z/VM
7.3

RSCS Networking Operation and Use

SC24-6319-73

Note:

Before you use this information and the product it supports, read the information in “Notices” on page 449.

This edition applies to version 7, release 3 of IBM® z/VM® (product number 5741-A09) and to all subsequent releases and modifications until otherwise indicated in new editions.

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About This Document

This document describes how to operate and use IBM Remote Spooling Communications Subsystem (RSCS) Networking for z/VM. It discusses RSCS operational tasks and provides reference information for RSCS commands and link operational parameters.

Intended Audience

This information is intended for anyone operating or using RSCS. You should be familiar with z/VM, IBM Systems Network Architecture (SNA), and TCP/IP concepts and terminology. z/VM, SNA, and TCP/IP are not discussed in detail, except when it is essential to the operation and use of RSCS.

Conventions

Some topics in this document refer to the RSCS installation user ID. The name of this user ID, which corresponds to the level of RSCS, is defined in the RSCS program directory.

Syntax, Message, and Response Conventions

The following topics provide information on the conventions used in syntax diagrams and in examples of messages and responses.

How to Read Syntax Diagrams

Special diagrams (often called *railroad tracks*) are used to show the syntax of external interfaces.

To read a syntax diagram, follow the path of the line. Read from left to right and top to bottom.

- The ►►—— symbol indicates the beginning of the syntax diagram.
- The ——► symbol, at the end of a line, indicates that the syntax diagram is continued on the next line.
- The ►—— symbol, at the beginning of a line, indicates that the syntax diagram is continued from the previous line.
- The ——►◄ symbol indicates the end of the syntax diagram.

Within the syntax diagram, items on the line are required, items below the line are optional, and items above the line are defaults. See the examples in Table 1 on page xv.

Table 1. Examples of Syntax Diagram Conventions

Syntax Diagram Convention	Example
Keywords and Constants A keyword or constant appears in uppercase letters. In this example, you must specify the item KEYWORD as shown. In most cases, you can specify a keyword or constant in uppercase letters, lowercase letters, or any combination. However, some applications may have additional conventions for using all-uppercase or all-lowercase.	►► KEYWORD ►◄

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Table 1. Examples of Syntax Diagram Conventions (continued)

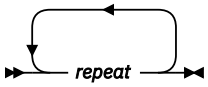
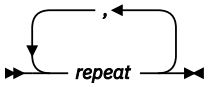
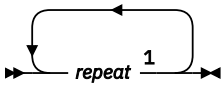
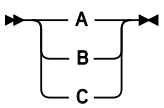
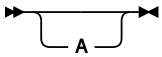
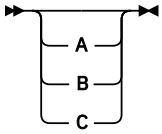
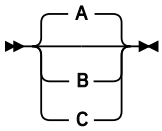
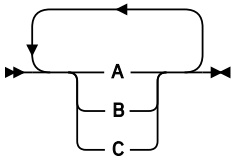
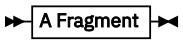
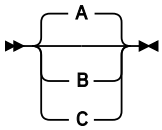
Syntax Diagram Convention	Example
Abbreviations Uppercase letters denote the shortest acceptable abbreviation of an item, and lowercase letters denote the part that can be omitted. If an item appears entirely in uppercase letters, it cannot be abbreviated. In this example, you can specify KEYWO, KEYWOR, or KEYWORD.	
Symbols You must specify these symbols exactly as they appear in the syntax diagram.	***** Asterisk **:** Colon **,** Comma **=** Equal Sign **-** Hyphen **()** Parentheses **.** Period
Variables A variable appears in highlighted lowercase, usually italics. In this example, *var_name* represents a variable that you must specify following KEYWORD.	
Repetitions An arrow returning to the left means that the item can be repeated. A character within the arrow means that you must separate each repetition of the item with that character. A number (1) by the arrow references a syntax note at the bottom of the diagram. The syntax note tells you how many times the item can be repeated. Syntax notes may also be used to explain other special aspects of the syntax.	   Notes: [1] Specify *repeat* up to 5 times.
Required Item or Choice When an item is on the line, it is required. In this example, you must specify A. When two or more items are in a stack and one of them is on the line, you must specify one item. In this example, you must choose A, B, or C.	 

Table 1. Examples of Syntax Diagram Conventions (continued)

Syntax Diagram Convention	Example
Optional Item or Choice When an item is below the line, it is optional. In this example, you can choose A or nothing at all. When two or more items are in a stack below the line, all of them are optional. In this example, you can choose A, B, C, or nothing at all.	 
Defaults When an item is above the line, it is the default. The system will use the default unless you override it. You can override the default by specifying an option from the stack below the line. In this example, A is the default. You can override A by choosing B or C.	
Repeatable Choice A stack of items followed by an arrow returning to the left means that you can select more than one item or, in some cases, repeat a single item. In this example, you can choose any combination of A, B, or C.	
Syntax Fragment Some diagrams, because of their length, must fragment the syntax. The fragment name appears between vertical bars in the diagram. The expanded fragment appears in the diagram after a heading with the same fragment name. In this example, the fragment is named "A Fragment."	 **A Fragment** 

Examples of Messages and Responses

Although most examples of messages and responses are shown exactly as they would appear, some content might depend on the specific situation. The following notation is used to show variable, optional, or alternative content:

xxx
Highlighted text (usually italics) indicates a variable that represents the data that will be displayed.

[ ]
Brackets enclose optional text that might be displayed.

{ }
Braces enclose alternative versions of text, one of which will be displayed.

|
The vertical bar separates items within brackets or braces.

...
The ellipsis indicates that the preceding item might be repeated. A vertical ellipsis indicates that the preceding line, or a variation of that line, might be repeated.

Where to Find More Information

For more information about RSCS and other z/VM topics, see the documents listed in “Bibliography” on page 453.

Links to Other Documents and Websites

The PDF version of this document contains links to other documents and websites. A link from this document to another document works only when both documents are in the same directory or database, and a link to a website works only if you have access to the Internet. A document link is to a specific edition. If a new edition of a linked document has been published since the publication of this document, the linked document might not be the latest edition.

How to Send Your Comments to IBM

We appreciate your input on this publication. Feel free to comment on the clarity, accuracy, and completeness of the information or give us any other feedback that you might have.

To send us your comments, go to z/VM Reader's Comment Form (https://www.ibm.com/systems/campaignmail/z/zvm/zvm-comments) and complete the form.

If You Have a Technical Problem

Do not use the feedback method. Instead, do one of the following:

- Contact your IBM service representative.
- Contact IBM technical support.
- See IBM: z/VM Support Resources (https://www.ibm.com/vm/service).
- Go to IBM Support Portal (https://www.ibm.com/support/entry/portal/Overview).

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Summary of Changes for z/VM: RSCS Networking Operation and Use

This information includes terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations for the current edition are indicated by a vertical line (**|**) to the left of the change.

SC24-6319-73, z/VM 7.3 (September 2022)

This edition supports the general availability of z/VM 7.3. Note that the publication number suffix (-73) indicates the z/VM release to which this edition applies.

SC24-6319-02, z/VM 7.2 (July 2021)

This edition includes terminology, maintenance, and editorial changes.

SC24-6319-02, z/VM 7.2 (September 2020)

This edition supports the general availability of z/VM 7.2.

SC24-6319-01, z/VM 7.1 (December 2018)

This edition includes changes to support product changes provided or announced after the general availability of z/VM 7.1.

[VM66174] Query RSCS Service Level

With the PTF for APAR VM66174, RSCS provides a SERVICE operand on the QUERY SYSTEM command to get information about the service level of each module in the running RSCS system. See "QUERY SYSTEM SERVICE" on page 248.

SC24-6319-00, z/VM 7.1 (September 2018)

This edition supports the general availability of z/VM 7.1.

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Part 1. Guide

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Chapter 1. Introduction

This chapter describes RSCS Networking and how it interacts with different types of users and with other products. For a general introduction to RSCS Networking, see *z/VM: RSCS Networking Planning and Configuration*.

RSCS Nodes and Links

RSCS is a special-purpose subsystem that lets you receive and send messages, files, commands, and jobs over a computer network. A *network* is any set of two or more devices (such as computers, workstations, or printers) that are linked so that data can be transmitted between them. A device is called a *node* when it is participating in a network. A *link* is the connection, or the ability to communicate, between two adjacent nodes in the network. Any two nodes in an RSCS network are considered to be *remote* from one another when they are physically separated and are connected only by one or more links.

Types of Nodes

A node is either a *system node* or a *station node*. A system node must be a computer; it can originate and receive information and can also relay it between two other nodes. A station node, however, can be a computer, a workstation, or a printer; it cannot relay information, but it can receive information and may be able to originate information.

RSCS can communicate with system nodes that are running under the control of a *network job entry (NJE)* compatible subsystem. NJE-compatible subsystems include:

- JES2 and JES3
- RSCS
- VSE/POWER
- AS/400 Communications Utilities
- Products that provide NJE functions for Linux® or AIX®

RSCS can communicate with station nodes that are:

- ASCII printers or plotters
- Computers running under the control of a system that can provide a *multi-leaving protocol*
- IBM 3270 Information Display System Printers or 3270-type printers
- Line printer daemons or clients
- Unsolicited file transfer (UFT) daemons or clients
- Workstations running under the control of *remote job entry (RJE)* protocol

RSCS also includes an optional facility called the RSCS Data Interchange Manager (RSCS Interchange), which handles the exchange of mail between NJE-compatible networks and networks that use Simple Mail Transfer Protocol (SMTP), such as an internet.

Types of Links

Each link has a name that can be the same as the name of the node at the other end of the link. Each link includes a programming routine, called a *link driver*, that manages the transmission and reception of files, messages, and commands over that link. The manner in which a driver manages the data is called a *protocol*. The driver that is used for a particular link depends on the hardware and protocol that is used on the node at the other end of the link.

Links can be divided into the following groups:

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- **Networking Links** connect two NJE-compatible system nodes. These are the GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links.
- **Workstation Links** connect a system node (or *host*) and a station node that is either a workstation or another computer acting as a workstation. These are the MRJE-type, RJE-type, and SNARJE-type links.
- **Printer Links** connect a system node and a station node, that is, an IBM 3270 printer or an ASCII printer or plotter. These are the ASCII-type, LPD-type, LPR-type, SNA3270P-type, TCPASCII-type, TN3270E-type, and 3270P-type links.
- **List Processor Links** provide a service that processes information to be distributed by the networking links. This is the LISTPROC-type link.
- **Notify Links** provide a service that generates and sends notes to users when RSCS discovers a problem with a file. (In this book, the service handles misdirected files in the network.) This is the NOTIFY-type link.
- **Unsolicited File Transfer (UFT) Links** connect a system node and a remote TCP/IP host for the purpose of transmitting a file using the UFT protocol. These are the UFT-type and UFTD-type links.

Table 2 on page 4 lists the different types of links and the type of communication that takes place over them.

Table 2. Link Types and Roles

Link Type	Remote Node and Kind of Communication
ASCII	ASCII printer or plotter using an ASCII control unit
GATEWAY	Installation-defined protocol
LISTPROC	List processor
LPD	Line printer daemon link that enables RSCS to receive print data streams from a line printer remote (LPR) client in a TCP/IP network
LPR	Routes print files to a line printer daemon in a TCP/IP network
MRJE	Multi-leaving RJE workstation using a binary synchronous communication (BSC) adapter
NJE	NJE system using a 3088 communication unit, channel-to-channel adapter (CTCA), IBM Enterprise Systems Connection Architecture (ESCON) CTCA, IBM Fibre Connection (FICON®) CTCA, or BSC adapter
NOTIFY	Note generator
RJE	RJE workstation using a BSC adapter
SNANJE	NJE system through VTAM®
SNARJE	RJE workstation through VTAM
SNA3270P	3270 printer through VTAM
TCPASCII	ASCII printer or plotter within a TCP/IP network
TCPNJE	NJE system within a TCP/IP network
TN3270E	Link to a TCP/IP attached 3270 printer
UFT	Link that enables RSCS to send data streams to a remote UFT daemon in a TCP/IP network
UFTD	Link that enables RSCS to receive data streams from a remote UFT client in a TCP/IP network
3270P	3270 printer, channel-attached or using a BSC adapter that is supported by the IBM VM/Pass-Through Facility (PVM) R3270 line driver

RSCS supports three types of connections:

- The SNANJE, SNARJE, and SNA3270P link drivers use Systems Network Architecture (SNA) protocols. These SNA links use VTAM to manage the physical transmission of data from its origin to its destination.
- On non-SNA links, such as BSC or CTC connections, RSCS itself manages the data transmission.
- The LPD-type, LPR-type, TCPASCII-type, TCPNJE-type, TN3270E-type, UFT-type, and UFTD-type links use TCP/IP connections. TCP/IP connections use sockets to establish the protocol layer to an IP network and to service the connections. The sockets also give RSCS information about the flow of data.

Attention
RSCS supports only IPv4 addressing; it does not support IPv6.

Networking Links

A networking link provides for communication between RSCS and one NJE-compatible subsystem.

GATEWAY-Type Link
Allows a connection to an NJE-compatible subsystem defined by your installation. For information about the gateway programming interface (GPI), see *z/VM: RSCS Networking Exit Customization*.

NJE-Type Link
Allows a connection through a BSC adapter, CTCA, ESCON or FICON CTCA, or 3088.

SNANJE-Type Link
Allows type 0 logical unit (LU_T0) sessions with SNA systems. An SNANJE link uses a full duplex protocol; that is, both session partners can simultaneously send and receive one or more data streams.

TCPNJE-Type Link
Allows a connection to an NJE peer within a TCP/IP network. Includes Linux, z/OS®, and z/VSE®.

Workstation Links

A workstation link provides communications with a single remote workstation.

MRJE-Type Link
Provides multi-leaving protocol either for a remote workstation or as a remote workstation. An MRJE link operates in one of four modes, which are specified when the link is started:

HOST
For a host to a remote entry workstation

JES2
As a remote entry workstation into a remote JES2 system

JES3
As a remote entry workstation into a remote JES3 system

RES
As a remote entry workstation into the Remote Entry Subsystem (RES) of OS/VS1

When an MRJE-type link is operating in HOST mode, it follows a common protocol for all remote stations. When acting as a host, an MRJE link can communicate to a workstation configuration having a maximum of one reader, one printer, and one punch. This allows for a single transmission stream (either print or punch output, depending on the current file being transmitted) to a remote workstation and the reception of a single input (job) stream from a remote workstation.

When acting as a workstation (in JES2, JES3, or RES mode), an MRJE link supports a single transmission stream (job) to a remote system and the simultaneous reception of one print output and one punch output stream from a remote system. When the link is acting as a workstation, virtual machine users can submit job streams to a remote batch system. Punch and printer output is returned over the link and is directed to the real printer and punch.

On a switched line, a dial-up procedure from either end of the line can establish the connection.

RJE-Type Link
Provides BSC line protocol only to a single remote workstation. When you start an RJE-type link, the line starts and RSCS gets information about the workstation type and configuration either from a signon card entered at the remote workstation or from any auto-signon operands (BUFF, CMPR, HDR, LPRT, PCH, PRINT, SYSTEM, TEXT, TRS, or TYPE) specified for the link. The workstation may then be used to submit files through its card reader and receive files on its punch and printer.

The remote workstation operator can control I/O activity using control cards and standard workstation procedures. Virtual machine users retrieve files sent to their virtual machines by using usual virtual card reader management programs; they direct output to the appropriate station by using the CP SPOOL and TAG commands.

An RJE-type link operates with variations of the basic BSC protocol, depending on the particular kind of workstation in use. The choice of protocol is based on the station identification information provided when you start the link (either by a signon card or by auto-signon operands).

SNARJE-Type Link
Provides a subset of the SNA LU_T1 protocol only to a single remote workstation (this protocol is defined in *Systems Network Architecture: Sessions Between Logical Units*). An SNARJE-type link transmits files between a host z/VM system and an SNA System/36 RJE workstation using LU_T1 sessions. The SNARJE-type link will send or receive data to or from the System/36 workstation and will allow temporary interruption of output transmission to receive data from the System/36 workstation. Only SNARJE output transmissions can be suspended. System/36 will not attempt to suspend its own output transmissions.

Transmissions over the SNARJE-type link can be sent or received in transparency mode. When in transparency mode, a X'35' control character, along with a length value, precedes the data stream being transmitted or received. The transparent data is then sent or received without any translation or conversion. You can specify transparency mode for output transmission on the link's PARM statement in the configuration file (described in *z/VM: RSCS Networking Planning and Configuration*) or on the DEFINE or START command for the link (see “SNARJE-Type Link Operational Parameters” on page 339). The SNARJE-type link can receive transparent data streams at any time.

Printer Links

A printer link communicates with an IBM 3270 printer, an ASCII printer or plotter, or a print daemon in a TCP/IP network.

ASCII-Type Link
Transmits data streams of ASCII characters and control sequences to ASCII printers and plotters connected to a host z/VM system using an IBM 7171 ASCII Device Attachment Control Unit. The control unit must support the "Hardcopy Transparent String request introducer" function as described in *IBM 7171 ASCII Device Attachment Control Unit Reference Manual and Programming Guide*. The ASCII-type link will drive ASCII devices connected to the 7171 control unit in transparent mode.

LPD-Type Link
Receives ASCII or binary data streams from an LPR client in a TCP/IP network. An LPD-type link handles one file at a time. However, you can send multiple files by creating several LPD-type links and defining them to use the same TCP/IP port number.

LPR-Type Link
Sends ASCII or binary data streams from RSCS to a line printer daemon in a TCP/IP network. An LPR-type link handles one file at a time. However, you can send multiple files by creating several LPR-type links and defining them as part of a routing group.

SNA3270P-Type Link
Transmits files from a host z/VM system to a 3270 printer through VTAM using types 0, 1, or 3 logical unit (LU_T0, LU_T1, or LU_T3) sessions. RSCS reads records from z/VM spool files, which contain virtual line printer (1403 or similar) output, and builds one of the following data streams, which are then passed to VTAM for transmission to the printer.

Session	Data Stream
LU_T1	SNA Character String (SCS)
LU_T0 or LU_T3	SNA3270 data stream

An SNA3270P-type link also permits production of the following types of output.

Session	Output
LU_T0 or LU_T1	Intelligent Printer Data Stream (IPDS) output from GDDM or PSF/VM
LU_T0 or LU_T3	Extended 3270 data stream output from GDDM

LU_T0 Sessions
Permit communications with non-SNA 3270 printers and control units that are attached to VTAM. Definition of a printer for LU_T0 sessions is intended for Graphical Data Display Manager (GDDM) Extended 3270 data stream output and for older printers that are not capable of higher-speed LU_T1 sessions.

LU_T1 Sessions
Support only those printers having the SNA Character String (SCS) feature. You can specify the type of session for a particular printer using a logon mode table entry; LU_T1 is recommended, whenever possible. All 3270 printers in current production are capable of communicating to RSCS using LU_T1 sessions. The SCS data stream and SNA protocols used in LU_T1 sessions permit more efficient operation of the printer, allowing it to perform closer to rated speed (lines per minute) than when supported by LU_T0 and LU_T3 sessions. Also, the control panel keys on the printer (see "Printer Key Support in an LU_T1 Session" on page 56) are supported only in LU_T1 mode.

Note: RSCS does not request a definite response from printers defined using LU_T1 sessions until the printer reaches the end of the file. If a problem arises (intervention required) while a file is printing, RSCS must requeue and resend the entire file. If you want the printer to resume printing from the point at which it left off, define the printer using an LU_T0 or LU_T3 session. RSCS requests a definite response from printers defined using LU_T0 and LU_T3 sessions after each buffer. This means RSCS knows which buffer was printed last and can resume printing from that point.

LU_T3 Sessions
Allow communications with SNA 3270 printers that do not have the SCS feature. Definition of a printer for LU_T3 sessions is intended for GDDM Extended 3270 data stream output and for older printers that are not capable of higher-speed LU_T1 sessions.

See *z/VM: RSCS Networking Planning and Configuration* for an example of a logon mode table.

TCPASCII-Type Link
Transmits data streams of ASCII characters and control sequences to ASCII printers and plotters that are attached to a terminal server within a TCP/IP network.

3270P-Type Link
Transmits files from a host z/VM system to a 3270 printer, which can be channel-attached locally or remotely through a BSC adapter that is supported by the PVM R3270 line driver. A 3270P-type link converts z/VM spool files, which contain virtual line printer (1403 or similar) output, to 3270 data streams before transmitting them to the printer. A 3270P-type link also permits production of GDDM Extended 3270 data stream output or IPDS output through GDDM or PSF/VM (Print Services Facility/VM).

TN3270E-Type Link
Transmits files from a host z/VM system to a 3270 printer attached within a TCP/IP network. A TN3270E-type link converts z/VM spool files, which contain virtual line printer (1403 or similar) output, to 3270 data streams before transmitting them to the printer. A TN3270E-type link also permits production of GDDM Extended 3270 data stream output or IPDS output through GDDM or PSF/VM.

List Processor Links

A list processor (LISTPROC-type) link processes a spool file containing a list of destinations. The objective is to send the file over a network to the destinations listed in the distribution list using the minimum number of copies of the file.

Notify Links

A notify (NOTIFY-type) link carries out three basic tasks:

- Creating notes
- Holding files
- Purging files

Your installation can use a NOTIFY-type link to store problem files, create notes to users about the files, and purge the files. This document, for example, shows how a NOTIFY-type link can store files that are either destined for an unknown user or an unknown node. When you find a misdirected file, queue it to a NOTIFY-type link. The link uses a note template provided by your installation to create the note. Based on the information in the template, the link sends the note to the appropriate person (or persons), usually the originating user. The user can choose to transfer the file, purge the file, or take no action. If the user does nothing, the NOTIFY-type link will eventually purge the file.

Unsolicited File Transfer Links

A UFT-type link sends data streams from RSCS to a UFT daemon. A UFTD-type link receives data streams from a UFT client in a TCP/IP network. These links handle one file at a time. However, you can send multiple files by creating several UFT-type links and define them as part of a routing group. You can receive multiple files by creating several UFTD-type links and define them to use the same TCP/IP port number. The data can be in ASCII, EBCDIC, binary, or NETDATA format.

How RSCS Works

RSCS sends and receives data in a computer network. When you begin RSCS, you are giving it information about your local node and its view of the network. RSCS finds most of this information in the *RSCS configuration file*, which contains information such as:

- Name by which your node is known to other nodes in the network
- Names and characteristics of each link
- Virtual addresses of your node's telecommunication ports
- First links to be used in routing files to indirect nodes
- Authorization of RSCS operators

For more information on the RSCS configuration file and how to specify its contents, see *z/VM: RSCS Networking Planning and Configuration*.

While processing the information in the configuration file, RSCS builds internal tables and data structures to store the information. For example, RSCS builds link and route tables during initialization. The link table stores information about all adjacent nodes that are directly connected to your local node. RSCS uses the information in the link table to determine which transmission method to use.

The route table stores information about routes to nonadjacent nodes. RSCS associates each nonadjacent node with one or more links. After receiving information destined for a nonadjacent node, RSCS uses the information in the route table to send the information one step closer to its final destination.

RSCS Domain Name Server

The RSCS domain name server (RSCSDNS) is an optional facility that does domain name system (DNS) searches on behalf of RSCS, translating fully qualified host names to dotted decimal IP addresses in a TCP/IP network. RSCSDNS listens on a TCP/IP port for a connect request from RSCS. When a connect

request is received, RSCSDNS reads the fully qualified host name sent by the RSCS server, issues the DNS search, and returns the dotted decimal IP address to the RSCS server.

Attention
RSCS supports only IPv4 addressing; it does not support IPv6.

RSCSDNS is required when the HOSTNAME parameter is used with LPR-type, TCPASCII-type, TCPNJE-type, and UFT-type links.

For information about setting up RSCSDNS, see *z/VM: RSCS Networking Planning and Configuration*.

For information about running RSCSDNS, see Chapter 9, "Running the RSCS Domain Name Server," on page 103.

RSCS Dynamic Authorization Server

The RSCS dynamic authorization (RSCSAUTH) server is an optional facility that handles user authorizations for RSCS commands and links outside of the RSCS configuration file. RSCSAUTH maintains the authorizations in a set of tables. You can add, change, or remove authorizations dynamically, without restarting the RSCSAUTH server or the RSCS server.

Users authorized through RSCSAUTH send their command requests to the RSCSAUTH server for processing instead of the RSCS server.

Authorizations defined through RSCSAUTH can coexist with authorizations defined in the RSCS configuration file. A user can be authorized using either method or both.

The RSCSAUTH configuration file contains information such as:

- User ID of the RSCSAUTH administrator
- File mode where the RSCSAUTH files are maintained
- Node where the RSCS server is running

For more information on all RSCSAUTH configuration options, see *z/VM: RSCS Networking Planning and Configuration*.

For more information about operating and using RSCSAUTH, see Chapter 10, "Using RSCS Dynamic Authorization," on page 105.

RSCS Data Interchange Manager

The RSCS Data Interchange Manager (RSCS Interchange) is an optional facility that handles communications between NJE networks and SMTP networks. Although NJE networks and SMTP networks have different mail formats, RSCS Interchange allows users in these networks to communicate with each other using their usual method of sending notes.

RSCS Interchange uses a nickname table to identify SMTP users and their addresses.

The RSCS Interchange configuration file contains information such as:

- Identification of the RSCS Interchange server to the SMTP virtual machine
- SMTP domain in which RSCS Interchange, SMTP, and the domain name server communicate
- Identification of the RSCS virtual machine to RSCS Interchange

For more information on the RSCS Interchange configuration file and how to specify its contents, see *z/VM: RSCS Networking Planning and Configuration*.

For information about operating and using RSCS Interchange, see Chapter 11, "Using the RSCS Data Interchange Manager," on page 117.

People Who Use RSCS

People who use RSCS fall into three categories: general users, users authorized through RSCSAUTH, and operators.

General Users

Many RSCS users are not aware that they are using RSCS because they use RSCS indirectly. When a z/VM user enters a TELL, NOTE, or SENDFILE command and the destination is not the local system, CMS calls on RSCS to send the data. These z/VM commands that use RSCS do not require you to know very much about RSCS.

However, if you are interested in making the network do more work for you, you can use RSCS commands to send messages and to inquire about the state of specific files, links, and systems. You also can control files that you have given to RSCS for transmission over the network or files RSCS is transmitting to you, by using the file control commands CHANGE, FLUSH, PURGE, and TRANSFER.

Users Authorized through RSCSAUTH

If the RSCSAUTH server is set up on your system, users do not need to be operators (authorized through the RSCS configuration file) to issue RSCS commands. The RSCSAUTH administrator can authorize users to issue RSCS and RSCSAUTH commands through the RSCSAUTH server. Any user who is authorized to issue RSCSAUTH commands can authorize other users for RSCS and RSCAUTH commands and RSCS links through the same RSCSAUTH server. Users can be authorized for specific commands or all commands, and for specific links or all links.

A user who is authorized for an RSCS command through RSCSAUTH has authority for that command equivalent to an operator. However, if the command requires a link, the user must also be authorized through RSCSAUTH for the link.

A user who is authorized for a link through RSCSAUTH has authority for that link equivalent to an operator. However, the user must also be authorized through RSCSAUTH for commands that use the link.

Operators

There are several types of RSCS operators, which are defined by their authority level and the type of work they do. One person may perform several roles.

RSCS recognizes the following types of operators:

RSCS Console Operator
: This is the person logged on to the RSCS virtual machine. This person has unlimited control over the local RSCS node, with one exception: the console operator cannot use the SET command to subscribe messages to the RSCS console. The RSCS console receives three messages for every file sent and three messages for every file received. For high traffic nodes, the RSCS console is constantly receiving messages, making it difficult for a dedicated operator to work. Therefore, not too many installations have a dedicated RSCS console operator. Instead, most installations leave RSCS as a disconnected virtual machine and authorize several users as system-authorized alternate operators.

System-Authorized Alternate Operator
: This person has unlimited control over the local RSCS node, with one exception: a system-authorized alternate operator cannot issue the INIT command, which can be issued only by the console operator. To authorize a system-authorized alternate operator, specify an AUTH statement in your RSCS configuration file before initialization.

  Note: You cannot authorize the same virtual machine to be both a system-authorized alternate operator and a link-authorized alternate operator.

Link-Authorized Alternate Operator
: This person is authorized to control a single link and the information that passes over that link to and from a single workstation or printer. To authorize a link-authorized alternate operator, specify an AUTH statement in your RSCS configuration file before initialization.

Note: You cannot authorize the same virtual machine to be both a link-authorized alternate operator and a system-authorized alternate operator.

Link operators usually are also workstation or printer operators but have added capability. Depending on the particular model of workstation or printer in use, its operator may have little or no ability to communicate with RSCS. However, if operators are also link operators, they can easily process commands and have almost as much ability to control the link and the information that passes over it as the local RSCS operator does. For a list of the commands that can be used by workstation operators and link-authorized alternate operators, see Table 9 on page 130.

Remote Workstation Operator
This person controls a remote workstation that is part of the RSCS network. That is, the remote workstation is a separate remote node and is connected to the local node by an RSCS link.

RSCSAUTH Console Operator
This is the person logged on to the RSCSAUTH server virtual machine. This person has unlimited control over the server. As the RSCSAUTH server is intended to be run disconnected, server operation will generally be handled by the RSCSAUTH administrator.

RSCSAUTH Administrator
This person is fully authorized for the local RSCSAUTH server. This person has unlimited control over the server. The RSCSAUTH administrator is specified on the AUTHUSER statement in the RSCSAUTH configuration file before initialization.

XCHANGE Console Operator
This is the person logged on to the RSCS Interchange server (XCHANGE) virtual machine. This person has unlimited control over the server. As the RSCS Interchange server is intended to be run disconnected, server operation will generally be handled by RSCS Interchange privileged users.

RSCS Interchange Privileged User
This person is authorized to issue privileged RSCS Interchange commands. To authorize an RSCS Interchange privileged user, specify an AUTHORIZE statement in your RSCS Interchange configuration file before initialization. After initialization, you can authorize a privileged user on a temporary basis by using the RSCS Interchange ADDPRIV command.

RSCSDNS Console Operator
This is the person logged on to the RSCSDNS server virtual machine. This person has unlimited control over the server. As the RSCSDNS server is intended to be run disconnected, no operational maintenance is required, and RSCSDNS does not provide support for privileged operators.

Entering RSCS Commands

When you enter a command on a z/VM system, z/VM assumes it is a CP, CMS, or GCS command. To make sure that z/VM knows the command is an RSCS command, you must preface the RSCS command with a special character string. Table 3 on page 11 lists the types of RSCS commands and shows what character string each user type must use to enter them. For more information, see:

- Chapter 12, “RSCS Commands,” on page 127
- “Using RSCSAUTH Commands” on page 377
- “Rules for Using RSCS Interchange Commands” on page 389

Table 3. Entering RSCS Commands

Type of command / user:	Use the following character string:
RSCS Commands	
General user	SMSG *rscsid*
Link-authorized alternate operator	SMSG *rscsid*
Remote workstation operator	—
RSCS console operator	RSCS

Table 3. Entering RSCS Commands (continued)

Type of command / user:	Use the following character string:
System-authorized alternate operator	SMSG *rscsid*
Local user authorized through RSCSAUTH	SMSG *rscsauthid*
Remote user authorized through RSCSAUTH	TELL *rscsauthid* at *node*
RSCSAUTH Commands	
Local authorized user	SMSG *rscsauthid*
Remote authorized user	TELL *rscsauthid* at *node*
RSCSAUTH console operator	—
RSCS Interchange Commands	
Local privileged user	SMSG *rscsintid*
RSCS Interchange console operator	—
RSCSDNS Commands	
RSCSDNS console operator	—

Note:

1. *rscsid* is the name of your local RSCS virtual machine.
2. Remote workstation operators do not have to preface RSCS commands. However, remote workstation operators cannot be link-authorized.
3. *rscsauthid* is the name of the RSCSAUTH server. Users authorized through RSCSAUTH must address commands to the RSCSAUTH server instead of the RSCS server.
4. *rscsintid* is the name of the RSCS Interchange server.
5. RSCSAUTH, RSCS Interchange, and RSCSDNS console operators do not need to preface their server commands.

Most examples in this document assume that the RSCS server is called RSCS, and therefore show each RSCS command prefaced with:

```
smsg rscs
```

However, if you are the RSCS console operator or a remote workstation operator, be aware that you should use an alternate format when entering any of the sample commands in this document.

The sample messages shown in this document may differ slightly from those produced at your local RSCS system. The sample messages in this document show what a message would look like if your local system had issued the CP SET EMSG ON command.

Getting Help for RSCS Commands

RSCS provides online Help panels for RSCS commands and messages, which can be viewed by issuing the CMS HELP command. These Help panels are available to any CMS user and are available to RSCS operators and alternate authorized operators through z/VM user IDs.

To display Help information for RSCS, enter one of the following commands:

Type of Information	HELP Command	Example
Specific RSCS command	`help rscs` *`command`*	`help rscs start`
Menu of RSCS commands	`help rscs menu`	

Type of Information	HELP Command	Example
Specific RSCS QUERY command	`help rquery` *`command`*	`help rquery system`
Menu of RSCS QUERY commands	`help rquery menu`	
Specific RSCS subcommand used with the Dump Viewing Facility	`help rdvf` *`subcommand`*	`help rdvf cvt`
Menu of RSCS subcommands used with the Dump Viewing Facility	`help rdvf menu`	
Specific RSCSAUTH command	`help rscsauth` *`command`*	`help rscsauth userauth`
Menu of RSCSAUTH commands	`help rscsauth menu`	
Specific RSCS Interchange command	`help inch` *`command`*	`help inch qnick`
Menu of RSCS Interchange commands	`help inch menu`	

Specific RSCS, RSCSAUTH, or RSCS Interchange message	`help message` *`message_ID`*
	or
	`help msg` *`message_ID`*
	or
	`help` *`message_ID`*
		`help message dmt101i`
		
		`help msg dmt101i`
		
		`help dmt101i`

Notes:

1. Each RSCS Help menu contains links to the other RSCS Help menus.
2. You can specify an RSCS or RSCSAUTH message ID in any of these formats:

```
DMTmmmnnnt
DMTmmmnnnnt
DMTnnnt
DMTnnnnt
```

   mmm
   is the module identifier. You can specify or omit this identifier; it is ignored by Help.

   nnnt
   nnnnt
   is the message number and type.

3. When you specify an RSCS Interchange message ID, you must omit the 2-character module identifier:

```
ACHAnnnt
```

4. For more information about CMS HELP command syntax, including options you can specify, see *z/VM: CMS Commands and Utilities Reference*.

Accounting Records

Your RSCS virtual machine might be set up to generate accounting records for various RSCS operations. The RSCS Data Interchange Manager can also be set up to generate accounting records. The accounting records are then passed to CP to include in the accounting log. For information about setting up the RSCS and RSCS Interchange virtual machines to enable the generation of accounting records, see *z/VM: RSCS Networking Planning and Configuration*.

If the virtual machine has been set up to enable the generation of accounting records, exit routines must be coded into RSCS or RSCS Interchange to gather the accounting information and generate the accounting records. For information about creating exit routines, see *z/VM: RSCS Networking Exit*

Customization. The exit routines must also be defined on the EXIT configuration statement for RSCS or RSCS Interchange. For more information, see *z/VM: RSCS Networking Planning and Configuration*.

Chapter 2. Sending Information to a Remote Location

This chapter explains how to use RSCS to send information to a remote destination. RSCS lets you send messages, commands, files, jobs, and output across the network. For RSCS to work, you must supply the destination and the item to be sent.

Sending Commands to a Remote Location

Use the CP SMSG and RSCS CMD commands to pass RSCS commands destined for a remote node:

```
SMSG RSCS CMD LONDON CPQUERY TIME
```

In this example, RSCS is the name of your local RSCS virtual machine and LONDON is the destination node. (If you do not know the name of your local RSCS virtual machine, use the CMS IDENTIFY command.)

For more information about the CP SMSG command, see "SMSG" on page 408. For more information about the RSCS CMD command, see "CMD" on page 142. For more information about the CMS IDENTIFY command, see *z/VM: CMS Commands and Utilities Reference*.

Sending Messages to a Remote Location

RSCS handles message traffic between your local node and a remote node. CP handles message traffic between local users (unless users specify they want RSCS to handle local traffic).

The CP SMSG (Special Message) command passes a command to RSCS, which transmits it over the network and processes it at a remote node. If you use the RSCS MSG command in combination with the CP SMSG command, RSCS delivers the message text to the specified node ID and user ID:

```
SMSG RSCS MSG LONDON TASKER Are you coming to Boston for the meeting?
```

In this example, RSCS is the name of your local RSCS virtual machine, LONDON is the remote node ID, and TASKER is the user ID of the person to receive the message. (If you do not know the name of your local RSCS virtual machine, use the CMS IDENTIFY command.)

You can also use the CMS TELL command to send a message to a remote location:

```
TELL TASKER AT LONDON Are you coming to Boston for the meeting?
TELL MARTIN Are you coming to Boston for the meeting?
```

The first example specifies the remote user ID and node ID. The second example assumes that you have added an entry to your NAMES file that looks something like this:

```
:nick.MARTIN     :userid.TASKER     :node.LONDON
```

For more information about the CP SMSG command, see "SMSG" on page 408. For more information about the RSCS MSG command, see "MSG" on page 179. For more information about the CMS TELL command, see *z/VM: CMS Commands and Utilities Reference*.

Sending Files to a Remote Location

RSCS handles file traffic between your local node and a remote node. To send a file to a remote node, you must:

1. Use the TAG command to place the destination node ID and user ID in the spool file tag record.
2. Use the SPOOL command to direct the output of your virtual printer or punch to RSCS's virtual reader.
3. Use the PRINT, PUNCH, or DISK DUMP command to send the file to the remote location.

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For example:

```
TAG DEV PUNCH BOSTON TAVAKOLI
SPOOL PUNCH TO RSCS
DISK DUMP PLANZ SCRIPT
Ready;
PUN FILE 1234 TO RSCS COPY 001 NOHOLD
From BOSTON: File (1234) spooled to TAVAKOLI -- origin NEWYORK(DIPPER) 07/10/95 15:54:45 EDT
```

In this example, BOSTON is the destination node ID, TAVAKOLI is the user ID of the person to receive the file, RSCS is the name of your local RSCS virtual machine, and PLANZ SCRIPT is the file name and file type of the file you are sending.

You can also use the CMS SENDFILE command to send the file:

```
SENDFILE PLANZ SCRIPT OLIVER
```

This example assumes you have added an entry to your NAMES file that looks something like this:

```
:nick.OLIVER     :userid.TAVAKOLI     :node.BOSTON
```

For either example, RSCS finds the file in its virtual reader, notes the destination in the spool file tag record, and transmits it over the first link on the path to the file's destination (CHICAGO).

For more information about the TAG command, see “TAG” on page 416. For more information about the SPOOL command, see “SPOOL” on page 409.

You can use the PPS command to send a file to a LPR-type or TCPASCII-type link for printing. The file can be plain text or Adobe PostScript. For more information, see “PPS EXEC” on page 430 and “PPS XEDIT” on page 437. In addition, you can use the asynchronous option of the TCP/IP LPR command to send files to an RSCS LPR-type link.

Spool File Identifiers

In the example above, the first message received after you issue the TAG, SPOOL, and DISK DUMP commands tells you the origin spool ID of the file being sent (1234). This is the number your local node assigned to your file when it was transmitted. The other message encloses the origin spool ID in parentheses and inserts another number before the origin spool ID. Each intermediate node temporarily assigns its own spool ID to your file while your file is at that node. This new number is called the current spool ID.

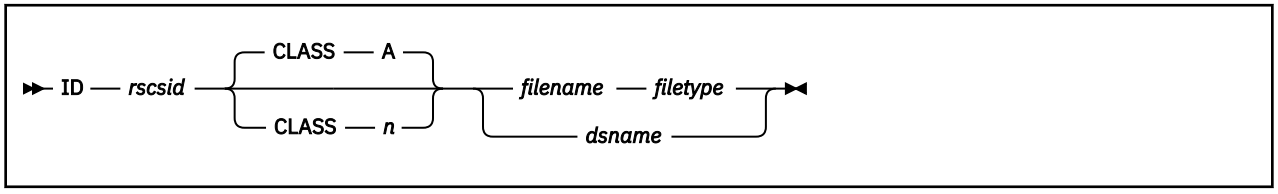
You can use these spool IDs when querying your files and when manipulating your files using the CHANGE, FLUSH, PURGE, or TRANSFER commands.

Using the z/VM Real Card Reader

Most of the examples in this document deal with transmitting a file or job that was originally stored as a CMS file. You can also use the z/VM real card reader to submit a file or job to RSCS for transmission. Each card deck must be preceded by:

1. An ID card (in place of a SPOOL command) to direct the deck to the RSCS virtual machine, and
2. A *tag text* card (in place of a TAG command) to specify the deck's destination.

Punching starts in card column 1 and all fields are separated by at least one blank column. The format of the ID card is:



ID
is a mandatory keyword.

rscsid
is the user ID of your local RSCS virtual machine.

CLASS A
CLASS *n*
specifies the file class, where *n* is any alphanumeric character in the range A to Z or 0 to 9. The default is A.

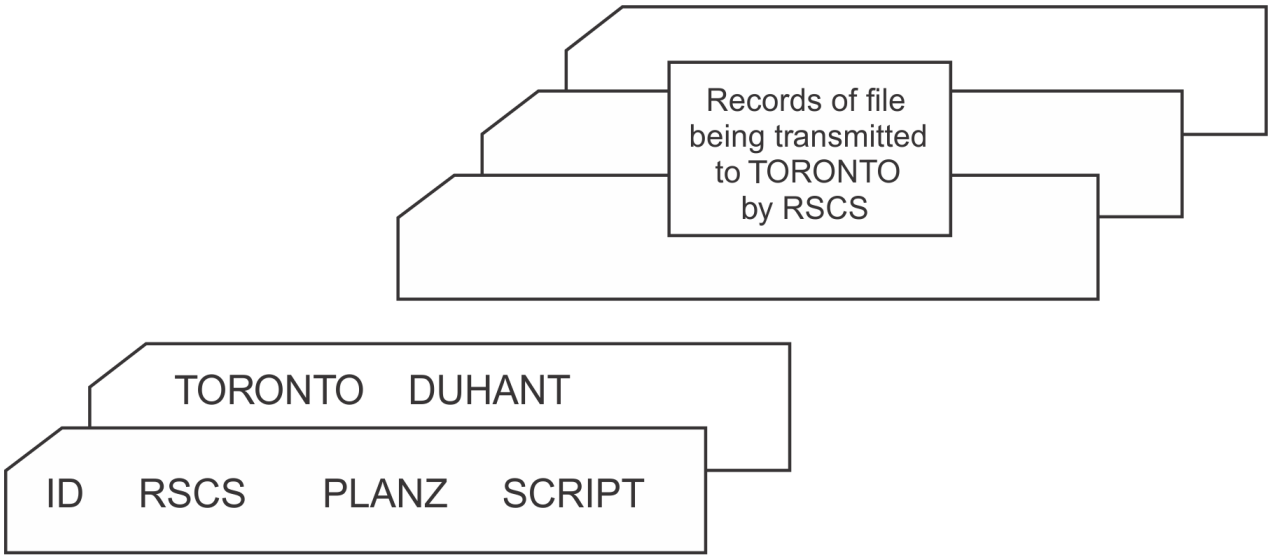
filename filetype
is the file name and file type of the file being transmitted.

dsname
is the data set name of the file being transmitted.

The second card tells RSCS the destination (the remote node and user) of the file. This card is called the tag text card, as it contains the tag text portion of the CP TAG.

```
tag text ...
```

For example, suppose you wanted to submit a file named PLANZ SCRIPT through the z/VM real card reader to user DUHANT at the TORONTO node. Assuming the user ID of your local RSCS virtual machine is RSCS, the following diagram shows what your text deck might look like.



If you want to submit a job to the TORONTO node instead of a file, you would include the keyword JOB on your tag text card in place of the user ID.

For more information about the ID card, see *z/VM: CMS Application Development Guide*. For more information about the TAG command, see "TAG" on page 416.

Using a List Processor to Send Files

A list processor is a special service link that processes files with distribution lists. Suppose you need to send a file to five people. Normally, you would use the CMS SENDFILE command to send one copy of the file to each of the five people:

```
SENDFILE STATUS REPORT TO AJ LEE MARTIN MATT OLIVER
```

This means there are five copies of STATUS REPORT in the network:

```
SMSG RSCS QUERY QUEUES
Ready;
 Pos   Loc      Origin         Destination     Link
 in Q   ID Node     Userid   Node     Userid   Queue    Status
```

```
    0 1003 NEWYORK  KATHYB   NYDEVSYS ACITELLI BB3      sending
    1 1010 NEWYORK  KATHYB   NYDEVSYS OHARE    BB3      waiting
    2 1016 NEWYORK  KATHYB   LONDON   TASKER   BB3      waiting
    3 1021 NEWYORK  KATHYB   NYDEVSYS MCKRELL  BB3      waiting
    4 1025 NEWYORK  KATHYB   BOSTON   TAVAKOLI BB3      waiting
 5 files found
```

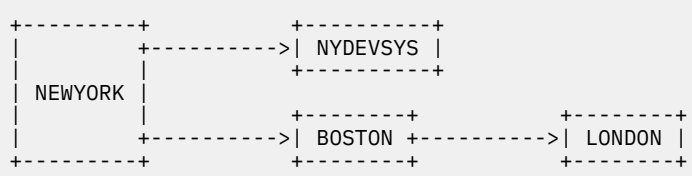
If you wanted to ask one or two people to review a specific section of the report, you would have to send one (or more) notes, thus increasing the number of files in the network. When many people throughout your network send files in this manner, your network file queues can fill up rather quickly.

The list processor handles file traffic more efficiently. Instead of sending one file to each person, you send one file (containing a distribution list) to the list processor. The easiest way to send such a file is using one of the sample programs shipped on the RSCS base tape: SENDLIST or PROFLIST. For example:

```
SENDLIST STATUS REPORT TO AJ LEE MARTIN MATT OLIVER (FORCE
```

The FORCE option tells RSCS to send the file to the list processor. If you do not specify the name of the list processor, SENDLIST assumes the name is *LIST. In this document, *LIST is used as the node ID and link ID of the list processor. If your list processor has a different name, you can use the LISTNODE option to specify the name of your list processor. (For more information about the SENDLIST sample program, see the associated Help file, SENDLIST HELPCMS.)

When the list processor receives your file, it looks at the distribution list and decides the optimum number of copies of the file to send to the next destination in the network. For example, suppose you were at node NEWYORK which has a list processor called *LIST and your network looked like this:



If you used the preceding SENDLIST command, the list processor would split your file into two files:

Destination Location	Destination User	Number of Data Set Headers	Distribution List
NYDEVSYS	*MULTI*	3	ACITELLI at NYDEVSYS OHARE at NYDEVSYS MCKRELL at NYDEVSYS
BOSTON	*MULTI*	2	TASKER at LONDON TAVAKOLI at BOSTON

If the file contains data set headers for more than one node, the destination location is the link ID over which RSCS is sending the file and the destination user is *MULTI*, which means the file has a distribution list (multiple data set headers). If the file contains data set headers destined for the same node, the destination location is the target node ID and the destination user is *MULTI*. If there is only one data set header in the file, the destination location is the target node ID and the destination user is the target user ID.

Once the NYDEVSYS *MULTI* file reaches node NYDEVSYS, RSCS splits it into three files, one for each user at NYDEVSYS. Once the BOSTON *MULTI* file reaches node BOSTON, the list processor splits it into two files, one for TAVAKOLI at node BOSTON and one for TASKER at node LONDON. Because the file destined for LONDON is only destined to one person, it is not a *MULTI* file. Here is your network with the files being sent:

Therefore, instead of sending five individual files throughout the network, you sent three: one to NYDEVSYS, one to BOSTON, and one from BOSTON to LONDON. The longer your distribution list, the more you save using the list processor.

Understanding the Format of a List Processor File

If you decide not to use one of the two sample programs, SENDLIST or PROFLIST, you must build your own file to send to the list processor. The file must have the following format:

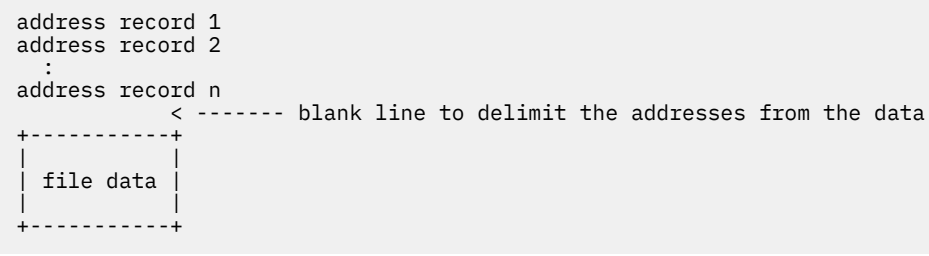


Figure 1. Format of a List Processor File

Until it meets the blank line, the list processor assumes each line is an address record. From that point, it assumes all records are file data until it reaches the end of the file. File data can be either a print or punch file.

Each address record has the same format as the CP TAG command, with two exceptions:

1. An optional count field number is available.
2. The BLDG, DEPT, JOBNAME, PGRNAME, and ROOM link options for printed output to an NJE system are not available.

(For a complete description of the CP TAG command, see “TAG” on page 416.)

The address record has the following format:

```
[count] nodeid [userid [priority [options]]]
[count records-of-data]
```

The optional count field at the beginning of the address record tells RSCS that you have one or more lines of personal data for the user specified in the address record. The count value can be 0 - 999999 and tells RSCS the number of lines that should be sent exclusively to the specified user. For example, if the personal message was three lines long, the count field would also be 3.

If you use the count field, you must place all the address records containing counts at the ***beginning*** of the list.

A Note about Duplicate Address Records
If you have duplicate entries in the distribution list, the list processor sends an unpredictable number of copies of the file to the specified destination. If you have duplicate entries in the distribution list of a print file destined for a z/OS system, the list processor groups the copies in an unpredictable manner.

Suppose you are on node NEWYORK and you want to send a status report to the following users on the following systems:

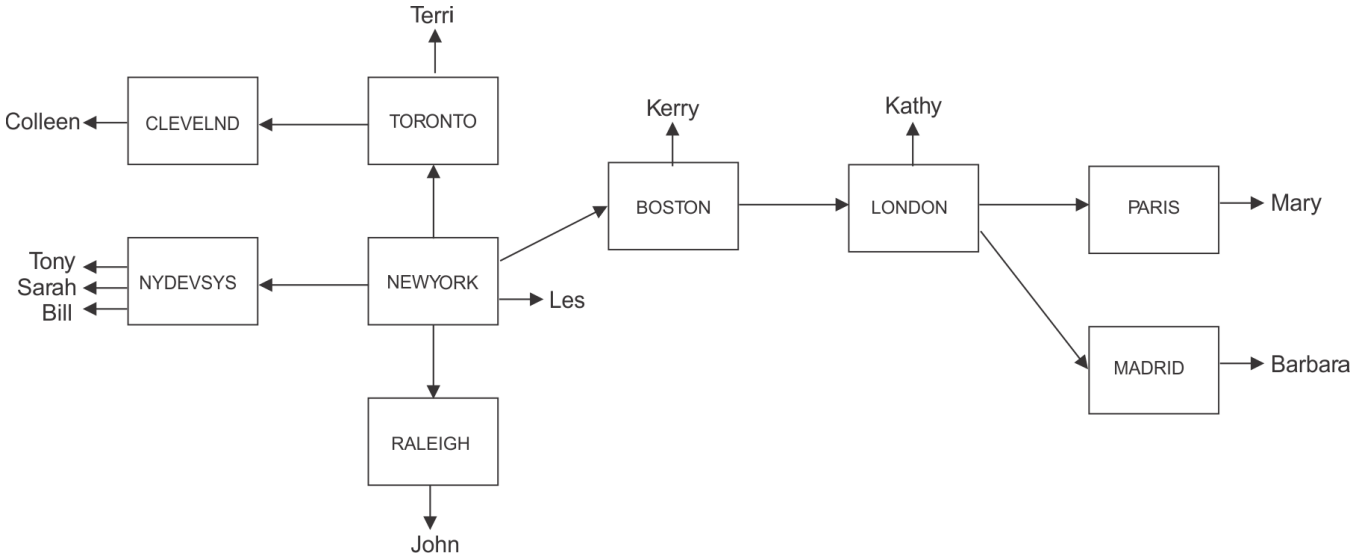


Figure 2. Example of a File Fanning Out over a Network

Your distribution list might look like this:

```
3 nydevsys bill 50 (sentmsg=no finalmsg=no Bill,
Please handle the outstanding work items
listed on page 6.
5 boston kerry 50 (finalmsg=no
Kerry,
Please represent me at the next meeting.
See page 17 for the time and place.  See
me tomorrow for the agenda.  Thanks!  I
owe you one!
1 london kathy
You are mentioned on page 3.
clevelnd colleen
madrid barbara
nydevsys tony 40 (sentmsg=no finalmsg=no
nydevsys sarah 40 (sentmsg=no finalmsg=no
newyork les
paris mary
raleigh john
toronto terri
```

Suppose you named this file DIST LIST, and you included a blank line as the last line of the file. To send the STATUS REPORT file to the destinations in DIST LIST, enter the following commands:

```
CP SPOOL PUN CONT TO RSCS
CP TAG DEV PUN *LIST
PUNCH DIST LIST (NOH
PUNCH STATUS REPORT
CP SPOOL PUN NOCONT CLOSE
```

The second command CP TAG DEV PUN *LIST tags the file to the special link ID defined for the list processor. If there was no list processor on the local system, you would have to specify *nodeid* *LIST (where *nodeid* is the name of the remote system that has a list processor).

The list processor at NEWYORK *LIST makes five copies of the file. One copy (NYDEVSYS *MULTI*) with three data set headers goes to node NYDEVSYS. On arrival at node NYDEVSYS, RSCS splits the file into three copies for Tony, Sarah, and Bill.

A second copy (TORONTO *MULTI*) with two data set headers goes to node TORONTO. On arrival at node TORONTO, RSCS splits the file into two copies. One copy goes to Terri and the other copy (CLEVELND COLLEEN) goes to node CLEVELND.

A third copy (BOSTON *MULTI*) with four data set headers goes to node BOSTON. On arrival at node BOSTON, RSCS splits the file into two copies. One copy goes to Kerry and the other copy (LONDON *MULTI*) with three data set headers goes to node LONDON. On arrival at node LONDON, RSCS splits the

file into three copies. One copy goes to Kathy, another copy (PARIS MARY) with one data set header goes to node PARIS, and the third copy (MADRID BARBARA) with one data set header goes to node MADRID.

The fourth copy of the original file goes to Les at the local NEWYORK node. The fifth (and final) copy of the original file (RALEIGH JOHN) with one data set header goes to node RALEIGH. So, instead of sending 11 files and 3 notes over the network, you sent 9 files.

Special Situations

In an ideal world, your network has a list processor defined at every node. In the real world, networks are made up of an assortment of networking products with different capabilities. Even if your network has RSCS on every node, those nodes might have different releases or levels of RSCS. The following sections address special situations you may have in your network.

Nodes without List Processor Support

Systems without list processors cannot handle files with an unlimited number of data set headers (large distribution lists). They have a limited capability to optimize the number of copies of a multiple data set header file. To overcome this limitation, you can use your list processor to divide the file into portions the other system can handle.

If you have a list processor defined and a GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type link defined to the system without a list processor, you can specify the MAXDSH operand. This operand tells RSCS the maximum number of data set headers the other system can handle in one file. When RSCS meets a file with too many data set headers for the other system, RSCS sends portions of the file over the link. Thus, your RSCS system is helping to prevent a system problem (caused by lack of URO devices) on the system without a list processor.

For more information about the MAXDSH operand, see the descriptions of the operands for GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type links in Chapter 13, “Link Operational Parameters,” on page 293.

Assigning Unit Record Output Devices to Your Networking Links

When a file comes in with multiple data set headers, RSCS must make a copy of the file for each user on the local system and for each link over which RSCS must send a copy of the file. For each copy, RSCS needs one unit record output (URO) device. If the file has a large distribution list or several files with distribution lists arrive at the same time, RSCS can quickly use up its allotment of URO devices. (Use the CHANNELS statement to reserve virtual device addresses; see *z/VM: RSCS Networking Planning and Configuration* for more information.)

If you want to optimize the use of your allotted URO devices, you can define a list processor link and divide the URO devices between your networking links. The MAXURO operand on GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, or TCPNJE-type links lets you specify the maximum number of URO devices for each stream. RSCS has created defaults that give the most URO devices to the list processor which allows it to handle files with multiple data set headers.

For more information about the MAXURO operand see the descriptions of the operands for GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type links in Chapter 13, “Link Operational Parameters,” on page 293.

Nodes with Parallel Links

When you send a file with multiple data set headers from one system to another, RSCS uses the name of the link as the destination location of the *MULTI* file. If you have defined more than one link between those nodes (using the NODE operand on the LINKDEFINE statement or DEFINE command), RSCS uses the name of the node as the destination location of the *MULTI* file. This way, RSCS can queue the *MULTI* file on all eligible links rather than forcing it to travel over one specific link.

Looping *MULTI* Files

Looping files are sometimes difficult to find. When you have a file with multiple data set headers and more than one of the destinations is involved in a loop, it is almost impossible to discover which looping nodes are involved without reviewing the file transmission messages. To help make this situation easier to diagnose, RSCS splits off all files with looping data set headers.

Sending Jobs to a Remote Location

Suppose a CMS user (MCKRELL) at node NEWYORK submits a job to be run on a z/OS JES2 system at node CHICAGO. Output returning from a batch job submitted through RSCS will be processed by the real unit record devices (printers and punches) attached to z/VM unless overridden by job control language (JCL) statements.

MCKRELL wants a source deck assembled, link edited, and processed at CHICAGO and the resultant listing, object deck, and message data set returned to the virtual machine reader. The output from the program processing will be printed on the IBM 3800 Printing Subsystem at NEWYORK. MCKRELL could use the JCL shown in Figure 3 on page 22. For more information about JCL statements, see *z/OS: MVS JCL Reference*.

```
  //EXAMPLE JOB 1,'MCKRELL/DARG',CLASS=A
  /*JOBPARM LINES=1,CARDS=100,TIME=1
  /*NOTIFY NEWYORK.MCKRELL
  /*ROUTE  PRINT NEWYORK.MCKRELL
  /*OUTPUT PRTA  DEST=NEWYORK,COPIES=2,CHARS=GT15
  /*OUTPUT PUNB  DEST=(NEWYORK.MCKRELL)
  //S    EXEC PROC=ASMFCLG
  //ASM.SYSPRINT DD SYSOUT=A
  //ASM.SYSPUNCH DD SYSOUT=(B,,PUNB)
  //ASM.SYSIN DD *
  START    CSECT
⋮
           END
  /*
  //GO.SYSPRINT  DD SYSOUT=(A,,PRTA)
  //
```

Figure 3. Job File Named PAYTAX PROGM

In this example, the control statements do the following:

NOTIFY
Causes any JES2 messages produced by the batch system to be returned by the network to MCKRELL's terminal.

ROUTE
Causes all printed output that is not specifically routed using the OUTPUT statement to be directed to MCKRELL's virtual reader.

OUTPUT
Provides specific routing for the object deck (SYSPUNCH) and program processing output (SYSPRINT) data sets. For SYSPRINT, two copies are specified, with the character arrangement table name specified as GT15.

The following example shows a terminal session for a job file named PAYTAX PROGM. The SPOOL command includes the name of the RSCS virtual machine, RSCS. The TAG command includes the keyword JOB. Because PAYTAX PROGM is input to a job, the PUNCH command must be used to ensure correct record length of 80 or less. RSCS can send SYSIN (job input) records only if the record length is 80 bytes or less. The PUNCH command includes the NOH operand, no-header, operand to prevent a header record from being added to the file.

```
SPOOL PUNCH TO RSCS
Ready;

TAG DEV PUNCH CHICAGO JOB
```

```
Ready;

PUNCH PAYTAX PROGM (NOH
Ready;
 PUN FILE 8921 TO RSCS COPY 001 NOHOLD
 FROM CHICAGO: 16.57.55 JOB 8921 $HASP165 EXAMPLE ENDED AT BUFFALO

 PRT FILE 8923 FROM RSCS COPY 001 NOHOLD
 File (8921) spooled to MCKRELL -- origin CHICAGO(SYSTEM) 10/03/90 16:57:59 EDT

 PUN FILE 8925 FROM RSCS COPY 001 NOHOLD
 File (8921) spooled to MCKRELL -- origin CHICAGO(SYSTEM) 10/03/90 16:58:01 EDT
```

Sending Output to a Remote System

As in the previous examples for sending files, you can direct output to a remote system by specifying:

1. A SPOOL command with the user ID of your local RSCS virtual machine.
2. A TAG command with the appropriate destination node ID and identifier of the remote printer or punch. The destination identifier can be a workstation or 3270 printer node ID that is directly attached at the destination node, a virtual machine user ID, or SYSTEM. See "Using Second-Level Remote Addressing" on page 23.
3. An appropriate command (such as the CMS PRINT, PUNCH, or MOVEFILE command), or load a program to produce the output.

Suppose a CMS user (OHARE) at node NEWYORK wants to print a file named PROFILE EXEC on the SEATTLE system printer, and that RSCS is the user ID of the RSCS virtual machine on the NEWYORK system. OHARE would enter the following commands and receive the following replies:

```
SPOOL PRINTER TO RSCS
Ready;

TAG DEV PRINTER SEATTLE SYSTEM
Ready;

PRINT PROFILE EXEC
Ready;
 PRT FILE 0150 TO RSCS COPY 001 NOHOLD
 From SEATTLE: Sent file 0386 (0150) on link SEATTLE to SEATTLE(SYSTEM)
```

Sending Output to Local Printers, Punches, or User IDs

Generally, printer or punch output is directed to a local real device when you specify SYSTEM on a SPOOL command:

```
SPOOL PRINTER TO SYSTEM
```

You can use the same kind of SPOOL and TAG formats to send output to a real device at your local node, as you use to send it to a remote node. Specify the name of the RSCS virtual machine on the SPOOL command. Specify your local node ID (here, NEWYORK) and the correct destination, if it is not the SYSTEM printer (here it is BIGPRNTR), in the TAG command.

```
SPOOL PRINTER TO RSCS
TAG DEV PRT NEWYORK BIGPRNTR
PRINT PROFILE EXEC
```

Using Second-Level Remote Addressing

A locally-defined link to a list processor, printer, or workstation node can be addressed from other locations without having to be defined throughout the network. This reduces the number of route table entries that have to be defined at originating nodes and is called *second-level remote addressing*.

When a file arrives at a destination location, RSCS compares the identifier that was originally specified on the TAG command for that file with the links (nodes) and route groups that are defined at that location. If RSCS finds a matching link ID for a list processor, printer, or workstation link or if RSCS finds a matching

group ID for a group containing printer or workstation links, RSCS queues the file on the appropriate link or links.

The following example illustrates sending spool output from a z/VM system to a remote 3270 Information Display System printer. This CMS user wants the output from the virtual printer directed to the real printer at node PRT38003. However, node PRT38003 is defined *only* at node TORONTO; that is, the user's local RSCS does not have a route table entry for it. RSCS is the user ID of the local RSCS virtual machine.

In the following TAG command example, note the use of PRT38003 in the identifier position. This TAG format uses second-level remote addressing defined at the destination node TORONTO. The following illustrates the commands and replies:

```
SPOOL PRINTER TO RSCS
Ready;
TAG DEV PRT TORONTO PRT38003
Ready;
PRINT PROFILE EXEC
Ready;
 PRT FILE 0026 TO RSCS COPY 001 NOHOLD
 FROM TORONTO : Sent file 0397 (0026) on link PRT38003 to PRT38003(SYSTEM)
```

Second-level remote addressing is valid only for list processor, printer, or workstation links or routing groups containing printer or workstation links. It is not valid for system nodes or routing groups containing a mixture of routes to networking and nonnetworking links. If you specify a link ID that is not a list processor, printer, or workstation link in the identifier field of the TAG command, RSCS treats the identifier as a user ID. If this attempt fails:

- If you have NOTIFY-type links defined to handle unknown user IDs, RSCS spools the file to the appropriate NOTIFY-type link which holds the file, generates a note to the origin user, and purges the file after a specified period.
- If you do not have a NOTIFY-type link defined:
  - RSCS spools the file to the z/VM system printer or punch at the destination location, and
  - The originating user receives an error message saying that the user ID is incorrect.

If you specify a group ID in the identifier field of the TAG command and it contains a mixture of routes to networking and non-networking links, the results are unpredictable.

Sending Output Files to a Remote PSF Printer

The Print Services Facility/VM (PSF) program provides a link between application programs and advanced-function printers, which receive the data for, and print, an entire page at a time. Advanced-function printers, such as the IBM 3800 Printing Subsystem, Models 3 and 8, and the IBM 3820 Page Printer, can print images and text in many fonts on the same page.

RSCS requires that a PSF-controlled printer be identified using the DEST statement or command (or included as an entry in a destination identifier file) at its location node. To send an output file to a PSF printer, include the destination identifier as the DEST operand of the SPOOL command (see “SPOOL” on page 409).

The user ID must be SYSTEM. You may either explicitly specify this in the TAG command, or omit it if no other operands follow.

If your print file contains only text data and if you are using the default options provided at the printer's location, you can use the CMS PRINT command:

```
SPOOL PRINTER TO RSCS DEST PSFPRT1
TAG DEV PRT DALLAS SYSTEM
PRINT PROFILE EXEC
```

If you want to specify special options to take advantage of the capabilities of an advanced-function printer, you must use the PSF command:

```
SPOOL PRINTER TO RSCS DEST PSFPRT1
TAG DEV PRT DALLAS SYSTEM
PSF $CARTOON SCRIPT (CC (FORMDEF (MYFDEF FDEF38PP)))
```

If your printer file contains image data, use either the PSF command or the PRINT command with the OVERSIZE option:

```
SPOOL PRINTER TO RSCS DEST PSFPRT1
TAG DEV PRT DALLAS SYSTEM
PRINT $CARTOON SCRIPT (OV CC)
```

Although many options may be specified on the SPOOL, TAG, PRINT, and PSF commands, a discussion of them is outside the scope of this document. For information on using PSF to print images and text on advanced-function printers, see the Advanced Function Printing and Print Services Facility documentation.

Note: The PSF buffer size must not exceed the buffer size of the printer or the RUSIZE specified in the logmode table. If it does, you will receive message DMT927E. (To find the RUSIZE or buffer size of the printer, enter the QUERY SYSTEM LINKS SHOW BUFFERSIZE command.)

Receiving a PSF Printer File

When the file destined for a PSF-controlled printer arrives at the destination location, RSCS compares the DEST parameter that was originally specified on the SPOOL command (PSFPRT1 in the preceding example) with the entries made by the DEST statement or command (or in the destination identifier file) if any exist. If RSCS finds a match, the file is spooled to SYSTEM, with a DEST of the destination identifier. If no match is found, RSCS looks for a link ID match. If it does not find a match, RSCS assumes the (TAG-specified) identifier is a user ID and spools the file to that user ID's virtual machine.

A PSF printer output file, such as $CARTOON SCRIPT in the preceding examples, can be sent to any workstation printer supported by RSCS. Here, any PSF-related channel commands and data in the file are removed before transmission to the workstation printer. Any printable data is truncated to the maximum print line length of the workstation printer.

Sending 3800 Output Files to a Remote Printer

A user may send 3800 output to RSCS for transmission to a remote system for printing in several ways. In the following examples, the CMS file $OUTPUT SCRIPT contains carriage control and table reference character (TRC) bytes; the RSCS virtual machine user ID is RSCS.

Specifying 3800 Printer Attributes

3800 printer attributes can be specified by using the commands:

- CP SPOOL
- CP TAG
- CMS SETPRT

The SPOOL command causes the 3800 printer attributes to be stored in the CP spool as control block information. The TAG command causes the 3800 printer attributes to be stored in the spool file tag record. The SETPRT command causes 3800 printer control information corresponding to the attributes to be stored in the CP spool as part of the printer data.

If 3800 attributes are specified using *both* the CMS SETPRT command and the CP SPOOL command:

- SETPRT values override the SPOOL values if the file is printed at a z/VM system.
- SPOOL values override the SETPRT values if the file is transmitted to a non-z/VM NJE system.

If 3800 attributes are specified using *both* the CP TAG command and the CP SPOOL command, the TAG command will override the corresponding SPOOL commands. For details, see "Usage Notes" on page 426.

3800 Output Considerations

It is the responsibility of the file originator (for example, a CMS user) to ensure that the destination system can print the file correctly. A virtual 3800 file containing control information that was specified in the CMS SETPRT command will not print at a non-z/VM NJE system, such as z/OS JES2, exactly as it would on the originating z/VM system. Any 3800 attributes that are specified with the CMS SETPRT command cause the corresponding control information to be stored as data in the CP spool. The output writers at a non-z/VM NJE system will incorrectly interpret virtual-3800-related control information as printable data, and the file is printed with the defaults that were set when the subsystem was initialized. For information on 3800 defaults, see *IBM 3800 Printing Subsystem Programmer's Guide*.

Sending 3800 Files to a z/VM System

Virtual 3800 files are created when you have used the CP DEFINE command, defining your virtual printer as a 3800, 3800-1, or 3800-3. Virtual-3800-related data includes control records that are sent as:

- Print records with machine carriage control (such as LOAD WCGM)
- Spanned records (such as LOAD GRAPHIC CHARACTER MODIFICATION)

These files are intended for processing only on z/VM systems running RSCS. These files can be transmitted *through* (but not *to*) non-z/VM NJE systems that are capable of handling spanned records.

Virtual 3800 output can be sent to any workstation printer that is supported by RSCS V1.3 or later. Here, any 3800-related channel commands and data in the file are removed before transmission to the workstation printer. Any printable data is truncated to the maximum print line length of the workstation printer.

Sending Virtual 3800 Output, Using CMS SETPRT Command

In this example, the SETPRT command causes the character arrangement tables (defined as GT12 and GB12) to be stored in the CP spool and transmitted over the network as spanned records. Therefore, the receiving (remote) node:

- Does not have to have those tables defined at its location, and
- Must be a z/VM system running RSCS

```
DEFINE 3800 00E
SETPRT CHARS GT12 GB12
SPOOL 00E RSCS
TAG DEV 00E CLEVELND SYSTEM
PRINT $OUTPUT SCRIPT (CC TRC)
```

If printer attributes had also been specified on the SPOOL command, they would have been overridden by the corresponding attributes specified on the SETPRT command.

Sending Virtual 3800 Output, Using CP SPOOL Command

In this example, the SPOOL command causes the *names* of the character arrangement tables to be stored in the CP spool. This information is passed to the receiving (remote) node, which must have these tables defined at its location.

```
DEFINE 3800 00E
SPOOL 00E RSCS CHARS GT12 CHARS GB12
TAG DEV 00E PITTSBGH SYSTEM
PRINT $OUTPUT SCRIPT (CC TRC)
```

As SETPRT was not used, there are no spanned records associated with this file, and it could also be sent to a non-z/VM NJE system for printing on a 3800.

Sending 3800 Files to a Non-z/VM NJE System

Files that can be sent to a non-z/VM NJE system for printing on a 3800 are created by defining the printer as any CP-supported virtual printer and by specifying the 3800 attributes on either the TAG command or SPOOL command as follows:

```
DEFINE 1403 00E
SPOOL 00E RSCS
TAG DEV 00E NYNORTH SYSTEM 50 CHARS=GT12 CHARS=GB12 OPTCD=J
PRINT $OUTPUT SCRIPT (CC)
```

or:

```
DEFINE 1403 00E
SPOOL 00E RSCS CHARS GT12 CHARS GB12
TAG DEV 00E NYNORTH SYSTEM 50 OPTCD=J
PRINT $OUTPUT SCRIPT (CC)
```

or:

```
DEFINE 3800 00E
SPOOL 00E RSCS CHARS GT12 GB12
TAG DEV 00E NYNORTH SYSTEM 50 OPTCD=J
PRINT $OUTPUT SCRIPT (CC TRC)
```

In these examples, 3800 files are sent with the TRC bytes still contained in the file. The first example shows the character arrangement tables specified on the TAG command while, in the second example, they are specified on the SPOOL command. For the file created in the third example, CMS will create 3800 "select translate table" opcodes. RSCS will convert these opcodes onto TRC characters in the file sent on the network. If any of these attributes are specified on *both* the TAG and SPOOL commands, the TAG command operands will *override* the corresponding SPOOL command operands.

These methods will work properly only if the ultimate destination of the output has a 3800 system printer with an output writer that converts the TRC bytes. Otherwise, the intact TRC bytes are printed as text.

For more information on specifying 3800 attributes to a non-z/VM NJE system, see “Link Options for Printed Output to an NJE System” on page 421.

Sending GDDM Files to a Remote Printer

PUNCH output from the Graphical Data Display Manager (GDDM) ADMOPUV program can be sent to an IBM 3270 Information Display System printer over a 3270P-type or SNA3270P-type link. Depending on the particular printer model and its features, you can produce alphanumeric (only), black-and-white graphic, or color graphic output.

To send GDDM output to the 3270 printer:

1. Use a SPOOL PUNCH command (as usual).
2. Include a PRT=GRAPH (or GRAF) operand on the usual TAG command.
3. Enter a GDDM ADMOPUV command.

Note: The GDDM buffer size (IOBUFSZ) must not exceed the buffer size of the printer or the RUSIZE specified in the logmode table. If it does, you will receive message DMT927E. (To find the RUSIZE or buffer size of the printer, enter the QUERY SYSTEM LINKS SHOW BUFFERSIZE command.)

The following example shows how you would send GDDM output to the 3287 printer identified by 3287NO3 at node CHICAGO. Because you are including the PRT=GRAF option on the TAG command, you must also specify the user ID (in this example, 3287NO3) and a priority (in this example, 50). This is necessary because RSCS requires three positional operands on the tag before any options can be specified.

```
SPOOL PUNCH RSCS
TAG DEV PUNCH CHICAGO 3287NO3 50 PRT=GRAF
ADMOPUV FILENAME ON PUNCH (DEV DEVTOK
```

In the ADMOPUV command you must include the appropriate file name, along with a *device token* (DEVTOK). The device token provides GDDM with a description of the intended printer. An example of a device token for a 3287 printer would be L87.

If your installation is using GDDM R4 or later, a nickname facility is available to simplify sending GDDM output to RSCS. In the following example the installation has customized GDDM so that 3287NO3 is a valid nickname for the 3287 printer used earlier. Now, all that you have to enter is the following command to send GDDM output to RSCS:

```
ADMOPUV FILENAME ON 3287NO3
```

For more information, see the GDDM documentation.

Note: If you are sending IPDS output from GDDM over an SNA3270P-type link, only LU_T0 or LU_T1 sessions are valid. If sending extended 3270 data stream output from GDDM over an SNA3270P-type link, only LU_T0 or LU_T3 sessions are valid. Otherwise, you will receive an error message and your file will be purged.

Sending Files to an ASCII Printer or Plotter

IBM supplies sample ASCII printer and plotter exit routine modules to demonstrate the use of typical printer and plotter processing modules. These files can be used with ASCII-type and TCPASCII-type links. Generally, these exit routine modules respond to options supplied on the CP CLOSE, SPOOL, and TAG commands to perform the necessary translations of the print data. See *z/VM: RSCS Networking Exit Customization* for more information about these sample exit routine modules and the format of the CP CLOSE, SPOOL, and TAG commands.

After specifying the proper CP CLOSE, SPOOL, and TAG commands, use the CMS PRINT and PUNCH commands to send a file to an ASCII printer or plotter. The PUNCH command limits the logical record length of a file to 80 characters, while the PRINT command accepts up to 204 characters, depending on the virtual printer type. The exit routine module for the Nicolet Zeta 8 Plotter (ASCXZETE), however, accepts files sent only by the PUNCH command and uses only the first 64 characters of each record. All other exit routine modules accept both PRINT and PUNCH files. See *z/VM: CMS Commands and Utilities Reference* for information on using the CMS PRINT and PUNCH commands.

If no EBCDIC to ASCII translation is performed, RSCS checks each print record to see if it is a header line which has been produced by the CMS PRINT command. If the previously processed line was the end of a page, the current line is assumed to be a page header. For the printer exit routine modules, the line is translated to ASCII. The CMS PRINT command can only produce EBCDIC headers, even if the actual file contains ASCII characters. For the IBM XY/749 plotter exit routine module, the header line is discarded.

Sending Files to a TCP/IP Line Printer Daemon

IBM supplies two sample exit routines to send data on an LPR-type link to a line printer daemon in a TCP/IP network. The first routine, LPRXONE, can be used when sending files to a generic, non-PostScript ASCII printer. The LPRXPSE exit routine handles files sent to a PostScript printer. You can issue the CP SPOOL and TAG commands, followed by the CMS PRINT or PUNCH commands, to send files to a printer daemon in a TCP/IP network; or you can use the RSCS PPS EXEC, the PPS XEDIT macro, or the TCP/IP LPR EXEC to send files to a printer daemon in a TCP/IP network. For more information, see “PPS EXEC” on page 430 and “PPS XEDIT” on page 437. The print daemon will then send the file on to a printer. For more information about sample exit routines, see *z/VM: RSCS Networking Exit Customization*.

Receiving Files from a TCP/IP LPR Client

IBM supplies a sample exit routine called LPDXMANY to receive print data on an LPD-type link from a LPR client in a TCP/IP network. For more information about LPDXMANY, see *z/VM: RSCS Networking Exit Customization*.

Sending Files to a TCP/IP UFT Daemon

IBM supplies a sample exit routine called UFTXOUT to send data on an UFT-type link to an UFT daemon in a TCP/IP network. Use the CMS SENDFILE command with the asynchronous UFT option to send files to an UFT daemon in a TCP/IP network. For more information about UFTXOUT, see *z/VM: RSCS Networking Exit Customization*. For more information about the CMS SENDFILE command, see *z/VM: CMS Commands and Utilities Reference*.

Receiving Files from a TCP/IP UFT Client

IBM supplies a sample exit routine called UFTXIN to receive data on an UFTD-type link from an UFT client in a TCP/IP network. For more information about UFTXIN, see *z/VM: RSCS Networking Exit Customization*.

Chapter 3. Starting and Stopping RSCS

This chapter describes how to start and stop your local RSCS virtual machine.

Before Starting Operations

Because RSCS permits communications between computers that are separated by some distance, the details of the network and your local node are governed by the needs of network users. These needs supply the answers to such questions as:

- What other nodes will be in the network?
- Which nodes will be directly-connected?
- What kinds of links will connect us to the nodes?
- Will the connections be made through switched or nonswitched lines?
- How many of the operating procedures will be automated?
- What provisions will be taken to aid in diagnosing problems?

See *z/VM: RSCS Networking Planning and Configuration* for more information about planning for your RSCS network.

Starting RSCS

You must start RSCS before using it to send and receive information. To start RSCS, follow these steps, which are described in more detail in the following sections:

Step	Action	Commands Issued
1	Log on to the RSCS virtual machine and IPL GCS	`ipl gcs`
2	Load RSCS into virtual storage	`global loadlib rscs` `loadcmd rscs dmtman`

3	Start RSCS	`filedef config disk rscs config *`
		`filedef events disk events config *`
		`rscs init`

4	Enable all switched telecommunication ports that are to receive incoming telephone calls	`rscs enable all`
5	(Optional) Start the RSCS/VTAM interface, if SNA links are used	`rscs network start`
6	(Optional) Stop the RSCS port redirector task, if TCP/IP connections are not required	`rscs tcpip stop`
7	Start the individual links	`rscs start` *`linkid`*
8	Disconnect the RSCS virtual machine.	`rscs disconnect`

As with other routine system operations, the start-up procedure can be automated using an exec. Running RSCS usually requires little operator action after the RSCS load module is loaded into virtual storage and is initialized.

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Step 1 — Log on to the RSCS Virtual Machine

RSCS runs in an ESA-mode virtual machine that must run as part of a GCS group. When the RSCS virtual machine is logged on, you must IPL GCS. You can enter this command from the command line or add it to the PROFILE GCS file of the RSCS virtual machine.

Step 2 — Load RSCS

RSCS product code is link-edited into one load module and stored in the load library for RSCS (RSCS LOADLIB). You must load it into virtual storage before using it. To load RSCS, use the GLOBAL and LOADCMD commands. The RSCS operator can enter these commands or you can include them in a PROFILE GCS exec that contains all the commands to be run when you IPL GCS.

The GLOBAL command points the LOADCMD command, which you issue next, to the RSCS LOADLIB file. If you want to use the load module (RSCSEXIT LOADLIB) for the sample exit routines that are supplied with RSCS, you can also specify it on the GLOBAL command.

LOADCMD is a GCS command that loads RSCS into virtual storage and lets the characters "RSCS" be identified and run as a command. That is, the LOADCMD command defines the RSCS commands discussed in Chapter 12, “RSCS Commands,” on page 127 to be operands of the GCS RSCS command. When an RSCS console operator enters an RSCS command, it must be preceded by the characters RSCS. If you want to use other characters as the command leader, specify them in place of RSCS in the LOADCMD command.

For example:

```
global loadlib rscs rscsexit
Ready;

loadcmd rscs dmtman
Ready;
```

In the preceding example, the Ready message is a GCS reply indicating that the commands ran successfully. If an error had occurred, an error return code would have been included in parentheses. For example:

```
loadcmd  rscs  dmtman
 CSILDC212E Member cannot be loaded. Command is not defined  RC=28.
Ready(28);
```

Step 3 — Initialize RSCS

During initialization, RSCS discovers what your network looks like. RSCS gets the information from various files you have created or modified. For example, RSCS creates link and route tables from the LINKDEFINE and ROUTE statements you have in your RSCS configuration file; RSCS CONFIG is the default and recommended file name. If you specify a different name for the RSCS configuration file, you must also specify that name on the FILEDEF command in the GCS profile. For more information about FILEDEF, see *z/VM: Group Control System*.

The link table maintains information about directly-connected locations; the route table maintains information about each indirectly-connected location and its first direct link. (You can dynamically change link and route table entries while RSCS is running by issuing the DEFINE and ROUTE commands.)

To successfully start RSCS, the following must occur:

- The GCS recovery machine must be logged on.
- The GCS recovery machine must IPL the GCS supervisor.
- The RSCS virtual machine must be logged on.
- The RSCS virtual machine must IPL the GCS supervisor.
- The GCS GLOBAL command for the RSCS load library must be issued; optionally, the RSCSEXIT load library can also be specified.

- The GCS LOADCMD command for RSCS must be issued.
- The GCS FILEDEF command for the RSCS configuration file must be issued.
- Optionally, the GCS FILEDEF command for the RSCS events file must be issued.
- The RSCS INIT command must be issued.
- The RSCS ENABLE command must be issued for auto-answer ports.
- The RSCS links must be started.

To run these events automatically, the following must occur:

- The directory definitions for the GCS recovery machine and the RSCS virtual machine must include an IPL statement for the GCS supervisor.
- The recovery machine must be autologged.
- When PROFILE GCS runs in the recovery machine, this must autolog the RSCS virtual machine.

See Figure 4 on page 34 for an example of a PROFILE GCS exec for the RSCS virtual machine.

Starting RSCS

You start RSCS by issuing, either manually or in an exec (Figure 4 on page 34), the FILEDEF and RSCS INIT commands:

```
filedef config disk rscs config *
filedef events disk events config *
rscs init
```

FILEDEF is a GCS command that allows RSCS to access files associated with it, such as the RSCS configuration file and the RSCS events file (RSCS CONFIG and EVENTS CONFIG, respectively, in the preceding example). INIT must be the first RSCS command that is run; it processes the configuration and events files, builds control blocks, and attaches the main system service tasks, including the port redirector task.

After a successful initialization, RSCS displays the following messages and begins usual processing by accepting files and commands:

```
DMTMAN010I RSCS Networking loaded at 0000B000-000A8400, CVT at 0000D0A8,
           initialization time was 11/08/06 09:27:13
DMTPRD778I TCP Port redirector ready
DMTMAN000I RSCS Networking Function Level nnn-0000 ready
Ready;
```

In the DMT010I message, the first set of numbers signifies the beginning and ending addresses of the load module and the last number signifies the address of the communications vector table (CVT), in hexadecimal. These addresses can be used in debugging. (If you need these addresses after initialization, use the QUERY SYSTEM LOADADDRESS command. See “QUERY SYSTEM LOADADDRESS” on page 236.)

During initialization, RSCS may detect an error, and stop initialization. If this happens, RSCS displays an error message, such as:

```
DMTMAN091T Initialization failure -- RSCS Networking terminated
Ready(12);
```

Note that in this instance, the Ready message contains an error return code. If an error occurs during initialization, look up the explanation for the error message in *z/VM: RSCS Networking Messages and Codes*. You could try to start RSCS again by entering the RSCS INIT command again after correcting the error condition. If the error persists, notify your local RSCS and z/VM support personnel.

Other messages, such as `DMTIRX460E Duplicate channel address`, specify a condition that will not stop RSCS from running, but that may produce unexpected or undesired results. The error should be corrected before proceeding.

A DMT420E message, such as `DMTCOM420E Unable to process file with ddname EVENTS -- invalid file format`, specifies that an events file was not created. As a result, RSCS initialization is halted.

```
/* Procedure to load and start RSCS */
'CP SET IMSG OFF'
'CP SET EMSG ON'
'CP SP CON START'

'GLOBAL LOADLIB RSCS'                   /* LOADLIB where RSCS lives  */
'FILEDEF CONFIG DISK RSCS CONFIG *'     /* RSCS configuration file   */
'FILEDEF EVENTS DISK EVENTS CONFIG *'   /* RSCS events file          */
'LOADCMD RSCS DMTMAN'                   /* Load RSCS module          */

'RSCS INIT'                             /* RSCS start command        */
if rc ¬= 0 then exit rc            /*   If failed then exit     */

'RSCS ENABLE 125'                       /* Enable auto-answer        */
'RSCS ENABLE 135'                       /*   ports.                  */

'RSCS START CHICAGO'                    /* Start a BSC link          */
'RSCS START NEWPRNTR'                   /* Start a local printer     */

'RSCS NETWORK START RETRY 10'           /* Talk to VM/VTAM           */

    /* The NETWORK command may complete before the VM/VTAM interface
       is operational. The following START commands will be queued
       until communication is open or the retries are exhausted.     */

'RSCS START BOSTON'                     /* Start an SNA NJE link     */
'RSCS START SNAPRT1'                    /* Start an SNA printer link */

exit
```

Figure 4. Sample RSCS Initialization Exec

A Note about PSF Destinations

There are two ways to tell RSCS about PSF printers:

1. Using the DEST statement or command (recommended)
2. Creating (and loading) a destination identifier file

For information about the DEST command, see “DEST” on page 155. For information about the DEST statement, see *z/VM: RSCS Networking Planning and Configuration*.

If you choose to create a destination identifier file, you must enter a GCS FILEDEF command for the file before you start RSCS.

Step 4 — Enable Switched Telecommunication Ports

After RSCS has completed initialization, you must enable all switched telecommunication ports that are to receive incoming telephone calls. The ENABLE command starts a previously disabled or non-enabled switched telecommunication port:

```
rscs enable all
Ready;
 Port 0080 being enabled
 Port 0081 being enabled
 Port 0082 being enabled
```

Step 5 — Start the RSCS/VTAM Interface

When RSCS has completed enabling all switched telecommunication ports, it is ready to begin communications with non-SNA nodes. To enable it to communicate with SNA nodes, you must first start the RSCS/VTAM interface by issuing the RSCS NETWORK START command. This command identifies RSCS

to VTAM and allows any further SNA communications to continue. RSCS displays the following messages if the interface starts successfully:

```
rscs network start
Ready;
 RSCS/VTAM interface starting
 RSCS/VTAM interface ready
```

RSCS establishes the interface to VTAM by, among other things, opening the ACB (Access Method Control Block) that identifies RSCS to VTAM. If the OPEN is not successful, RSCS will retry the command three times (or the number of times that you specify on the NETWORK START command). If the ACB cannot be opened, RSCS terminates the SNA control task. For example:

```
rscs network start retry 2
Ready;
 RSCS/VTAM interface starting
 VTAM ACB cannot be opened -- error 5A APPLID on NETWORK START command was not found by VTAM
 VTAM ACB cannot be opened -- error 5A APPLID on NETWORK START command was not found by VTAM
 VTAM ACB cannot be opened -- error 5A APPLID on NETWORK START command was not found by VTAM
```

Later, try to enter the command again. If the problem persists, notify your local RSCS and VTAM support personnel.

Step 6 — Stop the Port Redirector Task

The port redirector task, which is the RSCS interface to TCPNJE-type links, is started automatically when you initialize RSCS. If no TCPNJE-type links will be used, you can stop this interface. To do so, issue the TCPIP STOP command.

Step 7 — Start the Links

At this stage, if you have received no persistent error messages, RSCS is ready for work. That is, you can start individual links and use them to send and receive information. The START command starts an inactive link. For example, the following command assumes you have a printer link called PRT3820A defined in your RSCS configuration file:

```
rscs start prt3820a
Ready;
 Activating link PRT3820A 3270P line=037C class=* queuing=FIFO
 File queue reordered
 Line 037C ready for connection to link PRT3820A
 Link PRT3820A line 037C printer ready
```

You can also use the START command to override the attributes of a link defined in your configuration file. For example, if you want the link to use SETUP mode, you can issue the following START command:

```
rscs start prt3270 setup
Ready;
 Activating link PRT3820A 3270P line=037C class=* queuing=FIFO
 File queue reordered
 Line 037C ready for connection to link PRT3820A
 Link PRT3820A line 037C printer ready
```

Step 8 — Disconnect the RSCS Virtual Machine

It is usually not necessary to constantly monitor RSCS. Because of this, you can disconnect the console from the RSCS virtual machine, using the RSCS DISCONNECT command:

```
rscs disconnect log oper3
```

An individual other than the RSCS operator may have the responsibility of monitoring RSCS and replying to its operator messages. When you enter the DISCONNECT command to disconnect from the RSCS virtual machine, you can specify the user ID of that individual. If that user is logged on at the time you enter the command, that virtual machine will receive all the RSCS console messages.

To again take control of RSCS, reconnect to the RSCS virtual machine by logging on and entering the RSCS RECONNECT command:

```
rscs reconnect
Ready;
 RSCS Networking reconnected
```

Stopping RSCS

Stopping RSCS involves performing the reverse of the initialization process. That is, links must be deactivated, the interfaces with VTAM and TCP/IP must be shutdown (if they are active), and the RSCS control program must be terminated.

The easiest way to completely shut down RSCS is to use the SHUTDOWN command. The SHUTDOWN command:

- Deactivates all links (by issuing DRAIN commands
- Disables ports allocated to auto-answer links
- Deactivates the RSCS/VTAM interface (if necessary)
- Deactivates the port redirector task (if necessary)
- Terminates the RSCS control program

You can include the QUICK operand to stop the links immediately, using STOP commands instead of using DRAIN commands. You can also include the CP operand if you want to enter a CP command after the shutdown completes. For example:

```
rscs shutdown quick cp ipl gcs
```

This command shuts down RSCS by issuing STOP commands against each link and then re-IPLs the GCS virtual machine.

To deactivate a particular link, you can use either the DRAIN or STOP command. The main difference between them is that the STOP command deactivates the link immediately, while the DRAIN command finishes processing the current file. Either a DRAIN or STOP command must be entered for each active link.

If your RSCS node is directly connected to an SNA node by SNANJE-type, SNARJE-type, or SNA3270P-type links, the interface between RSCS and VTAM must be deactivated. To do so, enter the NETWORK HALT command; this command *also* drains each active SNA link. If you specify the QUICK option, RSCS issues a STOP command to each active SNA link:

```
rscs network halt quick
```

This means that all the SNA links are terminated immediately, without finishing the files being processed. Use NETWORK HALT to avoid your having to enter a separate DRAIN or STOP command to all the SNA links.

If your RSCS node is directly connected to another NJE Peer using TCPNJE-type links, the interface between RSCS and TCP/IP also must be deactivated. To do so, enter the TCPIP STOP command. However, this command does not drain or stop the links. You must use the DRAIN or STOP command to deactivate each link.

Chapter 4. Managing Links

This chapter describes how to define, start, stop, and control links. If you have more than one system in your network, see Chapter 6, “Changing the Structure of Your Network,” on page 75 for additional information.

Defining and Changing Link Attributes

Most links and their attributes are defined in the RSCS configuration file using the LINKDEFINE, PARM, and UPARM statements. See *z/VM: RSCS Networking Planning and Configuration* for more information on setting up your configuration file.) RSCS also provides commands to let you dynamically define or change link attributes (DEFINE and START.

DEFINE Command

Use the DEFINE command to temporarily define a new link or change the link attributes of an existing, inactive link. What you specify on the DEFINE command remains in effect until the next time RSCS is initialized or until you redefine the link. If you are defining a new link, RSCS uses the attributes you specify plus the defaults of any attributes you omit. When you are changing an existing link, RSCS replaces only those attributes that you specify. All others remain as they were.

START Command

In addition to starting an inactive link, you can use the START command to temporarily change the link attributes of an active link. The values you specify on the START command remain in effect until the link becomes inactive.

If the existing link is inactive, RSCS starts the link and replaces only those attributes that you specify. If the existing link is already active, you should be careful of what attributes you are trying to change. RSCS will change attributes like class and form on an active link but not an attribute like link type.

Using Link-Specific Parameters

All of the link types in RSCS have unique parameters that you can specify after the generic DEFINE or START operands. These link-specific parameters are described in Chapter 13, “Link Operational Parameters,” on page 293. To change a link-specific parameter, use one of the following operands:

Operand	Command	Effect
PARM	DEFINE	RSCS ignores all previously specified parameters and uses the newly specified parameters.
PARM	START	RSCS ignores all previously specified parameters and uses the newly specified parameters. When the link becomes inactive, RSCS drops the newly specified parameters and restores the previously specified parameters.
OPARM	START	RSCS replaces only those parameters specified. All other parameters remain as they were.
UPARM	DEFINE	RSCS ignores all previously-specified parameters and uses the newly specified parameters. This has no effect on PARM or OPARM parameters. UPARM parameters are defined by your installation.

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Starting Links

Starting a link establishes a connection, or ability to communicate, between two adjacent nodes in a network. (LISTPROC-type and NOTIFY-type links are actually links that provide services rather than links to a another node.) Links are started when an operator on the local node enters a START command (either manually or using an exec).

The format of the START command depends on the type of link you are starting, the hardware connecting the two nodes, and the protocol controlling data transmission and reception. The link characteristics are usually defined in the RSCS configuration file or by the DEFINE command. Because the link characteristics can be specified elsewhere, many START commands specify only the name of the link to be started:

```
smsg rscs start printer1
```

Links can also be started automatically under the following conditions.

Link	Condition
SNANJE-type	An operator on the remote node starts the link (manually or with an exec).
SNARJE-type	The remote System/36 workstation starts the link manually or with an exec.
SNA3270P-type	• A VTAM operator initiates a session by issuing a VTAM VARY command. • An operator turns on a printer that was defined to VTAM with a LOGAPPL parameter.
Autostart	A file is queued for transmission over the link.
Auto-answer MRJE-type, NJE-type, or RJE-type	A previously enabled switched line port receives a call with valid signon information.

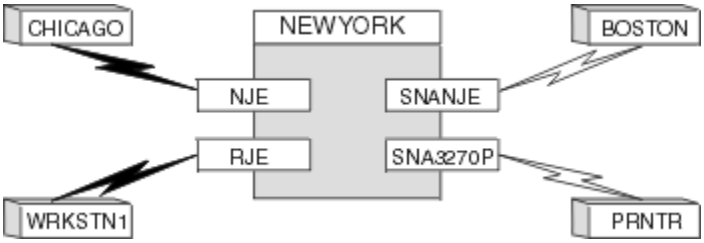


Figure 5. Activating Some Links

For example, suppose you are the RSCS operator at the NEWYORK node shown in Figure 5 on page 38 and you want to start the link to CHICAGO. NJE-type links require both sides of the link to issue START commands. Here is the START command you enter and the response from RSCS:

```
RSCS START CHICAGO TYPE NJE
Ready;
 Activating link CHICAGO NJE line=003C class=* queuing=priority
 File queue reordered
 Line 003C ready for connection to link CHICAGO
```

Next, you would have to tell the RSCS operator at the CHICAGO node to start that end of the link. Once that operator has entered the proper START command, you would see the following informational messages:

```
Link CHICAGO line 003C dataset ready
Signon of link CHICAGO complete, buffer size=4096
```

The CHICAGO operator would see the same five messages.

At the same time, the operator at the BOSTON node starts the link to the NEWYORK node, the VTAM operator on the same GCS system as the NEWYORK RSCS operator initiates a session for the PRNTR link, and a call is received over a switched telecommunication line from WRKSTN1. Four links are being started, only one by you (the NEWYORK RSCS operator). Although you did not start the other three links, you will see informational messages for each.

For link BOSTON, you will see:

```
Activating link BOSTON SNANJE LUNAME=BOSSNA class=* queuing=fifo LOGMODE=RSCSNJE0
File queue reordered
Link BOSTON LUNAME BOSSNA ready for session initiation
Link BOSTON LUNAME BOSSNA session established
Signon of link BOSTON complete, buffer size=4096
```

For link PRNTR, you will see:

```
Activating link PRNTR SNA3270P LUNAME=SNAPRNTR class=* queuing=size LOGMODE=RSCSPRT3
File queue reordered
Link PRNTR LUNAME SNAPRNTR ready for session initiation
Link PRNTR LUNAME SNAPRNTR session established
```

For link WRKSTN1, you will see:

```
Activating link WRKSTN1 RJE line=0125 class=* queuing=priority
File queue reordered
Signon of link WRKSTN1 complete, buffer size=256
```

Autodial and Auto-Answer Considerations

Autodial and auto-answer links relieve operators of having to manually dial (or answer) telephone connections.

An **autodial link** is an NJE-type, RJE-type, or MRJE-type link on a switched telecommunication line for which you have specified a PHONE parameter. (You can specify PHONE on a PARM statement, a DEFINE command, or a START command.) When an autodial link starts and there is an available port, the link automatically dials the telephone number specified by PHONE, completes the connection, and stands by to exchange information and commands with the remote node.

An **auto-answer link** is an NJE-type, RJE-type, or MRJE-type link that can be started on a switched telecommunication port that has been enabled. When RSCS receives an incoming call on that enabled line, RSCS verifies the signon information, starts the link, and stands by to exchange information and commands with the remote node.

Autodial and auto-answer links must be associated with a port that has the proper switched telecommunication equipment connected to it. For details, see *z/VM: RSCS Networking Planning and Configuration*.

You must specify a password for an auto-answer link. RSCS compares this password with the one supplied by the signon record sent from the calling node. If an auto-answer port does not receive a signon record within five minutes of receiving an incoming call, RSCS disables the port and automatically lets it receive another call. If the password is omitted or incorrect on the signon record, RSCS disables the port, does not start the link, and automatically lets the port receive another call. After receiving five calls with missing or incorrect passwords, RSCS forces the port to be enabled manually by the operator. This is done to prevent unauthorized callers from determining the correct password by trial and error.

If an autodial link connects to a remote auto-answer node, the autodial link must also specify a password parameter according to the requirements of the remote node.

An autodial or auto-answer link may specify an ITO (inactivity time out) parameter. If there is no activity on the link for the length of time that is specified by the ITO parameter, RSCS disables the port. (An auto-answer port is automatically re-enabled to receive another call.) If, instead of the ITO parameter, an error condition occurs to deactivate this link **and** you have specified the RETRY parameter on this link, RSCS may try to restart the link automatically. For more information about the RETRY parameter, see “Restarting Links” on page 41.

To use auto-answer, you must enter RSCS ENABLE commands for switched telecommunication ports over which incoming calls from workstations or remote systems are expected. Information messages will be displayed if the ports were correctly enabled:

```
rscs enable all
Ready;
 Port 0123 being enabled
 Port 0124 being enabled
.
.
 Port 0123 enabled, trace=none
 Port 0124 enabled, trace=none
```

To successfully enable an auto-answer switched port:

- Associated telecommunication equipment must be in working order.
- You must have previously specified the port's virtual address in a PORT statement or command.

If RSCS cannot enable a line, you will see an error message:

```
rscs enable all
Ready;
 Port 0123 is not a BSC port

rscs enable 0125
Ready;
 Port 0125 not available
```

RSCS might have issued the DMT225E message because you specified the wrong port address; enter the command again with the correct port. A telecommunication port that was incorrect for an auto-answer link produced the DMT223E message. Record the information in the message to help determine the problem.

To disable a previously enabled switched telecommunication port (that is, to make it unavailable for use by an auto-answer link), use the DISABLE command:

```
rscs disable 123
Ready;
 Port 0123 being disabled
 Port 0123 disabled
```

Auto-Signon Considerations

An **auto-signon** link is an RJE-type link for which you have specified one or more of the auto-signon parameters: BUFF, CMPR, HDR, LPRT, PCH, PRINT, SYSTEM, TEXT, TRS, or TYPE. (You can specify these parameters using the PARM statement, the DEFINE command, or the START command.) Because you specify the parameters before (or while) you start the link, auto-signon links relieve operators of having to manually submit signon cards from remote workstations.

An auto-signon link can also be an autodial or an autostart link, but not an auto-answer link.

You can use the RSCS DRAIN and STOP commands to deactivate an auto-signon link. The link retains its auto-signon status after deactivation, unless you specified the auto-signon parameters only on the START command. If so, the parameters are valid only until the link deactivates.

Autostart Considerations

An *autostart* link automatically starts when a file is queued for transmission over it. You can define any type of link as autostart (except an auto-answer, LPD-type, or UFTD-type link) by specifying the ASTART operand on the LINKDEFINE statement or DEFINE command. For SNA links, the SNA control task must be started and running before the links can start.

An autostart link can also be an autodial link. An autodial or autostart link that has a file queued for transmission may remain inactive until a port becomes available for its use. When queried, such a link will be in *dial-queue* status.

If you specify an ITO (inactivity time out) parameter on an autostart link and there is no activity on that link for the period equal to the ITO value, RSCS automatically deactivates the link. When RSCS deactivates a link because of an ITO *time out*, the link retains its autostart capability.

RSCS can deactivate an autostart link for the following reasons:

- The link abends.
- An irrecoverable line error occurs.
- A remote workstation node sends a signoff record.
- An operator enters an RSCS DRAIN, FORCE, or STOP command for the link.

RSCS will also disable the autostart capability of the link. This prevents RSCS from repeatedly attempting to autostart a link that has been deactivated by either RSCS or by an RSCS operator. You must enter a new DEFINE command with the ASTART operand to restore the autostart capability for a link disabled in this manner.

RSCS may try to automatically restart the link, if you specified the RETRY operand for this link. For more information, see "Restarting Links" on page 41.

If an autostart link uses forms control, the form of the file that is being processed much match the form specified for the link. If they do not match, the link will not start automatically. To avoid potential problems, you can specify the FORM * parameter when defining the printer link.

Restarting Links

Usually, a link will need to be restarted only if it has been deactivated through some malfunction (such as in the communications hardware or protocol) and the automatic restart procedures, if any have been specified, have failed. (There are three automatic restart procedures described below.) If a link was deliberately deactivated, for example, by the RSCS DRAIN, FORCE, or STOP command, the operator will use some discretion in determining if the link should be started again. This should be based on some standard operating procedures developed by the installation. In any case, the most direct way of starting a link again is by entering another RSCS START command for that link.

A link may restart *automatically* under certain conditions. For this to happen, the following conditions must be met:

1. The link driver that controls the link has determined that the error, which caused deactivation, might be corrected if the link were restarted. This determination is different for each link type, and many error conditions are evaluated. (For instance, a restart is **not** attempted if deactivation was caused by an abend, a permanent I/O error, or a VTAM error.)
2. You specified that one or more of the three automatic restart procedures should be used if the link were deactivated. RSCS will try to carry out the procedures in the following order:

   a. **Autostart Procedure** — If the link is an autostart link and a file is queued for transmission, RSCS will try to restart the link automatically.

   b. **Retry Procedure** — If you have specified the RETRY operand on the LINKDEFINE statement, DEFINE command, or START command for an autodial or SNA link, RSCS will (by default) try to restart the link automatically after 1 minute. If the restart fails, RSCS will wait 10 minutes before trying again. If that restart fails, RSCS will wait 19 minutes before trying again. RSCS will continue to retry the link indefinitely at increasing intervals.

      The intervals are at 1, 10, 19, 27, 34, 40, 45, 49, 52, 54, and 55 minutes. (To define intervals for your local system, use the RETRY statement described in *z/VM: RSCS Networking Planning and Configuration*.) Once RSCS reaches the 55 minute interval between restarts, all restarts after that point are 55 minutes apart until the link restarts or RSCS ends.

      Note: If you are interested in seeing how many times RSCS has tried to restart a link or how many minutes are left until the next attempt, the QUERY LINKS and QUERY SYSTEM LINKS commands both have retry filters and SHOW options you can use. See "QUERY LINKS" on page 199 and "QUERY SYSTEM LINKS" on page 229.

c. **Restart Procedure** — If you have created a generic **restart exec** (RESTART GCS) and this is a non-SNA link, RSCS will try to restart the link automatically. If it is on one of the disks accessed under GCS in the RSCS virtual machine (these may not be the same disks accessed under CMS), RSCS processes the generic restart exec, which requires only the name of the link as input. (For a sample generic restart exec, see "Restarting Links Using Restart Execs" on page 91.)

The file mode of your restart exec will consist of a letter followed by a number (for example, A1). Unless you specify otherwise, the file mode number defaults to 1. However, file mode numbers 1, 2, 4, 5, and 6 are acceptable. Do not use file mode numbers 0, 3, 7, 8, and 9. File mode 0 means the file is private; file mode 3 means that the system should erase the file after you have read it; and file modes 7 - 9 are reserved for IBM use.

If RSCS cannot find a generic restart exec, it looks for a file called *linkid* GCS for each link that deactivates because of peer system signoff or a nonfatal I/O error. (A *linkid* GCS exec does not ask you to supply the name of the link as input.)

At a minimum, this exec would contain an RSCS START command for the link. For example, here is a simple restart exec for link NYCVM1.

Table 4. Sample Exec for Restarting Links

NYCVM1 GCS

```
/* This exec will automatically restart the link that has  */
/* the same name as the filename of this exec.             */
/* The link will be started using the default parameters   */
/* that were specified on the PARM statement for this link */
/* in the RSCS CONFIG file or on the PARM operand of the   */
/* DEFINE command.                                         */

Parse Source . . linkid .
'RSCS START' linkid
Exit rc
```

The link will not be automatically restarted if the above conditions are not met, or if the link is:

- An auto-answer link
- An autodial link that is on a dynamically assigned port
- An autodial link that has been deactivated before it can sign on
- Terminated because its ITO value was exceeded
- An autostart link that received a signoff record over a switched telecommunication line

If any of the previous conditions are met, the link will not be restarted automatically. Here, the operator must determine if the link should be restarted manually, as described earlier.

Inappropriate Restarts

Under certain circumstances, such as if an incorrect phone number is specified, or if a required password is *not* specified, for an autodial/autostart link, RSCS will repeatedly deactivate the link and attempt to restart it. These deactivations and restarts will be signaled by repeated displays of message DMT953E. If this happens, enter a STOP command for the link and consult with support personnel at the remote node to verify the correct phone number, password, and so forth.

Verifying Link Attributes

You can use the QUERY LINKS or QUERY SYSTEM LINKS command to determine a link's status and attributes. For example:

```
smsg rscs query system links
Ready;
 Link                          Line
 Name     Status     Type      Addr LU Name  Logmode  Queueing
 BBONE1   connect    SNANJE    0000 NYB1RSCS RSCSNJE0 size
 BBONE2   connect    SNANJE    0000 NYB2RSCS RSCSNJE0 size
```

```
 BOSTON   connect    NJE      06E8 ...      ...      size
 CHICAGO  connect    NJE      06C2 ...      ...      size
 CLEVELND connect    NJE      0DEC ...      ...      size
 DALLAS   connect    NJE      06C6 ...      ...      size
 LONDON   connect    NJE      06F0 ...      ...      size
 NYASCII  connect    ASCII    07BA ...      ...      fifo
 NY6670A  connect    RJE      00A7 ...      ...      size
 NY6670B  connect    RJE      01A7 ...      ...      size
 NY3812A  connect    SNA3270P 038A PR2ARSCS RSCSNJE0 fifo
 NY3812B  connect    SNA3270P 038B PR2BRSCS RSCSNJE0 fifo
 RALEIGH  connect    NJE      06C7 ...      ...      size
 TOKYO    connect    NJE      0429 ...      ...      size
 TORONTO  connect    NJE      06E9 ...      ...      size
 *LIST    connect    LISTPROC 0000 ...      ...      fifo
 16 links found
```

This response tells you that you have 16 links and gives you the status, link type, line address, SNA LU name, SNA logmode, and type of queuing used for each link.

Suppose you only want to verify the link attributes of your SNA links and you want information about each link's PARM attributes:

```
smsg rscs query system links sna show id status type parm
Ready;
 Link
 Name     Status     Type     Parm Text
 BBONE1   connect    SNANJE   STREAMS=4 TA=0 BUFF=3200
 BBONE2   connect    SNANJE   STREAMS=4 TA=0 BUFF=3200
 NY3812A  connect    SNA3270P FEAT=AT TR=TEXT P=132 SEP=NO COMP=NO VFC=YES
 NY3812B  connect    SNA3270P FEAT=AT TR=TEXT P=132 SEP=NO COMP=NO VFC=YES
 4 links found
```

The QUERY LINKS and QUERY SYSTEM LINKS commands both have many filters and SHOW options to help you create a response that contains the information you need. See “QUERY LINKS” on page 199 and “QUERY SYSTEM LINKS” on page 229.

Suspending Transmission on Links

Occasionally, you may want to temporarily stop transmission over a link (for example, when a printer is getting low on paper). Before you try to load the printer, you should suspend transmission on the link to prevent other files from being transmitted to it. To do so, issue the HOLD command:

```
smsg rscs hold prt38003
Ready;
 Link PRT38003 to suspend file transmission
 Link PRT38003 file transmission suspended
```

The HOLD command temporarily suspends transmission over a link, but does not deactivate it. (For GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type links, HOLD also suspends file reception.) RSCS suspends transmission when the link finishes transmitting the current file. If you include the IMMEDIATE operand, RSCS suspends transmission before the link finishes transmitting the current file:

```
smsg rscs hold prt38003 immediate
Ready;
 Link PRT38003 file transmission suspended
```

If you include the INPUT operand, RSCS only suspends file reception. You may want to do this if your local RSCS system had a backlog of spool files and you did not want to receive any more files until you reduced the size of the file queue. For example:

```
smsg rscs hold dallas input
Ready;
 Link DALLAS file reception suspended
```

When you want the link to start transmitting again, use the FREE command:

```
smsg rscs free prt38003
Ready;
 Link PRT38003 resuming file transfer
```

For more information about the HOLD and FREE commands, see “HOLD” on page 169 and “FREE” on page 167.

You can also use the SLOWDOWN facility to automatically suspend file reception if the file backlog reaches a specific point. When the number of files awaiting processes decreases to an acceptable level, RSCS automatically resumes file transmissions on the link. For more information, see the LINKDEFINE and SLOWDOWN statements in *z/VM: RSCS Networking Planning and Configuration*. For information about the SLOWDOWN command, see “SLOWDOWN” on page 276. Also see Chapter 8, “Automating the Operation of Your Network,” on page 91.

Freeing Suspended Links

Occasionally, because of problems on the line or with hardware, a link can become suspended; transmissions on the link will not start or will not successfully be completed. In either case, the line is blocked and no further transmissions can take place over it. You will probably first become aware of the situation when you receive a series of messages from users saying that files are not arriving at their destinations. You can verify that the line is blocked by issuing a series of QUERY commands:

```
rscs query prt38003 active
Ready;
  Loc Orig   Destination            Records
   ID   ID Node     Userid        Done     Total Status
 5192 1140 PRT38003 SYSTEM        6961     56938 sending
 1 file found

rscs query prt38003 active
Ready;
  Loc Orig   Destination            Records
   ID   ID Node     Userid        Done     Total Status
 5192 1140 PRT38003 SYSTEM        6961     56938 sending
 1 file found
```

That is, if you enter the QUERY command several times and the number in the Records Done column does not change, deactivate the link and start it again:

```
smsg rscs stop prt38003
Ready;
 Link PRT38003 file transmission suspended

smsg rscs start prt38003
Ready;
 Activating link PRT38003 3270P line=037C class=* queuing=FIFO
 File queue reordered
 Line 037C ready for connection to link PRT38003
 Link PRT38003 line 037C printer ready
```

Note: When a printer link appears unresponsive or not functioning, enter a QUERY LINKID command to display the link's status. If the response says that intervention is required, the link in question need not be deactivated and restarted. Rather, the printer should be checked to determine what action is required to correct the problem. For example, the printer may have run out of paper.

Deactivating Links

Deactivating a link breaks the connection between your node and an adjacent node. After a link deactivates, you can no longer use it to communicate with the network.

RSCS deactivates a link when:

- An RSCS operator enters a DRAIN or STOP command.
- An RSCS operator enters a NETWORK HALT command, which deactivates all SNA links before deactivating the interface between RSCS and VTAM.
- An RSCS operator enters a SHUTDOWN command, which deactivates all links, the RSCS/VTAM interface, and the port redirector task; it then shuts down RSCS.
- The remote end of a networking or workstation link sends a signoff record.

- There has been no activity on a link for a period exceeding that link's inactivity time out (ITO) value. For more information on the ITO parameter for the individual link types, see Chapter 13, “Link Operational Parameters,” on page 293.
- A VTAM operator enters a VARY INACT, VARY NET, or VARY TERM command for an SNA link.
- A VTAM operator enters a HALT command, which deactivates all SNA links.

DRAIN and STOP Commands

To deactivate a single link, use either the DRAIN or STOP command. DRAIN deactivates the link after any current files (those being received and transmitted) finish processing. STOP deactivates the link immediately, without processing any current files further.

Between the time that you enter the DRAIN command and the time the current file finishes, RSCS displays a confirmation message. If you enter a START command for that link before the current file finishes processing, RSCS ignores the DRAIN command and usual processing continues. If you stop the link by entering the STOP command, processing will not continue.

When you enter a DRAIN or STOP command, there may be a small interval of time between the time you enter the command and the time the link deactivates. If someone sends a command to a link that is being deactivated, the link may or may not process the command. It will depend on whether the command makes it to the link before the link completes deactivation.

SHUTDOWN Command

To deactivate all links and end all RSCS processing, use the RSCS SHUTDOWN command.

FORCE Command

Occasionally, because of a malfunction within the system or on a telecommunication line, a DRAIN or STOP command fails to deactivate the link. If the non-SNA link must be stopped, but it does not respond to DRAIN or STOP, you can use the FORCE command. However, you should only use the FORCE command **in extreme cases**, because it causes the link driver to abend (abnormal end) and may make the link difficult to restart later.

If a DRAIN or STOP command fails to deactivate an SNANJE-type, SNARJE-type, or SNA3270P-type link, the link must be deactivated from VTAM by issuing a VARY INACT command for that link's LU name.

The following shows an example of a series of commands, and responses to them, to deactivate the links in Figure 5 on page 38:

```
smsg rscs drain chicago
 Link CHICAGO now set to deactivate

smsg rscs stop prntr
 Link PRNTR LUNAME SNAPRNTR session terminated
 Link PRNTR deactivated
 File queue reordered

 Link CHICAGO line 003C disabled
 Link CHICAGO deactivated
 File queue reordered

 Link BOSTON LUNAME BOSSNA UNBIND received -- session terminating
 Link BOSTON LUNAME BOSSNA session terminated
 Link BOSTON deactivated
 File queue reordered

 Link WRKSTN1 inactivity threshold reached -- link is being deactivated
 Link WRKSTN1 line 0125 disabled
 Link WRKSTN1 deactivated
 Port 0125 being re-enabled
 File queue reordered
```

Managing Networking Links

Networking links allow communication between RSCS and one NJE-compatible subsystem. The networking links are GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type. NJE-type, SNANJE-type, and TCPNJE-type are the RSCS networking links. GATEWAY-type is a networking link using a protocol defined and written by your installation. LISTPROC-type is a special link that processes spool files with distribution lists.

Each of these link types has common features and some have unique features. The rest of this section describes these features and shows on which link types they are available. For information on SNA NJE requirements, see *z/VM: RSCS Networking Planning and Configuration*.

Multistreaming

Multistreaming lets RSCS simultaneously send many files over a networking link (GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, or TCPNJE-type). This means that RSCS can send several short files at the same time as a very long file, rather than having to wait until the long file finishes transmission. This reduces the average time that short files have to wait before being transmitted.

For LISTPROC-type, NJE-type, SNANJE-type, or TCPNJE-type links, RSCS can send files concurrently on a total of seven streams. For GATEWAY-type links, RSCS can send files concurrently on a maximum of 32 streams.

To define the number of streams available for a networking link, use the STREAMS parameter when starting the link. You can also specify the STREAMS operand on the link's PARM statement in the configuration file (see *z/VM: RSCS Networking Planning and Configuration*). After you define the streams, you can check to see how many files RSCS transmits over each stream by using the QUERY SYSTEM COUNTS command with the SHOW options for streams (see "QUERY SYSTEM COUNTS" on page 216).

Connecting to RSCS Version 1
RSCS Version 1 does not support multistreaming. If you are connecting to an RSCS Version 1 system, you should specify STREAMS=1 and TA=0.

Note to z/OS and z/VSE Users
If you are connecting to a z/OS or z/VSE system, you must check the number of STREAMS specified for that system; it must match the value used for RSCS. If only one STREAM is specified for the remote system, use one of the following sets of values for RSCS: • STREAMS=1 and TA=0 • STREAMS=*n* (where *n* is not larger than the maximum number of SYSIN or SYSOUT receivers defined for the remote system) and TA=0 (TA=1 if *n* is greater than zero)

Transmission Algorithms

Transmission algorithms determine which stream RSCS should choose when sending a file over a networking link (GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, or TCPNJE-type). RSCS supplies two transmission algorithms, numbered 0 and 1, which reside inside the RSCS load library. These are called IBM-supplied transmission algorithms.

RSCS also lets you write and define your own transmission algorithms. These are called installation-defined transmission algorithms. You can place these transmission algorithms either inside or outside the RSCS load library. These are referred to, respectively, as internal and external installation-defined algorithms.

Besides the IBM-supplied transmission algorithms, RSCS lets you define transmission algorithms 2 through F (the internal installation-defined transmission algorithms). Before you can use these transmission algorithms, you must reassemble the DMTAXA module and build a new RSCS load library.

Because you must reassemble and rebuild, it is recommend that you use external installation-defined transmission algorithms.

The external installation-defined transmission algorithms do not require you to reassemble RSCS modules or rebuild the RSCS load library. Instead, you specify the name of the entry point on the TA parameter when starting the link.

Note: No matter where an installation-defined transmission algorithm resides, your installation must define and write the algorithm before you start any links which refer to that algorithm. If you try to start a link specifying an internal installation-defined transmission algorithm without supplying the associated algorithm, RSCS issues message DMT817E. If you try to start a link specifying an external installation-defined transmission algorithm without supplying the associated algorithm, RSCS issues message DMT823E and will not start the link.

For more information about specifying transmission algorithms, see the descriptions of the TA and TAPARM parameters in Chapter 13, "Link Operational Parameters," on page 293. For descriptions of the TA and TAPARM operands on PARM statements in the configuration file, see *z/VM: RSCS Networking Planning and Configuration*. For more information about installation-defined transmission algorithms, see *z/VM: RSCS Networking Exit Customization*.

Job Names

Networking links (GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type) require that each file has a job header. RSCS creates job headers for files originating at your local node and files arriving without a job header (that is, files coming from workstation links).

The job header contains information about the file (for example, information about the origin node and user). One of the fields in the job header is the job name. When printing the separator pages between jobs, many printers show the job name in large, block letters. RSCS lets you dictate the contents of the job name field.

The JOBNAME operand on the OPTION statement in the configuration file lets you dictate the contents of the job name field for your local system. For more information about the OPTION statement, see *z/VM: RSCS Networking Planning and Configuration*.

The JOBNAME parameter of GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links lets you dictate the contents of the job name field for a specific link. The JOBNAME operand on the CP TAG command lets you dictate the contents of the job name field for a specific file. See Chapter 13, "Link Operational Parameters," on page 293 for more information about the operands for a specific link.

Unit Record Output Devices

To create a spool file, each networking link (GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, or TCPNJE-type) needs one unit record output device (a virtual printer or punch). For each channel (as specified on the CHANNELS statement in your configuration file), you reserve 256 unit record output (URO) devices. RSCS uses some of these devices as virtual readers to handle outgoing traffic. RSCS can use the rest for virtual printers and punches to handle incoming traffic.

If a file comes in with multiple data set headers (the file is destined for multiple users), RSCS must make a copy of the file for each user on the local system. For each copy, RSCS needs one URO device. If the file has a large distribution list or several files with distribution lists arrive at the same time, RSCS can quickly use up its allotment of URO devices.

If you define a list processor link, you can tell RSCS how to divide the URO devices between the networking links. The MAXURO parameter on GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links lets you specify the maximum number of URO devices for each stream. RSCS has created defaults that give the most URO devices to the list processor. This lets the list processor handle files with multiple data set headers.

For more information about the MAXURO parameter, see Chapter 13, "Link Operational Parameters," on page 293.

Data Set Headers

Systems without list processors cannot handle files with an unlimited number of data set headers (large distribution lists). If you have a GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type link to a system without a list processor, you can help out the other system by sending files with a limited distribution list size.

The MAXDSH parameter on GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links lets you specify the maximum number of data set headers your system should include in a file to a system without a list processor. When RSCS meets a file with more data set headers than the other system can handle, RSCS sends portions of the file over the link. This lets your local RSCS system help prevent a system problem (caused by lack of URO devices) on the system without a list processor.

For more information about the MAXDSH parameter, see Chapter 13, “Link Operational Parameters,” on page 293.

File Buffers

RSCS uses buffers to send data over NJE-type, SNANJE-type, and TCPNJE-type links. If your local RSCS system connects to a remote NJE subsystem that supports the *mixed RCB feature* of NJE, RSCS can send file and message information in the same buffer. See z/OS: Network Job Entry (NJE) Formats and Protocols (https://www.ibm.com/servers/resourcelink/svc00100.nsf/pages/zosv2r5sa320988/$file/hasa600_v2r5.pdf) for more information about the mixed RCB feature of NJE. If the remote system does not support the mixed RCB feature, RSCS must send file and message information in separate buffers.

A message can usually fit in one buffer, but a file cannot. If one file requires several buffers and several messages come in, RSCS may take longer to send the file because of the interruption of the message traffic. To avoid this, RSCS lets your installation decide how important message traffic is.

Use the MSGSKIP parameter of NJE-type, SNANJE-type, and TCPNJE-type links to tell RSCS how many file buffers you want to send before sending a message buffer. For more information about the MSGSKIP parameter, see Chapter 13, “Link Operational Parameters,” on page 293.

Managing Printer Links

For additional information on printer groups, see the section on defining the structure of your network in *z/VM: RSCS Networking Planning and Configuration*.

Using Printer Forms Control

Print file selection by *form name* lets a link operator or the RSCS console operator specify which types of spool files are to be printed on a remote printer. Print file selection by form name in RSCS is compatible with the forms selection in z/VM spool.

The operator can individually specify each type of form to be printed or can direct RSCS to select the types, based on the form names of the files that are contained in the queue for a particular link. The following link types are eligible for forms control:

- ASCII-type (for ASCII printers and plotters)
- MRJE-type, RJE-type, and SNARJE-type (for workstation printers)
- SNA3270P-type and 3270P-type (for 3270 Information Display System Printers)
- TCPASCII-type (for ASCII printers and plotters within a TCP/IP network)
- LPR-type (for TCP/IP line printer daemon)

  Note: The START command SETUP operand is not valid for an LPR-type link.

In the following discussion, the terms *user form name* and *operator form name* refer to the form naming conventions introduced in z/VM.

The **user form name** is the form name given to the file by the virtual machine user through the CP SPOOL and CLOSE commands. Optionally, your installation can associate a corresponding **operator form name**

with each user form name when the CP system is generated. To do so, you can specify the required values in the SYSTEM CONFIG file.

In the SYSTEM CONFIG file, you can specify the form names on the FORM_DEFAULT and USERFORM statements. The FORM_DEFAULT statement generates default user form names. With the USERFORM statement, you can create a list of user form names and their corresponding operator form names. For more information about these statements and the SYSTEM CONFIG file, see *z/VM: CP Planning and Administration*.

To define form name characteristics, use the RSCS FORM statement. To specify print files by form name, use the RSCS OPFORM statement and the START, CHANGE, and READY commands.

RSCS initialization (see "Step 3 — Initialize RSCS" on page 32) includes reading the RSCS configuration file, which defines the local RSCS system and its view of the network with which it participates. The FORM statement lets the local system specify the characteristics of a form name. The OPFORM statement lets the local system specify the default operator form name. The form name is analogous to, and should agree with, the value of the FORMNAME operand of the RSCS FORM statement. Omitting the OPFORM statement produces a default operator form name of STANDARD. See *z/VM: RSCS Networking Planning and Configuration* for details about initialization.

By using the START command to start a link to a remote workstation printer, a link operator can:

- Request and verify that a particular printer form has been mounted on the remote workstation printer
- Send a setup page to the workstation printer, if requested by the workstation printer operator
- Send to the printer files with either:
  - A specified operator form name
  - All operator form names, but of a specified class

  In the latter case, automatic messages prompting the workstation operator to change print forms are produced when a different group of files that have the same form name is first met.

For more information about the operands you can use when starting links, see "START" on page 278 and see Chapter 13, "Link Operational Parameters," on page 293.

RSCS console operators and link-authorized alternate operators can use the CHANGE command to change the user form name (and other attributes) of an inactive file in the link's file queue.

The remote workstation operator uses the READY command to suggest to RSCS that the operator is requesting that a set-up page be printed. READY may also indicate that the operator has responded to a prompting message that requested a printer form change. The remote workstation operator can them issue the START command to enable the link to begin processing files.

Alternatively, a 3270 printer operator can use control keys in place of the READY and START commands; see "Printer Key Support in an LU_T1 Session" on page 56 for details.

File Selection Examples

The following examples show different ways to select forms.

No Form Selection

```
smsg rscs start linkid form * manual
```

All files are transmitted to the workstation. Forms are ignored; no forms-change messages are produced.

Manual Form Selection

```
smsg rscs start linkid form 12345 manual
```

In this case, all files with form 12345 will be sent to the workstation.

Automatic Form Selection

```
smsg rscs start linkid form form1 auto
```

In this case:

1. The first file in the queue for *linkid* with the form name FORM1 is selected. If there are none, the first file in the queue is selected.
2. RSCS sends a prompting message to the workstation:

   ```
   LINK LINKID PRINT MOUNT REQUIRED CLASS * FORM FORM1 AUTO MODE
   ```

   where FORM1 is the operator form name of the selected file. The operator now has four choices:

   a. Accept the forms-mount request. This is done by mounting the required form on the workstation printer and responding either START *linkid* or READY *linkid*.
   b. Ask RSCS for a different form, or end AUTO mode. This is done by entering the START command with a different form name or with the MANUAL option. A new file may be selected.
   c. Drain the link by issuing the DRAIN *linkid* command. The mount request will be canceled and the link will be drained.
   d. Start processing the next file by issuing a FLUSH command. (If there are no other files with the same form name, the file will be re-transmitted.)
3. RSCS starts transmitting the file to the workstation. The operator may enter the QUERY *linkid* ACTIVE command to see how many records are left to be transmitted, or the FLUSH command to stop transmitting the file.
4. When the active file has been transmitted, RSCS purges it from the queue and searches for another file with the same form name. If one is found, RSCS transmits it immediately. If none is found, RSCS searches for a new form name and issues the prompting message.

Automatic Form Selection with Setup Pages

```
smsg rscs start linkid form form1 setup
```

As in the preceding example, RSCS issues the prompting message:

```
LINK LINKID PRINT MOUNT REQUIRED CLASS * FORM FORM1 SETUP MODE
```

The word SETUP has replaced the word AUTO (except on LPR-type links, which do not support SETUP). If the workstation operator accepts the form request by mounting the required form and issuing a READY command, RSCS starts transmitting the file in setup mode. That is, only one page is transmitted at a time, and the data is masked by translating numbers to 9's and letters to X's. After the page prints, the operator can manually adjust the workstation printer alignment and (to verify alignment) either enter a READY command to print the next page, or enter BACKSPACE and READY commands to reprint the same page.

When the forms are properly aligned, the operator enters the START *linkid* command, and RSCS sends the file as usual, beginning with the first page. Because the link is already active, RSCS ignores any new PARM or OPARM parameters on the START command.

After transmitting the file, RSCS:

1. Transmits and prints other files with the same form name
2. Locates queued files with other form names
3. Transmits forms-mount request messages (and setup pages)
4. Repeats the process until the file queue is empty

If the operator does not accept the forms-mount request, that operator can ask for a different form, end the setup mode, drain the link, or flush the file.

Using Separator Pages

When print or punch files are transmitted to a 3270 printer or remote workstation for processing, you can tell RSCS to create a single separator (header) page to identify the output and to separate one file from another. RSCS supports the use of no separator page between files and two types of separator pages:

- **VM-style** separator pages are similar to those printed on CP-driven line printers. See "VM-Style Separator Page" on page 51. Also see "Differences Between VM-Style and CP-Style Separator Pages" on page 54.
- **RSCS-style** separator pages are the standard style that RSCS has supported on 3270 printer links in the past. See "RSCS-Style Separator Page" on page 54. The RSCS-style separator page is available on all workstation and printer links.

There are three ways to tell RSCS which separator page to use:

1. Set up a form name (using the FORM statement in the configuration file) and specify that form name when starting the link (using the FORM operand of the START command).
2. Define the separator page style using the SEP parameter (on an MRJE-type, SNARJE-type, SNA3270P-type, or 3270P-type link) or the HDR parameter (on an RJE-type link).

   Note:

   a. The separator page style specified on the SEP or HDR parameter overrides the separator page style specified on the FORM statement.

   b. When specifying the SEP parameter on an MRJE-type link, you must also specify SYSTEM=HOST. If you do not specify HOST, RSCS ignores the SEP parameter.
3. Start a link using the FORM * operand (which lets the link process any file regardless of the form name), then specify the appropriate form name on the SPOOL or TAG commands when you send the file.

If the VM-style and RSCS-style separator pages are not the format you want to use for your separator pages, you can use Exit 17 and Exit 18 to create an alternative style. Exit 17 and Exit 18 are described in *z/VM: RSCS Networking Exit Customization*.

VM-Style Separator Page

The VM-style separator page consists of a header page and a trailer page.

As shown in Figure 6 on page 53, the VM-style header page has the following format:

1. Do a page eject (only for MRJE, RJE, and SNARJE workstations).
2. Skip to the fourth line from the bottom of the page.
3. Print 10 lines of asterisks overlaid with:
   - z/VM service level
   - RSCS local node ID
   - RSCS service level
4. Skip 3 lines.
5. Print the user ID, the origin node ID, and the first line of the sequence number and the logo.
6. Print the second line of the sequence number and the logo.
7. Print the distribution, the link ID, and the third line of the sequence number and the logo.
8. Print the fourth line of the sequence number and the logo.
9. Print the file name, the file type, and the fifth line of the sequence number and the logo.
10. Print the sixth line of the sequence number and the logo.
11. Print the file creation date, the file creation time, and the seventh line of the sequence number and the logo.
12. Print the eighth line of the sequence number and the logo.

13. Print the spool file identifier, the record count, and the ninth line of the sequence number and the logo.
14. Print the tenth line of the sequence number and the logo.
15. Print the file print time, the file print date, and the eleventh line of the logo.
16. Print the twelfth line of the logo.
17. Print the file class, the link address (or LU name), and the thirteenth line of the logo.
18. Print the fourteenth line of the logo.
19. Print the form name and the fifteenth line of the logo.
20. Print the sixteenth line of the logo.
21. Skip 3 lines.
22. Print 10 lines of the origin user ID in 10 by 9 character block letters.
23. Skip 3 lines.
24. Print 10 lines of the distribution code in 10 by 9 character block letters.
25. Repeat entire process starting at item “2” on page 51 (Skip to the fourth line from the bottom of the page).
26. Do a page eject (only for SNARJE workstations, SNA3270P printers, and 3270P printers).
27. Print the file.

```
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
** z/VM SERVICE LEVEL 0000 ****** TESTNODE **** RSCS              FUNCTION LEVEL nnn-0000****************************************
```

A

```
TESTUSER    TESTNODE     USERID    ORIGIN        9999999    9999999    9999999
                                                999999999  999999999  999999999
TESTDIST    TESTLINK     DISTCODE  LINKID        99     99  99     99  99     99
                                                99     99  99     99  99     99
FILENAME    FILETYPE     FILENAME  FILETYPE      999999999  999999999  999999999
                                                 99999999   99999999   99999999
hh:mm:ss    mm/dd/yy     FILE CREATION DATE            99         99         99
                                                99     99  99     99  99     99
(1234)      00001234     SPOOLID   COUNT         999999999  999999999  999999999
                                                 9999999    9999999    9999999
hh:mm:ss    mm/dd/yy     FILE PRINT DATE

       A         B01     CLASS     LINE/LUNAME

USERFORM                FORMS
```

B

```
     zzzzzzzzzzzzzzzz
     zzzzzzzzzzzzzzzz
                 zzzz
               zzzz
VV       zzzVV MM         MM
VV   zzzz  VV MM          MM
VV   zzzzzzVVzMMMzzzz   MMM
VV   zzzzzzVVzMMzMzzz  M MM
VV         VV MM  M   M  MM
 VV       VV  MM   M M   MM
  VV     VV   MM    M    MM
   VV   VV    MM         MM
    VV VV     MM         MM
     VVV      MM         MM
      V       MM         MM
```

C

```
TTTTTTTTT  EEEEEEEEE   SSSSSSS   TTTTTTTTT  UU     UU   SSSSSSS   EEEEEEEEE  RRRRRRRR
TTTTTTTTT  EEEEEEEEE  SSSSSSSSS  TTTTTTTTT  UU     UU  SSSSSSSSS  EEEEEEEEE  RRRRRRRRR
   TTT     EE         SS     SS     TTT     UU     UU  SS     SS  EE         RR     RR
   TTT     EE         SS             TTT     UU     UU  SS         EE         RR     RR
   TTT     EEEEEE     SSSSSSSS       TTT     UU     UU  SSSSSSSS   EEEEEE     RRRRRRRRR
   TTT     EEEEEE      SSSSSSSS      TTT     UU     UU   SSSSSSSS  EEEEEE     RRRRRRRR
   TTT     EE                 SS     TTT     UU     UU         SS  EE         RR  RR
   TTT     EE         SS     SS     TTT     UU     UU  SS     SS  EE         RR   RR
   TTT     EEEEEEEEE  SSSSSSSSS     TTT     UUUUUUUUU  SSSSSSSSS  EEEEEEEEE  RR    RR
   TTT     EEEEEEEEE   SSSSSSS      TTT      UUUUUUU    SSSSSSS   EEEEEEEEE  RR     RR
```

D

```
TTTTTTTTT  EEEEEEEEE   SSSSSSS   TTTTTTTTT  DDDDDDDD   IIIIIIIII   SSSSSSS   TTTTTTTTT
TTTTTTTTT  EEEEEEEEE  SSSSSSSSS  TTTTTTTTT  DDDDDDDDD  IIIIIIIII  SSSSSSSSS  TTTTTTTTT
   TTT     EE         SS     SS     TTT     DD     DD     III     SS     SS     TTT
   TTT     EE         SS             TTT     DD     DD     III     SS             TTT
   TTT     EEEEEE     SSSSSSSS       TTT     DD     DD     III     SSSSSSS        TTT
   TTT     EEEEEE      SSSSSSSS      TTT     DD     DD     III      SSSSSSSS      TTT
   TTT     EE                 SS     TTT     DD     DD     III           SS     TTT
   TTT     EE         SS     SS     TTT     DD     DD     III     SS     SS     TTT
   TTT     EEEEEEEEE  SSSSSSSSS     TTT     DDDDDDDDD  IIIIIIIII  SSSSSSSSS     TTT
   TTT     EEEEEEEEE   SSSSSSS      TTT     DDDDDDDD   IIIIIIIII   SSSSSS       TTT
```

Figure 6. VM-Style Separator Page - Header

As shown in Figure 7 on page 54, the VM-style trailer page has the following format:

1. Do a page eject.
2. Print 10 lines of the *sequence number-END* message in 10 by 9 character block letters.
3. Skip 3 lines.
4. Print a message indicating:
   - The file has completed printing
   - The time the file completed
   - The origin user ID
   - The distribution code
5. Skip 3 lines.
6. Print 10 lines of the *END-sequence number* message in 10 by 9 character block letters.
7. Do a page eject (only for SNARJE workstations, SNA3270P printers, and 3270P printers).

```
                                  A

 9999999    9999999    9999999              EEEEEEEEE  N      NN  DDDDDDDD
999999999  999999999  999999999             EEEEEEEEE  NN     NN  DDDDDDDDD
99     99  99     99  99     99             EE         NNN    NN  DD      DD
99     99  99     99  99     99             EE         NNNN   NN  DD      DD
999999999  999999999  999999999   *******   EEEEEE     NN NN  NN  DD      DD
 99999999   99999999   99999999   *******   EEEEEE     NN  NN NN  DD      DD
       99         99         99             EE         NN   NNNN  DD      DD
99     99  99     99  99     99             EE         NN    NNN  DD      DD
999999999  999999999  999999999             EEEEEEEEE  NN     NN  DDDDDDDDD
 9999999    9999999    9999999              EEEEEEEEE  NN      N  DDDDDDDD


PRINT COMPLETED AT 11:02:56 FOR USER: TSTNODE2(TESTUSER)  DIST: TESTDIST

                                  B

EEEEEEEEE  N      NN  DDDDDDDD               9999999    9999999    9999999
EEEEEEEEE  NN     NN  DDDDDDDDD             999999999  999999999  999999999
EE         NNN    NN  DD      DD            99     99  99     99  99     99
EE         NNNN   NN  DD      DD            99     99  99     99  99     99
EEEEEE     NN NN  NN  DD      DD   *******  999999999  999999999  999999999
EEEEEE     NN  NN NN  DD      DD   *******   99999999   99999999   99999999
EE         NN   NNNN  DD      DD                   99         99         99
EE         NN    NNN  DD      DD            99     99  99     99  99     99
EEEEEEEEE  NN     NN  DDDDDDDDD             999999999  999999999  999999999
EEEEEEEEE  NN      N  DDDDDDDD               9999999    9999999    9999999
```

Figure 7. VM-Style Separator Page - Trailer

Differences Between VM-Style and CP-Style Separator Pages

The VM-style separator pages are similar to those printed on CP-driven line printers. The only differences are:

Where Difference Occurs	What CP-Driven Prints	What VM-Style Prints
Header: 10 lines of asterisks	CPU serial and model number	RSCS local node name and RSCS service level
Header: DISTCODE line	SYSTEM	LINKID
Header: CLASS line	DEVICE	LINE or LUNAME
Trailer: PRINT COMPLETED line	USER: *userid*	USER: *nodeid*(*userid*)

RSCS-Style Separator Page

The RSCS-style separator page is the standard style header that RSCS has supported on 3270 printer links in the past. This style header is available on all workstation and printer links. As shown in Figure 8 on page 55, the RSCS-style header page has the following format:

1. Do a page eject (only for LPR-type, MRJE-type, RJE-type, SNARJE-type, and TCPASCII-type links).
2. Print 1 line of asterisks.
3. Skip 2 lines.
4. Print the origin node ID, user ID, file creation date, file creation time, and time zone.
5. Skip 2 lines.
6. Print the link ID, spool ID, file name, file type, and distribution code.
7. Skip 2 lines.
8. Print the record count, print date, and print time.
9. Skip 2 lines.
10. Print 1 line of asterisks.
11. Do a page eject (only for LPR-type, SNARJE-type, SNA3270P-type, TCPASCII-type, TN3270E-type, and 3270P-type links). If this is a GDDM file, RSCS ejects the page only if you specify the VFC=YES operand on the START command.
12. Print the file.

```
**************************************************************************************************************************

TESTNODE    TESTUSER    04/10/95    05:12:30  EST     WAS THE ORIGIN

DEST: TESTLINK  FILE:     2345  NAME: FILENAME      FILETYPE      DIST: TESTDIST

RECS:     2345  PRINT DATE: 07/10/95  05:23:15

**************************************************************************************************************************
```

Figure 8. RSCS-Style Separator Page - Header

ASCII Operational Considerations

The ASCII-type and TCPASCII-type printer links use ASCII printer and plotter exit points to build device-specific data streams. On ASCII-type links, the data streams are then sent to printers and plotters connected to RSCS through a controller such as the IBM 7171 ASCII Device Attachment Control Unit or the 9370 ASCII Subsystem controller. For TCPASCII-type links, the ASCII printers or plotters are attached to a terminal server in a TCP/IP network.

RSCS provides the following sample ASCII printer and plotter exit routine modules:

ASCXDSOE
DS180 Matrix Printer from Datasouth

ASCXDWRE
LA120 DECwriter Printer from DEC

ASCXONE
Generic non-Postscript printer

ASCXPROP
IBM Proprinter

ASCXPSE
PostScript printer

ASCXSPWE
NEC 3515 Spinwriter Printer

ASCXZETE
Nicolet Zeta 8 Plotter

ASCX749E
IBM Instruments XY/749 Multipen Digital Plotter

You can use one of these sample modules to choose the appropriate protocol for a particular kind of ASCII printer or plotter. Or, you can write your own processing module using the sample modules as guides.

For more information on the ASCII printer and plotter exit points, see *z/VM: RSCS Networking Exit Customization*.

3270 Printer Operational Considerations

The 3270P-type, SNA3270P-type, and TN3270E-type printer links assume that the paper is in position to be printed on the very first line of the page. The paper in the printer should be positioned one line below the perforation in the continuous form paper to initially set the top of a page. To prevent the possibility that printing might begin while you are moving the paper, switch the Power ON/OFF switch to OFF or hold down the HOLD PRINT key before aligning the page.

The Vertical Forms Control (VFC) feature lets the operator manually set the forms length on printers started with the VFC=YES parameter. The link will then issue a Forms Feed (instead of multiple New Line

characters) to skip to the top of the next page. It is the operator's responsibility to align the vertical form control with the top of a page when changing forms or at initial setup, and to ensure that the LPAGE parameter value matches the VFC setting. Refer to the appropriate Operator's Guide for instructions on how to set the VFC control for a particular printer. See also the VFC and LPAGE operands of the START command for the printer links.

Output File Processing

When print or punch files are transmitted to a 3270 printer, a single header (separator) page is created to identify the output and to separate the file from the next file. RSCS lets the operator decide whether there will be a separator page between files. If the operator chooses to have a separator page between files, RSCS supports two different types of separator pages. See “Using Separator Pages” on page 51.

Printer Key Support in an LU_T1 Session

RSCS supports the use of the CANCEL PRINT, PA1, and PA2 keys on the 3270 printers when they are connected through an SNA3270P-type link that is using an LU_T1 session.

Canceling a File

To cancel a file that is being printed, press the following keys in the order shown:

1. HOLD PRINT key
2. CANCEL PRINT key
3. FORMS FEED key
4. ENABLE PRINT key

This is equivalent to issuing a FLUSH command. That is, printing of the file is halted, the remainder of the file is discarded, and the next file will be printed when the CANCEL processing is completed.

Responding to a Forms Mount Message

To start a file printing if your link is in the forms mount state, press the HOLD PRINT key, then do either of the following:

- Press the PA1 key then the ENABLE PRINT key to run a READY command.
- Press the PA2 key then the ENABLE PRINT key to run a START command.

Note: If you press either the PA1 or PA2 key while the link is *not* in the forms mount state, an error message will be issued and the key will be ignored.

GDDM File Considerations

When processing GDDM files, you should consider the following information:

- The BACKSPACE and FWDSPACE commands are ignored for a GDDM file.
- SETUP mode for the link is ignored for a GDDM file. That is, the file will be printed as usual in response to a START or READY command, as if AUTO had been specified.
- Certain printers (3284, 3286, and 3288) that do not support the Forms Feed order will lose proper page alignment after printing a GDDM file.

Managing Workstation Links

The following sections describe considerations for using MRJE-type and RJE-type links.

Remote Workstation Operator Commands

Remote workstation operators can use a subset of the RSCS commands that, usually, affect only their specific links. They are the "R" commands listed in Table 9 on page 130 and are described in

the remainder of Chapter 12, “RSCS Commands,” on page 127. Depending on the particular kind of workstation, you enter commands through its keyboard or on punched cards to be read through the remote card reader. The command cards must precede the ID control card for an input file; see “ID Card Format From Remote Workstations” on page 58.

Note: Remote workstation operators must not:

- Enter an RSCS command preceded by either RSCS or SMSG *rscsid* (see “Entering RSCS Commands” on page 11)
- Include the link ID in an RSCS command, except for the CMD, MSG, and QUERY commands

Workstation Link Messages

A subset of the RSCS operator messages is printed on the remote workstation printer. RSCS provides a message queue for workstations that have no separate console printer for messages. When the remote printer has completed processing an output file, the queued messages are transmitted and printed. See *z/VM: RSCS Networking Messages and Codes* for a key to the distribution of messages.

File Processing in a Workstation Mode

An MRJE-type link, operating in a workstation mode, can send files consisting of job control records and data to remote batch systems for processing. These files can originate from:

- z/VM users spooling files to RSCS
- Remote NJE systems submitting files, with valid destination information
- Remote workstations submitting card decks, with valid destination information in the ID card

When the remote batch system has processed the data, printer and punch output can be transmitted back to the originating system. This output is then printed or punched on the appropriate local real I/O device.

File Processing in Host Mode

An RJE-type link (or an MRJE-type link operating in host mode) communicates with a remote workstation from which input is received and to which output is returned. An SNARJE-type link communicates with an SNA System/36 RJE workstation from which input is received and to which output is returned.

Input File Processing

The remote workstation submits input to the RSCS machine through its card reader. This input can be directed to the virtual reader of a z/VM user or to another remote workstation. Output processing at the remote workstation can be interrupted at any point to allow the transmission of input data. The procedure for interrupting output processing varies according to the kind of workstation that is being used; it is explained in the operating procedures for the specific workstation. When the input has been processed, the output processing can be resumed from the point of interruption.

A control card is placed in front of the deck to be transmitted. The card's format is described below.

If you are using an MRJE-type link and the user ID on the ID card is incorrect, RSCS purges the incoming file.

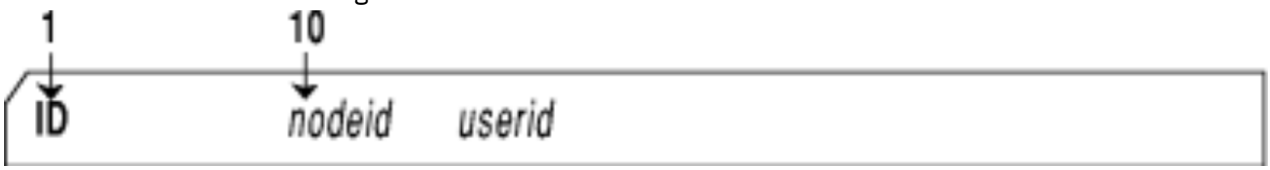
If you are using an RJE-type link and the user ID on the ID card is incorrect, RSCS reads the cards that follow as though they were RSCS commands. The card deck will not be recognized as containing a file.

If you are using an SNARJE-type link and there is no ID card or the ID card is incorrect, RSCS receives the file. If there is an ID card and the user ID or node ID fields are longer than eight characters, RSCS truncates these fields to eight characters and receives the file. If there is an incorrect ID card, RSCS ignores the ID card and receives the file.

ID Card Format From Remote Workstations

An ID card is entered at the beginning of a deck of cards from a remote workstation to specify the network destination of the file being entered. A single-parameter ID card has the following format: the *userid* specifies the destination user at the directly connected RSCS location to which the file following the ID card is addressed.

A two-parameter ID card has the following format: the *nodeid* and *userid* specify the destination node and user to which the file following the ID card is addressed.



The user ID may be replaced by the SYSTEM keyword if the file is to be produced as real unit record output at the destination location, and by the JOB keyword if the file is to be entered as a job at the destination batch processing system.

Note: For the ID card to be valid, the user ID (or node ID, for a two-parameter card) must start in card column 10, and there must be no other data (such as comments or sequence numbers) on the card. If the ID card is not valid, the following cards will either be flushed (for an MRJE-type link), taken as RSCS commands (for an RJE-type link), or received (for an SNARJE-type link).

Output File Processing in Host Mode

When punch files are transmitted to a remote workstation, RSCS creates a header line on the output to identify the originating user ID, date, and time of transmission. Card decks punched at the remote workstation contain the source header information on the first card punched; the rest of the card is filled with asterisks. The card header information has the following format.

Column	Field	Meaning
1	lllllll	file origin location
13	vmvmvmvm	file origin virtual machine
25	xx/xx/xx	file origin date
37	yy:yy:yy	file origin time
47	x.x.t.	time zone
55	WAS THE ORIGIN	

Printer files are separated from one another by header (separator) pages, which may be seen at the edge of the unburst paper, to allow the operator to easily separate printed output. RSCS supports the use of no separator page between files and two types of separator pages. See “Using Separator Pages” on page 51.

Signing On an RJE-type Link

There are two ways to sign on to an RJE-type link:

- Specify the link as auto-signon.
- Submit a signon card from the remote workstation.

To specify an auto-signon link, you must specify at least one of the auto-signon parameters when starting the link. For more information, see “Auto-Signon Considerations” on page 40.

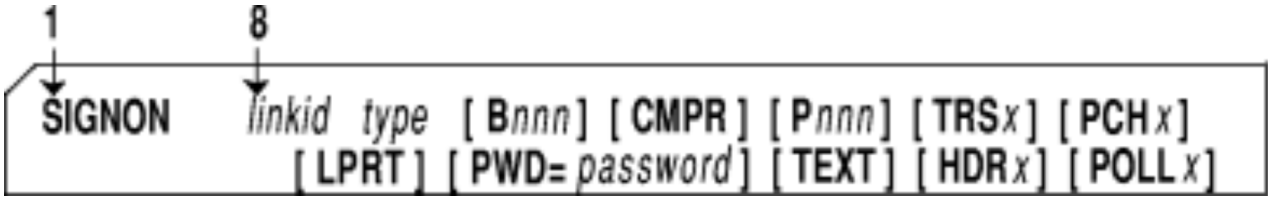
If you prefer not to have an auto-signon link, you must first start an RJE-type link. After starting the link, either end of the link can establish contact on a switched line by dialing the other side. Once you have established contact (or if the line is a leased line), you must submit a signon card through the card reader at the remote workstation.

The signon card is used only once per session. It must precede all other cards and must be completely processed (end-of-file generated) before you submit any other commands or input card decks. If the line drops, you must submit the signon card again after restarting the line.

If you have specified this link as an auto-answer link (its port has been enabled), RSCS starts the link automatically when it receives an incoming call and reads a valid signon card. This signon card must specify a password that matches the password you specified for the link. (You can specify the password on a PARM statement, DEFINE command, or START command). If the passwords do not match or were omitted, RSCS disables the port and will not start the link.

Signon Card Format

The signon card gives RSCS information about the remote workstation. The format of the signon card is:



SIGNON
is a required keyword; it must start in card column 1.

linkid
is the 1- to 8-character name of the link to the remote workstation. This field is required and must appear in columns 8 - 20. The link ID on the signon card must match the link ID of the START command for RSCS to accept the signon card.

type
is the workstation type: 2770, 2780, 3770, or 3780.

B*nnn*
specifies the line buffer size in bytes (*nnn*), depending on the workstation:

Workstation	Acceptable Values	Default
2770	128, 256, or 512	128
2780	170 or 400	170
3770	256	256
3780	512	512

Note: To avoid print-line truncation for the 2770, the number of bytes (B*nnn*) must be larger than the number of print positions (P*nnn*). The buffer must be large enough to contain 6 bytes of control information and the characters to be printed.

CMPR
specifies that the remote 2770, 3770, or 3780 workstation has the blank compression feature.

P*nnn*
specifies the number of print positions (*nnn*) available at the workstation printer, depending on the workstation type:

Workstation	Acceptable Values	Default
2770	120, 132, or 144	120
2780	120 or 144	120

Workstation	Acceptable Values	Default
3770	132	132
3780	120 or 144	120

Note: To avoid print-line truncation for the 2770, the number of print positions (P*nnn*) must be smaller than the line buffer size (B*nnn*).

TRS*x*
specifies whether the remote workstation has the transparency feature.

Y
The remote workstation has the transparency feature.

N
The remote workstation does not have the transparency feature. This is the default.

Note: RSCS usually translates characters less than X'40' and greater than X'FE' into blanks. If you do not want RSCS to translate these characters into blanks when it sends them to the remote workstation, specify TRSY.

PCH*x*
specifies whether the remote workstation has a punch.

Y
The remote workstation has a punch available.

N
The remote workstation does not have a punch available. This is the default.

LPRT
directs all print files to the line printer (for remote 3770 workstations only). If you omit this operand, RSCS directs all print files to the console printer.

PWD=*password*
specifies the 1- to 8-character password for the link. This password must match the one specified (on the PARM statement, DEFINE command, or START command) when you started the link. If you did not specify a password when you started the link, you can omit this operand.

If this is an auto-answer link (the port has been enabled), you must specify a password. If the password is omitted or incorrect on the signon card, RSCS disables the port and will not start the link.

TEXT
sends all characters on a TN text printing chain to the remote printer, allowing both uppercase and lowercase to print. If you omit this operand, RSCS translates lowercase to uppercase.

HDR*x*
specifies the type of separator page to be inserted before each print file sent across the link.

Y
RSCS-style separator page. This is the default.

N
No separator page.

V
VM-style separator page.

Note: HDRY and HDRV apply only to print files. When transmitting a punch file to a remote workstation, RSCS creates a header line on the output. For more information about the format of this header line, see “Output File Processing in Host Mode” on page 58.

POLL*x*
specifies whether the remote workstation should be polled when there is no work to be done on the link.

Y
Poll the remote workstation. This is the default.

N
Do not poll the remote workstation.

Signing On an MRJE-Type Link

If an MRJE-type link is operating in host mode (SYSTEM=HOST), it must receive signon information from the remote workstation node before other communication can continue.

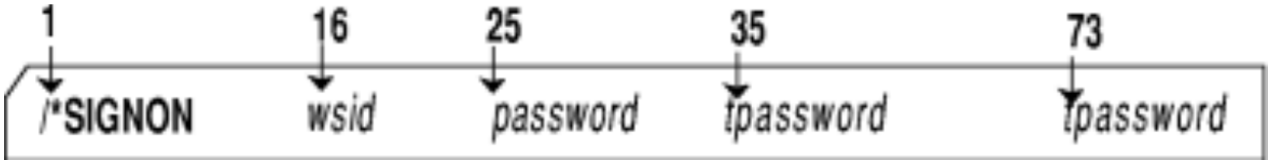
Remote programmable workstations are loaded with Remote Terminal Processor (RTP) programs to communicate with RSCS, and a signon card or its equivalent is included in the program deck. The RTP program reads the signon *card*, builds a signon *record*, and transmits it to the host system.

If an MRJE-type link is started as a workstation (SYSTEM=JES2, SYSTEM=JES3, or SYSTEM=RES), it uses PARM information to automatically build a signon record and transmits it to the host system. The PARM information was supplied by the PARM configuration file control statement, or by the operator in a START or DEFINE command.

When the host system accepts the signon record, the workstation is notified and communication can continue.

If the link is an auto-answer link (its port has been enabled), the link will be started automatically when an incoming call is received and a valid signon record is read. A valid signon record for an auto-answer link *must* contain a password that matches the password specified for the link in a PARM statement or in a DEFINE command. If there is no valid password in the signon record, RSCS disables the port and will not start the link.

The format of the signon card to be submitted through a remote programmable workstation is:



/*SIGNON
is a required keyword; it must start in card column one.

wsid
is the workstation ID; it must start in card column 16. The *wsid* can be either:

nodeid
The node ID of the workstation. This is the same as the link ID of the host's link to the workstation.

REMOTE*rn*.
The value of *rn* must match the workstation number specified in the RMT operand of the START command for the link operating as the host.

Note: RSCS verifies only the first two digits, *rn*, following REMOTE. If more than two digits are specified, RSCS does not examine them. That is, RSCS verifies only the eight characters starting in column 16.

password
is a 1- to 8-character password, starting in card column 25, which is required if the host system link has a mandatory password defined for it. This includes all auto-answer links. That password was defined using the PARM statement, or by the operator in a DEFINE or START command.

Note: RSCS verifies only the 8 characters starting in column 25 as a password. If you specify more than 8 characters in the password, RSCS ignores the extra characters.

tpassword
is an optional 1- to 8-character password, starting in card column 25 or 73, which is required only if the TPASS parameter was specified when the link was defined on the host system. This password can be used with or without the optional PASS parameter.

Note: RSCS verifies only the 8 characters starting in column 35 or 73 as a password. If you specify more than 8 characters in the password, RSCS ignores the extra characters.

The signon card must be completely processed (end-of-file generated) before commands or input card decks can be submitted. The system reads only the following areas on the signon card (**all other columns are ignored**):

- *wsid*, starting in column 16
- *password*, starting in column 25
- *tpassword* (optional), starting in column 35 or 73

Signing Off a Workstation Link

You can deactivate a link by issuing an RSCS STOP or DRAIN command to the link. You can also deactivate an RJE-type or MRJE-type link by reading a signoff card through the card reader. The signoff card is punched with /*SIGNOFF starting in column 1. Other information punched in the card is ignored.

All other commands or input cards must be completely processed (that is, end-of-file generated) before the signoff card is read.

Signing off a workstation link defined as an autostart link (or issuing a STOP or DRAIN command for it) will cause the link to be redefined as a non-autostart link.

Managing LPR Links

The LPR link drivers use exits to build device-specific data streams for transmission. These exits are also used to control the remote host and port to which the transmission is destined. IBM supplies the following sample exit routine modules in the RSCSEXIT LOADLIB:

LPRXPSE
Printing either plain text or PostScript files on PostScript capable printers

LPRXONE
Printing on non-PostScript capable printers

For more information about LPRXPSE and LPRXONE and coding your own LPR exit routines, see *z/VM: RSCS Networking Exit Customization*.

The host name to which a file will be delivered for printing can be specified using either dotted decimal or fully qualified notation. If fully qualified notation is desired, the RSCS domain name server (RSCSDNS) is required. See Chapter 9, “Running the RSCS Domain Name Server,” on page 103.

Attention
RSCS supports only IPv4 addressing; it does not support IPv6. Use care when rerouting print files for LPR links. For example, the user ID operand of the TAG command can be used to control whether the LPRXONE exit translates the data. However, when a user ID is specified on the REROUTE statement, the LPRXONE exit might not translate the data as expected.

LPR-type links have the ability to search for keywords at the beginning of the spool file to determine how to handle and process the file, overriding parameters that may have been defined for the LPR link. These keywords are automatically inserted at the beginning of a file by the PPS EXEC and the PPS XEDIT macro. For more information, see “PPS EXEC” on page 430 and see “PPS XEDIT” on page 437. In addition, the LPR EXEC provided with TCP/IP can be used to add these keywords. The use of the PPS EXEC and the PPS XEDIT macro or the TCP/IP LPR EXEC is the suggested way to add LPR keywords to a spool file for printing.

In addition, the LPR-type link will use the spool file form to search for a block of data, called the FORM block that also can be used to determine how to handle and process the file. The form blocks are defined using the LPRXFORM exit routine.

Attention
The LPRXFORM exit is not intended for use on the EXIT parameter of an LPR-type link. If used, the link will abend.

Using TCP/IP Well-Known Ports
By default, TCP/IP restricts the use of well-known ports (1 - 1023) with the RESTRICTLOWPORTS operand on the ASSORTEDPARMS statement in the TCP/IP configuration file (PROFILE TCPIP). To use ports 721 - 731 when usage is restricted, the RSCS virtual machine must be authorized on a PORT statement in the TCP/IP configuration file. For more information, see *z/VM: TCP/IP Planning and Customization*. An alternative to using well-known ports for LPR-type links is to specify SECURE=NO on the PARM statement for the link or on the DEFINE or START command. If neither of these actions is taken, RSCS will be unable to BIND to local ports 721 - 731 when attempting to deliver files through an LPR-type link.

The following section describes how to set up an LPR-type link. For information about how to manually add keywords to the beginning of a file prior to printing on an LPR-type link that has been defined with the USER=YES link parameter, see “User Supplied Keywords” on page 65. For information about using the LPRXFORM exit routine to add keywords to the beginning of a file prior to printing on an LPR-type link that has been defined with the SYSTEM=YES link parameter, see “System Supplied Keywords” on page 67.

Setting Up an LPR-Type Link

Use the following procedure to set up an LPR-type link:

1. Choose an exit environment:
   - LPRXPSE for use with PostScript printers
   - LPRXONE for use with non-PostScript printers
2. Change RSCS's PROFILE GCS file so it can load the exit routine modules. Locate the file on the RSCS 401 minidisk (or the RSCS 191 minidisk). Locate the line:

   ```
   'global loadlib RSCS'
   ```

   Change it to:

   ```
   'global loadlib RSCS RSCSEXIT'
   ```
3. Change RSCS's PROFILE GCS file so it can load configuration files for the exit routines. Locate a line containing a FILEDEF statement, then add one or both of the following lines:

   ```
   'FILEDEF LPR DISK LPR CONFIG'
   'FILEDEF LPRP DISK LPRP CONFIG'
   ```
4. Create configuration files for the exits. Copy the sample configuration file, LPREXITS CONFSAMP, from the RSCS installation user ID 406 minidisk to the RSCS user ID 401 minidisk as LPR CONFIG or LPRP CONFIG, or both.
5. Define the LPR-type printer links in the RSCS CONFIG file (located on the RSCS 401 minidisk) by adding one or both of the following:

- For a PostScript printer:

```
LINKDEFINE LPRP TYPE FORM * AST
PARM LPRP EXIT=LPRXPSE ITO=0 USER=Y SYS=Y #
          EPARM='S=N EH=N EOT=N C=LPRP'
```

  - USER=Y will allow users to specify a host name and printer queue name when using the LPR or PPS EXECs. See "User Supplied Keywords" on page 65.
  - SYS=Y will allow use of a spool file form to select a form name defined with the LPRXFORM exit. See "System Supplied Keywords" on page 67.
  - S=N will suppress the generation of a separator page.
  - EH=N will suppress sending the PostScript error handler.
  - EOT=N will suppress sending an end of transmission command sequence after completion of the file being printed.
- For a non-PostScript printer:

```
LINKDEFINE LPR TYPE FORM * AST
PARM LPR EXIT=LPRXONE ITO=0 USER=Y SYS=Y EPARM='S=N FF=N C=LPR'
```

  - USER=Y will allow users to specify a host name and printer queue name when using the LPR or PPS EXECs. See "User Supplied Keywords" on page 65.
  - SYS=Y will allow use of a spool file form to select a form name defined with the LPRXFORM exit. See "System Supplied Keywords" on page 67.
  - S=N will suppress the generation of a separator page.
  - FF=N will suppress any additional form feeds (before or after the file being printed).

6. Set up the RSCS domain name server (if not already set up). See Chapter 9, "Running the RSCS Domain Name Server," on page 103.
7. The next time RSCS is recycled (IPLed), the LPR printers will be available for use:

   Note: You need to use the PPS EXEC. It can be found on the RSCS installation user ID 406 minidisk. Copy it to the MAINT 19E minidisk.

   - To use the link defined with the name LPR, issue the following from a CMS user ID:

```
pps fn ft fm (hostn hostname printq printer_queue_name pr lpr
```

     Some sample printer queue names that certain printers accept (depending on the manufacturer) are "raw", "text", "lp", or "print_cr".
   - To use the link defined with the name LPRP, issue the following from a CMS user ID:

```
pps fn ft fm (hostn hostname printq printer_queue_name pr lprp
```

     Some sample printer queue names that certain printers accept (depending on the manufacturer) are "raw", "text", or "lp".

Advanced Topics

Some additional items to consider are:

- If you plan for moderate to heavy use of the RSCS LPR support, consider defining multiple LPR-type links and grouping them together. For example, define eight links named LPR1 - LPR8 and eight links named LPRP1 - LPRP8 in the RSCS CONFIG file, then add the following records:

```
ROUTE GROUP LPR TO LINK LPR1 LPR2 LPR3 LPR4 LPR5 LPR6 LPR7 LPR8
ROUTE GROUP LPRP TO LINK LPRP1 LPRP2 LPRP3 LPRP4 #
                         LPRP5 LPRP6 LPRP7 LPRP8
```

- Use the LPRXFORM exit to define system settings for the host name printer queue name, prefix (printer setup) string, suffix (printer reset) string, among others which can be selected by specifying a spool file form. See "System Supplied Keywords" on page 67.
- To avoid having a link hang due to connection problems, use the TIMEOUT=*nnn* and FILEHOLD=YES link parameters in conjunction with an RSCS EVENTS file entry as follows:

  1. Add a FILEDEF for the RSCS EVENTS file by adding the following entry to RSCS's PROFILE GCS file:

     ```
     'FILEDEF EVENTS DISK EVENTS CONFIG *'
     ```

  2. Create an EVENTS CONFIG file on the RSCS 401 minidisk and add the following entries:

     ```
     *-------------------------------------------------------*
     *                      RSCS Events File
     *-------------------------------------------------------*
     *              Days-of-    Range
     * Date   Time  the-week  Low  High  Command
     *------- ----- -------- ----- ----- ----------------------*
        *     M:020    *       *     *   CHANGE LPRP1 HOLD NOHOLD
        *     M:020    *       *     *   CHANGE LPR1  HOLD NOHOLD
     ```

     This will change all HOLD files for the LPR links to NOHOLD every 20 minutes, so that another connection can be attempted.

  3. Add the TIMEOUT parameter to each LPR-type link definition in the RSCS CONFIG file. If the timeout value is set too small, it can cause a job that is printing to be canceled. IBM recommends that you set the timeout value between 10 and 30 minutes, depending on the estimated printout sizes.
  4. Add the FILEHOLD parameter to each LPR-type link definition in the RSCS CONFIG file.

- To transfer a file, which has not been delivered to a remote daemon for a number of days, to a notify link, add the following:

  1. Copy the LPRHOLD TEMPSAMP file from the RSCS installation user ID 406 minidisk to the RSCS user ID 401 minidisk as LPRHOLD TEMPLATE.
  2. Add the following notify link definition to the RSCS CONFIG file:

     ```
     LINKDEF *LPRHOLD TYPE NOTIFY QUEUE PR AST
     PARM *LPRHOLD PURGE=1 MSGFILE=LPRHOLD NETD=YES
     ```

     PURGE=1 will cause the file to be purged from the notify link after one day.

  3. Add the DAYSHOLD parameter to each LPR-type link definition in the RSCS CONFIG file.

- The translate tables used within the LPR-type link exit routines can be replaced within the exit configuration file.
- Review all of the features provided with the PPS EXEC. See "PPS EXEC" on page 430.

User Supplied Keywords

Users can provide keywords at the beginning of files for an LPR-type link to use when printing the file. These keywords will be used as overrides to the link parameter definitions. An RSCS administrator can authorize users to provide keywords for use by LPR-type links using the USER=YES link parameter. Users can manually add these keywords to the beginning of a file.

Attention
Use caution when printing a file which has had keywords added manually to the beginning of a file. If you intend to use the CMS PRINT command, you will need to use the (CC option. Otherwise the RSCS LPR-type link will not find the keywords as the first data records of the spool file.

Rules for adding keywords to the beginning of files are:

- All parsing and validations are done by the LPR-type link.

- Keywords can be anywhere in a record but a valid keyword must be the first nonblank character found on a record.
- Multiple keywords are allowed per record
- Valid keywords must precede any data records. Once a data record is found, the LPR-type link will cease looking for keywords.
- The same keyword can be defined on multiple records. This allows long strings to be split across records.

  For example:

```
HOSTNAME=GDLVM7.ENDICOTT.
HOSTNAME=IBM.COM
```

- Once the defined string length has been reached for each keyword, any additional keyword data will cause an error message to be issued to the RSCS console and user, and the file to be purged.
- Not all keywords need be used
- Only HOSTNAME=, SUFFIX=, PREFIX=, and TRANS= will be checked for valid hexadecimal (0-9, A-F) characters as each record is read. Any errors will cause an error message to be issued to the RSCS console and user, and the file to be purged.
- HOSTID= will be checked for a valid IP address. Any errors will cause an error message to be issued to the RSCS console and user, and the file to be purged. This keyword cannot span multiple records.
- For more information on message DMTLPR256E, which will be issued for any errors found, see *z/VM: RSCS Networking Messages and Codes*.

The valid keywords are:

FILTER=*f*
specifies a 1-character filter to be used in the control file sent to a remote daemon.

HOSTID=*ipaddress*
specifies the host IP address of a remote daemon in dotted decimal format.

HOSTNAME=*address*
specifies up to 255 characters of a fully qualified domain name address of a remote daemon.

PREFIX=*string*
specifies up to 500 characters (250 when packed by RSCS) of a prefix string for the LPRXONE or LPRXPSE sample exits to send to the printer prior to sending data. This string can be used to initialize the printer, such as selecting a paper tray. See Appendix A, “Sample Prefix and Suffix PostScript Strings,” on page 443.

The prefix string can be split with part sent before the separator page and part sent after. The string will be split if the X'FF04' divider characters are detected within the prefix string. The part before the divider characters will be sent prior to the separator page with the remaining sent after.

PRINTER=*name*
specifies up to 256 characters of a printer queue name.

SEP=*string*
specifies a separator page setting for an LPR-type link exit to use. The LPRXONE and LPRXPSE sample exits will accept these settings:

YES
Indicates to send an RSCS-style separator page in front of the file.

NO
Indicates not to request or produce a separator page.

HOST
Indicates to include the 'L' control file record requesting a banner page be produced by the remote daemon.

2P
Indicates to print a 2-page separator page. This is useful with duplexing so that the print data starts on a fresh page.

Any other string settings will be ignored.

SUFFIX=*string*
specifies up to 500 characters (250 when packed by RSCS) of a suffix string for the LPRXONE or LPRXPSE sample exits to send to the printer after sending data. This string can be used to reset the printer state. See Appendix A, “Sample Prefix and Suffix PostScript Strings,” on page 443.

TRANS=*string*
specifies up to 512 characters for a replacement translate table for LPRXONE or LPRXPSE sample exits to use while printing this file.

System Supplied Keywords

PI

The RSCSEXIT LOADLIB includes an exit module called LPRXFORM, which utilizes exit points 0 and 1. This exit will read an external configuration file defined with a DDNAME of LPRXFORM on a FILEDEF statement in the PROFILE GCS file for the RSCS virtual machine. The exits will build FORM blocks based on keywords provided in the configuration file. These FORM blocks are then authorized for use by LPR-type links using the SYSTEM=YES link parameter. When files arrive for printing by an LPR-type link with SYSTEM=YES, the spool file form name will be used to search for a FORM block built by LPRXFORM. If found, keywords defined will be used as overrides to the link parameter definitions. If not found, the link name will be used to search for a FORM block. This allows the long link parameters, such as host name, prefix, and suffix to be moved from the RSCS configuration file to the LPRXFORM configuration file.

Rules of the LPRXFORM configuration file are:

- Each record must start in column one.
- Only one keyword is allowed per record.
- The same keyword can be defined on multiple records. This allows long strings to be split across records.

  For example:

```
HOSTNAME=GDLVM7.ENDICOTT.
HOSTNAME=IBM.COM
```

- Once the defined string length has been reached for each keyword, any additional keyword data will cause an error message to be issued.
- Not all keywords need be used for each FORM block.
- The FORM= keyword starts a new FORM block and must precede any other keyword. This FORM block name will be checked for uniqueness. If a duplicate is found, or the name exceeds eight-characters, the entire FORMBLOK will be ignored. This keyword cannot span multiple records of a FORM block.
- An asterisk (*) column one denotes a comment record.
- The entire file will be read, any errors will generate messages but processing will continue on valid statements, keywords, and forms
- Only HOSTNAME=, SUFFIX=, PREFIX=, and TRANS= will be checked for valid hexadecimal (0-9, A-F) characters as each record is read. Any errors will cause the record to be ignored and processing to continue.
- HOSTID= will be checked for a valid IP address. Any errors will cause the record to be ignored and processing to continue. This keyword cannot span multiple records of a FORM block.
- The LPRXFORM exit routine will always return to RSCS with RC=0.

The valid keywords are:

FILTER=*f*
specifies a 1-character filter to be used in the control file sent to a remote daemon.

FORM=*name*
specifies a 1- to 8-character name for the FORM block.

FORMSUB=*name*
specifies a 1- to 8-character form name to replace the spool file form name. This would provide a form name for use with the LPRXPSE sample exits.

HOSTID=*ipaddress*
specifies the host IP address of a remote daemon in dotted decimal format.

HOSTNAME=*address*
specifies up to 255 characters of a fully qualified domain name address of a remote daemon.

PREFIX=*string*
specifies up to 500 characters (250 when packed by RSCS) of a prefix string for the LPRXONE or LPRXPSE sample exits to send to the printer prior to sending data. This string can be used to initialize the printer, such as selecting a paper tray. See Appendix A, “Sample Prefix and Suffix PostScript Strings,” on page 443.

The prefix string can be split with part sent before the separator page and part sent after. The string will be split if the X'FF04' divider characters are detected within the prefix string. The part before the divider characters will be sent prior to the separator page with the remaining sent after.

PRINTER=*name*
specifies up to 256 characters of a printer queue name.

SEP=*string*
specifies a separator page setting for an LPR-type link exit to use. The LPRXONE and LPRXPSE sample exits will accept these settings:

YES
Indicates to send an RSCS-style separator page in front of the file.

NO
Indicates not to request or produce a separator page.

HOST
Indicates to include the 'L' control file record requesting a banner page be produced by the remote daemon.

2P
Indicates to print a two-page separator page. This is useful with duplexing so that the print data starts on a fresh page.

Any other string settings will be ignored.

SUFFIX=*string*
specifies up to 500 characters (250 when packed by RSCS) of a suffix string for the LPRXONE or LPRXPSE sample exits to send to the printer after sending data. This string can be used to reset the printer state. See Appendix A, “Sample Prefix and Suffix PostScript Strings,” on page 443.

TRANS=*string*
specifies up to 512 characters for a replacement translate table for LPRXONE or LPRXPSE sample exits to use when printing this file.

To use the LPRXFORM exit points, add these to the RSCS CONFIG file:

```
EXIT 0 ON LPRXFM00
EXIT 1 ON LPRXFM01
```

PI end

Managing LPD Links

The LPD link drivers use exits to receive and build specific data streams for acceptance into the RSCS network. These exits are also used to control the remote node and user ID, or the link, to which the print data is destined. IBM supplies a sample exit routine module called **LPDXMANY** in the RSCSEXIT LOADLIB. For more information about LPDXMANY and coding your own LPD exit routines, see *z/VM: RSCS Networking Exit Customization*.

Setting Up an LPD-Type Link

Use the following procedure to set up an LPD-type link:

1. Change RSCS's PROFILE GCS file so it can load the exit routine modules. Locate the file on the RSCS 401 minidisk (or the RSCS 191 minidisk). Locate the line:

   ```
   'global loadlib RSCS'
   ```

   Change it to:

   ```
   'global loadlib RSCS RSCSEXIT'
   ```

2. Change RSCS's PROFILE GCS file so it can load a configuration file for the exit routine. Locate a line containing a FILEDEF statement, then add the following line:

   ```
   'FILEDEF LPD DISK LPDXMANY CONFIG'
   ```

3. Create a configuration file for the exit. Copy the sample configuration file, LPDXMANY CONFSAMP, from the RSCS installation user ID 406 minidisk to the RSCS user ID 401 minidisk as LPDXMANY CONFIG.
4. Define the LPD-type link in the RSCS CONFIG file (located on the RSCS 401 minidisk) by adding the following line:

   ```
   LINKDEFINE LPD TYPE LPD
   PARM LPD EXIT=LPRXMANY EPARM='C=LPD'
   ```

5. Define printer queue names within the LPD CONFIG file (LPDXMANY CONFIG).
6. Start the LPD-type link in RSCS's PROFILE GCS file by adding the following line after the 'RSCS INIT' statement:

   ```
   'RSCS START LPD'
   ```

7. The next time RSCS is recycled (IPLed), the LPD link will be available for use. If you are an authorized operator or an authorized user, you can recycle the RSCS server by issuing the following as a special message (SMSG) to RSCS or on the RSCS console:

   ```
   rscs shutdown quick cp ipl gcs
   ```

8. If you are currently using the TCP/IP LPSERVE as your VM daemon, you will need to make the following changes in the TCPIP machine's configuration file:

   a. Remove LPSERVE from the autolog list.

   b. Change LPSERVE to RSCS for the port 515 reserve list.

Advanced Topics

Some additional items to consider are:

- The translate tables used within the LPD-type link exit routines can be replaced within the exit configuration file.
- If you plan for moderate to heavy use of the RSCS LPD support, consider defining multiple LPD-type links.

Using an LPD-Type Link as a Print Server

It is feasible to use RSCS for routing workstation printing for delivery to IP (internet) attached printers using LPR-type links. To do so, you will need to use the LPRXFORM exit as well as the LPDXMANY CONFIG file.

1. Set up the LPR and LPRP links as described in "Setting Up an LPR-Type Link" on page 63.
2. Update the LPDXMANY CONFIG file, adding printer queue names for an LPR link and an LPRP link as follows:

   ```
   LPRLINK  1280 * * LPRFORM  * * * ASISCC ASCII LPR
   LPRPLINK 1280 * * LPRPFORM * * * ASISCC ASCII LPRP
   ```

   Use a printer queue name of LPRLINK when printing to a non-PostScript printer from a workstation, and use a printer queue name of LPRPLINK when printing to a PostScript printer from a workstation.
3. Change RSCS's PROFILE GCS file so it can load the LPRXFORM configuration file. Locate a line containing a FILEDEF statement, then add the following line:

   ```
   'FILEDEF LPRXFORM DISK LPRXFORM CONFIG'
   ```

4. Update the LPRXFORM CONFIG file to specify the host name and printer queue name associated with the desired printer:

   ```
   FORM=LPRFORM
   HOSTNAME=host_name
   PRINTER=printer_queue_name
   *
   FORM=LPRPFORM
   HOSTNAME=host_name
   PRINTER=printer_queue_name
   FORMSUB=P+ASCII
   ```

   You will need to provide the host name and printer queue name fields associated with the printer.
5. Update the RSCS CONFIG file to enable the LPRXFORM exit by adding the following statements anywhere within the file:

   ```
   EXIT 0 ON LPRXFM00
   EXIT 1 ON LPRXFM01
   ```

6. The next time RSCS is recycled (IPLed), the LPRXFORM exit and LPD-type link will be available for use as a print server. You can recycle the RSCS server by issuing the following as a special message (SMSG) to RSCS or on the RSCS console:

   ```
   rscs shutdown quick cp ipl gcs
   ```

Managing UFT Links

The UFT link drivers use exits to build specific data streams for transmission. These exits are also used to control the remote host and port to which the transmission is destined. IBM supplies a sample exit routine module called **UFTXOUT** in the RSCSEXIT LOADLIB. For more information about UFTXOUT and coding your own UFT exit routines, see *z/VM: RSCS Networking Exit Customization*.

The host name to which a file will be delivered can be specified using either dotted decimal or fully qualified notation. If fully qualified notation is desired, the RSCS domain name server (RSCSNS) is required. See Chapter 9, "Running the RSCS Domain Name Server," on page 103.

Attention
RSCS supports only IPv4 addressing; it does not support IPv6.

The TCPIP DATA file **must** contain these **uncommented** UFTserverID statements. These two entries enable you to send the files asynchronously using the RSCS server and receive them using either the RSCS or TCP/IP UFTD servers.

Statement	Description
UFTserverID RSCS	Specifies the user ID the SENDFILE command will spool files to when using the UFTASYNC option. The default of * can be used as long as RSCS is specified in the SYSTEM NETID file. IN addition, this statement is used by the PEEK and RECEIVE commands when receiving UFT files to indicate the local RSCS UFT server user ID.
UFTserverID UFTD	Used by the PEEK and RECEIVE commands when receiving UFT files to indicate the local TCP/IP UFT server user ID.

Attention

The CMS SENDFILE command has a UFTASYNC option for preparing and sending files on an RSCS UFT-type link. For more information about the SENDFILE command with the UFTASYNC options see *z/VM: CMS Commands and Utilities Reference*.

Use caution when sending a file which has had keywords added manually to the beginning of a file. If you intend to use the CMS PRINT command, you will need to use the (CC option. Otherwise the RSCS UFT-type link will not find the keywords as the first data records of the spool file.

Any files already in NETDATA format should be sent using the CMS PUNCH command instead of using the CMS PRINT command. For more information on these commands, see *z/VM: CMS Commands and Utilities Reference*.

The following information describes the required file format by the RSCS UFT support if the use of the SENDFILE command is not sufficient.

End users desiring to send files to remote users through UFT will need to tag and spool (or other platform specific commands) their file to the RSCS UFT-type link. RSCS will accept files from locally connected users as well as remote users through any valid RSCS connection (NJE, RJE, LPD, and so forth). The files must be in NETDATA format. Preceding any data records must be NETDATA control records containing file characteristics (format, record length, name, and so forth). In addition, the following informational records must precede any NETDATA records for the UFT-type link to obtain and process:

DESTADDR=*userid@hostname*
Indicates the remote host and user ID to which the file is to be delivered. A host name in either dotted decimal or fully qualified notation is supported.

TRANSLATE=*string*
Passes up to 512 characters that RSCS will pack into a translate table to be used if translation to ASCII is required.

TRANSFORM=*type*
Used when forming the TYPE UFT command. These types are supported:

ASCII
Data is to be translated to ASCII and a X'0D0A' is added to the end of each record.

EBCDIC
Data is sent without translation and a X'15' is added to the end of each record.

BINARY
Data is sent as a stream of data without translating.

MAIL
Data is sent as a stream of data after translating to ASCII.

NETDATA
Data is sent as contained when punched to RSCS without translating.

VARREC
Data is sent as variable record length with a two-byte length preceding each record of the data. The maximum supported logical record length when using this type is 65535.

SPOOL
For use when transferring a z/VM print or punch file between an RSCS UFT client and RSCS UFT server. The maximum supported logical record length for print files is 1280.

Notes:

1. The use of SPOOl is the only time the data is not required to be in NETDATA format.
2. The DESTADDR=, and TRANSFORM= are required by the UFT-type link. If they are not found, message DMT265E will be issued and the file will be rejected and purged.

UFT-Type Link Use of Forms and Class

The UFT link driver will support the use of forms and class under these conditions:

- Class can be defined to restrict files processed by a UFT-type link
- The LPRXFORM exit can be utilized to define a host name or translation table for UFT-type links, if not provided within a keyword.

If class processing is not desired, then class * must be used when defining or starting a UFT-type link. Otherwise, RSCS may not select files for processing by a UFT-type link.

Managing UFTD Links

The UFTD link drivers use exits to receive and build specific data streams for acceptance into the RSCS network. These exits are also used to control the remote node and user ID, or the link, to which the print data is destined. IBM supplies a sample exit routine module called **UFTXIN** in the RSCSEXIT LOADLIB. For more information about UFTXIN and coding your own UFTD exit routines, see *z/VM: RSCS Networking Exit Customization*.

Some advanced setup topics to consider are:

- The translate tables used within the UFTD-type link exit routines can be replaced within the exit configuration file.
- If you plan for moderate to heavy use of the RSCS UFTD support, consider defining multiple UFTD-type links.

Chapter 5. Managing Ports

A port definition reserves the virtual address of a BSC telecommunication line so that RSCS can dynamically allocate the port to a link. Optionally, you can also specify that the port can be used by an autodial link.

Note: This port definition is not the same as the ports that are required for the TCP/IP connections (LPR-type, TCPASCII-type, and TCPNJE-type links).

If you want RSCS to dynamically allocate a port to an MRJE-type, NJE-type, or RJE-type link, you must specify the following operands on the indicated commands or statements:

Operand	Command or Statement
ASTART	LINKDEFINE statement or DEFINE command
ITO	PARM statement or PARM operand on DEFINE or START command
LINE	LINKDEFINE statement, DEFINE command, or START command (must be X'0000')
PASS	PARM statement or PARM operand on DEFINE or START commands **Note:** For NJE-type links you must specify the RLPASS, RNPASS, TLPASS, and TNPASS operands.)
PHONE	PARM statement or PARM operand on DEFINE or START commands
RETRY	LINKDEFINE statement, DEFINE command, or START command

You must also specify the DIAL or NODIAL operand on the PORT statement or command:

DIAL
specifies that RSCS dynamically allocates the port when you call out. You can specify PORT *ccuu* DIAL only for ports that are connected to the public switched telephone network through a modem that has an ACU (Automatic Calling Unit).

Note: You must define the link with a virtual device number (LINE operand) of X'0000'.

NODIAL
specifies that RSCS dynamically allocates the port when you start the link. It is also allocated when a call comes in and you have issued an ENABLE command for that port address. PORT *ccuu* NODIAL prevents an autodial link from using a previously defined port. You might want to do this if the ACU becomes inoperative.

To temporarily prevent a port from being dynamically allocated to any link, enter a PORT *ccuu* OFF command. This definition will remain in effect until the next time RSCS is initialized or until you enter another PORT command for this address (*ccuu*).

For more information about ports, see the LINKDEFINE, PARM, and PORT statements in *z/VM: RSCS Networking Planning and Configuration*. Also see:

- “DEFINE” on page 146
- “DISABLE” on page 156
- “ENABLE” on page 159
- “START” on page 278
- “MRJE-Type Link Operational Parameters” on page 313
- “NJE-Type Link Operational Parameters” on page 318
- “RJE-Type Link Operational Parameters” on page 328

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Chapter 6. Changing the Structure of Your Network

When an operator initializes RSCS, RSCS uses the information in the RSCS configuration file to build an overall view of the topology (configuration) of your network. RSCS users and operators can enter QUERY commands to request topology information, such as:

- Local node name
- Name (and status) of links connecting your local node to adjacent nodes
- Nodes routed to each link
- File queues for each link

After initialization, authorized operators can dynamically change the topology of your network using various RSCS commands. Authorized operators can:

- Define and delete links
- Define and delete groups
- Define and delete nodes
- Change routing for nodes
- Start and stop links

Determining the Structure of Your Network

Both users and operators can use the RSCS QUERY command to determine the current structure of your network as seen by RSCS.

Displaying Links

If you wanted to know the name and status of each link connected to your local system, you would enter:

```
smsg rscs query system links
Ready;
 Link                          Line
 Name     Status     Type      Addr LU Name  Logmode  Queueing
 BACKBON1 connect    SNANJE    0000 TN4RSCS  BBNJE0   size
 BACKBON2 connect    SNANJE    0000 TN6RSCS  BBNJE0   size
 BACKBON3 connect    SNANJE    0000 TN7RSCS  BBNJE0   size
 HQARCH   active     NJE       0406 ...      ...      size
 DPSYS3A  connect    NJE       0550 ...      ...      size
 DPSYS3B  connect    NJE       0560 ...      ...      size
 PRINTER1 connect    3270P     0310 ...      ...      fifo
 PRINTER2 connect    3270P     0320 ...      ...      fifo
 PRINTER3 int-req    3270P     0330 ...      ...      fifo
 PRINTER4 inactive   3270P     0340 PRINTER4 ...      fifo
 PRINTER5 inactive   3270P     0350 PRINTER5 ...      fifo
 PRINTER6 connect    SNA3270P  0000 XYPRT6   ...      fifo
 *LIST    connect    LISTPROC  0000 ...      ...      size
 13 links found
```

Limiting the Scope of the Display

If you do not want information about all links, you can limit the number of responses by letting RSCS know the exact information you need. For example, if you want information about non-networking links with connect status, enter:

```
smsg rscs query links connect nonnetworking
Ready;
 Link                          Line
 Name     Status     Type      Addr LU Name  Logmode  Queueing
 PRINTER1 connect    3270P     0310 ...      ...      fifo
 PRINTER2 connect    3270P     0320 ...      ...      fifo
```

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```
 PRINTER6 connect    SNA3270P 0000 XYPRT6   ...      fifo
 3 links found
```

You can also tell RSCS exactly what information to display about these links. For example, if you only want to know the link ID and status of these links, enter:

```
smsg rscs query links connect nonnetworking show name status
Ready;
 Link
 Name     Status
 PRINTER1 connect
 PRINTER2 connect
 PRINTER6 connect
 3 links found
```

Here is an alternate way of telling RSCS exactly what information to display:

```
smsg rscs query links connect nonnetworking show full - logmode - luname
Ready;
 Link                        Line
 Name     Status     Type     Addr Queueing
 PRINTER1 connect    3270P    0310 fifo
 PRINTER2 connect    3270P    0320 fifo
 PRINTER6 connect    SNA3270P 0000 fifo
 3 links found
```

You can reduce the scope of almost all QUERY command responses by using filters such as CONNECT and NONNETWORKING and SHOW options such as NAME and STATUS.

For more information about the QUERY command and its operands, filters, and SHOW options, see “QUERY” on page 187.

Displaying Paths to Nonadjacent Nodes

To discover which links RSCS uses to send traffic to a nonadjacent node, you would enter:

```
smsg rscs query research
Ready;
 Node                                                 Alternate
 Name     --------------- Primary Links -------------- Link
 RESEARCH BACKBON1 BACKBON2 ...      ...      ...      BACKBON3
```

This response tells you that RSCS would send files to node RESEARCH through the first primary link available (BACKBON1 or BACKBON2). The response also tells you that if the status of all primary links is not connect, RSCS sends files to RESEARCH through the alternate BACKBON3 link.

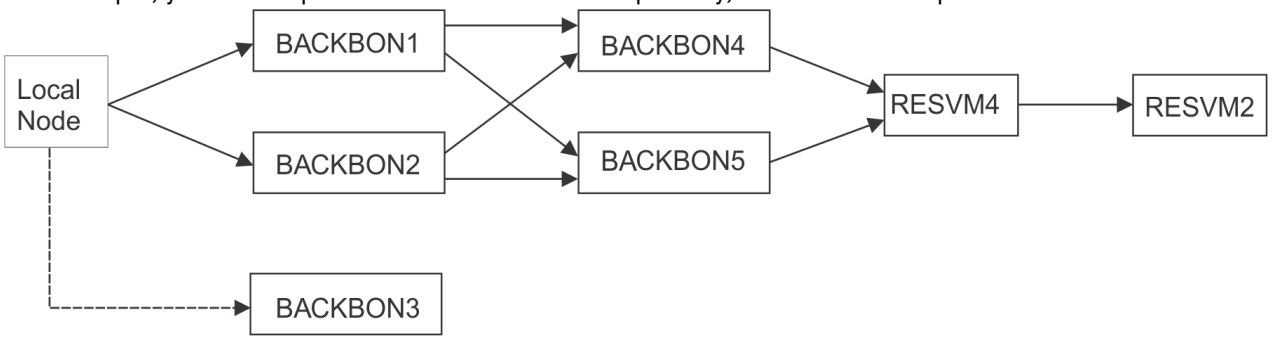
If you want to know all the routes from your node to a specific node, enter:

```
smsg rscs query resvm2 path
Ready;
 Node                                                 Alternate
 Name     --------------- Primary Links -------------- Link
 RESVM2   BACKBON1 BACKBON2 ...      ...      ...      BACKBON3

 From BACKBON1: Node                                                 Alternate
 From BACKBON1: Name     --------------- Primary Links -------------- Link
 From BACKBON1: RESVM2   BACKBON4 BACKBON5 ...      ...      ...      ...

 From BACKBON2: Node                                                 Alternate
 From BACKBON2: Name     --------------- Primary Links -------------- Link
 From BACKBON2: RESVM2   BACKBON4 BACKBON5 ...      ...      ...      ...

 From BACKBON4: Node                                                 Alternate
 From BACKBON4: Name     --------------- Primary Links -------------- Link
 From BACKBON4: RESVM2   RESVM4   ...      ...      ...      ...      ...

 From BACKBON5: Node                                                 Alternate
 From BACKBON5: Name     --------------- Primary Links -------------- Link
 From BACKBON5: RESVM2   RESVM4   ...      ...      ...      ...      ...

 From RESVM4: Node                                                  Alternate
 From RESVM4: Name     --------------- Primary Links -------------- Link
 From RESVM4: RESVM2   RESVM2   ...      ...      ...      ...      ...
```

```
From RESVM2: RESVM2 is the local node
```

The first message (three lines) is the response from your local RSCS system. This message tells you that traffic destined to node RESVM2 goes out over links BACKBON1 or BACKBON2. If the status of both links is not connect, RSCS sends traffic over alternate link BACKBON3.

After responding to your QUERY, RSCS propagates your command to the rest of the nodes in the path. In the example, you see responses from each node. Graphically, here is what the path looks like:



Displaying Routing Groups

Using the ROUTE command, you can define routing groups (groups of nodes). After defining a routing group, users can send traffic to the group, rather than to a specific link or node, and RSCS will send the information over the first available link in the group.

To determine whether a specific node is part of a routing group, enter:

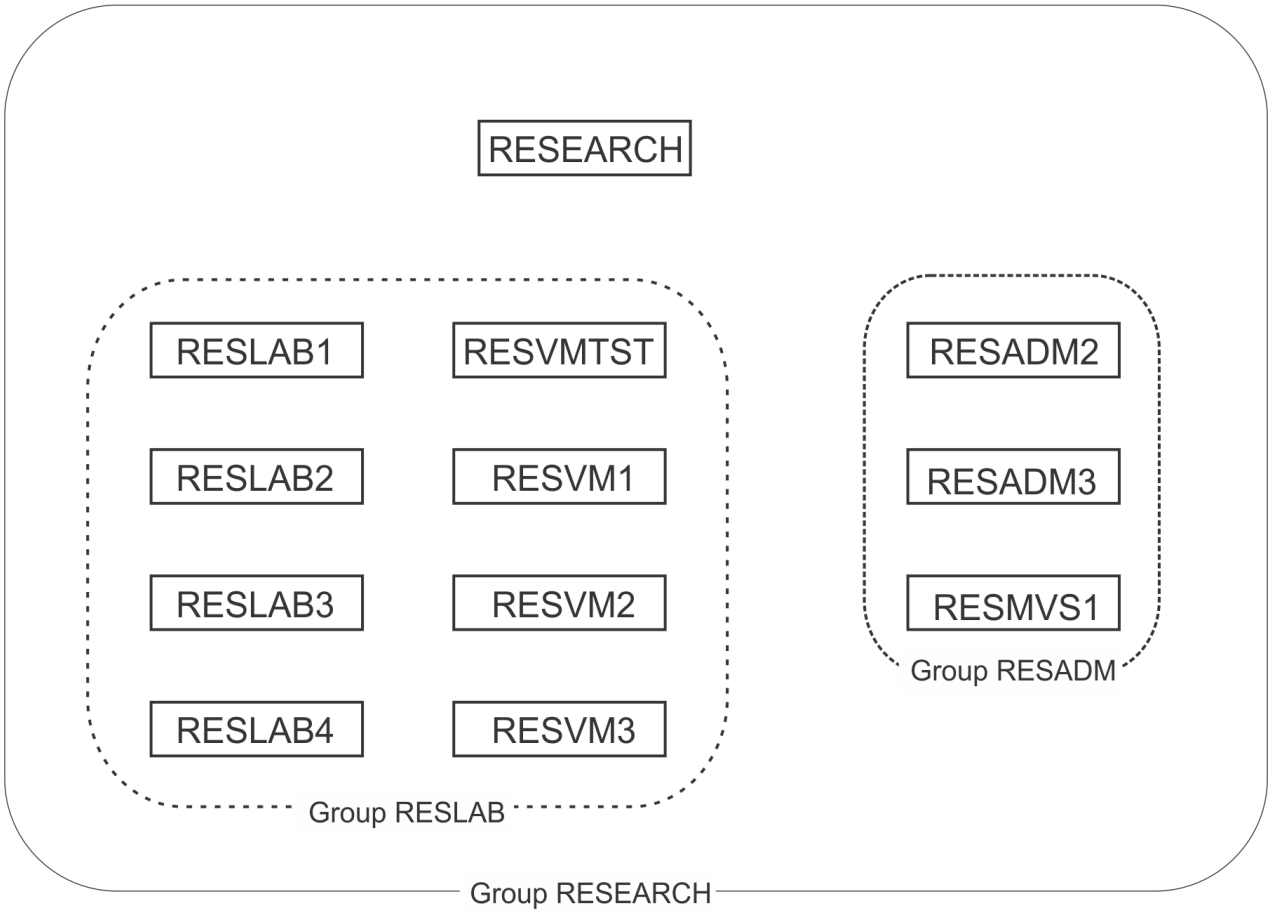
```
smsg rscs query node resvm1 hierarchy
Ready;
 Node RESVM1 routed to group RESLAB
 Group RESLAB routed to group RESEARCH
 Group RESEARCH is a root group
```

The first response tells you that node RESVM1 is part of routing group RESLAB. The second message tells you that RESLAB is part of group RESEARCH. The last message tells you that RESEARCH is not part of any other group.

If you needed to reroute the nodes in group RESEARCH, you could use the following QUERY command to find out what nodes would be affected by a ROUTE command:

```
smsg rscs query system groups in research display nodes
Ready;
 Group
 Name     ----------------- Nodes in the Group ----------------
 RESEARCH RESEARCH ...      ...      ...      ...      ...
 RESLAB   RESLAB1  RESLAB2  RESLAB3  RESLAB4  RESVMTST RESVM1
          RESVM2   RESVM3
 RESADM   RESADM2  RESADM3  RESMVS1  ...      ...      ...
 3 groups found
```

This message tells you that group RESEARCH has the following structure:



Changing the Routing of Your Network

If you are a system-authorized alternate operator, there are no limits imposed on the ways which you can change RSCS's view of the network. If you are a link-authorized alternate operator, you are limited to starting and stopping the links for which you are authorized. Link-authorized alternate operators cannot use ROUTE commands.

The primary reason for temporarily changing the structure (routing) of your network is to route around a problem (a link is down or has a backlog of files). To display the file queues on your system, enter:

```
smsg rscs query system queues
Ready;
 Link
 Name     Status     Sending Receiving Queued Looping Held
 BACKBON1 connect          3         0    320       0    0
 BACKBON2 connect          2         0    378       0    0
 BACKBON3 connect          0         1      0       0    0
```

If you have defined one or more routing groups, files may be queued on multiple links. Therefore, the response to this QUERY does not necessarily mean that you have 698 files waiting to be transmitted. To display the file inventory for each routing group, enter:

```
smsg rscs query system groups display files
Ready;
 Group
 Name     Sending Receiving Queued Looping Held
 RESLAB         2         0    298       0    0
 RESADM         2         0     23       0    0
 DEVLMENT       0         0     41       0    0
 **MISC**       1         1     16       0    0
 4 groups found
```

This response tells you that most of the files on your local node are queued for nodes in the routing group RESLAB. To reroute this set of files through link BACKBON3, enter:

```
smsg rscs route group reslab to link backbon3
Ready;
 Group RESLAB routed through primary link BACKBON3

smsg rscs query system queues
Ready;
 Link
 Name     Status     Sending Receiving Queued Looping Held
 BACKBON1 connect          3         0     22       0    0
 BACKBON2 connect          2         0     80       0    0
 BACKBON3 connect          0         1    298       0    0
```

By entering this ROUTE command, you have changed the route for traffic to the nodes in group RESLAB ***and*** you have removed group RESLAB from the larger RESEARCH routing group. If you make any more changes in the routing of group RESEARCH, those changes will not affect the nodes in group RESLAB. Later, if you decide to return group RESLAB to group RESEARCH, you would enter:

```
smsg rscs route group reslab to group research
Ready;
 Group RESLAB added to group RESEARCH
```

Defining New Links in Your Network

At times, it may be necessary to temporarily define a test link or to dynamically define a link that is being added permanently through an update to the RSCS configuration file. To define a new link, you might enter:

```
smsg rscs define devlvm1 type snanje luname tnxyz67 queue size parm buff=3200
Ready;
 New link DEVLVM1 defined
 Link DEVLVM1 default SNANJE line=0000 LUname=TNXYZ67 logmode=... retry=no
 Link DEVLVM1 class * queuing=size autostart=no DP=5
```

When you define a new link to a new node, RSCS automatically sends traffic to that node. When you define a new link to an existing node (a node already defined to RSCS), RSCS does not automatically send traffic to that node because there is already a path for the traffic to reach the node.

For example, if node DEVLVM1 (from the previous example) had been previously defined in group DEVLMENT and that group had been routed through link BACKBON2, defining link DEVLVM1 would not affect the traffic for node DEVLVM1.

To start the new link and to start traffic flowing over that link, enter:

```
smsg rscs start devlvm1
Ready;
 Activating link DEVLVM1 SNANJE LUNAME=TNXYZ67 class=* queuing=size LOGMODE=DTNNJE0
 Link DEVLVM1 LUNAME TNXYZ67 ready for session initiation
 Link DEVLVM1 LUNAME TNXYZ67 session established
 Signon of link DEVLVM1 complete, buffer size=3200

smsg rscs route node devlvm1 to link devlvm1
Ready;
 Node DEVLVM1 routed through primary link DEVLVM1
```

At times, you may want to define a second link between two RSCS virtual machines. Suppose your local RSCS virtual machine has a bisynchronous link defined to node DEVLVM2 called DEVLVM2:

```
smsg rscs query devlvm2
Ready;
 Link                        Line
 Name     Status     Type    Addr Hold   Trace Drain
 DEVLVM2  connect    NJE     04E8 no     none  no
```

If you want to add a SNANJE link between your local node and DEVLVM2 and you want to call the links DEVLVM2A and DEVLVM2B, you would enter the following series of commands:

```
smsg rscs define devlvm2b type snanje luname tnxyz68 queue size node devlvm2 parm buff=3200
Ready;
 New link DEVLVM2B defined
 Link DEVLVM2B default SNANJE line=0000 LUname=TNXYZ68 logmode=... retry=no
 Link DEVLVM2B class * queuing=size autostart=no DP=5

smsg rscs query system nodes primarylink devlvm2
Ready;
 Node                                                  Alternate
 Name     --------------- Primary Links -------------- Link
 DEVLVM2  DEVLVM2  ...      ...      ...      ...      ...
 1 node found

smsg rscs route node devlvm2 to link devlvm2b
Ready;
 Node DEVLVM2 routed through primary link DEVLVM2B

smsg rscs drain devlvm2
Ready;
 Link DEVLVM2 now set to deactivate
 Link DEVLVM2 line 04E8 disabled
 Link DEVLVM2 deactivated

smsg rscs delete devlvm2
Ready;
 Link DEVLVM2 now deleted

smsg rscs define devlvm2a type nje line 4e8 queue size node devlvm2 parm buff=3200
Ready;
 New link DEVLVM2A defined
 Link DEVLVM2A default NJE line=04E8 LUname=DEVLVM2A logmode=... retry=no
 Link DEVLVM2A class * queuing=size autostart=no DP=5

smsg rscs route node devlvm2 to link devlvm2a devlvm2b
Ready;
 Node DEVLVM2 routed through primary link DEVLVM2A
 Node DEVLVM2 routed through primary link DEVLVM2B
```

After starting the links, you could verify your changes by entering:

```
smsg rscs query links node devlvm2
Ready;
 Link                          Line
 Name     Status     Type      Addr LU Name  Logmode  Queueing
 DEVLVM2A connect    NJE       04E8 ...      ...      size
 DEVLVM2B connect    SNANJE    0000 TNXYZ68  ...      size
 2 links found
```

Important Note
Any link definitions or changes you make using the DEFINE command are temporary. Any routing definitions or changes you make using the ROUTE command are also temporary. If RSCS is reinitialized, your changes will be lost. To make permanent changes to your local RSCS system, add LINKDEFINE, PARM, and ROUTE statements to your RSCS configuration file.

Chapter 7. Manipulating Files in the Network

This chapter describes how operators and users can change, purge, transfer, reroute, and monitor file traffic in an RSCS network.

Changing the Order of the File Queue

When RSCS receives files to send, it places them in a queue associated with the link over which they will travel. The position files hold in the queue determines the order that they will be transmitted.

A Note about Shadows
If your local system has routed a node through multiple links, your file may seem to be in several file queues. RSCS did not clone your file and put a copy into each queue. Instead, RSCS copied some of the information from your file's spool file tag record, created a **tag shadow element**, and placed a copy of the tag shadow element in the queue for each link for which the file is eligible. The tag shadow element, or shadow, is a place holder. When RSCS selects a file for transmission, it removes all the file's shadows from their queues.

To change the order of files in a queue, use the RSCS ORDER command. You might want to do this to cause a recently queued file to be transmitted before any of the others in the queue.

Suppose you want RSCS to print one of the files queued on your link immediately, before any of the others. You enter the following commands:

HOLD
Suspends transmission over the link.

QUERY
Gets a description of the files on the queue.

ORDER
Promtes your file to the top of the queue.

FREE
Resumes transmission over the link.

For example:

```
smsg rscs hold printer1 immediate
 Link PRINTER1 to suspend file transmission
 Link PRINTER1 file transmission suspended
```

Before you can enter an ORDER command, you must know the spool identifier (or spool ID) of the file whose place in the queue you want to change. To determine this, enter a QUERY for the link's queue:

```
smsg rscs query queues on printer1
Ready;
 Pos   Loc      Origin          Destination     Link
 in Q   ID Node     Userid   Node     Userid   Queue    Status
    0 0327 BOSTON   KAREN    PRINTER1 PRT3812A PRINTER1 sending
    1 6900 NYDEVSYS JOSEPH   PRINTER1 SYSTEM   PRINTER1 waiting
    2 8762 BOSTON   MATTHEW  PRINTER1 SYSTEM   PRINTER1 waiting
    3 7355 CLEVELND KATHY    PRINTER1 PRT38003 PRINTER1 waiting
    4 9435 NYDEVSYS DOROTHY  PRINTER1 SYSTEM   PRINTER1 waiting
    5 4562 NYDEVSYS NED      PRINTER1 SYSTEM   PRINTER1 waiting
 6 files found
```

The spool ID in the second column is the local (or current) spool ID, assigned by the CP spool system at the local node.

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When you inspect these messages, you see that the second and third files, 8762 and 7355, are the ones that you want printed immediately. Also, you know that these two files are not the same length and you want the longer one printed first. So you enter an ORDER command, specifying the current spool ID, to change the files' order in the queue and follow it with a FREE command to reset the earlier HOLD command:

```
smsg rscs order printer1 7355 8762
 Link PRINTER1 queue reordered

smsg rscs free printer1
 Link PRINTER1 resuming file transfer
```

For more information about the commands used in this section, see “FREE” on page 167, “HOLD” on page 169, “ORDER” on page 183, and “QUERY” on page 187.

Purging Files

In the previous example, you queried the link to find out what files were queued, waiting to be transmitted to a printer. You promoted two of the files to the head of the queue. You could also cancel one (or all) of the other files by issuing a PURGE command to remove it from the queue. For example:

```
smsg rscs purge printer1 9435
 1 file(s) purged on link PRINTER1
```

You cannot enter a PURGE for a file that is in the process of being transmitted, but you can flush it. To remove the active file from the queue and immediately cancel its being printed, enter:

```
smsg rscs flush printer1 0327
 File 0327 processing terminated on link PRINTER1
```

In the PURGE and FLUSH commands above, you included the current spool ID of the file you were interested in. You got the spool Ids from the messages produced by issuing the QUERY command illustrated in “Changing the Order of the File Queue” on page 81.

The user that originally sent the file could have used the origin spool ID in a PURGE or FLUSH command.

For more information about the commands used in this section, see “FLUSH” on page 164 and “PURGE” on page 185.

Transferring Files

You can redirect one or more files that are queued on a link (waiting to be transmitted) by using the TRANSFER command. You might want to do this, for example, if the files are queued on a link to a printer that is not operating properly, and you want to redirect them to a different printer.

Like the commands described in the previous sections, you must know the current spool ID of the file before you can transfer if from one link to another. Using the files in the example in “Changing the Order of the File Queue” on page 81, suppose you wanted to transfer one of the files to another printer link. You would enter the following command:

```
smsg rscs transfer printer1 4562 to snaprntr
 1 file(s) transferred on link PRINTER1
```

Note: You cannot transfer a file with multiple destinations (a *MULTI* file). If you try, you will receive error message DMT646E.

For more information about the TRANSFER command, see “TRANSFER” on page 289.

Rerouting Traffic

In the previous example, a single file that was on a particular link was transferred to a different destination. To routinely redirect **all** files, messages, or commands to another destination, use the REROUTE command. Or, to make the rerouting permanent, you can add a REROUTE statement to your

RSCS configuration file. See *z/VM: RSCS Networking Planning and Configuration* for details. You might want to do this if:

- A printer is out of operation and you want files to be sent to a back-up machine.
- The person who would normally receive the files is away and wants them routinely sent to someone else.
- The person who would normally receive the files is on a business trip and wants them sent to a temporary user ID at the remote location.
- A group of users is moved to a different system; they want files and messages that are sent to them at their old system to be rerouted to the new system.
- Individuals who have several user IDs want everything sent to the one user ID that they use most frequently.
- You changed the name of a node and you want all commands, files, and messages rerouted to the new node.

RSCS keeps track of reroute definitions in the reroute table. Reroute definitions created by the REROUTE command remain in effect until changed by another REROUTE command or until RSCS is re-initialized.

The example in "Transferring Files" on page 82 showed how to transfer a single file destined for node PRINTER1 to node SNAPRNTR. To reroute all new PRINTER1 files to SNAPRNTR, enter:

```
smsg rscs reroute files for printer1 any to snaprntr =
 Files for PRINTER1(*) now rerouted to SNAPRNTR(=)
```

To verify this reroute, enter:

```
smsg rscs query system reroutes
       For                        To
 Node     User    Type      Node     User     Quiet
 PRINTER1 *        files    SNAPRNTR =        no
 1 reroute found
```

Reroute Looping

A particularly bothersome situation can occur when reroute specifications on different nodes *point* to each other. For example, suppose you have an operator with user IDs on several systems and that operator wants to make sure he gets all his messages no matter what system he is using. At the following nodes, he enters the following REROUTE commands:

Node	Command
LONDON	`smsg rscs reroute notrcvg for taskerm to newyork nymartin quiet`
NEWYORK	`smsg rscs reroute notrcvg for nymartin to boston oper3 quiet`
BOSTON	`smsg rscs reroute notrcvg for oper3 to london taskerm quiet`

If this operator is logged on any one of his user IDs, there is not a problem. However, if this operator is not logged on to any of the operator's user IDs and a message comes in, RSCS will route the message repeatedly back and forth between London, New York, and Boston. This is called *reroute looping*.

In this example, the QUIET operand was used, which suppresses reroute confirmation messages (DMT120I, DMT333I, and DMT336I). If QUIET was not specified, RSCS would issue reroute confirmation messages to the user who sent the message each time it was rerouted.

Generic Rerouting

You can enter a "generic" REROUTE, which is performed for all source node IDs or user IDs that have similar names. For example, suppose people in Department 51 at your location all have user IDs that begin with "D51", such as D51JONES and D51SMITH. Suppose further that the entire department is

being moved from one node to another. You can reroute material for the user IDs in Department 51 by specifying D51*. For example:

```
smsg rscs reroute all for nynorth d51* to nysouth =
```

This command reroutes files and messages destined for user ID names in the form **D51xxxxx** from NYNORTH to NYSOUTH. The equal sign means it will use the same node ID or user ID as used in the FOR clause.

You can limit message rerouting to those messages that cannot be displayed because the intended receiver is not logged on the terminal or is running disconnected because of the NOT RECEIVING operand. For example:

```
smsg rscs reroute notrcvg for d51jones to = d51boss
```

This makes messages (only) be sent to user ID D51BOSS if user ID D51JONES is not receiving.

For a full discussion of the REROUTE command, see “REROUTE” on page 259.

Conflicts in Specifying Reroutes

A conflict may arise when you try to specify a reroute for something that is already being rerouted. That is, if you specify a function (commands, files, or messages), node ID, or user ID that is *included within a **prior** specification*, RSCS issues error message DMT685E and ignores your REROUTE command.

For example, suppose that REROUTE ALL had previously been specified for a particular node ID and user ID. Since a REROUTE ALL function includes both files and messages, you will receive an error message if you enter a REROUTE with either FILES or MSGS for that same node ID and user ID. When this happens, you must cancel the first reroute specification and respecify it:

```
smsg rscs reroute all for newyork user* to nysys1 =
Ready;
 All for NEWYORK(USER*) now rerouted to NYSYS1(=)

smsg rscs reroute msgs for newyork user* to nysys2 =
Ready;
 Reroute already in effect for NEWYORK(USER*)

smsg rscs query system reroutes
Ready;
       For                          To
 Node     User    Type      Node     User     Quiet
 NEWYORK  USER*    all      NYSYS1   =        no
 1 reroute found

smsg rscs reroute all for newyork user* off
Ready;
 All reroute for NEWYORK(USER*) deactivated

smsg rscs reroute msgs for newyork user* to nysys2 =
Ready;
 Messages for NEWYORK(USER*) now rerouted to NYSYS2(=)

smsg rscs reroute files for newyork user* to nysys1 =
Ready;
 Files for NEWYORK(USER*) now rerouted to NYSYS1(=)

smsg rscs query system reroutes
Ready;
       For                          To
 Node     User    Type      Node     User     Quiet
 NEWYORK  USER*    messages NYSYS2   =        no
 NEWYORK  USER*    files    NYSYS1   =        no
 2 reroutes found
```

If you specify ANY as the node ID or user ID, you are including all nodes or users. If you specify a generic node ID or user ID (as in the previous example), you are including specific names. RSCS lets you specify generic and specific reroutes:

```
smsg rscs reroute files for newyork any to nysys1 =
Ready;
```

```
 Files for NEWYORK(*) now rerouted to NYSYS1(=)

smsg rscs reroute files for newyork myboss to nysys2 bigchief
Ready;
 Files for NEWYORK(MYBOSS) now rerouted to NYSYS2(BIGCHIEF)

smsg rscs query system reroutes
       For                       To
Ready;
 Node     User    Type      Node     User     Quiet
 NEWYORK  *        files     NYSYS1   =        no
 NEWYORK  MYBOSS   files     NYSYS2   BIGCHIEF no
 2 reroutes found
```

If you need to cancel these reroutes, note that canceling the all-inclusive reroute does not automatically cancel the specific reroute:

```
smsg rscs query system reroutes
Ready;
       For                       To
 Node     User    Type      Node     User     Quiet
 NEWYORK  *        files     NYSYS1   =        no
 1 reroute found

smsg rscs reroute files for newyork any off
Ready;
 Files reroute for NEWYORK(*) deactivated

smsg rscs query system reroutes
Ready;
       For                       To
 Node     User    Type      Node     User     Quiet
 NEWYORK  MYBOSS   files     NYSYS2   BIGCHIEF no
 1 reroute found
```

If you specify REROUTE ... ANY OFF, RSCS does not cancel all reroute items. RSCS cancels only the one reroute that specified ANY.

Monitoring Your Network

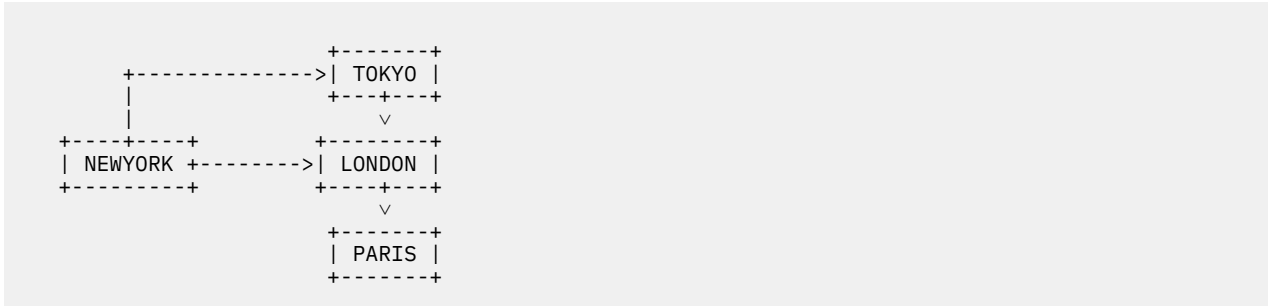
Occasionally, you need information about the status of your local operating system, your virtual machine, or the files you have transmitted. You can do this by using the CP QUERY command, which has a wide variety of operands that you can specify. See *z/VM: CP Commands and Utilities Reference* for a complete description of the CP QUERY command.

RSCS has its own QUERY command to let you inquire into the state of RSCS itself, its links and remote nodes, and any files it may be handling. (For detailed information about the RSCS QUERY command, see “QUERY” on page 187.) The remainder of this section shows examples of QUERY commands and their responses.

What links will RSCS use to get my file to the PARIS node?

```
smsg rscs query paris path
Ready;
 Node                                                  Alternate
 Name     --------------- Primary Links -------------- Link
 PARIS    LONDON   ...      ...      ...      ...      TOKYO
 From LONDON: Node                                                Alternate
 From LONDON: Name     --------------- Primary Links -------------- Link
 From LONDON: PARIS    PARIS    ...      ...      ...      ...      ...
 From PARIS: PARIS is the local node
```

This response means the node NEWYORK has the following path to node PARIS:



When sending traffic from node NEWYORK to node PARIS, RSCS sends the traffic to node LONDON, then to node PARIS. If the link between nodes NEWYORK and LONDON is not connect, RSCS sends the traffic through the alternate link to TOKYO.

What are the activity attributes and status of the CLEVELND link?

```
smsg rscs query clevelnd
Ready;
 Link
 Name     Status     Type     LU Name  Logmode  Hold Trace Drain
 CLEVELND connect    SNANJE   TN6RSCS  DTNNJE0  no   none  no
```

Link CLEVELND is `connect`; that is, it is operative and capable of transmitting or receiving information. The link could have been in one of several other states:

active
Link has been started but is not yet capable of transmitting or receiving information.

dial-queue
Link is in the process of being started but is not yet operational because it is waiting for a switched BSC port to become available. (NJE-type, MRJE-type, and RJE-type links only.) SNA and printer links may also be in dial-queue status if the autostart process has started, but has not yet completed, for the links.

inactive
Link has not been started.

intreq
Link is operational but the connected device requires intervention. (SNA3270P-type and 3270P-type links only.)

LOGOnwait
Links whose start command has been processed by the SNA control task and that are waiting for VTAM to notify RSCS to start the session.

released
An SNA3270P-type link is operational but cannot send information because the printer has been released to another VTAM application. Or, an LPR-type link is operational but is currently not transmitting any files.

retry-wait
Link is not operational and RSCS is waiting for a specific period before trying to start the link again.

RPLWait
Links whose start command cannot be processed by the SNA control task because there is a temporary shortage of SIMLOGON RPLs being managed by the SNA control task.

Note: If there are generally many links with a status of RPL-WAIT, or if one or more links is in this status for a long period, you should increase the number specified on the RPLs option on the NETWORK START command. Usually, the value specified for the RPLs option should be equal to the average number of links started at one time, plus the number that are in *starting* status for a long period.

starting
Link is in the process of being started but is not yet operational. (SNANJE-type, SNARJE-type, and SNA3270P-type links only.)

Where is my file in the queue?

```
smsg rscs query queues on printer1
Ready;
 Pos   Loc      Origin         Destination     Link
 in Q   ID Node     Userid   Node     Userid   Queue    Status
    0 2541 RESLAB1  KATHYB   PRINTER1 PRT3812A PRINTER1 sending
    1 2542 RESLAB1  KATHYB   PRINTER1 PRT3812A PRINTER1 waiting
    2 5432 RESLAB2  FETABEAR PRINTER1 PRT3820X PRINTER1 waiting
    3 5824 RESLAB2  DIPPER   PRINTER1 PRT3820X PRINTER1 waiting
    4 6380 RESLAB3  SNUPPERP PRINTER1 PRT38003 PRINTER1 waiting
    5 9214 RESLAB2  WINSTON  PRINTER1 PRT3812A PRINTER1 waiting
    6 9999 NEWYORK  KATE     PRINTER1 PRT3812B PRINTER1 waiting
    7 0334 RESLAB1  SANDY    PRINTER1 PRT42501 PRINTER1 waiting
    8 0335 RESLAB1  TERRI    PRINTER1 PRT42502 PRINTER1 waiting
    9 0336 RESLAB1  TERRI    PRINTER1 PRT42503 PRINTER1 waiting
   10 0337 RESLAB1  MARGARET PRINTER1 PRT42501 PRINTER1 waiting
   11 0338 RESLAB1  TOMW     PRINTER1 PRT42502 PRINTER1 waiting
 12 files found
```

This response tells you how many files are in the queue for link PRINTER1. If you were user KATE at node NEWYORK, you can see your file is sixth in the queue and your spool ID is 9999. This example shows two file states: sending and waiting. Files can have the following states:

exit-hold
File is being held by an exit routine.

hop-loop
File is in a hop-count loop.

immed-loop
File is in an immediate loop.

no stream
File was given no streams by the transmission algorithm.

receiving
File is being received.

sending
File is being transmitted.

spec-hold
File was put in a special hold by a NOTIFY-type link.

sys-hold
File is in system hold.

trace
Open trace file.

user-hold
File is in user hold.

waiting
File is waiting to be sent.

What are the default options for the local node?

```
smsg rscs query system options
Ready;
 accept message = yes, queue message = no
 sent message = yes, final message = yes
 loop checking = all, maximum hopcount = 64
 remote listproc = no, maximum dsh = 10, message skip = 2
 jobname setting = origin userid, secure origin id = no by default
```

This response tells you the default system options of your local node, as specified on the OPTION statement in your RSCS configuration file. For more information about these options, see *z/VM: RSCS Networking Planning and Configuration*.

Getting Information from Remote Nodes

The examples in the previous section showed how to query your local RSCS system. You can also query remote RSCS systems using the RSCS CMD command. Issue the command as before and place CMD *nodeid* before your command. This tells RSCS to direct the remainder of the command line to the remote node you specified. For example, here is a QUERY to your local node followed by a series of queries to remote nodes:

```
smsg rscs query system zone
Ready;
 Time zone offset is 5 hours 0 minutes 0 seconds west of GMT

smsg rscs cmd london query system zone
Ready;
 From LONDON: Time zone offset is 1 hour 0 minutes 0 seconds east of GMT

smsg rscs cmd tokyo query system zone
Ready;
 From TOKYO: Time zone offset is 9 hours 0 minutes 0 seconds east of GMT
```

These queries tell you how far away the remote system is from Greenwich Mean Time (GMT).

You can use any valid command with the SMSG ... CMD ... combination. For example, you can use CMD with the CPQUERY command to query a remote operating system:

```
smsg rscs cmd toronto cpquery time
Ready;
 From TORONTO: CPQ: TIME IS 15:00:00 EDT WEDNESDAY 10/17/95
 From TORONTO: CPQ: CONNECT= 13:10:52 VIRTCPU= 010:31.38 TOTCPU= 024:04.07
```

For more information, see “CMD” on page 142, “CPQUERY” on page 144. and “QUERY” on page 187.

Manipulating Your Files in the Network

Several RSCS commands let you change, stop, or redirect a file after you have started it on its way to its destination, by specifying its origin or local spool file identifier ("spool ID") number. You can use these same commands to manipulate files that are destined for you. When you manipulate a file destined for you, specify the local spool ID, not the origin spool ID.

Suppose you entered SPOOL and TAG commands to direct files to PRT38003 and requested several files to be printed:

```
SPOOL PRT TO RSCS
Ready;
tag dev prt reslab1 prt38003 50
Ready;

PRINT PROFILE EXEC
Ready;
 PRT FILE 0026 TO RSCS COPY 001 NOHOLD
 Sent file 0026 (0026) on link NYSYS1 to RESLAB1(PRT38003)
```

```
PRINT $OUTPUT SCRIPT A (CC
Ready;
 PRT FILE 0032 TO RSCS COPY 001 NOHOLD
 Sent file 0032 (0032) on link NYSYS1 to RESLAB1(PRT38003)

PRINT FUNCT1 EXEC
Ready;
 PRT FILE 0038 TO RSCS COPY 001 NOHOLD
 Sent file 0038 (0038) on link NYSYS1T to RESLAB1(PRT38003)
```

Shortly after this, you realize that you should have sent one of the files (FUNCT1 EXEC) to node SNAPRNTR instead. If you did not write down the spool IDs of the files, you can ask RSCS for this information:

```
smsg rscs cmd reslab1 query queues on prt38003 show toinfo
Ready;
 From RESLAB1: Orig       Origin           Fileid         Destination
 From RESLAB1:   ID        Time       Name     Type     Node     Userid
 From RESLAB1: 0006 95/07/20 09:09:09 WORK1    SCRIPT   PRT38003 SYSTEM
 From RESLAB1: 0014 95/07/20 09:11:30 WORK2    SCRIPT   PRT38003 SYSTEM
 From RESLAB1: 0026 95/07/20 09:16:07 PROFILE  EXEC     PRT38003 SYSTEM
 From RESLAB1: 0032 95/07/20 09:25:46 $OUTPUT  SCRIPT   PRT38003 SYSTEM
 From RESLAB1: 0036 95/07/20 09:43:13 WORK3    SCRIPT   PRT38003 SYSTEM
 From RESLAB1: 0038 95/07/20 09:44:09 FUNCT1   EXEC     PRT38003 SYSTEM
 From RESLAB1: 0041 95/07/20 09:57:30 STUFFIES FILE     PRT38003 SYSTEM
 From RESLAB1: 7 files found
```

To send the FUNCT1 EXEC to SNAPRNTR, enter the following TRANSFER command, specifying the origin spool ID (which was 0038) with a preceding asterisk:

```
smsg rscs cmd reslab1 transfer *38 to snaprntr
 From RESLAB1: 1 file(s) transferred on link PRT38003
```

This reply means that your file is on its way back to your home node, to be sent to SNAPRNTR.

If you wanted to remove the file from the network, you can use a PURGE command (for inactive files) to remove it from the NEWYORK node:

```
smsg rscs cmd reslab1 purge *38
```

For active files, use a FLUSH command:

```
smsg rscs cmd reslab1 flush *38
```

If you want to alter the attributes of a file at a remote node, use the CHANGE command, specify the origin spool ID, and include one or more options to tell RSCS what you want changed (see “Options” on page 139). For example, if you want to temporarily stop RSCS from processing the file, use the HOLD option:

```
smsg rscs cmd reslab1 change *38 hold
 From RESLAB1: File 3400 (0038) changed
```

RSCS will hold this file, until you (or some operator) release it using another CHANGE command that specifies the NOHOLD option.

You can also use any of these file manipulation commands (CHANGE, FLUSH, PURGE, and TRANSFER) on files that some one is sending to you. You need to know the local (or current) spool ID of the file. If you know of a file that is destined to you and you do not know the local spool ID, you can use the QUERY command to find out the local spool ID. For example, suppose user JOHN on node RALEIGH is sending a file to user OLIVER on node BOSTON. OLIVER can enter the following command:

```
smsg rscs cmd raleigh query files to boston oliver
Ready;
 From RALEIGH: 0 files found
 From NEWYORK:  Loc         Origin           Destination
 From NEWYORK:   ID   ID Node     Userid   Node     Userid   Status
 From NEWYORK: 7718 0948 RALEIGH  JOHN     BOSTON   OLIVER   waiting
 From NEWYORK: 1 file found
```

This response tells you the local spool ID is 7718. If you specify the TO filter on a QUERY FILES (or QUERY QUEUES) command with a specific node ID, RSCS propagates the command throughout the network. In this example, OLIVER sent the command to the origin node (RALEIGH) and RSCS propagated it through the links between the origin node and the destination node (BOSTON). From the response, you can see that RSCS sent the file to node NEWYORK where it is waiting to be sent to the next node. If there were more nodes between RALEIGH and BOSTON, you would receive messages from each node.

For more information about manipulating files, see "CHANGE" on page 137, "FLUSH" on page 164, "PURGE" on page 185, and "TRANSFER" on page 289.

Chapter 8. Automating the Operation of Your Network

By automating the operations of your RSCS network, you can:

1. Reduce the need for manual (human) intervention.
2. Improve the level of service you provide to your users.

The amount of effort required to automate RSCS operations at your node depends on the complexity of your RSCS network and the amount of automation you consider sufficient. RSCS nodes that have many links and handle large amounts of file traffic may require you to spend some time devising an automation *philosophy*. RSCS nodes with few links and little file traffic may require only the simplest of automation procedures.

Using RSCS, you can automate the following categories of network activities (listed in order of increasing complexity):

- Automatic link restarts
- Packaged RSCS execs for operator usage
- Packaged CMS execs for operator usage
- Automatic load balancing across network
- A service virtual machine that *watches over* RSCS

Restarting Links Using Restart Execs

The easiest automation procedure to carry out is a mechanism that automatically restarts non-SNA links when they deactivate because:

- The other side of the link sent a SIGNOFF record.
- A nonfatal I/O error occurred.
- A TCP/IP network error occurred.

These conditions cause non-SNA links to deactivate with a special return code indicating that RSCS should try to restart them. The absence of this special return code for chronic errors prevents a chronic error on a single link from affecting the performance of the entire RSCS machine.

Note: RSCS cannot detect if the phone number specified on an autodial link is the correct number. So, autodial links are the only non-SNA links that cannot be restarted using the restart exec. Instead, you can use the RSCS retry facility to restart non-SNA autodial links. For details see “Restarting Links Using the Retry Facility” on page 92.

RSCS tries to honor the restart request by searching all of its disks accessed under GCS for a GCS exec called RESTART GCS; these may not be the same disks accessed under CMS. If present, RSCS processes the restart exec, which requires only the name of the link as input. Table 5 on page 92 shows an example of such a restart exec.

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Table 5. Simple Exec for Restarting Links. Sample of restarting GCS.

RESTART GCS

```
/*--------------------------------------------------------------------*/
/* This exec will automatically restart the link whose linkid is      */
/* passed to the exec.  The link will be started using the default    */
/* parameters that were specified on the PARM statement for this      */
/* link in the RSCS CONFIG file or on the PARM operand of the DEFINE  */
/* command.                                                           */
/*--------------------------------------------------------------------*/

Parse Arg linkid

'RSCS START' linkid
Exit rc
```

You can include any CP, GCS, or RSCS commands within the exec. For example, you can expand the restart exec to perform customized recovery steps based on the link ID of the failing link:

Table 6. Dual Purpose Exec for Restarting Links. Sample of dual purpose restart for GCS.

RESTART GCS

```
/*--------------------------------------------------------------------*/
/* This exec will automatically restart the link whose linkid is      */
/* passed to the exec unless the link is a printer link (starting     */
/* with 'PRT'), in which case a message will be sent to the operator  */
/* about the link error                                               */
/*--------------------------------------------------------------------*/

Parse Arg linkid

If left(linkid,3) = 'PRT' Then
  'CP MSG OPERATOR Printer link 'linkid' has deactivated.'
Else
  'RSCS START' linkid

Exit rc
```

If you choose not to create the RESTART GCS exec, RSCS looks for a file called *linkid* GCS for each link that deactivates because of peer system signoff or a nonfatal I/O error. (Unlike the RESTART GCS exec, a *linkid* GCS exec does not ask you to supply the name of the link as a parameter.)

Restarting Links Using the Retry Facility

If an SNA link or an autodial link meets a temporarily irrecoverable error, it deactivates without causing RSCS to call the restart exec. This prevents a link with a temporary problem from continuously starting and stopping, unnecessarily consuming system resources.

If you specify the RETRY option on a LINKDEFINE (or LINK) statement or on a DEFINE command when defining a link, RSCS tries to restart the link after one minute by issuing a START command. If this restart attempt fails, RSCS waits successively longer amounts of time between restart attempts. The intervals (in minutes) after the first attempt are: 10, 19, 27, 34, 40, 45, 49, 52, 54, and 55. If the link still has not successfully restarted at this point, RSCS issues a START command for the link every 55 minutes.

Note: These are the default intervals. If you want to specify retry intervals for your local node, use the RETRY statement described in *z/VM: RSCS Networking Planning and Configuration*.

After the link restarts, RSCS resets the retry parameters. Any later problem on the link causes the retry procedure to begin again.

Note: RSCS resets the retry feature of the link when an operator issues a STOP or DRAIN command for that link. Before manually starting such a link, use the DEFINE command to redefine the link as eligible for retries.

Packaging Commands Together in RSCS Execs

You can simplify an operator's job by providing RSCS execs on any disk accessible to RSCS. You may create these execs to:

- Package complex commands (or sequences of commands) into one, easy to call exec
- Provide access to GCS functions, such as re-accessing disks, that cannot be processed directly from within RSCS
- Hide information, such as signon passwords or phone numbers, for links that may have to be defined dynamically in execs rather than making them known to the operators

Suppose you want to create an exec that lets operators run GCS commands at the RSCS virtual machine and you want to let the operator who issued the exec to know the return code of the GCS command. You could create the following exec and place it on an RSCS accessible disk:

Table 7. Exec to Execute GCS Commands

GCS GCS

```
/*************************/
/* Execute a GCS command */
/*************************/
parse arg cmd

cmd
'RSCS REPLY GCS RETURN CODE = 'rc
exit rc
```

An authorized alternate operator can now have RSCS access its 191 disk by entering:

```
smsg rscs exec gcs access 191 a
Ready;
 From YOURNODE(SYSTEM): GCS RETURN CODE = 0
```

You can use the REPLY command in any RSCS exec to return information to the user that started the exec.

If you have a simple procedure for defining links, it makes sense to create an exec for this purpose. The exec could accept the link ID and line address as parameters and use the standard options at your site.

Table 8. Exec to Execute GCS Commands

DEFNJE GCS

```
/*************************/
/* Execute a GCS command */
/*************************/
parse arg linkid line

'RSCS DEFINE 'linkid' LINE 'line' TYPE NJE AST PARM STREAMS=7 TA=0
'RSCS DEFINE 'linkid' UPARM RESTRICT=NO
exit rc
```

Because the operator entered the request to process the exec, RSCS automatically returns command responses to that operator. For example:

```
smsg rscs exec defnje tester 300
Ready;
```

```
New link TESTER defined
Link TESTER default NJE line=0300 LUname=TESTER logmode=... retry=no
Link TESTER class * queuing=priority autostart=no DP=5
Link TESTER redefined
Link TESTER default NJE line=0300 LUname=TESTER logmode=... retry=no
Link TESTER class * queuing=priority autostart=no DP=5
```

There is no limit on the complexity of tasks that your execs can automate. If your operators enter very few commands to RSCS, the rewards of automation may not be worth the effort of creating execs. However, the execs outlined in this section quickly pay dividends on busy systems.

Packaging Tasks Together in CMS Execs

To help your operators analyze the state of your network, you may want to provide tools that can perform several tasks. Often these tools make decisions about issuing commands based on responses from earlier commands. To make the correct decision, these tools may also need to consult a file containing configuration information.

Providing this type of function as RSCS execs can be, at best, difficult. Instead, you can create a CMS exec that communicates with RSCS using the RSCS Command Response Interface (CRI). This interface lets you request that responses to your command be:

- Delivered using the MSG, MSGNOH, or SMSG command
- Created in the local language, network language, or language independent form
- Returned with a signature that you specify

To request your preferences, specify the CRI prefix before any RSCS command. (For details see “CRI Prefix” on page 134). After specifying the prefix, RSCS returns command responses to you in the form you indicated. RSCS also returns the command responses independent of the EMSG setting of the RSCS virtual machine and RSCS includes line sequence numbers to help you determine how many lines have been sent, the order of the lines, and the last line in a series of messages.

Suppose your operators needed a tool to give them a list of all links on your system that have more than a certain number of files queued. Also, suppose the threshold number of files for each link is different and is maintained in a separate file. In this example, suppose the file containing the thresholds is called LINK LIMITS and looks like this:

LINK LIMITS

```
BOSTON   500
NEWYORK  2000
TORONTO  325
```

You could use the following CMS exec, LIMITS EXEC, to monitor the file queues of the links in the LINK LIMITS file.

```
/*--------------------------------------------------------------------*/
/*                                                                    */
/*                          L I M I T S                               */
/*                                                                    */
/*  Purpose: The purpose of this exec is to check the queues on the   */
/*           local system against thresholds in the LINK LIMITS file  */
/*                                                                    */
/**********************************************************************/
Address COMMAND

arg input .
if input  = '?' then do
  say 'LIMITS is a program that checks the queues on your local RSCS'
  say 'machine against thresholds established in LINK LIMITS.  A list'
  say 'of links that exceed their limits is placed on the console.'
  exit 200
```

```
end

'STATE LINK LIMITS a'                   /* check for LINK LIMITS file */
if rc <> 0 then do                      /* if not there then error    */
  say 'Unable to find file LINK LIMITS'
  exit 10
end
'EXECIO * DISKR LINK LIMITS * (FINIS STEM REC.' /* read in the file   */
limit. = 10000                          /* set default limit very high*/
do i = 1 to rec.0                       /* get info from LINK LIMITS  */
  parse var rec.i link thresh
  limit.link = STRIP(thresh)
end

'IDENTIFY (LIFO'                        /* ask CMS for information    */
pull me . local . netid .               /* get userid, node & RSCS id */
sig = STRIP(LEFT(me,6,' '))             /* signature must be <= 6 byt */

'CP SET SMSG ON'                        /* allow SMSG responses       */
'WAKEUP +00:00:01 (QUIET SMSG'          /* initialize WAKEUP          */
'CP SMSG 'netid' (SV.'sig') Q LINKS SHOW NAME QUEUED' /* ask for info */
call get_response sig                   /* collect up responses       */

if result = 4 then do                   /* rc 4 means too much time   */
  say 'Responses from 'netid' not received within allotted time'
  exit 100
end
if result = 8 then do                   /* rc 8 means out of sequence */
  say 'Responses from 'netid' received out of order'
  rc = 0
  do while rc <> 2                      /* flush to prevent problems  */
    'WAKEUP +00:00:01 (QUIET SMSG'      /* ... the next time around   */
  end
  exit 101
end

if msgnum.1 <> 0677 then do             /* could be no files queued   */
  say 'No links exceeded their allotted threshold'
  exit 0
end

do i = 1 to parms.0 - 1                 /* last message is 620 message*/
  llen = SUBSTR(parms.i,1,3)
  linkid = SUBSTR(parms.i,4,llen)
  nlen = SUBSTR(parms.i,4+llen,3)
  num = SUBSTR(parms.i,4+llen+3,nlen)
  if limit.linkid <= num then
    say 'Link 'linkid' has 'num' files queued (limit is 'limit.linkid')'
end
exit

/*--------------------------------------------------------------------*/
/* Get_response captures SMSGs from RSCS through the CRI.             */
/*                                                                    */
/* Input:                                                             */
/*      CRI signature  (only messages containing this signature       */
/*                      will be included in the output)               */
/*                                                                    */
/* Output:                                                            */
/*                                                                    */
/* The following data structures are built during the execution       */
/* of this procedure and available upon return:                       */
/*                                                                    */
/* 1. List of message numbers received from RSCS   (in msgnum. stem)  */
/*                                                                    */
/* 2. Array containing the text portion of received messages (in      */
/*    (parms. stem) ... in addition, parms.0 contains the number of   */
/*    messages received                                               */
/*                                                                    */
/* Note: Get_response will successfully receive CRI messages which    */
/*       are responses to commands issued to the local system with    */
/*       an '(SV.ssssss)' CRI option.                                 */
/*--------------------------------------------------------------------*/

Get_response:
procedure expose msgnum. parms.         /* things we're passing back  */
arg sigin                               /* signature passed to us     */
check = 1                               /* boolean variable for loop  */
count = 0                               /* counter for loop           */
retcode = 0                             /* optimistic return code     */

do while check
```

```
  'WAKEUP +00:00:10 (QUIET SMSG'        /* go to sleep               */
  select
    when rc = 1 then do                 /* rc 1 means got an SMSG    */
      parse pull line
      parse var line . . rscs msgnumber respnum node sig parameters
      parameters = STRIP(parameters)
      if sig = sigin then do
        if msgnumber = 0001 then check = 0
        else do
          count = count + 1
          if STRIP(respnum,L,'0') <> count then do
            retcode = 8
            check = 0
          end
          else do
            msgnum.count = msgnumber
            parms.count = parameters
          end
        end
      end
    end
    when rc = 2 then do                 /* rc 2 means time expired   */
      retcode = 4
      check = 0
    end
    otherwise nop
  end
end
parms.0 = count                         /* set number of things      */
msgnum.0 = count                        /* and again                 */
return retcode                          /* rc indicates how it went  */
```

This exec uses the language independent form of the CRI, which makes it impervious to message format changes. You can set up execs of this type for almost any moderately complex task.

A Note about LIMITS EXEC
This exec uses the CMS WAKEUP command. For more information, see *z/VM: CMS Commands and Utilities Reference*.

Understanding CRI Output

Before you create execs using the CRI, you should understand the format of the output RSCS gives you. In the LIMITS EXEC in "Packaging Tasks Together in CMS Execs" on page 94, you see the following line:

```
'cp sm 'netid' (sv.'sig') q links show name queued'   /* ask for info */
```

This command asks RSCS for information about links and asks that RSCS return the response in language-independent format using SMSG. The exec is designed to trap the responses and parse through the output.

By changing the CRI prefix, you can display these same responses at your terminal. For example, suppose you enter the same QUERY command without specifying a CRI prefix:

```
smsg rscs query links show name queued
Ready;
 Link
 Name     Queued
 BOSTON        6
 CHICAGO      17
 CLEVELND      3
 DALLAS        0
 LONDON       23
 RALEIGH      39
 TOKYO         0
 TORONTO      28
 *LIST         0
 *UNKNOWN      2
 *NOTHERE      1
 11 links found
```

Enter the same command and specify a CRI prefix that tells RSCS you want to see the message text and you want RSCS to send the response using MSG (or MSGNOH):

```
smsg rscs (mt.mysig) query links show name queued
Ready;
 RSCS 0677 0001 NEWYORK  MYSIG  H1  Link
 RSCS 0677 0001 NEWYORK  MYSIG  H2L Name     Queued
 RSCS 0677 0002 NEWYORK  MYSIG  B1L BOSTON        6
 RSCS 0677 0003 NEWYORK  MYSIG  B1L CHICAGO      17
 RSCS 0677 0004 NEWYORK  MYSIG  B1L CLEVELND      3
 RSCS 0677 0005 NEWYORK  MYSIG  B1L DALLAS        0
 RSCS 0677 0006 NEWYORK  MYSIG  B1L LONDON       23
 RSCS 0677 0007 NEWYORK  MYSIG  B1L RALEIGH      39
 RSCS 0677 0008 NEWYORK  MYSIG  B1L TOKYO         0
 RSCS 0677 0009 NEWYORK  MYSIG  B1L TORONTO      28
 RSCS 0677 0010 NEWYORK  MYSIG  B1L *LIST         0
 RSCS 0677 0011 NEWYORK  MYSIG  B1L *UNKNOWN      2
 RSCS 0677 0012 NEWYORK  MYSIG  B1L *NOTHERE      1
 RSCS 0620 0013 NEWYORK  MYSIG  M1L 11 links found
 RSCS 0001 0014 NEWYORK  MYSIG  M1L End of command response
```

The first column of information tells you the name of the program sending the response (here, RSCS). The second column tells you the message number. Note that the last line has 0001 as the message number. This is a special message that shows you have reached the end of the series of message lines.

The third column tells you the order of message lines (if they arrive out of sequence). The fourth column tells you the name of the node on which RSCS processed the command. The fifth column is the signature you specified on the CRI prefix. If you did not specify a signature, this column tells you what time RSCS processed the command.

The sixth column is a string that gives you information about the message line. The first character tells you what kind of message line it is:

H
Indicates a header line for a columnar message

B
Indicates a body line for a columnar message

M
Indicates a message line for a regular (noncolumnar) message

The second character of the sixth column tells you the line number of the message line (if there is more than one). Usually, only header lines for columnar messages have more than one line. The last character is either an L or a blank. The L indicates that the message line is the last one in a series. The blank indicates there is more than one line to this header, body, or message. The rest of the message lines contain the actual message information you requested. Now enter the command and request the language-independent form:

```
smsg rscs (mv.mysig) query links show name queued
Ready;
 RSCS 0677 0001 NEWYORK  MYSIG  006BOSTON0016***
 RSCS 0677 0002 NEWYORK  MYSIG  007CHICAGO00217***
 RSCS 0677 0003 NEWYORK  MYSIG  008CLEVELND0013***
 RSCS 0677 0004 NEWYORK  MYSIG  006DALLAS0010***
 RSCS 0677 0005 NEWYORK  MYSIG  005LONDON00223***
 RSCS 0677 0006 NEWYORK  MYSIG  007RALEIGH00239***
 RSCS 0677 0007 NEWYORK  MYSIG  005TOKYO0010***
 RSCS 0677 0008 NEWYORK  MYSIG  007TORONTO00228***
 RSCS 0677 0009 NEWYORK  MYSIG  005*LIST0010***
 RSCS 0677 0010 NEWYORK  MYSIG  008*UNKNOWN0012***
 RSCS 0677 0011 NEWYORK  MYSIG  008*NOTHERE0011***
 RSCS 0620 0012 NEWYORK  MYSIG  00211D08D01***
 RSCS 0001 0013 NEWYORK  MYSIG  ***
```

Notice that the first five columns remain the same. (Note that RSCS does not give you the two header lines in the language-independent form.) The sixth column gives you the information you requested. Each line consists of a sequence of 3-character lengths followed by the actual data and ended by three asterisks (the end of message line marker). For example, the first line reads:

```
006BOSTON0016***
```

The 006 tells you that data immediately following is six characters long (BOSTON). The next three characters (001) tell you that the next piece of data is one character long (6). And, finally, the *** tells you that you have reached the end of that line. Lines 0002 through 0011 are formatted in the same manner.

Lines 0012 and 0013 are different from the first 11 lines. Line 0013 only contains three asterisks, which means the line has no variable data. Line 0012 starts out like the previous 11 lines by having a 3-character length (002) followed by two characters of data (11). After that, you see:

```
D08D01***
```

When the 3-character length field starts with the letter D, it indicates a dictionary term. In the second column of line 0012, you see 0620, which tells you the message number. If you look up message DMT620I in *z/VM: RSCS Networking Messages and Codes*, you will see two sets of words enclosed in braces. D08 tells you to look at the eighth word in the first set and D01 tells you to look at the first word in the second set. Therefore, 00211D08D01*** translates into 11 links found.

For more information on the CRI message output, see the CRI Prefix description in Chapter 12, “RSCS Commands,” on page 127 and *z/VM: RSCS Networking Messages and Codes*.

Using the Slowdown Facility

z/VM imposes a limit (9,999) on the number of spool files that a single z/VM user ID can own. If your RSCS virtual machine is part of a busy network, RSCS may already have met this limit because of link or node outages. Typically, when this happens, you must shut down RSCS, dump files to tape, and restart RSCS. Unfortunately, by shutting down your local RSCS machine, you are causing link outages that effect the surrounding nodes. Once you restart your RSCS machine, the surrounding nodes will start sending the files they have been holding and you may soon find yourself with the same problem.

The best way to solve this problem is by preventing it. In the past, before such a problem occurred, you had to contact the authorized operators at your adjacent nodes to ask them to start their links to you using the CLASS 0 operand. This would allow you to send files out over the link, but would prevent others from sending files to you. The link became a *safety valve* that let you spread the network backlog over several nodes without causing the node closest to the outage to have to shut down.

RSCS makes it possible to automate this *safety valve* using the HOLD command or the slowdown facility. For example, if you enter:

```
smsg rscs hold newyork input
Ready;
 Link NEWYORK file reception suspended
```

Without requiring the intervention of an operator on the adjacent node, RSCS leaves the link up, sends outbound traffic, and prevents inbound traffic from the other side of the link. When the number of spool files drops to a reasonable level, you can accept inbound traffic by entering:

```
smsg rscs free newyork
Ready;
 Link NEWYORK resuming file exchange
```

Although this method relieves you of contacting operators on adjacent nodes, you would still be busy entering HOLD INPUT and FREE commands for all your networking links. To completely automate the process, use the slowdown facility.

The slowdown facility automatically prevents and resumes inbound traffic based on the limits you specify. An operator makes the decision to enter HOLD and FREE commands based on the size of the RSCS file inventory. For example, an operator may decide to stop all inbound traffic when the number of files reaches 8,000 and to resume traffic when the number of files drops below 7,000. Using the SLOWDOWN

statement or command, you tell RSCS these limits and have RSCS automatically turn slowdown mode on and off for you:

```
smsg rscs slowdown start 8000 stop 7000
Ready;
 Slowdown start = 8000, stop = 7000
```

After entering the command (or including the statement in the configuration file), RSCS issues HOLD INPUT commands for every networking link when the RSCS file inventory reaches 8,000 and issues FREE commands for every held networking link when the file inventory drops below 7,000 files. By using the SLOWDOWN command (or statement), you are setting system-wide defaults for starting and stopping slowdown mode.

You may want to set different limits for some of the networking links on your node. RSCS lets you change the slowdown start and stop values for a networking link by using the SLOWDOWN operand on the LINKDEFINE statement or the DEFINE command. You can adjust an individual link's slowdown values in one of two ways:

```
smsg rscs define link newyork slowdown 5000 3000
Ready;
 Link NEWYORK redefined
 Link NEWYORK default NJE line=0300 LUname=NEWYORK logmode=... retry=yes
 Link NEWYORK class * queuing=size autostart=no DP=5

smsg rscs define link newyork slowdown - 3000
Ready;
 Link NEWYORK redefined
 Link NEWYORK default NJE line=0300 LUname=NEWYORK logmode=... retry=yes
 Link NEWYORK class * queuing=size autostart=no DP=5
```

The first command sets the slowdown start and stop values for link NEWYORK to 5,000 and 3,000 files, respectively (this is called an *absolute* slowdown setting). The second command sets the slowdown start and stop values at 3,000 files less than the system-wide default (this is called a *relative* slowdown setting). Using the previous example, link NEWYORK would have a slowdown start value of 5,000 and a stop value of 4,000.

To display the slowdown values, use the QUERY command with the SLOWDOWN SHOW option:

```
smsg rscs query system links name newyork show slowdown
Ready;
 Link     ------------ Slowdown ------------
 Name     Mode        Delta    Start     Stop
 NEWYORK  relative    -3000     5000     4000
 1 link found
```

In summary, using the SLOWDOWN command (or statement) in combination with the SLOWDOWN operand on the LINKDEFINE statement or DEFINE command, you can configure your RSCS virtual machine to automatically quiesce and resume incoming file traffic on your networking links based on the size of RSCS's file inventory.

Using the Event Scheduler

The RSCS event scheduler lets you automate tasks that must be performed at specific times. Without the event scheduler, these tasks would have to be performed manually or by a program running in another virtual machine. The RSCS event scheduler can automate such tasks as:

- Changing shift settings
- Closing RSCS consoles
- Driving exit points at preappointed times

You can set up permanently scheduled events using the RSCS events file and dynamically scheduled events using the SCHEDULE command. You can also use the events file to define holidays and to perform different tasks based on whether it is a holiday, weekend, or week day.

```
*------------------------ RSCS Events File -----------------------------*
*                                                                       *
*                     Days of        Range                              *
*  Date      Time     the Week      Low   High   Command                 *
* --------   -----    --------     -----  -----  -------------------------*
     *       INIT     MTWRF---     00:00  07:59  SHIFT 2
     *       INIT     MTWRF---     08:00  16:59  SHIFT 1
     *       INIT     MTWRF---     17:00  23:59  SHIFT 2
     *       INIT     -----SS*       *      *    SHIFT 2

     *       08:00    MTWRF---       *      *    SHIFT 1
     *       17:00    MTWRF---       *      *    SHIFT 2
     *       ++:00    MTWRFSS*       *      *    CP CLOSE CONS
     *       M:090    MTWRFSS*       *      *    RECONFIGURE
     *       ++:30    -------C     08:00  17:00  CP MSG ALL MERRY XMAS
  95/07/16   12:00       *          *      *    MSG GLENDALE OPERATOR HELLO

SPECIAL C **/12/25
SPECIAL H **/01/01 **/04/01
```

Figure 9. Sample RSCS Events File

Figure 9 on page 100 shows that you can run events at RSCS initialization time, at a specific times (such as 8 a.m.), at some number of minutes past every hour, and every specified number of minutes. Before RSCS schedules an event to be processed, the event must meet the date, days of the week, and range criteria. You define special days (such as holidays) using the SPECIAL cards and the days of the week qualifier.

When RSCS initializes, the event scheduling task looks for a file with a DDNAME of EVENTS. If the events file in Figure 9 on page 100 had been created in a file called EVENTS CONFIG, you could start it using the following line in RSCS's PROFILE GCS before the RSCS INIT command:

```
FILEDEF EVENTS DISK EVENTS CONFIG *
```

After you have scheduled some events, you can use the QUERY SYSTEM SCHEDULE command to display information about those events. For details, see “QUERY SYSTEM SCHEDULE” on page 246.

Creating a Program to Monitor RSCS

If your RSCS network is complex enough, you may be justified in further automating your network operations by writing a program to monitor the operation of your RSCS machine. You might design a monitoring program to periodically check:

- Link connectivity, telling operators about links that remain inactive for an extended period
- Active files on links, telling operators if files seem to be stuck
- File queue size, reporting any anomalies to operators

You can carry out these functions using the CRI and a program that traps responses (such as the one in the LIMITS EXEC in “Packaging Tasks Together in CMS Execs” on page 94). The program can run in a disconnected virtual machine and be autologged at system IPL time.

You can also create a program that uses the RSCS facility that lets operators and programs subscribe to RSCS messages based on message number or associated link name. You can use the SETMSG command (or statement) to subscribe the virtual machine running the monitoring program for messages about VTAM errors, I/O errors, abends, and link deactivation. Once subscribed, RSCS would automatically supply the program with a copy of these messages whenever RSCS issues them. See “SETMSG” on page 272 for more information about the SETMSG command.

You can use the SET command to subscribe a program to all messages about a particular link. Once subscribed, RSCS would automatically supply the program with a copy of any message displayed on the RSCS console that pertains to the link. See “SET” on page 270 for more information about the SET command.

Both the SET and SETMSG commands support the CRI, which lets you ask RSCS to return these asynchronous messages in the format you want (as outlined in "Packaging Tasks Together in CMS Execs" on page 94). The program will be able to recognize all asynchronous messages because RSCS sets the response counter in the message to zero.

By creating a monitoring program with the features described in this section, you can greatly reduce the number of informational messages RSCS would usually send your operators and remove the need for operators to manually run programs to periodically *check out* RSCS. As a precaution, you should subscribe the operators to message DMT616E. If your monitoring program should become disabled for any reason, RSCS will issue message DMT616E to show that a message subscription recipient is unable to receive messages. Thus, RSCS informs the operators when there is a problem with the monitoring machine.

Chapter 9. Running the RSCS Domain Name Server

This chapter explains how to operate the RSCS domain name server. This server does domain name system (DNS) searches on behalf of RSCS, translating fully qualified host names to dotted decimal IP addresses for LPR-type, TCPASCII-type, TCPNJE-type, and UFT-type links in TCP/IP networks. For information about setting up the RSCS domain name server, see *z/VM: RSCS Networking Planning and Configuration*.

Starting or Restarting the Server

The RSCS domain name server virtual machine is usually defined with the name RSCSDNS. There are several ways you can start or restart the server.

1. The preferred method is:
   a. Enter the AUTOLOG command if the server is logged off:

      ```
      autolog rscsdns
      ```

   b. The IPL CMS command is automatically issued from the RSCSDNS virtual machine definition. The profile for RSCSDNS issues a call to the GETHOSTC MODULE.
2. An alternate method is:
   a. Log on to the RSCSDNS virtual machine.
   b. Enter the IPL CMS command to run the profile (if this command is not included in the virtual machine definition). The profile issues a call to the GETHOSTC MODULE.
3. If you are already logged on to the RSCSDNS server, you can start the GETHOSTC MODULE by entering:

   ```
   gethostc port
   ```

   where *port* is the TCP/IP port on which GETHOSTC will listen for connect requests. The default is 900.

GETHOSTC MODULE

The GETHOSTC MODULE is the main routine for the RSCSDNS server. GETHOSTC listens on a TCP/IP port for a connect request from an RSCS server. When a connect request is received, GETHOSTC reads the fully qualified host name sent by the RSCS server, issues the DNS search, and returns the dotted decimal IP address to the RSCS server.

Multiple virtual machines can run GETHOSTC, all listening on the same port. For more information, see *z/VM: RSCS Networking Planning and Configuration*.

GETHOSTC periodically checks for a command. Two commands are supported:

Query
Returns a message indicating the current service level.

SHUTDOWN
Terminates processing.

These commands have no operands and must be issued on the RSCSDNS server.

Stopping the Server

To stop the RSCSDNS server, log on to the RSCSDNS virtual machine and issue the SHUTDOWN command.

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Chapter 10. Using RSCS Dynamic Authorization

This chapter explains how to operate and use RSCS dynamic authorization (RSCSAUTH). RSCSAUTH allows you to authorize users for RSCS commands and links without updating the RSCS configuration file. For information about setting up the RSCS dynamic authorization server, see *z/VM: RSCS Networking Planning and Configuration*.

How RSCSAUTH Works

The RSCSAUTH server runs in a z/VM service virtual machine (usually called RSCSAUTH) that is authorized to issue all RSCS commands (except CMD and INIT). If you are authorized for RSCSAUTH, you use a set of RSCSAUTH commands to authorize users for RSCS commands and links and RSCSAUTH commands. RSCSAUTH maintains the authorization information in a set of tables.

A user who is authorized for a command through RSCSAUTH issues the command to the RSCSAUTH server instead of the RSCS server. When the RSCSAUTH server receives an RSCS command, it checks the authorization tables to validate the user's authorization for the command (and for the link, if required), then issues the command to the RSCS server. The RSCS server executes the command and returns the response to RSCSAUTH, which passes the response back to the user who originally issued the command.

If RSCSAUTH receives an RSCSAUTH command, it validates the sender's authorization and processes the command.

For descriptions of the RSCSAUTH commands, see Chapter 14, “RSCSAUTH Commands,” on page 377.

Starting or Restarting the Server

There are several ways you can start or restart the RSCSAUTH server.

1. The preferred method is:
   a. If the RSCSAUTH virtual machine is logged off, enter the AUTOLOG command:

      ```
      autolog rscsauthid
      ```

   b. The IPL CMS command is automatically issued from the RSCSAUTH virtual machine definition. The PROFILE EXEC for RSCSAUTH issues a call to the RSCSAUTH EXEC.
2. An alternate method is:
   a. Log on to the RSCSAUTH virtual machine.
   b. Enter the IPL CMS command to run the PROFILE EXEC (if this command is not included in the virtual machine definition). The PROFILE EXEC issues a call to the RSCSAUTH EXEC.
3. If you are already logged on to the RSCSAUTH virtual machine, and the RSCSAUTH server is not running, you can issue a call to the RSCSAUTH EXEC by entering:

   ```
   rscsauth
   ```

RSCSAUTH EXEC

The RSCSAUTH EXEC is the main routine for the RSCSAUTH server. It reads in the configuration file and message repository to determine the setup of the server. The files read are:

- RSCSAUTH CONFIG, for the configuration data
- DMTUME TEXT, for the message repository

The RSCSAUTH configuration file specifies the RSCSAUTH administrator, the location of the RSCSAUTH files, and other setup information. For more information about the RSCSAUTH configuration file, see *z/VM: RSCS Networking Planning and Configuration*.

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Stopping the Server

To stop the RSCSAUTH server, use the STOPRSCSAUTH command. Before stopping, the RSCSAUTH server will wait to receive any pending responses for outstanding command requests from the RSCS server. If you want to stop RSCSAUTH processing immediately, specify STOPRSCSAUTH IMMEDIATE. If the RSCSAUTH server is waiting for pending responses from the RSCS server, RSCSAUTH will not accept any command except STOPRSCSAUTH IMMEDIATE.

You can stop the RSCSAUTH server using either of the following methods:

- Log on to the RSCSAUTH virtual machine and enter the STOPRSCSAUTH command.
- If you are authorized for RSCSAUTH, you can send the STOPRSCSAUTH command to the server from your user ID:

```
smsg rscsauthid stoprscsauth
```

Issuing Commands through RSCSAUTH

If you are authorized to issue an RSCS or RSCSAUTH command through RSCSAUTH, you must address the command to the RSCSAUTH server instead of the RSCS server. If the command is an RSCS command, the RSCSAUTH server will verify your authorization and then send the command to the RSCS server for processing.

If you are issuing the command request on the same system as the RSCSAUTH server, enter it with the CP SMSG command:

```
smsg rscsauthid command_string
```

If you are issuing the command request remotely from another node, enter it with the CMS TELL command:

```
tell rscsauthid at node command_string
```

Creating Authorizations through RSCSAUTH

The RSCSAUTH administrator (MAINT, or as otherwise specified on the AUTHUSER statement in the RSCSAUTH configuration file) is fully authorized on the local RSCSAUTH server for all RSCSAUTH commands. The administrator uses the RSCSAUTH commands to authorize users for RSCS commands and links and RSCSAUTH commands on that RSCSAUTH server.

Any user who is authorized to issue RSCSAUTH commands can authorize other users for RSCS commands and links and RSCSAUTH commands on the same RSCSAUTH server.

There are three steps to creating authorizations through RSCSAUTH:

1. Define command groups.

   A command group is a list of RSCS and RSCSAUTH commands that are authorized as a group. You can create broad authorizations by defining command groups that contain many or all commands, and you can create limited authorizations by defining command groups that contain only a few commands, even a single command. You can include the same commands in multiple command groups.

2. Authorize users for command groups.

   The next step is to authorize users for the command groups you previously defined. Using command groups allows you to authorize multiple users for the same set of commands without having to repeat the list of commands for each user. You can give users different authority by authorizing them for different command groups. You can authorize users individually or you can authorize a large group of users (for example, all users on a given node) through a single authorization. You can easily update the authority of many users by updating the command groups for which they are authorized.

When you authorize a user for an RSCS command through RSCSAUTH, the user has authority for that command equivalent to an RSCS operator. However, if the command requires a link, you must also authorize the user for the link.

3. Authorize users for links.

   You need to authorize users for the RSCS links they will need to be able to use the commands for which they have been authorized. You can authorize a user for multiple links, and you can authorize a large group of users through a single authorization.

   When you authorize a user for a link through RSCSAUTH, the user has authority for that link equivalent to an RSCS operator. However, you must also authorize the user for RSCS commands that use the link.

Defining Command Groups

To define command groups in RSCSAUTH, use the COMMANDGROUP command. RSCSAUTH maintains the command group definitions in the command group (CMDGROUP) table in the CMDGROUP RSCSAUTH file.

Notes:

1. If both the CMDGROUP RSCSAUTH file and the USERAUTH RSCSAUTH file do not exist when the RSCSAUTH server is started, RSCSAUTH automatically creates the CMDGROUP RSCSAUTH file with command groups called GENERAL, RSCSAUTH, LINKAUTH, and RESTRICTED predefined.
2. The RSCS CMD, INIT, and comment (*) commands and all RSCS Interchange commands cannot be authorized through RSCSAUTH.
3. The RSCS comment (*) command is a special case. RSCSAUTH does not check the tables for authorization, because all users are always authorized for this command. The asterisk is used as a wildcard character in COMMANDGROUP syntax and in CMDGROUP table entries.
4. You can also use RSCSAUTH to authorize local RSCS commands created by your installation. The commands must be defined in the RSCSCMDS CONFIG file. For more information, see *z/VM: RSCS Networking Planning and Configuration*.

Command Group Table

Each entry in the CMDGROUP table identifies the commands associated with a command group name. The entry has the format:

```
command_group command1 [command2...]
```

The first field in the entry is the command group name, which is followed by the names of the RSCS and RSCSAUTH commands included in that command group. An asterisk (*) in the command names field instead of a list of commands indicates that all RSCS and RSCSAUTH commands (except CMD and INIT) are included in the command group. A command can be included in multiple command groups, but only one entry is allowed in the table for each command group name.

Use the QRSCSAUTH command to query the CMDGROUP table. See “Querying Authorizations in RSCSAUTH” on page 114.

Figure 10 on page 108 shows the contents of the default (automatically-generated) CMDGROUP table.

Attention: This representation of the CMDGROUP table is provided only to help explain the authorization process. It does not show the actual format of the table. Each entry is maintained on a single line; a long

entry is not split across multiple lines as shown here. **You should not attempt to edit this file directly.** Use the COMMANDGROUP command to update the CMDGROUP table.

```
GENERAL CHANGE CPQUERY FLUSH MSG PURGE QUERY REPLY TRANSFER
RSCSAUTH COMMANDGROUP QRSCSAUTH STOPRSCSAUTH TRACERSCSAUTH USERAUTH
         USERLINK
LINKAUTH BACKSPACE CHANGE DRAIN FLUSH FREE FWDSPACE HOLD ORDER PURGE
         READY SET START STOP TRACE TRANSFER
RESTRICTED BACKSPACE CP DEFINE DELETE DEST DISABLE DISCONNECT DRAIN
           ENABLE EXEC EXIT FORCE FREE FWDSPACE HOLD ITRACE LOOPING
           NETWORK ORDER PORT READY RECONNECT REORDER REROUTE
           RESETCOUNTERS ROUTE SCHEDULE SET SETMSG SHIFT SHUTDOWN
           SLOWDOWN START STOP TCPIP TRACE
```

Figure 10. Default RSCS Dynamic Authorization CMDGROUP Table

Using the COMMANDGROUP Command

The COMMANDGROUP command adds, updates, or removes a command group definition. For a complete description of the command, see "COMMANDGROUP" on page 378.

Adding Commands and Command Groups

Use the COMMANDGROUP ADD command to add commands to a command group or to define a new command group. The command syntax is the same:

```
commandgroup add command_group_name command_list
```

If an entry for the specified command group name exists in the CMDGROUP table, it is updated. If an entry for the command group name does not exist, it is created.

A command group name can be 1 - 32 characters. You can specify an asterisk (*) instead of a command list to indicate all commands that can be authorized through RSCSAUTH.

For example, to define a command group called ALL that contains all commands, enter:

```
smsg rscsauth commandgroup add all *
```

To define a command group called HOLD that contains the HOLD and FREE commands, enter:

```
smsg rscsauth commandgroup add hold hold free
```

To add the BACKSPACE command to the GENERAL command group, enter:

```
smsg rscsauth commandgroup add general backspace
```

The CMDGROUP table would now contain the following data (additions highlighted for demonstration only):

```
GENERAL CHANGE CPQUERY FLUSH MSG PURGE QUERY REPLY TRANSFER BACKSPACE
RSCSAUTH COMMANDGROUP QRSCSAUTH STOPRSCSAUTH TRACERSCSAUTH USERAUTH
         USERLINK
LINKAUTH BACKSPACE CHANGE DRAIN FLUSH FREE FWDSPACE HOLD ORDER PURGE
         READY SET START STOP TRACE TRANSFER
RESTRICTED BACKSPACE CP DEFINE DELETE DEST DISABLE DISCONNECT DRAIN
           ENABLE EXEC EXIT FORCE FREE FWDSPACE HOLD ITRACE LOOPING
           NETWORK ORDER PORT READY RECONNECT REORDER REROUTE
           RESETCOUNTERS ROUTE SCHEDULE SET SETMSG SHIFT SHUTDOWN
           SLOWDOWN START STOP TCPIP TRACE
ALL *
HOLD HOLD FREE
```

Deleting Commands and Command Groups

Use the COMMANDGROUP DELETE command to remove commands from a command group or to delete a command group. The command syntax is the same:

```
commandgroup delete command_group_name command_list
```

If the last command is removed from a command group, the entry is deleted from the CMDGROUP table. You can specify an asterisk (*) instead of a command list to remove all of the commands from the command group and delete the entry.

Note: You cannot delete a command group from the CMDGROUP table if that command group name is included in an entry in the USERAUTH table.

For example, to remove the BACKSPACE command from the GENERAL command group, enter:

```
smsg rscsauth commandgroup delete general backspace
```

To delete command group ALL, enter:

```
smsg rscsauth commandgroup delete all *
```

The CMDGROUP table would now contain the following data:

```
GENERAL CHANGE CPQUERY FLUSH MSG PURGE QUERY REPLY TRANSFER
RSCSAUTH COMMANDGROUP QRSCSAUTH STOPRSCSAUTH TRACERSCSAUTH USERAUTH
         USERLINK
LINKAUTH BACKSPACE CHANGE DRAIN FLUSH FREE FWDSPACE HOLD ORDER PURGE
         READY SET START STOP TRACE TRANSFER
RESTRICTED BACKSPACE CP DEFINE DELETE DEST DISABLE DISCONNECT DRAIN
           ENABLE EXEC EXIT FORCE FREE FWDSPACE HOLD ITRACE LOOPING
           NETWORK ORDER PORT READY RECONNECT REORDER REROUTE
           RESETCOUNTERS ROUTE SCHEDULE SET SETMSG SHIFT SHUTDOWN
           SLOWDOWN START STOP TCPIP TRACE
HOLD HOLD FREE
```

Authorizing Users for Command Groups

To authorize users for command groups defined in the CMDGROUP table, use the USERAUTH command. RSCSAUTH maintains the authorizations in the user authorization (USERAUTH) table in the USERAUTH RSCSAUTH file.

Note: If both the CMDGROUP RSCSAUTH file and the USERAUTH RSCSAUTH file do not exist when the RSCSAUTH server is started, RSCSAUTH automatically creates the USERAUTH RSCSAUTH file with a predefined entry that authorizes all users for the GENERAL command group.

User Authorization Table

Each entry in the USERAUTH table identifies the command groups for which a specific user ID and node combination is authorized. The entry has the format:

```
userid node command_group1 [command_group2...]
```

The first two fields in the entry identify the user ID and node, which are followed by the names of the command groups for which that user ID and node combination is authorized. An asterisk (*) in the user ID field or node field indicates all user IDs or all nodes. Only one entry is allowed in the table for each user ID and node combination.

Use the QRSCSAUTH command to query the USERAUTH table. See “Querying Authorizations in RSCSAUTH” on page 114.

Figure 11 on page 110 shows the contents of the default (automatically-generated) USERAUTH table.

Attention: This representation of the USERAUTH table is provided only to help explain the authorization process. **You should not attempt to edit this file directly.** Use the USERAUTH command to update the USERAUTH table.

```
* * GENERAL
```

Figure 11. Default RSCS Dynamic Authorization USERAUTH Table

Using the USERAUTH Command

The USERAUTH command adds, updates, or removes a user authorization for command groups. For a complete description of the command, see "USERAUTH" on page 384.

Adding Command Group Authorizations

Use the USERAUTH ADD command to add command group names to a user authorization or to define a new user authorization. The command format is the same:

```
userauth add userid at node command_group_list
```

If an entry for the specified user ID and node combination exists in the USERAUTH table, it is updated. If an entry for that user ID and node combination does not exist, it is created.

Note: You cannot add a command group authorization if the command group name is not defined in the CMDGROUP table.

For example, to authorize OPERATOR at all nodes for command group LINKAUTH, enter:

```
smsg rscsauth userauth add operator at * linkauth
```

To authorize CECIL at MAHVM7 for command groups RSCSAUTH and LINKAUTH, enter:

```
smsg rscsauth userauth add cecil at mahvm7 rscsauth linkauth
```

To authorize GROMMIT at MAHVM1 for command group HOLD, enter:

```
smsg rscsauth userauth add grommit at mahvm1 hold
```

To authorize GROMMIT at all nodes for command group HOLD, enter:

```
smsg rscsauth userauth add grommit at * hold
```

The USERAUTH table would now contain the following data (additions highlighted for demonstration only):

```
* * GENERAL
OPERATOR * LINKAUTH
CECIL MAHVM7 RSCSAUTH LINKAUTH
GROMMIT MAHVM1 HOLD
GROMMIT * HOLD
```

As you can see from this example, there are two types of user authorizations, explicit and implicit. The authorization of GROMMIT at MAHVM1 for command group HOLD is explicit, because both the user ID and the node are specifically identified in the GROMMIT MAHVM1 HOLD entry. On the other hand, the authorization of GROMMIT at MAHVM7 for command group HOLD is implicit, because only the user ID is specifically identified in the GROMMIT * HOLD entry. The node is specified as a wildcard character (*), meaning any node, which therefore implicitly includes MAHVM7.

You cannot explicitly authorize a user for a command group if the user is already explicitly or implicitly authorized for that command group. For example, if you enter the command:

```
smsg rscsauth userauth add operator at mahvm1 linkauth
```

the command will be rejected, because OPERATOR at MAHVM1 is already implicitly authorized for command group LINKAUTH by the OPERATOR * LINKAUTH entry.

However, you can add a broad authorization that implicitly includes existing authorizations. In the example above, the command that authorized GROMMIT at all nodes for command group HOLD was accepted because it is a broader authorization than the previous authorization for GROMMIT at MAHVM1.

Note: A broad authorization does not replace implicitly included authorizations but is added to them in the table. Keep this in mind when you delete authorizations. A user could be authorized for a command group through multiple authorization entries.

Deleting Command Group Authorizations

Use the USERAUTH DELETE command to remove command group names from a user authorization or to delete a user authorization. The command syntax is the same:

```
userauth delete userid at node command_group_list
```

If the last command group name is removed from an authorization, the entry is deleted from the table. You can specify an asterisk (*) instead of a command group list to remove all of the command groups from the user entry and delete the entry.

For example, to remove the authorization for command group LINKAUTH from CECIL at MAHVM7, enter:

```
smsg rscsauth userauth delete cecil at mahvm7 linkauth
```

To remove the authorization for command group HOLD from GROMMIT at MAHVM1, enter:

```
smsg rscsauth userauth delete grommit at mahvm1 hold
```

The USERAUTH table would now contain the following data:

```
* * GENERAL
OPERATOR * LINKAUTH
CECIL MAHVM7 RSCSAUTH
GROMMIT * HOLD
```

The user ID and node that you specify on the USERAUTH DELETE command must match an entry in the USERAUTH table. If you specify an explicit authorization, only the explicit authorization will be removed. In the previous example, although you deleted the explicit authorization for command group HOLD from GROMMIT at MAHVM1, GROMMIT at MAHVM1 is still implicitly authorized for command group HOLD through the GROMMIT * HOLD entry.

If you specify a wildcard character (*) for the user ID or node on a USERAUTH DELETE command, any implicitly included authorizations will also be removed. Therefore, in the previous example, if you had entered:

```
smsg rscsauth userauth delete grommit at * hold
```

both authorization entries for GROMMIT would have been removed.

If you want to remove the authorization to the LINKAUTH command group for OPERATOR at MAHVM1, and you enter:

```
smsg rscsauth userauth delete operator at mahvm1 linkauth
```

the command will be rejected, because there is no entry that matches that specification.

To remove the LINKAUTH authorization for OPERATOR at MAHVM1, but retain the LINKAUTH authorization for OPERATOR at other nodes, you need to delete the broad OPERATOR * LINKAUTH authorization and then add explicit authorizations for LINKAUTH for OPERATOR at specific nodes.

Before you issue the USERAUTH DELETE command to remove a command group authorization for a user ID and node, you might want to issue the QRSCSAUTH USERAUTH command to see what authorizations are defined in the USERAUTH table for that user ID and node. To completely remove the command group authorization, you might need to issue more than one USERAUTH DELETE command or make other changes to the USERAUTH table. You also might want to issue the QRSCSAUTH command after you use the USERAUTH DELETE command to make sure the authorization you removed is not still implicitly defined in the table. See “Querying Authorizations in RSCSAUTH” on page 114.

Authorizing Users for Links

To authorize users for RSCS links through RSCSAUTH, use the USERLINK command. RSCSAUTH maintains the authorizations in the link authorization (USERLINK) table in the USERLINK RSCSAUTH file.

Link Authorization Table

Each entry in the USERLINK table identifies the links for which a specific user ID and node combination is authorized. The entry has the format:

```
userid node link1 [link2...]
```

The first two fields in the entry identify the user ID and node, which are followed by the names of the links for which that user ID and node combination is authorized. An asterisk (*) in the user ID field or node field indicates all user IDs or all nodes. Only one entry is allowed in the table for each user ID and node combination.

Use the QRSCSAUTH command to query the table. See “Querying Authorizations in RSCSAUTH” on page 114.

Figure 12 on page 112 shows an example of the USERLINK table. A default USERLINK table is not automatically generated when the RSCSAUTH server is started. However, if the table does not exist, it is automatically created when the first USERLINK ADD command is issued.

Attention: This representation of the USERLINK table is provided only to help explain the authorization process. **You should not attempt to edit this file directly.** Use the USERLINK command to update the USERLINK table.

```
* MAHVM6 TCP
* * BSC
* CENTRAL TCP
CECIL MAHVM7 SNA LPR
OPERATOR * LPR
```

Figure 12. Example of the RSCS Dynamic Authorization USERLINK Table

Using the USERLINK Command

The USERLINK command adds, updates, or removes a link authorization. For a complete description of the command, see “USERLINK” on page 387.

Adding Link Authorizations

Use the USERLINK ADD command to add link names to a user authorization or to define a new user authorization. The command format is the same:

```
userlink add userid at node link_list
```

If an entry for the specified user ID and node combination exists in the USERLINK table, it is updated. If an entry for that user ID and node combination does not exist, it is created. If the USERLINK RSCSAUTH file does not exist, it is created.

For example, to authorize GROMMIT at MAHVM7 for link TCP, enter:

```
smsg rscsauth userlink add grommit at mahvm7 tcp
```

The USERLINK table would now contain the following data (additions highlighted for demonstration only):

```
* MAHVM6 TCP
* * BSC
* CENTRAL TCP
CECIL MAHVM7 SNA LPR
OPERATOR * LPR
GROMMIT MAHVM7 TCP
```

As in the USERAUTH table, there are two types of user authorizations in the USERLINK table, explicit and implicit. You cannot explicitly authorize a user for a link if the user is already explicitly or implicitly authorized for that link. For example, if you enter:

```
smsg rscsauth userlink add operator at mahvm1 lpr
```

the command will be rejected, because OPERATOR at MAHVM1 is already implicitly authorized for link LPR by the OPERATOR * LPR entry.

However, you can add a broad authorization that implicitly includes existing authorizations. For example, if you enter:

```
smsg rscsauth userlink add * mahvm1 lpr
```

the contents of the table will be updated as follows (additions highlighted for demonstration only):

```
* MAHVM6 TCP
* * BSC
* CENTRAL TCP
CECIL MAHVM7 SNA LPR
OPERATOR * LPR
GROMMIT MAHVM7 TCP
* MAHVM1 LPR
```

Note: A broad authorization does not replace implicitly included authorizations but is added to them in the table. Keep this in mind when you delete authorizations. A user could be authorized for a link through multiple authorization entries.

Deleting Link Authorizations

Use the USERLINK DELETE command to remove link names from a user authorization or to delete a user authorization. The command format is the same:

```
userlink delete userid at node link_list
```

If the last link name is removed from an authorization, the entry is deleted from the table. You can specify an asterisk (*) instead of a link list to remove all of the link names from the user entry and delete the entry.

For example, to remove the authorization for link SNA from CECIL at MAHVM7, enter:

```
smsg rscsauth userlink delete cecil at mahvm7 sna
```

To remove the authorization for all links from all users at CENTRAL, enter:

```
smsg rscsauth userlink delete * at central *
```

The USERLINK table would now contain the following data:

```
* MAHVM6 TCP
* * BSC
CECIL MAHVM7 LPR
OPERATOR * LPR
GROMMIT MAHVM7 TCP
* MAHVM1 LPR
```

The user ID and node that you specify on the USERLINK DELETE command must match an entry in the USERLINK table. If you specify an explicit authorization, only the explicit authorization will be removed. For example, if you want to remove the authorization for link LPR from OPERATOR at MAHVM1, and you enter:

```
smsg rscsauth userlink delete operator at mahvm1 lpr
```

the command will be rejected, because there is no entry that matches the OPERATOR MAHVM1 LPR specification.

If you specify a wildcard character (*) for the user ID or node, any implicitly included authorizations will also be removed. Therefore if you enter:

```
smsg rscsauth userlink delete * at mahvm1 lpr
```

the authorization for link LPR will be removed from all users at node MAHVM1, which implicitly includes OPERATOR at MAHVM1.

However, OPERATOR at MAHVM1 is still authorized for link LPR through the OPERATOR * LPR entry. To remove the LPR authorization for OPERATOR at MAHVM1, but retain the LPR authorization for OPERATOR at other nodes, you need to delete the broad OPERATOR * LPR authorization and then add explicit authorizations for LPR for OPERATOR at specific nodes.

Before you issue the USERLINK DELETE command to remove a link authorization for a user ID and node, you might want to issue the QRSCSAUTH USERLINK command to see what authorizations are defined in the USERLINK table for that user ID and node. To completely remove the link authorization, you might need to issue more than one USERLINK DELETE command or make other changes to the USERLINK table. You also might want to issue the QRSCSAUTH command after you use the USERLINK DELETE command to make sure the authorization you removed is not still implicitly defined in the table. See “Querying Authorizations in RSCSAUTH” on page 114.

Querying Authorizations in RSCSAUTH

To obtain authorization information from the CMDGROUP, USERAUTH, or USERLINK table, use the QRSCSAUTH command. If you specify only the name of the table, a copy of the corresponding file is sent to your reader. If you specify additional operands to qualify your request, the results are displayed on your screen.

For example, to request a copy of the USERAUTH RSCSAUTH file, enter:

```
smsg rscsauth qrscsauth userauth
```

The displayed response is:

```
DMTATH4035I USERAUTH has been sent to userid at node
```

To query the command group authorizations for CECIL at MAHVM7 from the USERAUTH table, enter:

```
smsg rscsauth qrscsauth userauth cecil at mahvm7
```

The displayed response is:

```
DMTATH2030I CECIL AT MAHVM7 AUTHORIZED FOR RSCSAUTH
```

To query the definition of command group GENERAL from the CMDGROUP table, enter:

```
smsg rscsauth qrscsauth cmdgroup general
```

The displayed response is:

```
DMTATH2030I GENERAL AUTHORIZED FOR CHANGE CPQUERY FLUSH MSG PURGE QUERY
REPLY TRANSFER
```

To query the link authorizations for CECIL at MAHVM7 from the USERLINK table, enter:

```
smsg rscsauth qrscsauth userlink cecil at mahvm7
```

The displayed response is:

```
DMTATH2030I CECIL AT MAHVM7 AUTHORIZED FOR LPR
```

In the USERAUTH and USERLINK tables, authorizations for a user ID or node can span entries. A query will return information about all authorizations that explicitly or implicitly match the user ID and node specified on the QRSCSAUTH command. A message will be issued for each authorization entry that matches the query.

Suppose the USERLINK table contains the following entries:

```
* MAHVM6 TCP
* * BSC
CECIL MAHVM7 LPR
OPERATOR * LPR
GROMMIT MAHVM7 TCP
* MAHVM1 LPR
```

If you query the USERLINK table for the link authorizations for OPERATOR at MAHVM1:

```
smsg rscsauth qrscsauth userlink operator at mahvm1
```

the displayed response is:

```
DMTATH2030I ALL USERS AT ALL NODES AUTHORIZED FOR BSC
DMTATH2030I OPERATOR AT ALL NODES AUTHORIZED FOR LPR
DMTATH2030I ALL USERS AT MAHVM1 AUTHORIZED FOR LPR
```

This indicates that OPERATOR at MAHVM1 is authorized for links BSC and LPR.

Tracing Problems

To help you trace possible problems with RSCSAUTH, you can issue the TRACERSCSAUTH command:

```
smsg rscsauth tracerscsauth on
```

The RSCSAUTH server will issue additional tracing messages and return codes to the RSCSAUTH server console. If the LOG statement is included in the RSCSAUTH configuration file, the tracing messages and return codes are also added to the log file.

Issue the TRACERSCSAUTH OFF command to turn tracing off.

Note: The TRACERSCSAUTH command sets the tracing status for the current session of the RSCSAUTH server. The TRACERSCSAUTH configuration statement defines the tracing status when the RSCSAUTH server is started. If the TRACERSCSAUTH statement is omitted from the configuration file, the default setting is OFF. The sample RSCSAUTH CONFIG file supplied with RSCS includes the TRACERSCSAUTH =

ON statement. If you do not want tracing to be always on when the server is started, you need to modify the configuration file to change this statement or remove it.

Chapter 11. Using the RSCS Data Interchange Manager

This chapter explains how to operate and use the RSCS Data Interchange Manager (RSCS Interchange). RSCS Interchange handles the exchange of mail between NJE networks and SMTP networks, which use different mail formats.

Notes:

1. RSCS and RSCS Interchange operate independently of each other. That is, one server can be running when the other is not running.
2. For information about setting up the RSCS Interchange server, see *z/VM: RSCS Networking Planning and Configuration*.

Starting or Restarting the RSCS Interchange Server

The RSCS Interchange server virtual machine is usually defined with the name XCHANGE. There are several ways you can start or restart the server, depending on your activities.

1. The preferred method is:
   - Enter the AUTOLOG command if the server is logged off:

     ```
     autolog xchange
     ```

   - The IPL CMS command is automatically issued from the XCHANGE virtual machine definition. The profile for XCHANGE issues a call to the ACHAMAIN EXEC.
2. An alternate method is:
   - Log on to the XCHANGE virtual machine.
   - Enter IPL CMS to run the profile (if this command is not included in the virtual machine definition). The profile issues a call to the ACHAMAIN EXEC.
3. If you are already logged on to the RSCS Interchange server, you can enter a call to ACHAMAIN EXEC by entering:

   ```
   ACHAMAIN
   ```

ACHAMAIN EXEC

The ACHAMAIN EXEC is the main routine for the RSCS Interchange server. It reads in the configuration file and message repository to determine the setup of the server. After initialization, it waits for files and commands to process. The default files read are:

- XCHANGE CONFIG, for the configuration data
- ACHAMESA MESSAGES, for the message repository (ACHAUPPC MESSAGES is the uppercase English message repository)

After calls to link and access various disks, the RSCS Interchange PROFILE EXEC will call the ACHAMAIN EXEC. You can modify this call if you want to access a different configuration file or message repository. The source file format (EXEC) and the compiled exec format (CEXEC) are supplied on the RSCS installation user ID 402 minidisk.

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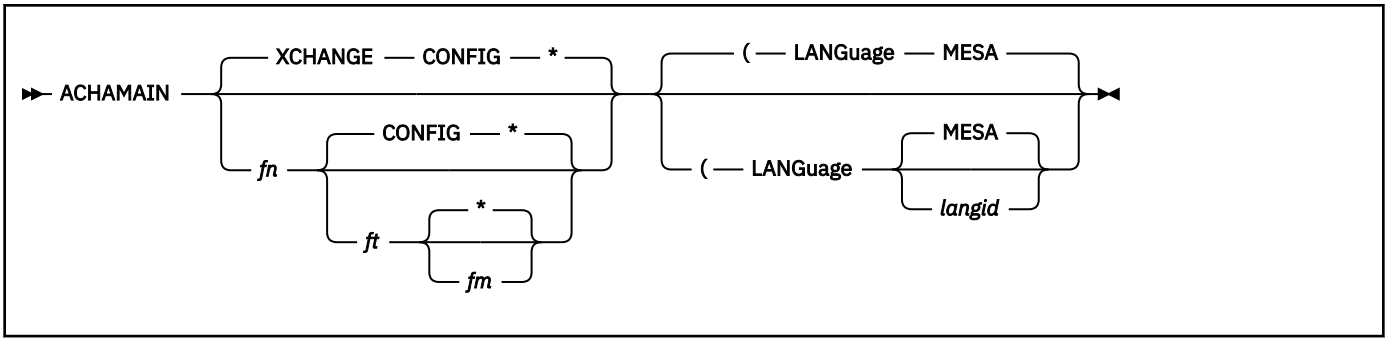

fn
is the file name of the configuration file to be used for RSCS Interchange. The default is XCHANGE.

ft
is the file type of the configuration file for RSCS Interchange. The default is CONFIG.

fm
is the file mode where the configuration file for RSCS Interchange resides. The default is *. When a file mode is specified, RSCS Interchange will use the file it finds on the first available disk.

(LANGuage *langid*
specifies the language message repository file to be used for RSCS Interchange messages. The first four characters of *langid* determine the file name of the repository. For example, LANGuage GER would look for ACHAGER MESSAGES file. If not specified, the default is MESA; therefore, ACHAMESA MESSAGES is the message repository.

Stopping the Server

You can stop the server for system maintenance by one of the following methods:

- Log on to the server and enter the STOP command.

  Note: If you are using the default NOLOG option with the server, then the server is not logged off.
- As a privileged user, you can issue the STOP command through issuing SMSG to the RSCS Interchange server. For example, enter:

  ```
  cp smsg server_id stop
  ```

  For more information, see "STOP" on page 405.

Establishing User Authority

Statements in the RSCS Interchange configuration file establish the user authority for working with RSCS Interchange. When you change these statements, the server must be restarted.

The ADMIN statement specifies the user ID of the system administrator. All error messages and some status messages, and all mail failing any security or validation checks are sent to this user ID for inspection and handling.

The AUTHORIZE statement specifies the user ID used to issue privileged commands to the RSCS Interchange server.

The INFORM_USER statement specifies an additional user ID to be notified whenever RSCS Interchange sends a message to the ADMIN user ID.

For more information about these and other configuration file statements, see *z/VM: RSCS Networking Planning and Configuration*.

Using the Administration Commands

Most RSCS Interchange commands are for privileged (authorized) users.

Changing User Authority

A privileged user can use the following commands to make temporary authority changes. These changes will expire if the RSCS Interchange server terminates.

The ADDINFORM command adds a user ID to the list of users that receive ADMIN messages from the RSCS Interchange server.

The ADDPRIV command adds a user ID to the list of users that may enter privileged commands on the RSCS Interchange server.

The DELPRIV command removes a user ID from the list of users that may enter privileged commands on the RSCS Interchange server.

The DELINFORM command removes a user ID from the list of users that receive ADMIN messages from the RSCS Interchange server.

Setting Up the Nickname Table

The nickname table is a list of SMTP user nicknames and their corresponding SMTP addresses. You can establish your nickname table using RSCS Interchange commands.

With the NICK command, you can ADD, CHANGE, or DELETE a nickname in the nickname table. General users can enter these commands, unless NICKPRIV is set ON in the RSCS Interchange configuration file.

To make many changes to the nickname table, you can use the QNICK command. This command puts RSCS into the "quick nickname" mode, which tells the server not to rewrite the nickname table after each NICK command is entered. QNICK makes it easier to handle many nickname table changes at once, allowing for better system performance.

You can also use the QNICK and NICK commands together in an EXEC that can automate these changes. For more information on QNICK, see “QNICK” on page 401.

Restricting Users

The RESTRICT command lets you maintain a list of users who are not permitted to send and receive mail through the gateway.

To check for nicknames of restricted users, if you are authorized, you can use the RESTRICT QUERY command.

Obtaining System Status

The LISTINFORM command displays all user IDs that receive ADMIN messages from the RSCS Interchange server.

The LISTPRIV command displays all user IDs that are authorized to enter privileged commands at the RSCS Interchange server.

The QUERY command displays a general status of the RSCS Interchange server. You can check the status of the nicknames you have defined by issuing the QUERY NICK command. You cannot find out about restricted users with this command.

Communicating with Other Users through RSCS Interchange

Sending mail from a z/VM system to an SMTP user is like sending a letter through a post office. You must put an address on the computer note just as you would on an envelope, so that the mail reaches its destination.

When sending a note from z/VM to an SMTP user, you prepare and send a note with whatever method you are familiar with, such as the CMS NOTE command or OfficeVision. However, you must know the network address of the receiving system. Your system administrator ensures that a network address has been identified to the RSCS Interchange server for your mail.

For example, using the NOTE command, you can begin a new note to "Mark", an SMTP user, with:

```
NOTE MARK AT IPGATE
```

In the preceding example, your administrator ensures that a network address is established for IPGATE.

Working with Nicknames

Before you send a note to Mark, you can check to see if Mark is identified as an RSCS Interchange nickname in the nickname table. The nickname table is a list of SMTP user nicknames and their corresponding SMTP addresses that resides on the RSCS Interchange server.

An RSCS Interchange nickname is not necessarily the same as a nickname in your CMS NAMES file or an OfficeVision nickname. However, you can make the user ID in the CMS NAMES file the same as in the RSCS Interchange nickname table.

For example, suppose your CMS NAMES file contains the following entry:

```
Nickname: MARK     Userid: MARKE    Node: IPGATE   Notebook: FUN
                     Name: Mark at SMTP
                    Phone:
                  Address:
                          :
                          :
```

The RSCS Interchange nickname table could contain this entry:

```
marke    mark@smtp.col.edu
```

Note that users do not see the nickname table. However, you must be aware of it if you want to send mail to someone using SMTP.

Using the QUERY Command to Check Nicknames

The RSCS Interchange QUERY command shows you information that may be helpful in finding or establishing nicknames. You can check for one or many nicknames or addresses with QUERY NICKNAME, as shown below:

```
q nick all
```

The response looks like this:

```
ACHAMA611I Nickname Type Owner          Date     SMTP Address
ACHAMA612I FATBEAR  Nick *    *        yy/mm/dd BARNEY.SMTPGATE.XYZ.COM
ACHAMA612I MATT     Nick *    *        yy/mm/dd MCKATE.IPGATE.XYZ.COM
ACHAMA612I DIPPER   Nick *    BARNEY   yy/mm/dd BARN.IPGATE.XYZ.COM
```

The QUERY SYSTEM command is also helpful in finding other information about nicknames. The command displays:

- If reserved nickname exists that can be used in overriding a nickname already used to send mail. This reserved nickname can be established by a system administrator in the RSCS Interchange configuration file with the NICK_OVERRIDE statement.
- If general users may add, change, or delete nicknames with the NICK command. The system administrator established this authority in the RSCS Interchange configuration file with the NICKPRIV statement.

You can check for a reserved nickname with the QUERY SYSTEM command. The response may look like this:

```
q system
ACHAMA621I Files processed = 0, rejected = 0
ACHAMA619I Nick Override is All
```

```
ACHAMA620I Nick Priv is 'Off'
ACHAMA000I RSCS Data Interchange Manager Function Level nnn-0000 ready
```

If you find that Mark is not identified to the RSCS Interchange server, you can establish an RSCS Interchange nickname for Mark. If you are an authorized user, based on your installation set up, you can put this nickname in a permanent nickname table with the NICK ADD command. Otherwise, your system administrator can add the nickname for you or grant you authorization.

Making Nicknames Permanent

If you think you may send mail to an SMTP user often, you should add an entry in the nickname table.

The RSCS Interchange server gives a temporary nickname to any mail it receives from an SMTP user when that user's address is not in the nickname table. If you do not add a nickname to the table, and use only the temporary nickname from the SMTP mail you received, your mail may not be delivered or it could be sent to another user when the temporary nickname expires. By default, temporary nicknames expire after 14 days. Your expiration date may vary, depending on your site guidelines. See your system administrator for more information.

Adding a Nickname

You can add a nickname any time to establish communications with an SMTP user by using the NICK command, unless this command has been reserved for privileged users only. You cannot define duplicate nicknames. You will receive a system message if the nickname you chose is already in use.

For example, if you add "mark" to the nickname table with the command:

```
SMSG XCHANGE NICK ADD MARK mark@tcpip.college.edu
```

and Mark is already in the nickname table, you will receive the message:

```
Nickname MARK already defined
```

As a result, you can define a different nickname for Mark. You can also check the nickname table with the QUERY NICKNAME command, to ensure that the current entry for Mark is valid.

Changing a Nickname

To change a nickname, you can use the NICK CHANGE command, but you can change only nicknames that you originally added. The nickname and SMTP address must be included. For example, if you know that Mark is already in the nickname table, and you must change his SMTP address, you can enter:

```
NICK CHANGE mark mark@hurrah.college.edu
```

Deleting a Nickname

To delete a nickname, you can use the NICK DELETE command, but you can delete only nicknames that you originally added. For example, if you want to delete Mark from the nickname table, you can enter:

```
nick delete mark
```

Addressing and Sending Mail

You can send a note to one SMTP user or many users, as you might do when you send a CMS note. The following examples show addressing for:

1. One SMTP user, with the user's SMTP address in the nickname table
2. Two SMTP users, with both addresses in the nickname table
3. Two SMTP users, with changing the addresses of one user within the body of the note, and one z/VM user

4. Two SMTP users, with one addresses in the nickname table and one with use of a "reserved" nickname.

If you want to send a note to an SMTP user, and a nickname is not set up for the user, you can specify the user's address in the body of the note as:

```
<mark>:mark@ipgate.edu.com
```

This must be the first line you enter in your note before any other information and must be the only entry on the line. If more than one override is specified in the file, each entry must be on a separate line.

Addressing z/VM Notes to SMTP Users

The examples in this section show some ways you can address your mail to ensure that it reaches the correct destination.

Example 1: Sending a z/VM Note to One SMTP User

The following example shows a typical note addressed to one SMTP user. The user's address is in the nickname table. For example, if you entered:

```
note mark at ipgate
```

your note to mark might look like this:

```
To: Mark at IPGATE
From: Barb at RSCSNODE

Hi!
When is the meeting this week?  Please send the latest report.
Barbara
```

Your note reaches Mark through RSCS Interchange as shown in Figure 13 on page 122.

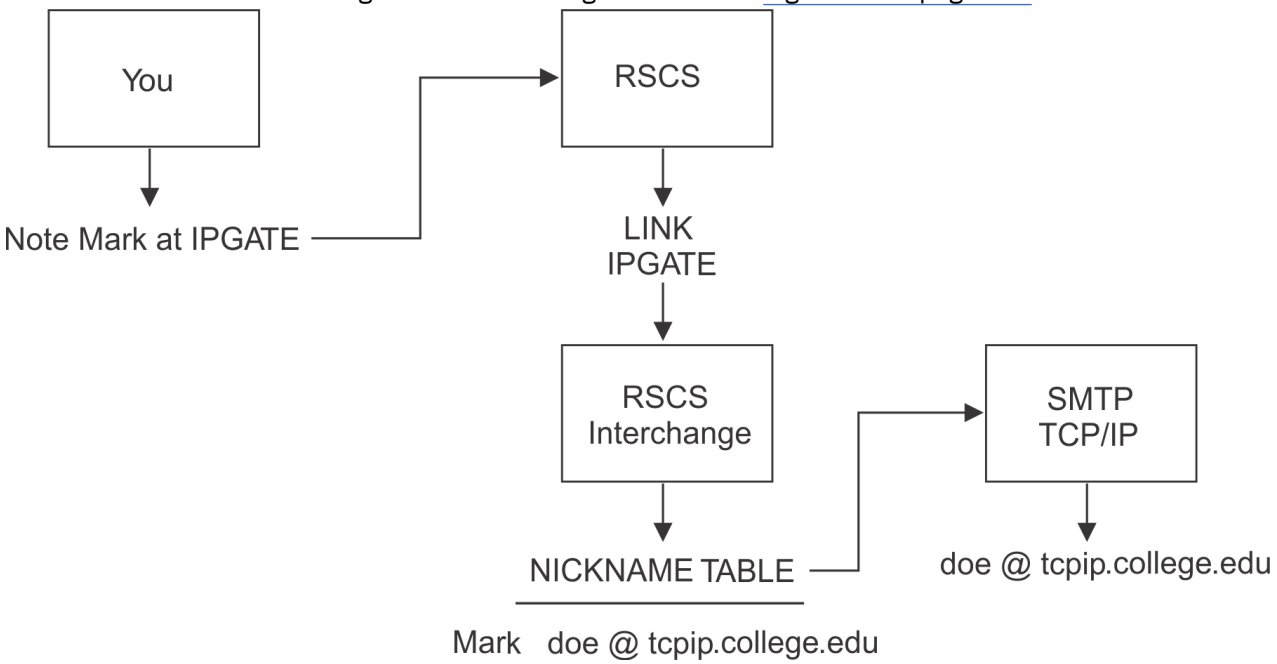

Figure 13. Sending a z/VM note to a SMTP User

Example 2: Sending a z/VM Note to Two SMTP Users

This example shows a typical note addressed to two SMTP users. Because Doug's address is not in the nickname table, you must identify Doug to the RSCS Interchange server.

```
To: Mark at IPGATE, Doug at IPGATE
From: Barb at RSCSNODE

Hi Team!
When is the meeting this week?  Please send the latest report.
Barbara
```

Example 3: Sending a z/VM Note to Two SMTP Users and One z/VM User

This example shows a typical note addressed to two SMTP users and one z/VM user. Mark is identified in the RSCS Interchange nickname table, but Doug may have a new address or is not in the nickname table. Paul is the z/VM user.

```
To: Mark at IPGATE, Doug at IPGATE, Paul at VMNODE
From: Barb at RSCSNODE
<doug>:doug@smtpgate.col.edu

Hi Team!
When is the meeting this week?  Please send the latest report.
Barbara
```

Example 4: Sending a z/VM Note to Two SMTP Users with a Reserved Nickname

The following example shows a typical note addressed to two SMTP users. Doug is identified in the nickname table. A reserved nickname of XYZ is established with the NICK_OVERRIDE statement in the RSCS Interchange configuration file. XYZ is reserved and is the only nickname that can be overridden.

XYZ can be used whenever you want to override a nickname in your note. As a reserved name, XYZ is not in the nickname table. You can use XYZ for only one SMTP address in a note.

```
To: XYZ at IPGATE, Doug at IPGATE
From: Barb at RSCSNODE
<XYZ>:mark@smtpnode.col.edu

Hi Team!
When is the meeting this week?  Please send the latest report.
Barbara
```

After you address your mail, you can send it. If the address was incorrect, you will receive an error message from RSCS Interchange.

Overriding Addresses

You can always override a nickname that exists on RSCS Interchange regardless of your installation setup. Some reasons you may override an existing nickname include:

- The SMTP user is not in the nickname table (you used the QUERY ADDR command to verify), and you cannot add the nickname to the table (NICKPRIV is ON in the configuration file)
- The nickname you want to use is taken for another user and you want to use it temporarily with a different SMTP address
- You know the user's SMTP address and it does not matter to you if the nickname is in the table.

For example, if you use the QUERY SYSTEM command and determine that NICK_OVERRIDE ALL is set in the configuration file, you can choose any nickname to send mail. The example in Figure 14 on page 124 shows some of the ways you can use NICK_OVERRIDE.

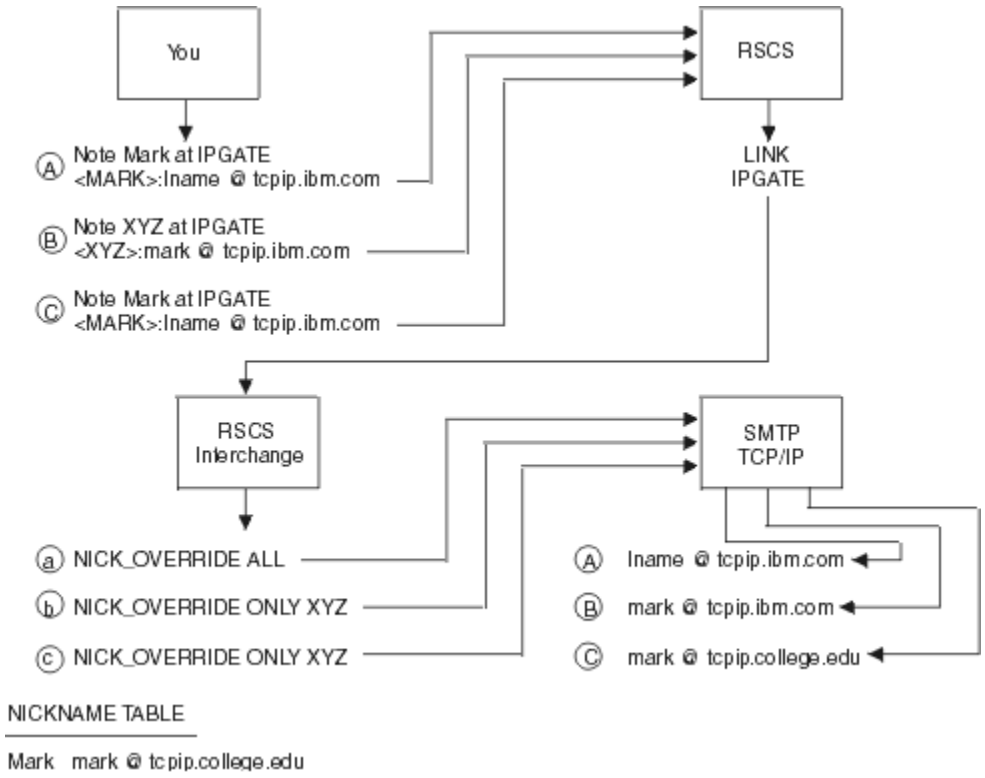

Figure 14. Changing an IP Address Destination with NICK_OVERRIDE

In example A (a), NICK_OVERRIDE ALL lets a user change any nickname already established in the nickname table.

In example B (b), NICK_OVERRIDE ONLY XYZ lets a user change only the nickname "XYZ" in the nickname table.

In example C (c), the attempted override of Mark does not take place because only XYZ can be overridden as specified in NICK_OVERRIDE ONLY XYZ.

For more information on the NICK_OVERRIDE statement with the ONLY operand, see *z/VM: RSCS Networking Planning and Configuration*.

Part 2. Reference

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Chapter 12. RSCS Commands

This chapter describes the basic RSCS commands. For a summary of the commands, see Table 9 on page 130.

For descriptions of the link operational parameters used with the DEFINE and START commands, see Chapter 13, “Link Operational Parameters,” on page 293.

For information about other commands, see:

- Chapter 14, “RSCSAUTH Commands,” on page 377
- Chapter 15, “RSCS Interchange Commands,” on page 389
- Chapter 16, “CP Commands Used with RSCS,” on page 407
- Chapter 17, “CMS Functions Used with RSCS,” on page 429

For information about how to read the command syntax diagrams, see “Syntax, Message, and Response Conventions” on page xv.

Operands on RSCS commands can be entered in any order, except where otherwise specified.

Users of RSCS Commands

RSCS commands may be issued by the following types of users:

- RSCS node operators
- System-authorized alternate operators
- Remote workstation or printer operators
- Link-authorized alternate operators
- Users authorized through RSCSAUTH
- General users

The following sections describe items each type of user should consider when issuing RSCS commands.

RSCS Node Operator or Console Operator

As an RSCS node or console operator, you can use all the commands, remembering:

- Each RSCS command you enter must be preceded by the RSCS keyword unless:
  - Your local installation provides an exec for each command that automatically puts the RSCS keyword before the command expression.
  - Your local installation provides for characters other than RSCS to precede the command expression; see “Step 2 — Load RSCS” on page 32 for more information.
- The SET command cannot be entered from the RSCS console unless you use the TO keyword to specify a target for the message.

System-Authorized Alternate Operator

As a system-authorized alternate operator, you can use all the commands (except INIT), remembering:

- Each RSCS command you enter must be included in a CP SMSG (special message) command that contains the RSCS virtual machine user ID:

```
smsg rscsid command
```

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This sends the RSCS command to the RSCS virtual machine to be processed. The exception to this is when your local installation has provided an exec for each command that automatically puts the "SMSG *rscsid*" characters before the RSCS command.

- You can use a CP command only if you have authorization. See the description of the AUTH statement in *z/VM: RSCS Networking Planning and Configuration*.

Remote Workstation or Printer Operator

As a remote workstation operator, you can use the commands listed in Table 9 on page 130 having an **R** key, remembering:

- The START command has limited functional capabilities when used by a remote workstation operator. See “START” on page 278 for details.
- Usually, you can use only those commands that affect your specific link or links. A remote workstation operator cannot be link-authorized, so you cannot use the *linkid* operand on most commands.

Link-Authorized Alternate Operator

As a link-authorized alternate operator, you can use the commands listed in Table 9 on page 130 having an **L** key, remembering:

- Each RSCS command you enter must be included in a CP SMSG (special message) command that contains the RSCS virtual machine user ID:

  ```
  smsg rscsid command
  ```

  This sends the RSCS command to the RSCS virtual machine to be processed. The exception to this is when your local installation has provided an exec for each command that automatically puts the "SMSG *rscsid*" characters before the RSCS command.
- The START command has limited functional capabilities when you use it. For more information, see “START” on page 278.
- When you use a privileged command, the command affects the status of only the link or links for which you are authorized.
- The CHANGE, FLUSH, PURGE, and TRANSFER commands have two formats:

  General User
  Use this format when you want to manipulate a file that you originated or that is destined for you *and* you are not an authorized operator for the link. Although you are an authorized operator for another link, you must specify the general user format of the command if you are not authorized for this link.

  Operator
  Use this format when you want to manipulate a file on a link for which you are an authorized operator.

Users Authorized through RSCSAUTH

As a user authorized through RSCSAUTH, you can use any commands and links for which you have been authorized, remembering:

- Each RSCS command you enter must be addressed to the RSCSAUTH server instead of the RSCS server.
  - If you issue the command on the local node, you must include it in a CP SMSG (special message) command that contains the RSCSAUTH virtual machine user ID:

    ```
    smsg rscsauthid command
    ```
  - If you issue the command from a remote node, you must include it in a CMS TELL command that contains the RSCSAUTH virtual machine user ID and node:

```
tell rscsauthid at node command
```

- Commands and links are authorized separately through RSCSAUTH. If you are authorized for a command through RSCSAUTH, you have authority for that command equivalent to a system-authorized alternate operator, except you have no implicit authority for any links. You must be explicitly authorized for links.

  If you are authorized for a link through RSCSAUTH, you have authority for that link equivalent to a link-authorized alternate operator, except you have no implicit authority for any commands. You must be explicitly authorized for commands. Therefore, to issue a command that specifies a link, you must be authorized through RSCSAUTH for both the command and the link.
- The CHANGE, FLUSH, PURGE, and TRANSFER commands have two formats:

  General User
  Use this format when you want to manipulate a file that you originated or that is destined for you *and* you are not authorized for the link. Although you might be authorized for other links, you must specify the general user format of the command if you are not authorized for this link.

  Operator
  Use this format when you want to manipulate a file on a link for which you are authorized.

General User

As a general user, you can use the commands listed in Table 9 on page 130 having a **G** key, remembering:

- Each RSCS command you enter must be included in a CP SMSG (special message) command that contains the RSCS virtual machine user ID:

  ```
  smsg rscsid command
  ```

  This sends the RSCS command to the RSCS virtual machine to be processed. The exception to this rule is when your local installation has provided an exec for each command that automatically puts the SMSG *rscsid* characters before the RSCS command expression.
- The CHANGE, FLUSH, PURGE, and TRANSFER commands have two formats, one for general users and one for operators. You can use only the general user format, to manipulate files that you originated or those that are destined for you.

Summary of RSCS Commands

Table 9 on page 130 lists the users, links supported, and functions of the RSCS commands. The following keys indicate the users of each command:

Key
User

C
RSCS console or node operator

G
General user

L
Link-authorized alternate operator

R
Remote workstation or printer operator

S
System-authorized alternate operator

U
User authorized through RSCSAUTH

Note: To issue a command through RSCSAUTH that specifies a link, you must be authorized through RSCSAUTH for both the command and the link.

The following keys indicate which commands are supported by each link type:

Key
Links

A
ASCII-type and TCPASCII-type

D
Daemon links (LPD-type and UFTD-type)

N
NJE links (NJE-type, SNANJE-type, and TCPNJE-type)

PR
Printer links (LPR-type, SNA3270P-type, TN3270E-type, and 3270P-type)

SP
System processed command

U
UFT-type client link

W
Workstation links (MRJE-type, RJE-type, and SNARJE-type)

The applicable user keys and link keys (where appropriate) are included in each command description in this chapter.

Table 9. RSCS Command Summary

Users	Links Supported	Command	Function
C, G, L, R, S, U	SP	*	Comment following asterisk prints out on the RSCS operator's console, but no function is performed.
C, L, R, S, U	A, PR, W	BACKSPACE	Restarts or repositions in a backward direction the file currently being sent.
C, G, L, R, S, U	SP	CHANGE	Changes one or more attributes of a file owned by RSCS.
C, G, R, S	N	CMD	Sends a command line to a remote system for processing.
C, S, U	SP	CP	Executes a command line as a z/VM CP console function. **Note:** Authorized alternate operators require additional authorization for this command.
C, G, R, S, U	SP	CPQUERY	Requests status information from CP, similar to a CP QUERY command.
C, S, U	SP	DEFINE	Temporarily adds a new link definition to the RSCS link table or temporarily alters an existing link definition.
C, S, U	SP	DELETE	Temporarily deletes a link definition from the RSCS link table.
C, S, U	SP	DEST	Temporarily adds or deletes local PSF printer destinations.
C, S, U	SP	DISABLE	Deactivates a switched telecommunication port (a dialed telephone line); incoming calls will not be received.
C, S, U	SP	DISCONNECT	Places RSCS in disconnect mode and optionally directs RSCS operator console output to another virtual machine.
C, L, R, S, U	A, D, N, PR, U, W	DRAIN	Quiesces file transfer and deactivates an active data link.
C, S, U	SP	ENABLE	Starts a switched telecommunication port (a dialed telephone line) and lets it receive an incoming dialed call.

Table 9. RSCS Command Summary (continued)

Users	Links Supported	Command	Function
C, S, U	SP	EXEC	Executes a series of commands contained in the specified user-built CMS file (file type: GCS).
C, S, U	SP	EXIT	Enables or disables one or more specified exit points.
C, G, L, R, S, U	A, N, PR, U, W	FLUSH	Stops processing the currently active file on the specified link.
C, S, U	A, D, N, PR, U, W	FORCE	Immediately deactivates an active link without quiescing file transfer.
C, L, R, S, U	A, N, PR, U, W	FREE	Resumes transmission (and reception) on a telecommunication link previously in hold status.
C, L, R, S, U	A, P, W	FWDSPACE	Repositions in a forward direction the file currently being transmitted.
C, L, R, S, U	A, N, PR, U, W	HOLD	Suspends file transmission and reception on an active link without deactivating the link.
C	SP	INIT	Initiates RSCS operations.
C, S, U	SP	ITRACE	Starts, stops, or changes the types of events RSCS will trace.
C, R, S, U	SP	LOOPING	Defines what type of route loop checking, if any, RSCS should perform.
C, G, R, S, U	A, N, PR, W (except LPR)	MSG	Sends a console message line to a local or remote operator or user.
C, S, U	SP	NETWORK	Initiates or terminates communications with VTAM.
C, R, S, U	SP	ORDER	Reorders files enqueued on a specific link.
C, S, U	SP	PORT	Specifies that a port is to be connected to the public switched telephone network and that the port may be used for an autodial or auto-answer link. It reserves a virtual address for a BSC telecommunication line to be dynamically allocated to a link that is started without explicit port specification.
C, G, L, R, S, U	SP	PURGE	Removes specified files from a link.
C, G, R, S, U	SP	QUERY	Requests system information about files, groups, links, nodes, queues, or the RSCS system.
C, L, R, S, U	A, PR, W (except TN3270E)	READY	Notifies RSCS that a forms mount has been satisfied or that a setup page is wanted.
C, S, U	SP	RECONNECT	Takes RSCS out of disconnect mode.
C, S, U	SP	REORDER	Sorts and reorders all files enqueued for all links.
C, G, R, S, U	SP	REPLY	Sends a message to the user that issued the command. When used within an exec, sends a message to the user that began the exec.
C, S, U	SP	REROUTE	Modifies the original destination of commands, files, and messages for specific systems and user IDs.
C, R, S, U	SP	RESETCOUNTERS	Resets all the counters RSCS uses to keep track of performance information for a link (or links).
C, S, U	SP	ROUTE	Adds, deletes, or alters an RSCS routing table entry.
C, S, U	SP	SCHEDULE	Temporarily adds, deletes, resumes, or suspends an event for the RSCS system.

Table 9. RSCS Command Summary (continued)

Users	Links Supported	Command	Function
C, L, S, U	SP	SET	Starts or stops the sharing of RSCS console messages based on link ID.
C, S, U	SP	SETMSG	Starts or stops the sharing of RSCS messages based on message number.
C, S, U	SP	SHIFT	Changes the RSCS shift setting. RSCS exit routines can use this number to perform shift-dependent processing.
C, S, U	A, D, N, PR, U, W	SHUTDOWN	Terminates RSCS in an orderly manner, issuing a DRAIN or STOP command to each active link. (Optional) Also passes a command to CP for processing after RSCS terminates.
C, S, U	N	SLOWDOWN	Specifies when RSCS should automatically start or stop slowdown mode for all active GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links.
C, L, R, S, U	SP	START	Starts a specified link or causes an active link to begin processing files of a specified set of classes or forms.
C, L, R, S, U	SP	STOP	Stops a specified link immediately.
C, S, U	SP	TCPIP	Starts or stops the port redirector task.
C, L, R, S, U	SP	TRACE	Monitors line activity on a specified link.
C, G, L, R, S, U	SP	TRANSFER	Changes the destination address for specified files.

* (comment)

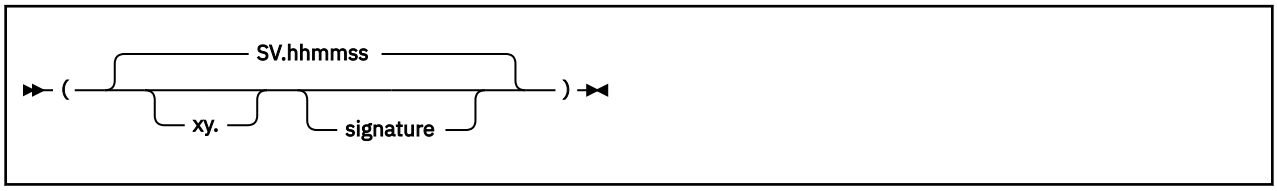
Authorization

C, G, L, R, S, U

Purpose

The * command lets you annotate listings. It carries out no function, but it is accepted by the RSCS command processor. The comment command is available to all classes of users and operators. It is most commonly used as program documentation.

CRI Prefix



Purpose

The command response interface (CRI) prefix is a character string you can specify before any RSCS command. The CRI prefix lets you specify:

- Which method RSCS uses to send the responses
- Which language RSCS uses to build the message text
- A signature RSCS returns with every response to the command

Operands

( )
are the required delimiters of the command prefix.

xy.
is the response modifier and its delimiter (a period). The response modifier tells RSCS how to send the responses to the target virtual machine.

x
is a character that identifies the method RSCS will use to send the responses. The valid values are:

M
MSG or MSGNOH.

S
SMSG. This is the default.

y
is a character that identifies the language RSCS will use to build the message text. The valid values are:

L
Local (national) language.

N
Network (remote) language.

T
Language appropriate to the target virtual machine. That is, if the user is at the local node, RSCS sends the message in the local (national) language. If the user is at a remote node, RSCS sends the message in the remote (network) language.

V
Language independent (machine-readable) format. This is the default.

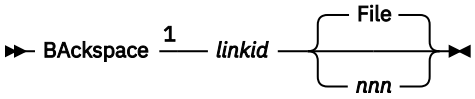
.
is the delimiter between the response modifier and the signature. The delimiter must be a period (.) and is required only if you specify the optional response modifier. If you are specifying just a signature, you can omit the delimiter.

signature
is the string that RSCS will return with every response to the command. This value can be 1 - 6 alphanumeric characters. If this operand is omitted, the signature will be a time-of-day stamp in the form *hhmmss*.

Usage Notes

1. RSCS will continue to send messages to disconnected users in case their virtual machines have console spooling in effect.
2. If you specify a CRI prefix on a SET or SETMSG command, RSCS supplies the signature from the prefix on any messages sent to the specified virtual machine.
3. You can use the CRI prefix on the SETMSG statement in the RSCS configuration file. RSCS processes the statements in the configuration file sequentially. If you specify more than one SETMSG statement with the same user ID, node ID, and signature combination, RSCS creates a cumulative list of shared messages. If you specify more than one SETMSG statement with the same user ID and node ID combination, but with different signatures, RSCS creates cumulative lists for each signature. The same effect will occur if an operator enters a SETMSG command with the same user ID, node ID, and signature combination.

BACKSPACE



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Links

A, PR, W

Purpose

The BACKSPACE command causes the current file being transmitted to be restarted or repositioned backward.

Operands

linkid
is the name of the link on which the current file being transmitted is to be repositioned. If you enter the command from a remote workstation, you must omit this operand.

File
restarts the file being transmitted from the beginning. This is the default.

nnn
is the number of data units to be backspaced. For a print file, data unit refers to printer pages, which are counted in the same way as for the CP BACKSPAC command. For a punch file, data unit refers to file records that include any write type command code. If *nnn* is specified for a virtual 3800 print file, the file is backspaced to the beginning.

Usage Notes

1. The BACKSPACE command is supported only by the ASCII-type, LPR-type, MRJE-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, TN3270E-type, and 3270P-type links. The ASCII-type, LPR-type, SNA3270P-type, TCPASCII-type, TN3270E-type, and 3270P-type links must be in HOLD status or must be in a forms mount wait state for the BACKSPACE command to have effect.
2. The BACKSPACE command is ignored for GDDM output files.

CHANGE

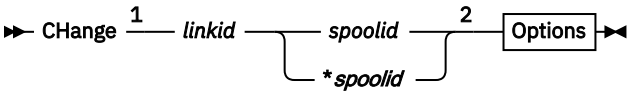
Purpose

The CHANGE command alters one or more attributes of an inactive spool file. No link may be actively processing this file.

This command has two formats:

- Use format 1 if you want to manipulate a file that you originated or that is destined for you, but you are not authorized for this link.
- Use format 2 if you are authorized for this link.

Format 1



Notes:

[1] The *linkid* must be specified by link-authorized alternate operators only; all others must omit this operand.
[2] You must specify at least one option.

Authorization 1

G, L (not authorized for this link), U (not authorized for this link)

Operands 1

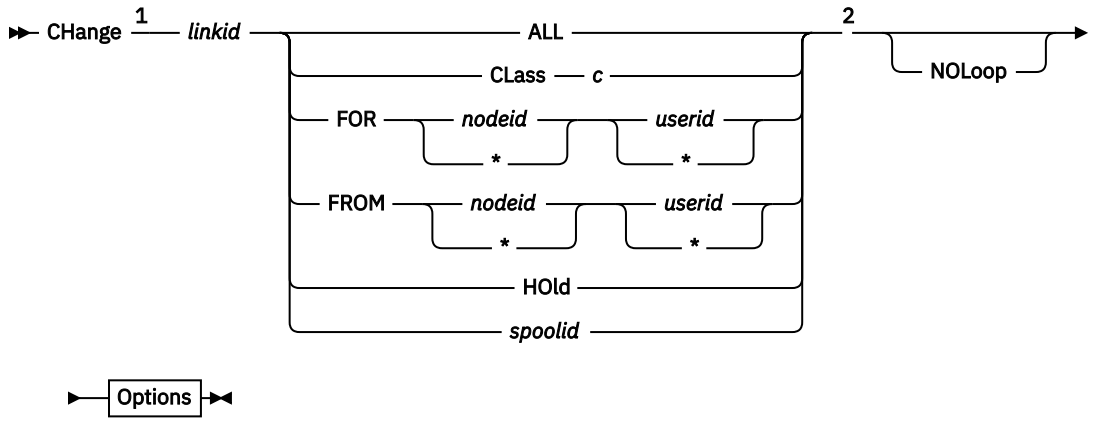
linkid
is the name of the link on which the file is queued. This operand must be specified by link-authorized alternate operators who are not authorized for this link. General users and users authorized through RSCSAUTH for this command but not this link must omit the *linkid*.

spoolid
is the current spool ID of the file to be changed.

****spoolid***
is the origin spool ID of the file to be changed.

You must specify at least one option. For details on options, see “Options” on page 139.

Format 2



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.
[2] You must specify NOLOOP or at least one option.

Authorization 2

C, L (authorized for this link), R, S, U (authorized for this link)

Operands 2

linkid
is the name of the link on which the file is queued. If you enter the command from a remote workstation, you must omit this operand.

ALL
changes all files queued on the link.

CLass *c*
changes all files of the specified class that are queued on the link.

FOR *nodeid userid*
changes all files destined for the specified virtual machine. To specify a generic node ID or user ID, specify an asterisk (*) as the last character of the node ID or user ID. To specify all nodes or all users, specify an asterisk (*) in place of the node ID or user ID.

For example, the following specification would effect all users on nodes whose first three characters are PRT:

```
FOR PRT* *
```

FROM *nodeid userid*
changes all files coming from the specified virtual machine. To specify a generic node ID or user ID, specify an asterisk (*) as the last character of the node ID or user ID. To specify all nodes or all users, specify an asterisk (*) in place of the node ID or user ID.

For example, the following specification would effect all users on nodes whose first two characters are VM:

```
FROM VM* *
```

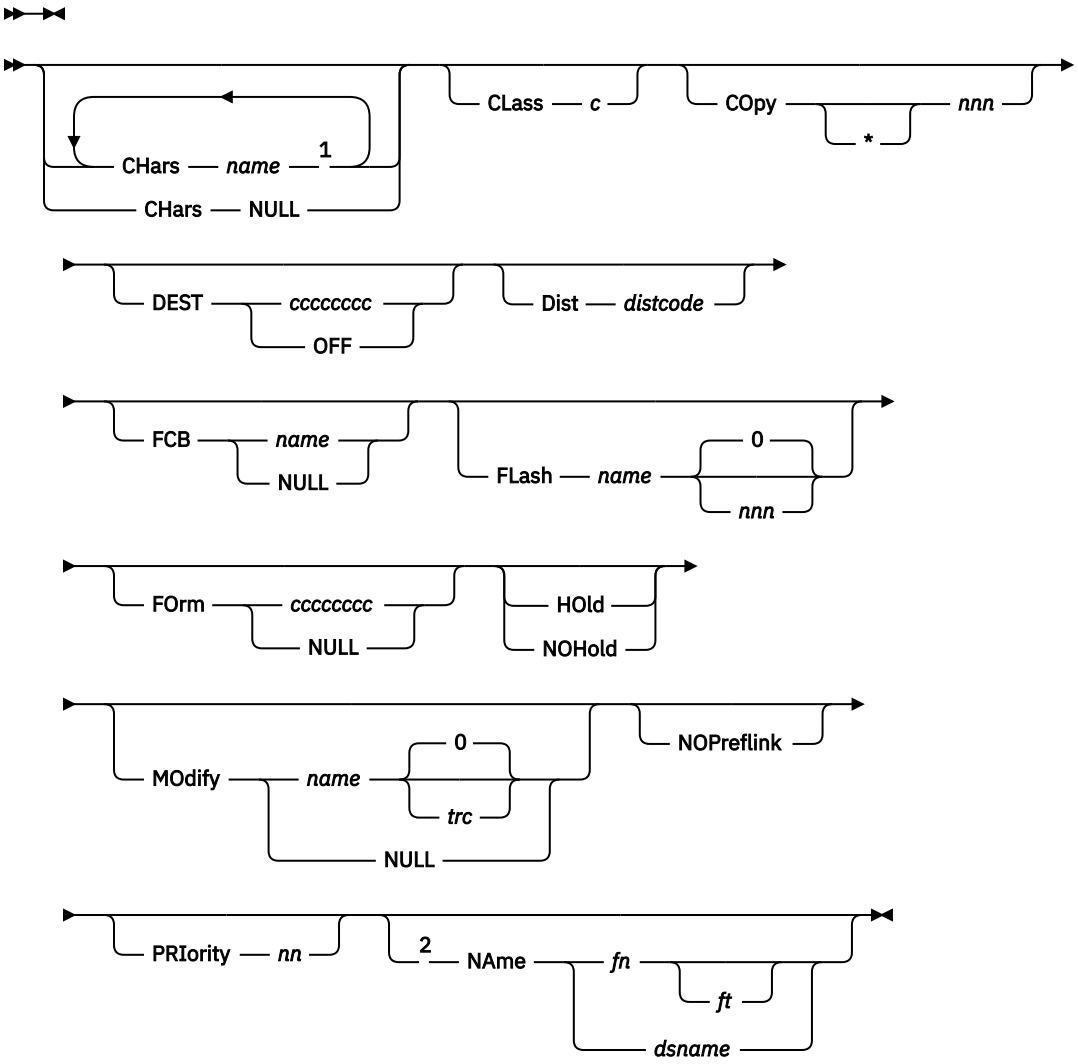
HOld
changes all files queued on the link in hold status.

spoolid
is the current spool ID of the file to be changed.

NOLoop
releases all files queued on the link in looping status.

You must specify at least one option. The options for format 2 are NOLOOP, described above, and the common options described below.

Options



Notes:

[1] CHARS *name* can be specified up to 4 times.
[2] If NAME is specified, it must be the last entry in the command line.

CHars *name*
CHars NULL
specifies the 1- to 4-character name of a character arrangement table to be used when printing a file. This determines which writable character generation module (WCGM) is used for printing on the 3800. CHARS *name* may be specified 1 - 4 times. The character arrangement table names specified on the CHANGE command completely replace all existing names associated with the spool file.

Specifying CHARS NULL nullifies all previous CHARS specifications. NULL cannot be combined with any other CHARS specification, or an error message will be issued.

CLass *c*
specifies the new class for the file. This value is a single character, A - Z or 0 - 9.

COpy *nnn*
COpy * *nnn*
specifies the number of copies to be made of the file. The maximum value is 255. Leading zeros are optional. An asterisk (*) can be specified on print files to be spooled to a 3800 printer to perform the file duplication internally, one page at a time. This option prevents retransmission of the print file to the virtual output device every time a copy is desired.

DEST *cccccccc*
DEST OFF
specifies the 1- to 8-character destination identifier to be associated with the file, such as with an Advanced Function Printing Data Stream (AFPDS) file, and the destination is SYSTEM. DEST OFF specifies that there is to be no destination identifier and that the destination is to be unchanged.

DIst *distcode*
specifies the 1- to 8-character distribution code to be associated with the file. The distribution code can be defined on the CP SPOOL command.

FCB *name*
FCB NULL
specifies the 1- to 4-character FCB name that controls the vertical spacing of output on a page. Specifying FCB NULL nullifies any previous or existing FCB specification.

FLash *name nnn*
specifies the forms overlay contained in the 3800 printer that is to be superimposed onto certain pages of the output. The 1- to 4-character *name* value identifies the forms overlay to be used in the projection. The *nnn* value is the number of pages of output to be superimposed. The maximum value is 255 (leading zeros are optional). The default is 0, which means that no superimposing is used, and the FLASH name is meaningless.

FOrm *cccccccc*
FOrm NULL
specifies the 1- to 8-character user form name for the file. Specifying FORM NULL nullifies any previous or existing FORM specification.

HOld
prevents the processing of the file until it is released by a CHANGE command specifying NOHOLD.

NOHold
releases the file from hold status.

MOdify *name trc*
MOdify NULL
specifies the 1- to 4-character name of a copy modification module to be used when printing a file on the 3800. This function makes it possible to alter text either by preventing the printing of certain information or by adding labels to output.

The *trc* value is the table reference character (0, 1, 2, or 3), which selects one of the character arrangement tables specified with the CHARS operand to be used for the copy modification text. The values correspond to the order which the table names have been specified with CHARS. If *trc* is not specified, reference character 0 is assumed.

Specifying MODIFY NULL nullifies any previous or existing MODIFY specification, and the file prints normally without modification.

NOPreflink
temporarily turns off preferred link status for a file with multiple copies. When someone sends a file with multiple copies to a printer group, RSCS waits for the first printer in that group to become available. When the first copy of the file starts printing, RSCS marks the link to that printer as *preferred*, so that all other copies of the file will print on the same printer. When you use the NOPREFLINK option, you are telling RSCS to free the next copy of the file for another printer in the group. When the freed copy of the file begins to print, RSCS marks the link to that printer as preferred and all other copies of the file will print on the new preferred link.

Use this option when the operator changes the class or the forms on the printer while a file with multiple copies is printing.

PRIority *nn*
specifies the new transmission priority for the file. This value is a decimal number, 0 - 99, with 0 signifying the highest priority.

Note: A change in a file's priority is effective only at the node at which the change was made. If a file whose priority was changed is sent on to another node, the priority of the file reverts to what it was originally.

NAme *fn ft*
NAme *dsname*
specifies the new name for the file. If this operand is specified, it must be the last entry in the command line.

Usage Notes

1. If your local system has used the ROUTE command (or statement) to create routing groups, there may be tag shadow elements representing the file on several different links. When you use the CHANGE command, RSCS automatically changes all associated tag shadow elements as well.
2. No characteristics of a SYSIN file can be changed while it is at a store and forwarding node.

CMD

Authorization

C, G, R, S

Links

N

Purpose

The CMD command passes a command to a remote node to be run at that node. The local RSCS system does not check the command for validity, except as noted in the command description. CMD gives operators and users the ability to issue query and control functions at remote locations.

Operands

nodeid
is the name of the system node that is to receive and process the command text. The node ID can represent either a local or remote node.

command-string
is the system command string that RSCS presents to the specified node. The string can be 1 - 132 alphanumeric characters. Format requirements for this string depend on the type of system implied by node ID.

Usage Notes

A user cannot be authorized for the CMD command through RSCSAUTH. If the user is authorized through RSCSAUTH on the remote node for the command to be run on that node, the user can send the command request to the remote RSCSAUTH server:

```
tell rscsauthid at nodeid command
```

CP

Authorization

C, S, U

Purpose

The CP command sends commands to the z/VM Control Program (CP) without leaving the RSCS command environment. This command is available to a system-authorized alternate operator only if that operator is authorized to use it. See the AUTH configuration file statement in *z/VM: RSCS Networking Planning and Configuration*.

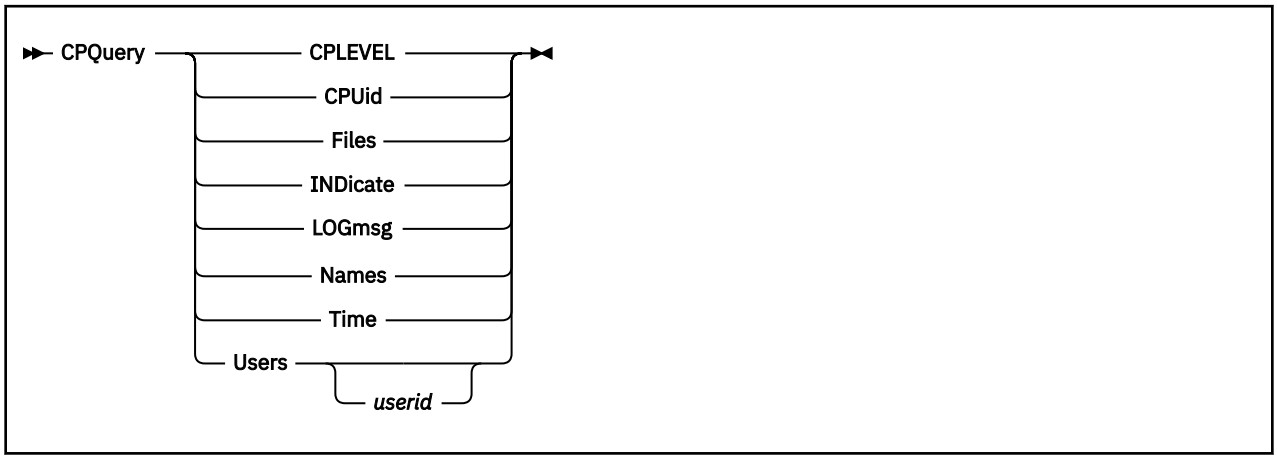
Operands

command-string
is any CP command permitted under the command privilege of the RSCS virtual machine.

Usage Notes

1. Use CP commands with caution.
2. Any CP command that alters the virtual machine environment (such as DEFINE STORAGE, DEFINE CHANNEL, IPL, and LOGOFF) will cause an abnormal end (abend) of the RSCS system.
3. CP commands that alter devices owned by RSCS or alter spool files queued by RSCS (such as DETACH, DEFINE, CHANGE, and CLOSE) can cause the RSCS system to function unpredictably.

CPQUERY



Authorization

C, G, R, S, U

Purpose

When used within an RSCS CMD command, the CPQUERY command allows you to request information about the status of a remote VM system.

Operands

CPLEVEL
displays the VM version and release, service level, generation date and time, and IPL date and time (equivalent to using the CP QUERY CPLEVEL command).

CPUid
displays the model and processor identifier of the processor associated with the RSCS virtual machine.

Files
displays the number of spooled I/O files (equivalent to using the CP QUERY FILES command).

INDicate
displays the operating load on the host system (equivalent to using the CP INDICATE LOAD command).

LOGmsg
displays the daily system log messages (equivalent to using the CP QUERY LOGMSG command).

Names
displays a list of the logged-on users and their terminal addresses (equivalent to using the CP QUERY NAMES command).

Time
displays the current time, time zone, day of week, date, connect time, and processor time (equivalent to using the CP QUERY TIME command).

Users
displays the number of logged-on users and the number of users dialed to other virtual machines (equivalent to using the CP QUERY USERS command). See usage note “2” on page 145.

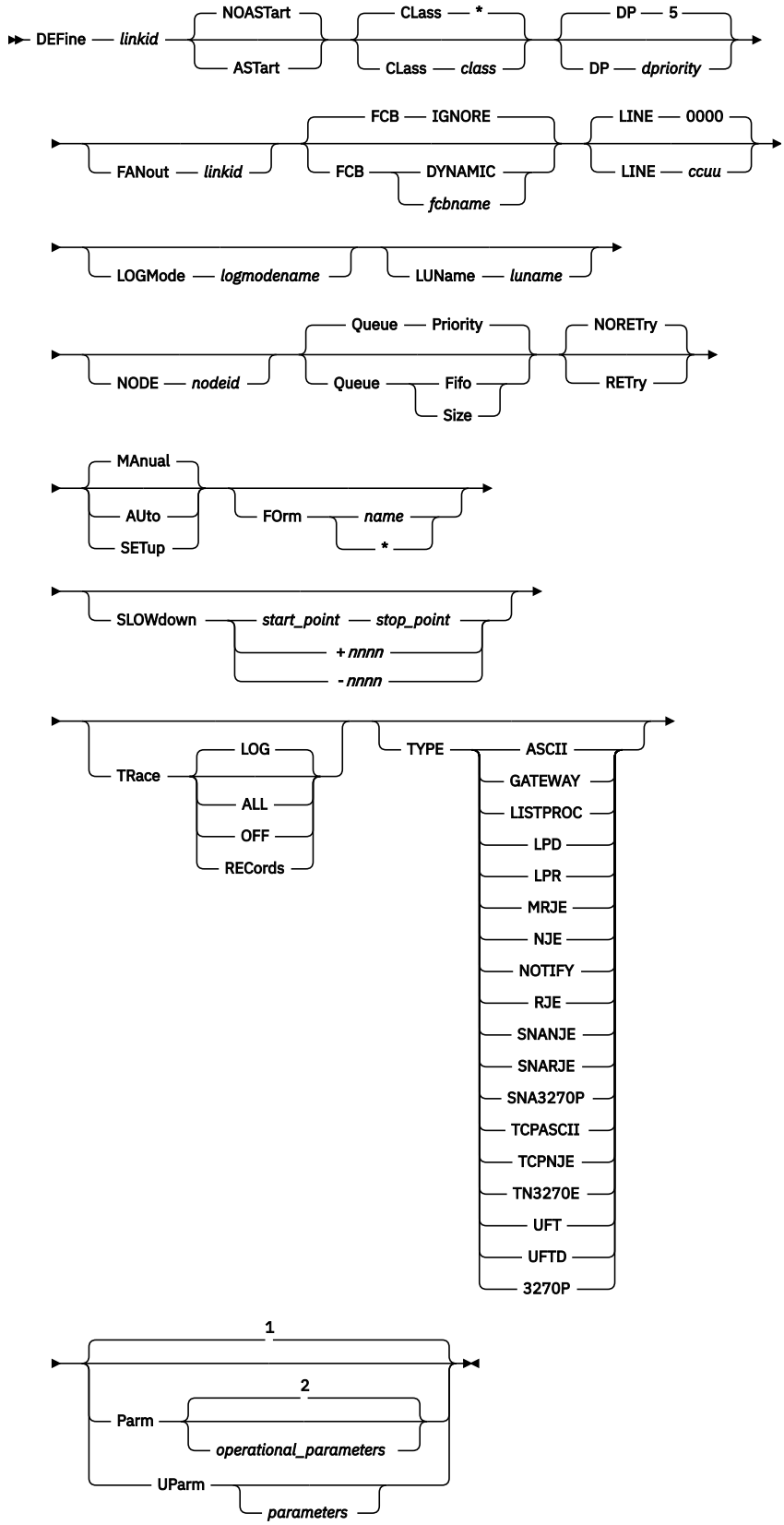
Usage Notes

1. The CPUID operand is the only CPQUERY operand for which RSCS alters the CP command response. All other operands return the same command responses you would see if you entered the corresponding CP QUERY or INDICATE LOAD command on your local system. For more information, see *z/VM: CP Commands and Utilities Reference*.
2. If you enter CP QUERY USERS *userid*, CP issues the following message for users that are not logged and for user IDs that are undefined:

   ```
   userid not logged on
   ```

   The RSCS CPQUERY USERS *userid* command distinguishes between users who are not logged on and user IDs that do not exist. If RSCS tells you that the user is not logged on, then that user ID exists in the CP directory. If you try to send a file or note to this user and CP tells you the user is not in the CP directory, CP is preventing contact because that user ID has either NOLOG status or RACF® protection.

DEFINE



Notes:

[1] Operational parameter values will remain as previously defined or as defaulted.
[2] All previously defined operational parameter values are negated; for parameters with defaults, default values will be used.

Authorization

C, S, U

Purpose

The DEFINE command causes a new link to be temporarily added to the set of valid links for the local RSCS virtual machine, or causes an existing inactive link to be temporarily redefined. Permanent link definitions and changes can be made only by modifying the RSCS configuration file. See the LINKDEFINE configuration statement in *z/VM: RSCS Networking Planning and Configuration*.

If an existing inactive link is redefined, only those options specified by the DEFINE command keywords will be changed. All other link options will remain as originally defined by the LINKDEFINE (or LINK) configuration statement or by a previous DEFINE command. If you attempt to define an active link, an error message will be produced and the command will be rejected.

Operands

linkid
is the 1- to 8-character name of the new link to be defined, or the existing link to be redefined. If the link defines a connection to a peer node, the link ID must be the name of the node (node ID) to which the link connects, unless you specify the NODE operand. If you specify NODE, you can use a nickname as the link ID.

NOASTart
ASTart
specifies whether the link is defined as an autostart link. An autostart link will be started automatically when a file is queued for transmission on the link while it is inactive. Printer links (ASCII-type, LPR-type, MRJE-type, RJE-type, SNA3270P-type, TCPASCII-type, TN3270E-type, UFT-type, and 3270P-type links) will be autostarted only if the queued file has a class and form name that match those defined for the link. The default is NOASTART.

CLass *class*
CLass *
specifies the class or classes of files that can be processed by the active link. You can specify an asterisk (*) to indicate all file classes can be processed, or you can specify 1 - 4 characters with no intervening blanks (*c*, *cc*, *ccc*, or *cccc*), where each character is one of the valid z/VM spool classes, A - Z and 0 - 9. RSCS processes files in the order that the classes are specified, and in priority order within each class. If omitted, the default is CLASS *. If you specify * or allow it to default, RSCS processes files in priority sequence only.

DP *dpriority*
specifies a decimal number, 1 - 9, that allows GCS to alter the dispatching priority of this link in relation to the dispatching priorities of other links. Priority 1 is the highest and 9 is the lowest. If a new link is being defined and this operand is not specified, the default is 5.

FANout *linkid*
specifies the name of the next link that is physically attached to the local system and through which RSCS routes files to other systems. RSCS uses the fanout link as a shared path when distributing multiple data set header files over the network. The fanout link must have been defined in the configuration file or by a previous DEFINE command.

FCB
specifies the forms control buffer (FCB) processing mode.

IGNORE
specifies that all FCB names are ignored. This is the default. If you specify FCB IGNORE for an SNA3270P-type or 3270P-type link, RSCS converts all channel skips (other than channel one) to a "line-space-one".

DYNAMIC
process files with any FCB name. For SNA3270P-type and 3270P-type links, RSCS will perform channel skip simulation. If the file does not specify an FCB name, RSCS treats the file as if IGNORE was specified (RSCS converts all channel skips to a "line-space-one"). Before using an FCB name, you must define the FCB image to RSCS using the FCB statement in the RSCS configuration file. For information about the FCB statement, see *z/VM: RSCS Networking Planning and Configuration*.

fcbname
processes only files with the specified FCB name. Before channel skip simulation can occur on SNA3270P-type and 3270P-type links, you must define the FCB name to RSCS by using the FCB statement in the RSCS configuration file. For information about the FCB statement, see *z/VM: RSCS Networking Planning and Configuration*.

Note: FCB is valid only for ASCII-type, MRJE-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, and 3270P-type links. If you specify FCB for any other link type, RSCS ignores the operand.

LINE *ccuu*
specifies the virtual address (device number) of a telecommunication adapter or printer for this link. Valid addresses are X'0000' and X'0002' - X'FFFF'. The default is X'0000'. The virtual addresses cannot be within the RSCS virtual unit record device pool (default X'0F00' - X'0FFF', or as specified on the CHANNELS statement). For more information about the CHANNELS statement, see *z/VM: RSCS Networking Planning and Configuration*. The value specified overrides a device address that may have been previously defined for the link.

If specified for a GATEWAY-type, LISTPROC-type, LPD-type, LPR-type, NOTIFY-type, SNANJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, TCPNJE-type, UFT-type, or UFTD-type link, RSCS checks the syntax of the virtual device number, but does not use it.

LOGMode *logmodename*
specifies the name of the logon mode table entry for an SNA LU. This allows the default logon mode table defined in the VTAM configuration to be overridden. If a new link is being defined and this operand is omitted, the name will be kept as blank, causing the default logon mode table to be used. If this operand is specified for a non-SNA link, the syntax is checked, but it is not used.

LUName *luname*
specifies the logical unit name for the device or system connected to this link. If a new link is being defined and this operand is omitted, the logical unit name is assumed to be the same as the link ID. If this operand is specified for a non-SNA link, the syntax is checked, but it is not used.

Note: You cannot use an LU name that was previously specified for another link (whether in the configuration file or by another DEFINE command). If you specify an already-defined LU name, RSCS rejects the DEFINE command and issues message DMT713E.

NODE *nodeid*
specifies the name of the node at the other end of the link. If NODE is omitted, the link ID must match the node ID of the node at the other end of this link. Otherwise, RSCS has no way of knowing what node this link connects to.

If you specify NODE *nodeid*, you have told RSCS the name of the node this link connects to, and therefore the link ID does not need to match the node ID. This lets you specify a nickname for the link and lets you define more than one link to the node. For more information about using NODE, see “Usage Notes” on page 152.

Note: The NODE operand applies only to GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links. It is ignored for all other link types.

Queue
specifies how files will be queued for transmission on the target link ID:

Priority
queues files by priority (low-numbered priority first) and by size within priority (small files first).

Fifo
queues arriving files in order of arrival (the time the file was written into the CP spool). Files that were already queued before the link is defined will not be reordered in the queue.

Size
queues files by size (small files first).

If a new link is being defined and this operand is not specified, the default is PRIORITY.

NORETry
RETry
specifies whether RSCS should try to restart an autodial or SNA link after certain temporary error conditions have occurred. These error conditions include VTAM errors and time outs on a dial to a remote system or workstation. The default is NORETRY.

If you specify RETRY on an autodial or SNA link, RSCS will (by default) automatically try to restart the link after 1 minute. If the restart fails, RSCS will wait 10 minutes before trying again. If that restart fails, RSCS will wait 19 minutes before trying again. RSCS will continue to retry the link indefinitely at increasing intervals. The intervals are 1, 10, 19, 27, 34, 40, 45, 49, 52, 54, and 55 minutes. Once RSCS reaches the 55 minute interval between restarts, all restarts after that point will be 55 minutes apart until the link restarts or RSCS terminates.

To change the default intervals for your local system, use the RETRY configuration statement described in *z/VM: RSCS Networking Planning and Configuration*.

MANual
specifies that RSCS will process only files with the current form name. This is the default. (If you specify the form name as FORM *, RSCS will process files with any form name.)

AUto
specifies that RSCS will process files with any form name and issue automatic prompting messages for any forms changes.

SETup
specifies that RSCS will process files with any form name and issue automatic prompting messages for any forms changes. Also, the workstation operator is allowed to check and adjust forms alignment when changing forms. If specified for an LPR-type link, this operand is ignored.

FOrm *name*
FOrm *
specifies the operator form name of files that may be processed for this link. If you specify an asterisk (*), any file may be processed, regardless of form name.

SLOWdown
specifies when RSCS will start and stop slowdown mode for this GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type link. (Slowdown mode applies to networking links only.) With this operand you can specify *absolute* (base) or *relative* links slowdown values.

Slowdown values are absolute (base) when you specify start and stop slowdown values. You can set absolute slowdown values for your system or for a specific link. To set absolute slowdown values for your system, use the SLOWDOWN statement or command. To set absolute slowdown values for a specific link, use the SLOWDOWN operand on the LINKDEFINE statement or the DEFINE command. The format is SLOWDOWN *start_point stop_point*, where:

start_point
is the absolute start slowdown value for this link. This can be any decimal number, 1 - 10000. The start value must be greater than the stop value.

stop_point
is the absolute stop slowdown value for this link. This can be any decimal number, 0 - 9999.

Slowdown values are relative when you add or subtract a delta value to or from the existing absolute slowdown value for the system. To set a relative slowdown value for a specific link, use the SLOWDOWN operand on the LINKDEFINE statement or the DEFINE command. The format is SLOWDOWN *+nnnn* or SLOWDOWN *-nnnn*, where:

+nnnn
specifies that RSCS will create relative slowdown values for this link by increasing the current absolute start and stop system slowdown values by this amount, which can be any decimal number, 1 - 9999.

-nnnn
specifies that RSCS will create relative slowdown values for this link by decreasing the current absolute start and stop system slowdown values by this amount, which can be any decimal number, 1 - 9999.

Notes:

1. When you change the absolute slowdown values for your system, RSCS will automatically change any relative values you assigned for a link.
2. If there are no absolute slowdown values for your system, you cannot assign relative slowdown values for a link. If you try, RSCS issues error message DMT489E.
3. For more information about specifying absolute system slowdown values for your system, see the SLOWDOWN statement described in *z/VM: RSCS Networking Planning and Configuration* or the SLOWDOWN command ("SLOWDOWN" on page 276).

TRace
specifies tracing for specific events. The trace records give additional details about the date and its flow across a link.

ALL
starts the full-buffer logging of activity on the link. (This operand is recommended by the IBM Support Center for diagnostic purposes.)

LOG
starts the partial-buffer logging of activity on the link. Only the first 16 bytes and last 16 bytes in the data buffer are logged. LOG is the default function.

OFF
stops the reporting of line activity, stops the logging of I/O activity (and initiates the automatic printout of the log data), and resets the routing of the log output.

RECords
starts the logging of NJE record segments sent and received on this link. This option is valid only for GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links. If you specify RECORDS for any other link type, RSCS issues message DMT204E.

TYPE
specifies a symbolic name that describes the type of telecommunication protocol to be used to communicate with the remote workstation or system.

ASCII
indicates a connection to an ASCII printer or plotter using an ASCII control unit.

GATEWAY
indicates a connection using an installation-defined protocol.

LISTPROC
indicates a list processor.

LPD
indicates a connection that enables RSCS to receive print data streams from an LPR client in a TCP/IP network for distribution in the RSCS network.

LPR
indicates a connection that enables RSCS to send print data streams to a remote line printer daemon in a TCP/IP network.

MRJE
indicates a BSC connection to a multi-leaving workstation or host system

NJE
indicates a BSC, CTCA, ESCON or FICON CTCA, or 3088 connection to a peer NJE system.

NOTIFY
indicates a note generator.

RJE
indicates a BSC connection to a BSC workstation.

SNANJE
indicates a connection to an NJE system through VTAM.

SNARJE
indicates a connection to an SNA System/36 RJE workstation through VTAM.

SNA3270P
indicates a connection to a 3270 Information Display System Printer through VTAM.

TCPASCII
indicates a connection to an ASCII printer or plotter attached to a terminal server in a TCP/IP network.

TCPNJE
indicates a connection to a remote peer NJE system in a TCP/IP network.

TN3270E
indicates a connection to a remote 3270 printer attached within a TCP/IP network.

UFT
indicates a connection that enables RSCS to send files to a remote UFT daemon in a TCP/IP network.

UFTD
indicates a connection that enables RSCS to receive files from a remote UFT client in a TCP/IP network for distribution in the RSCS network.

3270P
indicates a connection to a 3270 printer using a BSC adapter or channel attachment.

If your installation has defined a new link type (using the LINKTYPE statement in the configuration file), you can also specify that link type. For more information, see *z/VM: RSCS Networking Planning and Configuration*.

If the link type is omitted (and not previously specified on a LINK or LINKDEFINE statement or a DEFINE command), RSCS sets the link type to UNDEFIND. You must specify the link type before using the START command to start the link. If you try to start an undefined link, RSCS issues message DMT705E.

A link with type LISTPROC cannot be defined if one already exists. Also, if the DEFINE command is being used to redefine operands of an existing link, a specification of type LISTPROC can be used only to redefine a previously defined LISTPROC link.

Parm
UParm
specifies that the remainder of the command line to the right of the PARM or UPARM operand will be made available to the newly defined link as operational parameters, which have meaning to the link.

Parameters supplied after the PARM operand override all operational parameters previously defined by a PARM configuration file statement or on a previous DEFINE command. If no information is supplied after the PARM operand, all previously defined operational parameters are effectively negated, and parameters with defaults will assume their default values.

UPARM parameters are defined by your installation and have no effect on PARM operational parameters. If no information is supplied after the UPARM operand, all previously defined UPARM parameters are negated.

If the PARM or UPARM parameters contain sensitive information (for example, passwords) that you do not want users to see in response to a QUERY command, you can surround the sensitive section with the hide character. By default, the hide character is a backward slash (\), but you can use the HIDECHARACTER configuration file statement to change the default. For more information about the hide character and the HIDECHARACTER statement, see *z/VM: RSCS Networking Planning and Configuration*.

Each link type has its own PARM operational parameters. For descriptions of the operational parameters for all link types, see Chapter 13, "Link Operational Parameters," on page 293. For a specific link type, see:

- "ASCII-Type Link Operational Parameters" on page 294
- "GATEWAY-Type Link Operational Parameters" on page 297
- "LISTPROC-Type Link Operational Parameters" on page 302
- "LPD-Type Link Operational Parameters" on page 306
- "LPR-Type Link Operational Parameters" on page 308
- "MRJE-Type Link Operational Parameters" on page 313
- "NJE-Type Link Operational Parameters" on page 318
- "NOTIFY-Type Link Operational Parameters" on page 326
- "RJE-Type Link Operational Parameters" on page 328
- "SNANJE-Type Link Operational Parameters" on page 333
- "SNARJE-Type Link Operational Parameters" on page 339
- "SNA3270P-Type Link Operational Parameters" on page 342
- "TCPASCII-Type Link Operational Parameters" on page 349
- "TCPNJE-Type Link Operational Parameters" on page 352
- "TN3270E-Type Link Operational Parameters" on page 360
- "UFT-Type Link Operational Parameters" on page 366
- "UFTD-Type Link Operational Parameters" on page 369
- "3270P-Type Link Operational Parameters" on page 371

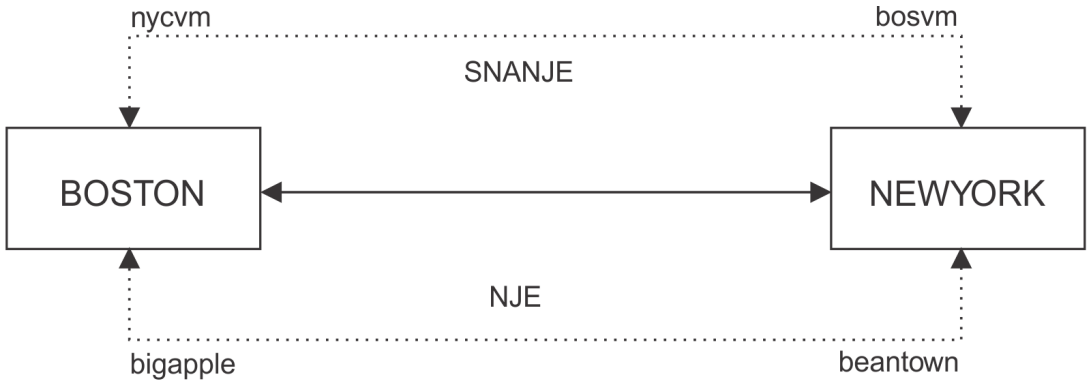
Usage Notes

1. You can use the NODE operand to define more than one link to an adjacent node. Without the NODE operand, a typical link and the associated DEFINE commands might be:

define newyork type snanje

define boston type snanje

If you used the NODE operand, you could define two (or more) links to the same node. Then, you could use the ROUTE command to create a routing group for the links. The link and the associated DEFINE and ROUTE commands would be:




```
define nycvm node newyork type snanje
define bigapple node newyork type nje

route group newyork to nycvm bigapple
```

```
define bosvm node boston type snanje
define beantown node boston type nje

route group boston to bosvm beantown
```

After setting up multiple links to the same node and creating a routing group that contains those links, users can send files to the node and have RSCS decide which link to take.

2. An immediate routing loop occurs when a file arrives and departs over the same link. RSCS flags this condition so that you can take the appropriate action. If you use the NODE operand to define more than one link to an adjacent node, an immediate routing loop can occur when a file arrives on one link and departs on the other. Although the link IDs are different for these two links, RSCS will also flag this as an immediate routing loop. (Using the example in Usage Note “1” on page 152), if node BOSTON sends a file to node NEWYORK over link NYCVM and node NEWYORK sends the file back to node BOSTON over link BEANTOWN, RSCS will detect the routing loop and flag the file as looping.
3. *MULTI* files (files with multiple data set headers) normally use the link ID as the file name of the file. If you create more than one link to a node (using the NODE operand), RSCS uses the node ID, instead of the link ID, as the file name. For example, if node BOSTON needs to send a *MULTI* file to node NEWYORK, RSCS creates a NEWYORK *MULTI* file (not a NYCVM *MULTI* or BIGAPPLE *MULTI* file). RSCS can then send this file to node NEWYORK over either link (NYCVM or BIGAPPLE).
4. Only one SNANJE-type link can be defined between one RSCS node and the same remote NJE node.

DELETE

Authorization

C, S, U

Purpose

The DELETE command causes a previously defined link to become temporarily undefined. Permanent deletion of a link can be made only by removing the entry from the RSCS configuration file. When entering the DELETE command, the link you are deleting must:

- Be inactive
- Have no files queued
- Have no other nodes or groups routed through it

Files addressed to an undefined link are not processed because of an incorrect address.

Operands

linkid
is the name of the link to be undefined.

DEST

Authorization

C, S, U

Purpose

The DEST command temporarily adds or deletes a Print Services Facility/VM (PSF) printer destination on the local system. The destinations are page-image printers on the local system under the control of PSF.

Operands

ADD *destid*
adds a destination to the list of PSF destinations specified to RSCS during initialization.

DELete *destid*
removes a destination from the list of PSF destinations specified to RSCS during initialization.

Usage Notes

1. To permanently add destinations, use the DEST statement in the RSCS configuration file. For information about the DEST statement, see *z/VM: RSCS Networking Planning and Configuration*.
2. Although RSCS continues to support the destination identifier file, it is recommend that you use DEST statements or commands rather than the file.

DISABLE

Authorization

C, S, U

Purpose

The DISABLE command deactivates a previously enabled switched telecommunication port, making it unable to receive an incoming dialed call. If an active session exists on the port (that is, the port has been assigned to a link because of an incoming call), the port will not become deactivated until the link active on it has been deactivated, for example, because of a DRAIN or STOP command.

An ENABLE command issued to a port before it has been deactivated will negate the DISABLE command.

Operands

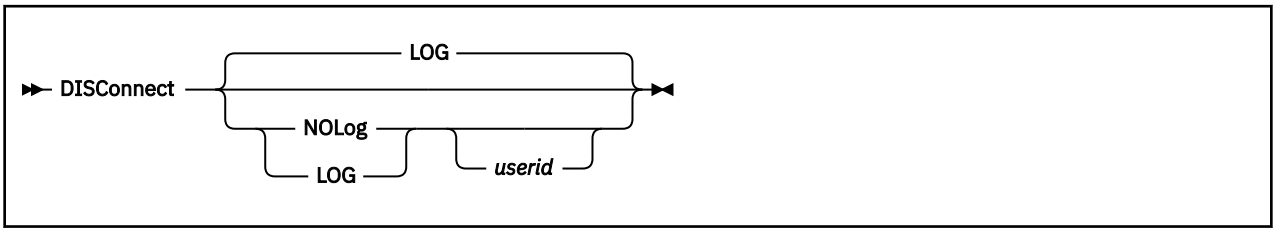
ccuu
is the virtual address of the switched telecommunication port to be deactivated.

ALL
deactivates all previously started switched telecommunications ports.

Usage Notes

Enter an RSCS QUERY SYSTEM PORTS command to determine the status of all telecommunication ports.

DISCONNECT



Authorization

C, S, U

Purpose

The DISCONNECT command disconnects the RSCS operator console from the z/VM system while RSCS continues to operate. The RSCS DISCONNECT command operates like the CP DISCONN command, except that another user ID may be specified to receive all RSCS operator's console output lines.

The RSCS operator must log on the system again and enter the RECONNECT command to reconnect the operator console and route the console messages to it.

Operands

LOG
specifies that all messages are to be logged to the RSCS console terminal. If the installation has spooled the RSCS console output, these messages will be preserved in the console log. LOG is the default if no operands follow DISCONNECT.

NOLog
specifies that no messages are to be preserved in the RSCS console log.

userid
is the user ID for the currently logged-on virtual machine that is to receive subsequent RSCS operator console output lines. When you enter DISCONNECT and specify a user ID, that user ID must be a virtual machine that is logged on to the local system and is capable of receiving messages. Otherwise, the DISCONNECT command is rejected.

DRAIN

Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Links

A, D, N, PR, U, W

Purpose

The DRAIN command deactivates the specified link after the current file processing completes. The link is deactivated immediately if no file is being processed when the DRAIN command is entered. An inactive link is started by a START command. If a START command is entered for the link before final file processing is complete, the link is not deactivated and usual processing continues.

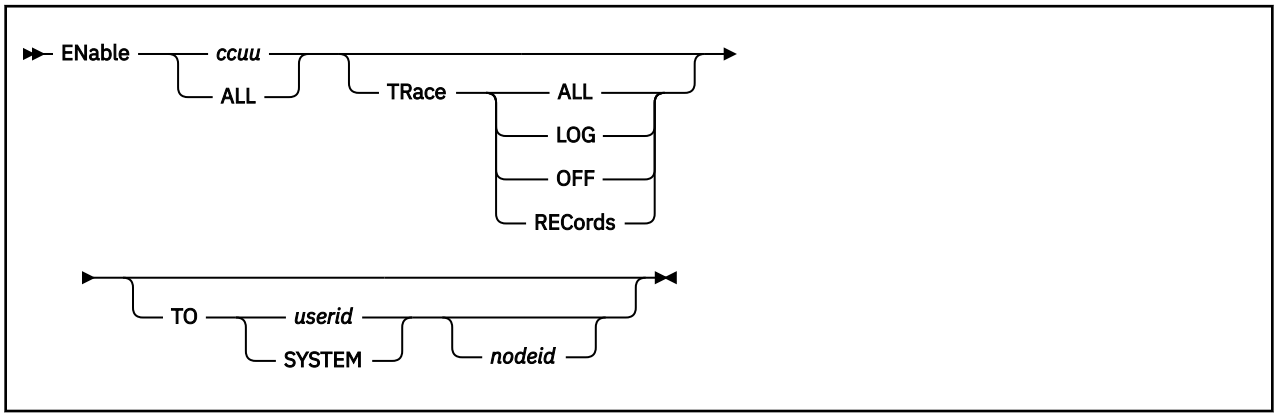
Operands

linkid
: is the name of the link to be deactivated. If you enter the command from a remote workstation, you must omit this operand.

Usage Notes

1. On a switched line, deactivation may take 30 seconds or more.
2. For links with more than one stream, you may have several files being transmitted simultaneously. RSCS waits for each file to finish transmitting before deactivating the link.
3. For multiple copy files, RSCS waits for the current file to finish printing before deactivating the link.
4. Using DRAIN causes an autostart link to be redefined as a non-autostart link.
5. Using DRAIN causes a link started with the RETRY operand to be changed to NORETRY.
6. DRAIN may also deactivate the remote end of a GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type link.
7. Using DRAIN on an auto-signon link causes RSCS to send a signoff card to the remote workstation.

ENABLE



Authorization

C, S, U

Purpose

The ENABLE command begins a previously disabled switched telecommunication port, or resets a pending disabled status from a previous DISABLE command. The port then becomes available to receive an incoming dialed call. ENABLE also changes the TRACE status of a port.

The port to be started must have been previously defined by the PORT command or configuration file statement. Previously enabled ports are not affected by the ENABLE command except to alter their logging status, if so requested. For information on the PORT statement, see *z/VM: RSCS Networking Planning and Configuration*.

Operands

ccuu
is the virtual address of the switched telecommunication port to be started.

ALL
starts all previously defined switched telecommunication ports.

TRace
starts or stops the logging of I/O activity on the port or ports. The file is queued for real printer output when the log trace is deactivated for the port.

ALL
starts the full-buffer logging of I/O activity on the port or ports.

LOG
starts the partial-buffer logging of I/O activity on the port or ports.

OFF
stops the logging of I/O activity on the port or ports, and begins printing out the log data.

RECords
logs any NJE record segments sent and received on this link after the link is started. This option is valid only for GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links (the networking links).

When RSCS attaches a link to this port, it may not be a networking link. Because RECORDS does not apply to non-networking links, RSCS sets the link to TRACE ALL when attaching a non-networking link. TRACE ALL will remain in effect until RSCS attaches a networking link to this port. Once RSCS attaches a networking link, the trace reverts to RECORDS.

TO *userid*
TO SYSTEM
identifies the virtual machine that is to receive the log output. If the output is to be sent to the system unit record device, the *userid* must be specified as SYSTEM.

If specified, the TO operand must be the rightmost operand string. If TO is omitted, RSCS sends the log output to the user ID specified on the TRACEDEST configuration file statement. If a TRACEDEST statement is not specified, RSCS sends the output to the local printer.

nodeid
is the remote destination location. When *userid* or SYSTEM is specified with a *nodeid*, they can identify a virtual machine, a workstation, a 3270 printer, or the system record device on the specified remote system. If a *nodeid* is not specified, the local system is assumed.

Usage Notes

1. RSCS closes a trace file only when you specify TRACE OFF. If tracing is not already in effect and you specify TRACE ALL, LOG, or RECORDS, RSCS will open a trace file and begin tracing the specified activity.

   If tracing is in effect for one of the three activities (ALL, LOG, or RECORDS) and you enter an ENABLE command with a new TRACE option, RSCS will start tracing the new activity without closing the trace file.
2. The routing specified by the TO option happens only when the trace file is closed by the specification of OFF or if the port is disabled using the RSCS DISABLE command. So the routing can be changed after tracing has started, because only the last routing that was specified is used.
3. Because an MRJE-type link in workstation mode is intended to handle only job data, it will not handle log output. If log output is routed to an MRJE-type link, it will be purged.
4. To check the status of all switched telecommunication ports, enter an RSCS QUERY SYSTEM PORTS command.

EXEC

Authorization

C, S, U

Purpose

The EXEC command lets you run a sequence of commands contained in a GCS exec file that is accessible to the RSCS virtual machine.

Operands

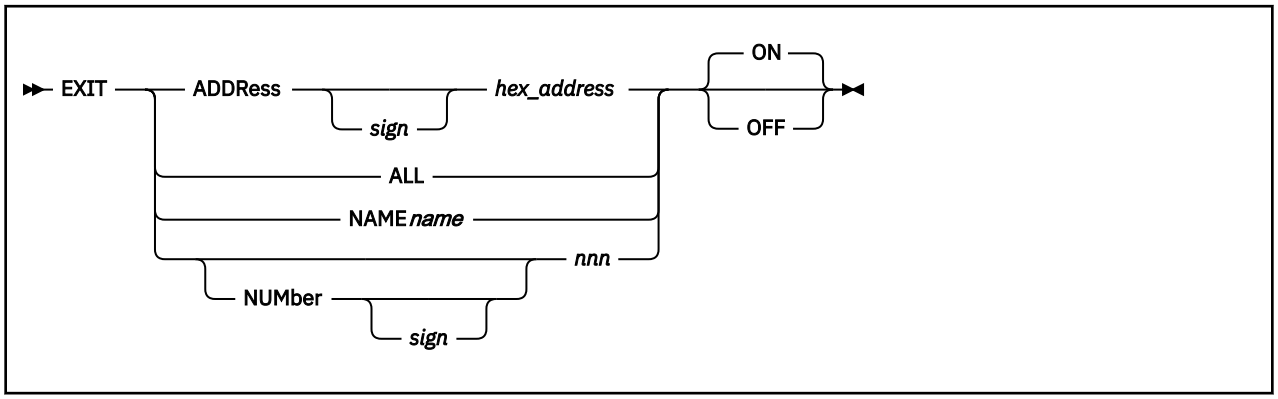
filename
is the name of a file containing one or more commands to be run. The file type must be GCS. The file must contain commands that are acceptable to GCS, such as CP and RSCS commands, and REXX statements.

arguments
is a string of input variables to be passed to the exec.

Usage Notes

1. An exec can contain any valid RSCS or GCS command. If another exec is called from within the exec, REXX calling procedures should be used (rather than the RSCS EXEC command) to avoid unpredictable results.
2. The file name and any arguments, including spaces, must not exceed 130 characters.
3. Use the REPLY command (see "REPLY" on page 258) within an exec to send a message back to the person who ran the exec.

EXIT



Authorization

C, S, U

Purpose

The EXIT command enables or disables one or more RSCS exit points. Each exit point must have been previously defined by an EXIT statement, and its corresponding exit routine loaded, when RSCS was started.

Operands

ADDRess *sign hex-address*
specifies the hexadecimal address of the entry point associated with the exit point to be enabled or disabled. See the usage notes for a list of valid signs.

ALL
specifies that all exits points that were previously defined and loaded (by an EXIT statement) are to be enabled or disabled.

NAME *name*
specifies the entry point name of the exit point to be enabled or disabled. To specify a generic entry point name, enter an asterisk (*) as the last character of the name.

For example, to enable the entry points GSM016EP, GSM019EP, and GSM032EP, you would enter:

```
exit name gsm0* on
```

NUMber *sign nnn*
specifies a decimal number, 0 - 255, that identifies the exit point to be enabled or disabled. See the usage notes for a list of valid signs.

ON
enables the specified exit points, but does not affect exit points that are already enabled. This is the default.

OFF
disables the specified exit points, but does not affect exit points that are already disabled.

Usage Notes

When using the ADDRESS or NUMBER operand, you can specify an optional sign before the hexadecimal address or decimal number that tells RSCS which exit points to enable or disable:

=
Equal to the number or address. This is the default.

<
Less than, but not including, the number or address.

>
Greater than, but not including, the number or address.

<=
Less than or equal to the number or address.

>=
Greater than or equal to the number or address.

<>
Less than or greater than, but not equal to, the number or address.

¬=
Not equal to the number or address.

¬<
Not less than the number or address.

¬>
Not greater than the number or address.

FLUSH

Purpose

The FLUSH command halts processing of a file currently being transmitted on a link. The file is either purged or held, and link processing continues with the next file queued for transmission on the link.

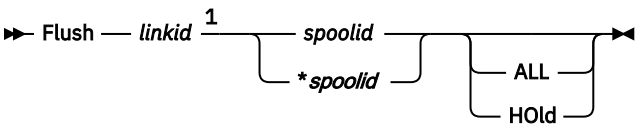
This command has two formats:

- Use format 1 if you want to manipulate a file that you originated or that is destined for you, but you are not authorized for this link.
- Use format 2 if you are authorized for this link.

Links

A, N, PR, U, W

Format 1



Notes:

[1] The *linkid* must be specified by link-authorized alternate operators only; all others must omit this operand.

Authorization 1

G, L (not authorized for this link), U (not authorized for this link)

Operands 1

linkid
is the name of the link on which the file is queued. This operand must be specified by link-authorized alternate operators who are not authorized for this link. General users and users authorized through RSCSAUTH for this command but not this link must omit the *linkid*.

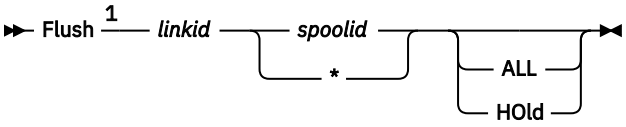
spoolid
is the *current* spool file identifier for the file to be flushed.

****spoolid***
specifies the *origin* spool file identifier for the file to be flushed.

ALL
specifies that all copies of the file being transmitted are to be deleted. If this option is not specified, only the current copy is deleted and the next copy, if any, is processed.

HOld
specifies that the file being transmitted is not to be deleted but rather is to be saved and placed in system hold status. Processing of the file may be restarted after the file has been taken out of hold status by a CHANGE command.

Format 2



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization 2

C, L (authorized for this link), R, S, U (authorized for this link)

Operands 2

linkid
is the name of the link on which the file to be flushed is being transmitted. If you enter the command from a remote workstation, you must omit this operand.

spoolid
is the *current* spool file identifier for the file to be flushed. This field is provided to ensure that an operator does not inadvertently destroy the wrong file through a timing error.

*****
specifies, for workstation and printer links, that the file currently being transmitted is to be flushed. For a networking link, this operand specifies specifies that all active files (that is, currently being transmitted) are to be flushed.

ALL
specifies that all copies of the file being transmitted are to be deleted. If this option is not specified, only the current copy is deleted and the next copy, if any, is processed.

HOld
specifies that the file being transmitted is not to be deleted but rather is to be saved and placed in system hold status. Processing of the file may be restarted after the file has been taken out of hold status by a CHANGE command.

FORCE

Authorization

C, S, U

Links

A, D, N, PR, U, W

Purpose

The FORCE command immediately deactivates the specified link.

Operands

linkid
is the name of the link to be deactivated.

Usage Notes

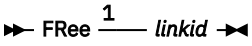
1. Using FORCE causes:
   - An autostart link to be redefined as a non-autostart link
   - The link's line driver task to abend (with a 13E abend code)
   - A dump to be sent to the GCS Common Dump Receiver

   Using FORCE may make it difficult to restart the link; therefore it should be used only when the DRAIN and STOP commands do not deactivate the link.

   Notes:

   a. The DRAIN command lets files in active transmission complete before deactivation of the link.
   b. The STOP command deactivates the link immediately, before finishing transmission of the active file.
2. An SNA-type link cannot be forced. If a DRAIN or STOP command fails to deactivate an SNA-type link, the link must be deactivated from the VTAM side by issuing a VTAM VARY INACT command for that link's *luname*.

FREE



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Links

A, N, PR, U, W

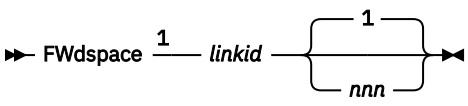
Purpose

The FREE command resumes file transmission and reception for a particular link. The hold status for each of the files queued on the link is not affected. FREE has no effect on a link for which file reception and transmission was not suspended by a HOLD command.

Operands

linkid
is the name of the link on which file transmission and reception is to be resumed. If you enter the command from a remote workstation, you must omit this operand.

FWDSPACE



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Links

A, PR, W

Purpose

The FWDSPACE command causes the file currently being transmitted to be repositioned forward.

Operands

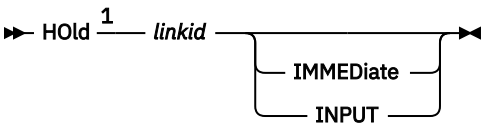
linkid
is the name of the link on which the file currently being transmitted is to be repositioned. If you enter the command from a remote workstation, you must omit this operand.

nnn
is the number of data units to be forward-spaced. The default is 1. For a print file, data unit refers to printer pages, which are counted in the same way as for the CP BACKSPACE command. For a punch file, data unit refers to file records that include any write-type command code.

Usage Notes

1. The FWDSPACE command is ignored for GDDM output files.
2. The FWDSPACE command is supported only by the ASCII-type, LPR-type, MRJE-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, TN3270E-type, and 3270P-type links. The ASCII-type, LPR-type, SNA3270P-type, TCPASCII-type, TN3270E-type, and 3270P-type links must be in HOLD status or must be in a forms mount wait state for the FWDSPACE command to have effect.
3. If *nnn* is greater than the number of data units remaining to be processed, FWDSPACE acts as a FLUSH command, except when done in a forms-mount-wait in SETUP mode. In that case, it acts as a BACKSPACE *linkid* FILE command.

HOLD



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Links

A, N, PR, U, W

Purpose

The HOLD command temporarily suspends file transmission for a particular link, without deactivating the link. File reception is also suspended for GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links. Transmission is suspended when the currently active file is completed. Optionally, it may be suspended immediately and later resumed from that point by a FREE command. The HOLD command does not affect the hold status of any file queued for transmission on the link.

Operands

linkid
is the name of the link for which file transmission is to be suspended. If you enter the command from a remote workstation, you must omit this operand.

IMMEDiate
immediately suspends any active file transmission. This operand is supported only by the ASCII-type, LISTPROC-type, LPR-type, MRJE-type, NOTIFY-type, RJE-type, TCPASCII-type, SNARJE-type, SNA3270P-type, TN3270E-type, UFT-type, and 3270P-type links.

INPUT
suspends any active file reception. This operand is valid only for networking links.

Usage Notes

1. The HOLD command suspends file reception only for GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links.
2. HOLD cannot be used for RJE-type and MRJE-type links while they are in SETUP mode. An error message will be issued.
3. You can use the INPUT operand to manually suspend file reception on a busy link. (Use the FREE command to resume file reception.) If you want RSCS to automatically suspend file reception when the number of files in your local RSCS file queue reaches a specific level, use the SLOWDOWN command (or statement) to define when RSCS should start and stop slowdown mode.
4. If the slowdown facility is in effect, the link may continue to transmit files even if you have issued the HOLD INPUT command. This may occur if the number of files queued for the link is less than the *start* value specified for the slowdown facility.

   For example, if you issue HOLD INPUT for a link that has 95 files queued and the slowdown start value is set for 100 files, files will not be held on the link. When more than 100 files are queued on the link,

the slowdown facility automatically issues a HOLD INPUT command for the link. When the file queue falls below 100, the slowdown facility will issue a FREE command for the link.

INIT

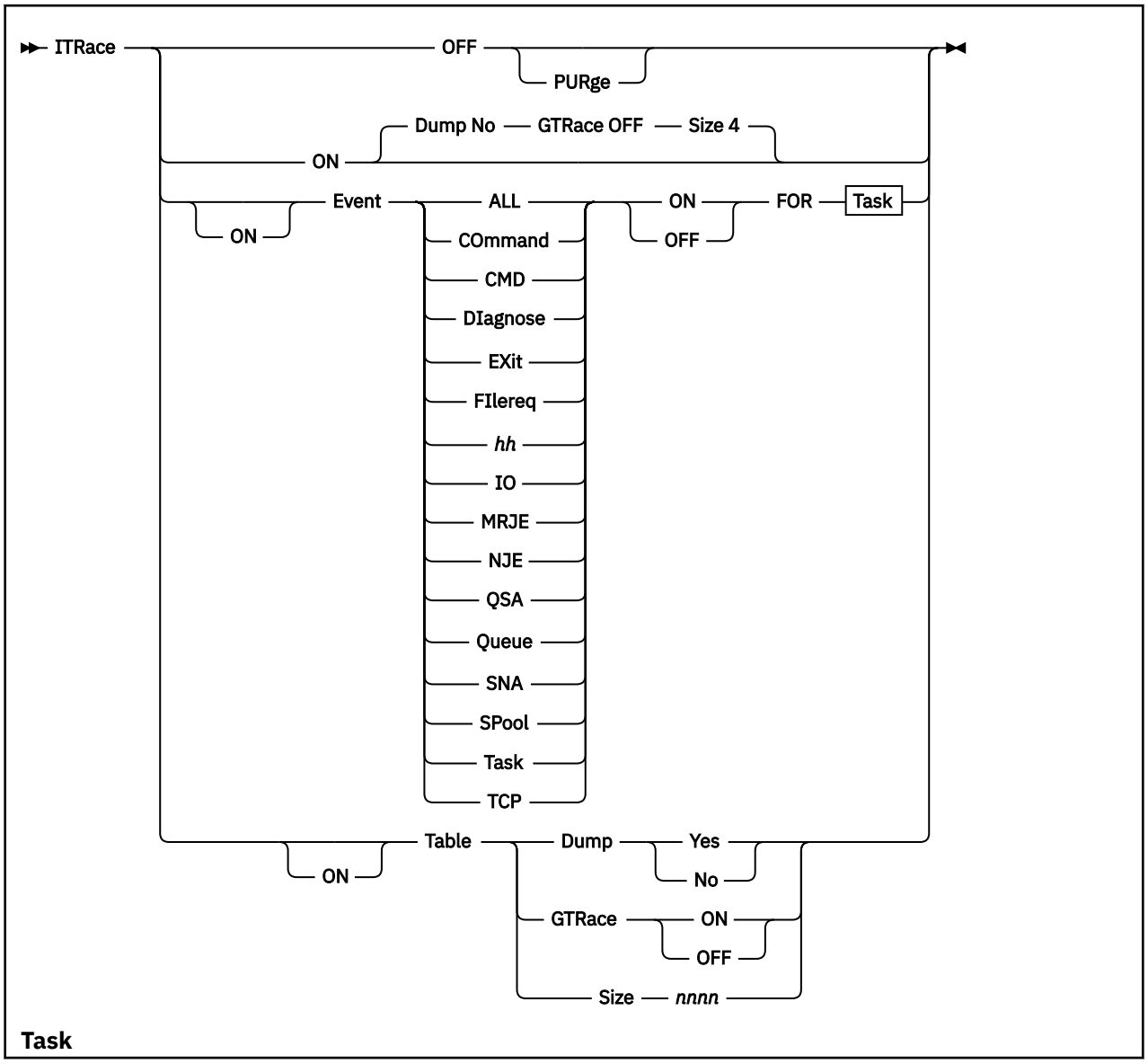
Authorization

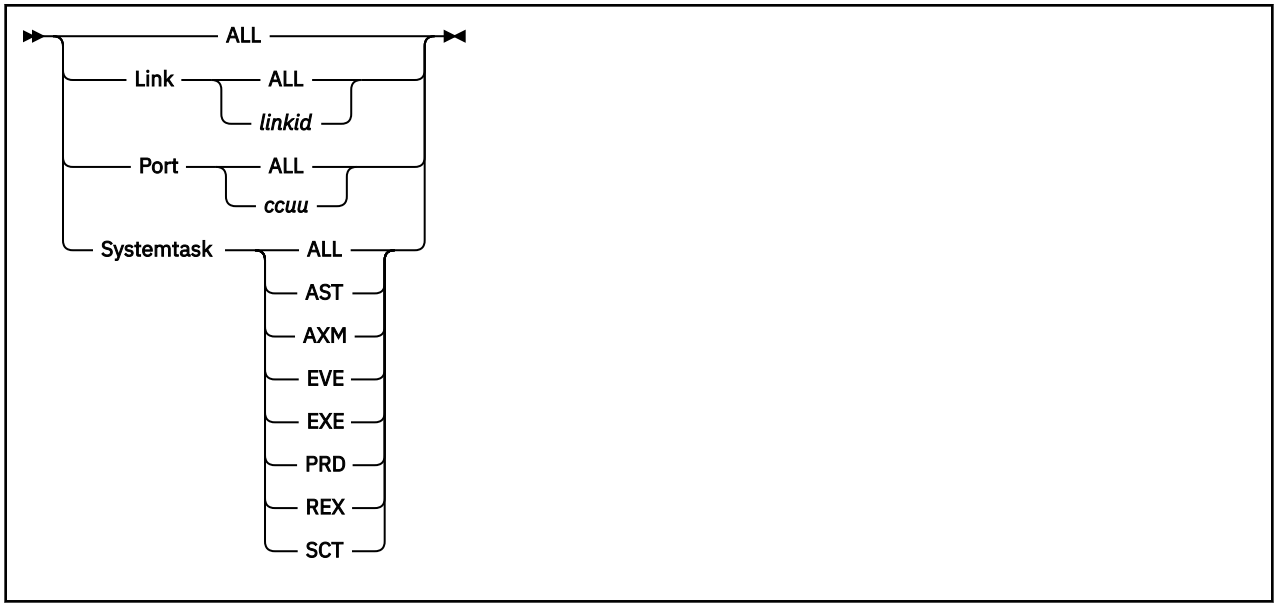
C

Purpose

The INIT command initiates RSCS operations. It must be the first RSCS command that is entered after the RSCS module is loaded into storage (using the GCS LOADCMD command). No other RSCS command is accepted until INIT is completed. If you try to use the INIT command after RSCS has been initiated, an error message will be issued.

ITRACE


ITRace
OFF
PURge
ON
Dump No
GTRace OFF
Size 4
ON
Event
ALL
COmmand
CMD
DIagnose
EXit
FIlereq
hh
IO
MRJE
NJE
QSA
Queue
SNA
SPool
Task
TCP
ON
OFF
FOR
Task
ON
Table
Dump
Yes
No
GTRace
ON
OFF
Size
nnnn
Task



Authorization

C, S, U

Purpose

The ITRACE command modifies the state of the internal RSCS trace table, modifies the types of events RSCS will trace, and turns tracing on and off.

Operands

OFF
stops internal tracing.

PURge
purges (resets) the internal trace table. After specifying ITRACE OFF PURGE, the state of the internal trace table is the same as it would be if you had never specified any ITRACE statements or commands.

ON
starts internal tracing. If omitted, RSCS remembers which events you specified, but will not begin tracing them until you enter an ITRACE ON command.

Event
specifies a type of event in the internal trace table. You can specify only one event on each ITRACE command, unless you specify ALL. If you need to specify more than one event, you must specify more than one ITRACE command.

ALL
indicates all events.

COmmand
CMD
indicates all commands that RSCS processes.

DIagnose
indicates all CP DIAGNOSE code functions that RSCS requests.

EXit
indicates all calls to exit routines from RSCS.

FIlereq
indicates all calls to open and close spool files and transmission algorithms.

hh
is the record ID of a specific event to be traced. (Each record type has a unique 2-digit hexadecimal record ID.) For a list of the record IDs, see usage note "3" on page 176.

IO
indicates all I/O requests and interrupts that RSCS processes.

MRJE
indicates data buffer transmissions before I/O initiation and after the completion of I/O operation. WRITE and READ data are collected, because both use the same buffer.

NJE
indicates all NJE records that RSCS processes or builds.

QSA
indicates all quick storage allocations and deallocations that RSCS does.

Queue
indicates any elements that RSCS places on or removes from the internal command and message queues.

SNA
indicates each time a VTAM request is made or an exit routine is scheduled.

SPool
indicates all records read from and written to the CP spool.

Task
indicates any tasks that RSCS starts or deactivates.

TCP
indicates TCP SOCKBLOK, SOCKCBLK, and PRDBLOK before and after IUCV calls to the TCP/IP virtual machine.

ON FOR
OFF FOR
starts or stops tracing the specified event for the indicated task in the internal trace table.

ALL
indicates all tasks (links, dial-out ports, and system tasks).

Link ALL
indicates events associated with all links.

Link *linkid*
indicates events associated with a specific link. You cannot specify a generic link ID (for example, LINK NY*). Only specific link IDs are allowed.

Port ALL
indicates events for all auto-answer ports.

Port *ccuu*
indicates events for a specific auto-answer port.

Systemtask
specifies a system task. You can specify only one task on each ITRACE command, unless you specify ALL. If you need to specify more than one task, you must specify more than one ITRACE command.

ALL
indicates all system tasks.

AST
indicates the autostart task, which attaches autodial links and monitors ITO and retry intervals.

AXM
indicates the spool manager task, which monitors the reader of the RSCS virtual machine and processes CP and RSCS spool-related commands.

EVE
indicates the event scheduling task, which monitors and processes all scheduled events.

EXE
indicates the EXEC task, which runs all RSCS EXEC command requests.

PRD
indicates the port redirector task, which monitors TCP/IP ports.

REX
indicates the communications task, which processes RSCS commands.

SCT
indicates the SNA control task, which maintains the RSCS ACB and contains most of the VTAM exit routines.

Table
sets global defaults for the RSCS internal trace table.

Dump Yes
Dump No
specifies whether RSCS dumps the internal trace table (using the CP DUMP or VMDUMP command) to the virtual machine specified on the DUMP statement before the trace table wraps to the beginning. For information about the DUMP statement, see *z/VM: RSCS Networking Planning and Configuration*.

GTRace ON
GTRace OFF
specifies whether RSCS also places the specified event in the GCS trace table using a GCS ITRACE GTRACE command. To copy these events into a CPTRAP file, use the GCS ETRACE command. For information about the GCS ITRACE and ETRACE commands, see *z/VM: Group Control System*.

Size *nnnn*
specifies the size of the RSCS internal trace table. The number you specify is the number of 4096-byte pages of storage that RSCS should get from GCS for the internal trace table. This value can be any decimal number, 4 - 9999, with a default of 4. That is, if RSCS cannot get the amount of storage you specify, it tries to get the default size and issues message DMT438W to let you know that 4 pages of storage were obtained.

Usage Notes

1. RSCS starts tracing only when you specify the ON operand (either by itself or with the EVENT or TABLE operand). You can specify the ON operand on an ITRACE statement in the configuration file or on an ITRACE command. For information about the ITRACE statement, see *z/VM: RSCS Networking Planning and Configuration*.
2. RSCS always uses the latest ITRACE specification. If you specify conflicting options, RSCS uses the most recent one. For example, if your configuration file contains the following statement:

   ```
   ITRACE ON EVENT EXIT ON FOR LINK TORONTO
   ```

   and you later entered the following command:

   ```
   itrace event exit off for link toronto
   ```

   RSCS would trace calls to exit routines for link TORONTO after initialization and would not trace calls after meeting the ITRACE command.

   If you specify options that do not conflict, RSCS adds the latest specification to the list of items to trace. For example, if you entered the following commands:

   ```
   itrace on event cmd on for link all
   itrace event diagnose on for all
   itrace table dump yes
   ```

   RSCS would:

   - Begin tracing
   - Trace all commands it ran for all links

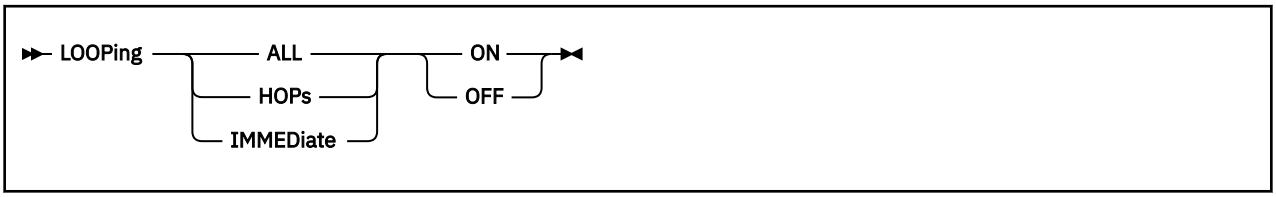
- Trace all CP Diagnose codes it requests for all tasks
- Dump the internal trace table before wrapping to the beginning

3. RSCS traces events using trace records. These trace records are identified by a 2-digit hexadecimal number. The following table lists the trace records, their event type, and their meaning.

Trace Record	Event Type	What RSCS is tracing
00	Task	Start of a task
01	Task	End of a task
02	EXit	Call to a GCS exit routine
03	IO	I/O interrupt
04	FIlereq	Call to request a file
05	Queue	Call to add an element to a queue
06	Queue	Call to remove a queue element
07	—	Call to issue a message
08	QSA	Call to allocate or deallocate storage
09	COmmand, CMD	Command entry
0B	SNA	Initial call to VTAM
0C	SNA	Completion of VTAM call
0D	EXit	Call to an exit (EXITCALL)
0E	EXit	Exit point return
0F	SPool	Call to input spool file routine
10	SPool	Call to output unit record device routine
11	IO	Call to I/O processing routine
12	NJE	NJE record sent and received
13	COmmand, CMD	A scheduled event
14	SPool	Data buffers sent and received
15	DIagnose	Diagnose code
16	SNA	VTAM exit routine
17	NJE	NJE job header
18	NJE	NJE data set header
19	NJE	NJE job trailer
1A	NJE	NJE request to open
1B	NJE	NJE permission granted
1C	NJE	NJE end of file
1D	NJE	NJE receiver online
1E	NJE	NJE reject
1F	NJE	NJE abend
20	NJE	NJE connection, RJE connection, or signon record
21	EXit	Call to exit routine
22	QSA	Call to deallocate storage

Trace Record	Event Type	What RSCS is tracing
23	NJE	NJE record received
24	TCP	IUCV calls to TCP/IP
25	TCP	Normal IUCV completion from TCP/IP
26	TCP	IUCV immediate error returns
27	MRJE	Send and receive buffer trace for MRJE
28-EF	—	Reserved for IBM service representatives
F0-FF	—	Reserved for customer use

LOOPING



Authorization

C, R, S, U

Purpose

The LOOPING command defines or disables RSCS route loop checking.

Operands

ALL
checks for both types of routing loops: immediate (two node) and long (hop count).

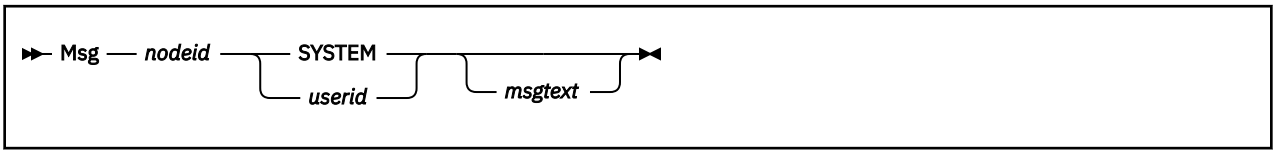
HOPs
checks only for long (hop count) routing loops.

IMMEDiate
checks only for immediate (two node) routing loops.

ON
starts the specified route loop checking.

OFF
stops the specified route loop checking.

MSG



Authorization

C, G, R, S, U

Links

A, N, PR (except LPR), W

Purpose

The MSG command causes a line of text to be sent to the specified node and presented to a user or operator as a message.

Operands

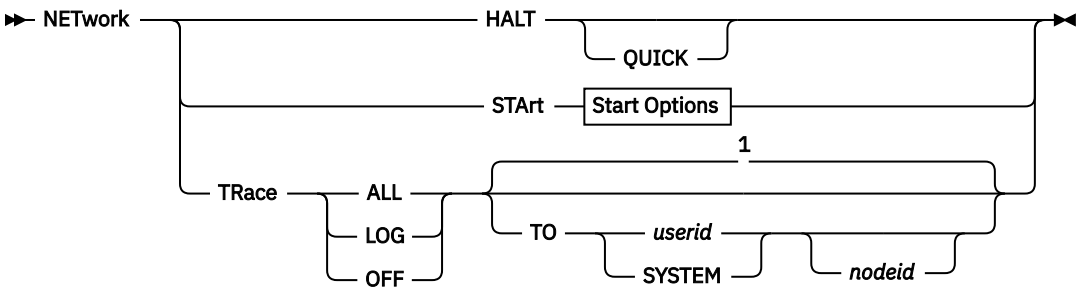
nodeid
is the name of the node (location) to receive the specified text line. If the message is for a local z/VM user, this operand is specified as the local RSCS location ID.

SYSTEM
specifies the remote RSCS operator's console.

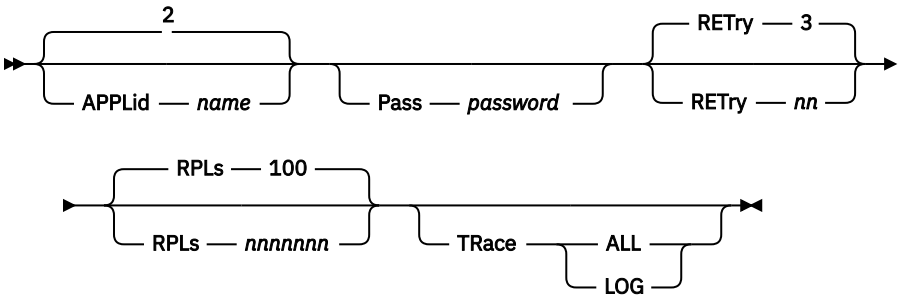
userid
is the ID of a user at the specified location. If the message is to be sent to a remote batch terminal, the *userid* field is ignored, but a dummy entry must be included to avoid deletion of the first word of the message text.

msgtext
is a string of 1 - 132 alphanumeric characters composing the message to be sent. For information about message truncation, see *z/VM: RSCS Networking Messages and Codes*.

NETWORK



Start Options



Notes:

[1] The default is the user ID specified in the TRACEDEST configuration statement, or the local printer.
[2] The default is the name specified in the LOCAL configuration statement.

Authorization

C, S, U

Purpose

The NETWORK command starts or ends communications with VTAM.

Operands

HALT
stops the RSCS-VTAM interface. No new sessions can start. A DRAIN command is issued to each active SNA link. When all SNA links are stopped, the ACB is closed to disassociate RSCS with VTAM and the SNA network.

QUICK
requests that communications with VTAM be stopped immediately. A STOP command is issued to each active SNA link. When all SNA links are stopped, the ACB is closed to disassociate RSCS with VTAM and the SNA network.

STArt
starts the RSCS-VTAM interface. An ACB is opened to associate RSCS with VTAM and the SNA network. Any SNA-related initialization is then performed. Until NETWORK START is entered, no SNA session drivers can be started.

APPLid *name*
specifies the name by which VTAM knows RSCS. This name is the same as the one specified by an APPL definition statement when VTAM was configured. If not specified on this command, the

name defaults to the RSCS location name (the name specified on the LOCAL statement in the RSCS configuration file).

Pass *password*
specifies a 1- to 8-character password that matches the one specified by an APPL definition statement when VTAM was configured. A PASS operand is not needed on the NETWORK command if no password was defined on the APPL statement.

RETry *nn*
specifies the number of retries to be attempted if the OPEN macro for the VTAM ACB fails. Retries are attempted at one minute intervals. This can be any decimal number, 0 - 99. A 0 means that no retries are attempted. The default is 3.

RPLs *nnnnnnn*
specifies the maximum number of simultaneous session initialization requests that can be passed to VTAM. This can be any decimal number, 1 - 4194303. The default is 100.

Note: If you are not sure what number to use for this operand, it is recommended that you specify a number that reflects the average number of SNA links on your system that are started at one time.

TRace
starts or stops the logging of I/O activity with VTAM.

ALL
starts the full-buffer logging of I/O activity.

LOG
starts the partial-buffer logging of I/O activity.

OFF
stops all I/O logging activity and starts printing the log data.

TO *userid*
TO SYSTEM
identifies the virtual machine to receive the log output. If the output is to be sent to the system unit record device, the *userid* must be specified as SYSTEM.

If TO is omitted, RSCS sends the log output to the user ID specified on the TRACEDEST configuration file statement. If a TRACEDEST statement is not specified, RSCS sends the output to the local printer.

nodeid
is the name of the remote destination location. When *userid* or SYSTEM is specified with a *nodeid*, they can identify a virtual machine, a workstation, a 3270 printer, or the system record device on the specified remote system. If the *nodeid* is not specified, the local system is assumed.

Usage Notes

1. To stop the RSCS-VTAM interface more quickly, you can enter a NETWORK HALT QUICK command while a NETWORK HALT is in progress. If you enter a NETWORK HALT while a NETWORK HALT QUICK or a previous NETWORK HALT is in progress, the new NETWORK HALT is still accepted, but it does not affect the processing speed.
2. Once you start logging I/O activity, you can switch from full-buffer to partial-buffer or from partial-buffer to full-buffer by entering another NETWORK TRACE command and specifying the other option (ALL or LOG).
3. If you specify the TO operand, RSCS sends the log output file to the specified virtual machine after you enter either:

   a. NETWORK TRACE OFF command (to close the log output file)

   b. NETWORK HALT command (to stop the SNA control task)

   Therefore, you can change the routing after log activity has started by entering another NETWORK TRACE command and specifying the TO operand.

4. If someone tries to route a log output file to an MRJE-type link in workstation mode, RSCS will purge the file. This occurs because an MRJE-type link in workstation mode is intended to handle only job data; it will not handle log output.
5. To see the status of the SNA control task, use the QUERY SYSTEM NETWORK command. For more information, see “QUERY SYSTEM NETWORK” on page 238.

ORDER

Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, R, S, U

Purpose

The ORDER command causes RSCS to rearrange the file queue for a particular link as specified. This command redefines the order of processing particular files on the link. RSCS places the specified files at the start of the link queue in the specified order. RSCS tries to keep the files in that order, but the order may change based on other factors. For example, if you re-IPL or change the routing of files, this affects the order of the file queue.

Operands

linkid
is the name of the link on which the file queue is to be reordered. If you enter the command from a remote workstation, you must omit this operand.

spoolid
is the spool ID of an affected file. The order in which they are specified defines the new order in which they are queued. Do not specify the same spool file identifier twice, or you may get unpredictable results.

PORT

Authorization

C, S, U

Purpose

The PORT command temporarily connects or disconnects a switched telecommunication line that is used for either an auto-answer or autodial link. This line can be enabled later using the RSCS ENABLE command.

PORT also temporarily reserves a new port for later dynamic allocation by RSCS to a link and its associated BSC telecommunication line. Addresses specified on PORT statements are kept in reserve for use if an address was not specified by the usual means, such as on a LINKDEFINE (or LINK) statement or on a DEFINE or START command for a link. If no address is specified when the link is started, RSCS chooses one from its reserve for dynamic allocation.

To permanently change a port definition, you must modify the PORT statement in the RSCS configuration file. For information on the PORT statement, see *z/VM: RSCS Networking Planning and Configuration*.

Operands

ccuu
is the virtual device address of the port to be defined or redefined. The value is in the range X'0002' - X'FFFF', except for numbers on the virtual channels reserved for use by RSCS (by default, X'0F01' - X'0FFF', or as specified on the CHANNELS statement).

DIAL
specifies that the port's line is connected to the public switched telephone network through a modem that has an attached automatic calling unit (ACU), and that its associated link is to be an autodial link.

NODial
specifies that:

- The port is connected to the public switched telephone network and is available for an auto-answer link, but has no attached ACU.
- The associated link is defined to be unavailable as an autodial link, as when the ACU is malfunctioning.

OFF
makes the previously defined port unavailable for dynamic allocation by RSCS.

Usage Notes

Do not assign a port to a burst mode channel path that has other ports or BSC devices attached. For more information about defining the RSCS virtual machine, see *z/VM: RSCS Networking Planning and Configuration*.

PURGE

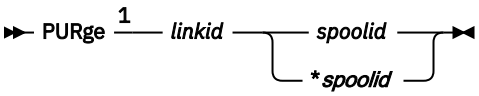
Purpose

The PURGE command causes a specified inactive file for a particular link to be removed from the system before being processed. Any file may be purged, regardless of its status, if it has not been selected for transmission.

This command has two formats:

- Use format 1 to manipulate a file that you originated or that is destined for you, but you are not authorized for this link.
- Use format 2 if you are authorized for this link.

Format 1



Notes:

[1] The *linkid* must be specified by link-authorized alternate operators only; all others must omit this operand.

Authorization 1

G, L (not authorized for this link), U (not authorized for this link)

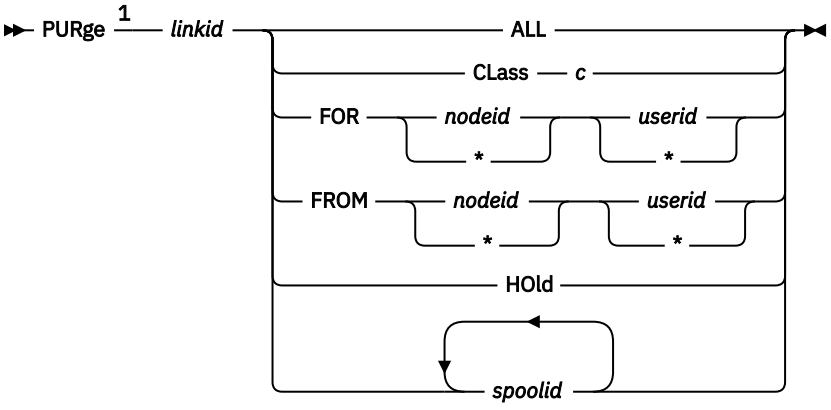
Operands 1

linkid
is the name of the link on which the file is queued. This operand must be specified by link-authorized alternate operators who are not authorized for this link. General users and users authorized through RSCSAUTH for this command but not this link must omit the *linkid*.

spoolid
is the *current* spool file identifier for the file to be purged.

****spoolid***
specifies the *origin* spool file identifier for the file to be purged.

Format 2



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization 2

C, L (authorized for this link), R, S, U (authorized for this link)

Operands 2

linkid
is the name of the link on which the files to be removed are queued. If you enter the command from a remote workstation, you must omit this operand.

ALL
purges the entire queue of files on the link.

CLass *c*
purges all class *c* files queued on the link.

FOR *nodeid userid*
purges all files destined for a particular virtual machine. To specify a generic node ID or user ID, place an asterisk (*) as the last character of the node ID or user ID. To specify all nodes or all users, use an asterisk (*) in place of the node ID or user ID. For example, if you specified:

```
FOR PRT* *
```

it would effect all users on nodes whose first three characters are PRT.

FROM *nodeid userid*
purges all files coming from a particular virtual machine. To specify a generic node ID or user ID, place an asterisk (*) as the last character of the node ID or user ID. To specify all nodes or all users, use an asterisk (*) in place of the node ID or user ID. For example, if you specified:

```
FROM VM* *
```

it would effect all users on nodes whose first two characters are VM.

HOld
purges all files queued on the link that are in hold status.

spoolid
is the *current* spool file identifier for the file to be purged. You can specify multiple spool IDs.

Usage Notes

If your local system has used the ROUTE command (or statement) to generate routes with multiple links, there may be tag shadow elements representing the file on several different links. When you use the PURGE command, RSCS automatically purges all associated tag shadow elements as well.

QUERY

Authorization

C, G, R, S, U

Purpose

The QUERY command displays status information for RSCS files, groups, links, nodes, queues, or the RSCS system. RSCS responds to QUERY requests using informational messages. For an explanation of the message format, see *z/VM: RSCS Networking Messages and Codes*.

Many of the QUERY operands have filters and SHOW or DISPLAY options. For more information, see:

- "Using QUERY Command Filters" on page 188
- "Using QUERY Command SHOW Options" on page 189
- "Using QUERY Command DISPLAY Options" on page 190

Operands

- "QUERY FILES" on page 191
- "QUERY GROUP" on page 197
- "QUERY LINKID" on page 198
- "QUERY LINKS" on page 199
- "QUERY NODE" on page 206
- "QUERY NODEID" on page 207
- "QUERY QUEUES" on page 208
- "QUERY SYSTEM" on page 214

General Usage Notes

1. If the RSCS console operator enters a QUERY command, RSCS sends the response to the RSCS operator's console. If a remote operator enters a QUERY command, RSCS prints the response on the remote workstation printer. Other virtual machine users can enter the QUERY command by prefacing it with the CP SMSG command.
2. Some QUERY commands generate many responses containing much information. To make these responses easier to read, RSCS formats them into columns of information. Each column has its own header indicating what type of information is in the column. For more information about which QUERY commands display responses in columnar format and for a list of column headings, see *z/VM: RSCS Networking Messages and Codes*.

   If adjacent column headers contain identical words, RSCS formats the header so the words are not duplicated. For example, if you enter a QUERY FILES command with SHOW options TONODE and TOUSER, RSCS formats the header to look like this:

   ```
     Destination
   Node     Userid
   ```

3. When you specify QUERY *id* (*linkid* or *nodeid*) with no other options, RSCS firsts checks to see if the *id* is a link ID. If there is no link ID by that name, RSCS checks to see if the *id* is a node ID. If there is no link ID or node ID by that name, RSCS sends you an error message.

   In most cases, the node ID of a node and the link ID to that node will be the same. In that case, RSCS gives you information about the link. If your installation has used the NODE operand (which lets you use a nickname for the link ID), RSCS gives you information about the node and the link.

4. RSCS can propagate four of the QUERY commands through the network: QUERY FILES, QUERY NODE, QUERY *nodeid*, and QUERY QUEUES. This saves you from having to send the same QUERY command to multiple nodes when trying to locate something in the network.

   For QUERY NODE and QUERY *nodeid*, the PATH option automatically propagates the command through the network.

   For QUERY FILES and QUERY QUEUES, command propagation happens automatically if you use the TO filter with a specific node ID. To prevent this propagation, specify either the NOPROP or ON *linkid* filters.

Using QUERY Command Filters

1. Filters let you request specific information from RSCS, thereby eliminating extraneous information you do not need to see. For example, if you want information about a specific exit point, but you do not need to see all of the exit points, you can enter:

   ```
   query system exits number 24
   ```

2. If you specify more than one filter on your QUERY command, RSCS shows you information about only those items that match all the filters entered. For example, if you enter either of these commands:

   ```
   query links fifo type 3270p
   query system links fifo type 3270p
   ```

   RSCS shows you information about all 3270P-type links that queue files in a first-in, first-out order.

3. RSCS does not check to see if you have entered conflicting filters or options. For example, if you enter:

   ```
   query files hold nohold
   ```

   RSCS does not show you any information because there are no files that are being held and not held at the same time.

4. If you choose a QUERY filter or option that requires you to specify a decimal or hexadecimal number, you can optionally choose to place a *sign* before that number. You must use a blank before and after *sign* to separate it from the option and the number. If you do not, RSCS will not recognize that it is a *sign* and you will get an error message.

   The *sign* can be any one of the following:

   =
   Equal to the number. This is the default.

   <
   Less than, but not including, the number.

   >
   Greater than, but not including, the number.

   <=
   Less than or equal to the number.

   >=
   Greater than or equal to the number.

   <>
   Less than or greater than, but not equal to, the number.

   ¬=
   Not equal to the number.

   ¬<
   Not less than the number.

   ¬>
   Not greater than the number.

Except for the ON and TO filters, you can specify a filter more than once in the same QUERY command. For example, if you want information about all files with a dispatching priority in the range 2 - 4, you can enter any one of the following QUERY commands:

```
query files priority >= 2 priority <= 4
query files priority >= 2 priority < 5
query files priority > 1 priority <= 4
query files priority > 1 priority < 5
```

5. If you chose a QUERY filter or option that requires you to specify one or more character strings, you can specify these strings generically by ending the string with an asterisk (*) or by just specifying an asterisk. For example, if you enter:

   ```
   query files name dmt* m*
   ```

   You will see a list of all files that have a file name beginning with the character string "DMT" and a file type beginning with "M". You will see a list of all SCRIPT files if you enter:

   ```
   query files * script
   ```

Using QUERY Command SHOW Options

1. SHOW options tell RSCS how to format the response by letting you specify the exact columns of information you want to see.
2. You can specify several SHOW options on the same QUERY command. If you enter more than one option, you can separate the options with a plus sign (+) or a minus sign (-) to tell RSCS exactly what you want to see. You must separate the options and the signs with blanks. If you chose not to use the signs, RSCS assumes there is a plus sign between the options. For example, the following QUERY commands all give you the same response:

   ```
   query system exits on show number status
   query system exits on show number + status
   query system exits on show full - epname - epaddr
   query system exits on show none number status
   query system exits on show none + number + status
   ```

3. Although you can specify as many SHOW options as you want, the response cannot be longer than 132 characters. If you specify a combination of SHOW options that generates a message longer than 132 characters, RSCS truncates the column or columns that will not fit and issues message DMT619I. RSCS does not truncate the message in the middle of a column.

   For example, RSCS will display only the link IDs if you specify:

   ```
   query system links show id + parmfull
   ```

   The PARMFULL option is 132 characters wide. When specified with the ID option, the message is longer than 132 characters and so RSCS truncates the entire PARMFULL column.

4. RSCS reads the SHOW options from left to right. For example, to see the NAME, LINE, and TYPE columns, enter:

   ```
   show name - type + line + type
   ```

   If you enter the following, you will see only the NAME and LINE columns:

   ```
   show name + type + line - type
   ```

5. Each group of SHOW options includes FULL and NONE. The FULL option gives you a composite of default options. The NONE option tells RSCS you want to see totals, not columns of information.

   Besides FULL, many QUERY commands have composites of other default options. For example, QUERY SYSTEM REROUTES has the composite options FOR, FULL, and TO. Many composite options contain the same columns. If you specify more than one composite option and they contain the same columns, RSCS displays the column only once.

6. If you see a string of X characters instead of the information you were expecting, an operator used the hide character to prevent you from seeing the information. Operators can use hide characters to mask sections of the RSCS configuration file and sections of the RSCS events file. The following statements and commands can specify the hide character:
   - DEFINE command (PARM and UPARM operands)
   - PARM statement
   - SCHEDULE command
   - START command (PARM and OPARM operands)
   - UPARM statement.

   Besides these statements and commands, operators can also use the hide character in the events file for your local system. Until an operator removes the hide characters from the statement, command, or events file, you will not be able to query the information.
7. When you enter the QUERY FILES command with the SHOW STATUS option, RSCS displays the status of the file, in this order:

   sys-hold
   File is in system hold.

   user-hold
   File is in user hold.

   spec-hold
   File was put in a special hold by a NOTIFY-type link.

   hop-loop
   File is in a hop-count loop.

   immed-loop
   File is in an immediate loop.

   exit-hold
   File is being held by Exit 31.

   no stream
   File was given no streams by the transmission algorithm.

   trace
   Open trace file.

   sending
   File is being transmitted.

   receiving
   File is being received.

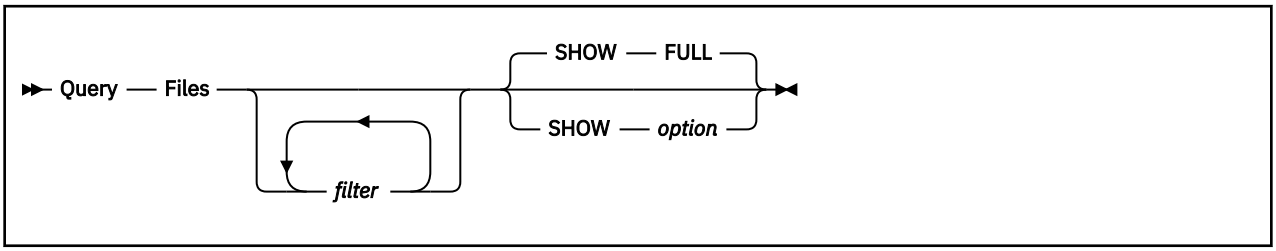
   waiting
   File is waiting to be sent.

   If a file qualifies for more than one of these status types, RSCS displays only the first one. For example, if a file is in SYS-HOLD and IMMED-LOOP, RSCS tells you the file is in SYS-HOLD. To find out more about the file's status, use a more specific option, like HOLD or LOOPING.

Using QUERY Command DISPLAY Options

DISPLAY options tell RSCS which of several preformatted displays to use in response to your QUERY command. DISPLAY options are similar to composite SHOW options, except that you cannot add or subtract columns from the preformatted DISPLAY response. For additional information about columnar messages, see *z/VM: RSCS Networking Messages and Codes*.

QUERY FILES



Authorization

C, G, R, S, U

Purpose

The QUERY FILES command requests information about files currently present on a node. The files may be receiving, sending, waiting to be sent, or held in some manner.

Note: The QUERY FILES and QUERY QUEUES commands are very similar in function. QUERY FILES displays information about a file. QUERY FILES does not display information about which link (or links) RSCS queued the file on. QUERY QUEUES displays information about where the file is located in the network. If someone sends a file to multiple links, the file may be queued on several links, causing you to receive several messages about the same file. For more information about QUERY QUEUES, see "QUERY QUEUES" on page 208.

Operands

filter
is a filter that selects a group of files. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

ACTive
Files being sent or received.

BLocks *sign size*
Files less than, greater than, or equal to a specific block size; *size* is the decimal number of blocks and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

CLass *c*
Files with a specific spool class.

DEST *destname*
3820 files with a specific PSF destination.

DIST *code*
Files with a specific distribution code.

FILEName *filename*
Files with a specific file name.

FILEType *filetype*
Files with a specific file type.

FN *filename*
Files with a specific file name.

FROM *nodeid userid*
Files from a specific user or virtual machine.

FOrm *formname*
Files with a specific user form name.

FT *filetype*
Files with a specific file type.

HOld
Files in hold status.

INActive
Inactive files in the queue.

INgroup *groupid*
Any queued or active files destined to nodes belonging to a specific routing group.

LOOPing
Files in looping status.

NAME *fn ft*
Files with a specific file name and file type.

NOHold
Files not in hold status.

NOPROP
Files at your local node. (This QUERY command is not propagated to other nodes in the network.)

OFOrm *formname*
Files with a specific operator form name.

ON *linkid*
Any queued or active files on that specific link.

OSPid *sign spoolid*
Files less than, greater than, or equal to a specific origin spool identifier; *spoolid* is the decimal spool ID number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

PRINTer
Files being sent to printers.

PRIority *sign nn*
Files with a specific transmission priority; *nn* is the decimal transmission priority number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

PRT
Files created on a virtual printer.

PUNch
Files created on a virtual punch.

RECEiving
Files being received on a link.

RECords *sign num*
Files less than, greater than, or equal to a specific number of records; *num* is the decimal number of records and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SENDing
Files being transmitted on a link.

SPECHOld
Files put into a special hold by a NOTIFY-type link.

SPid *sign spoolid*
Files less than, greater than, or equal to a specific local spool identifier; *spoolid* is the decimal spool ID number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

TO *nodeid userid*
Files being sent to a specific user or virtual machine.

Note: If you specify the TO filter with a specific node ID, RSCS automatically propagates this command throughout the network. To prevent this propagation, also specify either the NOPROP filter or the ON *linkid* filter.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

ACcmsg
Accepted message setting.

BASE
Tag slot address.

BLOCKs
Total number of blocks in the file, or if the file is being received, total number of expected blocks.

BLOCKSDone
Number of blocks transmitted or received thus far.

CHAR0
Character translation table number 0.

CHAR1
Character translation table number 1.

CHAR2
Character translation table number 2.

CHAR3
Character translation table number 3.

CLass
Spool file class.

COpies
Spool file copy count.

COpy
Spool file copy count.

COUNT
Flash count.

DEST
PSF destination.

DESTInfo
Destination node ID and destination user ID, in that order.

DEVice
Virtual device type used to create the file (printer, punch, 3800-1, 3800-3, 3800-8, or unknown).

DIST
Distribution code.

DSName
Data set name.

ENQmsg
Enqueue message setting.

FCB
Forms control buffer name.

FILEInfo
File name, file type, spool file class, priority, and distribution code, in that order.

FILEName
File name.

FILEType
File type.

FINalmsg
Final message setting.

FLash
Flash name.

FN
File name.

FOrm
User form name.

FROMNode
Origin node ID.

FROMQual
Origin node qualifier (only for files originating from an MVS™ system).

FROMUser
Origin user ID.

FT
File type.

FULL
Spool ID, origin spool ID, origin node ID, origin user ID, destination node ID, destination user ID, and status, in that order. This is the default.

HOld
Hold status of files.

ID
Spool ID.

Jobid
Five-digit job identifier of files.

LOOPing
Looping status of files.

MODify
Name of copy modification module.

MSGInfo
Accept, queue, sent, and final message settings, in that order.

NONE
Nothing; just show total number of files found.

OFOrm
Operator form name.

ORDered
The ordered status of files

ORIGID
Origin spool ID.

ORIGInfo
Origin spool ID, origin node ID, origin user ID, origin node qualifier, and network origin time of file, in that order.

OSPid
Origin spool ID.

OTIme
Time the file entered the network.

OVerridenode
Name of the node to which RSCS will queue the file regardless of the destination node originally specified for the file.

PREFlink
Preferred link for printing this file. (This column applies only to files with multiple copies.) RSCS "prefers" to print a file with multiple copies on the same printer. Therefore, when the first of several copies of a file begins printing, RSCS marks the link to that printer as "preferred" so that the other copies of the file will print on the same printer.

PREVNode
Name of the previous node that this file was on. If there is no previous node, RSCS displays an ellipsis (...) in this column.

PRIority
Priority.

PROGRESS
Spool ID, origin spool ID, destination node ID, destination user ID, number of records transmitted or received thus far, total number of records (or if the file is being received, total number of expected records), and status, in that order.

PROGRESSBlocks
Spool ID, origin spool ID, destination node ID, destination user ID, number of blocks transmitted or received thus far, total number of blocks (or if the file is being received, total number of expected blocks), and status, in that order.

PRTInfo
User form name, operator form name, spool file copy count, forms control buffer name, and device type, in that order.

QInfo
Spool ID and status, in that order.

RECords
Total number of records in the file, or if the file is being received, total number of expected records.

RECSDone
Number of records transmitted or received thus far.

RERouted
Files in reroute status.

Rscs
Spool ID, origin spool ID, origin node ID, origin user ID, network origin time of file, destination node ID, and destination user ID, in that order.

SANDFwd
The store-and-forward status of files.

SEntmsg
Sent message setting.

SPid
Spool ID.

STATInfo
Hold, looping, reroute, store-and-forward, and ordered status of files, in that order.

STatus
Status of the file (sys-hold, user-hold, spec-hold, hop-loop, immed-loop, exit-hold, no stream, trace, sending, receiving, or waiting). For more information about this option, see usage note “7” on page 190.

TOInfo
Origin spoolid, time the file entered the network, file name, file type, destination node ID, and destination user ID, in that order.

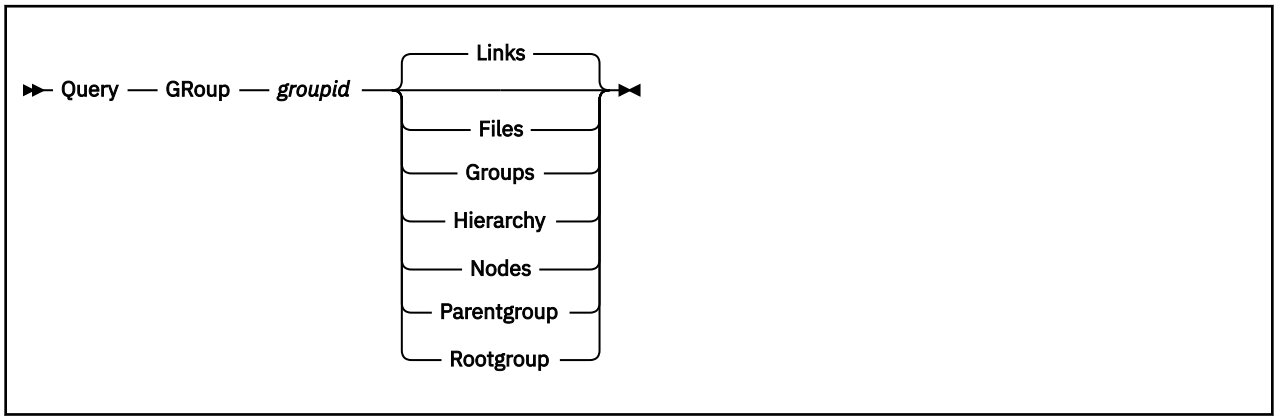
TONode
Destination node ID.

TOUser
Destination user ID.

Vm
Location ID, file name, file type, spool file class, distribution code, PSF DEST, user form name, and operator form name, in that order.

3800Info
Flash name, flash count, name of copy modification module, and character translation tables 0, 1, 2, and 3, in that order.

QUERY GROUP



Authorization

C, G, R, S, U

Purpose

The QUERY GROUP command requests information about an existing routing group.

Operands

groupid
is the name of the routing group you want information about.

Files
displays the number of files destined for the specified routing group or any of its subordinate groups.

Groups
displays the groups in the specified routing group.

Hierarchy
displays the hierarchy of nodes leading from the specified routing group to its root group.

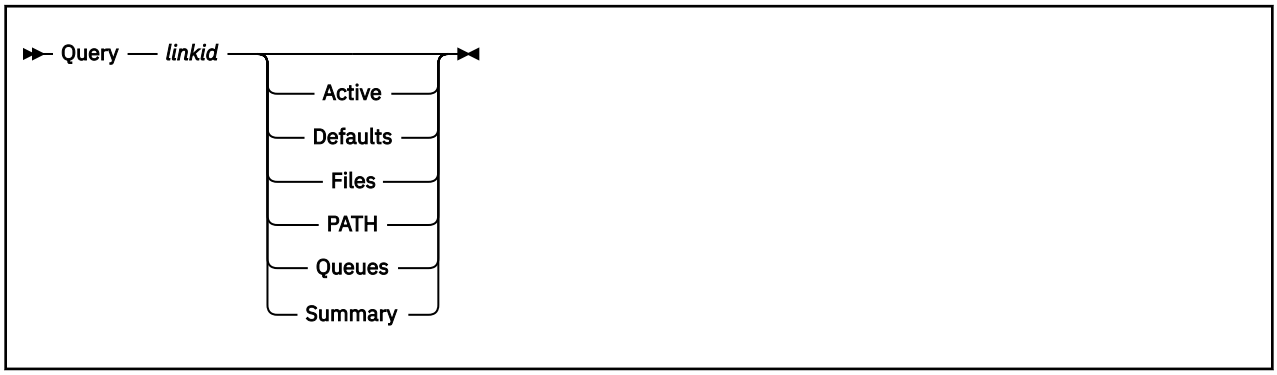
Links
displays the link or links the routing group is routed through. This is the default.

Nodes
displays the nodes in the specified routing group.

Parentgroup
displays the name of the parent group of the specified routing group. If this routing group is a root group, RSCS displays an ellipsis (...) instead of the name.

Rootgroup
dDiplays the name of the root group of the specified routing group. If this routing group is a root group, RSCS displays the name of the specified routing group instead of the name of the root group.

QUERY LINKID



Authorization

C, G, R, S, U

Purpose

The QUERY LINKID command requests information about a specific link.

Operands

linkid
is the name of link you want information about.

Active
displays information about the active files, both incoming and outgoing.

Defaults
displays information about the defined default attributes of the link.

Files
displays information about the files associated with a link (sending, receiving, queued, looping, and held).

PATH
displays information about the routing path for the node associated with this link.

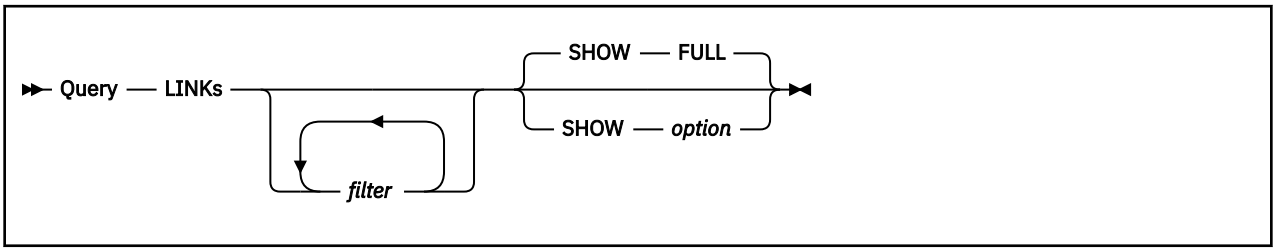
Queues
displays information about the files queued on this link. (The information appears in summary form and in list form.)

Summary
displays information about the I/O transactions, errors, and timeouts on the link.

Usage Notes

When TCPNJE "active" or "connect" links are queried an additional column with the header TLS will be included. This will have a "yes" or "no" to indicate whether the link has been defined to be secure using TLS protocols once connected.

QUERY LINKS



Authorization

C, G, R, S, U

Purpose

The QUERY LINKS command requests information about links currently defined in the network.

Operands

filter
is a filter that selects a group of links. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

ACTive
Active links.

ASTart
Links with autostart enabled.

AUto
Links with automatic forms setup.

CLass *c*
Links with a specific transmission spool class.

CONNect
Links with connect status.

DIalqueue
Links in dial-up queue status.

DP *sign nn*
Links with a specific dispatching priority; *nn* is the decimal dispatching priority number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

DRAin
Links with a pending DRAIN command.

FANout *linkid*
Links with a specific fanout link.

FIFO
Links with files queued in first-in, first-out order.

FOrm *formname*
Links with a specific forms name.

HELD *sign nnnn*
Links with a specific number of files being held; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

HOld
Links in hold status.

INActive
Inactive links.

INPuthold
Links with incoming traffic on hold. The incoming traffic is on hold because a HOLD INPUT command is in effect at the node on receiving side of the link. The HOLD INPUT command may have been issued by an operator or by RSCS when the link went into slowdown mode.

INTreq
Links requiring operator intervention.

LINE *sign ccuu*
Links with a specific virtual device number; *ccuu* is the hexadecimal virtual device number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

LOGMode *logmode*
Links with a specific SNA logmode.

LOGOnwait
Links whose START command has been processed by the SNA control task and that are waiting for VTAM to notify RSCS to start the session.

LOOPing *sign nnnn*
Links with a specific number of files that are looping; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

LUName *luname*
Links with a specific SNA LU name.

MAnual
Links in manual forms setup mode.

NAME *linkid*
Links with a specific link identifier.

NETworking
Networking links (LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links).

NOASTart
Links that do not have autostart enabled.

NOCONNect
Links not in connect status.

NODE *nodeid*
Links that connect to a specific node.

NODrain
Links that do not have a pending DRAIN command.

NOHold
Links not in hold status.

NOINActive
Links that are not inactive. These include links that have active, connect, dial-queue, intreq, released, retry-wait, and starting status.

NONNETworking
Non-networking links (ASCII-type, GATEWAY-type, LPD-type, LPR-type, MRJE-type, NOTIFY-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, TN3270E-type, UFT-type, UFTD-type, and 3270P-type links).

NONSNA
Non-SNA links (ASCII-type, GATEWAY-type, LISTPROC-type, LPD-type, LPR-type, MRJE-type, NJE-type, NOTIFY-type, RJE-type, TCPASCII-type, TCPNJE-type, TN3270E-type, UFT-type, UFTD-type, and 3270P-type links).

NOTRace
Links where tracing is not active.

OUTPuthold
Links with outgoing traffic on hold. The outgoing traffic is on hold because a HOLD INPUT command is in effect at the destination node on the other side of the link. The HOLD INPUT command may have been issued by an operator or by RSCS when the link went into slowdown mode.

PRIority
Links which queue files by their priority.

Queued *sign nnnn*
Links with a specific number of files queued; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

RECeiving *sign nnnn*
Links with a specific number of files being received; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

RELeased
Links released to another VTAM application.

RETrying
Inactive links attempting to restart.

RETRYOption
Links that have specified the RETRY operand.

RPLWait
Links whose start command cannot be processed by the SNA control task because there is a temporary short of SIMLOGON RPLs being managed by the SNA control.

Note: If there are generally many links with a status of RPL-WAIT, or if one or more links is in this status for a long period, you should increase the number specified on the RPLs option on the NETWORK START command. Usually, the value specified for the RPLs option should be equal to the average number of links started at one time, plus the number that are in starting status for a long period.

SENDing *sign nnnn*
Links with a specific number of files being sent; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SETup
Links started in forms set-up mode.

SIZE
Links which queue files by size.

SLOWDElta *sign nnnn*
Links that specified the SLOWDOWN operand on a LINKDEFINE statement or a DEFINE command to add (or subtract) a delta value to (or from) the system slowdown values; *nnnn* is the decimal delta value and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SLOWSTArt *sign nnnn*
Links with a specific slowdown start value; *nnnn* is the slowdown start value and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SLOWSTOp *sign nnnn*
Links with a specific slowdown stop value; *nnnn* is the slowdown stop value and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SLOWUNique
Links that specified the SLOWDOWN operand on a LINKDEFINE statement or a DEFINE command to define slowdown values for that link because there are no system slowdown values.

SNA
SNA links (SNANJE-type, SNARJE-type, and SNA3270P-type links).

STARTing
Links that are starting.

TCPip
TCP/IP links (LPD-type, LPR-type, TCPASCII-type, TCPNJE-type, UFT-type, and UFTD-type links)

TRace
Links for which tracing is in effect.

TYPE *type*
Links of a specific type (ASCII, GATEWAY, LISTPROC, LPD, LPR, MRJE, NJE, NOTIFY, RJE, SNANJE, SNARJE, SNA3270P, TCPASCII, TCPNJE, TN3270E, UFT, UFTD, 3270P, or one defined using the LINKTYPE statement).

WAITFOrm
Links waiting for an operator to change the form.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

ACTive
Link ID, link status, link type, line address, SNA LU name, SNA logmode, transmission spool class, type of queuing used on the link, and dispatching priority, in that order.

ASTart
Autostart status of a link.

BASE
Base address of the link table (LINKTABL).

BUFFersize
Size of the transmission buffers used on a link. If this link is not active or if this is a NOTIFY-type link, RSCS displays an ellipsis (...) instead of the buffer size.

CLass
Transmission spool class.

COUNTs
Link ID, link status, number of files being transmitted, number of files being received, number of files queued, number of files in looping status, and number of files being held, in that order.

DEFault
Link ID, default link type, default line address, default SNA LU name, default SNA logmode, default transmission spool class, default type of queuing used on the link, and default dispatching priority, in that order.

DEFCLass
Default transmission spool class.

DEFDP
Default dispatching priority.

DEFLINE
Default line address.

DEFLOGMode
Default SNA logmode.

DEFLUName
Default SNA LU name.

DEFPARM
First 50 bytes of default text from the PARM operand of the link. (For information about hidden text, see usage note "6" on page 190.)

DEFPARMFull
Full 132 bytes of default text from the PARM operand of the link. (For information about response truncation, see usage note "3" on page 189; for information about hidden text, see usage note "6" on page 190.)

DEFQType
Default type of queuing used on a link.

DEFTYPE
Default link type.

DP
Dispatching priority of a link.

DRAin
Links in drain status.

FANout
Fanout link. If you did not define a fanout link, RSCS displays the link ID of the link rather than the fanout link ID.

FCBInfo
Link name, name of the FCB image, and type of FCB processing, in that order.

FCBMode
Type of FCB processing (dynamic, ignore, or selection).

FCBName
Name of the FCB image that this link will process. If this link does not have an FCB name defined, RSCS displays an ellipsis (...) instead of the FCB name.

FOrm
Current form name on a link.

FULL
Link ID, link status, link type, line address, SNA LU name, SNA logmode, and type of queuing used on the link, in that order. This is the default.

HELD
Number of files being held on a link.

HOld
Links in hold status.

ID
Link identifier.

LINE
Line address.

LOGMode
SNA logmode.

LOOPing
Number of files in looping status on a link.

LUName
SNA LU name.

MOde
Mode used on a link (AUTO, MANUAL, or SETUP).

NAME
Link identifier.

NODE
Name of the peer node at the other end of the link.

NONE
Nothing; just show total number of links found.

OPARM
First 50 bytes of override text from the OPARM operand of the link. (For information about hidden text, see usage note "6" on page 190.)

OPARMFull
Full 132 bytes of override text from the OPARM operand of the link. (For information about response truncation, see usage note "3" on page 189; for information about hidden text, see usage note "6" on page 190.)

PARM
First 50 bytes of text from the PARM operand of the link. (For information about hidden text, see usage note "6" on page 190.)

PARMFull
Full 132 bytes of text from the PARM operand of the link. (For information about response truncation, see usage note "3" on page 189; for information about hidden text, see usage note "6" on page 190.)

QType
Type of queuing used on a link.

Queued
Number of files queued on a link.

RECeiving
Number of files being received on a link.

RETRIESDone
Number of retries done on a link.

RETRYInfo
RETRY operand setting, number of retries done on the link, and number of minutes until the next retry, in that order.

RETRYINTerval
Number of minutes until the next retry.

RETRYOption
RETRY operand setting (yes or no).

SENDing
Number of files being transmitted on a link.

SLOWDElta
Difference (delta) between system slowdown values and the slowdown values for the link.

SLOwdown
Link ID, type of slowdown value, slowdown delta, slowdown start value, and slowdown stop value, in that order.

SLOWSTArt
Slowdown start value.

SLOWSTOp
Slowdown stop value.

SLOWMOde
Type of slowdown value (absolute or relative).

STatus
Link status.

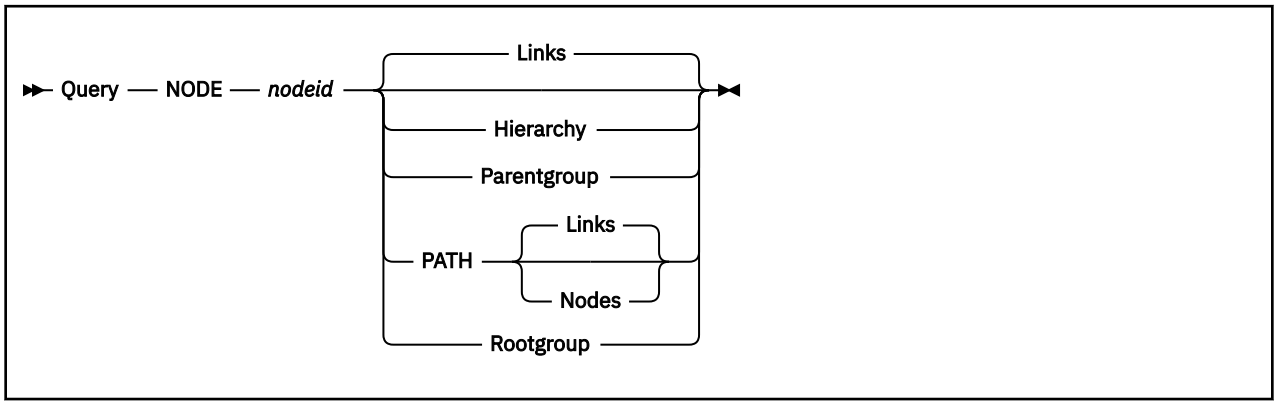
TRace
Trace status.

TYPE
Link type (ASCII, GATEWAY, LISTPROC, LPD, LPR, MRJE, NJE, NOTIFY, RJE, SNANJE, SNARJE, SNA3270P, TCPASCII, TCPNJE, TN3270E, UFT, UFTD, 3270P, or one defined using the LINKTYPE statement).

UPARM
First 50 bytes of user text from the UPARM operand of the link. (For information about hidden text, see usage note "6" on page 190.)

UPARMFull
Full 132 bytes of user text from the UPARM operand of the link. (For information about response truncation, see usage note "3" on page 189; for information about hidden text, see usage note "6" on page 190.)

QUERY NODE



Authorization

C, G, R, S, U

Purpose

The QUERY NODE command requests information about a node. Use this command (rather than QUERY *nodeid*) if you have a group or link with the same name as the node.

Operands

nodeid
is the name of the node you want information about.

Hierarchy
displays the hierarchy of nodes leading from the specified node to its root group.

Links
displays the links the node is routed through. This is the default.

Parentgroup
displays the name of the parent group of the specified node. If this node is not part of a routing group, RSCS displays an ellipsis (...) instead of the name.

PATH
displays the path to the specified node. After RSCS discovers the route to the specified node, it propagates the QUERY command to the next node in the route, until it reaches the final node.

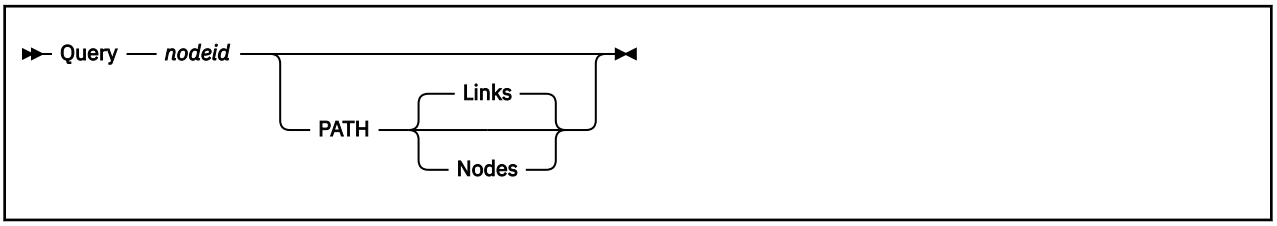
Because RSCS lets you define links with names that are different from the nodes to which they connect, you can specify whether you want to display the link IDs or the node IDs.

Links
displays the names of the links in the path that connects your local system to the specified node. This is the default.

Nodes
displays the names of the nodes in the path that connects your local system to the specified node.

Rootgroup
displays the name of the root group of the specified node. If this node is not part of a routing group, RSCS displays an ellipsis (...) instead of the name.

QUERY NODEID



Authorization

C, G, R, S, U

Purpose

The QUERY *nodeid* command requests information about how RSCS reaches a remote node.

Operands

nodeid
is the name of the node you want information about.

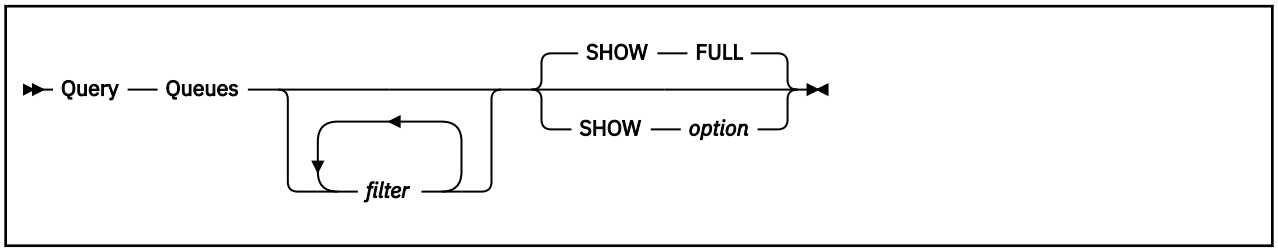
PATH
specifies that after RSCS discovers the route to the specified node, it should propagate the QUERY command to the next node in the route, until it reaches the final node.

Because RSCS lets you define links with names that are different from the nodes to which they connect, you can specify whether you want to display the link IDs or the node IDs.

Links
displays the names of the links in the path that connects your local system to the specified node. This is the default.

Nodes
displays the names of the nodes in the path that connects your local system to the specified node.

QUERY QUEUES



Authorization

C, G, R, S, U

Purpose

The QUERY QUEUES command requests information about the files currently present in the queue for a node. RSCS may be in the process of receiving, sending, waiting to send, or holding these files.

Note: The QUERY QUEUES and QUERY FILES commands are very similar in function. QUERY QUEUES displays information about where the file is located in the network. If someone sends a file to multiple links, the file may be queued on several links, causing you to receive several messages about the same file. QUERY FILES displays information about a file. QUERY FILES does not display information about which link or links RSCS queued the file on. For more information about QUERY FILES, see "QUERY FILES" on page 191.

Operands

filter
is a filter that selects a group of files. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

ACTive
Files being sent or received.

BLocks *sign size*
Files less than, greater than, or equal to a specific block size; *size* is the decimal number of blocks and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

CLass *c*
Files with a specific spool class.

DEST *destname*
3820 files with a specific PSF destination.

DIST *code*
Files with a specific distribution code.

EXITHOld
Files being held by Exit 31.

FILEName *filename*
Files with a specific file name.

FILEType *filetype*
Files with a specific file type.

FN *filename*
Files with a specific file name.

FOrm *formname*
Files with a specific user form name.

FROM *nodeid userid*
Files being sent from a specific user or virtual machine.

FT *filetype*
Files with a specific file type.

HOld
Files in hold status.

INActive
Inactive files in the queue.

INgroup *groupid*
Active and queued files destined to nodes belonging to a specific routing group.

LOOPing
Files in looping status.

NAME *fn ft*
Files with a specific file name and file type.

NOHold
Files not in hold status.

NOPROP
Files in the queue on your local node. (This QUERY command is not propagated to other nodes in the network.)

OFOrm *formname*
Files with a specific operator form name.

ON *linkid*
Active and queued files on a specific link.

OSPid *sign spoolid*
Files less than, greater than, or equal to a specific origin spool identifier; *spoolid* is the decimal spool ID number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note “4” on page 188.)

POSinq *sign nnnn*
Files less than, greater than, or equal to a specific position in the queue; *nnnn* is the position number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note “4” on page 188.)

PRINTer
Files being sent to printers.

PRIority *sign nn*
Files with a specific transmission priority; *nn* is the decimal transmission priority number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note “4” on page 188.)

PRT
Files created on a virtual printer.

PUNch
Files created on a virtual punch.

RECEiving
Files being received on a link.

RECords *sign num*
Files less than, greater than, or equal to a specific number of records; *num* is the decimal number of records and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note “4” on page 188.)

SENDing
Files being transmitted on a link.

SPECHOld
Files put into a special hold by a NOTIFY-type link.

SPid *sign spoolid*
Files less than, greater than, or equal to a specific local spool identifier; *spoolid* is the decimal spool ID number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

TO *nodeid userid*
Files being sent to a specific user or virtual machine.

Note: If you specify the TO filter with a specific node ID, RSCS automatically propagates this command throughout the network. To prevent this propagation, also specify either the NOPROP filter or the ON *linkid* filter.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

ACcmsg
Accepted message setting.

BASE
Tag slot address.

BLOCKs
Total number of blocks in the file, or if the file is being received, total number of expected blocks.

BLOCKSDone
Number of blocks transmitted or received thus far.

CHAR0
Character translation table number 0.

CHAR1
Character translation table number 1.

CHAR2
Character translation table number 2.

CHAR3
Character translation table number 3.

CLass
Spool file class.

COpies
Spool file copy count.

COpy
Spool file copy count.

COUNT
Flash count.

DEST
PSF destination.

DESTInfo
Destination node ID and destination user ID, in that order.

DEVice
Virtual device type used to create the file (printer, punch, 3800-1, 3800-3, 3800-8, or unknown).

DIST
Distribution code.

DSName
Data set name.

ENQmsg
Enqueue message setting.

FCB
Forms control buffer name.

FILEInfo
File name, file type, spool file class, priority, and distribution code, in that order.

FILEName
File name.

FILEType
File type.

FINalmsg
Final message setting.

FLash
Flash name.

FN
File name.

FOrm
User form name.

FROMNode
Origin node ID.

FROMQual
Origin node qualifier (only for files originating from an MVS system).

FROMUser
Origin user ID.

FT
File type.

FULL
Position in queue, spool ID, origin node ID, origin user ID, destination node ID, destination user ID, files queued on link, and status, in that order. This is the default.

HOld
Hold status of files.

ID
Spool ID.

Jobid
Five-digit job identifier of files.

LINK
Files queued on link.

LOOPing
Looping status of files.

MODify
Name of copy modification module.

MSGInfo
Accept, queue, sent, and final message settings, in that order.

NONE
Nothing; just show the total number of queues found.

OFOrm
Operator form name.

ORDered
Ordered status of files.

ORIGID
Origin spool ID.

ORIGInfo
Origin spool ID, origin node ID, origin user ID, origin node qualifier, and network origin time of file, in that order.

OSPid
Origin spool ID.

OTIme
Time the file entered the network.

OVerridenode
Name of the node to which RSCS will queue the file regardless of the destination node originally specified for the file.

POSinq
Position in the queue.

PREFlink
Preferred link for printing this file. (This column applies only to files with multiple copies.) RSCS "prefers" to print a file with multiple copies on the same printer. Therefore, when the first of several copies of a file begins printing, RSCS marks the link to that printer as "preferred" so that the other copies of the file will print on the same printer.

PREVNode
Name of the previous node that this file was on. If there is no previous node, RSCS displays an ellipsis (...) in this column.

PRIority
Priority.

PROGRESS
Spool ID, origin spool ID, destination node ID, destination user ID, number of records transmitted or received thus far, total number of records (or if the file is being received, total number of expected records), and status, in that order.

PROGRESSBlocks
Spool ID, origin spool ID, destination node ID, destination user ID, number of blocks transmitted or received thus far, total number of blocks (or if the file is being received, total number of expected blocks), and status, in that order.

PRTInfo
User form name, operator form name, spool file copy count, forms control buffer name, and device type, in that order.

QInfo
Position in the queue, spool ID, files queued on link, and status, in that order.

RECords
Total number of records in the file, or if the file is being received, total number of expected records.

RECSDone
Number of records transmitted or received thus far.

RERouted
Files in reroute status.

Rscs
Spool ID, origin spool ID, origin node ID, origin user ID, network origin time of file, destination node ID, and destination user ID, in that order.

SANDFwd
Store-and-forward status of files.

SEntmsg
Sent message setting.

SPid
Spool ID.

STATInfo
Hold, looping, reroute, store-and-forward, and ordered status of files, in that order.

STatus
Status of the file (sys-hold, user-hold, spec-hold, hop-loop, immed-loop, exit-hold, no stream, trace, sending, receiving, or waiting). For more information about this option, see Usage Note "7" on page 190.

TOInfo
Origin spoolid, time the file entered the network, file name, file type, destination node ID, and destination user ID, in that order.

TONode
Destination node ID.

TOUser
Destination user ID.

Vm
Spool ID, origin spool ID, file name, file type, spool file class, priority, distribution code, user form name, operator form name, and spool file copy count, in that order.

3800Info
Flash name, flash count, name of copy modification module, and character translation tables 0, 1, 2, and 3, in that order.

QUERY SYSTEM

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM command requests information about the RSCS system. If you enter the command with no additional operands, the default is QUERY SYSTEM LINKS, which gives you information about all the links. For additional information about links or for information about other aspects of the RSCS system, specify the appropriate operand. Many of the QUERY SYSTEM operands have filters and SHOW or DISPLAY options.

Operands

- "QUERY SYSTEM ACTIVE" on page 215
- "QUERY SYSTEM COUNTS" on page 216
- "QUERY SYSTEM DEST" on page 221
- "QUERY SYSTEM EXITS" on page 222
- "QUERY SYSTEM GROUPS" on page 224
- "QUERY SYSTEM ITRACE" on page 226
- "QUERY SYSTEM LEVEL" on page 228
- "QUERY SYSTEM LINKS" on page 229
- "QUERY SYSTEM LOADADDRESS" on page 236
- "QUERY SYSTEM LOCAL" on page 237
- "QUERY SYSTEM NETWORK" on page 238
- "QUERY SYSTEM NODES" on page 239
- "QUERY SYSTEM OPTIONS" on page 240
- "QUERY SYSTEM PORTS" on page 241
- "QUERY SYSTEM QUEUES" on page 243
- "QUERY SYSTEM REROUTES" on page 244
- "QUERY SYSTEM SCHEDULE" on page 246
- "QUERY SYSTEM SERVICE" on page 248
- "QUERY SYSTEM SET" on page 249
- "QUERY SYSTEM SETMSG" on page 250
- "QUERY SYSTEM SHIFT" on page 251
- "QUERY SYSTEM SLOWDOWN" on page 252
- "QUERY SYSTEM TCPIP" on page 253
- "QUERY SYSTEM ZONE" on page 254

QUERY SYSTEM ACTIVE

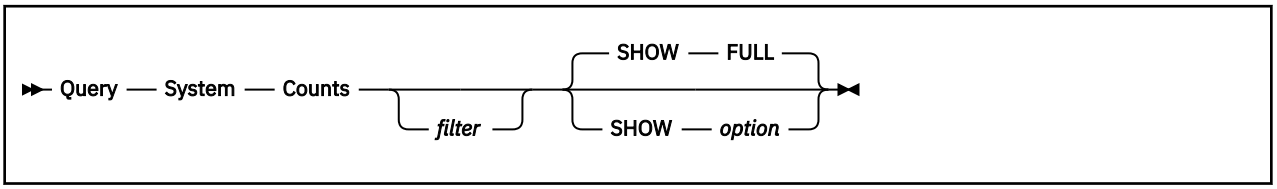
Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM ACTIVE command requests information about all the active links. This includes links with connect, intreq, and released status.

QUERY SYSTEM COUNTS



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM COUNTS command requests information about RSCS traffic statistics. For every link, RSCS keeps track of the number of files and messages sent and received, the number of bytes sent and received, and other performance information (such as spool reads and writes).

Note: The numbers representing byte counts are approximate numbers. Use the QUERY SYSTEM COUNTS command to help you gauge the performance of a specific link or the performance of RSCS overall.

The following counters will reset when these fields reach the maximum value of X'7530' or 30000 decimal:

- FILEIn
- FILEOut
- MSGIn
- MSGOut
- SPReads
- SPWrites

The following counters will reset when these fields reach the maximum value of X'77359400' or 2,000,000,000 decimal:

- FILEINKbytes
- FILEOUTKbytes
- MSGINKbytes
- MSGOUTKbytes

Operands

filter
is a filter that selects a group of links. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

FILEIn *sign nnnnnnnn*
Links that have received a specific number of files; *nnnnnnnn* is the decimal number of files received and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

FILEINKbytes *sign nnnnnnnn*
Links that have received a specific number of file kilobytes; *nnnnnnnn* is the decimal number of file bytes received and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

FILEOut *sign nnnnnnnn*
Links that have sent a specific number of files; *nnnnnnnn* is the decimal number of files sent and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

FILEOUTKbytes *sign nnnnnnnn*
Links that have sent a specific number of file kilobytes; *nnnnnnnn* is the decimal number of file bytes sent and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

IO *sign nnnnnnnn*
Links that have performed a specific number of I/O transactions; *nnnnnnnn* is the decimal number of I/O transactions processed and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

IOERRors *sign nnnnnnnn*
Links that have had a specific number of errors in I/O transactions; *nnnnnnnn* is the decimal number of I/O errors and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

LINEIOTime *sign nnnnnnnn*
Links that have a specific average line I/O time; *nnnnnnnn* is the average number (decimal) of microseconds for RSCS to perform the line I/O and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

LINK *linkid*
Links with a specific link identifier.

MSGIn *sign nnnnnnnn*
Links that have received a specific number of messages; *nnnnnnnn* is the decimal number of messages received and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

MSGINKbytes *sign nnnnnnnn*
Links that have received a specific number of message kilobytes; *nnnnnnnn* is the decimal number of message bytes received and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

MSGOut *sign nnnnnnnn*
Links that have sent a specific number of messages; *nnnnnnnn* is the decimal number of messages sent and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

MSGOUTKbytes *sign nnnnnnnn*
Links that have sent a specific number of message kilobytes; *nnnnnnnn* is the decimal number of message bytes sent and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

NETworking
Networking links (LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links).

NODE *nodeid*
Links connected to a specific node.

NONNETworking
Non-networking links (ASCII-type, GATEWAY-type, LPD-type, LPR-type, MRJE-type, NOTIFY-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, TN3270E-type, UFT-type, UFTD-type, and 3270P-type links).

NONSNA
Non-SNA links (ASCII-type, GATEWAY-type, LISTPROC-type, LPD-type, LPR-type, MRJE-type, NJE-type, NOTIFY-type, RJE-type, TCPASCII-type, TCPNJE-type, TN3270E-type, UFT-type, UFTD-type, and 3270P-type links).

RPLRc *sign nnnn*
Links with a specific RPL return code; *nnnn* is the hexadecimal return code number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

RPLSense *sign nnnn*
Links with a specific RPL sense code; *nnnn* is the hexadecimal sense code and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

RPLUSense *sign nnnn*
Links with a specific RPL user sense code; *nnnn* is the hexadecimal user sense code and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SNA
SNA links (SNANJE-type, SNARJE-type, and SNA3270P-type links).

SPReads *sign nnnnnnnn*
Links that have performed a specific number of spool reads; *nnnnnnnn* is the decimal number of spool reads performed and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SPREADTime *sign nnnnnnnn*
Links that have a specific average spool read time; *nnnnnnnn* is the average number (decimal) of microseconds for RSCS to perform a spool read and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SPWrites *sign nnnnnnnn*
Links that have performed a specific number of spool writes; *nnnnnnnn* is the decimal number of spool writes performed and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SPWRITETime *sign nnnnnnnn*
Links that have a specific average spool write time; *nnnnnnnn* is the average number (decimal) of microseconds for RSCS to perform a spool write and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

TIMEOuts *sign nnnnnnnn*
Links that have a specific number of timeouts; *nnnnnnnn* is the decimal number of timeouts and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

TCPIP
TCP/IP links (LPR-type, LPD-type, TCPASCII-type, TCPNJE-type, UFT-type, and UFTD-type links).

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

BASE
Base address of the LINKSTAT entry.

KBytes
Link ID, number of received file kilobytes, number of sent file kilobytes, number of received message kilobytes, and number of sent message kilobytes, in that order.

FILEIn
Number of files received.

FILEINKbytes
Number of received file kilobytes.

FILEOut
Number of files sent.

FILEOUTKbytes
Number of sent file kilobytes.

FULL
Link ID, number of files received, number of files sent, number of messages received, number of messages sent, number of spool reads performed, and number of spool writes performed, in that order. This is the default.

IO
Total number of line I/O transactions performed.

IOERRors
Total number of I/O errors.

IOTime
Link ID and average time (in microseconds) to perform a spool write, a spool read, and a line I/O transaction, in that order.

LINEIOTime
Average time to perform a line I/O transaction (in microseconds).

LINK
Link identifier.

MSGIn
Number of messages received.

MSGINKbytes
Number of received message kilobytes.

MSGOut
Number of messages sent.

MSGOUTKbytes
Number of sent message kilobytes.

NONE
Nothing; just show total number of links found.

RPLRc
Last RPL return code.

RPLR0
Last RPL value in register 0.

RPLR15
Last RPL value in register 15.

RPLSense
Last RPL sense code.

RPLUSense
Last RPL user sense code.

SINCE
Date and time that the link statistics began (or were reset).

SNAInfo
Link ID, last RPL return code, last RPL sense code, last RPL user sense code, last RPL value in register 15, last RPL value in register 0, and last VTAM request code, in that order.

SPReads
Number of spool reads performed.

SPREADTime
Average time to perform a spool read (in microseconds).

SPWrites
Number of spool writes performed.

SPWRITETime
Average time to perform a spool write (in microseconds).

STatus
Link status.

STREAMS
Link ID, number of files sent on streams 1, 2, 3, 4, 5, 6, and 7, in that order.

STREAM1
Number of files sent on stream 1.

STREAM2
Number of files sent on stream 2.

STREAM3
Number of files sent on stream 3.

STREAM4
Number of files sent on stream 4.

STREAM5
Number of files sent on stream 5.

STREAM6
Number of files sent on stream 6.

STREAM7
Number of files sent on stream 7.

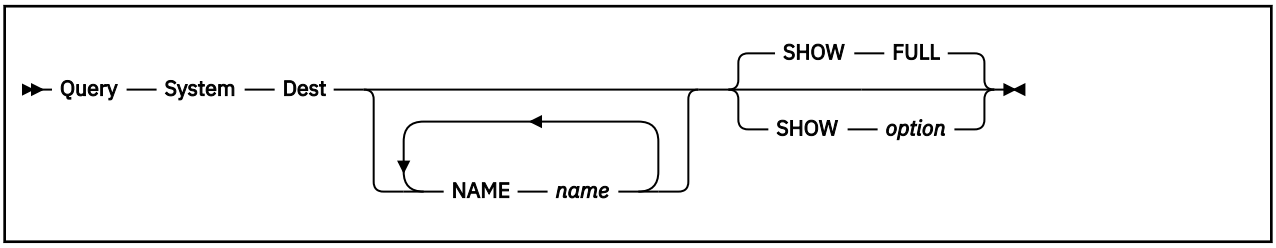
STREAM8to32
Total number (combined) of files sent on streams 8 through 32. RSCS does not provide totals for individual streams beyond stream 7.

SUMmary
Link ID, total number of line I/O transactions performed, total number of I/O errors occurred, and total number of timeouts occurred, in that order.

TIMEOuts
Total number of timeout occurred.

VTAMRequest
Last VTAM request code.

QUERY SYSTEM DEST



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM DEST command requests information about the PSF destinations defined in the DEST file.

Operands

NAME *name*
specifies the name of a PSF destination. You can specify as many destinations as you want. If you do not specify a PSF destination, RSCS shows you information about all the destinations.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

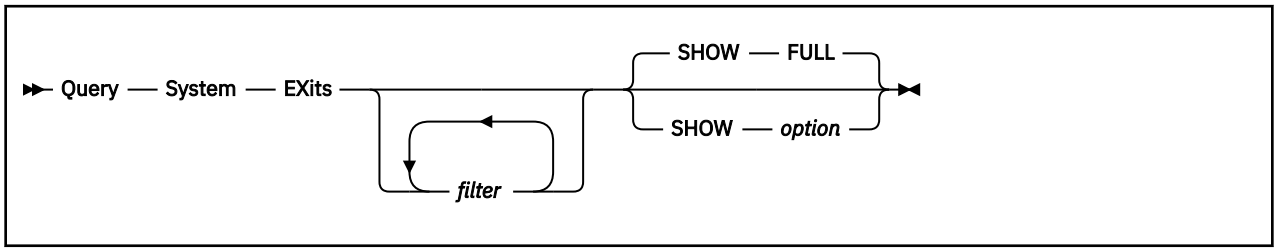
BASE
Base address of the DEST entry.

FULL
PSF destination name. This is the default.

NAME
PSF destination name.

NONE
Nothing; just show total number of PSF destinations found.

QUERY SYSTEM EXITS



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM EXITS command requests information about RSCS exit points.

Operands

filter
is a filter that selects a group of exit points. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

ADDRess *sign hex-address*
Entry point address; *hex-address* is the hexadecimal address and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

NAME *name*
Entry point name.

NUMber *sign exitnumber*
Exit point number; *exitnumber* is the decimal exit point number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

OFF
Disabled exit points.

ON
Enabled exit points.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

ADDRess
Entry point address.

BASE
Base address of the exit block (EXITBLOK).

FULL
Exit point number, entry point name, entry point address, and the status of the exit point, in that order. This is the default.

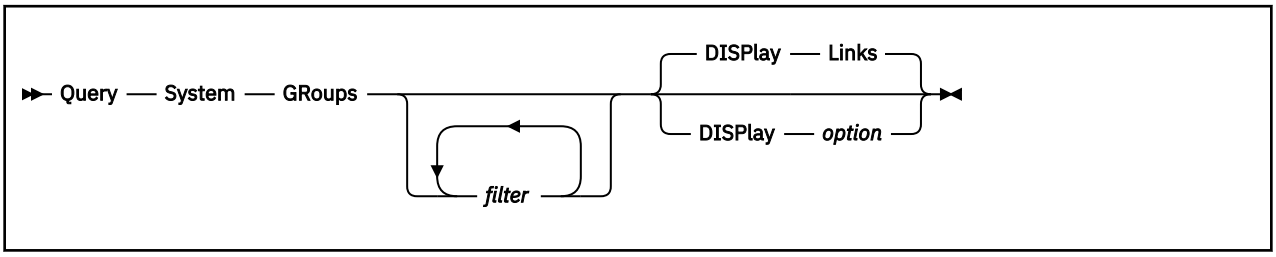
NAME
Entry point name.

NONE
Nothing; just show total number of exit points found.

NUMber
Exit point number.

STatus
Status of the exit point (enabled or disabled).

QUERY SYSTEM GROUPS



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM GROUPS command requests information about routing groups.

Operands

filter
is a filter that selects a group of routing groups. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

Alternatelink *linkid*
Groups containing a specific alternate link.

Bottomlevel
Groups containing links only, no routing groups.

GRoup *groupid*
Groups that directly own a specific routing group.

INgroup *groupid*
All subgroups that are direct or indirect members of a specific routing group.

NAME *groupid*
Groups with a specific name.

NODE *nodeid*
Groups that directly own a specific node ID.

Primarylink *linkid*
Groups containing a specific primary link.

Root
Groups that are not owned by another routing group.

Toplevel
Groups that are not owned by another routing group.

DISPlay *option*
tells RSCS which format to use for the response. (For more information about using DISPLAY options, see "Using QUERY Command DISPLAY Options" on page 190.)

The valid DISPLAY options and what they display are:

Files
Number of files destined for the routing group (or any subordinate routing groups).

Groups
Subordinate routing groups.

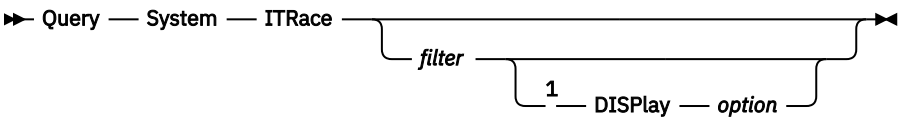
Links
Primary and alternate links belonging to the routing group. This is the default.

Nodes
Nodes belonging to the routing group.

Parentgroup
Name of the group that directly owns this routing group. If this routing group is a root group (the topmost level), RSCS displays an ellipsis (...) instead of the name.

Rootgroup
Name of the root group (topmost level) of this routing group. If this routing group is a root group, RSCS displays the group ID in both columns.

QUERY SYSTEM ITRACE



Notes:

[1] A DISPLAY option cannot be specified with the SYSTEMTASK filter.

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM ITRACE command requests information about internal trace settings for RSCS tasks. If you do not specify a filter and DISPLAY option, RSCS issues message DMT431I to tell you whether tracing is in effect.

Operands

filter
is a filter that selects a group of internal trace settings. If you do not specify a filter, you cannot specify a DISPLAY option. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

LINK *linkid*
Internal trace settings for a specific link.

Port *sign ccuu*
Internal trace settings for a specific port; *ccuu* is the hexadecimal virtual device number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

Systemtask *task*
Internal trace settings for a specific system task (AST, AXM, EVE, EXE, PRD, REX, or SCT) or all system tasks (*). You cannot specify a DISPLAY option with this filter.

Table
Global trace information: whether RSCS should dump the trace table before wrapping, trace table size, and whether RSCS should place the event in the GCS trace table.

DISPlay *option*
tells RSCS which format to use for the response. If you specify the SYSTEMTASK filter, you cannot specify a DISPLAY option. (For more information about using DISPLAY options, see "Using QUERY Command DISPLAY Options" on page 190.)

The valid DISPLAY options and what they display are:

ALL
All records with tracing active.

COmmand
Status of tracing (on or off) for records associated with the command task. These trace records are X'07' (event scheduled) and X'09' (command entry).

CMD
Status of tracing (on or off) for records associated with the command task. These trace records are X'07' (event scheduled) and X'09' (command entry).

DIagnose
Status of tracing (on or off) for records associated with CP Diagnose code requests. The trace record is X'15'.

EXit
Status of tracing (on or off) for records associated with the exit routine calls. These trace records are X'02' (call to a GCS exit routine), X'0D' (exit point calls), X'0E' (exit point return), and X'21' (call to exit routine).

Filerequest
Status of tracing (on or off) for records associated with file requests. The trace record is X'04'.

hh
Specific trace record in the range X'00' - X'FF'.

IO
Status of tracing (on or off) for records associated with I/O requests and interruptions. These trace records are X'03' (I/O interrupts) and X'11' (call to I/O processing routine).

MRJE
Status of tracing (on or off) for records associates with MRJE tasks. This trace record is X'27' (before I/O initiation and at I/O completion). Send data and receive data are traced.

NJE
Status of tracing (on or off) for records associated with the NJE task. These trace records are X'12' (NJE records sent and received), X'17' (NJE job header), X'18' (NJE data set header), X'19' (NJE job trailer), X'1A' (NJE open requests), X'1B' (NJE permission granted), X'1C' (NJE end of file), X'1D' (NJE receiver online), X'1E' (NJE reject), X'1F' (NJE abend), and X'20' (NJE connection, RJE connection, or signon record).

QSA
Status of tracing (on or off) for records associated with storage allocation requests. The trace record is X'08'.

Queue
Status of tracing (on or off) for records associated with elements placed on the internal command and message queues. These trace records are X'05' (add a queue element) and X'06' (remove a queue element).

SNA
Status of tracing (on or off) for records associated with VTAM requests or exit routines. These trace records are X'0B' (VTAM calls), X'0C' (VTAM completion), and X'16' (VTAM exit routines).

SPool
Status of tracing (on or off) for records associated with the CP spool task. These trace records are X'0F' (call to input spool file routine), X'10' (call to output unit record device routine), and X'14' (data buffers sent and received).

Task
Status of tracing (on or off) for records associated with tasks that RSCS starts or deactivates. These trace records are X'00' (start of a task) and X'01' (end of a task).

TCP
Status of tracing (on or off) for records associated with TCP tasks. These trace records are X'24' (before the IUCV call), X'25' (completion of the IUCV operation), and X'26' (error during initiation of IUCV).

QUERY SYSTEM LEVEL

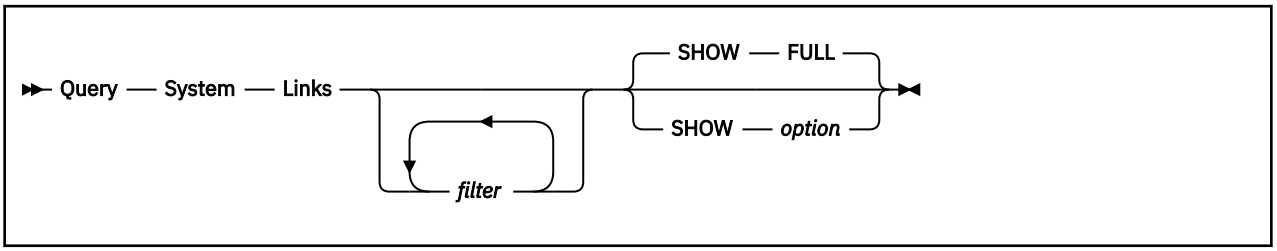
Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM LEVEL command requests information about the function level and maintenance level of your RSCS system.

QUERY SYSTEM LINKS



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM LINKS command requests information about each link currently defined in the network. This is the default QUERY SYSTEM function.

Operands

filter
is a filter that selects a group of links. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

ACTive
Active links.

ASTart
Links with autostart enabled.

AUto
Links with automatic forms setup.

CLass *c*
Links with a specific transmission spool class.

CONNect
Links with connect status.

DIalqueue
Links in dial-up queue status or autostart links for which the autostart process has not yet completed.

DP *sign nn*
Links with a specific dispatching priority; *nn* is the decimal dispatching priority number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

DRAin
Links with a pending DRAIN command.

FANout *linkid*
Links with a specific fanout link.

FIFO
Links with files queued in first-in, first-out order.

FOrm *formname*
Links with a specific forms name.

HELD *sign nnnn*
Links with a specific number of files being held; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

HOld
Links in hold status.

INActive
Inactive links.

INPuthold
Links with incoming traffic on hold. The incoming traffic is on hold because a HOLD INPUT command is in effect at the node on receiving side of the link. The HOLD INPUT command may have been entered by an operator or by RSCS when the link went into slowdown mode.

INTreq
Links requiring operator intervention.

LINE *sign ccuu*
Links with a specific virtual device number; *ccuu* is the hexadecimal virtual device number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

LOGMode *logmode*
Links with a specific SNA logmode.

LOGOnwait
Links whose start command has been processed by the SNA control task and that are waiting for VTAM to notify RSCS to start the session.

LOOPing *sign nnnn*
Links with a specific number of files that are looping; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

LUName *luname*
Links with a specific SNA LU name.

MAnual
Links in manual forms setup mode.

NAME *linkid*
Links with a specific link identifier.

NETworking
Networking links (LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links).

NOASTart
Links that do not have autostart enabled.

NOCONNect
Links not in connect status.

NODE *nodeid*
Links that connect to a specific node.

NODrain
Links that do not have a pending DRAIN command.

NOHold
Links not in hold status.

NOINActive
Links that are not inactive. These include links that have active, connect, dial-queue, intreq, released, retry-wait, and starting status.

NONNETworking
Non-networking links (ASCII-type, GATEWAY-type, LPD-type, LPR-type, MRJE-type, NOTIFY-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, TN3270E-type, UFT-type, UFTD-type, and 3270P-type links).

NONSNA
Non-SNA links (ASCII-type, GATEWAY-type, LISTPROC-type, LPD-type, LPR-type, MRJE-type, NJE-type, NOTIFY-type, RJE-type, TCPASCII-type, TCPNJE-type, TN3270E-type, UFT-type, UFTD-type, and 3270P-type links).

NOTRace
Links where tracing is not active.

OUTPuthold
Links with outgoing traffic on hold. The outgoing traffic is on hold because a HOLD INPUT command is in effect at the destination node on the other side of the link. The HOLD INPUT command may have been entered by an operator or by RSCS when the link went into slowdown mode.

PRIority
Links which queue files by their priority.

Queued *sign nnnn*
Links with a specific number of files queued; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

RECeiving *sign nnnn*
Links with a specific number of files being received; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

RELeased
Links released to another VTAM application.

RETrying
Inactive links attempting to restart.

RETRYOption
Links that have specified the RETRY operand.

RPLWait
Links whose start command cannot be processed by the SNA control task because there is a temporary short of SIMLOGON RPLs being managed by the SNA control.

Note: If there are generally many links with a status of RPL-WAIT, or if one or more links is in this status for a long period, you should increase the number specified on the RPLs option on the NETWORK START command. Usually, the value specified for the RPLs option should be equal to the average number of links started at one time, plus the number that are in *starting* status for a long period.

SENDing *sign nnnn*
Links with a specific number of files being sent; *nnnn* is the decimal number of files and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SETup
Links started in forms set-up mode.

SIZE
Links which queue files by size.

SLOWDElta *sign nnnn*
Links that specified the SLOWDOWN operand on a LINKDEFINE statement or a DEFINE command to add (or subtract) a delta value to (or from) the system slowdown values; *nnnn* is the decimal delta value and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SLOWSTArt *sign nnnn*
Links with a specific slowdown start value; *nnnn* is the slowdown start value and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SLOWSTOp *sign nnnn*
Links with a specific slowdown stop value; *nnnn* is the slowdown stop value and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

SLOWUNique
Links that specified the SLOWDOWN operand on a LINKDEFINE statement or a DEFINE command to define slowdown values for that link because there are no system slowdown values.

SNA
SNA links (SNANJE-type, SNARJE-type, and SNA3270P-type links).

STARTing
Links that are starting.

TCPip
TCP/IP links (LPD-type, LPR-type, TCPASCII-type, TCPNJE-type, UFT-type, and UFTD-type links)

TRace
Links for which tracing is in effect.

TYPE *type*
Links of a specific type (ASCII, GATEWAY, LISTPROC, LPD, LPR, MRJE, NJE, NOTIFY, RJE, SNANJE, SNARJE, SNA3270P, TCPASCII, TCPNJE, TN3270E, UFT, UFTD, 3270P, or one defined using the LINKTYPE statement).

WAITFOrm
Links waiting for an operator to change the form.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

ACTive
Link ID, link status, link type, line address, SNA LU name, SNA logmode, transmission spool class, type of queuing used on the link, and dispatching priority, in that order.

ASTart
Autostart status of a link.

BASE
Base address of the link table (LINKTABL).

BUFFersize
Size of the transmission buffers used on a link. If this link is not active or if this is a NOTIFY-type link, RSCS displays an ellipsis (...) instead of the buffer size.

CLass
Transmission spool class.

COUNTs
Link ID, link status, number of files being transmitted, number of files being received, number of files queued, number of files in looping status, and number of files being held, in that order.

DEFault
Link ID, link status, default link type, default line address, default SNA LU name, default SNA logmode, default transmission spool class, default type of queuing used on the link, and default dispatching priority, in that order.

DEFCLass
Default transmission spool class.

DEFDP
Default dispatching priority.

DEFLINE
Default line address.

DEFLOGMode
Default SNA logmode.

DEFLUName
Default SNA LU name.

DEFPARM
First 50 bytes of default text from the PARM operand of the link. (For information about hidden text, see usage note "6" on page 190.)

DEFPARMFull
Full 132 bytes of default text from the PARM operand of the link. See usage note "3" on page 189 for information about message length and see usage note "6" on page 190 for information about hidden text.

DEFQType
Default type of queuing used on a link.

DEFTYPE
Default link type.

DP
Dispatching priority of a link.

DRAin
Links in drain status.

FANout
Fanout link. If you did not define a fanout link, RSCS displays the link ID of the link rather than the fanout link ID.

FCBInfo
Link name, name of the FCB image, and type of FCB processing, in that order.

FCBMode
Type of FCB processing (dynamic, ignore, or selection).

FCBName
Name of the FCB image that this link will process. If this link does not have an FCB name defined, RSCS displays an ellipsis (...) instead of the FCB name.

FOrm
Current form name on a link.

FULL
Link ID, link status, link type, line address, SNA LU name, SNA logmode, and type of queuing used on the link, in that order. This is the default.

HELD
Number of files being held on a link.

HOld
Links in hold status.

ID
Link identifier.

LINE
Line address.

LOGMode
SNA logmode.

LOOPing
Number of files in looping status on a link.

LUName
SNA LU name.

MOde
Mode used on a link (AUTO, MANUAL, or SETUP).

NAME
Link identifier.

NODE
Name of the peer node at the other end of the link.

NONE
Nothing; just show total number of links found.

OPARM
First 50 bytes of override text from the OPARM operand of the link. (For information about hidden text, see usage note "6" on page 190.)

OPARMFull
Full 132 bytes of override text from the OPARM operand of the link. See usage note "3" on page 189 for information about message length and see usage note "6" on page 190 for information about hidden text.

PARM
First 50 bytes of text from the PARM operand of the link. (For information about hidden text, see usage note "6" on page 190.)

PARMFull
Full 132 bytes of text from the PARM operand of the link. See usage note "3" on page 189 for information about message length and see usage note "6" on page 190 for information about hidden text.

QType
Type of queuing used on a link.

Queued
Number of files queued on a link.

RECeiving
Number of files being received on a link.

RETRIESDone
Number of retries done on a link.

RETRYInfo
RETRY operand setting, number of retries done on the link, and number of minutes until the next retry, in that order.

RETRYINTerval
Number of minutes until the next retry.

RETRYOption
RETRY operand setting (yes or no).

SENDing
Number of files being transmitted on a link.

SLOWDElta
Difference (delta) between system slowdown values and the slowdown values for the link.

SLOwdown
Link ID, type of slowdown value, slowdown delta, slowdown start value, and slowdown stop value, in that order.

SLOWSTArt
Slowdown start value.

SLOWSTOp
Slowdown stop value.

SLOWMOde
Type of slowdown value (absolute or relative).

STatus
Link status.

TRace
Trace status.

TYPE
Link type (ASCII, GATEWAY, LISTPROC, LPD, LPR, MRJE, NJE, NOTIFY, RJE, SNANJE, SNARJE, SNA3270P, TCPASCII, TCPNJE, TN3270E, UFT, UFTD, and 3270P, or one defined using the LINKTYPE statement).

UPARM
First 50 bytes of user text from the UPARM operand of the link. For information about hidden text, see usage note "6" on page 190.

UPARMFull
Full 132 bytes of user text from the UPARM operand of the link. See usage note "3" on page 189 for information about message length and see usage note "6" on page 190 for information about hidden text.

QUERY SYSTEM LOADADDRESS

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM LOADADDRESS command requests information about the addresses where:

- RSCS was loaded (starting and ending addresses of the RSCS loadlib)
- The CVT was loaded (starting address of the CVT)

RSCS provides this information at initialization. If it becomes necessary to re-IPL, these addresses may change. Use the QUERY SYSTEM LOADADDRESS command to display the current load addresses.

QUERY SYSTEM LOCAL

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM LOCAL command requests information about the local RSCS node (the RSCS local ID and the VTAM application ID).

QUERY SYSTEM NETWORK

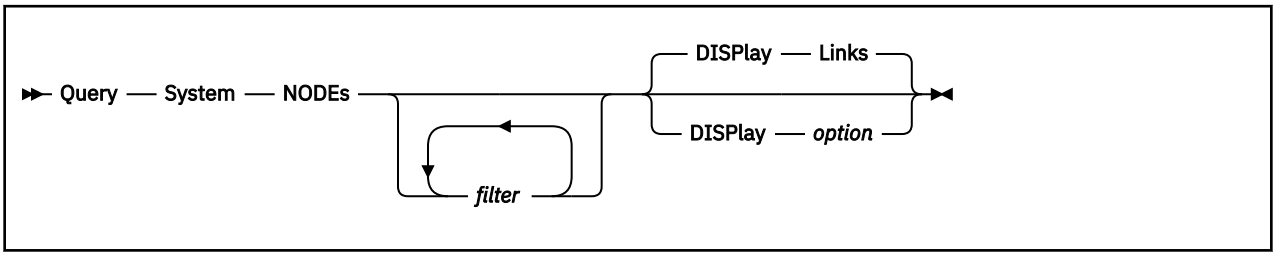
Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM NETWORK command requests information about the status of the RSCS-VTAM interface. There are four possible states: starting, ready, stopping, or stopped.

QUERY SYSTEM NODES



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM NODES command requests information about the nodes defined to your RSCS system.

Operands

filter
is a filter that selects a group of nodes. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

Alternatelink *linkid*
Nodes with a specific alternate link.

INgroup *groupid*
All nodes that are direct or indirect members of a specific routing group.

NAME *nodeid*
Specific nodes.

Primarylink *linkid*
Nodes with a specific link.

DISPlay *option*
tells RSCS which format to use for the response. (For more information about using DISPLAY options, see "Using QUERY Command DISPLAY Options" on page 190.)

The valid DISPLAY options and what they display are:

Links
Primary and alternate links for this node. This is the default.

Parentgroup
Name of the routing group that directly owns this node. If this node does not belong to a routing group, RSCS displays an ellipsis (...) instead of the group name.

Rootgroup
Name of the root group (topmost level) of this node. If this node does not belong to a routing group, RSCS displays an ellipsis (...) instead of the group name.

QUERY SYSTEM OPTIONS

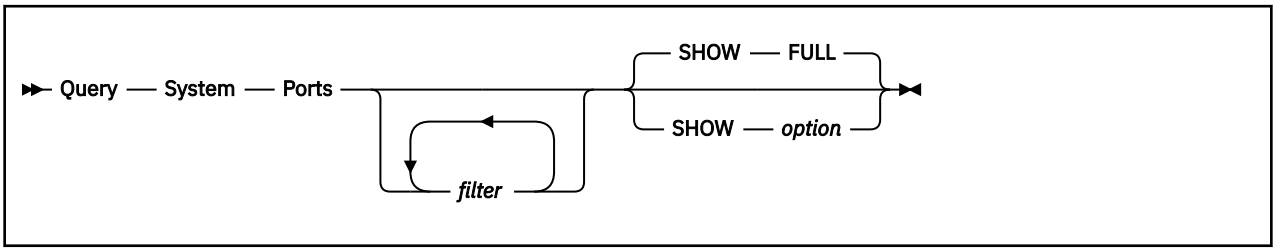
Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM OPTIONS command requests information about general RSCS options. These include message suppression, loop checking, list processor, and jobname setting options.

QUERY SYSTEM PORTS



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM PORTS command requests information about the dial-up ports.

Operands

filter
is a filter that selects a group of dial-up ports. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

DIal
Ports enabled for autodial links.

DISabling
Ports in the process of being disabled. (Someone entered an RSCS DISABLE command, but RSCS has not finished processing the command.)

FRee
Ports available for allocation.

LINE *sign ccuu*
Ports with a specific virtual device number; *ccuu* is the hexadecimal virtual device number and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note "4" on page 188.)

LINK *linkid*
Ports owned by a specific link.

NODIal
Ports enabled for auto-answer links.

TRace
Ports where tracing is in effect.

NOTRace
Ports where tracing is not in effect.

Used
Ports already being used by a link.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

BASE
Base address of the PORT entry.

DIal
Port type (dial or no-dial).

FULL
Line address, status, port type, and name of the link that owns the port, in that order. This is the default.

LINE
Line address of the port.

LINK
Name of the link that owns the port (if any).

NONE
Nothing; just show total number of ports found.

STatus
Status of the port (disabling, enabled, free, or in use).

TRace
Trace status.

QUERY SYSTEM QUEUES

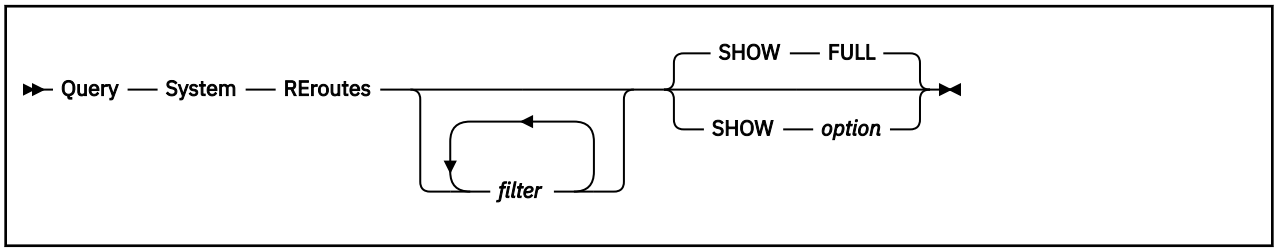
Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM QUEUES command requests information about files in the queue. This information includes a summary of the files for each link. For each link with files in the queue, RSCS specifies which files are queued, looping, being held, being sent, and being received.

QUERY SYSTEM REROUTES



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM REROUTES command requests information about the entries in the reroute table. RSCS places entries in the reroute table whenever it finds a REROUTE command or statement.

Operands

filter
is a filter that selects a group of reroutes. You can specify as many filters as you want. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

ALL
Reroutes for all files and messages.

Cmds
Reroutes for commands.

Files
Reroutes, including files.

FILEOnly
Reroutes for files, only.

FOR *nodeid userid*
Intended destination of the reroute.

Msgs
Reroutes, including messages.

MSGOnly
Reroutes for messages, only.

NOQuiet
Reroutes that do not suppress messages DMT102I, DMT333I, or DMT336I.

NOTrcvg
Reroutes for not-received messages.

Quiet
Reroutes that suppress messages DMT102I, DMT333I, or DMT336I.

TO *nodeid userid*
New destination of rerouted traffic.

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see "Using QUERY Command SHOW Options" on page 189.)

The valid SHOW options and what they display (in columns) are:

BASE
Base address of the REROUTE entry.

FOR
Node ID and user ID being rerouted, type of reroute, and whether RSCS is suppressing messages, in that order.

FORNode
Node ID being rerouted.

FORUser
User ID being rerouted.

FULL
Node ID and user ID being rerouted, type of reroute, target node ID and user ID for the reroute, and whether RSCS is suppressing messages, in that order. This is the default.

NONE
Nothing; just show total number of reroutes found.

Quiet
Whether RSCS is suppressing messages (yes or no).

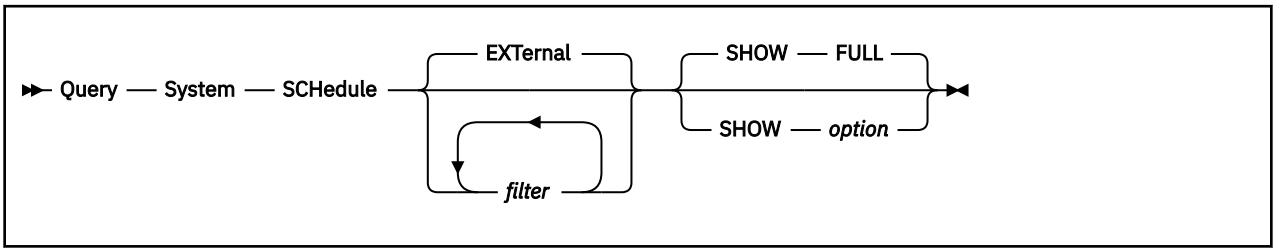
TO
Target node ID and user ID for the reroute, in that order.

TONode
Target node ID for the reroute.

TOUser
Target user ID for the reroute.

TYPE
Type of reroute (all, commands, files, messages, or not-rec).

QUERY SYSTEM SCHEDULE



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM SCHEDULE command requests information about RSCS events scheduled by the Event Scheduler. Your installation can create an RSCS events file that RSCS loads during initialization and you can add to the RSCS events file using the SCHEDULE command. For more information about the RSCS events file, see *z/VM: RSCS Networking Planning and Configuration*.

When you enter the QUERY SYSTEM SCHEDULE command, RSCS shows you a list of events that are currently scheduled but have not yet been processed. A currently-scheduled event is an event that is going to happen during the current day or an event that has been defined with the DAILY operand of the SCHEDULE command.

You cannot query events that are scheduled for future days or events that have already been processed. After processing an event, RSCS removes that event from the list of scheduled events. For example, if you schedule a permanent event to be processed at midnight (00:00), you cannot query that event because RSCS will process the event before you can enter the QUERY SYSTEM SCHEDULE command.

Operands

filter
is a filter that selects a group of events. You can specify as many filters as you want. To get information about all events (internal, external, user, system, daily, and midnight), use the ALL filter. (For more information about using ilters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

ACTive
Active events.

ALL
All events (internal, external, user, system, daily, and midnight).

EXTernal
External events. This is the default.

HIGHRange *hh*:*mm*
Upper time range associated with an event.

INTernal
Internal events.

LOWRange *hh*:*mm*
Lower time range associated with an event.

SUSPended
Suspended events.

SYStem
Events scheduled by the system (those in the EVENTS file).

TASKid *sign nnn*
Task ID of a specific event; *nnn* is the number RSCS assigns to the event and *sign* is one of the numeric operators: =, <, >, <=, >=, <>, ¬=, ¬<, or ¬>. (For more information about these numeric operators, see usage note “4” on page 188.)

TASKName *name*
Task name of an event.

TIME *hh*:*mm*
Specific time of an event.

User
Events scheduled by the user (using the SCHEDULE command).

SHOW *option*
tells RSCS how to format the response. (For more information about using SHOW options, see “Using QUERY Command SHOW Options” on page 189.)

The valid SHOW options and what they display (in columns) are:

BASE
Base address of the event block (EVEBLOK).

Command
First 32 bytes of command text associated with the event.

FULL
Time, time range, status, task ID, and the first 32 bytes of command text associated with the event, in that order. This is the default.

FULLCommand
Full 132 bytes of command text associated with the event. (For information about message length, see QUERY command usage note “3” on page 189.)

NONE
Nothing; just show total number of events found.

Range
Time range (low and high) within which the event will occur.

STatus
Status of the event (active or suspend).

TASKid
Task ID of the event, as assigned by RSCS.

TASKName
Task name of the event.

TIME
Specific time of the event.

TYPE
Event type (external, internal, or midnight).

QUERY SYSTEM SERVICE

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM SERVICE command requests information about the service level of each module in the running RSCS system.

Note: This command does not provide service information for certain parts of RSCS, such as the sample exit modules and macros.

Response

The QUERY SYSTEM SERVICE command displays the service level obtained from the SLVL line near the top of each module in the RSCS LOADLIB. If no service has been applied to the module, the SLVL line contains the word BASE. If service has been applied to the module, BASE is replaced with the most recent APAR number.

If you make a user modification to a module, you can replace BASE or the APAR number with your own identifier (which must begin in column 32 and end in column 38), and this will be displayed in the command output.

The following example shows an excerpt of the output provided by the QUERY SYSTEM SERVICE command. In this example, APAR VM66174 has been applied to module DMTCMZ, and a user modification identified as INTEST1 has been applied to module DMTCMQ.

```
14:11:11  * MSG FROM RSCS    : RSCS    Service       Level
14:11:11  * MSG FROM RSCS    : ----    -------       -----
...
14:11:11  * MSG FROM RSCS    : SLVL    DMTCMX        BASE
14:11:11  * MSG FROM RSCS    : SLVL    DMTCMY        BASE
14:11:11  * MSG FROM RSCS    : SLVL    DMTCMZ        VM66174
14:11:11  * MSG FROM RSCS    : SLVL    DMTCMA        BASE
14:11:11  * MSG FROM RSCS    : SLVL    DMTCMB        BASE
14:11:11  * MSG FROM RSCS    : SLVL    DMTCMQ        INTEST1
14:11:11  * MSG FROM RSCS    : SLVL    DMTCQX        BASE
14:11:11  * MSG FROM RSCS    : SLVL    DMTCQY        BASE
...
```

QUERY SYSTEM SET

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM SET command requests information about RSCS console message sharing by link. Using the SET command, operators can assign (subscribe) or cancel the assignment of (unsubscribe) a virtual machine (user) to share RSCS console messages for a specific link. When you query console message sharing, RSCS tells you the node ID, user ID, and link ID.

Operands

filter
is a filter that selects a group of message subscriptions. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

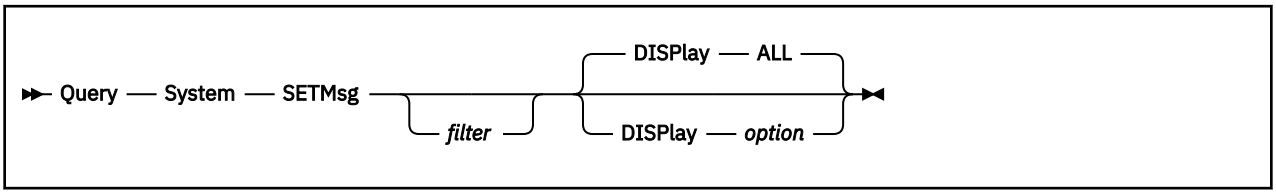
The valid filters and what they select are:

FOR *nodeid userid*
Message subscriptions for a specific virtual machine (user).

LINK *linkid*
Message subscriptions for a specific link.

*****
Message subscriptions for all console messages assigned using the SET * MSG command.

QUERY SYSTEM SETMSG



Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM SETMSG command requests information about message sharing by message number. Using the SETMSG command or statement, operators can assign (subscribe) or cancel the assignment of (unsubscribe) a virtual machine (user) to share RSCS messages by message number. (Only private messages cannot be shared.)

Operands

filter
is a filter that selects a group of message subscriptions. (For more information about using filters, see "Using QUERY Command Filters" on page 188.)

The valid filters and what they select are:

FOR *nodeid userid*
Message subscriptions for a specific virtual machine (user).

MSG *nnn*
Message subscriptions for a specific message number.

DISPlay *option*
tells RSCS which format to use for the response. (For more information about using DISPLAY options, see "Using QUERY Command DISPLAY Options" on page 190.)

The valid DISPLAY options and what they display are:

ALL
All message subscriptions for each virtual machine (user). This is the default.

nnn
Whether each virtual machine is subscribed to RSCS message number *nnn*.

QUERY SYSTEM SHIFT

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM SHIFT command requests information about the current shift number. Use the SHIFT command to define or change the shift number.

QUERY SYSTEM SLOWDOWN

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM SLOWDOWN command requests information about the system start and stop slowdown values. Use the SLOWDOWN command or statement to set the system slowdown values.

QUERY SYSTEM TCPIP

Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM TCPIP command requests information about the status of the RSCS TCP/IP port redirector task. The status may be: ready or stopped.

QUERY SYSTEM ZONE

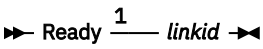
Authorization

C, G, R, S, U

Purpose

The QUERY SYSTEM ZONE command requests information about the time zone offset from Greenwich Mean Time (GMT) and Coordinated Universal Time (UTC). RSCS compares the time stamp at your local system to Greenwich Mean Time and displays the difference in hours, minutes, and seconds. RSCS also displays whether the offset is east or west of Greenwich.

READY



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Links

A, PR (except TN3270E), W

Purpose

The READY command (which is valid only for the workstation and printer links) lets the workstation or printer operator communicate with RSCS, when using AUTO or SETUP mode forms selection. READY specifies that:

- If in AUTO mode, a form mount has been satisfied.
- If in SETUP mode, the printing of a setup page is desired.

Operands

linkid
is the name of the link whose pending mount request has been satisfied. If you enter the command from a remote workstation, you must omit this operand.

Usage Notes

1. The READY command is supported only by the ASCII-type, LPR-type, MRJE-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, and 3270P-type links.
2. If READY is issued when no mount is pending, message DMT750E is issued and no further action is taken.
3. If a 3270 printer is so equipped, the PA1 key may be used in place of a READY command. For more information, see “Printer Key Support in an LU_T1 Session” on page 56.

RECONNECT

Authorization

C, S, U

Purpose

The RECONNECT command notifies RSCS that the RSCS operator console is reconnected to the z/VM system.

Usage Notes

1. If a user ID was specified when a preceding DISCONNECT command was entered, RSCS operator console messages were sent to that user ID. Enter the RECONNECT command to stop the routing of RSCS console messages to that user ID, and to send them only to the RSCS operator's console.
2. The RSCS console output lines were saved only if the console output was spooled and if a DISCONNECT LOG was entered.

REORDER

Authorization

C, S, U

Purpose

The REORDER command causes all inactive spool files that are owned by the RSCS virtual machine to be requeued for transmission on the appropriate links, based on the files' TAG information and the RSCS link and route tables.

No other RSCS commands are accepted until the REORDER is completed.

Operands

QUICK
tells RSCS to perform an internal reorder. If QUICK is omitted, RSCS does a full reorder.

Usage Notes

1. REORDER tells RSCS to perform either a full reorder or an internal reorder. In a full reorder, RSCS "forgets" what it knows about each file, reads the TAG information from the CP spool, and builds the file queue accordingly. In an internal reorder, RSCS uses what it already knows about each file to reorder the file queue.
2. A full reorder is needed only after a CP CHANGE command has been used to modify a spool file that is in the RSCS virtual reader. Unless a full reorder is performed, RSCS will send the file based on the original spool file attributes, rather than the changed ones.
3. A full reorder may be useful after entering CP PURGE, SPXTAPE LOAD, or TRANSFER commands for spooled files. Until a full reorder is performed, the missing files will still appear queued for RSCS when an RSCS QUERY command is issued.
4. A full reorder can take an appreciable amount of time to complete if there are many files in the RSCS virtual reader. During this time, RSCS will process no other commands and will temporarily stop all file transmission and reception.
5. RSCS automatically does an internal reorder whenever:
   - A link is started
   - A link is deactivated
   - An RSCS DEFINE, DELETE, LOOPING, ROUTE, or START command is issued

REPLY

Authorization

C, G, R, S, U

Purpose

The REPLY command sends a message to the command originator. Although this command can be entered on the command line, RSCS provides the REPLY command for people writing and running execs. Without the REPLY command, the creator of the exec has no way of returning information to the person who ran the exec.

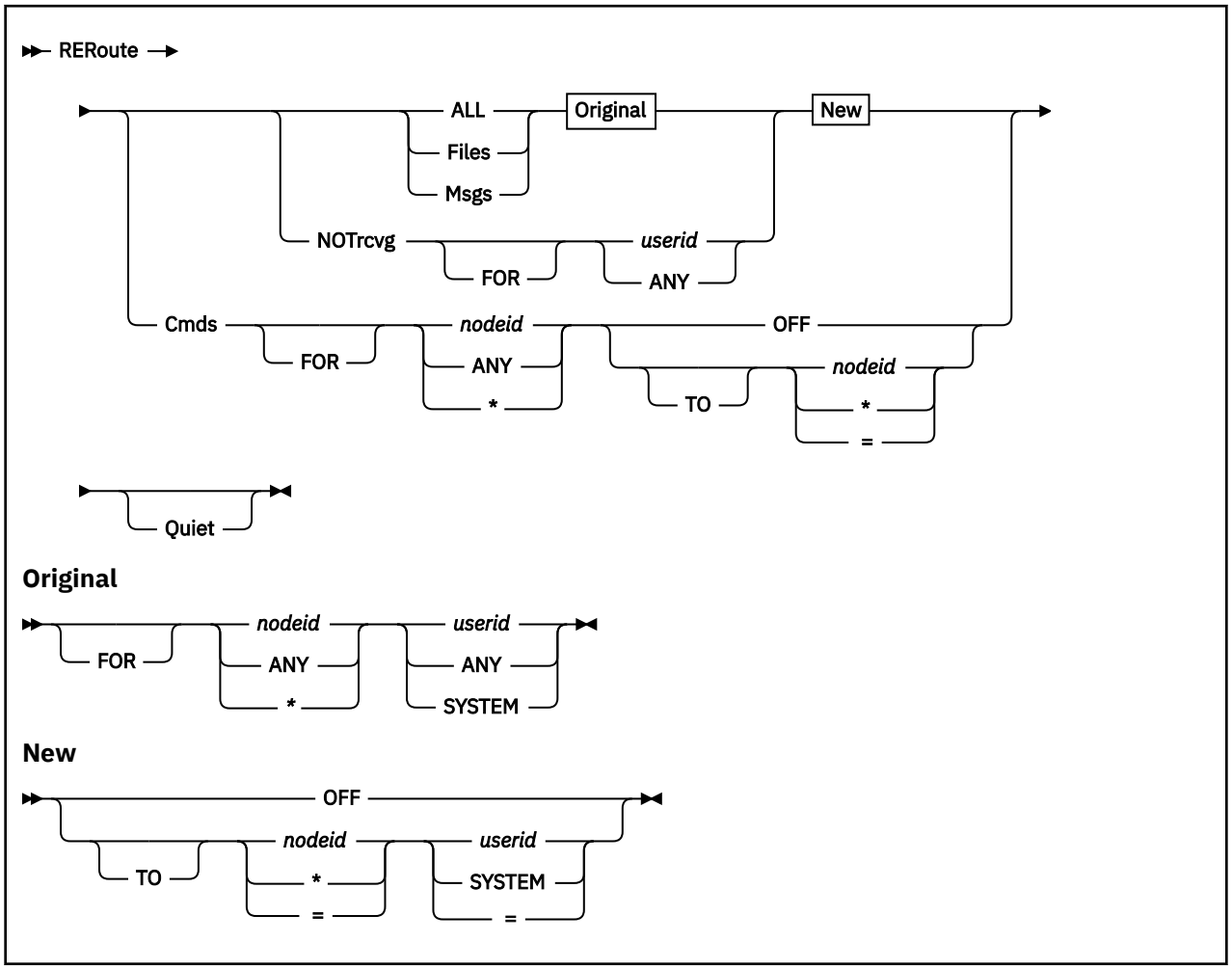
Operands

message-text
is an alphanumeric string of 1 - 132 characters defining the text of the message that RSCS returns to the command originator (or exec originator, if you used REPLY within an exec).

Usage Notes

1. RSCS displays the message text as if the RSCS console operator entered a MSG command to the REPLY command originator (or exec originator, if you used REPLY within an exec). For more information about the MSG command, see see “MSG” on page 179.
2. Use the REPLY command to send messages from within an exec. Using the REPLY command at strategic points within an exec, you can find out when the exec started running, which branch the exec took, and when the exec stopped running. For example, Table 7 on page 93 shows an exec that uses the REPLY command to let users know the return code of any GCS command they enter.
3. Because GCS also has a REPLY command, make sure you identify this REPLY command as an RSCS command. If you are entering the REPLY command from the command line, preface the command as you would any other RSCS command. If you are entering the REPLY command from within an exec, insert RSCS before the command (see Table 7 on page 93) or use the REXX ADDRESS instruction at the beginning of the exec to identify the environment as RSCS.

REROUTE



Authorization

C, S, U

Purpose

The REROUTE command changes the destination of commands, files, and messages, including command responses, for specific systems and user IDs.

Operands

ALL
reroutes all files and messages. ALL has no effect on the rerouting of commands or the rerouting of messages to users who are not receiving.

Files
reroutes files only.

Msgs
reroutes messages (and command responses) only.

FOR *nodeid userid*
specifies the original destination of the files or messages being rerouted.

nodeid
identifies a specific node; or you can specify:

ANY
indicates all nodes.

*****
indicates your local node.

userid
is the user ID of a specific z/VM virtual machine or the link ID of a workstation or printer link; or you can specify:

ANY
indicates all users.

SYSTEM
indicates the system unit record device at the specified node or nodes.

NOTrcvg FOR *userid*
reroutes messages for a local user when the local user is unable to receive messages because of being logged off, not receiving, disconnected, and so forth. NOTRCVG has no effect on the rerouting of messages to users that are receiving. To reroute messages for a local user to a local user, specify an equal sign (=) as the node in the TO clause of the REROUTE command.

userid
is the user ID of a specific z/VM virtual machine or the link ID of a workstation or printer link; or you can specify:

ANY
indicates all users who are not receiving.

OFF
cancels a single, specific reroute. You cannot use OFF to cancel all the defined reroutes. If there are ten reroute entries in the reroute table, you must issue ten REROUTE commands with the OFF operand to cancel all of the defined reroutes.

TO *nodeid userid*
specifies the new destination of the files or messages being rerouted.

nodeid
identifies a specific node; or you can specify:

*****
indicates your local node.

=
indicates the original destination node.

userid
is the user ID of a specific z/VM virtual machine or the link ID of a workstation or printer link; or you can specify:

SYSTEM
indicates the system unit record device at the specified node or nodes.

=
indicates the original destination user.

Cmds FOR *nodeid*
reroutes commands only. CMDS has no effect on files or messages.

nodeid
identifies a specific node; or you can specify:

ANY
indicates all nodes.

*****
indicates your local node.

TO *nodeid*
specifies the new destination of the commands being rerouted.

nodeid
identifies a specific node; or you can specify:

*****
indicates your local node.

=
indicates the original destination node.

Quiet
suppresses messages DMT120I, DMT333I, and DMT336I when rerouting a file, message, or command.

Usage Notes

1. You can specify generic nodes and users by coding an asterisk (*) as the last character in the FOR *nodeid* or FOR *userid* clause. This causes RSCS to consider all identifiers that begin with the specified characters. For example, the following command tells RSCS to reroute all files destined for nodes of the form NYC*xxxxx*:

   ```
   reroute files for nyc* any to ...
   ```

2. You can specify generic reroutes and specific exceptions to those reroutes in any order. RSCS processes specific reroutes first and generic reroutes last. For example, suppose you had one specific reroute and two generic reroutes:

   ```
   reroute all for nyc* any to newyork =
   reroute all for nycvm2 operator to nycvm1 =
   reroute all for nycvm* operator to nycvm1 oper1
   ```

   If a file came in for OPERATOR at NYCVM2, RSCS would reroute it to OPERATOR at NYCVM1 because the second reroute is the most specific. If a file came in for OPERATOR at NYCVM1, RSCS would reroute it to OPER1 at NYCVM1 because the third reroute is more specific than the first reroute. If a file came in for OPERATOR at NYCMVS1, RSCS would reroute it to OPERATOR at NEWYORK because the first reroute is the most specific reroute match that RSCS could find.

   Note: RSCS processes generic reroutes by matching the destination node ID with the most specific node ID entry in the reroute table. After comparing node IDs, RSCS will compare user ID specifications.

3. You can specify generic reroutes and cancel (or block) a specific reroute. For example:

   ```
   reroute all for nyc* any to newyork =
   reroute msgs for nycvm2 operator to = =
   ```

   Again, the first command tells RSCS to reroute all files and messages for all users at all NYC*xxxxx* nodes to the same users at node NEWYORK. The second command blocks the reroute for user OPERATOR at node NYCVM2 by rerouting those messages back to the same node ID and user ID.

4. When RSCS reroutes a file, message, or command, RSCS issues a message (DMT120I, DMT333I, or DMT336I, respectively) that tells the sender the new destination of the file, message, or command. If you do not want the sender to receive a message saying the file, message, or command was rerouted, use the QUIET operand to suppress the message.

   Note: Specifying QUIET affects only one reroute entry at a time. If you specify a specific reroute (a specific node ID and user ID in the FOR clause), RSCS suppresses the reroute messages for only that reroute. If you specify a generic reroute, RSCS suppresses the reroute messages for all reroutes that match the generic specification. **When comparing destinations and generic reroutes, RSCS always sends traffic to the most specific reroute.** The only one way to suppress messages for all reroutes is to specify the QUIET operand on every REROUTE command and statement.

5. RSCS reroutes files and messages once per node, unless there is a NOTRCVG reroute in effect, which causes RSCS to reroute a message a second time. For example, suppose you have the following reroutes in effect, and users CHUCK and MATT are not logged on:

```
reroute all for newyork chuck to = matt
reroute all for newyork matt to = john
reroute notrcvg for matt to = jack
```

   If a file comes in for CHUCK, RSCS reroutes it to MATT because of the first command in the example. Although the second command tells RSCS to reroute everything for MATT to JOHN, RSCS will not reroute the file because it has already been rerouted once from CHUCK to MATT.

   However, if a message comes in for CHUCK, RSCS reroutes it to MATT and then to JACK because of the third command in the example.

6. RSCS will reroute commands for the local node only if the commands originated from another system or if they are issued in the form:

```
.
smsg rscsid cmd local_nodeid command_text
```

7. When RSCS finds a propagating QUERY command (for example, QUERY FILES or QUERY *nodeid* PATH), RSCS tests the next node in the propagation to see whether the command should be rerouted.
8. Make sure that reroutes do not refer to each other. Reroute loops involve more than one node, which makes them difficult to find. For example, suppose you had three nodes with one operator at each node:

Node	Command
BOSTON	`reroute notrcvg for operator to newyork =`
NEWYORK	`reroute notrcvg for operator to london =`
LONDON	`reroute notrcvg for operator to boston =`

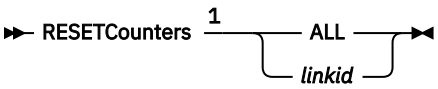
   If all three operators were not receiving and a message came in for one of them, you would have a reroute loop. For more information, see “Reroute Looping” on page 83.

9. REROUTE might cause problems if the external writer field (set using the CP TAG command) is used for something other than an MVS TSO user ID, because REROUTE changes this field if it matches the destination user field.
10. Use care when rerouting print files for LPR links. For example, the user ID field can be used to control whether the LPRXONE exit translates the data. However, when a user ID field is specified on the REROUTE statement, the LPRXONE exit might not translate the data as expected.
11. For printer links, two reroutes should be active:

```
reroute all for * oldprt to * newprt
reroute all for oldprt ANY to newprt =
```

    This will reroute all files arriving remotely as well as locally.

RESETCOUNTERS



Notes:

[1] Remote workstation operators must omit all operands.

Authorization

C, R, S, U

Purpose

The RESETCOUNTERS command resets all the counters RSCS uses to keep track of performance information for a link or links. For each link, RSCS tracks the following data:

- Date and time since tracking began
- Number of:
  - Files sent and received
  - Messages sent and received
  - I/O transactions
  - Errors in I/O transactions
  - Spool reads and writes
  - Timeouts
- Approximate byte count of:
  - Files sent and received
  - Messages sent and received
- Average time to perform:
  - Line I/O
  - Spool read
  - Spool write
- Return code, sense code, and user sense code of the last RPL on which an error occurred

Operands

ALL
resets the counters for all links.

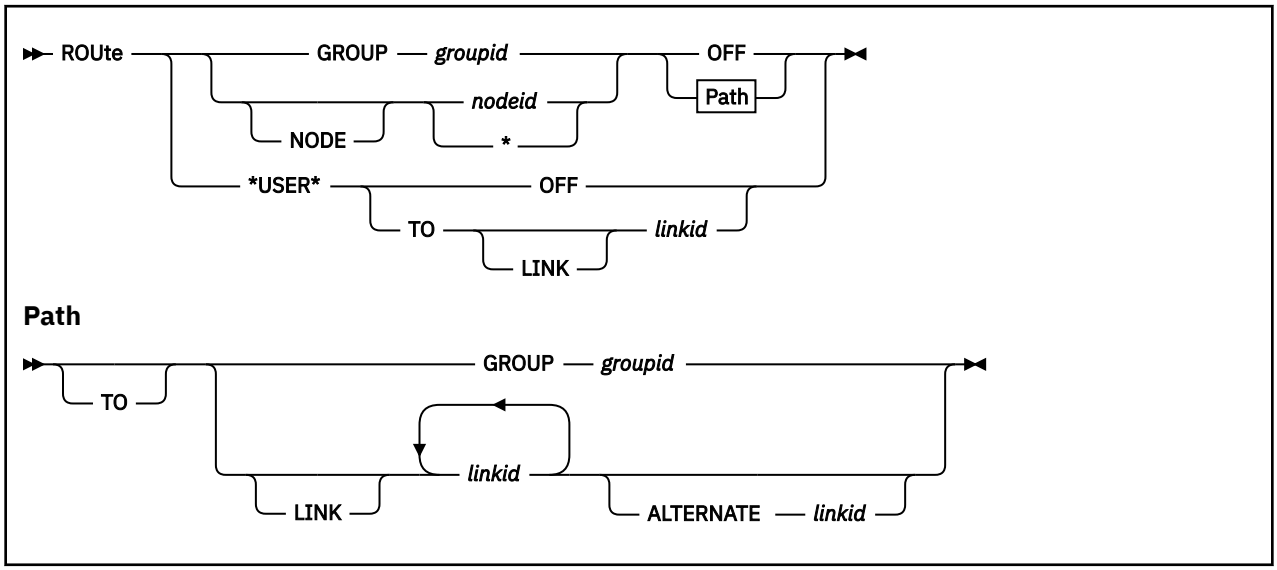
linkid
resets the counters for the specified link.

Usage Notes

1. Only the RSCS console operator, system-authorized alternate operators, and users authorized for all links through RSCSAUTH can use the ALL operand.
2. Remote workstation operators must enter the RESETCOUNTERS command with no operands. All other operators must choose between ALL and *linkid*.

3. To query the counters or the last time the counters were reset, use the QUERY SYSTEM COUNTS command. See "QUERY SYSTEM COUNTS" on page 216.

ROUTE



Authorization

C, S, U

Purpose

The ROUTE command temporarily defines, modifies, or deletes a path to a remote device, system, or group of systems with which RSCS communicates indirectly through one or more links. Permanent routing changes can be made only by modifying the RSCS configuration file and re-initializing RSCS. RSCS uses routing information to determine which links are to first receive files, commands, and messages that are to be transmitted to a nonadjacent node. RSCS file queues are resorted following execution of a ROUTE command, so that transmission of affected files can begin immediately.

Operands

GROUP *groupid*
routes traffic for the specified group ID (the name of a collection of nodes).

NODE *nodeid*
NODE *
routes traffic for the specified node ID. If you specify an asterisk (*), then traffic for all nodes not explicitly defined will be routed to the specified link. To specify a generic node ID, specify an asterisk (*) as the last character. Traffic will be routed for all node IDs that begin with the characters specified to the left of the asterisk.

OFF
cancels routing for the specified group ID or node ID.

TO GROUP *groupid*
routes the traffic through the same links as defined for the specified group ID.

TO LINK *linkid*
routes the traffic through the specified links, where each *linkid* is the name of a previously defined link.

ALTERNATE *linkid*
specifies an alternate link to be used if all the primary links are not in connect state.

USER
specifies how traffic sent to an undefined user ID on the local node should be handled.

OFF
cancels the routing.

TO LINK *linkid*
routes the traffic to the specified link, where *linkid* is the name of a previously defined link. This is the next link through which RSCS will send files, messages, and commands destined for the specified node.

For more information about routing files to a NOTIFY-type link for processing, see usage note "4" on page 266.

Usage Notes

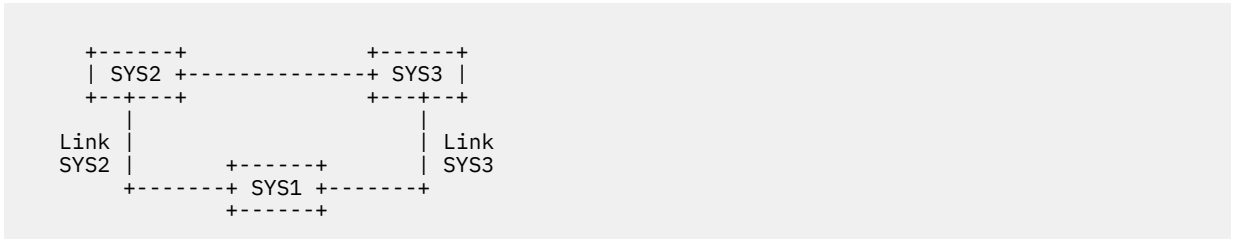
1. You cannot define a route where a destination node ID is routed to a LISTPROC link.
2. When specifying generic node IDs, the length of the character string determines the order in which a match will be made for selecting a route. If multiple matches are possible, longer strings are matched first. Explicit specification of a node ID always takes precedence over a generic specification. The actual order ROUTE commands are entered is not a determining factor.

3. If you plan to take advantage of the support that lets you route a node through multiple links, make sure you reserve an appropriate number of tag shadow elements (TASHADOWs). See *z/VM: RSCS Networking Planning and Configuration* for more information about using the SHADOWS statement to reserve tag shadow elements.
4. If your local node has defined a NOTIFY-type link to handle misdirected files, you can use ROUTE commands (or statements) to tell RSCS to route files to that link. For example, suppose you have two NOTIFY-type links called *NOTHERE and *UNKNOWN. You could use the following ROUTE commands:

```
route * to *unknown
route *user* to *nothere
```

The first command would route all files destined to unknown nodes through the *UNKNOWN link. The second command would route all files destined to unknown users on the local system through the *NOTHERE link.

5. **Important Note for Users Migrating from RSCS Version 2:** The concept of routing has changed.



Suppose you issued the following ROUTE command for system SYS1:

```
route sys2 to sys3
```

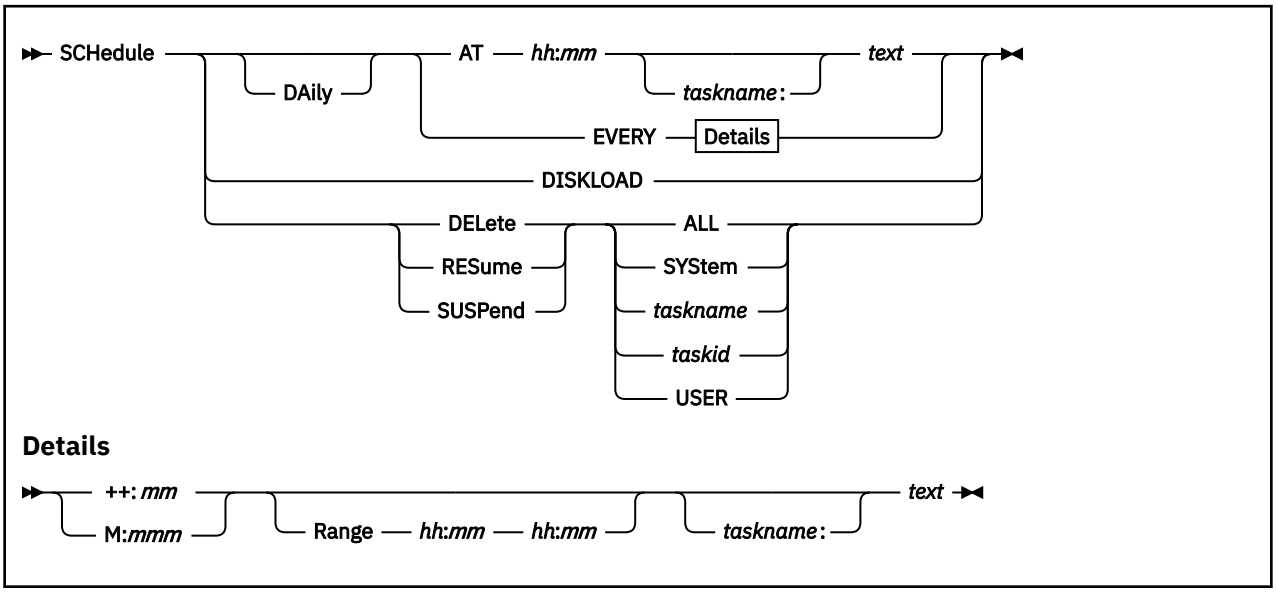
If system SYS1 was using RSCS Version 2, the link between SYS1 and SYS2 would have to go down before the ROUTE command became effective. Once the link went down, all files destined for node SYS2 would be queued on link SYS3.

Now, however, this ROUTE command would cause all files destined for node SYS2 to be automatically queued on link SYS3 regardless of the connection status of the link between SYS1 and SYS2.

If you are migrating from RSCS Version 2 and you want your ROUTE commands to perform the same as they have in the past, you would change the previous ROUTE command to:

```
route node sys2 to link sys2 alternate sys3
```

SCHEDULE



Authorization

C, S, U

Purpose

The SCHEDULE command temporarily adds, deletes, resumes, or suspends an event for the RSCS system. Use the SCHEDULE command to define a new event or to delete, resume, or suspend an existing event defined in the RSCS events file or defined by a previous SCHEDULE command.

Operands

DAily
continues the event past midnight (24:00). DAILY can be used only with the AT or EVERY operand. If you try to specify DAILY before the DELETE, DISKLOAD, RESUME, or SUSPEND operand, RSCS issues an error message.

AT *hh*:*mm* *taskname*: *text*
specifies the event and the time it should take place.

hh*:*mm
is the exact time in hours and minutes (using the 24-hour clock) the event should take place.

***taskname*:**
is an optional 1- to 8-character name (which must be followed by a colon) that you can assign to the event (or group of related events) you are defining.

text
is the command string to be run.

EVERY
performs the event at specific intervals.

++:*mm*
performs the event at *mm* minutes past each hour.

M:*mmm*
performs the event every *mmm* minutes.

Range *hh*:*mm hh*:*mm*
performs the event only during a specific time period. The first *hh*:*mm* indicates when the time period begins, and the second one indicates when the time period ends.

***taskname*:**
is an optional 1- to 8-character name (which must be followed by a colon) that you can assign to the event (or group of related events) you are defining.

text
is the command string to be run.

DISKLOAD
loads or reloads the RSCS events file into RSCS storage.

Attention
If you have changed the events file and you want to use the DISKLOAD operand to reload it, you must reaccess the disk the events file is on before you enter the SCHEDULE DISKLOAD command. If you do not reaccess the disk, RSCS will not pick up the latest changes.

DELete
deletes an event or a group of related events.

RESume
resumes the processing of an event or a group of related events, which were previously suspended using the SUSPEND operand.

SUSPend
suspends the processing of an event or a group of related events. Use the RESUME operand when you are ready to resume processing.

ALL
indicates all events. For RESUME, this means all previously suspended events.

SYStem
indicates all events (for RESUME, all previously suspended events) that were scheduled from entries in the events file.

taskname
identifies a specific event by the name you assigned to the event when you defined it.

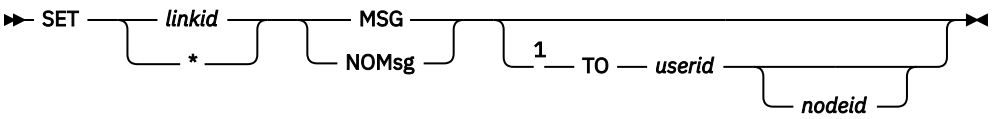
taskid
identifies a specific event by the decimal number that RSCS assigned to the event when it was defined.

USER
indicates all events (for RESUME, all previously suspended events) that were scheduled using the SCHEDULE command.

Usage Notes

1. At midnight (24:00), RSCS automatically resets all the events using the events listed in the RSCS events file. Therefore, any events you defined using the SCHEDULE command are no longer valid, unless you specify the DAILY operand. Events scheduled using the DAILY operand will survive the midnight reset, but will not survive an IPL.
2. To define a permanent event, add an entry to the RSCS events file. For more information about the events file, see *z/VM: RSCS Networking Planning and Configuration*.

SET



Notes:

[1] TO must be specified by RSCS console operators.

Authorization

C, L, S, U

Purpose

The SET command lets an authorized operator start or stop the sharing of RSCS console messages based on the associated link ID. Remote workstation operators cannot use the SET command.

When console message sharing is not in effect (the default), authorized operators receive messages in response to the commands they enter. For example, if an operator starts a link, that operator and the RSCS console receive error, initiation, and end messages for that link. However, the operator does not receive file transmission and reception messages unless the operator sends or receives a file.

When console message sharing is in effect, operators can choose to receive all messages associated with links they are authorized for, and they can choose to share messages with other local or remote virtual machines or users. For example, an operator who entered the SET command for a specific link receives all file transmission and reception messages and error, initiation, and ending messages for that link. Link-authorized alternate operators can receive only messages associated with their links, while system-authorized alternate operators can receive messages about any combination of links and the system.

Note: If you want to start console message sharing based on message number rather than link ID, use the SETMSG command. See “SETMSG” on page 272.

Operands

linkid
is the name of the link for which you want to start or stop console message sharing. If you are not authorized for the specified link, RSCS issues message DMT209E after you enter the SET command.

*****
indicates all links.

Note: Only an RSCS console operator, a system-authorized alternate operator, or a user authorized for all links through RSCSAUTH can specify an asterisk.

MSG
starts console message sharing for the specified link.

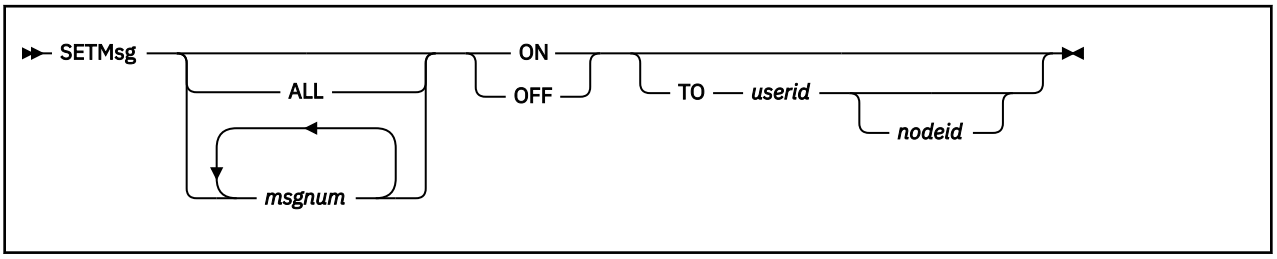
NOMsg
stops console message sharing for the specified link.

TO *userid nodeid*
specifies the user ID and node ID of the virtual machine to receive the shared console messages. If the TO operand is not specified, RSCS sends console messages to the operator entering the SET command. If *nodeid* is not specified, RSCS sends console messages to the specified user ID on the local system. RSCS console operators must specify the TO operand.

Usage Notes

1. If the message recipient logs off the system while console message sharing is in effect, RSCS automatically disables message sharing for the specific node ID and user ID combination. The operator must reenter the SET command after the message recipient has logged on again. RSCS can detect logged-off users only if they are at the same node as the RSCS virtual machine that owns their authorization table entry.
2. RSCS will continue to send messages to disconnected users to account for the fact that their virtual machines may have console spooling in effect.
3. If you specify a command response interface (CRI) prefix on the SET command, the message recipient will receive shared messages in the form and with the signature, if any, that you specify in the prefix.
4. To change the CRI prefix for a specific virtual machine, enter a SET command with the NOMSG operand for that user, then enter a second SET command for that user and specify a new CRI prefix.

SETMSG



Authorization

C, S, U

Purpose

The SETMSG command lets an authorized operator start or stop the sharing of RSCS messages based on the message number. Link-authorized alternate operators and remote workstation operators cannot use the SETMSG command.

Only messages marked as private cannot be shared. For more information about private messages, see *z/VM: RSCS Networking Messages and Codes*.

Note: If you want to start console message sharing based on associated link ID, use the SET command. See "SET" on page 270.

Operands

ALL
specifies that the message sharing setting applies to all non-private messages.

msgnum
is the 1- to 3-digit number of the RSCS message you want shared. For a list of all RSCS messages, see *z/VM: RSCS Networking Messages and Codes*.

Note: If message sharing is already in effect for the specified virtual machine and you enter a new SETMSG command, RSCS will:

- Add the new messages to the list of shared messages (if you specify ON)
- Delete the messages from the list (if you specify OFF).

ON
starts message sharing for the specified virtual machine.

OFF
stops message sharing for the specified virtual machine.

TO *userid nodeid*
specifies the user ID and node ID of the virtual machine to receive the shared messages.

Usage Notes

1. RSCS can detect logged-off users only if they are at the same node as the RSCS virtual machine that owns their authorization table entry. If the virtual machine receiving the shared messages becomes disabled, RSCS issues message DMT616E to reflect this situation to the RSCS console and to the operator that issued the SETMSG command.
2. RSCS will continue to send messages to disconnected users to account for the fact that their virtual machines may have console spooling in effect.

3. If you specify a command response interface (CRI) prefix on the SETMSG command, the message recipient will receive shared messages in the form and with the signature, if any, that you specify in the prefix.
4. RSCS keeps cumulative lists of shared messages based on user ID, node ID, and signature.

   When you use the SETMSG command to add a message or messages to the shared message list, if the user ID, node ID, and signature combination:

   - Match an existing entry, RSCS adds the new message or messages to the cumulative list of shared messages
   - Do not match an existing entry, RSCS creates a new list for the specified combination

   When you use the SETMSG command to delete a message or messages from the shared message list, RSCS checks the user ID, node ID, and signature combination that you specify against the existing entries. If you want to delete the entries for a specific user ID, node ID, and signature, the specified signature must match the existing entry or RSCS will not delete the message or messages. If you specify a user ID and node ID, but no signature, RSCS deletes the message or messages for all signatures belonging to that user ID and node ID combination.
5. If you specify a CRI prefix, the signature field is used to match other SETMSG settings for the specified user ID. If you do not specify a CRI signature, the SETMSG setting will affect any messages specified for that user ID. The specified messages will be added to the previous SETMSG setting that has the same signature.

SHIFT

Authorization

C, S, U

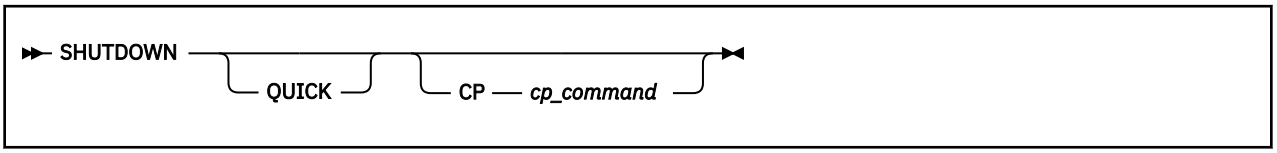
Purpose

The SHIFT command changes the RSCS shift setting. The exit routines can use this number to perform shift-dependent processing. For example, your installation may choose to write an exit routine that lets only large jobs print between the hours of 5 p.m. and 9 a.m. (second and third shifts).

Operands

shift-number
is a decimal number, 1 - 2147483647 (or 2^{31}-1), that RSCS passes to all enabled exit routines for processing.

SHUTDOWN



Authorization

C, S, U

Links

A, D, N, PR, U, W

Purpose

The SHUTDOWN command stops RSCS operations in an orderly fashion. Each active link is deactivated and, if any of them are SNA links, the RSCS-VTAM interface is also deactivated.

Attention
Use care when entering the SHUTDOWN command. If you accidentally enter it without the appropriate RSCS prefix, it is treated as a CP command and passed to CP for processing. If you have the proper CP privilege class, this command would stop your z/VM operating system.

Operands

QUICK
tells RSCS to issue a STOP command to each active link.

CP *cp_command*
tells RSCS to issue the specified CP command after the shutdown completes.

Usage Notes

1. The SHUTDOWN command issues a DRAIN command to each active link. SHUTDOWN QUICK produces a faster deactivation by issuing a STOP command to each active link. For NJE-type and SNANJE-type links, SHUTDOWN QUICK also deactivates the remote end of the links. Under certain unusual circumstances, it may take an appreciable length of time for the command to complete processing. You can hasten deactivation by issuing a second SHUTDOWN QUICK command.
2. You can enter a SHUTDOWN QUICK command while a SHUTDOWN command is in progress to cause faster ending of RSCS operations. If you enter a SHUTDOWN command while a SHUTDOWN QUICK command or a previous SHUTDOWN command is in progress, the new SHUTDOWN will be accepted, but it will not affect the processing speed.
3. The CP operand lets you specify a CP command that you want RSCS to issue after the shutdown has completed. For example, if you specify:

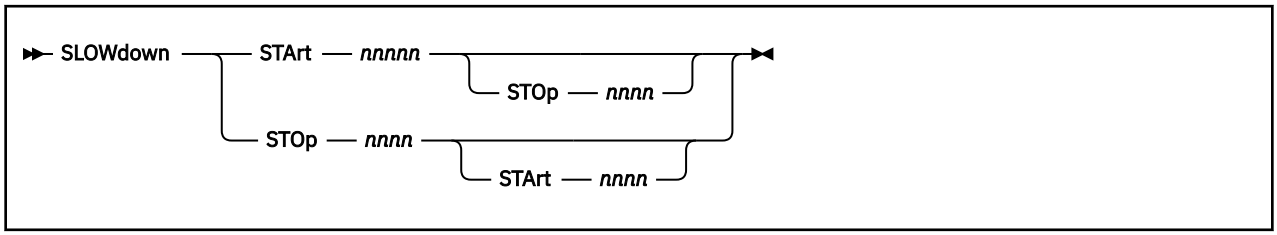
   ```
   shutdown cp ipl gcs
   ```

   RSCS will shut down and then re-IPL GCS. Or, if you specify:

   ```
   shutdown cp logoff
   ```

   RSCS will shut down and then log itself off.

SLOWDOWN



Authorization

C, S, U

Links

N

Purpose

The SLOWDOWN command lets you specify or dynamically change the absolute (base) system slowdown values. These values tell RSCS when to automatically start or stop slowdown mode for all active GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links. The values specified on the SLOWDOWN command set the absolute (base) slowdown start and stop values for the system and override any values specified on the SLOWDOWN statement in the RSCS configuration file.

Slowdown mode starts when the number of files in the RSCS virtual machine's reader grows large enough to match (or surpass) the slowdown start value. To start slowdown mode, RSCS issues HOLD INPUT commands to all active GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links (except those links that have specified their own slowdown values). This prevents incoming traffic so RSCS can concentrate on reducing the size of the current file queue. When the number of files in the reader drops below the stop value, RSCS issues FREE commands to all active GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links and file transmission resumes. Slowdown mode has no effect on message and command traffic.

For more information about slowdown mode, see “Using the Slowdown Facility” on page 98.

Operands

STArt *nnnnn*
: specifies the absolute (base) slowdown start value for your system. This value tells RSCS to start slowdown mode when the total number of files in the RSCS file queue reaches or surpasses the value specified for *nnnnn*, which can be any decimal number, 1 - 10000. This value must be greater than the value specified for STOP.

  If this operand is omitted, RSCS uses the start value specified on the SLOWDOWN statement. If no SLOWDOWN statement was specified and no start value was specified on a previous SLOWDOWN command, the start value is 0 (zero).

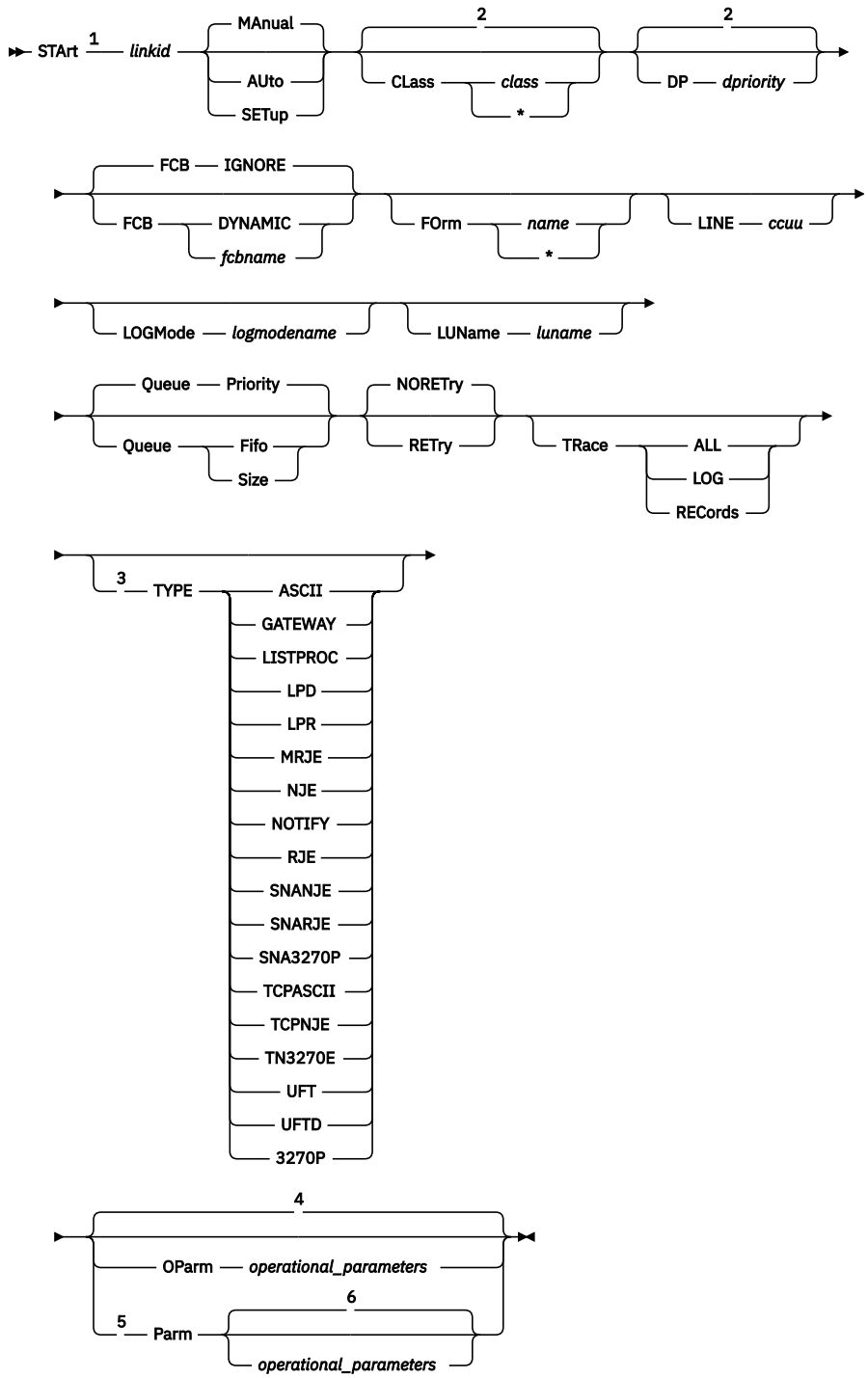
STOp *nnnn*
: specifies the absolute (base) slowdown stop value for your system. This value tells RSCS to end slowdown mode when the total number of files in the RSCS file queue reaches or becomes less than the value specified for *nnnn*, which can be any decimal number, 0 - 9999. This value must be less than the value specified for START.

  If this operand is omitted, RSCS uses the stop value specified on the SLOWDOWN statement. If no SLOWDOWN statement was specified and no stop value was specified on a previous SLOWDOWN command, RSCS sets the stop value to 0 (zero).

Usage Notes

1. This command applies only to GATEWAY-type, NJE-type, SNANJE-type, and TCPNJE-type links.
2. To avoid excessive starting and stopping of slowdown mode, specify a stop value sufficiently less than the start value. We recommend that you set the stop value to at least 10% less than the start value.
3. If you enter the SLOWDOWN command specifying only the stop value, and you did not specify a SLOWDOWN statement in the configuration file, then you never set a start value. If you do not set a start value, it automatically becomes 0. Because the start value must be greater than the stop value, RSCS issues error message DMT211E.
4. To define or change the start or stop values for a specific link, use the SLOWDOWN operand on the LINKDEFINE statement or the DEFINE command. For information about the LINKDEFINE statement, see *z/VM: RSCS Networking Planning and Configuration*. For information about the DEFINE command, see "DEFINE" on page 146.

START



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.
[2] The default is the definition in the link table entry.
[3] TYPE is required if not previously defined.
[4] Operational parameter values remain as previously defined or as defaulted.
[5] Depending on the link type, some operational parameters do not have defaults and are required if not previously defined.

[6] All previously defined operational parameter values are negated; for parameters with defaults, default values are used.

Authorization

C, L, R, S, U

Purpose

The START command reactivates the specified inactive link or resets a pending deactivation because of a DRAIN command. It can also be used to cause an active link to begin processing files of a specified set of classes or forms. If a 3270 printer is so equipped, the PA2 key may be used in place of a START command. For more information, see “Printer Key Support in an LU_T1 Session” on page 56.

Operands

linkid
is the name of the inactive link to be started, or the active link on which file processing is to be altered. If you enter the command from a remote workstation, you must omit this operand.

MAnual
tells RSCS to process only files with the current form name. If you specify the form name as an asterisk (*), RSCS will process files with any form name. MANUAL is the default.

AUto
tells RSCS to process files with any form name and issue automatic prompting messages for any forms changes.

SETup
tells RSCS to process files with any form name and issue automatic prompting messages for any forms changes. Also, the workstation operator is allowed to check and adjust forms alignment when changing forms. If specified for an LPR-type link, this parameter is ignored. For information about default settings, see usage note “4” on page 283.

CLass *class*
CLass *
specifies the class or classes of files that can be processed by the active link. You can specify 1 - 4 characters with no intervening blanks (*c*, *cc*, *ccc*, or *cccc*), where each character is one of the valid z/VM spool classes, A - Z or 0 - 9. Or you can specify an asterisk (*) to indicate all file classes can be processed. If you specify multiple classes, RSCS processes files in the order that the classes are specified, and in priority order within each class. If you specify *, RSCS processes files in priority sequence only. If the CLASS operand is omitted, RSCS uses the class definition in the link table entry.

DP *dpriority*
specifies a decimal number, 1 - 9, that allows GCS to alter the dispatching priority of this link in relation to the dispatching priorities of other links. Priority 1 is the highest and priority 9 is the lowest. If the DP operand is omitted, RSCS uses the priority definition in the link table entry.

FCB
specifies the forms control buffer (FCB) processing mode.

IGNORE
ignores all FCB names. This is the default. If you specify FCB IGNORE for a SNA3270P-type or 3270P-type link, RSCS converts all channel skips (other than channel one) to a "line-space-one".

DYNAMIC
processes files with any FCB name. For SNA3270P-type and 3270P-type links, RSCS will perform channel skip simulation. If the file does not specify an FCB name, RSCS treats the file as if IGNORE was specified (RSCS converts all channel skips to a "line-space-one"). Before using an FCB name, you must define the FCB image to RSCS using the FCB statement in the RSCS

configuration file. For information about the FCB statement, see *z/VM: RSCS Networking Planning and Configuration*.

fcbname
processes only files with the specified FCB name. Before channel skip simulation can occur on SNA3270P-type and 3270P-type links, you must define the FCB name to RSCS by using the FCB statement in the RSCS configuration file. For information about the FCB statement, see *z/VM: RSCS Networking Planning and Configuration*.

FCB is valid only for ASCII-type, MRJE-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, and 3270P-type links. If you specify FCB for a GATEWAY-type, LISTPROC-type, LPD-type, LPR-type, NJE-type, NOTIFY-type, SNANJE-type, TCPNJE-type, TN3270E-type, UFT-type, or UFTD-type link, RSCS ignores the operand.

FOrm *name*
FOrm *
specifies the operator form name of files that may be processed after execution of the command. If you specify an asterisk (*), any file may be processed, regardless of form name.

If FORM is not specified on the START command, the current form for the link remains in effect. The current form is maintained if the link is drained and restarted. When a link is started for the first time, or if the link has been deleted and redefined, the default operator form name specified on the OPFORM configuration file statement is used. If neither MANUAL, AUTO, nor SETUP is specified, the previous mode setting remains in effect. The previous mode is maintained if the link is drained and restarted. For more information, see usage note "4" on page 283.

LINE *ccuu*
specifies the virtual address (device number) of a telecommunication adapter or printer for this link. Valid addresses are X'0000' and X'0002' - X'1FFF'. The virtual address cannot be within the RSCS virtual unit record device pool (default X'0F01' - X'0FFF', or as specified on the CHANNELS statement). For information about the CHANNELS statement, see *z/VM: RSCS Networking Planning and Configuration*.

The specified value overrides a device address that may have been previously defined for the link. If no address was previously defined and no address is specified, an available switched port is selected for use, and the operator is informed of that selection. This operand is valid only when starting an inactive link.

If specified for a GATEWAY-type, LISTPROC-type, LPD-type, LPR-type, NOTIFY-type, SNANJE-type, SNARJE-type, SNA3270P-type, TCPNJE-type, UFT-type, or UFTD-type link, RSCS checks the syntax of the virtual device number, but does not use it.

LOGMode *logmodename*
specifies the name of the logon mode table entry for an SNA LU. This allows the default logon mode table defined in the VTAM configuration to be overridden. If a new link is being defined and this operand is not specified, the name will be kept as blank, causing the default logon mode table to be used. If this operand is specified for a non-SNA link, the syntax is checked but it is not used.

LUName *luname*
specifies the logical unit name for the device or system connected to this link. If a new link is being defined and this operand is not specified, the logical unit name is assumed to be the same as the link ID. If this operand is specified for a non-SNA link, the syntax is checked but it is not used.

You cannot use an LU name that was previously specified for another link (whether in the configuration file or by another DEFINE command). If you specify an already defined LU name, RSCS rejects the START command and issues message DMT713E.

Queue
specifies how files will be queued for transmission on the target link ID:

Priority
queues files by priority (low-numbered priority first) and size within priority (small files first). This is the default.

Fifo
queues arriving files in order of arrival (the time the file was written into the CP spool). Files that were already queued before the link is started will not be reordered in the queue.

Size
queues files by size (small files first).

The specified value overrides a value that may have been previously defined for the link. This operand is valid only when starting an inactive link.

NORETry
RETry
specifies whether RSCS should try to restart an autodial or SNA link after certain temporary error conditions have occurred. These error conditions include VTAM errors and time outs on a dial to a remote system or workstation. The default is NORETRY.

If you specify RETRY on an autodial or SNA link, RSCS will (by default) try to restart the link automatically after 1 minute. If the restart fails, RSCS will wait 10 minutes before trying again. If that restart fails, RSCS will wait 19 minutes before trying again. RSCS will continue to retry the link indefinitely at increasing intervals. The intervals are at 1, 10, 19, 27, 34, 40, 45, 49, 52, 54, and 55 minutes. Once RSCS reaches the 55 minute interval between restarts, all restarts after that point will be 55 minutes apart until the link restarts or RSCS terminates.

To change the default retry intervals for your local system, use the RETRY statement described in *z/VM: RSCS Networking Planning and Configuration*.

TRace
starts the logging of I/O transactions on the target link. This is similar to issuing the RSCS START command followed by the RSCS TRACE command. When entered as an option of the START command, transactions related to the start of link activity can be traced. This operand is valid only when starting an inactive link.

ALL
starts the full-buffer logging of I/O activity on the link.

LOG
starts the partial-buffer logging of I/O activity on the link.

RECords
starts the logging of NJE record segments sent and received on this link. This option is valid only for GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links. If you specify RECORDS for any other link type, RSCS issues message DMT204E.

The TRACE operand lets you start tracing, but does not allow you to specify where RSCS should send the trace file. Use the TRACEDEST statement or the TRACE command to specify the destination of the trace file. For information about the TRACEDEST statement, see *z/VM: RSCS Networking Planning and Configuration*. For information about the TRACE command, see "TRACE" on page 287.

TYPE
specifies a symbolic name that describes the type of telecommunication protocol to be used to communicate with the remote workstation or system.

ASCII
indicates a connection to an ASCII printer or plotter using an ASCII control unit.

GATEWAY
indicates a connection using an installation-defined protocol.

LISTPROC
indicates a list processor.

LPD
indicates a link that enables RSCS to receive print data streams from an LPR client in a TCP/IP network.

LPR
indicates a connection to send print data streams to a line printer daemon in a TCP/IP network.

MRJE
indicates a BSC connection to a multi-leaving workstation or host system.

NJE
indicates a BSC, CTCA, ESCON or FICON CTCA, or 3088 connection to a peer NJE system.

NOTIFY
indicates a note generator.

RJE
indicates a BSC connection to a BSC workstation.

SNANJE
indicates a connection to an NJE system through VTAM.

SNARJE
indicates a connection to an SNA System/36 RJE workstation through VTAM.

SNA3270P
indicates a connection to a 3270 printer through VTAM.

TCPASCII
indicates a connection to an ASCII printer attached to a terminal server within a TCP/IP network.

TCPNJE
indicates a connection to an NJE system within a TCP/IP network.

TN3270E
indicates a connection to a 3270 printer using a TCP/IP Telnet attachment.

UFT
indicates a link that enables RSCS to send files to a UFT daemon in a TCP/IP network.

UFTD
indicates a link that enables RSCS to receive files from a UFT client in a TCP/IP network.

3270P
indicates a connection to a 3270 printer using a BSC adapter or channel attachment.

The value specified overrides a value that may have been previously defined for the link. This option is valid only when starting an inactive link. If omitted and not previously specified on a LINK statement, LINKDEFINE statement, or DEFINE command, RSCS issues error message DMT705E to tell you that you cannot start a link without specifying a link type.

Type LISTPROC can be used only to override values of a previously defined LISTPROC link. The START command cannot be used to dynamically redefine an existing link as a LISTPROC-type link or to dynamically redefine a LISTPROC-type link to a different link type.

OParm
Parm
causes the remainder of the command line to the right of the OPARM or PARM operand to be made available to the inactive link as operational parameters, which have meaning to the link. If neither OPARM nor PARM is specified, or if the link is already active, the operational parameters remain the same as previously defined by a PARM configuration file control statement or a previous DEFINE command.

Operational parameters supplied after an OPARM operand override the corresponding parameters previously defined by a PARM configuration file statement or a previous DEFINE command.

Operational parameters supplied after a PARM operand override **all** operational parameters previously defined by a PARM configuration file statement or on a previous DEFINE command. If no information is supplied after the PARM operand, all previously defined operational parameters are effectively negated, and parameters with defaults will assume their default values.

If the OPARM or PARM parameters contain sensitive information (for example, passwords) that you do not want users to see in response to a QUERY command, you can surround the sensitive section with the hide character. By default, the hide character is a backward slash (\), but you can use the HIDECHARACTER configuration file statement to change the default. For more information about

the hide character and the HIDECHARACTER statement, see *z/VM: RSCS Networking Planning and Configuration*.

Each link type has its own operational parameters. For general information about operational parameters, see Chapter 13, "Link Operational Parameters," on page 293. For a specific link type, see:

- "ASCII-Type Link Operational Parameters" on page 294
- "GATEWAY-Type Link Operational Parameters" on page 297
- "LISTPROC-Type Link Operational Parameters" on page 302
- "LPD-Type Link Operational Parameters" on page 306
- "LPR-Type Link Operational Parameters" on page 308
- "MRJE-Type Link Operational Parameters" on page 313
- "NJE-Type Link Operational Parameters" on page 318
- "NOTIFY-Type Link Operational Parameters" on page 326
- "RJE-Type Link Operational Parameters" on page 328
- "SNANJE-Type Link Operational Parameters" on page 333
- "SNARJE-Type Link Operational Parameters" on page 339
- "SNA3270P-Type Link Operational Parameters" on page 342
- "TCPASCII-Type Link Operational Parameters" on page 349
- "TCPNJE-Type Link Operational Parameters" on page 352
- "TN3270E-Type Link Operational Parameters" on page 360
- "UFT-Type Link Operational Parameters" on page 366
- "UFTD-Type Link Operational Parameters" on page 369
- "3270P-Type Link Operational Parameters" on page 371

Usage Notes

1. If a 3270 printer is so equipped, the PA2 key can be used instead of a START command. For more information, see "Printer Key Support in an LU_T1 Session" on page 56.
2. AUTO, FORM, MANUAL, and SETUP are valid only for ASCII-type, LPR-type, MRJE-type, RJE-type, SNARJE-type, SNA3270P-type, TCPASCII-type, and 3270P-type links in HOST mode. If they are specified for a GATEWAY-type, LISTPROC-type, LPD-type, NJE-type, NOTIFY-type, SNANJE-type, TCPNJE-type, TN3270E-type, UFT-type, or UFTD-type link, they are validated for proper syntax but are ignored.
3. When you define a form name (using the FORM configuration file statement), you can define these characteristics:
   - Separator page style
   - Line length
   - Page length
   - Lines per inch (only for LU_T1 printers and workstations)

   If you specify a form name when starting a link, be aware that the form name characteristics always override any SEP, LLINE, and LPAGE specifications and will override LPI specifications when SETPAGE=YES.
4. The default forms control mode is determined by the DEFINE command or the LINKDEFINE statement. If you do not specify any forms control mode information on the START command, the values defined by the DEFINE command or LINKDEFINE statement are used. If no forms control information is specified on the DEFINE or START commands or the LINKDEFINE statement, the default is MANUAL. Starting a link with FORM * MANUAL specified on the START command means *no* forms control.

STOP

Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Purpose

The STOP command deactivates a specified link without completing transmission of a file or files. RSCS requeues any files that did not complete transmission on the link. This contrasts with the DRAIN command, which deactivates the link after the current file or files have finished being transmitted.

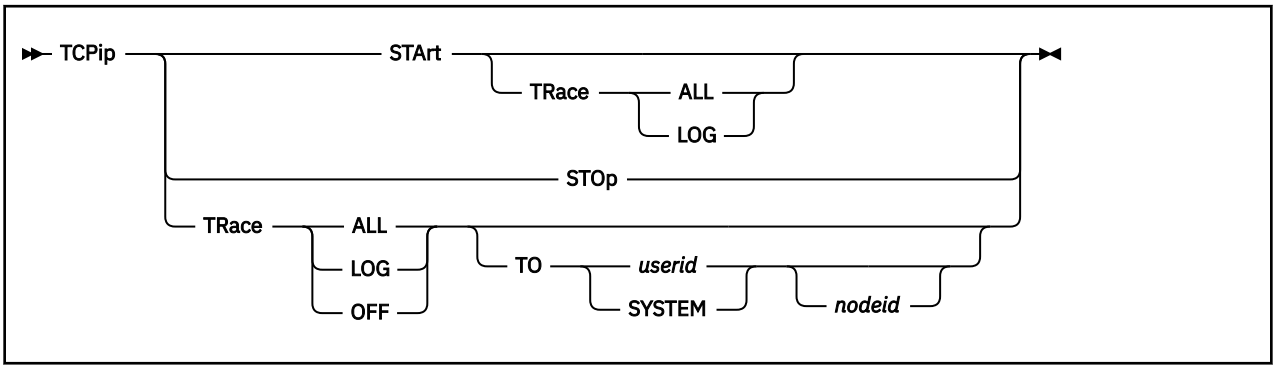
Operands

linkid
is the name of the active link to be deactivated, or the active link on which file processing is to be altered. If you enter the command from a remote workstation, you must omit this operand.

Usage Notes

1. Using STOP causes an autostart link to be redefined as a non-autostart link.
2. Using STOP causes a link started with the RETRY operand to be changed to NORETRY.
3. STOP may also deactivate the remote end of a GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type link.
4. For a GATEWAY-type, NJE-type, SNANJE-type, or TCPNJE-type link, or for a link on a switched line, deactivation may take 30 seconds or more. You can hasten deactivation of the link by entering a second STOP command.
5. Using STOP on an auto-signon link causes RSCS to send a signoff card to the remote workstation.
6. If STOP fails to deactivate the link, try deactivating the link with the FORCE command. For more information, see “FORCE” on page 166.

TCPIP



Authorization

C, S, U

Purpose

The TCPIP command starts or stops the RSCS port redirector task.

Operands

STArt
starts the RSCS port redirector task. This task will accept requests from other RSCS tasks to listen for remote IP host connect requests on a specific local TCP/IP port.

STOp
stops the RSCS port redirector task. All active TCP/IP socket listen requests are terminated. Any task that has an active listen request will not have the ability to be notified when an incoming connect request satisfies it. Any task that already has had a listen request satisfied and has an active TCP/IP connection will not be affected.

TRace
starts or stops the logging of port redirector socket activity.

ALL
starts full-buffer logging of port redirector socket activity.

LOG
starts partial-buffer logging of port redirector socket activity.

OFF
stops all port redirector socket logging activity and starts printing the log data.

TO *userid*
TO SYSTEM
specifies the user ID of the virtual machine to receive the log output. If the output is to be sent to the system record device, the *userid* must be specified as SYSTEM.

If specified, TO must be the rightmost operand. If TO is omitted, RSCS sends the log output to the user ID specified on the TRACEDEST configuration file statement. If a TRACEDEST statement is not specified, RSCS sends the output to the local printer.

nodeid
is the node ID of a remote destination location. When *userid* or SYSTEM is specified with a *nodeid*, they can identify a virtual machine, a workstation, a 3270 printer, or the system record device on the specified remote system. If a *nodeid* is not specified, the local system is assumed.

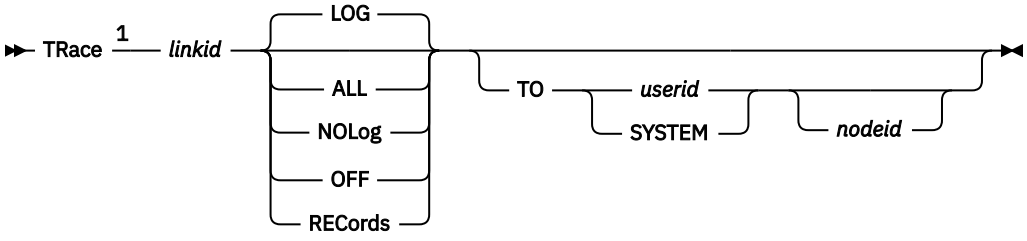
Usage Notes

1. The RSCS port redirector task is automatically attached and started when RSCS initializes. You need to enter the TCPIP START command only if the port redirector task was previously stopped by a TCPIP STOP command or if it abended.
2. After you start logging I/O activity, you can switch from full-buffer to partial-buffer, or from partial-buffer to full-buffer, by entering another TCPIP TRACE command and specifying the other option (ALL or LOG).
3. If you specify the TO operand, RSCS sends the log output file to the specified virtual machine after you enter:
   - TCPIP TRACE OFF command (to close the log output file)
   - TCPIP STOP command (to stop the RSCS port redirector task)

   You can change the routing after log activity has started by entering another TCPIP TRACE command and specifying the TO operand.
4. The RSCS port redirector task always has an active listen outstanding for a requesting task, even when a connect request for that task has been received and processed. The listen remains active until the task requests the listen to be deleted, or the port redirector task finds that the requesting task has terminated.

   A requesting task, such as a TCPNJE link driver, may not be notified immediately by the TCP/IP network when the underlaying IP connection has been broken. If a new connect request is received while a task still thinks a valid connection exists, the RSCS port redirector task will notify the task of this connect request. To the requesting task, this indicates that the TCP/IP network connection has been broken. A task can then handle this broken TCP/IP network connection condition. This ability is lost when the RSCS port redirector task is stopped.
5. To see the status of the RSCS redirector task, use the QUERY SYSTEM TCPIP command. See “QUERY SYSTEM TCPIP” on page 253.

TRACE



Notes:

[1] If you enter the command from a remote workstation, omit the *linkid*.

Authorization

C, L, R, S, U

Purpose

The TRACE command lets you verify that the line service is working properly. It also generates documentation useful in problem determination. TRACE starts, alters, or stops logging of each transaction on a link. While log trace is active for a link, a record of each transaction is written to a spool print file. The spool file is queued for real printer output, or directed to the specified user ID when the log trace is deactivated for the link.

Operands

linkid
is the name of the link for which tracing is to be started or stopped. If you enter the command from a remote workstation, you must omit this operand.

LOG
starts partial-buffer logging of activity on the link. Only the first 16 and last 16 bytes in the data buffer are logged. LOG is the default function.

ALL
starts full-buffer logging of activity on the link. (This operand is recommended by the IBM Support Center for diagnostic purposes.)

NOLog
stops the logging of activity on the link. This is the initial state at RSCS start-up.

OFF
stops the reporting of line activity, stops the logging of I/O activity (and initiates the automatic printout of the log data), and resets the routing of the log output.

RECords
starts the logging of NJE record segments sent and received on this link. This option is valid only for GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, and TCPNJE-type links. If you specify RECORDS for any other link type, RSCS issues message DMT204E.

TO *userid*
TO SYSTEM
specifies the user ID of the virtual machine to receive the log output. If the output is to be sent to the system unit record device, the *userid* must be specified as SYSTEM.

If you specify the TO operand, it must be the rightmost operand. If TO is omitted, RSCS sends the output to the destination specified by the TRACEDEST configuration file statement. If no TRACEDEST

statement was specified, RSCS sends the output to the local system printer. For information about the TRACEDEST statement, see *z/VM: RSCS Networking Planning and Configuration*.

nodeid
is the node ID of a remote destination location. When *userid* or SYSTEM is specified with a *nodeid*, they can identify a virtual machine, a workstation, a 3270 printer, or the system record device on the specified remote system. If a *nodeid* is not specified, the local system is assumed.

Usage Notes

1. RSCS closes a trace file only when you specify TRACE OFF or when a link session ends. If tracing is not already in effect and you specify TRACE ALL, LOG, or RECORDS, RSCS opens a trace file and starts tracing the specified activity. If tracing is in effect for one of the three activities (ALL, LOG, or RECORDS) and you enter an ENABLE command with a new TRACE option, RSCS will start tracing the new activity without closing the trace file.
2. Using the TRACEDEST statement in the configuration file, you can specify a default destination for the trace output of all links. Using the TRACE command with the TO operand, you can temporarily override the TRACEDEST statement, or specify a default destination if no TRACEDEST statement was specified in the configuration file.
3. The routing specified by the TO operand takes place only when you specify OFF to close the trace output file. So the routing can be changed after trace activity is started, because only the last routing that was specified is used.
4. Because an MRJE link in workstation mode is intended to handle only job data, it will not handle trace information, which will be purged if you attempt to route it through an MRJE link.
5. If you want to see how large an active trace file is, use the QUERY *linkid* ACTIVE command. See “QUERY LINKID” on page 198.

TRANSFER

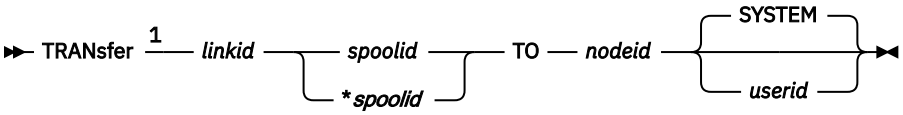
Purpose

The TRANSFER command redirects one or more inactive files to a new destination. RSCS removes the file from *linkid* and queues it on the link for the path to the new *nodeid*.

This command has two formats:

- Use format 1 if you want to manipulate a file that you originated or that is destined for you, but you are not authorized for this link.
- Use format 2 if you are authorized for this link.

Format 1



Notes:

[1] The *linkid* must be specified by link-authorized alternate operators only; all others must omit this operand.

Authorization [1]

G, L (not authorized for this link), U (not authorized for this link)

Operands [1]

linkid
is the name of the link on which the file is queued. This operand must be specified by link-authorized alternate operators who are not authorized for this link. General users and users authorized through RSCSAUTH for this command but not this link must omit the *linkid*.

spoolid
is the *current* spool file identifier for the file to be transferred.

****spoolid***
specifies the *origin* spool file identifier for the file to be transferred.

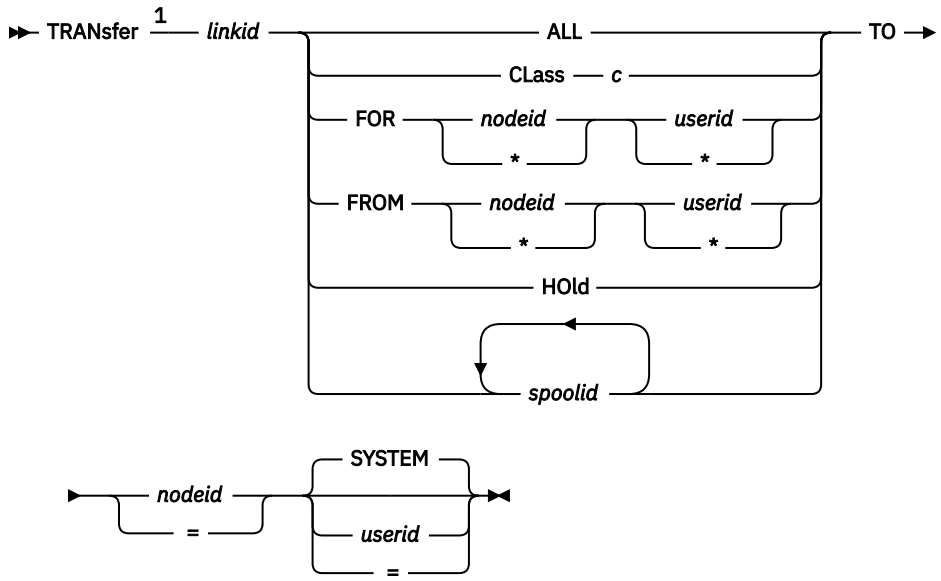
TO *nodeid*
specifies the new destination node ID for the file.

userid
SYSTEM
specifies the new destination user ID for the file. The default is SYSTEM.

Usage Notes [1]

You can transfer only one file at a time. If you want to transfer more than one file, enter the TRANSFER command for each file.

Format 2



Notes:

[1] If you enter this command from a remote workstation, omit the *linkid*.

Authorization 2

C, L (authorized for this link), R, S, U (authorized for this link)

Operands 2

linkid
is the name of the link from which the file is to be transferred. If you enter the command from a remote workstation, you must omit this operand.

ALL
tells RSCS to transfer all files queued on the link.

CLass *c*
tells RSCS to transfer all class *c* files queued on the link.

FOR *nodeid userid*
tells RSCS to transfer all files destined for a particular virtual machine. To specify a generic node ID or user ID, place an asterisk (*) as the last character of the node ID or user ID. To specify all node or all users, use an asterisk (*) in place of the node ID or user ID. For example, if you specified:

```
FOR PRT* *
```

it would effect all users on nodes whose first three characters are PRT.

FROM *nodeid userid*
tells RSCS to transfer all files coming from a particular virtual machine. To specify a generic node ID or user ID, place an asterisk (*) as the last character of the node ID or user ID. To specify all node or all users, use an asterisk (*) in place of the node ID or user ID. For example, if you specified:

```
FROM VM* *
```

it would effect all users on nodes whose first two characters are VM.

HOld
tells RSCS to transfer all files queued on the link in hold status.

spoolid
is the *current* spool file identifier for the file to be transferred. You can specify multiple spool IDs.

TO *nodeid userid*
specifies the new destination node ID and user ID for the files being transferred. The default user ID is SYSTEM. If you specify an equal sign (=) instead of a node ID or user ID, RSCS transfers the files to the same node IDs or user IDs. For example, when you enter:

```
transfer nycvm all to boston =
```

RSCS takes all files enqueued on link NYCVM and transfers them to the same user IDs at node BOSTON.

Usage Notes 2

1. If your local system has used the ROUTE command (or statement) to generate routes with multiple links, there may be tag shadow elements representing the file on several different links. When you use the TRANSFER command, RSCS automatically transfers all associated tag shadow elements as well.
2. The TRANSFER command is not valid for a file that has multiple destinations (a file with a file type of *MULTI*). If you try to transfer a *MULTI* file, RSCS issues an error message and rejects the command.
3. If your local node has a list processor, you can transfer files:
   - To users on your local node
   - From networking links (GATEWAY-type, LISTPROC-type, NJE-type, NOTIFY-type, SNANJE-type, and TCPNJE-type links) to other types of links.

   The list processor prepares the file for delivery to the new destination. If your local node does not have a list processor and you try to perform one of these two transfers, RSCS will reject the command and the file will continue to its original destination.
4. If your system uses the misdirected file support in RSCS and you send a file to an unknown node or to an unknown user, RSCS sends the file to special nodes (suggested node ID's are *NOTHERE and *UNKNOWN). These special nodes hold your file and send you a note telling you that you can purge the file, transfer the file, or do nothing and RSCS will purge the file after a specified number of days. If you chose to transfer the file and you transfer it to another unknown node or unknown user, RSCS sends the file to one of the special nodes again and you will receive another note.

Chapter 13. Link Operational Parameters

This chapter describes the link-dependent operational parameters ("parm values") for each type of link. Parm values can be supplied when a link is:

- Permanently defined using the PARM or UPARM statement in the RSCS configuration file (see *z/VM: RSCS Networking Planning and Configuration*)
- Temporarily defined or altered using the PARM or UPARM operand of the DEFINE command (see "DEFINE" on page 146)
- Started using the PARM or OPARM operand of the START command ("START" on page 278)

For addition information about defining and starting links, see Chapter 4, "Managing Links," on page 37.

The format and content of the parm values varies for each type of link. The link types and supported parm values are listed in alphabetic order.

- "ASCII-Type Link Operational Parameters" on page 294
- "GATEWAY-Type Link Operational Parameters" on page 297
- "LISTPROC-Type Link Operational Parameters" on page 302
- "LPD-Type Link Operational Parameters" on page 306
- "LPR-Type Link Operational Parameters" on page 308
- "MRJE-Type Link Operational Parameters" on page 313
- "NJE-Type Link Operational Parameters" on page 318
- "NOTIFY-Type Link Operational Parameters" on page 326
- "RJE-Type Link Operational Parameters" on page 328
- "SNANJE-Type Link Operational Parameters" on page 333
- "SNARJE-Type Link Operational Parameters" on page 339
- "SNA3270P-Type Link Operational Parameters" on page 342
- "TCPASCII-Type Link Operational Parameters" on page 349
- "TCPNJE-Type Link Operational Parameters" on page 352
- "TN3270E-Type Link Operational Parameters" on page 360
- "UFT-Type Link Operational Parameters" on page 366
- "UFTD-Type Link Operational Parameters" on page 369
- "3270P-Type Link Operational Parameters" on page 371

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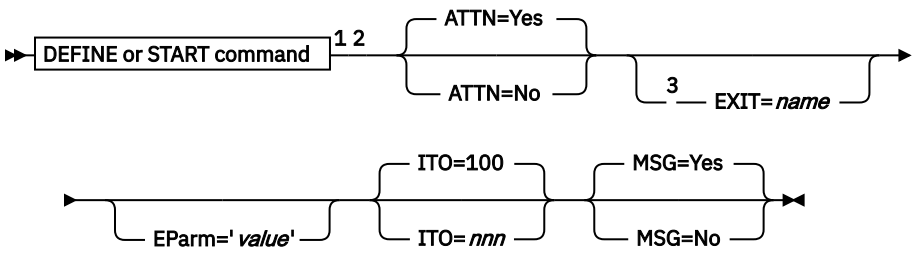
ASCII-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] EXIT is required on the START command if not previously defined.

Purpose

An ASCII-type link connects your local RSCS system to a remote ASCII printer or plotter. These link operational parameters can be specified on the DEFINE or START command for a specific ASCII-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

ATTN=Yes
ATTN=No
specifies whether RSCS should wait for an attention interrupt after printing each buffer transmitted to the ASCII control unit. The default is YES.

If you have a 7171 ASCII Device Attachment Control Unit, you should not specify ATTN=NO.

If you have a 9370 ASCII Subsystem Controller, the value of ATTN depends on whether the controller was configured to respond to the host with an attention interrupt after printing each buffer. To configure the controller, use the **QFADEF** menu of the Device Definition Table for that particular device. Choose the **Send ATTN after transparent write** option. Usually, it is recommended that you specify ATTN=NO for 9370 ASCII Subsystem Controllers.

PI

EXIT=*name*
specifies the name of the exit routine module that contains the exit routines supporting the specific ASCII device. The exit routine module must reside in a LOADLIB that has been identified by using the

GCS GLOBAL command. If you omit this parameter and the exit name is not previously defined, or if RSCS cannot find the exit routine module, the link driver will not start.

IBM supplies the following sample ASCII exit routine modules in the RSCSEXIT LOADLIB.

ASCXDSOE
DS180 Matrix Printer from Datasouth

ASCXDWRE
LA120 DECwriter Printer from DEC

ASCXONE
Generic ASCII printer

ASCXPROP
IBM Proprinter

ASCXPSE
PostScript printer

ASCXSPWE
NEC 3515 Spinwriter Printer

ASCXZETE
Nicolet Zeta 8 Plotter

ASCX749E
IBM Instruments XY/749 Multipen Digital Plotter

For more information about the ASCII exit routines, see *z/VM: RSCS Networking Exit Customization*.

EParm='*value*'
specifies a parameter value associated with the exit routine module. This value is a character string up to 239 bytes in length, enclosed in single quotation marks. Any characters are allowed between the single quotation marks except another single quotation mark. The actual value of the character string is defined by the exit routine module.

For information about the EPARM parameters supported for use with the ASCXONE and ASCXPSE sample modules, see *z/VM: RSCS Networking Exit Customization*.

PI end

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

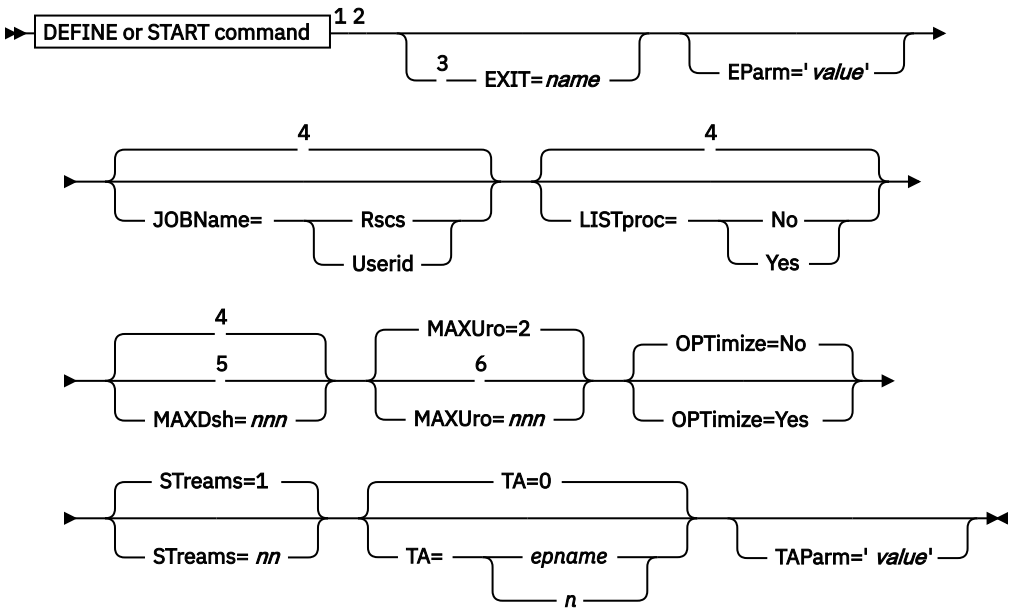
100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

MSG=
specifies whether RSCS will allow the link driver to dequeue messages destined for transmission to the remote printer.

Yes
specifies RSCS will select all messages for transmission. This is the default.

No
specifies RSCS will select messages, but they will not be sent to the remote printer. The messages will be purged.

GATEWAY-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] EXIT is required on the START command if not previously defined.
[4] The default value is derived from the corresponding operand on the OPTION configuration statement.
[5] MAXDSH is ignored if LISTPROC=YES is specified.
[6] MAXURO is ignored if a LISTPROC-type link is not defined.

Purpose

A GATEWAY-type link is an installation-defined link that lets an installation customize a network gateway. These link operational parameters can be specified on the DEFINE or START command for a specific GATEWAY-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link (or, for certain parameters, on the OPTION configuration statement) or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

PI

EXIT=*name*
specifies the name of the exit routine module that contains the gateway program. The exit routine module must reside in a LOADLIB that has been identified by using the GCS GLOBAL command. If you omit this parameter and the exit routine module name is not previously defined, or if RSCS cannot find the exit routine module, the link driver will not start.

IBM supplies a sample gateway exit routine module called GPI in the RSCSEXIT LOADLIB. For more information about the gateway programming interface, see *z/VM: RSCS Networking Exit Customization*.

EParm='*value*'
specifies a parameter value associated with the exit routine module. This value is a character string up to 80 bytes in length, enclosed in single quotation marks. Any characters are allowed between the single quotation marks except another single quotation mark. The actual value of the character string is defined by the exit routine module.

PI end

JOBName=
specifies the type of job name RSCS will create for all files originating at your local node or for all files arriving at your local node without a job header (that is, those coming from a workstation link).

Rscs
specifies RSCS will generate a job name of RSCS*nnnn*, where *nnnn* is the origin spool ID of the file.

Userid
specifies RSCS will use the origin user ID as the job name.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

To override the default job name for a specific file, use the JOBNAME operand on the CP TAG command. See "TAG" on page 416.

LISTproc=No
LISTproc=Yes
specifies whether the connected system can handle an unlimited number of data set headers. If you specify NO, the link will use the number of data set headers specified on the MAXDSH parameter.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

The following table summarizes how non-list processor systems will handle list processor files.

Table 10. How Non-List Processor Systems Handle List Processor Files

Non-List Processor Systems	How the File Will Be Handled
• RSCS V1.3* • JES3 • VSE/POWER	These systems will immediately split the file into separate spool files. These files will be either distributed to local user IDs or sent on to other links.
• RSCS V2.2* (without list processor support) • RSCS V2.3* or later* (without a list processor defined) • JES2	These systems will receive the file and split out separate files for local user IDs. They will also split out one file containing data set headers to be sent to each link on the distribution list.

Note: * These systems will handle only a limited number of data set headers.

MAXDsh=*nnn*
specifies the maximum number of data set headers the link driver will put on the link when processing a file with multiple data sets. This value is intended for connections to NJE subsystems that do not have list processor capabilities. This parameter is ignored if LISTPROC=YES is specified.

This value can be 0 - 100. A value of 0 is a special case that means the determination for the number of data set headers place on the link is based on the actual number of data set headers contained in the spool file. A value of 0 should be specified only with full understanding of the number of data set headers that the remote system can handle.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

MAXUro=*nnn*
specifies the maximum number of unit record output devices (virtual printers or punches) for each stream that the link driver will use at any one time while receiving a file. RSCS uses these devices to fan out files containing data set headers which the link driver determines must be split off the original file. All remaining data set headers (and the file contents) are written to an additional unit record device and queued on the list processor link. This parameter is ignored if a LISTPROC link is not defined.

This value can be 0 - 255. The default is 2. Specifying a value of 0 will cause all received data set headers and file contents to be queued to the list processor task. Under standard conditions, a link will always use one more device per stream than was specified. If you specify 0 and the first data set header received in a file is for the local system or for a non-networking link attached to the local system, an extra device will be defined to hold the remaining data set headers.

OPTimize=No
OPTimize=Yes
specifies whether optimization (merging of CCWs) should be used for files that originate on the local system and files that are processed by the local system. (This does not include store-and-forward files that are passing through the local node.) The default is NO.

STreams=*nn*
specifies the maximum number of files that may be transmitted simultaneously. This value can be 1 - 32. The default is 1.

Notes:

1. RSCS cannot actually send more than one file at a time. When several files are active on different streams, RSCS sends the file with the smallest number of blocks and credits the other files for having to wait. After the file is transmitted, RSCS subtracts the credits from the number of blocks left to send for each active file. RSCS then chooses the file with the lowest number to send. The longer a large file has to wait, the more credits it will accumulate. When the difference between the accumulated credits and the actual file size becomes small enough, RSCS transmits the large file.

   PI
2. Transmission algorithm 1 can handle only seven streams. If you specify more than seven streams, you cannot specify TA=1. Instead, you must define your own transmission algorithm and identify it by number or entry point name on the TA parameter.

TA=
specifies the transmission algorithm, which tells RSCS how to select files for transmission on the link.

epname
is the name of the entry point (outside of the RSCS LOADLIB) where your installation-defined algorithm resides.

n
is a hexadecimal value, 0 - F, that identifies the exit routine in the DMTAXA module (DMTAXAG*n*):

0
Identfies an IBM-supplied algorithm that allows files to be selected regardless of size. This is the default.

Note: If you specify TA=0 or allow it to default, do not specify the TAPARM parameter.

1
Identifies an IBM-supplied algorithm that specifies a default size for each stream specified on the STREAMS parameter, up to seven streams. You can override the default by specifying the stream size on the TAPARM parameter.

2 - F
Identifies an algorithm defined by your installation.

Note: If you update the DMTAXA module, it must be reassembled.

TAParm='*value*'
specifies a parameter value associated with the transmission algorithm. This value is a character string up to 80 bytes in length, enclosed in single quotation marks. (The single quotation marks are optional if you do not include blanks in the character string.) Any characters are allowed between the single quotation marks except another single quotation mark.

The value that you specify for TAPARM depends on the value that you specify for TA:

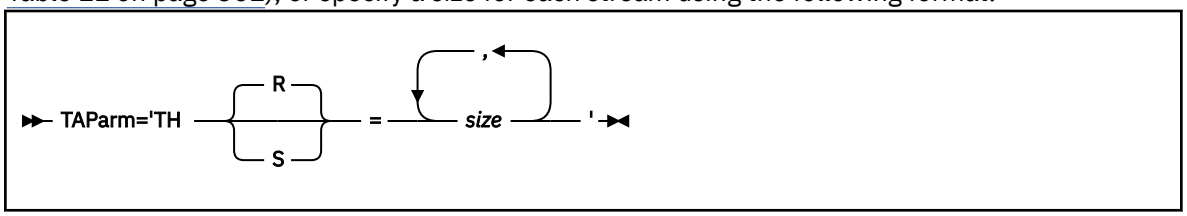
TA=
TAPARM=

0
Do not specify TAPARM; it will be rejected with an error message.

epname
Specify a TAPARM defined by your installation.

2 - F
Specify a TAPARM defined by your installation.

1
Either omit TAPARM to accept the default size for each stream, up to seven streams (as shown in Table 11 on page 301), or specify a size for each stream using the following format:



TH=
THR=
specifies the threshold number of records. THR is the default.

THS=
specifies the threshold number of spool file blocks. Specify THS when you expect to send files with very large records, such as printer output files, containing page image data, that are destined for a PSF-controlled printer.

size
is the file size. This can be specified as either of the following:

nnnnnnnn
Maximum file size RSCS should send on the stream. The minimum file size is one more than the maximum file size from the previous stream specification. If there is no previous stream specification, there is no minimum file size.

(*min*,*max*)
Minimum and maximum file size RSCS should send on the stream. If you do not want to specify a minimum file size, omit *min*. If you do not want to specify a maximum file size, omit *max*. Specifying `(,)` means you do not want to specify either a minimum or a maximum file size; any file is eligible for transmission on the stream.

For example, if you specified STREAMS=3, you can choose the TAPARM default by omitting TAPARM or you can specify any one of the following:

TAPARM='TH=*size1*'
TAPARM='TH=*size1*,*size2*'
TAPARM='TH=*size1*,*size2*,*size3*'

TAPARM='THR=*size1*'
TAPARM='THR=*size1*,*size2*'
TAPARM='THR=*size1*,*size2*,*size3*'

TAPARM='THS=*size1*'
TAPARM='THS=*size1*,*size2*'
TAPARM='THS=*size1*,*size2*,*size3*'

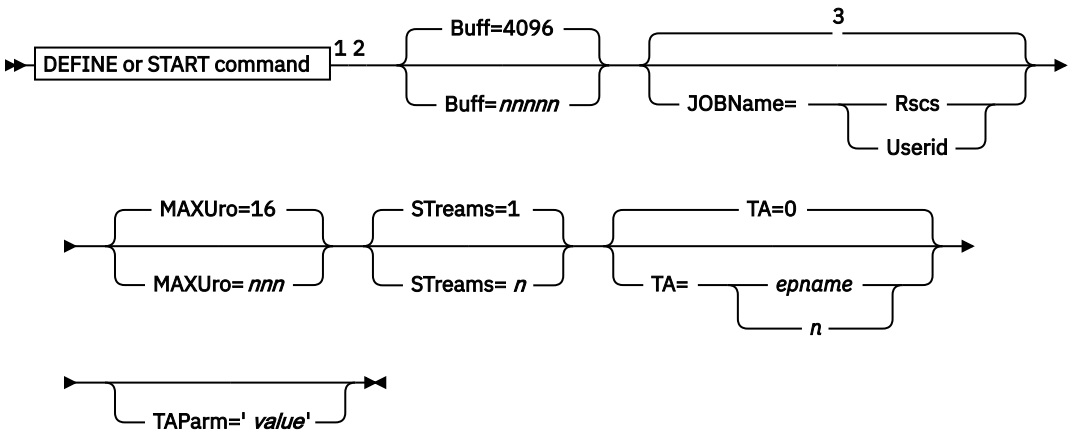
If you specify TA=1 and omit TAPARM, the default file size for each stream is shown in the following table.

Table 11. Default Minimum and Maximum File Size for Each Stream

If you specified	THR= Default for Stream 1	THR= Default for Stream 2	THR= Default for Stream 3	THR= Default for Stream 4	THR= Default for Stream 5	THR= Default for Stream 6	THR= Default for Stream 7
STREAMS=1	No limits	—	—	—	—	—	—
STREAMS=2	(,100)	(101,)	—	—	—	—	—
STREAMS=3	(,100)	(101,)	(101,)	—	—	—	—
STREAMS=4	(,100)	(101,)	(101,)	(101,)	—	—	—
STREAMS=5	(,100)	(101,)	(101,)	(101,)	(101,)	—	—
STREAMS=6	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	—
STREAMS=7	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	(101,)

PI end

LISTPROC-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.

[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.

[3] The default value is derived from the corresponding operand on the OPTION configuration statement.

Purpose

A LISTPROC-type link is a list processor link, which processes information to be distributed by the networking links. These link operational parameters can be specified on the DEFINE or START command for a specific LISTPROC-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link (or, for certain parameters, on the OPTION configuration statement) or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

Buff=*nnnnn*
specifies the buffer size used internally by the link driver for reading and writing records. This value can be 300 - 32765 bytes. The default is 4096.

JOBName=
specifies the type of job name RSCS will create for all files originating at your local node and all files arriving at your local node without a job header (that is, those coming from a workstation link).

Rscs
specifies RSCS will generate a job name of RSCS*nnnn*, where *nnnn* is the origin spool ID of the file.

Userid
specifies RSCS will use the origin user ID as the job name.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

To override the default job name for a specific file, use the JOBNAME operand on the CP TAG command. See "TAG" on page 416.

MAXUro=*nnn*
specifies the maximum number of unit record output devices (virtual printers or punches) for each stream that the list processor will use at any one time while processing a distribution list. This value can be 1 - 255. The default is 16.

STreams=*n*
specifies the maximum number of files that may be transmitted simultaneously on different streams. This value can be 1 - 7. The default is 1.

Note: RSCS cannot actually send more than one file at a time. When several files are active on different streams, RSCS sends the file with the smallest number of blocks and credits the other files for having to wait. After the file is transmitted, RSCS subtracts the credits from the number of blocks left to send for each active file. RSCS then chooses the file with the lowest number to send. The longer a large file has to wait, the more credits it will accumulate. When the difference between the accumulated credits and the actual file size becomes small enough, RSCS transmits the large file.

PI

TA=
specifies the transmission algorithm, which tells RSCS how to select files for transmission on the link.

epname
is the name of the entry point (outside of the RSCS LOADLIB) where your installation-defined algorithm resides.

n
is a hexadecimal value, 0 - F, that identifies the exit routine in the DMTAXA module (DMTAXAG*n*):

0
Identfies an IBM-supplied algorithm that allows files to be selected regardless of size. This is the default.

Note: If you specify TA=0 or allow it to default, do not specify the TAPARM parameter.

1
Identifies an IBM-supplied algorithm that specifies a default size for each stream specified on the STREAMS parameter. You can override the default by specifying the stream size on the TAPARM parameter.

2 - F
Identifies an algorithm defined by your installation.

Note: If you update the DMTAXA module, it must be reassembled.

TAParm='*value*'
specifies a parameter value associated with the transmission algorithm. This value is a character string up to 80 bytes in length, enclosed in single quotation marks. (The single quotation marks are optional if you do not include blanks in the character string.) Any characters are allowed between the single quotation marks except another single quotation mark.

The value that you specify for TAPARM depends on the value that you specify for TA:

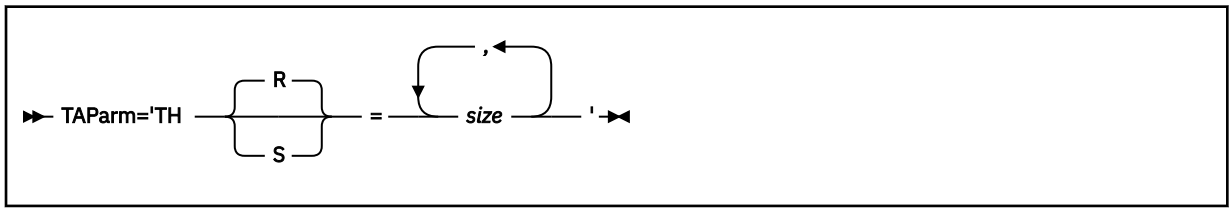
TA=
TAPARM=

0
Do not specify TAPARM; it will be rejected with an error message.

epname
Specify a TAPARM defined by your installation.

2 - F
Specify a TAPARM defined by your installation.

1
Either omit TAPARM to accept the default size for each stream (as shown in Table 12 on page 305), or specify a size for each stream using the following format:



TH=
THR=
specifies the threshold number of records. THR is the default.

THS=
specifies the threshold number of spool file blocks. Specify THS when you expect to send files with very large records, such as printer output files, containing page image data, that are destined for a PSF-controlled printer.

size
is the file size. This can be specified as either of the following:

nnnnnnnn
Maximum file size RSCS should send on the stream. The minimum file size is one more than the maximum file size from the previous stream specification. If there is no previous stream specification, there is no minimum file size.

(*min*,*max*)
Minimum and maximum file size RSCS should send on the stream. If you do not want to specify a minimum file size, omit *min*. If you do not want to specify a maximum file size, omit *max*. Specifying (,) means you do not want to specify either a minimum or a maximum file size; any file is eligible for transmission on the stream.

For example, if you specified STREAMS=3, you can choose the TAPARM default by omitting TAPARM or you can specify any one of the following:

TAPARM='TH=*size1*'
TAPARM='TH=*size1*,*size2*'
TAPARM='TH=*size1*,*size2*,*size3*'

TAPARM='THR=*size1*'
TAPARM='THR=*size1*,*size2*'
TAPARM='THR=*size1*,*size2*,*size3*'

TAPARM='THS=*size1*'
TAPARM='THS=*size1*,*size2*'
TAPARM='THS=*size1*,*size2*,*size3*'

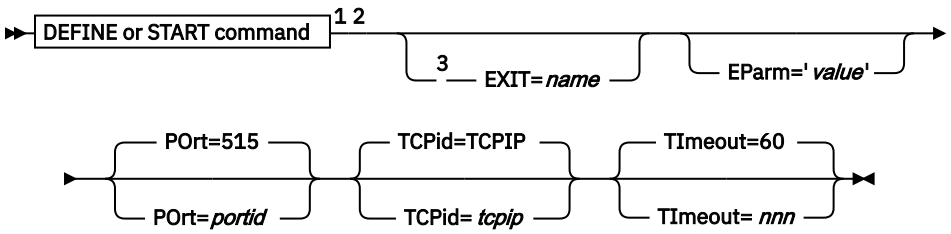
If you specify TA=1 and omit TAPARM, the default file size for each stream is shown in the following table.

Table 12. Default Minimum and Maximum File Size for Each Stream

If you specified	THR= Default for Stream 1	THR= Default for Stream 2	THR= Default for Stream 3	THR= Default for Stream 4	THR= Default for Stream 5	THR= Default for Stream 6	THR= Default for Stream 7
STREAMS=1	No limits	—	—	—	—	—	—
STREAMS=2	(,100)	(101,)	—	—	—	—	—
STREAMS=3	(,100)	(101,)	(101,)	—	—	—	—
STREAMS=4	(,100)	(101,)	(101,)	(101,)	—	—	—
STREAMS=5	(,100)	(101,)	(101,)	(101,)	(101,)	—	—
STREAMS=6	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	—
STREAMS=7	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	(101,)

PI end

LPD-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] EXIT is required on the START command if not previously defined.

Purpose

An LPD-type link enables your local RSCS system to receive print data streams from an LPR client within a TCP/IP network. These link operational parameters can be specified on the DEFINE or START command for a specific LPD-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Manually by an operator or authorized user

Attention
Any file queued to this link type will be ignored (not processed).

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

PI

EXIT=*name*
specifies the name of the exit routine module that contains the exit routines supporting the specific LPD driver. The exit routine module must reside in a LOADLIB that has been identified by using the GCS GLOBAL command. If you omit this parameter and the exit name is not previously defined, or if RSCS cannot find the exit routine module, the link driver will not start.

IBM supplies a sample LPD exit routine module called LPDXMANY in the RSCSEXIT LOADLIB. For more information about the LPD exit routines, see *z/VM: RSCS Networking Exit Customization*.

EParm='*value*'
specifies a parameter value associated with the exit routine module. This value is a character string up to 239 bytes in length, enclosed in single quotation marks. Any character is allowed between the

single quotation marks except another single quotation mark. The actual value of the character string is defined by the exit routine module.

For information about the EPARM parameters supported for use with the LPDXMANY sample module, see *z/VM: RSCS Networking Exit Customization*.

PI end

POrt=*portid*
specifies the port number on the local host where RSCS will listen for connect requests. The default is 515.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 515 or any other well-known port when usage is restricted, the RSCS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

TCPid=*tcpip*
specifies the name of the TCP/IP virtual machine. The default name is TCPIP.

TImeout=*nnn*
specifies the maximum amount of time, in seconds, that RSCS will wait for a response when receiving data from a TCP/IP LPR client prior to breaking the socket connection. The default is 60. After the LPD link driver breaks this connection, it will remain operational waiting for another LPR client to connect.

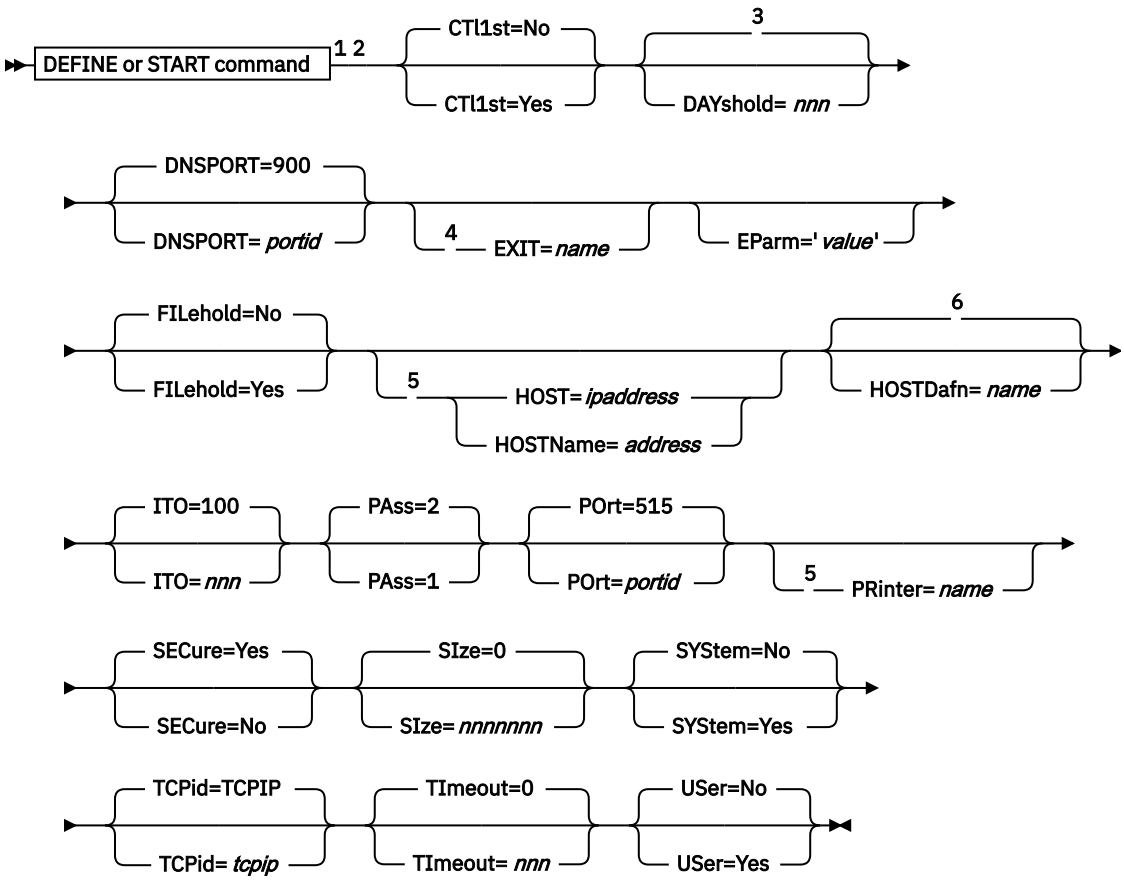
Usage Notes

PI

Any command received through the CP SMSG facility or the RSCS console will be truncated at 132 bytes. This may limit the amount of EPARM data which can be passed on the START command.

PI end

LPR-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.

[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.

[3] The default is no hold; the link will continue indefinitely to try to deliver the file.

[4] EXIT is required on the START command if not previously defined.

[5] If a value is not defined for the link on the DEFINE or START command, a value must be supplied for each file.

[6] The default name is the link ID.

Purpose

An LPR-type link enables your local RSCS system to connect to a remote line printer daemon (LPD) within a TCP/IP network. These link operational parameters can be specified on the DEFINE or START command for a specific LPR-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

CTl1st=No
CTL1st=Yes
specifies whether the control file is sent before the data file. The default is NO, which means the data file is sent first.

DAYshold=*nnn*
specifies the number of days that an undeliverable file will be placed on hold before requeueing it to a NOTIFY-type link. This value can be 0 - 365. In order to requeue files to a NOTIFY-type link, a route for *LPRH* must be defined; for example:

```
ROUTE *LPRH* TO *LPRHOLD
```

This parameter must be used with an events file entry that periodically changes any files on hold to nohold for the LPR-type link. If you specify a value of 0, the LPR-type link will requeue files to a NOTIFY-type link every time it places them on hold. If you omit this parameter, the LPR-type link will continue indefinitely to try to deliver the file.

DNSPort=*portid*
specifies the port number on the local system where the RSCS domain name server (RSCSDNS), if running, listens for connect requests. The default is 900.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 900 or any other well-known port when usage is restricted, the RSCSDNS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

PI

EXIT=*name*
specifies the name of the exit routine module that contains the exit routines supporting the specific LPR driver. The exit routine module must reside in a LOADLIB that has been identified by using the GCS GLOBAL command. If you omit this parameter and the exit name is not previously defined, or if RSCS cannot find the exit routine module, the link driver will not start.

IBM supplies the following sample LPR exit routine modules in the RSCSEXIT LOADLIB.

LPRXONE
Non-PostScript printer

LPRXPSE
PostScript printer

For more information about the LPR exit routines, see *z/VM: RSCS Networking Exit Customization*.

EParm='*value*'
specifies a parameter value associated with the exit routine module. This value is a character string up to 239 bytes in length, enclosed in single quotation marks. Any character is allowed between the single quotation marks except another single quotation mark. The actual value of the character string is defined by the exit routine module.

For information about the EPARM parameters supported for use with the LPRXONE and LPRXPSE sample modules, see *z/VM: RSCS Networking Exit Customization*.

PI end

FILehold=No
FILehold=Yes
specifies whether the link should place a file on hold when it is unable to connect to a remote daemon after approximately 1 minute. The default is NO, which means the link will continue attempting to connect until successful or the link is stopped (with the STOP command).

If you specify YES, the link will attempt to connect to the remote daemon at 1, 2, 4, 8, 16, and 32 second intervals. If the link is still unable to connect, the file will be placed on hold. The RSCS events file can be used to periodically change any files on hold to nohold, allowing for another delivery attempt. For example, an RSCS events file entry which will change all files from hold to nohold on an LPR-type link named LPR every 10 minutes would look like this:

```
     *      M:010     *         *      *   CHANGE LPR HOLD NOHOLD
```

HOST=*ipaddress*
specifies the IP address (in dotted decimal format) of the remote host to which to connect. This value may be overridden for individual files by the LPRXFORM exit (if SYSTEM=YES is specified) or passed by a user with the file (if USER=YES is specified). If a HOST or HOSTNAME value is not defined for the link, a value must be supplied for each file.

HOSTName=*address*
specifies the fully qualified domain name address (up to 200 characters) of the remote host to which to connect. This value may be overridden for individual files by the LPRXFORM exit (if SYSTEM=YES is specified) or passed by a user with the file (if USER=YES is specified). When overridden, the host name address can be up to 255 characters. If a HOST or HOSTNAME value is not defined for the link, a value must be supplied for each file.

Note: Use of this parameter requires the RSCS domain name server, which will resolve the host name address to an IP address.

HOSTDafn=*name*
specifies a 1- to 8-character name to be used as the host name portion of the control and data file names. A control or data file name is used within the **Receive control file** and **Receive data file** subcommands of the daemon's **Receive job** command. The name should start with `cfa` (control file) or `dfa` (data file), followed by a 3-digit job number and the name of the host that has constructed the control or data file.

If you omit this parameter, RSCS uses the link ID for the host name portion of the file names. Certain daemons do not tolerate a name which does not match an existing defined host name. This parameter allows you to supply a defined name instead of using the link name.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

PAss=
specifies the number of passes that RSCS will make through a spool file when sending it on the link.

2
specifies RSCS will make two passes through the file. This is the default. The TAG, Record, and EOF file exits will be called to determine the byte count of the file. This value is required by most host systems to which the file will be sent. A second pass will then be made to send the file itself. The byte count determined for the file must match for each pass made over the file.

1
specifies RSCS will send a byte count of 0 to the host and then make only one pass through the spool file as it is sent. No binary zero characters must be sent, as this will indicate the end of the file.

POrt=*portid*
specifies the port number to which RSCS connects on the remote host. The default is 515.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 515 or any other well-known port when usage is restricted, the RSCS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

PRinter=*name*
specifies the default printer queue name. This value may be overridden for individual files by the LPRXFORM exit (if SYSTEM=YES is specified) or passed by a user with the file (if USER=YES is specified). If a printer name is not defined for the link, a value must be supplied for each file.

Note: Depending on the line printer daemon, the printer name may be case-sensitive. You can use mixed-case letters to specify the printer name in the RSCS configuration file. However, CP converts to uppercase all data that is entered from the RSCS console or sent on the SMSG command. To ensure that the correct letters are used, you can create an exec to specify a case-sensitive printer name to RSCS on the SMSG command. Issue the following EXECIO command:

```
EXECIO * CP (STEM CPMSG. STRING SMSG rscsid options
```

where:

rscsid
is the CP name of the RSCS virtual machine.

options
is the uppercase RSCS command and any options which may need to be in mixed case, such as the printer name.

For more information about EXECIO, see *z/VM: CMS Commands and Utilities Reference*.

SECure=Yes
SECure=No
specifies whether only local ports 721 - 731 are to be used. The default is YES. If you specify NO, any available stack-selected port will be used. SECURE=NO is the recommended setting to avoid TCP/IP low port restrictions.

SIze=*nnnnnnn*
specifies the maximum number of records the spool file may contain in order to be processed. This value can be 0 - 1048576. The default is 0, which means there is no limit. If the number of records exceeds the maximum allowed amount, an error message will be issued to the user and the console, and the file will be placed on hold.

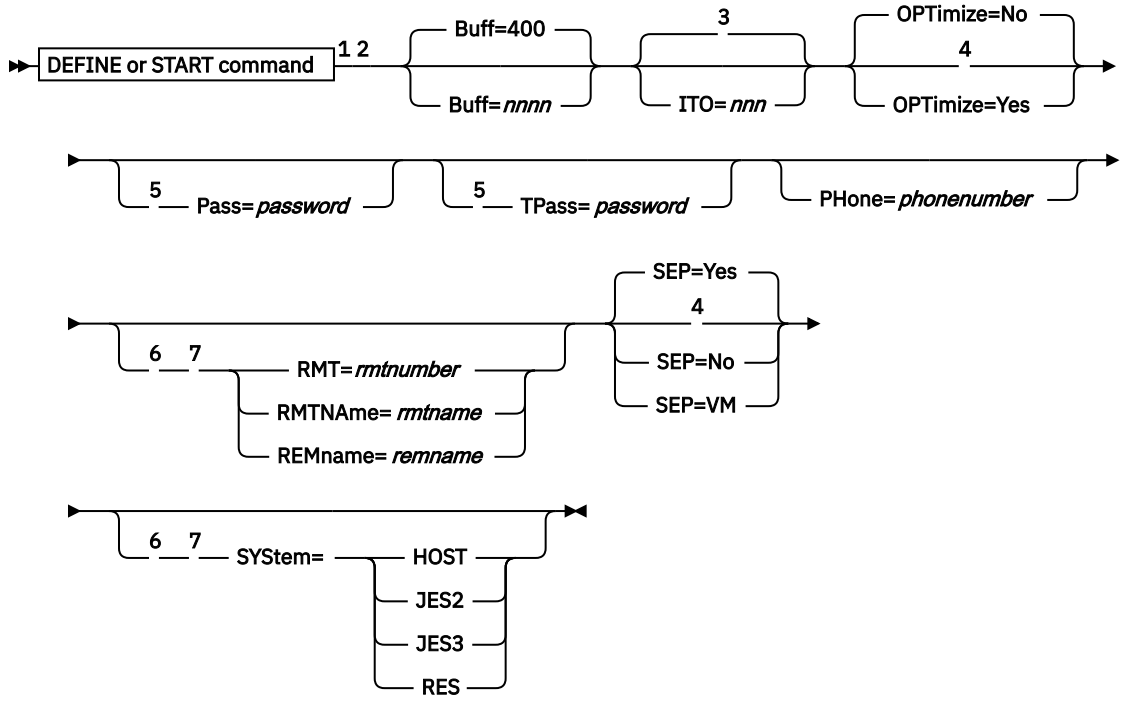
SYStem=No
SYStem=Yes
specifies whether RSCS should search for a FORM table provided by the LPRXFORM exit, using the form name the file was spooled with. The default is NO. When sending a print file to a remote LPR daemon, the FORM table can provide keywords to define the printer queue name, remote host address, translate table, filter, substitute form, prefix string, separator page setting, and suffix string to be used for the file, overriding the values defined for the link.

TCPid=*tcpip*
specifies the name of the TCP/IP virtual machine. The default name is TCPIP.

TImeout=*nnn*
specifies the maximum amount of time, in seconds, to wait for a response from the remote host before halting delivery of the file and placing it on hold. The default is 0, which means the link will wait indefinitely.

USer=No
USer=Yes
specifies whether RSCS will allow keywords to be defined and looked for at the beginning of a print file. The default is NO. When sending a print file to a remote LPR daemon, these keywords can define the printer queue name, remote host address, translate table, filter, prefix string, separator page setting, and suffix string to be used for the file, overriding the values defined for the link.

MRJE-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] The default is 1 on a dialed link and 100 on a non-dialed link.
[4] This parameter is valid only if SYSTEM=HOST is specified.
[5] PASS is required on an auto-answer link; PASS must be specified to specify TPASS.
[6] This parameter is required on the START command if not previously defined.
[7] The link operation mode and remote identifier are interrelated; see the parameter descriptions.

Purpose

An MRJE-type link is a workstation link. It can connect a system node to:

- (In HOST mode) a remote workstation node
- (Acting as a workstation in JES2, JES3, or RES mode) another system that is acting as the host

These link operational parameters can be specified on the DEFINE or START command for a specific MRJE-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Automatically when a call is received over an enabled (auto-answer) switched telecommunication line
- Manually by an operator or authorized user

For other than a link on an auto-answer line, the host side of the link must be started first, before a remote station can sign on.

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

Buff=*nnnn*
specifies the telecommunication buffer size. This value can be 300 - 1017 bytes. The default is 400.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs.

If you omit this parameter, the default value is:

- 1 (one minute) for a dialed link
- 100 (no ITO in effect) for a link that is not dialed

OPTimize=No
OPTimize=Yes
specifies whether optimization (merging of CCWs) should be used for print files being transmitted over this workstation link. The default is NO.

Specify NO, or allow it to default, when using a workstation link to communicate with a device that will use specialized file data such as page formatting information, or that requires preservation of original carriage control information.

This parameter is valid only if SYSTEM=HOST is also specified; otherwise, it will be ignored regardless of the setting.

Pass=*password*
specifies an identification that validates the start of a session. You must specify the PASS parameter to use the TPASS parameter.

If this end of the link is acting as a workstation (SYSTEM=JES2, SYSTEM=JES3, or SYSTEM=RES), the PASS identification is passed along to the remote system as part of the signon record:

- If SYSTEM=JES2 or SYSTEM=JES3, the identification is a 1- to 8-character line password.
- If SYSTEM=RES, the identification consists of a 1- to 8-character user ID, followed by a slash and a 1- to 8-character password (for a maximum of 17 characters).

If this end of the link is acting as a host (SYSTEM=HOST), the PASS identification is a 1- to 8-character password that the remote station must supply on its signon card to connect to RSCS.

For an auto-answer link (automatically started when a call is received on an enabled port), SYSTEM=HOST is forced, PASS is mandatory, and RMT and RMTNAME are ignored.

TPass=*password*
specifies an identification that can be used with the PASS value to validate the start of a session. To use the TPASS parameter, you must also specify the PASS parameter.

If this link is acting as a workstation (SYSTEM=JES2 or SYSTEM=JES3), the TPASS identification is passed along to the remote system as part of the signon record:

- If SYSTEM=JES2, the identification is a 1- to 8-character password beginning in column 73.
- If SYSTEM=JES3, the identification is a 1- to 8-character password beginning in column 35.

If SYSTEM=RES, the TPASS parameter is ignored.

If this link is acting as a host (SYSTEM=HOST), the TPASS identification is a 1- to 8-character password that the remote station must supply on its signon card (starting in column 35 or 73) to connect to RSCS.

PHone=*phonenumber*
specifies the phone number to be used when starting an autodial link. The *phonenumber* string can be up to 32 characters long, optionally enclosed within single quotation marks. Only the following characters may be used:

0 1 2 3 4 5 6 7 8 9
Decimal numerals are used for the actual dial digits of the phone number. For example:

```
PHONE=5551234
```

(blank)
Blanks make the phone number easier to read. They are not transmitted to the Automatic Calling Unit (ACU). If you use blanks, you must enclose the phone number within single quotation marks. For example:

```
PHONE='1 607 555 1234'
```

–
Hyphens also make the phone number easier to read. They are not transmitted to the ACU. For example:

```
PHONE='1-607 555-1234'
```

*****
The asterisk is a separator character you can include following an access digit. For a private automatic branch exchange (PABX) extension, this character delays dialing to allow the dial tone to be returned from the public exchange. For example:

```
PHONE='9*1-607 555-1234'
```

.
The period is an end-of-number character that marks the end of the dial-digit group for those ACUs that require such an end character. The type of ACU in use determines whether you need an end-of-number character. For example:

```
PHONE='9*1-607 555-1234.'
```

RMT=*rmtnumber*
specifies a number that RSCS uses to generate the name of the workstation. This parameter must be specified if SYSTEM=RES is specified. It may be specified if SYSTEM=JES2 or SYSTEM=HOST is specified. It is not valid if SYSTEM=JES3 is specified.

If SYSTEM=JES2 or SYSTEM=RES is specified, the generated name is placed on the signon record that will be sent to the host system. If SYSTEM=JES2, the range for *rmtnumber* is 1 - 999, and the generated name is REMOTE*nnn*. If SYSTEM=RES, the range for *rmtnumber* is 1 - 99, and the generated name is REMOTE*nn*. A leading zero is significant; for instance, RMT=01 produces a remote name of

REMOTE01, while RMT=1 produces a remote name of REMOTE1. This name must correspond to the name that was defined at the remote system for the RSCS system identifier.

If SYSTEM=HOST is specified, the generated name is the name of the remote workstation that RSCS expects to sign on. A leading zero is not significant; a remote workstation named either REMOTE1 or REMOTE01 could sign on to an RSCS system where either RMT=01 or RMT=1 was specified. If neither RMT, RMTNAME, nor REMNAME is specified for a HOST system, the workstation identifier on the signon record must be the remote workstation's node name.

For an auto-answer link (automatically started when a call is received on an enabled port), the RMT parameter is ignored.

RMTName=*rmtname*
specifies the 5-character alphanumeric remote workstation name that was assigned to RSCS when the remote system was generated. This parameter must be specified if SYSTEM=JES3 is specified. It may be specified if SYSTEM=JES2 or SYSTEM=HOST is specified. It is not valid if SYSTEM=RES is specified.

For an auto-answer link (automatically started when a call is received on an enabled port), the RMTNAME parameter is ignored.

REMname=*remname*
specifies a 2- to 9-character alphanumeric name that is acceptable to JES2 as a remote identifier. This parameter may be specified if SYSTEM=JES2 or SYSTEM=HOST is specified. It is not valid if SYSTEM=JES3 or SYSTEM=RES is specified.

SEP=
specifies the type of separator page to be inserted before each print file sent across the link. This parameter is valid only if SYSTEM=HOST is specified.

Yes
specifies an RSCS-style separator page. This is the default. For a description of RSCS-style separator pages, see “RSCS-Style Separator Page” on page 54.

No
specifies no separator page.

VM
specifies a VM-style separator page. For a description of VM-style separator pages, see “VM-Style Separator Page” on page 51.

Note: This parameter applies only to print files. When transmitting a punch file to a remote workstation, RSCS creates a header line on the output. For information about the format of this header line, see “Output File Processing in Host Mode” on page 58.

SYStem=
specifies the operation mode of the link.

HOST
indicates operation as a host to a remote workstation signing on either as REMOTE*rmtnumber* or with the remote workstation's node name.

JES2
indicates operation as a workstation into a remote JES2 system, signing on with the defined remote name (REMOTE*rmtnumber*, *rmtname*, or *remname*).

JES3
indicates operation as a workstation into a remote JES3 system, signing on as remote *rmtname*.

RES
indicates operation as a workstation into the Remote Entry Subsystem (RES) of OS/VS1, signing on as REMOTE*rmtnumber*.

For an auto-answer link (automatically started when a call is received on an enabled port), SYSTEM=HOST is forced.

Usage Notes

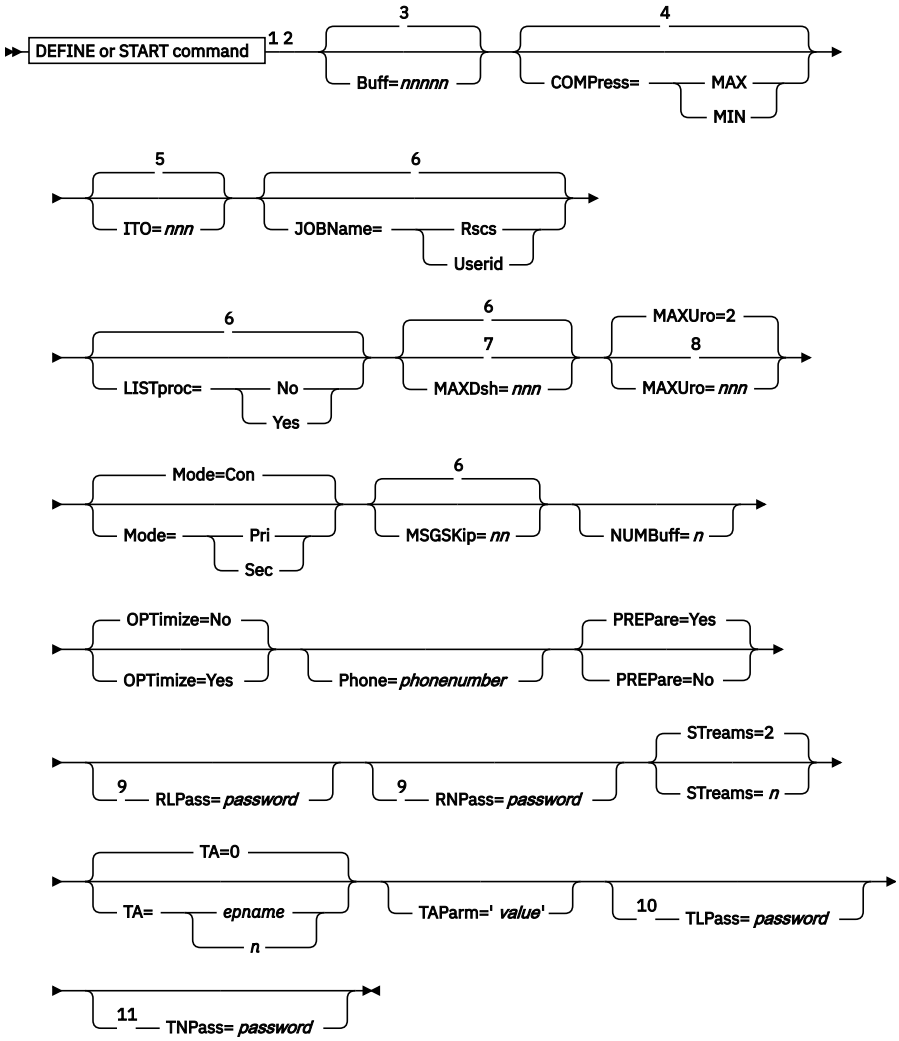
1. The remote workstation operator, under control of MRJE in HOST mode, is allowed to use a subset of the RSCS commands. Usually, the remote operator can enter commands that affect only that specific link. They are described in Chapter 12, "RSCS Commands," on page 127.

   Note: Except for the MSG, CMD, and QUERY commands, the *linkid* operand is not to be included in a command that is used by a remote workstation operator.
2. A subset of the RSCS operator messages is printed on the remote workstation printer. RSCS provides a message queue for workstations that have no separate console printer for messages. When the remote printer has completed processing an output file, the queued messages are transmitted and printed. For more information on the key to the distribution of messages, see *z/VM: RSCS Networking Messages and Codes*.
3. When you define a form name (using the FORM configuration statement), you can define these characteristics:

   - Separator page style
   - Line length
   - Page length
   - Lines per inch (only for LU_T1 printers and workstations)

   If you specify a form name when starting a link, be aware that the form name characteristics always override any SEP, LLINE, and LPAGE specifications and will override LPI specifications when SETPAGE=YES.

NJE-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.

[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.

[3] The default is 800 on a BSC link and 4096 on a CTCA, ESCON CTCA, FICON CTCA, or 3088 link.

[4] The default is MAX on a BSC link and MIN on a CTCA, ESCON CTCA, or FICON CTCA link.

[5] The default value is 1 on a dialed link and 100 on a non-dialed link.

[6] The default value is derived from the corresponding operand on the OPTION configuration statement.

[7] MAXDSH is ignored if LISTPROC=YES is specified.

[8] MAXURO is ignored if a LISTPROC-type link is not defined.

[9] On an auto-answer link, RLPASS or RNPASS (or both) must be specified.

[10] TLPASS must be specified to connect to a remote system where RLPASS is specified.

[11] TNPASS must be specified to connect to a remote system where RNPASS is specified.

Purpose

An NJE-type link is a networking link It manages BSC, CTCA, ESCON CTCA, FICON CTCA, or 3088 communications between z/VM and either another z/VM system or a non-z/VM NJE system. These link operational parameters can be specified on the DEFINE or START command for a specific NJE-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Automatically when a call is received over an enabled (auto-answer) switched telecommunication line
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link (or, for certain parameters, on the OPTION configuration statement) or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

Buff=*nnnnn*
specifies the maximum size buffer this link can accept from the communications adapter. This value can be 300 - 32765 bytes. The default is 800 on a BSC link and 4096 on a CTCA, ESCON CTCA, FICON CTCA, or 3088 link. The actual buffer size used for other than a JES3 system is determined at signon time and is the smaller of the buffer sizes specified (or defaulted to) by the two connected systems. If a small buffer size is specified (or defaulted to) by the remote node, it should be encouraged to specify a larger buffer.

The value for BUFF must be selected based on the type of data link. If the link is over a BSC line, the baud rate must also be considered. Usually, the largest buffer sizes can be used only on CTCA, ESCON CTCA, or FICON CTCA links. When starting a link to a JES3 system, both sides must specify the same buffer size.

Note: Other systems may have software limitations that determine the largest acceptable buffer size. The maximum valid buffer size can be used only if RSCS is connected to an RSCS Version 2 or later system.

COMPress=
specifies the degree of data compression to be used when transmitting the file.

MAX
specifies maximum data compression. This is the default on a BSC link.

MIN
specifies minimum data compression. This is the default on a CTCA, ESCON CTCA, or FICON CTCA link.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100.

0
Specifies that the link will be deactivated immediately when there is no activity on it. If ITO=0 is specified for the local and remote nodes of the link and files are queued on one end of the link, the link will deactivate before the files are sent. If both sides of the link have files to process, the files will be sent.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs.

If you omit this parameter, the default value is:

- 1 (one minute) on a dialed link
- 100 (no ITO in effect) on a link that is not dialed

JOBName=
specifies the type of job name RSCS will create for all files originating at your local node and all files arriving at your local node without a job header (that is, those coming from a workstation link).

Rscs
specifies RSCS will generate a job name of RSCS*nnnn*, where *nnnn* is the origin spool ID of the file.

Userid
specifies RSCS will use the origin user ID as the job name.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

To override the default job name for a specific file, use the JOBNAME operand on the CP TAG command. See "TAG" on page 416.

LISTproc=NO
LISTproc=Yes
specifies whether the connected system can handle an unlimited number of data set headers. If you specify NO, the link will use the number of data set headers specified on the MAXDSH parameter.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

The following table summarizes how non-list processor systems will handle list processor files.

Table 13. How Non-List Processor Systems Handle List Processor Files

Non-List Processor Systems	How the File Will Be Handled
• RSCS V1.3* • JES3 • VSE/POWER®	These systems will immediately split the file into separate spool files. These files will be either distributed to local user IDs or sent on to other links.
• RSCS V2.2* (without list processor support) • RSCS V2.3* or later* (without a list processor defined) • JES2	These systems will receive the file and split out separate files for local user IDs. They will also split out one file containing data set headers to be sent to each link on the distribution list.

Note: * These systems will handle only a limited number of data set headers.

MAXDsh=*nnn*
specifies the maximum number of data set headers the link driver will send on the link when processing a file with multiple data sets. This value is intended for connections to NJE subsystems that do not have list processor capabilities. This parameter is ignored if LISTPROC=YES is specified.

This value can be 0 - 100. A value of 0 is a special case that means the determination for the number of data set headers place on the link is based on the actual number of data set headers contained in the spool file. A value of 0 should be specified only with full understanding of the number of data set headers that the remote system can handle.

If you omit this parameter, and there is no previously defined value the default value is derived from the corresponding operand on the OPTION configuration statement.

MAXUro=*nnn*
specifies the maximum number of unit record output devices (virtual printers or punches) for each stream that the link driver will use at any one time while receiving a file. RSCS uses these devices to fan out files containing data set headers which the link driver determines must be split off the original file. All remaining data set headers (and the file contents) are written to an additional unit record device and queued on the list processor link. This parameter is ignored if a LISTPROC-type link is not defined.

This value can be 0 - 255. The default is 2. Specifying a value of 0 will cause all received data set headers and file contents to be queued to the list processor task. Under standard conditions, any link will always use one more device per stream than specified. If a value of 0 is specified and the first data set header received in a file is for the local system or for a non-networking link attached to the local system, an extra device will be defined to hold the remaining data set headers.

Mode=
specifies the mode of the local RSCS system in a BSC connection. This parameter has no meaning for a CTCA, ESCON CTCA, FICON CTCA, or 3088 connection.

CON
specifies contention mode. This is the default. This option is intended for nonswitched line connections, where both sides of the connection can act as the primary when the initial connection is being made. A contention situation will exist, with the loser becoming the secondary.

PRI
identifies RSCS as the primary system and transmits a Type I signon response record to establish communications. If PRI is specified for both sides of a connection, the system will not connect.

SEC
identifies RSCS as the secondary system and transmits a Type J response record to establish communication. If SEC is specified for both sides of a connection, the system will not connect.

For best results, if the remote system is:

- RSCS Version 1 system (which is always primary), specify MODE=SEC
- RSCS Version 2 or later auto-answer system (which is automatically started with MODE=SEC when it receives the call on an enabled port), specify MODE=PRI
- JES2 system started by a $S LNE*n* command, specify either MODE=PRI or MODE=CON
- JES2 system started by a $SN LNE*n* command, specify either MODE=SEC or MODE=CON
- JES3 or VSE/POWER system (which can be either primary or secondary, but cannot be forced into a particular mode), specify any of the three modes

MSGSKip=*nn*
specifies the number of file buffers that RSCS will send on the link before sending a message buffer (unless there are no file buffers available). This value can be 0 - 15. Specifying 0 is a special case that tells RSCS to send a message buffer whenever messages are available to send on the link, regardless of whether file buffers are available.

If you omit this parameter, and there is no previously defined value. the default value is derived from the corresponding operand on the OPTION configuration statement.

Note: If the link determines during signon that the peer system supports the mixed RCB feature of NJE, RSCS ignores the MSGSKIP setting. The mixed RCB feature lets RSCS send buffers containing a mixture of information (files and messages). If RSCS can send files and messages in one buffer, there is no need to use the MSGSKIP parameter to tell RSCS how many file buffers to send before sending a message buffer. For more information about the mixed RCB feature of NJE, see z/OS: Network Job Entry (NJE) Formats and Protocols.

NUMBuff=*n*
has no meaning and exists only to enable the current level of RSCS to maintain compatibility with RSCS Version 2. Whether you specify or omit this parameter, RSCS gives each link two transmission buffers.

OPTimize=No
OPTimize=Yes
specifies whether optimization (merging of CCWs) should be used for files that originate on the local system and files that are processed by the local system. (This does not include store-and-forward files that are passing through the local node.) The default is NO.

PHone=*phonenumber*
specifies the phone number to be used when starting an autodial link. The *phonenumber* string can be up to 32 characters long, optionally enclosed within single quotation marks. Only the following characters may be used:

0 1 2 3 4 5 6 7 8 9
Decimal numerals are used for the actual dial digits of the phone number. For example:

```
PHONE=5551234
```

(blank)
Blanks make the phone number easier to read. They are not transmitted to the Automatic Calling Unit (ACU). If you use blanks, you must enclose the phone number within single quotation marks. For example:

```
PHONE='1 607 555 1234'
```

–
Hyphens also make the phone number easier to read. They are not transmitted to the ACU. For example:

```
PHONE='1-607 555-1234'
```

*****
The asterisk is a separator character you can include following an access digit. For a private automatic branch exchange (PABX) extension, this character delays dialing to allow the dial tone to be returned from the public exchange. For example:

```
PHONE='9*1-607 555-1234'
```

.
The period is an end-of-number character that marks the end of the dial-digit group for those ACUs that require such an end character. The type of ACU in use determines whether you need an end-of-number character. For example:

```
PHONE='9*1-607 555-1234.'
```

PREPare=
specifies whether the NJE PREPARE protocol will be used between two RSCS nodes during idle link time. The PREPARE protocol defines a method by which non-SNA links do not have to send null buffers to each other every one or two seconds.

Yes
specifies PREPARE sequences will be carried out if the opposite node agrees through signon concurrence. This is the default.

Notes:

1. The remote node must have RSCS V2.2 or later installed.
2. Using PREPARE sequences reduces needless I/O. However, it is recommended that you not use PREPARE if you meet error recovery problems when using the 3088 Channel Unit or the 3725, 3735, or 3745 Transmission Control Units.

No
specifies PREPARE sequences will not be used. Each node will send null buffers every one or two seconds.

RLPass=*password*
specifies the 1- to 8-character line password that is required from the remote system on its signon record before transmission of data is initiated. If the correct password is not received at signon time, RSCS deactivates the link. On an auto-answer link, RLPASS or RNPASS (or both) must be defined.

RNPass=*password*
specifies the 1- to 8-character node password that is required from the remote system on its signon record before transmission of data is initiated. If the correct password is not received at signon time, RSCS deactivates the link. On an auto-answer link, RLPASS or RNPASS (or both) must be defined.

STreams=*n*
specifies the maximum number of files that may be transmitted simultaneously on different streams. This value can be 1 - 7. The default is 2.

Notes:

1. RSCS cannot actually send more than one file at a time. When you have several files active on different streams, RSCS sends the file with the smallest number of blocks and credits the other files for having to wait. After the file is transmitted, RSCS subtracts the credits from the number of blocks left to send for each active file. RSCS then chooses the file with the lowest number to send. The longer a large file has to wait, the more credits it will accumulate. When the difference between the accumulated credits and the actual file size becomes small enough, RSCS transmits the large file.
2. To allow the link to operate in a mode compatible with RSCS V1 (that is, only one file will be transmitted at a time and all files are eligible for selection), specify a stream number of 1 and a transmission algorithm number of 0 (TA=0, which is the default).

TA=
specifies the transmission algorithm, which tells RSCS how to select files for transmission on the link.

epname
is the name of the entry point (outside of the RSCS LOADLIB) where your installation-defined algorithm resides.

n
is a hexadecimal value, 0 - F, that identifies the exit routine in the DMTAXA module (DMTAXAG*n*):

0
Identfies an IBM-supplied algorithm that allows files to be selected regardless of size. This is the default.

Note: If you specify TA=0 or allow it to default, do not specify the TAPARM parameter.

1
Identifies an IBM-supplied algorithm that specifies a default size for each stream specified on the STREAMS parameter. You can override the default by specifying the stream size on the TAPARM parameter.

2 - F
Identifies an algorithm defined by your installation.

Note: If you update the DMTAXA module, it must be reassembled.

TAParm='*value*'
specifies a parameter value associated with the transmission algorithm. This value is a character string up to 80 bytes in length, enclosed in single quotation marks. (The single quotation marks are optional if you do not include blanks in the character string.) Any characters are allowed between the single quotation marks except another single quotation mark.

The value that you specify for TAPARM depends on the value that you specify for TA:

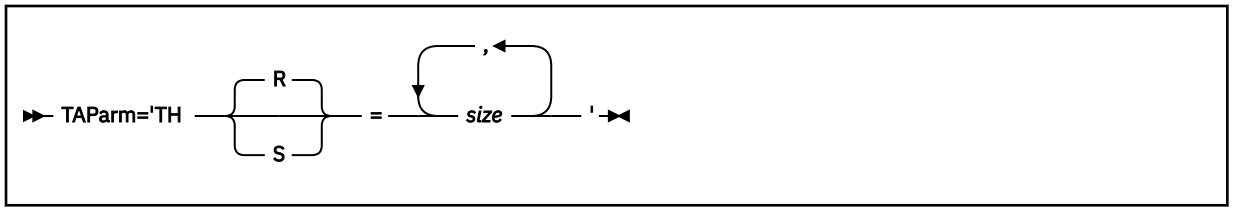
TA=
TAPARM=

0
Do not specify TAPARM; it will be rejected with an error message.

epname
Specify a TAPARM defined by your installation.

2 - F
Specify a TAPARM defined by your installation.

1
Either omit TAPARM to accept the default size for each stream (as shown in Table 14 on page 325), or specify a size for each stream using the following format:



TH=
THR=
specifies the threshold number of records. THR is the default.

THS=
specifies the threshold number of spool file blocks. Specify THS when you expect to send files with very large records, such as printer output files, containing page image data, that are destined for a PSF-controlled printer.

size
is the file size. This can be specified as either of the following:

nnnnnnnn
Maximum file size RSCS should send on the stream. The minimum file size is one more than the maximum file size from the previous stream specification. If there is no previous stream specification, there is no minimum file size.

(*min*,*max*)
Minimum and maximum file size RSCS should send on the stream. If you do not want to specify a minimum file size, omit *min*. If you do not want to specify a maximum file size, omit *max*. Specifying (,) means you do not want to specify either a minimum or a maximum file size; any file is eligible for transmission on the stream.

For example, if you specified STREAMS=3, you can choose the TAPARM default by omitting TAPARM or you can specify any one of the following:

TAPARM='TH=*size1*'
TAPARM='TH=*size1*,*size2*'
TAPARM='TH=*size1*,*size2*,*size3*'

TAPARM='THR=*size1*'
TAPARM='THR=*size1*,*size2*'
TAPARM='THR=*size1*,*size2*,*size3*'

TAPARM='THS=*size1*'
TAPARM='THS=*size1*,*size2*'
TAPARM='THS=*size1*,*size2*,*size3*'

If you specify TA=1 and omit TAPARM, the default size for each stream is shown in the following table.

Table 14. Default Minimum and Maximum File Size for Each Stream

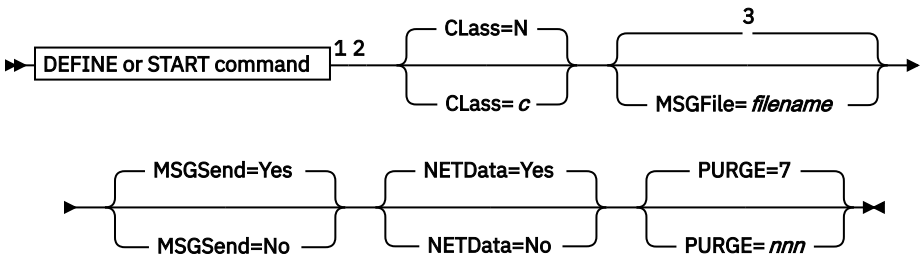
If you specified	THR= Default for Stream 1	THR= Default for Stream 2	THR= Default for Stream 3	THR= Default for Stream 4	THR= Default for Stream 5	THR= Default for Stream 6	THR= Default for Stream 7
STREAMS=1	No limits	—	—	—	—	—	—
STREAMS=2	(,100)	(101,)	—	—	—	—	—
STREAMS=3	(,100)	(101,)	(101,)	—	—	—	—
STREAMS=4	(,100)	(101,)	(101,)	(101,)	—	—	—
STREAMS=5	(,100)	(101,)	(101,)	(101,)	(101,)	—	—
STREAMS=6	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	—
STREAMS=7	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	(101,)

PI end

TLPass=*password*
specifies the 1- to 8-character line password to be transmitted to the remote system at signon time. TLPASS must be specified to connect to a remote system where RLPASS is defined.

TNPass=*password*
specifies the 1- to 8-character node password to be transmitted to the remote system at signon time. TNPASS must be specified to connect to a remote system where RNPASS is defined.

NOTIFY-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default is used.
[3] The default name is the link ID.

Purpose

A NOTIFY-type link holds files, generates notes, and purges files. For example, a NOTIFY-type link can be used to handle misdirected files. A misdirected file is a file routed to an incorrect user ID or incorrect node. These link operational parameters can be specified on the DEFINE or START command for a specific NOTIFY-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default is used.

CLass=*c*
specifies the CP spool file class to be used for the NOTICE file created by this link. The valid CP spool file classes are A - Z and 1 - 9. The default is N.

MSGFile=*filename*
specifies the 1- to 8-character file name of the message template for the link. The file must have a file type of TEMPLATE. The message template determines the content and destination of notes generated by the NOTIFY link driver. If RSCS cannot find the file, the link will not start. The default file name is the link ID.

MSGSend=Yes
MSGSend=No
specifies whether an active NOTIFY-type link should notify users when they send messages to undefined locations. The default is YES; RSCS sends message DMT310E to the user who sent the message to the undefined location. After receiving a message destined for an incorrect location and notifying (or not notifying) the message sender, the NOTIFY-type link purges the message.

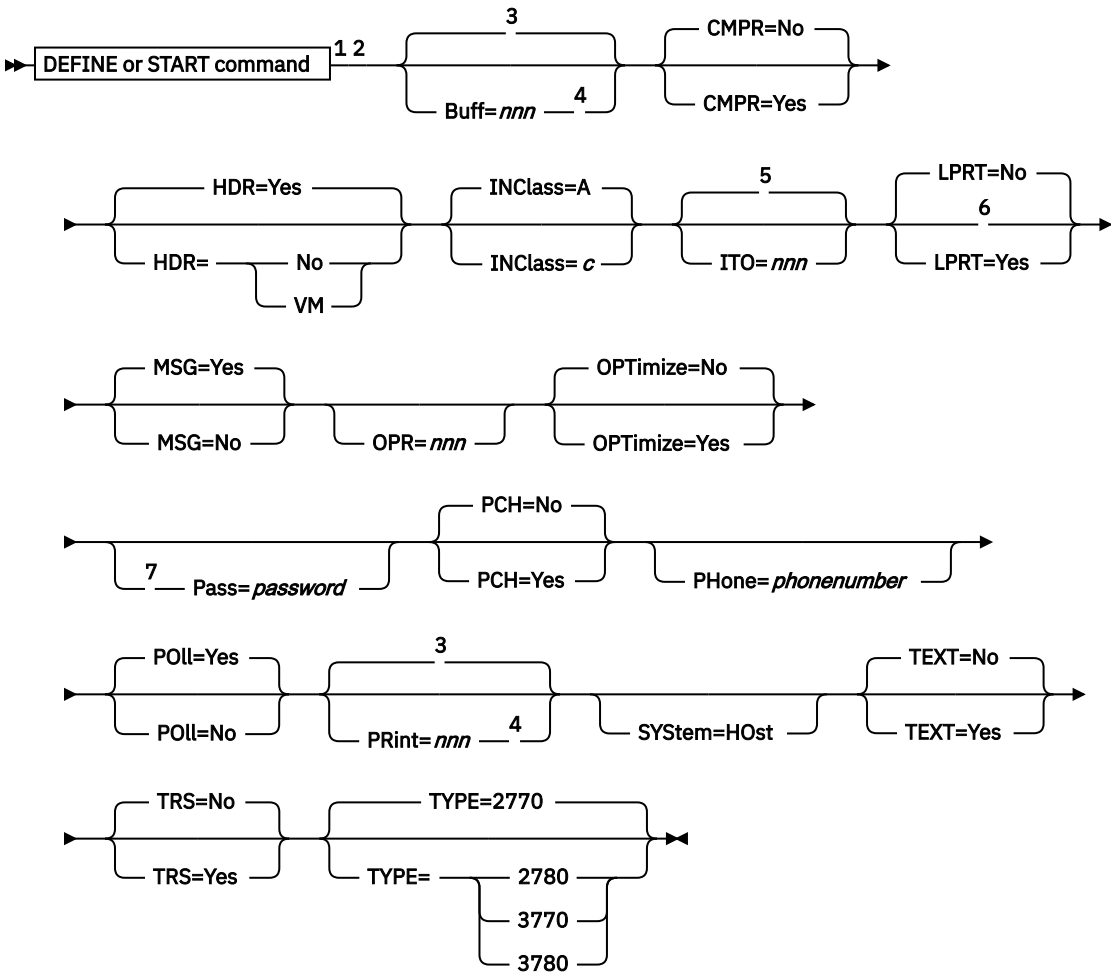
NETData=Yes
NETData=No
specifies whether the NOTIFY-type link should generate notes in NETDATA format. The default is YES. If you specify NO, the link will generate notes in 80-byte punch format. However, if the logical record length of the note template exceeds 80 bytes, the note file will be truncated to 80 bytes.

PURGE=*nnn*
specifies the number of days to retain a file after RSCS sends a notice to the originator. This value can be 0 - 365. The default is 7. Specifying a value of 0 tells RSCS not to purge the file.

Usage Notes

Files that originate from the SYSTEM user ID will automatically be held on NOTIFY-type links until the specified purge interval has expired. However, RSCS will not send a NOTIFY message to the file originator. This will prevent two or more NOTIFY-type links from constantly sending each other messages.

RJE-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] The default value depends on the workstation type.
[4] For a 2770, the BUFF value must be larger than the PRINT value.
[5] The default value is 1 on a dialed link and 100 on a non-dialed link.
[6] LPRT is valid only when TYPE=3770.
[7] PASS is required on an auto-answer link.

Purpose

An RJE-type link is a workstation link, connecting a system node to a workstation node over a BSC line. These link operational parameters can be specified on the DEFINE or START command for a specific RJE-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link

- Automatically when a call is received over an enabled (auto-answer) switched telecommunication line
- Manually by an operator or authorized user

For other than a link on an auto-answer line, the host side of the link must be started first, before a remote station can sign on.

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

Buff=*nnn*
specifies the size of the line buffer, in bytes. This value depends on the workstation type:

Workstation	Acceptable Values	Default
2770	128, 256, or 512	128
2780	170 or 400	170
3770	256	256
3780	512	512

Note: To avoid print-line truncation for the 2770, the number of bytes in the buffer (BUFF=*nnn*) must be larger than the number of print positions (PRINT=*nnn*). This is because the buffer must be large enough to contain 6 bytes of control information in addition to the characters to be printed.

CMPR=No
CMPR=Yes
specifies whether the 2770, 3770, or 3780 workstation has the blank compression feature. The default is NO.

HDR=
specifies the type of separator page to be inserted before each print file sent across the link.

Yes
specifies an RSCS-style separator page. This is the default.

No
specifies no separator page.

VM
specifies a VM-style separator page.

For more information about separator pages, see “Using Separator Pages” on page 51.

INClass=*c*
specifies the CP spool file class to be used for files received from the remote workstation. The valid CP spool file classes are A - Z and 1 - 9. The default is A.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs.

If you omit this parameter, the default value is:

- 1 (one minute) for a dialed link
- 100 (no ITO in effect) for a link that is not dialed

LPRT=
specifies where RSCS will direct print files. This parameter is valid only when TYPE=3770.

No
specifies RSCS will direct all print files to the console printer. This is the default.

Yes
specifies RSCS will direct all print files to the line printer.

MSG=
specifies whether RSCS will allow the link driver to dequeue messages destined for transmission to the remote workstation.

Yes
specifies RSCS will select all messages for transmission. This is the default.

No
specifies RSCS will select messages, but they will not be sent to the remote workstation. The messages will be purged.

OPR=*nnn*
specifies a printer width (number of characters) to override the value previously specified on the PRINT parameter. RSCS will truncate the file to the specified OPR value. This value can be 1 - 255. For files created in CMS or a guest virtual machine, the minimum value is 132.

OPTimize=No
OPTimize=Yes
specifies whether optimization (merging of CCWs) should be used for print files being transmitted over this workstation link. The default is NO.

Specify NO when using a workstation link to communicate with a device that will use specialized file data such as page formatting information, or that requires preservation of original carriage control information.

Pass=*password*
specifies the 1- to 8-character password that the remote workstation must supply to be allowed to connect to RSCS. If the correct password is not received at signon time, RSCS deactivates the link. If a password is not defined for the link on the PARM configuration statement or on the DEFINE or START command, the remote workstation is not required to supply a password at signon time.

For an auto-answer link (automatically started when a call is received on an enabled port), PASS is mandatory.

PCH=No
PCH=Yes
specifies whether a punch is available at the remote workstation. The default is NO.

PHone=*phonenumber*
specifies the phone number to be used when starting an autodial link. The *phonenumber* string can be up to 32 characters long, optionally enclosed within single quotation marks (' '). Only the following characters may be used:

0 1 2 3 4 5 6 7 8 9
Decimal numerals are used for the actual dial digits of the phone number. For example:

```
PHONE=5551234
```

(blank)
Blanks make the phone number easier to read. They are not transmitted to the Automatic Calling Unit (ACU). If you use blanks, you must enclose the phone number within single quotation marks. For example:

```
PHONE='1 607 555 1234'
```

–
Hyphens also make the phone number easier to read. They are not transmitted to the ACU. For example:

```
PHONE='1-607 555-1234'
```

*****
The asterisk is a separator character you can include following an access digit. For a private automatic branch exchange (PABX) extension, this character delays dialing to allow the dial tone to be returned from the public exchange. For example:

```
PHONE='9*1-607 555-1234'
```

.
The period is an end-of-number character that marks the end of the dial-digit group for those ACUs that require such an end character. The type of ACU in use determines whether you need an end-of-number character. For example:

```
PHONE='9*1-607 555-1234.'
```

POll=
specifies whether the link will poll the remote workstation when the link does not have work to perform.

Yes
specifies the link will poll continuously. This is the default.

No
specifies the link will remain idle until it receives work.

PRint=*nnn*
specifies the number of print positions available at the workstation printer. This value depends on the workstation type:

Workstation	Acceptable Values	Default
2770	120, 132, or 144	120
2780	120 or 144	120
3770	132	132
3780	120 or 144	120

Note: To avoid print-line truncation for the 2770, the number of print positions (PRINT=*nnn*) must be *smaller* than the number of bytes in the buffer (BUFF=*nnn*) This is because the buffer must be large enough to contain 6 bytes of control information in addition to the characters to be printed.

SYStem=HOst
specifies that the link will operate as a host to a remote workstation. The workstation can consist of a card reader, a printer, and optionally a card punch.

TEXT=
specifies whether characters on a TN text printing chain should be transmitted to the remote printer in a mixture of uppercase and lowercase.

No
specifies RSCS will translate any lowercase characters to uppercase before transmitting them to the remote printer. This is the default.

Yes
specifies RSCS will transmit both uppercase and lowercase characters to the remote printer.

TRS=No
TRS=Yes
specifies whether the remote workstation has the transparency feature. This feature is only for punch files, not print files. The default is NO.

Note: Usually, RSCS translates characters less than X'40' and greater than X'FE' into blanks. If you do not want RSCS to translate these characters into blanks when it sends them to the remote workstation, specify TRS=YES.

TYPE=
specifies the workstation type.

2770
indicates the 2770 Data Communication System. This is the default.

2780
indicates the 2780 Data Transmission Terminal.

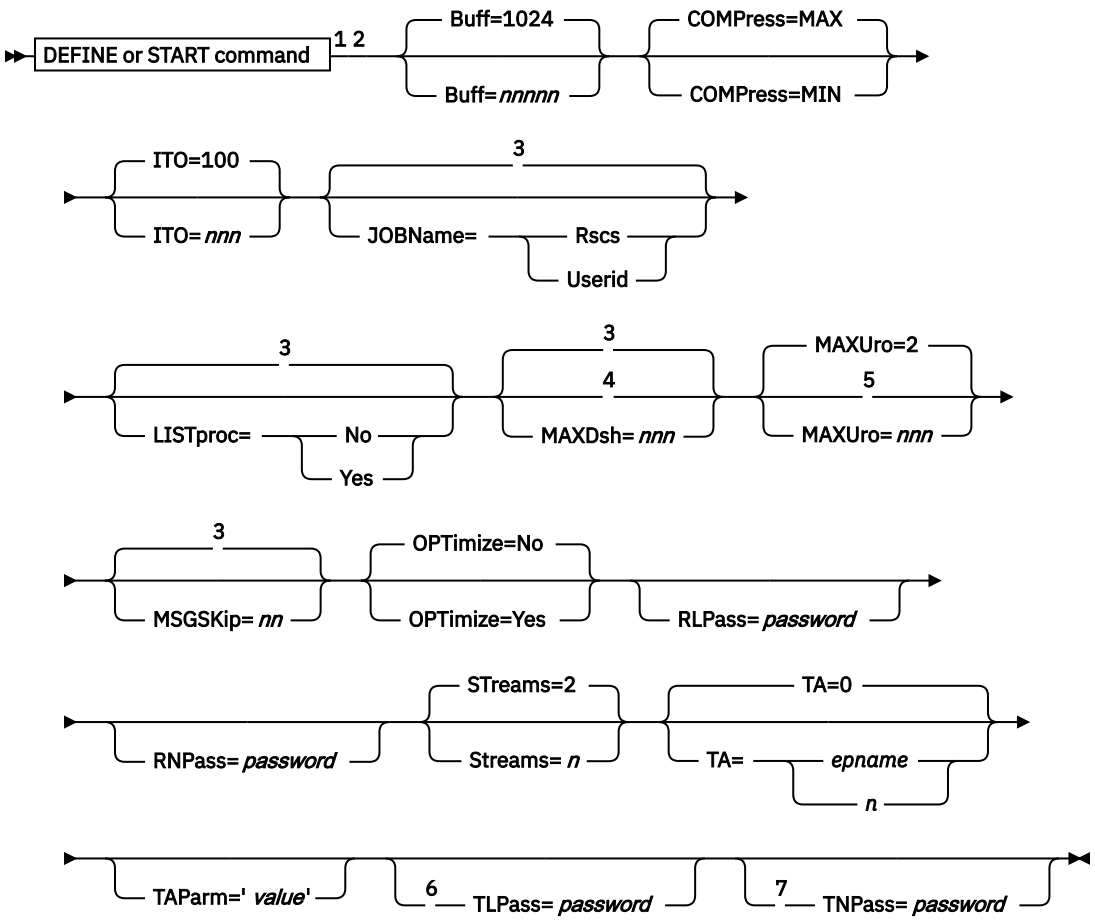
3770
indicates the 3770 Data Communication System.

3780
indicates the 3780 Data Communication Terminal.

Usage Notes

1. If you specify the BUFF, CMPR, LPRT, TRS, or TYPE parameter but you do not specify the PASS parameter, RSCS will internally perform the signon for this specific remote workstation. (That is, it will be an auto-signon link.) Once RSCS establishes the connection, the workstation receives all appropriate messages indicating the successful completion of this signon.
2. When you specify the PASS parameter, the remote workstation must sign on to this host so that passwords are validated.
3. Most remote RJE nodes are printer (output) workstations. To assist operation with real or true emulation of hardware, the POLL=NO and MSG=NO options are recommended for RJE-type links. The OPR and INCLASS options are also recommended. These options enable you to select the type of files that should be processed on the link. You can define an RJE-type link that will process only printer and punch files, without processing message files. In addition, POLL=NO reduces the number of I/O operations needed on the link and within CP.
4. A subset of the RSCS operator messages is printed on the remote workstation printer. RSCS provides a message queue for workstations that have no separate console printer for messages. When the remote printer has completed processing an output file, the queued messages are transmitted and printed. See *z/VM: RSCS Networking Messages and Codes* for a key to the distribution of messages.

SNANJE-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] The default value is derived from the corresponding operand on the OPTION configuration statement.
[4] MAXDSH is ignored if LISTPROC=YES is specified.
[5] MAXURO is ignored if a LISTPROC-type link is not defined.
[6] TLPASS must be specified to connect to a remote system where RLPASS is specified.
[7] TNPASS must be specified to connect to a remote system where RNPASS is specified.

Purpose

An SNANJE-type link starts a session with a remote NJE system connected to an SNA network. These link operational parameters can be specified on the DEFINE or START command for a specific SNANJE-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Automatically if the remote system initiates the session

- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link (or, for certain parameters, on the OPTION configuration statement) or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

Buff=*nnnnn*
specifies the maximum size RU (Request Response Unit) that this link can accept from VTAM. This value can be 300 - 32765 bytes. The default is 1024. The actual buffer size used for transmission is determined at signon time and is the smaller of the buffer sizes specified (or defaulted to) by the two connected systems.

COMPress=
specifies the degree of data compression to be used when transmitting the file.

MAX
specifies maximum data compression. This is the default.

MIN
specifies minimum data compression.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100.

0
Specifies that the link will be deactivated immediately when there is no activity on it. If ITO=0 is specified for the local and remote nodes of the link and files are queued on one end of the link, the link will deactivate before the files are sent. When both sides of the link have files to process, the files will be sent.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

JOBName=
specifies the type of job name RSCS will create for all files originating at your local node and all files arriving at your local node without a job header (that is, those coming from a workstation link).

Rscs
specifies RSCS will generate a job name of RSCS*nnnn*, where *nnnn* is the origin spool ID of the file.

Userid
specifies RSCS will use the origin user ID as the job name.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

To override the default job name for a specific file, use the JOBNAME operand on the CP TAG command. See "TAG" on page 416.

LISTproc=No
LISTproc=Yes
specifies whether the connected system can handle an unlimited number of data set headers. If you specify NO, the link will use the number of data set headers specified on the MAXDSH parameter.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

The following table summarizes how non-list processor systems will handle list processor files.

Table 15. How Non-List Processor Systems Handle List Processor Files

Non-List Processor Systems	How the File Will Be Handled
• RSCS V1.3* • JES3 • VSE/POWER	These systems will immediately split the file into separate spool files. These files will be either distributed to local user IDs or sent on to other links.
• RSCS V2.2* (without list processor support) • RSCS V2.3* or later* (without a list processor defined) • JES2	These systems will receive the file and split out separate files for local user IDs. They will also split out one file containing data set headers to be sent to each link on the distribution list.

Note: * These systems will handle only a limited number of data set headers.

MAXDsh=*nnn*
specifies the maximum number of data set headers that the link driver will send on the link when processing a file with multiple data sets. This value is intended for connections to NJE subsystems that do not have list processor capabilities. This parameter is ignored if LISTPROC=YES is specified.

This value can be 0 - 100. A value of 0 is a special case that means the determination for the number of data set headers place on the link is based on the actual number of data set headers contained in the spool file. A value of 0 should be specified only with full understanding of the number of data set headers that the remote system can handle.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

MAXUro=*nnn*
specifies the maximum number of unit record output devices (virtual printers or punches) for each stream that the link driver will use at any one time while receiving a file. RSCS uses these devices to fan out files containing data set headers, which the link driver determines must be split off the original file. All remaining data set headers (and the file contents) are written to an additional unit record device and queued on the list processor link. This parameter is ignored if a LISTPROC-type link is not defined.

This value can be 0 - 255. The default is 2. Specifying a value of 0 will cause all received data set headers and file contents to be queued to the list processor task. Under usual conditions, a link will always use one more device per stream than specified. If a value of 0 is specified, and the first data set header received in a file is for the local system or for a non-networking link attached to the local system, an extra device will be defined to hold the remaining data set headers.

MSGSKip=*nn*
specifies the number of file buffers that RSCS will send on the link before sending a message buffer (unless there are no file buffers available). This value can be 0 - 15. Specifying 0 is a special case that tells RSCS to send a message buffer whenever messages are available to send on the link, regardless of whether file buffers are available.

If you omit this parameter, and there is no previously defined value, the default value is derived from the corresponding operand on the OPTION configuration statement.

Note: If the link determines during signon that the peer system supports the mixed RCB feature of NJE, RSCS ignores the MSGSKIP settings. The mixed RCB feature lets RSCS send buffers containing a mixture of information (files and messages). If RSCS can send files and messages in one buffer, there is no need to use the MSGSKIP parameter to tell RSCS how many file buffers to send before sending a message buffer. For more information about the mixed RCB feature of NJE, see z/OS: Network Job Entry (NJE) Formats and Protocols.

OPTimize=No
OPTimize=Yes
specifies whether optimization (merging of CCWs) should be used for files that originate on the local system and files that are processed by the local system. (This does not include store-and-forward files that are passing through the local node.) The default is NO.

RLPass=*password*
specifies the 1- to 8-character line password that is required from the remote system before transmission of data is initiated. If the correct password is not received at signon time, RSCS deactivates the link.

RNPass=*password*
specifies the 1- to 8-character node password that is required from the remote system before transmission of data is initiated. If the correct password is not received at signon time, RSCS deactivates the link.

STreams=*n*
specifies the maximum number of files that may be transmitted simultaneously on different streams. This value can be 1 - 7. The default is 2.

Note: RSCS cannot actually send more than one file at a time. When several files are active on different streams, RSCS sends the file with the smallest number of blocks and credits the other files for having to wait. After the file is transmitted, RSCS subtracts the credits from the number of blocks left to send for each active file. RSCS then chooses the file with the lowest number to send. The longer a large file has to wait, the more credits it will accumulate. When the difference between the accumulated credits and the actual file size becomes small enough, RSCS transmits the large file.

PI

TA=
specifies the transmission algorithm, which tells RSCS how to select files for transmission on the link.

epname
is the name of the entry point (outside of the RSCS LOADLIB) where your installation-defined algorithm resides.

n
is a hexadecimal value, 0 - F, that identifies the exit routine in the DMTAXA module (DMTAXAG*n*):

0
Identfies an IBM-supplied algorithm that allows files to be selected regardless of size. This is the default.

Note: If you specify TA=0 or allow it to default, do not specify the TAPARM parameter.

1
Identifies an IBM-supplied algorithm that specifies a default size for each stream specified on the STREAMS parameter. You can override the default by specifying the stream size on the TAPARM parameter.

2 - F
Identifies an algorithm defined by your installation.

Note: If you update the DMTAXA module, it must be reassembled.

TAParm='*value*'
specifies a parameter value associated with the transmission algorithm. This value is a character string up to 80 bytes in length, enclosed in single quotation marks. (The single quotation marks are optional if you do not include blanks in the character string.) Any characters are allowed between the single quotation marks except another single quotation mark.

The value that you specify for TAPARM depends on the value that you specify for TA:

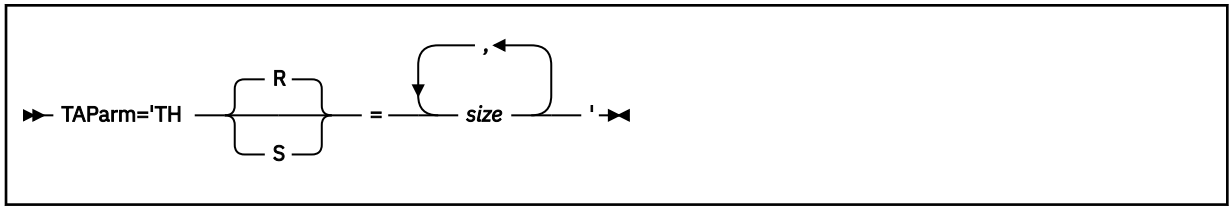
TA=
TAPARM=

0
Do not specify TAPARM; it will be rejected with an error message.

epname
Specify a TAPARM defined by your installation.

2 - F
Specify a TAPARM defined by your installation.

1
Either omit TAPARM to accept the default size for each stream (as shown in Table 16 on page 338), or specify a size for each stream using the following format:



TH=
THR=
specifies the threshold number of records. THR is the default.

THS=
specifies the threshold number of spool file blocks. Specify THS when you expect to send files with very large records, such as printer output files, containing page image data, that are destined for a PSF-controlled printer.

size
is the file size. This can be specified as either of the following:

nnnnnnnn
Maximum file size RSCS should send on the stream. The minimum file size is one more than the maximum file size from the previous stream specification. If there is no previous stream specification, there is no minimum file size.

(*min*,*max*)
Minimum and maximum file size RSCS should send on the stream. If you do not want to specify a minimum file size, omit *min*. If you do not want to specify a maximum file size, omit *max*. Specifying (,) means you do not want to specify either a minimum or a maximum file size; any file is eligible for transmission on the stream.

For example, if you specified STREAMS=3, you can choose the TAPARM default by omitting TAPARM or you can specify any one of the following:

TAPARM='TH=*size1*'
TAPARM='TH=*size1*,*size2*'
TAPARM='TH=*size1*,*size2*,*size3*'

TAPARM='THR=*size1*'
TAPARM='THR=*size1*,*size2*'
TAPARM='THR=*size1*,*size2*,*size3*'

TAPARM='THS=*size1*'
TAPARM='THS=*size1*,*size2*'
TAPARM='THS=*size1*,*size2*,*size3*'

If you specify TA=1 and omit TAPARM, the default file size for each stream is shown in the following table.

Table 16. Default Minimum and Maximum File Size for Each Stream

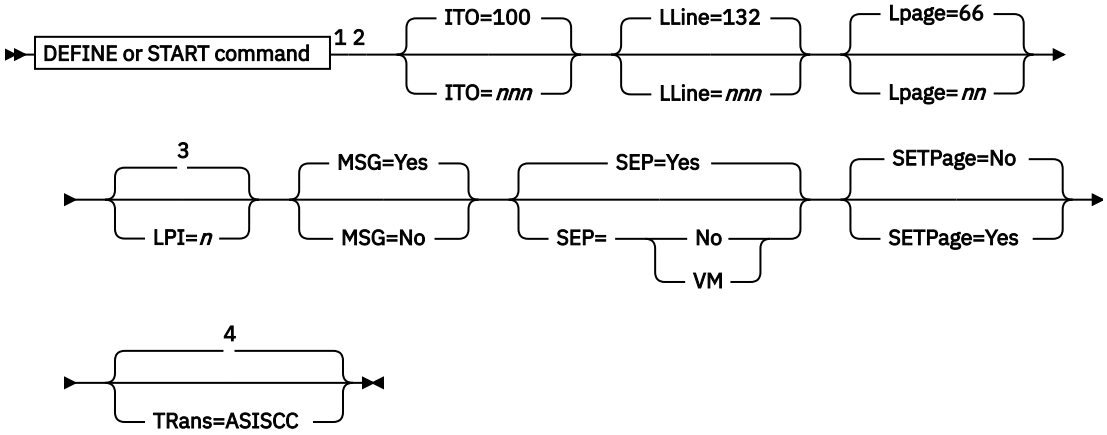
If you specified	THR= Default for Stream 1	THR= Default for Stream 2	THR= Default for Stream 3	THR= Default for Stream 4	THR= Default for Stream 5	THR= Default for Stream 6	THR= Default for Stream 7
STREAMS=1	No limits	—	—	—	—	—	—
STREAMS=2	(,100)	(101,)	—	—	—	—	—
STREAMS=3	(,100)	(101,)	(101,)	—	—	—	—
STREAMS=4	(,100)	(101,)	(101,)	(101,)	—	—	—
STREAMS=5	(,100)	(101,)	(101,)	(101,)	(101,)	—	—
STREAMS=6	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	—
STREAMS=7	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	(101,)

PI end

TLPass=*password*
specifies the 1- to 8-character line password to be transmitted to the remote system at signon time. TLPASS must be specified to connect to a remote system where RLPASS is defined.

TNPass=*password*
specifies the 1- to 8-character node password to be transmitted to the remote system at signon time. TNPASS must be specified to connect to a remote system where RNPASS is defined.

SNARJE-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default is used.
[3] The default LPI value of the device will be used.
[4] Unprintable characters will be translated into blanks.

Purpose

An SNARJE-type link is a workstation link, connecting a system node to an SNA System/36 RJE workstation. These link operational parameters can be specified on the DEFINE or START command for a specific SNARJE-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Automatically if the remote workstation initiates the session
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default is used.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

LLine=*nnn*
specifies the maximum line length (number of characters per line). LLINE is a logical maximum, which is determined by the size of the form being used in the printer. This value can be 1 - 220. The default is 132. All print lines are truncated at the length specified by this value. If a number less than 74 is specified for LLINE, no separator page is printed.

Lpage=*nn*
specifies the number of lines per page on the type of form inserted in the printer. This value can be 0 - 99. The default is 66. A value of 0 specifies that no page eject will be done when a page eject is found in the file.

Note: RSCS uses this value only to determine the current vertical position on a page while printing a file. Any actual page ejects are determined by Skip-to-Channel-1 CCWs within the file. If there are no Skip-to-Channel-1 CCWs in the file, no page ejects are done, except between files. The actual number of lines contained in the file between consecutive Skip-to-Channel-1 CCWs must be equal to or less than this value.

LPI=*n*
specifies the number of lines per inch to be printed on the form for an LU_T1 session. This value can be 3, 4, 6, or 8. If this parameter is not specified, RSCS sets the value for LPI in the SNA Character String (SCS) to X'00'. According to LU_T1 protocol, X'00' for LPI causes the device to use its default value for lines per inch. See the printer documentation for information about what this default value is.

Note: RSCS sends SCS orders to the device to set page characteristics by overriding defaults. RSCS will not send the SCS orders unless you also specify SETPAGE=YES.

MSG=
specifies whether RSCS will allow the link driver to dequeue messages destined for transmission to the remote workstation.

Yes
specifies RSCS will select all messages for transmission. This is the default.

No
specifies RSCS will select messages, but they will not be sent to the remote workstation. The messages will be purged.

SEP=
specifies the type of separator page to be inserted before each print file sent across the link.

Yes
specifies an RSCS-style separator page. This is the default. For a description of the format of an RSCS-style separator page, see “RSCS-Style Separator Page” on page 54.

No
specifies no separator page.

VM
specifies a VM-style separator page. For a description of the format of a VM-style separator page, see “VM-Style Separator Page” on page 51.

Note: This parameter applies only to print files. When transmitting a punch file to a remote workstation, RSCS creates a header line on the output. For information about the format of this header line, see "Output File Processing in Host Mode" on page 58.

SETPage=
specifies whether RSCS will send SCS orders to the device to set page characteristics for printing for an LU_T1 session. These page characteristics are based on the values specified on the LLINE, LPAGE, and LPI parameters.

No
specifies RSCS will not set page characteristics. No SCS orders will be sent. This is the default.

Yes
specifies RSCS will automatically set page characteristics for the device. SCS orders will override hardware defaults and those set manually on the device.

Note: If the device is being shared with another VTAM application, you should specify SETPAGE=YES to ensure proper page alignment when RSCS regains control of the session.

TRans=ASISCC
specifies that RSCS will not translate unprintable characters in files into blanks. This allows the user to pass SCS orders to the remote workstation.

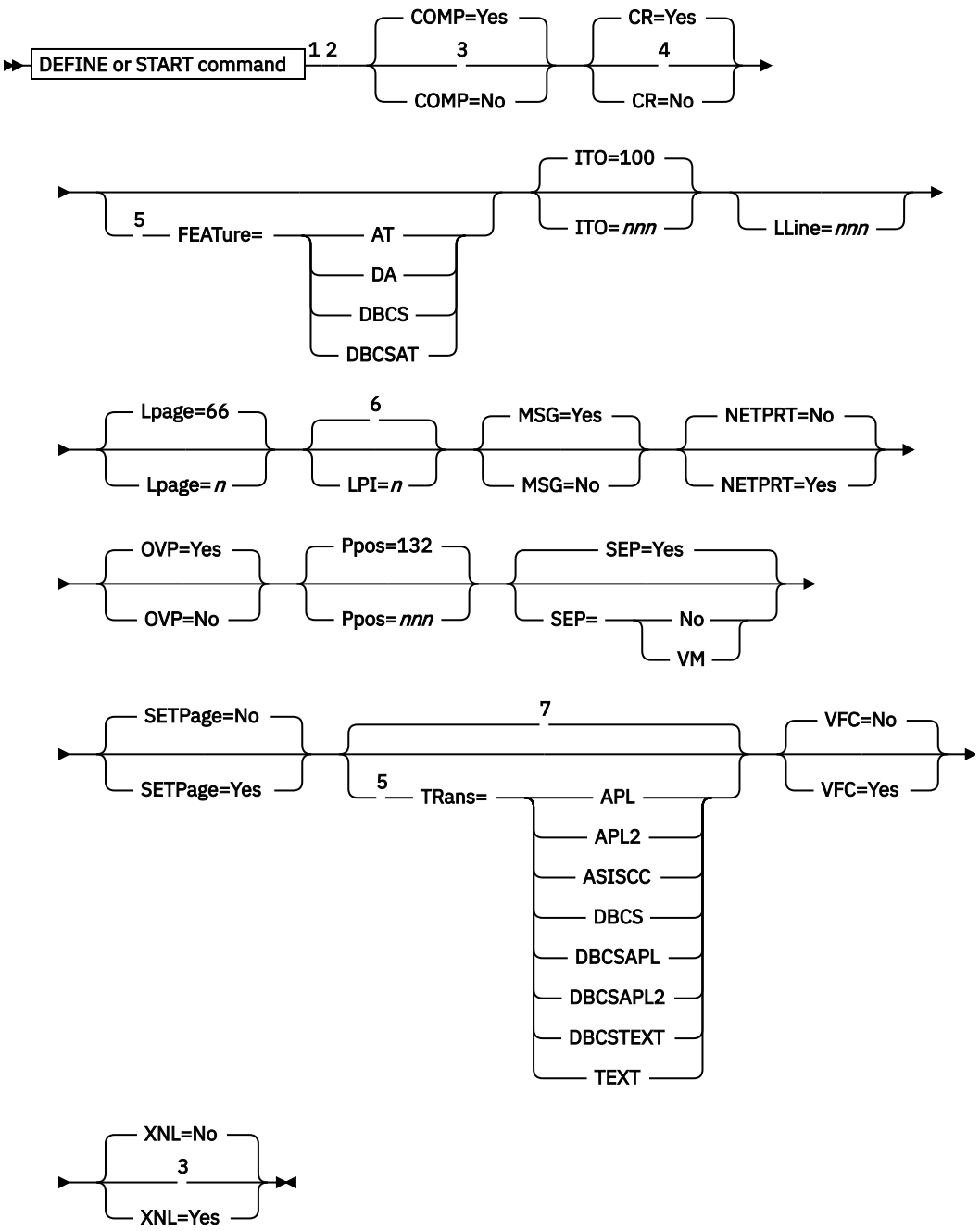
Usage Notes

When you define a form name using the FORM configuration statement, you can define these characteristics:

- Separator page style
- Line length
- Page length
- Lines per inch (only for LU_T1 printers and workstations)

If you specify a form name when starting a link, be aware that the form name characteristics always override any SEP, LLINE, and LPAGE specifications and will override LPI specifications when SETPAGE=YES.

SNA3270P-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] This parameter is ignored for a printer defined for an LU_T1 session.
[4] CR is ignored if VFC=NO.
[5] FEATURE is required to specify TRANS (except TRANS=ASISCC).
[6] The default LPI value of the device will be used.
[7] Unprintable characters will be translated into blanks.

Purpose

An SNA3270P-type links starts a session with a remote IBM 3270 Information Display System printer connected to an SNA network. These link operational parameters can be specified on the DEFINE or START command for a specific SNA3270P-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Automatically if the remote workstation initiates the session
- Manually by an operator or authorized user

The START command does not have to be entered to start the link if the link is an autostart link, or if the session is started by the VTAM operator or by an automatic logon when the printer is turned on by its operator.

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

COMP=Yes
COMP=No
specifies whether the link will perform blank compression. The default is YES; occurrences of five or more blanks will be compressed. You should specify NO for a locally attached printer. This parameter is ignored for a printer defined for an LU_T1 session, and no blank compression will occur.

CR=Yes
CR=No
specifies whether the link should send a 3270 carriage return (CR) order after a forms feed (FF) when VFC=YES is specified. The default is YES. This parameter has no meaning unless VFC=YES is also specified. Specify CR=NO when VFC=YES is specified and cut paper is used in a 5210 printer.

FEATure=
specifies that the printer has the indicated feature.

AT
indicates the APL/Text feature.

DA
indicates the Data Analysis-APL feature.

DBCS
indicates the Double-Byte Character Set feature.

DBCSAT
indicates the AT and DBCS features.

For the valid combinations of FEATURE and TRANS settings, see Table 17 on page 348.

Notes:

1. To use the TRANS parameter and the PRT option on the CP TAG command, FEATURE must be specified. This rule does not apply to TRANS=ASISCC or to the ASISCC, GRAF, GRAPH, and NOTR settings on the PRT option, because they have no corresponding FEATURE setting.
2. Specifying a FEATURE parameter as a default is helpful, even if you are specifying TRANS=ASISCC, because it lets you specify a TRANS setting as a holding position. You can then override the TRANS

setting for a file by using the PRT option on the TAG command. If TRANS is not specified, then the only PRT settings allowed will be ASISCC, GRAF, GRAPH, and NOTR.

3. The DBCS feature processes the double-byte character set but does not translate any APL or TEXT representation that may exist in the file. The only translation done with the DBCS setting is 3270 control character removal. If you want APL or TEXT translation, use FEATURE=DBCSAT with TRANS=DBCSAPL, TRANS=DBCSAPL2, or TRANS=DBCSTEXT. If APL, APL2®, or TEXT is specified, the DBCS characters will not be verified or translated to the correct format for the printer output.

For more information about the PRT option on the TAG command, see "Link Options for Printed Output to a 3270 Printer" on page 418.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

LLine=*nnn*
specifies the maximum line length (number of characters per line). LLINE is a logical maximum, which is determined by the size of the form being used in the printer. This value can be 1 - 220. All print lines are truncated at the length specified by this value.

If LLINE is not specified, or if the LLINE value is greater than the PPOS value, LLINE is ignored and the PPOS value is used. If a file is sent to a printer with a character width equal to the LLINE value, the output will be truncated to the PPOS width.

If the LLINE value is less than PPOS value, the LLINE value will override the PPOS value and will remain as the printer default for its active duration. If a number less than 74 is specified for LLINE, no separator page is printed.

Note: The 5210 printer accepts print wheels that allow it to print in various size fonts. Therefore, the font size on the print wheel must be considered when you specify the LLINE value. For example, if the 5210 is using a 10-pitch font print wheel, the LLINE value should be 85. However, if a 12-pitch font print wheel is being used, the LLINE value should be greater than 85.

Lpage=*nn*
specifies the number of lines per page on the type of form inserted in the printer. This value can be 0 - 99. The default is 66. A value of 0 means that no page eject will be done when a page eject is found in the file.

Note: RSCS uses this value only to determine the current vertical position on a page while printing a file. Any actual page ejects are determined by Skip-to-Channel-1 CCWs within the file. If there are no Skip-to-Channel-1 CCWs in the file, no page ejects are done, except between files. The actual number of lines contained in the file between consecutive Skip-to-Channel-1 CCWs must be equal to or less than this value.

LPI=*n*
specifies the number of lines per inch to be printed on the form for an LU_T1 session. This value can be 3, 4, 6, or 8. If this parameter is not specified, RSCS sets the value for LPI in the SNA Character

String (SCS) to X'00'. According to LU_T1 protocol, X'00' for LPI causes the printer to use its default value for lines per inch. See the printer documentation for information about what this default value is.

Note: RSCS sends SCS orders to the printer to set page characteristics by overriding printer defaults. RSCS will not send the SCS orders unless you also specify SETPAGE=YES.

MSG=
specifies whether RSCS will allow the link driver to dequeue messages destined for transmission to the remote printer.

Yes
specifies RSCS will select all messages for transmission. This is the default.

No
specifies RSCS will select messages, but they will not be sent to the remote printer. The messages will be purged.

NETPRT=No
NETPRT=Yes
specifies whether an IBM Network printer 4312, 4317, or 4324 is attached to this link. The default is NO. You must specify YES if one of these printers is attached and it is to print IDPS graphic files. Specify NO if any other printer type is attached.

OVP=Yes
OVP=No
specifies whether the link will allow overprinting to occur (such as underscored words or overstruck characters for highlighting). The default is YES. Specify NO for a printer or control unit that does not support the 3270 carriage return (CR) order.

Ppos=*nnn*
specifies the maximum number of print positions available on the printer. This value can be 1 - 220, depending on the printer. The default is 132.

PPOS is a hardware maximum determined by the number of characters the printer can print on each line, independent of the size of the form used in the printer. Each printer has its own PPOS value; see the printer documentation for more information. If the PPOS value you specify does not match the printer's PPOS value, some types of printed output (including separator pages) will not print correctly.

SEP=
specifies the type of separator page to be inserted before each print file sent across the link.

Yes
specifies an RSCS-style separator page. This is the default. For a description of the format of an RSCS-style separator page, see “RSCS-Style Separator Page” on page 54.

No
specifies no separator page.

VM
specifies a VM-style separator page. For a description of the format of a VM-style separator page, see “VM-Style Separator Page” on page 51.

Note: This parameter applies only to print files. When transmitting a punch file to a remote workstation, RSCS creates a header line on the output. For information about the format of this header line, see “Output File Processing in Host Mode” on page 58.

SETPage=
specifies whether RSCS will send SCS orders to the printer to set page characteristics for printing for an LU_T1 session. These page characteristics are based on the values specified on the LLINE, LPAGE, and LPI parameters.

No
specifies RSCS will not set page characteristics. No SCS orders will be sent. This is the default.

Yes
specifies RSCS will automatically set page characteristics on the printer. SCS orders will override printer hardware defaults and those set manually on the printer.

Note: If the printer is being shared with another VTAM application, you should specify SETPAGE=YES (and VFC=YES if the printer supports vertical forms control and the 3270 carriage control order) to ensure proper page alignment when RSCS regains control of the printer.

TRans=
specifies the default translation mode for files being transmitted to a printer that has the AT, DA, DBCS, or DBCSAT feature (as specified on the FEATURE parameter). The translation mode tells RSCS that all files may contain the indicated special characters and that RSCS should translate these special characters accordingly. Alternatively, you can use this parameter to specify that unprintable characters should not be translated into blanks.

The default translation mode you specify on TRANS can be overridden for a specific file by using the PRT option on the CP TAG command. For more information, see "Link Options for Printed Output to a 3270 Printer" on page 418.

APL
indicates RSCS will translate internally represented EBCDIC special APL characters into the appropriate 2-byte I/O interface codes.

APL2
indicates RSCS will translate internally represented EBCDIC special APL2 characters into the appropriate 2-byte I/O interface codes.

This mode is valid only when FEATURE is set to AT or DBCSAT. If TRANS=APL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

ASISCC
indicates RSCS will not translate unprintable characters into blanks. This lets the user pass SCS orders to the remote printer or workstation. Table 17 on page 348 shows that ASISCC can be used with all FEATURE settings.

TRANS=ASISCC means the default is no translation. If a file needs translation, then override this default by using the PRT option on the CP TAG command (assuming that you specified the correct FEATURE setting). If FEATURE is not specified, then only the ASISCC, GRAF, GRAPH, or NOTR setting can be specified on the TAG command.

Note: TRANS=ASISCC can be specified without a FEATURE setting.

DBCS
indicates RSCS will verify double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

DBCSAPL
indicates RSCS will translate internally represented EBCDIC special APL characters into the appropriate 2-byte I/O interface codes and will verify all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

DBCSAPL2
indicates RSCS will translate internally represented EBCDIC special APL2 characters into the appropriate 2-byte I/O interface codes and will verify all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

This mode is valid only when FEATURE is set to DBCSAT. If TRANS=DBCSAPL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

DBCSTEXT
indicates RSCS will translate internally represented EBCDIC special TEXT characters into the appropriate 2-byte I/O interface codes and will verify double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

TEXT
indicates RSCS will translate internally represented EBCDIC special TEXT characters into the appropriate 2-byte I/O interface codes.

For the valid combinations of FEATURE and TRANS settings, see Table 17 on page 348.

Notes:

1. If you omit the TRANS parameter, the usual character translation occurs (unprintable characters will be translated into blanks).
2. RSCS ignores the TRANS parameter unless you also specify the corresponding FEATURE setting. TRANS=ASISCC is the exception; it does not require a FEATURE setting.
3. RSCS does not perform blank compression within DBCS SO/SI characters.
4. RSCS translates only those characters identified in the list above. RSCS will not change the standard EBCDIC data.

VFC=
specifies whether the printer will use the 3270 Vertical Forms Control (VFC) feature for vertical spacing.

No
specifies vertical spacing will be achieved through multiple new line (NL) orders. This is the default.

Yes
specifies the printer will use the 3270 VFC feature and the 3270 carriage control (CC) order. VFC=YES is valid only for those printers and control units that support the 3270 CC order.

Note: Generally, IBM recommends that you specify VFC=YES. If users send GDDM or IPDS graphic files to this printer, you must specify VFC=YES to ensure that the pages align correctly.

XNL=No
XNL=Yes
specifies whether the link is to include an extra new line (NL) order following each line that is as long as the maximum number of print positions. The default is NO. Specify YES for those printers (such as the 3262, 3289, 4234, and 6262) that do not generate an extra new line function for a maximum length line. (This parameter is ignored if specified for a printer defined for LU_T1 sessions.)

Usage Notes

1. For LU_T1 sessions only, RSCS supports the use of the CANCEL PRINT, PA1 (for READY), and PA2 (for START) keys on the 3270 Information Display System printers. For more information, see “Printer Key Support in an LU_T1 Session” on page 56.
2. When you define a form name using the FORM configuration statement, you can define these characteristics:
   - Separator page style
   - Line length
   - Page length
   - Lines per inch (only for LU_T1 printers and workstations)

   If you specify a form name when starting a link, be aware that the form name characteristics always override any SEP, LLINE, and LPAGE specifications and will override LPI specifications when SETPAGE=YES.
3. If you specify an incorrect combination of FEATURE and TRANS settings, the SCO receives error message DMT807E and the link is deactivated.
4. Table 17 on page 348 indicates the valid combinations of FEATURE and TRANS settings.

Table 17. Valid Combinations of FEATURE and TRANS Settings

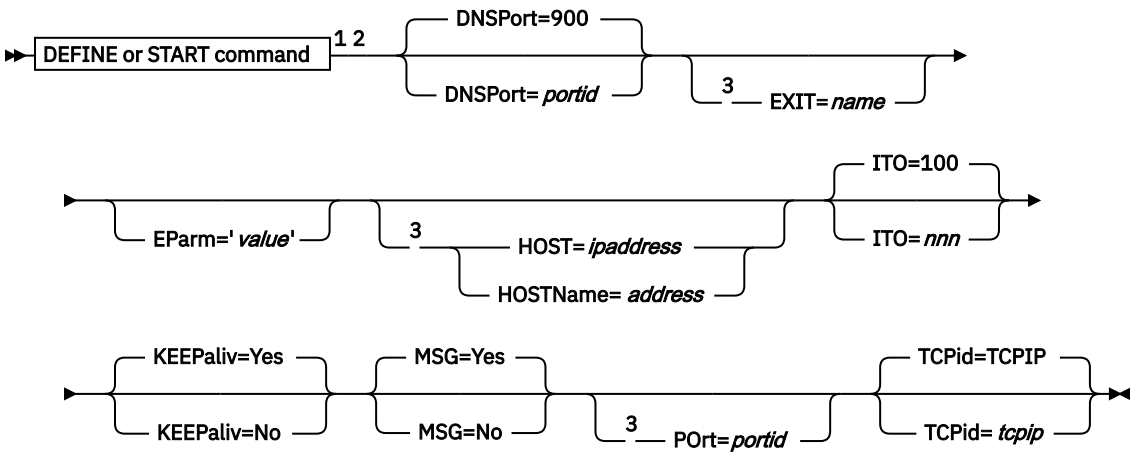
TRans=	FEATure= DA	FEATure= AT	FEATure= DBCS	FEATure= DBCSAT
APL	X	X		X
APL2		X		X
TEXT	X	X		X
DBCS			X	X
DBCSAPL				X
DBCSAPL2				X
DBCSTEXT				X
ASISCC	X	X	X	X

Notes:

a. If APL, APL2, or TEXT is specified on the TRANS parameter, and the FEATURE parameter is set to DBCSAT, then there is no DBCS translation of the file, only APL, APL2, or TEXT. The DBCS translation will occur only with APL, APL2, or TEXT translation when the TRANS setting is DBCSAPL, DBCSAPL2, or DBCSTEXT.

b. TRANS=ASISCC does not require the FEATURE parameter to be specified.

TCPASCII-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.

[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.

[3] This parameter is required on the START command if not previously defined.

Purpose

A TCPASCII-type link begins a session with a remote ASCII printer or plotter attached to a print server in a TCP/IP network. These link operational parameters can be specified on the DEFINE or START command for a specific TCPASCII-type link to define or redefine operational characteristics to be used by the link driver when the link is started.

The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

DNSPort=*portid*
specifies the port number on the local system where the RSCS domain name server (RSCSDNS), if running, listens for connect requests. The default is 900.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 900 or any other well-known port when usage is restricted, the RSCSDNS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

PI

EXIT=*name*
specifies the name of the exit routine module that contains the exit routines supporting the specific ASCII device. The exit routine module must reside in a LOADLIB that has been identified by using the GCS GLOBAL command. If you omit this parameter and the exit name is not previously defined, or if RSCS cannot find the exit routine module, the link driver will not start.

IBM supplies the following sample ASCII exit routine modules in the RSCSEXIT LOADLIB.

ASCXDSOE
DS180 Matrix Printer from Datasouth

ASCXDWRE
LA120 DECwriter Printer from DEC

ASCXONE
Generic ASCII printer

ASCXPROP
IBM Proprinter

ASCXPSE
PostScript printer

ASCXSPWE
NEC 3515 Spinwriter Printer

ASCXZETE
Nicolet Zeta 8 Plotter

ASCX749E
IBM Instruments XY/749 Multipen Digital Plotter

For more information about the ASCII exit routines, see *z/VM: RSCS Networking Exit Customization*.

EParm='*value*'
specifies a parameter value associated with the exit routine module. This value is a character string up to 239 bytes in length, enclosed in single quotation marks. Any character is allowed between the single quotation marks except another single quotation mark. The actual value of the character string is determined by the exit routine module.

For information about the EPARM parameters supported for use with the ASCXONE and ASCXPSE sample modules, see *z/VM: RSCS Networking Exit Customization*.

PI end

HOST=*ipaddress*
specifies the IP address (in dotted decimal format) of the host to which to connect.

If a HOST or HOSTNAME value is not previously defined, it must be specified on the START command, or the link driver will not start.

HOSTName=*address*
specifies the fully qualified domain name address (up to 200 characters) of the remote host to which to connect.

Note: Use of this parameter requires the RSCS domain name server, which will resolve the domain name address to an IP address.

If a HOST or HOSTNAME value is not previously defined, it must be specified on the START command, or the link driver will not start.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

KEEPaliv=Yes
KEEPaliv=No
specifies whether keep alive packets will be sent when a connection has been idle for the keep alive interval. This allows the link driver to detect that the other side has terminated or become unreachable even when no data is being exchanged. The keep alive interval is specified in the configuration file for the TCP/IP virtual machine. The default value is YES.

MSG=
specifies whether RSCS will allow the link driver to dequeue messages destined for transmission to the remote printer.

Yes
specifies RSCS will select all messages for transmission. This is the default.

No
specifies RSCS will select messages, but they will not be sent to the remote printer. The messages will be purged.

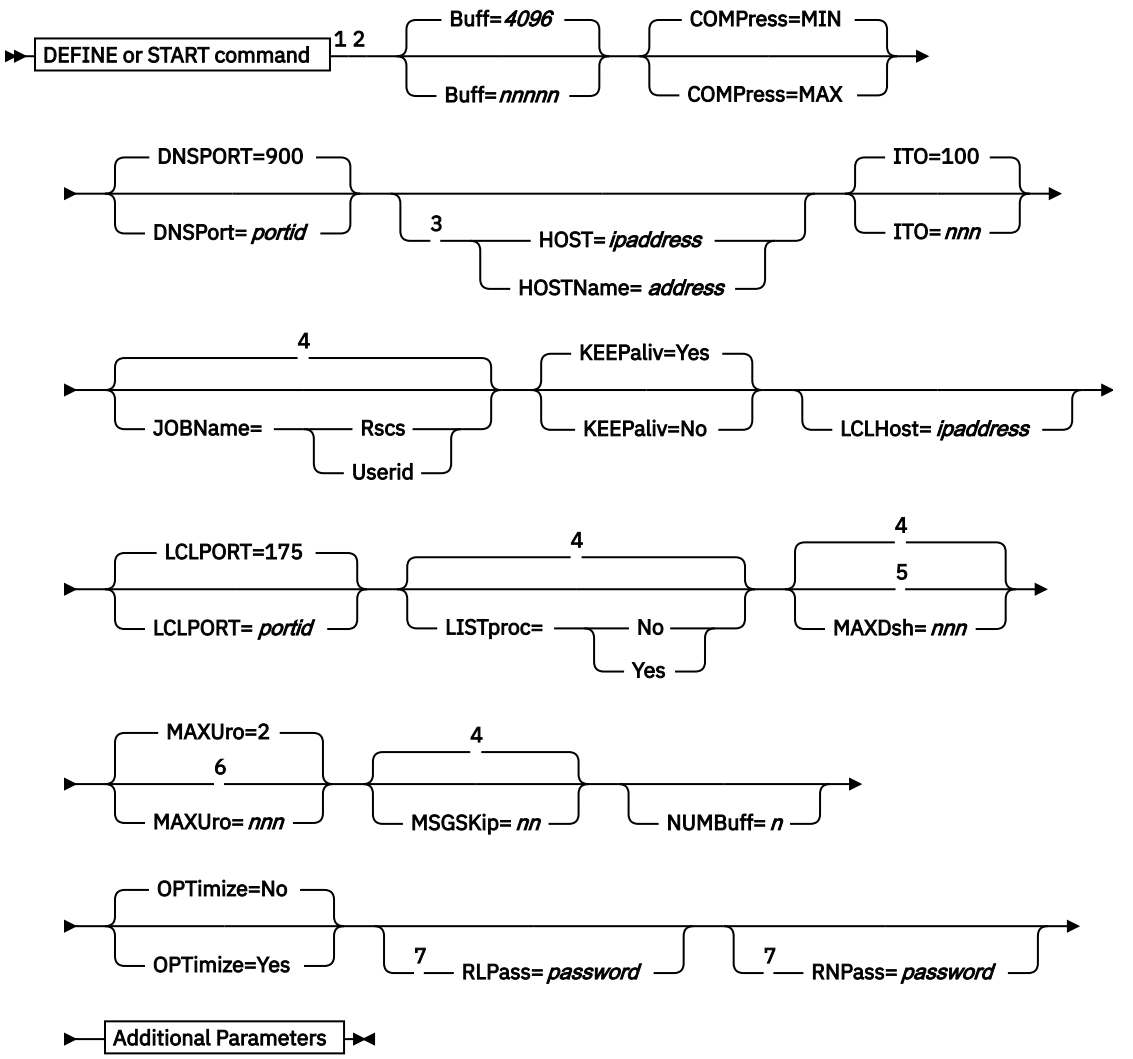
POrt=*portid*
specifies the port number to which to connect on the host.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use a well-known port when usage is restricted, the RSCS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

If the port number is not previously defined, it must be specified on the START command, or the link driver will not start.

TCPid=*tcpip*
specifies the name of the TCP/IP virtual machine. The default name is TCPIP.

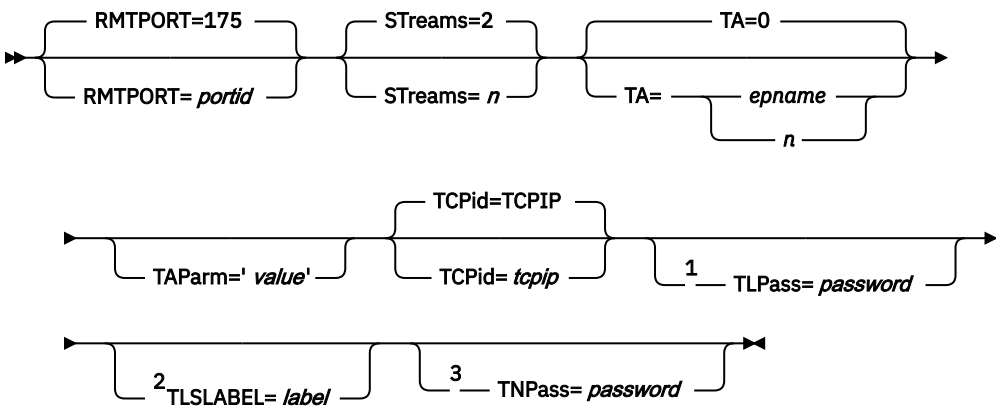
TCPNJE-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] This parameter is required on the START command if not previously defined.
[4] The default value is derived from the corresponding operand of the OPTION configuration statement.
[5] MAXDSH is ignored if LISTPROC=YES is specified.
[6] MAXURO is ignored if a LISTPROC-type link is not defined.
[7] For an auto-answer link, RLPASS or RNPASS (or both) must be specified.

Additional Parameters



Notes:

[1] TLPASS must be specified to connect to a remote system where RLPASS is specified.
[2] TLSLABEL input must be uppercase.
[3] TNPASS must be specified to connect to a remote system where RNPASS is specified.

Purpose

A TCPNJE-type link is a link to a remote NJE system within a TCP/IP network. The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link (or, for certain parameters, on the OPTION configuration statement) or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

Buff=*nnnnn*
specifies the maximum size buffer that this link can accept. This value can be 300 - 32765 bytes. The default is 4096. The actual buffer size used is determined at signon time and is the smaller of the buffer sizes specified (or defaulted to) by the two connected systems. If a small buffer size is specified or defaulted to by the remote node, it should be encouraged to specify a larger buffer.

The transfer rate of files across TCPNJE-type links is dependent on the buffer sizes defined for the link and within the TCP/IP stack. The available buffer sizes within the TCP/IP stack should match or be larger than the buffer size defined on the TCPNJE-type link PARM statement.

COMPress=
specifies the degree of data compression to be used when transmitting the file.

MIN
specifies minimum data compression. This is the default.

MAX
specifies maximum data compression.

DNSPort=900
DNSPort=*portid*
specifies the port number on the local system where the RSCS domain name server (RSCSDNS), if running, listens for connect requests. The default is 900.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 900 or any other well-known port when usage is restricted, the RSCSDNS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

HOST=*ipaddress*
specifies the IP address (in dotted decimal format) of the remote host to which to connect.

If not previously defined, either HOST or HOSTNAME must be specified on the START command.

HOSTName=*address*
specifies the fully qualified domain name address (up to 200 characters) of the remote host to which to connect.

Note: Use of this parameter requires the RSCS domain name server, which will resolve the domain name address to an IP address.

If not previously defined, either HOST or HOSTNAME must be specified on the START command.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100.

0
Specifies that the link will be deactivated immediately when there is no activity on it. If ITO=0 is specified for the local and remote nodes of the link and files are queued on one end of the link, the link will deactivate before the files are sent. When both sides of the link have files to process, the files will be sent.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

JOBName=
specifies the type of job name RSCS will create for all files originating at your local node and all files arriving at your local node without a job header (that is, those coming from a workstation link).

Rscs
specifies RSCS will generate a job name of RSCS*nnnn*, where *nnnn* is the origin spool ID of the file.

Userid
specifies RSCS will use the origin user ID as the job name.

If you omit this parameter, and a value is not previously defined, the default value is derived from the corresponding operand on the OPTION configuration statement.

To override the default job name for a specific file, use the JOBNAME operand on the CP TAG command. See "TAG" on page 416.

KEEPaliv=Yes
KEEPaliv=No
specifies whether keep alive packets will be sent when a connection has been idle for the keep alive interval. This allows the driver to detect that the other side has terminated or become unreachable even when no data is being exchanged. The keep alive interval is specified in the configuration file for the TCP/IP virtual machine. The default is YES.

LCLHost=*ipaddress*
specifies the IP address (in dotted decimal format) on which RSCS should send socket connect requests for this link. This IP address must match the IP address provided with the HOST parameter on the remote side.

LCLPORT=*portid*
specifies the port number on the local system where the link listens for connect requests from one or more remote host. The default is 175.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 175 or any other well-known port when usage is restricted, the RSCS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

LISTproc=No
LISTproc=Yes
specifies whether the connected system can handle an unlimited number of data set headers. If you specify NO, the link will use the number of data set headers specified on the MAXDSH parameter.

If you omit this parameter, and a value is not previously defined, the default value is derived from the corresponding operand on the OPTION configuration statement.

The following table summarizes how non-list processor systems will handle list processor files.

Table 18. How Non-List Processor Systems Handle List Processor Files

Non-List Processor Systems	How the File Will Be Handled
• RSCS V1.3* • JES3 • VSE/POWER	These systems will immediately split the file into separate spool files. These files will be either distributed to local user IDs or sent on to other links.
• RSCS V2.2* (without list processor support) • RSCS V2.3* or later* (without a list processor defined) • JES2	These systems will receive the file and split out separate files for local user IDs. They will also split out one file containing data set headers to be sent to each link on the distribution list.

Note: * These systems will handle only a limited number of data set headers.

MAXDsh=*nnn*
specifies the maximum number of data set headers the link driver will send on the link when processing a file with multiple data sets. This value is intended for connections to NJE subsystems that do not have list processor capabilities. This parameter is ignored if LISTPROC=YES is specified.

This value can be 0 - 100. A value of 0 is a special case that means the determination for the number of data set headers place on the link is based on the actual number of data set headers contained in the spool file. A value of 0 should be specified only with full understanding of the number of data set headers that the remote system can handle.

If you omit this parameter, and a value is not previously defined, the default value is derived from the corresponding operand on the OPTION configuration statement.

MAXUro=*nnn*
specifies the maximum number of unit record output devices (virtual printers or punches) for each stream that the link driver will use at any one time while receiving a file. RSCS uses these devices to fan out files containing data set headers which the link driver determines must be split off the original file. All remaining data set headers (and the file contents) are written to an additional unit record device and queued on the list processor link. This parameter is ignored if a LISTPROC-type link is not defined.

This value can be 0 - 255. The default is 2. Specifying a value of 0 will cause all received data set headers and file contents to be queued to the list processor task. Under standard conditions, a link will always use one more device per stream than specified. If a value of 0 is specified and the first data set header received in a file is for the local system or for a non-networking link attached to the local system, an extra device will be defined to hold the remaining data set headers.

MSGSKip=*nn*
specifies the number of file buffers that RSCS will send on the link before sending a message buffer (unless there are no file buffers available). This value can be 0 - 15. Specifying 0 is a special case that tells RSCS to send a message buffer whenever messages are available to send on the link, regardless of whether file buffers are available.

If you omit this parameter, and a value is not previously defined, the default value is derived from the corresponding operand on the OPTION configuration statement.

Note: If this link determines during signon that the peer system supports the mixed RCB feature of NJE, RSCS ignores the MSGSKIP setting. The mixed RCB feature lets RSCS send buffers containing a mixture of information (files and messages). If RSCS can send files and messages in one buffer, there is no need to use the MSGSKIP parameter to tell RSCS how many file buffers to send before sending a message buffer. For more information about the mixed RCB feature of NJE, see z/OS: Network Job Entry (NJE) Formats and Protocols.

NUMBuff=*n*
has no meaning and exists only to maintain compatibility with levels of RSCS prior to Version 3. Whether you specify or omit this parameter, RSCS gives each link two transmission buffers.

OPTimize=No
OPTimize=Yes
specifies whether optimization (merging of CCWs) should be used for files that originate on the local system and files that are processed by the local system. (This does not include store-and-forward files that are passing through the local node.) The default is NO.

RLPass=*password*
specifies the 1- to 8-character line password that is required from the remote system on its signon record before transmission of data is initiated. If the correct password is not received at signon time, RSCS deactivates the link. On an auto-answer link, RLPASS or RNPASS (or both) must be defined.

RNPass=*password*
specifies the 1- to 8-character node password that is required from the remote system on its signon record before transmission of data is initiated. If the correct password is not received at signon time, RSCS deactivates the link. On an auto-answer link, RLPASS or RNPASS (or both) must be defined.

RMTPORT=*portid*
specifies the port number to which to connect on the remote host. The default is 175.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 175 or any other well-known port when usage is restricted, the RSCS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

STreams=*n*
specifies the maximum number of files that may be transmitted simultaneously on different streams. This value can be 1 - 7. The default is 2.

Notes:

1. RSCS cannot actually send more than one file at a time. When you have several files active on different streams, RSCS sends the file with the smallest number of blocks and credits the other files for having to wait. After the file is transmitted, RSCS subtracts the credits from the number of blocks left to send for each active file. RSCS then chooses the file with the lowest number to send. The longer a large file has to wait, the more credits it will accumulate. When the difference between the accumulated credits and the actual file size becomes small enough, RSCS transmits the large file.

2. Specifying a stream number of 1 and a transmission algorithm number of 0 (TA=0) allows the link to operate in a mode compatible with RSCS Version 1 (that is, only one file will be transmitted at a time, with all files eligible for selection).

PI

TA=
specifies the transmission algorithm, which tells RSCS how to select files for transmission on the link.

epname
is the name of the entry point (outside of the RSCS LOADLIB) where your installation-defined algorithm resides.

n
is a hexadecimal value, 0 - F, that identifies the exit routine in the DMTAXA module (DMTAXAG*n*):

0
Identfies an IBM-supplied algorithm that allows files to be selected regardless of size. This is the default.

Note: If you specify TA=0 or allow it to default, do not specify the TAPARM parameter.

1
Identifies an IBM-supplied algorithm that specifies a default size for each stream specified on the STREAMS parameter. You can override the default by specifying the stream size on the TAPARM parameter.

2 - F
Identifies an algorithm defined by your installation.

Note: If you update the DMTAXA module, it must be reassembled.

TAParm='*value*'
specifies a parameter value associated with the transmission algorithm. This value is a character string up to 80 bytes in length, enclosed in single quotation marks. (The single quotation marks are optional if you do not include blanks in the character string.) Any characters are allowed between the single quotation marks except another single quotation mark.

The value that you specify for TAPARM depends on the value that you specify for TA:

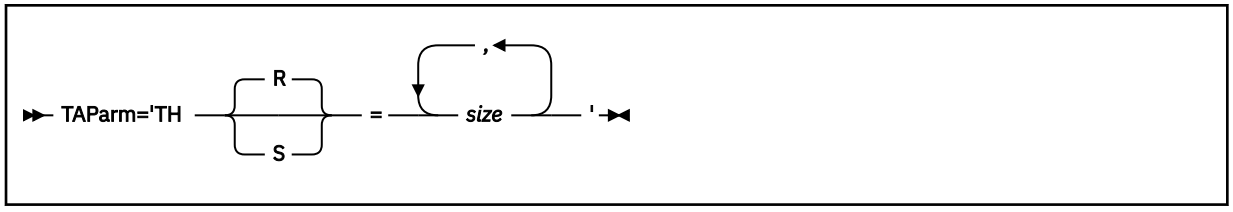
TA=
TAPARM=

0
Do not specify TAPARM; it will be rejected with an error message.

epname
Specify a TAPARM defined by your installation.

2 - F
Specify a TAPARM defined by your installation.

1
Either omit TAPARM to accept the default size for each stream (as shown in Table 19 on page 358), or specify a size for each stream using the following format:



TH=
THR=
specifies the threshold number of records. THR is the default.

THS=
specifies the threshold number of spool file blocks. Specify THS when you expect to send files with very large records, such as printer output files, containing page image data, that are destined for a PSF-controlled printer.

size
is the file size. This can be specified as either of the following:

nnnnnnnn
Maximum file size RSCS should send on the stream. The minimum file size is one more than the maximum file size from the previous stream specification. If there is no previous stream specification, there is no minimum file size.

(*min*,*max*)
Minimum and maximum file size RSCS should send on the stream. If you do not want to specify a minimum file size, omit *min*. If you do not want to specify a maximum file size, omit *max*. Specifying (,) means you do not want to specify either a minimum or a maximum file size; any file is eligible for transmission on the stream.

For example, if you specified STREAMS=3, you can choose the TAPARM default by omitting TAPARM or you can specify any one of the following:

TAPARM='TH=*size1*'
TAPARM='TH=*size1*,*size2*'
TAPARM='TH=*size1*,*size2*,*size3*'

TAPARM='THR=*size1*'
TAPARM='THR=*size1*,*size2*'
TAPARM='THR=*size1*,*size2*,*size3*'

TAPARM='THS=*size1*'
TAPARM='THS=*size1*,*size2*'
TAPARM='THS=*size1*,*size2*,*size3*'

If you specify TA=1 and omit TAPARM, the default file size for each stream is shown in the following table.

Table 19. Default Minimum and Maximum File Size for Each Stream

If you specified	THR= Default for Stream 1	THR= Default for Stream 2	THR= Default for Stream 3	THR= Default for Stream 4	THR= Default for Stream 5	THR= Default for Stream 6	THR= Default for Stream 7
STREAMS=1	No limits	—	—	—	—	—	—
STREAMS=2	(,100)	(101,)	—	—	—	—	—
STREAMS=3	(,100)	(101,)	(101,)	—	—	—	—
STREAMS=4	(,100)	(101,)	(101,)	(101,)	—	—	—
STREAMS=5	(,100)	(101,)	(101,)	(101,)	(101,)	—	—
STREAMS=6	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	—
STREAMS=7	(,100)	(101,)	(101,)	(101,)	(101,)	(101,)	(101,)

PI end

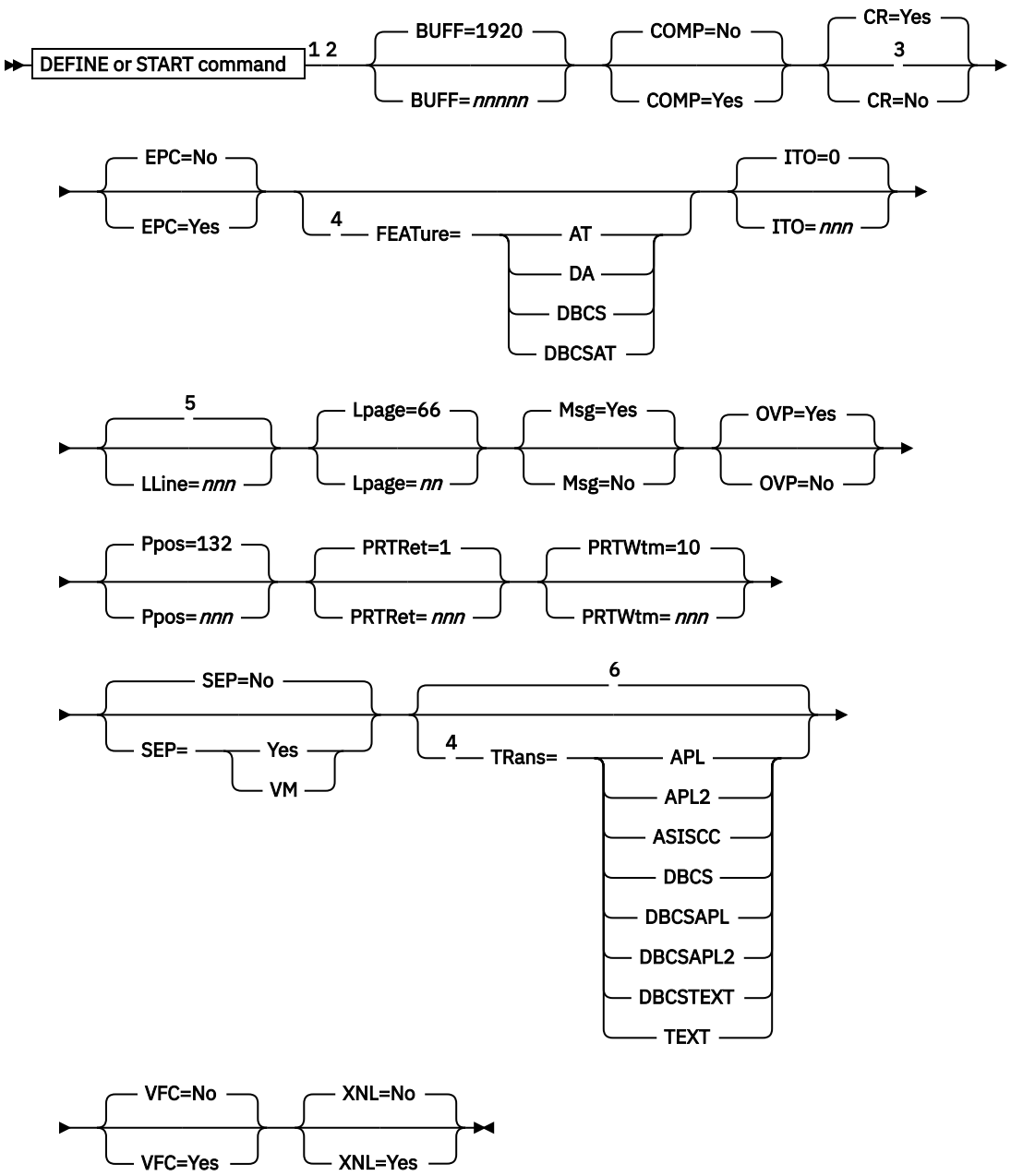
TCPid=*tcpip*
specifies the name of the TCP/IP virtual machine. The default name is TCPIP.

TLPass=*password*
specifies the 1- to 8-character line password to be transmitted to the remote system at signon time. TLPASS must be specified to connect to a remote system where RLPASS is defined.

TLSLABel=*label*
specifies the 1- to 8-character label of an x.509 digital certificate that will be used to encrypt/decrypt all data flowing over the link using TLS protocols. The specified certificate and its corresponding TLSLABEL must exist in the TLS/SSL Server certificate database. For additional information on the TLS/SSL Server and managing its certificate database, see *z/VM: TCP/IP User's Guide* and *z/VM: TCP/IP Planning and Customization*.

TNPass=*password*
specifies the 1- to 8-character node password to be transmitted to the remote system at signon time. TNPASS must be specified to connect to a remote system where RNPASS is defined.

TN3270E-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] CR is ignored if VFC=NO.
[4] FEATURE is required to specify TRANS (except TRANS=ASISCC).
[5] The PPOS value will be used.
[6] Unprintable characters will be translated to blanks.

Purpose

A TN3270E-type link starts a session with a remote IBM 3270 Information Display System printer connected to an TCP/IP network. The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

COMP=No
COMP=Yes
specifies whether the link will perform blank compression. The default is NO. If you specify YES, occurrences of five or more blanks will be compressed. You should specify NO for a locally attached printer.

CR=Yes
CR=No
specifies whether the link should send a 3270 carriage return (CR) order after a forms feed (FF) when VFC=YES is specified. The default is YES. The CR parameter has no meaning unless VFC=YES is also specified. Specify CR=NO when VFC=YES is specified and cut paper is used in a 5210 printer.

EPC=No
EPC=Yes
specifies whether Early Print Complete should be used by the link driver (for example, when you have a 6262 printer). The default is NO.

FEATure=
specifies that the printer has the indicated feature.

AT
indicates the APL/Text feature.

DA
indicates the Data Analysis-APL feature.

DBCS
indicates the Double-Byte Character Set feature.

DBCSAT
indicates the AT and DBCS features.

For the valid combinations of FEATURE and TRANS settings, see Table 20 on page 365.

Notes:

1. To use the TRANS parameter and the PRT option on the CP TAG command, FEATURE must be specified. This rule does not apply to TRANS=ASISCC or to the ASISCC, GRAF, GRAPH, and NOTR settings on the PRT option, because they have no corresponding FEATURE setting.
2. Specifying the FEATURE parameter as a default is helpful, even if you are specifying TRANS=ASISCC, because it lets you specify a TRANS setting as a holding position. You can then override the TRANS setting for a file by using the TAG command with the PRT option. If TRANS is not specified, then the only PRT settings allowed will be ASISCC, GRAF, GRAPH, and NOTR.
3. DBCS processes only the double-byte character set and does not translate any APL or TEXT representation that may exist in the file. The only translation done with the DBCS setting is

3270 control character removal. If you want APL or TEXT translation, use FEATURE=DBCSAT with TRANS=DBCSAPL, TRANS=DBCSAPL2, or TRANS=DBCSTEXT. If APL, APL2, or TEXT is specified, the DBCS characters will not be verified or translated to the correct format for the printer output.

For more information about the PRT option, see page "Link Options for Printed Output to a 3270 Printer" on page 418.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated when there is no activity on the link. RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link. This is the default.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs.

LLine=*nnn*
specifies the maximum line length (number of characters per line). LLINE is a logical maximum, which is determined by the size of the form being used in the printer. This value can be 1 - 220. All print lines are truncated at the length specified by this value.

If LLINE is not specified, or if the LLINE value is greater than the PPOS value, LLINE is ignored and the PPOS value is used. If a file is sent to a printer with a character width equal to the LLINE value, the output will be truncated to the PPOS width.

If the LLINE value is less than the PPOS value, the LLINE value will override the PPOS value and will remain as the printer default for its active duration. If a number less than 74 is specified for LLINE, no separator page is printed.

Note: The 5210 printer accepts print wheels that allow it to print in various size fonts. Therefore, the font size on the print wheel must be considered when you specify the LLINE value. For example, if the 5210 is using a 10-pitch font print wheel, the LLINE value should be 85. However, if a 12-pitch font print wheel is being used, the LLINE value should be greater than 85.

Lpage=*nn*
specifies the number of lines per page on the type of form inserted in the printer. This value can be 0 - 99. The default is 66. A value of 0 means that no page eject will be done when a page eject is met in the file.

Note: This value is used by RSCS only to determine the current vertical position on a page while printing a file. Any actual page ejects are determined by Skip-to-Channel-1 CCWs within the file. If there are no Skip-to-Channel-1 CCWs in the file, then no page ejects are done, except between files. The actual number of lines contained in the file between consecutive Skip-to-Channel-1 CCWs must be equal to or less than this value.

MSG=
specifies whether RSCS will allow the link driver to dequeue messages destined for transmission to the remote printer.

Yes
specifies RSCS will select all messages for transmission. This is the default.

No
specifies RSCS will select messages, but they will not be sent to the printer. The messages will be purged.

OVP=Yes
OVP=No
specifies whether the link will allow overprinting to occur (such as underscored words or overstruck characters for highlighting). The default is YES. Specify NO for a printer or control unit that does not support the 3270 carriage return (CR) order.

Ppos=*nnn*
specifies the maximum number of print positions available on the printer. This value can be 1 - 220, depending on the actual printer. The default is 132.

PPOS is a hardware maximum determined by the number of characters the printer can print on each line, independent of the size of the form used in the printer. Each printer has its own PPOS value. See the printer documentation for more information. If the PPOS value you specify does not match the printer's PPOS value, some types of printed output (including separator pages) will not print correctly.

PRTRet=*nnn*
specifies the number of hours the link will attempt error recovery due to an unattached device before terminating. This value can be 1 - 100. The default is 1.

PRTWtm=*nnn*
specifies the number of seconds between recovery attempts due to an unattached device. This value can be 1 - 600. The default is 10.

SEP=
specifies the type of separator page to be inserted before each print file sent across the link.

No
specifies no separator page. This is the default.

Yes
specifies an RSCS-style separator page. For a description of the format of an RSCS-style separator page, see “RSCS-Style Separator Page” on page 54.

VM
specifies a VM-style separator page. For a description of the format of a VM-style separator page, see “VM-Style Separator Page” on page 51.

TRans=
specifies the default translation mode for files being transmitted to a printer that has the AT, DA, DBCS, or DBCSAT feature (as specified on the FEATURE parameter). The translation mode tells RSCS that all files may contain the indicated special characters and that RSCS should translate these special characters accordingly. Alternatively, you can use this parameter to specify that unprintable characters should not be translated into blanks.

The default translation mode you specify on TRANS can be overridden for a specific file by using the PRT option on the CP TAG command. See “TAG” on page 416.

APL
indicates RSCS will translate internally represented EBCDIC special APL characters into the appropriate 2-byte I/O interface codes.

APL2
indicates RSCS will translate internally represented EBCDIC special APL2 characters into the appropriate 2-byte I/O interface codes. This mode is valid only when FEATURE is set to DBCSAT or AT. If TRANS=APL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

ASISCC
indicates RSCS will not translate unprintable characters into blanks. This lets the user pass SCS orders to the remote printer or workstation.

Table 20 on page 365 shows that ASISCC can be used with all FEATURE settings.

TRANS=ASISCC means no translation occurs as a default. If a file needs translation, you can override this by using the TAG command (assuming you used the correct setting for the FEATURE parameter).

If the FEATURE parameter is not specified, only PRT=ASISCC, GRAPH, GRAF, or NOTR can be used on the TAG command.

Note: TRANS=ASISCC can be specified without a FEATURE setting.

DBCS
indicates RSCS will verify double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

DBCSAPL
indicates RSCS will translate internally represented EBCDIC special APL characters into the appropriate 2-byte I/O interface codes and will verify all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

DBCSAPL2
indicates RSCS will translate internally represented EBCDIC special APL2 characters into the appropriate 2-byte I/O interface codes and will verify all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

This mode is valid only when FEATURE is set to DBCSAT. If TRANS=DBCSAPL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

DBCSTEXT
indicates RSCS will translate internally represented EBCDIC special TEXT characters into the appropriate 2-byte I/O interface codes and will verify double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

TEXT
indicates RSCS will translate internally represented EBCDIC special TEXT characters into the appropriate 2-byte I/O interface codes.

For the valid combinations of FEATURE and TRANS settings, see Table 20 on page 365.

Notes:

1. If you omit the TRANS parameter, the usual character translation occurs (unprintable characters will be translated into blanks).
2. RSCS ignores the TRANS parameter unless you also specify the corresponding FEATURE setting. TRANS=ASISCC is the exception; it does not require a FEATURE setting.
3. RSCS does not perform blank compression within DBCS SO/SI characters.
4. RSCS translates only those characters identified in the list above. RSCS will not change the standard EBCDIC data.

VFC=
specifies whether the printer will use the 3270 Vertical Forms Control (VFC) feature for vertical spacing.

No
specifies vertical spacing will be achieved through multiple 3270 new line (NL) orders. This is the default.

Yes
specifies the printer will use the 3270 VFC feature and the 3270 carriage control (CC) order. VFC=YES is valid only for those printers and control units that support the 3270 CC order.

Note: Generally, IBM recommends that you specify VFC=YES. If users send GDDM or IPDS graphic files to this printer, you must specify VFC=YES to ensure that the pages align correctly.

XNL=No
XNL=Yes
specifies whether the link is to include an extra new line (NL) order following each line that is as long as the maximum number of print positions. The default is NO. Specify YES for those printers (such as the 3262, 3289, 4234, and 6262) that do not generate an extra new line function for a maximum length line.

Usage Notes

1. When you define a form name using the FORM configuration statement, you can define these characteristics:
   - Separator page style
   - Line length
   - Page length

   If you specify a form name when starting a link, be aware that the form name characteristics always override any SEP, LLINE, and LPAGE specifications and will override LPI specifications when SETPAGE=YES.
2. If you specify an incorrect combination of FEATURE and TRANS settings, the SCO receives error message DMT807E and the link is deactivated.
3. Table 20 on page 365 indicates the valid combinations of FEATURE and TRANS settings.

Table 20. Valid Combinations of FEATURE and TRANS Settings

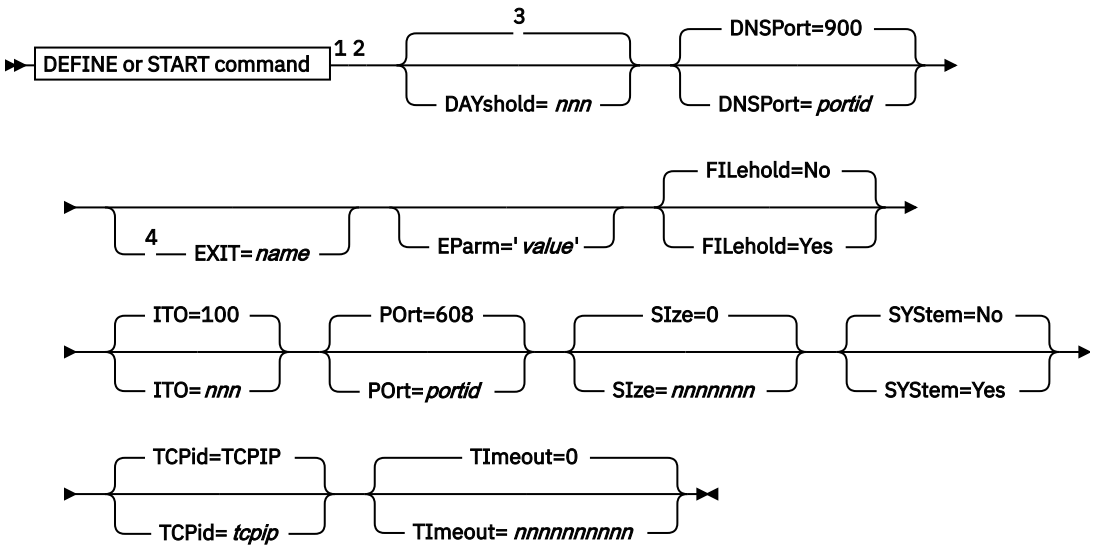
TRans=	FEATure= DA	FEATure= AT	FEATure= DBCS	FEATure= DBCSAT
APL	X	X		X
APL2		X		X
TEXT	X	X		X
DBCS			X	X
DBCSAPL				X
DBCSAPL2				X
DBCSTEXT				X
ASISCC	X	X	X	X

Notes:

a. If APL, APL2, or TEXT is specified for the TRANS parameter, and the FEATURE parameter is set to DBCSAT, then there is no DBCS translation of the file, only APL, APL2, or TEXT. The DBCS translation will occur only with APL, APL2, or TEXT translation when the TRANS setting is DBCSAPL, DBCSAPL2, or DBCSTEXT.

b. TRANS=ASISCC does not require the FEATURE parameter to be specified.

UFT-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] The link will continue indefinitely to try to deliver the file.
[4] EXIT is required on the START command if not previously defined.

Purpose

An UFT-type link enables your local RSCS system to connect to a remote UFT daemon within a TCP/IP network. The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

DAYshold=*nnn*
specifies the number of days that undeliverable files will be placed on hold before requeueing them to a notify link. This value can be 0 - 365. In order to requeue files to a notify link, a route for *UFTH* must be defined; for example:

```
ROUTE *UFTH* TO *UFTHOLD
```

This parameter must be used with an events file entry, which periodically changes any files on hold to nohold for the UFT link. If a DAYshold parameter is not specified, the UFT link will continue indefinitely

to try to deliver the file. If 0 is specified, the UFT link will requeue files to a notify link every time it places them on hold.

DNSPort=900
DNSPort=*portid*
specifies the port number on the local system where the RSCS domain name server (RSCSDNS), if running, listens for connect requests. The default is 900.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 900 or any other well-known port when usage is restricted, the RSCSDNS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

PI

EXIT=*name*
specifies the name of the exit module that contains the exit routines supporting the specific UFT driver. The exit module must reside in a LOADLIB that has been identified by using the GCS GLOBAL command. If you omit this parameter and the exit name is not previously defined, or if RSCS cannot find the exit routine module, the link driver will not start.

IBM supplies a sample UFT exit routine module called UFTXOUT in the RSCSEXIT LOADLIB. For more information about the UFT exit routines, see *z/VM: RSCS Networking Exit Customization*.

EParm='*value*'
specifies a parameter value associated with the exit routine module. This value is a character string up to 239 bytes in length, enclosed in single quotation marks. Any character is allowed between the single quotation marks except another single quotation mark. The actual value of the character string is defined by the exit routine module.

For information about the EPARM parameters supported for use with the UFTXOUT sample module, see *z/VM: RSCS Networking Exit Customization*.

PI end

FILehold=No
FILehold=Yes
specifies whether the link should place a file on hold when it is unable to connect to a remote UFT daemon after approximately 1 minute. The default is NO, which means the link will continue attempting to connect until successful or the link is stopped (with the STOP command).

If you specify YES, the link will attempt to connect to the remote daemon at 1, 2, 4, 8, 16, and 32 second intervals. If the link is still unable to connect, the file will be placed on hold. The RSCS events file can be used to periodically change any files on hold to nohold, allowing for another delivery attempt. For example, an RSCS events file entry which will change all files on hold to nohold for a link called UFT every 10 minutes would look like this:

```
     *      M:010     *         *      *   CHANGE UFT HOLD NOHOLD
```

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

POrt=*portid*
specifies the port number to which to connect on the remote host. The default is 608.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 608 or any other well-known port when usage is restricted, the RSCS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

SIze=*nnnnnnn*
specifies the maximum number of records the spool file may contain in order to be processed. This value can be 0 - 1048576. The default is 0, which indicates there is no limit. If the number of records exceeds the maximum allowed amount, an error message will be issued to the user and the console, and the file will be placed on hold.

SYStem=No
SYStem=Yes
specifies whether RSCS should search for a FORM table provided by the LPRXFORM exit, using the form name the file was spooled with. The default is NO. When sending a print file to a remote UFT daemon, the FORM table can provide keywords to define the remote host address, translate table, and substitute form to be used for the file, overriding the values defined for the link.

TCPid=*tcpip*
specifies the name of the TCP/IP virtual machine. The default is TCPIP.

TImeout=*nnnnnnnnnn*
specifies the maximum amount of time, in seconds, to wait for a response from the remote daemon before halting delivery of the file and placing it on hold. This value can be 0 - 2147483647. The default is 0, which means the link will wait indefinitely.

Usage Notes

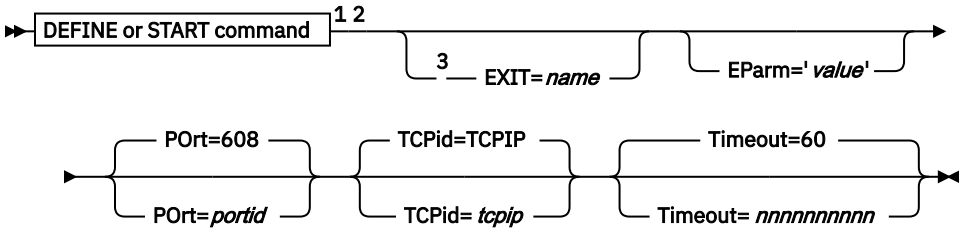
1. RSCS will truncate any command received through the SMSG facility or the RSCS console at 132 bytes. This may limit the amount of EPARM data which can be passed on the START command.
2. CP converts all data that is entered from the RSCS console or sent using the CP SMSG command to uppercase letters. To ensure the correct letters are used in any EPARM data, you can create an exec:

```
'EXECIO * CP (STEM CPMSG. STRING SMSG rscsid options'
```

rscsid
specifies the CP name of the RSCS virtual machine.

options
specifies the uppercase RSCS command and any options that may need to be in mixed case.

UFTD-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] EXIT is required on the START command if not previously defined.

Purpose

A UFTD-type link enables your local RSCS system to receive data streams from a UFT client within a TCP/IP network. The link can be started:

- Automatically during system start-up
- Manually by an operator or authorized user

Attention
Any file queued to this link type will be ignored (not processed).

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

PI

EXIT=*name*
specifies the name of the exit routine module that contains the exit routines supporting the specific UFTD driver. The exit routine module must reside in a LOADLIB that has been identified by using the GCS GLOBAL command. If you omit this parameter and the exit name is not previously defined, or if RSCS cannot find the exit routine module, the link driver will not start.

IBM supplies a sample UFTD exit routine module called UFTXIN in the RSCSEXIT LOADLIB. For information about the UFTD exit routines, see *z/VM: RSCS Networking Exit Customization*.

EParm='*value*'
specifies a parameter value associated with the exit routine module. This value is a character string up to 239 bytes in length, enclosed in single quotation marks. Any character is allowed between the single quotation marks except another single quotation mark. The actual value of the character string is defined by the exit routine module.

For information about the EPARM parameters supported for use with the UFTXIN sample module, see *z/VM: RSCS Networking Exit Customization*.

PI end

POrt=*portid*
specifies the port number on the local host where RSCS will listen for connect requests. The default is 608.

Note: By default, TCP/IP restricts the use of well-known ports (1 - 1023). To use port 608 or any other well-known port when usage is restricted, the RSCS server must be authorized on a PORT statement in the TCP/IP configuration file (PROFILE TCPIP). For more information, see *z/VM: TCP/IP Planning and Customization*.

TCPid=*tcpip*
specifies the name of the TCP/IP virtual machine; The default name is TCPIP.

Timeout=*nnnnnnnnnn*
specifies the maximum amount of time, in seconds, that RSCS will wait for data from a TCP/IP UFT client before breaking the socket connection. This value can be 0 - 2147483647. The default is 60. A value of 0 means to wait indefinitely. After the UFTD link driver breaks the connection, it will remain operational waiting for another UFT client to connect.

Usage Notes

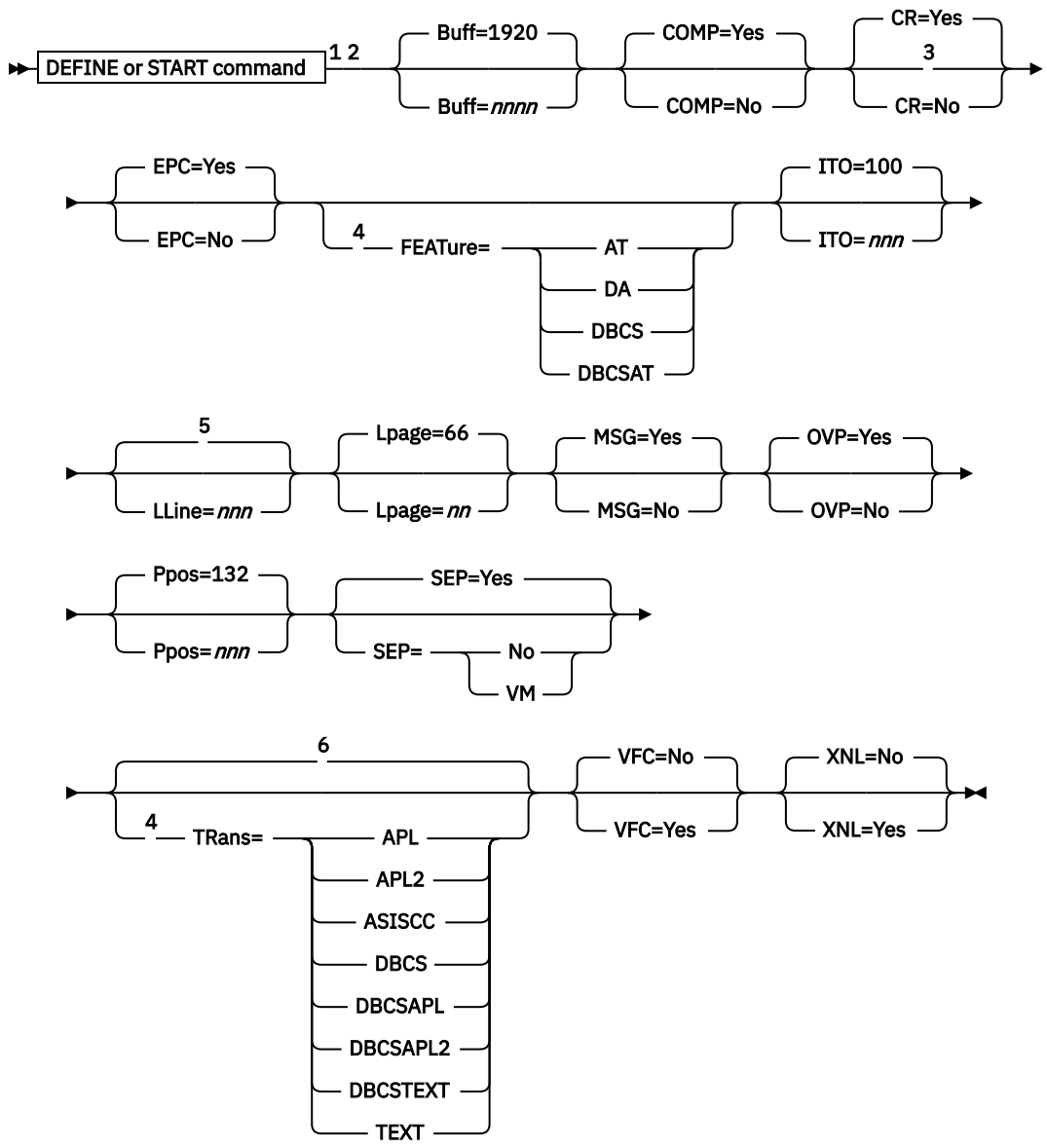
1. RSCS will truncate any command received via the CP SMSG facility or the RSCS console at 132 bytes. This may limit the amount of EPARM data which can be passed on the START command.
2. CP converts all data that is entered from the RSCS console or sent using the CP SMSG command to uppercase letters. To ensure the correct letters are used in any EPARM data, you can create an exec:

```
'EXECIO * CP (STEM CPMSG. STRING SMSG rscsid options'
```

rscsid
specifies the CP name of the RSCS virtual machine.

options
is the uppercase RSCS command and any options which may need to be in mixed case.

3270P-Type Link Operational Parameters



Notes:

[1] Parameters can be entered in any order, separated by blanks.
[2] The primary default for each parameter is the previously defined value. If there is no previously defined value, the indicated default (if any) is used.
[3] CR is ignored if VFC=NO.
[4] FEATURE is required to specify TRANS (except TRANS=ASISCC).
[5] The PPOS value will be used.
[6] Unprintable characters will be translated into blanks.

Purpose

A 3270P-type link starts a session with a remote IBM 3270 Information Display System printer. The link can be started:

- Automatically during system start-up
- Automatically when a file is queued for transmission on an autostart link
- Manually by an operator or authorized user

Parameters

Defaults and Overrides
If you specify a parameter, it will override any previously defined value or default for the link. If you omit a parameter, the previously defined value is used. This value may have been defined on the PARM configuration statement for the link or on a DEFINE command. If there is no previously defined value, the indicated default (if any) is used.

Buff=*nnnn*
specifies the size of the buffer in the 3271, 3272, 3274, or 3276 control unit. This value can be 480, 960, 1920, 2560, 3440, or 3564 bytes. The default is 1920. The correct buffer size must be specified to match the buffer size on the control unit being used.

COMP=Yes
COMP=No
specifies whether the link will perform blank compression. The default is YES; occurrences of five or more blanks are compressed. Specify NO for a locally attached printer.

CR=Yes
CR=No
specifies whether the link should send a 3270 carriage return (CR) order after a forms feed (FF) when VFC=YES is specified. The default is YES. This parameter has no meaning unless VFC=YES is also specified. Specify CR=NO when VFC=YES is specified and cut paper is used in a 5210 printer.

EPC=Yes
EPC=No
specifies whether Early Print Complete should be used by the link driver (for example, when you have a 6262 printer). The default is YES.

FEATure=
specifies that the printer has the indicated feature.

AT
indicates the APL/Text feature.

DA
indicates the Data Analysis-APL feature.

DBCS
indicates the Double-Byte Character Set feature.

DBCSAT
indicates the AT and DBCS features.

For the valid combinations of FEATURE and TRANS settings, see Table 21 on page 376.

Notes:

1. To use the TRANS parameter and the PRT option on the CP TAG command, FEATURE must be specified. This rule does not apply to TRANS=ASISCC or to the ASISCC, GRAF, GRAPH, and NOTR settings on the PRT option, because they have no corresponding FEATURE setting.
2. Specifying the FEATURE parameter as a default is helpful, even if you are specifying TRANS=ASISCC, because it lets you specify a TRANS setting as a holding position. You can then override the TRANS setting for a file by using the PRT option on the TAG command. If TRANS is not specified, then the only PRT settings allowed will be ASISCC, GRAF, GRAPH, and NOTR.
3. The DBCS feature processes the double-byte character set but does not translate any APL or TEXT representation that may exist in the file. The only translation done with the DBCS setting is 3270 control character removal. If you want APL or TEXT translation, use FEATURE=DBCSAT with

TRANS=DBCSAPL, TRANS=DBCSAPL2, or TRANS=DBCSTEXT. If APL, APL2, or TEXT is specified, the DBCS characters will not be verified or translated to the correct format for the printer output.

For more information about the PRT option on the CP TAG command, see page "Link Options for Printed Output to a 3270 Printer" on page 418.

ITO=*nnn*
specifies the inactivity time out (ITO) value, which defines the length of time that can occur with no activity (that is, no file transmission or reception) before the link is deactivated. If a link is ended because its ITO value has been exceeded, its restart exec will not be processed.

The ITO value can be 0 - 100:

0
Specifies that the link will be deactivated immediately when there is no activity on it. However, RSCS will first send files that are queued for transmission, or finish reception of the file currently being received, before deactivating the link.

1 - 99
Approximates the number of minutes until the link will be deactivated if there has been no activity on it.

100
Specifies that no ITO will be in effect. The link will stay active until it is deactivated manually or an unrecoverable error occurs. This is the default.

LLine=*nnn*
specifies the maximum line length (number of characters per line). LLINE is a logical maximum, which is determined by the size of the form being used in the printer. This value can be 1 - 220. All print lines are truncated at the length specified by this value.

If LLINE is not specified, or if the LLINE value is greater than the PPOS value, LLINE is ignored and the PPOS value is used. If a file is sent to a printer with a character width equal to the LLINE value, the output will be truncated to the PPOS width.

If the LLINE value is less than the PPOS value, the LLINE value will override the PPOS value and will remain as the printer default for its active duration. If a number less than 74 is specified for LLINE, no separator page is printed.

Note: The 5210 printer accepts print wheels that let it print in various size fonts. Therefore, the font size on the print wheel must be considered when you specify the LLINE value. For example, if the 5210 is using a 10-pitch font print wheel, the LLINE value should be 85. However, if a 12-pitch font print wheel is being used, the LLINE value should be greater than 85.

Lpage=*nn*
specifies the number of lines per page on the type of form inserted in the printer. This value can be 0 - 99. The default is 66. A value of 0 specifies that no page eject will be done when a page eject is found in the file.

Note: This value is used by RSCS only to determine the current vertical position on a page while printing a file. Any actual page ejects are determined by Skip-to-Channel-1 CCWs within the file. If there are no Skip-to-Channel-1 CCWs in the file, then no page ejects are done, except between files. The actual number of lines contained in the file between consecutive Skip-to-Channel-1 CCWs must be equal to or less than this value.

MSG=
specifies whether RSCS will allow the link driver to dequeue messages destined for transmission to the local printer.

Yes
specifies RSCS will select all messages for transmission. This is the default.

No
specifies RSCS will select messages, but they will not be sent to the local printer. The messages will be purged.

OVP=Yes
OVP=No
specifies whether the link will allow overprinting to occur (such as underscored words or overstruck characters for highlighting). The default is YES. Specify NO for a printer or control unit that does not support the 3270 carriage return (CR) order.

Ppos=*nnn*
specifies the maximum number of print positions available on the 3270 printer. This value can be 1 - 220, depending on the printer. The default is 132.

PPOS is a hardware maximum determined by the number of characters the printer can print on each line, independent of the size of the form used in the printer. Each printer has its own PPOS value; see the printer documentation for more information. If the PPOS value you specify does not match the printer's PPOS value, some types of printed output (including separator pages) will not print correctly.

SEP=
specifies the type of separator page to be inserted before each print file sent across the link.

Yes
specifies an RSCS-style separator page. This is the default. For a description of the format of RSCS-style separator pages, see "RSCS-Style Separator Page" on page 54.

No
specifies no separator page.

VM
specifies a VM-style separator page. For a description of the format of VM-style separator pages, see "VM-Style Separator Page" on page 51.

TRans=
specifies the default translation mode for files being transmitted to a printer having the AT, DA, DBCS, or DBCSAT feature (as specified on the FEATURE parameter). The translation mode tells RSCS that all files may contain the indicated special characters and that RSCS should translate these special characters accordingly. Alternatively, you can use this parameter to specify that unprintable characters should not be translated into blanks.

The default translation mode you specify on TRANS can be overridden by using the PRT option on the CP TAG command. See "TAG" on page 416.

APL
indicates RSCS will translate internally represented EBCDIC special APL characters into the appropriate 2-byte I/O interface codes.

APL2
indicates RSCS will translate internally represented EBCDIC special APL2 character into the appropriate 2-byte I/O interface codes.

This mode is valid only when FEATURE is set to DBCSAT or AT. If TRANS=APL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

ASISCC
indicates RSCS will not translate unprintable characters into blanks. This lets the user pass SCS orders to the remote printer or workstation.

Table 21 on page 376 shows that ASISCC can be used with all FEATURE settings.

TRANS=ASISCC means no translation occurs as a default. If a file needs translation, you can override this by using the TAG command (assuming you used the correct setting for the FEATURE parameter).

If the FEATURE parameter is not specified, only ASISCC, GRAPH, GRAF or NOTR can be used on the PRT option of the TAG command.

Note: TRANS=ASISCC can be specified without a FEATURE option.

DBCS
indicates RSCS will verify double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

DBCSAPL
indicates RSCS will translate internally represented EBCDIC special APL characters into the appropriate 2-byte I/O interface codes and will verify all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

DBCSAPL2
indicates RSCS will translate internally represented EBCDIC special APL2 characters into the appropriate 2-byte I/O interface codes. This mode is valid only when FEATURE is set to DBCSAT. If TRANS=DBCSAPL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

DBCSTEXT
indicates RSCS will translate internally represented EBCDIC special TEXT characters into the appropriate 2-byte I/O interface codes and will verify double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters for valid DBCS syntax before transmitting a file.

TEXT
indicates RSCS will translate internally represented EBCDIC special TEXT characters into the appropriate 2-byte I/O interface codes.

For the valid combinations of FEATURE and TRANS settings, see Table 21 on page 376.

Notes:

1. If you omit the TRANS parameter, the usual character translation occurs (unprintable characters will be translated into blanks).
2. RSCS ignores the TRANS parameter unless you also specify the corresponding FEATURE setting. TRANS=ASISCC is the exception; it does not require a FEATURE setting.
3. RSCS does not perform blank compression within DBCS SO/SI characters.
4. RSCS translates only those characters identified in the list above. RSCS will not change the standard EBCDIC data.

VFC=
specifies whether the printer will use the 3270 Vertical Forms Control (VFC) feature for vertical spacing.

No
specifies vertical spacing will be achieved through multiple 3270 new line (NL) orders. This is the default.

Yes
specifies the printer will use the 3270 VFC feature and the 3270 carriage control (CC) order. When YES is specified, the page length must be set manually on the printer and the LPAGE value must match that setting. VFC=YES is valid only for a printer or control unit that also supports the 3270 CC order.

Note: Generally, IBM recommends that you specify VFC=YES. If users send GDDM or IPDS graphic files to this printer, you must specify VFC=YES to ensure that the pages align correctly.

XNL=No
XNL=Yes
specifies whether the link is to include an extra new line (NL) order following each line that is as long as the maximum number of print positions. The default is NO. Specify YES for a printer (such as the 3262, 3289, 4234, or 6262) that does not generate an extra new line function for a maximum length line.

Usage Notes

1. When you define a form name using the FORM configuration statement, you can define these characteristics:
   - Separator page style
   - Line length
   - Page length

   If you specify a form name when starting a link, be aware that the form name characteristics always override any SEP, LLINE, and LPAGE specifications and will override LPI specifications when SETPAGE=YES.
2. If you specify an incorrect combination of FEATURE and TRANS settings, the SCO receives error message DMT807E and the link is deactivated.
3. Table 21 on page 376 indicates the valid combinations of FEATURE and TRANS settings.

Table 21. Valid Combinations of FEATURE and TRANS Settings

TRans=	FEATure= DA	FEATure= AT	FEATure= DBCS	FEATure= DBCSAT
APL	X	X		X
APL2		X		X
TEXT	X	X		X
DBCS			X	X
DBCSAPL				X
DBCSAPL2				X
DBCSTEXT				X
ASISCC	X	X	X	X

Notes:

a. If APL, APL2, or TEXT is specified for the TRANS parameter, and the FEATURE parameter is set to DBCSAT, then there is no DBCS translation of the file, only APL, APL2, or TEXT. The DBCS translation will occur only with APL, APL2, or TEXT translation when the TRANS setting is DBCSAPL, DBCSAPL2, or DBCSTEXT.

b. TRANS=ASISCC does not require the FEATURE parameter to be specified.

Chapter 14. RSCSAUTH Commands

This chapter describes the RSCS dynamic authorization commands.

For descriptions of the basic RSCS commands, see Chapter 12, "RSCS Commands," on page 127.

For information about how to read command syntax diagrams, see "Syntax, Message, and Response Conventions" on page xv.

Using RSCSAUTH Commands

All RSCSAUTH commands are privileged. The RSCSAUTH administrator (identified on the AUTHUSER statement in the RSCSAUTH configuration file) is fully authorized for the RSCSAUTH server from all nodes and can issue all RSCSAUTH commands on that server. The administrator can authorize other users to issue RSCSAUTH commands on that server. Any user who is authorized to issue RSCSAUTH commands can authorize other users to issue RSCSAUTH commands on the same server.

For information about the RSCSAUTH CONFIG file, see *z/VM: RSCS Networking Planning and Configuration*.

To issue commands locally to the RSCSAUTH server, use the CP SMSG command:

```
cp smsg rscsauthid command
```

To issue commands remotely to the RSCSAUTH server, use the CMS TELL command:

```
tell rscsauthid at node command
```

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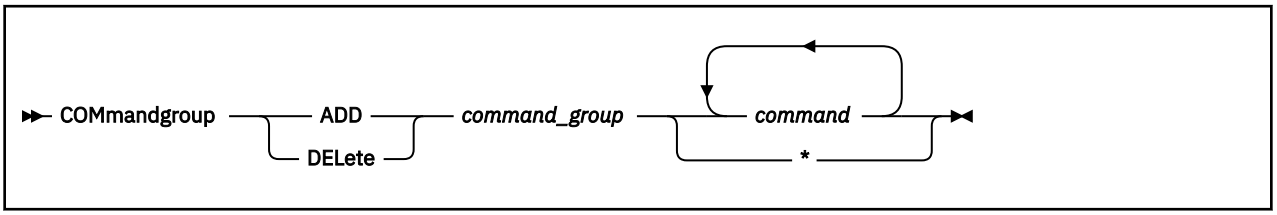
COMMANDGROUP



Authorization

RSCSAUTH

Purpose

The COMMANDGROUP command adds, updates, or deletes a command group. A command group is a list of RSCS and RSCSAUTH commands that are authorized through RSCSAUTH as a group. RSCSAUTH maintains the command group definitions in the command group table (CMDGROUP RSCSAUTH file).

Operands

ADD
adds the specified commands to a command group. If an entry for the specified command group name does not exist in the CMDGROUP table, it is created.

DELete
deletes the specified commands from a command group. If the last command is deleted from the specified command group, the entry is deleted from the CMDGROUP table. If the last command group is deleted from the CMDGROUP table, the CMDGROUP file is deleted.

command_group
is the 1- to 32-character name of the command group.

command
*****
is the name of an RSCS or RSCSAUTH command. You can specify multiple command names.

Instead of listing command names, you can specify an asterisk (*). For the ADD option, this means all RSCS and RSCSAUTH commands are included in the command group definition. For the DELETE option, this means all commands are deleted from the command group, and the entry is deleted from the CMDGROUP table.

Usage Notes

1. Each entry in the CMDGROUP table defines a command group and has the format:

   ```
   command_group command1 [command2...]
   ```

2. The RSCS CMD, INIT, and * commands and all RSCS Interchange commands cannot be authorized through RSCSAUTH.
3. A request to delete a command group will be rejected if that command group name is included in an entry in the USERAUTH table.
4. If you specify a wildcard character (*) instead of a command list, all local RSCS commands defined in the RSCSCMDS CONFIG file will also be included in the specification.
5. To query the contents of a command group, use the QRSCSAUTH command. See “QRSCSAUTH” on page 380.

Examples

To create a command group called GROUP1 containing the DRAIN and SHUTDOWN commands, enter:

```
commandgroup add group1 drain shutdown
```

To add the START command to command group GROUP1, enter:

```
commandgroup add group1 start
```

To create a command group called RSCSAUTH_GROUP that includes all RSCS and RSCSAUTH commands, enter:

```
commandgroup add rscsauth_group *
```

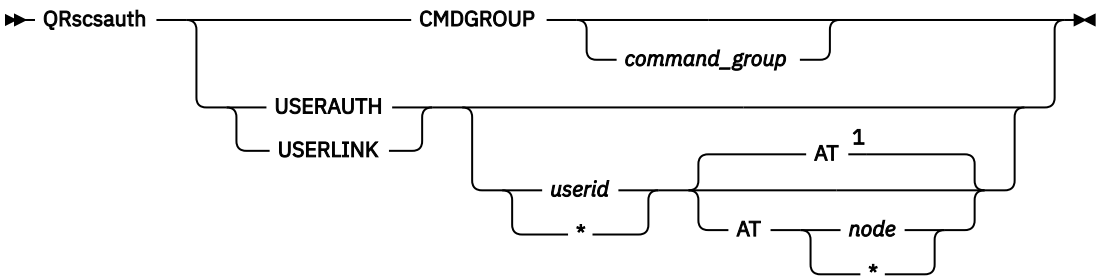
To remove the SHUTDOWN command from command group GROUP1, enter:

```
commandgroup delete group1 shutdown
```

To delete command group GROUP1, enter:

```
commandgroup delete group1 *
```

QRSCSAUTH



Notes:

[1] The default is the node of the RSCSAUTH server.

Authorization

RSCSAUTH

Purpose

The QRSCSAUTH command obtains authorization information from the RSCSAUTH tables. If you specify only the name of the table, the corresponding file is sent to your reader. If you specify additional operands to qualify your request, the results are displayed on your screen.

Operands

CMDGROUP
specifies that the CMDGROUP table is to be queried. This table contains command group definitions.

command_group
is the name of the command group whose definition you are requesting from the CMDGROUP table.

USERAUTH
specifies that the USERAUTH table is to be queried. This table contains user authorizations for command groups.

USERLINK
specifies that the USERLINK table is to be queried. This table contains user authorizations for links.

userid
*****
is the user ID whose authorization information you are requesting from the USERAUTH or USERLINK table. You can specify an asterisk (*) to indicate all user IDs at the specified node.

AT *node*
AT *
identifies the node of the user ID. You can specify an asterisk (*) to indicate all nodes. If you omit the node, the default is the node of the RSCSAUTH server.

Usage Notes

1. RSCSAUTH maintains the CMDGROUP, USERAUTH, and USERLINK tables in the CMDGROUP RSCSAUTH, USERAUTH RSCSAUTH, and USERLINK RSCSAUTH files, respectively.
2. The results of the query are returned in message DMTATH2030I. For a USERAUTH or USERLINK query, several of these messages may be issued to provide the complete query results.

3. In the USERAUTH and USERLINK tables, authorizations for a user ID or node can span entries. A query of the USERAUTH or USERLINK table returns information about all authorizations that explicitly or implicitly match the user ID and node specified on the command. For example, user MAINT at MAHVM1 is included in the user ID and node specification in all of the following USERAUTH entries:

   ```
   MAINT MAHVM1 GROUP1
   MAINT * GROUP2 GROUP3
   * MAHVM1 GROUP4
   * * GROUP5
   ```

   Therefore, if you issue the command:

   ```
   qrscsauth userauth maint at mahvm1
   ```

   the following responses are returned:

   ```
   DMTATH2030I MAINT AT MAHVM1 AUTHORIZED FOR GROUP1
   DMTATH2030I MAINT AT ALL NODES AUTHORIZED FOR GROUP2 GROUP3
   DMTATH2030I ALL USERS AT MAHVM1 AUTHORIZED FOR GROUP4
   DMTATH2030I ALL USERS AT ALL NODES AUTHORIZED FOR GROUP5
   ```

   These responses indicate that MAINT at MAHVM1 is authorized for command groups GROUP1, GROUP2, GROUP3, GROUP4, and GROUP5.
4. For a USERAUTH or USERLINK query, specifying * AT * for the user ID and node requests information about all users at all nodes. No results are displayed; the corresponding file is sent to your reader.

Examples

To display the command group authorizations for user ID MAINT at all nodes, enter:

```
qrscsauth userauth maint at *
```

To display the link authorizations for user ID OPERATOR at node CENTRAL, enter:

```
qrscsauth userlink operator at central
```

To display the contents of command group RSCSAUTH_GROUP, enter:

```
qrscsauth cmdgroup rscsauth_group
```

To send the CMDGROUP RSCSAUTH file to your reader, enter:

```
qrscsauth cmdgroup
```

STOPRSCSAUTH

Authorization

RSCSAUTH

Purpose

The STOPRSCSAUTH command terminates processing on the RSCSAUTH server. If the IMMEDIATE operand is not specified, the RSCSAUTH server will wait to receive pending responses from the RSCS server for any outstanding requests. If there are no pending responses from the RSCS server, the RSCSAUTH server is terminated immediately.

Operands

IMMediate
terminates processing immediately. Any pending responses from the RSCS server are lost.

Usage Notes

If the STOPRSCSAUTH command has been issued without the IMMEDIATE operand, and the RSCSAUTH server is waiting for pending responses from the RSCS server, the RSCSAUTH server will not accept any command except STOPRSCSAUTH IMMEDIATE.

Examples

To stop the RSCSAUTH server from the server console, enter:

```
stoprscsauth immediate
```

To locally stop the RSCSAUTH server running on node XYZ, enter:

```
smsg rscsauth stoprscsauth immediate
```

To remotely stop the RSCSAUTH server running on node XYZ, enter:

```
tell rscsauth at xyz stoprscsauth immediate
```

TRACERSCSAUTH

Authorization

RSCSAUTH

Purpose

The TRACERSCSAUTH command changes the setting that determines whether additional tracing messages and return codes will be issued by the RSCSAUTH server.

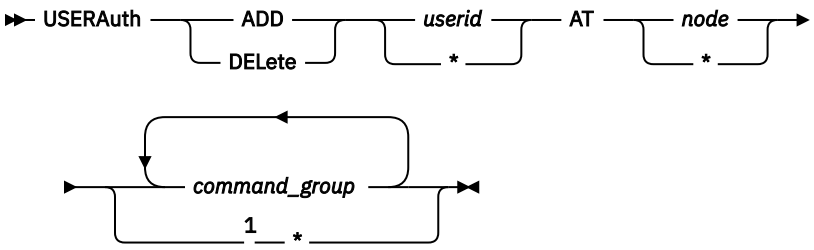
Operands

OFF
ON
turns tracing ON or OFF for the current server session. The default is OFF.

Usage Notes

1. The optional TRACERSCSAUTH configuration statement sets the tracing status when the RSCSAUTH server is started. If the statement is omitted, the setting is OFF. The setting on the TRACERSCSAUTH command overrides the setting on the TRACERSCSAUTH statement for the current server session.
2. The tracing messages and return codes will be displayed at the RSCSAUTH server console. If the LOG statement is included in the RSCSAUTH CONFIG file, the messages and return codes will also be added to the log.

USERAUTH



Notes:

[1] This option is valid for DELETE only.

Authorization

RSCSAUTH

Purpose

The USERAUTH command adds, updates, or deletes a user authorization for command groups defined in the CMDGROUP table. RSCSAUTH maintains the authorizations in the user authorization table (USERAUTH RSCSAUTH file).

Operands

ADD
adds the specified command groups to a user authorization. If an entry for the specified user ID and node combination does not exist in the USERAUTH table, it is created.

DELete
deletes the specified command groups from a user authorization. If the last command group name is deleted from the authorization for the specified user ID and node combination, the entry is deleted from the USERAUTH table. If the last entry is deleted from the USERAUTH table, the USERAUTH file is deleted.

userid
*****
is the user ID authorized for the specified command groups. You can specify an asterisk (*) to indicate all user IDs at the specified node.

AT *node*
AT *
identifies the node of the user ID. You can specify an asterisk (*) to indicate all nodes.

command_group
is the name of a command group defined in the CMDGROUP table. You can specify multiple command group names.

For the DELETE option only, you can specify an asterisk (*) to remove all command group authorizations for the specified user ID and node combination. The corresponding entry is removed from the RSCSAUTH table.

Usage Notes

1. Each entry in the USERAUTH table identifies the command groups authorized for a specific user ID and node combination. The entry has the format:

```
userid node command_group1 [command_group2...]
```

2. On a USERAUTH ADD command, if you specify a command group name that is not defined in the CMDGROUP table, the command will be rejected.
3. To query command group authorizations or command group definitions, use the QRSCSAUTH command. See "QRSCSAUTH" on page 380. To add, update, or remove command group definitions, use the COMMANDGROUP command. See "COMMANDGROUP" on page 378.
4. There is only one entry in the USERAUTH table for a specific user ID and node combination. However, a user ID or node can be included implicitly in multiple entries. For example, user MAINT at MAHVM1 is included in the user ID and node specification in all of the following entries:

   ```
   MAINT MAHVM1 GROUP1
   MAINT * GROUP2 GROUP3
   * MAHVM1 GROUP4
   * * GROUP5
   ```

   Note that the command group names specified in these entries are different. Although command groups may contain the same commands, a user ID and node cannot be authorized for the same command group name in multiple entries.

   For example, if you issue the command:

   ```
   userauth add maint at mahvm1 group3
   ```

   the command will be rejected, because MAINT at MAHVM1 is already authorized for command group GROUP3 in the MAINT * GROUP2 GROUP3 entry.

   If you issue the command:

   ```
   userauth add * at mahvm1 group6
   ```

   the contents of the table will be updated as follows:

   ```
   MAINT MAHVM1 GROUP1
   MAINT * GROUP2 GROUP3
   * MAHVM1 GROUP4 GROUP6
   * * GROUP5
   ```

   If you now issue the command:

   ```
   userauth delete maint at mahvm1 group6
   ```

   the command will be rejected. The authorization exists, but there is not a matching entry in the table for that specific user ID and node combination. To delete the GROUP6 authorization for MAINT, you will have to remove GROUP6 from the broad * MAHVM1 GROUP4 GROUP6 authorization and define GROUP6 authorizations for specific user IDs at MAHVM1.
5. If you issue the command:

   ```
   userauth delete * at * *
   ```

   this will delete all entries in the USERAUTH table and subsequently delete the USERAUTH file.

Examples

To authorize user ID OPERATOR at node PARK75 for command group GROUP123, enter:

```
userauth add operator at park75 group123
```

To authorize all users at node PARK75 for command group GROUP1, enter:

```
userauth add * at park75 group1
```

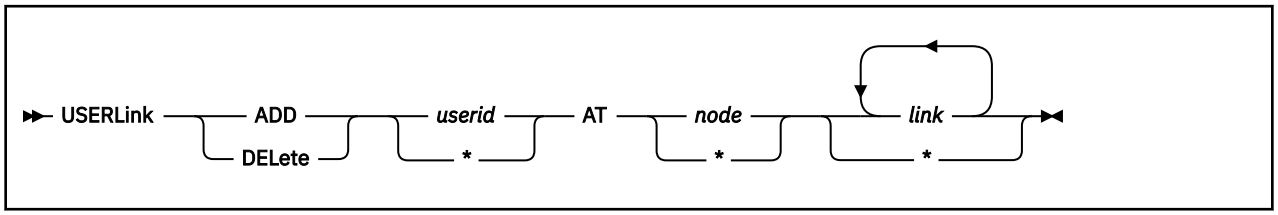
To authorize user ID MAINT at any node for command group RSCSAUTH_GROUP, enter:

```
userauth add maint at * rscsauth_group
```

To delete the authorization for user ID OPER at all nodes for command group GROUP123, enter:

```
userauth delete oper at * group123
```

USERLINK



Authorization

RSCSAUTH

Purpose

The USERLINK command adds, updates, or deletes a user authorization for links to be specified on RSCS commands issued through RSCSAUTH. RSCSAUTH maintains the authorizations in the link authorization table (USERLINK RSCSAUTH file).

Operands

ADD
adds the specified links to a user authorization. If an entry for the specified user ID and node combination does not exist in the USERLINK table, it is created.

DELete
deletes the specified links from a user authorization. If the last link name is deleted from the authorization for the specified user ID and node combination, the entry is deleted from the USERLINK table. If the last entry is deleted from the USERLINK table, the USERLINK file is deleted.

userid
*****
is the user ID authorized for the specified links. You can specify an asterisk (*) to indicate all user IDs at the specified node.

AT *node*
AT *
identifies the node of the user ID. You can specify an asterisk (*) to indicate all nodes.

link
*****
is the name of an RSCS link. You can specify multiple link names.

Instead of listing link names, you can specify an asterisk (*). For the ADD option, this means the specified user ID and node combination is authorized for all links. For the DELETE option, this means all link authorizations for the specified user ID and node combination are removed, and the entry is deleted from the USERLINK table.

Usage Notes

1. Each entry in the USERLINK table identifies the links authorized for a specific user ID and node combination. The entry has the format:

   ```
   userid node link1 [link2...]
   ```

2. To query link authorizations, use the QRSCSAUTH command. See “QRSCSAUTH” on page 380.
3. There is only one entry in the USERLINK table for a specific user ID and node combination. However, a user ID or node can be included implicitly in multiple entries. For example, user MAINT at MAHVM1 is included in the user ID and node specification in all the following entries:

```
MAINT * SNA
* MAHVM1 TCP
* * BSC
```

Note that the link names specified in these entries are different. A user ID and node cannot be authorized for the same link name in multiple entries.

For example, if you issue the command:

```
userlink add maint at mahvm1 tcp
```

the command will be rejected, because MAINT at MAHVM1 is already authorized for link TCP by the * MAHVM1 TCP entry.

If you issue the command:

```
userlink add * at mahvm1 lpr2
```

the contents of the table will be updated as follows:

```
MAINT MAHVM1 LPR
MAINT * SNA
* MAHVM1 TCP LPR2
* * BSC
```

If you now issue the command:

```
userlink delete maint at mahvm1 lpr2
```

the command will be rejected. The authorization exists, but there is not a matching entry in the table for that specific user ID and node combination. To delete the LPR2 authorization for MAINT, you will have to remove LPR2 from the broad * MAHVM1 TCP LPR2 authorization and define LPR2 authorizations for specific user IDs at MAHVM1.

4. If you issue the command:

   ```
   userlink delete * at * *
   ```

   this will delete all entries in the USERLINK table and subsequently delete the USERLINK file.

Examples

To authorize user ID OPERATOR at node PARK75 to use link name MACYS, enter:

```
userlink add operator at park75 macys
```

To authorize all users at node PARK75 to use link name MASTER, enter:

```
userlink add * at park75 master
```

To authorize user ID MAINT at any node to use link names DIALAPS and DIALATM, enter:

```
userlink add maint at * dialaps dialatm
```

To authorize user ID OPER at any node to use all link names, enter:

```
userlink add oper at * *
```

To delete the authorization for user ID OPER at all nodes to use link name DIALMAS, enter:

```
userlink delete oper at * dialmas
```

Chapter 15. RSCS Interchange Commands

This chapter describes the RSCS Interchange commands.

For descriptions of the basic RSCS commands, see Chapter 12, "RSCS Commands," on page 127. For descriptions of the RSCSAUTH commands, see Chapter 14, "RSCSAUTH Commands," on page 377.

For information about how to read the command syntax diagrams, see "Syntax, Message, and Response Conventions" on page xv.

Rules for Using RSCS Interchange Commands

1. RSCS Interchange commands can be issued by z/VM users on the same system as the RSCS Interchange server by using the CP SMSG command.

   ```
   smsg rscsintid command
   ```

   RSCS Interchange commands issued directly on the RSCS Interchange console do not require the SMSG preface.

   RSCS Interchange commands from remote users will be displayed at the RSCS Interchange server console and ignored.
2. For CMS commands that provide console output, such as LISTFILE, RSCS Interchange will not pass the output back to the issuer of the command. The output will remain on the RSCS Interchange console. Acceptance, success, or failure of the command will, however, be reflected back to the command issuer. CP command responses will be returned to the command issuer.
3. Most RSCS Interchange commands are privileged, which means they can be issued only by privileged users. The exceptions are the QUERY command, and the NICK command when the NICKPRIV setting is OFF, which can be issued by general users. See the NICKPRIV configuration file statement in *z/VM: RSCS Networking Planning and Configuration*. Privileged commands are shown with an authorization of **P**. General user commands are shown with an authorization of **G**.
4. Privileged users are defined by the AUTHORIZE configuration file statement (see *z/VM: RSCS Networking Planning and Configuration*) or by the ADDPRIV command (see "ADDPRIV" on page 391). The RSCS Interchange server console and ADMIN user ID can always issue privileged commands. You will receive an error message if you try to add a user ID that is currently privileged to the authorized list.
5. You cannot use RSCS dynamic authorization (RSCSAUTH) to manage user authorizations for RSCS Interchange commands.
6. Some commands require SMTP addresses as operands. SMTP addresses can contain special characters such as # or @ that are also used by CP as terminal editing characters (for example, LINEND or CHARDEL). As a result, be sure to turn off CP line editing if you plan to use SMTP addresses in commands. You can enter:

   ```
   cp set linedit off
   ```

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ADDINFORM

Authorization

P

Purpose

The ADDINFORM command temporarily enables a user to receive ADMIN messages from the RSCS Interchange server.

Operands

vmid
is a z/VM user ID to be given temporary authorization to receive RSCS Interchange ADMIN messages.

Usage Notes

1. If the RSCS Interchange server terminates, the user IDs you specified will not receive ADMIN messages when the server becomes active again. Use the INFORM_USER configuration file statement to permanently enable a user to receive these messages. See *z/VM: RSCS Networking Planning and Configuration*.
2. The RSCS Interchange server user ID is always granted inform authority. An error message occurs if you try to add that user ID to the inform list.

ADDPRIV

Authorization

P

Purpose

The ADDPRIV command temporarily enables a user to enter privileged commands on the RSCS Interchange server.

Operands

vmid
is a z/VM user ID to be given temporary authority to issue privileged RSCS Interchange commands.

Usage Notes

1. If the RSCS Interchange server terminates, the user IDs you specified will be dropped from the privileged list when the server becomes active again. If a user ID needs to be more permanent, use the AUTHORIZE configuration file statement to grant the user privileged status. See *z/VM: RSCS Networking Planning and Configuration*.
2. The RSCS Interchange server user ID is always authorized. An error message occurs if you try to add that user ID to the authorize list.

CMS

Authorization

P

Purpose

The CMS command tells the RSCS Interchange server to execute the specified CMS command.

Operands

cms_command
is the CMS command to be run on the RSCS Interchange server.

Usage Notes

1. No output from the CMS command is returned to the user; the output will remain on the RSCS Interchange console. However, the acceptance, success, or error of the command is reflected back to the command issuer by the RSCS Interchange server.

Examples

To change a minidisk access file mode, you can enter the CMS ACCESS command:

```
smsg serverid cms acc 194 b
```

CP

Authorization

P

Purpose

The CP command tells the RSCS Interchange server to process the specified CP command.

Operands

cp_command
is the CP command to be run on the RSCS Interchange server.

Usage Notes

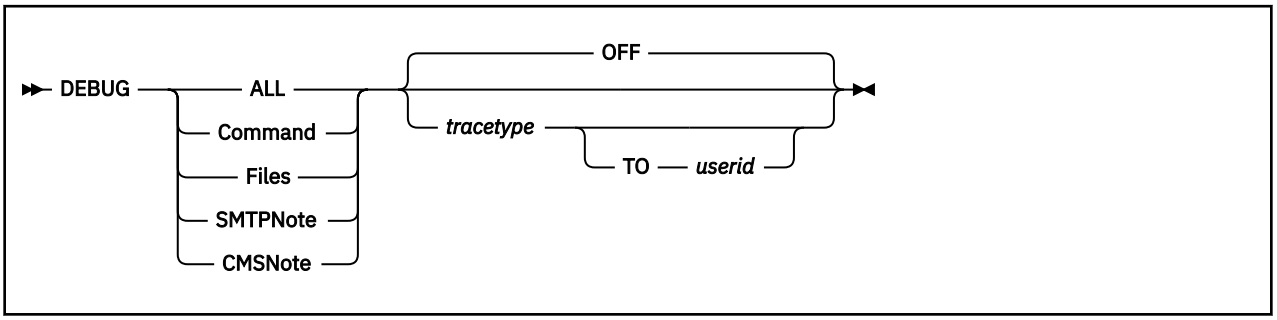
1. The server's CP privilege class, specified in the virtual machine definition, might limit what CP commands may be executed.

Examples

To spool the server console, you can enter the CP SPOOL command:

```
smsg serverid cp spool con start to maint
```

DEBUG



Authorization

P

Purpose

The DEBUG command traces RSCS Interchange problems to find errors. Output can be directed to the console or to a file.

Operands

ALL
specifies tracing of the entire exec.

CMSNote
specified tracing of routines that process mail files going to z/VM users. This will not trace any mail preprocessing routines.

Command
specifies tracing of routines that process commands.

Files
specifies tracing of all file processing, z/VM to SMTP, and SMTP to z/VM. This option will turn on SMTPNote and CMSNote, and will trace all other file preprocessing routines.

SMTPNote
specifies tracing of routines that process mail files going to SMTP users. This will not trace any mail preprocessing routines.

OFF
specifies no trace type. This is the default.

tracetype
specifies a REXX trace type such as ALL, ?I, or OFF.

TO *userid*
specifies the user to receive console tracing data.

Usage Notes

1. The OFF operand turns off only the trace area specified. To turn off all debugging, specify DEBUG ALL OFF.
2. The console is started when DEBUG is entered. If the console log is already started, you may want to close the console before issuing this command. Original settings are maintained and restored when all DEBUG areas are turned off.
3. When you enter DEBUG TO *userid1*, the current console is closed and spooled to *userid1*. If DEBUG is then issued to *userid2*, the console is closed again and sent to *userid1*, then spooled to *userid2*.

4. When all areas of DEBUG have been set off by entering multiple DEBUG OFF commands or by entering DEBUG ALL OFF, the console will be closed and restored to the original settings prior to the DEBUG command. If a user ID has been specified, the console is sent to that user ID. Refer to the table below for more information.
5. Note that the REXX Trace facility is not supported for compiled REXX execs. If you are running the compiled RSCS Interchange EXEC and you try to run the DEBUG command, an error message will be issued.
6. For more information, see *z/VM: REXX/VM Reference*.

Examples

The following table describes what happens with the console when you enter the DEBUG command with various operands.

Command	Current Console	New Console
`debug cmsnote all`	Settings saved	New console started
`debug files all to admin`	Previous console closed	New console started
`debug command all to admin2`	Previous console closed and sent to ADMIN	New console started for ADMIN2
`debug command off`	Console closed and sent to ADMIN2	New console started for ADMIN2
`debug all off`	Console closed and sent to ADMIN2	Console restored to original setting

DELINFORM

Authorization

P

Purpose

The DELINFORM command temporarily removes a user ID from the list of users that will receive ADMIN messages from the RSCS Interchange server.

Operands

vmid
is a z/VM user ID whose authorization to receive RSCS Interchange ADMIN messages is to be temporarily removed.

Usage Notes

1. If the RSCS Interchange server terminates, the user IDs you specified will be authorized again when the server restarts if they are defined by INFORM_USER statements in the RSCS Interchange configuration file. If you need to permanently remove a user ID from the list of users receiving ADMIN messages, you must remove the INFORM_USER configuration statement for that user ID. See *z/VM: RSCS Networking Planning and Configuration*.

DELPRIV

Authorization

P

Purpose

The DELPRIV command temporarily removes a user ID from the list of users who can enter privileged commands from the RSCS Interchange server.

Operands

vmid
is a z/VM user ID whose authority to issue privileged RSCS Interchange commands is to be temporarily removed.

Usage Notes

1. If the RSCS Interchange server terminates, the user IDs you specified will be privileged users again when the RSCS Interchange server restarts if they are defined by AUTHORIZE statements in the RSCS Interchange configuration file. If you need to permanently remove a user ID from the authorize list, you must remove the AUTHORIZE configuration statement for that user ID. See *z/VM: RSCS Networking Planning and Configuration*.

LISTINFORM

Authorization

P

Purpose

The LISTINFORM command displays the user IDs that are permitted to receive ADMIN messages from the RSCS Interchange server.

Usage Notes

1. The RSCS Interchange server user ID is always informed, so it will not be displayed.

Examples

Output from the LISTINFORM command might look like this:

```
ACHAMA613I Inform users:
ACHAMA612I MIKE
```

LISTPRIV

Authorization

P

Purpose

The LISTPRIV command displays all of the user IDs that are authorized to enter privileged commands on the RSCS Interchange server.

Usage Notes

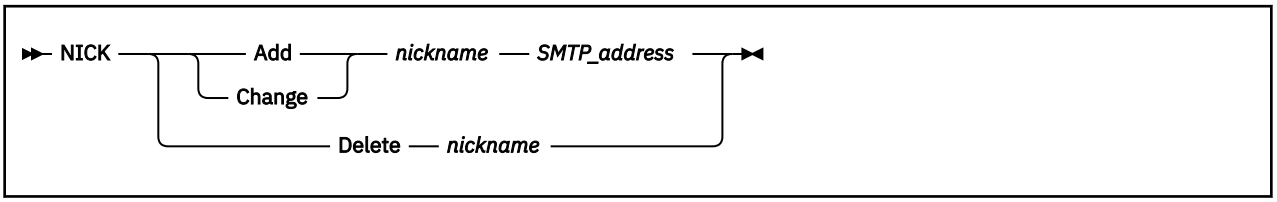
1. The RSCS Interchange server user ID is always authorized, so it will not be displayed.

Examples

Output from the LISTPRIV command might look like this:

```
ACHAMA614I Authorized users:
ACHAMA612I MATT     DOUG      BARNEY
```

NICK



Authorization

G or P

Purpose

The NICK command adds, changes, or deletes a nickname entry in the RSCS Interchange nickname table. If NICKPRIV is set ON in the RSCS Interchange configuration file, only privileged users can enter the NICK command.

Operands

Add
adds a nickname to the RSCS Interchange nickname table. The nickname and SMTP address must be specified.

Change
changes a nickname in the RSCS Interchange nickname table. The nickname and SMTP address must be specified.

Delete
removes a nickname from the RSCS Interchange nickname table. Only the nickname can be specified.

nickname
is the name of the IP network user where mail can be sent.

SMTP_address
is the address of the IP network user where mail can be sent.

Usage Notes

1. A general user cannot change or delete a nickname entry defined by another user ID.
2. A privileged user can change or delete any nickname entry.
3. Duplicate nicknames are not allowed. A request to ADD a duplicate nickname will be refused.

QNICK

Authorization

P

Purpose

The QNICK command allows you to enter many NICK commands to update the nickname table. When you enter QNICK ON, RSCS Interchange does not rewrite the nickname table after each command. When you enter QNICK OFF, the nickname table is updated to include all your changes.

Operands

ON
turns "quick nickname" mode on.

OFF
turns "quick nickname" mode off. This will force the RSCS Interchange server to rewrite the nickname table to disk.

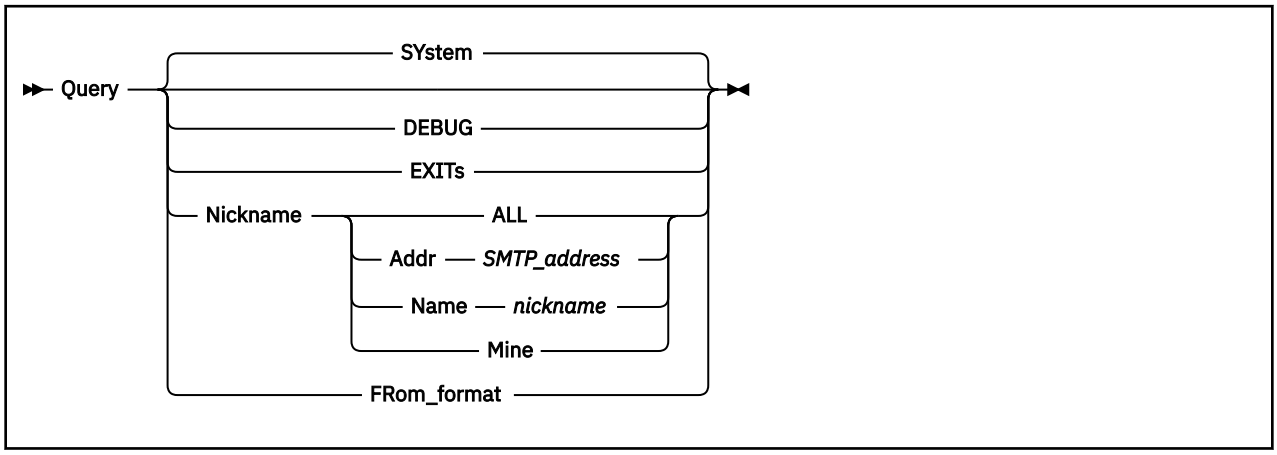
Usage Notes

1. Be sure to end quick nickname mode using QNICK OFF. Otherwise, if the RSCS Interchange server terminates unexpectedly after you enter a group of NICK commands, your changes could be lost.

Examples

```
smsg xchange qnick on
smsg xchange nick add joe joe@tcpip.college.edu
smsg xchange nick change tom tom@tcpip.college.edu
smsg xchange nick delete sue
⋮
smsg xchange qnick off
```

QUERY



Authorization

G

Purpose

The QUERY command displays the general status of the RSCS Interchange server. The status includes the level of the RSCS Interchange server, cumulative counts of files processed, the status of the NICK_OVERRIDE statement, and the privilege setting of the NICK command.

Operands

SYstem
displays the level of the RSCS Interchange server. This is the default.

DEBUG
displays the RSCS Interchange server trace setting. For information about debug type settings, see “DEBUG” on page 394.

EXITs
displays the active exits for each of the exit types. For information about exit types, see the EXIT configuration statement in *z/VM: RSCS Networking Planning and Configuration*.

Nickname
requests the nickname table information about a nickname, IP address, or nicknames "owned" by the requester.

ALL
displays nickname table information about all the nicknames known to the RSCS Interchange server.

Addr *SMTP_address*
displays information about the user at the specified *SMTP_address*.

Name *nickname*
displays information about the user specified by *nickname*.

Mine
requests information about the nicknames you have entered in the RSCS Interchange nickname table. Only the owner can delete the entries under the owner's user ID.

FRom_format
displays whether the local RSCS Interchange node ID will be pre-appended to the "From:" header of files that are sent to a remote domain.

Usage Notes

1. QUERY NICKNAME ALL might display a large number of responses depending on the size of the nickname table.

Examples

The following examples show typical output from the QUERY command and operands. Your output may vary based on your installation setup.

Example 1: When you enter the QUERY EXIT command, the response might look like this:

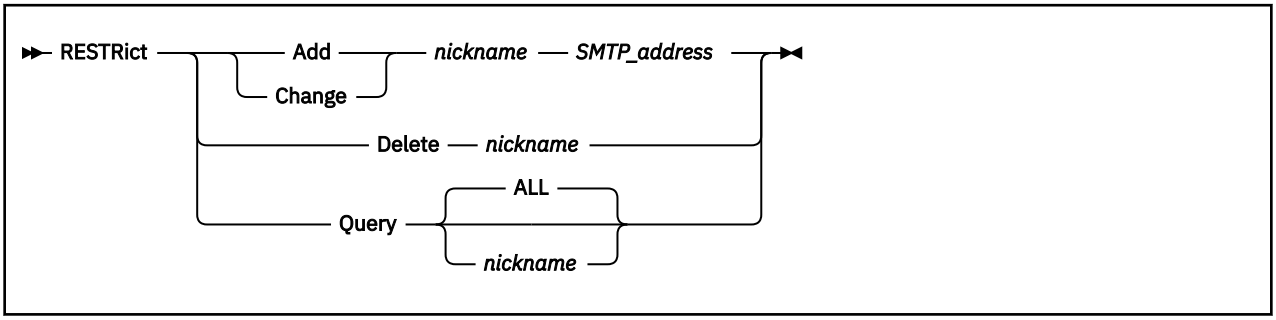
```
ACHAMA623I Security exits:  SEC1
ACHAMA623I Accounting exits:  ACCT1 ACCT2
ACHAMA622I No exits enabled for Format exit
ACHAMA622I No exits enabled for Command exit
```

Example 2: When you enter the QUERY DEBUG command, the response might look like this:

```
smsg drb1 q debug

ACHAMA617I Trace Area     Setting
ACHAMA612I CMS Note       OFF
ACHAMA612I SMTP Note      ON
ACHAMA612I Commands       OFF
```

RESTRICT



Authorization

P

Purpose

The RESTRICT command lets administrators maintain a list of users who are not permitted to use the gateway. In RSCS Interchange, the gateway is a functional unit that interconnects a local data network with another network having different protocols.

When RSCS Interchange receives a file from an SMTP user, the SMTP address is checked for a match with an existing restricted entry in the nickname table. If a match is found, the mail is forwarded to the RSCS Interchange administrator's user ID. The user ID is defined by the ADMIN configuration file statement.

Operands

Add
adds a nickname to the list of users not allowed to use the gateway. The nickname and SMTP address must be specified.

Change
changes the address of a nickname in the list of users not allowed to use the gateway. The nickname and SMTP address must be specified.

Delete
removes a nickname from the list of users not allowed to use the gateway. Only the nickname can be specified.

Query
checks the specified nickname in the list of users not allowed to use the gateway. Only the nickname or ALL can be specified; ALL is the default.

SMTP_address
is the SMTP address of the nickname that is not permitted to use the gateway.

nickname
is the name in the nickname table that is not permitted to use the gateway. ALL is the default for Query.

STOP

Authorization

P

Purpose

The STOP command ends the operation of the RSCS Interchange server.

Operands

Nolog
prevents automatic logoff of the RSCS Interchange server user ID when termination of the server is complete. This is the default.

Log
automatically logs off the RSCS Interchange server user ID when termination of the server is complete.

Usage Notes

1. If NOLOG is set, use the IPL CMS command to re-initialize the server, or call ACHAMAIN directly.
2. Use this command for system administrator operations such as servicing the RSCS Interchange code. You may also use this command to provide maintenance to the configuration file.

STOP

Chapter 16. CP Commands Used with RSCS

The CP SMSG, SPOOL, and TAG commands have special uses with RSCS. The descriptions of the SMSG, SPOOL, and TAG commands in this chapter are RSCS-oriented and may differ from the descriptions in *z/VM: CP Commands and Utilities Reference*.

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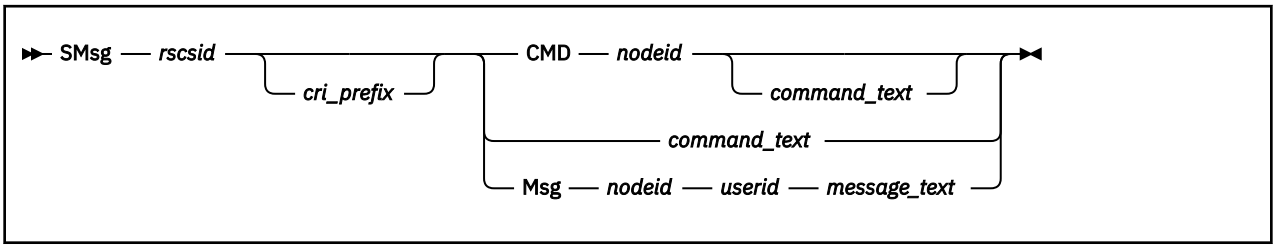
SMSG



Authorization

CP Privilege Class G

Purpose

The CP SMSG sends a special message to a virtual machine programmed to accept and process the message. In RSCS, this command is used to deliver command text to the RSCS virtual machine to be processed.

All RSCS commands that are entered by a virtual machine user (including authorized alternate operators) must be included as text in an SMSG command. The exception to this rule is when a local installation has provided an exec for each command that automatically puts the SMSG *rscsid* characters before the RSCS command expression.

Note: This description of the CP SMSG command is RSCS-oriented, and shows syntax to be used only for RSCS.

Operands

rscsid
is the identifier of the local RSCS virtual machine.

cri_prefix
is a command response interface (CRI) prefix, a character string you can specify before any RSCS command to control RSCS responses and messages. For more information, see "CRI Prefix" on page 134.

CMD *nodeid*
specifies the system node that is to receive and process the command text.

command_text
is a command string, containing up to 132 characters, that is acceptable to the specified RSCS virtual machine. Text that exceeds 132 characters will be truncated.

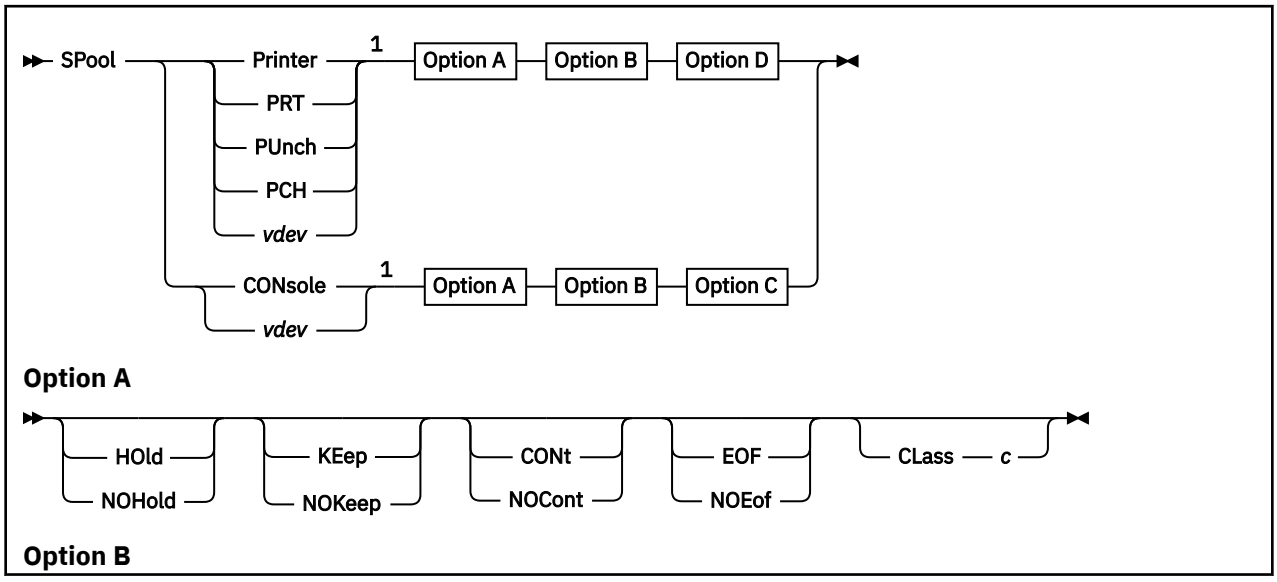
Msg *nodeid userid*
specifies the operator or user who is to receive the text string, presented as a message.

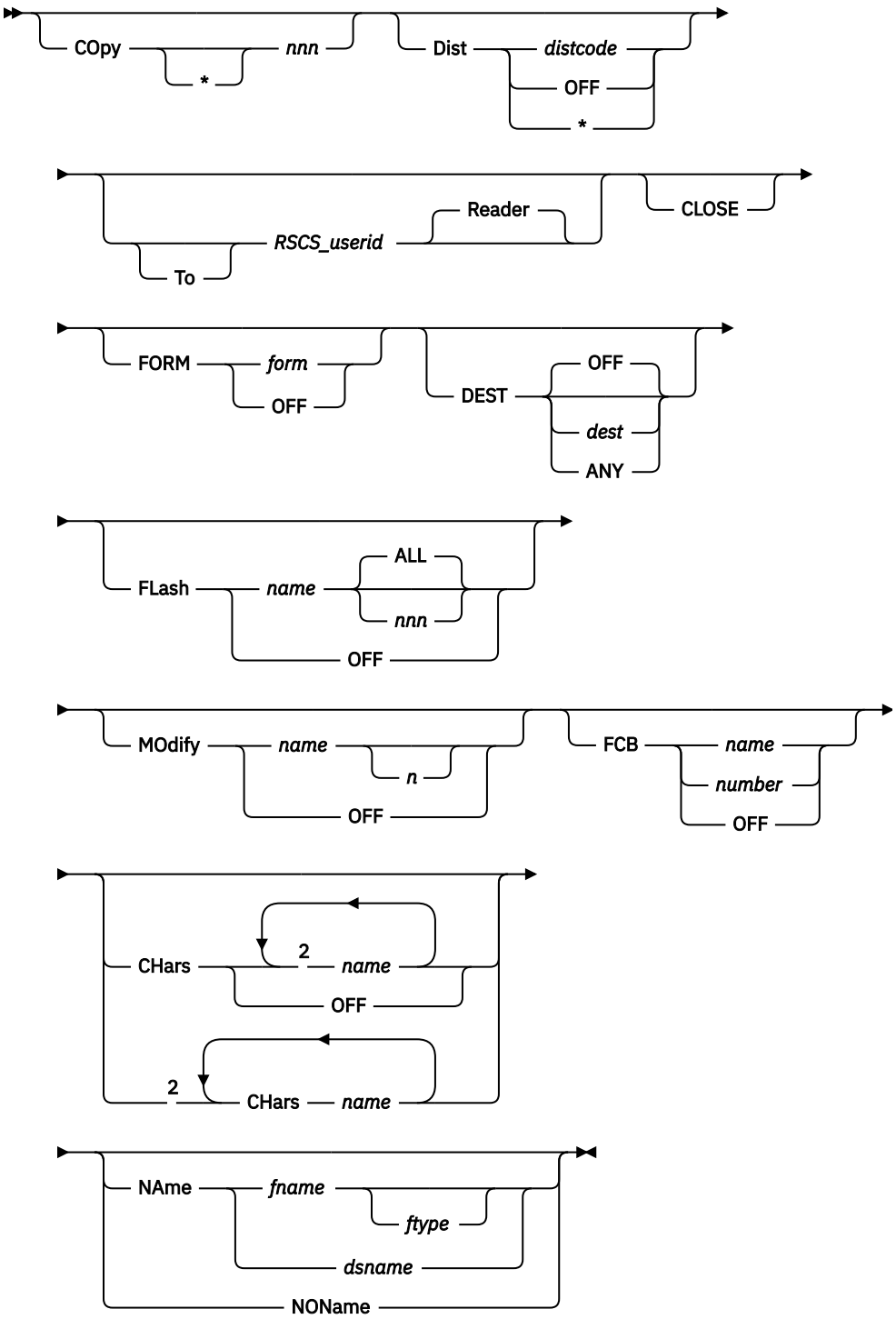
message_text
is a string of up to 132 characters containing the message to be sent.

Usage Notes

1. The SMSG command can deliver text to a local user ID other than RSCS. For a complete discussion of SMSG, see *z/VM: CP Commands and Utilities Reference*.

SPOOL

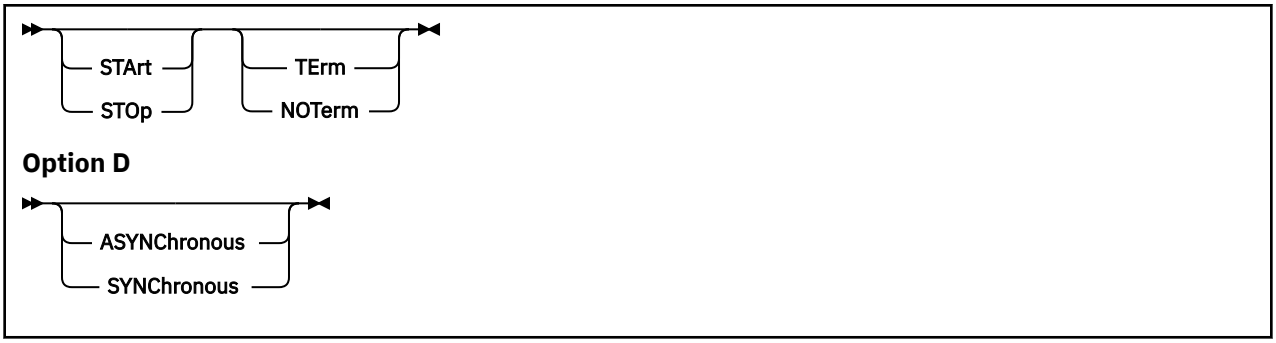

SPool
Printer
PRT
PUnch
PCH
vdev
1
Option A
Option B
Option D
CONsole
vdev
1
Option A
Option B
Option C
Option A
HOld
NOHold
KEep
NOKeep
CONt
NOCont
EOF
NOEof
CLass
c
Option B



Notes:

[1] You must specify at least one option.
[2] A maximum of four names can be specified.

Option C



Authorization

CP Privilege Class G

Purpose

The CP SPOOL command sets control options for one or more of your virtual spool devices. The options you select modify operational functions associated with your virtual printer, punch, or console. These options also control the disposition of files after they have been processed.

Note: This description of the CP SPOOL command is RSCS-oriented. Some command options might not be described because they are not used for RSCS. For a complete description of the SPOOL command, see *z/VM: CP Commands and Utilities Reference*.

Operands

Printer
PRT
PUnch
PCH
CONsole
vdev
: modifies the options for all of your virtual printers, punches, or console spooling devices, including the starting or stopping of spooling operations. Alternatively, you can enter the virtual device number *vdev* of the virtual spooling device whose options you want to modify.

Options

HOld
NOHold
: indicates whether you want to HOLD files.

  If you specify HOLD for an output device, all the files created by the device are placed in user hold status. When a spool file is in user hold status, it is not processed at its destination device (the real printer, punch, or virtual reader) until you remove the hold status by issuing the CHANGE command with the NOHOLD option.

  If you specify HOLD for an input device, files are retained after they have been read. Unless you specify the KEEP option for the file or for the device, the file remains in the reader queue and is the next file eligible for processing. This is in contrast to the hold status on a spool file, which makes the file ineligible for processing.

KEep
NOKeep
: indicates whether a spool file should be retained in the system after it has been processed.

Attention
RSCS does not support KEEP.

CONt
NOCont
controls the continuous spooling option. For output devices, CONT causes all CLOSE requests to be ignored unless specified with the EOF override option. NOCONT resets the option.

EOF
NOEof
causes the printer or punch device to be closed automatically when 50000 records are placed into the active spool file. Punches are closed immediately at 50000 records. If page controls are found in a print file within the next 100 records, the file is closed at the end of the page. If no page controls are found by then, it is presumed there are none, and the file is closed after 50100 records.

CLass *c*
specifies the spool class of the device, where *c* is a 1-character value that can be A - Z, 0 - 9, or an asterisk (*).

The CLASS option determines which destination devices can process the spool file. If you print or punch a file from one of your virtual devices, the file is assigned the class that is associated with the device. The file is then printed or punched on a real device that also has this class associated with it. The operator sets this class.

COpy *nnn*
COpy * *nnn*
specifies the number of copies to be printed or punched when the file is spooled to the real unit record device. Note that regardless of what number you specify for COPY, only one spool file is actually created. However, z/VM continues to associate the COPY number with the spool file until the spool file is processed by a real printer or punch. At that time, z/VM produces the specified number of real printed or punched copies.

If the real printer is a 3800 device, an asterisk (*) specifies that the printer is to print each page *nnn* times before going on to the next page, where *nnn* is a decimal number, 1 - 255.

Dist *distcode*
Dist OFF
Dist *
specifies the 1- to 8-character distribution code to be assigned to spool files created on this virtual device. You can override this value using the DIST option on the CLOSE or CHANGE commands.

DIST OFF and DIST * reset the distribution code to the value in the system directory at the time you logged on and will not reset to an updated value until logoff.

To *RSCS_userid*
sends the output of the virtual device to the RSCS machine. The distribution code on the spool files retains the distribution code specified for the originator in the system directory.

When you use this option, you retain control of the spool file. For example, you can use the TRANSFER command to retrieve the file.

Reader
directs the spool files to the RSCS machine's reader queue. This is the default.

CLOse
closes the spool file on the specified device regardless of the CONT setting for the device. CLOSE is equivalent to entering CLOSE with the EOF option. If PURGE is specified, CLOSE is not necessary.

FORM *form*
FORM OFF
specifies the 1- to 8-character form name for the resulting spool file or files. The FORM option determines which destination devices can process the spool file. If you print or punch a file from one

of your virtual devices, the file is assigned the form associated with the device. The file is then printed or punched on a real device that also has this form associated with it. The operator sets this form.

FORM OFF resets the form to the system default as specified by the installation.

DEST OFF
DEST *dest*
DEST ANY
specifies the 1- to 8-character destination value for the resulting spool file or files. The DEST option determines which destination devices can process the spool file. If you print or punch a file from one of your virtual devices, the file is assigned the destination associated with the device. The file is then printed or punched on a real device that also has this destination associated with it. The operator sets this destination.

DEST ANY specifies that the resulting spool file or files can be processed on any CP output device that meets other selection criteria, regardless of the device's DEST setting.

DEST OFF specifies that the resulting spool files are processed by a device specifically started, or they are defaulted to OFF. OFF is the initial setting of the destination value for virtual devices.

FLash *name* ALL
FLash *name nnn*
FLash OFF
specifies a form overlay contained in the 3800 printer that is to be superimposed (or flashed) onto the specified number of copies of the output. The 1- to 4-character *name* value identifies the forms overlay to be used in the projection. The value *nnn* can be 0 - 255, and specifies that the first *nnn* copies of output are to be flashed.

For example, if you specify COPY 4 and FLASH *name* 2, the first two copies of your file are flashed, while the last two copies remain unflashed. If ALL is specified, the flash count matches the copy count. ALL is the default.

FLASH OFF resets the flash parameters. Blanks are inserted into the flash name field of the specified spool file or files, and the count is set to 0.

MOdify *name n*
MOdify OFF
specifies a copy modification module to be used when printing the spool file or files on the 3800. This function makes it possible to alter text by either preventing the printing of certain information or adding labels to output. The value *name* can be 1 - 4 characters.

The value *n* selects one of the character sets specified by the CHARS option, to be used for the copy modification text. The values 0, 1, 2, and 3 correspond to the order in which the names are specified. If *n* is not specified, the first character set (0) is assumed.

MODIFY OFF resets the modification parameters. Blanks are inserted into the modify name field of the spool file or files and, when printed, no modification occurs. The modify number *n* is set to 0.

FCB *name*
FCB *number*
FCB OFF
specifies the 1- to 4-character name of the forms control buffer (FCB) image to be used when printing the spool file or files on the 3800 printer. The value *number* can be 6, 8, 10, or 12, and tells the 3800 to print the entire spool file at that number of lines per inch, regardless of the size of the paper that is currently loaded. An FCB specification of 10 will print only on a 3800 Model 3 printer.

FCB OFF resets the FCB parameter. Blanks are inserted into the FCB name field of the spool file or files and, when printed, a default FCB will control the vertical spacing of the output text.

CHars *name*
CHars OFF
specifies the name of the character set or sets used when printing the spool file or files on the 3800 printer. Each name can be 1 - 4 characters, and a maximum of four names can be specified. The multiple use of the CHARS keyword is necessary only if a specified character set name would conflict

with an option name (for example, FORM) or with a user ID. If more than one name is specified, along with modification, the order in which the names appear determines which table is used for copy modification text.

CHARS OFF resets the CHARS parameters. Blanks are inserted into the name fields of character sets used for output generation. The resulting spool file or files, therefore, uses a default character set when actually printed on a 3800 printer.

NAme *fname ftype*
NAme *dsname*
NONAme
specifies the file name and optional file type, or the data set name, that will be given to each spool file the virtual device creates. The *fname* and *ftype* values can be 1 - 8 characters. The *dsname* value can be 1 - 24 characters; however, if the name has more than 16 characters, it is truncated to 16 characters.

NONAME resets the NAME option. Blanks are inserted into the name field for spool files the virtual device creates.

STArt
begins placing input and output from your display station into a spool file. Full-screen data output operations are not placed in the spool file. After the console is closed, the file becomes a printer spool file. START applies only to consoles.

STOp
stops the spooling of display station input and output. STOP does not close the console spool file. STOP applies only to consoles.

TErm
displays the display station input and output on your display screen and places it in a spool file. The TERM option has no effect unless the START function is also in effect. TERM applies only to consoles.

NOTerm
suppresses the display of input and output on your display screen while placing it in a spool file. The display of console input and output is not suppressed if:

- It is the result of CP commands entered from CP mode.
- The output line immediately precedes a virtual machine read to the console.

The NOTERM option has no effect unless the START function is in effect. NOTERM applies only to consoles.

Full screen mode applications such as XEDIT and full screen CMS are not supported when the console is spooled NOTERM.

ASYNChronous
allows you to run other commands while the SPOOL command completes.

SYNChronous
prevents you from executing other commands until the SPOOL command completes.

Usage Notes

1. When specifying the *RSCS_userid* option, if you omit the keyword TO, *RSCS_userid* cannot be T or TO. If you are transferring your output to your own virtual machine, you may specify *RSCS_userid* as an asterisk (*).
2. On a user console spooled NOTERM, full screen functions may cause a problem. For example, if a user is in XEDIT and tries to QUIT, the keyboard remains locked.
3. SET IMSG OFF suppresses informational messages for this command.
4. A spool file is created when the first record for a printer or punch is processed by the virtual unit record simulation routines in CP. CP associates this spool file with the virtual unit record device and assigns it a number called the *spoolid* (spool file identification). You can use *spoolid* to identify the file

that you have produced, and to manipulate the file using the z/VM CP spooling commands, such as ORDER, CHANGE, and PURGE.

When you print or punch a file, CP displays its *spoolid*. You can use the *spoolid* to find out various kinds of information about the file using the QUERY command.

5. It is important to remember that the SPOOL command controls both operational characteristics of your virtual spooling devices and the disposition of files after they have been processed.

   For output devices (virtual printers, punches, and consoles) use the SPOOL command to define the characteristics of the spool files you are creating. You can use the SPOOL command to specify whether files are to be held from further processing, and whether they are to be retained after they have been processed. This information is associated with the spool file itself, regardless of the characteristics of the device on which the file is to be processed. Also, use SPOOL to direct the output files that you are creating to unit record devices (readers, printers, and punches) associated with other virtual machines.

6. Unless you reset these values, the following options are the default values for your spool files:

Device	Default Values
Punch	NOHOLD NOKEEP NOCONT CLASS A[1] OFF COPY 001 NOMSG NONAME NOEOF DEST OFF
Printer	NOHOLD NOKEEP NOCONT CLASS A[1] OFF COPY 001 NOMSG NONAME NOEOF DEST OFF
Console	NOHOLD NOKEEP NOCONT CLASS T[1] OFF COPY 001 TERM TO * PRINTER NOMSG STOP NONAME NOEOF DEST OFF

Note: [1] These are default classes only if a specific class is not part of your entry in the system directory.

7. You can transfer a spool file to another z/VM user by issuing the SPOOL, CHANGE, CLOSE, or TRANSFER command. Use CHANGE or TRANSFER to transfer existing files. Use SPOOL or CLOSE to transfer files that you are in the process of creating, or files you plan to create.

   For example, to transfer the printer or punch files you are creating to another user's virtual reader, enter the following command (*vdev* identifies by number or type your virtual machine output device, and *userid* identifies the virtual machine of the receiving user):

   ```
   spool vdev to userid rdr
   ```

   Designating a reader, a printer, or a punch is optional; the default name is reader. The command defines the user queue to which you are directing the file.

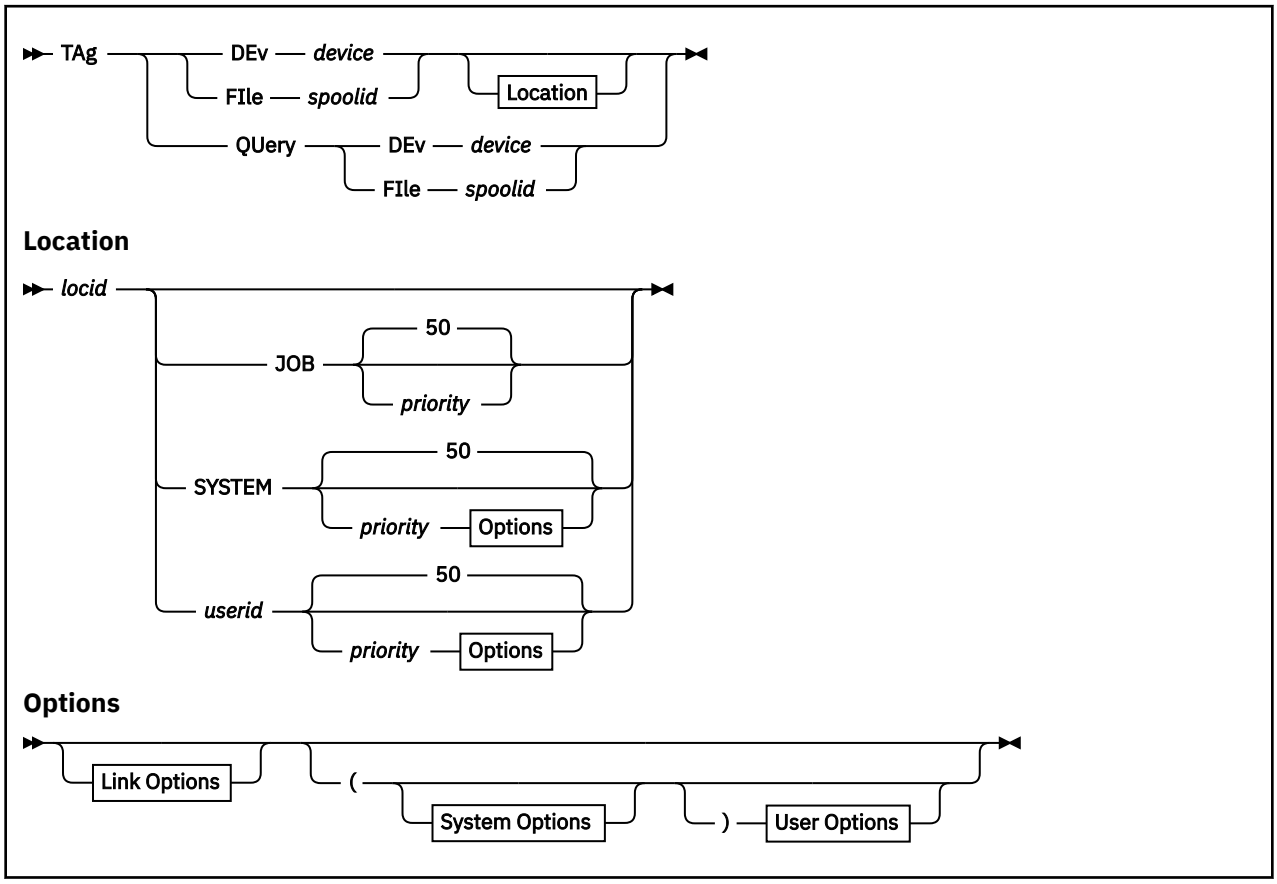
8. When a file changes ownership, as when it is changed to or from another user, the *spoolid* number changes also; the new number is obtained from a pool of numbers available to the file recipient.

   Thus, if user JOE transfers file number 3 to user KAREN, JOE receives the following response, and user KAREN now has the file as file number 18.

   ```
   RDR 0003 SENT TO KAREN RDR AS 0018
   ```

9. If you specify options that apply to a 3800 printer, such as COPY(*), FLASH, MODIFY, FCB, or CHARS, the 3800 printer must be controlled by CP rather than the print server.
10. If DEST is not specified on a command that sets a DEST value, the current value is unchanged.
11. If an external security manager is installed on your system, you may not be authorized to transfer spool files using the TO option. For additional information, contact your security administrator.
12. The SPOOL command may not be used to direct files to the RDR queue of a user with a password of NOLOG. SPOOL may be used to direct files to the PRT and PUN queues of a user with a password of NOLOG.

TAG



Authorization

CP Privilege Class G

Purpose

The CP TAG command specifies the destination address of a spool file and additional control information on a file by file basis. Using the TAG command, you can:

- Replace the tag for a device or a closed output file.
- Specify the tag for all output files from a particular category of virtual output devices or from a single virtual output device.

Note: This description of the CP TAG command is tailored for RSCS. Descriptions of some TAG command options are expanded to show specific RSCS usage. For basic information about the TAG command, see *z/VM: CP Commands and Utilities Reference*.

Operands

DEv *device*
specifies the output device for which you want to start, replace, or delete the associated tag data. All spool files created by *device* will contain the tag text specified in the operands that follow. If there are no following operands, the tag is set to blanks. The following values are permitted for *device*:

ccuu
Virtual device number of a virtual unit record device or console.

CONsole
All console class devices.

PUnch
All punch class devices.

PCH
All punch class devices.

Printer
All printer class devices.

PRT
All printer class devices.

FIle *spoolid*
replaces the entire tag of the specified spool file queued on your virtual reader. The *spoolid* is the identification number (1 - 9999) assigned to a spool file by the z/VM spooling facility. The new tag is specified in the operands that follow. This lets you correct the tag of a file returned to your reader by RSCS because of an incorrect address in the tag. If there are no following operands, the tag is set to blanks.

locid
specifies the destination location node ID for output created by the virtual device.

JOB
indicates that the output of this device is to be transmitted as a job to a non-z/VM NJE system.

SYSTEM
indicates that the output of this device is to be transferred to the system printer or punch. You must specify SYSTEM if you also specify DEST on the SPOOL command, to allow DEST to have effect.

userid
identifies the virtual machine user ID, the directly attached workstation, or the directly attached 3270 printer node ID at the destination location (*locid*) that is to receive the output generated by the virtual device.

If the user ID is omitted or specified as SYSTEM, the file will be transferred to the system printer or punch. You must specify a user ID (or SYSTEM) if you also specify a priority. You must specify SYSTEM if you also specify DEST on the SPOOL command, to allow DEST to have effect.

Attention
When using the LPRXONE exit (for LPR-type links) or the ASCXONE exit (for ASCII-type links), the following values for *userid* have special meaning: **ASCII** The file will not be translated into ASCII. No carriage control will be added by the exit. Any imbedded control characters within the file will be left as is. **ASCIIC** The file will not be translated into ASCII. Carriage controls will be added after each data record by the exit. Any imbedded control characters within the file will be translated to ASCII "#". If *userid* is set to any other value, the file will be translated and carriage control will be performed.

priority
is the requested transmission priority. This value is a decimal number 0 - 99; a lower number signifies a higher priority. The default is 50 if no options are specified on the TAG command.

QUery DEv *device*
displays the current setting of the tag associated with the specified output device or device class.

QUery FIle *spoolid*
displays the tag of the specified closed spool file.

Link Options

RSCS checks the TAG parameters only to verify that the correct options are specified on valid keywords. If you enter a link option on the TAG command that RSCS does not recognize as a valid keyword, RSCS will pass that keyword on to the destination without checking it for validity. This lets RSCS pass a keyword that it does not recognize to another system that does recognize the keyword. This section describes only the valid keywords that RSCS recognizes.

For example, if you enter the TAG command with the OPTCD option and you do not specify J, RSCS will issue the following error message:

```
DMTNHE910E Invalid parameter parm on tag -- parameter ignored
```

However, if you enter the TAG command and you misspell OPTCD, RSCS will not issue an error message because the misspelling is not recognized as a valid keyword.

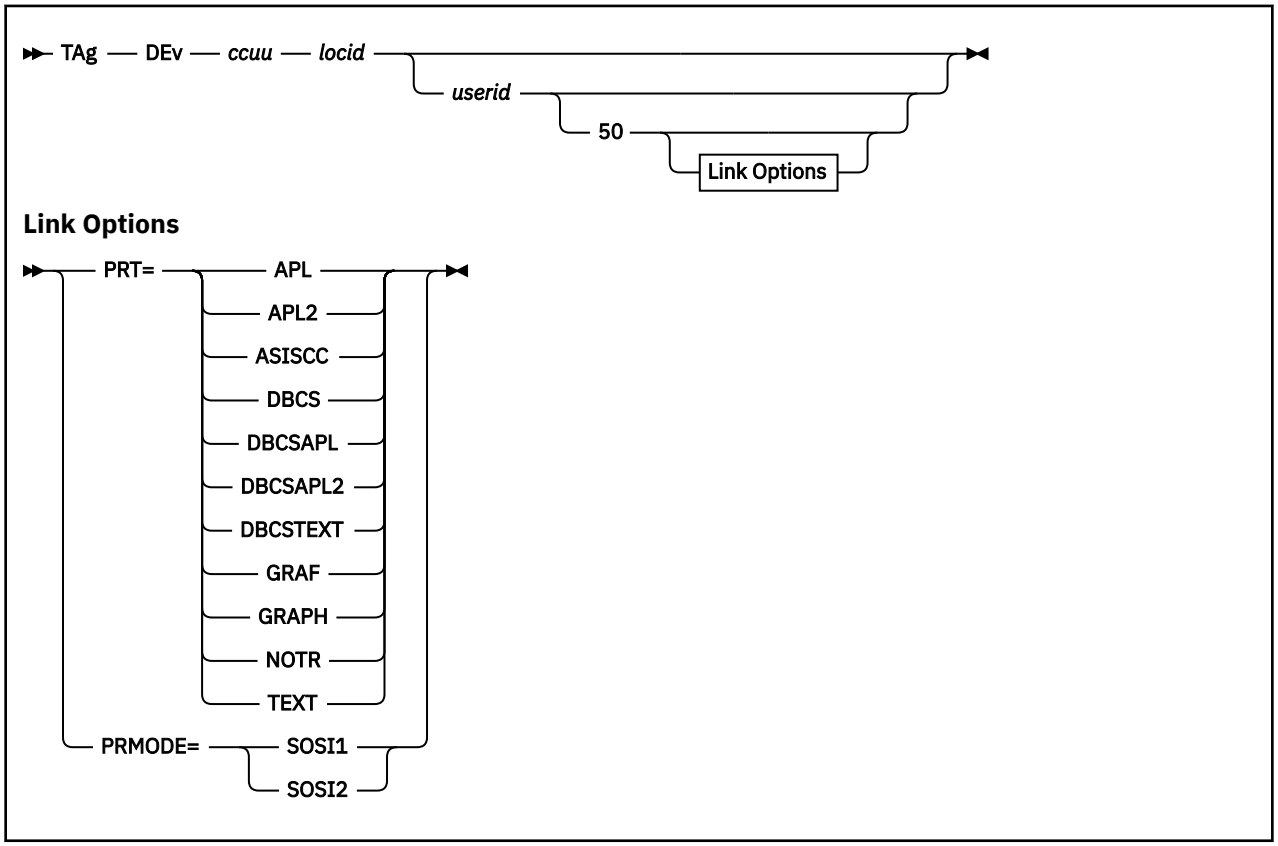
RSCS processes all the link options until it meets a left (open) parenthesis or the end of the command.

Link Options for Printed Output to an ASCII Printer or Plotter

These options are determined by the installation. *z/VM: RSCS Networking Exit Customization* shows some sample TAG commands in the description of sample ASCII printer and plotter exit routine modules.

Link Options for Printed Output to a 3270 Printer

Use the following TAG command syntax when transmitting a file to an IBM 3270 Information Display System printer. The basic TAG operands are described in "Operands" on page 416.



PRT=
overrides any translation mode (TRANS) specification of APL, APL2, TEXT, or DBCS on the RSCS START command for SNA3270P-type, TN3270E-type, and 3270P-type links. If no APL, TEXT, or DBCS related PARM operands were specified when the link was started, PRT is ignored, except for NOTR, GRAF, GRAPH, or ASISCC.

If PRT is not specified, the START PARM or OPARM (if specified) TRANS setting is the default translation used for the file.

Alternatively, PRT can be used to identify a GDDM (Graphical Data Display Manager) spool file.

PRT= can have the following settings. (For valid combinations of PRT and FEATURE settings, see the usage notes starting with "4" on page 427.)

APL
Internally represented EBCDIC special APL characters will be translated to the appropriate 2-byte I/O interface codes.

APL2
All files containing internally represented EBCDIC special APL2 characters will be translated to the appropriate 2-byte I/O interface codes. This mode is valid only when FEATURE is set to DBCSAT or AT. If PRT=APL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

ASISCC
RSCS will not translate unprintable characters in files into blanks. This lets the user pass 3270 or SCS orders to the remote printer.

DBCS
The file contains Double-Byte Character Set (DBCS) data.

DBCSAPL
All files containing internally represented EBCDIC special APL characters will be translated to the appropriate 2-byte I/O interface codes, and all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters will be verified for valid DBCS syntax before being transmitted.

DBCSAPL2
All files containing internally represented EBCDIC special APL2 characters will be translated to the appropriate 2-byte I/O interface codes, and all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters will be verified for valid DBCS syntax before being transmitted.

This mode is valid only when FEATURE is set to DBCSAT. If PRT=DBCSAPL2 is specified with any other FEATURE setting, it is marked as an incorrect combination and an error message is issued.

DBCSTEXT
All files containing internally represented EBCDIC special text characters will be translated to the appropriate 2-byte I/O interface codes, and all double-byte EBCDIC character strings delimited by SO/SI (shift-out/shift-in) characters will be verified for valid DBCS syntax before being transmitted.

GRAPH
GRAF
The file contains GDDM (Graphical Data Display Manager) output records. For translation to occur, the file must be in punch format.

NOTR
Internally represented EBCDIC special APL, APL2, or TEXT characters will not be translated to the 2-byte I/O interface codes for this file. Only 3270 translation will occur for the removal of 3270 control characters.

TEXT
Internally represented EBCDIC special text characters will be translated to the appropriate 2-byte I/O interface codes.

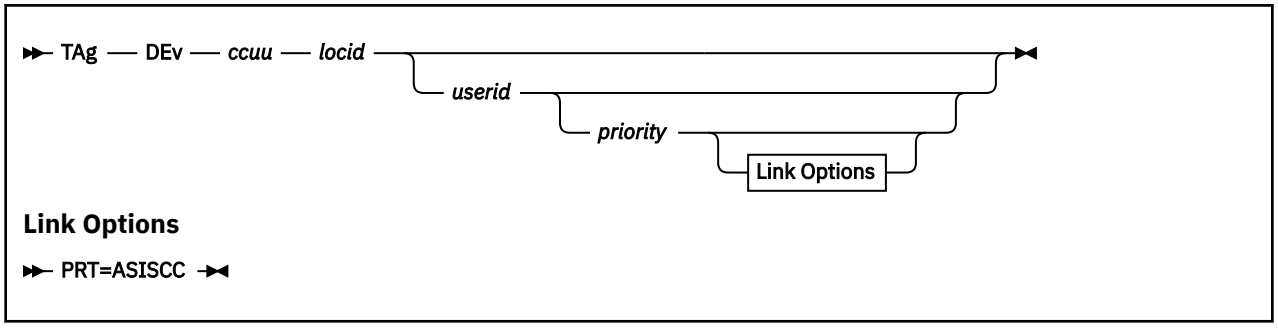
PRMODE=
specifies whether a blank character should be printed before and after a DBCS character string. If this option is not specified, the format defaults to the LU type session that was started. An LU_T1 session does not print a blank. LU_T0 and LU_T3 sessions will print a blank. RSCS recognizes the following processing modes:

SOSI1
prints a blank before and after a DBCS character string.

SOSI2
does not print a blank before and after a DBCS character string.

Link Options for Printed Output to an SNARJE Workstation

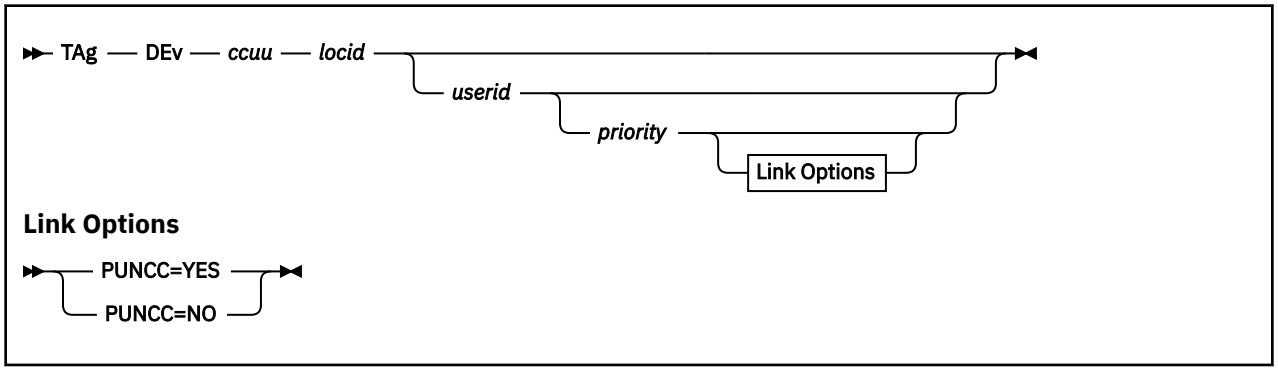
Use the following TAG command syntax when transmitting print output to an SNARJE workstation. The basic TAG operands are described in "Operands" on page 416.



PRT=ASISCC
specifies that RSCS will not translate unprintable characters in files into blanks. This lets the user pass SCS orders to the remote workstation.

Link Option for Punch Output to an NJE System

Use the following TAG command syntax when transmitting punch output to an NJE destination system. The basic TAG operands are described in "Operands" on page 416.



Note: When transmitting a file to a non-z/VM NJE system, *userid* is merely a placeholder in the TAG command. It can be a dummy identifier, such as SYSTEM, but a value must be included when a priority and link option are also included.

PUNCC=YES
specifies that the following are to be retained and transmitted:

1. Carriage control (from the spool file records)
2. Spool file records with NOP carriage control

PUNCC=YES is needed only when an application program at the receiving z/VM node *requires* carriage control characters (and NOP records) in your punch output file.

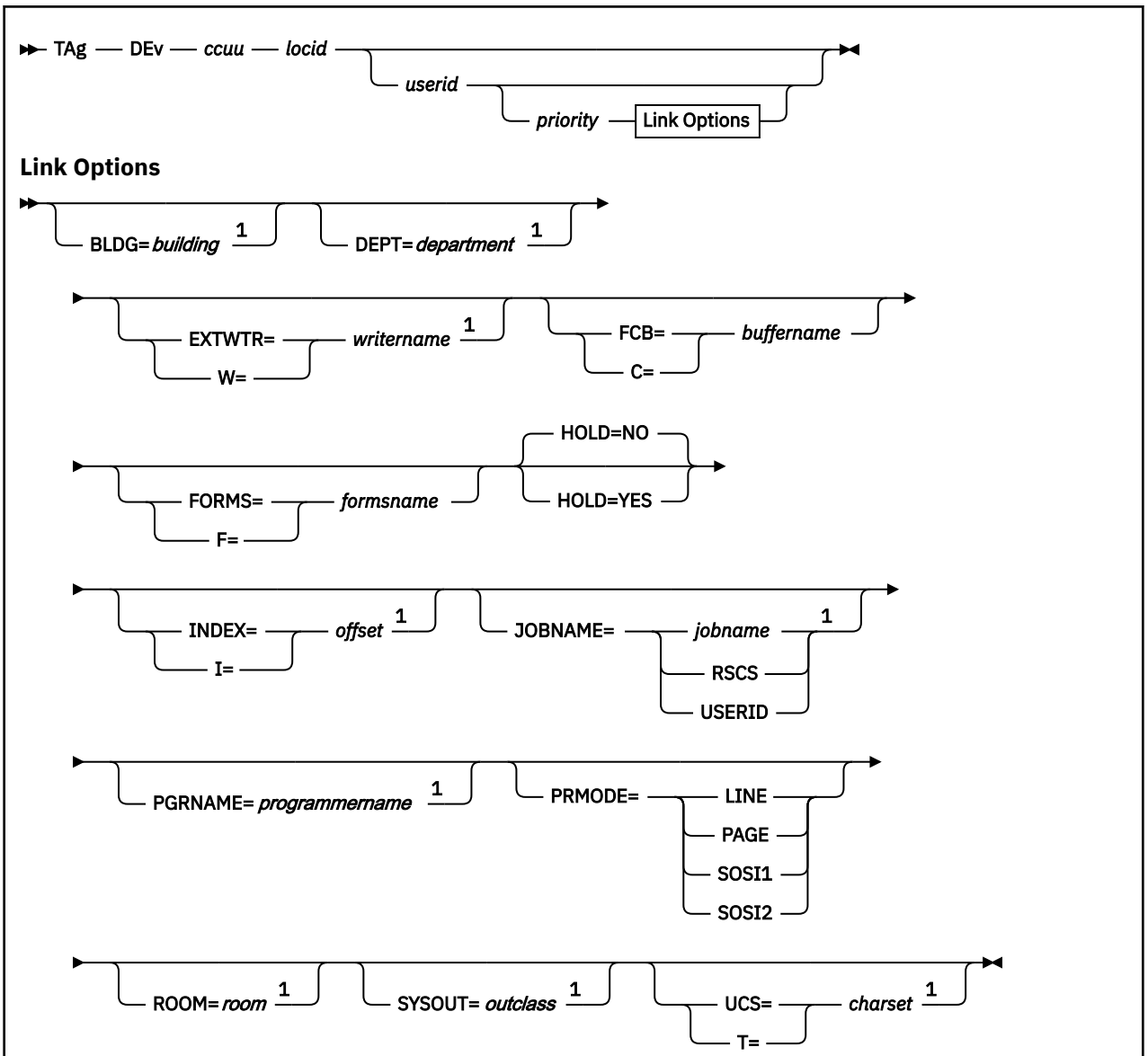
PUNCC=YES has meaning only for punch output files (that is, when you have also specified DEV PUNCH or DEV PCH). It will be ignored for all other output files. This includes print files (which are always sent with carriage control, and NOP records are kept with the data) and JOB files (which are always sent without carriage control, and NOP records are removed from the data).

PUNCC=NO
specifies that:

1. Carriage control (from the spool file records) is not to be transmitted.
2. NOP records are to be removed from the file before transmission.

Link Options for Printed Output to an NJE System

Use the following TAG command syntax when transmitting print output to an NJE destination system. The basic TAG operands are described in "Operands" on page 416.



Notes:

[1] This option has meaning in a non-z/VM system only.

Note: When transmitting a file to a non-z/VM NJE system, *userid* is merely a placeholder in the TAG command. It can be a dummy identifier, such as SYSTEM, but a value must be included when a priority and link option are also included. You must specify SYSTEM if you also specify DEST on the SPOOL command, to allow DEST to have effect.

BLDG=*building*
specifies the 1- to 8-character building identifier of the file. This option has meaning only to a non-z/VM system. Non-z/VM systems can use this information on separator pages for printed output.

Note: You cannot use BLDG as an option on a list processor address record; if you do, RSCS ignores the option.

DEPT=*department*
specifies the 1- to 8-character department identifier of the file. This option has meaning only to a non-z/VM system. Non-z/VM systems can use this information on separator pages for printed output.

Note: You cannot use DEPT as an option on a list processor address record; if you do, RSCS ignores the option.

EXTWTR=*writername*
W=*writername*
specifies the external writer to process the output of this device when it is printed or punched at a remote location.

FCB=*buffername*
C=*buffername*
specifies the 1- to 8-character name of the forms control buffer for printing the output of this device.

FORMS=*formsname*
F=*formsname*
specifies the special forms for printing the output of this device. This value can be 1 - 8 characters.

HOLD=NO
HOLD=YES
specifies whether a file should be placed in HOLD status at its destination. This option is valid only for files to be transmitted over an NJE-type or SNANJE-type link to a remote NJE system. This option has no effect if the destination node is an RSCS Version 1 system.

INDEX=*offset*
I=*offset*
specifies the data set indexing position offset for a 3211 printer. This value can be 1 - 31. This option has meaning only to a non-z/VM system.

JOBNAME=
specifies the type of job name to create for this file. The JOBNAME value specified on the CP TAG command overrides any job name specified on the OPTION statement in your configuration file or on the PARM operand of a GATEWAY-type, LISTPROC-type, NJE-type, SNANJE-type, or TCPNJE-type link.

jobname
generates a job name with this 1- to 8-character string.

RSCS
generates a job name of RSCS*nnnn*, where *nnnn* is the origin spool ID of the file.

USERID
uses the origin user ID as the job name.

This option has meaning only to a non-z/VM system. Non-z/VM systems can use this information on separator pages for printed output.

Note: You cannot use JOBNAME as an option on a list processor address record. If you do, RSCS ignores the option.

PGRNAME=*programmername*
specifies the programmer name. The name can be 1 - 20 characters. If you want to specify imbedded blanks, enclose the programmer name in single quotation marks:

```
PGRNAME='YOUR NAME HERE'
```

This option has meaning only to a non-z/VM system. Non-z/VM systems can use this information on separator pages for printed output.

Note: You cannot use PGRNAME as an option on a list processor address record. If you do, RSCS ignores the option.

PRMODE=
specifies the processing mode for printing the file. RSCS recognizes the following processing modes:

LINE
specifies line mode data.

PAGE
specifies page mode data.

SOSI1
prints a blank before and after a DBCS character string.

SOSI2
does not print a blank before and after a DBCS character string.

If you specify a PRMODE other than LINE, PAGE, SOSI1, or SOSI2, RSCS assumes your installation defined its own PRMODE value and passes that value to the destination NJE system.

ROOM=*room*
specifies the 1- to 8-character room identifier. If this option is not specified, RSCS uses the distribution code of the file. This option has meaning only to a non-z/VM system. Non-z/VM systems can use this information on separator pages for printed output.

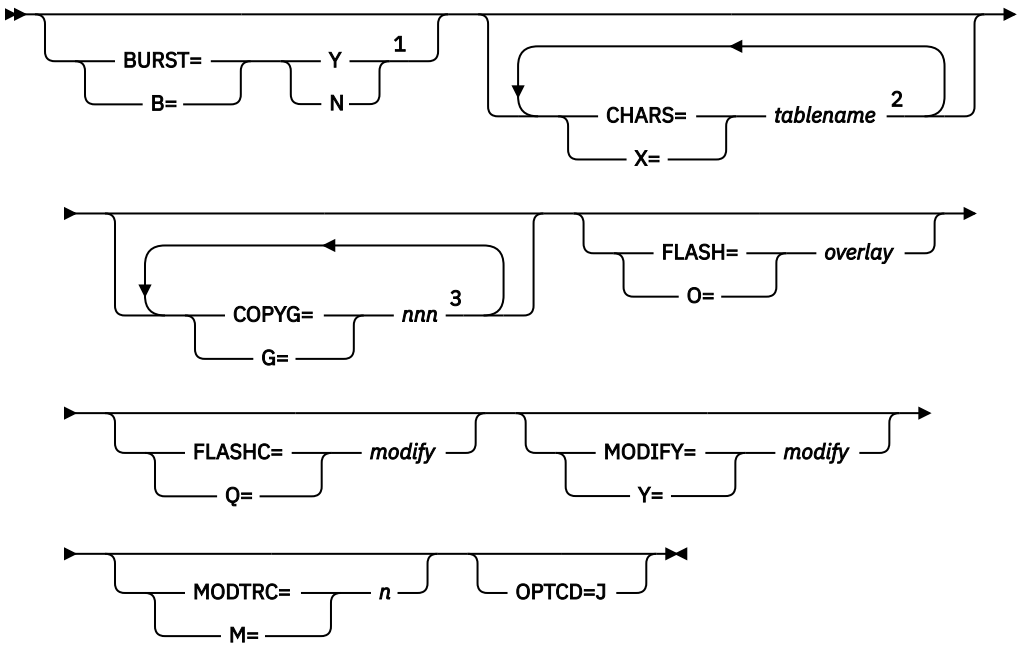
Note: You cannot use ROOM as an option on a list processor address record. If you do, RSCS ignores the option.

SYSOUT=*outclass*
specifies the output class at the receiving node. The *outclass* value is one character and represents a valid output class at the receiving node.

UCS=*charset*
T=*charset*
specifies the 1- to 8-character name of the universal character set for printing the output of this device. This option has meaning only to a non-z/VM system.

Additional Link Options for Printing to a 3800

You can specify additional options if the receiving subsystem will print the data on an IBM 3800 printer. Before specifying any of these options, be sure the subsystem at the output location supports these features. You may specify any combination of these options, separated by blanks, up to a total tag length of 127 characters.



Notes:

[1] This option has meaning in a non-z/VM system only.
[2] The CHARS or X option can be specified up to 4 times.
[3] The COPYG or G option can be specified up to 8 times.

BURST=Y
BURST=N
B=Y
B=N
specifies whether the output from this device should be threaded into the Burster-Trimmer-Stacker on a 3800 printer. This option has meaning only to a non-z/VM system.

CHARS=*tablename*
X=*tablename*
specifies the 1- to 4-character name of a character arrangement table, which defines the characters for printing on a 3800 printer. You can specify this option up to four times, once for each table.

COPYG=*nnn*
G=*nnn*
specifies the copy grouping for the output of this device when printed on a 3800 printer. This value can be 1 - 255. You can specify this option up to eight times, indicating eight copy groups.

FLASH=*overlay*
O=*overlay*
specifies the 1- to 8-character name of the forms overlay frame to be used when printing the output of this device on a 3800 printer.

FLASHC=*modify*
Q=*modify*
specifies the total number of copies of the output of this device on which the forms overlay is to be printed on a 3800 printer. This value can be 1 - 255.

MODIFY=*modify*
Y=*modify*
specifies the 1- to 8-character name of the copy modification module to be used in modifying the data produced by this device when printed on a 3800 printer.

MODTRC=*n*
M=*n*
specifies the table reference character for selecting the character arrangement table that is to be used when printing the copy modification text on a 3800 printer. This value can be 0, 1, 2, or 3.

OPTCD=J
specifies that each line of data produced by this device contains a table reference character for a 3800 printer.

RSCS ignores the remainder of the 127-byte tag.

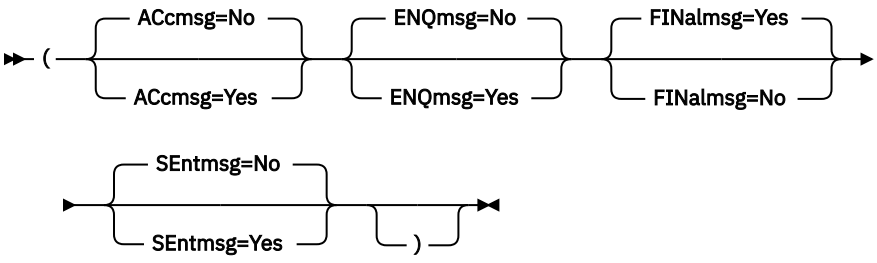
System Options

When scanning the TAG command, RSCS assumes that a system option is anything immediately after a left (open) parenthesis and immediately before a following right (close) parenthesis, if included. If you want to specify system options and user options, enclose the system options in parentheses:

```
tag ... (system options) user options
```

To specify default system options for your local system, use the OPTION statement in the configuration file. Specifying a system option on the CP TAG command overrides the system default for that one file.

System Options



ACcmsg=
specifies whether the local RSCS system generates the initial file accepted message (DMT102I).

No
does not generate the message. This is the default.

Yes
sends the message to the originating virtual machine.

This message tells you that RSCS has accepted your file for transmission to its ultimate destination. It does not tell you on which link or links the file is queued.

ENQmsg=
specifies whether the local RSCS system generates the initial file queued message (DMT101I).

No
does not generate the message. This is the default.

Yes
sends the message to the originating virtual machine.

If your local RSCS system is using the support that routes a node through multiple links and you specify ENQMSG=YES, you will receive one message for each link on which the file is queued. To avoid this, specify ENQMSG=NO and ACCMSG=YES.

FINalmsg=
specifies whether RSCS delivers the confirmation-of-arrival message from the destination RSCS system (DMT104I for a user ID; DMT147I for a printer or workstation).

Yes
sends the message to both the originating virtual machine and the destination virtual machine. This is the default.

No
sends the message to the destination virtual machine only.

SEntmsg=
specifies whether RSCS delivers the confirmation-of-sending messages from intermediate RSCS systems (DMT147I).

No
does not generate the message. This is the default.

Yes
sends the message to the originating virtual machine.

User Options

When scanning the TAG command, RSCS assumes a user option is anything immediately after a right (close) parenthesis. As these options are defined by the user, RSCS does not process them and just passes them on.

If you want to specify user options without specifying system options, include both left and right parentheses (with nothing between them) before the user options:

```
tag ... ( ) user options
```

At the destination RSCS node, these user options are contained in a coded NOP record, not as a part of the tag. For more information, see usage note "3" on page 426.

Usage Notes

1. Some CP TAG options are equivalent to options on the CP SPOOL command and can be specified on either TAG or SPOOL. If an option is specified on *both* TAG and SPOOL, the TAG option specification will override the corresponding option specification on SPOOL.
2. The support provided in z/VM for the specification of copy groups (COPY * nnn) is different from that provided in an NJE system such as z/OS MVS. z/VM provides for one copy group, while MVS provides for eight copy groups. Multiple copy groups must always be specified on the CP TAG command. The TAG and SPOOL equivalents are:

   Table 22. Equivalent TAG and SPOOL Operands for 3800 Printers

TAG command	SPOOL command
CHARS=	CHARS
FLASH/FLASHC=	FLASH
MODIFY/MODTRC=	MODIFY
FCB=	FCB
COPYG=	COPY * *nnn*
FORMS=	FORM

   You can specify additional optional operands. See *z/VM: CP Commands and Utilities Reference* for details.
3. When you send a file from one RSCS virtual machine to another RSCS virtual machine, the original tag information is usually contained in a coded NOP record directly after the new tag for that file. RSCS places the original tag data in the second record of the first SPLINK with a NOP CCW. When

the destination system completely receives the file, RSCS re-tags the file with the new information indicating the file origin. You can receive the original tag information using Diagnose code X'14'.

4. If you specify an incorrect combination of PRT and FEATURE settings, error message DMT911E is issued to the sender of the file. This may not be the FO, because the file could have been sent from a PSF machine. File processing ends and the default translation does not occur on the file. Table 23 on page 427 provides the correct combinations of PRT and FEATURE settings.

Table 23. Correct Combinations of PRT and FEATURE Settings

TRans=	FEATure= DA	FEATure= AT	FEATure= DBCS	FEATure= DBCSAT
APL	X	X		X
APL2		X		X
TEXT	X	X		X
DBCS			X	X
DBCSAPL				X
DBCSAPL2				X
DBCSTEXT				X
ASISCC	X	X	X	X
GRAF	X	X	X	X
GRAPH	X	X	X	X
NOTR	X	X	X	X

Notes:

- If APL, APL2, or TEXT is specified for the PRT option, and the FEATURE option is set to DBCSAT, there is no DBCS translation of the file, only APL, APL2, or TEXT. The DBCS translation occurs only with APL, APL2, or TEXT translation when the PRT setting is DBCSAPL, DBCSAPL2, or DBCSTEXT.
- ASISCC, GRAF, GRAPH, and NOTR options do not require any FEATURE option to be specified on the START command.

5. When a file that was sent from a remote node is destined for a user at the local node, RSCS places a new TAG at the beginning of the file. This TAG contains the origin information of the file.

   For example, RSCS receives the following file from a remote node:

```
FILE (1454) ORIGIN GDLSYS   BILLD     5/10/95 13 30 22 EST JOBID 01454
```

   The final TAG that RSCS creates for this file would then have the following format:

```
DC Layout of TAG    Description of DC Field     Example Layout

DC    C'FILE ('     Start of text portion       File (
DC    C'....'       Origin spoolid              1454
DC    C') ORIGIN '  More text                   ) ORIGIN
DC    CL8' '        Origin nodeid               GDLSYS
DC    C' '          Spacer
DC    CL8' '        Origin userid               BILLD
DC    C' '          Spacer
DC    CL24' '       Origin TOD clock            5/10/95 13 30 22 EST
DC    C'  JOBID '   More text                   JOBID
DC    CL5' '        Origin Job Number           01454
```

Chapter 17. CMS Functions Used with RSCS

RSCS includes two functions that you can use from CMS to perform some RSCS operations. You can use the PPS command (PPS EXEC) from the CMS ready prompt. You can use the PPS macro (PPS XEDIT) from within the XEDIT environment.

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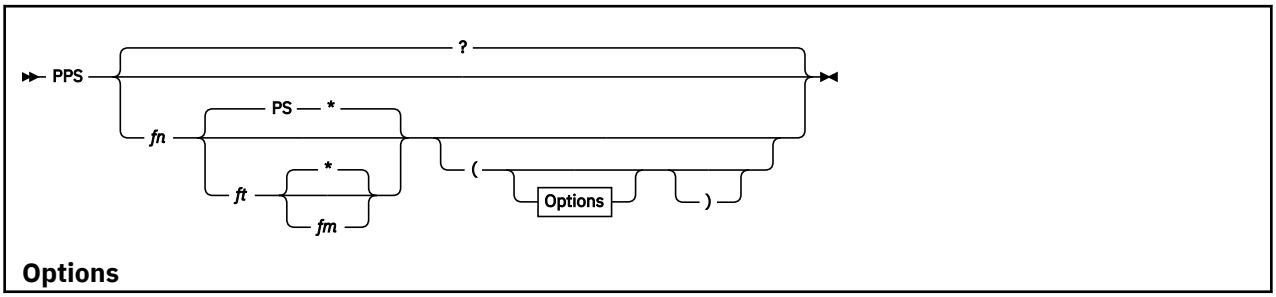
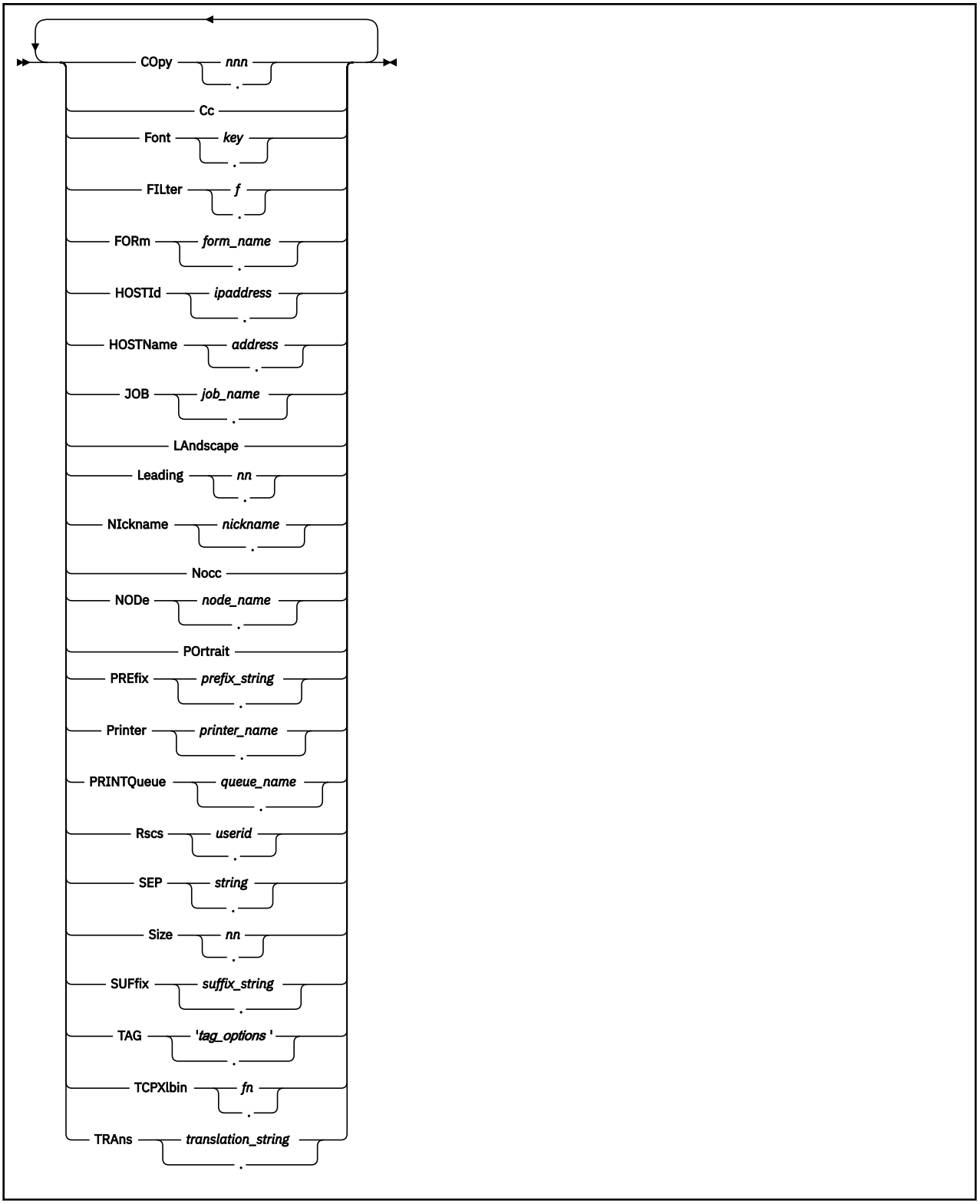
PPS EXEC





Purpose

The PPS command can be used from the CMS ready prompt to send files, including PostScript files, to:

- An RSCS LPR-type link using the LPRXONE or LPRXPSE sample exit routine
- An RSCS TCPASCII-type link using the ASCXONE or ASCXPSE sample exit routine

Operands

?
displays a short Help that lists the PPS command options. This is the default if the command is entered without any operands.

fn
is the file name of the file to print.

ft
is the file type of the file to print. The default is PS.

***
fm
is the file mode of the file to print. The default is *, meaning the first occurrence of the file name and file type on any accessed disk will be printed.

COpy *nnn*
specifies the number of copies to be printed. This value can be 1 - 255. The default is COPY 1.

Cc
specifies that the file to be printed already contains carriage control characters in column one of each record. This is the default for file type LISTING.

FILter *f*
specifies a 1-character print filter used in the control file sent to the remote daemon.

Font *key*
specifies a 2-character key that represents the name of the font to be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

key
Font name

CB
Courier-Bold

CI
Courier-Oblique

CP
Courier (exit default)

CX
Courier-BoldOblique

HB
Helvetica-Bold

HI
Helvetica-Oblique

HP
Helvetica

HX
Helvetica-BoldOblique

SP
Symbol

TB
Times-Bold

TI
Times-Italic

TP
Times-Roman

TX
Times-BoldItalic

FORm *form_name*
specifies a 1- to 8-character name used as the form when the file is spooled to RSCS for printing.

Note: FORM is not applicable, nor used, when the FONT, LANDSCAPE, LEADING, PORTRAIT, or SIZE operand is specified.

HOSTId *idaddress*
specifies the host IP address (in dotted decimal) of a remote daemon.

HOSTName *address*
specifies up to 255 characters of the fully qualified host name of a remote daemon.

Note: Use of this operand requires the RSCS domain name server, which will resolve the host name address to an IP address.

JOB *job_name*
specifies a 1- to 8-character job name or additional job information. The default job name is the file name. Depending on the LPR server, this allows job information to be printed on the burst page. The job name will also be used for the name of the source file by the LPRXONE and LPRXPSE sample exits.

LAndscape
specifies that the file should be printed in landscape mode. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

Leading *nn*
specifies a 2-digit additional leading size, which will be added to the font size to give leading. The leading sizes 0.0 - 9.9 are specified as LEADING values 00 - 99. The default is 09 for portrait and 12 for landscape orientation. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

NIckname *nickname*
specifies the name of a nickname tag within an RSCS NAMES file containing additional keywords to be used when printing a file. This option is valid only for print files destined to an LPR-type link using the USER=YES link parameter. See usage note “4” on page 435 for a list of the available keyword tag/value pairs.

Nocc
specifies that the file to be printed does not contain carriage control characters in column one of each record. This is the default for all file types except LISTING.

NODe *node_name*
specifies the name of the node where the printer is located. If this option is not specified, the printer is assumed to be attached to the local RSCS node.

POrtrait
specifies that the file should be printed in portrait mode. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

PREfix *prefix_string*
specifies up to 500 characters (250 when packed by RSCS) of a prefix string for the LPRXONE or LPRXPSE sample exit to send to the printer prior to sending the data. This string can be used to initialize the printer, such as selecting a paper tray. For examples of prefix PostScript strings, see Appendix A, “Sample Prefix and Suffix PostScript Strings,” on page 443.

The prefix string can be split with part sent before the separator page and part sent after. The string will be split if the X'FF04' divider characters are detected within the prefix string. The part before the divider characters will be sent prior to the separator page with the remaining part sent after.

Printer ***printer_name***
specifies the name of an RSCS LPR-type or TCPASCII-type link. This option must be specified on the command invocation, in LASTING GLOBALV, or within the selected nickname in the RSCS NAMES file.

PRINTQueue ***queue_name***
specifies up to 256 characters of a printer queue name.

Rscs ***userid***
specifies the user ID of the virtual machine running RSCS. The default is the user ID returned from the CMS IDENTIFY command.

SEP ***string***
specifies a separator page setting for an LPR-type link exit to use. The LPRXONE and LPRXPSE sample exits will accept the following settings:

YES
Sends an RSCS-style separator page in front of the file.

NO
No separator is requested or produced.

HOST
Includes the 'L' control file record requesting a banner page to be produced by the remote daemon.

2P
Requests a two-page separator. This is useful with duplexing so that the print data starts on a fresh page.

Any other string settings will be ignored.

Size ***nn***
specifies the 2-digit font size. This value can be 04 - 99. The default is 11 for portrait and 10 for landscape orientation. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

SUFfix ***suffix_string***
specifies up to 500 characters (250 when packed by RSCS) of a suffix string for the LPRXONE or LPRXPSE sample exit to send to the printer after sending the data. This string can be used to reset the printer state. For information about suffix PostScript strings, see Appendix A, “Sample Prefix and Suffix PostScript Strings,” on page 443.

TAG '*tag_options*'
specifies any valid RSCS-accepted CP TAG command options. If you specify this option, the data must start with the TAG priority option.

Note: All characters between the quote immediately following the TAG operand and the last quote on the PPS command invocation will become the *tag_options*.

An example of using TAG on the command line is:

```
TAG '50 (ACCMSG=YES'
```

An example of using TAG within an RSCS NAMES file is:

```
:TAG.50 (ACCMSG=YES
```

Note: Quotes should not be used in the :TAG. nickname entry.

TCPXlbin ***fn***
specifies the file name of a TCP/IP TCPXLBIN file containing a translation table for the LPRXONE or LPRXPSE sample exit to use when printing this file.

TRAns ***translation_string***
specifies up to 512 characters of a replacement translation table for the LPRXONE or LPRXPSE sample exit to use when printing this file.

Usage Notes

1. The LASTING GLOBALV file can be used to save command options. If the PPS command is issued with options only (that is no file name is provided to print), the specified options will be saved in LASTING GLOBALV. When the PPS command is issued, the options will be obtained from LASTING GLOBALV. Values saved in LASTING GLOBALV can be overridden by specifying new values for those options when issuing the PPS command.
2. For those options which have a keyword/value pair, specifying a period (.) will remove the keyword/value pair from LASTING GLOBALV.
3. The first record of a file will be examined for the PostScript identifier (%!PS) in both ASCII and EBCDIC. If this identifier is found at the beginning of the record, the file is assumed to be PostScript. The file will be packed into blocks of 80 bytes with line feeds separating the records, prior to issuing the CMS PUNCH command.
4. The NICKNAME option can be used to specify a nickname tag within an RSCS NAMES file on any accessed disk, which contains additional keywords that can be used when printing a file to an LPR-type link. These keywords will be placed as No-Operational records at the beginning of the spool file. The LPR-type link on which the file is printed must have the link parameter USER=YES specified in order for these keywords to be used.

   The keywords are standard `:`*tag*`.`*value* pairs following a `:nick.`*name* tag, where *name* matches the name specified with the NICKNAME option. All PPS EXEC options except NICKNAME can be placed within the RSCS NAMES file.

   The nickname entry can be used to specify keywords, such as `:TRANS.`, which are too long to include in the PPS command invocation or within LASTING GLOBALV.

   Rules for the RSCS NAMES file:

   - File can be on any accessed disk.
   - Any non-blank character preceding the colon (:) will cause the line to become a comment and not processed or used.
   - Within a nickname entry, each keyword/value record must be on a separate line.
   - Keywords must be fully specified, with no abbreviations. The available keywords are:

     `:COPY.`*nnn*
     `:CC.`
     `:FILTER.`*f*
     `:FONT.`*key*
     `:FORM.`*form_name*
     `:HOSTID.`*idaddress*
     `:HOSTNAME.`*address*
     `:JOB.`*job_name*
     `:LANDSCAPE.`
     `:LEADING.`*nn*
     `:NOCC.`
     `:NODE.`*node_name*
     `:PORTRAIT.`
     `:PREFIX.`*prefix_string*
     `:PRINTER.`*printer_name*
     `:PRINTQUEUE.`*queue_name*
     `:RSCS.`*userid*
     `:SEP.`*string*
     `:SIZE.`*nn*
     `:SUFFIX.`*suffix_string*
     `:TCPXLBIN.`*fn*
     `:TAG.`*tag_options*

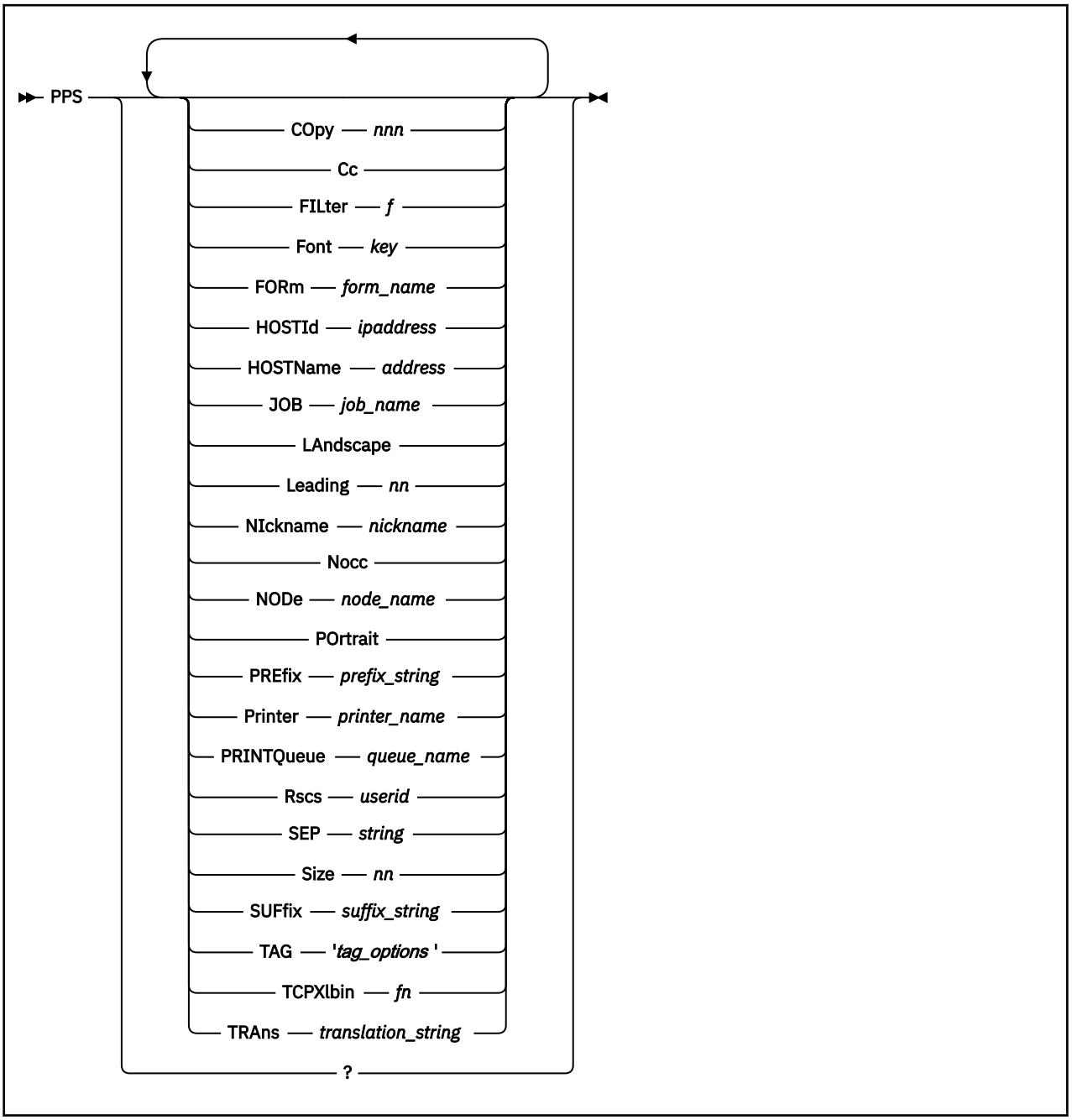
:TRANS.*translation_string*

- Each record will be uppercased before processing, except for the :FILTER., :HOSTNAME., and :PRINTQUEUE. tag data, which will be left as specified.
- The same keyword can be used multiple times within a nickname entry for a keyword/value pair longer than will fit on one record. For example:

```
:TRANS.100 characters of the translation table
:TRANS.100 characters of the translation table
:TRANS.100 characters of the translation table
:TRANS.100 characters of the translation table
:TRANS.112 characters of the translation table
```

5. Any options specified on the command invocation will override LASTING GLOBALV settings which will override nickname tag settings.

PPS XEDIT



Purpose

The PPS XEDIT macro can be used from within the XEDIT environment to send files, including PostScript files, to:

- An RSCS LPR-type link using the LPRXONE or LPRXPSE sample exit routine
- An RSCS TCPASCII-type link using the ASCXONE or ASCXPSE sample exit routine

Operands

?
displays a short Help describing the XEDIT macro input parameters.

COpy *nnn*
specifies the number of copies to be printed. This value can be 1 - 255. The default is COPY 1.

Cc
specifies that the file to be printed already contains carriage control characters in column one of each record. This is the default for file type LISTING.

FILter *f*
specifies a 1-character print filter used in the control file sent to the remote daemon.

Font *key*
specifies a 2-character key that represents the name of the font to be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

key
Font name

CB
Courier-Bold

CI
Courier-Oblique

CP
Courier (exit default)

CX
Courier-BoldOblique

HB
Helvetica-Bold

HI
Helvetica-Oblique

HP
Helvetica

HX
Helvetica-BoldOblique

SP
Symbol

TB
Times-Bold

TI
Times-Italic

TP
Times-Roman

TX
Times-BoldItalic

FORm *form_name*
specifies a 1- to 8-character name to be used as the form when the file is spooled to RSCS for printing.

Note: FORM is not applicable, nor used, when the FONT, LANDSCAPE, LEADING, PORTRAIT, or SIZE operand is specified.

HOSTId *idaddress*
specifies the host IP address (in dotted decimal) of a remote daemon.

HOSTName *address*
specifies up to 255 characters of the fully qualified host name of a remote daemon.

Note: Use of this operand requires the RSCS domain name server, which will resolve the host name address to an IP address.

JOB *job_name*
specifies a 1- to 8-character job name or additional job information. The default job name is the file name. Depending on the LPR server, this allows job information to be printed on the burst page. The job name will also be used for the name of the source file by the LPRXONE and LPRXPSE sample exits.

LAndscape
specifies that the file should be printed in landscape mode. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

Leading *nn*
specifies a 2-digit additional leading size to be added to the font size to give leading. The leading sizes 0.0 - 9.9 are specified as LEADING values 00 - 99. The default is 09 for portrait and 12 for landscape orientation. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

NIckname *nickname*
specifies a nickname entry within an RSCS NAMES file that contains additional keywords to be used when printing a file. This option is valid only for print files destined to an LPR-type link using the USER=YES link parameter. See usage note "3" on page 440 for a list of the available keyword tag/value pairs.

Nocc
specifies that the file to be printed does not contain carriage control characters in column one of each record. This is the default for all file types except LISTING.

NODe *node_name*
specifies the name of the node where the printer is located. If this option is not specified, the printer is assumed to be attached to the local RSCS node.

POrtrait
specifies that the file should be printed in portrait mode. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

PREfix *prefix_string*
specifies up to 500 characters (250 when packed by RSCS) of a prefix string for the LPRXONE or LPRXPSE sample exit to send to the printer prior to sending the data. This string can be used to initialize the printer, such as selecting a paper tray. For examples of prefix PostScript strings, see Appendix A, "Sample Prefix and Suffix PostScript Strings," on page 443.

The prefix string can be split with part sent before the separator page and part sent after. The string will be split if the X'FF04' divider characters are detected within the prefix string. The part before the divider characters will be sent prior to the separator page, with the remaining part sent after.

Printer *printer_name*
specifies the name of an RSCS LPR-type or TCPASCII-type link. This option must be specified on the macro, in the LASTING GLOBALV file, or within the specified nickname entry in the RSCS NAMES file.

PRINTQueue *name*
Provides up to 256 characters of a printer queue name.

Rscs *userid*
specifies the user ID of the virtual machine running RSCS. If this option is not specified, it defaults to the user ID returned from the CMS IDentify command.

SEP *string*
specifies the separator page setting for an LPR-type link exit to use. The LPRXONE and LPRXPSE sample exits will accept these settings:

YES
Sends RSCS-style separator page in front of the file.

NO
No separator is requested or produced.

HOST
Includes the 'L' control file record requesting a banner page to be produced by the remote daemon.

2P
Prints a two-page separator. This is useful with duplexing, so that the print data starts on a fresh page.

Any other string settings will be ignored.

Size *nn*
specifies the 2-digit font size. This value can be 00 - 99. The default is 11 for portrait and 10 for landscape orientation. This option can be used when printing plain text files to a PostScript printer on an LPR-type link using the LPRXPSE sample exit or on a TCPASCII-type link using the ASCXPSE sample exit.

SUFfix *string*
specifies up to 500 characters (250 when packed by RSCS) of a suffix string for the LPRXONE or LPRXPSE sample exit to send to the printer after sending the data. This string can be used to reset the printer state. For information about suffix PostScript strings, see Appendix A, “Sample Prefix and Suffix PostScript Strings,” on page 443.

TAG '*tag_options*'
specifies any valid RSCS-accepted CP TAG command options. If you specify this option, the data must start with the TAG priority option.

Note: All characters between the quote immediately following the TAG operand and the last quote on the command invocation will become the *tag_options*.

An example of using TAG on the command line is:

```
TAG '50 (ACCMSG=YES'
```

An example of using TAG within an RSCS NAMES file is:

```
:TAG.50 (ACCMSG=YES
```

Note: Quotes should not be used in the :TAG. nickname entry.

TCPXlbin *fn*
specifies the file name of a TCP/IP TCPXLBIN file containing a translation table for the LPRXONE or LPRXPSE sample exit to use when printing this file.

TRAns *translation_string*
specifies up to 512 characters for a replacement translation table for the LPRXONE or LPRXPSE sample exit to use when printing this file.

Usage Notes

1. When the PPS XEDIT macro is issued, option values will be obtained from the LASTING GLOBALV file. Those values must have been saved previously by using the PPS EXEC. Values saved in LASTING GLOBALV can be overridden by specifying those options when issuing the PPS XEDIT macro.
2. The first record of a file will be examined for the PostScript identifier (%!PS) in both ASCII and EBCDIC. If this identifier is found at the beginning of the record, the file is assumed to be PostScript. The file will be packed into blocks of 80 bytes with line feeds separating the records, prior to issuing the CMS PUNCH command.
3. The NICKNAME option can be used to specify a nickname tag within an RSCS NAMES file on any accessed disk, which contains additional keywords that can be used when printing a file to an LPR-type link. These keywords will be placed as No-Operational records at the beginning of the spool file. The LPR-type link on which the file is printed must have the link parameter USER=YES specified in order for these keywords to be used.

The keywords are standard `:tag.`*value* pairs following a `:nick.`*name* tag, where *name* matches the name specified with the NICKNAME option. All PPS XEDIT options except NICKNAME can be placed within the RSCS NAMES file.

The nickname entry can be used to specify keywords, such as `:TRANS.`, which are too long to include in the PPS macro invocation or within LASTING GLOBALV.

Rules for the RSCS NAMES file:

- File can be on any accessed disk.
- Any non-blank character preceding the colon (:) will cause the line to become a comment and not processed or used.
- Each record will be uppercased before processing, except for the `:FILTER.`, `:HOSTNAME.`, and `:PRINTQUEUE.` tag data, which will be left as specified.
- The same keyword can be used multiple times within a nickname tag for a keyword/value pair longer than will fit on one record. For example:

```
:TRANS.100 characters of the translation table
:TRANS.100 characters of the translation table
:TRANS.100 characters of the translation table
:TRANS.100 characters of the translation table
:TRANS.112 characters of the translation table
```

- Keywords must be fully specified, with no abbreviations.
- The available keywords are:

  `:COPY.`*nnn*
  `:CC.`
  `:FILTER.`*f*
  `:FONT.`*key*
  `:FORM.`*form_name*
  `:HOSTID.`*idaddress*
  `:HOSTNAME.`*address*
  `:JOB.`*job_name*
  `:LANDSCAPE.`
  `:LEADING.`*nn*
  `:NOCC.`
  `:NODE.`*node_name*
  `:PORTRAIT.`
  `:PREFIX.`*prefix_string*
  `:PRINTER.`*printer_name*
  `:PRINTQUEUE.`*queue_name*
  `:RSCS.`*userid*
  `:SEP.`*string*
  `:SIZE.`*nn*
  `:SUFFIX.`*suffix_string*
  `:TCPXLBIN.`*fn*
  `:TAG.`*tag_options*
  `:TRANS.`*translation_string*

4. Any options specified on the macro invocation will override LASTING GLOBALV settings which will override nickname tag settings.

Appendix A. Sample Prefix and Suffix PostScript Strings

Prefix and suffix strings can be defined and used by LPR-type links to initialize or reset the printer, such as selecting the paper tray or turning on duplexing. When the printer is PostScript, the prefix and suffix strings can be PostScript commands.

The prefix and suffix strings can be defined within the configuration file read by the LPRXFORM exit, making them selectable via a form.

A sample PIPELINE that could be used to convert commands from EBCDIC to the format required by the prefix and suffix strings is:

```
'PIPE < INPUT EBCDIC A',
'| Strip',
'| xlate *-* from 1047 to 819 ba 5b bb 5d
'|Specs 1-* C2X 1',
'|Join * /0D0A/',
'| > OUTPUT ASCII A'
```

Some sample prefix PostScript commands are:

- To turn off duplexing and select the paper from tray 1 for a separator page, the PostScript commands would be:

  ```
  %!PS-AdobeCRLF
  statusdict begin false setduplexmode 0 setpapertray endCRLF
  ```

  The prefix string would be:

  ```
  PREFIX=2521
  PREFIX=50532D41646F62650D0A
  PREFIX=737461747573646963742062656769 6E2066616C736520
  PREFIX=7365746475706C65786D6F6465203020736574706170657
  PREFIX=727472617920656E640D0A
  ```

- To split the prefix string before and after the separator page, the prefix string would be:

  ```
  PREFIX=FF04
  ```

- To turn on duplexing and select the paper from tray 2 for a separator page, the PostScript commands would be:

  ```
  *%!PS-AdobeCRLF
  *statusdict begin true setduplexmode 1 setpapertray endCRLF
  ```

  The prefix string would be:

  ```
  PREFIX=2521
  PREFIX=50532D41646F62650D0A
  PREFIX=737461747573646963742062656769 6E207472756520
  PREFIX=7365746475706C65786D6F6465203120736574706170
  PREFIX=657274726179206 56E640D0A
  ```

Note: The above PostScript commands work with the IBM network printer. The paper tray numbers might be different for each printer manufacturer.

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Appendix B. Common RSCS Problems and Solutions

This appendix identifies some common problems that could occur while using RSCS and describes some actions you can take to resolve them. If a problem cannot be resolved using the described solution, contact the IBM Support Center for further assistance.

The first section identifies possible problems in the RSCS base. For RSCS Interchange problems, see "RSCS Interchange Problems and Solutions" on page 447.

For information about performance considerations, see *z/VM: RSCS Networking Planning and Configuration*.

Problem	Solution
ABEND0C1	If you are using EXITS, this abend can be caused by the entry point name not being the same as the label on the RMOD macro plus 2 characters. See *z/VM: RSCS Networking Exit Customization* for information about invoking exit routines.
ABEND0C2	If a 0C2 abend occurs after starting the RSCS/VTAM Interface task, ensure the RSCS application ID (APPLID) definition in VTAM includes the AUTHEXIT=YES Parameter.
ABEND0C4 or ABEND0C5	Check that SAVAREA=PREALLOC (recommended) or RENT=NO and SAVAREA=NONE is used for exit routines.
Message GCTABD226E or GCTABD232E	A problem occurred when IPLing GCS. Ensure that RSCS has been authorized to the GCS group being IPLed.
Files not being sent or printed	• Check if the CP TRANSFER command was used to transfer the file, instead of the RSCS TRANSFER command. RSCS will not know the file is there if the CP TRANSFER command is used. • Use the QUERY command, described in Chapter 12, "RSCS Commands," on page 127, to check the following: – The FORM, CLASS, and FCB of the files match the FORM, CLASS, and FCB of the link. Try specifying FORM * and CLASS * on the link definition. – If an FCB was used, ensure the file information in it is correct.
Link deactivates with files queued	If files are queued on a networking link and they are not in HOLD status, determine if ITO=0 has been specified for the local and remote nodes of this link. If ITO=0 is specified on both nodes, the files cannot be sent because the link on the remote node deactivates before the files are sent. To correct the problem, specify a different ITO value on one side of the link.
On NJE links (any type), some files are sent but others are not	If the problem appears to be related to the size of the file, try specifying TA=0 on the link parameters statement.

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Problem	Solution
TCP/IP links will not connect	Ensure the following information is specified correctly on each end (local and remote node) of the link: • TCP/IP port number – If RESTRICTLOWPORTS is specified, then the default ports used by RSCS (for example, 175 on TCPNJE-type links, 515 on LPR-type links) will be restricted. To correct the problem, grant RSCS access to the port in question with the TCP/IP configuration file, use a port that is not restricted, or in the case of LPR links use the SECURE=NO link parm. • The IP address (a local TCPNJE-type link must specify the IP address of the target remote node) For TCPNJE-type links, ensure that: • The TCPNJE-type link has been started on the local and remote nodes • The port redirector task has started on the remote node • If one or both of the nodes have multiple IP interfaces to the TCP/IP stack, you might need to use the LCLHOST=*ipaddress* operand to tell RSCS which IP address it should use for sending socket connect requests for the link. You can specify this value on the DEFINE or START command (see "TCPNJE-Type Link Operational Parameters" on page 352) or on the PARM statement for the link (see *z/VM: RSCS Networking Planning and Configuration*). The IP address specified on LCLHOST must match the IP address provided with the HOST operand on the remote side.
TCPNJE-type links to JES2 do not transmit files queued for sending when the link connects; however, RSCS is able to receive files sent by JES2	Ensure that JES2 APAR OA22718 has been applied.
Unusable file	The CP TRANSFER command may have been used to transfer files out of the RSCS reader. You should use the RSCS TRANSFER command, not the CP TRANSFER command.
Negative Acknowledgment Received by a LPR- type link	The printer queue name supplied to the LPR- type link may not be correct. If the supplied name was uppercased, try specifying it in lowercase. Some common printer queue names are *raw*, *text*, *lp*, and *print-lp*.
Message DMTLPR083E	When starting an LPR link, a bind socket error, PERMISSION DENIED, occurs. This can occur when the ASSORTEDPARMS statement in the TCP/IP configuration has the RESTRICTEDLOWPORTS option specified. To resolve the problem, do one of the following: • Specify PORT statements for ports 721-731 authorizing the RSCS machine. • Specify the SECure=No LPR link parameter to cause RSCS to use ports that are not restricted. **Note:** Certain LPR daemons require ports 721-731 to be used. Some of these daemons will allow an override by configuring "security off". See relevant documentation for the remote LPR daemon being used.
Message DMT083E Return Code = -1013	Increase the MAXCONN setting in the directory for the RSCS user ID. Then recycle the RSCS server by shutting it down, logging the ID off, logging back on, and restarting RSCS.
Message DMT083E Return Code = -1014	Increase the MAXCONN setting in the directory for the TCP/IP user ID. Then recycle the TCP/IP server by shutting it down, logging the ID off, logging back on, and restarting TCP/IP.
Message DMTTNE185E	If the TCPNJE link is defined with the remote node name in the NODE *nodeid* parameter instead of the *linkid* parameter, ensure that the link is part of a route group.

RSCS Interchange Problems and Solutions

The following table describes some possible problems you may encounter with RSCS Interchange and contains suggestions for actions you may take. For additional information about debugging and tracing problems in RSCS Interchange, see *z/VM: RSCS Networking Exit Customization*.

Table 24. Common RSCS Interchange Problems and Messages with Possible Solutions

Problem	System Action/Symptom	Possible Solution
Unrecognized Note/Mail Format.	System Administrator receives the note.	Code additional format recognition exits for the unrecognized mail format.
Destination Address Unknown (Origin is z/VM User).	RSCS Interchange cannot resolve an address. Original note is transferred back to user. User receives another note from the RSCS Interchange server stating the problem.	Define a valid nickname.
Destination Address Unknown (Origin is IP User).	RSCS Interchange does not validate the address; action goes to RSCS.	Send the note again.
Server Disk Full (A-Disk or Log Disk).	Nickname table is too big or contains too many log files (LOGKEEP value is high).	Allocate more disk space; decrease LOGKEEP value.
Server not Initialized.	• Configuration file is missing. • Error in configuration file: missing or incorrect statement.	Add or correct the configuration file.
REXX trace not supported on compiled exec.	DEBUG command gives error message when trying to issue DEBUG on compiled REXX exec.	Stop the RSCS Interchange server. Rename the ACHAMAIN CEXEC to ACHAMAIN OCEXEC. Restart the RSCS Interchange server, then enter the DEBUG command again.

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Bibliography

This topic lists the publications in the z/VM library. For abstracts of the z/VM publications, see *z/VM: General Information*.

Where to Get z/VM Information

The current z/VM product documentation is available in IBM Documentation - z/VM (https://www.ibm.com/docs/en/zvm).

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Device Support Facilities

- Device Support Facilities (ICKDSF): User's Guide and Reference (https://www.ibm.com/servers/resourcelink/svc00100.nsf/pages/zosv2r5gc350033/$file/ickug00_v2r5.pdf), GC35-0033

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