

Using RSCS in the New Millennium



Share Conference
Boston

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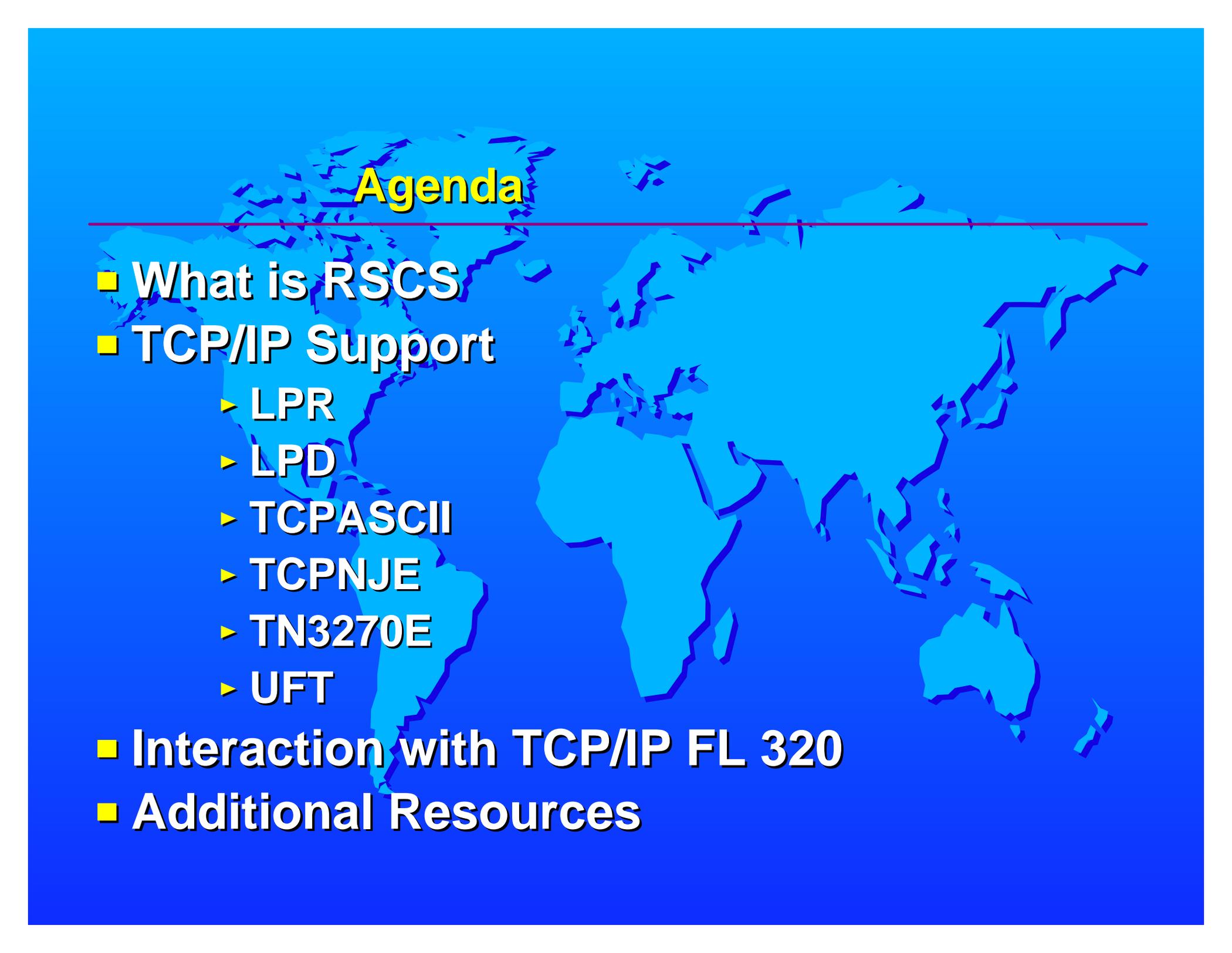
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- Virtual Machine/Enterprise System Architecture
- ACF/VTAM
- VTAM
- OV/VM
- OS/2
- AIX/ESA

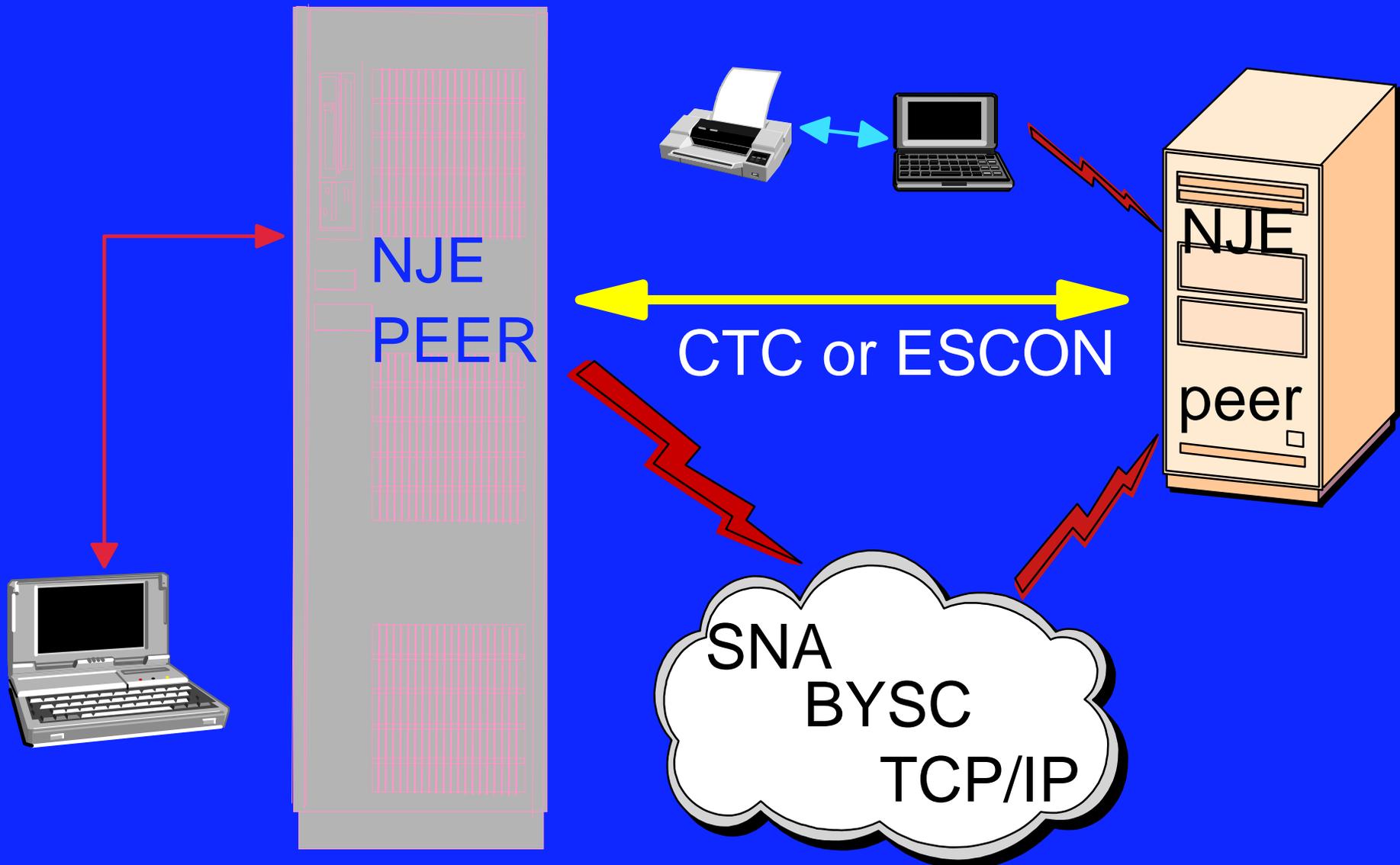


Agenda

- **What is RSCS**
- **TCP/IP Support**
 - ▶ LPR
 - ▶ LPD
 - ▶ TCPASCII
 - ▶ TCPNJE
 - ▶ TN3270E
 - ▶ UFT
- **Interaction with TCP/IP FL 320**
- **Additional Resources**

RSCS Server

General Information



What is RSCS?

- Uses VM spooling facilities to:
 - Store and retrieve data
 - Guaranteed deliver
 - Contains a "tag"
- Allows VM users to send:
 - Notes
 - E-mail
 - Messages
 - Files
 - commands



What is RSCS?

- Remote input and output
 - JCL
 - BATCH
 - Text data
- To users and systems within:
 - TCP/IP networks
 - SNA networks
 - Non-SNA networks



What is RSCS?

- Any store and forward system supporting Network Job Entry (NJE) such as:
 - VM/ESA
 - OS/390 (MVS/ESA)
 - OS/400
 - VSE/ESA
 - UNIX/LINUX
 - AIX/ESA



What is RSCS?

- Gateway between NJE and the Internet
- To exchange e-mail between VM and SMTP
- Outgoing mail can be:
 - PROFS / OfficeVision
 - CMS Notes
 - User written application
- Incoming mail converted to CMS Note format



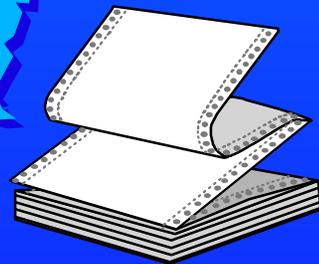
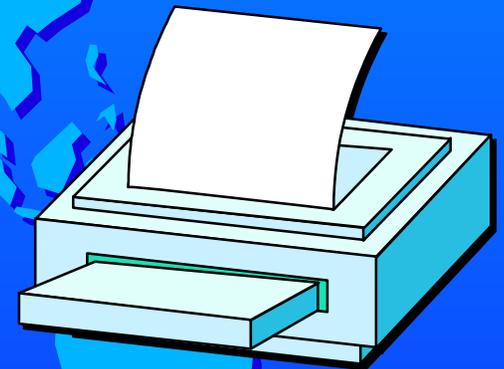
What is RSCS?

- RSCS also supports secure data transfer to workstations which support:
 - Remote Job Entry (RJE)
 - Multi-leaving RJE (MRJE)
- With connectivity options:
 - SNA
 - BI-Sync



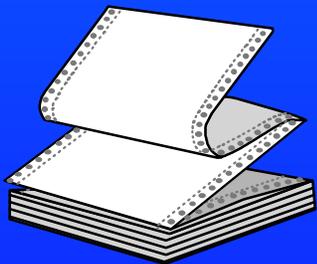
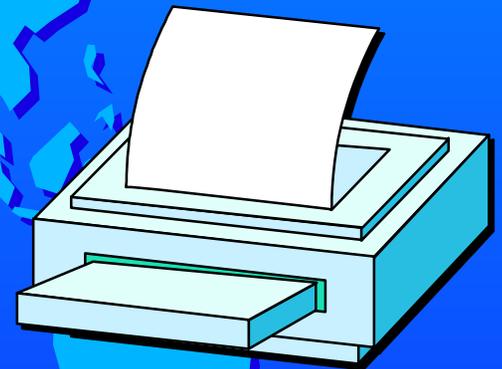
What Is RSCS?

- **A Print Server for printing:**
 - Text
 - Graphics
 - Postscript
- **On 3270 or ASCII printers**



What Is RSCS?

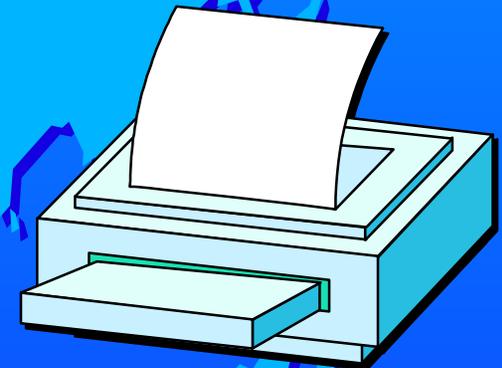
- **For printers:**
 - Channel attached locally
 - SNA attached
 - IP attached
 - VIA an LPR Daemon



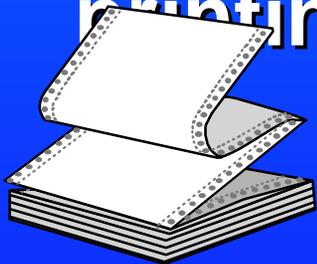
What Is RSCS?

- **Local printer links can be accessed via:**

- A local user
- Any NJE node
- LPD and UFTD links

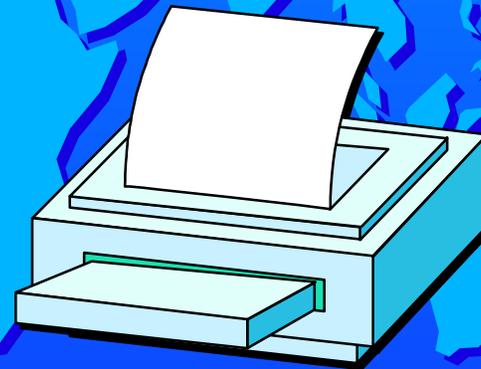
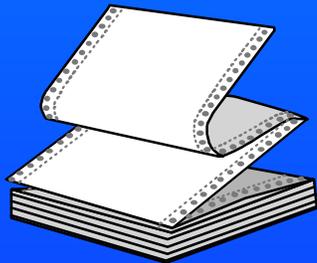


- **Can send files to remote nodes for printing**



What Is RSCS?

- **RSCS printer services allow:**
 - **Sharing between users or GVM's**
 - **For intranet and Internet print delivery transparently**



- **Accept intranet and Internet print jobs for delivery anywhere**

Using RSCS:

- RSCS can process files using:
 - CMS NOTE command
 - CMS SENDFILE command
 - RSCS PPS EXEC
 - TCP/IP LPR EXEC
 - ▶ async option
 - CP TAG/SPOOL commands
 - with CMS PRT/PUN commands



RSCS User ID's

- **Four Virtual Machines:**
 - P684096K - Install ID
 - RSCS - General Server
 - XCHANGE - E-mail Server
 - RSCSDNS - DNS Server



How RSCS Can Be Installed

- Part of VM/ESA 2.3.0 base
 - ▶ or higher
 - With a current RSU level
 - ▶ at time of order
- As a standalone product
 - With an RSU tape
- From an SDO tape

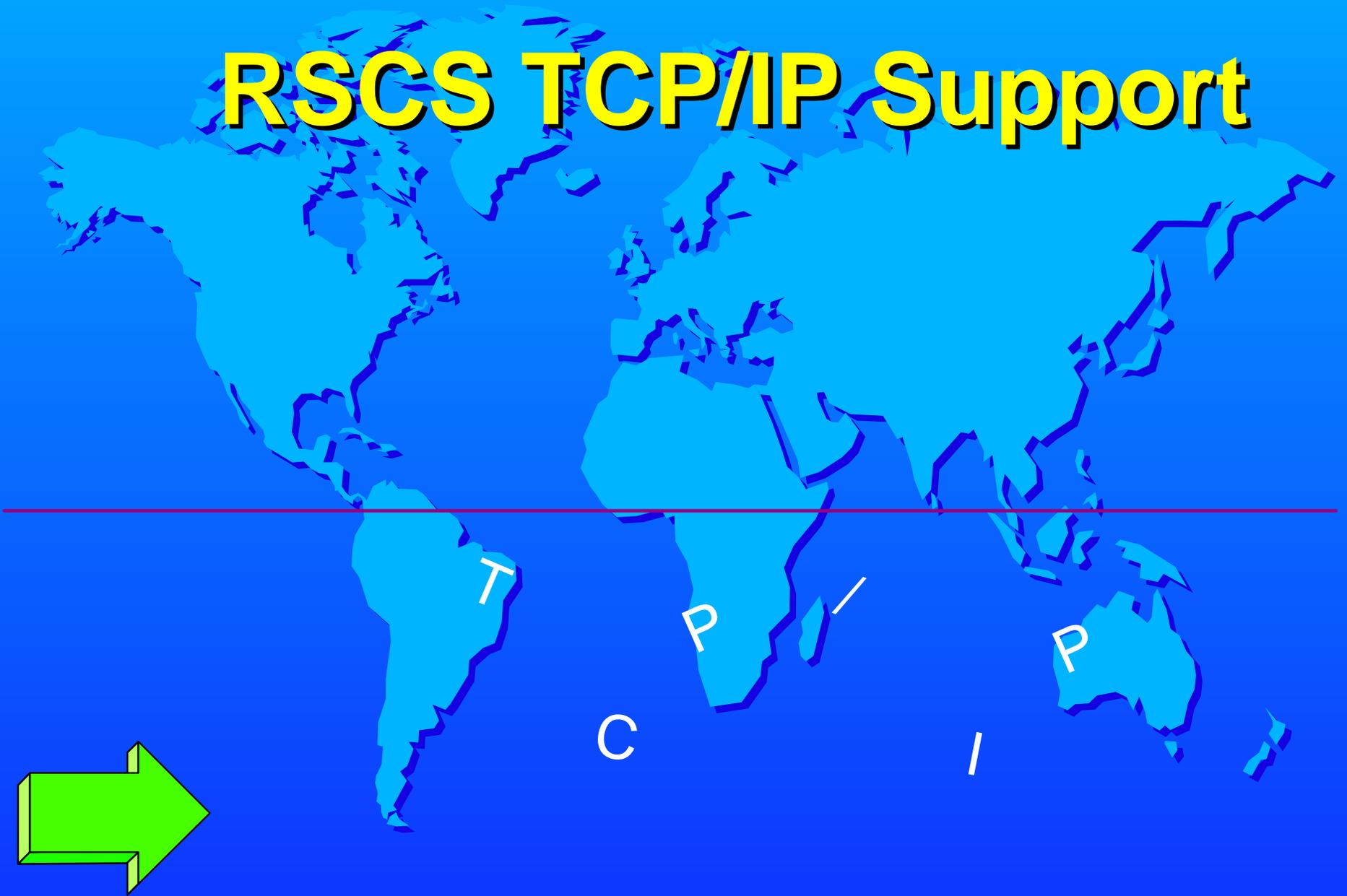


RSCS Is:

- 31-bit enabled
- ESA Capable
- Runs under GCS
 - ✓ Group Control System
 - ✓ With VTAM
- VMSES/E enabled
- RSU enabled (9902 current)



RSCS TCP/IP Support



RSCS TCP/IP Support

- **TCP/IP Support includes:**

- **LPD**

- **LPR**

- **TCPASCII**

- **TCPNJE**

- ✓ **VMNET compatible**

- **TN3270E Printer**

RSCS TCP/IP Support

- **TCP/IP Support includes (cont):**
 - **UFT (Unsolicited File Transfer)**
 - **Client**
 - **Server**

 - **Domain Name Server**
 - **RSCSDNS user ID**

 - **Sockets library**
 - ✓ **"C" like where possible**

LPR Support



RSCS LPR Support

- **Addressable from within NJE network**
- **Destination from LPD link**
- **Hostname can be:**
 - Fully qualified
 - Dotted decimal
- **One Link**
 - Support one printer
 - OR Support multiple printers
 - ▶ Group links under the same name
- **Hold file when unable to connect**
 - Notify support

RSCS LPR

Support

- **Postscript and non-postscript printing**
 - Can print plain text on postscript printers
- **Translate/no translate to ASCII**
 - tables can be overridden
- **Separator page**
 - One or Two page (for duplexing)
- **Printer setup and reset strings**
- **Imbedded PCL/SCS string support**
- **Port usage 721-731 vs 1024-2048**
- **Receive time-out**

Supplying LPR Information

- Hostid or hostname
- Printer queue name
- Prefix strings for printer setup
 - Are PCL / postscript commands
 - Can be split around separator page
- Suffix strings for printer reset
- Whether to translate to ASCII
- Translate table override
- Filter
- Separator page setting

Supplying LPR Information

- For postscript printers:
 - Font name
 - Font size
 - Leading size
 - ▶ space between lines
 - File orientation
 - ▶ landscape vs portrait
- Non-postscript requires PCL commands
 - Specified as prefix strings

Supplying LPR Information

- Previous Information can be supplied to LPR links via:
 - RSCS linkdefine and parm configuration statements
 - RSCS define and start commands
 - PPS and LPR EXEC's
 - Requires USer=YES link parm
 - use required for postscript
 - LPRXFORM exit
 - Requires SYStem=YES link parm
 - Requires spool file form name

LPRXFORM

Config Example

- **FORM=MYFORM**
HOSTNAME=ABC.END.IBM.COM
FILTER=F
SEP=2P
PREFIX=25215053
PREFIX=2D41646F
PRINTER=ptq1
- **Uses Exit's 0/1**
EXIT 0 ON LPRXFM00
EXIT 1 ON LPRXFM01

PPS/LPR EXECs

Also Support:

- Also provide the following information:
 - Number of copies
 - Carriage control
 - Form name
 - Job name
 - ✓ PPS only
 - RSCS node name
 - RSCS SVM name
 - Additional TAG information
 - ✓ PPS only

Supplying Information To PPS/LPR EXECs

- Parameters for PPS/LPR supplied:
 - On command invocation
 - Saved in LASTING GLOBALV
 - Invoke PPS without filename
 - LPRSET for LPR
 - In a nickname file
 - RSCS NAMES for PPS
 - CMS NAMES for LPR
- Command options override globalv
- globalv settings override NAMES

Additional PPS Information

- **Print files from:**
 - CMS ready
 - XEDIT environment
- **Required when printing postscript**
- **Printing to LPR or TCPASCII links**
- **Many command options require USer=Yes
LPR link parm**

RSCS NAMES

File Example

— :NICK.myname
:HOSTNAME.abc.end.ibm.com
:FILTER.f
:SEP.2p
:PREFIX.25215053
:PREFIX.2D41646F
:PRINTER.ptq1
:LA.

RSCS LPR

Exit Information

- **EXITs manipulate the data**
 - LPRXONE for non-postscript
 - LPRXPSE for postscript
- **EXITs can read a configuration file**
 - Translate tables
 - Domain and host
 - User name for 'P' record
 - Font name (LPRXPSE)
 - Postscript file (LPRXPSE)
 - Encoding (LPRXPSE)

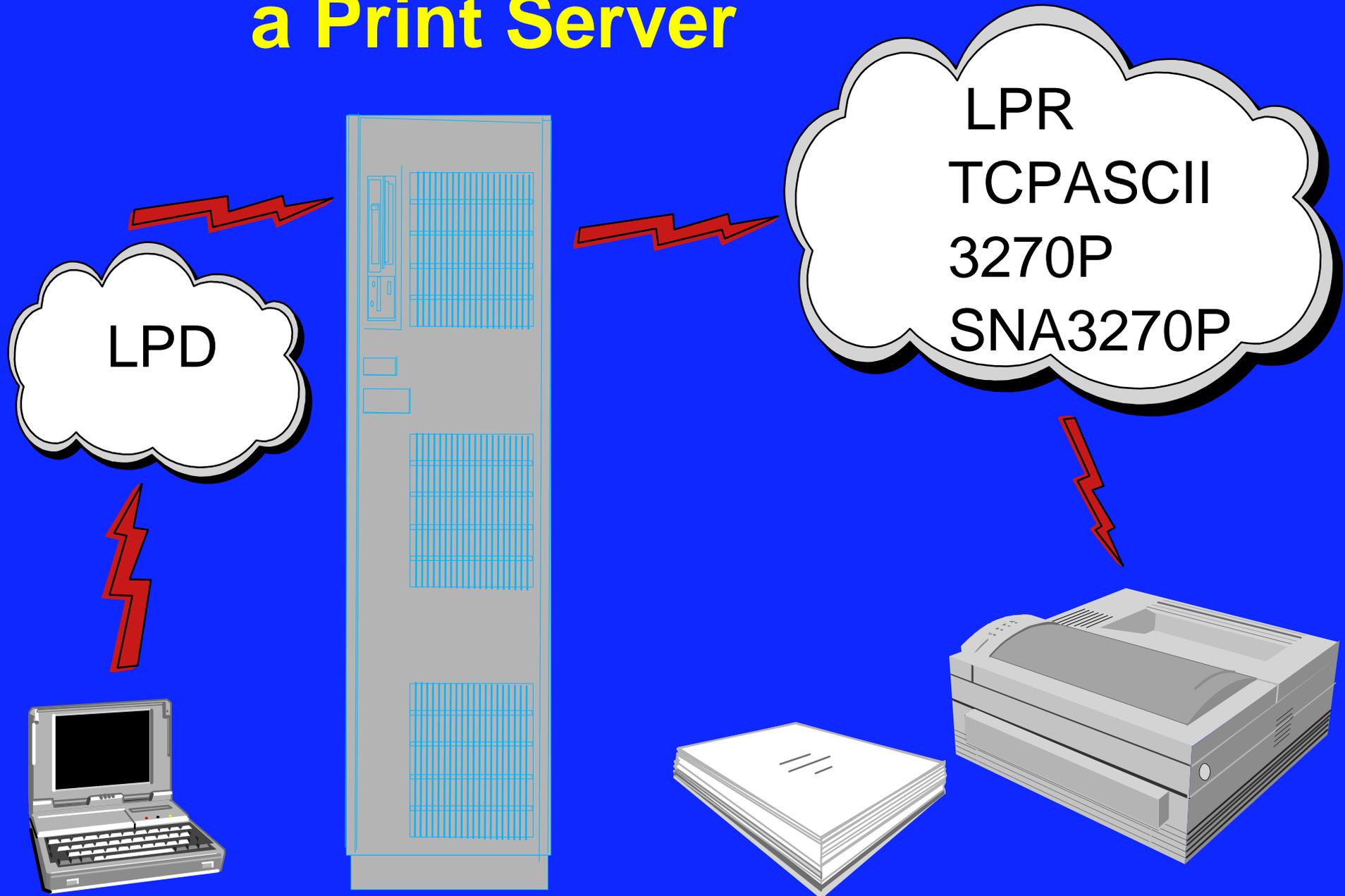
Grouping LPR Links

- Multiple LPR linkdefine statements
- Group using route group statement
 - ROUTE GROUP LPR TO LINK LPR1 LPR2 LPR3 LPR4
 - Use groupname as printer link name
- Define FORM names in LPRXFORM
 - To define IP printer
 - like hostname and printer queue name
- Use spool file form when printing
 - To select LPRXFORM form name

Why Use RSCS LPR?

- **Guaranteed deliver**
- **Deferred printing**
 - End users not left blocked
 - Waiting for printing to finish
- **Enhanced error recovery**
 - Periodic retransmit attempts
- **Users can print remotely**
- **VM print spooler**
 - When used with LPD

RSCS LPD as a Print Server



RSCS LPD as a Print Server

- Receive files from remote LPR
- Translate to EBCDIC
 - Or spool it as received
- Forward to any RSCS destination
 - Local printer or user
 - Remote NJE printer or user
 - Print 3270P, SNA3270P, LPR, etc.
- Obtain RSCS guaranteed delivery
- Utilize LPR links retry capabilities
 - Use in conjunction with LPRXFORM

RSCS LPD

Exit

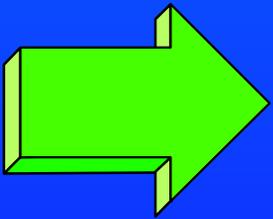
- **Exit manipulates tag and data**
 - LPDXMANY Supplied exit

- **Reads a configuration file**
 - Containing translate tables
 - Printer queue name records
 - Define spool file characteristics
 - When destination is LPR
 - ▶ Use in conjunction with LPRXFORM
 - ▶ Use 'form' positional field of PQN
 - ▶ Use ASISCC to spool data unaltered

Configuring RSCS LPD

- **Remove LPSERVE from autolog list**
 - In TCP/IP configuration
- **Change LPSERVE to RSCS for port 515 reserve list**
 - In TCP/IP configuration
- **Define one or more LPD links**
 - In RSCS configuration

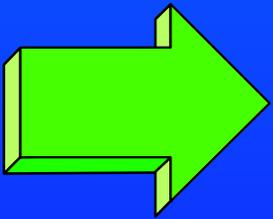
TCPASCII Support



TCPASCII LINK

- ASCII printer support when IP attached
 - Similar support as LPR
- Printer attached to a terminal server
 - LPR daemon or
 - TN3270E emulator unavailable
- Postscript and non-postscript support
- Do not use port 515
- Port configurable at terminal server

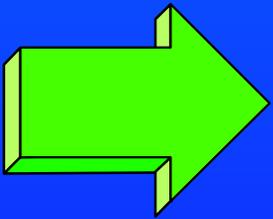
TCPNJE Support



TCPNJE LINK

- NJE link over an IP network
 - Between NJE peers
- VMNET compatible
 - Connection with VMNET can be established
- Uses well know port 175
 - Can be changed
- Several TCPNJE peers available

TN3270E Support



TN3270E

LINK

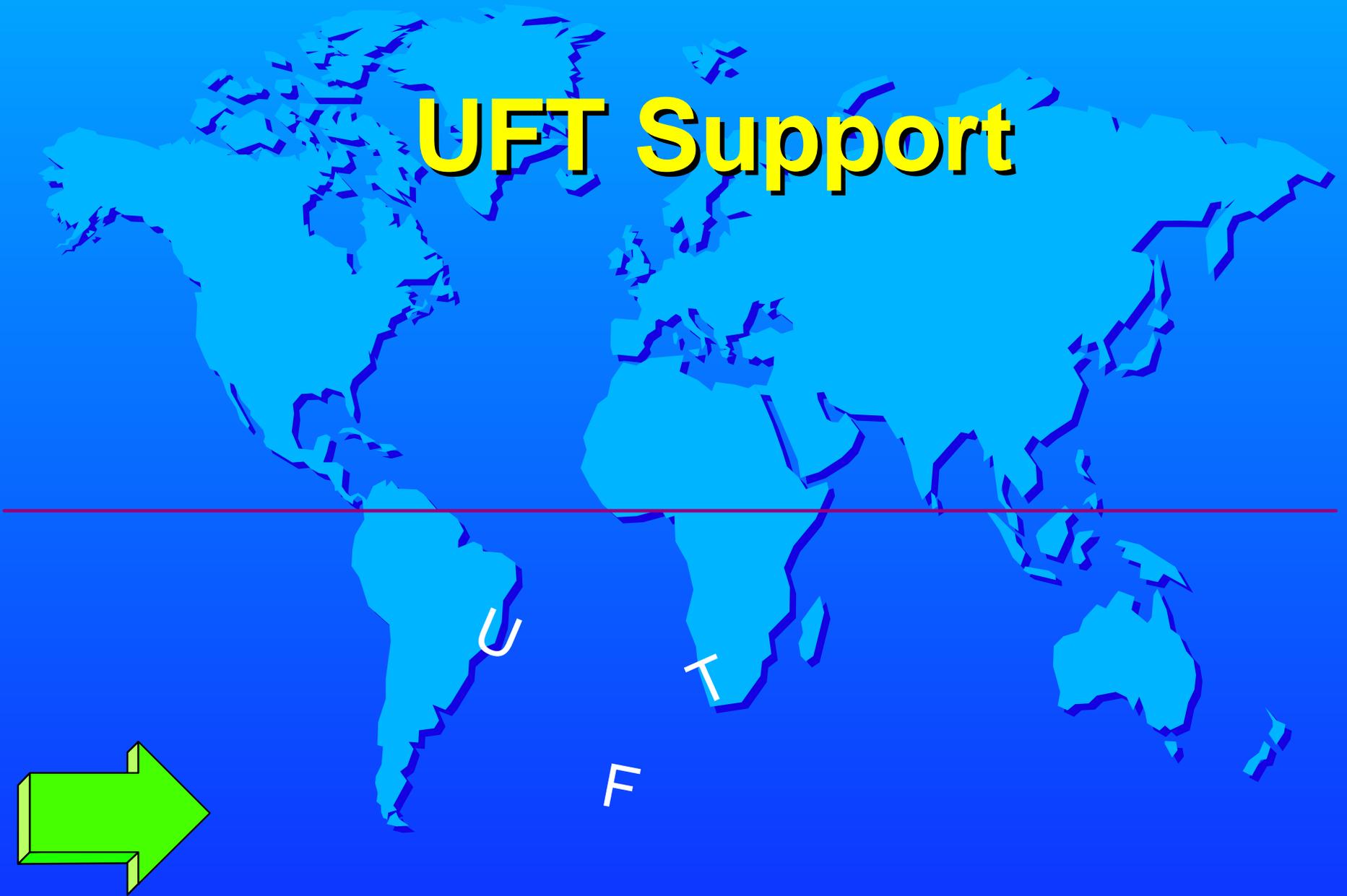
- **Special adaptation of 3270P link**
 - For printing to TELNET attached printer
- **Interacts with TCP/IP stack only**
 - Does not replace 3270P
- **Provide print capabilities without LPD**
 - on workstation
- **Requires TN3270E supported emulator**
 - TN3270E 'flag' must be enabled

TN3270E

Configuring

- TN3270E statement PROFILE TCPIP
- Printer Management exit enabled by TN3270EEXIT parameter
 - of INTERNALCLIENTPARMS statement
- LINKDEFINE in RSCS configuration
- "LU name" configured in emulator

UTF Support



Unsolicited File Transfer (UFT) Support

- **Sender-Initiated File Transfer (SIFT)**
 - Sendfile version of FTP
 - RFC 1440A
- **Sendfile gateway between NJE and TCP/IP**
 - Send files to any Internet destinations
 - Running a UFT daemon
 - Including another RSCS
 - ▶ Or VM TCP/IP UFTD
- **Send files from VM using SENDFILE**
 - With UFTASYNC option
 - VM/ESA 2.4.0

RSCS UFT Support

- **Two drivers**
 - **UFT**
 - **Very similar to LPR**
 - **Use to send files outbound**
 - **Files must be in NETDATA format**
 - **Addressable within NJE network**
 - **Connect to port 608**
 - **UFTXIN exit provided**
 - ▶ **Manipulates data**
 - ▶ **Reads a configuration file**
 - ✓ **Translation tables**

RSCS UFT Support

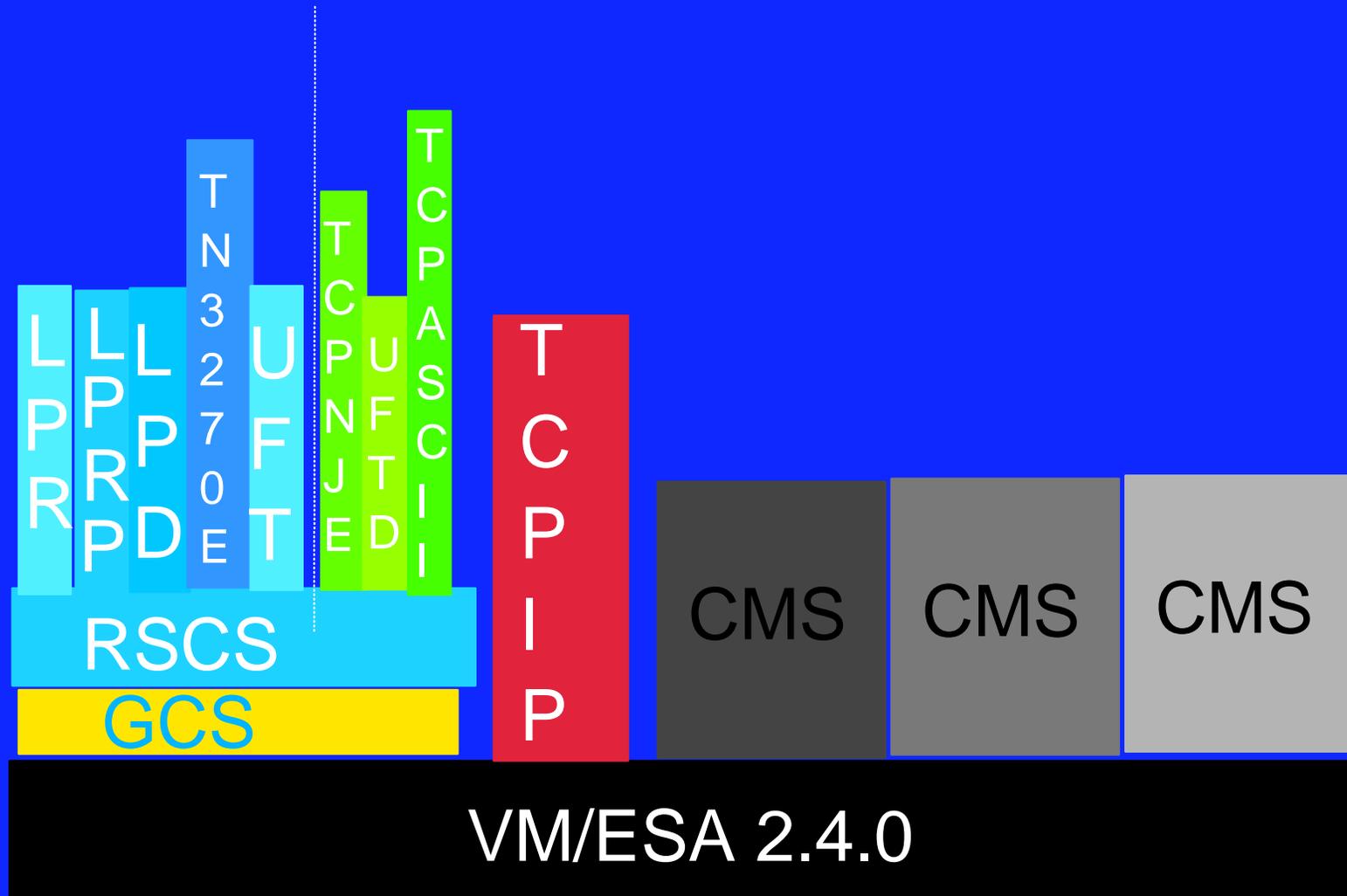
– UFTD

- Very similar to LPD
- Used to receive files
- Converts data into NETDATA format
 - ▶ For sending within NJE network
- UFTXOUT exit provided
 - ▶ Manipulates tag and data
 - ▶ Reads a configuration file
 - ✓ username records
 - ✓ Translation tables

Configuring UFT and UFTD

- Remove UFTD from autolog list
 - In TCP/IP configuration
- Change UFTD to RSCS for port 608 reserve list
 - In TCP/IP configuration
- Add UFTserverID RSCS
 - in TCPIP DATA file
 - ▶ must be first one
- Define UFT and UFTD links
 - In RSCS configuration

Interaction with TCP/IP FL 320



VM/ESA

2.4.0

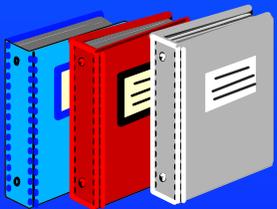
- **RSCS 3.2.0 part of VM/ESA 2.4.0**
 - Installed disabled
- **LPR, LPD, TN3270E, UFT**
 - Available when disabled
- **SCONFIG files on TCPMAINT 198**
 - 5 for RSCS

SCONFIG Files For RSCS

- **RSCSTCP**
 - ▶ RSCS configuration file
- **RSCSLPR**
 - ▶ LPRXONE configuration file
- **RSCSLPRP**
 - ▶ LPRXPSE configuration file
- **RSCSLPD**
 - ▶ LPDXMANY configuration file
- **RSCSUFT**
 - ▶ UFTXOUT configuration file



RSCS HELP



RSCS WEB Resources

- <http://www.ibm.com/s390/vm/related/rscs>
 - Main page
- <http://www.ibm.com/s390/vm/related/rscs/lprsetup.html>
 - LPR set up
- <http://www.ibm.com/s390/vm/related/rscs/lpdsetup.html>
 - LPD set up
- <http://www.ibm.com/s390/vm/related/rscs/rsvslpr.html>
 - Comparison with RSCS and TCP/IP LPR
- <http://www.ibm.com/s390/vm/printing>
 - PCL / Postscript reference links
 - redbook links
- <http://www.ibm.com/s390/vm/related/rscs/rscsqa.html>
 - Common problems and solutions

RSCS V3 Library

- **General Information**
 - GH24-5218
- **Planning and Installation**
 - SH24-5219
- **Operation and Use**
 - SH24-5220
- **Messages and Codes**
 - SH24-5221
- **Exit Customization**
 - SH24-5222

RSCS V3 Library

- Reference Summary
 - SX24-5257
- Diagnosis Reference
 - LY24-5248
- Data Interchange Manager
 - SH24-5248
- NJE Formats and Protocols
 - SC23-0070
- HELP RSCS MENU

Additional RSCS Resources

- **VM Collection kit**
 - SK2T-2067
 - Current version of books
- **Les Geer**
 - lesgeer@us.ibm.com
- **Colleen Brown**
 - browncol@us.ibm.com
- **Donna Rahner - mgr**
 - rahner@us.ibm.com