Automating Operations on z/VM and Linux on System z with IBM Solutions

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Agenda

- Requirements for these automation scenarios
- Overview of IBM product being used
- Automation scenarios
  - Can be product agnostic
  - Live demos
  - Configuration options and sample code
- Summary
Requirements

Implementing these Scenarios
Automation requirements for z/VM system

- Take an action based on a message on a console
  - Provide data from the message to the action
- Send commands to Linux guests
- Schedule an action to occur immediately
  - Or on a regular schedule
- Trigger an action if spool usage reaches a specified percent full
- Chain any actions (triggered by messages, schedules, etc.)
- Suspend and resume message rules, schedules, spool monitors, etc.
- Issue commands real-time on a service machine console
- Add messages to a console view from local or remote sources
- Detect a user ID logging off
IBM Management Software

- **System and performance management, automating operations**
  - OMEGAMON XE on z/VM and Linux
  - Operations Manager for z/VM

- **Storage management**
  - Backup and Restore Manager for z/VM
  - Tape Manager for z/VM
  - Archive Manager for z/VM
Automating Operations

Operations Manager for z/VM
Operations Manager for z/VM

**Increase productivity**
- Authorized users view and interact with monitored virtual machines without logging onto them
- Multiple users view/interact with a virtual machine simultaneously

**Improve system availability**
- Monitor virtual machines and processes
- Take automated actions based on console messages
- Reduce problems due to operator error

**Automation**
- Routine activities done more effectively with minimal operations staff
- Schedule tasks to occur on a regular basis

**Integration**
Fulfill take action requests from OMEGAMON XE on z/VM and Linux
Features and Functions

- Monitor service machine consoles
- Monitor spool usage
- Monitor system events
- View and interact with monitored consoles from authorized user IDs
- Find and view spool files
- Schedule events/actions
- Dynamic configuration
- Separation of access control
Monitor Service Machine Consoles

Operations Manager

Data space 1
- TEST Message 1
- TEST Message 2
- OPER Message 1
- OPER Message 2
- OPER Message 3
- ...

Data space 2
- TEST Message 1
- TEST Message 2
- OPER Message 1
- OPER Message 2
- OPER Message 3
- ...

Data space 3
- LNX Message 1
- LNX Message 2
- LNX Message 3
- ...

Data space 4
- TCP Message 1
- TCP Message 2
- ...

Data space 5
- slog Message 1
- slog Message 2
- slog Message 3
- ...

Data space 6
- OPER Message 1
- LNX Message 1
- LNX Message 2
- TCP Message 1
- slog Message 1
- TEST Message 1
- OPER Message 2
- ...

Test Data
- OPERATOR
- LINUX
- TCPIP
- syslog data
- Daily log
- Unfiltered
- Filtered

Test Data
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Test Data
- OPERATOR
- LINUX
- TCPIP
- syslog data
- Daily log
- Unfiltered
- Filtered
Monitor Service Machines

Define rules to

- Scan console messages for text matching
  - Includes column, wildcard, and exclusion support
  - Optionally restrict to specific user ID(s)
- Take actions based on matches

Multiple rules can apply to one message

- Rules processed in order of definition in the configuration file
- FINAL option available to indicate no additional rules should be evaluated
View and Interact with Consoles

- **Authorized users can view live consoles of monitored service machines and guests**
  - Multiple users can view the same console simultaneously
  - No need to logon to the service machine to see its console
  - Test data and Linux syslog data treated as a “console”
  - Views can be defined to look at a group of consoles in one view

- **Full screen mode**
  - Scroll up and down to view and search historical data
  - Auto scroll (on or off) as new output is displayed on the console
  - From command line, issue commands back to the monitored console

- **Amount of data that is visible depends on specified or default data space size**

- **Rules/actions may modify the view**
  - Suppress messages from the console
  - Hold or highlight messages with color, blinking, etc.

- **Authorized users can view the log file**
  - Can also request a copy of the log file from today or a previous day
Monitor and View Spool Files

- Create spool monitors to trigger actions when
  - Percent of spool usage falls within a specified range
  - Percent of spool usage increases at a specified rate

- Actions triggered can be the same actions used by console monitoring

- Authorized users can
  - Display a list of spool files based on one or more attributes
    - Owner
    - Size
    - Date created
  - From the list the user can
    - View the contents of an individual spool file
    - Transfer, change, or purge a spool file
Schedule Events and Actions

- **Define schedules**
  - Hourly, daily, weekly, monthly, or yearly, nth weekday of the month
  - Once on specified month, day, year, and time
  - At regular intervals
    - Every x hours and y minutes
  - Within a specified window of time
    - Specify start time
    - Specify conflicting schedules
    - Specify maximum time to defer this schedule
  - Within limits
    - Restrict to specific days of the week: Monday through Sunday plus holidays
    - Restrict to certain hours of the day

- **Specify the action associated with the schedule**
  - Actions specified are the same as those for console and spool monitoring
Respond to System Events

- Create monitors for z/VM system events (*VMEVENT) related to user IDs
  - Logon
  - Logoff
  - Failure condition (typically CP READ)
  - Logoff timeout started
  - Forced sleep started
  - Runnable state entered (VM READ)
  - Free storage limit exceeded

- Optionally restrict to specific user ID(s)

- Specify the action associated with the event
  - Actions specified are the same as those for schedules and console and spool monitors
Dynamic Configuration

- **Initial configuration file loaded at startup**
  - May imbed other configuration files

- **Most configuration options can be updated while Operations Manager is running**
  - Add, delete, or change:
    - Rules, actions, monitors, schedules, holidays, groups, user authorization
  - Suspend or resume rules, monitors, schedules

- **Multiple methods**
  - GOMCMD command interface
  - Load a new or updated configuration file
  - Commands in DEFACTN statements
Operations Manager

- **Existing Service Virtual Machine 1 being monitored**
- **Existing Service Virtual Machine 2 being monitored**
- **Existing Service Virtual Machine 3 being monitored**
- **z/VM**
- **Authorized Users**
  - View and interact with monitored consoles
  - Find and view spool files
  - Update configuration information
- **Main Server (OPMGRM1)**
  - Captures consoles
  - Evaluates rules
  - Triggers schedules
  - Monitors events and spool usage
  - Executes actions or sends them to action processing servers
- **Action Processing Server (OPMGRSn)**
  - 0 to n server instances
  - Processes actions as a result of:
    - Console rule matching
    - Spool monitors
    - Event monitors
    - Schedules
- **Existing Service Virtual Machine or remote system**
Recommended Practices – Operational Management

Generate alerts and/or automatically recover from:
- Service machine disks approaching full
- Termination messages
- Abend messages
- Critical user IDs being logged off or entering error state
- Spool approaching full

Event monitors

Schedule automated system maintenance procedures:
- Spool cleanup based on policies
- Minidisk cleanup (from logs) – may include archiving

SFPURGER

Schedules

Rules

Spool monitors

Archive or Backup Manager
Summary

- **Use Operations Manager to**
  - Automate daily operations
  - Prevent problems rather than react to them
  - Automate reactions to problems when they can’t be prevented
  - Improve problem determination procedures
  - Increase programmer and operator productivity
Reference Information

- **Product Web site**
  - Product pages include
    - Publications
    - Pre-requisites
    - Announcements
    - Presentations
    - White papers
    - Support

- **e-mail**
  - Mike Sine, sine@us.ibm.com, Technical Marketing
  - Tracy Dean, tld1@us.ibm.com, Product Manager

- **White paper for routing Linux syslog data**

- **White paper for sending alerts from Operations Manager to Netcool/OMNIbus**
Demonstration Scenarios
Demos Available

1. Send an e-mail based on a console message
2. Send an alert to Netcool/OMNIbus based on a console message
   a. Using POSTZMSG interface to Netcool/OMNIbus
   b. Using SNMP interface to Netcool/OMNIbus
3. Send a message or e-mail based on spool usage
4. View and clean up spool files
5. Automated spool cleanup
6. Archiving DIRMAINT’s log files when disk gets full
7. Process a file of test messages as a console
8. Process Linux syslog data as a console
9. Create a central operations console on one z/VM system
10. Create a central operations console across multiple z/VM systems
11. Integration with OMEGAMON XE on z/VM and Linux - take action based on CPU usage of a Linux guest
12. Monitor service machines for logoff – and autolog them
Automation Scenarios
Scenario 1: Send an E-mail if Abend or Fatal Message Occurs

- Watch all monitored consoles for an error message that includes the word “fatal” or “abend”
  - Message must also contain the word “mail” (for demo purposes only)

- Send an e-mail if one of the words appears on a console

- Dynamically include in the e-mail
  - Host name of z/VM system where the error occurred
  - User ID that received the error message
  - Indicator of whether the word was fatal or abend
  - Full text of the error message
Scenario 1: Detailed Steps

- From any VM user ID:
  `tell opmgrc1 this is an abend message from SHARE. Send an e-mail, please.`

- From an authorized VM user ID, view the console of OPMGRC1:
  `gocmcmd opmgrm1 viewcon user(opmgrc1)`

- Check the inbox of the appropriate person to see the e-mail
tell opmgrcl this is an abend message from SHARE. Send an e-mail, please.
Ready; T=0.01/0.01 19:36:19
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The following message was received on OPMGRC1 running on MSINE.WASHINGTON.IBM.COM:

* MSG FROM SINE : this is an abend message from SHARE. Send an e-mail, please.

DO NOT REPLY - This e-mail was generated by an automated service machine
Scenario 1: How Do You Do That?

Rules in Operations Manager:

* Send an e-mail to someone if I see a message containing the word "fatal" on any monitored console

DEFRULE NAME(FATLMAIL),+
    MATCH(*FATAL*mail*),+
    EXUSER(ESMTS112),+
    ACTION(EMAIL),+
    PARM(FATAL)

* Send an e-mail to someone if I see a message containing the word "abend" on any monitored console

DEFRULE NAME(ABNDMAIL),+
    MATCH(*ABEND*mail*),+
    EXUSER(ESMTS112),+
    ACTION(EMAIL),+
    PARM(ABEND)
Scenario 1: How Do You Do That?

**Action in Operations Manager:**

* Replace "tld1 at us.ibm.com" with the e-mail address of the user that
  should receive the e-mail
* Leave &u, &p, and &t as-is. These represent the user ID that had the
  "fatal" message, the parameter passed (fatal or abend), and the
  text of the message. These will be included in the text of the
  e-mail.

DEFACTN NAME(EMAIL),+

   COMMAND(EXEC SMTPNOTE tld1 at us.ibm.com &u &p &t),+
   OUTPUT(LOG),+
   ENV(LVM)
Scenario 1: How Do You Do That?

SMTPNOTE EXEC (excerpts)

/* */
Parse arg mail_user 'AT' mail_node baduser errtype msgtext
if errtype = 'FATAL' then
   errtext = 'Fatal error on user ID' baduser 'on z/VM system'
else
   if errtype = 'ABEND' then
      errtext = 'Abend on user ID' baduser 'on z/VM system'
   else errtext = msgtext
/* Construct the e-mail */
line.1 = 'OPTIONS: NOACK LOG SHORT NONOTEBOOK ALL CLASS A'
line.2 = 'Date: ' Date() ',' Time()
line.3 = 'From: Operations Manager for z/VM'
line.4 = 'To: ' mail_user 'at' mail_node
line.5 = 'Subject: ' errtext
line.6 = 'The following message was received on' baduser 'running on'
line.7 = msgtext
line.8 = '
line.9 = 'DO NOT REPLY - This e-mail was generated by an automated service machine
line.0 = 9
'PIPE stem line. | > TEMP NOTE A'
'EXEC SENDFILE TEMP NOTE A (NOTE SMTP'
Scenario 2a: Send an Alert to OMNIbus – Using POSTZMSG

- Watch all monitored consoles for an error message that includes the word “fatal” or “abend”
  - Message must also contain the word “omni” (for demo purposes only)

- Send an alert to OMNIbus if one of the words appears on a console
  - Use POSTZMSG, running on Linux guest
    - Do not trigger the action if the message is on this guest

- **Dynamically include in the alert**
  - User ID that received the error message
  - Indicator of whether the word was fatal or abend
Scenario 2a: Detailed Steps

- View “All Events” in OMNIbus
- From any VM user ID:
  
tell opmgrc1 this user is abending at SHARE. Tell OMNIBUS.
- From an authorized VM user ID, view the console of OPMGRC1:
  
gomcmd opmgrm1 viewcon user(opmgrc1)
- From an authorized VM user ID, view the console of the Linux guest that runs POSTZMSG:
  
gomcmd opmgrm1 viewcon user(esmts112)
- View the OMNIbus console to see the alert
Ready; T=0.01/0.01 26:10:47
Tell opmgrcl this user is abandoning at SHARE. Tell OMNIBUS.
Ready; T=0.01/0.01 26:10:52

RUNNING ZVMV5R20

Connected to remote server host 10.32.24.129 using port 23
Scenario 2a: How Do You Do That?

Rules in Operations Manager:

* Send an alert to OMNIBUS for fatal errors on consoles

DEFRULE NAME(FATLOMNI),+
  MATCH(*fatal*omni*),+
  EXUSER(ESMTS112),+
  ACTION(ALRTOMNI),+
  PARM(FATAL)

* Send an alert to OMNIBUS for abends on consoles

DEFRULE NAME(ABNDOMNI),+
  MATCH(*abend*omni*),+
  EXUSER(ESMTS112),+
  ACTION(ALRTOMNI),+
  PARM(ABEND)
Scenario 2a: How Did You Do That?

**Action in Operations Manager:**

* Call POSTZMSG on a Linux guest to send alert to OMNIBUS

DEFACTN NAME(ALRTOMNI),+
   COMMAND(EXEC POSTZMSG &u &p),+
   OUTPUT(LOG),+
   ENV(LVM)
Scenario 2a: How Did You Do That?

POSTZMSG EXEC (excerpts)
/* */
Parse arg baduser errtype
if errtype = 'ABEND' then
  do
    zerrtype = 'CRITICAL'
    cmdpart2 = '-m guest_is_abending hostname='baduser
    cmdpart4 = 'sub_origin=tcp SCARY_EVENT OpsMgr'
  end
else
  do
    zerrtype = 'WARNING'
    cmdpart2 = '-m fatal_error_on_guest hostname='baduser
    cmdpart4 = 'sub_origin=tcp WARN_EVENT OpsMgr'
  end
end

  cmdpart1 = './postzmsg -f e2o.conf -r' zerrtype
  cmdpart3 = 'sub_source=postzmsg origin='baduser
  'CP SEND ESMTS112 cd /workloads'
  'CP SEND ESMTS112' cmdpart1 cmdpart2 cmdpart3 cmdpart4
Scenario 2b: Send an Alert to OMNIbus – Using SNMP

- Watch all monitored consoles for an error message that includes the word “abend”
  - Message must also contain the word “snmp” (for demo purposes only)

- Send an alert to OMNIbus if this word appears on a console
  - Use SNMPTRAP command on z/VM

- Dynamically include in the alert
  - IP address of the z/VM system where the error occurred
  - User ID that received the error message
  - Text of the abend message
Scenario 2b: Detailed Steps

- View “All Events” in OMNIbus

- From any VM user ID:
  
tell opmgrc1 this user is abending during demo. Send SNMP alert to Netcool

- From an authorized VM user ID, view the console of OPMGRC1:
  
gomcmd opmgrm1 viewcon user(opmgrc1)

- View the OMNIbus console to see the alert
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**Automating Operations on z/VM and Linux on System z with IBM Solutions**

![Netcool/OMNibus Event List: Filter="All Events", View="Default"](image)

<table>
<thead>
<tr>
<th>Node</th>
<th>Alert Group</th>
<th>Summary</th>
<th>Last Occurrence(+)</th>
<th>Count</th>
<th>Type</th>
<th>Expire Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>nwhbp</td>
<td>TEST</td>
<td>Test Message</td>
<td>07/19/2008 02:15:57 PM</td>
<td>4</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>hasl123</td>
<td>TESTE1F</td>
<td>test_message_from_eif_z</td>
<td>08/19/2008 03:30:51 PM</td>
<td>2</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>USIBMVZ.HSLV12</td>
<td>TBSMV3_SOURCE390</td>
<td></td>
<td>09/05/2008 09:38:25 AM</td>
<td>1</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>OP4AGRC1</td>
<td>WARN_EVENT</td>
<td>fatal_error_on_guest</td>
<td>04/24/2008 11:26:56 AM</td>
<td>2</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>hasl313:LSZ</td>
<td>ITM_Linux_CPU</td>
<td>Linux_High_CPU_Overload((Idle_CPU&lt;10).</td>
<td>02/10/2010 07:39:46 PM</td>
<td>1</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>hasl332</td>
<td>JIELD</td>
<td>A JIELD process running on hasl332 ha</td>
<td>02/14/2010 11:05:10 AM</td>
<td>1</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>9.6.2.3.193</td>
<td>Generic</td>
<td>Top Neighbour Loss</td>
<td>02/15/2010 09:00:09 PM</td>
<td>3</td>
<td>Type Not Set</td>
<td>Not Set</td>
</tr>
<tr>
<td>Primary:HASLE337:</td>
<td>ITM_HT_Monitored_Log</td>
<td>NT_Log_Space_Low(,%Usage&gt;95) ON</td>
<td>02/16/2010 12:12:47 PM</td>
<td>1</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>Primary:HASLE337:</td>
<td>ITM_HT_Monitored_Log</td>
<td>NT_Log_Space_Low(,%Usage&gt;95) ON</td>
<td>02/16/2010 12:12:47 PM</td>
<td>1</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>9.6.2.4.129</td>
<td>Generic</td>
<td>Cold Start</td>
<td>03/03/2010 02:25:12 PM</td>
<td>1</td>
<td>Type Not Set</td>
<td>Not Set</td>
</tr>
<tr>
<td>hasl332</td>
<td>MacMissed</td>
<td>Disconnecting o@09522621@095226211.</td>
<td>03/03/2010 04:55:00 PM</td>
<td>1</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>hasl332</td>
<td>Unix Event List</td>
<td>A e@09522621@095226211.0 process e</td>
<td>03/03/2010 09:03:44 AM</td>
<td>1</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>OP4AGRC1</td>
<td>SCARY EVENT</td>
<td>guest is abandoning</td>
<td>03/03/2010 12:25:42 PM</td>
<td>28</td>
<td>Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>WSCZPLEXMVS:SY</td>
<td>ITM_Sysplex_DASD_Gr</td>
<td>KM5_No_Sysplex_DASD_Filter_Warn[VM]</td>
<td>03/03/2010 03:42:32 PM</td>
<td>2</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>Primary:HASLE337:</td>
<td>ITM_HT_Logical_Disk</td>
<td>NT_Logical_Disk_Space_Warning(,% Free)</td>
<td>03/03/2010 04:28:37 PM</td>
<td>3</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>Primary:HASLE337:</td>
<td>ITM_HT_Logical_Disk</td>
<td>NT_Logical_Disk_Space_Warning(,% Free)</td>
<td>03/11/2010 03:27:47 PM</td>
<td>1</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>HAWSVSLMVS:SY</td>
<td>ITM_Sysplex_DASD_Gr</td>
<td>KM5_No_Sysplex_DASD_Filter_Warn[VM]</td>
<td>03/11/2010 03:38:17 PM</td>
<td>1</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>hasl313:PA</td>
<td>ITM_Disk_ Utilization_LT</td>
<td>Warning threshold for disk utilization on a</td>
<td>03/11/2010 11:24:46 PM</td>
<td>1</td>
<td>ITM Problem</td>
<td>Not Set</td>
</tr>
<tr>
<td>hasl332</td>
<td>mtrtrap probe on hasl332:Heartbeat Me</td>
<td>mtrtrap probe on hasl332:Heartbeat Me</td>
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<td>03/12/2010 12:46:23 PM</td>
<td>9</td>
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</table>
Scenario 2b: How Do You Do That?

Rule and action in Operations Manager:

* Send an alert to OMNIbus using SNMP for abend msgs on consoles

DEFRULE NAME(ABNDSNMP),+
  MATCH(*abend*snmp*),+
  ACTION(SNMPALRT),+
  PARM(ABEND)

DEFACTN NAME(SNMPALRT),+
  COMMAND(EXEC SNMP2OMN &T),+
  ENV(SVM)
Scenario 2b: How Did You Do That?

SNMP2OMN EXEC
/* SNMP2OMN action routine for Operations Mgr */
address command
parse arg ":" msgtext
msgtext2 = '"'msgtext '"'
/* Send message */
snmptrap trape 1.1 number 30 1.2 text "UXZVM001" 1.3 text msgtext2 ent 1.3.6.1.4.1.9545.6
exit
Scenario 2b: Additional Steps Required on z/VM

- SNMPD user ID configured and running

- Update files on TCPMAINT 198 disk
  - Add OMNIbus IP address to SNMPTRAP DEST file
  - Open SNMPD and SNMPQE ports in PROFILE TCPIP
  - Update SNMPMIBX TEXT section of MIB_EXIT DATA

- Give OPMGRM1 and OPMGRSn access to SNMPTRAP command
  - On TCPMAINT 592 disk
Scenario 2b: Additional Steps Required on OMNIbus

- **Install the IBM Tivoli Netcool/OMNIbus SNMP Probe**
  - Install it on same platform as target OMNIbus server

- **Customize operational information in the probe properties (mttrapd.props)**
  - Listening port, heartbeat interval, mibs and mibs locations, etc.

- **Customize the probe rules (mttrapd.rules)**
  - Map variables created by the probe (from data extracted from the SNMP trap) into the desired OMNIbus event fields
    - Default mappings for the SNMP generic traps (trap types 0-5)
    - Enterprise-specific traps (trap type 6) require customization

- **Documentation for installation and customization**
  - IBM Tivoli Netcool/OMNIbus SNMP Probe Reference Guide (SC23-6003-04)
Scenarios 2a and 2b – POSTZMSG vs SNMP

**Using POSTZMSG**

- Can direct the alert to only the IP address(es) you specify
- Need a Linux guest running and logged on that can run POSTZMSG and must be on the same z/VM system
  - Can be overcome by using a socket interface to send POSTZMSG command to the guest
- Limit of 160 characters on POSTZMSG command sent to Linux guest (using CP SEND)
  - Can’t always send full text of message
  - Can be overcome by using a socket interface to send POSTZMSG command to the guest

**Using SNMP**

- No requirement for a Linux guest. SNMP runs on z/VM.
- No limit on message size
- All SNMP alerts on z/VM go the same set of IP addresses
Scenario 3:
Send a Message or E-mail if Spool Usage is Too High

- Operations Manager monitors the spool usage (percent full)
- Usage exceeds the specified limit
  - For demo purposes, we’ll dynamically resume (re-activate) an existing spool monitor that requires the spool to only be 25% full
- Automatically send an e-mail to someone who can evaluate and take action
- For demo purposes, suspend (de-activate) the spool monitor when complete
Scenario 3: Detailed Steps

- From an authorized VM user ID, see the spool usage:
  gomcmd opmgrm1 viewsp1

- From a user ID with Operations Manager privileges:
  gomcmd opmgrm1 resume spool(splfull2)

- Check the Operations Manager log to see the spool monitor triggered:
  gomcmd opmgrm1 viewlog

- Check the inbox of the appropriate person to see the e-mail

- From a user ID with Operations Manager privileges:
  gomcmd opmgrm1 suspend spool(splfull2)
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<th>TYP</th>
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<td>15:08:03</td>
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<td>15:22:28</td>
<td></td>
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</tbody>
</table>
Automating Operations on z/VM and Linux on System z with IBM Solutions

IBM Software

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```
Ready; T=0 01/01 10:56:46
gomcmd opmgrml resume spool(splfull2)
Ready; T=0 01/01 10:56:52
```

```
gomcmd opmgrml viewlog_
```
Spool is 48% full on z/VM system

03/14/2010 05:04 PM

The following message was received on GDP4.GOPSPLEX.USCLAB.WASHINGTON.IBM.COM:

Spool is 48% full on z/VM system

DO NOT REPLY - This e-mail was generated by an automated service machine
Scenario 3: How Do You Do That?

Spool monitor and action in Operations Manager:

* *
  DEFSMON NAME(SPLFULL2),+
    USAGE(025-099),+
    ACTION(SPLEMAIL),+
    PARM(SPOOL)
  *
  DEFACTN NAME(SPLEMAIL),+
    COMMAND(EXEC SMTPNOTE tld1 at us.ibm.com &4 &p),+
    ENV(LVM)
Scenario 3: How Do You Do That?

SMTPNOTE EXEC (excerpts)

/* */
Parse arg mail_user dummyat mail_node baduser errtype msgtext
if errtype = 'ABEND' then
    errtext = 'Abend on user ID' baduser ' on z/VM system'
else
    if errtype = 'SPOOL' then do
        errtext = 'Spool is' baduser' % full on z/VM system'
        msgtext = errtext
    end
    else errtext = msgtext /* Construct the e-mail */
line.1 = 'OPTIONS: NOACK    LOG    SHORT   NONOTEBOOK ALL CLASS A'
line.2 = 'Date: ' Date() ',' Time()
line.3 = 'From: Operations Manager for z/VM'
line.4 = 'To: ' mail_user ' at' mail_node
line.5 = 'Subject: ' errtext
...
line.7 = msgtext
line.8 = '
line.9 = 'DO NOT REPLY - This e-mail was generated by an automated service machine
line.0 = 9
'PIPE stem line. | > TEMP NOTE A'
'EXEC SENDFILE TEMP NOTE A (NOTE SMTP'
Scenario 4: 
Find and View Spool Files – Clean up the Spool

- **Authorized user specifies spool search criteria**
  - By user ID
  - By date
  - By file size

- **Result list presented**
  - Sort
  - Open/view a specific spool file
  - Purge, modify metadata, or transfer a file
Scenario 4: Detailed Steps

- From an authorized VM user ID, view the spool files:
  
gomcmd opmgrm1 viewsp

- Sort by date
  
  – Put cursor on date column header and hit F6

- Find the spool files just sent and type PURGE next to them

- From an authorized VM user ID, view the log to see that the spool monitor is no longer triggered:

  
gomcmd opmgrm1 viewlog
<table>
<thead>
<tr>
<th>Cmd</th>
<th>Owner</th>
<th>File</th>
<th>CLS</th>
<th>QUE</th>
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<th>Size</th>
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<th>Date</th>
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<th>Name</th>
<th>Type</th>
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Scenario 5: Automated Spool Clean Up

- Use z/VM SFPURGER utility to manage spool files based on criteria, e.g.
  - User ID
  - Days in spool
  - Class
  - Number of records

- Automate SFPURGER execution
  - Regularly scheduled using Operations Manager
  - Triggered by Operations Manager spool monitor
Scenario 5: Detailed Steps

- From an authorized VM user ID, view the spool files for a specific user:
  
gomcmd opmgrml viewspl user(tstadmn2)

- Send a file to this user as class Z
  
sendfile profile exec a tstadmn2 (class z

- View spool files for this user again to see the new file
  
gomcmd opmgrml viewspl user(tstadmn2)

- Delete any existing schedules called DEMO
  
gomcmd opmgrml delschd name(demo)

- Schedule SFPURGER for execution
  - It will purge any files of class Z
    
gomcmd opmgrml defschd name(demo),action(sfpurger),WHEN(now)

- View spool files for this user again to see the new file is gone
  
gomcmd opmgrml viewspl user(tstadmn2)
Ready; T=0.01/0.01 15:01:23

GOMCMD OPMGRM1 VIEWsp1 user(tstadm2)_
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<th>Owner</th>
<th>File</th>
<th>CLS</th>
<th>QUE</th>
<th>TYP</th>
<th>Size</th>
<th>Hold</th>
<th>Date</th>
<th>Time</th>
<th>Name</th>
<th>Type</th>
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<td>TSTADMIN2</td>
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<td>A</td>
<td>RDR</td>
<td>PUN</td>
<td>576K</td>
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<td>04:55:56</td>
<td>AMV1004</td>
<td>BADARC</td>
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<tr>
<td>TSTADMIN2</td>
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<td>A</td>
<td>RDR</td>
<td>PUN</td>
<td>64K</td>
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<td>08/25</td>
<td>11:07:21</td>
<td>TSTADMIN1</td>
<td>NETLOG</td>
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</table>
sendfile profile exec a tstdmn2 (class z)
File PROFILE EXEC A1 went to TSTADMN2 at DEM1ZVM on 09/27/09 15:23:11
Ready; T=0.01/0.11 15:23:11
### Session A - TSTADMIN1 [32 x 80]

- **System:** DEM1ZVM
- **Spool:** 5% Used 0% Used
- **Files:** 1 of 3
- **Max:** 2.4G 1655640

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<th>QUE</th>
<th>TYP</th>
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<th>Time</th>
<th>Name</th>
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<td>15:23:11</td>
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Ready; T=0.01/0.01 15:09:49
GOMCMD OPMGRMI DELSCHD NAME(DEMO)
09/27/2009 15:09:56 GOMCMD0212E DELSCHD "DEMO " NOT FOUND
Ready; T=0.01/0.01 15:09:56
GOMCMD OPMGRMI DEFSCHD NAME(DEMO),ACTION(sftpurger),WHEN(NOW)
Ready; T=0.01/0.01 15:11:33

RUNNING DEM12VM
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<th>TYP</th>
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<td>11:07:21</td>
<td>TSTADMN1</td>
<td>NETLOG</td>
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Scenario 5: How Do You Do That?

Action in Operations Manager to call z/VM’s SFPURGER EXEC

*  
DEFACTN NAME(SFPURGER),+  
  COMMAND(EXEC SFPURGER FORCE),+  
  OUTPUT(LOG),+  
  ENV(LVM)

SFPURGER OPTIONS file

*  
Send console log to user ID TSTADMN1 at demo node  
CONSOLE  TSTADMN1 DEM1ZVM  
*  
Erase LOG and RUN files that are more than 3 days old  
KEEPDAY  21  
*  
Set prime shift start and end times  
PRIMSHFT  07:30:00 16:30:00  
*  
Use defaults for the following:  
  *  
  MSGTYPE  SORTMOD  SFPCTRL  SOSCTRL  SFPMOD  APPEND  
SFPCTRL  SFPTRAC
Scenario 5: How Do You Do That?

**SFPTRACY CONTROL**

* Ignore any spool files found in the NSS queue (privilege class E)
  
  QUEUE NSS ACTION IGNORE

* Purge any spool files found in class Z
  
  CLASS Z ACTION PURGE

Make sure OPMGRM1 links and accesses MAINT 193 disk for access to SFPURGER functions
Scenario 6: Detecting Disk Full Conditions of Logging IDs

- **Operations Manager monitors the console of a user ID that does logging**
  - DIRMAINT, for example

- **Disk full or early warning message triggers a rule/action in Operations Manager**
  - Quiesce or shut down DIRMAINT
  - Send the log files to a separate service machine
  - Erase the log files from DIRMAINT’s logging disk
  - Restart DIRMAINT
  - Separately, other service machine automatically archives all files it receives (in Archive Manager for z/VM)
  - Log files are safely archived in Archive Manager and DIRMAINT is running with a clean log disk

- **Get a copy of the console for further review/debugging**
Scenario 6: Detailed Steps

- **From an authorized VM user ID, view the DIRMAINT console:**
  
gomcmd opmgrm1 viewcon user(dirmaint)

- **In the console view**
  - Issue CMS commands to copy old (large) log files to DIRMAINT’s log disk
    
cms copyfile dirmaint tlog0914 t = tlog0912 h
  - Verify the logging disk is more than 75% full
    
cms q disk
  - Run DIRMAINT’s hourly processing now
    
exec dvhourly
  - Verify the logging disk is less than 75% full
    
cms q disk

- **Exit the console view and find the files in the archive**
  
amvlist
  - Type “archlogs” in the owner field and press ENTER

- **Request a copy of the console for further review/debugging**
  
gomcmd opmgrm1 viewcon user(dirmaint),mode(rdr)
DIRMAINT DEM1ZVM. - 2009/02/24; T=0.01/0.01 22:56:04
DVHWAI2140I Waiting for work on 09/02/24 at 22:56:04.
DVHWAI2143I Wakeup caused by timer file entry on 09/02/24 at 23:01:02.
DVHWAI2143I Processing event number 00005 scheduled for ==/==/== at
DVHWAI2143I +01:00:0.
DIRMAINT DEM1ZVM. - 2009/02/24; T=0.02/0.02 23:01:02
DVHREQ2290I Request is: CMS EXEC DVHOURLY
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.
DVHRLY3886I Hourly processing started; with 0 log
DVHRLY3886I files.
DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DIRMAINT DEM1ZVM. - 2009/02/24; T=0.03/0.03 23:01:03
DVHWAI2140I Waiting for work on 09/02/24 at 23:01:03.
DVHWAI2142I Wakeup caused by elapsed time on 09/02/24 at 23:06:03.
DIRMAINT DEM1ZVM. - 2009/02/24; T=0.01/0.01 23:06:03
DVHWAI2140I Waiting for work on 09/02/24 at 23:06:03.
DVHWAI2142I Wakeup caused by elapsed time on 09/02/24 at 23:11:03.
DIRMAINT DEM1ZVM. - 2009/02/24; T=0.01/0.01 23:11:03
DVHWAI2140I Waiting for work on 09/02/24 at 23:11:03.
* -- Operations Manager VIEWCON session from TSTADMINI entered the following --
cms acc 333 t
DVHWAI2146I Wakeup caused by console attention on 09/02/24 at 23:12:15.
DIRMAINT DEM1ZVM. - 2009/02/24; T=0.01/0.01 23:12:16
DVHREQ2290I Request is: CMS acc 333 t
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.
DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DIRMAINT DEM1ZVM. - 2009/02/24; T=0.02/0.03 23:12:17
DVHWAI2140I Waiting for work on 09/02/24 at 23:12:17.
cms copyfile dirmaint tlog0914 t = tlog0912 h_

DIRMAINT (Scroll)
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| 09/02/24 23:01:03 | DVHWA1240I Waiting for work | **IBM Software**  
| 09/02/24 23:06:03 | DVHWA1242I Wakeup caused by elapsed time |
| 09/02/24 23:06:03 | DIRMAINT DEM1ZVM - 2009/02/24: T=0.01/0.01 23:06:03 |
| 09/02/24 23:11:03 | DVHWA1240I Waiting for work |
| 09/02/24 23:11:03 | DIRMAINT DEM1ZVM - 2009/02/24: T=0.01/0.01 23:11:03 |
| 09/02/24 23:11:03 | DVHWA1240I Waiting for work |

* -- Operations Manager VIEWCON session from TSTADMIN1 entered the following --

cms acc 333 t
DVHWA1240I Wakeup caused by console attention on 09/02/24 at 23:12:15.
DVHWA1240I Wakeup caused by console attention on 09/02/24 at 23:12:15.
DVHREQ2298I Your CMS request for DIRMAINT at * has been accepted.
DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DVHWA1240I Wakeup caused by console attention on 09/02/24 at 23:12:17
DVHWA1240I Wakeup caused by console attention on 09/02/24 at 23:12:17.
DVHWA1240I Wakeup caused by console attention on 09/02/24 at 23:14:06.
DVHWA1240I Wakeup caused by console attention on 09/02/24 at 23:14:06.
DVHREQ2298I Your CMS request for DIRMAINT at * has been accepted.
DVHREQ2298I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2298I = 0.

DIRMAINT DEM1ZVM - 2009/02/24: T=0.02/0.03 23:12:17

DVHWA1240I Waiting for work on 09/02/24 at 23:14:08.
DVHWA1240I Wakeup caused by elapsed time on 09/02/24 at 23:19:08.
DVHWA1240I Waiting for work on 09/02/24 at 23:19:08.
DVHWA1240I Waiting for work on 09/02/24 at 23:19:08.

DIRMAINT DEM1ZVM - 2009/02/24: T=0.01/0.01 23:19:08

DVHWA1240I Waiting for work on 09/02/24 at 23:19:08.

DIRMAINT (Scroll)
Operations Manager VIEWCON session from TSTADMIN1 entered the following --
cms q disk

DIRMAINT DEM1ZVM. - 2009/02/24; T=0.01/0.01 23:24:42

DIRMAINT DEM1ZVM. - 2009/02/24; T=0.03/0.03 23:24:43

DIRMAINT DEM1ZVM. - 2009/02/24; T=0.02/0.02 23:25:09

DIRMAINT DEM1ZVM. - 2009/02/24; T=0.02/0.03 23:25:09

DIRMAINT DEM1ZVM. - 2009/02/24; T=0.01/0.01 23:24:42
gomcmd opmgrm1 viewcon user(dirmaint),mode(rdr)
RDR FILE 0112 SENT FROM OPMGRM1 PRT WAS 0043 RECS 4039 CPY 001 A NOHOLD NOKEEP
Ready, T=0.01/0.01 11:58:24
Scenario 6: How Do You Do That?

Console rule and action in Operations Manager:

DEFRULE NAME(DIRMLOG), +
  MATCH (*DVHRLY3895*01AA*), +
  USER(DIRMAINT), +
  ACTION(DIRMLOG)
*
DEFACTN NAME(DIRMLOG), +
  INPUT(AHI), +
  NEXTACTN(DIRMLOGB)
*
DEFACTN NAME(DIRMLOGB), +
  COMMAND(EXEC DIRM1AA &U), +
  ENV(LVM)

Authorize Operations Manager to issue DIRM SHUTDOWN – from MAINT issue

DIRM AUTHFOR OPMGRM1 CMDLEVEL 150A CMDSET 0
Scenario 6: How Do You Do That?

**DIRM1AA EXEC (excerpts):**

Parse Upper Arg Tuser .
/* Try to shut DIRMAINT down. */
Say 'DIRM1AA - Issuing DIRM SHUTDOWN ....';
Address CMS 'DIRM SHUTDOWN';

Address Command 'CP LINK' Tuser '1AA' Dev 'MR';
Address CMS 'ACCESS' Dev Fm;

Address Command 'PIPE CMS LISTFILE DIRMAINT *LOG*' Fm '( NOHEADER',
   ' | STEM FILES.');
Do I = 1 to Files.0;
   Parse Upper Var Files.I Fn Ft .
   Address CMS 'SENDFILE' Fn Ft Fm 'TO ARCHLOGS';
   If Rc = 0 then Do;
      Sent = Sent+1;
      Address CMS 'ERASE' Fn Ft Fm;
   End

Address Command 'CP XAUTOLOG' Tuser;
Scenario 7: Process a File of Test Messages as a Console

- Create a file containing lines of test messages
  - Test rules and actions without creating critical conditions
- Use Operations Manager to send the file for processing
  - Treat it as the console of one user
  - Send it again treating it as the console of another user
  - Notice triggered rules and actions are different
- View the “consoles” of these two users
Scenario 7: Detailed Steps

- Create or view a file of test messages
  xedit test consdata a
  - Notice the “hello” message in the file

- From a z/VM user ID, send the test file to Operations Manager
  - Send it twice, specifying two different “owning” user IDs. One generates a message and one doesn’t:
    gomrsif test consdata a 9.39.64.72 63000 tstadmn8
    gomrsif test consdata a 9.39.64.72 63000 tstuser8

- From an authorized z/VM user ID, view the consoles of the owning user IDs:
  gomcmd opmgrml viewcon user(tstadmn8)
  gomcmd opmgrml viewcon user(tstuser8)
gomrsif test consdata a 9.39.68.141 63000 tstadmin8
Connecting to 9.39.68.141
Sending TEST CONSDATA A to 9.39.68.141
Ready; T=0.01/0.01 13:39:18

gomrsif test consdata a 9.39.68.141 63000 tstuser8
Connecting to 9.39.68.141
Sending TEST CONSDATA A to 9.39.68.141
Ready; T=0.01/0.01 13:39:18
hello there from remote system input
here is another critical system message
warning message to test
junk
noise
Scenario 7: How Do You Do That?

Console rule and action in Operations Manager:

*  
DEFRULE NAME (TESTEX), +  
 MATCH (*HELLO*), +  
 MCOL (001:030), +  
 ACTION (TESTEX), +  
 EXGROUP (TSTUSERS)  
*  
DEFACTN NAME (TESTEX), +  
 COMMAND (CP MSG TSTADMN1 HELLO BACK FROM &U.), +  
 OUTPUT (LOG), +  
 ENV (LVM)
Scenario 7: How Do You Do That?

Set up TCP/IP listener for test data and define group of consoles:

* 
DEFTCPA NAME(TESTDATA),+
  TCPUSER(TCPIP),+
  TCPAPPL(GOMRSIF),+
  TCPADDR(000.000.000.000),+
  TCP_PORT(63000)
*

DEFGROUP NAME(TSTUSERS),+
  USER(TSTUSER*)

Update TCP/IP configuration to allow Operations Manager to listen on the specified port
Scenario 8: Process Linux Syslog Data as a Console

- Route syslog data from a Linux guest to Operations Manager for z/VM
  - Supports syslog and syslog-ng
  - syslog-ng includes hostname or IP address in message
- Treat it as the console of a “fake” user ID
- Trigger rules and actions based on syslog data
- View the “console” containing syslog data
- Option to create one console per syslog or combine multiple syslogs into one console
Scenario 8: Detailed Steps

- From an authorized z/VM user ID, view any syslog data already received
  
  `gomcmd opmgrml viewcon user(lxsyslog)`

- Use PUTTY to connect to a Linux guest

- Login as root and issue the command
  
  `logger here is a critical test message from SHARE`

- Return to the VIEWCON session
  
  - See the message in the syslog “console”
  
  - Using syslog, so no hostname or IP address

- Repeat from a different Linux guest that uses syslog-ng
root@hasl106:~
login as: root
root@9.82.56.106's password:
Last login: Thu Feb 12 17:12:21 2009
[root@hasl106 ~]# logger here is a critical test message from share
[root@hasl106 ~]#
IBM Software

Automating Operations on z/VM and Linux on System z with IBM Solutions

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14:14:58  * MSG FROM OPMGRM1: GOT A CRITICAL MESSAGE 'ROOT: HERE IS A CRITICAL TEST MESSAGE FROM SHARE.' FROM LXSYSLOG.

Ready; T=0.01/0.01 14:18:41
login as: root
Using keyboard-interactive authentication.

Password:
hasl114:~ # logger demo message from linux guest with syslog-ng
hasl114:~ #
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Session A - TSTDADMIN: [32 x 80]

<table>
<thead>
<tr>
<th>File</th>
<th>Edit</th>
<th>View</th>
<th>Communication</th>
<th>Actions</th>
<th>Window</th>
<th>Help</th>
</tr>
</thead>
</table>

Oct 27 13:16:08 omegnx1 -- MARK --.
Oct 27 13:16:08 omegnx1 syslog-ng[1301]: Log statistics; dropped='pipe(/dev...
Oct 27 13:36:08 omegnx1 -- MARK --.
Oct 27 14:43:49 hasl114 syslog-ng[1433]: STATS: dropped 0.
Oct 27 13:56:08 omegnx1 -- MARK --.
Oct 27 14:16:08 omegnx1 -- MARK --.
Oct 27 14:16:08 omegnx1 syslog-ng[1301]: Log statistics; dropped='pipe(/dev...
Oct 27 14:16:08 omegnx1 -- MARK --.
Oct 27 15:42:14 hasl114 ssdh[7329]: error: PAM: Authentication failure for...
Oct 27 15:44:38 hasl114 ssdh[7329]: fatal: Timeout before authentication fo...

I -- Operations Manager Action MSG0008 scheduled for execution -- I
Oct 27 15:44:38 hasl114 ssdh[7323]: pam_unix2(sshd:auth): conversation fail...
Oct 27 14:56:08 omegnx1 -- MARK --.
Oct 27 15:16:08 omegnx1 -- MARK --.
Oct 27 15:16:08 omegnx1 syslog-ng[1301]: Log statistics; dropped='pipe(/dev...
Oct 27 15:36:08 omegnx1 -- MARK --.
Oct 27 15:56:08 omegnx1 -- MARK --.
Oct 27 16:16:08 omegnx1 -- MARK --.
Oct 27 16:16:08 omegnx1 syslog-ng[1301]: Log statistics; dropped='pipe(/dev...
Oct 27 16:36:08 omegnx1 -- MARK --.
Oct 27 17:43:49 hasl114 syslog-ng[1433]: STATS: dropped 0.
Oct 27 16:56:08 omegnx1 -- MARK --.
Oct 27 17:16:08 omegnx1 -- MARK --.
Oct 27 17:16:08 omegnx1 syslog-ng[1301]: Log statistics; dropped='pipe(/dev...
Oct 27 17:36:08 omegnx1 -- MARK --.


100

LXSYSLOG (Scroll)
Session A: TSTADM1 [32 x 80]

Ready; T=01/01/98 17:38:19

GOMCMD OPMGRM1 VIEWCON USER(LXSYSLg2),mode(rdr)

RDR FILE 0135 SENT FROM OPMGRM1 PRT WAS 0004 RECS 0663 CPY 001 A NOHOLD NOKEEP

Ready; T=01/01/98 17:38:25

receive 135 (rep)

DMSRDC738I Record length is 204 bytes

VIEWCON LXSYSLg2 A1 replaced

File VIEWCON LXSYSLg2 A1 received from OPMGRM1 at DEM1ZVM sent as VIEWCON LXSYSLg2 A1

Ready; T=01/01/98 17:38:32

---

Connected to remote server 'host 9.39.68.14' using port 23

RUNNING DEM1ZVM
Scenario 8: How Do You Do That?

Console rule and action in Operations Manager:

*  
DEFRULE NAME(LXLOG),+  
  MATCH(*critical test message*),+  
  ACTION(LXLOG),+  
  USER(LXSYSLOG)  
*  
DEFACTN NAME(LXLOG),+  
  COMMAND(CP MSG TSTADMIN1 Got a critical message '&T' from &U.),+  
  OUTPUT(LOG),+  
  ENV(LVM)
Scenario 8: How Do You Do That?

- **Set up TCP/IP listener for syslog data**

  
  - `DEFTCPA NAME(LNXSYSLG),+
    TCPUSER(TCPIP),+
    TCPAPPL(GOMRSYL),+
    TCPADDR(000.000.000.000),+
    TCPPORT(00514),+
    PARM(LXSYSLOG03330417UTF8)
  `

  - `DEFTCPA NAME(LNXSYSL2),+
    TCPUSER(TCPIP),+
    TCPAPPL(GOMRSYL),+
    TCPADDR(000.000.000.000),+
    TCPPORT(00515),+
    PARM(LXSYSLOG203330417UTF8)
  `

- **Update TCP/IP configuration to allow Operations Manager to listen for UDP traffic on the specified port(s)**
  - Ports 514 and 515 used here

- **Update the Linux guest to send its syslog data to the IP address and port of your z/VM system**
Scenario 9: Create a Central Operations Console on One z/VM System

- Use Operations Manager to watch for error, warning, fatal messages on service machine consoles
  - DIRMAINT, TCP/IP, RACF, etc.
  - Linux guests
  - Linux syslog
- Route these messages to a central operations console
- Operations staff watches operations console for signs of trouble
  - View individual service machine consoles for more details when needed
Scenario 9: Detailed Steps

- From an authorized z/VM user ID, put “abend”, “fatal”, and error messages on DIRMAINT console
  
  ```
  msgnoh dirmaint this is a test abend message
  msgnoh dirmaint this is a fake fatal message
  msgnoh dirmaint DMSxxxxxxxxxE here is a made-up CMS error msg
  ```

- View the “Operations Console” to see the messages
  
  ```
  gomcmd opmgrm1 viewcon user(oper8)
  ```

- Note the fatal message is red and abend message is highlighted and will be held when other messages come in
Scenario 9: Detailed Steps

- From another user ID, run an EXEC to send multiple messages to the Operations Console
  
  \texttt{lotsmsgs}

- View the “Operations Console” to see the messages
  
  \texttt{gomcmd opmgrml viewcon user(oper8)}

- Watch the scrolling, held messages, etc.
msgnoh dirmaint this is a test abend message
Ready; T=0.01/0.01 10:36:23
msgnoh dirmaint this is a fake fatal message
Ready; T=0.01/0.01 10:36:29
msgnoh dirmaint DMSxxxxxxxxxE here is a made-up CMS error msg
Ready; T=0.01/0.01 10:36:39

gomcmd opmgrml viewcon user(oper8)
11:54:03 A FAKE ABEND HAS OCCURRED
14:13:50 A fake abend has occurred
17:40:26 DIRMAINT : TEST MESSAGE WITH ABEND TEXT
10:36:23 DIRMAINT : THIS IS A TEST ABEND MESSAGE
10:48:16 A fake abend has occurred
10:46:23 This is standard non scary message 8
10:46:25 This is standard non scary message 9
10:46:26 This is standard non scary message 10
10:46:26 This is standard non scary message 11
10:46:27 This is standard non scary message 12
10:46:28 This is standard non scary message 13
10:46:29 This is standard non scary message 14
10:46:30 This is standard non scary message 15
10:46:31 This is standard non scary message 16
10:46:32 This is standard non scary message 17
10:46:33 This is standard non scary message 18
10:46:34 This is standard non scary message 19
10:46:35 This is standard non scary message 20
10:46:36 This is standard non scary message 21
10:46:37 This is standard non scary message 22
10:46:38 This is standard non scary message 23
10:46:39 This is standard non scary message 24
10:46:40 This is standard non scary message 25
10:46:41 A fake fatal message
10:46:42 This is standard non scary message 1
10:46:43 This is standard non scary message 2
10:46:44 This is standard non scary message 3
10:46:45 This is standard non scary message 4
10:46:47 This is standard non scary message 5
10:46:48 This is standard non scary message 6

OPER8 (Scroll)
11:54:03 A FAKE ABEND HAS OCCURRED
14:13:50 A fake abend has occurred
17:40:26 DIRMAINT: TEST MESSAGE WITH ABEND TEXT
10:36:23 DIRMAINT: THIS IS A TEST ABEND MESSAGE
10:46:16 A fake abend has occurred
10:46:52 This is standard non scary message 11
10:46:53 This is standard non scary message 12
10:46:54 This is standard non scary message 13
10:46:55 This is standard non scary message 14
10:46:56 This is standard non scary message 15
10:46:57 This is standard non scary message 16
10:46:58 This is standard non scary message 17
10:46:59 This is standard non scary message 18
10:47:00 This is standard non scary message 19
10:47:01 This is standard non scary message 20
10:47:02 This is standard non scary message 21
10:47:03 This is standard non scary message 22
10:47:04 This is standard non scary message 23
10:47:05 This is standard non scary message 24
10:47:06 This is standard non scary message 25
10:47:07 This is standard non scary message 26
10:47:09 This is standard non scary message 27
10:47:10 This is standard non scary message 28
10:47:10 This is standard non scary message 29
10:47:11 This is standard non scary message 30
10:47:12 This is standard non scary message 31
10:47:13 This is standard non scary message 32
10:47:14 This is standard non scary message 33
10:47:15 This is standard non scary message 34
10:47:16 This is standard non scary message 35
Scenario 9: How Do You Do That?

**Console rules in Operations Manager:**

- DEFRULE NAME (ABEND), +
  MATCH (*abend*), +
  EXUSER (OPER8), +
  ACTION (MSGOPER8)

- DEFRULE NAME (FATAL), +
  MATCH (*fatal*), +
  EXUSER (OPER8), +
  ACTION (MSGOPER8)

- DEFRULE NAME (EMSGS), +
  MATCH (DMS*E), +
  MCOL (001:011), +
  EXUSER (OPER8), +
  ACTION (MSGOPER8)

**Action in Operations Manager:**

- DEFACTN NAME (MSGOPER8), +
  COMMAND (CP MSGNOH OPER8 &U : &T), +
  OUTPUT (LOG), +
  ENV (LVM)
Scenario 9: How Do You Do That?

**Console rules in Operations Manager:**

*  
DEFRULE NAME(ABENDHLT),+  
  MATCH(*abend*),+  
  USER(OPER8),+  
  ACTION(HLTHOLD)  
*  
DEFRULE NAME(FATALRED),+  
  MATCH(*fatal*),+  
  USER(OPER8),+  
  ACTION(RED)

**Actions in Operations Manager:**

*  
DEFACTN NAME(HLTHOLD),+  
  INPUT(AHI,HLD)  
*  
DEFACTN NAME(HILITE),+  
  INPUT(AHI)  
*  
DEFACTN NAME(RED),+  
  INPUT(CRE)
Scenario 10: Create a Central Operations Console across multiple z/VM systems

- Use Operations Manager to watch for error, warning, fatal messages on service machine consoles
  - OPERATOR, DIRMAINT, TCP/IP, RACF, etc.
  - Linux guests
  - Linux syslog

- Route these messages to a central operations console on another z/VM system

- Operations staff watches operations console for signs of trouble across multiple z/VM systems
  - View individual service machine consoles for more details when needed
Scenario 10: Detailed Steps

- On System A (DEM1ZVM) put an “error” message on the OPERATOR console
  - Must contain the text “remote error”
  `msgnoh operator here is a remote error message`

- View the “Operations Console” on System B (ZVMV5R40) to see the message
  `gomcmd opmgrml viewcon user(opmgrc1)`

- Note the message received on OPMGRC1 on ZVMV5R40 from OPERATOR on DEM1ZVM
msgnoh operator here is a remote error message
Automating Operations on z/VM and Linux on System z with IBM Solutions
hello there from remote system input
21:56:42 * -- Operations Manager Action TESTEX2 scheduled for execution -- *
21:56:42 hello there from remote system input
21:56:42 * -- Operations Manager Action TESTEX scheduled for execution -- *
21:56:42 here is another critical system message
21:56:42 warning message to test
21:56:42 junk
21:56:42 noise
00:00:00 HCPMID6001I TIME IS 00:00:00 EDT WEDNESDAY 01/12/11
00:00:00
10:36:13 FROM DEM1ZVM: * MSG FROM TSTADMNI: error message on dem1zvm
11:23:21 FROM DEM1ZVM: ERROR MESSAGE ON DEM1ZVM
11:30:20 FROM OPERATOR ON DEM1ZVM: MSGNOH OPERATOR HERE IS A REMOTE ERROR MESSA
11:32:55 FROM OPERATOR ON DEM1ZVM: HERE IS A REMOTE ERROR MESSAGE

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Scenario 10: How Do You Do That?

Console rule in Operations Manager on System A:

* 
DEFRULE NAME(OPERMSGS), +
  MATCH(*remote error*), +
  USER(OPERATOR), +
  ACTION(MSG2GBRG)

Action in Operations Manager on System A:

* 
DEFACTN NAME(MSG2GBRG), +
  COMMAND(EXEC MSG2OPS OPMGRC1 From &u on DEM1ZVM: &t), +
  OUTPUT(LOG), +
  ENV(LVM)
Scenario 10: How Do You Do That?

MSG2OPS EXEC on System A:

/* Send a message to a console in Ops Mgr on another system */
/* */
trace r
Address Command
Parse arg cons_user msgtext
'PIPE var msgtext | > TEMP NOTE A'
'EXEC GOMRSIF TEMP NOTE A 9.82.24.129 63000' cons_user
Exit
Scenario 10: How Do You Do That?

TCP/IP listener definition in Operations Manager on System B:

```
*  
DEFTCPA NAME(TESTDATA),+
   TCPUSER(TCPIP),+
   TCPAPPL(GOMRSIF),+
   TCPADDR(000.000.000.000),+
   TCPPORT(63000)
```

- May also need to update TCPIP on System B to allow Operations Manager to listen on port 63000
- Can alternatively use TELL (instead of GOMRSIF) to send messages from System A to System B, but requires RSCS
Scenario 11
Integration with OMEGAMON XE on z/VM and Linux

- Use Operations Manager to take action based on a triggered situation in OMEGAMON XE on z/VM and Linux
- Virtual CPU consumption is high for a Linux guest
- OMEGAMON detects the situation, creates an event, and sends message to Operations Manager
- Action is triggered by a rule in Operations Manager
- Operations Manager checks SHARE status of guest and issues CP commands to tune the guest
  - SET QUICKDSP
  - SET SHARE
- Event is resolved in OMEGAMON when virtual CPU consumption of guest is back down
OMEGAMON XE and Operations Manager for z/VM

Process Flow

System z

Operations Manager

Perf Toolkit

z/VM

1

*MONITOR

2

VM Cmd Proc

TMS

3

VM Agent

Linux Guest

4

Web Server

Database Server

5
Scenario 11: Detailed Steps

- **Create and start an application on a Linux guest that uses more than 20% of virtual CPU**
  - HOG command on our demo system

- **Updates to Tivoli Enterprise Portal**
  - z/VM CPU graph shows guest CPU % as it runs the application
  - Event pops up on situation event console to say higher than 20%

- **Use Operations Manager to watch z/VM user console used by OMEGAMON**
  - Message receive from OMEGAMON to address high CPU on the guest
  - Message from Operations Manager indicating action is triggered

- **Updates on Tivoli Enterprise Portal**
  - CPU used by that guest decreases below 20%
  - Event closed (removed from the event console)
Scenario 11: How Do You Do That?

Rules in Operations Manager:

* Adjust SHARE of Linux guest if CPU usage is too high
* Watch for message from OMEGAMON

DEFRULE NAME(GUSTCPU),+
    MATCH(*NEEDS CPU PRIORITY*),+
    ACTION(GUESTCPU)

* Highlight message from OMEGAMON and call EXEC to check and adjust
* SHARE of Linux guest

DEFACTN NAME(GUESTCPU),+
    INPUT(AHI),+
    NEXTACTN(GUSTCPUB)

DEFACTN NAME(GUSTCPUB),+
    COMMAND(EXEC VCPU &4),+
    ENV(LVM),+
    OUTPUT(LOG)
Scenario 11: Detailed Steps
OMEGAMON Configuration
Scenario 11: Detailed Steps
OMEGAMON Configuration
Scenario 12: Monitor Service Machines for LOGOFF Status – and AUTOLOG them

- **Monitor specific service machines to make sure they stay logged on**
  - Demo will monitor TSTADMN2 user ID
  - If it changes from logged on to logged off status, then restart it

- **Dynamically pass the user ID to the action**
  - Re-use action for multiple user IDs
11:57:57 z/VM V5.4.0  2009-09-23 15:29
11:57:57 DMSACP723I C (198) R/O
11:57:57 Ready; T=0.01/0.01 11:57:57
11:58:08 CONNECT= 00:00:10 VIRICPU= 000:00.00 TOTCPU= 000:00.00
11:58:08 LOGOFF AT 11:58:08 CST TUESDAY 03/01/11 BY MAINT
11:58:12 z/VM V5.4.0  2009-09-23 15:29
11:58:12 DMSACP723I C (198) R/O
11:58:12 Ready; T=0.01/0.01 11:58:12
11:59:35 * -- Operations Manager VIEWCON session from TSTADMN1 entered the foll
11:59:35 id
11:59:35 TSTADMN2 AT DEMIzVM VIA RSCS 03/01/11 11:59:35 CST TUESDAY
11:59:35 Ready; T=0.01/0.01 11:59:35
00:00:00 HCPMID6001I TIME IS 00:00:00 CST WEDNESDAY 03/02/11
00:00:00
00:00:00 HCPMID6001I TIME IS 00:00:00 CST THURSDAY 03/03/11
00:00:00
Scenario 12: How Do You Do That?

Console rule and action in Operations Manager:

*  
DEFEMON NAME(ADMIN2), +
   TYPE(1), +
   USER(TSTADMIN2), +
   ACTION(AUTOLOG1)
*  
DEFACTN NAME(AUTOLOG1), +
   COMMAND(CP SLEEP 3 SEC), +
   NEXTACTN(AUTOLOG2), +
   OUTPUT(LOG), +
   ENV(OPMGRS1)
*  
DEFACTN NAME(AUTOLOG2), +
   COMMAND(CP XAUTOLOG &3), +
   OUTPUT(LOG), +
   ENV(OPMGRS1)