What’s New with z/OS Network Performance Monitoring with OMEGAMON?

OMEGAMON XE for Mainframe Networks v5.1

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IBM

Wednesday, February 6, 2013
Session 12779
Increasing visibility with mainframe monitoring can improve availability across entire Enterprise

Key Takeaways

- IBM has provided leadership and best practices with System z Service Management Visibility, Control and Automation capability for years.

- Enterprise-wide Monitoring and Management provides much better availability and performance results than individual separate products.

- IBM’s System z OMEGAMON family addresses key requirements, including reducing risk and decreasing costs, with improved productivity.
OMEGAMON for Mainframe Networks V5.1 fits into Integrated Service Management Ecosystem

Visibility
Problem Determination, Management and Resolution

Automation
Application, network and system command and message automation

NetView for z/OS
IP support, SNA Support, Automation Engine

Control
Commands, Management and Environmental Control

Integration across TBSM & OMNIbus

OMEGAMON XE for Mainframe Networks

Events
Msgs

System Automation for MP/zOS/AM

Commands, Management and Environmental Control

GDPS Active/Active

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
NetView and OMEGAMON for MfN working together create single view of enterprise networks

- Common user interface integrates TCP/IP data from both NetView for z/OS and OMEGAMON XE for Mainframe Networks.
- Integration function provides customers with a consolidated TCP/IP workbench
  - Allowing management of both TCP/IP availability and performance from the same user interface.
- Smart IP tracing to immediately learn where poor or unstable TCP/IP connections hamper application performance
OMEGAMON V5.1 now has a complete family across System z sub-systems

OMEGAMON XE z/OS v 5.1
OMEGAMON XE CICS v 5.1
OMEGAMON XE DB2 v 5.1.1
OMEGAMON XE IMS v 5.1
OMEGAMON XE Storage v 5.1
OMEGAMON XE Messaging v 7.1
OMEGAMON XE Mainframe Networks v 5.1
OMEGAMON for z/OS Management Suite V5.1
All the components work together to keep applications and services available.

- Role appropriate views of right data at right time
- Rapid problem diagnostics via common UI and drill down between products
- Consistent historical views of resource performance and availability data
- Alert me when thresholds breeched and enable to automate corrective actions
Business Agility with improved IT visibility now available with OMEGAMON V5.1 family

Modernized and strengthened OMEGAMON product line for reduced resource usage and faster problem resolution

Increased System Availability with faster problem resolution
- Enhanced 3270 User Interface for SMEs
- Built-in Problem Solving Scenarios

Improved Productivity with simplified information
- Faster Install/Configuration/Maintenance
- zEnterprise monitoring across z196/114 and zBX

Reduced Costs with decreased resource usage
- Usage of zIIP specialty servers
- Simplified OMEGAMON architecture

Individual products include additional capability
Enhanced 3270 user interface creates Enterprise wide view of information for improved availability

- Understand transactions across your enterprise
- Color coding to provide ability to find and resolve problems quickly
- Eliminates need to move between multiple screens and monitors

“GUI on a green screen”

At a glance, view key information for each OMEGAMON product

Navigate quickly through the data to identify the source of a problem
Customer prioritized **Problem Solving scenarios** built into enhanced 3270 user interface

- Customized screens focused on customer defined problems
- Screen content based on high priority problems
- Includes Healthcheck and Bottleneck analysis

Easy to see and find critical system and sub-system information for improved performance and availability across System z

Top consumers view of details

Gain graphical view of data
Example of quickly finding and fixing z/OS Problem

Screen 1

New E3270UI highlights problems and simplifies resolving them quickly

Possible Looping Job

Screen 2

Enter ‘c’ to cancel job

In prior releases this would have taken from 5 to 15 screen interactions

Screen 3

Job Cancelled
OMEGAMON V5.1 enhanced configuration and maintenance capability with **Self-Describing Agents**

Faster, easier, less error-prone for improved reliability and productivity

- Eliminate monitoring outages caused by ITM Server recycles
  - Product upgrades/maintenance requires agent or RTEMS recycles only
- Eliminate maintenance upgrade errors:
  - Applies to new installs, staged upgrades, and maintenance
  - Crosschecks/validates version with installed data and framework
  - Avoids inconsistent application data in ITM framework layers
- Self-describing framework extensible to new capabilities
- Eliminates application data DVDs and CDs:
  - No extra distributed installs or upgrades for mainframe-centric customers

- Moving from 40 hours a week to 4 hours a week maintenance
- 80% improvement in time for installation and maintenance
- 30% improvement in time to configure post installation
Customer Driven improvements simplify Installation and Configuration using PARMGEN

Replaces ICAT as primary way to install and configure

Before: 145 ICAT product-centric jobs to configure 38 components for 1 LPAR RTE
Today: 8 Parmgen function-centric jobs to configure components for 1 LPAR RTE
Customers experiencing over 35% improvement in install and configuration time

- Easy to walkthrough steps to complete configuration and customize profile
- Automatically updates hundreds of configuration artifacts, including auto-discovery of system values
- Validate parameter settings for tolerance and type
- Imports settings from an existing ICAT environment
- Re-run to change values, add or delete products

"I like using the PARMGEN approach better than ICAT. I find it much easier to make things repeatable... I like the fact that PARMGEN does not overwrite my running members"
Typical quotes from early adopters program

The overall process has been simple and quick. Total time for 3-4 products (z/OS, CICS, DB2, TOM plain vanilla) has been about 2 hours Field Engineer
Moving to simplified architecture driving decreased resource utilization without loss of current function

Enhanced OMEGAMON Architecture

Current OMEGAMON Architecture

Multiple Address Spaces and User Interfaces across each OMEGAMON

Single Manager and User Interface across OMEGAMON family
OMEGAMON for Mainframe Networks V5.1 improves network diagnostics and management

In addition to OMEGAMON V5.1 family capability:

- Increased system availability with faster problem resolution through built-in problem solving scenarios
- Improved diagnostics and decreased CPU utilization
- Support for zEnterprise mainframe server improves application availability
- Improved resource usage with more control over data collection
- Greater synergy with IBM Tivoli NetView for z/OS
- Improved management through additional Take Action commands
- Improved troubleshooting of data collection problems
Increased System Availability with faster problem resolution

OMEGAMON XE for Mainframe Networks V5.1 delivers problem solving scenarios for your network

- Monitor application and TCP listener activity
- Monitor OSA and interface activity
- Monitor TN3270 server activity
- Monitor TCP/IP stacks activity
Scenario A: Scheduled logons and “silent” failures

The setting:
A mainframe network systems programmer was building a baseline for network performance of his LPARs and applications. A very high number of rejected connections were being reported by OMEGAMON XE for Mainframe Networks just after 10 pm each evening. At first, the systems programmer thought he had found a problem with the monitoring software.
Scheduled logons and “silent” failures

1. Johann, the network systems programmer, enabled a situation that e-mails him when backlog connections are rejected.

2. The e-mails confirmed that thousands of connection requests were being rejected before the FTP server was able to accept.
Scheduled logons and “silent” failures ...

She types the alias, NETWORK, and presses **Enter** to bring up the Enterprise Network Workspaces menu.

The network expert starts at the KNSTART Enterprise Applications Health workspace.

She selects **a** to display the Enterprise Application Health workspace and presses **Enter**.
Scheduled logons and “silent” failures ...

She locates the FTP application in the Connections in Backlog OR Total Backlog Connections Rejected subpanel.
Scheduled logons and “silent” failures …

She navigates to the **Application Details for Application_Name** workspace and verifies that the server has been up since the last IPL and is accepting connections, and that the connections are doing work.
Scheduled logons and “silent” failures …

She then navigates to the *Application TCP Listeners and Connections* workspace to view the current connections to the FTP server. The backlog limit is 10, which is low. She reconfigures the FTP server to have a backlog limit of 50.

Now, when the operator checks the **Backlog Limit**, the maximum number of connections allowed in backlog at any one time, she finds that new value of **50**.
Scheduled logons and “silent” failures …

That evening starting at 10 pm, the FTP server was accepting connections as usual, but the backlog limit is quickly exceeded and subsequent connections are rejected.

10 The OMEGAMON operator again verifies that the FTP application is accepting connections, and the connections in backlog returns to zero by 10:30 pm. She calls the network expert to update her on the problem.

11 When she investigates further, the network expert finds that 10,000+ workstations all “wake up” at the same time and attempt to FTP files at 10pm every night.

12 She increases the backlog limit for the FTP server temporarily to 2000 to provide relief until desktop support can roll out a change to the automated nightly timer, staggering the FTP connection requests over a couple of hours.
Scenario B: Spotting trends in abnormal connection count

The setting:
In this use case, a network systems programmer needs to identify the reasons behind slow, steady growth in the number of connections in one IMS region.

The network systems programmer navigates to the Enterprise Applications Health (KN3TAPO) workspace to view the IMS applications.
Spotting trends in an abnormal connection count ...

1. She brings up the **Filter(s)** menu and selects 1 to specify a **Job Name** filter.

2. She types `=` as the operator and `IMS*` as the value. This action will enable the **Application Summary** subpanel to filter on IMS and show all the IMS regions in the **Applications Summary** subpanel. She presses **Enter**.

3. The workspace shows only IMS regions.

   He observes the values of **Connection Count** and **Active Connections High Water Mark**.
Spotting trends in an abnormal connection count …

4 To focus on the IMS regions on System SP13, she types **SP13** into the **SMF ID** field and presses **Enter**.

5 **IMSBYCON** has a higher connection count than the other IMS regions.

6 He contacts an IMS systems programmer who verifies that all the IMS regions, including **IMSBYCON**, are performing work and no one has reported any connectivity issues.

7 There are no connections in backlog and the Idle Time shows that the IMS region is accepting connections.

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*Complete your sessions evaluation online at SHARE.org/SanFranciscoEval*
Spotting trends in an abnormal connection count …

8 He observes the IMS regions over time, watching the **Connection Count** increase while the **Idle Time** and **Connections in Backlog** remain in a normal range.

<table>
<thead>
<tr>
<th></th>
<th>IMSBYCON</th>
<th>0.50</th>
<th>227</th>
<th>140</th>
<th>140</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td></td>
<td>0.50</td>
<td>1228</td>
<td>1000</td>
<td>1000</td>
<td>0</td>
</tr>
</tbody>
</table>

9 He again contacts the IMS systems programmer.

By now, 1000+ connections are open, but not performing any work.

They determine that connections are being opened that are not being closed. The recycle IMS server to relieve the problem and the IMS programmer further investigates the IMS region.
Scenario C: Congested OSA Interface

The setting:
A systems programmer needs to quickly identify whether one OSA is processing a significantly higher volume of traffic than the other OSA on LPAR SP12. Traffic should be evenly distributed between the two OSA ports.
Congested OSA interface ...

He views the OSA Interface Status subpanel to ensure that the Interface Status is **Active**.
He issues a D TCPIP OMP RTTABLE command to display the main OMPROUTE table and determines that a first hop switch is congested for the non-productive OSA.

He contacts the enterprise networking team to resolve.
Scenario D: TN3270 connectivity problems

The setting:
A user has reported a problem accessing a 3270 application using a TN3270 session. Since the enterprise has more than 10,000 TN3270 connections, systems programmers cannot chase down individual connection issues.

However, after more users call with a similar complaint, a systems programmer starts to investigate.
TN3270 connectivity problems …

1. He navigates to the Enterprise TN3270 Servers Overview workspace

2. He knows that this 3270 application is accessed using a distributed DVIPA. He needs to look at the TN3270 servers in the PLEX3 sysplex.

He presses F4 to bring up the Filter Detail menu, specifies the Sysplex Name filter as “= PLEX3” and returns to this workspace.
TN3270 connectivity problems ...

He observes that the TN3270 server has no Connections in Backlog and no Backlog Connections Rejected.

The Idle Time Since Last Accept is less than 10 minutes, so the server has accepted new connections recently.
TN3270 connectivity problems ...

5. He positions the cursor on the action field to the left of the row and presses Enter to navigate to the default Active TN3270 Connections for Port Port_Number workspace.

6. No active sessions have remote IP addresses in the same subnet as the users reporting the problems.

7. He types an A in the action field to navigate to the TN3270 Connections for Port Port_Number workspace.
TN3270 connectivity problems ...

To view only closed sessions, he adds a filters on Session Indicator with a value of 2.
TN3270 connectivity problems …

He determines that some closed sessions have remote IP addresses in the reported subnet, but all of those connections ended more than an hour ago. This is likely a router issue. He contacts network support.
Scenario E:
Determining stack health using throughput

The setting:
A network systems programmer needs to identify issues with the throughput of network traffic through the z/OS TCP/IP stacks in the enterprise.

She is notified of slow network performance on one or more systems. These problems do not appear to be associated with any particular application.
Determining stack health using throughput

1. He starts at the Enterprise Summary workspace for all installed OMEGAMON agents.

2. He types `t` and presses Enter to navigate to the Enterprise TCP/IP Stack Performance Overview workspace.
Determining stack health using throughput...

He reviews the **IP Layer Metrics**. There are no datagrams discarded.

The **TCP Layer Metrics** subpanel reveals that there have been segments retransmitted and out of order segments on LPAR SP13.
Determining stack health using throughput

Scrolling to the right, he notices that **Total Out of Order Segments** is growing.

He types `/` and presses Enter next to **SP13** to display the **Options Menu**.

He types `I` and presses Enter to navigate to the TCPIP Stack IP Performance Details workspace.
Determining stack health using throughput

He determines that a configuration error on another system is causing the high number of reassemblies in the IPv4 layer. He corrects the error and confirms that the reassemblies stop.
Improved Diagnostics and decreased CPU utilization

Source changed:
• Old: SNMP
• New: Callable NMI

- Interfaces node
- Interface Status workspace
- Interface Statistics workspace
- Data Link Control (DLC) Read and Write Queue Statistics workspace
- Additional data collected
- ICMP Statistics workspace
- IP Statistics workspace
- UDP Statistics workspace
- TCP Statistics workspace
- TCPIP Stack Layer node
Improved Diagnostics and decreased CPU utilization

**Gateways:**
Gateways (Routing table) collected via IOCTL
- Lower CPU
- Reduce SNMP

<table>
<thead>
<tr>
<th>Collection Time</th>
<th>Network Address</th>
<th>First Hop</th>
<th>Link or Interface Name</th>
<th>Subnet Mask</th>
<th>Subnet Value</th>
<th>Link or Interface Status</th>
<th>Route Status</th>
<th>Route Type</th>
<th>MTU Value</th>
<th>Dynamic Route</th>
<th>Network Route</th>
<th>IP Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/05/10:13:54:56</td>
<td>172.17.0.0</td>
<td>&lt;direct&gt;</td>
<td>LS64102L</td>
<td>255.255.0.0</td>
<td>172.17.0.0</td>
<td>Ready</td>
<td>Active</td>
<td>ICMP</td>
<td>1500</td>
<td>Yes</td>
<td>Yes IPv4</td>
<td></td>
</tr>
<tr>
<td>03/05/10:13:54:56</td>
<td>127.0.0.1</td>
<td>&lt;direct&gt;</td>
<td>LOOPBACK</td>
<td>127.0.0.1</td>
<td>Ready</td>
<td>Active</td>
<td>Static</td>
<td>95535</td>
<td>No</td>
<td>No IPv4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03/05/10:13:54:56</td>
<td>10.92.0.0</td>
<td>&lt;direct&gt;</td>
<td>IUTIOGFEI</td>
<td>255.255.255.0</td>
<td>10.92.0.0</td>
<td>Ready</td>
<td>Active</td>
<td>Static</td>
<td>8192</td>
<td>No</td>
<td>Yes IPv4</td>
<td></td>
</tr>
<tr>
<td>03/05/10:13:54:56</td>
<td>10.93.2.2</td>
<td>&lt;direct&gt;</td>
<td>IUTIOGFEI</td>
<td>255.255.255.0</td>
<td>10.93.2.2</td>
<td>Ready</td>
<td>Active</td>
<td>Static</td>
<td>576</td>
<td>No</td>
<td>No IPv4</td>
<td></td>
</tr>
<tr>
<td>03/05/10:13:54:56</td>
<td>10.117.2</td>
<td>&lt;direct&gt;</td>
<td>MPC4172L</td>
<td>255.255.255.0</td>
<td>10.117.2</td>
<td>Ready</td>
<td>Active</td>
<td>Static</td>
<td>0</td>
<td>No</td>
<td>No IPv4</td>
<td></td>
</tr>
<tr>
<td>03/05/10:13:54:56</td>
<td>10.117.2</td>
<td>&lt;direct&gt;</td>
<td>MPC4172L</td>
<td>255.255.255.0</td>
<td>10.117.2</td>
<td>Ready</td>
<td>Active</td>
<td>Static</td>
<td>0</td>
<td>No</td>
<td>No IPv4</td>
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<td>255.255.255.0</td>
<td>10.117.2</td>
<td>Ready</td>
<td>Active</td>
<td>Static</td>
<td>0</td>
<td>No</td>
<td>No IPv4</td>
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<td>10.117.2</td>
<td>&lt;direct&gt;</td>
<td>MPC4172L</td>
<td>255.255.255.0</td>
<td>10.117.2</td>
<td>Ready</td>
<td>Active</td>
<td>Replaceable Static</td>
<td>0</td>
<td>No</td>
<td>No IPv4</td>
<td></td>
</tr>
</tbody>
</table>

**Dynamic Virtual IP Addresses (DVIPAs)** reported in Gateways (formerly in Interfaces) table

**OSA-Express:**
- **Speed diagnosis of OSA and interface problems** by following links from OSA to Gateways or Interfaces workspaces
- Each instance of the monitoring agent does not need to collect OSA data for each instance of the monitoring agent in your environment
  - Collect OSA performance statistics from a single LPAR that is sharing the OSA adapter
  - OSA is the only data that is collected via SNMP. You may choose not to configure or run the SNMP daemon on systems where you do not collect OSA data.

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Improved Diagnostics and decreased CPU utilization

From **Connections** node…

- Connections
- UDP Endpoints
- TCP Listeners
- TCP Connections
- Application Connections
- Application UDP Endpoints
- Application TCP Listeners
- Application TCP Connections
- TCP Connections Link

Improve overall TCP/IP performance with additional visibility:

- Monitoring the sent and received data queued for TCP connections
- Monitoring Application Transport–Transport Layer Security (AT-TLS)
- Defining the Local Port attribute numerically (sorting)
- Displaying connection state for all connection types
- Enabling the remaining Connections node workspaces for product-specific Take Action commands
Support for zEnterprise mainframe server improves application availability

OMEGAMON XE for Mainframe Networks provides:

Visibility into the zEnterprise IntraNode Management Network (INMN) and zEnterprise IntraEnsemble Data Network (IEDN)
- Isolate and analyze traffic flowing over zEnterprise private networks

Visibility into z/OS applications and connections using the new zEnterprise Management Network with performance metrics that are useful in debugging problems
- Filter on Outbound Interface Name to show connections using the new INMN and IEDN interfaces
Improved resource usage with more control over data collection

The ability to turn data collection on and off is now available for the following types of data (at system and stack level):

- OSA Statistics
- Interface Statistics
- Data Link Control (DLC) Read and Write Queue Statistics
- Stack Layer Statistics

<table>
<thead>
<tr>
<th>Configuration Tool</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>SPECIFY COMPONENT CONFIGURATION (Page 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify the following global information:</td>
<td></td>
</tr>
<tr>
<td>OSA Statistics Collection:</td>
<td>==&gt; Y (Y,N)</td>
</tr>
<tr>
<td>Interface Statistics Collection:</td>
<td>==&gt; Y (Y,N)</td>
</tr>
<tr>
<td>Interface Data Link Control Statistics Collection:</td>
<td>==&gt; Y (Y,N)</td>
</tr>
<tr>
<td>TCP/IP Stack Layer Statistics Collection:</td>
<td>==&gt; Y (Y,N)</td>
</tr>
</tbody>
</table>

Four new attributes for the four new configurable data collection options:
Greater synergy with IBM Tivoli NetView for z/OS

- Launch in context to start or stop a NetView packet trace
  1. Select TCP connection to trace
  2. Logon to NetView
  3. View packet trace definitions after link script completed
Greater synergy with IBM Tivoli NetView for z/OS

Sample situations trigger NetView for z/OS automation
- Execute command in NetView address space
- Send situation information in message

Sample NetView for z/OS automation
- Recognize messages
- Recognize situation events
- Parse message text
- Parse Situation event
Improved management through additional Take Action commands

- NSLookup and Tracerte added to Ping and Drop
- Available for Connections, TCP Connections, UDP Endpoints, TCP Listeners, and TN3270 Server Sessions

TEP Scenario:
- Situation alert created when connection experiences slow response time
- SME navigates to Connections workspace and sees high retransmission rate for a connection
- Is there high congestion in the network?
- Right clicks on the row for connection and choose Tracerte to display Tracerte dialog.
- Issues Tracerte to understand route between the two hosts and if router that is not working

Enhanced 3270 Scenario:
- Situation alert created when connection experiencing slow response time
- SME navigates to Application TCP Listeners and Connections workspace and identifies connection
- SME types the “/” option to display a list of options
- Types “D” to display the Drop dialog
- Issues Drop and verifies connection dropped
Improved troubleshooting of data collection problems

- Agent Status workspace provides configuration and status information about the agent and its data collectors.
- Troubleshoot data collection problems resulting in missing or incomplete data
  - After an install or upgrade
  - After the agent has been running for some time
- New attributes display status of data collection interfaces
OMEGAMON integrates within a total System z Business Service Management solution

OMEGAMON Portfolio provides performance and availability visibility for System z events and data consumed by a set of Tivoli BSM products

Business Assessment
- TBSM OMNIbus

Discovery
- TADDM

Transaction Tracking
- ITCAM

OMEGAMON V5.1

- e3270ui
- Tivoli OMEGAMON Manager
- OM DE
- TEP
- IBM Tivoli Monitoring (ITM)

TADDM – Tivoli Application Dependency Discovery Manager
ITCAM – IBM Tivoli Composite Application Manager
TBSM – Tivoli Business Service Manager

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Business success is directly dependent on the health of underlying IT systems, applications, and networks

- Complexity of today’s enterprise environments demands solutions that integrate across the enterprise

- IBM in unique position to deliver monitoring and management solutions across enterprise subsystems, including mainframe network

- IBM Tivoli OMEGAMON XE for Mainframe Networks V5.1 key to system and network availability and performance, providing Visibility, Control, and Automation
## Tivoli System z Sessions at SHARE

### Tuesday
- **9:30** 12617: What’s New with System z Monitoring with OMEGAMON
- **11:00** 12789: OMEGAMON v5 Enhanced 3270 Hands-on Lab
- **1:30** 12616: Speeding Performance Problem Solving by Breaking Down Silo Domain Views on Your z/OS Systems
- **4:30** 12780: Understanding The Impact Of The Network On z/OS Performance

### Wednesday
- **11:00** 12880: Automated Performance Management Using IBM Tivoli: Techniques And Best Practices
- **1:30** 12779: What's New for z/OS Network Performance Monitoring with OMEGAMON
- **4:30** 12781: Using NetView for z/OS for Enterprise-Wide Event Management and Automation

### Thursday
- **8:00** 12901: Managing the Mainframe From an End-to-End Perspective
- **9:30** 12774: Get Up and Running With NetView IP Management
- **9:30** 12791: Improve Service Levels with Enhanced Data Analysis
- **11:00** 12790: Learn How to Leverage System z in Your Cloud
Session 12799
What’s New for z/OS Network Performance Monitoring with OMEGAMON

Dean Butler
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Reference Materials
Product Documentation

- IBM Tivoli OMEGamon XE for Mainframe Networks:
  - Planning and Configuration Guide, **SC27-4447**
  - Enhanced 3270 User Interface Guide, **SC27-4450**
  - Tivoli Enterprise Portal User’s Guide, **SC27-4446**
  - Troubleshooting Guide, **SC27-4448**
  - Parameter Reference, **SC27-4449**

- IBM Tivoli OMEGamon XE and Tivoli Management Services on z/OS:
  - Common Planning and Configuration Guide: **SC23-9734**

**New**
- IBM Tivoli OMEGamon XE and Tivoli Management Services: Enhanced 3270 User Interface Guide: **SC22-5426**
Technotes

- OMEGAMON XE for Mainframe Network v5.1.0 GA technote:

- High Availability z/OS Hub TEMS support Technote

- Troubleshooting no data conditions on the OMEGAMON Enhanced 3270 User Interface
Community, Forum, Wiki

- OMEGAMON XE for Mainframe Networks Community/Forum Support Site:

- Tivoli System z Monitoring and Application Management:

- OMEGAMON XE for Mainframe Networks Wiki:

- Service Management Connect: