The IBM Tivoli Monitoring Infrastructure on System z and zEnterprise

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IBM Advanced Technical Skills
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ABSTRACT

Are you a mainframe person who is overwhelmed with understanding the various components of IBM Tivoli Monitoring that run across both mainframe and distributed platforms? Then never fear, this session is here!

This technical tutorial will cover the components and relationships of IBM Tivoli Monitoring, including their applicability to the System z and zEnterprise environment. In addition, information on the key best practices for implementing and using these components will be provided.
Agenda

• IBM Tivoli Monitoring Architecture Overview
• Components
  • Monitoring Servers
  • Portal Server
  • Clients
  • Agents
• Additional Features
  • Enhanced 3270 Interface
  • Tivoli Data Warehouse
  • Tivoli Common Reporting
  • Performance Analyzer
  • Command Line Interface
• Installation and Customization
• Operational Integration
Overview and Components
What is IBM Tivoli Monitoring (ITM)?

- An infrastructure for supporting end-to-end real time and historical monitoring across both System z and distributed environments
- Provides availability and performance monitoring for a wide range of technologies
- Designed to support small, medium, and large environments
- A focal point for integrating data from OMEGAMON, Composite Application Management (ITCAM), and other IBM and third party products
- Enables building bridges across islands of monitoring
- A key element for supporting IBM IT Service Management at the operational level
ITM Infrastructure at a Glance

Tivoli Enterprise Portal Client
(Browser, Webstart, Desktop)

Tivoli Enterprise Portal Server (TEPS)

Data Warehouse

Tivoli Common Reporting

Warehouse Proxy Agent (WPA)

Summarization and Pruning Agent (SPA)

Performance Analyzer Agent (ITPA)

Enhanced 3270 User Interface

Tivoli Enterprise Monitoring Server (TEMS)

Hub

Agents

Agents

Monitored Environments

Monitored Environments

Remote

Monitored Environments

Agents

Tivoli Enterprise Monitoring Server (TEMS)
## Primary Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
<th>Platforms</th>
</tr>
</thead>
</table>
| Tivoli Enterprise Portal Client (TEP) | • User interface  
  • Standalone client  
  • Web browser (IE, Firefox)  
  • Java Web Start | • Windows  
  • Linux  
  • AIX (browser client) |
| Tivoli Enterprise Portal Server (TEPS) | • Provides presentation views (workspaces) of metrics, events, and thresholds  
  • Sends commands to Monitoring server or agent to execute  
  • Caches requested short term data  
  • Database can be embedded or DB2/Oracle/SQL Server | • Windows  
  • Linux (Intel, System z)  
  • AIX |
| Tivoli Enterprise Monitoring Server (TEMS) | • Collects data from agents  
  • Runs threshold situations and report results  
  • Executes commands  
  • **Hub (1)** and **Remote** (0 or more) for scalability and grouping | • Windows  
  • Linux (Intel, System z)  
  • z/OS  
  • UNIX (AIX, HP-UX, Solaris)  
  • i |
| Agents | • Integrate with monitored component to return metrics and status to TEMS  
  • Execute commands | All |
TEP Client Functions

- **Navigation Tree**
  - Physical placement of agents by default
  - Custom placement as desired can be created
  - Associated workspaces and actions

- **Workspaces**
  - “Container” for various monitoring views from one or more agents
  - User authorization required for access

- **Views**
  - Various agent data representations (table, bar, pie, plot, circular, linear, graphic, topology)
  - Events (TEP, TEC, Netcool/OMNIbus, situation and policy status)
  - External information (web browser, 3270, telnet)
  - Dynamic links between views

- **Situations**
  - Notification and optional reactive automation based on agent data values

- **Workflow Policies**
  - Monitoring “flow” allowing of multiple situations and generating of multiple actions

- **Take Action**
  - Issue commands for execution on target resource (manual or automated)
### Agents

<table>
<thead>
<tr>
<th>Type</th>
<th>Monitored areas</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Tivoli Monitoring (ITM)</td>
<td>Non-z/OS operating systems and resources, hardware platforms</td>
<td>Windows, Linux, UNIX, I, databases, applications, clusters, virtual, energy, zEnterprise,…</td>
</tr>
<tr>
<td>OMEGAMON XE</td>
<td>System z platform and resources</td>
<td>CICS, DB2, IMS, Mainframe Networks, Messaging, Storage, z/OS, z/VM and Linux</td>
</tr>
<tr>
<td>Composite Application Management (ITCAM)</td>
<td>Applications, middleware, transactions</td>
<td>Applications, SOA, Application Diagnostics (HTTP/WebSphere/J2EE), Transaction Response Time/Tracking,…</td>
</tr>
<tr>
<td>Other products</td>
<td>Product monitored information for ITM integration</td>
<td>NetView, System Automation/GDPS, TWS, TBSM, Netcool/OMNIibus, third party…</td>
</tr>
</tbody>
</table>

- Each agent has an associated 2 character product code used in the infrastructure
- Most can operate in autonomous mode (function without being connected to a TEMS
  - Forward EIF or SNMP events to event management servers
Agentless Monitoring

- An agent that remotely monitors one or more target platforms
- Data obtained via remote APIs: SNMP, CIM, or WMI
- Supported target platforms: Windows, AIX, Solaris, HP-UX, Linux
- Up to 10 agentless monitors on a system
- Up to 100 remote monitored systems per agentless monitor
- Key metrics monitored
  - Logical and physical disk utilization.
  - Network utilization
  - Virtual and physical memory
  - System-level information
  - Aggregate processor utilization
  - Process availability
Universal Agent

- Provides a variety of interfaces ("Data Providers") to capture data
- Used for custom monitoring solutions
  - some available on the Integrated Service Management Library (formerly OPAL) website
- Ability to access/receive data from other platforms via network connectivity
- Runs on Unix/Windows/Linux, but can be used to integrate with and monitor z/OS or z/VM information remotely
Agent Builder

• Strategic method for building custom monitoring
• A “wizard-driven” solution for creating agents
  • Develop customized agent solutions, including agent installation package
• Data Sources
  • Availability Monitoring:
    • Process Monitoring
    • Windows Service Monitoring
    • Functionality Test
  • WMI, CIM
  • Windows Performance Monitor
  • Windows Event Log
  • SNMP and SNMP events
  • Scripts, Log Files
  • HTTP, SOAP, JMX, ICMP
  • JDBC, Java API
• Created agents execute on Windows/Unix/Linux, but can remotely monitor z/OS or z/VM information
Agent Application Support

- Files that allow agent to participate in infrastructure
  - Catalog and attribute (CAT and ATR) files for presenting workspaces, online help, and expert advice for the agent in Tivoli Enterprise Portal.
  - SQL files for adding product-provided situations, templates, and policies to the Enterprise Information Base (EIB) tables maintained by the hub monitoring server
    - Also called “seed data”
  - ODI files for historical attribute groups
  - Must be synchronized across TEPS/TEMS/Client
    - Missing, empty or Kxx: named workspaces usually a result of missing or mismatched application support files
High Availability Options

• Agents
  • Define primary and secondary TEMS for failover

• Remote TEMS
  • Use multiple Remotes TEMS, place to eliminate single points of failure
  • Define primary and standby Hub TEMS for failover

• Hub TEMS
  • Non-z/OS: define hot standby TEMS
    • Synchronizes and monitors Hub TEMS
    • Takes over if Hub TEMS fails
  • z/OS: Define High Availability Hub
    • Requires DVIPA IP address, moveable among Sysplex LPARs
    • No agents defined in its runtime environment (RTE)

• TEPS
  • Manual actions required to switch TEPS to backup Hub TEMS
    • Possible to automate with external automation products
  • Can use multiple TEPS
    • One “Administrative”, others read only
System z Infrastructure Placement Example
zEnterprise Infrastructure Placement Example

- High Speed Private Network
- PR/SM
- Hardware Resources
- Support Element
- z/OS
- z/VM
- Linux
- RTEMS
- Agents
- z/OS
- Linux or Win
- Agents
- PR/SM
- xHyp
- Hub TEMS
- R TEMS
- TEPS
- WPA SPA
- AIX
- pHyp
- zBX
- AIX
- Linux or Win
- RTEMS
- AIX
- RTEMS
- RTEMS
- RTEMS
- RTEMS
- RTEMS
Additional Features
Enhanced 3270 Interface

- 3270 view that allows access to data across multiple agents and agent types
  - All sysplexes, all CICS regions, specific groupings of agents, etc.
  - Drill down to detailed agent data
- Data is retrieved from Hub TEMS
  - Requires Hub TEMS and desired agents to be active and enabled (Runtime Environment customization)
- Enhanced 3270 Address Space provides user interface
  - Only one needed per sysplex
  - Define global settings and individual user settings (source Hub, panel views)
  - Threshold alerts to highlight information
Tivoli Data Warehouse

- Stores any desired agent metrics for long term trending and reporting purposes
- Supports information correlation and trending for incident, capacity and change management purposes
- Components
  - Database: DB2 (z/OS or distributed), Oracle, or SQL Server
  - Warehouse Proxy Agent – offload data from agents and stores in database
  - Summarization and Pruning Agent – summarizes and prunes database
- Data is in relational format and can be reported on by:
  - Any product or function that can process SQL
  - IBM Tivoli Common Reporting

Historical data is configured for an agent via the TEP client or command line interface
- Desired attribute groups
- Frequency of collection interval and warehouse upload
- Filtering based on agent and/ or metric values
Tivoli Common Reporting

- Provided as part of ITM
- A packaged WebSphere application that uses Cognos (TCR 1.3 and later) and BIRT engines to provide reports on data in Warehouse
  - Supported on Linux on System z
- Most agents come with a set of canned reports
- Provided reports can be modified, or new ones developed, to address specific requirements
Performance Analyzer Agent

- Provides analytic engine for linear forecasting, basic transformation analysis, and (with SPSS) non-linear forecasting of any metrics collected in the Tivoli Data Warehouse
- Provides medium and long term forecasts within a confidence factor
- Provides predefined workspaces, tasks situations, and TCR reports for Unix, Linux, Windows, DB2 (distributed), Oracle, ITCAM, VMware, System p
  - e.g. can use for forecasting future z/VM or xHyp* Linux guest capacity
- GUI tool in TEP to
  - Create and modify analytical tasks
  - Define trending/forecasting for any warehouse data
Command Line Interface

- **TACMD** function provides a command line driven interface from Windows, Linux, or UNIX to manage and control ITM Functions
- Requires authentication to Hub TEMS
- Supports all actions that can be done from the TEP client and more:
  - Install agent packages into repository
  - Check prerequisites on a target system
  - Deploy new/upgrade existing agents
  - Edit agent configurations
  - Define and control situations and historical data collection
  - Import/export custom navigator views, workspaces, queries, and situation associations
  - Display configured information and execute commands
  - Start and stop agents
- Allows ITM administration to be automated from external products
Installation and Customization
**z/OS Installation**

- z/OS components execute within a Runtime Environment (RTE)
  - A set of datasets with TEMS and/or agent code
  - Several RTE configuration options available
    - Full – complete self-contained RTE
    - Base – sharable libraries only, for use with Sharing RTE
    - Sharing – Image-specific libraries, shares with Base RTE, Full RTE, or SMP/E target libraries
- Options for creating/maintaining RTEs and customizing components:
  1. Configuration Tool (ICAT)
     - ISPF menu driven interface
     - Identify agent to be configured
     - Identify RTE to configure agent in
     - Submit jobs to create/update RTE members
     - Batch ICAT option to create new RTEs from existing ones
  2. PARMGEN method
     - Introduced in ITM 6.22
     - Edit a set of PDS members to define RTE and agents to be associated with RTE
     - Execute jobs to create/update RTE members
Non-z/OS Installation

• Standalone Prerequisite Checking
  • Provided to verify platform (Windows, Linux, or UNIX) meets agent installation requirements
  • Currently for Operation System agents only
• Checking methods
  • Manually executed standalone program run directly on checked platform
  • Remote checking done via `tacmd checkprereq` command
    • *Can be done for individual systems or a group of systems*
TEPS/TEMS Installation

• Optional: Install on TEPS platform
  • DB2 UDB Version 9.x (provided)
  • SQL Server (option for Windows)
• If using embedded database, DB2 or SQL database client software required if
  • Using DB2 or SQL for TEPS database
  • Accessing TDW from TEPS views
• “Typical” installation path is fine
• Take all defaults
• Upgrade to FPx (or higher level)
• Install TEPS and TEMS
  • Windows: GUI or silent installation process
  • Linux: Command Line or silent installation process
Startup Center

- A graphical user interface tool to guide setup of a new IBM Tivoli Monitoring environment on Windows/Linux/UNIX
  - Not intended for upgrading existing components
- Topology diagrams are used to configure and deploy an initial base IBM Tivoli Monitoring environment
- Runs on both Windows and Linux Intel x86-32 systems
  1. Scan IP range(s) to discover systems, or add systems manually
  2. Assign systems to components (drag and drop)
  3. Provide system access information
  4. Identify installation image repository
  5. Start installation
Agent Remote Deployment

- Requires Hub TEMS running on Linux/UNIX/Windows
- Agent packages (‘bundles’) installed in repositories on any Hub or Remote TEMS
- Commands provided to install/upgrade agents
- Provides for mass and/or automated agent installation

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>tacmd addBundles</td>
<td>Add one or more deployment bundles to the local agent deployment depot.</td>
</tr>
<tr>
<td>tacmd addgroupmember</td>
<td>Add a group member to the specified group.</td>
</tr>
<tr>
<td>tacmd addSystem</td>
<td>Deploy a monitoring agent to a computer in your IBM Tivoli Monitoring environment.</td>
</tr>
<tr>
<td>tacmd clearDeployStatus</td>
<td>Remove entries from the table that stores the status of the asynchronous agent deployment operations.</td>
</tr>
<tr>
<td>tacmd creategroup</td>
<td>Create a new group on the server.</td>
</tr>
<tr>
<td>tacmd createNode</td>
<td>Deploy an OS agent to a remote computer.</td>
</tr>
<tr>
<td>tacmd getDeployStatus</td>
<td>Display the status of the asynchronous agent deployment operations.</td>
</tr>
<tr>
<td>tacmd listBundles</td>
<td>Display the details of one or more deployment bundles that are available for deployment to the local deployment depot.</td>
</tr>
<tr>
<td>tacmd login</td>
<td>Log on to a monitoring server and create a security token used by subsequent commands.</td>
</tr>
<tr>
<td>tacmd removeSystem</td>
<td>Remove one or more instances of an agent or uninstall an agent from a managed system.</td>
</tr>
<tr>
<td>tacmd viewDepot</td>
<td>Display the types of agents you can install from the deployment depot on the server which you are logged on to.</td>
</tr>
</tbody>
</table>
Agent Application Support Installation/Upgrade

- Prior to ITM 6.23

<table>
<thead>
<tr>
<th>Agent on z/OS</th>
<th>TEPS on z/OS</th>
<th>TEMS on non-/zOS and TEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product configuration (ICAT or PARMGEN)</td>
<td></td>
<td>Install from product/fixpack media</td>
</tr>
<tr>
<td>Remotely install from TEPS platform</td>
<td></td>
<td>Install from product/fixpack media</td>
</tr>
</tbody>
</table>

- ITM 6.23
  - Self-describing agent function added (support being added to agents in new releases)
    - TEPS/TEMS support receiving and updating application support from agents with self-describing function
    - Agents provided with as part of ITM 6.23 contain function
  - Application support can be automatically installed on TEMS and TEPS when agent first connects
    - Function enabled via Hub TEMS parameter
Custom Queries

- Metrics are retrieved for viewing via queries to agent attributes
- Custom queries can be developed to display data from
  - Agents (individual or multiple agents of same type)
  - Hub TEMS Enterprise Information Base
  - Data Warehouse
  - ODBC or JDBC data sources
- Filtering at query time and/or in view to customize actual data being displayed
Custom View Example
Custom View Example
Operational Integration
Situations

- Allow notifications to be generated based on values of one or more metrics in an attribute group
- Done via TEP or tacmd commands
- Notifications can be an alert on the TEP, a message in the ITM message view, EIF event, or reflex automation
- Text documentation or instructions can be associated with a situation
- Selective distribution to individual targets or groups
- Every agent comes with a set of predefined situations
- Existing situations can be modified, or new ones added
- Reflex automation allows a command to be executed at the command interface of the agent or the TEMS it is connected to
  - For z/OS, console command
    - security authentication is provided via NetView for z/OS
Workflow Policies

- Connect multiple situations and actions in a flow
- Allows correlation across multiple agents
  - Situation from one agent can trigger actions in other agents
  - Situations from multiple different agents can be combined to trigger one or more actions
Actions

• z/OS Commands can be issued from the TEP to z/OS
  • Manually (Take Action)
  • Triggered by a Situation
  • “One way” (command response is not captured)
Event Integration

- Event Integration Facility (EIF)
  - A Situation can send an EIF event to multiple EIF receivers when triggered
    - Maps situation attributes to EIF event slots
  - Event synchronization between ITM and Netcool/OMNIbus or TEC
    - e.g. close situations when EIF event is closed in those products
  - Agents can be enabled to send EIF events directly to EIF receivers
  - Common Event Console view shows Netcool/OMNIbus and TEC events along with ITM events

- SNMP
  - Universal Agent provides a SNMP Emitter, which can be used in workflow policies to send SNMP traps
  - Agents can be enabled to directly send SNMP events
  - Other integration is possible via command execution from situations and take actions
  - Information from situation or view can be passed to executing function
SOAP Integration

- Hub TEMS can be configured as a SOAP Server
  - Can also direct SOAP requests to other Hub TEMS
- Access to ITM data and functions via SOAP calls
- Results returned in XML format
ITM Audit Tools

• Available from the Integrated Service Management Library website
• Retrieves data from TEMS, TEPS, and the Data Warehouse to show current configuration and connectivity
• Highlights areas where problems may exist examples:
  • Topology (e.g. agents offline for long periods)
  • TEMS and Agent connectivity and response time
  • TEMS Servers (e.g. situation statistics)
  • Exceptions Analysis (e.g. situations never fired)
  • Distributions (e.g. situations distributed to agents)
  • Situation and Policy Testing
  • Outages (infrastructure availability)
  • TEPS (e.g. installed application support analysis, user login information)
  • Stressed resources (from analyzing TDW data)
  • Warehouse information (e.g. active collections)
• Provides batch tools for additional analysis
• Sessions can be saved
## Auditing Tools

### Situation Error Statistics Hub at RTFO1:CMS

<table>
<thead>
<tr>
<th>System</th>
<th>Error Situations</th>
<th>Time (Seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REMOTE_HASLE315</td>
<td>3</td>
<td>0.672</td>
</tr>
<tr>
<td>REMOTE_HASLE104</td>
<td>12</td>
<td>0.187</td>
</tr>
<tr>
<td>RTE01:CMS</td>
<td>0</td>
<td>0.703</td>
</tr>
</tbody>
</table>

### Catalog Comparisons

<table>
<thead>
<tr>
<th>System</th>
<th>No. of Apps</th>
<th>Time (Seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REMOTE_HASLE315</td>
<td>97</td>
<td>22.062</td>
</tr>
<tr>
<td>REMOTE_HASLE104</td>
<td>73</td>
<td>4.547</td>
</tr>
</tbody>
</table>

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Best Practices Summary
Hub TEMS Considerations

- Placement based on
  - Security
    - User access controlled via Hub TEMS platform security or LDAP
  - Resource availability
    - processor, memory, storage
  - Data conversion considerations
    - ASCII<->EBCDIC translation between components
  - Network topology
    - Impact of firewalls, NAT, agent locations
  - Failover capabilities
    - Manual restart vs automated
  - Remote deployment for agents
    - Requires HUB on non-z/OS platform
  - Minimize number of directly connecting agents
Remote TEMS Considerations

- Define at least 2 for availability and performance
  - Offload work from Hub TEMS
  - Agents can have primary and backup TEMS defined
- One TEMS per z/OS image
  - z/OS and Storage agent must run within TEMS address space
  - Agents can have primary and backup TEMS defined
- Rule of Thumb: 500-1500 agents per remote TEMS
  - Processor speed more a factor than memory or storage
  - Workload depends on event arrival rate, situation processing, workflow policy processing, client, action commands running on the TEMS server,…
  - Start with relatively few agents and measure performance before moving toward a final workload level target
    - Continue to measure performance over time and make adjustments to match goals
- On z/OS TEMS should be at a higher workload priority than agents
- Network topology
  - Locate Remote TEMS as close to connecting agents as possible
    - Acts as a concentrator for NAT/firewall/geographical locations
TEP Client Considerations

• **Java Webstart is recommended client**
  - Automatically keeps synchronized with TEPS when agents are added/upgraded/removed
  - Easier to manager multiple clients going to different TEPS – files are stored separately

• **Browser is next best option**
  - Best for users with limited access or smaller client platforms
  - Conflicts can arise when trying to use with multiple TEPS at different levels, or other Java based browser
  - Not as fast as desktop or webstart clients

• **Desktop client issue: staying in sync with TEPS**
  - Must manually install updated application support files
  - Difficult having multiple desktops going to different TEPS
Agent Considerations

• For agents on z/OS:
  • Run agents in separate address space (except z/OS and Storage)
  • TEMS agent reports to should be on z/OS
• Collect historical data at agent to reduce performance impact on TEMS
• Define primary and backup TEMS for availability
  • Agent will connect to backup if primary is not available
• Keep agent application support synchronized on TEP and TEMS
  • Otherwise will have missing data
  • Requires installing application support on TEPS and TEMS whenever agent upgrade/fixpack provides new application support
• Use Monitoring Server workspaces and ITM Audit Tools to validate
  • ITM 6.23 adds self-describing agent function
• Determine how much of the “default” monitoring is really needed
• Agent autonomous operation
  • Agent monitors and send events when not connected to a TEMS
Historical Data Collection Considerations

- Collect data at agent where possible
  - For z/OS TEMS and Agents, persistent datastore datasets must be defined
- Only collect data that will be used
- Use the Warehouse Load Projections Spreadsheet or agent users guides to estimate warehouse database size
  - Manage size via pruning
- Use multiple WPAs based on number of agents
  - Assign a WPA to each TEMS to collect from connected agents
- Data compression can be enabled between agents and WPA to reduce network traffic
  - Tradeoff is increased processor use at agent and WPA
- Only summarize on intervals needed for reporting or capacity planning
- Use standard database policies/procedures for tuning and archiving beyond ITM capabilities
- Apply documented WPA and SPA performance and tuning options
Summary

- IBM Tivoli Monitoring provides a platform for consolidated end-to-end monitoring across System z and distributed environments.
- Fully supports monitoring of z/OS, z/VM and Linux on System z, and application operating system platforms and components running across a zEnterprise.
- System z and zEnterprise can act as a “manage from” platform to manage itself and other operating system platforms and networks.
- Data, event, automation, and historical analysis can be integrated with other products.
- Be sure to plan and guidelines and best practices experiences to get the most out of IBM Tivoli Monitoring.
For Further Information

• IBM Tivoli Monitoring and OMEGAMON XE Information Center

• IBM Tivoli Monitoring: Implementation and Performance Optimization for Large Scale Environments
  • http://www.redbooks.ibm.com/abstracts/sg247443.html

• IBM Tivoli Monitoring Wiki

• Tivoli System z Monitoring and Application Management Wiki
  • https://www.ibm.com/developerworks/wikis/display/tivoliomegamon/Home

• Flashes, Technotes, and White Papers on IBM Techdocs
  • http://www.ibm.com/support/techdocs (search on “IBM Tivoli Monitoring”, “ITM”, or “OMEGAMON”)

• YouTube videos (search “IBM Tivoli Monitoring” and/or “OMEGAMON”)

• IBM Integrated Service Management Library
  • https://www.ibm.com/software/brandcatalog/ismlibrary/
System z Social Media

- System z official Twitter handle:
  - @ibm_system_z

- Top Facebook pages related to System z:
  - Systemz Mainframe
  - IBM System z on Campus
  - IBM Mainframe Professionals
  - Millennial Mainframer

- Top LinkedIn Groups related to System z:
  - Mainframe Experts Network
  - Mainframe
  - IBM Mainframe
  - System z Advocates
  - Cloud Mainframe Computing

- YouTube
  - IBM System z

- Leading Blogs related to System z:
  - Evangelizing Mainframe (Destination z blog)
  - Mainframe Performance Topics
  - Common Sense
  - Enterprise Class Innovation: System z perspectives
  - Mainframe
  - MainframeZone
  - Smarter Computing Blog
  - Millennial Mainframer
# Tivoli System z Session at SHARE

## Monday
- **11:00** 11207: Automating your IMSplex with System Automation for z/OS  
  Platinum 7
- **1:30** 11832: What’s New with Tivoli System Automation for z/OS  
  Elite 1
- **3:00** 11886: Improve Service Levels with Enhanced Data Analysis  
  Elite 1

## Tuesday
- **9:30** 11792: What’s New with System z Monitoring with OMEGAMON  
  Elite 1
- **11:00** 11791: Tuning Tips To Lower Costs with OMEGAMON Monitoring  
  Platinum 8
- **1:30** 11900: Understanding Impact of Network on z/OS Performance  
  Grand Salon A

## Wednesday
- **9:30** 11835: Automated Shutdowns using either SA for z/OS or GDPS  
  Elite 1
- **1:30** 11479: Predictive Analytics and IT Service Management  
  Grand Salon E/F
- **1:30** 11899: Top 10 Tips for Network Perf. Monitoring w/ OMEGAMON  
  Platinum 9
- **4:30** 11836: Save z/OS Software License Costs with TADz  
  Elite 1

## Thursday
- **9:30** 11905: Using NetView for z/OS for Enterprise-Wide Mgmt and Auto  
  Grand Salon A
- **11:00** 11909: Get up and running with NetView IP Management  
  Grand Salon A
- **11:00** 11887: Learn How To Implement Cloud on System z  
  Grand Salon E/F

## Friday
- **9:30** 11630: Getting Started with URM APIs for Monitoring & Discovery  
  Elite 1