

# IBM Service Management Suite for z/OS with Service Management Unite

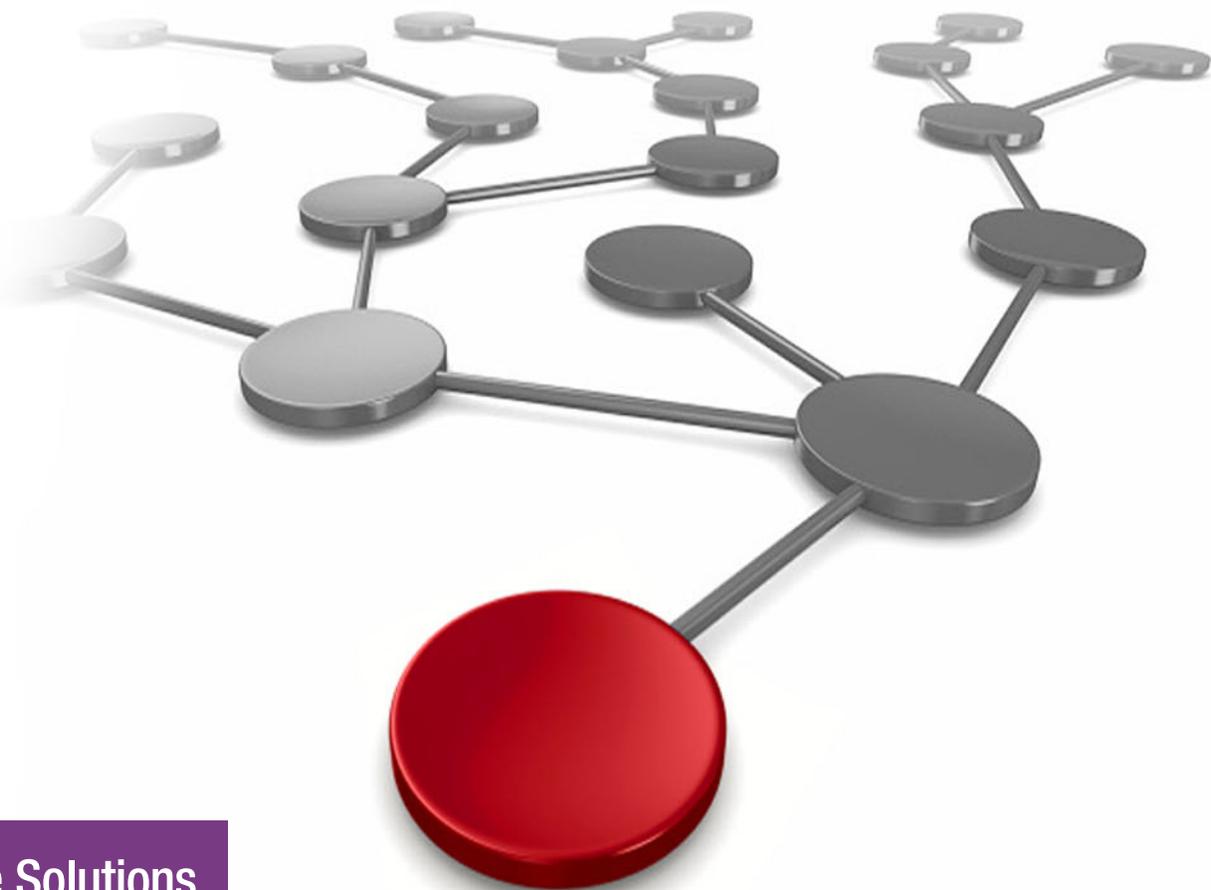
Lorin Ullmann

Carol Davis

Michael Gouveia

Arthur McDonald

Wolfgang Schaeberle



Infrastructure Solutions



Changes are happening in record time, forcing IT managers to develop strategies to anticipate and address these looming IT challenges. These service-driven demands are confronting IT management and making them choose how to best prepare for the future. They must be proactive and agile, which requires getting the most out of their team's skills and experience to manage this increasingly complex environment.

IBM® Service Management Suite for z/OS® (Figure 1) offers a single point of control for systems management functions, such as visibility, control, and automation. It spans hardware and software enterprise resources in an IBM z/OS systems environment and beyond.

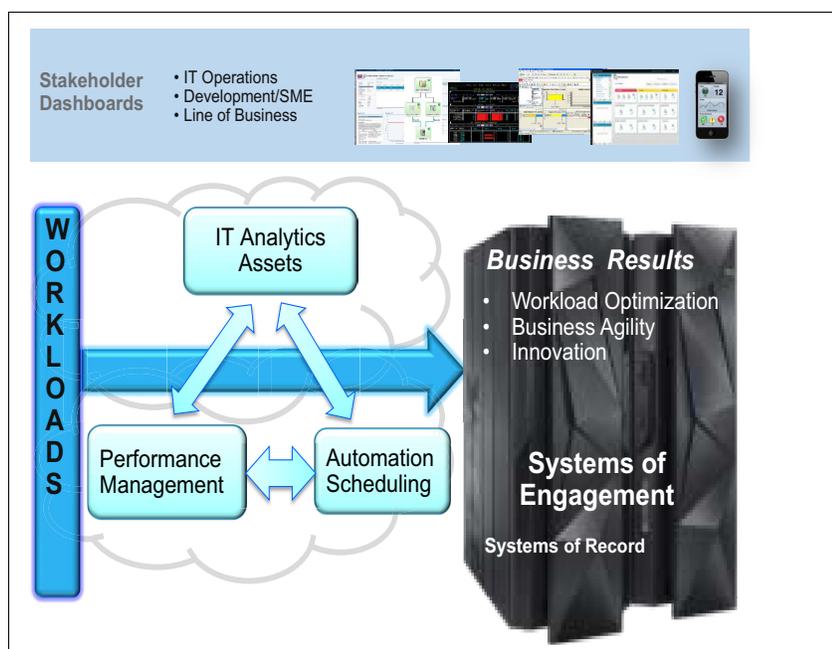


Figure 1 Service Management Suite for z/OS overview and strategy for IBM z Systems®

## Did you know?

Service Management Suite for z/OS provides operators a transparent view of the IBM z Systems compute landscape, including central electronic complex (CECs), LPARs, and Sysplexes with key performance indicators for improved problem isolation, analysis, and diagnosis.

This IBM Redbooks® Solution Guide describes Service Management Suite for z/OS and its new user interface IBM Service Management Unite and includes high-level architectures (for each solution) with their key components. The guide also explains the integration of Service Management Unite with Service Management Suite for z/OS components and integration with other IBM products and third-party solutions to create a comprehensive solution. The business value and usage scenarios are also included.

## Business value

It is essential to optimize your IT team skills to deal with the increased number of requests and to handle a fast-paced operating environment. You can lower operational risk by adopting an integrated service management approach to handle system-related problems. Your organization can take advantage of Service Management Suite for z/OS in the following ways:

- ▶ Swiftly isolate, analyze, and diagnose complex problems by using integrated tools that encourage effective collaboration across team boundaries.
- ▶ Minimize the training and experience that is needed for users to be effective at their tasks, by providing user interfaces (UIs) with a common look and feel. UIs can be designed by the users as needed.
- ▶ Allow less experienced personnel to handle complex problems and restore service quickly, helping the organization reduce costs with a smarter IT management system.
- ▶ Save time by enabling users to make decisions and act quickly based on intuitive and consolidated UIs that have access to information from multiple sources. An additional advantage is that fewer user interactions are required.
- ▶ Improve service levels and reduce system downtime and outages by applying automated high availability (HA) and operational services.
- ▶ Increase efficiency of resources and reduce software costs with improved resource tracking that is provided by performance monitoring capabilities.
- ▶ Identify and resolve issues swiftly by using tightly integrated management tools for monitoring, automation, analytics, and network management.

## Solution overview

Service Management Suite for z/OS provides comprehensive service management capabilities for IBM z Systems environments. It is your comprehensive mainframe management solution that includes these features:

- ▶ Automation capabilities and application control:
  - Supports policy-based management and self-healing capabilities.
  - Offers high availability and disaster recovery.
  - Optimizes efficiency and availability of critical systems and applications.
  - Helps improve availability and provides capabilities for shutdown, recovery, and response to problems by using IBM Tivoli® System Automation for z/OS (referred to in this document as SA for z/OS) and IBM NetView® for z/OS.
- ▶ Performance monitoring and network management capabilities:
  - Provides transparency and ease of use of performance-based alarms and root cause problem determination.
  - Offers monitoring for IBM z/OS operating system, mainframe networks, storage subsystems, Java runtimes, IBM DB2®, IBM CICS®, IBM IMS™, IBM MQ for z/OS, and IBM WebSphere® Application Server for z/OS by using the IBM Tivoli OMEGAMON® Performance Management Suite for z/OS (referred to in this document as OMEGAMON).

Service Management Suite for z/OS has a new interface provided by IBM Service Management Unite. IBM Service Management Unite adds the following capabilities:

- ▶ Provides a consolidated view of system health status and accelerates problem identification.
- ▶ Delivers simplified, efficient automation, and system and network management capabilities.
- ▶ Improves productivity with an integrated operations console, which can be used to issue commands and resolve problems.

## Solution architecture

Service Management Suite for z/OS offers a single point of control for systems management functions, such as visibility, management, and automation, for many system elements. It spans both the hardware and software enterprise resources in an IBM z Systems environment. Figure 2 shows the high-level architecture of this solution.

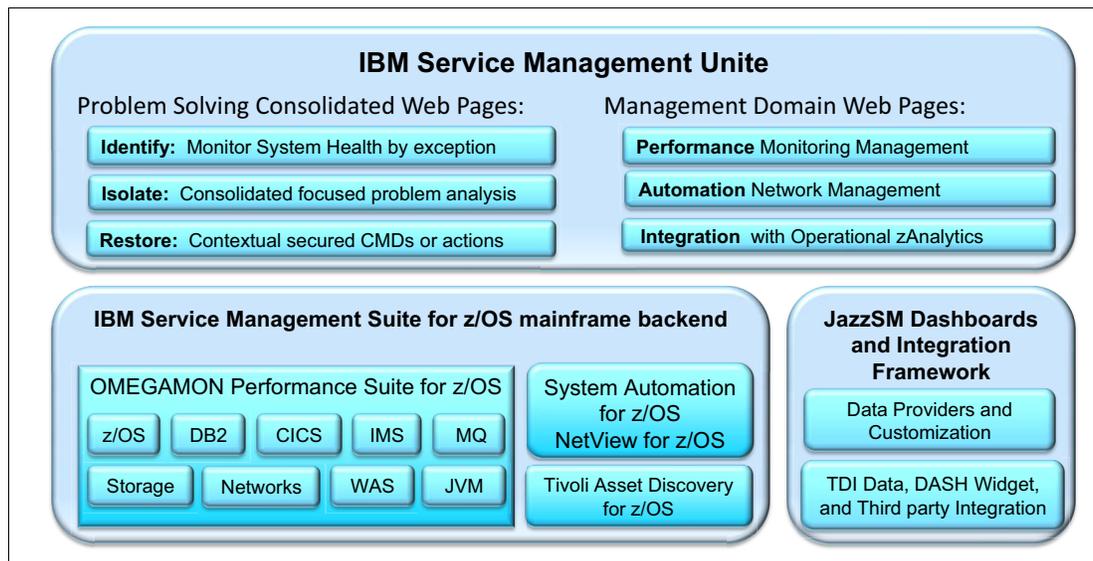


Figure 2 Service Management Suite for z/OS architecture

Starting at the top of Figure 2, the Service Management Suite for z/OS has a new user interface, IBM Service Management Unite. Service Management Unite is a customizable dashboard UI providing system programmers, operators, and administrators with a comprehensive view of the system health status. Service Management Unite supports easy problem identification by using tools within Service Management Suite for z/OS. Service Management Unite supports two types of views:

- ▶ Problem-solving consolidated views
- ▶ Management domain views

The problem-solving consolidated views provide the following capabilities:

- ▶ Identify: Monitor system health by exception

The UI consolidates and identifies events or alarms for your z/OS environment, enabling your team to manage by exception. Unexpected automation states pinpoint only the resources that require operator action. Performance events are displayed only if a threshold has been exceeded for the monitored resources.

- ▶ **Isolate: Consolidated focused problem analysis**

From an event, operators can open a view that provides more details about what triggered the alarm. Problem isolation pages consolidate data that is needed for analysis of a particular issue.

For example, a problem isolation page for an IBM MQ high queue depth situation contains monitoring results about the sending queue and the receiving queue, IBM MQ messages, the rate the queue is filling up, and suggested actions.

From the problem isolation page, the operator can directly open a SA for z/OS page to issue a command to restore service.

- ▶ **Restore: Contextual secured commands or actions**

Service Management Unite helps with problem resolution and restoration of service by building commands for the operator to reduce typing errors and save time. To build commands, the operator just right-clicks a row within a table or a node in a topology graphical view. Performance monitoring management pages display the list of possible commands that the operator can run for a resource. When Service Management Unite detects that a resource (address space) is under system automation control, it gives the user the option to perform commands through SA for z/OS. The results of each command issued are provided in a consolidated window for the user to view. All actions and commands against backend z/OS resources are secured by IBM Tivoli NetView for z/OS and either System Authorization Facility (SAF) or IBM Resource Access Control Facility (IBM RACF®).

Management domain pages have features and capabilities for each of the management products in the Service Management Suite for z/OS backend:

- ▶ **Performance monitoring management pages**

Performance monitoring management monitoring agents provide monitoring data that is displayed in the IBM Service Management Unite overview and detail pages. These performance overview and performance detail pages also include analytics integration (such as searching and analyzing logs) for environments that have IBM Operations Analytics - Log Analysis.

- ▶ **Automation and network management pages**

SA for z/OS provides data for Service Management Unite pages. This data enables users to explore automation domains, issue automation requests, define schedules, and review resource status.

Tivoli NetView for z/OS views securely display system logs and provide the ability to issue z/OS and Tivoli NetView for z/OS commands.

- ▶ **Integration and federation with IBM Operations Analytics for z Systems pages**

Performance Monitoring Management monitoring pages provide the ability to use the existing advanced log search and analysis capabilities of Operations Analytics for z Systems already in your environment. If Operations Analytics for z Systems exists in your environment, logs can be searched by using IBM Operations Analytics - Log Analysis for error messages about a particular resource and time period. While looking at monitoring data, an operator can launch in context from a monitoring page to a particular Operations Analytics for z Systems search results page (for example, logs for a CICS region of interest) without leaving Service Management Unite.

Figure 2 on page 3 (lower right box) shows IBM Jazz™ for Service Management dashboard and the Integration framework (provided by IBM Tivoli Directory Integrator). The Service Management Unite web UI design leads to a highly approachable UI used by more people than traditional UIs that are optimized for subject matter experts. The users can easily type into data entry areas and do filtering or searching on the data that is displayed in a widget.

**Value of a common look and feel:** Web interfaces that use a common look and feel help users learn navigation, find data, and perform tasks. You can navigate in context by moving from one view that is focused on a particular resource to another view that is focused on the same resource, which is critical to decreasing the number of required interactions.

IBM Dashboard Application Services Hub (DASH) provides visualization and dashboard services based on Jazz for Service Management (JazzSM). DASH has a single console for administering IBM products and related applications. DASH is highly customizable, enabling users with appropriate permissions to create dashboards by using a self-service palette. Multiple widgets can be arranged on the dashboard in a flexible and proportional manner. DASH employs a series of intuitive icons to access non-core customization, administration, and user management tasks, providing more area for displaying user content.

DASH is used by other IBM products along with Service Management Suite for z/OS. Use of the same DASH UI framework reduces training and improves reuse of skills, allows for integration, and builds end-to-end views across z Systems and distributed resources with a common widget palette. The following are other example other uses:

- ▶ Scheduling integration uses IBM Workload Scheduler for z/OS
- ▶ IBM Tivoli OMEGAMON XE for z/VM® and Linux on IBM System z®
- ▶ IBM Netcool® Operations Insight™ (includes distributed tools for OMNIBus events and network management)
- ▶ IBM System Automation Application Manager with IBM System Automation for Multiplatforms (distributed resources)

IBM Tivoli Directory Integrator implements the most complex integration by decomposing problems into data sources and data flows, allowing logic to be added to transform, create, or combine data. A Tivoli Directory Integrator DASH connector is provided. The connector converts the many data sources that Tivoli Directory Integrator understands into formats that are needed by DASH widgets. Tivoli Directory Integrator data can be displayed by Service Management Unite in DASH dashboards, by getting data from many sources and running logic that is needed to tightly integrate monitoring, automation, and analytics.

Figure 2 on page 3 (lower left box) shows the IBM Service Management Suite for z/OS backend composed of management agents and servers that subject matter experts (SMEs) and system programmers use to automate and monitor their environment. This solution provides application programming interfaces (APIs) that are used by UIs to read and write management data, perform management functions, and use a secure task execution framework into the backend products. It includes these products:

- ▶ IBM Tivoli System Automation for z/OS  
SA for z/OS is a policy-based, self-healing, high availability solution. It maximizes efficiency and availability of critical systems and applications, and reduces administrative and operational tasks. Flexible, cluster-wide, policy-based, self-healing high availability is delivered that minimizes the implementation, coding, and support time for automation of IBM z/OS systems and IBM Parallel Sysplex® clusters.
- ▶ IBM Tivoli NetView for z/OS  
Tivoli NetView for z/OS provides automation and network and systems management to address the requirement for business agility. It provides the automation framework used by SA for z/OS and manages heterogeneous networks and supports changing network and system requirements. It provides problem diagnostics with network and system log browsing, consolidated message logging capability, and packet tracking analysis.

► IBM Tivoli Asset Discovery for z/OS

Tivoli Asset Discovery for z/OS provides discovery, monitoring, and reporting to understand z/OS product and application usage. It automatically discovers and identifies IBM and third-party software that is running on the z/OS platform. It provides high-speed scanning and in-house application tagging to ensure that you have a complete inventory of products on your system, with minimal use of resources. It monitors software usage and related growth to proactively plan for future capacity needs. It lowers costs by removing unused and obsolete software.

► IBM Tivoli OMEGAMON Performance Management Suite for z/OS

This suite helps manage performance and availability of z/OS platforms and other resources. The suite provides composite alerts from multiple areas to quickly identify root problems, suggests actions to address problems, and fosters greater communication among IT groups for a more efficient way of managing the z/OS platform and resources. This highly integrated solution provides advantages in sharing information between the different management groups within your organization to help increase effectiveness, meet service level agreements (SLAs), and help reduce costs. The suite includes these applications:

- IBM Tivoli Composite Application Manager for Application Diagnostics: Monitoring for WebSphere Application Server on z/OS and deployed applications.
- IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS: Monitors and manages IBM DB2 transactions and interactions with applications.
- IBM Tivoli OMEGAMON XE for Messaging for z/OS: Monitors your business application and system availability and capacity.
- IBM Tivoli OMEGAMON XE for CICS on z/OS: Centrally monitors and manages IBM CICS transactions and interactions with other applications. It also provides monitoring of CICS Transaction Gateway on z/OS.
- IBM Tivoli OMEGAMON XE for IMS on z/OS: Monitors and manages IBM IMS transactions and interactions with applications.
- IBM Tivoli OMEGAMON Dashboard Edition on z/OS: A systems management integration tool that displays information from various tools in one location, including IBM Tivoli OMEGAMON XE for Messaging monitors and third-party software.
- IBM Tivoli OMEGAMON XE on z/OS: Provides detailed monitoring and problem management for IBM z Systems and IBM zEnterprise® systems.
- IBM OMEGAMON for JVM on z/OS: Provides resource level monitoring of all Java virtual machines (JVMs) on z/OS enabling visibility and insight into Java performance across subsystems. It includes monitoring for z/OS Connect Enterprise Edition.
- IBM Tivoli OMEGAMON XE for Mainframe Networks: Supports the health and performance of your applications and associated IT and network infrastructures across system environments.
- IBM Tivoli OMEGAMON XE for Storage on z/OS: Provides storage monitoring, management, and corrective action capabilities to prevent storage-related outages or performance problems.

# Usage scenarios

Service Management Suite for z/OS with Service Management Unite providing the user interface is used to identify, isolate, and fix real world problems in a z/OS environment. Alarms or events from OMEGAMON, SA for z/OS, and Composite Application Manager are the way to provide support.

The Service Management Unite dashboards help you solve problems more quickly. The Monitor System Health window shows events that are categorized by status values: Critical, Minor, or Normal. This window is used to monitor and automate issue resolution. You can click an error event to navigate to detailed information about the resource. Service Management Unite enables operators with less experience to isolate, diagnose, and even fix problems by using an intuitive web-based user interface.

Figure 3 shows an overview of the Service Management Unite identify, isolate, and fix steps.

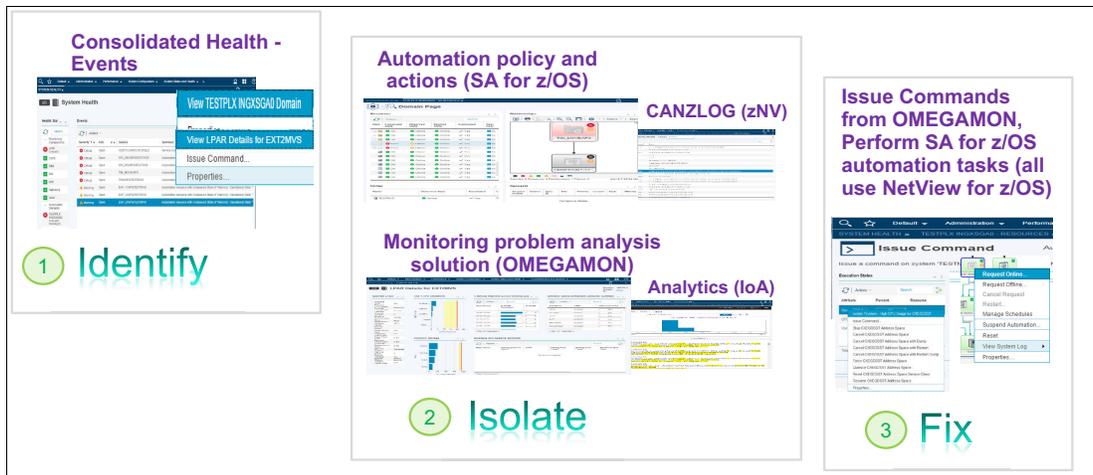


Figure 3 Service Management Unite steps to problem resolution

## Problem isolation scenario

Josh, a new junior operator relies on the Service Management Unite System Health window (Figure 4 on page 8) to notify him of any problems within the mainframe environment. Rather than looking at the performance events and automation states for all resources one by one, he can filter events based on specific subsystems or view all performance or all automation events as a collective group. Color indicates the severity of an event, allowing Josh to quickly determine the most important issues to work on. Events are generated after a predefined threshold has been exceeded or an automation resource changes to an undesirable state. Events clear automatically after the problem has been resolved.

As an example, Josh might focus on a red performance event that indicates that an address space is using too much CPU, which could impact other jobs running in the system or an IBM MQ queue is exceeding the defined queue depth and requires immediate attention before the limit is reached. An automation event might show that a resource has failed to start correctly and another resource that has a dependency on the failing resource has also not started.

Figure 4 shows the Service Management Unite System Health window.

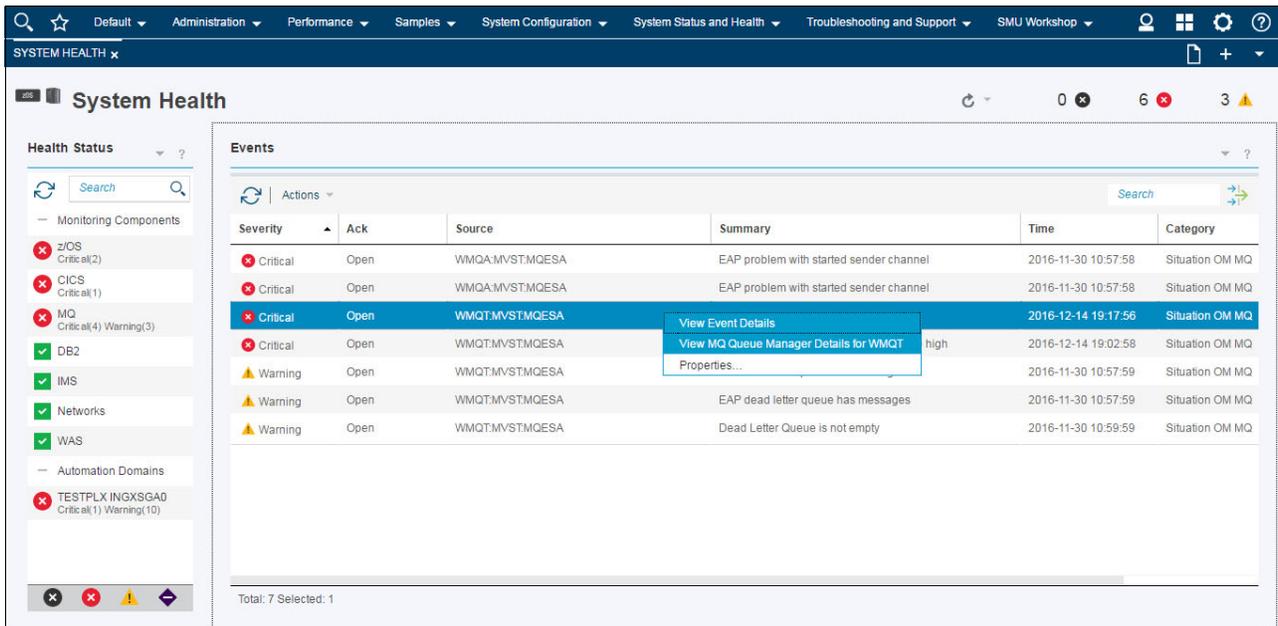


Figure 4 System Health page

### Identify problem by using performance details windows

In each situation, Josh can drill down from the high-level events to view specific details windows about the resource that is having issues. These details might include charts and tables with related content such as a graph showing where the performance issues are. For the high CPU event, the performance detail window displays these items:

- ▶ The top five jobs with the highest CPU utilization
- ▶ A table that contains an address space bottleneck analysis summary
- ▶ A table that contains the 4-hour rolling average
- ▶ Millions of Service Units per hour (MSU) statistics
- ▶ A chart that displays the common storage utilization percentage
- ▶ An enqueue and reserve summary table

Similarly, Josh can drill from an IBM MQ problem event to an IBM MQ Queue Manager Details window that has bar graphs with queues having these items:

- ▶ Queues with Highest Depth
- ▶ Queues Not Being Read
- ▶ Queues with Oldest Message Age
- ▶ Channels Not Running
- ▶ TRANSMIT (XMIT) Queues with Messages
- ▶ Dead Letter Queues

Often a problem event has several consequences. Figure 5 shows this queue manager has issues with high depth, old messages, and channels that are not running.

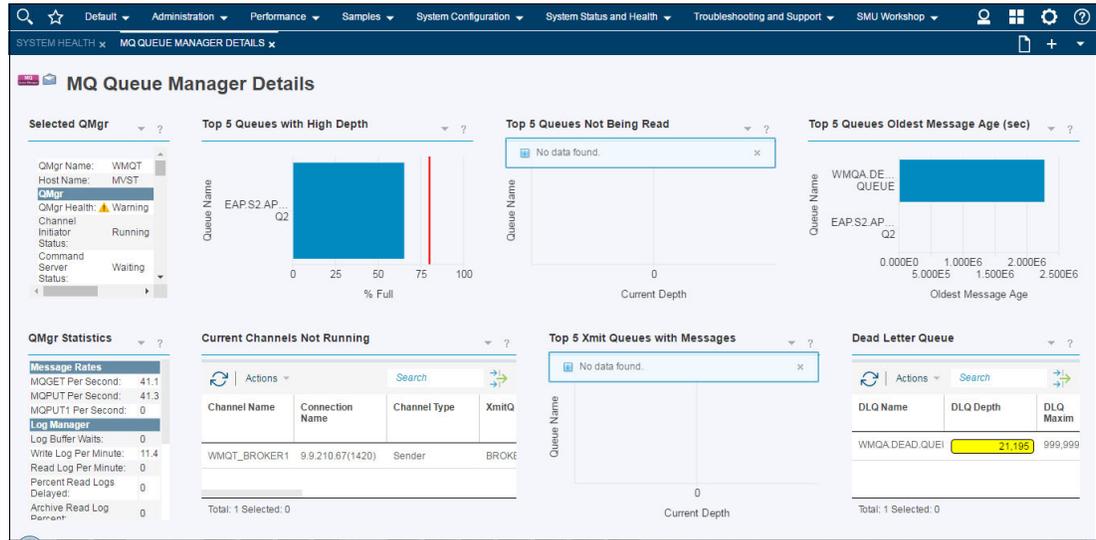


Figure 5 IBM MQ Queue Manager Details page

### Identify and work problem using automation domain detail windows

From an automation event, Josh can view the corresponding SA for z/OS resource on the provided Automation Domain Page. The Domain Page (Figure 6) displays all automated resources that are defined in the SA for z/OS policy for the Sysplex, provides a graphical view of the defined relationships to other resources in context of a selected resource, shows operator requests, and gives access to operational tasks. Josh can see whether a resource is running or not, and status indicators show if resources are in an error state. Problem detail information can be viewed. When started from an automation event, the corresponding automated resource is selected and all relevant automation data is presented for the selected resource. For further problem diagnosis, Josh can view the system log at the time when an error was detected. From the menu of a resource, Josh can issue actions such as starting or stopping a resource, moving a resource to another system, and changing the availability target of a server group. All actions are processed by SA for z/OS, ensuring that all defined relationships such as stop sequences are followed.

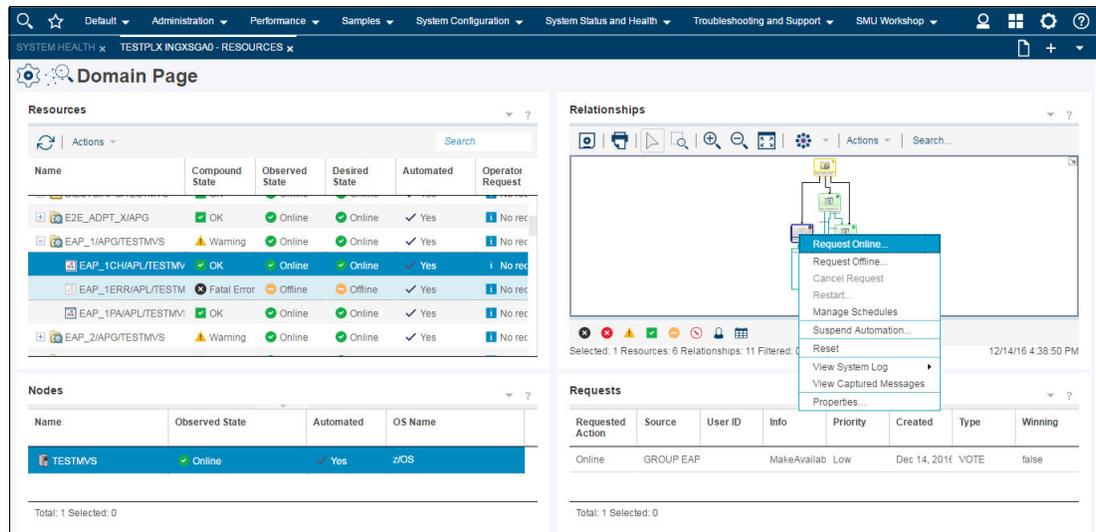


Figure 6 Domain Page

## Isolate the problem

Service Management Unite delivers problem isolation dashboards for selected situational events that allow Josh to quickly navigate to a detailed information dashboard related to the problem. This dashboard can include real-time or historical performance metrics in the form of graphs, charts and tables, detailed attributes of the problem resource, and a list of suggested actions for resolving the problem.

To begin the isolation phase, Josh can right-click an entry in a table or chart on the related details page and select **Isolate Problem** from the list of menu options. A more senior Operations Analyst, Annette, might run a preformatted command to change the queue depth. However, for many problems it is not this easy to figure out what should be done to restore or fix a service. For example, as Josh works a Queue Depth High situation, he focuses on the Top 5 Queues with High Depth chart on the MQ Queue Manager Details page. He selects the bar representing the queue that has exceeded the depth threshold in the Top 5 Queues with High Depth chart. The Isolate Problem action is displayed in the menu list, as shown in Figure 7.

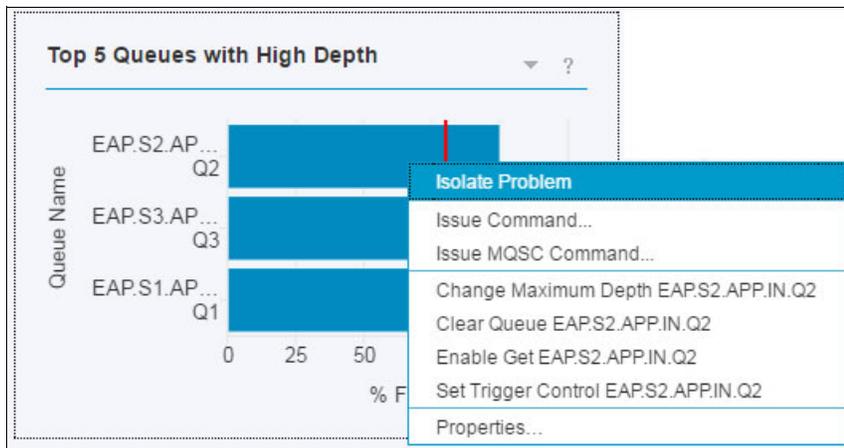


Figure 7 Navigate to MQ High Depth Problem Isolation page or issue commands

Josh selects Isolate Problem to open the Problem Isolation window with High IBM MQ Depth (see Figure 8).

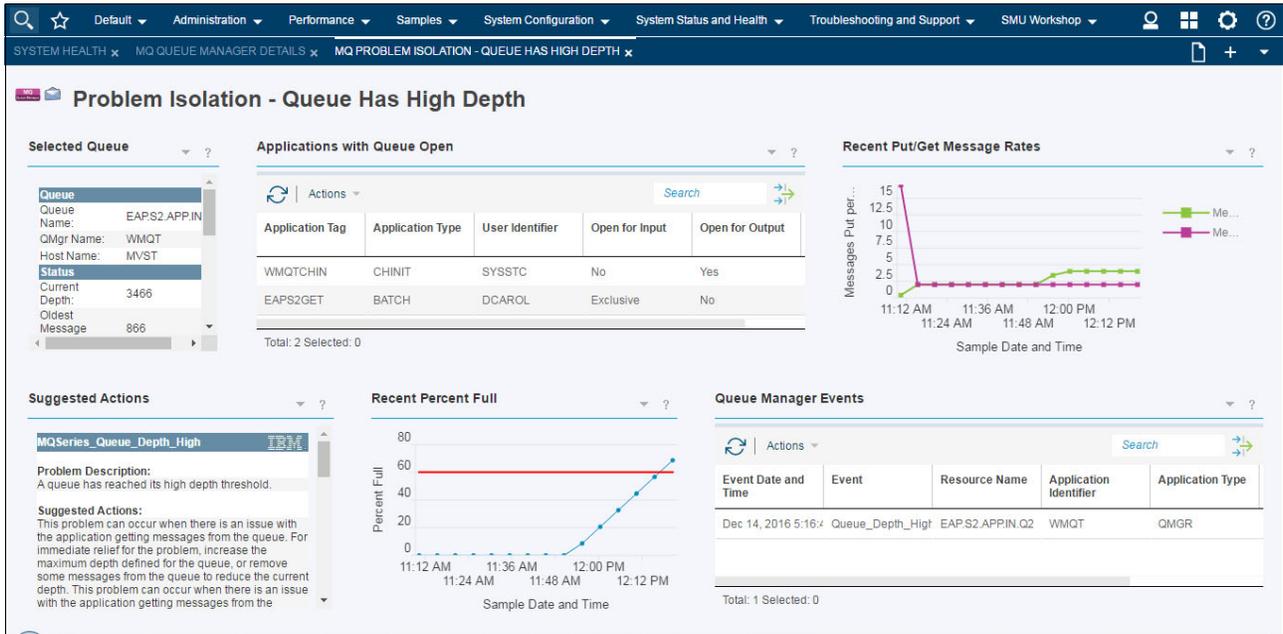


Figure 8 Problem Isolation window

Josh sees from the graph on the Problem Isolation page that the queue continues to rise beyond the defined threshold. He reads the list of problems and solutions described in the Suggested Actions widget that states For immediate relief of the problem, increase the maximum depth defined for the queue. From the data in the Selected Queue widget, Josh can determine the maximum depth that is currently defined for the queue in question. By increasing the queue depth, Josh prevents the queue from becoming full, allowing him time to contact the application owner to further investigate the queue depth problem.

### Fix the problem and restore service

Service Management Unite can be used to fix simple problems to quickly restore service. There are many places in Service Management Unite user interfaces that allow a user to perform a task using command lines and automation that has already been set up in your environment.

After isolating the IBM MQ problem caused by a high queue depth, Josh can fix the issue from within Service Management Unite. He selects the bar representing the queue that has exceeded the depth threshold in the Queues with High Depth chart. In the menu, he can select the corresponding command to increase the queue depth. He specifies the new queue depth and submits the command to be run on the corresponding z/OS system.

Another example of a suggested action is to cancel the address spaces to restore service in a high CPU case. Josh saw that the CPU usage chart indicates that the CPU usage has been constantly high over the last hour. Referring to the Suggested Actions list on the Problem Isolation window, Josh learns that the suggested solution is to cancel the job. To accomplish this action, he right-clicks the job that shows the high CPU usage in the Top 5 CPU Utilization list. The menu provides access to common commands. The list of commands for the resource includes stopping, canceling, and forcing the address space. He selects **Cancel Address Space**, which opens the Issue Command window with the **Cancel** command pre-filled. Tivoli NetView for z/OS runs the command.

Figure 9 shows another way to resolve the problem by selecting a system resource in the automation resource tree. From that entry, he can do activities such as view the system log or run a command on the system. He can also view the LPAR monitoring details window.

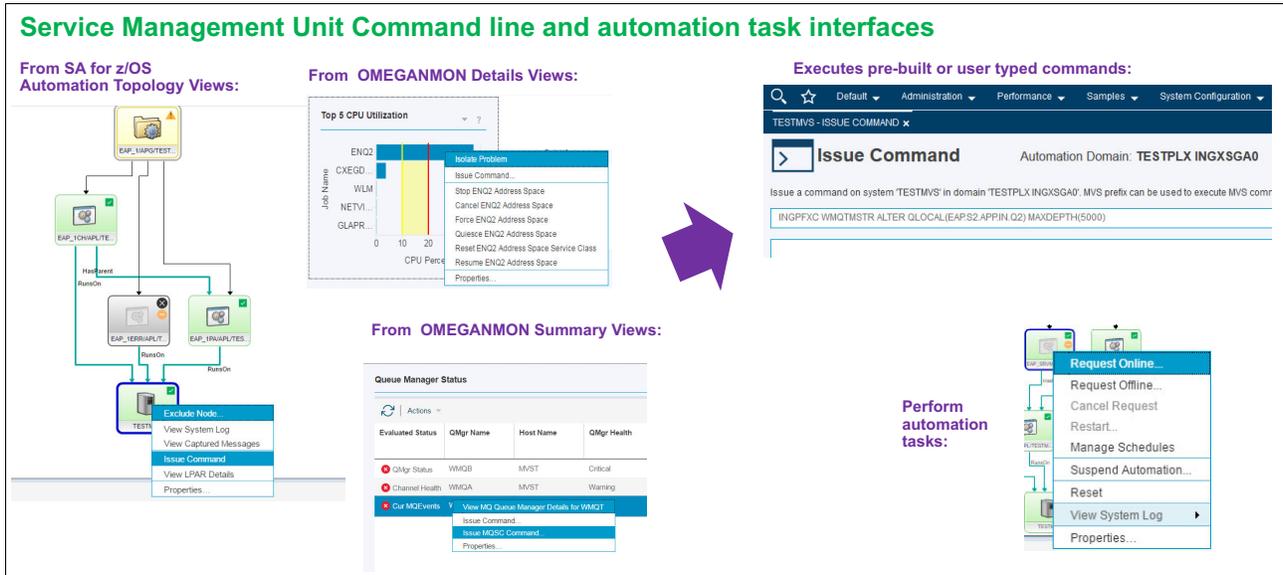


Figure 9 Service Management Unite can issue commands that are preformatted for users

## Proactive automation using OMEGAMON and SA for z/OS scenario

With SA for z/OS, you can automate the recovery of application outages and provide high availability. For example, if an application crashes, SA for z/OS can automatically restart that application. This feature is called reactive automation.

High availability and automation can be further improved by providing proactive automation, where monitoring data is used to drive automated actions. Proactive automation that uses monitoring can resolve performance problems before they cause outages.

This scenario shows how automation can help the system to adapt its configuration to the workload. Using Tivoli OMEGAMON XE on z/OS, you can detect when IMS subsystems working in an IMSplex are overcommitted and automatically start additional IMS regions to handle the workload by performing the following steps:

1. OMEGAMON detects that IMS transaction queuing is causing a response time problem and triggers a situation when a certain threshold is reached.
2. A situation event is created and information about this situation is sent to SA for z/OS.
3. SA for z/OS receives the information about the response time problem and starts another IMS Message Processing Region based on its automation definition. Starting a new IMS Message Processing Region reduces queuing and therefore improves response time.

# Integration

The IBM Service Management Suite for z/OS architecture is extremely flexible and can support multiple user interfaces in a single data collection point on the z/OS platform. When the data is collected, it is used to provide critical visibility and control for SMEs, developers, and operations staff. The IBM Service Management Suite for z/OS now has a new user interface, IBM Service Management Unite.

The Service Management Unite Integrated Architecture (Figure 10) consolidates data from various performance and monitoring tools to empower the operations staff to analyze and resolve problems more quickly.

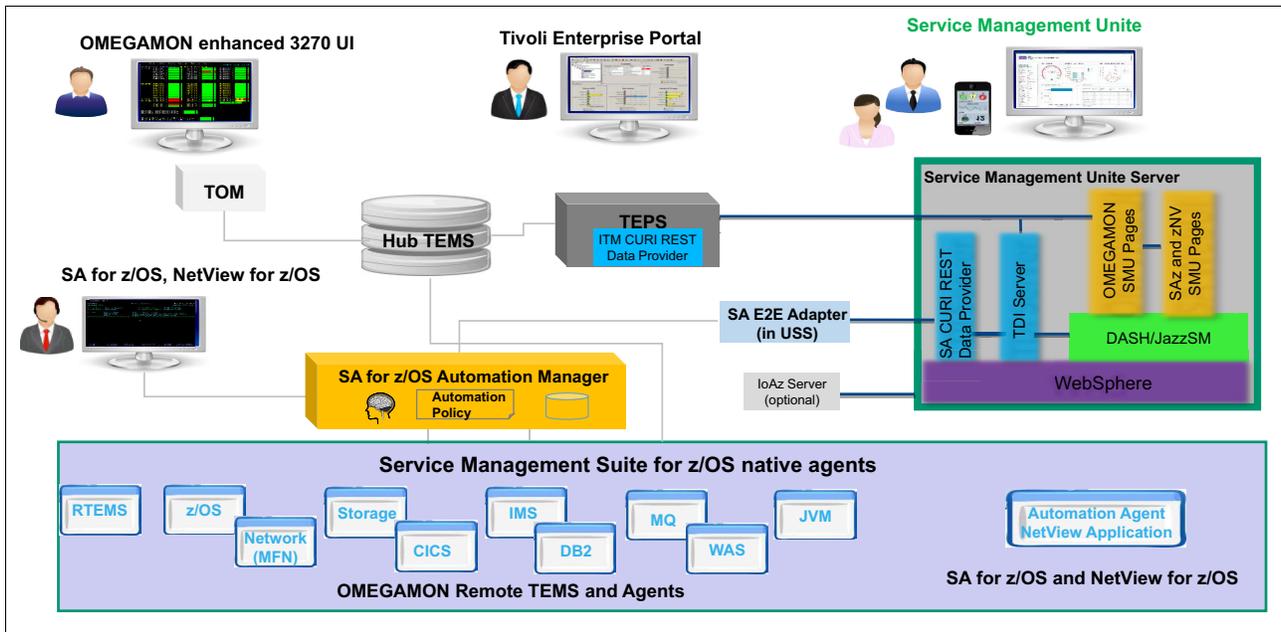


Figure 10 Service Management Unite Integration Architecture

The Service Management Unite Integration Architecture (Figure 10) takes advantage of what is in your environment:

- ▶ IBM Tivoli OMEGAMON Enhanced 3270 User Interface component with IBM Tivoli OMEGAMON Manager (TOM)

TOM provides OMEGAMON Enhanced 3270 User Interface, a single 3270 view for all OMEGAMON information and navigation that spans your sysplexes and system resources. This approach allows a user to LOGON once and be able (if allowed by your security rules) to view consolidated data from all your systems and subsystems in a single view. TOM gets the performance metric data from OMEGAMON XE for Messaging agents and formats the data per the workspace request and paints the 3270 screen.

- ▶ Tivoli Enterprise Portal Server

Tivoli Enterprise Portal Server acts as a conduit for Tivoli Enterprise Portal clients requesting data for analysis from monitoring agents and other components within the enterprise. The portal server connects directly to the Tivoli Enterprise Monitoring Server Hub issuing queries for enterprise information and receiving updates as they occur.

- ▶ Tivoli Enterprise Monitoring Server

Tivoli Enterprise Monitoring Server controls one or more monitoring agents and performs these important functions:

- Monitoring availability of agents
- Retrieving data from agents for reporting
- Evaluating situations (alarms that occur when thresholds are reached)
- Distributing situations and policies to agents

The hub Tivoli Enterprise Monitoring Server provides data to Tivoli Enterprise Portal Server and TOM. The Tivoli Enterprise Monitoring Server hub monitoring server controls the remote Tivoli Enterprise Monitoring Server servers and any agents that might be directly connected to the hub. The hub monitoring server is the master copy or repository that stores and persists monitoring data, situations, user definitions, and managed object definitions. The Remote Tivoli Enterprise Monitoring Server (RTEMS) maintain a subset of the Tivoli Enterprise Monitoring Server hub repository that is relevant to them, which is synchronized with the hub. The hub monitoring server is the nerve center of the monitoring architecture.

- ▶ Service Management Suite for z/OS with its OMEGAMON native agents collects data that pertains to how well mainframe resources (such as z/OS, DB2, IMS, CICS, networks, IBM MQ, storage, and JVM) are performing.

- ▶ The SA for z/OS customization window (ISPF-based) is used to create an enterprise-wide automation policy. This z/OS enterprise-wide automation policy governs the automated resources and their wanted status (goal).

- ▶ SA for z/OS automation manager

The coordinating, decision-making, and controlling elements are grouped into a single address space that is known as the automation manager. It is loaded with a model of the automated resources that are defined across the SA for z/OS sysplex, also referred to as a “domain” (that is, a subset of systems in a Parallel Sysplex) in the enterprise-wide automation policy. Each domain is managed by its own automation manager. This z/OS enterprise-wide automation policy governs the automated resources and their wanted status (goal).

- ▶ IBM Tivoli NetView for z/OS-based automation agent

The automation agent observes, reacts, and takes action. It runs within the Tivoli NetView for z/OS address space and is present on every system being automated.

- ▶ SA for z/OS end-to-end (E2E) adapter

SA for z/OS provides the end-to-end automation adapter that is used to connect a SA for z/OS domain to Service Management Unite.

The E2E automation adapter is used for these functions:

- ▶ Provide access to SA for z/OS.
- ▶ Provide information about the automated resources that are available in the automation domain.
- ▶ Send resource attribute and status changes to Service Management Unite so that it can always show an up-to-date status of the displayed resources. The message adapter service of the Tivoli NetView for z/OS event/automation service is used to convert and forward messages from Tivoli NetView for z/OS to the E2E automation adapter.
- ▶ Issue automation requests against resources. For example, start and stop automated resources if requested by an operator using Service Management Unite.
- ▶ Issue Tivoli NetView for z/OS commands and provide access to NetView CANZLOG for operators working with Service Management Unite.

Service Management Unite has a service infrastructure that incorporates key products and services that pull everything together and enable you to extend it by adding new/customized UIs to meet your particular needs. It includes these components:

- ▶ IBM DASH that is the foundation for OMEGAMON, SA for z/OS, and Tivoli NetView for z/OS web pages
- ▶ CURI-based REST APIs (such as OMEGAMON and IBM Tivoli Monitoring data provider and SA for z/OS data provider)
- ▶ IBM Tivoli Directory Integrator
- ▶ IBM WebSphere Application Server

Service Management Unite takes advantage of the DASH web UI toolkit that provides visualization and dashboard services (Figure 11). DASH is a component of JazzSM.

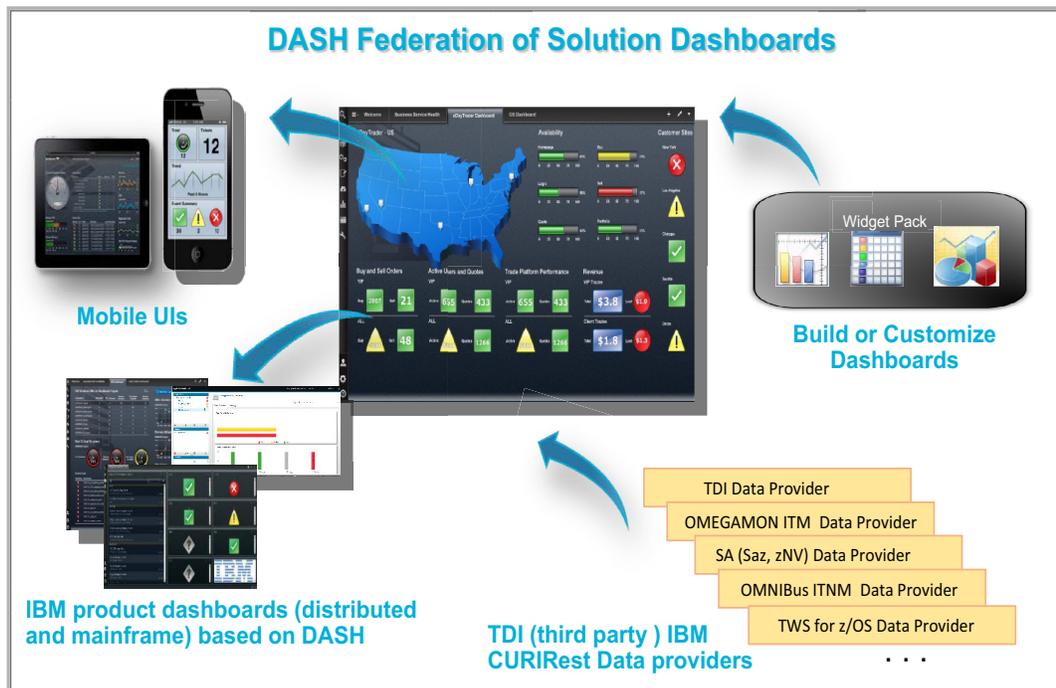


Figure 11 DASH web UI toolkit

The DASH integration platform supports data processing and rendering of content from multiple sources. This data is integrated and presented in interactive dashboards. DASH has a single console for administering IBM products and related applications. The following are the key capabilities of DASH:

- ▶ Federates solution dashboards and pages to provide end-to-end ready to use solutions.
- ▶ Provides a framework for solution UIs for IBM products including OMEGAMON, SA for z/OS, IBM Tivoli Workload Scheduler for z/OS, IBM Tivoli Netcool/OMNIBus, IBM Tivoli OMEGAMON XE on z/VM and Linux, and IBM Tivoli Network Manager.
- ▶ Allows for dashboard creation or customization of dashboards included by IBM in these ways:
  - Use catalog of widgets and data sources from IBM and third parties.
  - Assemble dashboards per personal requirements, for example details for technical experts or overviews for executives.
  - Enable context passing, page launch, and drill down.

- ▶ Easy navigation of dashboards, including search and favorites.
- ▶ Integrate third-party data (raw data using Tivoli Directory Integrator, widgets, and page URLs).
- ▶ Enable mobile access.
- ▶ Support single sign-on and a unified security model.

DASH provides integration at several levels: Data, widget, and web page. This approach allows for flexible integration by using either or both of these methods:

- ▶ Tightly integrated where new data is often created for widgets by combining multiple sources.
- ▶ Loosely integrated by reading data already formatted and rendered in a widget or a web page.

Figure 12 shows DASH and Tivoli Directory Integration providing data, pages, and widgets to Service Management Unite.

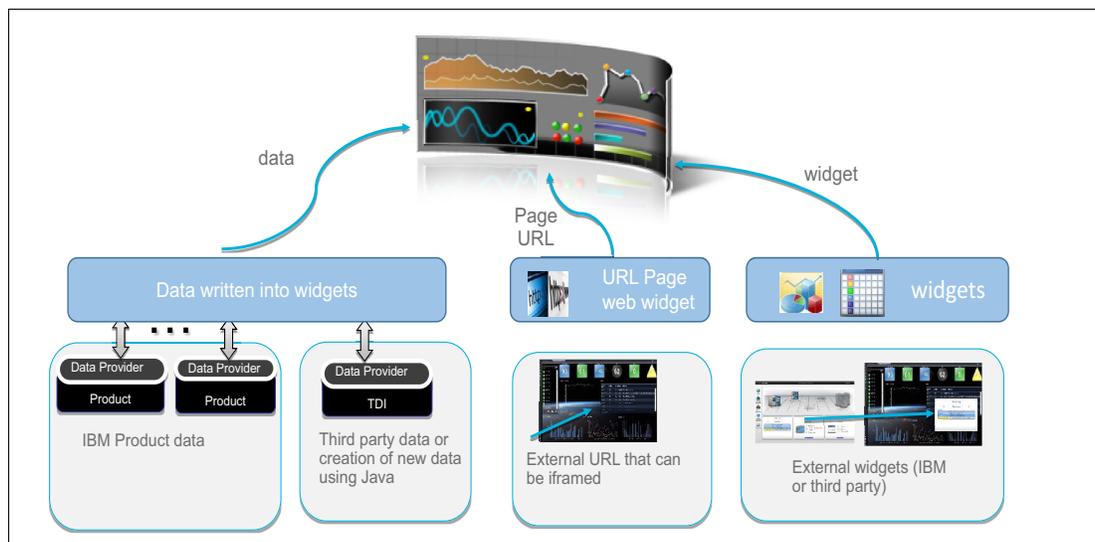


Figure 12 DASH and Tivoli Directory Integration with Service Management Unite

Data can be read into DASH widgets. APIs are used to read, modify, and create data that is displayed in the Service Management Unite UI. Service Management Unite uses various methods to obtain data:

- ▶ OMEGAMON data is read by using IBM Tivoli Monitoring data provider CURI-based REST APIs running on Tivoli Enterprise Portal Server.
- ▶ SA for z/OS and Tivoli NetView for z/OS data and actions are read by using the SA for z/OS E2E adapter together with the CURI-based REST SA for z/OS API data provider running on the Service Management Unite server.
- ▶ IBM Tivoli Directory Integrator can be used to read virtually any third-party data or your data for display in DASH widgets. Also, Java can be used to combine data from multiple sources and create data for display by DASH widgets.
- ▶ Many other IBM products have CURI-based REST APIs that feed data directly into DASH widgets, including IBM Tivoli Monitoring (IBM Tivoli Monitoring), IBM Tivoli Workload Scheduler for z/OS, IBM Tivoli Netcool/OMNibus, IBM Tivoli OMEGAMON XE on z/VM and Linux, IBM Tivoli Network Manager, and IBM Tivoli Business Service Manager.

DASHbuilder APIs and capabilities allow adding third-party widgets (for example, Twitter) on web pages. The DASH tab federation capability allows another party to provide a widget that is already pre-populated and can be displayed in a DASH page. Web pages and URLs can also be read into DASH. APIs allow web-based URLs to be read into DASH common web session.

Tivoli Directory Integrator can be used to access data originating from a single source or multiple sources, potentially altering that data and passing the resulting data set to DASH. This approach is the method Service Management Unite uses to reformat data or create data that does not come directly from IBM Tivoli Monitoring, OMEGAMON, Tivoli Enterprise Portal Server, or SA for z/OS CURI-based REST data providers. This approach is also the method for incorporating third-party data into DASH shown in Figure 13.

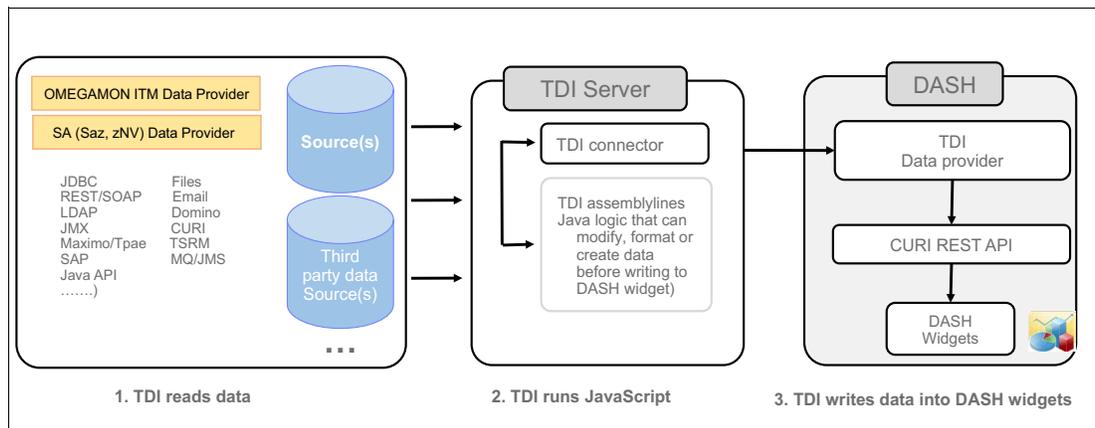


Figure 13 Tivoli Directory Integrator provides data to Service Management Unite

Tivoli Directory Integrator is composed of two components:

- ▶ Runtime engine (referred to as Tivoli Directory Integrator server)
- ▶ Configuration Editor (CE)

The Tivoli Directory Integrator server is a prerequisite to Service Management Unite, and is responsible for running the Tivoli Directory Integrator components or assemblylines.

As shown in Figure 13, Tivoli Directory Integrator performs three steps:

1. Tivoli Directory Integrator reads data from multiple sources such as files, spreadsheets, and CURI-based REST API data providers. For Service Management Unite, it reads the OMEGAMON IBM Tivoli Monitoring CURI-based REST data provider and the SA CURI-based REST data provider. Data from your own homegrown tools or third-party tools can be read into Tivoli Directory Integrator. Tivoli Directory Integrator is often used to map data in one data format and converting it to another data format.
2. Tivoli Directory Integrator runs JavaScript. Assemblylines define the data source, read entries from this source, transform the data, and optionally pass the resulting data set to another assemblyline for further processing. Assemblylines can use product supplied functions or user created JavaScript components for manipulating data within the assemblyline. The CE is used to edit and create assembly lines and CE project, a collection of assemblylines that is exported to the Tivoli Directory Integrator server. The assemblylines are processed by the Tivoli Directory Integrator server and the resulting data set is made available to DASH for visualizing in a widget. Tivoli Directory Integrator includes a set of helper assemblylines that make it easy to perform common functions. These functions include changing the column names to be used in a table, creating a task list, and passing parameters during widget customization to alter the data set displayed in the widget.

3. A Tivoli Directory Integrator connector and a Tivoli Directory Integrator CURI-based REST API Data Provider are used to integrate with DASH widgets. The connector converts the many data sources that Tivoli Directory Integrator understands into formats that are needed by DASH widgets. Service Management Unite in DASH dashboards can display Tivoli Directory Integrator data, get data from many sources, and run logic that is needed to tightly integrate monitoring, automation, and analytics.

Tivoli Directory Integrator advanced customization does require you to use and understand the core JavaScript language. IBM JSEngine is included in Tivoli Directory Integrator to provide a fast, reliable scripting environment that allows complex processing. Service Management Unite uses Tivoli Directory Integrator in this manner to combine or better sort metrics from OMEGAMON or to integration OMEGAMON and SA for z/OS pages.

## Supported platforms

Supported platforms details and related software requirements for Service Management Suite for z/OS and Service Management Unite are found in *Service Management Unite Deployment Planning Checklist* at this web address:

<http://ibm.biz/SMUChecklist>

## Ordering information

To order Service Management Suite for z/OS, use Shopz, the online solution for ordering and delivery of z Systems software. Shopz is used by customers worldwide to plan, place, and track orders at any time. To access Shopz, visit this website:

[http://www.ibm.com/software/shopzseries/ShopzSeries\\_public.wss](http://www.ibm.com/software/shopzseries/ShopzSeries_public.wss)

The Service Management Suite for z/OS ordering information is shown in Table 1.

*Table 1 Ordering part number*

Program name	PID number	Charge unit description
IBM Service Management Suite for z/OS	5698-AAF	Value unit

## Related information

For more information, see the following documents:

- ▶ *Save Time and Lower Costs with IBM Service Management Suite for z/OS*  
<http://www.redbooks.ibm.com/abstracts/redp5393.html?Open>
- ▶ IBM Service Management Suite for z/OS product page  
<http://www.ibm.com/software/products/en/ibm-service-management-suite-for-zos>
- ▶ The IBM Knowledge Center for IBM Service Management Suite for z/OS  
<http://www.ibm.com/support/knowledgecenter/SSANTA>
- ▶ IBM Service Management Unite product page  
<http://www.ibm.com/software/products/en/ibm-service-management-unite>

- ▶ IBM Operations Analytics - Log Analysis product page  
<http://www.ibm.com/software/products/en/ibm-operations-analytics---log-analysis>
- ▶ Jazz for Service Management (JazzSM) - IBM developerWorks® blog  
<https://www.ibm.com/developerworks/community/blogs/69ec672c-dd6b-443d-add8-bb9a-9a490eba?lang=en>
- ▶ IBM Tivoli OMEGAMON Performance Management Suite for z/OS product page  
<http://www.ibm.com/software/products/en/tivoli-omegamon-performance-management-suite-for-zos>
- ▶ IBM System Automation for z/OS product page  
<http://www.ibm.com/software/products/en/tivosystautoforzos>
- ▶ IBM Tivoli NetView for z/OS product page  
<http://www.ibm.com/software/products/en/tivoli-netview-zos>
- ▶ IBM developerWorks wiki community for IBM Service Management Suite for z/OS  
<https://www.ibm.com/developerworks/community/groups/service/html/communitystart?communityUuid=91f16cce-c251-4278-931f-315f40d1e148>
- ▶ IBM Service Management Suite for z/OS V1.3 Overview & Service Management Unite videos  
<https://www.youtube.com/watch?v=HBxB1Sq05hM>
- ▶ IBM Offering Information page (announcement letters and sales manuals)  
[http://www.ibm.com/common/ssi/index.wss?request\\_locale=en](http://www.ibm.com/common/ssi/index.wss?request_locale=en)

On this page, enter IBM Service Management Suite for z/OS, select the information type, and then click **Search**. On the next page, narrow your search results by geography and language.

## Authors

This Solution Guide was produced by a team of specialists from around the world working with the International Technical Support Organization.

**Lorin Ullmann** is the Lead Architect for IBM z Systems Integrated Service Management, focusing on z Systems technical strategies, solution architectures, and software designs. He is located in Austin, Texas, and has over 28 years of experience in a broad range of technologies. These technologies include mainframe systems management; Linux on System z, Java, OS/2, thin network clients, mobile operating systems, printer device drivers, graphic rendering engines, power management firmware, personal computer video hardware, and IO optical storage hardware. Lorin is an IBM Master Inventor, is a frequent speaker at conferences, has written various IBM Redbooks deliverables, and contributes to technical designs.

**Carol Davis** is an IBM IT Management Consultant located in Phoenix, Arizona. She has over 26 years with IBM and 20 years of experience in the Systems Management field. During her IBM career, she has held positions as a system programmer, test engineer, and services consultant. Prior to IBM, Carol worked as a systems programmer for a life insurance company.

**Michael Gouveia** is the IBM Development Team Lead in the OMEGAMON organization in IBM z Systems Management, located in Research Triangle Park, North Carolina, US. He has over 25 years of experience in software research and development focusing on OMEGAMON monitoring, mainframe networks, z/OS, 3270 user interface frameworks, and web user interface technologies.

**Arthur McDonald** is a Software Test Lead for IBM z Systems Management, located in Research Triangle Park, North Carolina, US. He has over 30 years of experience in software test. Arthur has worked at IBM for 35 years. His areas of expertise include mainframe systems management and mainframe networking.

**Wolfgang Schaeberle** is a Development Team Lead and Architect in the IBM Research and Development Laboratory in Boeblingen, Germany. He has over 16 years of experience in the systems management, business resilience, and automation field. He has worked at IBM for 19 years. His areas of expertise include UI development, User Experience (UX) research and design, system designs, and high availability architectures. He is a frequent speaker at conferences, works closely with clients, creates technical designs, and has published various patents and other publications.

Thanks to the following people for their contributions to this project:

LindaMay Patterson  
International Technical Support Organization, Rochester, MN

## Now you can become a published author, too!

Here's an opportunity to spotlight your skills, grow your career, and become a published author—all at the same time! Join an ITSO residency project and help write a book in your area of expertise, while honing your experience using leading-edge technologies. Your efforts will help to increase product acceptance and customer satisfaction, as you expand your network of technical contacts and relationships. Residencies run from two to six weeks in length, and you can participate either in person or as a remote resident working from your home base.

Find out more about the residency program, browse the residency index, and apply online at:  
[ibm.com/redbooks/residencies.html](http://ibm.com/redbooks/residencies.html)

## Stay connected to IBM Redbooks

- ▶ Find us on Facebook:  
<http://www.facebook.com/IBMRedbooks>
- ▶ Follow us on Twitter:  
<http://twitter.com/ibmredbooks>
- ▶ Look for us on LinkedIn:  
<http://www.linkedin.com/groups?home=&gid=2130806>

- ▶ Explore new Redbooks publications, residencies, and workshops with the IBM Redbooks weekly newsletter:  
<https://www.redbooks.ibm.com/Redbooks.nsf/subscribe?OpenForm>
- ▶ Stay current on recent Redbooks publications with RSS Feeds:  
<http://www.redbooks.ibm.com/rss.html>



# Notices

This information was developed for products and services offered in the US. This material might be available from IBM in other languages. However, you may be required to own a copy of the product or product version in that language in order to access it.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing, IBM Corporation, North Castle Drive, MD-NC119, Armonk, NY 10504-1785, US*

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product and use of those websites is at your own risk.

IBM may use or distribute any of the information you provide in any way it believes appropriate without incurring any obligation to you.

The performance data and client examples cited are presented for illustrative purposes only. Actual performance results may vary depending on specific configurations and operating conditions.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to actual people or business enterprises is entirely coincidental.

## COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs.

# Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at “Copyright and trademark information” at <http://www.ibm.com/legal/copytrade.shtml>

The following terms are trademarks or registered trademarks of International Business Machines Corporation, and might also be trademarks or registered trademarks in other countries.

CICS®	Netcool®	Tivoli®
DB2®	NetView®	WebSphere®
developerWorks®	OMEGAMON®	z Systems®
IBM®	Parallel Sysplex®	z/OS®
IBM z Systems®	RACF®	z/VM®
IMS™	Redbooks®	zEnterprise®
Insight™	Redbooks (logo)  ®	
Jazz™	System z®	

The following terms are trademarks of other companies:

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Java, and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Other company, product, or service names may be trademarks or service marks of others.





REDP-5394-00

ISBN 0738455970

Printed in U.S.A.

Get connected

