Manage your Workloads and Performance with z/OSMF

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Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.
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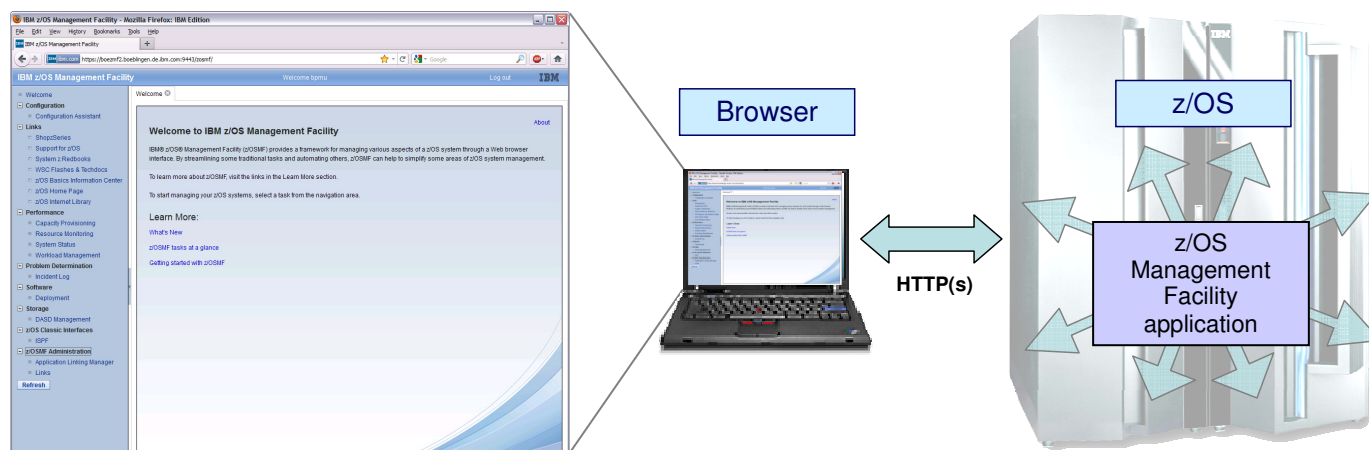
z/OS Management Facility

- The IBM z/OS Management Facility provides a Web-browser based management console for z/OS.
- Helps system programmers to more easily manage and administer z/OS by simplifying day to day operations and administration.
- More than just a graphical user interface, the z/OS Management Facility provides real value
  - Automated tasks can help reduce the learning curve and improve productivity
  - Embedded active user assistance (such as wizards) guides you through tasks and helps provide simplified operations
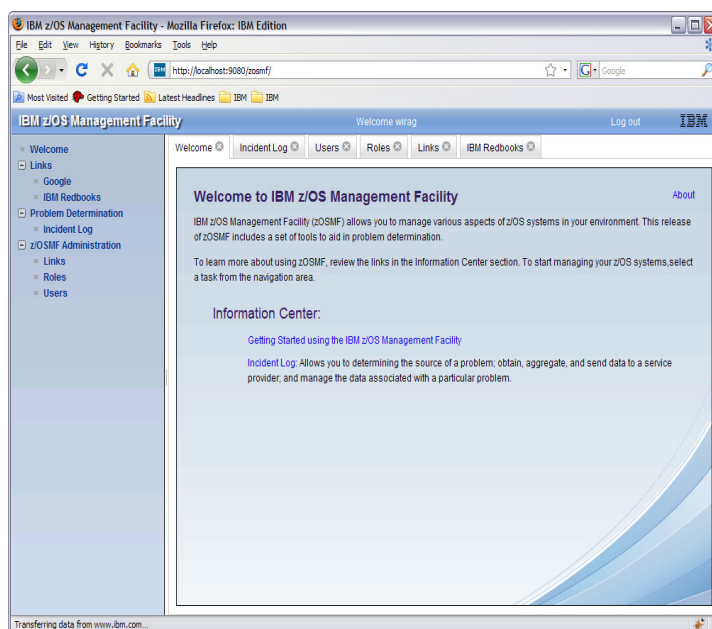
- IBM z/OS Management Facility (z/OSMF), a new zero priced product, will simplify, optimize and modernize the
z/OS system programmer experience starting in V1R11 with problem data management and TCP/IP Policy based configuration. With z/OS V1R12 the Workload Management and the Resource Monitoring Application have been added

- z/OSMF will deliver solutions in a task oriented, Web browser based user interface with integrated user assistance. And z/OSMF will make the day to day operations and administration of the mainframe z/OS systems easier to manage for both new and experienced system programmers. The focus is to help improve system programmer productivity, and make the functions easier to understand and use

IBM z/OSMF Management Facility

z/OS application, browser access

- *z/OS Management Facility is a Web 2.0 application on z/OS*
  - Manages z/OS from z/OS
  - Browser communicates with z/OSMF via secure connection, anywhere, anytime

- This chart explains the structure for z/OSMF and how it fits into the z/OS environment.

- z/OSMF is on the right hand side and it manages z/OS from z/OS itself. It is not an external application, nor does it have an external client. z/OSMF is an application on z/OS with direct access to z/OS data and information, and it has a browser interface from the workstation. z/OSMF contains the GUIs and the application code. Everything is installed on the z/OS server and there are no client side install requirements.

- In the middle of the screen is a workstation with a browser and it communicates with z/OSMF via HTTP(s). z/OSMF is a Web 2.0 based solution. It incorporates a browser interface that communicates with the z/OS system. The browser can be anywhere... in the data center ... or around the world. You just need a secure connection.

- And on the left is a screen capture of the z/OSMF welcome page once you log into z/OSMF.

IBM z/OSMF Management Facility …

Industry standards

Browser

HTTP(s)

z/OS

App. server
- z/OSMF app
- Servlets
- DOJO/JAVA script

z/OS elements
- CIM
- System REXX
- RACF
- and others

Java apps and Java-based CIM client eligible for zAAP

z/OS CIM server eligible for zIIP (R11)
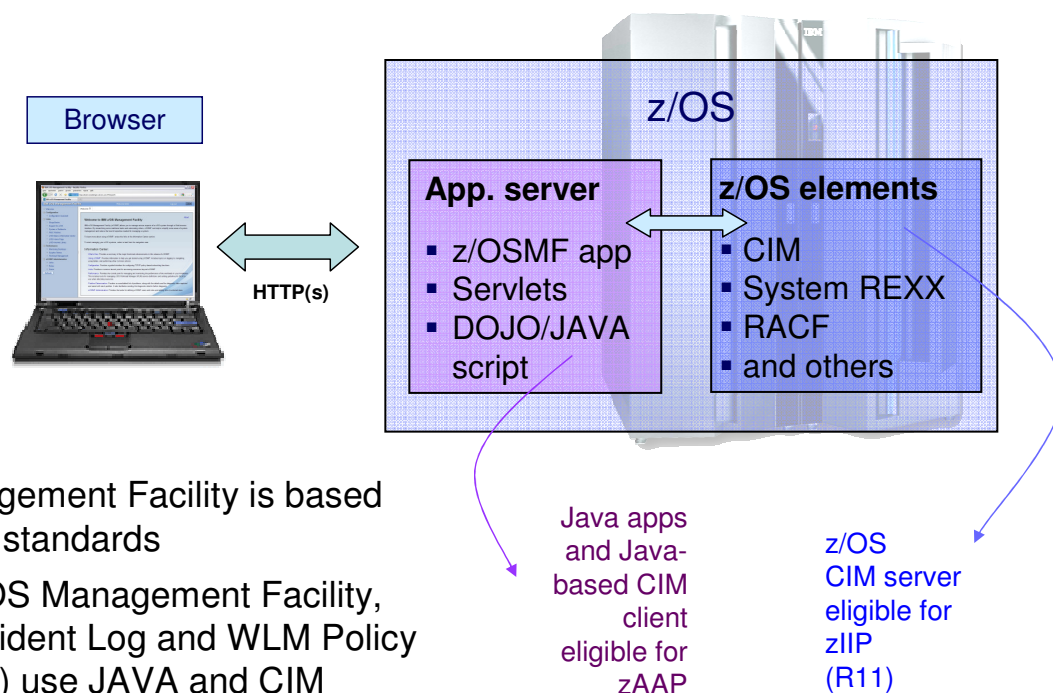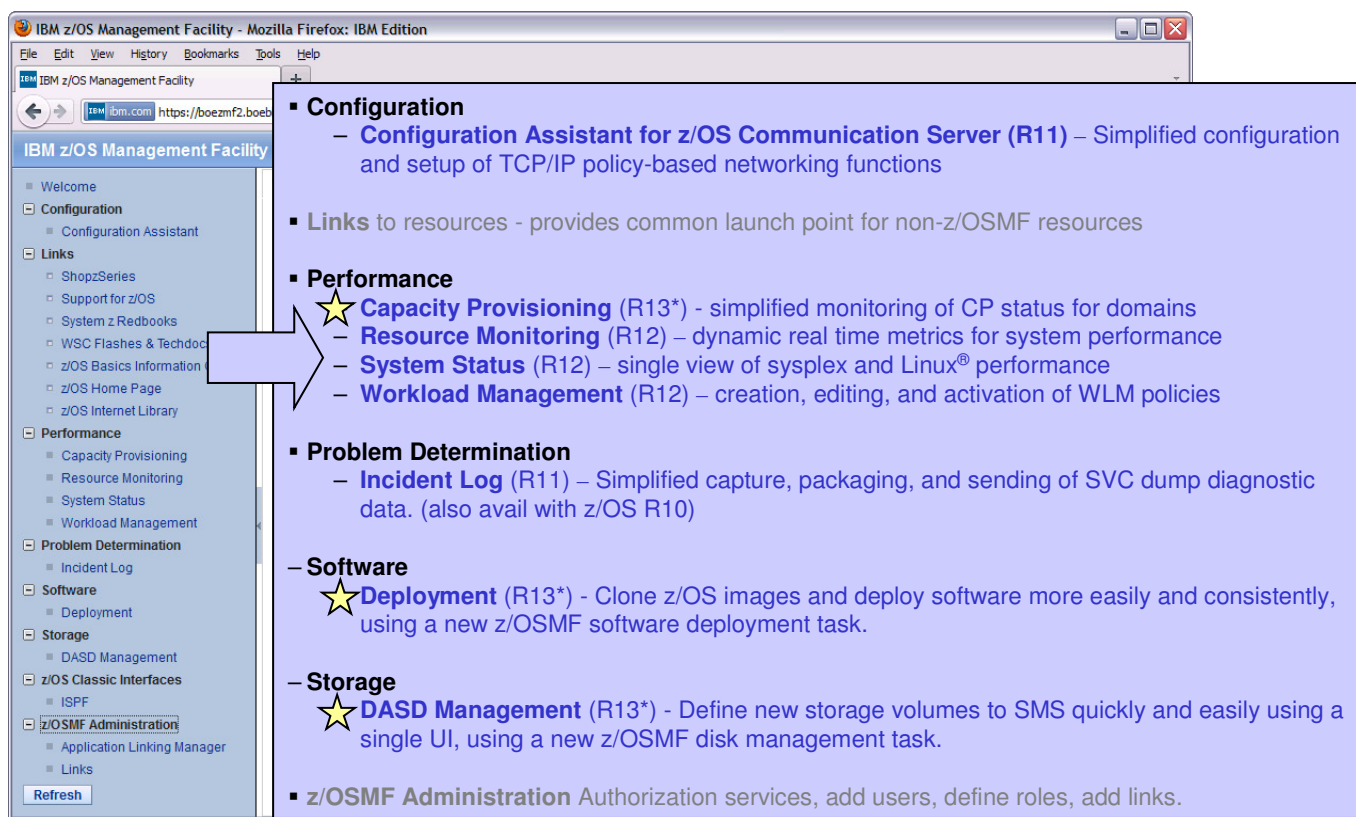
- z/OS Management Facility is based on industry standards
- Parts of z/OS Management Facility, such as Incident Log and WLM Policy Editor (R12) use JAVA and CIM

- z/OS Management Facility requires an application server and a runtime environment. The app server box you see on the right is really a special version of WebSphere Application Server V7.0 which is packaged together with z/OSMF. Scripts and documentation to make it easier to set up and config this runtime on z/OS.

- Once WebSphere Application Server has been set up and installed, the z/OS Management Facility application itself is deployed into this runtime and this is where the application servlets and GUIs reside. z/OSMF uses the DOJO technology for GUIs, which uses Java script and that helps improve performance overall because the GUI can perform all the graphics rendering in the browser on the workstation. DOJO is an Open Source DHTML toolkit written in JavaScript. DOJO allows you to build dynamic capabilities into web pages and any other environment supporting JavaScript.

- This application stack communicates with z/OS components and the components can be whatever that is applicable for that particular task there are not technical limitations. For the initial release the tasks and components we have we have added (in alphabetical order) are the Configuration Assistant for the z/OS Communications server – which performs network configuration, Links – which is a way for you to list links to documentation, information, and product information in an easily accessible location. Incident Log is our problem determination solution, which provides a consociated view of abend-related problems on your system or sysplex with details behind it and the ability to send the data collected as a result of a problem to a destination of choice IBM or ISVs. And we also provide some z/OSMF administration functions which enable you to use the tasks in z/OSMF.

- The applications utilize the dojo framework and Javascript and run on an special version of WebSphere® Application Server. The applications exploit functions provided by z/OS system components.

- Everything is installed on the z/OS server and there are no client side install requirements.

- **z/OS** V1R11 is updated so z/OS CIM server processing is eligible to run on the System (zIIP)

- zIIP eligible workloads include CIM server and CIM provider workloads.

- Other CIM-related workloads (such as CIM client and CIM-enabled resource systems processing) are not eligible for zIIP.

- Parts of **z/OSMF** V1R11 (and V1R12) use the z/OS CIM Server, this workload is eligible for the zIIP.

IBM z/OSMF Management Facility …

Applications / R13 plugins

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IBM z/OS Management Facility - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

IBM z/OS Management Facility

ibm.com https://boezmf2.boeb

IBM z/OS Management Facility

- Welcome
- ☐ Configuration
  - ■ Configuration Assistant
- ☐ Links
  - □ ShopzSeries
  - □ Support for z/OS
  - □ System z Redbooks
  - □ WSC Flashes & Techdoc
  - □ z/OS Basics Information
  - □ z/OS Home Page
  - □ z/OS Internet Library
- Performance
  - ■ Capacity Provisioning
  - ■ Resource Monitoring
  - ■ System Status
  - ■ Workload Management
- ☐ Problem Determination
  - ■ Incident Log
- ☐ Software
  - ■ Deployment
- ☐ Storage
  - ■ DASD Management
- z/OS Classic Interfaces
  - ■ ISPF
- ☐ z/OSMF Administration
  - ■ Application Linking Manager
  - ■ Links
- Refresh

- ▪ **Configuration**
  - **Configuration Assistant for z/OS Communication Server (R11)** – Simplified configuration and setup of TCP/IP policy-based networking functions

- ▪ **Links** to resources - provides common launch point for non-z/OSMF resources

- ▪ **Performance**
  - ★ **Capacity Provisioning** (R13*) - simplified monitoring of CP status for domains
  - **Resource Monitoring** (R12) – dynamic real time metrics for system performance
  - **System Status** (R12) – single view of sysplex and Linux® performance
  - **Workload Management** (R12) – creation, editing, and activation of WLM policies

- ▪ **Problem Determination**
  - **Incident Log** (R11) – Simplified capture, packaging, and sending of SVC dump diagnostic data. (also avail with z/OS R10)

- **Software**
  - ★ **Deployment** (R13*) - Clone z/OS images and deploy software more easily and consistently, using a new z/OSMF software deployment task.

- **Storage**
  - ★ **DASD Management** (R13*) - Define new storage volumes to SMS quickly and easily using a single UI, using a new z/OSMF disk management task.

- ▪ **z/OSMF Administration** Authorization services, add users, define roles, add links.

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Once you've logged in , this screen shows you the full scope of what z/OSMF provides in this first release. And really the first user that logs in as a z/OSMF administrator. So when z/OSMF is first set up, always the first ID is that of an administrator – that is a requirement for setup. And the reason for this it allows the first person to get in and to add and enable others.

z/OSMF offers the following system management tasks:

Configuration category: Simplified configuration and setup of TCP/IP policy-based networking functions

Links category:

> This is like 'My favorites' - Provides common launch point for accessing resources beyond the IBM z/OS Management Facility.
>
> Some links are pre-defined in the product.
>
> The administrators can define additional links to share commonly used resources for their installation.
>
> With z/OSMF R12 you can add 'links' and launch points to anywhere in the left hand navbar – and not just the "Links" category. You can customize /OSMF.

Performance category

> **Capacity Provisioning** (R13) **–** simplified monitoring of z/OS Capacity Provisioning status (monitoring only, not management) – as a reminder z/OS Capacity Provisioning is part of the base of z/OS and can automate System z On/Off Capacity on Demand.
>
> The ***z/OSMF Resource Monitoring*** plugin allows cross-sysplex performance monitoring from a single point of control. From the z/OSMF task tree, you can select the following subtasks:
>
> > The ***System Status task*** provides an enterprise-wide health check of all z/OS sysplexes.
> >
> > For further analysis, the ***Resource Monitoring task*** can graphically display RMF Monitor III metrics as well as Linux metrics by means of customizable views.
>
> **Workload Manager Policy Editor** -- Facilitate the creation and editing of WLM service definitions, installation of WLM service definitions, and activation of WLM service policies

Under the **Problem Determination** category on the navigation bar, you will find the **Incident Log task.**

> This will help all system programmers with problem data management tasks, providing experienced teams with procedural advantages through an incident log summary and detail views of z/OS dump incidents. The Incident Log provides a consolidated list of SVC Dump related problems, along with details and diagnostic data captured with each incident. It also facilitates sending the data for further diagnostics.
>
> Task is updated to include support for adding comments, the ability to attach user-defined data, and use of encrypted parallel FTP for sending data to IBM.

Software category

> **Deployment** (R13) - Clone z/OS images and deploy software more easily and consistently, using a new z/OSMF software deployment task.

Storage category

> **DASD Management** (R13) - Define new storage volumes to SMS quickly and easily using a single UI, using a new z/OSMF disk management task.
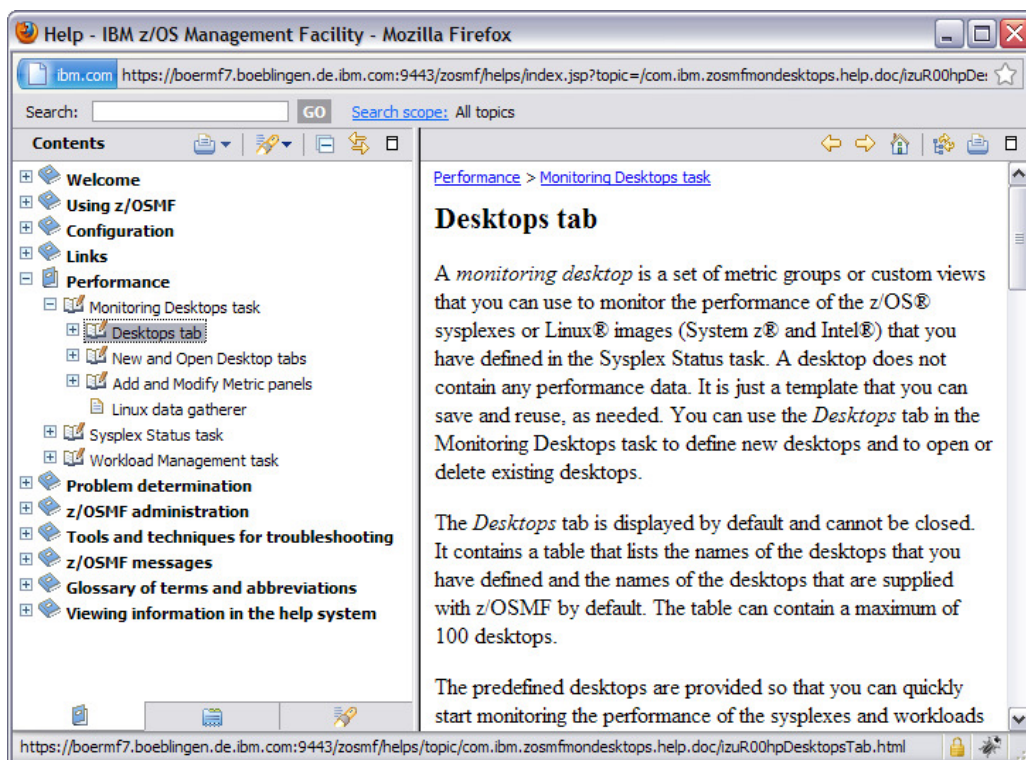
z/OSMF Administration category

> Provides Authorization services for the administrator
>
> Allows Dynamic addition of links to non-z/OSMF resources

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IBM z/OSMF Management Facility

Integrated Help Facility

- Alltogether, the main objectives of all z/OSMF applications are simplification and ease of use.
- Comprehensive online helps are provided for each dialog.
- Tool tips, descriptive texts as well as error, warning and information indications are provided for further guidance.
- Try it and stay tuned! There is more to follow in the future!

The z/OSMF Workload Management Task

Functions

- Policy editor
  - Simplified creation and editing of WLM policies
    - The elements of a service definition are displayed in tabular form
    - Service definition elements are created or edited directly in tables
    - The creation and editing of WLM service definitions is supported by best practice checks
  - Support for review and investigation of WLM policies
    - Direct navigation between policy elements
    - Filtering, sorting, and search functions
  - Serialization of the editing of the active service definition

- Policy repository
  - WLM policies are stored in a repository integrated in the z/OSMF file system
  - Policies can be exported to the local workstation or a host data set as well as imported from a file or a host data set
  - Policies or best-practice recommendations can be printed for further study
  - Integrated operation history makes manual tracking superfluous

Functions (cont.)

- Installation and activation of WLM policies

- Monitoring of the WLM status in the sysplex
  - WLM status report is automatically updated if the WLM status on the systems changes

- Administration and operation tasks can be performed simultaneously
  - Simplified migration: Policy elements can be copied from one service definition to another
  - Simplified operation: User can start to edit a policy, interrupt the editing to activate a policy, and then continue with the editing without loosing the context

- z/OSMF Workload Management synchronizes automatically with z/OS WLM

Some Benefits

	Without WLM Policy Editor** using WLM Administrative Application	With WLM Policy Editor** in z/OSMF
Optimization of a service definition based on best-practices	Read through WLM-related manuals and identify best-practices. Print out the service definition and investigate it with respect to proposed best-practices. If required, modify the policy elements correspondingly. **Hours (or days when done initially)**	Check the best-practice hints the GUI displays for policy elements. If required, modify the policy elements correspondingly. **Minutes (or hours when done initially)**
Review of service definitions for daily changes, migration, consolidation	To get an overview of a service definition you have to print it to a data set, download the data set, and print it out or feed it into the Service Definition Formatter tool to filter and sort policy elements. **5-10 minutes until review can start**	Open a service definition from the service definition repository. Navigate through it using links. Filter and sort policy elements in the tables. **Seconds until review can start**
Transfer policy elements from a test service definition to a production service definition	Print out the test service definition and update the production service definition by typing in the changes. **Up to several minutes per policy element**	Open the test and production service definition simultaneously and copy over the changed policy elements via copy&paste operations. **Seconds per policy element**

** Based on IBM laboratory results, your results may vary

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Workload Management Task Integration in z/OSMF

- The Workload Management task is displayed in the Performance category of the Navigation tree

- The Workload Management task is displayed on the Roles Properties panel and can be assigned to the roles z/OSMF Administrator, z/OSMF User, z/OSMF Authenticated Guest

  - By default the Workload Management task is assigned to the role z/OSMF Administrator

  - The Workload Management plugin shows up on the About page with version information
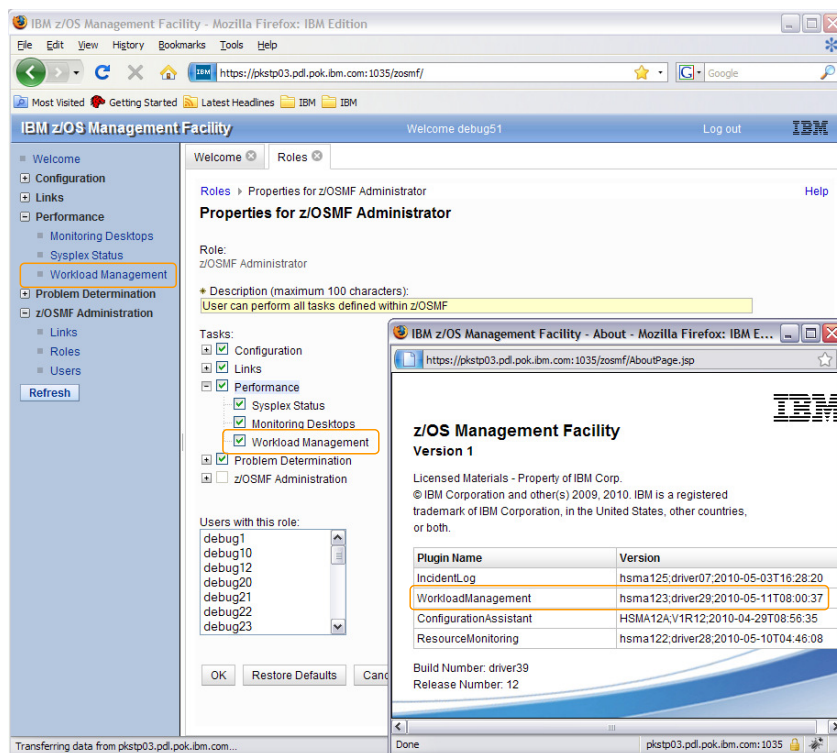
Workload Management Task Overview

- **Manage Service Definitions:** Create, modify, import, export, print, install service definitions
- **Manage Service Policies for Sysplex:** Activate or view the service policies in the service definition that is currently installed in the WLM couple data set
- **Manage Settings:** Specify history length, codepage, user preferences
- **View Status for Sysplex:** Displays information about the service definition installed in the WLM couple data set and the service policy active in the sysplex.
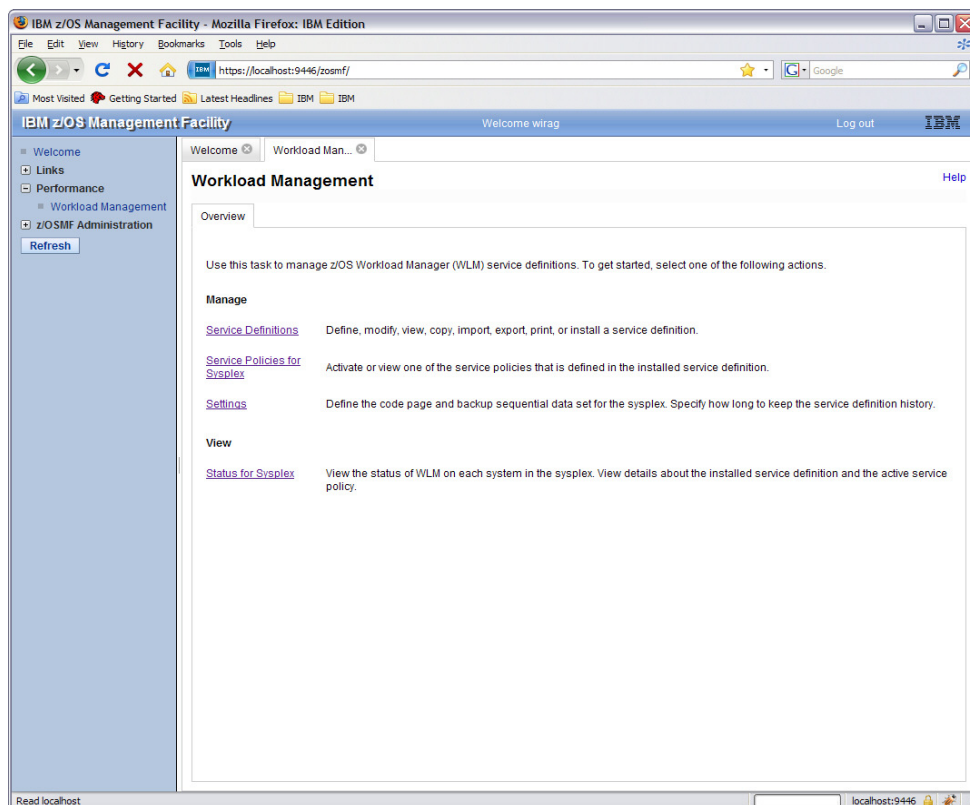
- The z/OSMF Workload Management task provides the following subtasks:

- Manage Service Definitions: Create, modify, import, export, print, install service definitions.

- Managed Service Policies for Sysplex: Activate or view the service policies in the service definition that is currently installed in the WLM couple data set.

- Manage Settings: Specify history length, codepage, user preferences

- View Status for Sysplex: Displays information about the service definition installed in the WLM couple data set and the service policy active in the sysplex.

13

Service Definition Repository

- Integrated repository for service definitions
- Service definitions can be
  - Imported
  - Exported
  - Printed
  - Viewed or edited
  - Created or Copied
  - Installed on the sysplex
- Indications
  - If service definition is installed and active
  - If service definitions are being viewed or edited
  - If messages exist for a service definition

- The repository synchronizes automatically with the WLM couple data set: When the Service Definitions panel is launched or refreshed, z/OSMF checks if the service definition currently installed in the WLM couple data set is contained in the Service Definitions table. If it is not contained, z/OSMF extracts the service definition automatically, displays it in the Service Definitions table, and marks it with the label „Installed". Furthermore, the service definition that is currently used by z/OS WLM to manage the system/sysplex is marked with the label „Active". If the installed service definition and the service definition used to manage the system/sysplex are identical, the corresponding service definition is marked with the label „Installed & Active".

Editing Service Definitions

- Simplified creation, modification and review of service definitions
    - Policy elements are presented in tables
    - Tables can be filtered and sorted
    - Direct editing of policy elements within tables
    - Best-practice hints are displayed automatically while specifying policy elements
    - Several service definitions can be opened simultaneously
    - Cut, Copy, Paste of policy elements between service definitions
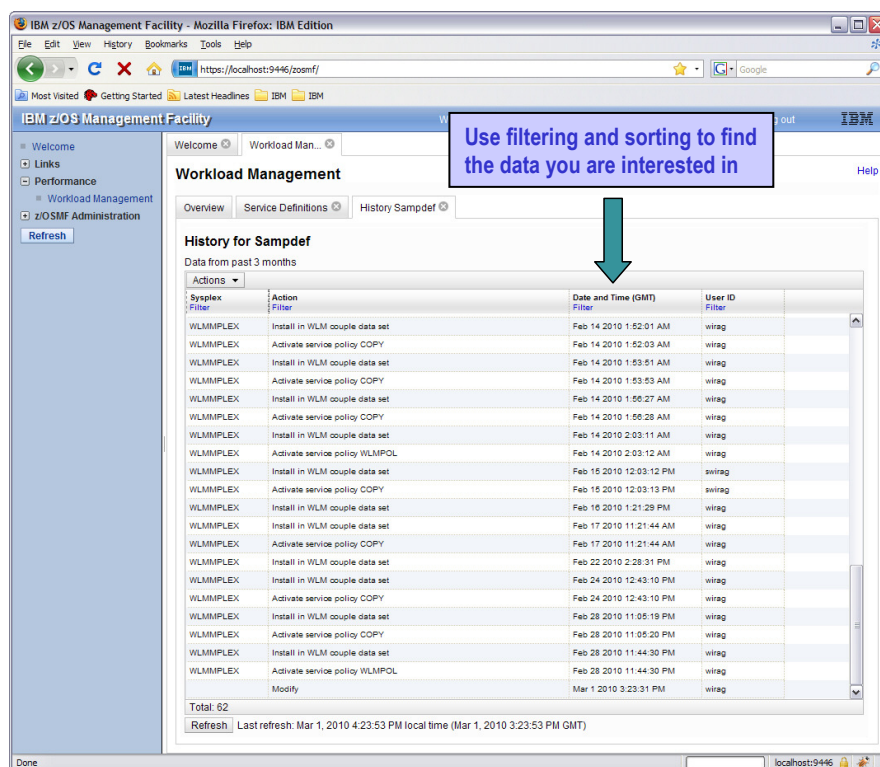
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- The WLM Policy Editor in z/OSMF follows the same concept as the WLM Service Definition Editor tool. Service definition items/elements of the same type are displayed in one table. If service definition items contain child items the tables are tree tables where the parent items can be collapsed or expanded. For example, in the table with service classes, service class items can be expanded to make the periods visible. For tree tables the user can switch also to a flat table representation which provides additional sort capabilities.
- The user can switch to another section of the service definition using the „Switch to" menu.

Service Definition History

- A history is provided for each service definition listing the activities performed on the service definition
- A service definition history contains edit, install, activate, import, export activities
- The history displays for each activity timestamp and user
- The user can customize how long the history is kept

Printing Service Definitions

- Before printing, a Print Preview function enables to
  - filter service definition elements
  - apply service policies
- Hints, warnings can also be printed
- Besides printing, the Print Preview panel is well suited to get a general idea of a service definition
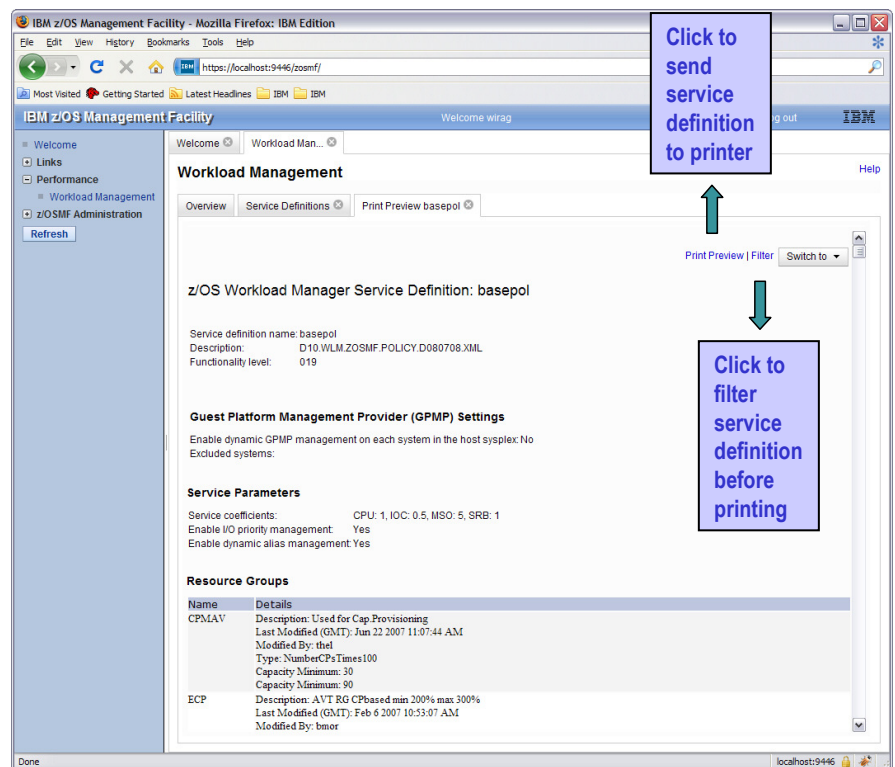
- The Print Preview panel displays a service definition as HTML document. If the user triggers the print action the content of the Print Preview panel is send to the printer. Even if a service definition should not actually be printed out, the Print Preview panel provides a clearly formatted view of a service definition well suited to get a general idea.
- The Print Preview panel allows to view a service definition with an applied service policy. The service policy to apply on the service definition can be selected with the „Switch To" menu. If a service policy is selected, the service definition is displayed with service classes and resource groups after the overrides of the selected service policy have been applied. Therefore, the user can see how the service definition looks like if a certain service policy would be activated.

Installing Service Definitions

- A wizard enables to install and activate a service definition
    1. Review properties of currently installed service definition and the one that is going to be installed
    2. Select service policy to be activated
    3. Review summary of install and activate that will be done and trigger it
- If a backup data set has been specified in the Settings, a copy of the installed service definition is stored in that data set
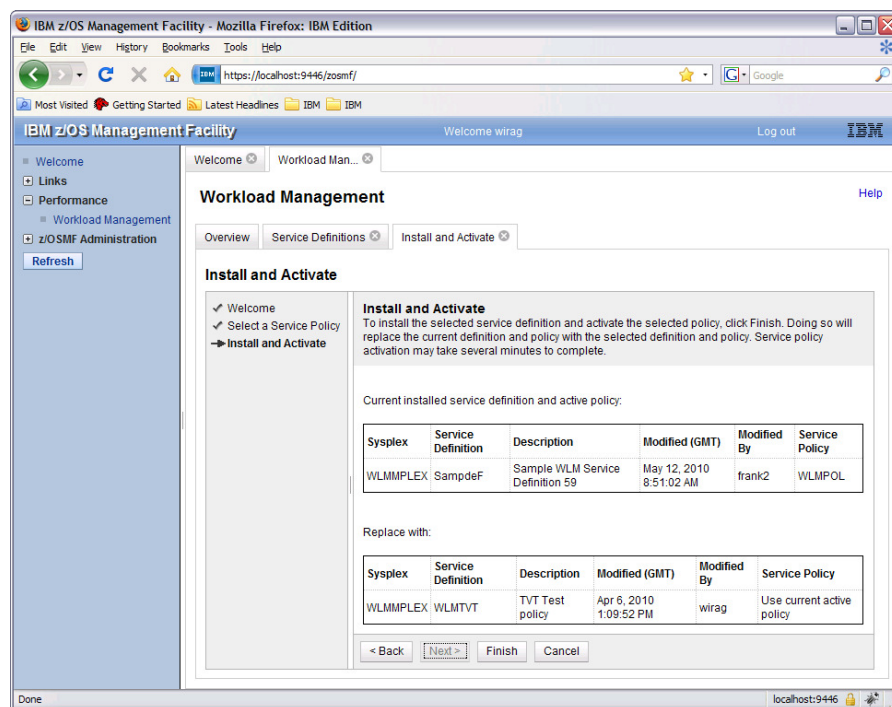
Manage Service Policies
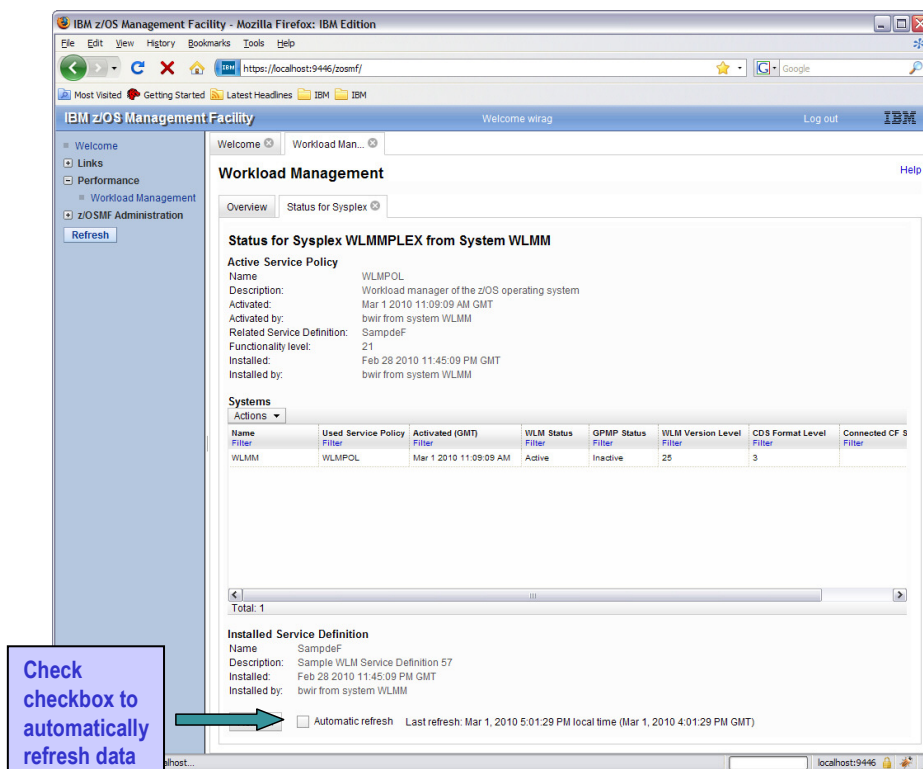
- The Manage Service Policies task enables to
  - View or print the service policies of the installed service definition
  - Activate a service policy of the installed service definition
- The Manage Service Policies panel displays the state of the service policies in the installed service definition
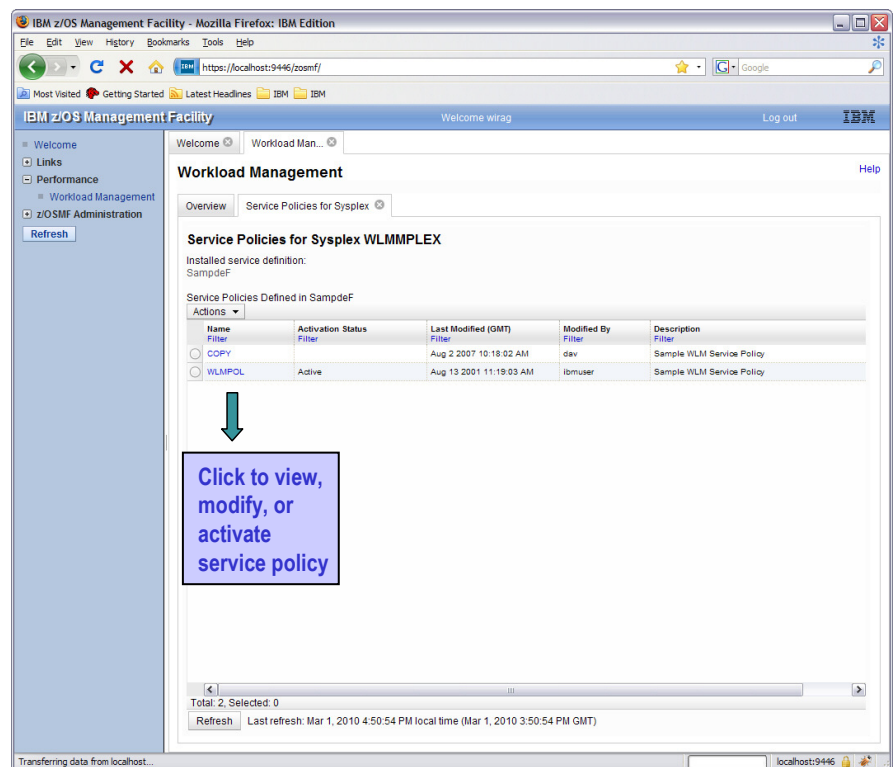
- The Manage Service Policies panel displays the state of the service policies contained in the service definition that is installed in the WLM couple data set. For example, it indicates the service policy which is currently active. The panel enables to activate another service policy or to view and print service policies.

View Sysplex Status

- The View Sysplex Status task displays
  - The active service policy
  - The WLM status on the systems in the sysplex
  - The installed service definition
- The Sysplex Status panel comprises the information provided by the MVS console command D WLM, SYSTEMS
- Information may be automatically refreshed

Check checkbox to automatically refresh data

- The Sysplex Status panel displays information that is produced by the MVS console command D WLM,SYSTEMS. In addition, the panel displays the service definition that is currently installed in the WLM couple data set and provides the option to automatically refresh the panel content.

Settings

- Specify how long to keep the service definition history
- Specify if consistency checking with the WLM couple data set should be performed
- Specify the code page for the sysplex
- Specify a backup sequential data set name for the sysplex
  - Name may contain variables &&TIME&&, &&USER&& which are replaced with the current time and logon userid
- Specify if confirmation messages should be displayed (user-specific setting)
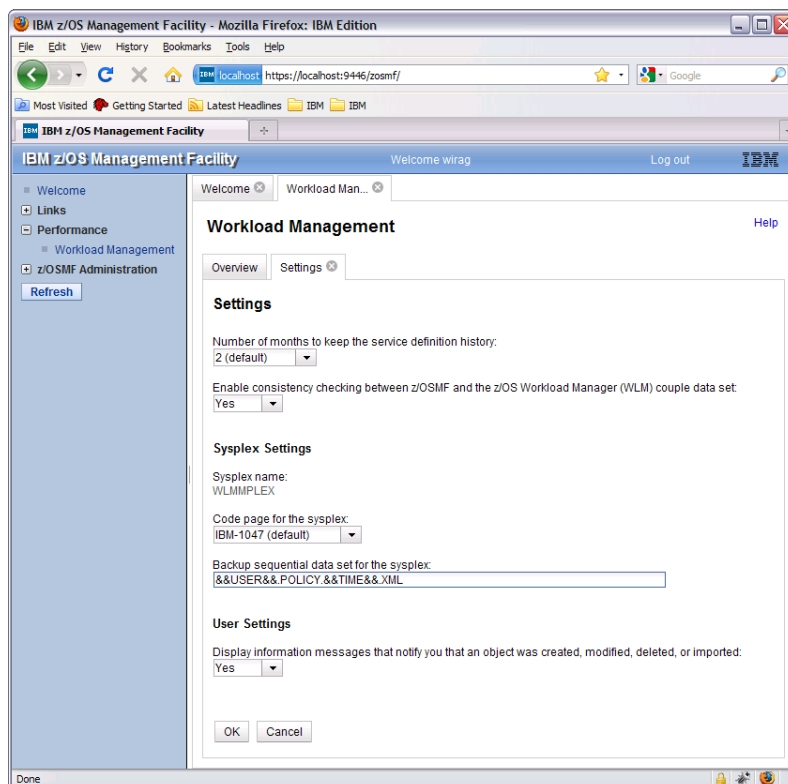
WLM Component Environment Overview
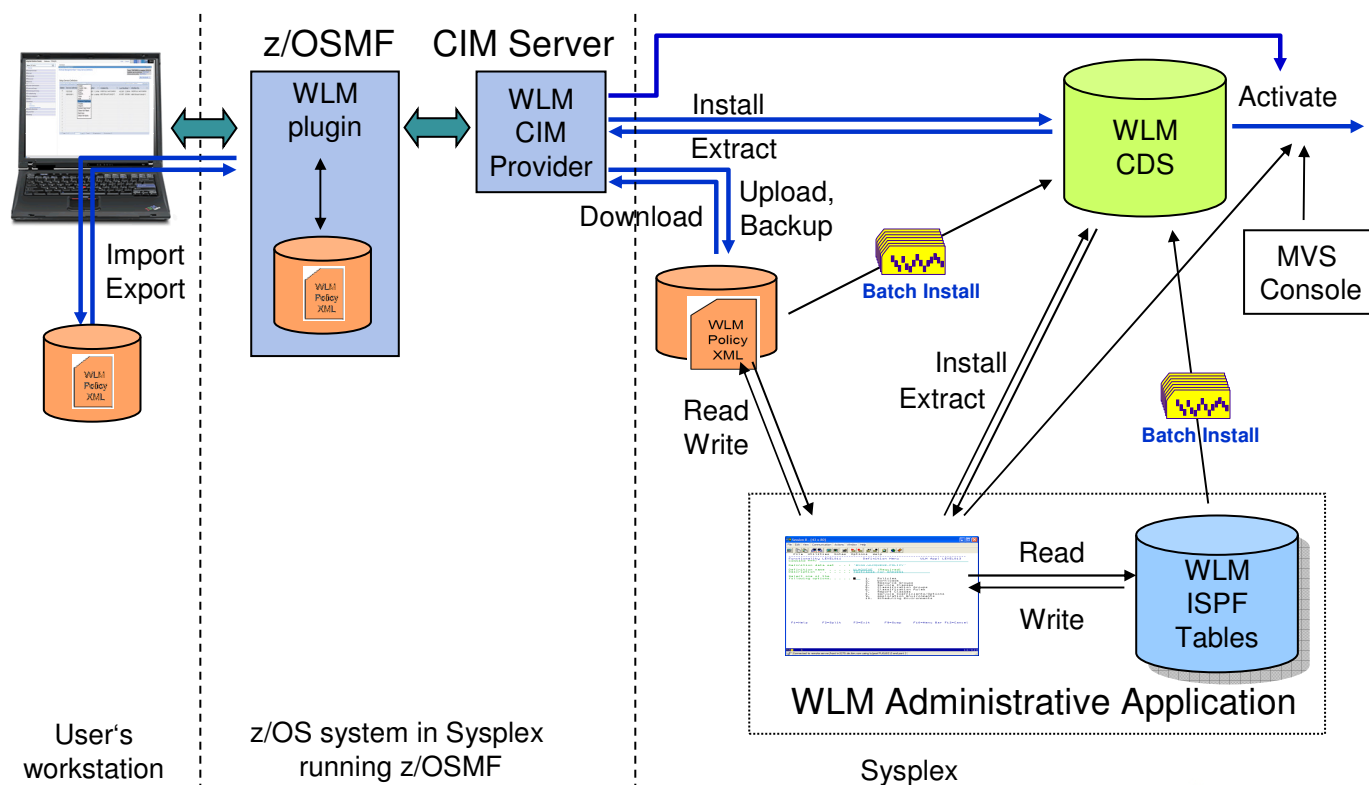
- Today, service definitions are created or edited with the ISPF-based WLM Administrative Application. The WLM Administrative Application incorporates the function of a policy editor that stores created service definitions as ISPF tables. The WLM Administrative Application can also be used to extract or install a service definition from the WLM couple dataset or to activate a service policy from the service definition in the WLM couple dataset. A service definition stored as ISPF-tables in a dataset can also be installed and activated via a batch job. Furthermore, an operator can activate a service policy of the installed service definition via a MVS console command.

- The status of a service policy activation within the sysplex can be displayed by issuing the MVS console command D WLM,SYSTEMS.

- As preparatory work for the z/OSMF WLM application, WLM APIs have been enhanced in z/OS 1.10 so that service definitions can be installed or extracted in XML format. Furthermore, a WLM CIM provider has been implemented that provides similar status information as the MVS console command D WLM,SYSTEMS and which allows to install and extract service definitions in XML format and to activate a service policy. The WLM CIM provider allows also to upload a XML service definition to a sequential dataset and to download a XML service definition from a sequential dataset. The z/OSMF WLM plugin communicates with the WLM CIM provider on the local system for all WLM-related tasks.

- The z/OSMF WLM plugin incorporates the functions provided today by the WLM Administrative Application in combination with the MVS console command D WLM,SYSTEMS. Furthermore, it improves those functions by utilizing techniques provided by the web environment.

- The z/OSMF WLM application works with XML service definitions. The WLM Administrative Application has been enhanced in V1R10 to open XML service definition datasets and write XML service definition datasets. Batch install has also been enhanced in V1R10 to install XML service definition datasets. Furthermore, the z/OSMF WLM plugin allows uploading and downloading XML service definitions from the local z/OS system as well as storing a copy of the installed service definition in a dataset on the z/OS system.

- The z/OSMF WLM plugin also allows to import and export service definitions to the local workstation of the user in order to enable the user to exchange service definitions with colleagues or to embed them in documents or presentations.

Fine-grained Authorization (R13)

- Separate authorization levels for
  - Viewing of service definitions,
    service policies, and WLM status
  - Installation and activation of service policies
  - Modification of service definitions

- In repository authorization mode the WLM
  authorization of roles is controlled by three
  tasks on the Roles panel:
  - Workload Management
  - Workload Management Install
  - Workload Management Modify

- In SAF authorization mode the WLM authorization
  of roles is controlled via the SAF resource names:
  - ZOSMF.WORKLOAD_MANAGEMENT.WORKLOAD_MANAGEMENT.VIEW
  - ZOSMF.WORKLOAD_MANAGEMENT.WORKLOAD_MANAGEMENT.INSTALL
  - ZOSMF.WORKLOAD_MANAGEMENT.WORKLOAD_MANAGEMENT.MODIFY

- To enable a role to launch the Workload Management task it is not sufficient to provide
  authorization for 'installation' or 'modification'; in addition the role has to be authorized for
  'viewing'.

23
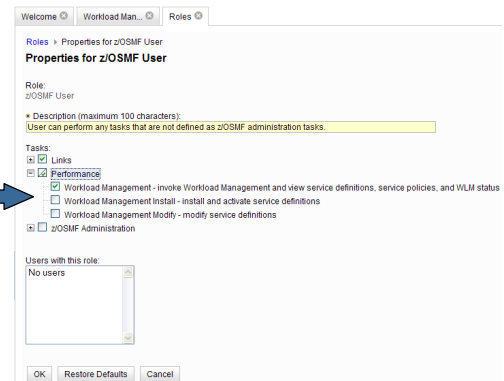
z/OSMF Resource Monitoring

IBM z/OSMF Resource Monitoring

Infrastructure

Browser

DDS on
PRODPLEX

z/OSMF

DDS on
LOCALPLEX

DDS on
TESTPLEX
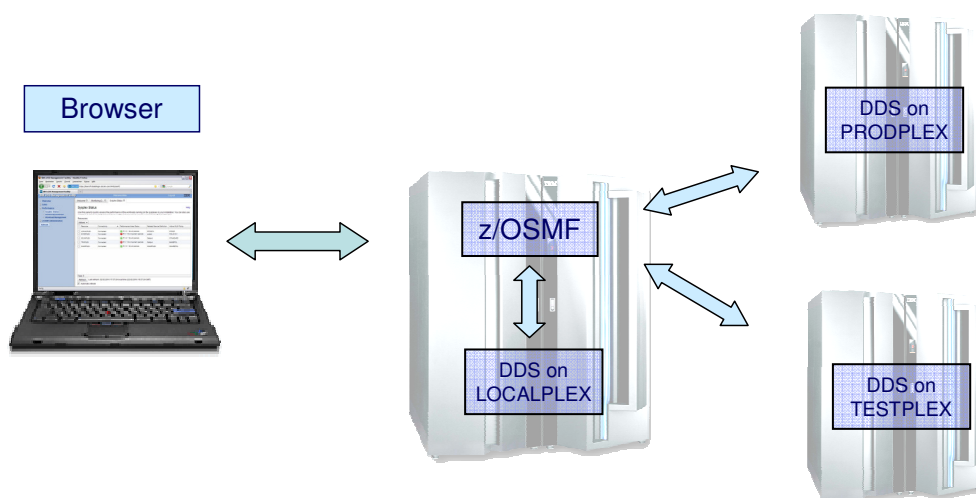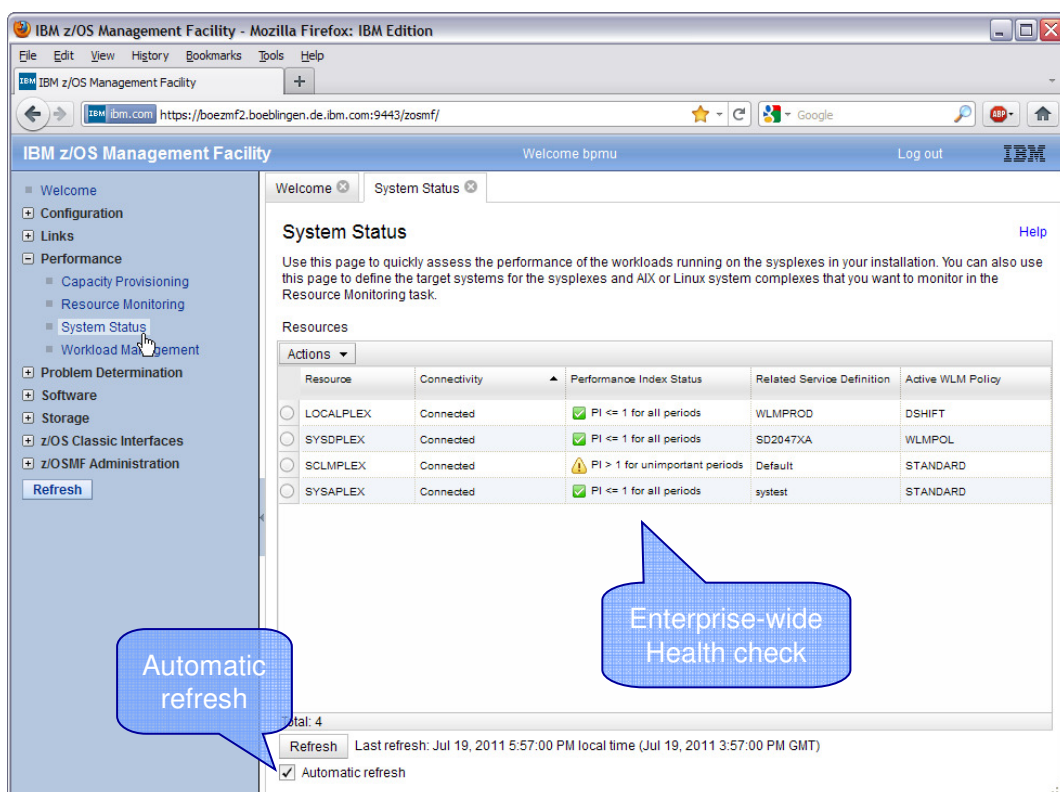
- Browser connects to z/OSMF
- z/OSMF Resource Monitoring can connect to all systems where the RMF Distributed Data Server (DDS) is running

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- In case you are running an instance of the RMF Distributed Data Server on the same sysplex where your z/OSMF is active, you can get started with the z/OSMF Resource Monitoring application immediately
- The application is able to detect the DDS system and connects to this DDS instance automatically
- Use the System Status task to define all other connections to your remote DDS systems
- Ensure that access to the DDS is configured properly:
    - If your installation does not requires DDS authentication you can allow global access by means of the HTTP_NOAUTH(*) directive in the DDS configuration member GPMSRV00
    - Otherwise the application is able to generate passtickets for DDS access. Note that the passtickets are generated on behalf of the WAS servant userid (i.e. this userid must be enabled to create the passtickets)

IBM z/OSMF Resource Monitoring …

System Status Task

- The starting point for the monitoring is the *System Status* task. This task provides a comfortable way to assess the health status of all systems in your installation at a glance.

- The table contains the list of z/OS sysplexes and Linux images. You can add, modify and delete items in the table using the *Actions* menu.

- When you start the task for the first time, one default entry is provided as *LOCALPLEX* that points to the DDS in the sysplex in which z/OSMF is running. If you have a running DDS in this sysplex the *System Status* task detects it automatically without requiring an explicit declaration of its host name or IP address. Also, the *System Status* task can automatically detect the DDS movement within the sysplex during the z/OSMF session.

- In addition to the *LOCALPLEX* you can add all target sysplexes you want to monitor to the table. Now let's explore the column output as shown in the chart:

   - The PI-Status column gives you a red-yellow-green indicator for the sysplex health. This indicator is based on the WLM service class period goals and actuals.

   - If all service class periods on the system are meeting their goals (that is, have a *performance index* (PI) of less than or equal to 1), the PI Status is green.

   - If service classes with importance of 3, 4, and 5 with the PI greater than 1 are detected, the indicator is yellow.

   - If at least one important service class (that is, importance of 1 or 2) misses the WLM goal, the indicator is red

- In this case it becomes essential to figure out the reasons by drilling down into the details on the respective sysplex. This can be done within the *Resource Monitoring* task.

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Resource Monitoring – Sysplex Definitions

Enterprise-wide Connections to RMF Distributed Data Server (DDS)

- In addition to the preconfigured LOCALPLEX, we have already defined two additional sysplexes: SCLMPLEX and SYSDPLEX
- Now let's add another sysplex: click on the *Actions* menu

Resource Monitoring – Sysplex Definitions

Add a new Entry

- From the *Actions* menu drow list select *Add Entry*

Resource Monitoring – Sysplex Definitions

Add a new Entry

- Type any name of your choice in the *Resource name* entry field
- Specify a hostname or IP address where the RMF DDS is running
- Adjust the port number or confirm the default port number 8803
- Select the operating system running the DDS:
  - z/OS (GPMSERVE)
  - AIX (GPM4CIM)
  - Linux on System x (GPM4CIM)
  - Linux on System z (GPM4CIM)
  - Linux (rmfpms) ← Based on rmfpms Linux data gatherer available on RMF Homepage
- Then confirm with OK

Resource Monitoring – Sysplex Definitions
Add a new Entry

• The new connection will be activated dynamically and an additional row for the new sysplex is displayed instantly

IBM z/OSMF Resource Monitoring …

Resource Monitoring Task: Monitoring Dashboards
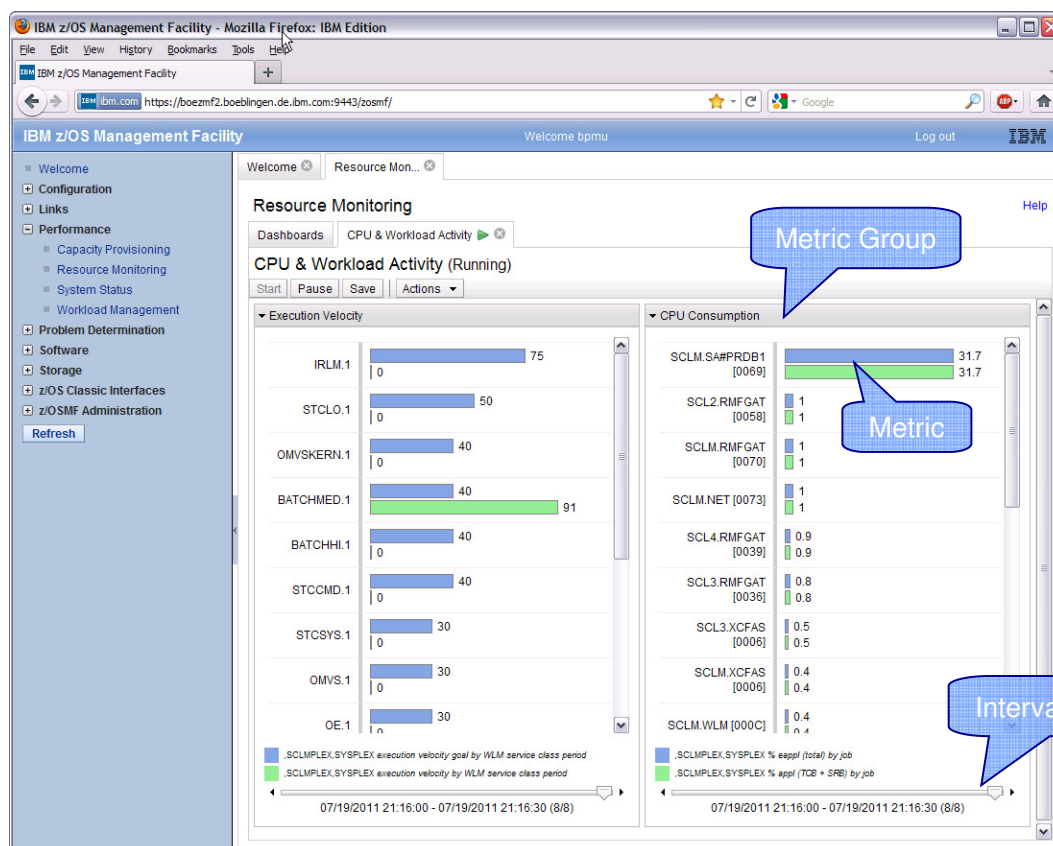
- The **Resource Monitoring** task allows you to monitor the performance of the z/OS sysplexes, AIX system complexes (System p), Linux system complexes (System z and System x) in your environment. The performance data is displayed in so called **Monitoring Dashboard**s.

- A *Monitoring Dashboard* is a customizable view containing different performance metrics that you can group and arrange flexibly.

- You can create and save your own dashboards or open and modify the predefined dashboards that are with the task in z/OSMF.

- When you start a Monitoring Dashboard it begins retrieving the online data from the DDS periodically.

- By default, the most current snapshot is displayed

- It's possible to browse through the data collected since the start of the current session.

- A dashboard contains multiple metric groups; their size and column count are adjustable. You add one or multiple metrics to each group.

Resource Monitoring – Monitoring Dashboards

Predefined Dashboards

- To open the Resource Monitoring task, select Resource Monitoring from the z/OSMF navigation tree

Resource Monitoring – Monitoring Dashboards

Predefined Dashboards

- The z/OSMF resource monitoring application provides a set of preconfigured *Monitoring Dashboards* for all performance relevant areas.

- All preconfigured *Monitoring Dashboards* are applicable for all of your defined sysplexes. In other words, the internal format of these definitions does not contain any references to specific resource names (e.g. system or job names).

- Hence, the preconfigured *Monitoring Dashboards* are **generic** Dashboards (in contrast to **non-generic** Dashboards). Generic Dashboards can only contain metrics which are associated with the sysplex resource as the top-level resource.

Resource Monitoring – Monitoring Dashboards

Predefined Dashboards

- As an example for a preconfigured *Monitoring Dashboard*, now let's open the *Common Storage Activity* Dashboard:
- Either double click *Common Storage Activity* or click the corresponding radio button and open the Dashboards *Actions* menu.

Resource Monitoring – Monitoring Dashboards

Predefined Dashboards

- From the Dashboards *Actions* menu, now select *Open.* This action creates a new internal tab*.*

- As an alternative, you can select *Open in New Tab or Window*. In this case a new browser window or browser tab is created, depending on your browser settings. This method can have two advantages:
  - The complete space of a browser window can be exploited for the display.
  - The complete URL string is visible in the address bar of your browser. This string contains the complete definition of the *Monitoring Dashboard*. You might exchange this string with other users or store the URL to your browsers favourites.

Resource Monitoring – Monitoring Dashboards

Predefined Dashboards
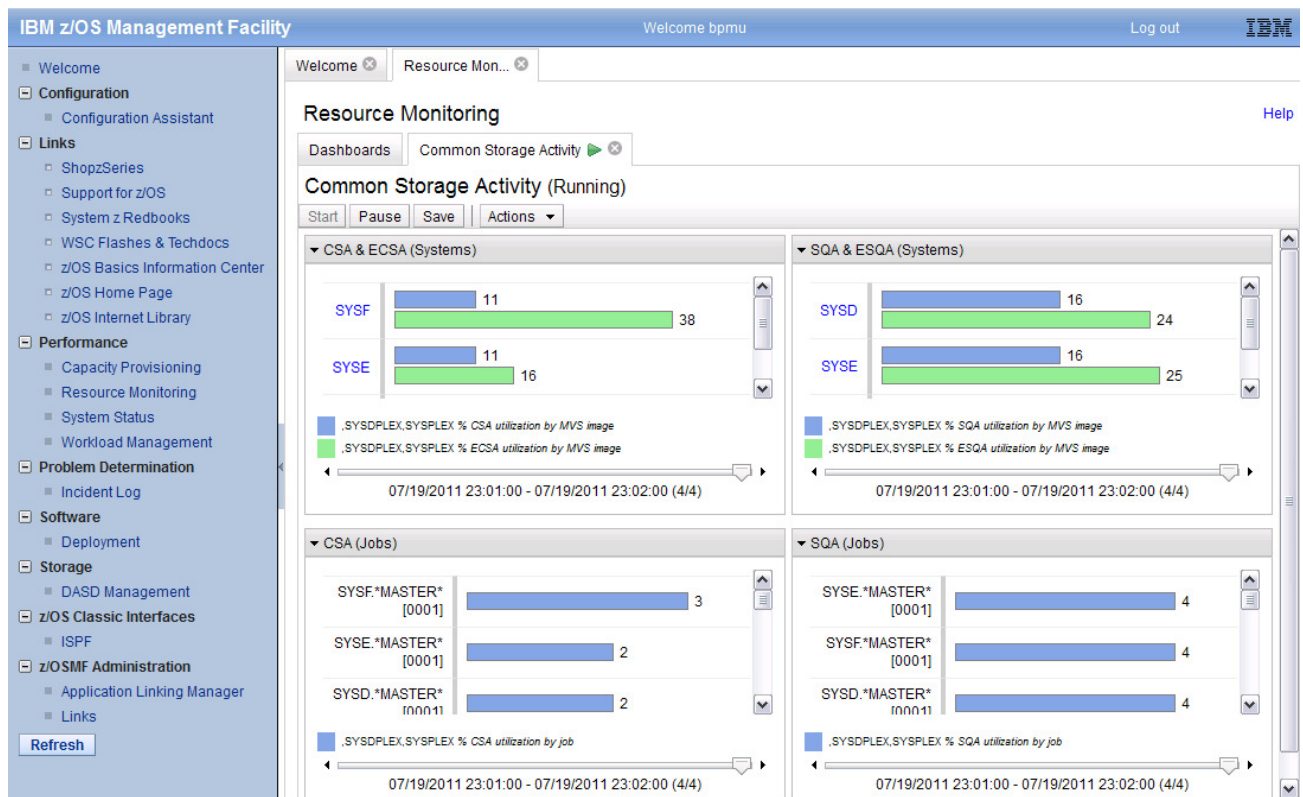
- When you open a generic *Monitoring Dashboard* or a *Monitoring Dashboard* which contains at least one generic metric definition, you will be prompted for the sysplex where the *Dashboard* should be applied to. From a drop-down box, you can then select one of the sysplexes you have defined in the *System Status* task.

- Once you have choosen your sysplex, the metric values are retrieved from the DDS instantly and displayed in terms of graphical bar charts.

- Accordingly to the Monitor III gatherer interval (mintime) the display is refreshed periodically.

- For each *Metric Group* you can control the currently displayed interval by means of a slider. The interval start and end times are displayed below the slider.

- With the *Pause* and *Start* push buttons you can stop and resume the data collection.

- As a matter of course, you can run multiple *Monitoring Dashboards* in parallel. One new tab is created for each *Monitoring Dashboard.*

- The *Common Storage Activity* dashboard consists of four *Metric Groups*. You can expand or collapse individual *Metric Groups* in order to make room for others.

- The first and second *Metric Group* displays a list of system names which are equal to the members of the sysplex. In case the instances of a list are formatted as hyperlink, additional information can be obtained:

Resource Monitoring – Monitoring Dashboards

Predefined Dashboards
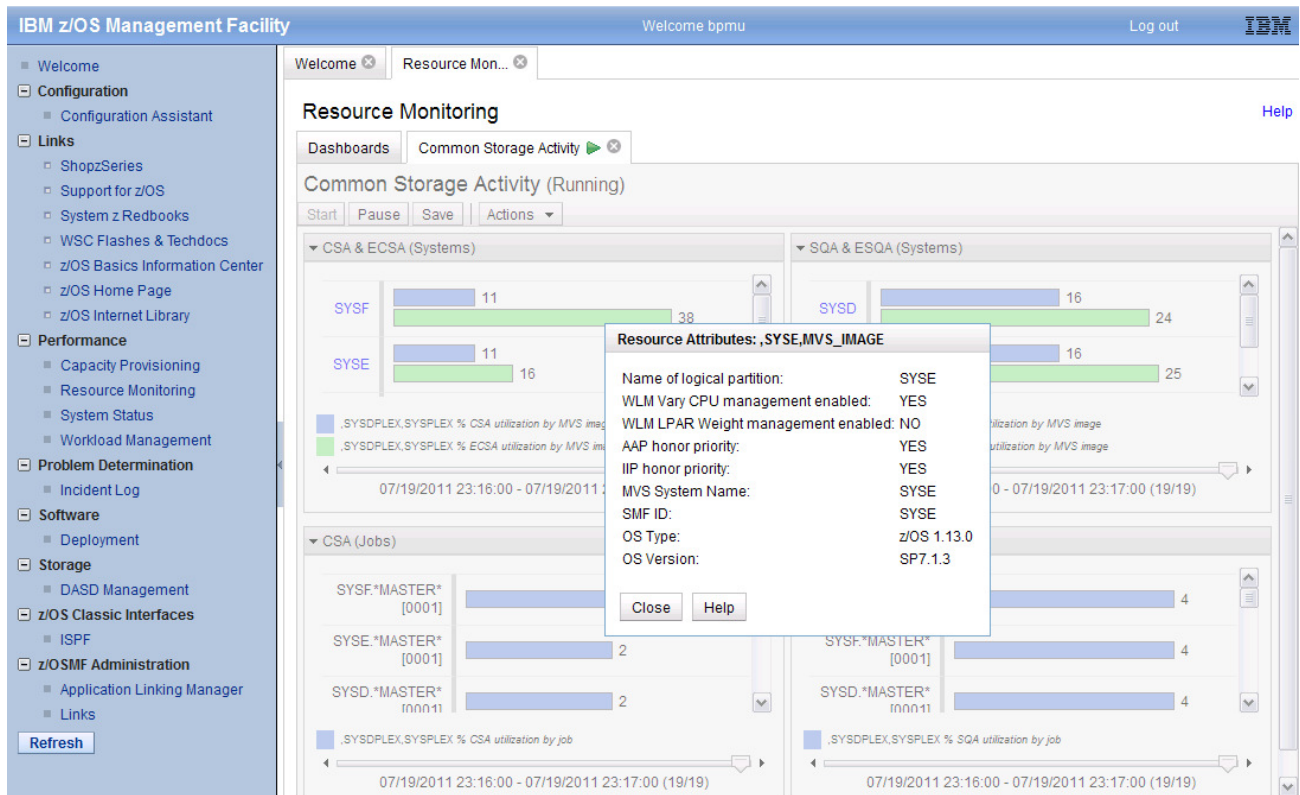
- Once you click on the SYSE hyperlink, the attributes for the System SYSE are displayed in a popup window.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- Beyond the preconfigured *Monitoring Dashboards* you want to define your own *Monitoring Dashboards* which contain your favourite metrics for your preferred systems and resources.
- From the Dashboards *Actions* drop-down menu, select *New.* This action creates a new tab with an empty *Monitoring Dashboard*.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- The next step is now to populate the empty *Monitoring Dashboard* with *Metrics* (resp. *Metric Groups*).
- Click on the *Actions* drop-down menu.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- From the *Actions* drop-down menu, select *Add Metric.* This action opens a new dialog where you can specify the details for your new *Metric.*

Resource Monitoring – Monitoring Dashboards

New Dashboard

- The definition of a new metric is performed in two mandatory and two optional steps:
    - Select a target resource
    - Select the associated metric
    - Specify a filter (optional)
    - Specify a workscope (optional)
- All sysplexes you have defined in the *System Status* task are displayed on the *Resource* tab
- In order to select your target resource, navigate to the sysplex of your choice.
- Otherwise, if you want to create a generic definition, select the (?) sysplex. Note that this generic sysplex has no children and cannot be expanded.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- Once you have selected the sysplex of your choice, this top level resource can be expanded and shows all contained resources (accordingly to the RMF Monitor III resource model).

- Now you are able to navigate to the resource where you want to select then the appropriate Metrics.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- On the *Metrics* tab, all metrics are displayed which are applicable for the curently selected resource.
- Use the *Quick filter* capability to find a certain metric instantly.
- For a comprehensive overview, you can expand and collapse the individual metric categories.
- Don't forget to specify a name for your *Metric Group* before you save your metric definition.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- On the Filter tab, you can specify a rich set of filter criteria for list-valued metrics:
    - Filter Pattern: Only those instances are returned in the list which match to a certain name pattern.
    - Sorting: Determine whether the sort order is descending or ascending (by value or by name).
    - Filters: Only those instances are returned in the list which match to a lower or upper threshold value.
    - Number of resources (=list elements) to display: either highes or lowest values.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- Use the Work Scope tab to qualify a request for performance data in more detail with regard to address spaces and WLM entities.

- Workscopes can be applied to single valued metrics as well as to list valued metrics. For example:

  - for the metric *performance index*, the workscope parameter denotes the associated service class period.

  - for the metric *% # frames active by job*, you can use this parameter to focus on jobs that belong to a certain service class.

- Once you have finished all steps of your metric definition click OK

Resource Monitoring – Monitoring Dashboards

New Dashboard
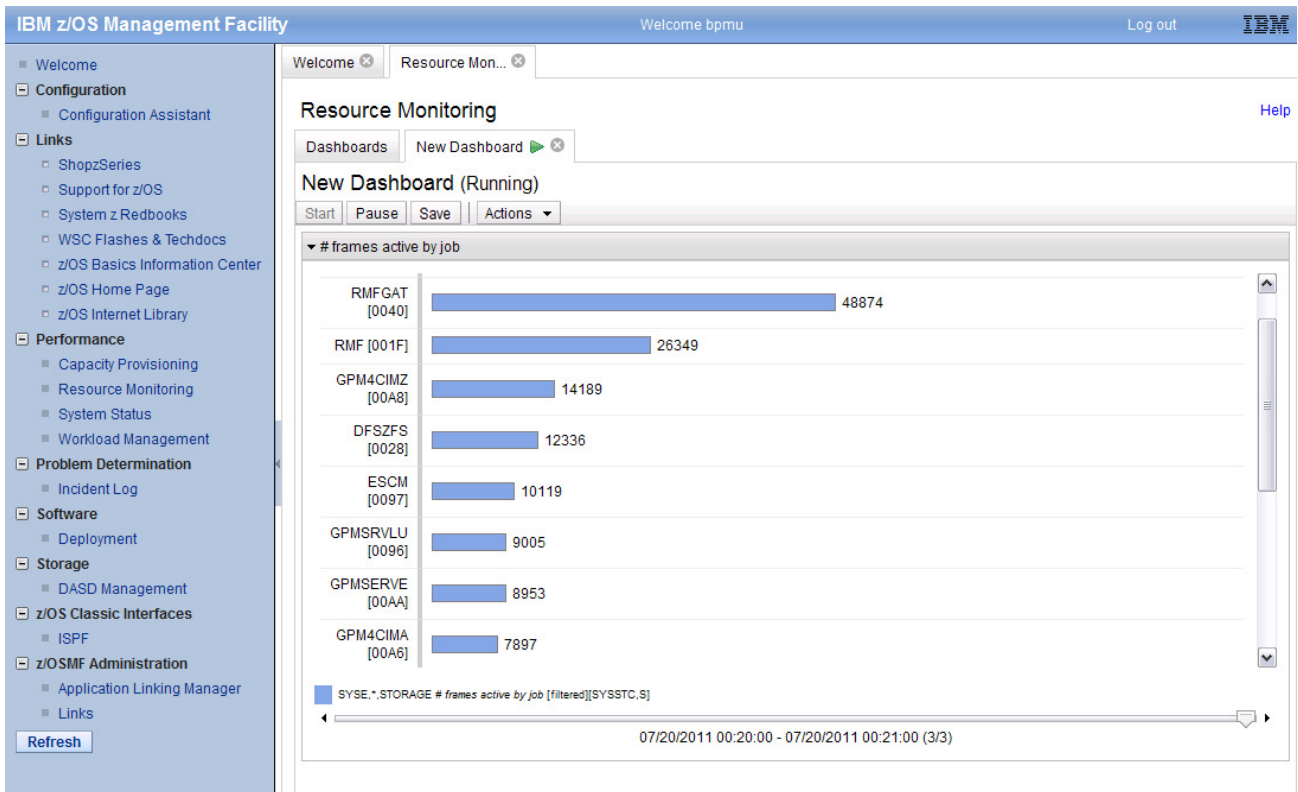
- The *Metric Definition* dialog dissapears and the new *Metric Group* with the corresponding metric is displayed instantly on the tab. Accordingly to the Monitor III gatherer interval (mintime) the data is refreshed periodically.

- Please note, that you can adjust the display settings to fit your needs. From the *Actions* drop-down menu, choose *Modify Settings*. You can determine:
  - How many *Metric Groups* are displayed in one row (maximum column count)
  - The height of the Metric Groups (row height)
  - The color contrast (color)

- In addition, from the *Actions* drop-down menu, you can also rearrange the order of *Metric Groups* within a *Monitoring Dashboard* as well as the order of *Metrics* within a *Metric Group*.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- Finally, you should not forget to save your new *Monitoring Dashboard*, otherwise all your definitions will be lost.
- Click on the Save push button and specify any name for your *Monitoring Dashboard*, then confirm with OK.

Resource Monitoring – Monitoring Dashboards

New Dashboard

- Once you have saved your new *Monitoring Dashboard* an additional row in the *Monitoring Dashboards* list is displayed instantly.
- Please note that *Monitoring Dashboards* are stored on user level. In other words there is no sharing concept for *Monitoring Dashboards* (the same applies for Sysplex Definitions).
- However, you can transfer definitions for *Monitoring Dashboards* to other users by exchanging the complete browser URL strings.
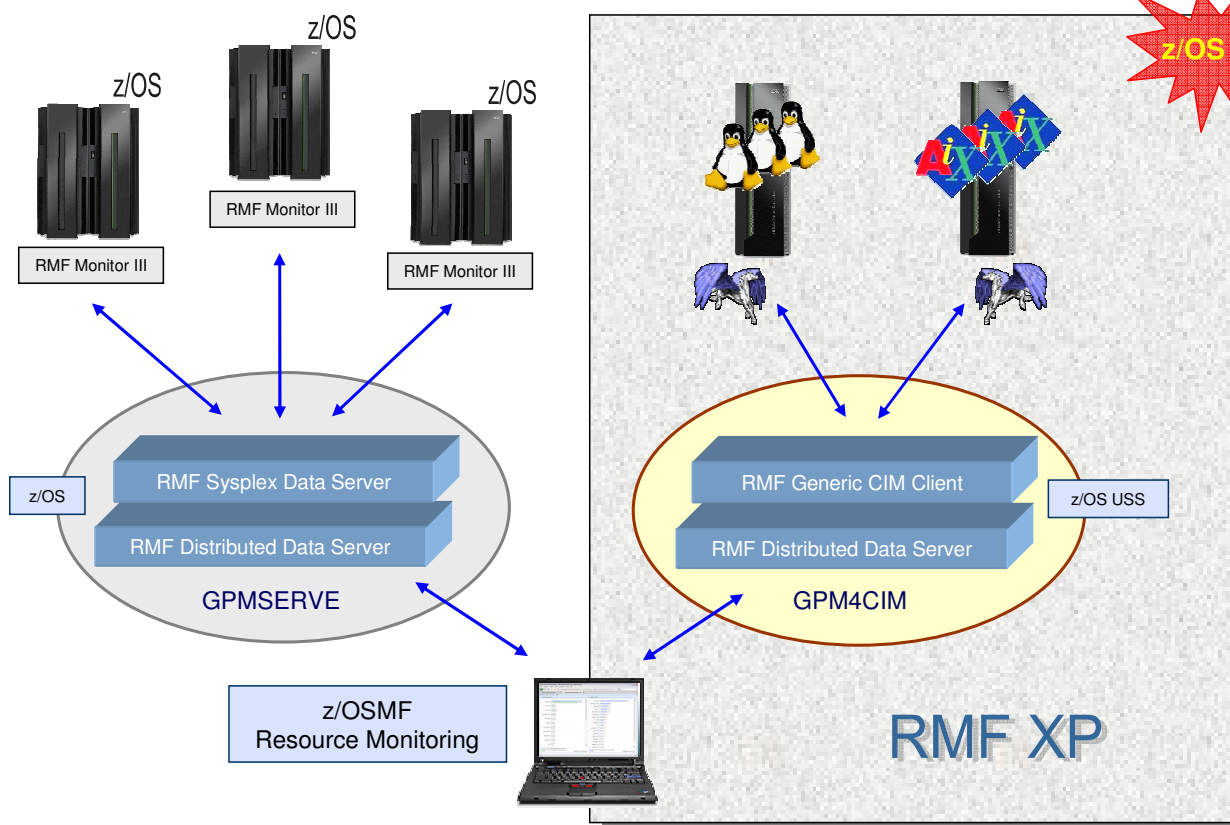
Resource Monitoring – Monitoring Dashboards

z/OS and Linux
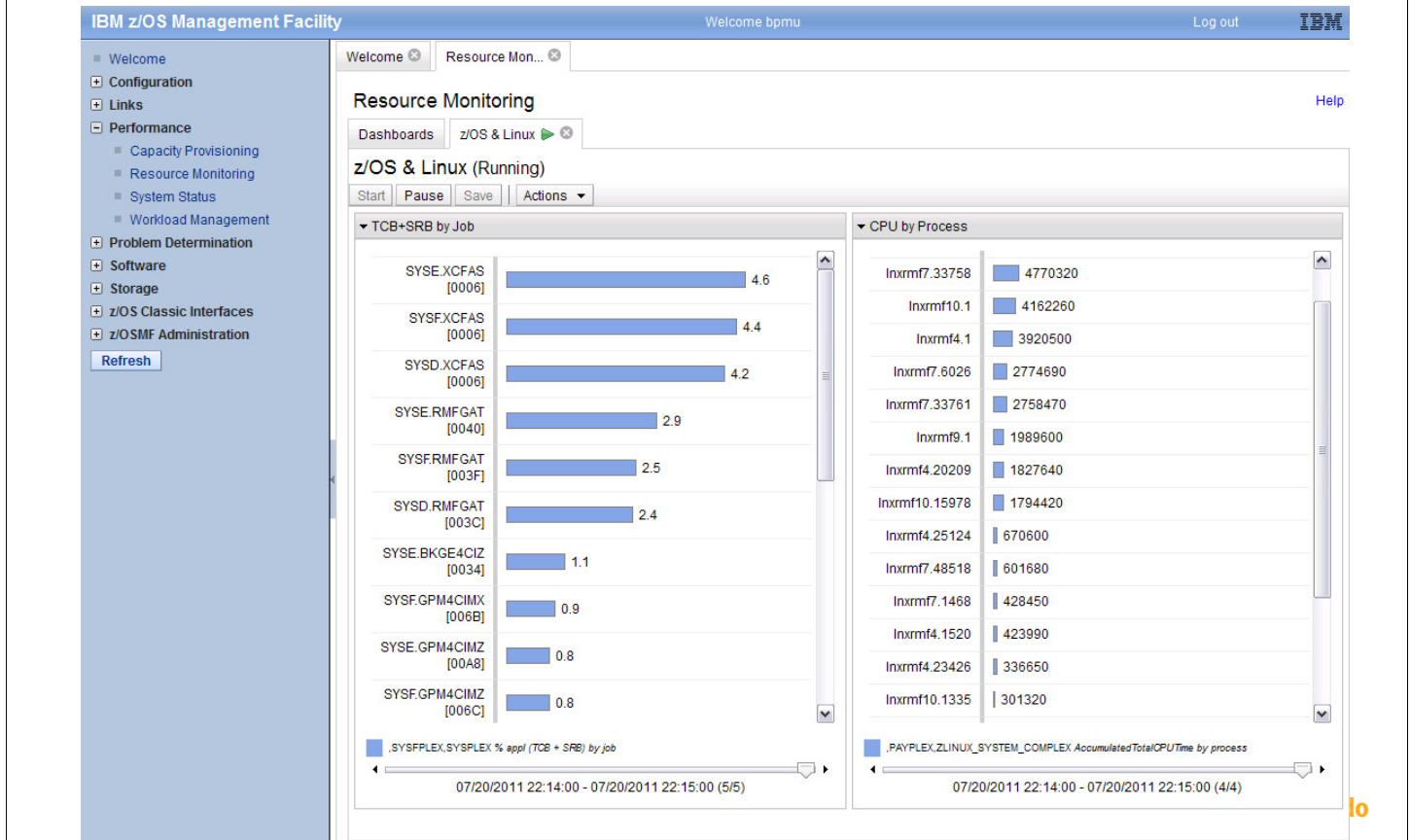
- The concept of the z/OSMF *Resource Monitoring* allows to combine metrics from multiple sysplexes in one *Monitoring Dashboard*.
- Moreover, it is even possible to display metrics from a z/OS sysplex together with metrics from a Linux image in a common *Monitoring Dashboard*.

RMF XP– Component Overview

z/OS

z/OS

z/OS

RMF Monitor III

RMF Monitor III

RMF Monitor III

z/OS

RMF Sysplex Data Server

RMF Distributed Data Server

GPMSERVE

RMF Generic CIM Client

RMF Distributed Data Server

z/OS USS

GPM4CIM

z/OSMF
Resource Monitoring

RMF XP

RMF XP - Invocation

- Started Task: SYS1.PROCLIB(GPM4CIM)
- Runs in USS Environment via BPXBATCH
- Multiple instances can run in parallel: one STC per platform
  - S GPM4CIM.GPM4A,OS=A
  - S GPM4CIM.GPM4X,OS=X
  - S GPM4CIM.GPM4Z,OS=Z

```
//GPM4CIM  PROC OS=X
//STEP1    EXEC PGM=BPXBATCH,TIME=NOLIMIT,REGION=0M,
//       PARM='PGM /usr/lpp/gpm/bin/gpm4cim cfg=/etc/gpm/gpm4&OS..cfg'
//STDENV   DD   PATH='/etc/gpm/gpm4cim.env'
//STDOUT   DD   PATH='/var/gpm/logs/gpm4cim&OS..out',
//       PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
//       PATHMODE=(SIRUSR,SIWUSR,SIRGRP)
//STDERR   DD   PATH='/var/gpm/logs/gpm4cim&OS..trc',
//       PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
//       PATHMODE=(SIRUSR,SIWUSR,SIRGRP)
//SYSPRINT DD   SYSOUT=*
//SYSOUT   DD   SYSOUT=*
//         PEND
```

RMF XP - z/OSMF Integration
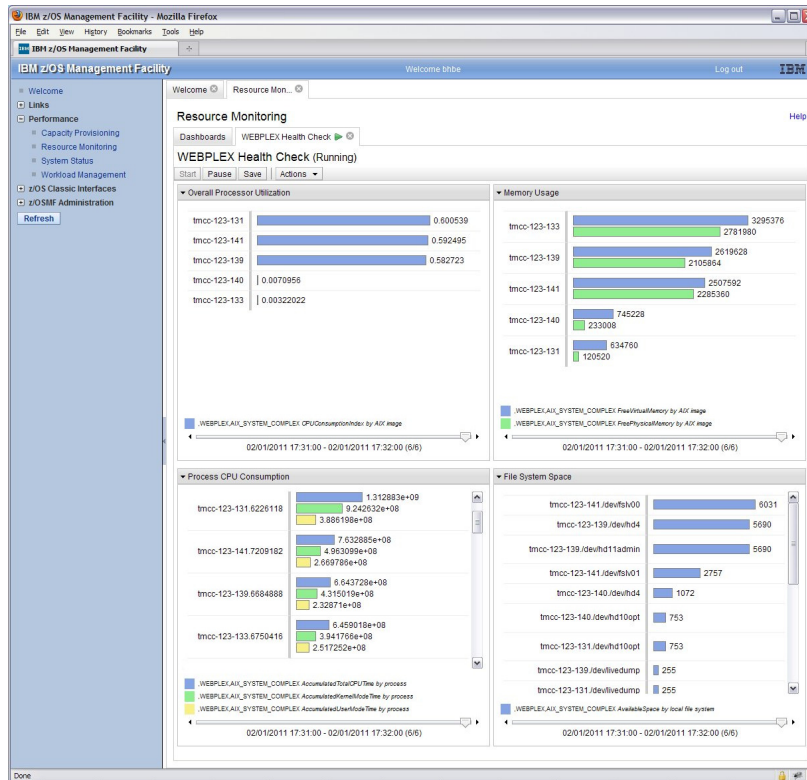
धन्यवाद
Hindi

多謝
Traditional Chinese

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

Thank You
English

Obrigado
Brazilian Portuguese

شكراً
Arabic

Grazie
Italian

多谢
Simplified Chinese

Danke
German

Bedankt
Dutch

Merci
French

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다
Korean