IBM Education Assistance for z/OS V2R2

Item: z/OS Management Facility Enhancements
Element/Component: z/OSMF

Material current as of May 2015

Agenda

- Trademarks
- Presentation Objectives
- Overview
- Usage & Invocation
- Interactions & Dependencies
- Migration & Coexistence Considerations
- Installation
- Presentation Summary
- Appendix

Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.

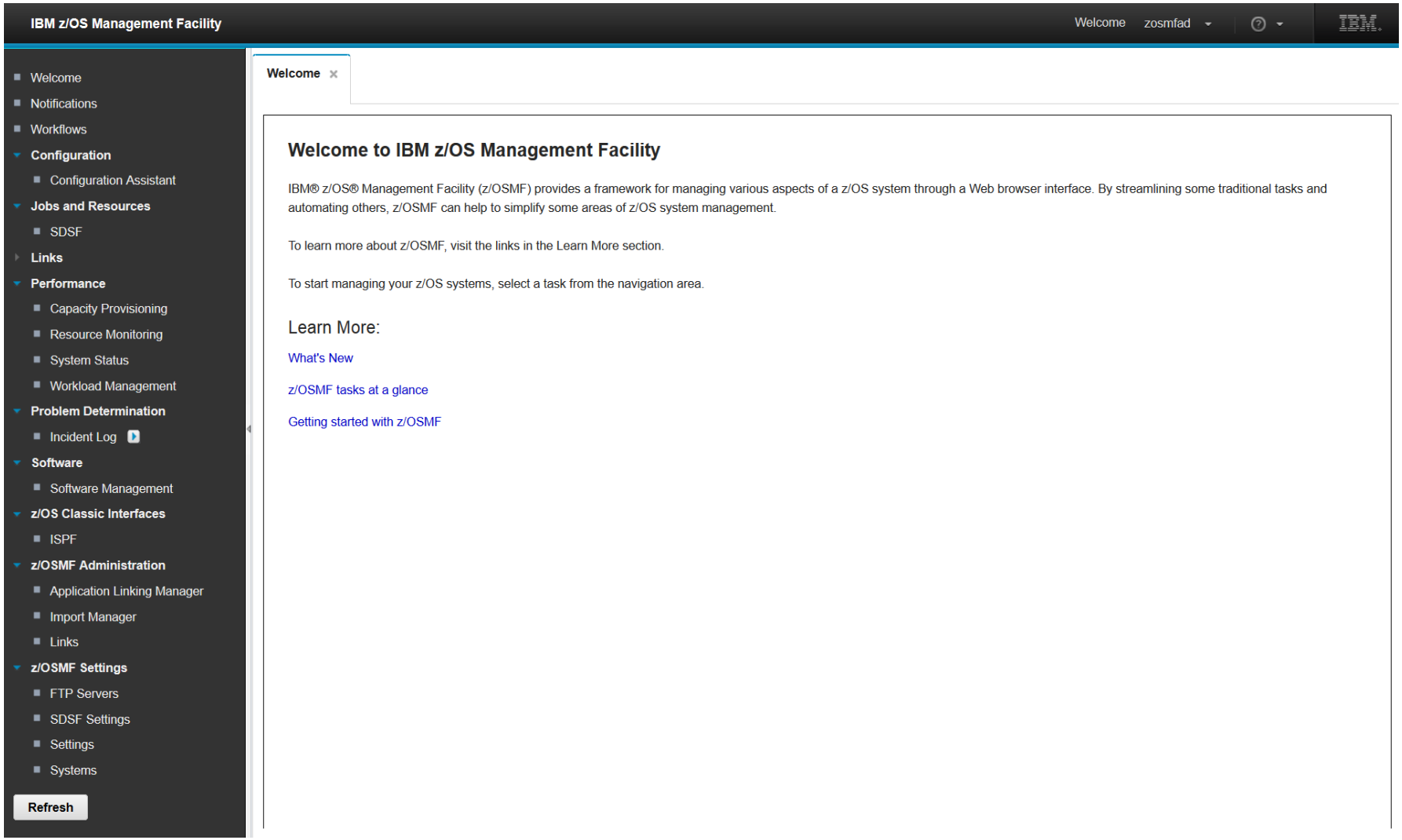
Presentation Objectives

- z/OSMF V2R2 includes the following new enhancements. Any item highlighted in blue indicates that *some* amount of function was rolled back to z/OSMF V2R1.
  - Include z/OSMF as an element of z/OS
  - Multiple sysplex support
  - Incident Log aggregation
  - Workflows enhancements
  - Compliance with One UI standard
  - External application support
  - z/OSMF SDSF UI
  - z/OS data set and file REST interface
  - Enhancement on z/OS jobs REST interface
  - Upgrade application server and improve service maintenance
  - Other miscellaneous updates

Overview

- Problem Statement / Need Addressed
  - Management scope of z/OSMF needs to be extended to multiple sysplex.
  - z/OSMF Workflow needs to be more powerful and flexible.
  - Apply service should not require execution of script
  - More functions should be provided to enable the system programmer to manage z/OS system better
- Solution
  - z/OSMF V2R2 provides the framework to manage multiple sysplex.
  - z/OSMF Workflow is continuously improved to provide more functions such as “Support edit step”, “REST workflow service”, “Workflow call workflow”, “Conditional step”, “Automation support”, etc.
  - Eliminate the need of script execution when applying z/OSMF PTF.
  - Enhanced 9 plugins and introduced 6 REST services
- Benefit / Value
  - z/OSMF provides the framework supports managing multiple sysplex. As the 1st exploiter, z/OSMF Incident Log is able to manage incidents from multiple sysplex.
  - z/OSMF workflow is more powerful and flexible.
  - User does not have to perform script when applying service
  - z/OSMF plugins are improved and more REST services easy invocation of z/OS services

z/OSMF V2R2 welcome page after logon



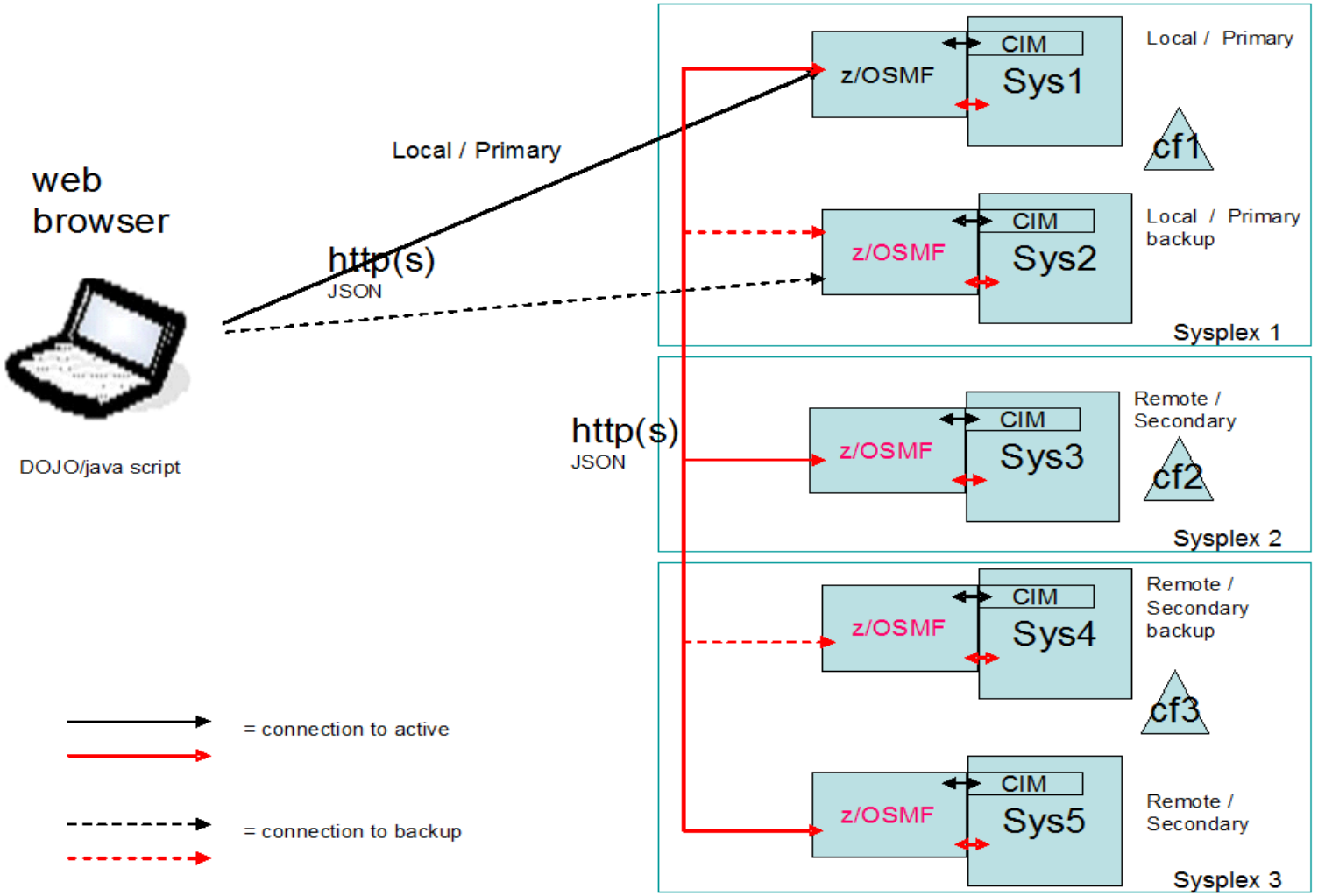
Include z/OSMF as an element of z/OS

- Starting with z/OS V2R2, z/OSMF, previously a separate prodcut, is planned to become a base element of z/OS.
- Delivered with z/OS, no need to order z/OSMF separately.
- Customer is not required to configure and start z/OSMF.
- The production file system is under “/usr/lpp/zosmf”. “VxRy” is now removed.

Multiple Sysplex support

- Problem Statement / Need Addressed:
  - Previously z/OSMF is single sysplex scope although some plugins do have the capability to manage multiple sysplex by their own way such as Software Management plugin.
- z/OSMF V2R2 provides a common framework supports managing multiple sysplex from single z/OSMF. This framework enables managing multiple sysplex from single user interface (one z/OSMF tab in browser).
- Each sysplex should have at least one z/OSMF instance running.
- The z/OSMF instance which is connected by the user interface is known as “primary z/OSMF”. Other z/OSMF instances which are managed by “primary z/OSMF” are known as “remote or secondary z/OSMF”.

Multiple Sysplex support – layout of managing multi-sysplex

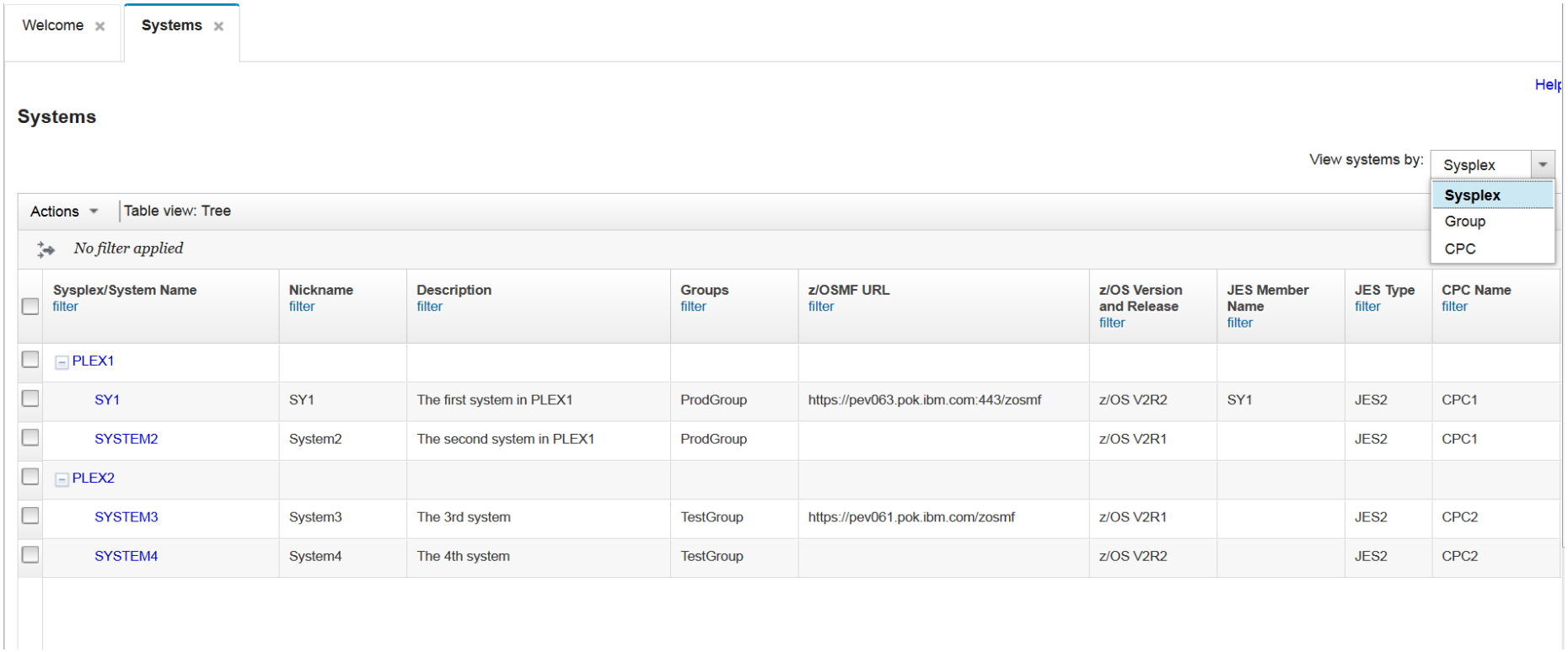


Multiple Sysplex support – Framework introduction

- The common framework supports managing multiple sysplex includes:
  - z/OSMF Systems task is improved to be able to manage the topology information of systems, sysplex, CPC and group.
  - Supports graphic view of topology information and exporting the graphic view.
  - "Topology REST interface" is provided for working with topology information such as groups, sysplexes through REST API invocation.
  - z/OSMF navigation tree provides target chooser to enable opening a plugin on the scope of single sysplex, CPC or specific group which is defined by user and could contain any systems.
  - "Multisystem routing REST service" is provided for communicating with single remote system or group of remote systems.
  - Supports Single Sign On (SSO) avoids the need of logon each remote/secondary z/OSMF when managing them from primary z/OSMF.
  -
- Primary z/OSMF must be V2R2 or above. Functions in Blue are also available on V2R1, which makes V2R1 system is eligible as remote/secondary z/OSMF.

Multiple Sysplex support – z/OSMF Systems task (1/4)

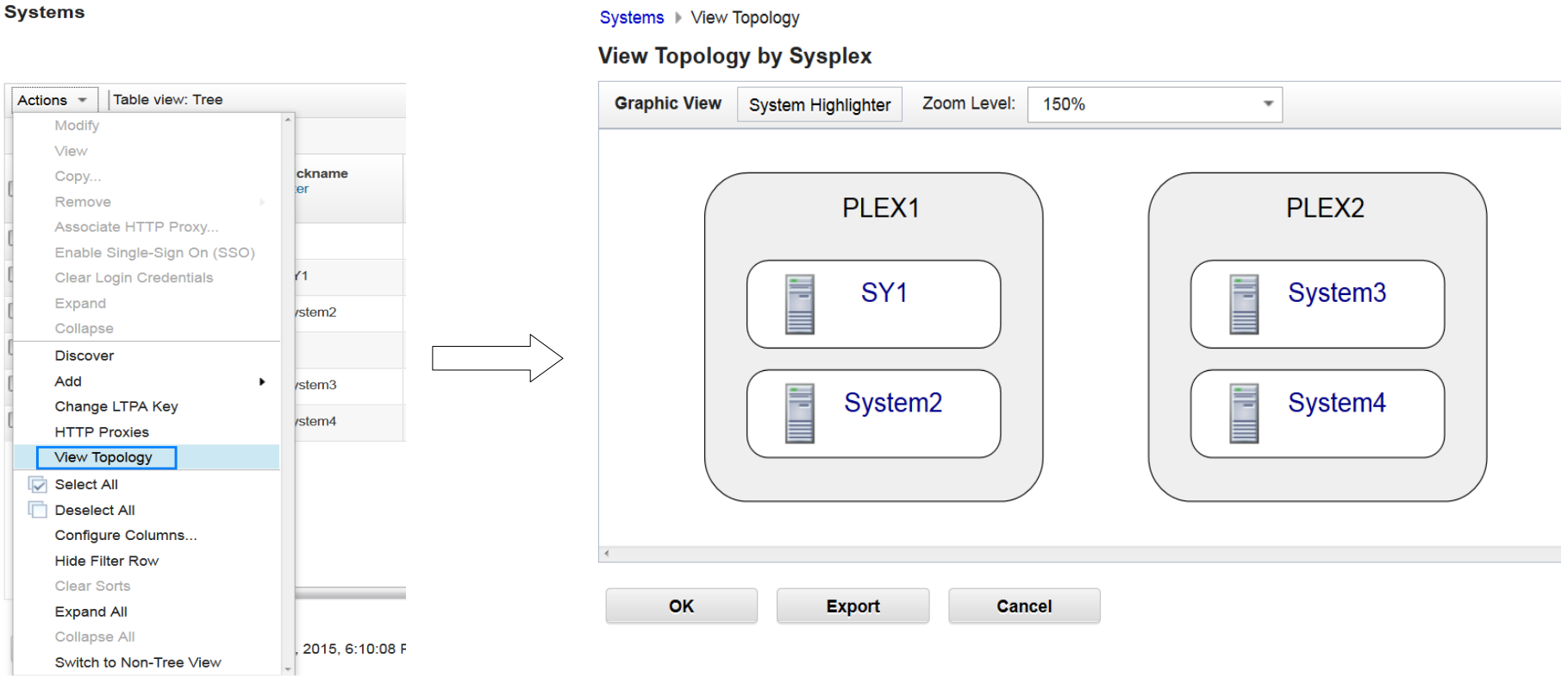
- View topology by sysplex



Sysplex/System Name filter	Nickname filter	Description filter	Groups filter	z/OSMF URL filter	z/OS Version and Release filter	JES Member Name filter	JES Type filter	CPC Name filter
PLEX1								
SY1	SY1	The first system in PLEX1	ProdGroup	https://pev063.pok.ibm.com:443/zosmf	z/OS V2R2	SY1	JES2	CPC1
SYSTEM2	System2	The second system in PLEX1	ProdGroup		z/OS V2R1		JES2	CPC1
PLEX2								
SYSTEM3	System3	The 3rd system	TestGroup	https://pev061.pok.ibm.com/zosmf	z/OS V2R1		JES2	CPC2
SYSTEM4	System4	The 4th system	TestGroup		z/OS V2R2		JES2	CPC2

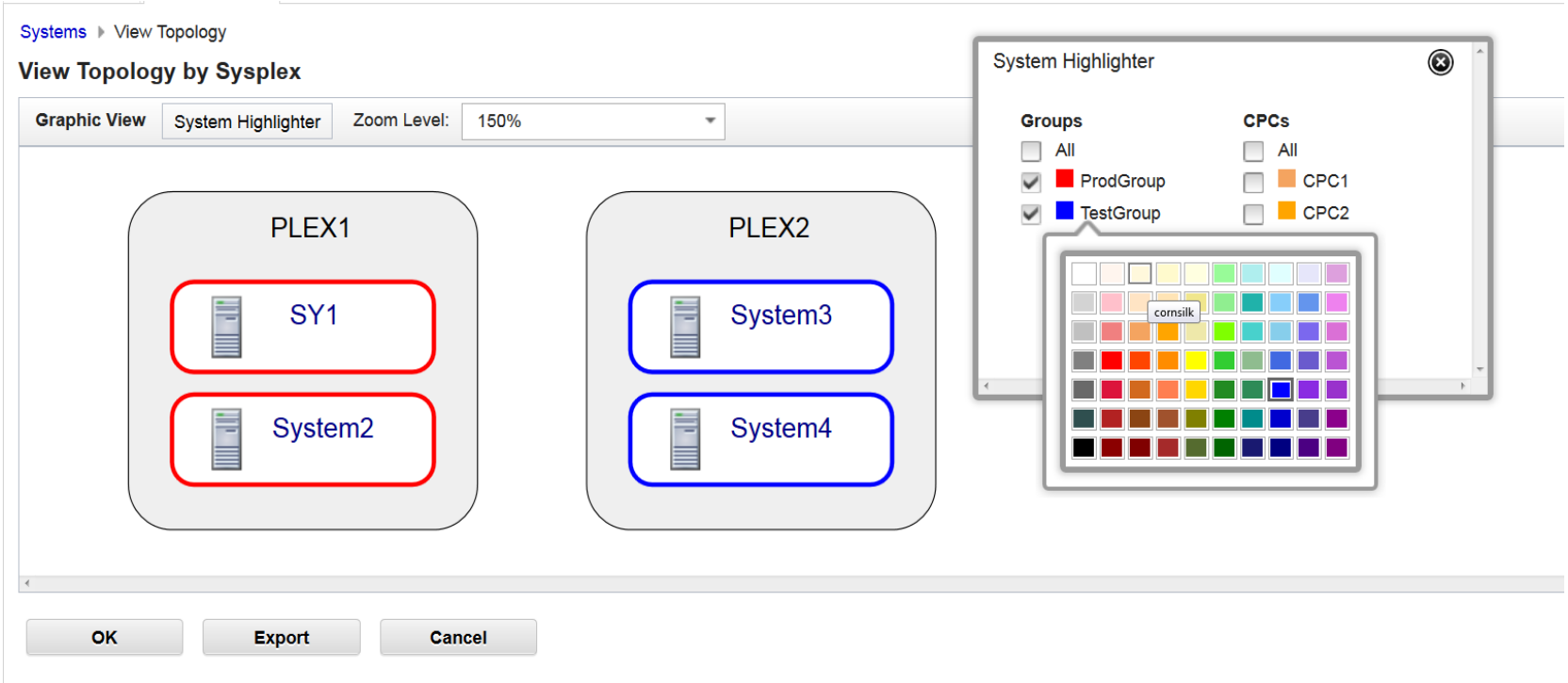
Multiple Sysplex support – z/OSMF Systems task (2/4)

- Graphic view support (Take sysplex view for instance)



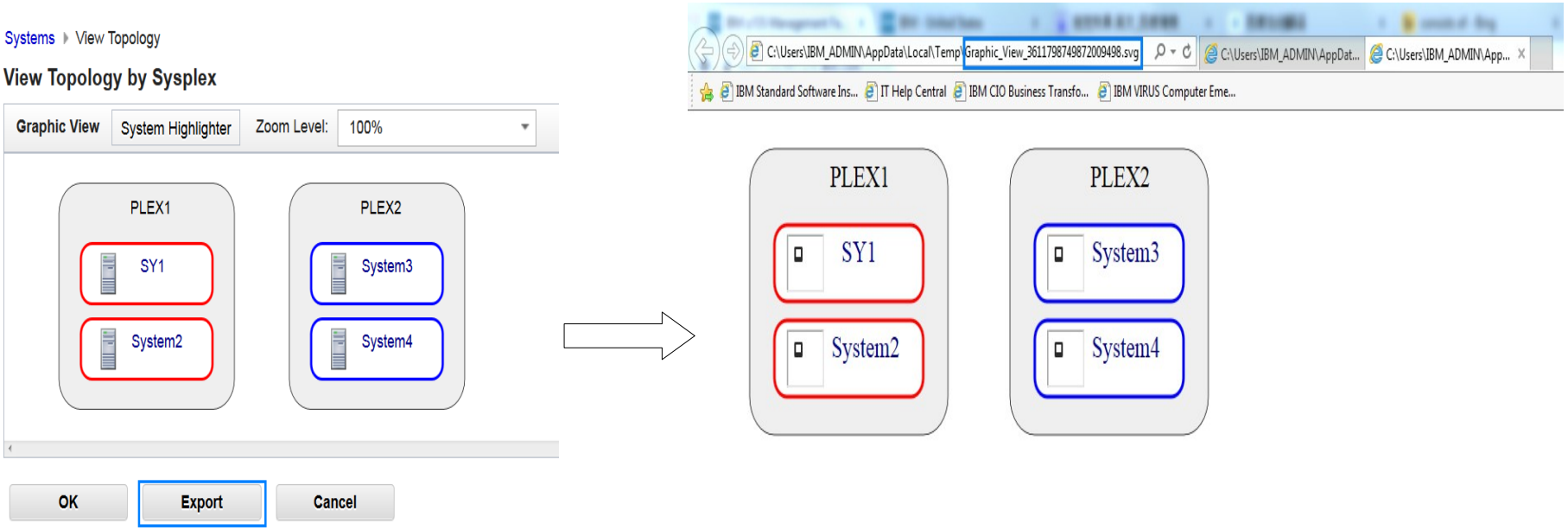
Multiple Sysplex support – z/OSMF Systems task (3/4)

- Graphic view support (More customization of visual effects)



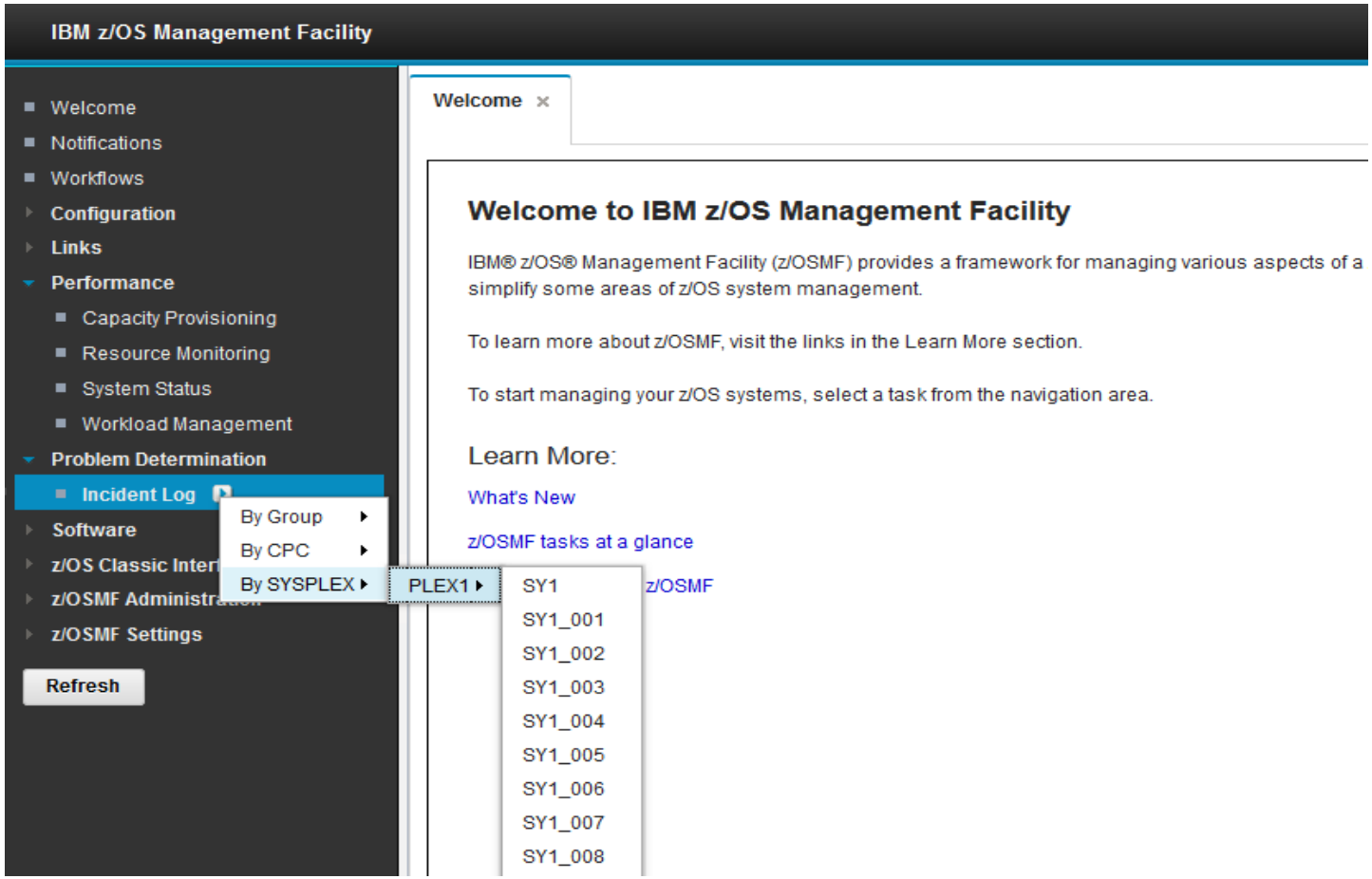
Multiple Sysplex support – z/OSMF Systems task (4/4)

- Graphic view support (Supports export)



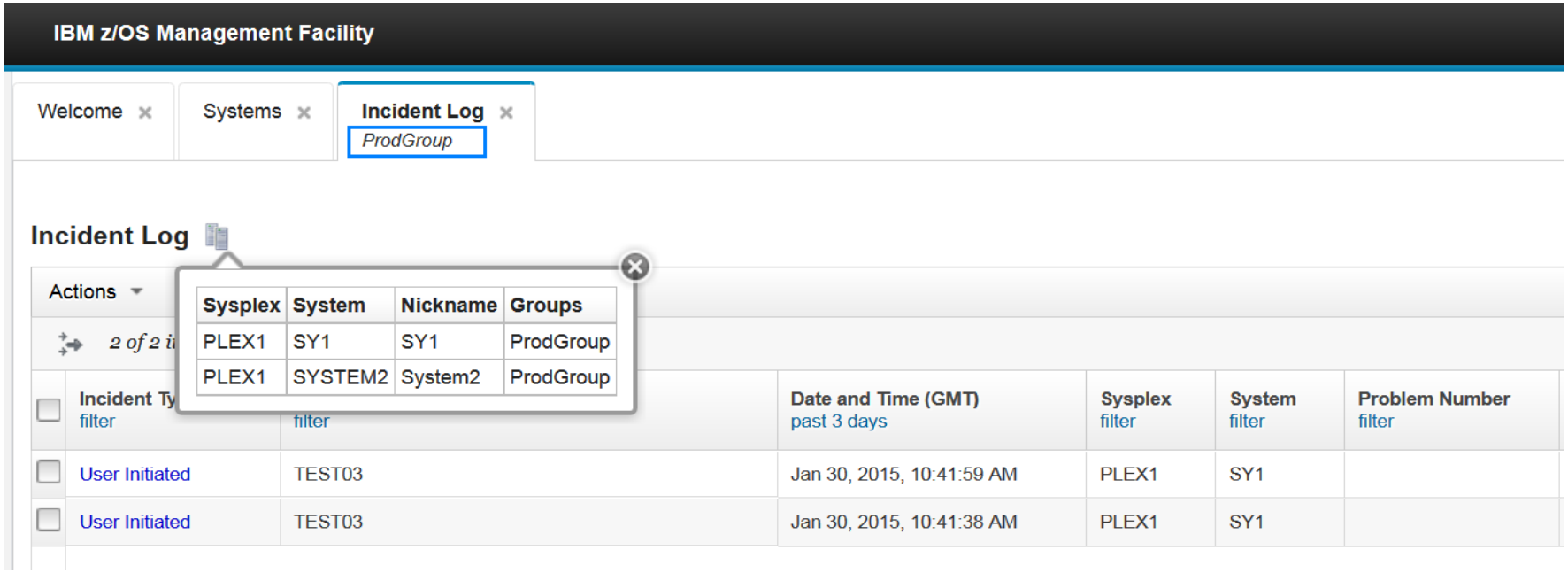
Multiple Sysplex support – Target chooser (1/2)

- Target chooser is used to select the scope on which plugin is opened



Multiple Sysplex support – Target chooser (2/2)

- Plugin is opened on the chosen scope



Multiple Sysplex support – Supports SSO

- Procedure for enabling SSO environment:
  - Ensure secondary z/OSMF resides in the same LTPA domain with the primary z/OSMF
  - The user id to be used to manage multiple systems should exist and be the same in SAF user registries in all systems to be managed.
  - Use one common CA certificate or sharing CA certificates between z/OSMF instances to be managed.
  - Ensure secondary z/OSMF has the same LTPA key file with the primary z/OSMF. This could be done by “Enable Single-Sign On (SSO)” menu in the “Actions” menu of “z/OSMF Systems” table. The “Enable Single-Sign On (SSO)” menu shares LTPA key file on primary z/OSMF with target secondary z/OSMF. Restart z/OSMF is required to make the LTPA key file take effect on the secondary z/OSMF.

Multiple Sysplex support – Multisystem routing REST service

- Multisystem routing REST service is provided for communicating with single system/group of systems via HTTP API invocation*.

Operation	HTTP Method
Retrieve data from one system, a list of systems or all the systems in a group	GET
Update data for one system, a list of systems or all the systems in a group	POST or PUT
Delete data from one system, a list of systems or all the systems in a group	DELETE
Authenticate with a secondary z/OSMF instance	POST

- Please refer to Appendix *Examples of z/OSMF V2R2 REST services* for details.

* The target system requires running z/OSMF V2R1 or above

Multiple Sysplex support – Topology REST service

- Topology REST service is provided for working with topology information managed by z/OSMF via HTTP API invocation.

Operation	HTTP Method
List the system defined to z/OSMF	GET
List the groups defined to z/OSMF	GET
List the systems included in a group	GET
List the sysplexes defined to z/OSMF	GET
List the systems included in a sysplex	GET

- Please refer to Appendix *Examples of z/OSMF V2R2 REST services* for details.

Multiple Sysplex support – Summary

- z/OSMF V2R2 provides framework to support manage multiple sysplex from single user interface connected to primary z/OSMF.
- The framework consists of:
  - z/OSMF Systems task is used to manage the topology information of systems, sysplex, CPC and group.
  - Supports display and export graphic view of topology information
  - “Topology REST interface” and “Multisystem routing REST service” facilitate z/OSMF to manage multiple sysplex. They are also published to be used by ISV or external z/OSMF application.
  - Target chooser allows user to open a plugin on specified scope.
  - Supports Single Sign On (SSO)

Incident Log aggregation

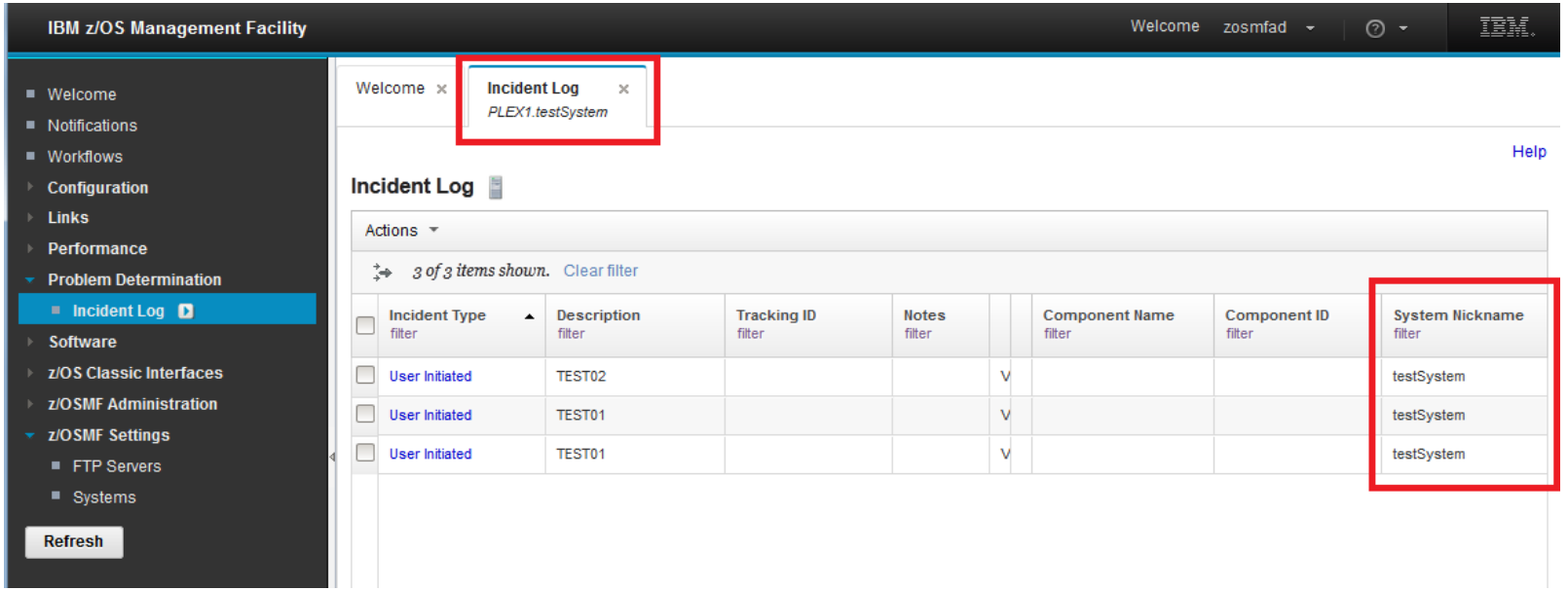
- Problem Statement / Need Addressed:

Incident Log plugin helps user to manage incidents, automatically capture diagnostic data of incidents and send the data to support center. Previously, Incident Log plugin is single sysplex scope which means user has to open multiple z/OSMF user sessions (multiple tabs in browser) to manage multiple sysplex in the same time.

- By exploiting “Multiple Sysplex support” framework of z/OSMF V2R2, Incident Log allows user to manage incidents from single or multiple sysplex in one user interface which is only connected to primary z/OSMF.
- Incident Log plugin now supports two modes in terms of the managed scope:
  - Basic-Proxy mode: Incident Log is opened on a single sysplex
  - Aggregation mode: Incident Log is opened on a group which contains multiple sysplex

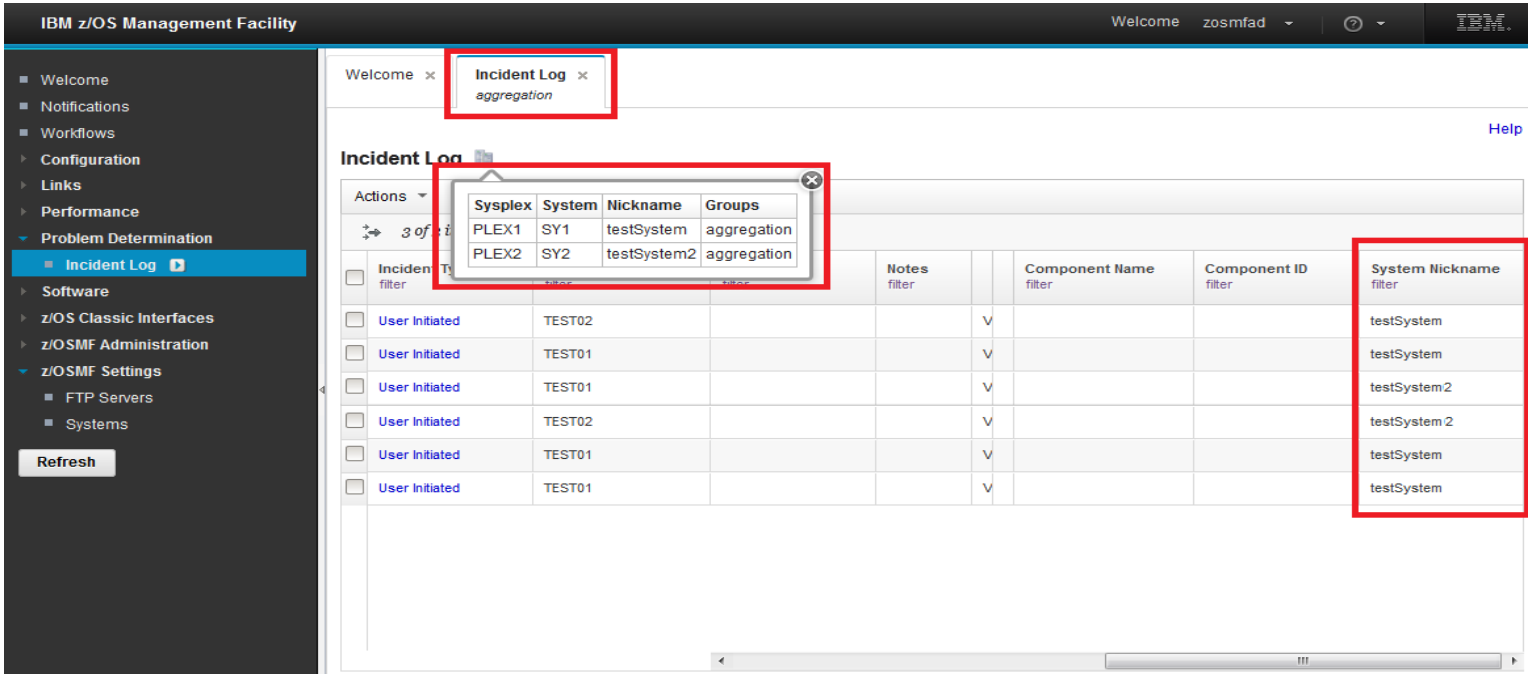
Incident Log aggregation

- Basic-Proxy mode:
  - Table settings (e.g. filter, sort, column configuration) is retrieved from the remote z/OSMF
  - Data (incidents) is retrieved from the remote sysplex.
  - Actions are routed to remote system (sysplex) for performing. The function of actions remain the same with V2R1.



Incident Log aggregation

- Aggregation mode:
  - Table settings (e.g. filter, sort, column configuration) is retrieved from the primary z/OSMF
  - Data (incidents) is consolidated from all the managed sysplex and managed from one single table.
  - Actions are routed to remote system(s) for performing. The function of actions remain the same with V2R1.



Workflows enhancements

- History of z/OSMF Workflows (1/3):
  - z/OSMF Workflows is a z/OSMF plugin which was introduced in V2R1
  - z/OSMF Workflows provides a framework supports user (Workflow provider) to define a guided flow (a.k.a. workflow) through steps to accomplish a task.
  - Step is the basic unit of workflow
    - Steps may instruct the user to perform a task via documentation or invoke wizards that guide the user through performing the task. Wizards can update and submit jobs, execute shell scripts and run REXX EXECs
    - Steps may define dependencies on other steps
    - Steps may be assigned to an individual or a specific role
    - Steps may be performed manually or automatically

Workflows enhancements

- History of z/OSMF Workflows (2/3):

User Scenario (Product Configuration)

- The system programmer installs a product's code that provides a z/OSMF Workflow for its configuration.
- The person that will configure the product logs on to z/OSMF and creates a new workflow from file provided by the product.
  - z/OSMF Workflows prompts the user to provide the location
  - z/OSMF reads in the metadata file(s).
  - This will create a workflow instance. That person becomes the workflow owner
- The owner can then start by opening the workflow instance and assign steps to either individual users or roles
- Assignees will then get notified that steps are assigned to them
- Each assignee then accepts the steps and can perform the steps when they are ready.
- Everyone can track the progress of the workflow and view what steps have been completed, what steps are ready, and what steps are waiting

Workflows enhancements

- History of z/OSMF Workflows (3/3):

The z/OSMF Workflows application is useful to:

- Assist people unfamiliar with how to perform a given task, or a task that they perform rarely.
- Ensure that all tasks are performed in the right order and only when their dependencies have been met.
- Ensure that all steps are completed even if many of the tasks have been delegated to a number of different colleagues
- Monitor and track progress toward the completion of the task
- Provide a history (audit trail) of the steps performed for a task.
- Easy to perform the same tasks on multiple systems

Workflows enhancements

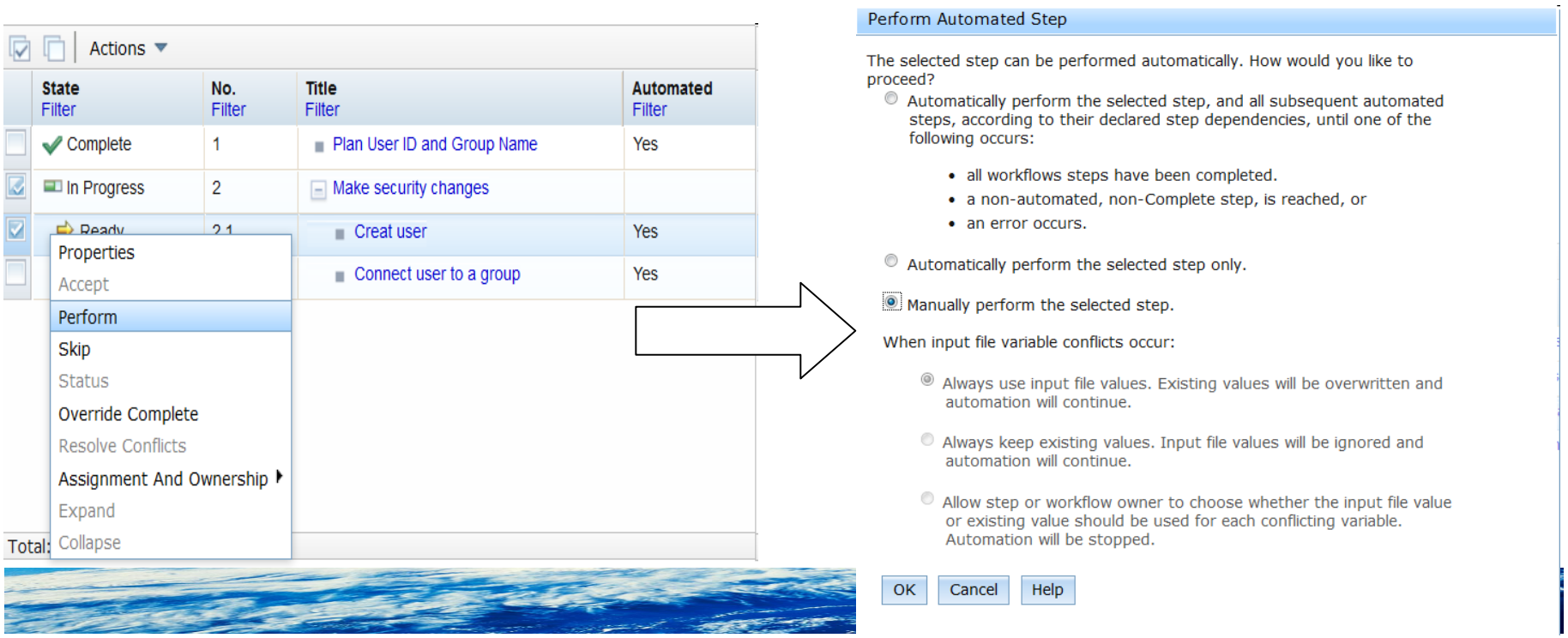
- Problem Statement / Need Addressed:
  - Along with more exploitation (zEDC, z/OS Migration workflow, Communication Server, etc.), more requirements are received about z/OSMF Workflows application
- z/OSMF V2R2 implements a lot of enhancements about z/OSMF Workflows application:
  - Variable input file is enabled to populate the new workflow.
  - Supports automatically perform workflow
  - Step could set value to variables referenced by subsequent steps.
  - State of step could be dynamically changed according to run-time result of various conditions. The condition could consist of expression contains variable value, step return code/state, etc.
  - Workflow could reference other workflow which provides more flexibility.
  - Job statement could be customized in the scope of global, system, workflow instance and workflow step.
  - REST service is provided for working with workflows through programmatic way (REST API invocation) instead of having to logon to z/OSMF UI.
- Enhancements in blue are also available on z/OSMF V2R1.
  -

Workflows enhancements – Workflow automation (1/2)

- User scenario

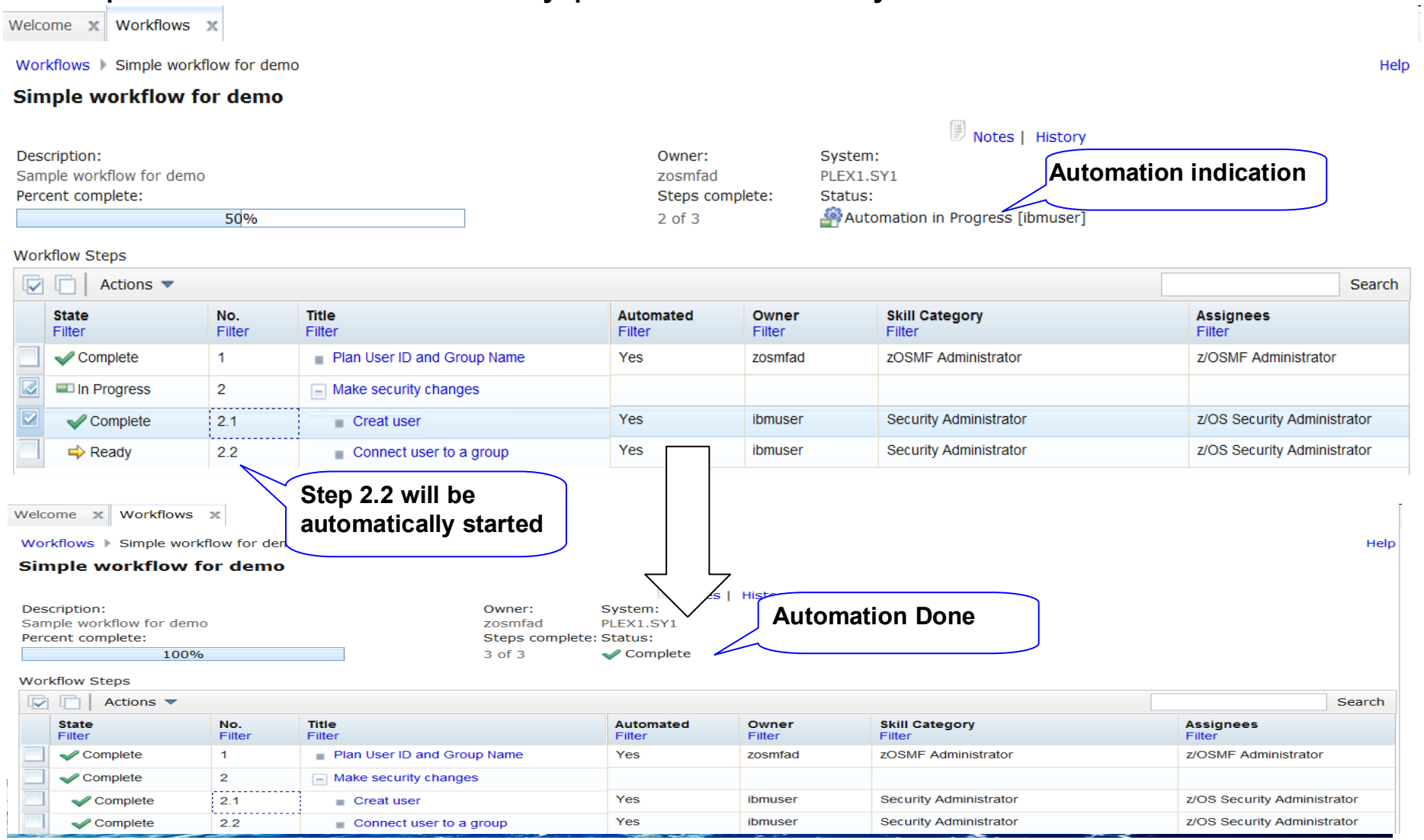
Steps of workflow could be automatically performed without the need of interaction.

- Implementation
  - "autoEnable" tag is defined in Workflow schema to indicate whether the corresponding step is eligible for automatic perform.
  - Step with true value of "autoEnable" attribute has 3 options for perform:



Workflows enhancements – Workflow automation (2/2)

- Steps could be automatically performed one by one



Workflows enhancements – Conditional step (1/2)

- User scenario

Step state could be dynamically changed according to execution of former steps.

- Step supports “condition” attribute which defines:
  - “expression” where contains the condition
  - “description” where describes the condition such as the intention of the condition
  - “targetState” where indicates the state of current step when “expression” (condition) becomes true

```
<step name="condWithStepAttr">
    <title>A step attribute conditional step</title>
    <description>In this step, step attributes are used in the condition expression.</description>
    <prereqStep name="submitEmptyJCL" />
    <condition>
        <expression><![CDATA[ ${submitEmptyJCL.returnCode} == "0000" ||
        ${variableStep.stepState} == "Skipped" ]]></expression>
        <description>This step state will become "Skipped" when:<br/>
            o - The return code of step "submitEmptyJCL" equals to "0000"<br/>
            o - OR The stepState of step "variableStep" equals to "Skipped";
        </description>
        <targetState>Skipped</targetState>
    </condition>
    <instructions>
        In this sample step, step attributes such as "returnCode" and "stepState" are used in the expression of a
        conditional step.
```

Workflows enhancements – Conditional step (2/2)

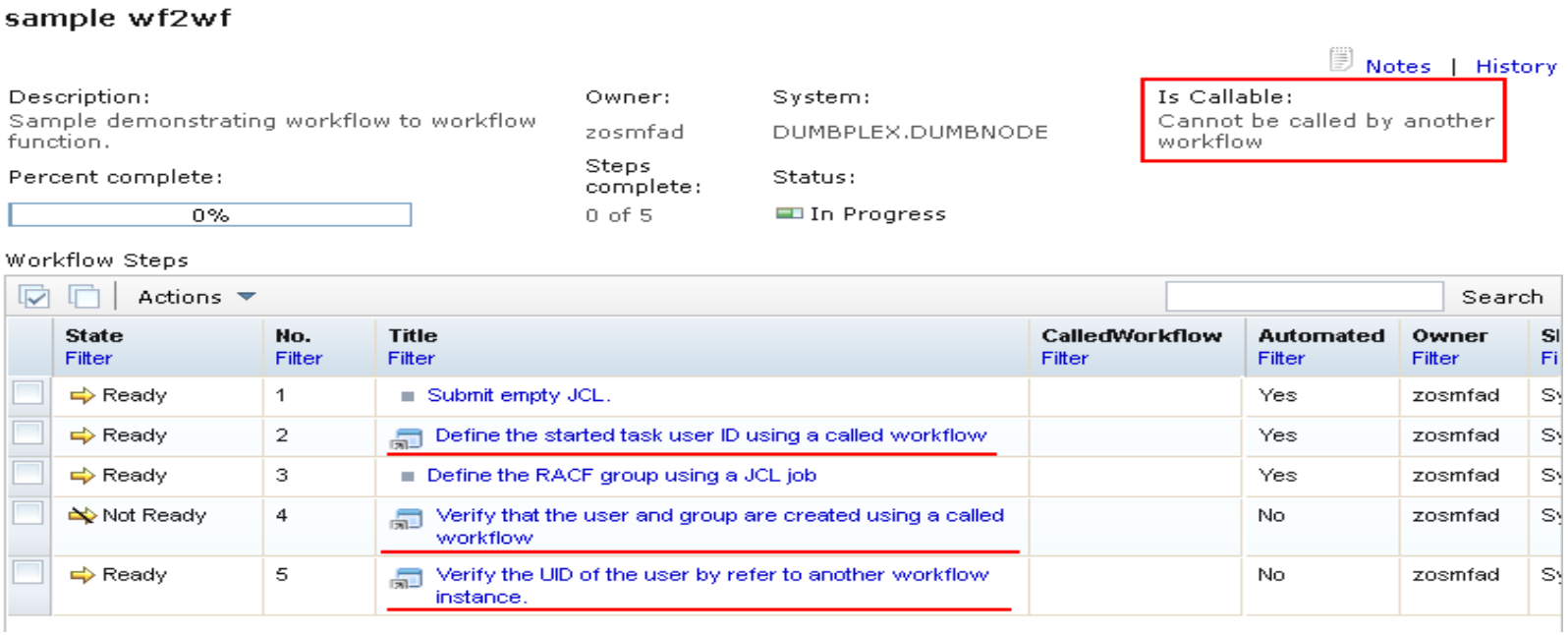
- "expression" could reference variables including:
  - Step attribute such as return code of step or step state
  - Any variable defined in the workflow

  Result of "expression" will be calculated dynamically.

- "targetState" allows two possible values:
  - Skipped
  - Ready

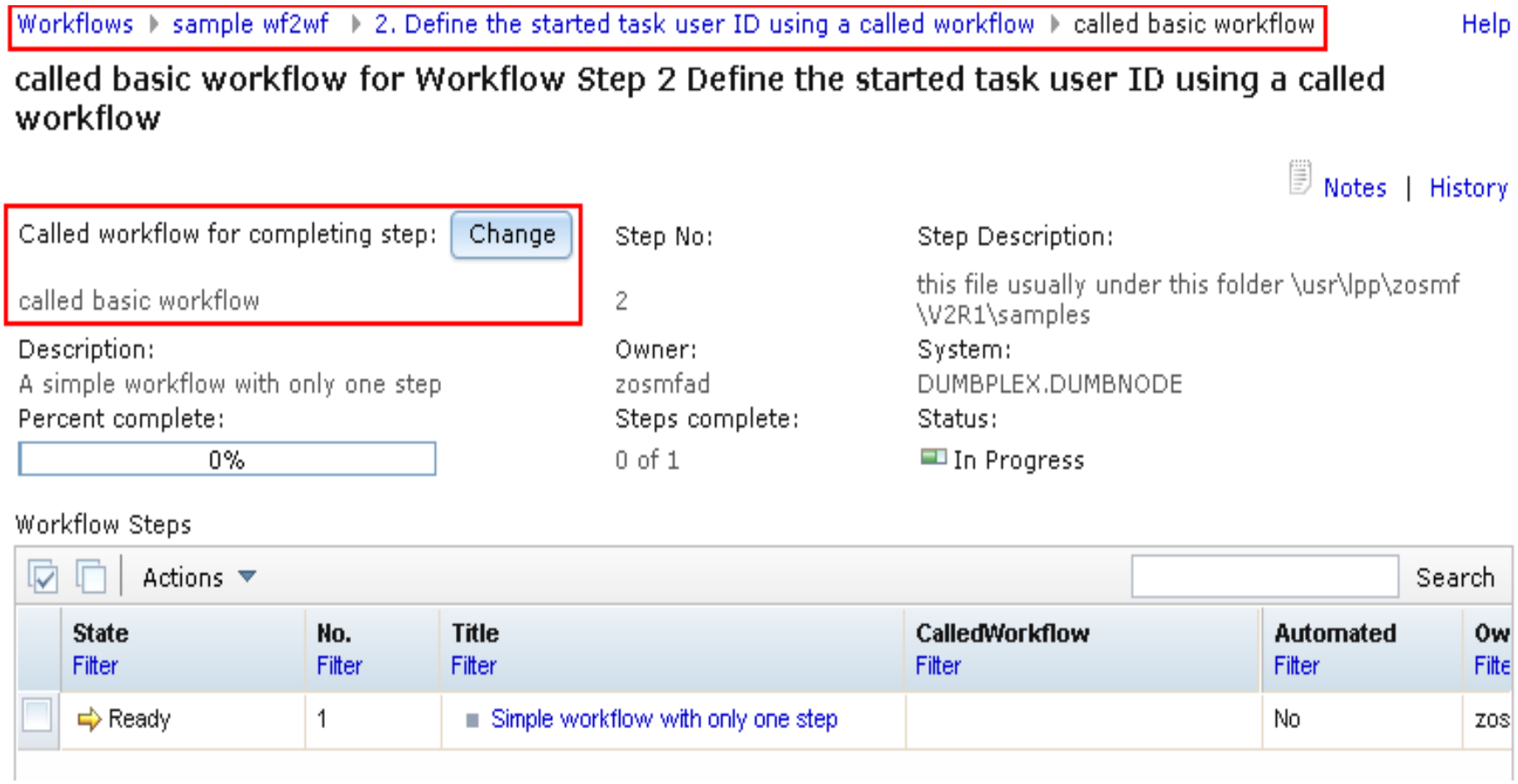
Workflows enhancements – Workflow to workflow execution (1/3)

- User scenario
  - Workflow provider can define some steps that refer to third-party workflow instances and allows more flexibility.
  - Common product configuration process could be configured once and then be reused as a referred step by other workflow instances
- Calling workflow (workflow contains steps refer to other workflow)



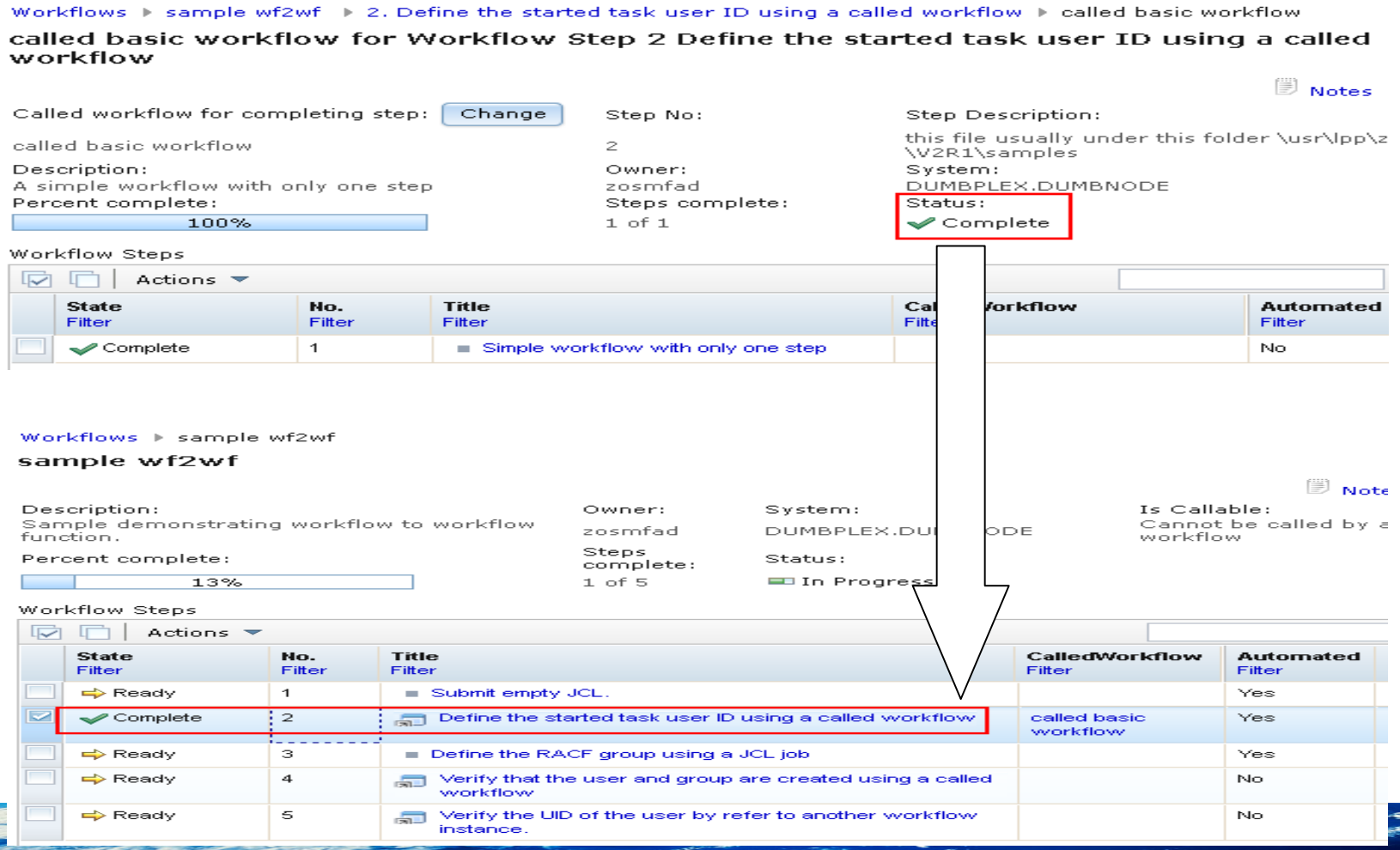
Workflows enhancements – Workflow to workflow execution (2/3)

- Perform the step which refer to other workflow



Workflows enhancements – Workflow to workflow execution (3/3)

- When the called workflow completes, the step which refer to the called workflow becomes completed.



Workflows enhancements – Workflow REST service

- User Scenario

Workflow REST service provides a programmatic way (HTTP API invocation) to work with z/OSMF Workflows application. Therefore, it facilitates automatically executing work flow remotely.

Operation	HTTP Method
Create a workflow	POST
Start a workflow	PUT
Retrieve workflow properties	GET
Lists workflows by search criteria	GET
Delete a workflow	DELETE
Cancel workflow	PUT
Retrieve workflow definition	GET

- Please refer to Appendix *Examples of z/OSMF V2R2 REST services* for details.

Workflows enhancements – Summary

- z/OSMF V2R2 introduces a lot of enhancements about z/OSMF Workflows application:
  - Variable input file is enabled to populate the new workflow .
  - Supports automatically perform workflow avoids the need of interaction.
  - Step could set value to variables referenced by subsequent steps.
  - Conditional step makes workflow more dynamic during execution.
  - Workflow to workflow execution provides more flexibility.
  - Job statement could be customized in various scope to provide more flexibility
  - REST service is provided for working with z/OSMF Workflows application programmatically. This enables remotely executing workflow.

Configure workflow

- Problem Statement / Need Addressed:

Since V2R1, it's recommended that user only installs z/OSMF Core at first. Then enable z/OSMF optional plugins on demand later.

Enable z/OSMF optional plugins includes below work:

- Customize z/OS for optional plugin to be enabled
- Execute z/OSMF configure script to enable target optional plugin

z/OSMF V2R2 exploits “z/OSMF Workflows” application by providing a workflow example (a.k.a. Configure workflow) intends to simplify the to process of enabling z/OSMF optional plugins. Traditional way of enabling optional plugin is still available for use.

- Benefits

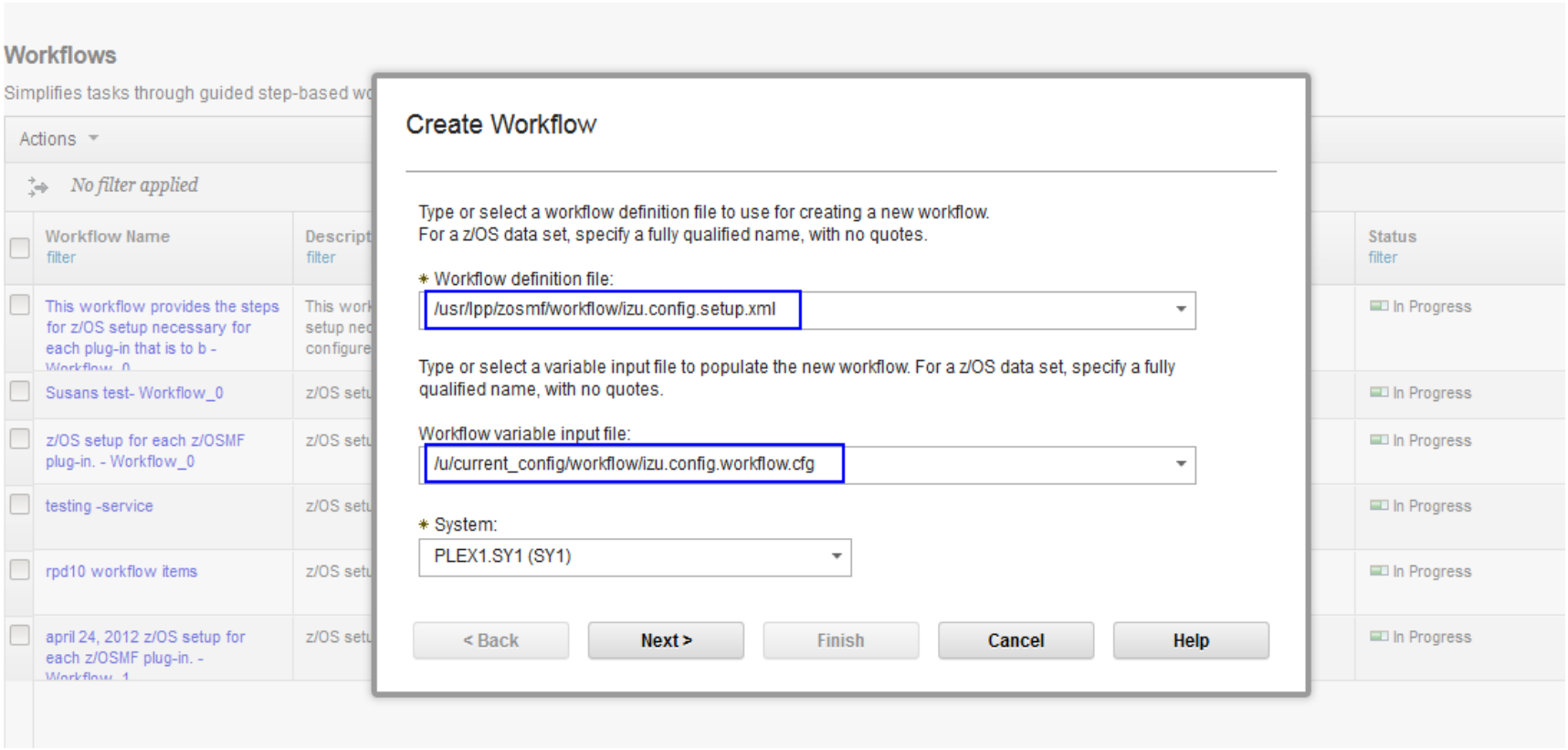
- Embedded scripts helps to discover current configuration and customize z/OS for user. User doesn't have to do these work in 3270 for most cases.
- Inherit advantages of z/OSMF Workflows:
  - Manage process in the concentrated place
  - Ensure correct order is followed
  - Conditional steps customize the process according to user's current configuration and input.

Configure workflow

- Process of using “Configure workflow” to enable optional plugin:
  - Create workflow instance for “Configure workflow”
    - Use “z/OSMF Workflows” plugin to create workflow instance of “Configure workflow”: The path of workflow definition file is “<z/OSMF installed path>/workflow/izu.config.setup.xml”. <z/OSMF installed path> is “/usr/lpp/zosmf” for V2R2 by default. Please also specify the path of “Workflow variable input file” as “<z/OSMF configure directory>/workflow/izu.config.workflow.cfg” when creating workflow. <z/OSMF configure directory> is “/etc/zosmf” by default.
  - Be familiar with the workflow
  - Assign steps to corresponding person for execution
  - Discover current configuration
  - Choose which optional plugin(s) to be enabled
  - Customize z/OS for target plugin(s) with the help of:
    - Embedded scripts for discovery and customization
    - Conditional step for identifying which work is optional
  - Enable the target plugin(s)

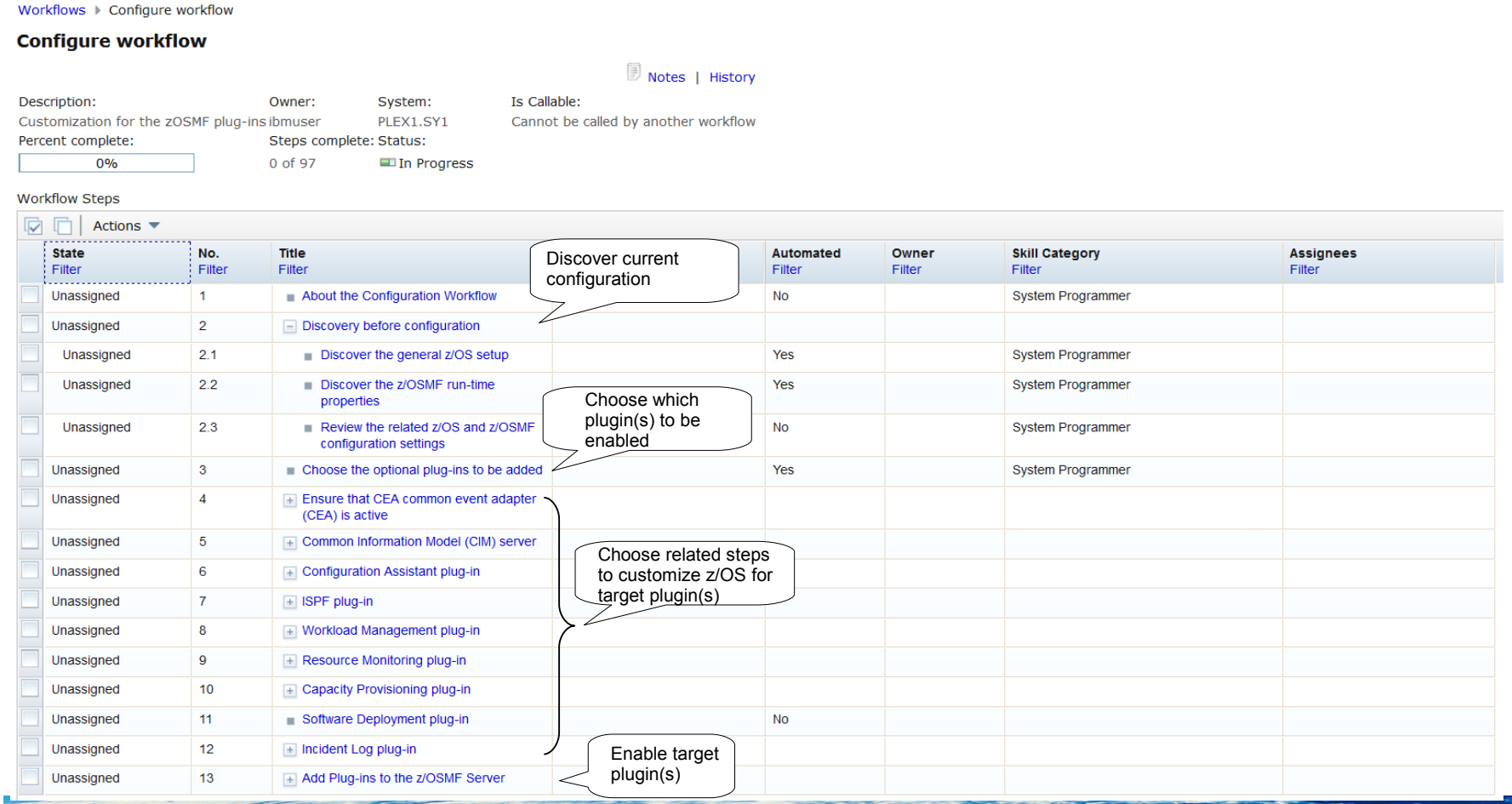
Configure workflow

- Create workflow instance for “Configure workflow”



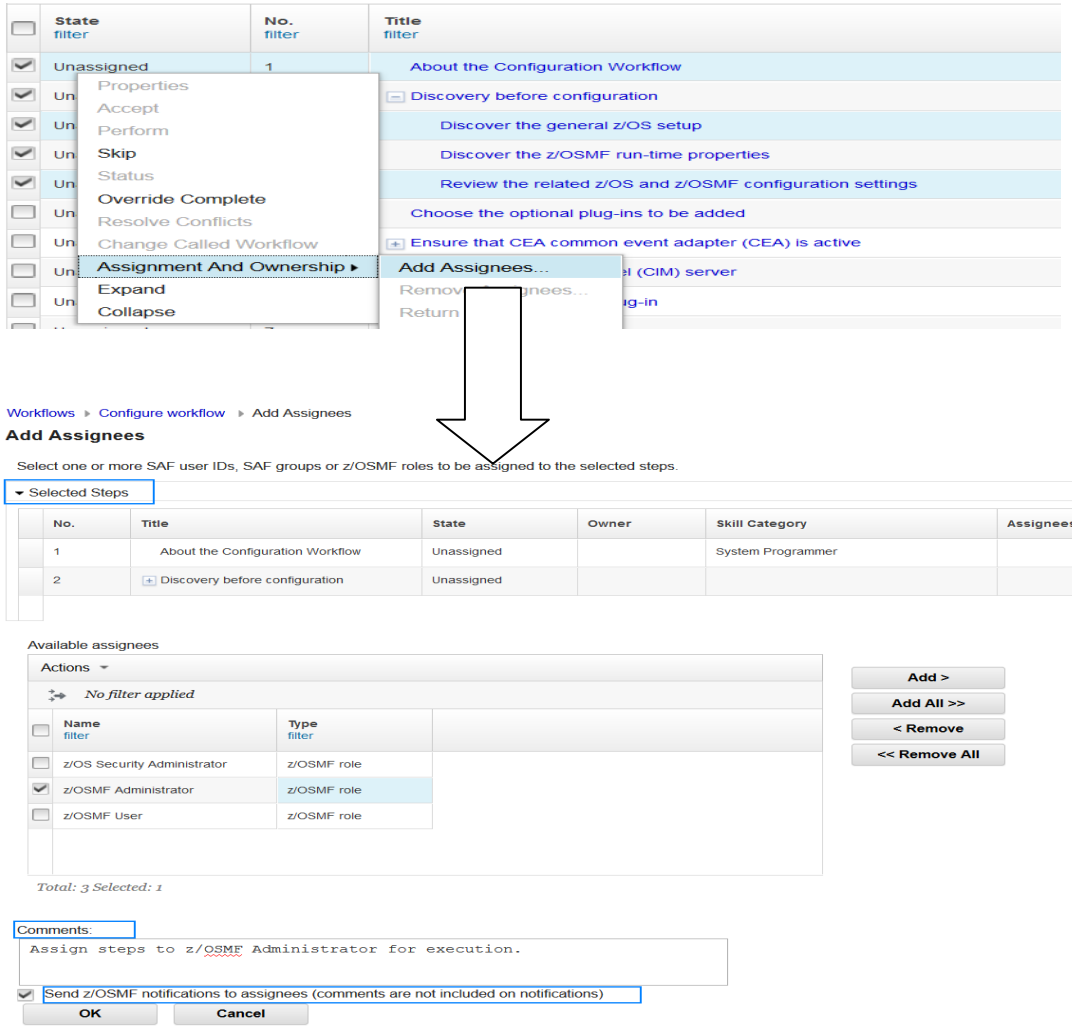
Configure workflow

- Be familiar with the workflow



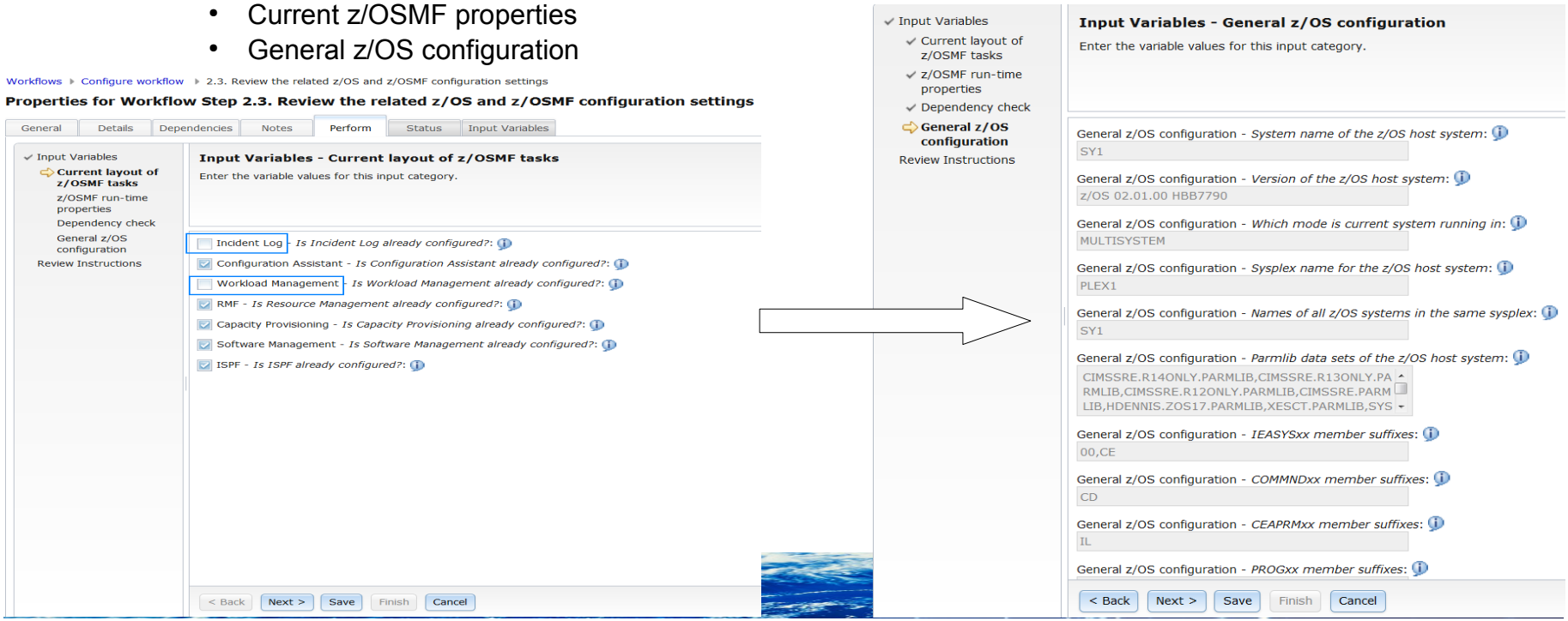
Configure workflow

- Assign steps to corresponding person for execution



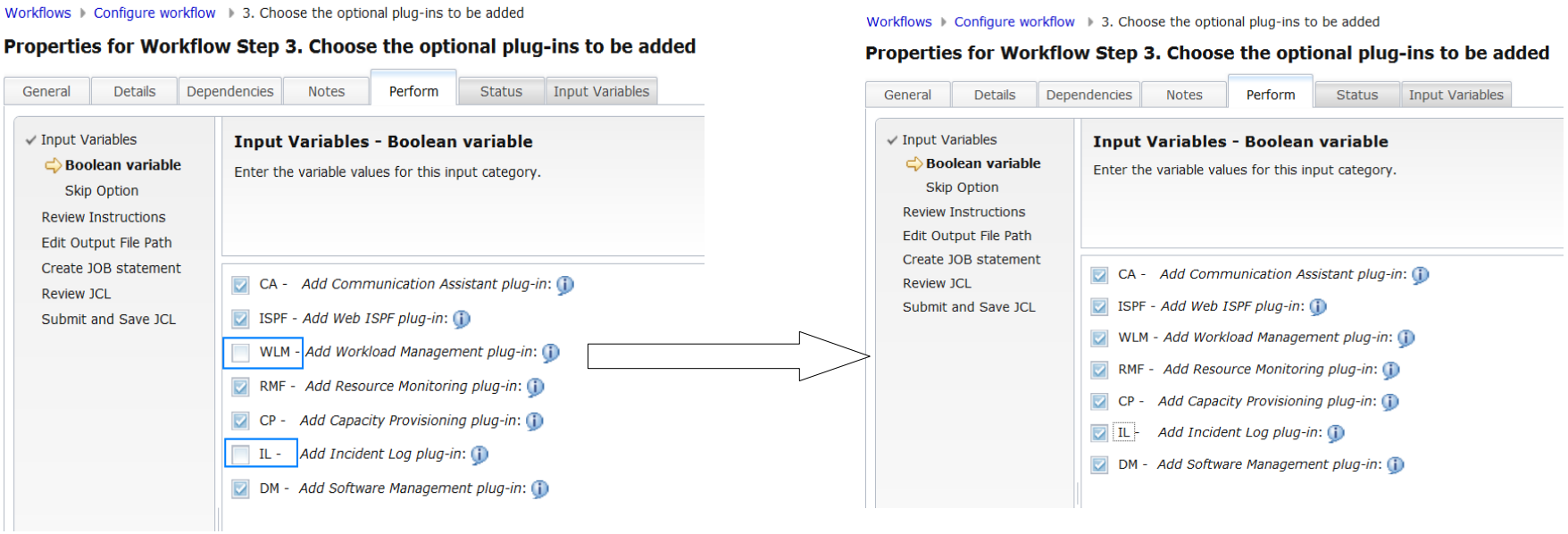
Configure workflow

- Discover current configuration
  - Perform step 2.1 to detect current configuration.
  - Embedded scripts of step 2.1 help doing discovery. User doesn't have to manually figure out these configuration in z/OS.
  - Step 2.1 and 2.2 could be automatically performed together.
  - Review discovered configuration by performing step 2.3. Step 2.3 tells:
    - Which optional plugins are installed or not
    - Current z/OSMF properties
    - General z/OS configuration



Configure workflow

- Choose which optional plugin(s) to be enabled
  - Check “WLM” and “IL” in our example which means enable “Workload Management” and “Incident Log” plugin.



Configure workflow

- Exploits “Conditional step” feature makes the logic more clear
  - “Configure workflow” automatically identifies which steps need to be executed and which could be “Skipped”.

State Filter	No. Filter	Title Filter
Complete	1	About the Configuration Workflow
Complete	2	Discovery before configuration
Complete	2.1	Discover the general z/OS setup
Complete	2.2	Discover the z/OSMF run-time properties
Complete	2.3	Review the related z/OS and z/OSMF configuration settings
Complete	3	Choose the optional plug-ins to be added
Skipped	4	Ensure that CEA common event adapter (CEA) is active
In Progress	5	Common Information Model (CIM) server
Skipped	6	Configuration Assistant plug-in
Skipped	7	ISPF plug-in
In Progress	8	Workload Management plug-in
Skipped	9	Resource Monitoring plug-in
Skipped	10	Capacity Provisioning plug-in
Skipped	11	Software Deployment plug-in
In Progress	12	Incident Log plug-in
In Progress	13	Add Plug-ins to the z/OSMF Server

Configure workflow

- Customize z/OS for target plugin(1/2)

In Progress	12	Incident Log plug-in
Complete (Override)	12.1	Ensure that the CIM server is configured
In Progress	12.2	Ensure log snapshots are configured properly
Complete	12.2.1	Discover the setup of the log shapshot
Complete	12.2.2	Determine whether log shapshot is already configured
Complete	12.2.3	Make decision before configuring
In Progress	12.2.4	Enabling log stream for diagnostic snapshots
Skipped	12.2.4.1	Ensure logger subsystem is active
In Progress	12.2.4.2	Ensure logger couple data sets are defined proferly
Ready	12.2.4.2.1	Evaluate size of Log Stream Record(LSR)
Not Ready	12.2.4.2.2	Define a couple data set for logger
Not Ready	12.2.4.2.3	Apply new couple data set
Not Ready	12.2.4.2.4	Ensure that COUPLEXX parmlib is configured properly

Step 12.2.1 detects current configuration about log snapshot and display them in step 12.2.2

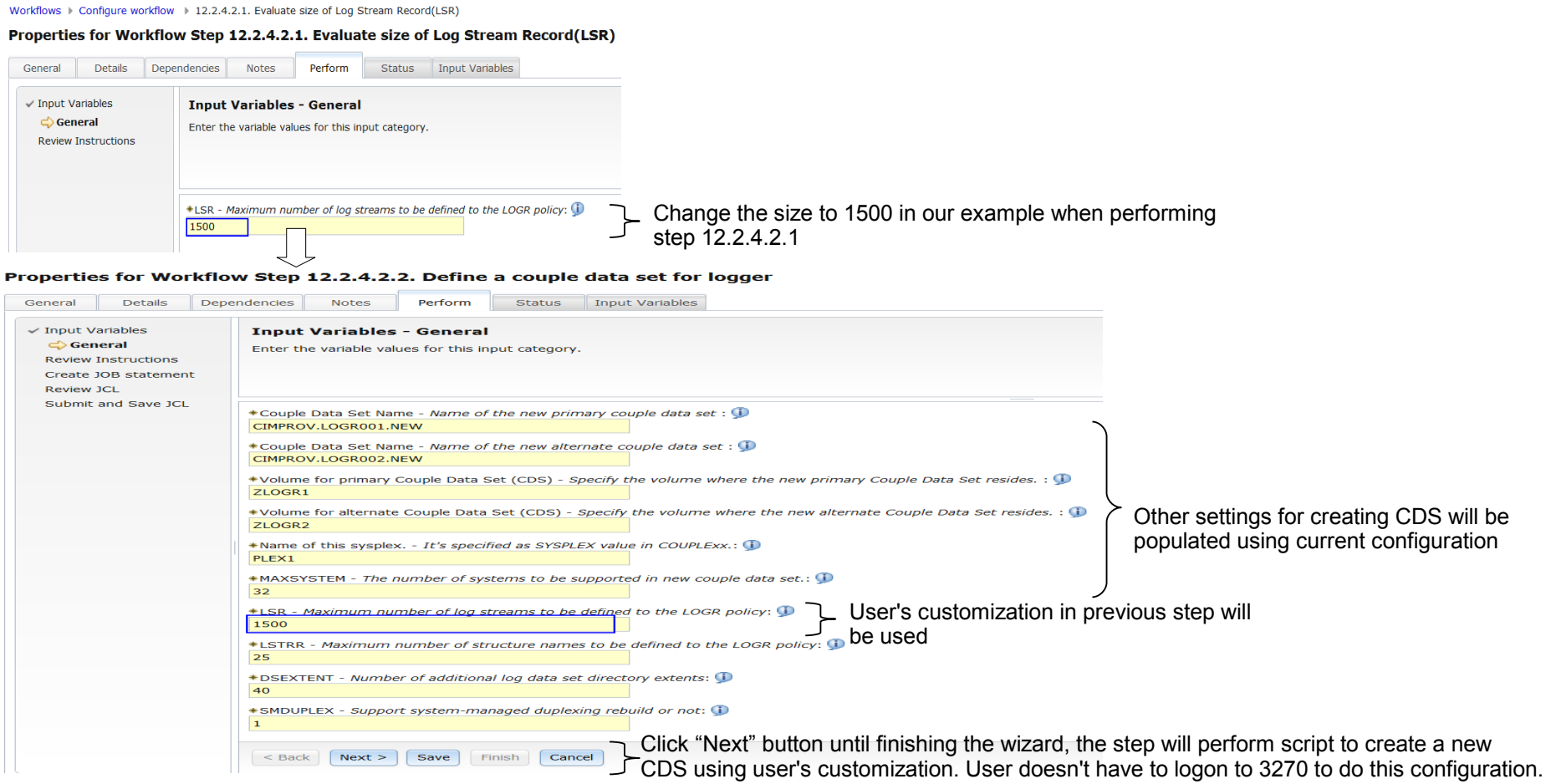
Step 12.2.3 asks user which scope of log snap shot to be enabled. Depends on user's choice, status of subsequent steps will be automatically updated to identify which work is not necessary to be done.

Step 12.2.4.1 is automatically marked as “Skipped” since System Logger is already active in this example.

Perform step 12.2.4.2.1 to evaluate if the size of log stream record is sufficient.

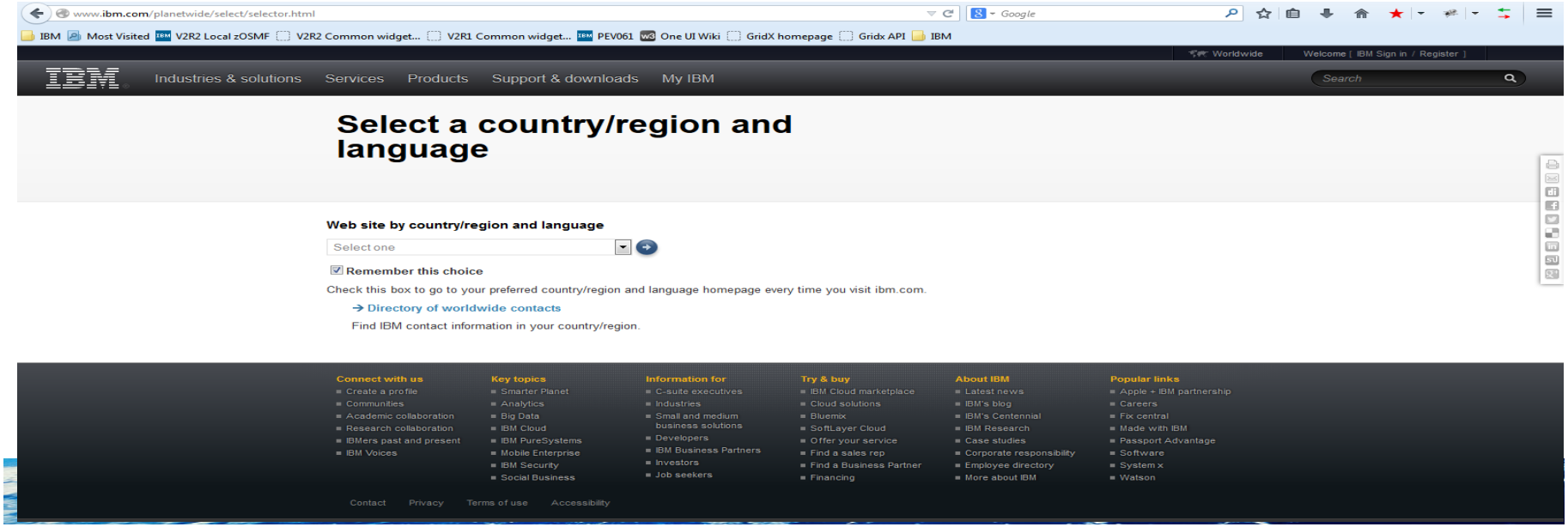
Configure workflow

- Customize z/OS for target plugin(2/2)



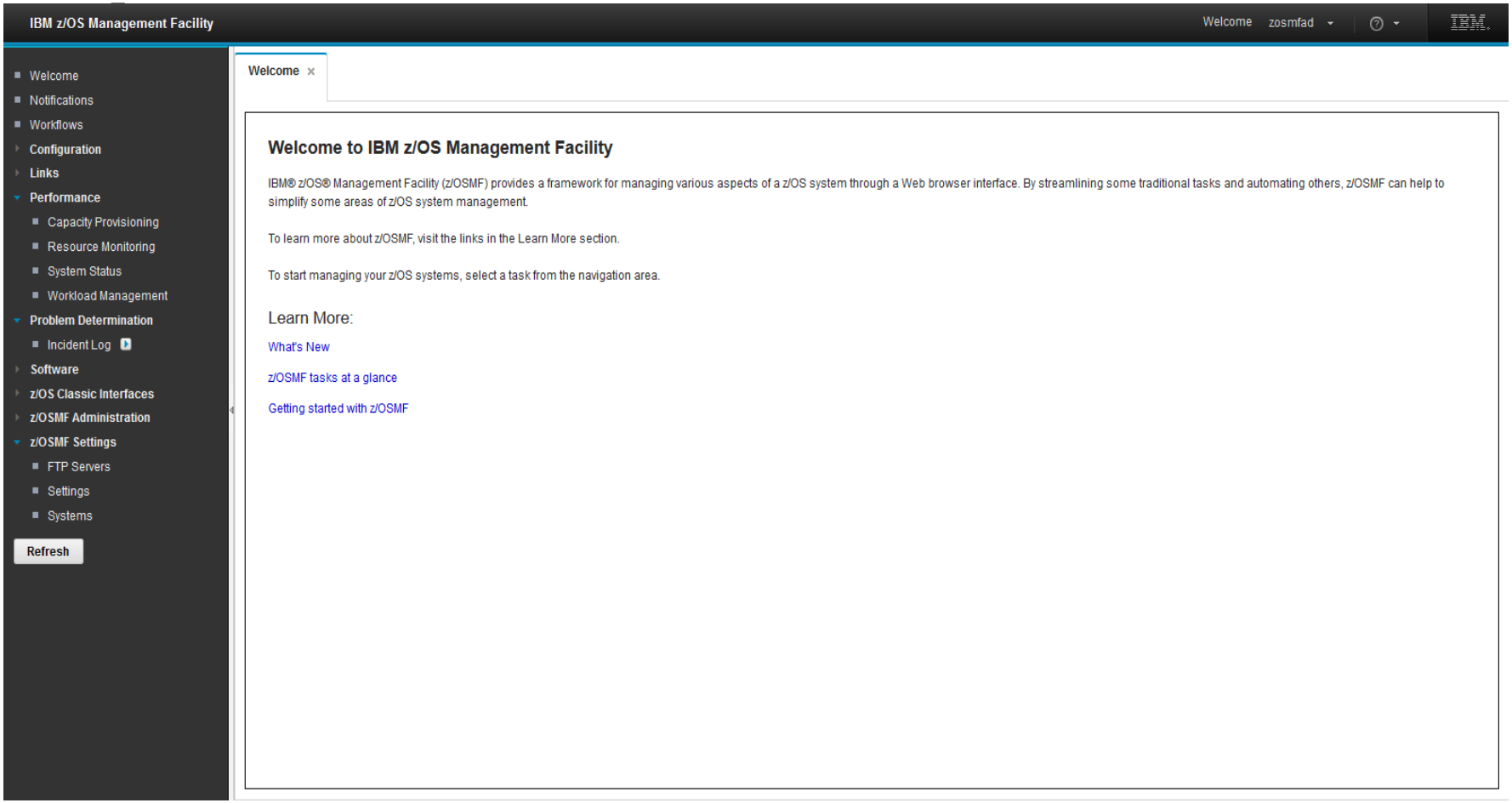
Compliance with One UI standard

- Problem Statement / Need Addressed:
  - IBM One UI standard intends to deliver great and consistent user experience to IBM customers. z/OSMF should also apply One UI standard to delivery unified user experience.
- z/OSMF V2R2 is compliant with One UI standard
  - UI style is changed to be compliant with One UI standard.
  - No impact to most functions
- www.ibm.com VS z/OSMF - www.ibm.com



Compliance with One UI standard

- www.ibm.com VS z/OSMF – z/OSMF welcome page



Compliance with One UI standard

- z/OSMF V2R2 is tested on below browsers and platforms

	Windows 7	Windows 8 Pro, Desktop
Internet Explorer 9	YES	No
Internet Explorer 10	YES	YES
Internet Explorer 11	YES	YES
Firefox ESR 31	YES	YES

External Application Support

- Problem Statement / Need Addressed:

Customers/Vendors could develop their own web application and deploy it into z/OSMF.

- External application support enables non-z/OSMF web application – html and/or JavaScript applications to render their UI and run in the z/OSMF browser.
- The external applications can be added to z/OSMF navigation in a category selected by the user, and communicate with associated z/OS back-end components.
- Customers and vendors can create their own web applications and register to z/OSMF at runtime.
  - SDSF is the first exploiter (available with V2R1 PTF UI15294)
- The “External Application support” solution is also available on z/OSMF V2R1.

External Application Support

- z/OSMF “External application support” solution provides a set of services to help 3rd party to easily develop and deploy their non-z/OSMF web application:
  - z/OS TSO/E address space REST service allows external application to communicate with their back-end TSO/E application. This facilitates reusing existing TSO/E application to serving web application.
  - Data persistence REST service helps external application to read/write their persistent data.
  - Import Manager plugin provides the GUI interface to import the property file of external application and register the external application in the z/OSMF navigation tree.

External Application Support – Process of external app registration

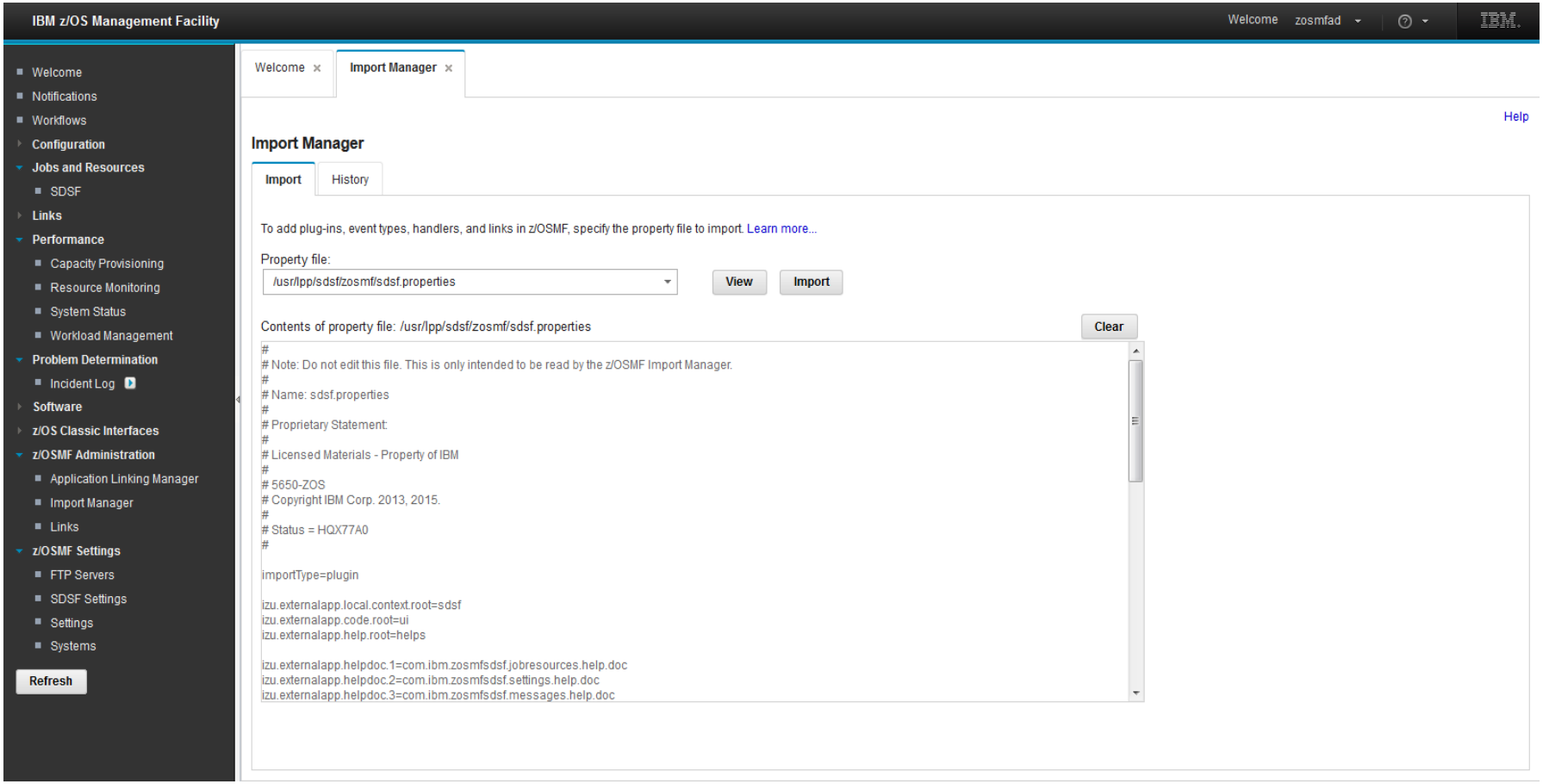
- Before adding a plug-in to z/OSMF, user should have one or more web applications ready, including the client side code and online help documentation in the z/OS UNIX file system.
- The z/OS application needs to provide a property file that describes the attributes for the web interface and defines all the required parameters for z/OSMF.
- The z/OSMF Administrator can register the web application by providing the path of the property file in the Import Manager.
- The Import Manager task will convert the parameters in property file into plug-in object and register the plug-in with tasks.

External Application Support – Import Manager (1/2)

- The Import Manager task provides the following functions:
  - Add external application to z/OSMF
  - Add application linking event types and handlers to z/OSMF.
  - Add links to z/OSMF
  - View the property file content before import.
  - View/Delete the import history records.
  - View the historical property file content of the import records.
  - Application linking from Links and Application Linking
  - Manager tasks to Import Manager

External Application Support – Import Manager (2/2)

- Using Import Manager task to import “z/OSMF SDSF UI application”

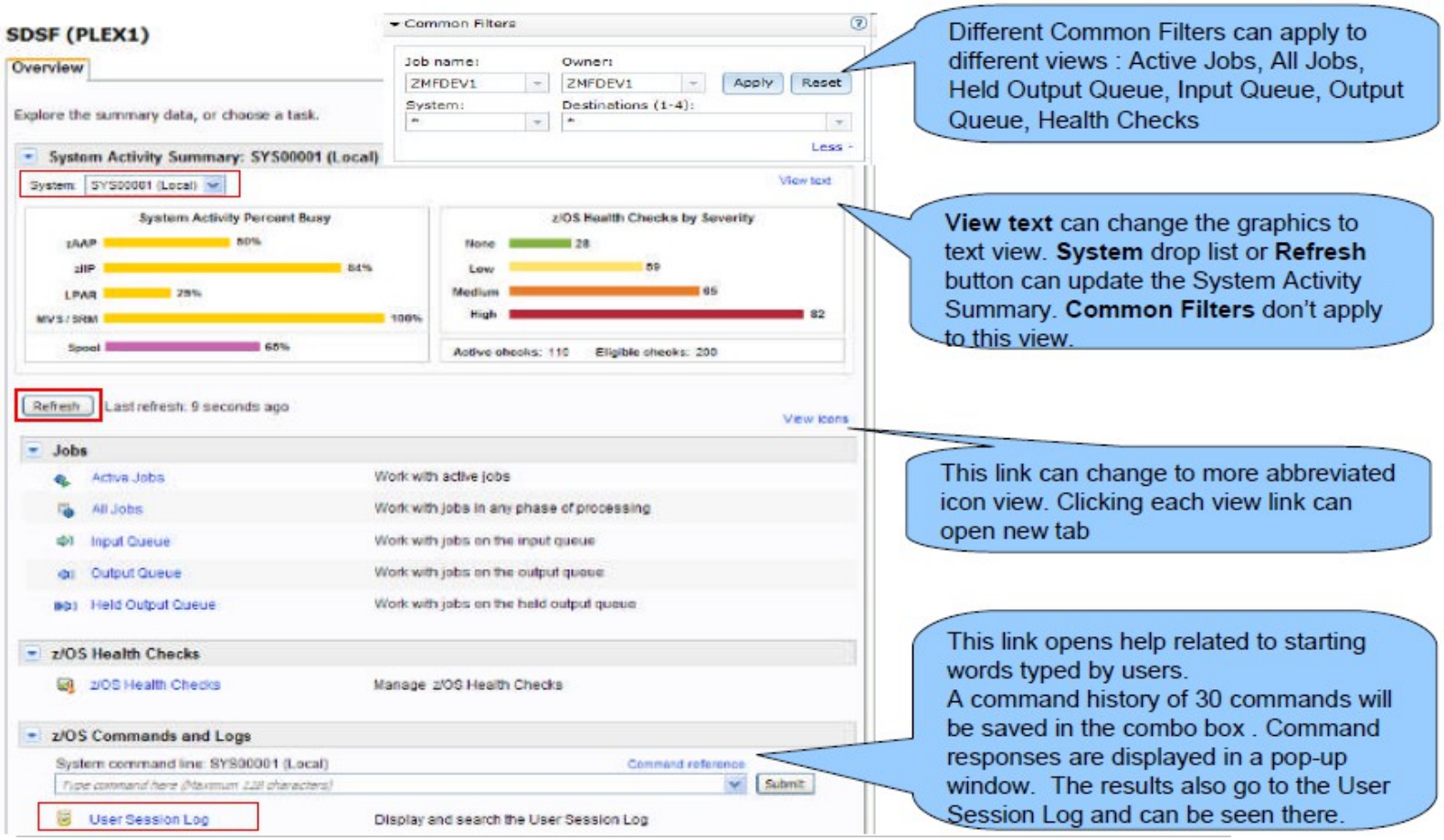


z/OSMF SDSF UI

- By exploiting z/OSMF “External application support” solution, SDSF product provides a web interface through a z/OSMF SDSF Plug-in
- z/OSMF SDSF Plugin can:
  - Show graphic/textual overview about Processors, Spool, Health Checker
  - Display a table of Job list in different status/queue. The property column, filters, sort can be customized, and the table can be exported and printed.
  - Enable users to select a Job, view detailed properties, and perform actions such as Cancel, Edit, Submit, etc.
  - Issue system command and display output.
  - Display the User Session Log. Users can search and take notes.
- z/OSMF SDSF Plugin is also available on V2R1

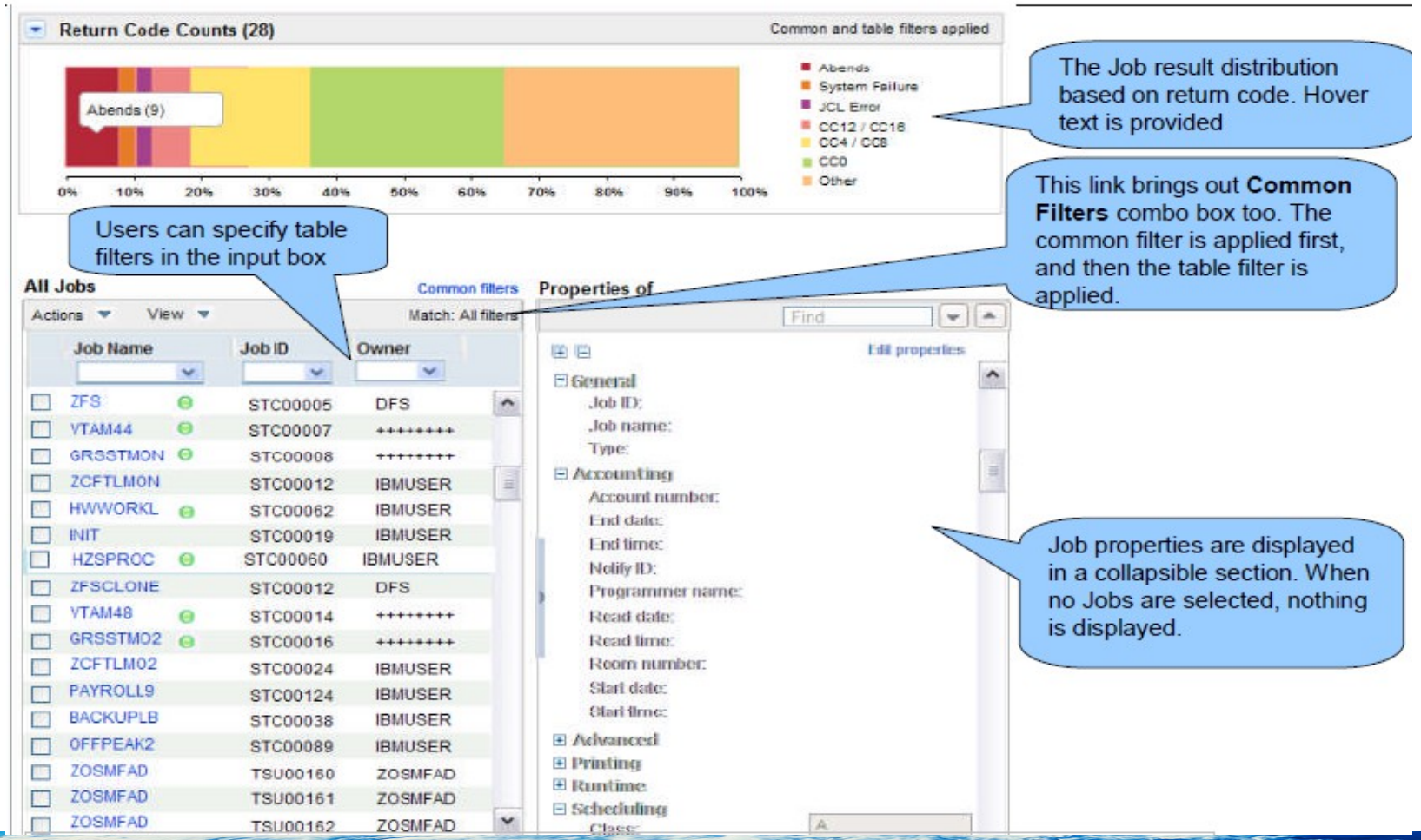
z/OSMF SDSF UI

- Home page of SDSF UI



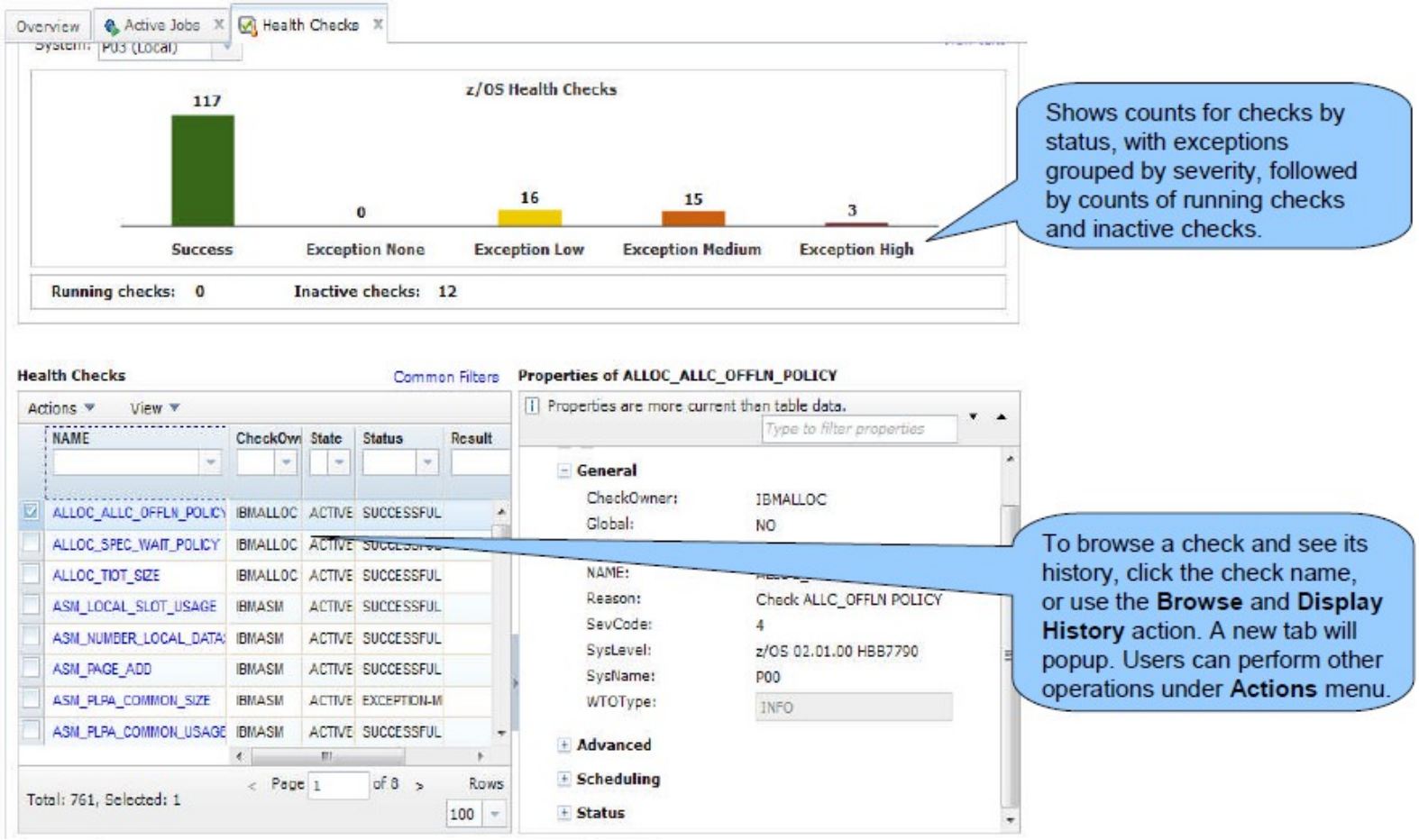
z/OSMF SDSF UI

- All Jobs view



z/OSMF SDSF UI

- z/OS Health Checks view



z/OS data set and file REST service

- Problem Statement / Need Addressed:

Most of z/OS is locked up in assembler interfaces where most application developers may only know C or Java APIs of a non-z/OS platforms. Today z/OS supports an interface via FTP to manipulate data set or unix file. Unfortunately it is considered by many to be insecure for use.

- z/OS data set and file REST service provides REST APIs (via HTTP) to manipulate data set and unix files
  - RESTful API is easy to call for application developers compare with Assembler interface. This makes z/OS resource more approachable. Application developer could focus on application logic.
  - Many platforms support REST invocation including Mobile platform like Android.
  - The communication is protected by industry standard HTTPS which is more secure than FTP.
- z/OS data set and file REST service is contained in z/OSMF Core. No need to install any optional plugin.
- z/OS data set and file REST service is also available on V2R1.

z/OS data set and file REST service – API list

- z/OS data set and file REST service includes:

Operation	HTTP Method
List the data sets on a z/OS system. You can filter the returned list of data set names through the specification of high-level qualifiers and wild cards. Data set attributes are also able to be retuned via setting specific HTTP header.	GET
List the members of a z/OS partitioned data set (PDS or PDSE). You can filter the returned list of member names through the specification of wildcards.	GET
List the files and directories in a UNIX file path on a z/OS system.	GET
Retrieve the contents of a sequential data set, or a member of a PDS or PDSE.	GET
Retrieve the contents of a z/OS UNIX file.	GET
Write data to a sequential data set or a member of a PDS or PDSE.	PUT
Write data to a z/OS UNIX file.	PUT

z/OS data set and file REST service – API example

- Example for listing data set names with specific qualifier (1/2)
  - API definition
    - Protocol: Hypertext Transfer Protocol Secure (HTTPS)
    - HTTP method: GET
    - Request format(s):
      *https://host[:port]/zosmf/restfiles/ds/?**dslevel**=<dataset_name_pattern>*
    - Input: NONE
    - HTTP version: HTTP/1.0 or HTTP/1.1
    - Headers: NONE
  -
  - Usage of parameter “dslevel”
    Indicates the criteria for data sets are being queried. Wildcard characters '*' (multiple characters) and '%' (single character) can be used. (If you want the single character wild card, you must pass %25 instead of a % sign. For URIs, the % sign is an escape character.)

z/OS data set and file REST service – API example

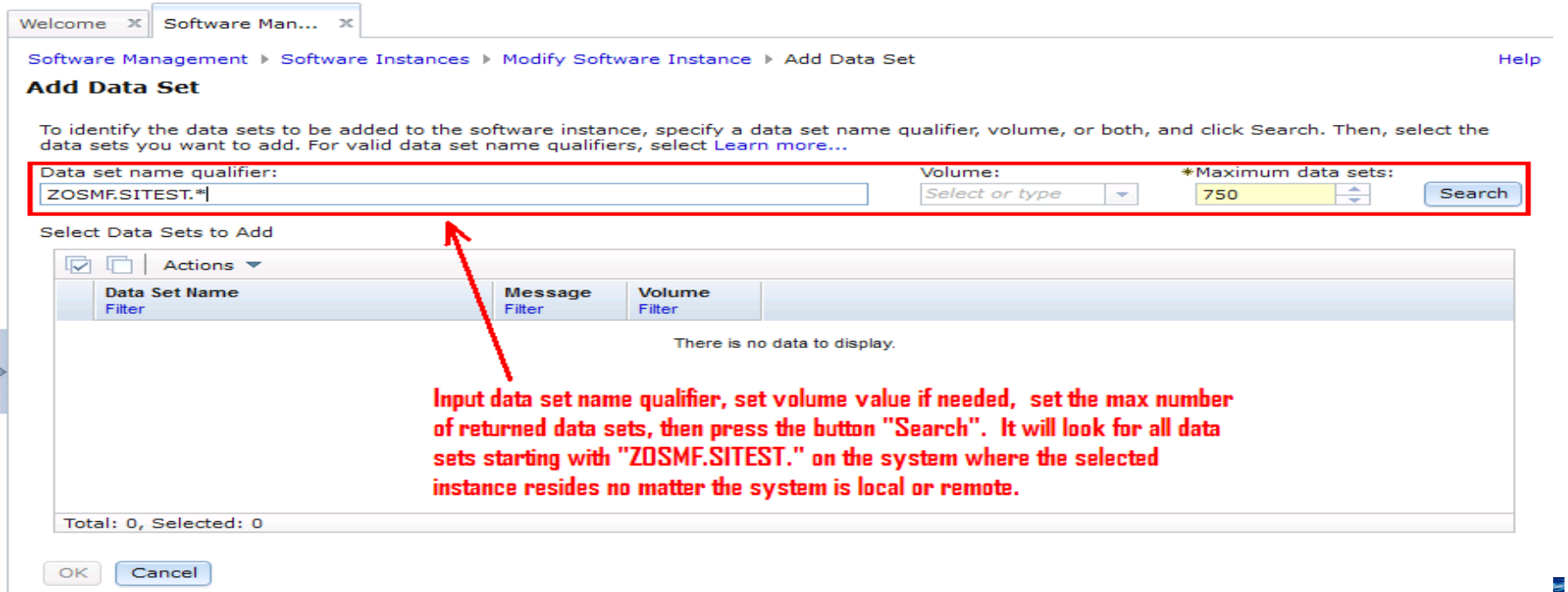
- Example for listing data set names with specific qualifier (2/2)

GET zosmf/restfiles/ds/?dslevel=sys1.*lib HTTP/1.1

```
HTTP/1.1 200 OK

Date: Wed, 23 Oct 2013 00:43:49 GMT

Content-Type: application/json

Connection: close

{ "items":[

        { "dsname":"SYS1.AUXLIB" }, { "dsname":"SYS1.BDTLIB" }, { "dsname":"SYS1.CHSLIB" },
        { "dsname":"SYS1.CMDLIB" }, { "dsname":"SYS1.COBLIB" }, { "dsname":"SYS1.CSSLIB" },
        { "dsname":"SYS1.FDEFLIB" }, { "dsname":"SYS1.FONTLIB" }, { "dsname":"SYS1.FORTLIB" },
        { "dsname":"SYS1.GRSLIB" }, { "dsname":"SYS1.IMAGELIB" }, { "dsname":"SYS1.JES3LIB" },
        { "dsname":"SYS1.KANLIB" }, { "dsname":"SYS1.LINKLIB" }, { "dsname":"SYS1.LPALIB" },
        { "dsname":"SYS1.MACLIB" }, { "dsname":"SYS1.MIGLIB" }, { "dsname":"SYS1.NCPLIB" },
        { "dsname":"SYS1.NFSLIB" }, { "dsname":"SYS1.OVERLIB" }, { "dsname":"SYS1.PARMLIB" },
        { "dsname":"SYS1.PARMLIB.CB" }, { "dsname":"SYS1.PARMLIB.INSTALL" },
        { "dsname":"SYS1.PARMLIB.MSYS" }, { "dsname":"SYS1.PARMLIB.PD" }, { "dsname":"SYS1.PROCLIB" },
        { "dsname":"SYS1.PROCLIB.CB" }, { "dsname":"SYS1.PROCLIB.INSTALL" },
        { "dsname":"SYS1.PROCLIB.MSYS" }, { "dsname":"SYS1.PROCLIB.PD" },
        { "dsname":"SYS1.PROCLIB.TEST" }, { "dsname":"SYS1.PSEGLIB" }, { "dsname":"SYS1.PSPMLIB" },
        { "dsname":"SYS1.SADRYLIB" }, { "dsname":"SYS1.SAMPLIB" }, { "dsname":"SYS1.SIATLIB" },
        { "dsname":"SYS1.SICETLIB" }, { "dsname":"SYS1.SIFALIB" }, { "dsname":"SYS1.SISTCLIB" },
        { "dsname":"SYS1.XCFLIB" } ],

   "returnedRows":40, "totalRows":40

}
```

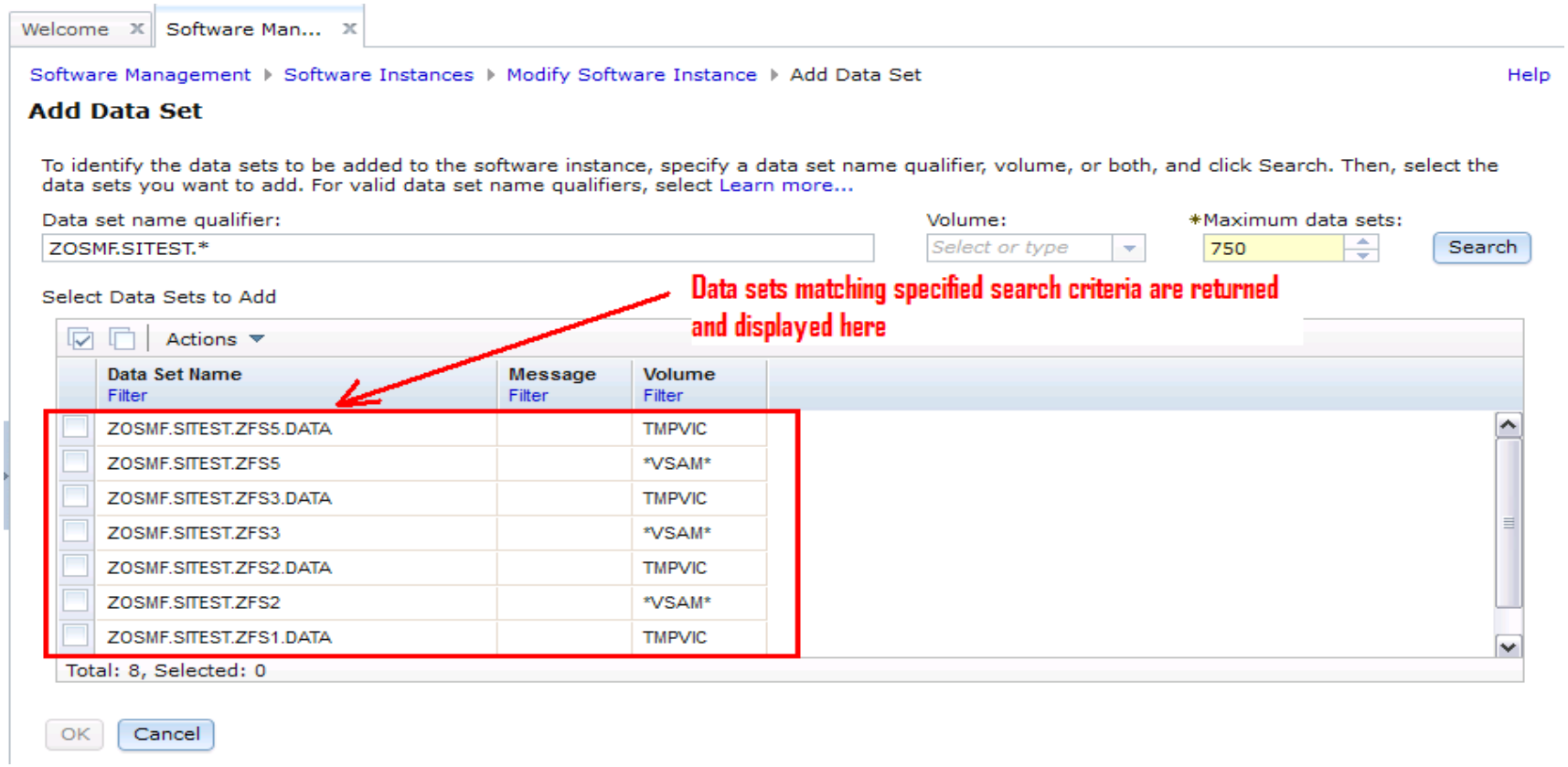
z/OS data set and file REST service – Exploiter example

- By exploiting “z/OS data set and file REST service”, application developer could focus on their application logic, no need to take care how to reach information of z/OS resource.
- “z/OSMF Software Management” plugin exploits “z/OS data set and file REST service” to easily get the capability of searching data sets. (1/2)



z/OS data set and file REST service – Exploiter example

- "z/OSMF Software Management" plugin exploits "z/OS data set and file REST service" to easily get the capability of searching data sets. (2/2)



z/OS jobs REST service

- z/OS jobs REST service was introduced in z/OSMF V1R13 to provide a way for working with jobs via RESTful invocation.
- z/OSMF V2R2 includes below enhancements:
  - Supports JES2 step completion code
  - Supports JES2 SSI85 interface provides synchronized interface to cancel, delete, hold and release job. User now can choose either synchronized way or asynchorized way which was supported before.
  - Supports to submit job to secondary JES and hold/release job in asynchronized way.
- Function in blue is also available on V2R1.

z/OS jobs REST service – supports JES2 step completion code

- Example for getting job status and its step data

GET /zosmf/restjobs/jobs/BLSJPRMI/STC00052?**step-data=Y** HTTP/1.1

Response:

```
{
  "retcode": "CC 0000",
  "jobname": "BLSJPRMI",
  "status": "OUTPUT",
  ......
  "step-data": [
    {
      "end-time": "2014-12-08T21:50:38.080",
      "sid": "SP21",
      "selected-time": "2914-12-08T21:50:35.210",
      "path-name": "",
      "substep-number": 0,
      "active": false,
      "step-number": 1,
      "proc-step-name": "STARTING",
      "completion": "CC 0000",
      "step-name": "IEFPROC ",
      "program-name": "BLSQPRMI"
    }
  ],
  ......
}
```

Upgrade application server and improve service maintenance

- z/OSMF V2R2 uses WebSphere Liberty 8.5.5.3 which was 8.5.0.2 in V2R1.
  - No security changes
  - Some new features of 8.5.5.3 like concurrent, dynamic cache, binary log and compression will be enabled
  - No impact to configuration
- Previously, applying service sometimes needs execution of script. z/OSMF V2R2 integrates the execution of script into z/OSMF server procedure. This means user doesn't have to execute script in order to take service effective since V2R2. This benefits especially for customers having large number of installation.

z/OSMF V2R2 security changes

- Problem Statement / Need Addressed:

Previously, a set of generic security profiles are generated to manage z/OSMF authorization. Customers require more granularity on resource protection.

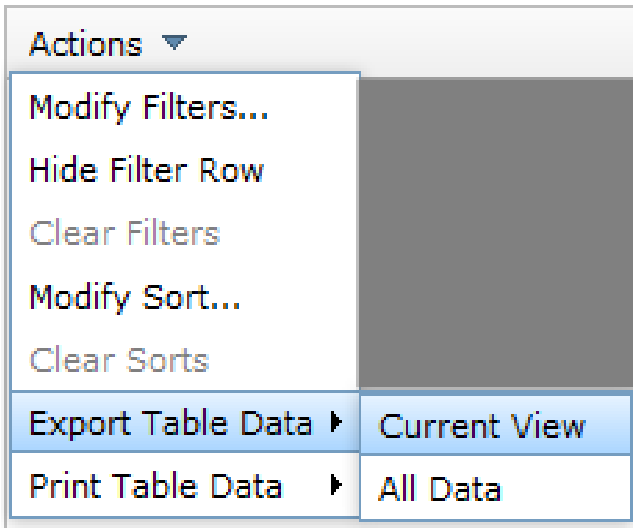
- z/OSMF V2R2 creates discrete security profiles to protect resources. Therefore, corresponding generic profiles created before should be removed.
- For details about which generic profiles are replaced by which discrete profiles, please refer to Appendix *z/OSMF V2R2 security changes*.

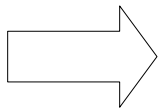
Misc – Other V2R2 enhancements (1/5)

- z/OSMF Capacity Provisioning
  - Supports “Utilization condition” (CPC, Utilization thresholds) in domain configurations and policies.
- z/OSMF Resource Monitoring
  - Supports retrieving historic data before dashboard is opened.
  - Allows to export spreadsheet for dashboard data facilitates third party tool (E.g. Excel) to analyze dashboard data.
  - Supports z13 hardware
  - Supports V2R2 z/OS RMF
- z/OSMF Workload Management
  - Supports history comments allows user to record comments for various service definition operations such as edit service definition, install/active service policy, etc.
- Function in blue is also available on z/OSMF V2R1

Misc – Other V2R2 enhancements (2/5)

- z/OSMF Software Management provides a set of enhancements which are also available on z/OSMF V2R1.
- z/OSMF Software Management – Supports Export/Print on all tables (1/2)





	A	B
1	Name	Volume
2	IBMUSRM.PPLB88D.CSI.INDEX	
3	IBMUSRM.PPLB88D.CSI.DATA	
4	IBMUSRM.PPLB88D.CSI	
5		

Misc – Other V2R2 enhancements (3/5)

- z/OSMF Software Management – Supports Export/Print on all tables (2/2)

The following tables support Export/Print:

No.	Table Name	Report or Panel
1	Product Table	Product Panel
2	Software Instance	Software Instance Panel
3	Data Set List	Deployment – Config -- Data Sets
4	Catalog List	Deployment – Config -- Catalogs
5	Target Volume & Target Storage Class Tables	Deployment – Config – Volumes & Storage Classes
6	Mount Point Table	Deployment – Config – Mount Points
7	Job List	Deployment – Submit & View Jobs
8	Job List	View Deployments – Deployment Jobs
9	Deployment	Deployment Panel
10	Non-SMP/E Managed DS	Add Software Instance
11	Non-SMP/E Managed DS	View/Modify/Copy SW Instance
12	Target and DLIB Zone List	Deployment – Config -- SMP/E Zones
13	SMP/E Zones	View Deployments – Deploy Config
14	Data Sets	View Deployments – Deploy Config
15	Catalog	View Deployments – Deploy Config
16	Volume & Storage Class	View Deployments – Deploy Config
17	Mount Points	View Deployments – Deploy Config

Misc – Other V2R2 enhancements (4/5)

- z/OSMF Software Management – provides REST service
  - List all software instances defined to z/OSMF
  - Read properties of a single software instance
  - Add a new software instance definition
- Please refer to Appendix *Examples of z/OSMF V2R2 REST services* for details.
- z/OSMF Software Management exploits "z/OS jobs REST service" to:
  - Submit deployment job
  - Manage deployment jobs
- z/OSMF Software Management – Other enhancements
  - Supports SFTP to secure the transfer of deployment data
  - Allows to retrieve product information data from multiple files
  - Exploits "z/OS data set and file REST service" to allow search non-SMP/E data sets and add multiple data sets once.
  - Supports the display of associated UNIX directory for Unix file system data set

Misc – Other V2R2 enhancements (5/5)

- z/OSMF Incident Log supports SFTP protocol to transfer diagnostic data
- z/OSMF WebISPF allows user to use “Ctrl” key as enter in workstation.
- Function in blue is also available on z/OSMF V2R1.

Interactions & Dependencies

- Software Dependencies
  - IBM z/OS Java 7.1 64 bit
- Hardware Dependencies
  - None
- Exploiters
  - None

Migration & Coexistence Considerations

- Migration considerations
  - z/OSMF provides the scripts and instructions to migrate from a previous release to V2R2.
  - SAF mode is required for V2R2 and scripts are provided help convert from Repository mode to SAF mode.
  - Note: If migrating from z/OSMF R13, the conversion to SAF mode can be performed in R13 also, prior to migration to z/OSMF V2R2
- Migrate to V2R2 from V2R1:
  - Actions to perform before configuring V2R2:
    - Preparing for fallback
  - Configuring the new release of z/OSMF
    - Using “izusetup.sh -config” to configure z/OSMF
    - Configure security
    - Complete configuration by “izusetup.sh -finish”
  - Start z/OSMF server
  - Clean-up actions to perform when satisfied with the new release
    - Please refer to chapter “z/OSMF V2R2 security changes” to remove corresponding generic profiles.

Migration & Coexistence Considerations

- Migrate to V2R2 from V1R13 (1/2):
  - Actions to perform before installing V2R2:
    - Converting to SAF Authorization mode
  - Actions to perform before configuring V2R2:
    - Retaining the “ZOSMFAD” user ID if it's needed
    - Notice the migration consideration for Software Management plugin (prior to APAR PM73833)
    - Authorize the z/OSMF server to create PassTickets for Capacity Provisioning plugin and Resource Monitoring plugin.
    - Installing the z/OSMF cataloged procedures
    - Preparing for fallback
    - Using “izumigrate.sh” to migrate your configuration and optionally override file
  - Configuring the new release of z/OSMF
    - Using “izusetup.sh -config” to configure the new release of z/OSMF
    - Configure security
    - Complete configuration by “izusetup.sh -finish”
  - Start z/OSMF server

Migration & Coexistence Considerations

- Migrate to V2R2 from V1R13 (2/2):
  - Clean-up actions to perform when satisfied with the new release
    - Please refer to chapter “z/OSMF V2R2 security changes” to remove corresponding generic profiles.
    - Check the security for HTTPS and HTTP ports used by previous release
    - Remove “ZOSMFAD” owned objects and authorizations if “ZOSMFAD” is not used any more.
    - Cleanup WASOEM
- Please refer to *z/OS V2R2 Migration* for the details
- Coexistence considerations
  - No Coexistence APARs identified

Installation

- Previously, z/OSMF is a separate product with z/OS. Since V2R2, z/OSMF becomes an element of z/OS. User doesn't need to order z/OSMF separately. It's not required to configure and start z/OSMF.
- Since V2R1, the installation jobs provided by ServerPac only installs z/OSMF Core.
  - Optional z/OSMF plugins could be enabled later.
  - User can also create workflow instance of “Configure Workflow” to enable optional plugins. Please refer to chapter “Configure Workflow” for details.

Presentation Summary

- z/OSMF V2R2 becomes an element of z/OS. No need to order z/OSMF separately.
- z/OSMF V2R2 extends scope to multiple sysplex. Incident Log supports managing incidents from remote system or a group of remote systems by exploiting the framework.
- z/OSMF V2R2 continuously improves Workflows application to provide more powerful and flexible framework for executing workflow in z/OS.
- “External application support” solution allows customer or ISV to develop their web application and deploy it in z/OSMF.
- z/OSMF V2R2 provides several kinds of REST service to make z/OS and z/OSMF more approachable.
- Applying service does not need to execute script any more.
- Enhancements are also made on other plugins.

Appendix

- Product package details
- Publications
- z/OSMF V2R2 security changes
- Examples of z/OSMF V2R2 REST services

Product package details

Product ID: 5650-ZOS

FMID	COMPID	Component Name
HSMA220	5655S28SM	z/OSMF Core Functions
HSMA220	5655S28RJ	z/OSMF RESTJOBS
HSMA220	5655S28WL	WebSphere Liberty Profile
HSMA220	5655S28TS	z/OSMF TSO REST Services
HSMA220	5655S28RF	z/OSMF REST z/OS data set and files service
HSMA221	5655S2801	z/OSMF ISPF
HSMA222	5655S2802	z/OSMF Resource Monitoring
HSMA223	5655S2803	z/OSMF WLM
HSMA224	5655S2804	z/OSMF Software Deployment
HSMA225	5655S2805	z/OSMF Incident Log
HSMA226	5655S2806	z/OSMF Capacity Provisioning
HSMA227	5655S2807	z/OSMF Workflow
HSMA22A	5655S28CA	z/OSMF Configuration Assistant
HQX77A0	5655S2808	z/OSMF SDSF UI

Publications

- *IBM z/OS Management Facility Configuration Guide Version 2 Release 2*
  - SA38-0657
- *IBM z/OS Management Facility Programming Version 2 Release 2*
  - SA32-1066
- *z/OS V2R2 Migration*
  - GA32-0889

z/OSMF V2R2 security changes (1/4)

- z/OSMF Core

If user upgrades to z/OSMF V2R2, below generic profiles in class “ZMFAPLA” could exist:

IZU_SAF_PROFILE_PREFIX.ZOSMF.ADMINTASKS.**

IZU_SAF_PROFILE_PREFIX.ZOSMF.SETTINGS.*.VIEW

IZU_SAF_PROFILE_PREFIX.ZOSMF.SETTINGS.*.MODIFY

They should be removed since below concrete profiles should be created during configuration:

IZU_SAF_PROFILE_PREFIX.ZOSMF.ADMINTASKS.APPLINKING

IZU_SAF_PROFILE_PREFIX.ZOSMF.ADMINTASKS.IMPORTMANAGER

IZU_SAF_PROFILE_PREFIX.ZOSMF.ADMINTASKS.LINKSTASK

IZU_SAF_PROFILE_PREFIX.ZOSMF.ADMINTASKS.LOGGER

IZU_SAF_PROFILE_PREFIX.ZOSMF.ADMINTASKS.UI_LOG_MANAGEMENT

IZU_SAF_PROFILE_PREFIX.ZOSMF.SETTINGS.SYSTEMS.VIEW

IZU_SAF_PROFILE_PREFIX.ZOSMF.SETTINGS.SYSTEMS.MODIFY

IZU_SAF_PROFILE_PREFIX.ZOSMF.SETTINGS.FTP_SERVERS.VIEW

IZU_SAF_PROFILE_PREFIX.ZOSMF.SETTINGS.FTP_SERVERS.MODIFY

IZU_SAF_PROFILE_PREFIX.ZOSMF.WORKFLOW.WORKFLOWS

z/OSMF V2R2 security changes (2/4)

- z/OSMF Capacity Provisioning

If user upgrades to z/OSMF V2R2, below generic profile in class “ZMFAPLA” could exist:

IZU_SAF_PROFILE_PREFIX.ZOSMF.CAPACITY_PROVISIONING.CAPACITY_PROVISIONING.EDIT.**

It should be removed since below concrete profiles should be created during configuration:

IZU_SAF_PROFILE_PREFIX.ZOSMF.CAPACITY_PROVISIONING.CAPACITY_PROVISIONING.EDIT.DOMAIN

IZU_SAF_PROFILE_PREFIX.ZOSMF.CAPACITY_PROVISIONING.CAPACITY_PROVISIONING.EDIT.POLICY

- z/OSMF Software Management

If user upgrades to z/OSMF V2R2, below generic profiles in class “ZMFAPLA” could exist:

IZU_SAF_PROFILE_PREFIX.ZOSMF.SOFTWARE_DEPLOYMENT.**

IZU_SAF_PROFILE_PREFIX.ZOSMF.SOFTWARE_DEPLOYMENT.SOFTWARE_MANAGEMENT.PRODUCT_INFO_FILE.*

It should be removed since below concrete profiles should be created during configuration:

IZU_SAF_PROFILE_PREFIX.ZOSMF.SOFTWARE_DEPLOYMENT.SOFTWARE_MANAGEMENT

IZU_SAF_PROFILE_PREFIX.ZOSMF.SOFTWARE_DEPLOYMENT.SOFTWARE_MANAGEMENT.PRODUCT_INFO_FILE.RETRIEVE
IZU_SAF_PROFILE_PREFIX.ZOSMF.SOFTWARE_DEPLOYMENT.SOFTWARE_MANAGEMENT.CATEGORIES.MODIFY

z/OSMF V2R2 security changes (3/4)

- z/OSMF Incident Log

If user upgrades to z/OSMF V2R2, below generic profile in class “ZMFAPLA” could exist:

IZU_SAF_PROFILE_PREFIX.ZOSMF.INCIDENT_LOG.**

It should be removed since below concrete profiles should be created during configuration:

IZU_SAF_PROFILE_PREFIX.ZOSMF.INCIDENT_LOG.INCIDENT_LOG

- z/OSMF Resource Monitoring

If user upgrades to z/OSMF V2R2, below generic profile in class “ZMFAPLA” could exist:

IZU_SAF_PROFILE_PREFIX.ZOSMF.RESOURCE_MONITORING.**

It should be removed since below concrete profiles should be created during configuration:

IZU_SAF_PROFILE_PREFIX.ZOSMF.RESOURCE_MONITORING.PERFDESKS

IZU_SAF_PROFILE_PREFIX.ZOSMF.RESOURCE_MONITORING.OVERVIEW

z/OSMF V2R2 security changes (4/4)

- z/OSMF Web ISPF

If user upgrades to z/OSMF V2R2, below generic profile in class “ZMFAPLA” could exist:

IZU_SAF_PROFILE_PREFIX.ZOSMF.ISPF.**

It should be removed since below concrete profile should be created during configuration:

IZU_SAF_PROFILE_PREFIX.ZOSMF.ISPF.ISPF

Examples of z/OSMF V2R2 REST services

- Multisystem routing services – retrieve data from all the systems in a group

To retrieve the handlers that are registered for event type IBM.ZOSMF.IMPORT_EXTERNAL_APP from all the systems in group “mygroup”, submit the following request:

GET https://zosmf1.yourco.com/zosmf/gateway/group?content={"target":"mygroup",
"resourcePath":"/izual/rest/handler?eventTypeId=IBM.ZOSMF.IMPORT_EXTERNAL_APP"} HTTP/1.1

A sample response is shown below (The left side is the 1st piece of data and the other side is the 2nd piece):


```
HTTP/1.1 200 OK
Date: Thu, 15 Jan 2015 05:39:28 +0000GMT
Connection: close

{
  "primaryAPIVersion":1.0,
  "systemsOutput":[
    {
      "systemOutput":
        {
          "error":null,
          "result":[
            {
              "id":"IBM.ZOSMF.IZU_IMPORT_HANDLER",
              "taskId":"IZUG_TASK_zOSMFImportManager",
              "enabled":true,
              "defaultHandler":false,
              "applId":"IzuImportManager",
              "type":"INTERNAL",
              "displayName":"Import Manager",
              "url":"/zosmf/IzuImportUtility/index.jsp",
              "eventTypeId":"IBM.ZOSMF.IMPORT_EXTERNAL_APP",
              "options":{"CONTEXT_SUPPORT":"OPT_CONTEXT_SUPPORT_LAUNCH_AND_SWITCH"}
            }
          ],
        },
      "rc":"Ok",
      "secondaryApiVersion":1.0,
      "systemVersion":"{"zosNode":"SY1","zosVrm":"04.24.00","zosSysplex":"PLEX1"}",
     "systemName":"sys057"
    },
```

```
    {
      "systemOutput":
        {
          "error":
          {
            "msgid":"IZUG0000E",
            "msgtxt":"The HTTPS request to server "sys058" failed with return code
                     "LoginRequired" and HTTP response code "401"."
          },
          "result":null
        },
      "rc":"LoginRequired",
      "secondaryApiVersion":1.0,
      "systemVersion":"{"zosNode":"SY2","zosVrm":"04.24.00","zosSysplex":"PLEX2"}",
      "systemName":"sys058"
    }
    {
      "systemOutput":
        {
          "error":
          {
            "msgid":"IZUG0000E",
            "msgtxt":"The HTTPS request to server "sys059" failed with return code
                     "HttpConnectionTimedOut" and HTTP response code "0"."
          },
          "result":null
        },
      "rc":"HttpConnectionTimedOut",
      "secondaryApiVersion":1.0,
      "systemVersion":"{"zosNode":"SY3","zosVrm":"04.24.00","zosSysplex":"PLEX3"}",
      "systemName":"sys059"
    }],
  "numOfSystems":3
}
```

Examples of z/OSMF V2R2 REST services

- Topology services – retrieve the list of systems in sysplex “plex1”

To retrieve a list of the systems that are defined to the z/OSMF instance with host name “zosmf1.yourco.com” and that are included in sysplex “plex1”, submit the following request:

GET https://zosmf1.yourco.com/zosmf/resttopology/systems/sysplexName/plex1 HTTP/1.1

A sample response is shown below:

```
HTTP/1.1 200 OK
Date: Thu, 15 Jan 2015 05:39:28 +0000GMT
Connection: close

{
 "items":[
   {
    "systemNickName":"sys1",
    "systemName":"sys1",
    "sysplexName":"plex1",
    "groupNames":"test,development",
    "zosmfUrl":"https://zosmf1.yourco.com/zosmf/",
    "zosVR":"z/OS V2R1",
    "jesMemberName":"SY1",
    "jesType":"JES2",
    "cpcName":"",
    "cpcSerial":"",
    "httpProxyName":"No Proxy",
    "ftpDestinationName":"IBM-testcase-mvs"
   }
 ],
 "numRows":"1"
}
```

Examples of z/OSMF V2R2 REST services

- Workflow services – create workflow (1/2)

To create a workflow instance through REST invocation, submit the following request:

```
POST /zosmf/workflow/rest/1.0/workflows HTTP/1.1
Content-Type: application/json
Content-Length: nnn
{
"workflowName" : "defaultWorkflow",
"workflowDefinitionFile" : "/u/tmp/workflowTemplate.xml",
"variableInputFile" : "/u/tmp/propertyfile.txt",
"variables" : [
{"name" : "st_user", "value" : "IBMUSER"},
{"name" : "st_srv", "value" : "demosrv1"},
{"name" : "st_wlpuserdir", "value" : "/home"}
],
"system" : "SYS1",
"owner" : "bob",
"comments" : "This workflow is created by Rest API",
"assignToOwner" : true
}-
```

Examples of z/OSMF V2R2 REST services

- Workflow services – create workflow (2/2)

A sample response is shown below:

201 Created
Date: Wed, 14 Jan 2015 02:45:44 GMT
Content-type: application/json
Content-Length: nnn
Location: /zosmf/workflow/rest/1.0/workflows/0389ed37-fe13-4176-af65-c171b6ba6b37

```
{
"workflowKey" : "0389ed37-fe13-4176-af65-c171b6ba6b37",
"workflowDescription" : "The workflow description",
"workflowVersion" : "1.0",
"vendor" : "IBM"
}
```

Examples of z/OSMF V2R2 REST services

- Software Management services – List the software instances defined to z/OSMF

To retrieve a list of the software instances that are defined to the z/OSMF instance that has a host name of zosmf1.yourco.com, submit the following request:

GET https://zosmf1.yourco.com/zosmf/swmgmt/swi HTTP/1.1

A sample response is shown below:

HTTP/1.1 200 OK
Date: Thu, 15 Jan 2015 05:39:28 +0000GMT
Content-Type: application/json
Content-Language: en
Connection: close

{"swilist":[
{"name":"DB2V9", "system":"PEV174", "description":null,
"globalzone":"DB2.GLOBAL.CSI", "targetzones":["DB2TGT"], "categories":null,
"productinforetrieved":"2014-08-20T19:23:25+00:00", "lastmodified":"2014-08-
20T19:23:25+00:00", "modifiedby":"FRED", "created":"2014-08-20T19:23:25+00:00",
"createdby":"BARNEY", "locked":null, "lockedby":null,
"swiurl":"https://zosmf1.yourco.com/zosmf/swmgt/swi/PEV174/DB2V9"}
{"name":"zOSV2R1", "system":"PEV174", "description":null,
"globalzone":"ZOS.GLOBAL.CSI", "targetzones":["MVST100","MVST110"],
"categories":null, "productinforetrieved":"2014-08-20T19:23:25+00:00",
"lastmodified":"2014-08-20T19:23:25+00:00", "modifiedby":"WILMA",
"created":"2014-08-20T19:23:25+00:00", "createdby":"BETTY", "locked":null,
"lockedby":null,"swiurl":"https://zosmf1.yourco.com/zosmf/swmgt/swi/PEV174/zOSV2R1"}
]}