#SHAREorg

SHARE
Technology · Connections · Results

Setting up IBM zAware Step by Step

Garth Godfrey
IBM
ggodfrey@us.ibm.com

Tom Mathias
IBM
mathiast@us.ibm.com

Feb 6, 2013
Session 13066

SHARE in San Francisco 2013

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States, other countries, or both.

DS8000
ECKD
FICON*
GDPS*
GPFS
HiperSockets
IBM*
IBM (logo)*
InfiniBand*
Parallel Sysplex*
PR/SM
Redbooks*
System x*
System z*
System z9*
System z10*
Tivoli
WebSphere*
Z9*
z10
z10 Business Class
z10 EC
z/OS*
z/VM*
zEnterprise

The following are trademarks or registered trademarks of other companies.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.
Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.
Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.
Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.
Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
UNIX is a registered trademark of The Open Group in the United States and other countries.
Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.
ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.
IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency, which is now part of the Office of Government Commerce.

* All other products may be trademarks or registered trademarks of their respective companies.

Notes:

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.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

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

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

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

Notice Regarding Specialty Engines (e.g., zIIPs, zAAPs and IFLs):

Any information contained in this document regarding Specialty Engines ("SEs") and SE eligible workloads provides only general descriptions of the types and portions of workloads that are eligible for execution on Specialty Engines (e.g., zIIPs, zAAPs, and IFLs). IBM authorizes customers to use IBM SE only to execute the processing of Eligible Workloads of specific Programs expressly authorized by IBM as specified in the “Authorized Use Table for IBM Machines” provided at

www.ibm.com/systems/support/machine_warranties/machine_code/aut.html (“AUT”).

No other workload processing is authorized for execution on an SE.

IBM offers SEs at a lower price than General Processors/Central Processors because customers are authorized to use SEs only to process certain types and/or amounts of workloads as specified by IBM in the AUT.

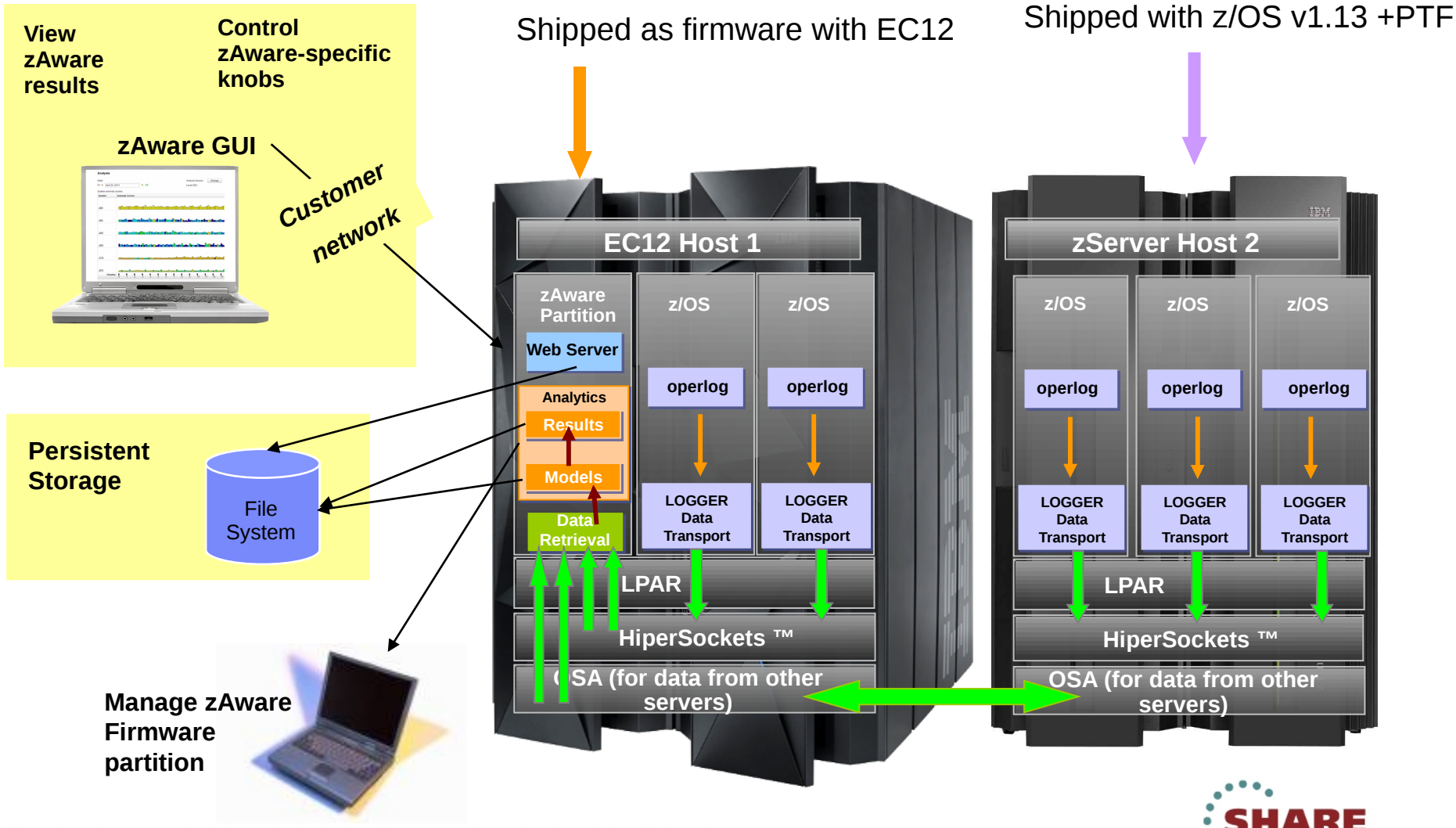
Agenda

- Definition of the zAware partition
- zAware GUI Configuration
  - DASD Storage assignment
  - Security set up
  - Analytics configuration
- z/OS setup for monitored systems
- Priming the zAware partition with existing data
  - z/OS
  - zAware GUI
  - Training a model
- Ongoing operations

IBM zAware – IBM System z Advanced Workload Analysis Reporter

- Monitors z/OS OPERLOG including all messages written to z/OS console, including ISV and application generated messages
- Detects things typical monitoring systems miss due to:
  - Message suppression (message too common)
    Useful for long-term health issues
  - Uniqueness (message not common enough)
    Useful for real-time event diagnostics
- Color coded easy to use GUI via web browsers
- Output can be queued up to existing monitoring systems.
- Early detection and focused diagnosis can help improve time to recovery

Inside IBM zAware



Operating Requirements – IBM zAware Server

- Logical partition on a zEC12 server
  - Runs on IFL or general purpose CP – may be dedicated or shared
  - Runs its own self-contained firmware stack
  - Recommended 2 partial engines
- Memory and DASD resources are dependent on the number of monitored clients, amount of message traffic, length of time data retained
  - Minimum Memory is 6 GB for the first 6 clients
    For > 6 clients + 256 MB per client required
  - Estimated DASD storage is ~ 500 GB (ECKD)
- Network resources
  - HiperSockets or shareable OSA ports
  - IP address for partition
- Internet Explorer 9 or Firefox ESR 10 browser

zAware Partition Background & IOCDS Definition

- IBM zAware Partition, including I/O, is defined like any other partition. You can use Hardware Configuration Definition (HCD) / Hardware Configuration Management (HCM) or equivalent.
- Similar in many ways to Coupling Facility type partitions
- zAware application loaded from Support Element (SE)
- zAware application is firmware
  - Separate EC stream
  - Updated like all other firmware
    - Part of Support Element (SE) version 2.12.0
    - Hardware Management Console (HMC) support starting with HMC version 2.12.0
    - Concurrent Driver Upgrade (CDU)
    - EC Upgrade
    - MCFs/MCLs
- Prerequisites to defining a zAware partition: Purchase and install the zAware Feature Codes (FC)

Several ways to define the zAware Partition

- Web Services APIs
- User Interface (**Customize/Delete Activation Profile):**

Traditional Image Profile Customization

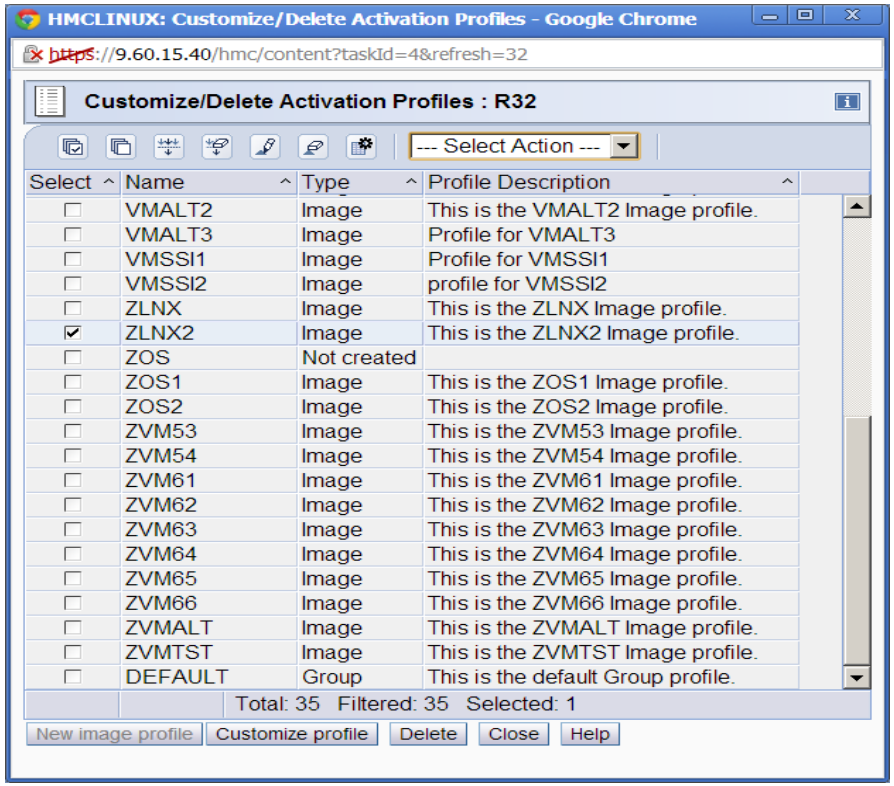
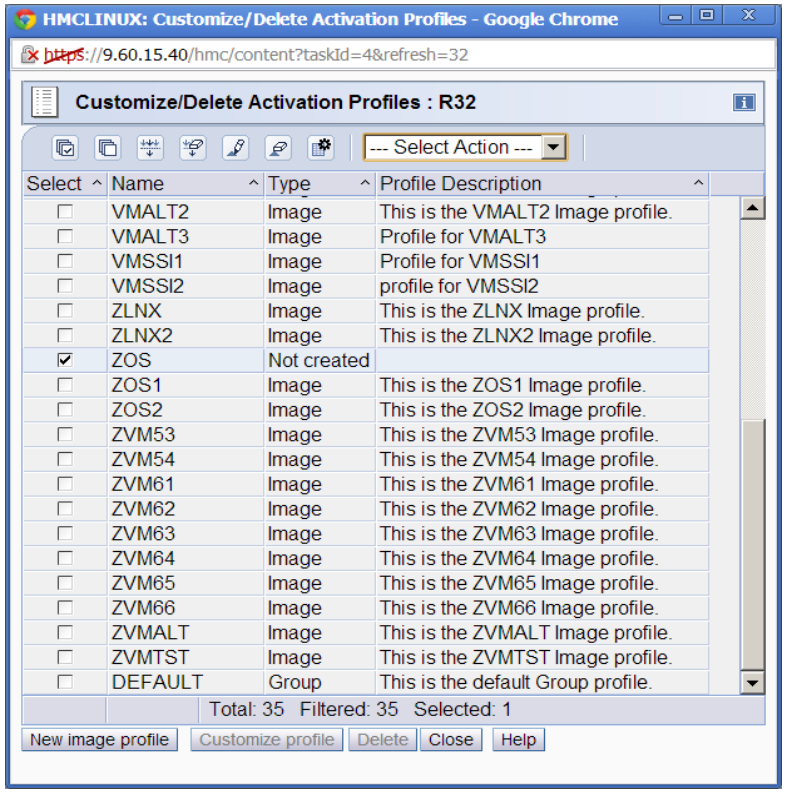
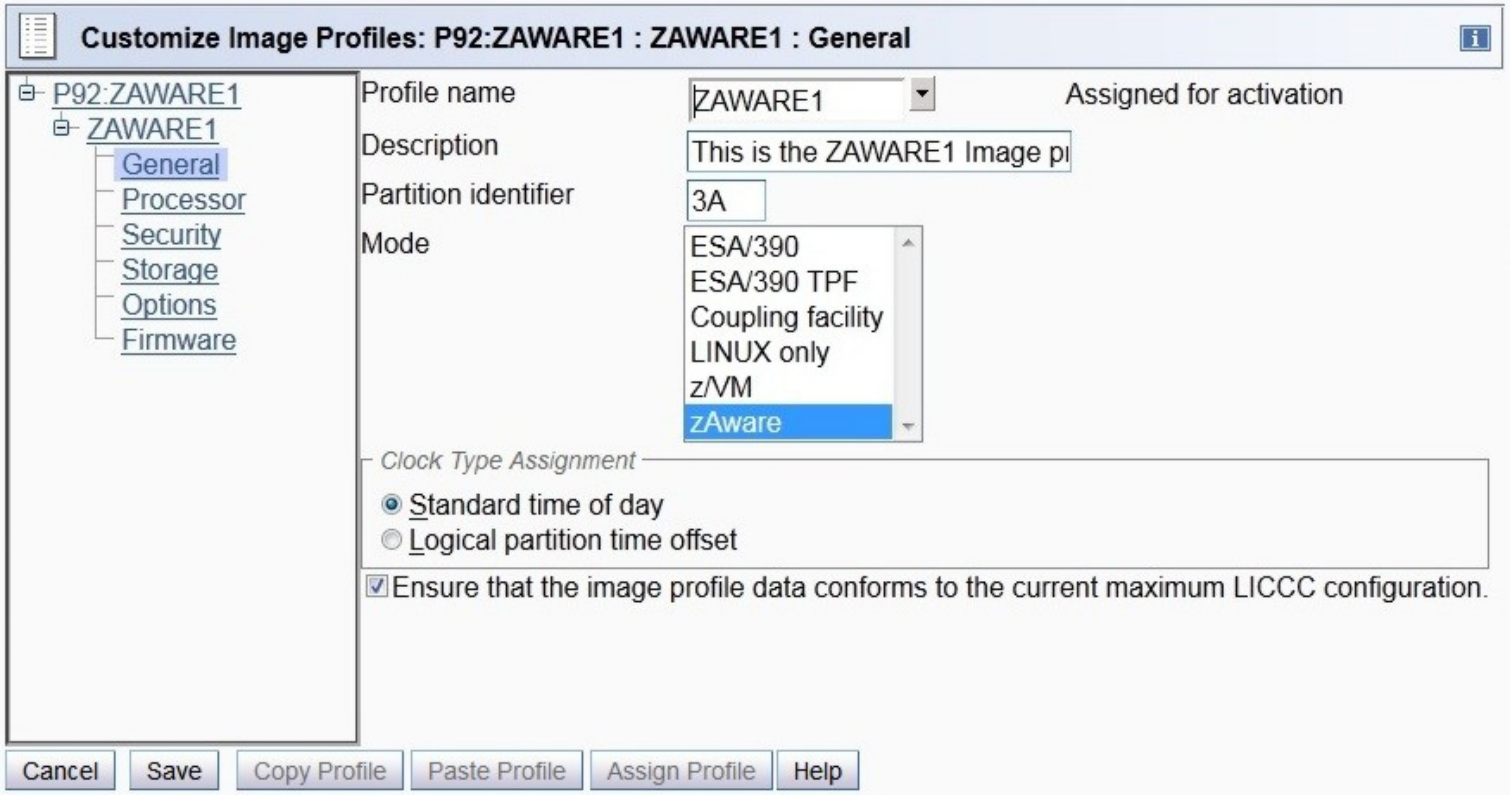


Image Profile Wizard



Defining the zAware Image Profile (Traditional) – Setting the partition mode

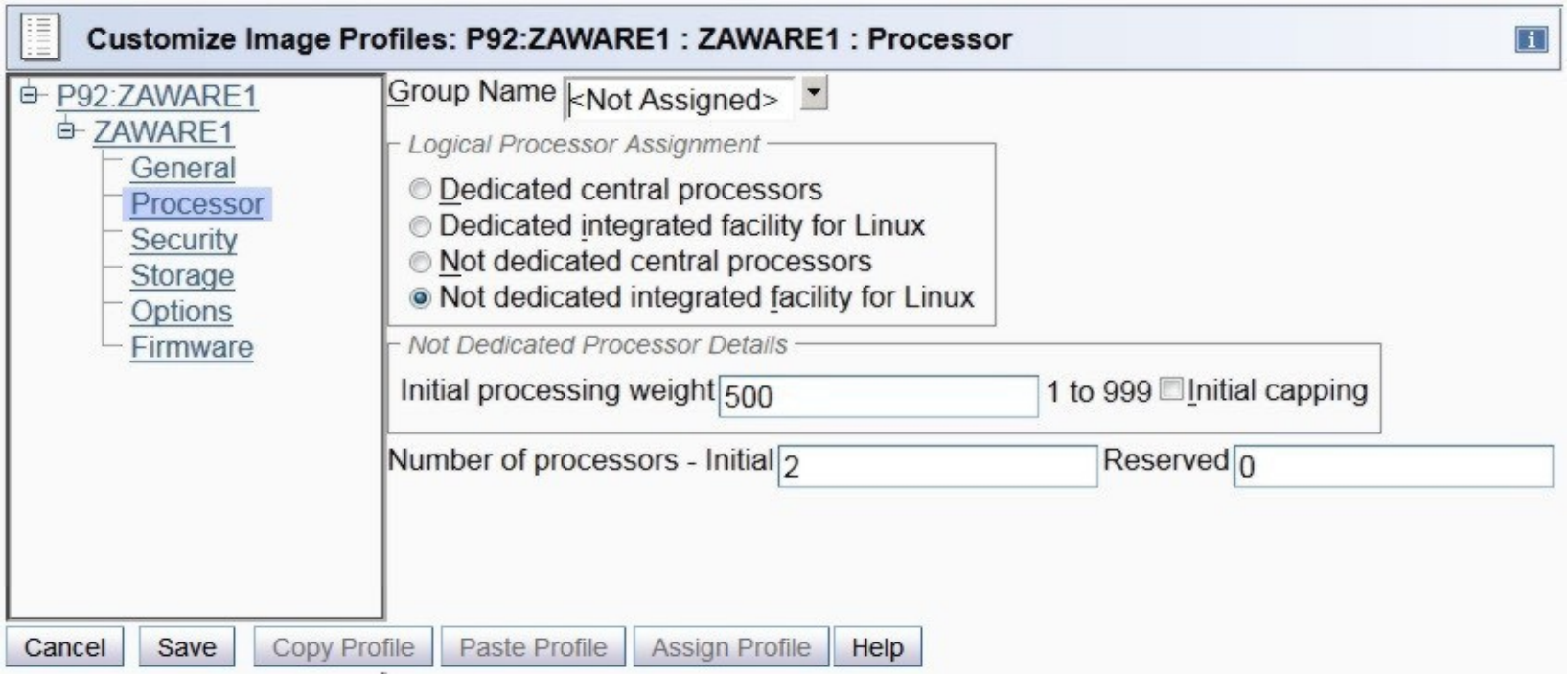
- Create or Modify an image profile for the defined partition.
- On the **General** tab, select “zAware” for the partition mode:



Notice no “Load” page; Again, zAware application loaded from SE's HDD

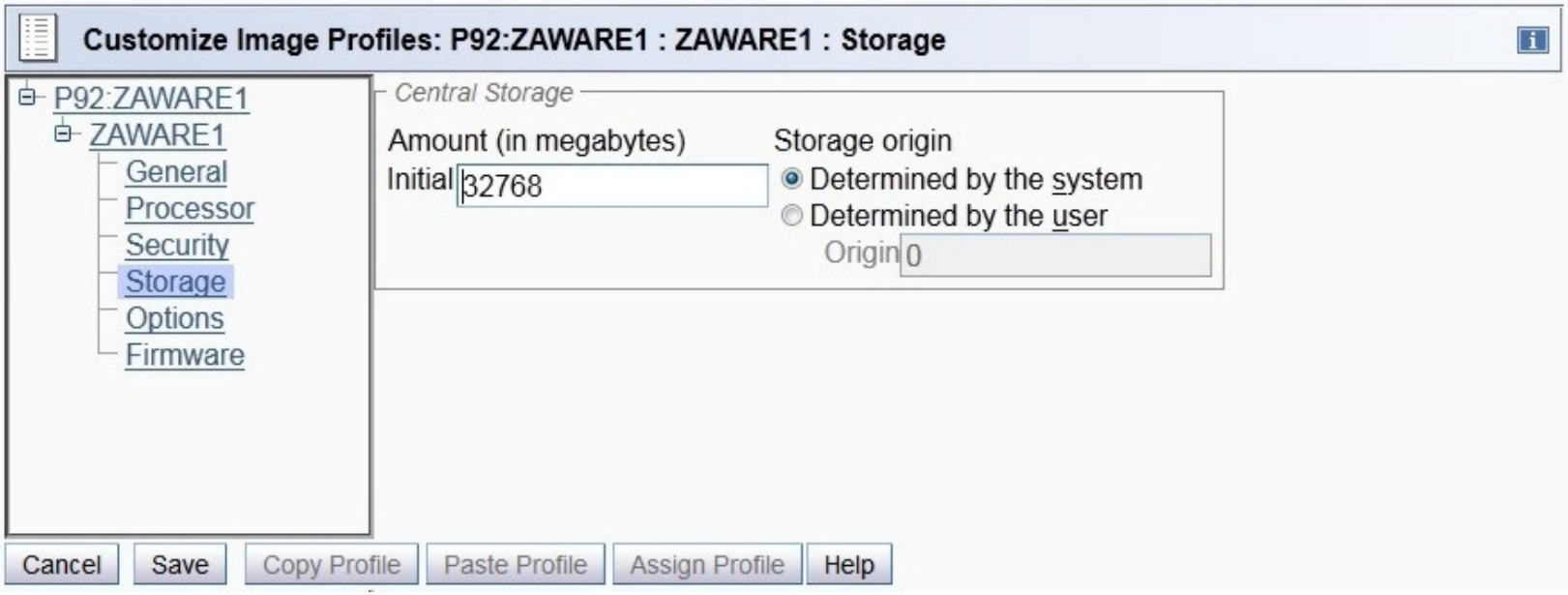
Defining the zAware Image Profile (Traditional) – Setting the processors

- You can use central processors or IFL processors
- You can use dedicated or shared processors
- Assign 2 processors to support monitored clients with message traffic up to 1500 messages per second.

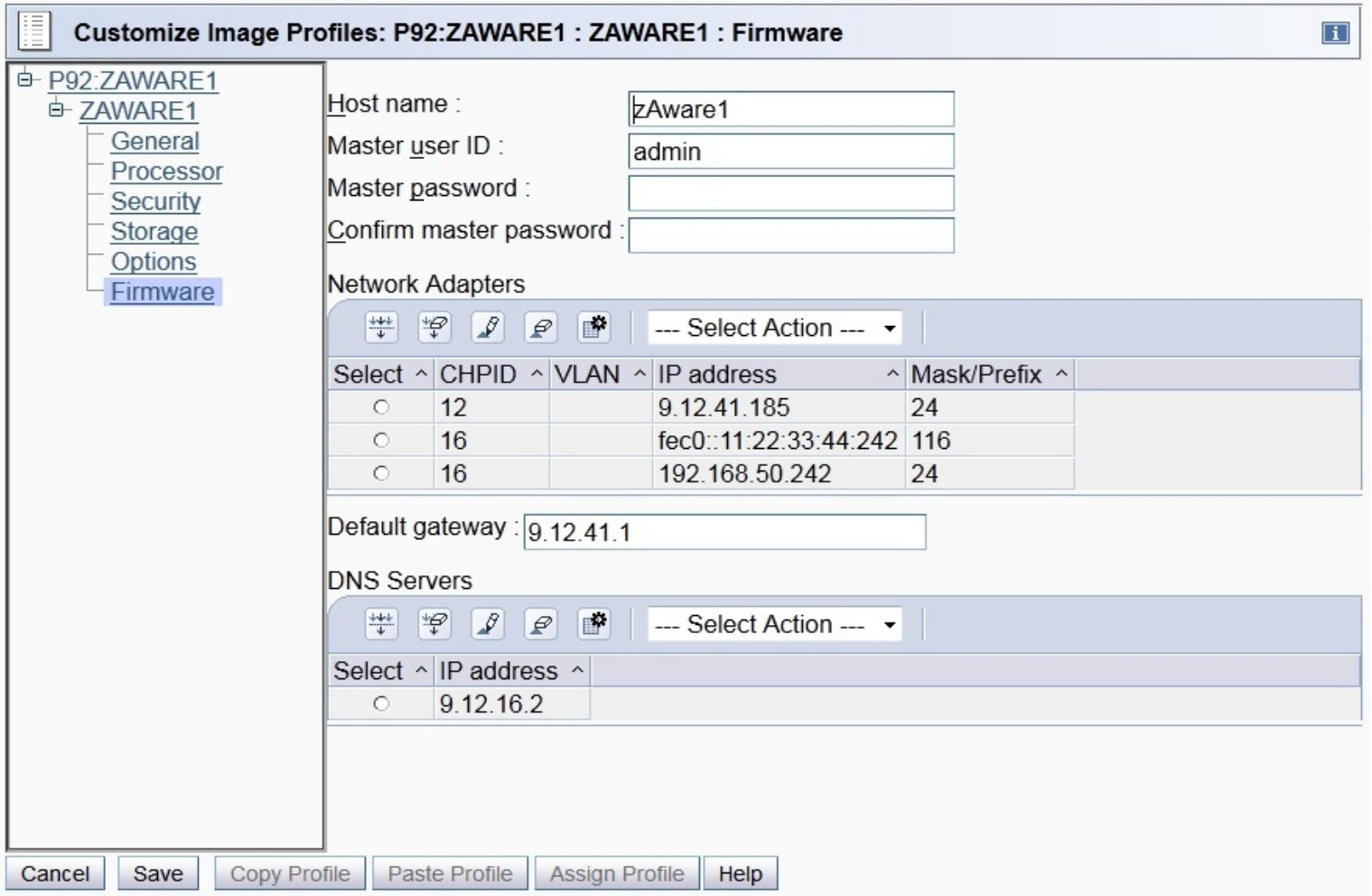


Defining the zAware Image Profile (Traditional) – Setting the Storage size

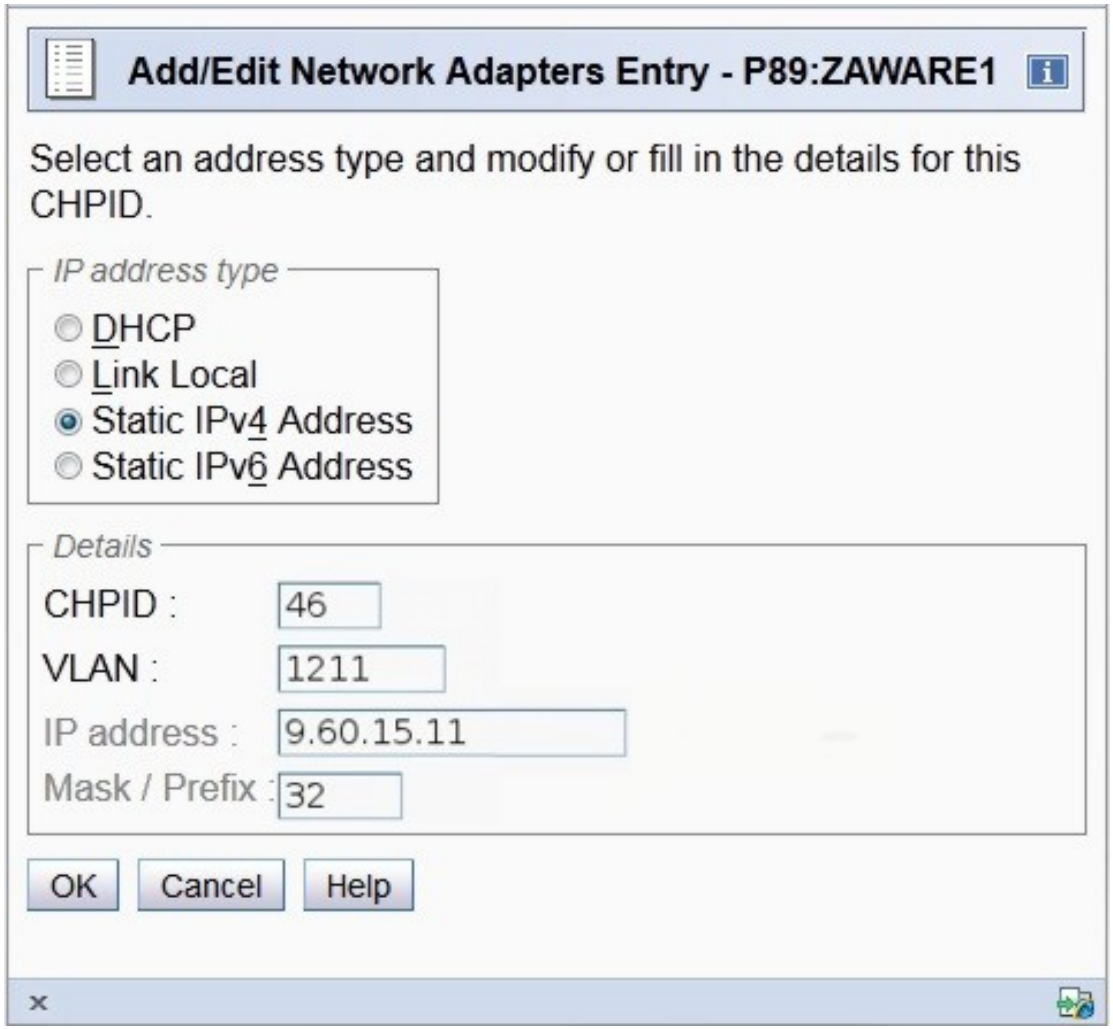
- Minimum storage for a zAware partition is 4096 MB (4 GB)
- 6144 MB (6 GB) is recommended for a small number of monitored clients (6 or less) with light message traffic (up to 500 messages/second)
- 11264 MB (11 GB) is recommended for message traffic up to 1500 messages/second.
- As with all performance recommendations, you may be able to reduce or have to increase the memory footprint for your specific situation.



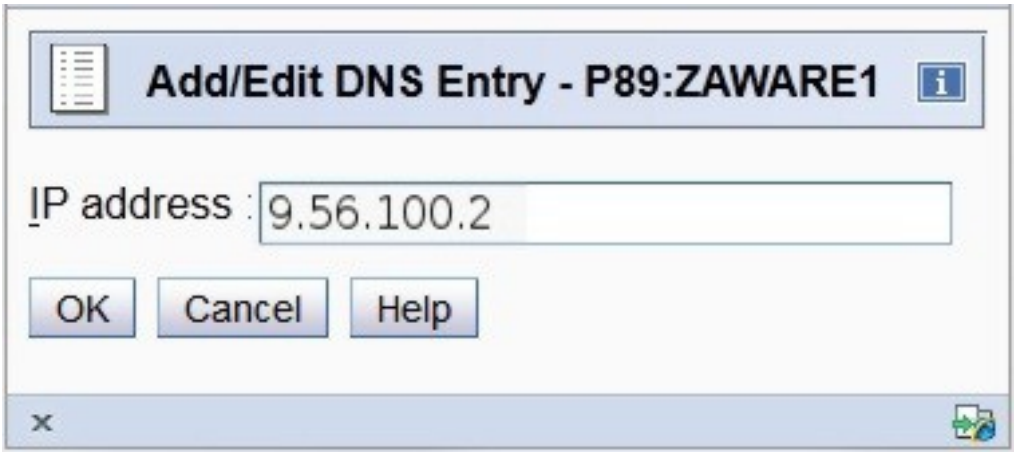
Use new tab to specify zAware-specific image profile parameters



Add new Network Adapter Entry

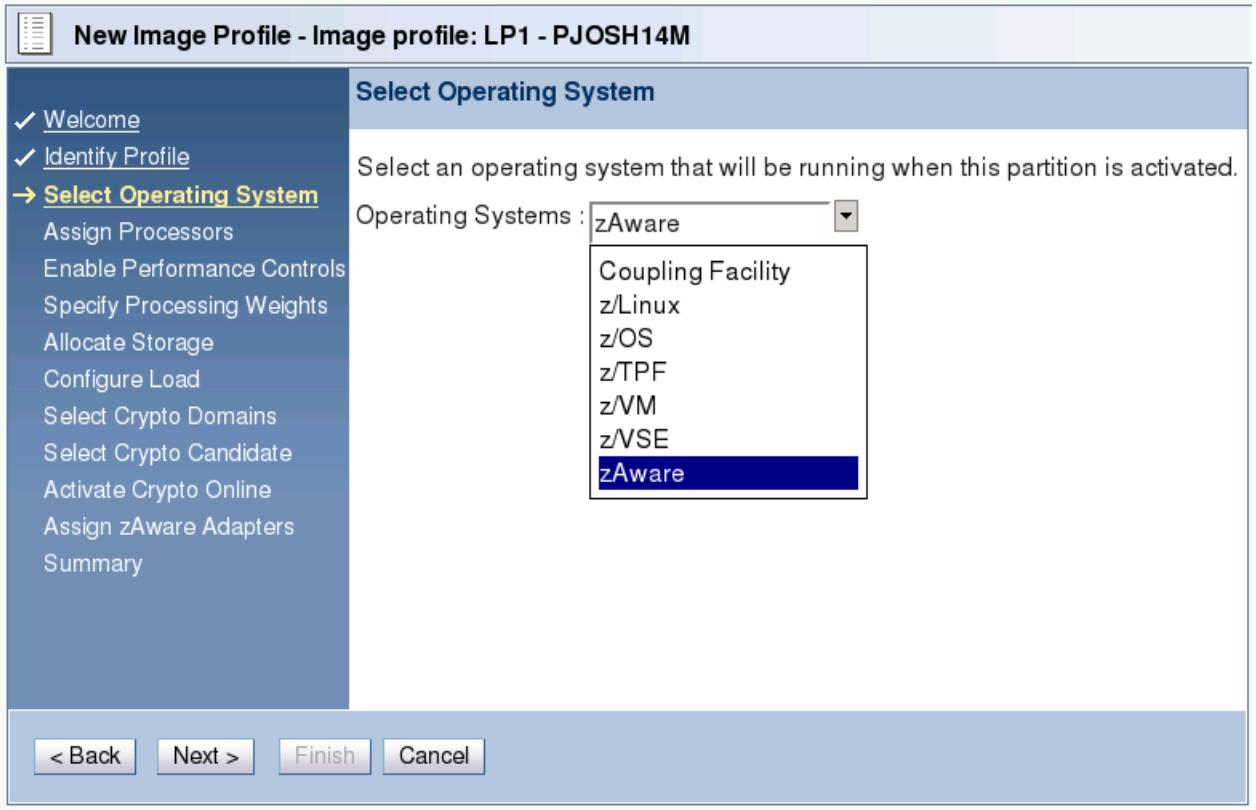


Add new DNS Entry



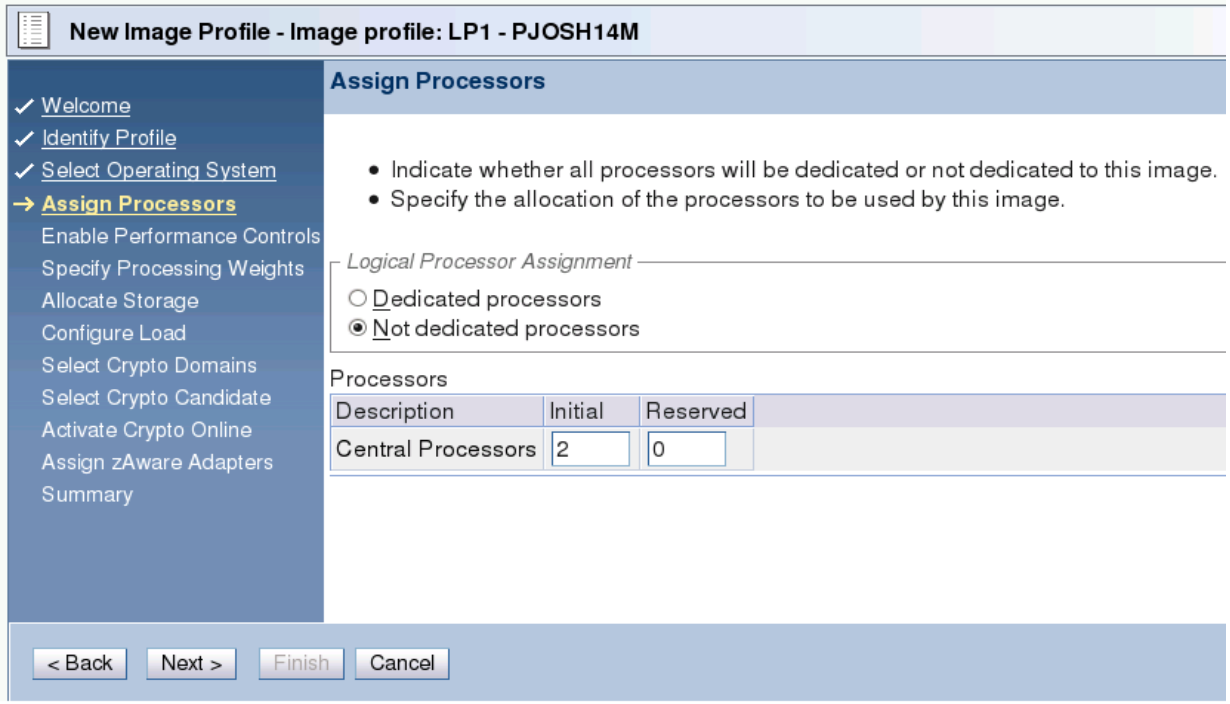
Defining the zAware Image Profile (Wizard) – Setting the Operating System type (i.e. partition mode)

- Create a new image profile
- Set the Operating System type to zAware



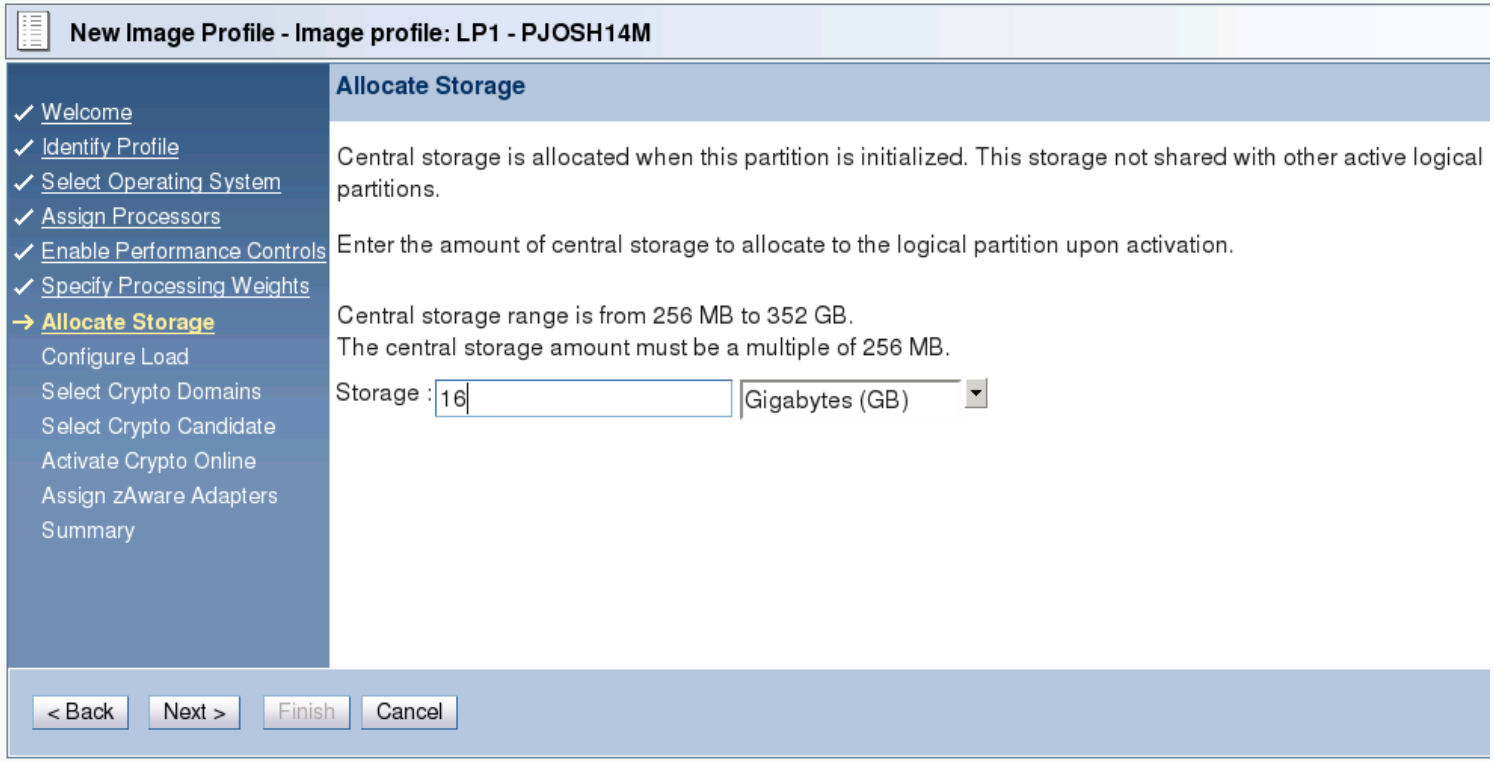
Defining the zAware Image Profile (Wizard) – Setting the Processors partition mode)

- You can use central processors or IFL processors
- You can use dedicated or shared processors
- Assign 2 processors to support monitored clients with message traffic up to 1500 messages per second.

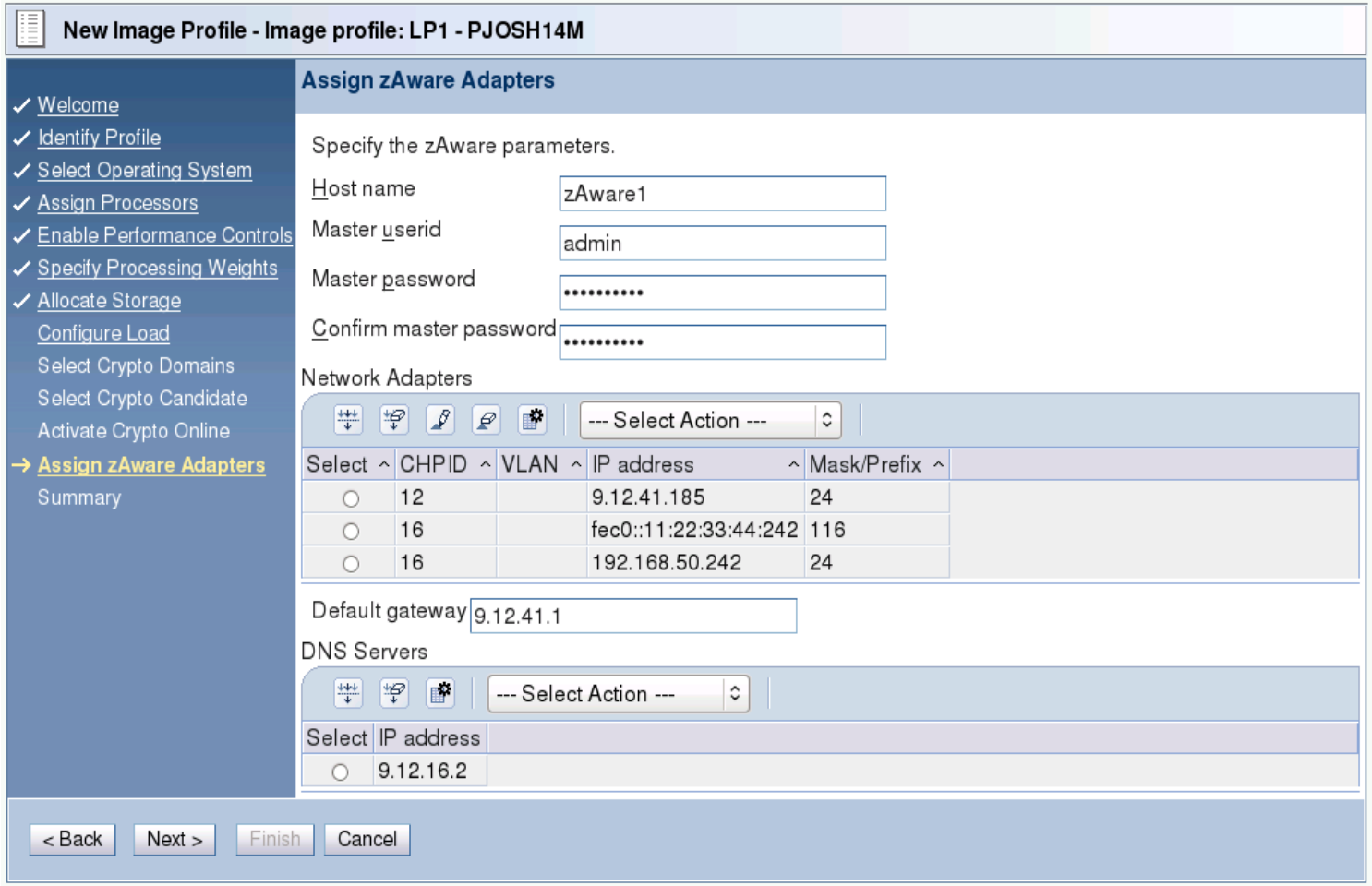


Defining the zAware Image Profile (Wizard) – Setting the Storage

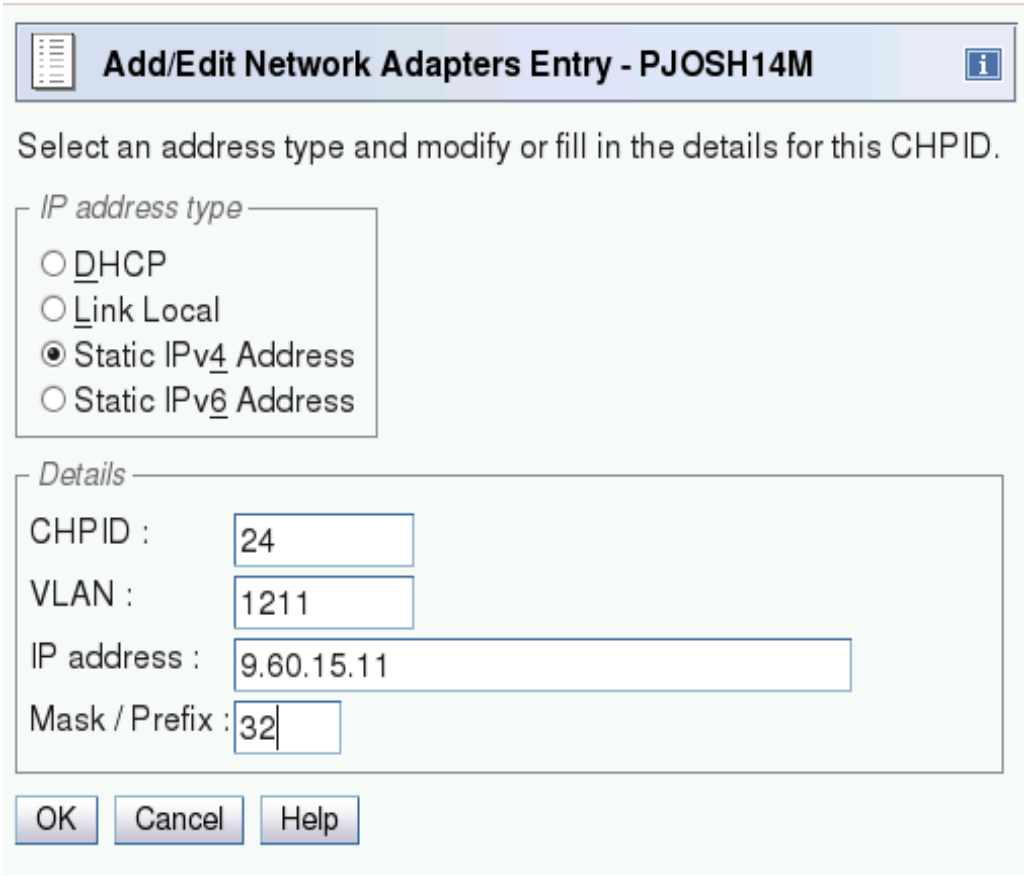
- Minimum storage for a zAware partition is 4096 MB (4 GB)
- 6144 MB (6 GB) is recommended for a small number of monitored clients (6 or less) with light message traffic (up to 500 messages/second)
- 11264 MB (11 GB) is recommended for message traffic up to 1500 messages/second.
- As with all performance recommendations, you may be able to reduce or have to increase the memory footprint for your specific situation.



Defining the zAware Image Profile (Wizard) – zAware specific parameters



Add new Network Adapter Entry (Wizard)



Add new DNS Entry (Wizard)

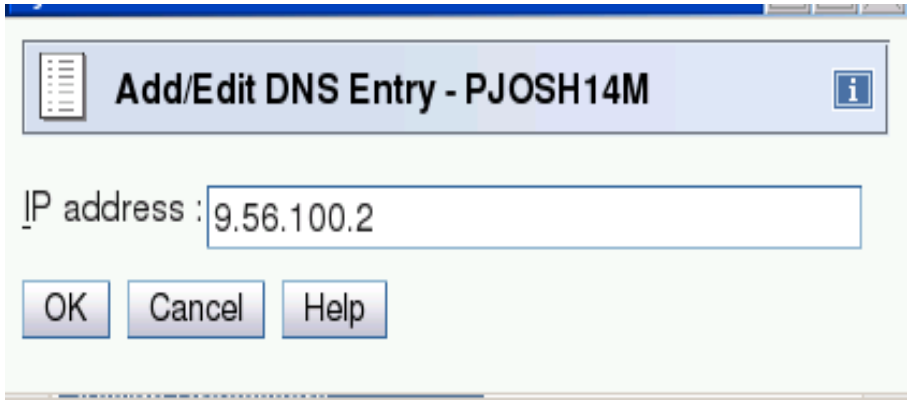
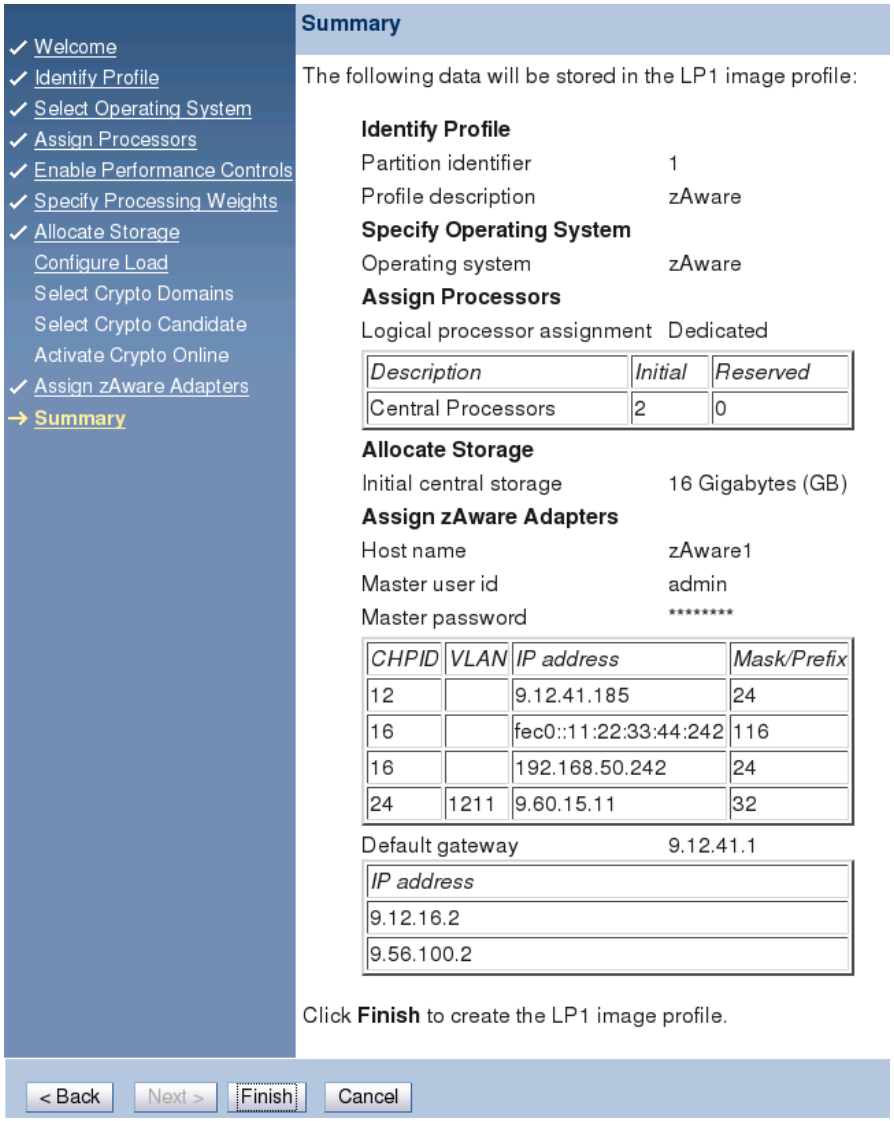
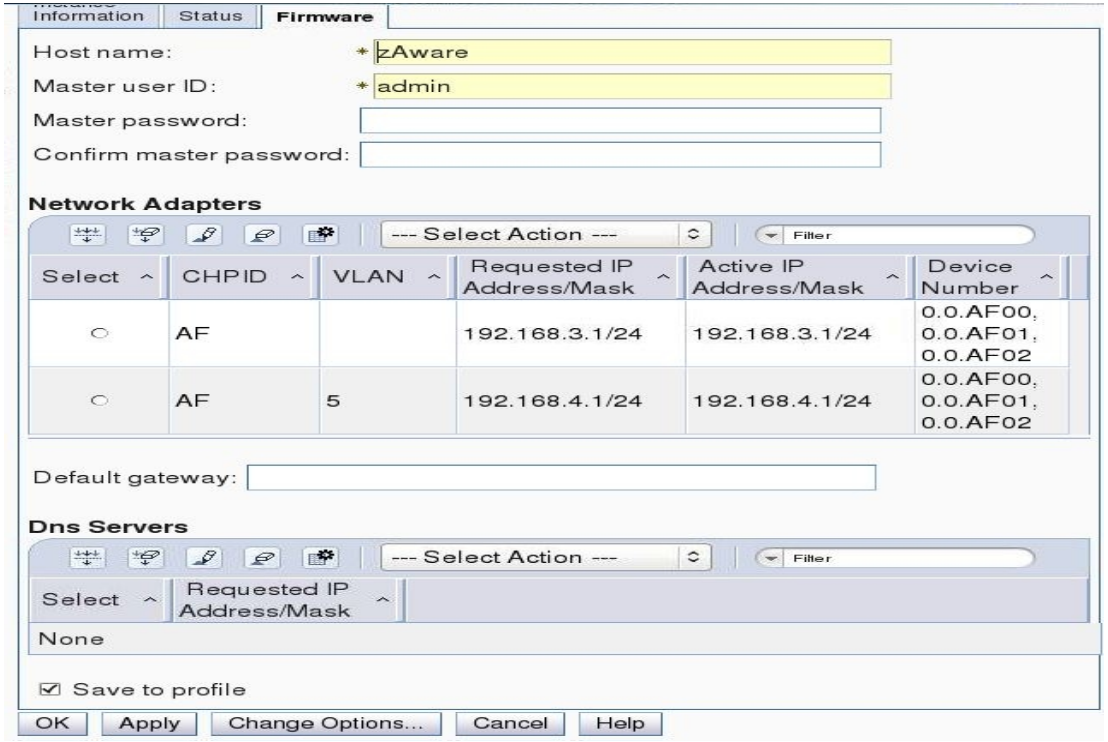


Image Profile Wizard Summary



Activate the Partition / Dynamic Changes to the zAware configuration

- Activate the partition using the **Activate** task, just like all other partitions.
- Dynamic changes to the zAware partition can be made by using a new tab on the image details:



- Running system always updated
- Can also update the image profile or not ("Save to Profile" checkbox)
- If you just want to change just the image profile, you must use the **Customize Activation Profiles** Task or equivalent (such as WebServices APIs).

APIs

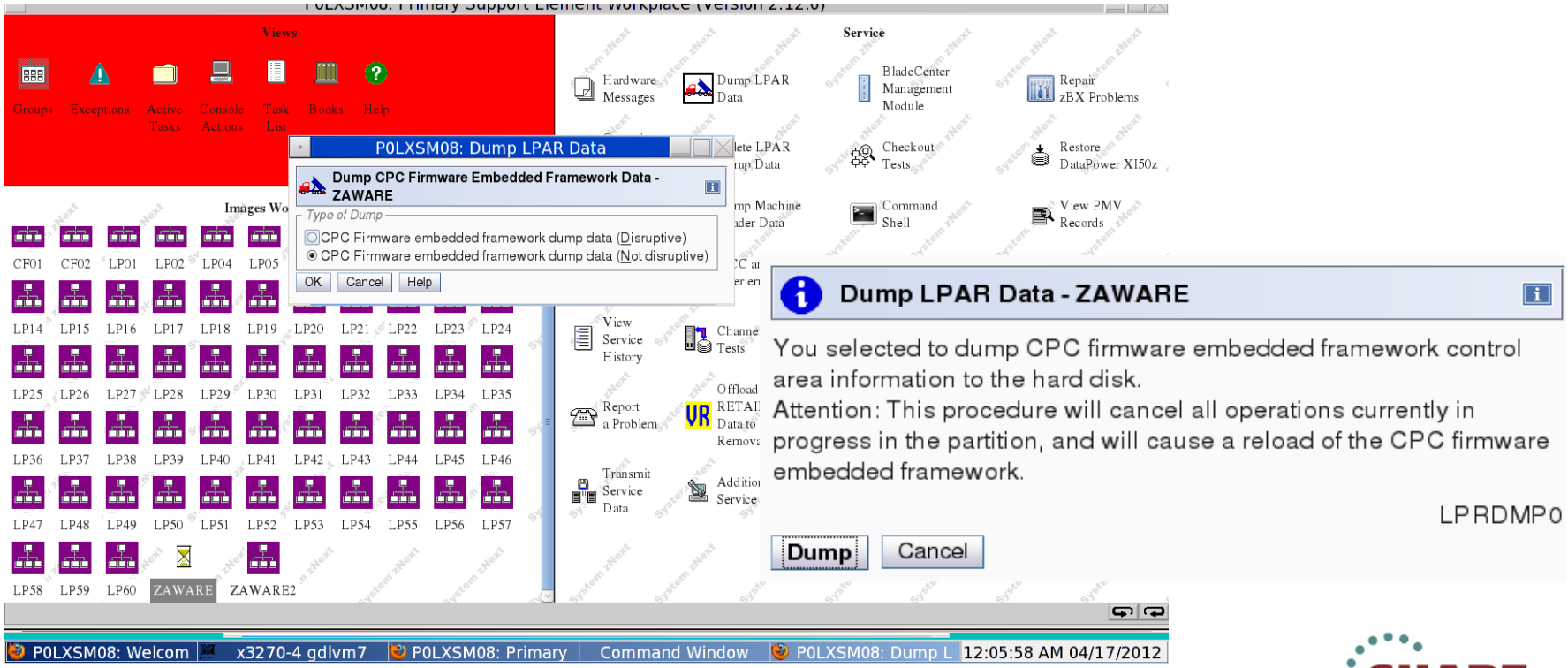
- API Support
  - WebServices APIs updated to fully support IBM zAware
  - SNMP API only updated to handle new zAware mode
  - CIMOM API only updated to handle new zAware mode

Security Log Updated for new IBM zAware image profile parameters


```
Profile name[11KZAWAR]
Profile type[Image]
Profile description[This is the default Image profile.]
Host name[zAwareHost]
Master userid[zAware.User-Id]
Master password[********]
Network Adapters[CHPID 0x44  VLAN 1944  DHCP]
Network Adapters[CHPID 0x44  VLAN 1171  Link Local]
Network Adapters (New)[CHPID 0xA1  IP Address 9.60.15.111/28]
Network Adapters[CHPID 0xA2  VLAN 8001  IP Address e111:d123:c98a:4::0/128]
Network Adapters[CHPID 0x44  VLAN 1877  Link Local]
Network Adapters (Old)[CHPID 0xA1  IP Address 9.60.15.111/30]
Default gateway[9.60.15.255]
DNS[9.0.0.0]
DNS[e111:d123::ffff]
Load Parameter[        ]
Load Address[00000]
Load Type[Clear]
```

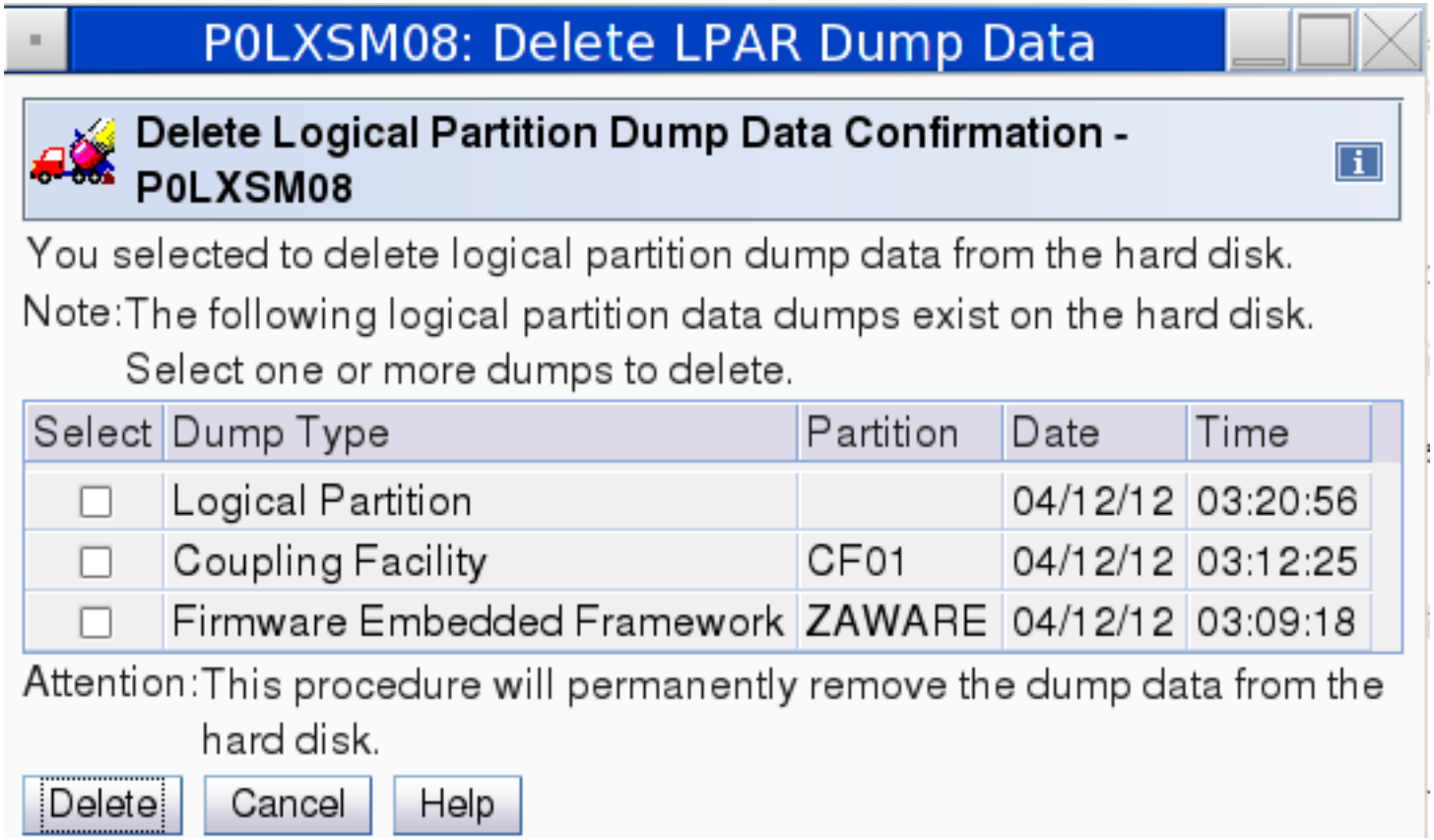
IBM zAware Dump

- Like a CF Dump, new zAware Dump support
- LPAR Dump Task
  - Concurrent
  - Disruptive



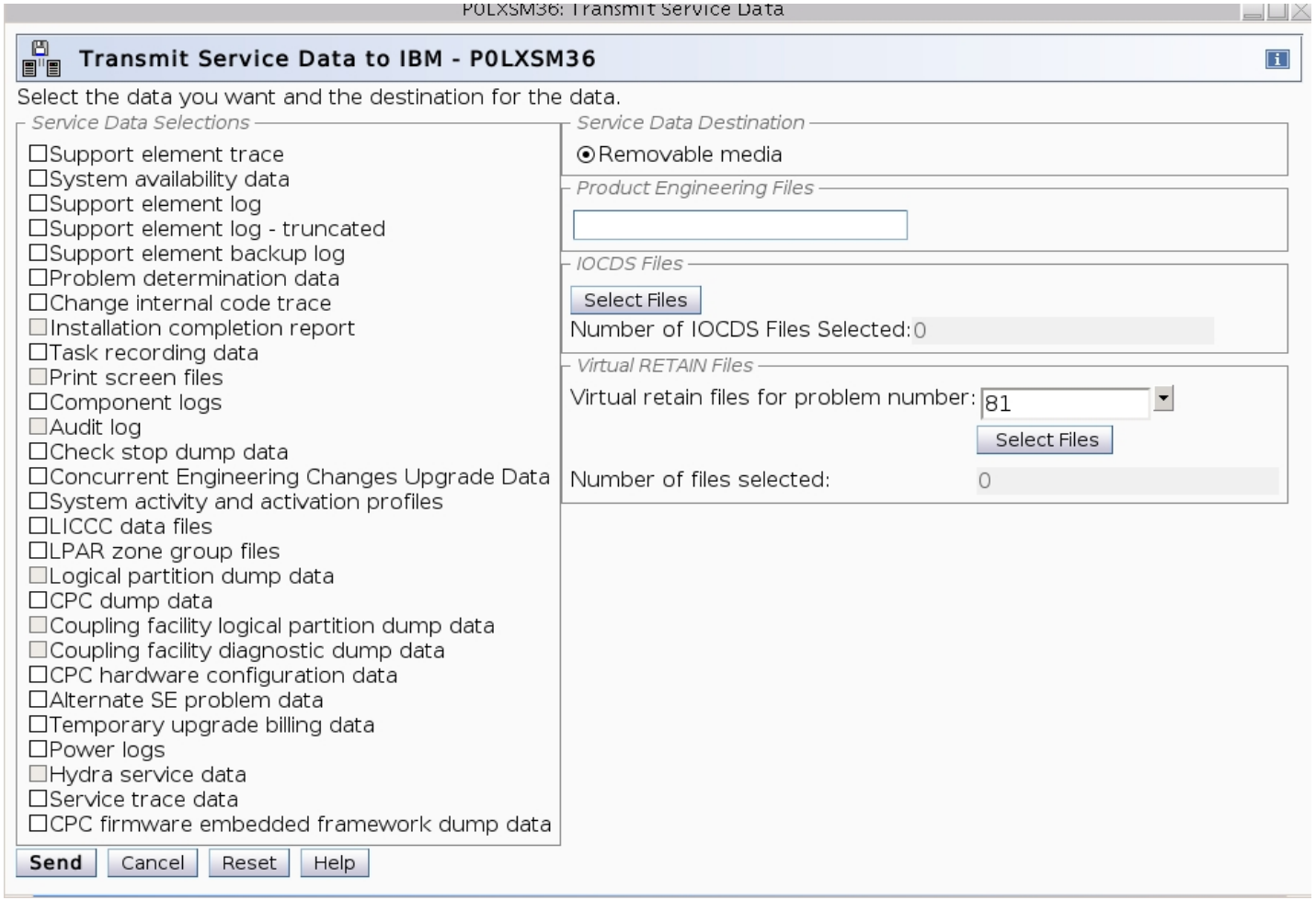
IBM zAware Dump

- Use the **Delete LPAR Dump Data** task to delete a zAware Dump



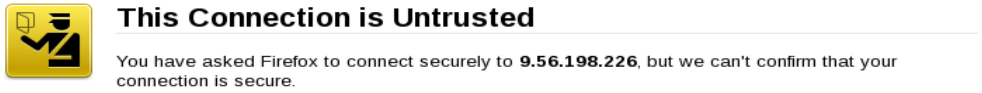
Transmit Service Data to IBM

- New Transmit Service Data to IBM (TSD) Task option to collect zAware Dump: Use the **CPC Firmware Embedded Framework Dump Data** option.

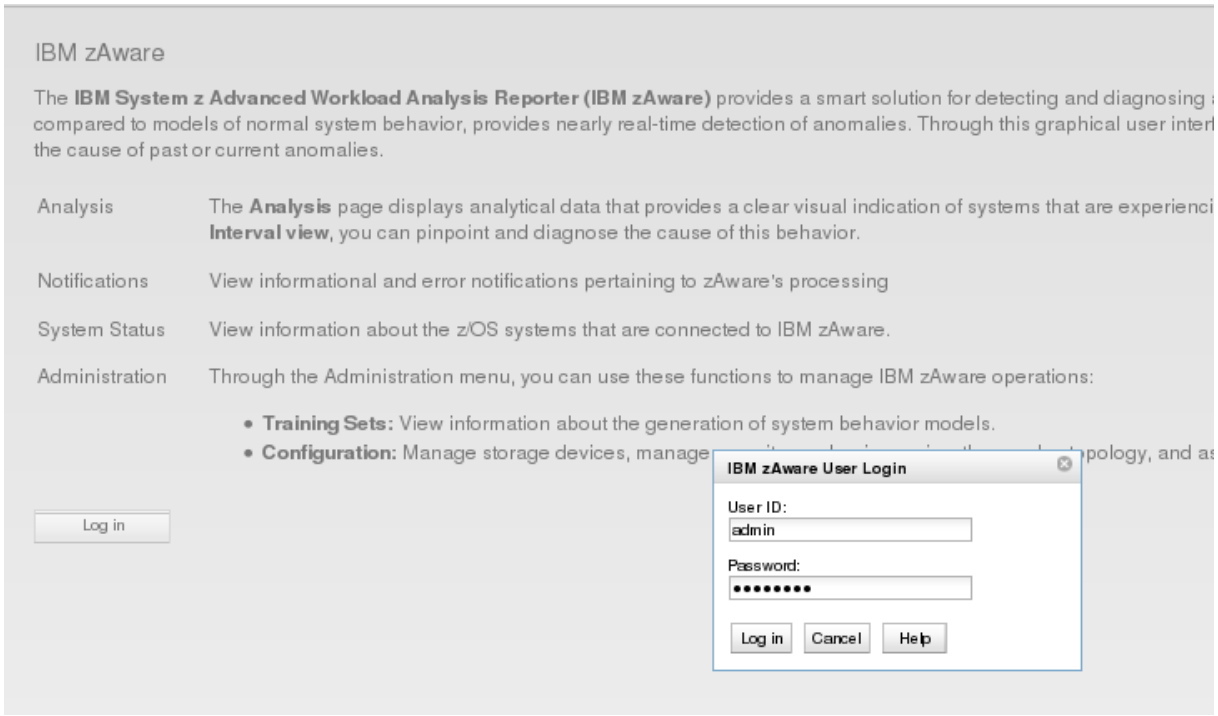


zAware Initial GUI login

- URL is https://*addr*/zAware
  - where *addr* is IP address from the image profile or hostname from the DNS entry
- If browser warns of the default SSL certificate, add a security exception

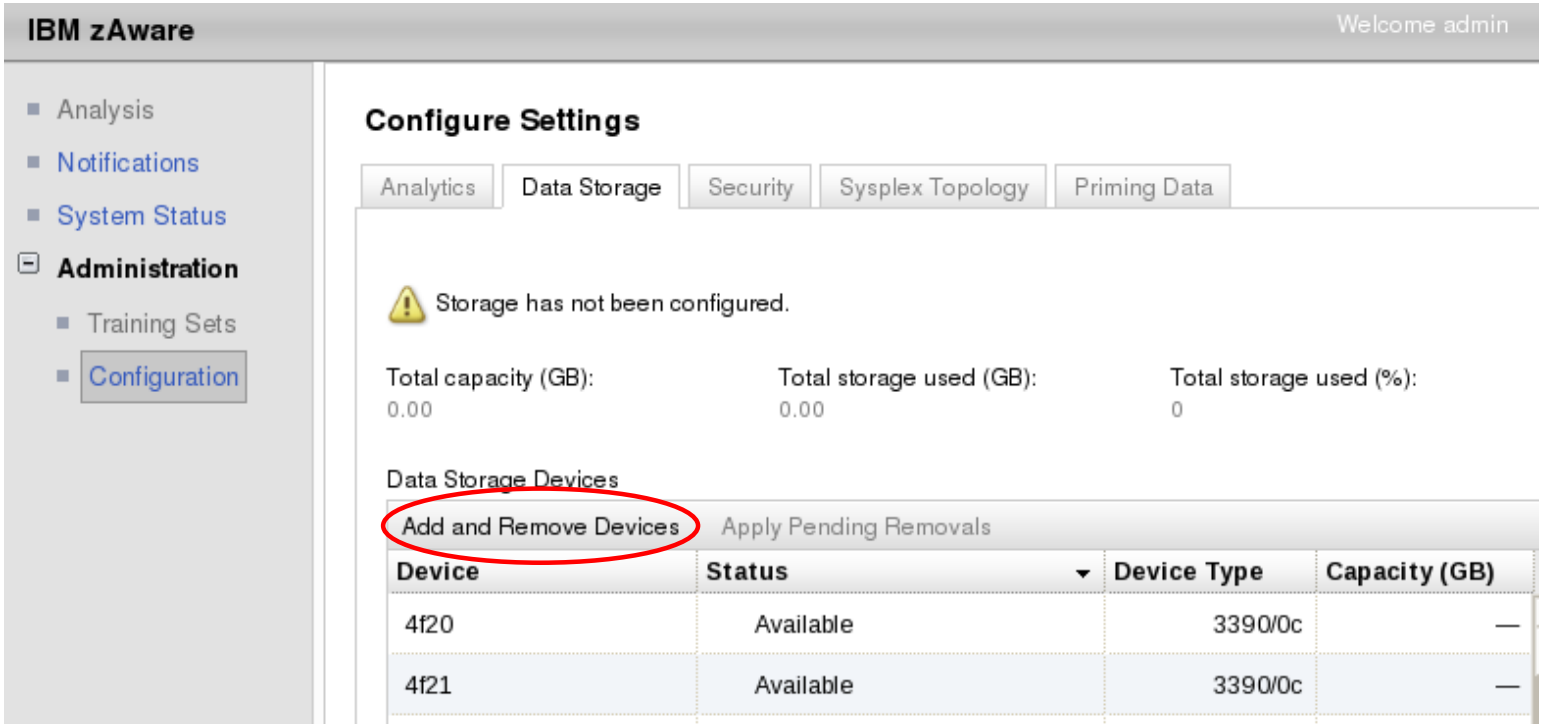


- Use default master userID and password

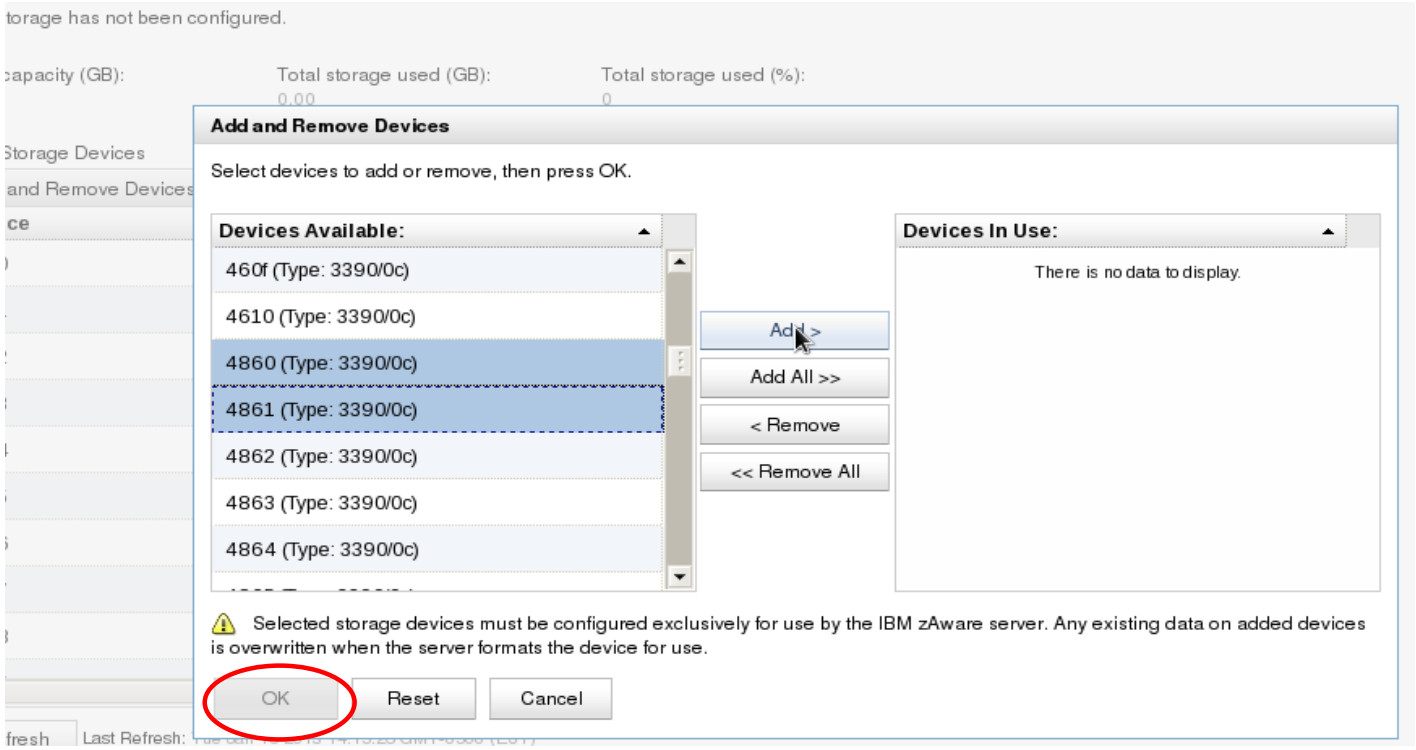


Storage assignment

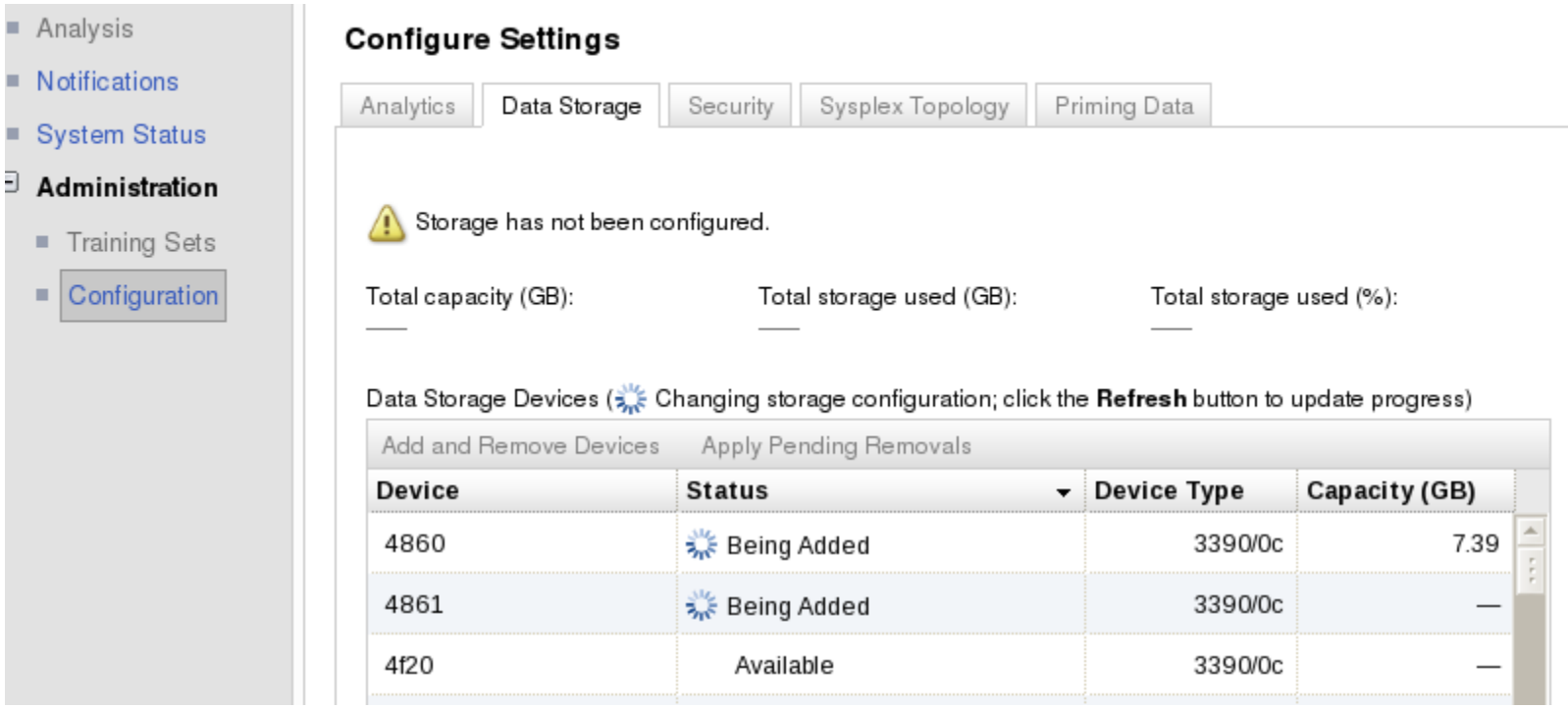
- ECKD DASD is required
- Add storage devices defined in the I/O configuration
- Devices must be exclusively for use by IBM zAware



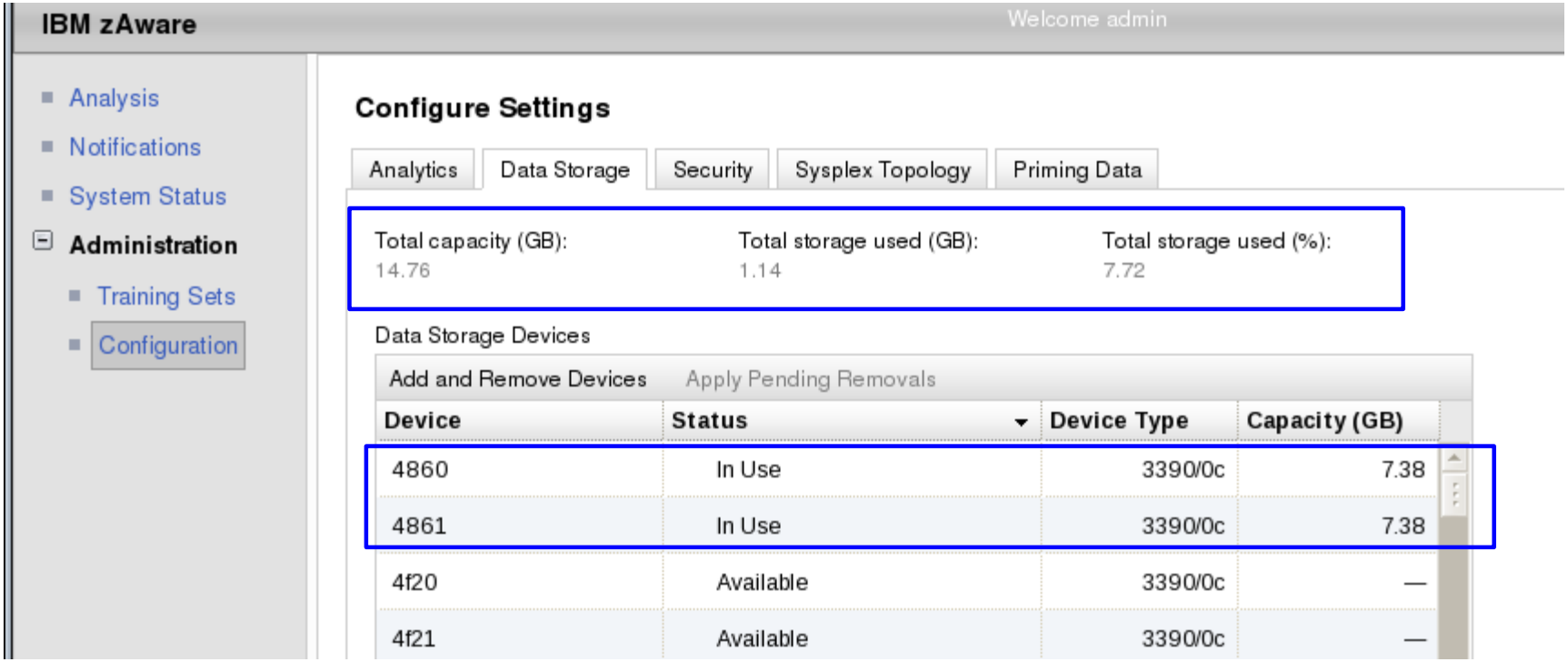
Storage assignment – add devices



Storage assignment – adding devices

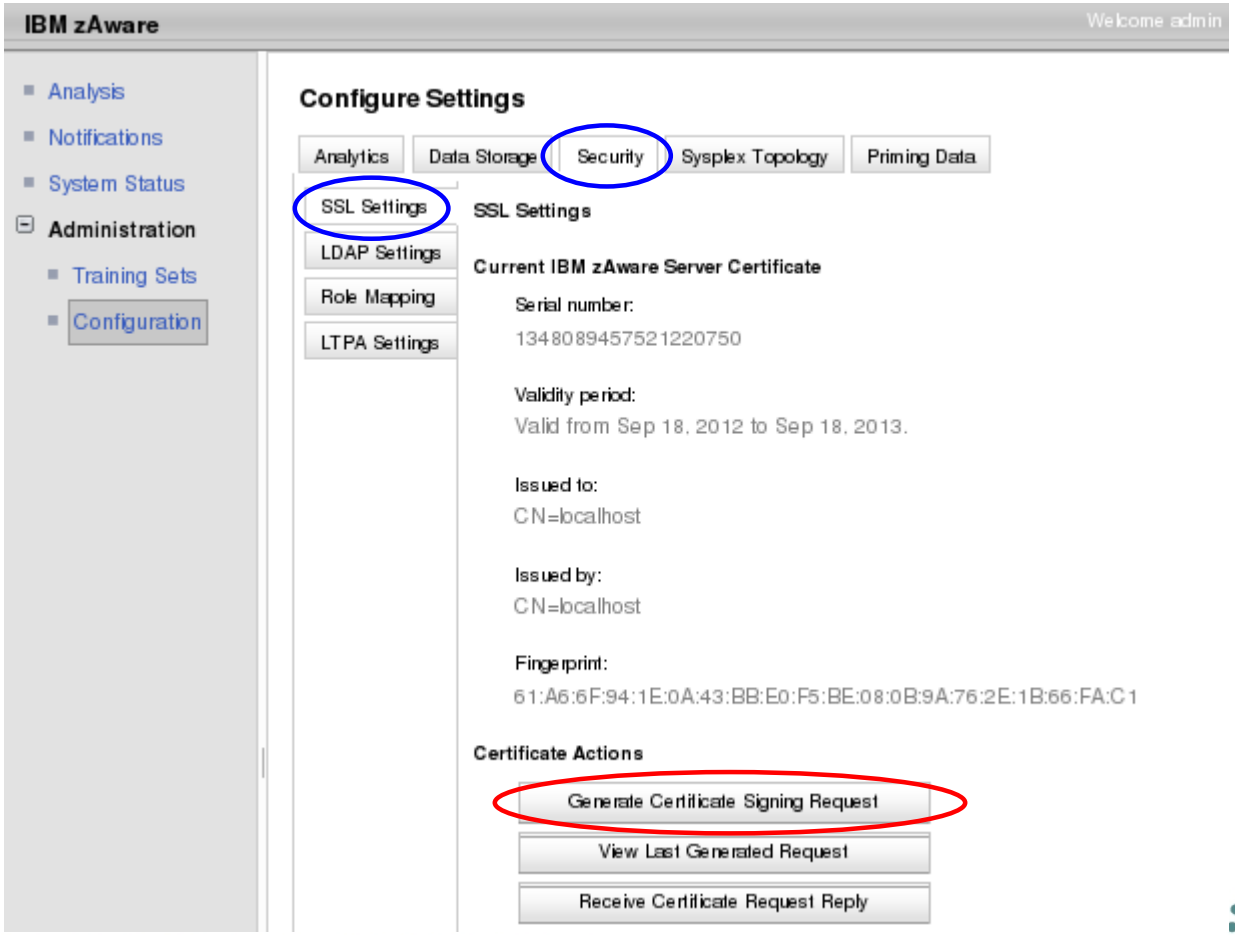


Storage assignment – complete



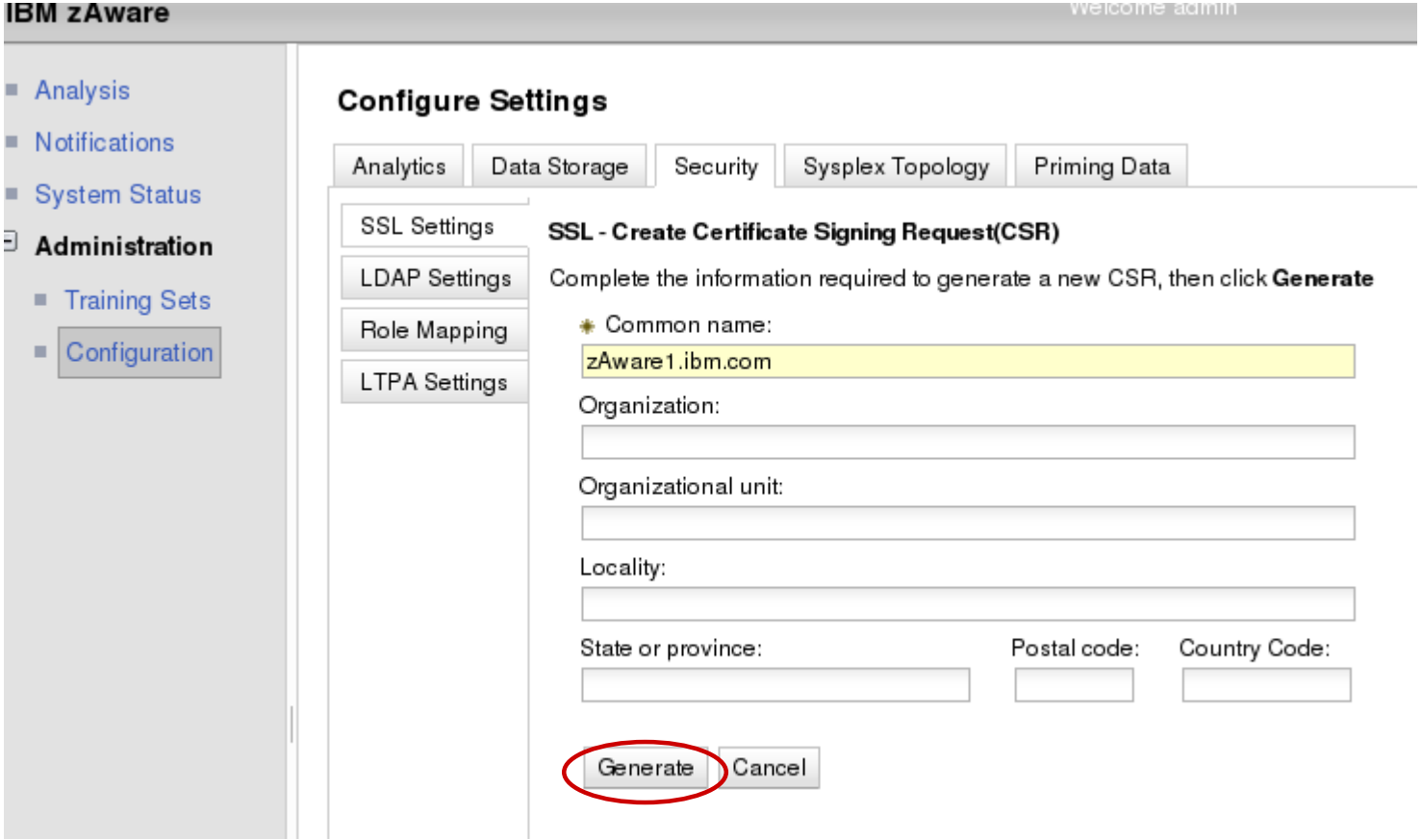
Security set up – SSL part 1

- To secure browser communication, request an SSL cert from a CA, and import it
- Generate Certificate Signing Request
- Copy CSR and send to the CA



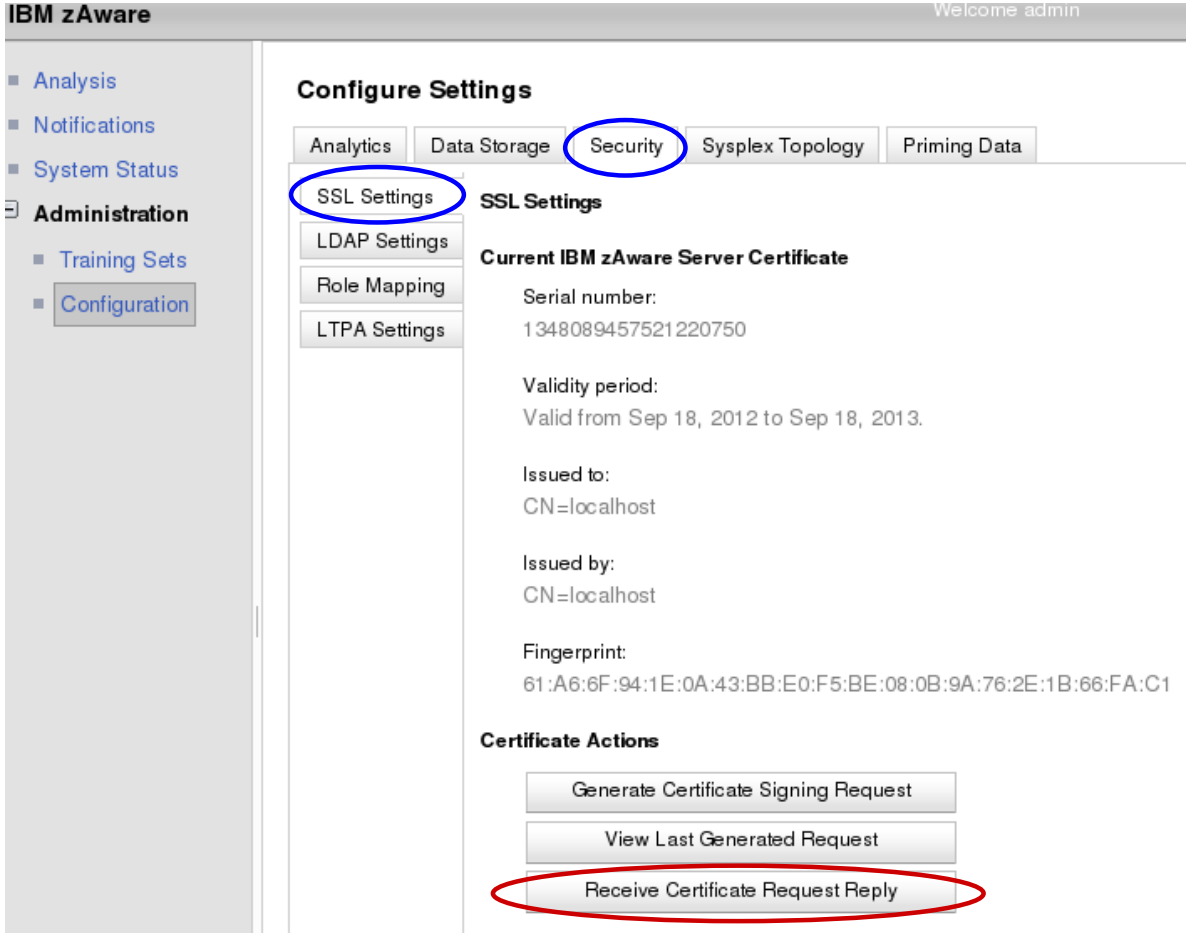
Security set up – SSL part 2

- Fill in the Common name with host name or IP addr of the zAware partition
- Use the **host name** or **IP address** from the image profile Firmware page



Security set up – SSL part 3

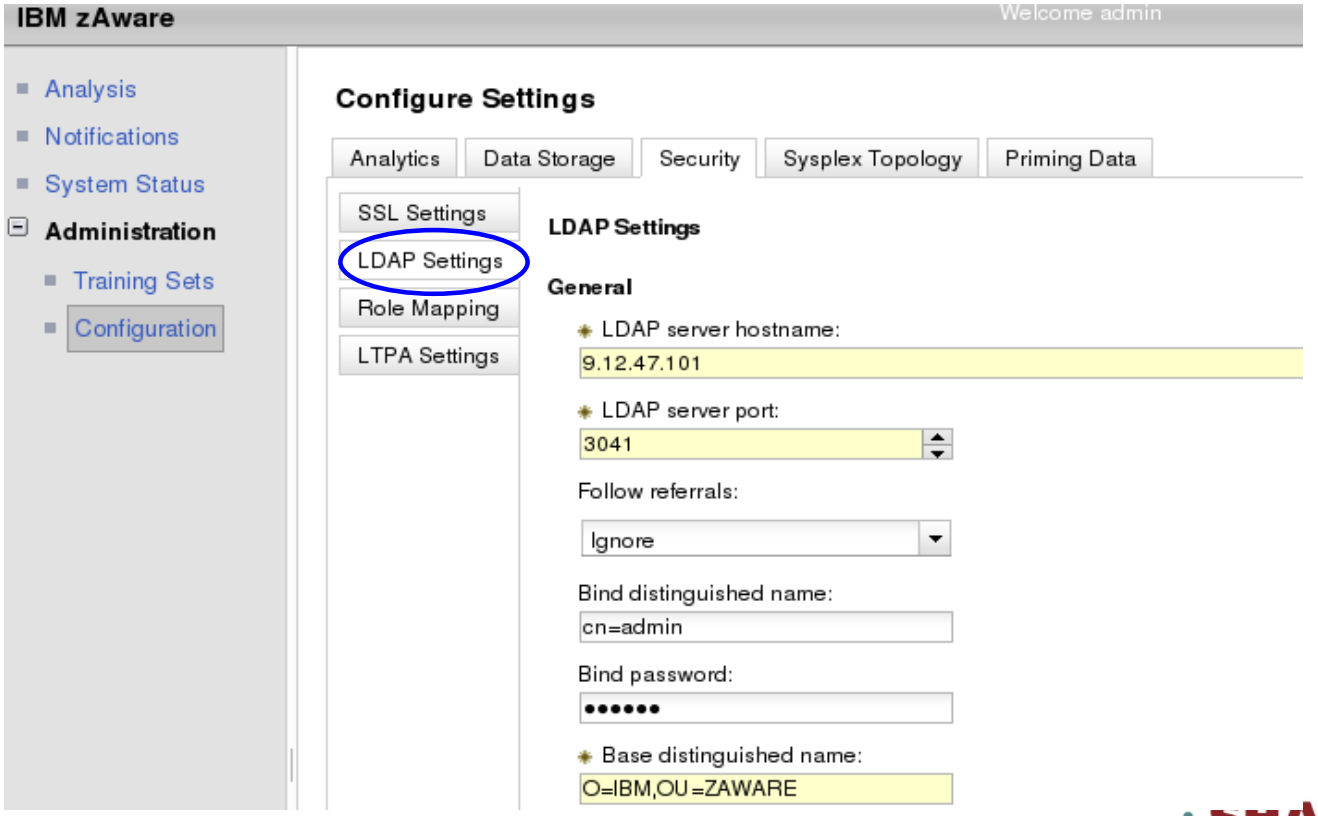
After the CA replies with a certificate, import it with Receive ...



- **Paste the reply** (include the entire chain) and click Receive

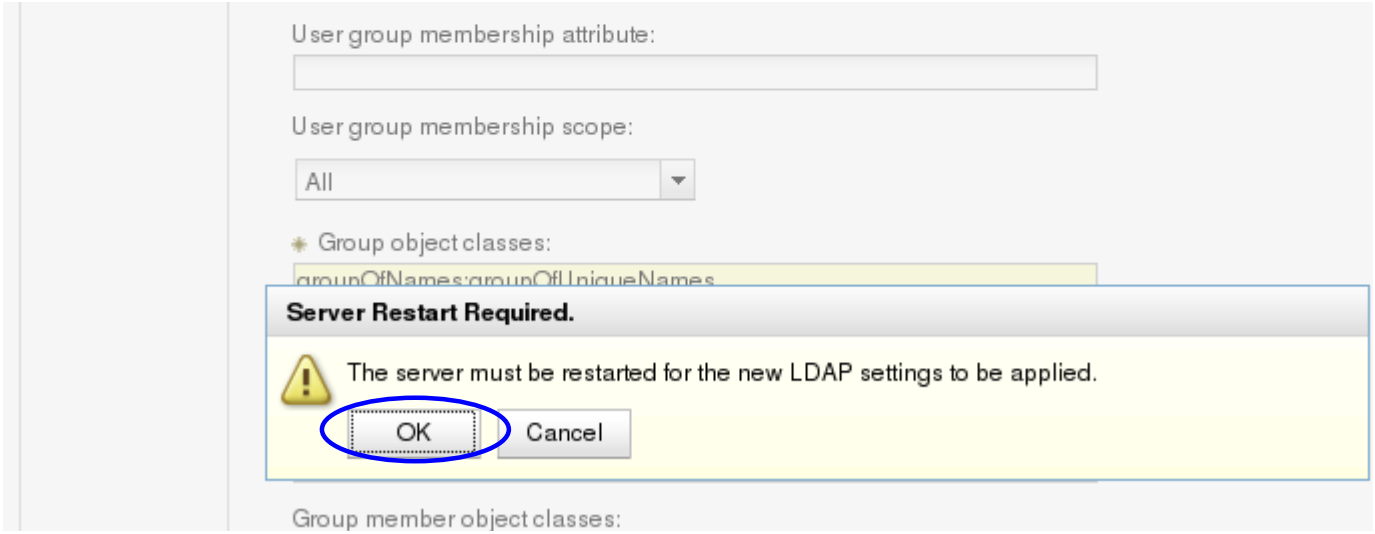
Security set up – LDAP

- User authentication via existing LDAP repository
  - Alternatively, use a local file-based repository
- General LDAP settings (from LDAP Admin)
- Group LDAP settings (from LDAP Admin)
- Apply



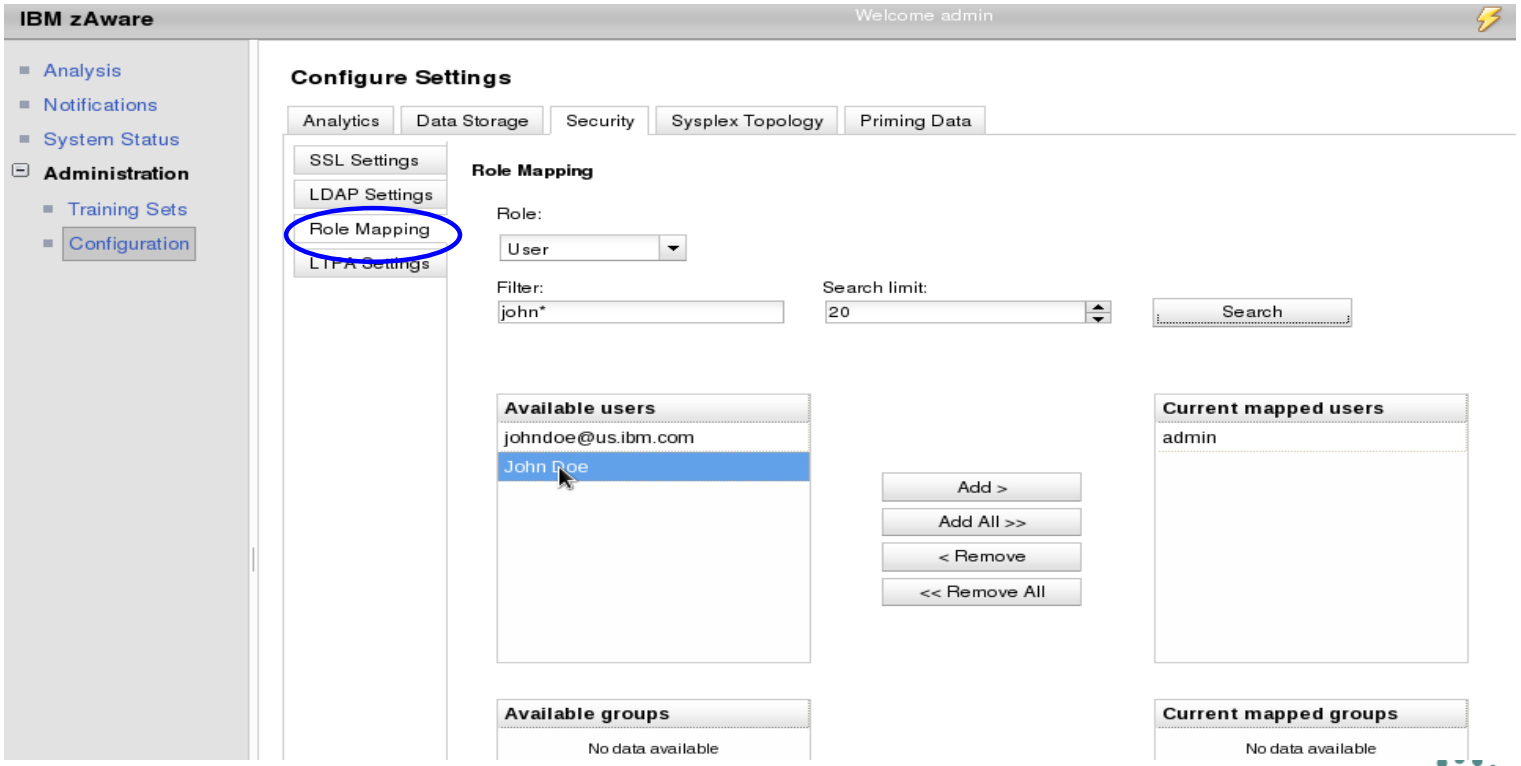
Security set up – LDAP

- Apply, then confirm zAware server restart
- The GUI will be unavailable while restarting



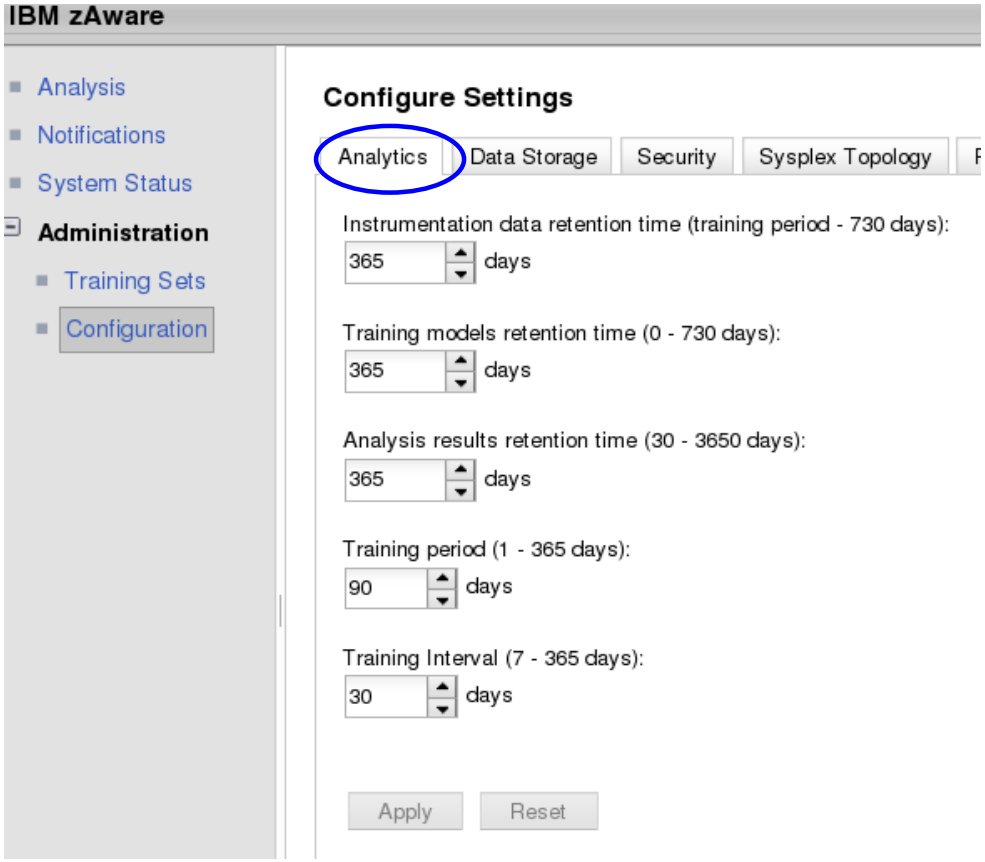
Security set up – Role Mapping

- Search
- Add users or groups to Admin or User role
- Apply
- Confirm zAware server restart



Analytics configuration

- Defaults should be good for most
- Retention times will affect DASD usage
  - Check the Data Storage capacity and usage periodically



Operating Requirements - z/OS Monitored Clients

- System z servers supported as IBM zAware monitored clients
  - *zEC12*
  - *IBM zEnterprise™ 196 (z196) or z114,*
  - *IBM System z10™ EC or BC*
  - *Prior generations that meet the OS and configuration requirements*

- Running z/OS 1.13 + PTFs
  - *APAR OA38747*
  - *APAR OA38613*
  - *APAR OA39256*

- System needs to be configured as a monoplex, system in a multisystem sysplex, or a member of a parallel sysplex
- Using operations log (OPERLOG) as the hardcopy medium
- Sysplex name + system name must uniquely identify system
- Requires an OSA or HiperSocket for IP network connection

z/OS monitored system set up

- Configure network connection to zAware
  - TCP/IP profile, DNS, Resolver, firewall settings
- **D XCF** to confirm MONOPLEX or MULTISYSTEM
- **D CONSOLES** to confirm OPERLOG hardcopy
  - set in CONSOLxx

- Configure z/OS logger to send data to zAware
  - Give IXGLOGR a z/OS UNIX segment for TCP/IP connectivity
    - ADDUSER IXGLOGR OMVS(UID(xxxx) HOME('/'))
  - From a user with SAF update access to IXGZAWARE_CLIENT resource in the FACILITY class
    - Create **IXGCNFxx** parmlib member for logger
    - Add **IXGCNF=xx** to IEASYSxx parmlib member

z/OS monitored system - logger config

- **IXGCNFxx** parmlib member contains system logger values

The **ZAI** statement contains parameters for IBM zAware

- **SERVER(***host_name***|***IP_address***)**

  Specifies the host name or IP address of IBM zAware server
- **PORT(***number***)**

  Port number IBM zAware server is using. Port must be 2001
- **LOGBUFMAX(***value***)**

  Maximum amount of storage buffers (GB) to be used by system logger to manage data that is being sent to the IBM zAware server
- **LOGBUFWARN(***nn***)**

  Percent of used buffer space to trigger warning message
- **LOGBUFFULL(MSG|QUIESCE)**

  Action system logger is to take when the log stream buffers are full

Sample in **SYS1.SAMPLIB(IXGCNFXX)**

- Update the OPERLOG log stream to add:
  - **ZAI(YES)**
  - **ZAIDATA('OPERLOG')**

z/OS monitored system - logger config

- **SET IXGCNF=xx** to dynamically pick up the logger settings
- **DISPLAY LOGGER,STATUS,ZAI,VERIFY** to verify the config

```
ZAI LOGSTREAM CLIENTS: AVAILABLE
BUFFERS IN USE: 00 GB 0000 MB
ZAI VERIFY INITIATED, CHECK FOR MESSAGES IXG37X, IXG38X
     ...
IXG380I ZAI LOGSTREAM CLIENT ESTABLISHED
FOR DISPLAY ZAI,VERIFY
```

- Start sending to zAware Also, defines the *plex.system* to zAware

SETLOGR FORCE,ZAICONNECT,LSNAME=SYSPLEX.OPERLOG

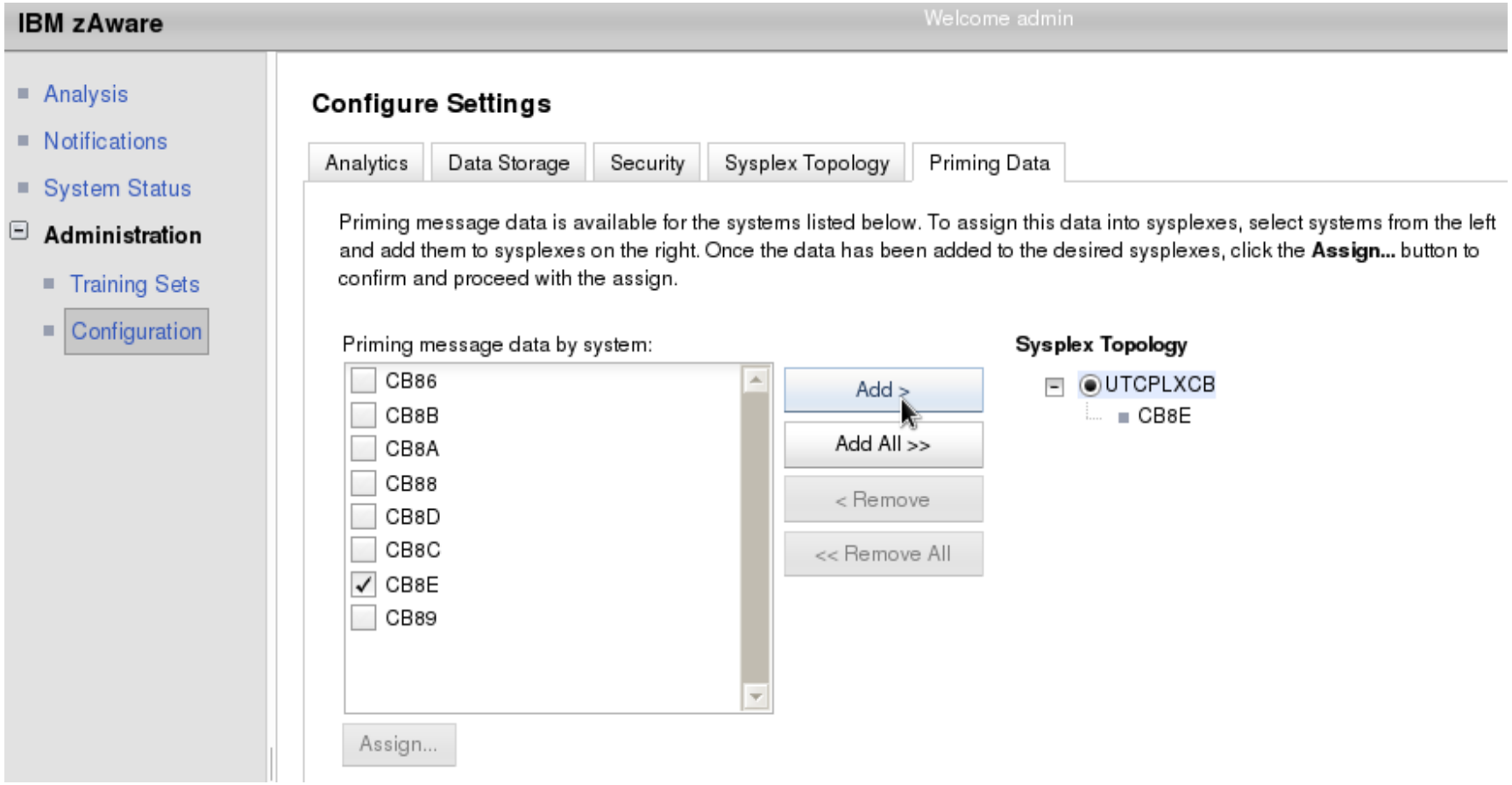
```
IXG651I SETLOGR FORCE ZAICONNECT COMMAND ACCEPTED FOR
  LOGSTREAM=SYSPLEX.OPERLOG
IXG386I ZAI LOGSTREAM CLIENT CONNECT ATTEMPT IN PROGRESS FOR LOGSTREAM
  SYSPLEX.OPERLOG
STATUS: ATTEMPTING SOCKET CREATE
     . . .
IXG380I ZAI LOGSTREAM CLIENT ESTABLISHED FOR LOGSTREAM SYSPLEX.OPERLOG
```

Priming zAware – Bulk Load from z/OS

- Prior SYSLOG data may be sent to IBM zAware
- Reduces the time to build a model, and begin analysis
- Data sets should not exceed 90 days earlier than today
- Bulk load may be run from any z/OS system configured for IBM zAware
- Copy SYS1.SAMPLIB(AIZBLK) JCL to your JCL and modify
  - See instructions in the file
- Copy SYS1.SAMPLIB(AIZBLKE) REXX to your SYSEXEC
- Run bulk load for a small set of data to verify config
- Run bulk load for one plex at time

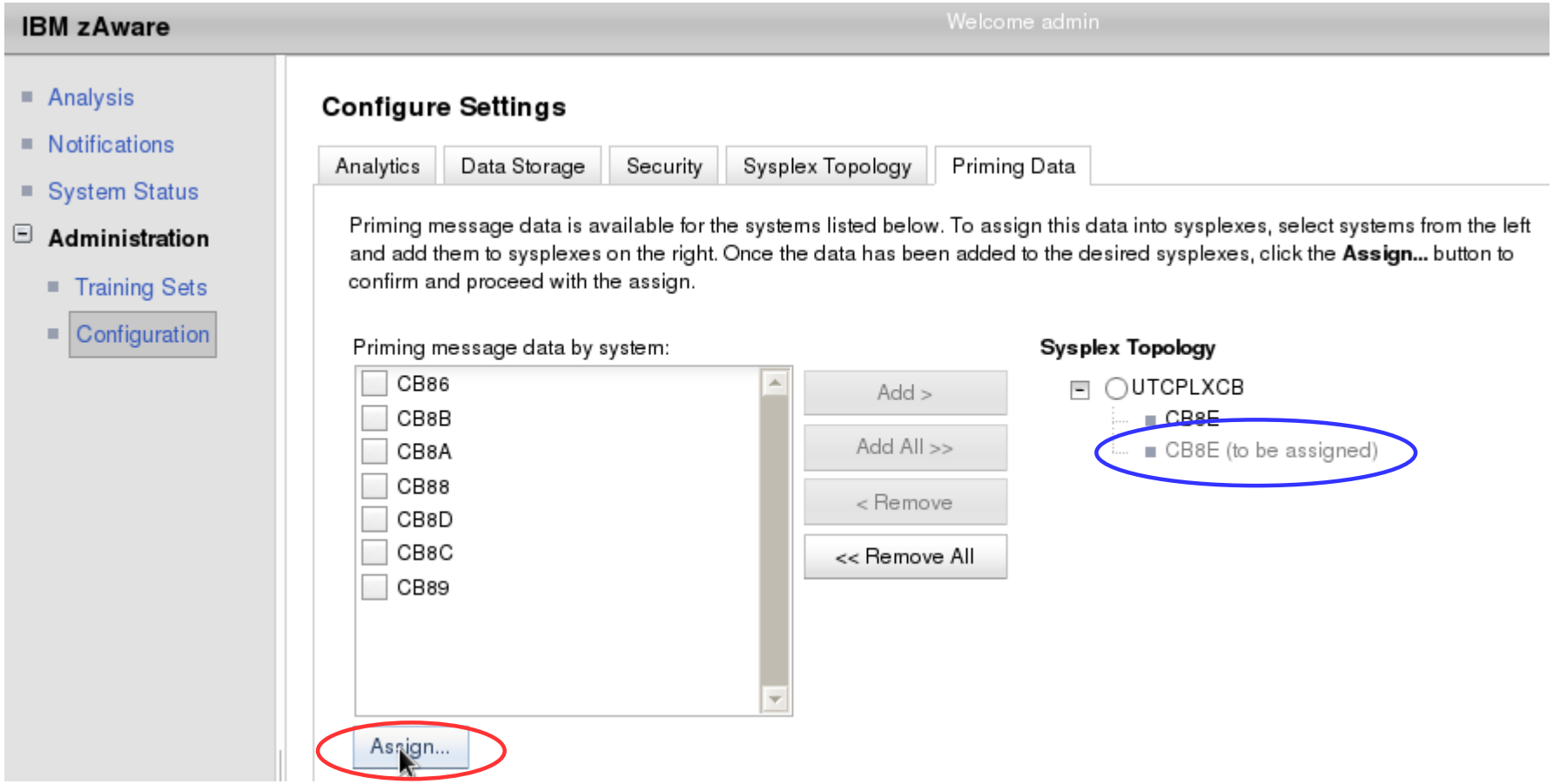
Priming zAware – zAware GUI – part 1

- Recommended bulk load all logs before assigning
  - Connections are terminated during assignment

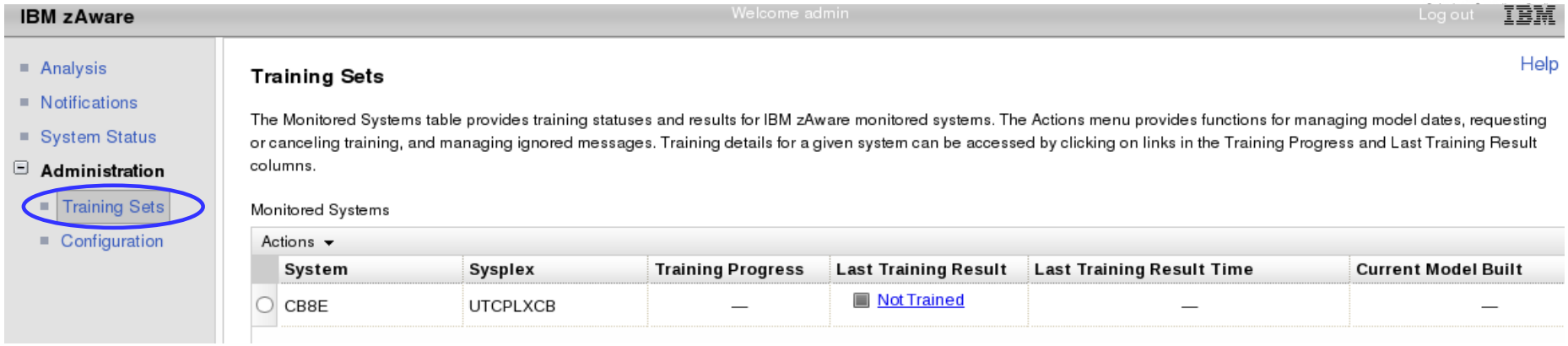


Priming zAware – zAware GUI – part 2

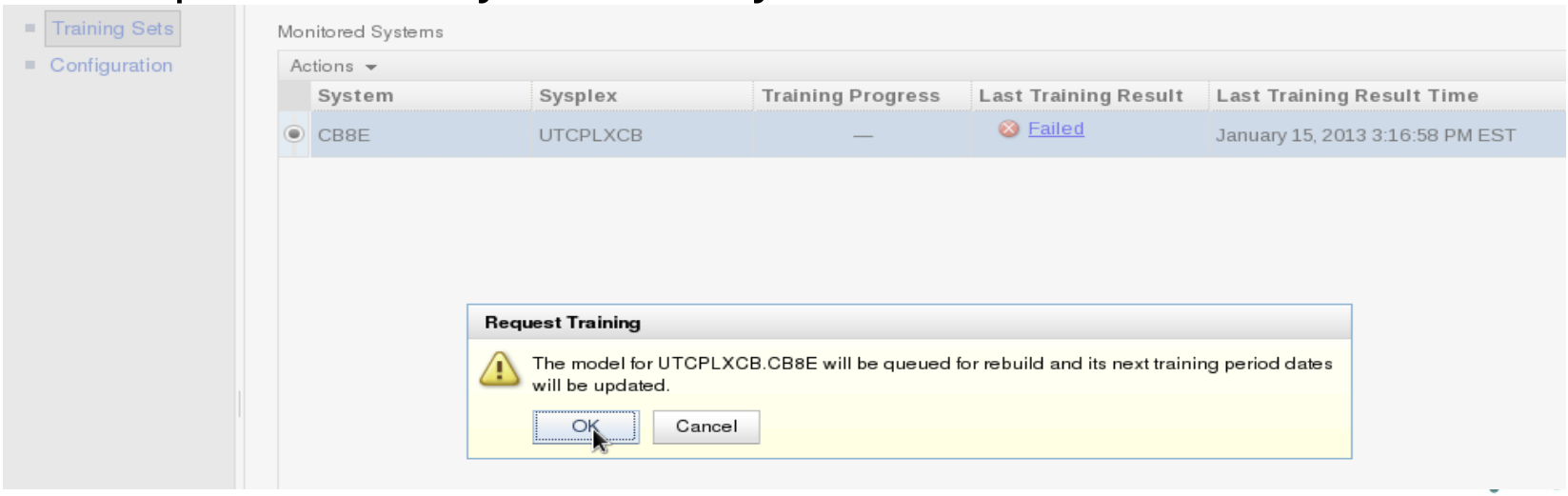
- Assign, then confirm disconnect of all systems
- Usually logger reconnects automatically



Training a model

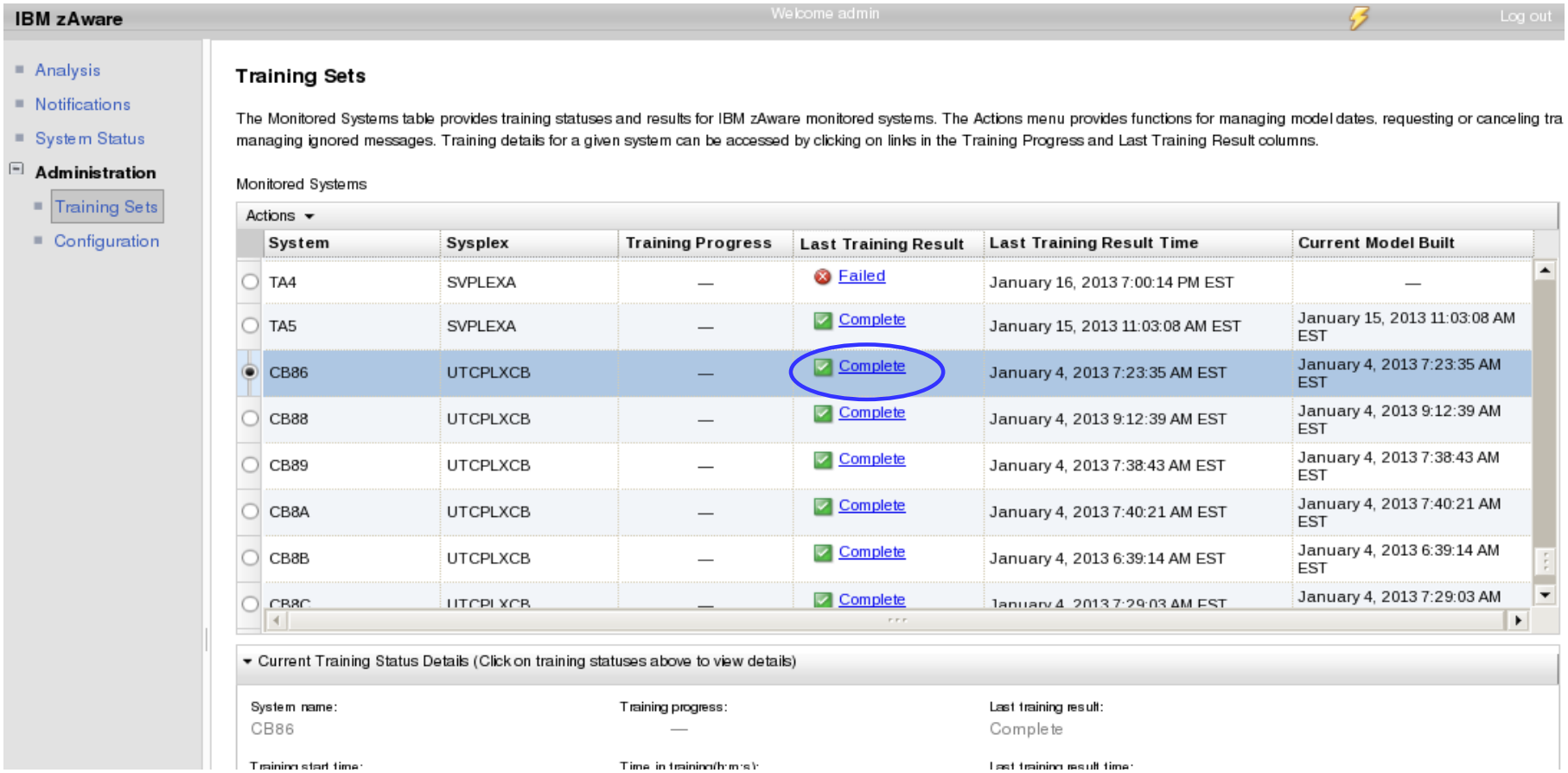


- Actions > Request Training
  - processed asynchronously



Training complete

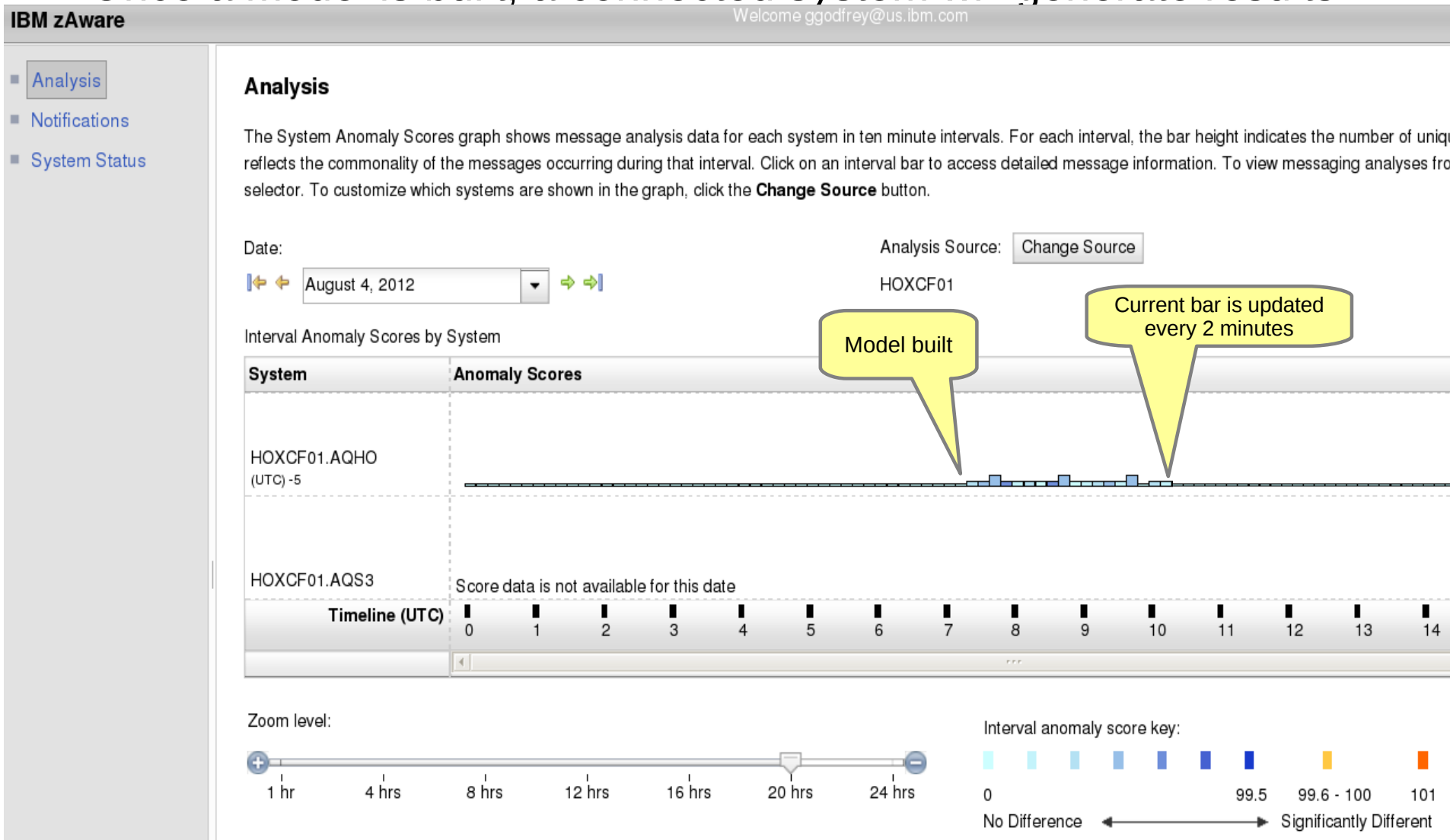
- After more systems have connected and trained



- Failed training is typically due to too few unique messages. Check the Notifications.

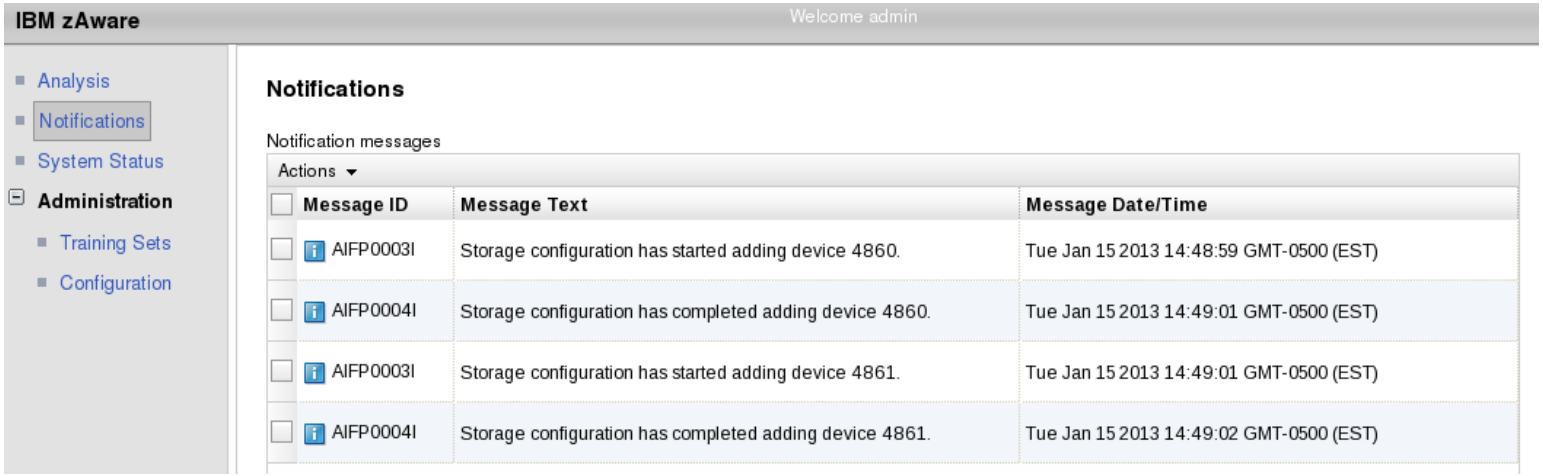
Analysis results

- Once a model is built, a connected system will generate results



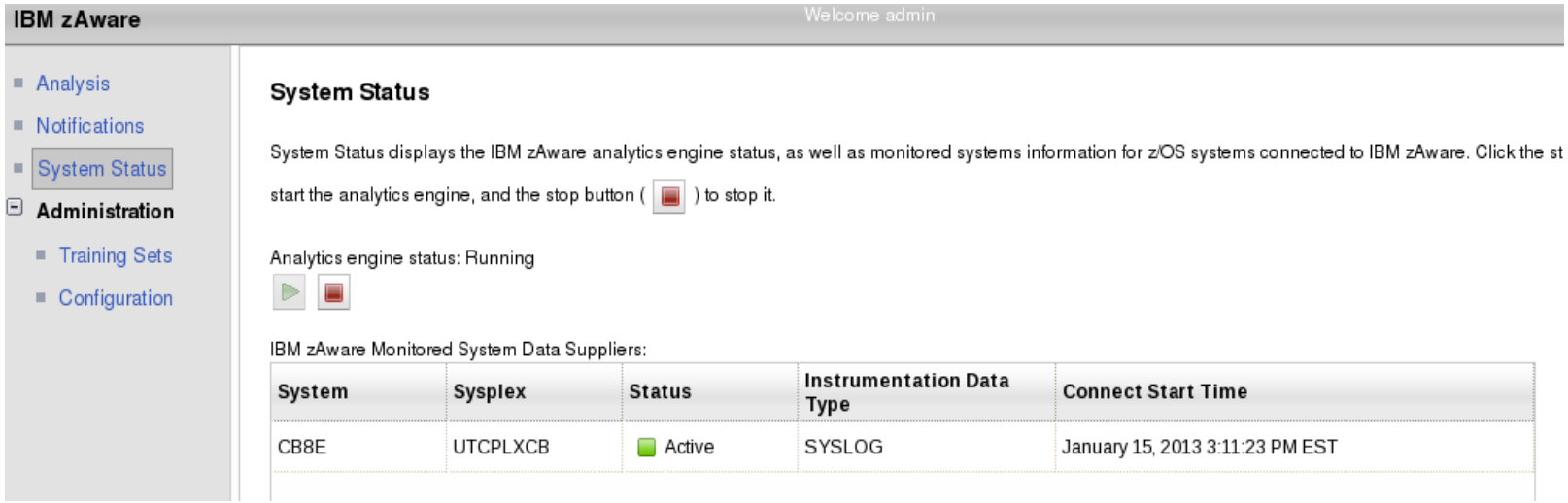
Notifications

- Notifications
  - zAware messages for asynchronous events
    - Storage, Training, Bulk load, ...
  - Viewable by all users
  - Persistent, until removed by an admin
  - New ones indicated by  in header

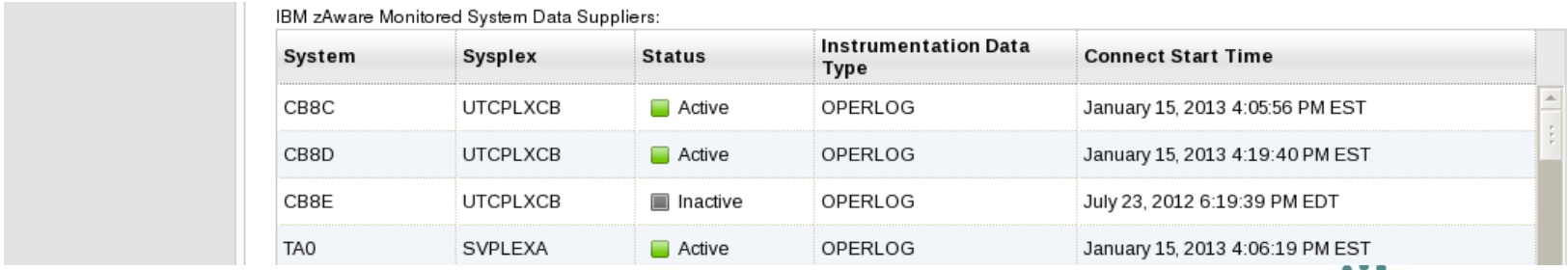


Connection status

- System status of monitored systems
  - Bulk load in progress



  - Normal operation



You should now understand the steps to set up IBM zAware.

Questions?

Primary References

- IBM System z Advanced Workload Analysis Reporter (IBM zAware) Guide
  - SC27-2623-00
  - http://www.ibm.com/systems/z/os/zos/bkserv/r13pdf/#E0Z
    or
  - IBMResourceLink Library → zEC12 → Publications

- Redbook: Extending z/OS System Management Functions with IBM zAware
  - SF24-8070-00

- z/OS 1.13 MVS Setting Up a Sysplex SA22-7625-22

Additional References

- Available from “Books” group of Classic Style UI and the Welcome page of the Tree Style UI (& IBM Resource Link: Library->zEC12->Publications)
  - IBM SC28-6919: Hardware Management Console Operations Guide (Version 2.12.0)
  - IBM SC28-6920: Support Element Operations Guide (Version 2.12.0)
  - IBM SB10-7030: Application Programming Interfaces
  - IBM SC28-2605: Capacity on Demand User’s Guide
  - IBM SB10-7154: Common Information Model (CIM) Management Interfaces
  - IBM SB10-7156: PR/SM Planning Guide
  - IBM SA22-1088: System Overview

- Available from IBM Resource Link: Library->zEC12->Technical Notes
  - System z Hardware Management Console Security
  - System z Hardware Management Console Broadband Remote Support Facility
  - System z Activation Profile Update and Processor Rules

Registering for IBM Resource Link Access

- Registering for IBM Resource Link Access
- To view the documents on the Resource Link Web site. you need to register your IBM Registration ID (IBM ID) and password with Resource Link.
- To register:
  - Open the Resource Link sign-in page: http://www.ibm.com/servers/resourcelink/
  - You need an IBM ID to get access to Resource Link.
    - If you do not have an IBM ID and password, select the "Register for an IBM ID" link in the "Your IBM Registration" menu. Return to the Resource Link sign-in page after you get your IBM ID and password.
    - Note: If you're an IBM employee, your IBM intranet ID is not an IBM ID.
  - Sign in with your IBM ID and password.
  - Follow the instructions on the subsequent page.

#SHAREorg

SHARE
Technology · Connections · Results

Setting up IBM zAware - Step by Step

Garth Godfrey
IBM
ggodfrey@us.ibm.com

Tom Mathias
IBM
mathiast@us.ibm.com

Feb 6, 2013 - Session 13066

Please fill out the online session evaluation at either:

SHARE.org/SanFranciscoEval, or

Aim your smartphone at this QR code below:

SHARE in San Francisco 2013