



# IBM System z Hardware Management Console (HMC) 2.12.1

**March 11, 2014**

*SHARE in Anaheim*

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*File Updated: 03-05-14*

IBM Systems

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**SHARE Session 15101**

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## HMC System support

- **The new HMC Version 2.12.1 will support the systems/SE (Support Element) versions shown in the table.**
  - ▶ **9672 G5/G6 (Driver 26, SE version 1.6.2) systems are no longer supported.**
  
- **User Interface**
  - ▶ **Classic and Tree styles continue to be supported.**

<b>Machine Family</b>	<b>Machine Type</b>	<b>Firmware Driver</b>	<b>SE Version</b>
zBC12	2828	15	2.12.1
zEC12	2827	15	2.12.1
z114	2818	93	2.11.1
z196	2817	93	2.11.1
z10 BC	2098	79	2.10.2
z10 EC	2097	79	2.10.2
z9 BC	2096	67	2.9.2
z9 EC	2094	67	2.9.2
z890	2086	55	1.8.2
z990	2084	55	1.8.2
z800	2066	3G	1.7.3
z900	2064	3G	1.7.3

# Browser Support

- The Internal Console Browser (Firefox) is considerably newer, so there might be a slightly different feel to the local HMC, SE, TKE console panels.

<u>Remote Browser</u>	HMC 2.12.1	HMC 2.12.0
<b>IE (Internet Explorer)</b>	Version 8, 9, & 10	Version 8 & 9
<b>Firefox</b>	Version 17.5 & 21	Version 10
<b>Google Chrome</b>	Version 26	Version 20

*New Browser Support on HMC 2.12.0 !!!*



## HMC 2.12.1 - RSF Infrastructure Changes

- ▶ **Introduction of enhanced IBM Support System** for RSF (Remote Support Facility) call-home
  - Modernizing IBM support infrastructure for **capacity and reliability**
  - Scope of supported functions in HMC 2.12.1 limited to:
    - Problem Management (report, transmit service data, problem close via repair)
    - Transmit System Availability Data (scheduled operation)
    - Transmit VPD
    - Functionally equivalent to traditional IBM Service infrastructure
- ▶ Enhanced IBM support system used when requesting system and HMC are both at 2.12.1
- ▶ *Traditional IBM support system* used as backup during migration period
- ▶ Enhanced Infrastructure always attempted first if possible
- ▶ Currently Enhanced and Traditional support have equivalent functionality for supported functions
- ▶ Fix and eBoD (eBusiness on Demand) RSF functionality continues to use Traditional IBM support system

## DNS resolution of addressing to enhanced IBM Support structure

DNS host name resolution is required for connectivity to the Enhanced IBM infrastructure.

- ▶ If RSF connection is not configured to use an SSL Proxy Server
  - Network Settings on call-home HMCs must include DNS configuration
  - Recommend a backup DNS for reliability
- ▶ If RSF connection uses an SSL Proxy Server, customer has choice where the ip address resolution is done:
  - Can be resolved on HMC, using Network Settings on HMC
  - Can be resolved at SSL Proxy, if Proxy has DNS available

Note: Use of hostnames usage facilitates dynamic management of redundant servers.

## Customize Outbound Connectivity Panel: Proxy usage

Indicates if proxy required to connect to the internet, and how to reach it

*Resolve* setting dictates whether hostnames or ip addresses passed to SSL Proxy

✓ if checked, DNS is required on HMC

☐ if unchecked, DNS is required from SSL Proxy

**Outbound Connectivity Settings**

Enable the local console as a call-home server

**Configure Internet Options**

Use SSL Proxy Connection to Internet  
Address: \* 9.60.14.42  
Port: \* 3128

Resolve IBM IP addresses on console  
 Use SSL Proxy Authentication  
User: \*  
Password: \*  
Confirm Password: \*

Internet Protocol: \* IPv4

Test...

OK Cancel Help



## Network Setting customized on HMC for DNS

- Name Services is defined using Customize Network Settings Task
- Select DNS enabled
- One or more DNS Servers must be defined in search order
  - Recommendation that at least 2 be defined to avoid single point of failure
- Domain Suffix Search Order is not used by RSF, can be configured for other reasons

The screenshot shows the 'Customize Network Settings' dialog box with the 'Name Services' tab selected. The 'DNS Configuration' section is expanded, showing a checked 'DNS enabled' checkbox. Below it, the 'DNS Server Search Order' section contains a list box with two entries: '9.0.3.1' and '9.0.2.11'. To the right of the list box are 'Add' and 'Remove' buttons. The 'Domain Suffix Search Order' section below it is currently empty, with its own 'Add' and 'Remove' buttons. At the bottom of the dialog are 'OK', 'Cancel', and 'Help' buttons.

## Potential firewall changes required

**If using ipv4, outbound connectivity must be permitted to port 443 to the following destinations:**

- 129.42.26.224 (traditional)
- 129.42.34.224 (traditional)
- 129.42.42.224 (traditional)
- 129.42.56.189 (enhanced)
- 129.42.58.189 (enhanced)
- 129.42.60.189 (enhanced)

**If using ipv6, outbound connectivity must be permitted to port 443 to the following destinations:**

- 2620:0:6c0:1::1000
- 2620:0:6c1:1::1000
- 2620:0:6c2:1::1000
- 2620:0:6c0:200:129.42.56.189 (enhanced)
- 2620:0:6c1:200:129.42.58.189 (enhanced)
- 2620:0:6c2:200:129.42.60.189 (enhanced)

**If using an SSL Proxy, and plan for it to resolve host names, it must accept the following host names:**

- www-945.ibm.com (traditional)
- esupport.ibm.com (enhanced)

# Enhancements to Logging of RSF Events

- RSF Security events moved from Security to Audit Logs to meet Common Security Criteria
- New log entry includes hostname, hostname on certificate, and cipher suite in RSF connection
- Below is a sample of the new format, and new connection message

**Audit and Log Management**

Select the type of report and the information to be included in the report.

Report type

HTML  XML

Range for event based audit data types

Limit event based audit data to a specific range of dates and times

Starting date: 7/29/13 Starting time: 2:32 PM Ending date: 7/29/13 Ending time: 2:32 PM

Audit data types

Select	Audit data types
<input type="checkbox"/>	Logs
<input checked="" type="checkbox"/>	Audit log
<input type="checkbox"/>	Console events
<input type="checkbox"/>	Security Log
<input type="checkbox"/>	Service History
<input type="checkbox"/>	Tasks performed log

Total: 17 Selected: 1

OK Cancel Help

**Audit and Log Report**

**Audit log**

Audit Logs	Date	Audit Event
	Mon Jul 29 14:38:18 EDT 2013	Remote support call generated on TC2HMC1 completed successfully by server TC2HMC1(9.60.15.57).
	Mon Jul 29 14:38:11 EDT 2013	A remote connection was successful.
	Mon Jul 29 14:38:04 EDT 2013	RSF initiated an SSL connection with host www-945.ibm.com at address www-945.ibm.com/129.42.26.224 authenticated as www-945.ibm.com with encryption cipher SSL_RSA_WITH_3DES_EDE_CBC_SHA
	Mon Jul 29 14:38:03 EDT 2013	Starting remote support call 2013-07-29 02:38:03 PM for console TC2HMC1(9.60.15.57). Type: PMV Request.
	Mon Jul 29 14:38:03 EDT 2013	Remote support call generated on TC2HMC1 is being handled by call-home server TC2HMC1(9.60.15.57).
	Mon Jul 29 14:38:03 EDT 2013	Remote support call generated on TC2HMC1 completed successfully by server TC2HMC1(9.60.15.57).

Save... Cancel Help

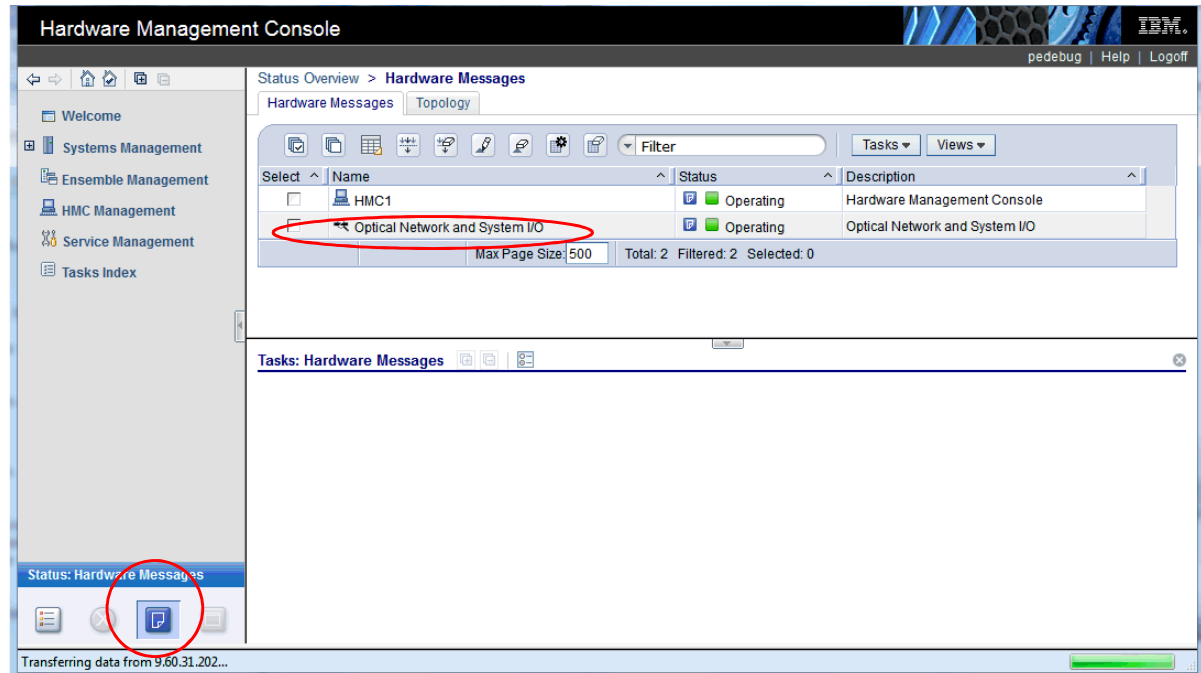
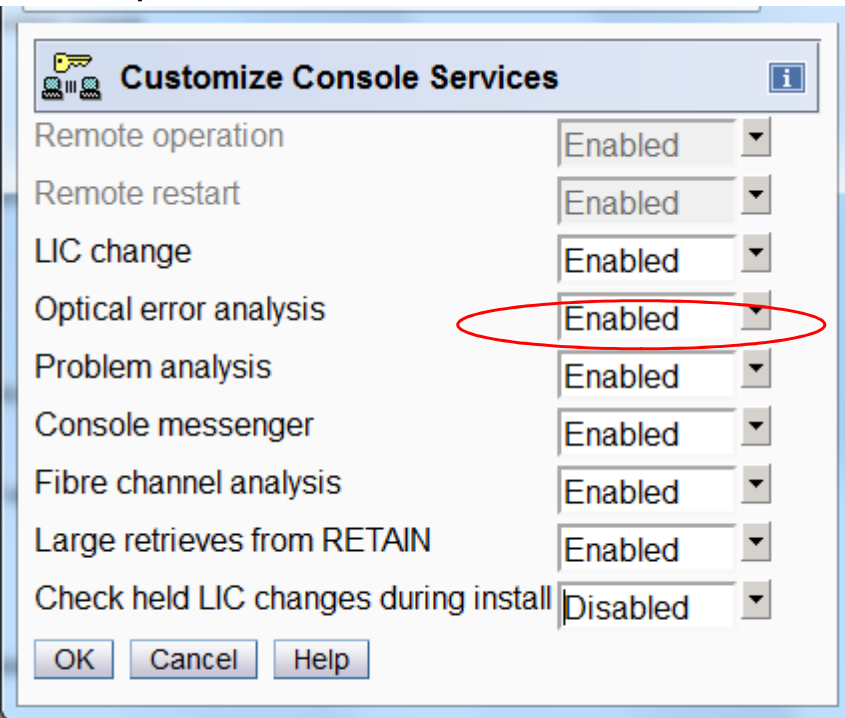
## HMC 2.12.1 - RSF Infrastructure Changes Summary

- ▶ Introduction of new, “enhanced”, IBM infrastructure
- ▶ Outside of initial setup, functionality is equivalent and transparent
- ▶ Depending on your current installation, there may be changes required to exploit this:
  - DNS enablement
  - Additional firewall rules
- ▶ This is the first rollout, currently dual support is available, but IBM recommends you make changes to enable this now.
- ▶ RSF Event Logging changes
- ▶ Full description for RSF setup can be found in:
  - **SC28-6927-01**: *zEnterprise System Integrating the Hardware Management Console’s Broadband Remote Support Facility into your Enterprise*

## HMC 2.12.1 - Changes to Link Incident Records Management

### Link Incident

- ▶ Problem detected when an attached device (e.g., Control Unit, DASD) connected with a FICON channel is not connected to the CPC
- ▶ Optical Error Analysis in HMC is enabled.
- In the past, each link incident was automatically called home if Optical Error Analysis was enabled.
  - ▶ These were mostly ignored by service as “noise”.
- As of HMC 2.12.1 Link Incidents will continue to create hardware messages, but they will require manual intervention to create a RETAIN PMR using Hardware Messages



# Calling home a Link Incident error

HMC1: Hardware Messages - Mozilla Firefox: IBM Edition

9.60.31.202:8080/hmc/content?taskId=3&refresh=4

**Hardware Messages - Optical Network and System I/O**

Select	Date	Time	Message Text
<input type="checkbox"/>	July 29, 2013	1:26:15 PM	Optical link problem. [Problem # 6]

**Details...** Delete Select All Deselect All Cancel Help

Optical Network and System I/O

Done

**Problem Analysis - Optical Network and System I/O**

System name: Optical Network and System I/O

Date: Jul 29, 2013

Time: 1:26:15 PM

*Problem Description*

An Optical link failure was detected. Note: Information is not available for one or more nodes.

Node 1	Node 2
Machine: 3990-006	Machine: 2084-C24
Serial: IBM130094394	Serial: IBM000016FCA
Physical Interface: 0010	Physical Interface: 8000
Logical Interface: 0000	Logical Interface: 00AA

*Corrective Actions*

Service is required.

**Request Service...** No Service Delete Message Cancel Help

Done



# HMC/SE Publications/Online Help Strategy Changes

## ▶ Previously

- Publications => High level information
  - Overall Directions, Basic Operations, Task Overview
- Online Helps => Detailed information only on per task basis
- Separate information on HMC & SE => both on tasks & concepts

## ▶ 2.12.1 Strategy Change

- Merge HMC/SE Publications and Online Helps
- One information package available on
  - HMC Online Helps
  - SE Online Helps
  - IBM Information Center
    - ◆ <http://pic.dhe.ibm.com/infocenter/hwmca/v2r12m1/index.jsp>
- HMC/SE specific publications no longer exist
  - **SC28-6919** *System z Hardware Management Console Operations Guide*
  - **SC27-2622** *zEnterprise System Hardware Management Console Operations Guide for Ensembles*
  - **SC28-6920** *zEnterprise System Support Element Operations Guide*

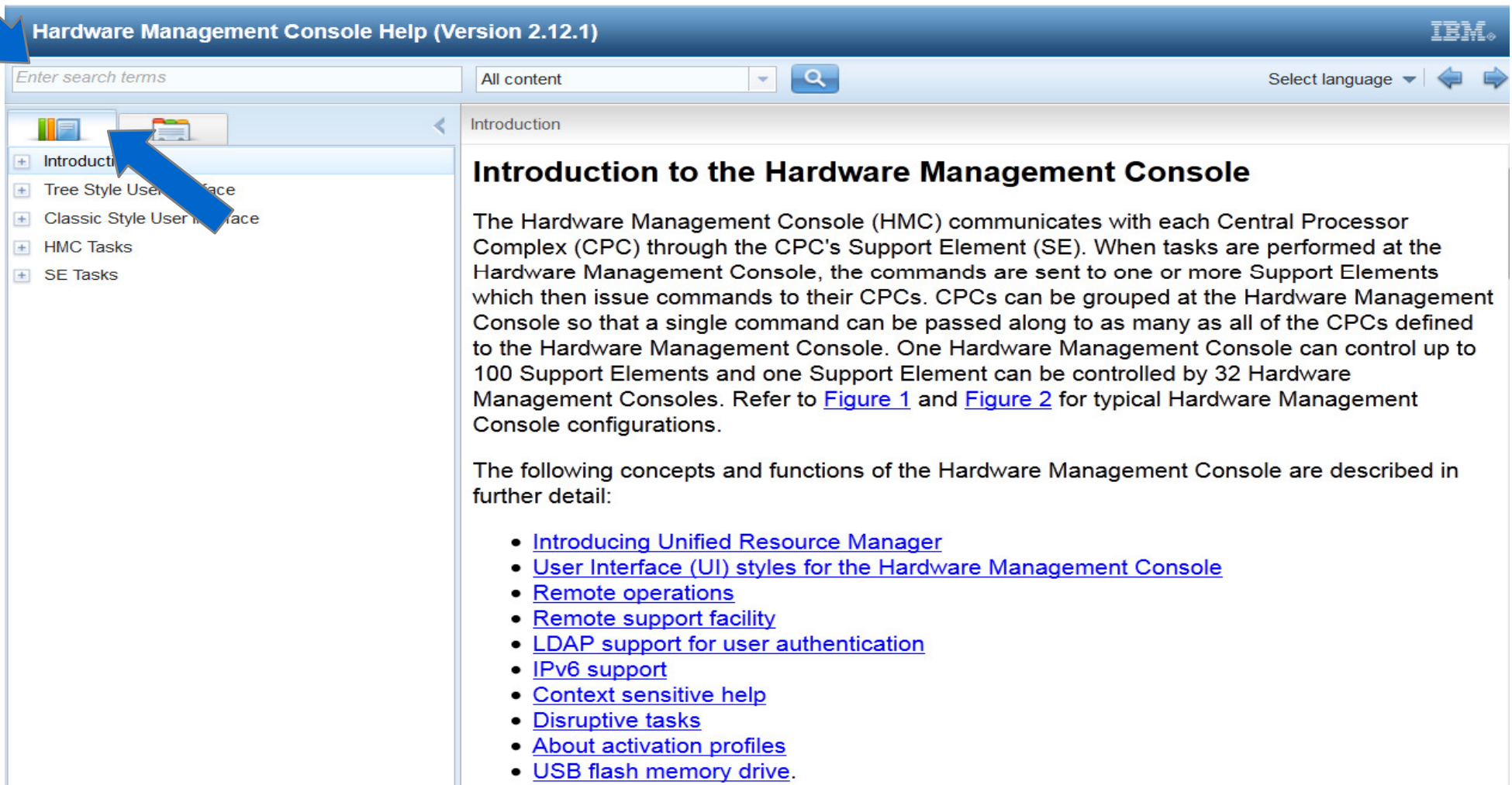
## HMC/SE Publications/Online Help Strategy Changes (cont.)

- ▶ Overview/directional information and details available in one place
  - HMC or SE console
  - IBM Information Center
  
- ▶ Ability to offload or print as much information as you like from IBM Info Center
  
- ▶ Search capability from the Table of Contents or Index
  
- ▶ Should hopefully save time without navigating between the publications and the console help.
  
- ▶ Remaining non HMC/SE specific information/publications
  - No change in direction
  - Continue to be available on IBM Resource Link
    - <http://www.ibm.com/servers/resourcelink/>
    - See Additional Materials for IBM Resource Link access process
    - **Note:** IBM Information Center requires no special registration for access



# Searching the help content from the HMC or SE

From the **Table of Contents** tab, enter a search string in the *Enter search terms* input area.



Hardware Management Console Help (Version 2.12.1)

Enter search terms

All content

Select language

Introduction

## Introduction to the Hardware Management Console

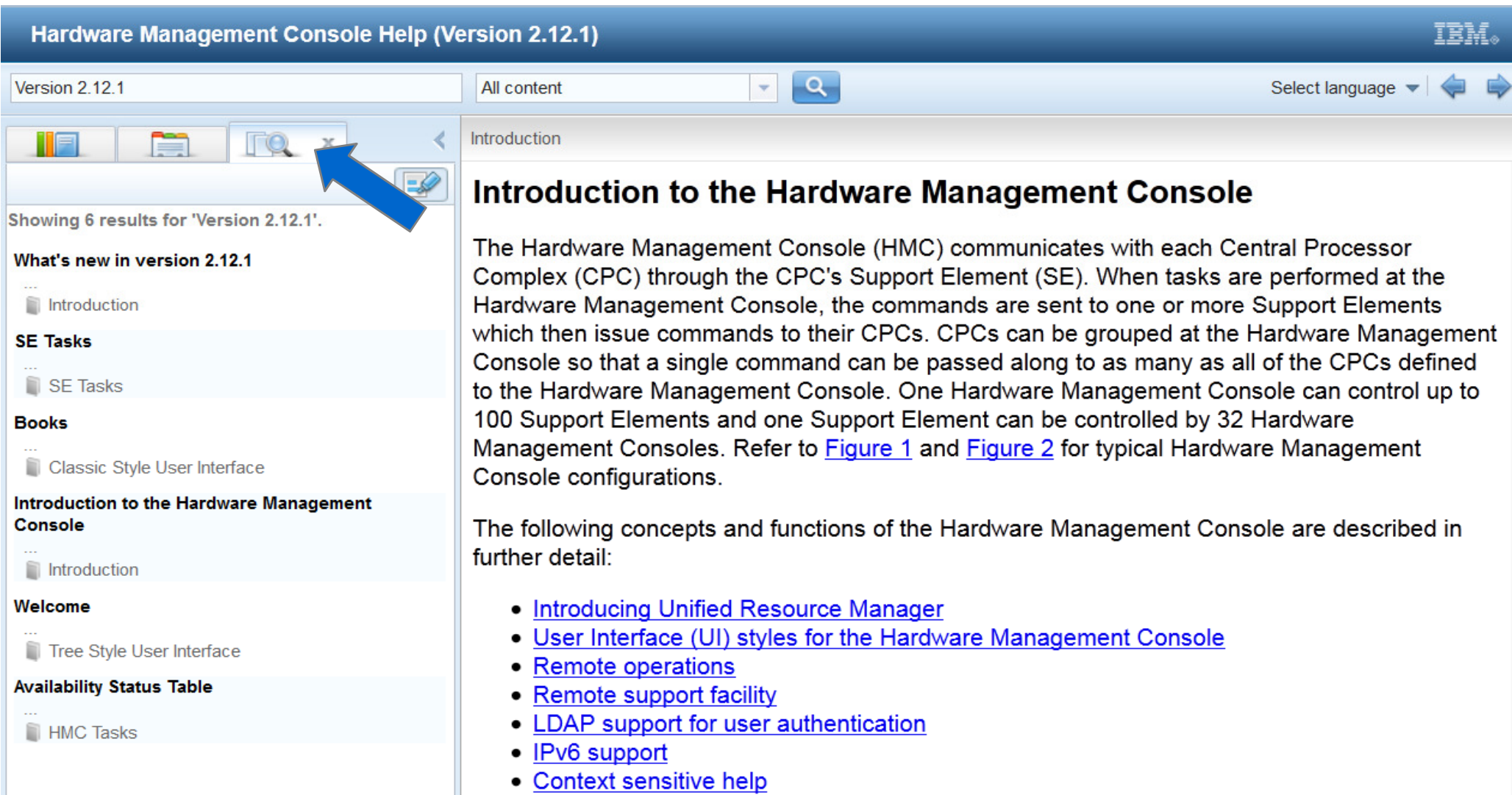
The Hardware Management Console (HMC) communicates with each Central Processor Complex (CPC) through the CPC's Support Element (SE). When tasks are performed at the Hardware Management Console, the commands are sent to one or more Support Elements which then issue commands to their CPCs. CPCs can be grouped at the Hardware Management Console so that a single command can be passed along to as many as all of the CPCs defined to the Hardware Management Console. One Hardware Management Console can control up to 100 Support Elements and one Support Element can be controlled by 32 Hardware Management Consoles. Refer to [Figure 1](#) and [Figure 2](#) for typical Hardware Management Console configurations.

The following concepts and functions of the Hardware Management Console are described in further detail:

- [Introducing Unified Resource Manager](#)
- [User Interface \(UI\) styles for the Hardware Management Console](#)
- [Remote operations](#)
- [Remote support facility](#)
- [LDAP support for user authentication](#)
- [IPv6 support](#)
- [Context sensitive help](#)
- [Disruptive tasks](#)
- [About activation profiles](#)
- [USB flash memory drive.](#)

# Searching the help content from the HMC or SE

The results of the search are displayed under the **Search** tab.



Hardware Management Console Help (Version 2.12.1)

Version 2.12.1 All content Select language

Introduction

## Introduction to the Hardware Management Console

The Hardware Management Console (HMC) communicates with each Central Processor Complex (CPC) through the CPC's Support Element (SE). When tasks are performed at the Hardware Management Console, the commands are sent to one or more Support Elements which then issue commands to their CPCs. CPCs can be grouped at the Hardware Management Console so that a single command can be passed along to as many as all of the CPCs defined to the Hardware Management Console. One Hardware Management Console can control up to 100 Support Elements and one Support Element can be controlled by 32 Hardware Management Consoles. Refer to [Figure 1](#) and [Figure 2](#) for typical Hardware Management Console configurations.

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- [IPv6 support](#)
- [Context sensitive help](#)

Showing 6 results for 'Version 2.12.1'.

**What's new in version 2.12.1**

- Introduction

**SE Tasks**

- SE Tasks

**Books**

- Classic Style User Interface

**Introduction to the Hardware Management Console**

- Introduction

**Welcome**

- Tree Style User Interface

**Availability Status Table**

- HMC Tasks

# Searching the help content from the HMC or SE

You can also search for content from the **Index** tab. Specify a search string in the *input text to filter input area*.

Hardware Management Console Help (Version 2.12.1)

Enter search terms All content Select language

Input text to filter

3270  
emulators, configuring  
integrated console  
acceptable status  
access removable media task  
Access to Removable Media  
Access to Removable Media  
Accessing the Access Removable Media task  
account information task  
instructions for starting  
account information, about  
activate availability policy  
activate option  
activate performance policy  
activate policies task  
activate task  
About activation profiles  
Accessing the Activate task when targeting one or  
Accessing the Activate task when targeting one or  
instructions for starting  
activate, zBX Blade  
Accessing the Activate task when targeting a zBX I  
Accessing the Activate task when targeting a zBX I  
activating an integrated coupling facility process  
dynamic integrated coupling facility expansion  
Using integrated facilities for Linux processor  
Using integrated facilities for Linux processor  
Using internal coupling facility processors  
Using internal coupling facility processors  
Using integrated facilities for Linux processor

Introduction

## Introduction to the Hardware Management Console

The Hardware Management Console (HMC) communicates with each Central Processor Complex (CPC) through the CPC's Support Element (SE). When tasks are performed at the Hardware Management Console, the commands are sent to one or more Support Elements which then issue commands to their CPCs. CPCs can be grouped at the Hardware Management Console so that a single command can be passed along to as many as all of the CPCs defined to the Hardware Management Console. One Hardware Management Console can control up to 100 Support Elements and one Support Element can be controlled by 32 Hardware Management Consoles. Refer to [Figure 1](#) and [Figure 2](#) for typical Hardware Management Console configurations.

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- [LDAP support for user authentication](#)
- [IPv6 support](#)
- [Context sensitive help](#)
- [Disruptive tasks](#)
- [About activation profiles](#)
- [USB flash memory drive](#).



# Searching the help content from the Information Center

Specify a search string in the **Search:** input area, then press **Enter** or click **Go**.  
 (Note: tabs appear at the bottom of the left pane in the Information Center.)

The screenshot shows the IBM System z HMC and SE Information Center interface. At the top, there is a search bar with the text "Version 2.12.1" and a "Go" button. A blue arrow points to the "Go" button. Below the search bar is a navigation menu with tabs for "Home", "Solutions", "Services", "Products", "Support & downloads", and "My IBM". The left pane contains a "Contents" list with several items, including "Using the information center", "Product information", "Hardware Management Console (HMC)", "Support Element (SE)", and "ibm.com: About IBM - Privacy - Contact". A blue arrow points to the "Using the information center" item. At the bottom of the left pane, there are three tabs: "Contents", "Index", and "Search". A blue arrow points to the "Search" tab. The main content area displays the title "IBM System z HMC and SE (Version 2.12.1) Information Center" and a description: "Contains information describing the System z Hardware Management Console and Support Element for Version 2.12.1." Below the description are three tabs: "Learning", "Tasks", and "Support". A tip box on the right contains the text "Information center tips" and "Collapse All: Collapse all branches in the navigation tree when viewing the table of contents frame." At the bottom of the page, there is a copyright notice: "© Copyright IBM Corporation 2013. | Terms of use" and "This information center is Built on Eclipse™. (www.eclipse.org)".

# Searching the help content from the Information Center

The results of the search are displayed under the **Search Results**.

**Search Results**

Total 7 result(s) found for **Version 2.12.1:**

- What's new in version 2.12.1**  
This guide reflects the licensed internal code for Support Element Console Application, Version 2.12.1. You can tell if your Support Element console has this version installed by looking at the title
- What's new in version 2.12.1**  
This information reflects the licensed internal code for the Hardware Management Console Application, Version 2.12.1 . You can tell if your Hardware Management Console has this version installed by lo
- SE Tasks**  
This section provides detailed information on each of the Support Element (SE) (Version 2.12.1) tasks.
- Books**  
Display the Books view by double-clicking with the left mouse button on the Books icon in the Views area. Object icons representing the following online books provided with the Hardware Management Con
- Introduction to the Hardware Management Console**  
The Hardware Management Console (HMC) communicates with each Central Processor Complex (CPC) through the CPC's Support

**IBM System z HMC and SE (Version 2.12.1) Information Center**

Contains information describing the System z Hardware Management Console and Support Element for Version 2.12.1.

**Learning** | **Tasks** | **Support**

**The information center contains topics that will help you with basic, as well as advanced, HMC and SE tasks.**

**HMC**  
[Hardware Management Console tasks](#)

**SE**  
[Support Element tasks](#)

**Information center tips**

**Collapse All:** Collapse all branches in the navigation tree when viewing the table of contents frame.

© Copyright IBM Corporation 2013. | [Terms of use](#)  
This information center is Built on Eclipse™. ([www.eclipse.org](http://www.eclipse.org))

# Printing from the Information Center

You can choose to print one selected topic or the selected topic and all subtopics.

The screenshot displays the IBM System z Hardware Management Console (HMC) Information Center interface. The top navigation bar includes the IBM logo, a 'Country/region [ select ]' dropdown, and a search bar containing 'System z' with a 'Search' button. Below the navigation bar, there are tabs for 'Home', 'Solutions', 'Products', 'Support & downloads', and 'My IBM'. A search bar is also present with a 'Go' button and a 'Scope: All topics' dropdown. The main content area is divided into a left-hand 'Contents' pane and a right-hand main content area. The 'Contents' pane shows a tree view of topics, with 'Access Removable Media' selected and highlighted in blue. A context menu is open over this selected item, showing two options: 'Print selected topic' and 'Print selected topic and all subtopics'. A blue arrow points to the second option. The main content area displays the title 'Access Removable Media' and a 'Contents' section with a single bullet point: '• [Access to Removable Media](#)'. Another blue arrow points to the 'Go' button in the search bar.

# Sample of Resource Link publication entries

IBM
Industries & solutions
Services
Products
Support & downloads
My IBM

Search
🔍

IBM Systems > System z > Resource Link > Library >

## zEnterprise EC12 library

**Resource Link**

Site search

Planning

Education

**Library**

Fixes

Problem solving

Services

Tools

Customer Initiated Upgrade

Feedback

Publications

Technical notes

By title

By order number

*New link to Information Center*

Title	Order number	Last modified	Download
Hardware Management Console Operations Guide	<ul style="list-style-type: none"> <li style="margin-bottom: 5px;">· <a href="#">Version 2.12.1</a></li> <li>· <a href="#">Version 2.12.0</a></li> </ul>	SC28-6919-00a 12 Oct 2012	<a href="#">SC28-6919-00a.pdf</a> (8.84MB)
IOCP User's Guide (ICP)	<ul style="list-style-type: none"> <li>· <a href="#">Level -11</a></li> </ul>	SB10-7037-11 22 Jul 2013	<a href="#">SB10-7037-11.pdf</a> (1.75MB)
PR/SM Planning Guide	<ul style="list-style-type: none"> <li>· <a href="#">SB10-7156-01</a></li> </ul>	3 Sep 2013	<a href="#">SB10-7156-01.pdf</a> (6.02MB)

*All remaining publications continue to reside on Resource Link*

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# Absolute Capping of Logical Partitions

- ▶ Existing ways to cap the utilization of a partition
  - Dedicated processors
  - Active manipulation of LPAR weights (i.e. WLM)
  - capping via LPAR weights
  - Limit number of shared logical processors to physical capping requirement (may actually cause LPAR to have under-defined logical processors as compared to the partition's weight)
  
- ▶ Potential drawbacks with methods above
  - Dedicated processors
    - Not very granular, may want to cap less than one processor's worth of capacity
    - May not be possible if there aren't enough engines
    - Loses processor utilization efficiency of shared processors
  - Existing Shared processor capping is based off of the weight of all **active** partitions
    - Customers may fail to compute the capacity correctly
    - Configuration change (processors add) may lead to more capacity being allocated than desired
  - If partitions are deactivated, other active partitions capping increases
    - If only one shared active partition left, result => no capping (100 % of shared pool)



## Absolute Capping of Logical Partitions (cont.)

- ▶ Absolute Capping introduced to ensure
  - software licensing Terms and Conditions related to capacity are always met
    - ie, Software Pricing
  
- ▶ Absolute Capping => method to define an absolute cap for a given partition
  - Absolute cap, if specified, always works independently of any other capping
  - User or API specifies
    - an absolute number of processors to cap the partition's activity to
  - Absolute cap value
    - Specified to hundredths of a processor (eg 4.56 processors) worth of capacity
      - ◆ Increasing processing capacity may require granular controls
    - Value not tied to the LICCC processor maximum
      - ◆ 0.01 to 255.00 valid
      - ◆ Activation profiles more portable as you migrate to higher machine capacity or newer systems
      - ◆ However, if you specify a value above current machine maximum or number of processors defined for a LPAR (Image),
        - absolute capping ignored, but other capping means honored

## Absolute Capping of Logical Partitions (cont.)

- ▶ Absolute Capping support added for:
  - Activation Profiles
    - Customize Activation Profiles
      - ◆ Classic editor
      - ◆ Profile wizard
    - Change LPAR Controls Task
    - Change LPAR Weights Scheduled Operation
  - APIs
    - SNMP APIs
    - CIMMOM APIs
    - WebServices APIs

# Absolute Capping of Logical Partitions (cont.)

Customize Image Profiles: P0LXSM12 : LP01 : Processor

Group Name: GROUP1

Logical Processor Assignments

Dedicated processors

Select	Processor Type	Initial	Reserved
<input checked="" type="checkbox"/>	Central processors (CPs)	1	0
<input type="checkbox"/>	System z application assist processors (zAAPs)	0	0
<input type="checkbox"/>	System z integrated information processors (zIIPs)	0	0

Not Dedicated Processor Details

Initial processing weight: 10 (1 to 999)  Initial capping

Enable workload manager

Minimum processing weight: 0

Maximum processing weight: 0

Buttons: Cancel, Save, Copy Profile, Paste Profile, Help



- HMC 2.12.0
- Capping or WLM capping
- No Absolute Capping

# Absolute Capping of Logical Partitions (cont.)

HMCDAILY01: Customize/Delete Activation Profiles - Mozilla Firefox: IBM Edition

https://9.60.15.40/hmc/content?taskId=2883&refresh=5229

### Customize Image Profiles: P15 : ZOS1 : Processor

Group Name: <Not Assigned>

**Logical Processor Assignments**

Dedicated processors

Select	Processor Type	Initial	Reserved
<input checked="" type="checkbox"/>	Central processors (CPs)	11	0
<input type="checkbox"/>	System z application assist processors (zAAPs)	0	0
<input type="checkbox"/>	System z integrated information processors (zIIPs)	0	0

**Not Dedicated Processor Details**

Initial processing weight:  1 to 999  Initial capping

Enable workload manager

Minimum processing weight:

Maximum processing weight:

Absolute Capping:  None  Number of processors (0.01 to 255.0)

Buttons: Cancel Save Copy Profile Paste Profile Help



- HMC 2.12.1
- Absolute Capping => 5.5
- Also allowed
  - Traditional Capping or
  - WLM, but not both

# Absolute Capping of Logical Partitions (cont.)

**Change Logical Partition Controls - POLXSM28**

Last reset profile attempted:  
Input/output configuration data set (IOCDS): a1 zH small

CPs Processor Running Time

Logical Partitions with Central Processors

--- Select Action ---

Logical Partition	Active	Defined Capacity	WLM	Current Weight	Initial Weight	Min Weight	Max Weight	Current Capping	Initial Capping	Absolute Capping	Number of Dedicated Processors	Number of Not dedicated Processors
CF01	No	0	<input type="checkbox"/>	0	0			No	<input type="checkbox"/>	None	1	0
CF02	No	0	<input type="checkbox"/>	0	0			No	<input type="checkbox"/>	None	1	0
LP01	Yes	0	<input type="checkbox"/>	10	10			No	<input type="checkbox"/>	6.00	0	11
LP02	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP04	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP05	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP06	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP07	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP08	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP09	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP11	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP14	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
LP15	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
ZAWARE	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1
ZAWARE2	No	0	<input type="checkbox"/>	0	10			No	<input type="checkbox"/>	None	0	1

Save to Profiles Change Running System Save and Change Reset Cancel Help

- **Change LPAR Controls**
- **Without Absolute Capping**
  - up to 11 CPs
- **With Absolute Capping**
  - limit up to 6 CPs



# Absolute Capping of Logical Partitions (cont.)

Customize Image Profiles: P0LXSM22 : LP01 : Processor

Group Name: <Not Assigned>

Logical Processor Assignments

Dedicated processors

Select	Processor Type	Initial	Reserved
<input checked="" type="checkbox"/>	Central processors (CPs)	1	0
<input type="checkbox"/>	System z application assist processors (zAAPs)	0	0
<input type="checkbox"/>	System z integrated information processors (zIIPs)	0	0

Not Dedicated Processor Details

Initial processing weight: 50 (1 to 999)  Initial capping

Enable workload manager

Minimum processing weight: 10

Maximum processing weight: 60

Absolute Capping:  None  Number of processors (0.01 to 255.0) 5.5

Buttons: Cancel, Save, Copy Profile, Paste Profile, Help

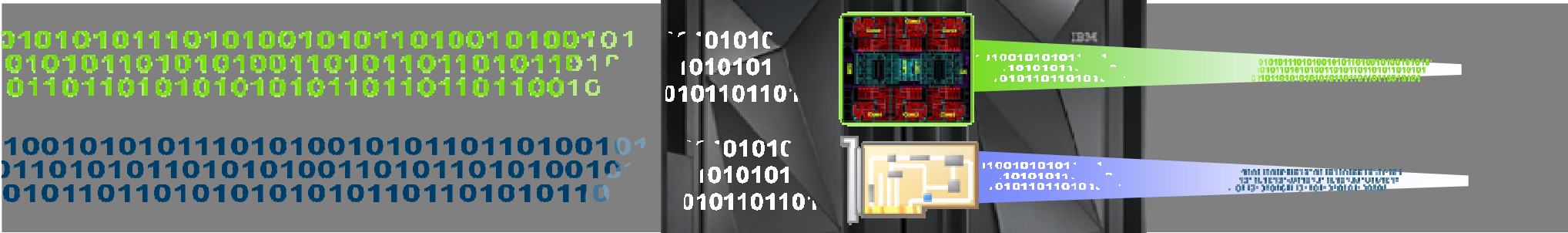


- HMC 2.12.1
- Absolute Capping independent
- Absolute Capping => 5.5
- Absolute Capping Ignored
  - CPs max of 1



# zEnterprise Data Compression (zEDC) - can help to reduce CPU & storage

Every day 2.5 quintillion bytes of data are created



Compress your data **4X**  
(efficient system data compression)

Should see significant reduction in CPU usage and throughput improvements when zlib uses zEDC



- Efficiently compress active data by providing a low CPU, high performance, dedicated compression accelerator
  - Industry standard compression for cross platform data distribution

▪ **Typical Client Use Cases:**

- **Significant disk savings** with trivial CPU cost for large BSAM/QSAM sequential files
  - **More efficiently store audit data** in application logs
  - **Reduce the amount of data** needed for data migration and backup/restore
- **Transparent acceleration** of Java compressed applications



▪ zEDC Express



▪ z/VM 6.3 support for guests



▪ z/OS V2.1 zEDC

## zEnterprise Data Compression (zEDC) (cont.)

- ▶ zEDC Express adapter for zEC12 and zBC12
  - Compression work is offloaded to the card
  - Minimal CP cycles consumed
  - zlib-based, industry-standard deflate compression
  - Data can be inflated anywhere zlib processing is available
  
- ▶ New terminology/controls used for zEDC (and Shared Memory Communications (SMC-R))
  - Function IDs (FIDs) logical I/O naming versus CSS.CHPIDs
  - Virtualization infrastructure uses a different architecture for new I/O (zEDC/SMC-R) than traditional I/O (OSA, FICON, etc.)
  - PCHIDs (Physical Channel IDs) => still apply for new & traditional I/O



## zEnterprise Data Compression (zEDC) (cont.)

### ▶ zEDC

- Shareable by up to 15 LPARs
  - Shared using SR/IOV framework
  - Up to 15 Function IDs (FIDs) per PCHID
    - ◆ These FIDs can be assigned to customer LPAR

### ▶ More on FIDs

- FIDs => unique across the CEC
- FIDs=> can be configured to only one LPAR at a time
  - CSS.CHPIDs can be configured to multiple LPARs

### ▶ Sample IOCDS excerpt for zEDCs

- FUNCTION FID=B2,PCHID=5F8,VF=1,PART=((VMALT1),(VMALT1,VMALT2))
- FUNCTION FID=B3,PCHID=5F8,VF=2,PART=((VMALT1),(VMALT1,VMALT2))
- FUNCTION FID=B4,PCHID=5F8,VF=3,PART=((VMALT1),(VMALT1,VMALT2))

### ▶ Notes on Sample

- FIDs can be configured to VMALT1 or VMALT2
- Currently configured to VMALT1

# Shared Memory Communication (SMC-R)

Optimize server to server networking – transparently “HiperSockets™-like” capability across systems

**Significant CPU savings for FTP file transfers across z/OS systems versus standard TCP/IP**

**Significant reduction in response time and moderate CPU savings for CICS workloads exploiting IPIC using SMC-R versus TCP/IP**

**Significant reduction in overall transaction response time for WAS workload accessing z/OS DB2**

**Significant increase in WebSphere MQ messages delivered across z/OS systems**



## Shared Memory Communications (SMC-R):

- Exploit RDMA over Converged Ethernet (RoCE) with qualities of service support for dynamic failover to redundant hardware

## Typical Client Use Cases:

- Help to reduce both latency and CPU resource consumption over traditional TCP/IP for communications across z/OS systems
- **Any** z/OS TCP sockets based workload can **seamlessly** use SMC-R without requiring any application changes

**NEW** ▪ z/OS V2.1  
▪ SMC-R

**NEW** ▪ z/VM 6.3 support  
for guests

**NEW** ▪ 10GbE RoCE  
Express

## Shared Memory Communication (SMC-R) (cont.)

- RDMA based technology has been available in the industry for many years – primarily based on Infiniband (IB)
  - ▶ RDMA technology provides the capability to allow hosts to logically share memory
  - ▶ IB requires a completely unique network eco system (unique hardware such as host adapters, switches, host application software, system management software/firmware, security controls, etc.)
  - ▶ IB is popular in the HPC (High Performance Computing) market
- RDMA technology is now available on Ethernet – RDMA over Converged Ethernet (RoCE)
  - ▶ RoCE uses existing Ethernet fabric (switches with Global Pause enabled) but requires advanced Ethernet hardware in the host (RDMA capable NICs)
  - ▶ ***RoCE is a game changer!***
    - **RDMA technology becomes more affordable and prevalent in datacenter networks**
- Host software exploitation options fall into two general categories:
  - ▶ Native / direct application exploitation
    - Several variations, all involve deep level expertise in RDMA and a new programming model
  - ▶ Transparent application exploitation (e.g. sockets based)
    - Improve Time to Value by automatically exploiting RDMA/RoCE for sockets based TCP applications
- *Focus is on providing a transparent Sockets over RDMA solution*
  - ▶ Obtain performance benefits of RDMA without compromising existing IP based qualities of service

## Shared Memory Communication (SMC-R) (cont.)

- Shared Memory Communications over RDMA (SMC-R) is a communication protocol that allows *TCP sockets* applications to transparently exploit RDMA (RoCE)
  
- SMC-R is a “hybrid” solution that:
  - ▶ Uses TCP connection (3-way handshake) to establish SMC-R connection
  - ▶ Each TCP end point exchanges TCP options that indicate whether it supports the SMC-R protocol
  - ▶ SMC-R “rendezvous” (RDMA attributes) information is then exchanged within the TCP data stream (similar to SSL handshake)
  - ▶ Socket application data is exchanged via RDMA (write operations)
  - ▶ TCP connection remains active (controls SMC-R connection)
  - ▶ This model preserves many critical existing operational and network management features of TCP/IP

## Shared Memory Communication (SMC-R) (cont.)

- ▶ Function ID (FID) for SMC-R currently only support one FID per PCHID
- ▶ FID can only be configured to one LPAR, but it is reconfigurable
  
- ▶ Sample IOCDS excerpt for SMC-Rs
  - FUNCTION FID=01,PCHID=5D8,PART=((VMALT1), (VMALT1,VMALT2))
- ▶ Notes on Sample
  - FID 01 can be configured to VMALT1 or VMALT2
  - Currently configured to VMALT1



# zEDC/SMC-R: Channels View

P15: Primary Support Element Workplace (Version 2.12.1)

Support Element

Manage Print Screen Files

System Management > P15 > Channels

Channels Topology

Select	PCHID	CSS.CHPIDs	Status	State	Swapped	Cage-Slot-Jack	Type
<input type="checkbox"/>	05A9	0.A1	Operating	Online		Z15B-D213-J.00	FICON Express8S
<input type="checkbox"/>	01B0	0.B0	Operating	Online		A01B-LG13-J.00 - 01	OSA-Express3
<input type="checkbox"/>	01B1	0.B1	Operating	Online		A01B-LG13-J.02 - 03	OSA-Express3
<input type="checkbox"/>	0230	0.Co	Operating	Online		A01B-D122-J.00	FICON Express8
<input type="checkbox"/>	0231	0.C1	Operating	Online		A01B-D222-J.00	FICON Express8
<input type="checkbox"/>	0700	0.FB	Operating	Online			HiperSockets
<input type="checkbox"/>	0701	0.FC	Operating	Online			HiperSockets
<input type="checkbox"/>	0702	0.FD	Operating	Online			HiperSockets
<input type="checkbox"/>	0703	0.FE	Operating	Online			HiperSockets
<input type="checkbox"/>	05D8	0001	Operating	Online		Z15B-LG27-J.00	10GbE RoCE Express
<input type="checkbox"/>	05F8	00B2 00B3 00B4	Operating	Online		Z15B-LG37-J.00	zEDC Express

Max Page Size: 500 Total: 47 Filtered: 47 Selected: 0

Tasks: Channels

- PCHIDs
- Physical View
- FIDs shown for last two channels
- CSS.CHPIDs shown for rest of Traditional I/O
- Column really should be named IDs

Status: Exceptions and Messages

P15: Welcome to the Primary Support Eleme | P15: Primary Support Element Workplace (V | P15: Manage Print Screen Files | 10:03:23 AM 02/10/2014

# zEDC/SMC-R: FIDs View

P15: Primary Support Element Workplace (Version 2.12.1)

Support Element

Manage Print Screen Files

System Management > P15 > Partitions > VMALT1 > FIDs

FIDs Topology

Select	FID	PCID	Status	State	Characteristic	Type
<input type="checkbox"/>	0001	05D8	Operating	Online	Reconfigurable - Not isolated	RoCE Express
<input type="checkbox"/>	zEDC 00B2	05F8	Operating	Online	Reconfigurable - Not isolated	zEDC Express

Max Page Size: 500 Total: 2 Filtered: 2 Selected: 0

Tasks: FIDs

Status: Exceptions and Messages

P15: Welcome to the Primary Support Eleme | P15: Primary Support Element Workplace (V | P15: Manage Print Screen Files | 10:06:23 AM 02/10/2014

- FIDs
- Logical View for New I/O

# zEDC/SMC-R: CHPIDs View (Traditional I/O)

P15: Primary Support Element Workplace (Version 2.12.1)

Support Element

Manage Print Screen Files

System Management > P15 > Partitions > VMAL1 > **CHPIDs**

CHPIDs Topology

Select	CSS.CHPID	PCHID	Status	State	Characteristic	Type
<input type="checkbox"/>	0.02	0200	Operating	Online	Shared	OSX - OSA-Express for zBX
<input type="checkbox"/>	0.92	0290	Operating	Online	Shared	OSX - OSA-Express for zBX
<input type="checkbox"/>	0.93	0291	Operating	Online	Shared	OSX - OSA-Express for zBX
<input type="checkbox"/>	0.03	0201	Operating	Online	Shared	OSX - OSA-Express for zBX
<input type="checkbox"/>	0.40	0140	Operating	Online	Shared	OSM - OSA-Express for Unified Resource Manager
<input type="checkbox"/>	0.41	0141	Operating	Online	Shared	OSM - OSA-Express for Unified Resource Manager
<input type="checkbox"/>	0.B0	01B0	Operating	Online	Shared	OSD for QDIO
<input type="checkbox"/>	0.B1	01B1	Operating	Online	Shared	OSD for QDIO
<input type="checkbox"/>	0.80	05E4	Operating	Online	Shared	OSD for QDIO
<input type="checkbox"/>	0.30	0594	Operating	Online	Shared	OSD for QDIO
<input type="checkbox"/>	0.10	05B8	Operating	Online	Shared	OSD for QDIO

Max Page Size: 500 Total: 28 Filtered: 28 Selected: 0

Tasks: CHPIDs

- CSS.CHPIDs
- Logical View for Traditional I/O

Status: Exceptions and Messages

P15: Welcome to the Primary Support Eleme | P15: Primary Support Element Workplace (V | P15: Manage Print Screen Files | 10:40:01 AM 02/11/2014



## Migration of OSA Support Facility (OSA/SF) to HMC/SE

- ▶ OSA/SF previously available on z/OS => Migrated to HMC/SE as follows
  - z/OS => supports OSA Express 4S and prior OSA generations
  - HMC/SE => supports OSA Express 4S & 5S
  - **Note:** OSA Express 5S only available on HMC/SE
  
- ▶ Overview of OSA/SF support merged into HMC/SE Advanced Facilities
  - Configuration of OSE as well as import/export capabilities
    - Import/Export capabilities to migrate configs from one system to another
  - View OAT (OSA Address Table) for all supported OSAs (OSE, OSD, OSN)
    - OAT defines connection information
      - ◆ IP addresses
      - ◆ Devices attached to
      - ◆ Mode of connection
      - ◆ Etc.
  - OSA/SF View parms ported to View Port Parms (with export capabilities)
    - Export commonly used for LAN issues problem determination

# Migration of OSA Support Facility (OSA/SF) to HMC/SE

HMC1: OSA Advanced Facilities

**Display OSA Address Table (OAT) Entries - P05**

Channel ID:0594 LAN port type:OSE

--- Select Action ---      Filter

Select ^	CSS ^	IID ^	Unit Address ^	Device Number ^	LPAR Name ^	Port Number ^	Session Type ^	IP Address ^	Router Indica
<input checked="" type="radio"/>	00	00	00, 01	0930, 0931	UNKNOWN	0	TCPIP	NONE	NONE
<input type="radio"/>	00	00	02, 03	0932, 0933	UNKNOWN	1	TCPIP	NONE	NONE
<input type="radio"/>	00	01	00, 01	0930, 0931	LP01	0	TCPIP	NONE	NONE
<input type="radio"/>	00	01	02, 03	0932, 0933	LP01	1	TCPIP	NONE	NONE
<input type="radio"/>	00	02	00, 01	0930, 0931	LP02	0	TCPIP	NONE	NONE
<input type="radio"/>	00	02	02, 03	0932, 0933	LP02	1	TCPIP	NONE	NONE
<input type="radio"/>	00	03	00, 01	0930, 0931	LP03	0	TCPIP	NONE	NONE
<input type="radio"/>	00	03	02, 03	0932, 0933	LP03	1	TCPIP	NONE	NONE
<input type="radio"/>	00	04	00, 01	0930, 0931	CF02	0	TCPIP	NONE	NONE
<input type="radio"/>	00	04	02, 03	0932, 0933	CF02	1	TCPIP	NONE	NONE
<input type="radio"/>	00	05	00, 01	0930, 0931	LP05	0	TCPIP	NONE	NONE
<input type="radio"/>	00	05	02, 03	0932, 0933	LP05	1	TCPIP	NONE	NONE
<input type="radio"/>	00	06	00, 01	0930, 0931	LP06	0	TCPIP	NONE	NONE
<input type="radio"/>	00	06	02, 03	0932, 0933	LP06	1	TCPIP	NONE	NONE
<input type="radio"/>	00	07	00, 01	0930, 0931	LP07	0	TCPIP	NONE	NONE
<input type="radio"/>	00	07	02, 03	0932, 0933	LP07	1	TCPIP	NONE	NONE
<input type="radio"/>	00	08	00, 01	0930, 0931	LP08	0	TCPIP	NONE	NONE
<input type="radio"/>	00	08	02, 03	0932, 0933	LP08	1	TCPIP	NONE	NONE

Close

# Migration of OSA Support Facility (OSA/SF) to HMC/SE

Channel path: 0594  
 LAN port type: 1000Base-T Ethernet

Local MAC address: 6CAE8B48000F  
 Universal MAC address: 6CAE8B48000F  
 Configured speed, mode: Auto Negotiate  
 Active speed, mode: 1000 Mb, Full Duplex

TCP port name: .....  
 Exclusive owner ID: .....  
 Exclusive owner MAC address: 000000000000  
 Total packets transmitted: 32026  
 Total packets received: 32026  
 Total octets transmitted: 7652814  
 Total octets received: 7652814

*Packets transmitted*

1 to 63 bytes: 8  
 64 to 126 bytes: 0  
 127 to 254 bytes: 32018  
 255 to 510 bytes: 0  
 511 to 1022 bytes: 0  
 1023 to 1517 bytes: 0  
 1518 to MAX bytes: 0

*Packets received*

1 to 63 bytes: 8  
 64 to 126 bytes: 0  
 127 to 254 bytes: 32018  
 255 to 510 bytes: 0  
 511 to 1022 bytes: 0

<i>Packets received</i>	
1 to 63 bytes:	8
64 to 126 bytes:	0
127 to 254 bytes:	32018
255 to 510 bytes:	0
511 to 1022 bytes:	0
1023 to 1517 bytes:	0
1518 to MAX bytes:	0

Broadcast packets transmitted:	0
Broadcast packets received:	0
Multicast packets transmitted:	32018
Multicast packets received:	32018
Pause frames transmitted:	0
Pause frames received:	0
Receive length error count:	0
Receive jabber count:	0
Receive undersize count:	0
Receive oversize count:	0
Receive drops with no free status descriptors on NIC:	0
Receive drops with no free status descriptors on LAN driver:	0
Receive drops with no free receive descriptors:	0
FCS error count:	0
Align error count:	0

# Operating System Messages/Integrated 3270 Console

- ▶ Operating System Messages
  - Depending on your requirements:
    - Limit what HMCs can manage the CEC
    - Limit access to which HMC users can access the LPAR
    - Limit access to which HMC users can run the Operating System Messages task
      - ◆ Limit to read-only if read-write is not required
  - For z/OS levels prior to z/OS 2.1
    - use RACF profiles to limit which commands can be issued by the system console
    - Operating System Messages commands issued as if from the system console
  - **For z/OS 2.1 or newer,**
    - **use new HMC Integrated 3270 Console support**
    - **Unique user logon/RACF controls for commands**
  - For z/VM and z/Linux consoles accessed from the HMC,
    - Operating System Messages required to logon via an OS user ID
- ▶ For additional security recommendations:
  - Attend:
    - **March 13<sup>th</sup>, 9:30 – 10:30 AM**
      - ◆ **15053: *IBM System z Security Best Practices***

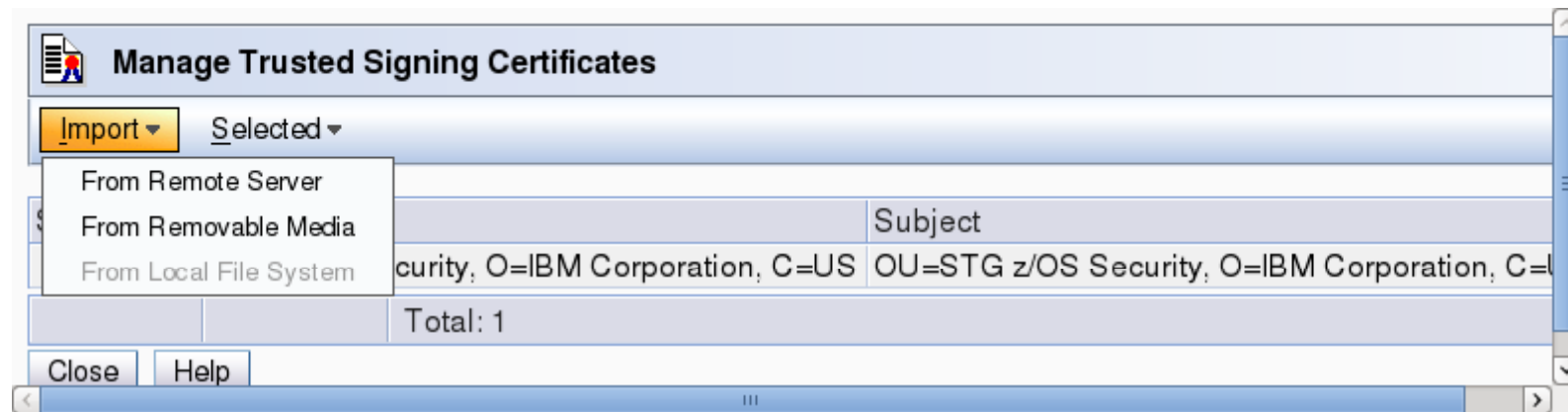


## Updates to x3270 Support (aka Secure 3270)

- ▶ “Configure 3270 Emulators” task on the HMC and TKE consoles
  - Certificate validation returned by the 3270 server when a secure/encrypted SSL external network connection used
  - “Certificate Management” task
    - used if the certificate(s) returned by the 3270 server are not signed by a well known trusted Certifying Authority (CA) certificate such as Verisign or Geotrust.
    - HMC/TKE as clients to 3270 server
      - ◆ Already have installed well known CA certificates
      - ◆ Probably don’t have Corporate CA certificates
  
- ▶ Usage
  - **TKE (Trusted Key Entry) 7.3**
    - General recommendation to use Secure 3270 enhancement if possible
  - **HMC 2.12.1**
    - Generally, most customers expected to use “Integrated 3270 Console”
      - ◆ Uses “internal communication service” between Support Elements and System z LPARs/Operating Systems
      - ◆ Integrated 3270 Console support now available on z/OS 2.1
    - However, customers can technically use the Configure 3270 Emulators path
      - ◆ External network connection from HMC to System z Operating System

## Updates to x3270 Support (aka Secure 3270)

- The advanced action **“Manage Trusted Signing Certificates”** within the **“Certificate Management”** task => used to add trusted signing certificates
  - For example, if the certificate associated with the 3270 server on OS is signed/issued by a corporate certificate, the corporate certificate will need to be imported.

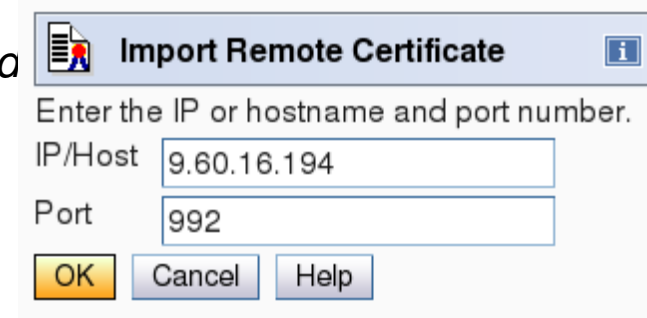


- If the connection between the console and the System z Operating System can be trusted at the time of importing the certificate,

>> the import from the remote server option can be used

>> otherwise, the certificate should be imported from removable media:

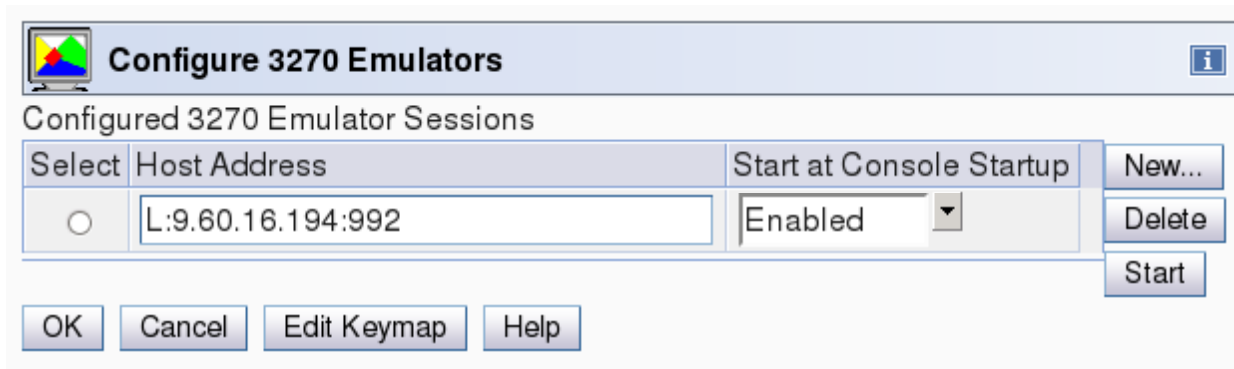
====> media: recommended general practice





## Updates to x3270 Support (aka Secure 3270)

- *A secure telnet connection is established by pre-pending a "L:" to the IP address:port of the IBM host*



## zBX (System z BladeCenter Extension)

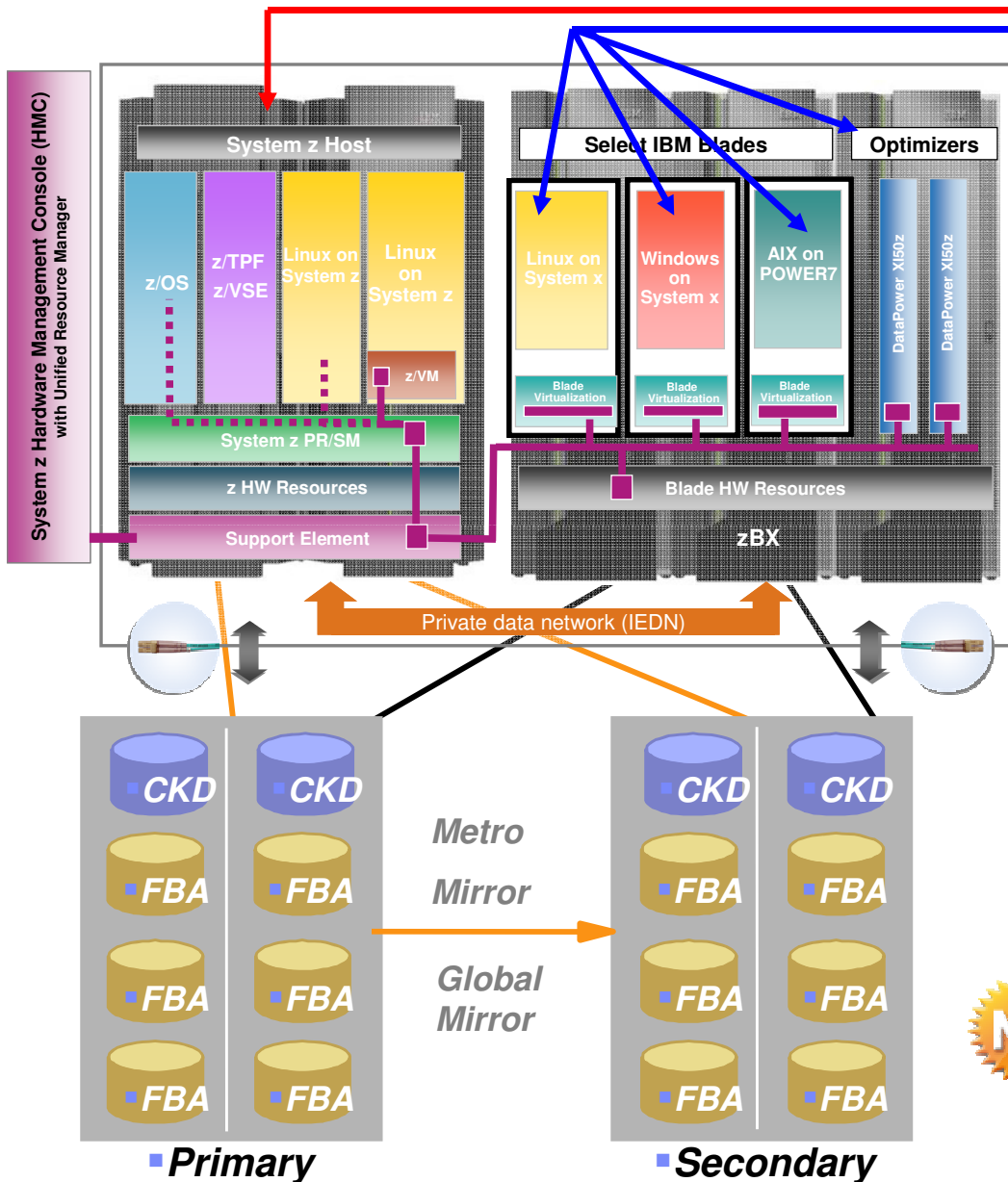
- ▶ Pending IBM System x sale to Lenovo
  - IBM will continue to support zBX, and it's service is uninterrupted!
  - IBM has worked with Lenovo before as a partner
    - For example, System z Support Elements that are Lenovo laptops
  - IBM is continuing forward with our plans to support zBX
  - zBX remains an integrated System z component supported by System z Service.
  
- ▶ In regards to HMC/SE 2.12.1
  - Updated all zBX internal firmware
    - AMM, switches, uEFI, IMM, FSPs, DataPower XI50z, etc
  - Support to carry zBX Configuration/Virtualization data to new location in same ensemble
    - Upgrade support
      - ◆ z196/z114 (zBX Mod 002) to zEC12/zBC12 (zBX Mod 003)

# GDPS zBX Support: Unmatched Resiliency and Availability

- **zBX provides Integration, Resiliency, and Redundancy for increased Availability of Hardware and Firmware components**
  - Pre-configured Hardware Components
  - Encapsulated Hypervisors, deployed as firmware
  - 24 x 7 IBM Maintenance support / Call home
  - Reduced Cabling and Integrated L2 switch
  - zBX firmware treated like CPC Firmware to ensure efficient, secure, concurrent update
  - Redundant Built-in Components: (switches, cables, HMCs, SE's....)
  - All components tested together
- **Unified Resource Manager enables Availability Management of Virtual Servers and Workloads**
  - APIs allows for better integration with availability management and/or dashboard products
  - Existing cluster layer management is supported in the context of zEnterprise (e.g. Sysplex and PowerHA®)
  - Redundant HMCs keep the system available—accessed via the Web and configured to separate role, objects, and actions
  - APIs exist for Starting, Restarting and Stopping virtual servers **NEW**
- **New Ensemble Availability Manager**
  - Monitor and report virtual server availability based on policy
  - Provide availability status for virtual servers associated with a workload
- **GDPS (Geographically Dispersed Parallel Sysplex) support for zBX**
  - GDPS products support the start, stop, and switching of applications executing on virtual servers in a zBX to active target virtual servers **NEW**
  - Automated Multi-Site Recovery Extends GDPS/PPRC continuous availability/disaster recovery capabilities to virtual servers in a zBX



# GDPS Capabilities for zEnterprise Business Continuity



- **Metro Mirror or Global Mirror configurations**
  - Data consistency across system z (z/OS, zVM, and Linux on System z) and distributed systems running in zBX
  - Single point of control
- **xDR for z/OS and Linux applications on system z**
  - Data consistency, HyperSwap™
  - Planned/Unplanned site switches
- **Distributed Cluster Management (DCM)**
  - Tivoli System Automation Application Manager
  - Veritas® Cluster Server clusters
  - Coordinated Planned and unplanned site switches for
    - zEnterprise sysplex
    - Distributed Cluster Servers in zBX (Windows, AIX, Linux)
- **GDPS Automated multi-site recovery for zBX announced July 23, 2013**
  - Extends GDPS/PPRC continuous availability/disaster recover capabilities to virtual servers in a zBX
  - Help facilitate the management of planned and unplanned outages across IBM zEnterprise

## *GDPS zBX Support Hardware and Software Pre-Reqs*



- *GDPS v3.10*
- *IBM z196 Mod 2 zBX or EC12 Mod 3 zBX with p and/or x Blades*
- *IBM zManager HMC primary and backup*
- *Mainframe and Distributed System storage on shared IBM DS8K with OpenLUN*
- *IBM System Automation for z/OS v3.4*
  - *ISQECMD ProcOp and return codes*
  - *zEnsemble commands and return codes*
- *IBM Tivoli System Automation Application Manager (SA AppMan) V3.2.2*
  - *Distributed systems workload management*



## GDPS zBX Support

### Q2 2013: GDPS/PPRC & GDPS/GM v3.10

- Support for zBX running AIX, Linux and/or Windows
- zBX workload management provided by GDPS Distributed Cluster Management (DCM) and SA AppMan



### Q3 2013: GDPS/PPRC & GDPS/GM v3.10

- SA AppMan Toggle Support
- Agentless Adapter support to control standalone zBX server workloads

### Q4 2013: GDPS/PPRC v3.10

- zBX hardware control
  - Hardware provisioning as part of workload site failover
  - Planned and Unplanned CA/DR for virtual servers on zBX blades
- zManager HMC Automatic Failover

## Summary: Ensemble Availability Manager (EAM)

*Monitor, display and emit workload availability requirements within installation-defined objectives*

- *Monitor Operating status of Workload Elements (Virtual Servers, Workload Element Groups)*
- *Workload Availability Policy Management*
- *Workload Availability Status and Goal Compliance*
- *Workload Element Group Management*
- *Virtual Server Availability Status*
- *Availability Status Reports (Workload Resource Groups, Virtual Servers, Workload Element Group)*

*First step to delivering on Availability management in Unified Resource Manager*

## Value delivered with Ensemble Availability Manager (EAM)

- **Consistent high availability management across Virtual Servers in the zCEC & zBX in Ensemble**
  - ▶ **Availability assessment for Virtual Servers in Workload Resource Groups, given a user-defined Availability Policy**
    - PR/SM LPARs (zCEC)
    - KVM guests (zBX)
    - PowerVM virtual machines (zBX)
  - ▶ **Availability enhancements**
    - **Differentiated levels of availability management within the ensemble, based on**
      - WRG availability importance
      - Redundancy
      - Capacity management

# Ensemble Availability Manager

- Goal: Ensure WRG availability requirements are met, within installation-defined objectives
- **Monitor the operating status** of the Workload elements (virtual servers, workload element groups)
- **Determine Workload availability status** on all “element” status changes
- **Present Workload & Virtual Server Availability status:** Available, Exposed, Critical, Not Available
  - ▶ Status “reason” identifies Workload elements for exposed & not available states
- **Create, Monitor Workload Element Group compliance:** redundant servers associated with 1 or more workloads
- **Prioritize availability management via Workload Availability Policy**
  - ▶ Workload availability importance, Workload Impact (Directly-assoc VS), Redundancy Objectives
- **HMC display of Availability status**, “metric” for Workloads, EGs, VS’s
- **Workload Availability Report**
  - ▶ All workloads, Selected workload, Virtual server, all elements
- **Interoperate with data center availability management** via external API to define Availability configuration/policy, or receive Availability status updates

\*\* Ensemble must be at the AUTOMATE entitlement level

## Workload Details – Availability Tab

jdmler: Workload Resource Group Details - Mozilla Firefox: IBM Edition

jdmler.endicott.ibm.com:8080/hmc/wcl/T9fa

**Workload Resource Group Details - fred**

General | Status | Elements | Performance | **Availability**

--- Select Action ---

Select	Availability Policy	Activation Status	Business Importance	Revision	Description
<input checked="" type="radio"/>	<a href="#">Day Policy</a>		Medium	1	
<input type="radio"/>	<a href="#">Default</a>	Active	Medium	1	The default workload availability policy

Total: 2 Selected: 1

**Details for Day Policy**

Activation status: Not Active  
 Last activated date: Last activated by:

Virtual Servers Not Impacting Workload Availability

Virtual Server	Hypervisor	Member	Type
pvs000	C.2.01	PIKACHU	PowerVM
pvs001	C.2.01	PIKACHU	PowerVM

Workload Element Group Objectives

Element Group	Policy Override	Minimum Available Virtual Servers	Preferred Available Virtual Servers
eg02	✓	2	3
eg01	-	2	4
eg03	-	2	4

OK Apply Print View Cancel Help



## Workload Details Status

jdmler: Workload Resource Group ...

jdmler.endicott.ibm.com:8080/hmc/wcl/T9

**Workload Resource Group Details - fred**

General **Status** Elements Performance Availability

Status: Not compliant  
 Performance status: No status  
 Availability status: Not available

Acceptable status:

Compliant  Not compliant

Compliant performance status:

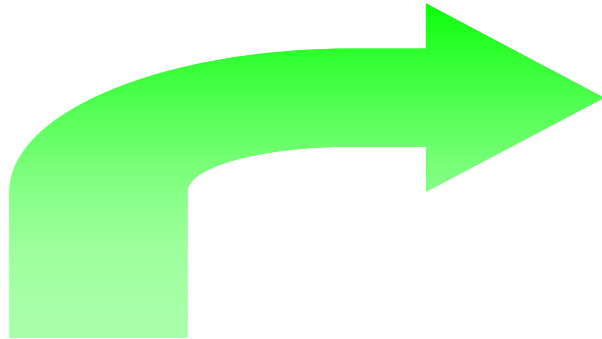
Goals met  Exposed  
 Severe  Critical  
 No status

Compliant availability status:

Available  Exposed  
 Critical  Not available

OK Apply Print View Cancel Help

# Tivoli System Automation can ensure Application Software availability using insight from EAM's view of Virtual Servers



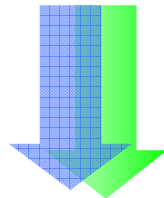
Management of software stack and Business Application availability



GDPS

Automate Operations

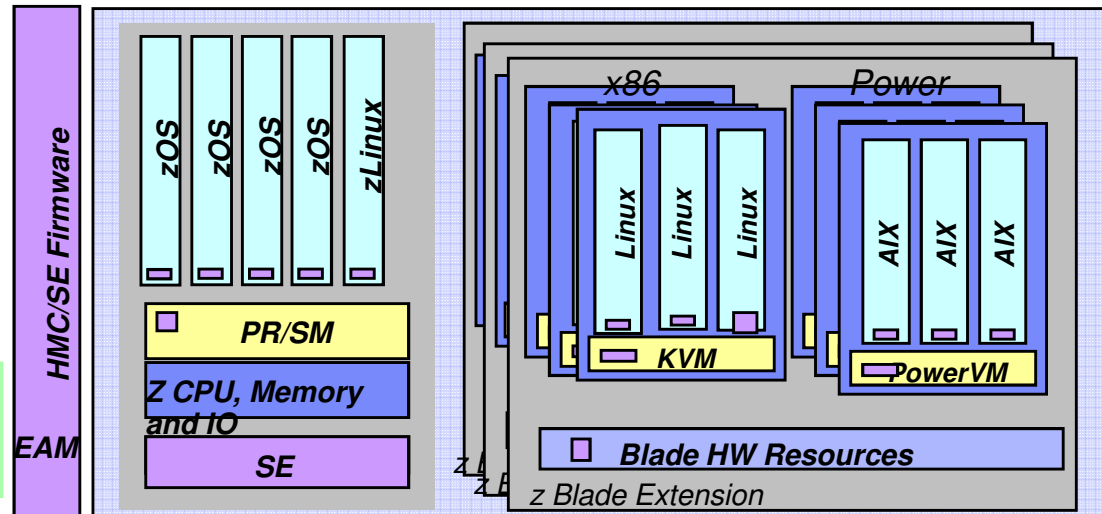
EAM Availability status & events



Integrated Workload availability for normal operations and disaster recovery!  
(e.g., Planned app move, Recover workload)

Availability for hypervisor view of Workload Resource Groups with Virtual Server containers

Unified Resource Manager APIs



# Workload Resource Group Availability Policy

## Workload Resource Group Policy

PerformancePolicyName  
Business Importance

Service Classes  
Classification Rules

Availability Policy Name  
Business Importance

- **Customize Workload Impact**
  - Ignore Availability Impact for selected virtual servers
- **Customize Redundancy Objectives**
  - Preferred # Available VS
  - Minimum # Available VS

- **Availability Business Importance** (highest, high, medium, low, lowest)
- **Customize Redundancy Objectives by workload**
- **Workload impact:**
  - ▶ **Indicate virtual servers that will not affect the workload's availability status when the selected availability policy is active**

---

# What's New for zEnterprise Monitoring and Discovery

zEnterprise Monitoring Agent (v6.2.3.2)

TADDM (IBM Tivoli Application Dependency Discovery Manager) 7.2.2

Released 1H2013





## zEnterprise Monitoring Agent v6.2.3.2 - New Content

- **Visibility of zAware LPAR Health** – The zEnterprise Monitoring Agent monitors the availability and key performance metrics, such as CPU utilization, of zAware logical partitions. Historical CPU utilization measurements can be used for capacity planning to evaluate the need of additional CPU utilization before bringing on-line more zAware clients.
  
  - **End-to-end visibility of all virtualized workloads running across both zBX and the zCPC** – The zEnterprise Monitoring Agent can now monitor the availability and key configuration settings for all Logical Partitions defined in the Ensemble. Detailed monitoring information about the z/OS or z/VM virtual servers is available for each LPAR. This addition completes the detailed monitoring of all hypervisor and virtual server types supported by the zEnterprise platform.
  
  - **Intra-ensemble data network monitoring** – The zEnterprise Monitoring Agent provides a summary of all Virtual Networks and Uplinks defined in an Ensemble. Monitoring of key performance metrics can be used to quickly see overall utilization and health of the intra-ensemble data network (IEDN).
  
  - **Dynamic workspace linking to OMEGAMON zVM and Linux for faster problem resolution** – As with Linux, AIX, and Windows agents, the zEnterprise monitoring agent also links to OMEGAMON for z/VM and Linux to provide more detailed information about z/VM configuration settings and performance metrics.
  
  - **Visibility to the health of zEnterprise Monitoring Agent** - Monitors the availability of the Hardware Management Console (HMC) connection and notifies operations if the agent is no longer able to monitor resources managed by that HMC.
- 
- The zEnterprise Monitoring Agent ships with IBM Tivoli Monitoring (ITM).
  - Utilizes HMC WebServices APIs.



## zEnterprise Discovery with TADDM 7.2.2

- TADDM (IBM Tivoli Application Dependency Discovery Manager) - **Provides robust and automated discovery and application mapping for building an inventory of applications, configurations and dependencies**
- Agent-less Discovery of zEnterprise resources - **Discover and create new zEnterprise resource objects and their associated configuration using “agent-less” System z Hardware Management Console (HMC) API and TADDM sensor technology**
- Extend and complement existing System z discovery – **Extend investments in TADDM, z/OS DLA and z/VM DLA installations to include zEnterprise physical and logical resource configuration.**
- Extend and complement existing distributed discovery – **Extend investments for operating systems that can be hosted on zEnterprise zBX virtual servers (i.e. Linux, AIX and Windows®)**
- Create relationships between resources **within the zEnterprise ensemble and the associated System z environment workload topology**
- Visibility into configuration setting for zEnterprise Systems -**Track high level configuration data provided by the System z HMC**

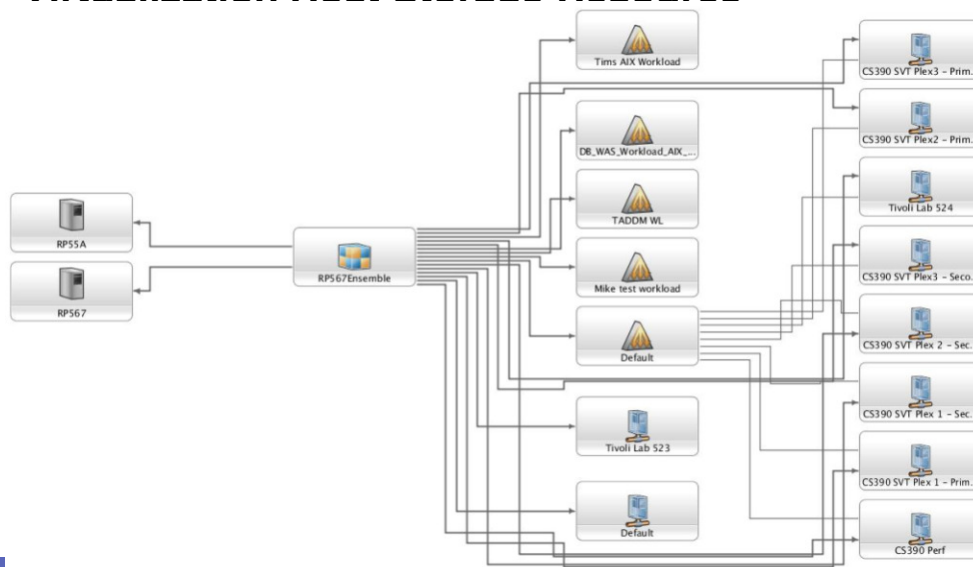
# Ensemble entities discovered with TADDM zEnterprise sensor

## Physical:

- ▶ CPC (zEC12, z196, z114)
- ▶ zBX
- ▶ Rack
- ▶ BladeCenter
- ▶ IBM System x Blade
- ▶ IBM POWER7 Blade
- ▶ IBM WebSphere® DataPower® Integration Appliance XI50 for zEnterprise
- ▶ Virtualization Host Storage Resource

## Logical:

- ▶ Ensemble
- ▶ z/VM Virtualization Host
- ▶ PowerVM® Virtual Server
- ▶ xHyp Virtual Server
- ▶ PR/SM™ Virtual Server
- ▶ z/VM® Virtual Server
- ▶ Logical Partition
- ▶ Virtual Network
- ▶ Workload Resource Group



**Thank you for your time and consideration....**

**Brian Valentine  
HMC/SE Team**

***Contact for any Questions:***

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## Additional Materials

- **Other SHARE Sessions of Related Interest**
- **Registering for IBM Resource Link Access**
- **Notable HMC/SE Publications**

## Other SHARE Sessions of Related Interest

- ▶ March 11<sup>th</sup>, 9:30 – 10:30 AM
  - **14680**: *z/OS V2R1 Communications Server: Shared Memory Communications – RDMA (SMC-R)*
- ▶ March 11<sup>th</sup>, 12:15 – 1:15 PM
  - **14571**: *Crypto and TKE – Your Future*
- ▶ March 11<sup>th</sup>, 3:00 – 4:00 PM
  - **14209**: *Experiences with IBM zAware and zEDC*
- ▶ March 12<sup>th</sup>, 8:00 – 9:00 AM
  - **15048**: *What's New in BCPii in z/OS 2.1? Full REXX Support and Faster Data Retrieval*
- ▶ March 12<sup>th</sup>, 9:30 – 10:30 AM
  - **14652**: *Introducing the IBM zEnterprise BC12 and EC12 Updated Hardware: Processor, Memory, System Structure, and Installation Planning*
- ▶ March 13<sup>th</sup>, 9:30 – 10:30 AM
  - **15053**: *IBM System z HMC Security Best Practices*
- ▶ March 13<sup>th</sup>, 4:30 – 5:30 PM
  - **15043**: *zEC12 User Experiences*



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- **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.**

## Reference Documentation

- Available from IBM Resource Link: [Library->zEC12->Publications](#)
  - ▶ Info Center Link: *Hardware Management Console Operations Guide Version 2.12.1*
  - ▶ Info Center Link: *Support Element Operations Guide Version 2.12.1*
  - ▶ Info Center Link: *Hardware Management Console Operations Guide for Ensembles Version 2.12.1*
  - ▶ IBM SB10-7030: *Application Programming Interfaces*
  - ▶ IBM SC28-2605: *Capacity on Demand User's Guide*
  - ▶ IBM SC27-2626: *Hardware Management Console Web Services API Version 2.12.1*
  - ▶ IBM SB10-7156: *PR/SM Planning Guide*
  - ▶ IBM SA22-1088: *System Overview*
  - ▶ IBM Z121-0243: *Hardware Management Console: Frequently Asked Questions*
- 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*

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