



Today

Updating Power Systems, I/O and HMC
Starting at 10:00 am UK time by Steve Harnett



Series details, registration and replays of previous webinars from
<http://tinyurl.com/UK-PowerVM-VUG>

Register by sending email to Jyoti Dodhia – jyoti_dodhia@uk.ibm.com

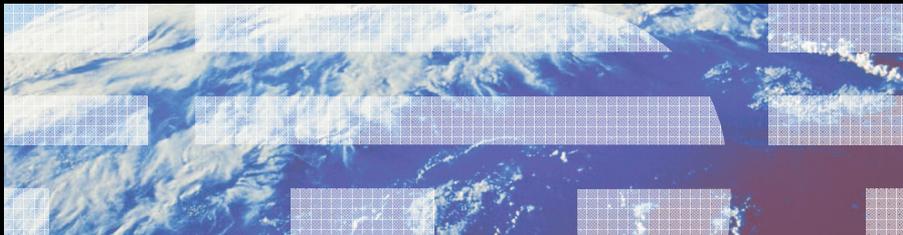
Upcoming sessions

Information will be posted to

<http://tinyurl.com/UK-PowerVM-VUG>



Firmware management strategies for Power Systems, I/O and HMC



Today's agenda

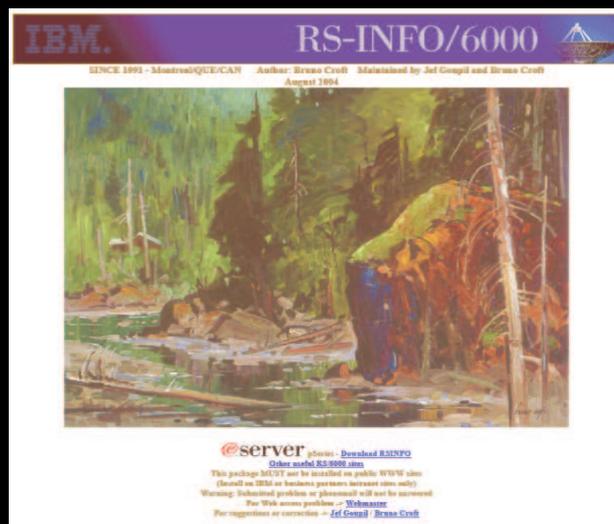
- Firmware and microcode, what are they ?
- Inventory and automation tools
- Hardware Management Console – How to
- System Firmware – How to
- I/O device management
- Summary

Source: If applicable, describe source origin

3

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Firmware and microcode, what are they?



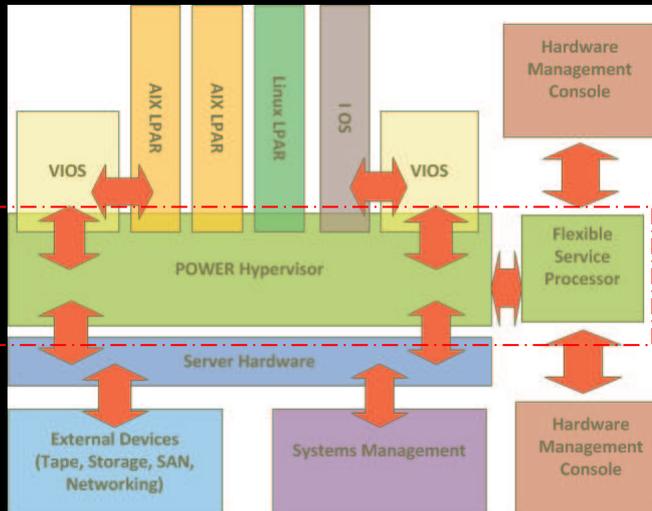
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IBM POWER Systems Firmware

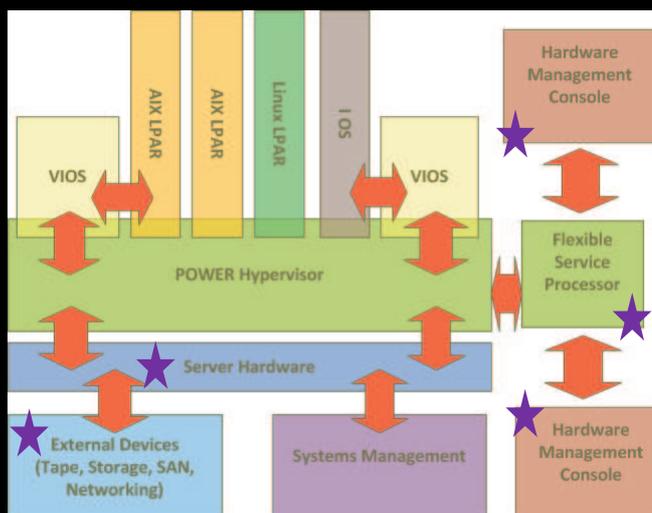
Definition of *firmware*
noun
[mass noun] Computing permanent software programmed into a read-only memory'

▪ Firmware or 'POWER Hypervisor' is fully integrated with every component of a POWER System



IBM Microcode

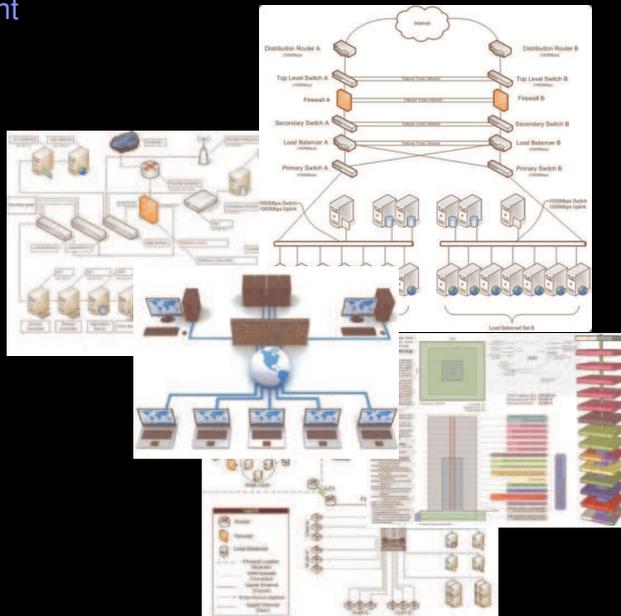
Definition of *microcode*
noun
[mass noun] Computing a very low-level instruction set which is stored permanently in a computer or peripheral controller and controls the operation of the device'.



Know your environment

Every client's infrastructure is unique to them, it is key that this is fully understood in order to properly evaluate:

- Dependencies
 - SAN, Storage, HMC, AIX, IBM I, Linux, SDMC, Systems Director, etc,
- Risks
 - Business impact
 - Back out strategy
 - Skills
- Timescales
 - Update schedule – what first?
 - Disruptive – Non-disruptive
- Tools
 - Inventory tools
 - Systems Director
 - HMC



IBM Electronic Service Agent

IBM Electronic Service Agent

IBM Electronic Service Agent – support automation for your IBM systems



Overview Platforms Security Downloads Documentation

IBM Electronic Service Agent™ can increase system availability and help you stay focused on your company's strategic initiatives.

Immediate reporting

Do your IBM systems contact IBM Support when they need service? They can with IBM Electronic Service Agent.

IBM Electronic Service Agent is a monitoring tool that proactively reports hardware events as soon as they are detected. A service request is electronically routed directly to the appropriate IBM support engineer, with no intervention needed from you. The result: higher availability and faster fix delivery for your environment. This time-saving tool is available at no extra charge for systems covered under warranty or maintenance agreements.

For more information, contact your IBM Systems Services Representative (SSR), or talk to your local IBM representative.

Accurate fixes

Electronic Service Agent has call home functionality that is fully integrated with IBM's hardware support centers. When ESA reports an error to IBM, it transmits essential technical detail and routes the problem to the appropriate support engineer.

In addition, extended error information, such as error logs and system snapshots, is sent to IBM Support with the problem description. In many examples, this means that the support engineer can immediately start working on resolving the problem. Not only does this save valuable time in the problem diagnosis process, it ultimately speeds up resolution time. In specific cases, your IBM customer engineer may be contacted automatically with specific replacement parts information.

- A key tool in overall system availability and monitoring
- Fully integrated into the POWER Hypervisor, AIX, IBM I, POWER Linux, HMC, Systems Director, etc, etc
- 'No charge' option with warranty or maintenance
- Demonstrated to significantly improve system availability by over 30%

Inventory Upload

- Brand new tool for individual inventory analysis
- Client can download and run the Support Assistant Data Collector OR select inventory files from ESA

<http://www-933.ibm.com/support/fixcentral/inventory/entry#>

My Notifications

- Tailored to match your Inventory
- Electronic Service Agent linked
- Tuneable

<https://www-947.ibm.com/systems/support/myview/subscription/css.wss/subscriptions>

Fix Level Recommendation Tool (FLRT)

- Specific recommendations based on actual values

Fix Level Recommendation Tool

The following consolidated information is for guidance purposes only. This information was obtained from generally available product support documentation. These combinations of product levels are supported by IBM.

Date: 2012.09.29
Model: IBM Power 740 (8205-ENC)
Click here for the latest device firmware for this model.
Check: 3.7 gts.

	Input level	Recommended update	Recommended upgrade
System firmware	ALT40.070 Release date: 2012.02.26 Eo-SPS: 2013.10.31	ALT40.077 Release date: 2012.03.08 Eo-SPS: 2013.10.31	None
BMC Software	PTF 8M91310 Release date: 2012.08.25 Eo-SPS: 2014.09.31	PTF 8M91310	None
Notes			
PTF 8M91310, PTF 8M91312 is the Mandatory PTF for BMC V7 R750.			
VIOS	2.2.2.12 Release date: 2011.05.12 Eo-SPS: Not Announced	2.2.1.4 Release date: 2012.05.23 Eo-SPS: Not Announced	None
AIX	7100-00-01 Release date: 2012.06.16 Eo-SPS: 2013.09.10	7100-00-06 Release date: 2012.09.21 Eo-SPS: 2014.10.17	7100-01-04 Release date: 2012.06.16 Eo-SPS: 2014.10.17
PowerVM	2.1.0.4 Release date: 2011.08.01 Eo-SPS: Not Announced	2.1.1.2 Release date: 2012.05.01 Eo-SPS: Not Announced	None

<http://www-304.ibm.com/support/customerarcare/flrt/>

IBM Fix Central

As of 31st January 2012
Fix Central is now
Entitlement checked,
access is only allowed for

- Warranty
- Maintenance
- Subscription

Fix Central

Fix Central provides fixes and updates for your system's software, hardware, and operating system.

For additional information, click on the following link:
Getting started with Fix Central

Select product: [Find product]

Select the product below:
When using the keyboard to navigate this page, use the Alt and down arrow keys to navigate the selection lists.

Product Group: All Hardware

Product: [Select]

Product: Firmware, BMC and BMC

Machine type model: 8205-ENC

My product history: [List of products]

As of January 31, 2012, each IBM client accessing Fix Central (whether through their employees or other authorized representatives) is required to have an individual IBM ID to download fixes (some exemptions may apply). The registration is quick and simple and will provide users with a customized experience to better serve their needs. Fix Central downloads are available only for IBM clients with hardware or software under warranty, maintenance contracts, or subscription and support. Software code, samples, updates and fixes being accessed on this website (collectively, the Code) are subject to the terms of the license agreements which govern the use of the associated Code.

Continue

<http://www-933.ibm.com/support/fixcentral/>

Compatibility matrices

HMC / Firmware Supported Combinations

HMC	p7 System Firmware	p6 System Firmware	p5 System Firmware
V7R7.5.0	AM740_095	EH059_132	SF240_417
	AM740_098	EH059_128	SF240_415
	AM740_077	EH059_109	SF240_403
	AM740_075	EH059_108	SF240_390
	AM740_045	EH059_107	
	AM740_042	EH059_103	
	AL740_099	EH059_085	
	AL740_098	EH059_071	
	AL740_077	EH059_048	
	AL740_075	EH059_038	
	AL740_048	ES330_132	
	AL740_043	ES330_128	
	AH730_099	ES330_109	

Supported combinations for HMC/Server code and SDMC/Server code

IBM Systems with POWER7 processors

The following tables list currently supported firmware (FW) Release Levels for the specified POWER7 systems, as well as the compatibility of Hardware Management Console (HMC) and Systems Director Management Console (SDMC) firmware levels with system firmware levels. For specific recommendations within a Release Level, please refer to 2.3.2.

MTMs 6292-24C, 6295-67C, 6231-61C, 6231-63C, 6246-12C, 6246-12S, 6246-11C, 6246-11S servers, and 6492-20Y7 and 6495-52Y servers

HMC levels	AL740 Release	AL720 Release	AL710 Release	AL710 Release
V7R7.4.9	Supported	Supported	Supported	Supported
Later level				

Supported combinations for HMC and Server code

For IBM Systems with POWER7 processors

The following table lists currently supported firmware (FW) Release Levels for POWER7 systems, as well as the compatibility of Hardware Management Console (HMC) firmware levels with system firmware levels. For specific recommendations within a Release Level, please refer to the following location:

→ Fix Level Recommendation Tool (FLRT)

Note: The POWER7 MTMs are not supported via the Systems Director Management Console (SDMC).

For all MTMs with POWER7 processors

HMC levels	240 Release	235 Release	230 Release	225 Release
V7R7.4 Latest level	Supported at SF240_359 level and higher	Not supported	Not supported	Not supported
V7R7.5	Supported at SF240_359 level and higher	Not supported	Not supported	Not supported
V7R7.2	Supported at SF240_359 level and higher	Not supported	Not supported	Not supported
V7R7.1	Supported at SF240_359 level and higher	Not supported	Not supported	Not supported
V7R6.5	Supported at SF240_289 level and higher	Not supported	Not supported	Not supported
V7R6.4	Supported at SF240_289 level and higher	Not supported	Not supported	Not supported
V7R6.3	Supported at SF240_289 level and higher	Not supported	Not supported	Not supported
V7R6.1	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.
V7R6.2	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.
V7R5.1	Not supported.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.
V7R5.0	Minimum HMC level required to support POWER7 Release Level SF240.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.
V7R4.9	Minimum HMC level required to support POWER7 Release Level 235.	Not supported.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.
V7R4.8	Minimum HMC level required to support POWER7 Release Level 230.	Not supported.	Upgrade recommended. See 2.3.2 for specific details.	Upgrade recommended. See 2.3.2 for specific details.

<http://www14.software.ibm.com/webapp/set2/sas/f/power5cm/power7.html>

<http://www-933.ibm.com/support/fixcentral/firmware/supportedCombinations>

Firmware End Of Service

- Good practice to be on recent code levels but this will not affect your maintenance contract should it not be the case

Support & downloads My IBM

HMC and Power Systems firmware

Support lifecycle information

POWER7 | POWERS | POWERS | Support lifecycle | Terminology

- Firmware for IBM Power Systems
- Code for HMC V7 releases
- Code for HMC V6 and V5 releases
- Code for HMC V4 and V3 releases

The following tables list the general availability and end of service pack support dates for firmware for IBM Power Systems and for machine code for the Hardware Management Console (HMC).

To determine the current status of a System firmware or HMC code level, refer to the **Matrix key** to the right, which shows the color code for the status.

System firmware release level	General availability date	End of service pack support
740 Release	October 2011	October 2013
730 Release	May 2011	May 2013
720 Release	September 2010	September 2012
710 Release	February 2010	February 2012
350 Release*	November 2009	November 2011
340 Release	November 2008	November 2010
330 Release	May 2008	May 2010
320 Release	December 2007	January 2010
310 Release	June 2007	June 2009

Matrix key

- Latest Release Level
- Maximum Stable Release Level
- Reduced Fix support
- End of Service Pack support

Did you know?

You can quickly find APARs marked PE or WPER in the [Technical help database for AIX](#).

Simply add the word Yes/PE or Yes/WPER to your query.

Related support

- System firmware & HMC V7 and higher
- HMC V6 and lower
- Other system firmware
- Virtualization software
- Cluster software
- AIX updates
- Linux updates
- IBM i updates
- FLRT (Fix Level Recommendation Tool)
- IBM Prerequisite tool
- Other software

<http://www14.software.ibm.com/webapp/set2/sas/f/power5cm/eoss.html>



Firmware Terminology

▪ POWER5

The file naming convention for POWER5 System Firmware is as follows:

01SFXXX_YYY_ZZZ **01BPXXX_YYY_ZZZ**

where

XXX is the *release* level,

YYY is the *service pack* level, and

ZZZ is the *last disruptive service pack* level.

Using the above example, System Firmware 01SF235_185, as displayed on the Firmware Download page, would be described as Release Level 235, Service Pack 185.

▪ POWER6

The file naming convention for POWER6 Midrange System Firmware is as follows:

01EMXXX_YYY_ZZZ **01BPXXX_YYY_ZZZ**

where

XXX is the *release* level,

YYY is the *service pack* level, and

ZZZ is the *last disruptive service pack* level.

Using the above example, System Firmware 01EM310_048, as displayed on the Firmware

Download page, would be described as Release Level 310, Service Pack 048. © 2012 IBM Corporation



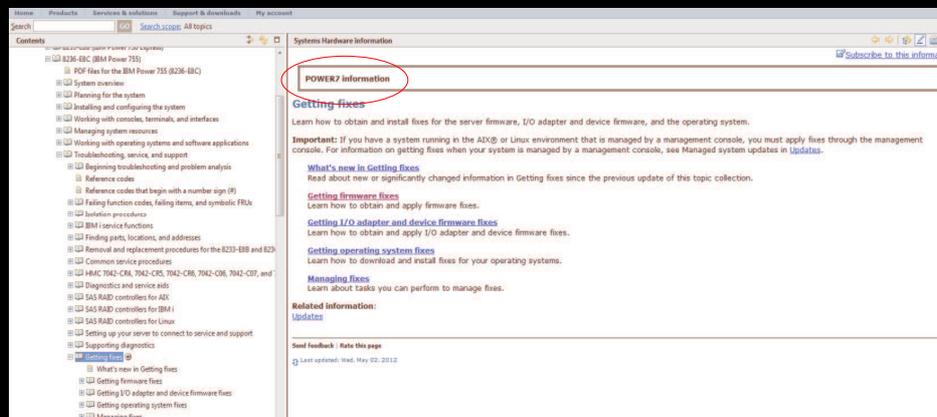
Firmware Terminology cont'd

- With POWER6 upwards FW we introduced 4 streams
 - High
 - Medium
 - Low
 - 'S' for HPC

This allows any fix packs to be targeted to specific system products and reduces the frequency of firmware releases

730 Release	
Component	Version
System firmware	AS730_103 Firmware for MTM: 9125-F2C
	AH730_095 Firmware for MTM: 9119-FHB
	AM730_095 Firmware for MTMs: 9117-MMB and 9179-MHB
Power subsystem firmware	AL730_095 Firmware for MTMs: 8202-E4B, 8205-E6B, 8231-E2B, 8233-E8B, 8236-E8C servers, and 8492-DW2 and 8493-SV2 solutions
	AP730_086 (9125-F2C only) AB730_095 (9119-FHB only)
Hardware Management Console	Version 7 Release 7.5.0 Service Pack 1 + MH01325
List of new HMC features & functionality	Hardware Management Console V7.R750
Systems Director Management Console	SDMC Version 6 Release 7.3.0

IBM Infocenter



Hardware Infocenter can provide guidance on obtaining and applying firmware and microcode but can sometimes be vague or difficult to navigate.

<http://pic.dhe.ibm.com/infocenter/powersys/v3r1m5/>

Planning code updates – HMC code and System Firmware

- In a HMC managed environment
 - The HMC must always be installed with code equal to that of the highest managed system
 - In a dual HMC environment only upgrade one HMC at a time, however the pair MUST be running identical versions, fix packs and fixes
 - A HMC update can be performed without affecting the managed systems
 - A full HMC backup should be done prior and post to an update of the HMC
 - Always have valid recovery media for the current and target code levels (Fix Central)
 - Multiple managed servers can be updated at once but this may add extra time when compared with a single install
 - ALWAYS back up system profile data regardless of the service action
- Without a HMC
 - Always use the operating system to update the system firmware
 - This is always disruptive regardless of the OS type or fix status
 - Do not use the USB option of updating firmware without contacting support first
- SDMC or Systems Director
 - Neither are covered in this presentation but should be used to update system firmware

These are suggested best practices which I have developed over several years of updating code and may not be reflected by IBM publications

Hardware Management Console

- Identify the current version

'Ishmc -V not -v'

The screenshots show the HMC web interface and a terminal window. The HMC interface displays system information including Version 7, Release 7.5.0, Service Pack 1, Build Level 20120806.1, Base Version V7R7.5.0, Model Type T042CR8, Serial Number 054H23C, and BIOS D0E148B0S-1.06. The terminal window shows the command 'ishmc -V' and its output: 'version= Version: 7', 'Release: 7.5.0', 'Service Pack: 1', 'HMC Build level 20120806.1', and 'base_version=V7R7.5.0'.

Hardware Management Console

- Installation method is personal choice
 - CD/DVD – The only option in DMZ/ secure environments
 - Local repository – Useful for management of images single install reference
 - Internet - IBM FTP site – network install requires minimal user input
- ISO images can be found on Fix Central

The screenshots show the IBM Fix Central website. The left sidebar shows the 'Firmware and HMC' section. The main content area displays a list of HMC recovery packages. The table below summarizes the packages shown:

Package Name	Released	Part Number	Description
HMC Recovery V7R7.3.0M0 Recovery Image	Released 20 May 2011	8M41255	
HMC Recovery V7R7.3.0M0 Release Update Package	Released 20 May 2011	8M41256	
HMC specific files for HMC V7R7.30	Released 18 Jul 2011	8M41263	
Mandatory files for HMC V7R7.30	Released 20 May 2011	8M41257	

Hardware Management Console

Hardware Management Console

Install HMC Corrective Service Wizard

Current HMC Driver Information

HMC name: localhost
 Machine type/serial number: server eServer 338 (7310003)/653701A
 Original installation date: 2011-04-28
 Version: 7
 Release: 7.2.0
 Service pack: 6

Select Service Repository

Removable media
 Remote server

Installation and Configuration Options

Choose the remote server type.
 FTP
 NFS

Remote server: public.dhe.ibm.com
 User ID: anonymous
 Password: *****
 Remote directory: /software/server/hmc/updates

FTP
 public.dhe.ibm.com
 Anonymous
 <your email address>
 /software/server/hmc/updates OR
 /software/server/hmc/fixes

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Hardware Management Console

Confirm Service Installation

Install HMC service from a remote server
 Remote server: public.dhe.ibm.com
 Service package: InfoCenter_MH400270.zip
 Click the Finish button to begin the HMC corrective service action.

Install HMC Corrective Service Progress

Elapsed time: 00:20:17

```

/info/IBMhmc.InfoCenter.de_DE-5.0.1-bld.noarch.rpm
inflating: /dump/hsc_install.images/images
/info/IBMhmc.InfoCenter_it_IT-5.0.1-bld.noarch.rpm
extracting: /dump/hsc_install.images/images/inventory extracting:
/dump/hsc_install.images/images/signature inflating:
/dump/hsc_install.images/images/installImages
Verifying Certificate Information
Authenticating Install Packages
Installing Packages
Incompatible service package
Corrective service installation has failed.
View the HMC log for details.
    
```

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In this instance I attempted to install an update for V7R74 onto a HMC running V7R1 demonstrating that the process does have some fail safe elements.

HMC command line

```
updhmc -t s -h <myservname> -f </home/updates/corrective_service.iso> -u
<HMC_username> -i
```

```
UPDRMC (1) User Manuals UPDRMC (1)

NAME
  updhmc - update code on the Hardware Management Console

SYNOPSIS
  updhmc -t {m | s | l}
  [-h ftp-server -u user-id [-p password | -i]]
  [-f file] [-r] [-c] [--help]

DESCRIPTION
  updhmc updates code on the Hardware Management Console (HMC). This
  command performs the equivalent of the Update HMC task under Updates
  on the console.

  This command can be used with either a .iso or a .zip corrective
  service file. You are not required to burn CD-R or DVD-R media in
  order to use a .iso file.

OPTIONS
  -t The source type to update from. Valid values are:
  Manual page updhmc(1) line 1
```

System Firmware considerations

- With a HMC
 - Ensure a good network connection – reset connection
 - Ensure that all FSP's are connected - reset connection
 - Reboot the HMC to ensure that it is in a clean stable state
 - Check for serviceable events relating to the managed system(s)
 - Check for deferred fixes
 - Update OR upgrade ?
 - Update is usually concurrent
 - Upgrade is disruptive and will require a system outage
- Without a HMC
 - All updates must be done from the operating system
 - AIX – 'lsmcode -c' will display :
 - The current permanent system firmware image is EM310_005
 - The current temporary system firmware image is EM310_006
 - The system is currently booted from the temporary image.
 - Then use SMIT to install OR DIAG >Tasks and Service aids >Update and manage flash
 - IBM I you can use 'GO PTF' to display and install specific fixes

In either situation the system MUST be booted from the temporary side

System Firmware

- On HMC V7 the update process is simple:
 - Updates
 - Select system
 - Options for that system then appear
 - This is possible from the systems management screen but does not give the summary view seen below

Hardware Management Console

Updates

HMC Code Level

Version: 7
Release: 7.1.0
Service Pack: 4

Build Level: 2010903.1
Base Version: V7R7.1.0

Serial Number: 65451CA
Model Type: server sSeries 335 (7318CR2)
BIOs: T2E138AUS

Update HMC

System Code Levels

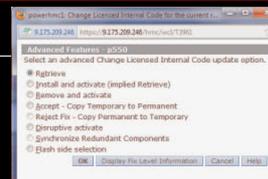
Select	Name	Status	Platform (PL) Level	Activated Level	EC Number	Deferred Level
<input checked="" type="checkbox"/>	p550	Operating		403	403 018P240	None
<input checked="" type="checkbox"/>	p570	Operating		417	417 018P240	None

Max Page Size: 50 Total: 3 Filtered: 3 Selected: 1

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Advanced Features Options

Use with caution



- **Retrieve** Allows you to copy updates from the selected repository location to either the hard drive on the HMC or to removable media on the HMC. If the updates are copied to the hard drive, they are available to be installed.
- **Install and activate (implied Retrieve)** Installs and activates available LIC updates from the selected repository location.
- **Remove and Activate** Returns the system back to the update level on the permanent side. You can use this option to back off an update level.
Note: This procedure is estimated to take 60 minutes to complete. When a remove and activate procedure is disruptive, it may take up to 2 1/2 hours because of the time necessary to power off and power on the system. Schedule your time accordingly.
- **Accept - Copy Temporary to Permanent** Copies the currently running level to the permanent side. This applies a fix permanently, which cannot be backed off the system.
- **Reject Fix - Copy Permanent to Temporary** Copies the currently running level to the temporary side. This can be used to reject a fix that has been applied.
- **Disruptive activate** A system restart is performed. This completes the **Concurrent install only, with deferred disruptive activate** procedure. To ensure your system is ready for the disruption, first quiesce, or close, all applications that are running on the system.
- **Synchronize Redundant Components** Synchronizes Licensed Internal Code on redundant components. LIC will be synchronized from the primary Service Processor to the secondary Service Processor, and from the Side-A Bulk Power Controller to the Side-B Bulk Power Controller. **Flash side selection** Selects which flash side will be active after the next activation, t-side (temporary side) or p-side (permanent side).

I/O device management

'If it isn't broken don't fix it !'

- Unless you have a specific reason to update device driver or adapter code don't do it.
 - Exceptions to this are EOS code levels, new installations, new functionality, etc,

- All devices should be updated from the owning operating system, VIOS, AIX, Linux 'I'
 - PTF's on IBM I
 - Device downloads on Fix Central

- Follow the installation instructions from Fix central or IBM Support

- Only install microcode from Fix Central or IBM Support NOT from 3rd party vendor sites such as Emulex or Qlogic as they will not be tested with AIX or I

- Ensure that you fully read the instructions particularly the cautionary notes

- If you are using VIOS on your system then any updates must be performed from the VIOS

- Ensure that all compatibility checks are done prior to any update

Summary

- 'PPPPP' Prior Preparation Prevents 'really bad' Performance
- Ensure that you receive regular updates on the whole of your infrastructure
 - My notifications
 - Survey tools – Systems Director, TPC, HMC, ESA,
 - IBM Support Portal
 - Technical Account Manager

- Plan a full review of you infrastructure stack (Microcode, Sys FW, OS, VIOS, Applications, SAN) every 6 months

- 'Try' to have in place regular maintenance windows for your systems and ensure that they are not taken up just with application updates, backups, etc

- Don't rush to have the latest code on your systems N – 1 is a good place to be unless you have a 'cast iron' reason to install the latest

Steve_Harnett@uk.ibm.com Mobile 07802 245352



Additional information

- ESA / HMC security whitepaper : <http://www-01.ibm.com/support/docview.wss?uid=isg3T7000236&aid=1>
- AIX developer Works : <http://www.ibm.com/developerworks/aix/>
- Fix Central : <http://www-933.ibm.com/support/fixcentral/>
- Infocenter : <http://pic.dhe.ibm.com/infocenter/powersys/v3r1m5/index.jsp>
- IBM Support Portal : <http://www-947.ibm.com/support/entry/myportal/overview>