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Technical **Forum** & 17 al 21 Octubre 2011
Executive Briefing

Imagine **PODER** Imagine **CAPACIDAD**

Upgrade Planning for POWER™ IBM Power Systems™

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Agenda

Terminology

IBM Power Systems

Hardware Considerations

Consoles Options

Power is performance redefined
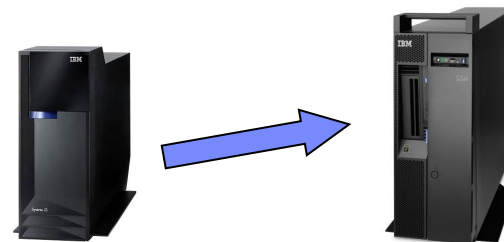
Hardware Upgrade terminology

Hardware upgrade
- An upgrade that refers to any of the following:
  - ❖ A hardware change to a later level of the server hardware that maintains the original server serial number
  - ❖ The addition of hardware to the server
  - ❖ An enhanced hardware function

Machine type upgrade
- A hardware MES that causes a change to the hardware machine type. A machine type upgrade could involve adding, removing, or changing features, or transferring your server data. The server's serial number does not change.

Model upgrade
- A specific type of hardware MES that causes a change to the hardware model. A model upgrade could involve adding, removing, or changing features, or transferring your server data. The server's serial number does not change.
  - ❖ Example 9406-550 to 8204-E8A

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Software Upgrade terminology

Software upgrade
- Any software change to an existing server that can include any of the following:
  - ❖A software change to a more recent release
  - ❖A software addition
  - ❖An enhancement in software function

Operating System upgrade
- A specific type of software upgrade for an existing server that refers to either of the following:
  - ❖A change to a more recent release of the operating system
  - ❖An enhancement in operating system function

System Firmware upgrade and/or Licensed Internal Code (LIC)
- A specific type of software upgrade for an existing server that refers to either of the following:
  - ❖A change to a more recent release of the LIC or System Firmware
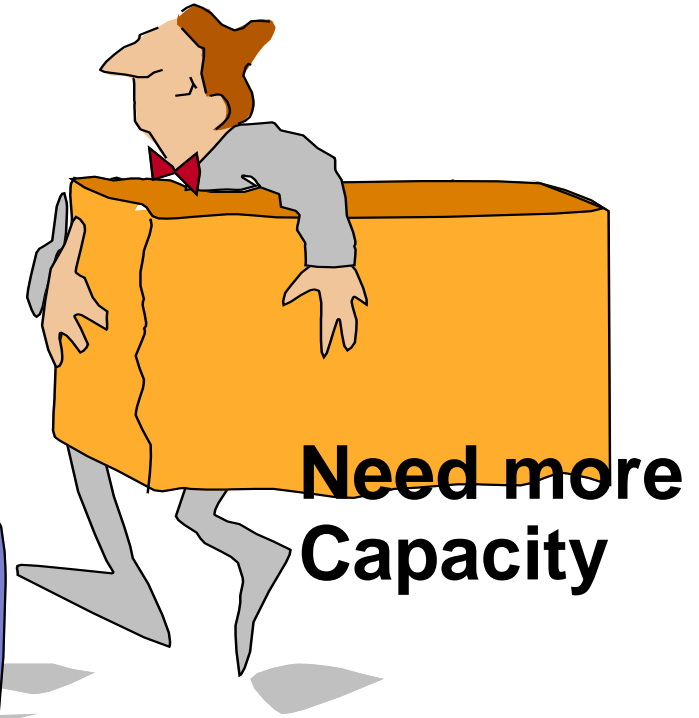 - ❖An enhancement in the LIC or System Firmware function

HMC/SDMC Code upgrade
  - ❖A change to a more recent release of the HMC code level
  - ❖An enhancement in the HMC function

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Why upgrade your Server ?

Leveraging Investment

Enabling New Technology

Need more Capacity

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2011 Power Systems Portfolio

POWER7
IBM

Select from the broadest system portfolio in the industry
- The highest performance, most scalable UNIX system ever
- Entry thru Enterprise Servers for IBM i, AIX and Linux

Enterprise Servers

Power 795

Power 780

Power 770

Express Servers

Power 750

Power 720/740

Power 710/730

PS Blades

i Editions Express for BladeCenter S

PowerHA   PowerVM   IBM® Systems Director

AIX®   i for Business   Linux

High Performance Computing

Power 755

Power 775

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Power Systems Basic Terminology

Applications	Applications

VIOS	AIX or Linux	IBM i
		LIC

Firmware

Hardware

HMC or SDMC

- **Operating System**
- IBM i, AIX, Linux
- Updates via standard PTFs, CUM packages, Hiper group, Patches etc.

- **LIC** (License Internal Code) or sometimes referred to as **LMC** (Licensed Machine Code) or **SLIC** component replaced by .
- Latest LIC Level: V5R4M5 Resave E or V6R1M0 Resave E

- **Firmware** (sometimes referred to as POWER Hypervisor or PHYP (pronounced p-hype) because it is one of the major firmware components).
- Components run on both the system and the HMC
  - Updates/Upgrades = Version/Releases, Service Packs (SP)
  Latest release level = 730
  - Latest fixpack System model unique

- **HMC -** Hardware Management Console
  This code is paired with the system firmware code levels
- Latest level V7.3.4

- **SDMC –** System Director Management Console
  This code is paired with the system firmware code levels
- Latest level 6.730.0

as of Sept 2011

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Power Systems Basics

OS Level

AIX
6.1

Linux

IBM i
6.1

IBM i
7.1

LIC Level

LIC 6.1.1

LIC 7.1

Firmware Level

POWER Hypervisor

Hardware

Disks

Disks

Tape drive/library

HMC and OS Console:
•Service Focal Point

HMC Level

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POWER6 new technologies

Power 520/550/560/570/595 have multiple new technologies

- **Choice of 12X and/or HSL-2 (RIO-2) loops**
  - ❖Support for HSL-2 speed I/O drawers and towers (exception IXA)
  - ❖12X SDR 19" I/O drawer 5796 (520/550/560/570)
    - o**May 2009 new 5802/5877 12x DDR 19" IO drawer**
  - ❖12X SDR 24" I/O drawer 5797/5798 (595 only)
    - o**May 2009 new 5803/5873 12x DDR 24" IO drawers**
  - ❖No HSL optical loop support in POWER6
- **SAS (Serial Attached SCSI) only disk drives supported in the CEC**
  - ❖Redundant write cache protection options now available in the 520/550/560 and 570 with May 2009 enhancements
  - ❖520/550 can drive a EXP12S (5886) drawer with FC5679 write cache
  - ❖Mirroring is the only disk protection allowed for 570 CEC drives
  - ❖Mix of New PCIe slots and PCI-X DDR slots in CEC
- **New Adapter technology**
  - ❖PCIe adapters - they do not use an IOP (IOPless only)
  - ❖No IOPs supported in the CEC
  - ❖Mix of New PCIe slots and PCI-X DDR slots in CEC
    - o(second loop uses one of the adapter slots)

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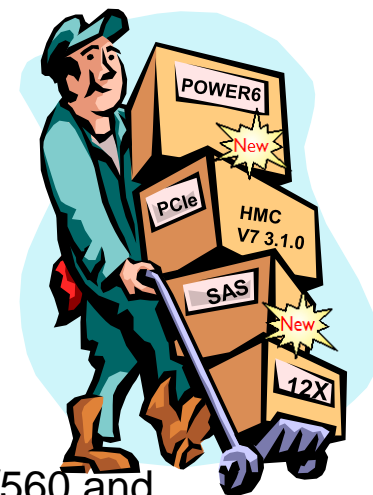
POWER6 new technologies to plan for

Power 520/550/560/570/595 have multiple new technologies

- Buffered DDR2 Memory DIMMs
- Integrated Virtual Ethernet adapter (520/550/560/570)
- HMC GUI browser based interface
  - ❖ V7R3.1.0 or later HMC machine code required
- HMC required for POWER6 560, 570 & 595
- System Firmware numbering from POWER5
  - ❖ EL320 for Power 520/550 Systems
  - ❖ EM320 for Power 560 & 570
  - ❖ EH330 for Power 595
- IBM i V5R4 and V5R4M5 LIC or later required
- Support for IBM i Load Source outside of the CEC
  on a single image system without HMC

http://publib.boulder.ibm.com/infocenter/systems/scope/i5os/index.jsp?topic=/rzahc/rzahcdmodeiplvpd.htm&tocNode=toc:rzahg/i5os/7/1/12/9/

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POWER7 new technologies to plan for

POWER7 Systems have multiple new technologies

- New buffered DDR3 Memory DIMMs
- New integrated Virtual Ethernet adapter
  (710,720,730/740,750,755,770,780)
  - ❖ Quad 1Gbs
  - ❖ Dual 1Gbs & dual 10Gbs SFP twinax,
  - ❖ Dual 1Gbs & dual 10Gbs SFP optical
- New HMC GUI browser based interface
  - ❖ V7R7.1.0 or later HMC machine code required depends on system GA date
- HMC required for POWER7 770, 780 and 795
- New System Firmware numbering from POWER6
  - ❖ AE720 for 710,720,730,740
  - ❖ AL710 for Power 750 & 755 Systems
  - ❖ AM710 for Power 770 & 780 Systems
  - ❖ AM720 for Power 795
- PCI-e Gen 1 and Gen 2 adapters
- New PCIe SSD options

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Hardware Considerations

Server Model Upgrades Paths

IBM Systems Hardware Information Center

http://publib.boulder.ibm.com/infocenter/systems/scope/hw/index.jsp

Systems Hardware information
- Power Systems information
  - POWER7 systems
  - POWER6 systems
  - POWER5 systems
  - pSeries POWER4 systems
  - RS/6000 systems
- Intellistation POWER information
- OpenPower information
- System i information
- System p information
- Hardware Management Console information
  - IBM Systems Director Management Console information
- POWER solutions information

ibm.com: About IBM - Privacy - Contact

IBM Power Systems Hardware Information Center

This information center is your source for technical information about IBM® systems.

Popular topics

- Beginning troubleshooting and problem analysis
- Hardware Management Console (HMC) information
- Systems Director Management Console (SDMC) information
- How to find reference codes
- POWER5™ hardware parts catalog, finding part locations, and addresses
- POWER6® hardware parts catalog, finding part locations, and addresses
- POWER7® hardware parts catalog, finding part locations, and addresses
- Statement of Limited Warranty
- Upgrading the system and data migration

Related product documentation

- IBM BladeCenter® Information Center
- IBM iDataPlex™ Information Center
- Power Systems™ hardware and operating systems

Resource information
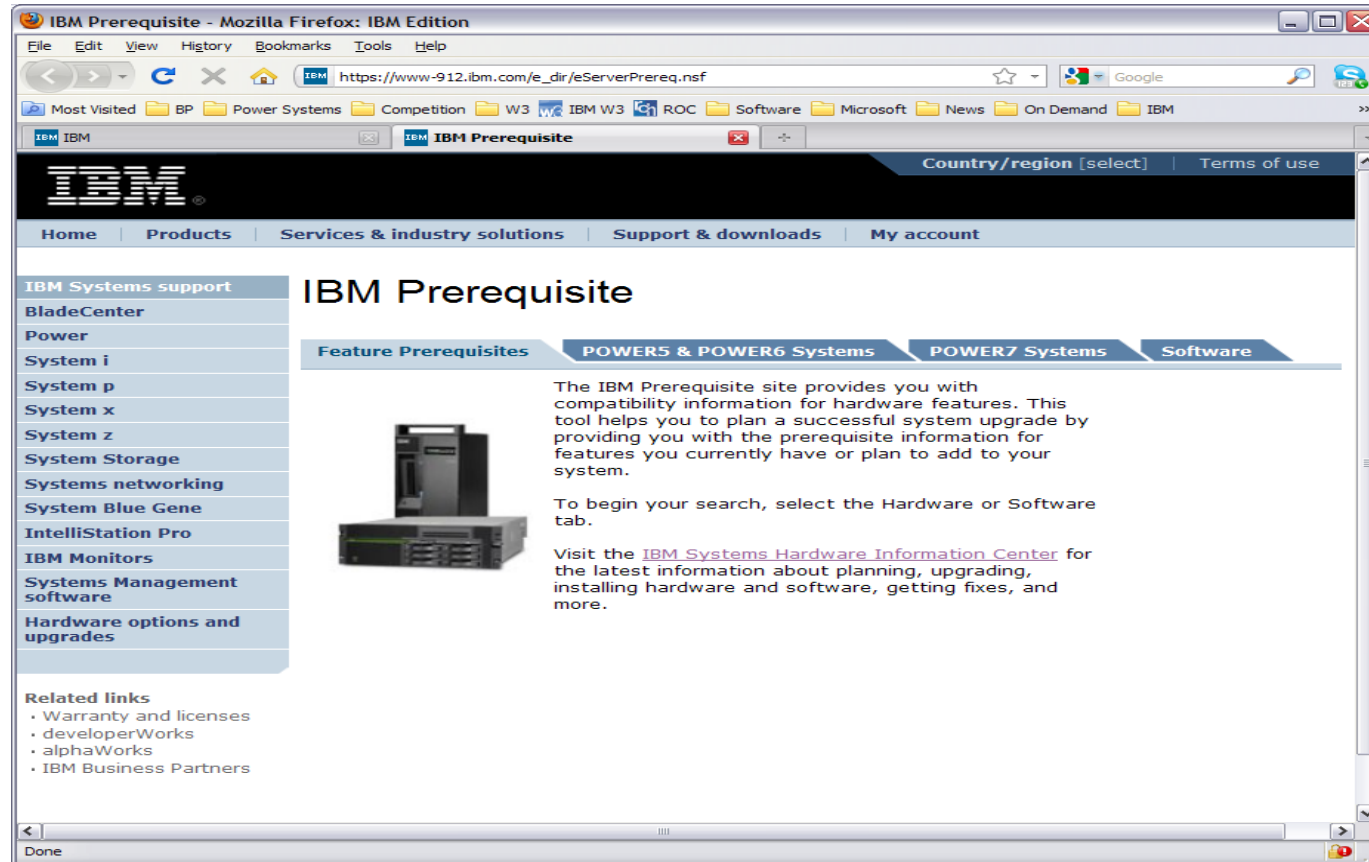
- Fix Central
- IBM developerWorks®
- IBM Electronic Services
- IBM Redbooks®
- IBM Systems Forums
- Open service request
- Order status

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Are You Looking for Upgrade Directions?

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Serial Number Upgrade Options into Power Systems

Basically same Model hardware upgrade rules / philosophy
as used in the past

- From POWER5™ to POWER5+ (1.5/1.65 to 1.9/2.2/2.3GHz)
- From POWER5(+) to POWER6 (4.2, 4.4, 4.7, 5.0GHz)
- From POWER6 to POWER7 (3.0 to 4.25GHz)

NO one-step from POWER5 to POWER7

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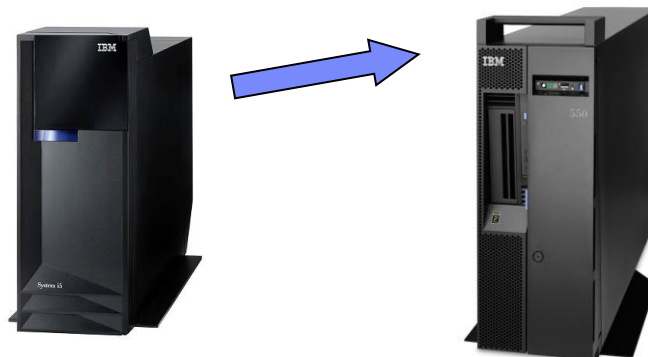
Model Upgrade Methodologies

There are four basic methodologies for a model upgrade that are based around three different application runtime impacts.

1. **Basic**

This is a non-concurrent upgrade.   All of the customer's applications and partitions present on the POWER6 are halted while the hardware upgrade is performed.

(595 to 795 - assuming the preparatory work is completed, the typical amount of time for this upgrade when 2 SSRs are present is expected to be 4 - 8 hours and therefore, the customer will experience at least a 4 - 8 hour outage before he can resume his applications.)

2. **Side-by-Side (RPQ)**

This upgrade allows customers to move applications and partitions from an POWER6 to a POWER7 system over a 30 to 60 day period. This allows the majority of applications and partitions to continue running.   Applications can be stopped and moved to the new machine or can be moved while running using Live Partition Mobility

3. **Concurrent Upgrade via Live Partition Mobility (for AIX today)**

This upgrade allows customers to keep partitions and workloads running while thePOWER6 to POWER7 server upgrade takes place.

4. **PEX – Power EXchange**

Done thru IBM financing and is where we exchange a new serial number system for clients installed serial number system.

Upgrade Paths (Retain System Serial Number)

795
9119-FHB
POWER7

595
9406-595
POWER5/5+

595
9119-FHA
POWER6

590/595
9119
POWER5/5+

770/780
9117-MMB
9179-MHB
POWER7

Done via Machine Type MES,
Firmware & deep IPL

Done via firmware
& deep IPL

570
9406-MMA
POWER6

570
9117-MMA
POWER6

570
9117-MMA
POWER6

570
9406-570
POWER5/5+

570
9117-570
POWER5/5+

🟩	**Power Systems**
🟧	**System i™ Server**
🟪	**System p™ Server**

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Upgrade Paths (Retain System Serial Number)

795
9119-FHB
POWER7

POWER7

770/780
9117-MMC
9179-MHC

Clients that have
9406-MMA
MUST upgrade
to 9117-MMA
prior to upgrading to
9117-MMB, 9117-MMC
9117-MHB, or 9117-MHC

595
9119-FHA
POWER6

POWER7

770/780
9117-MMB
9179-MHB

Done via Machine Type MES,
Firmware & deep IPL

Done via firmware
& deep IPL

570
9406-MMA
POWER6

570
9117-MMA
POWER6

570
9117-MMA
POWER6

Power Systems

System i™ Server

System p™ Server

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Minimum Bootable System Requirements for 795

This is the minimum requirements for a bootable 795 system:

- One HMC

- One POWER7 Processor Node

- 64 GB Memory (this would be 8 – 8GB DIMMs)

- One GX Adapter

- Two Flexible Service Processor (FSP) Controller cards

- Two DC/DC Converter Assemblies (DCA)

- Four Bulk-Power Regulators (BPR)

- Two Bulk-Power Controllers (BPC)

- Two Bulk-Power Distributors (BPD)

- Two Bulk-Power Hubs (BPH)

- Two Air Moving Devices (AMD)

- One I/O drawer in location EIA 5

  - ❖ FC 5803

  - ❖ RPQ for 5877 (Diskless 5803) No support for Media drawer

  - ❖ FC 5797 only supported on model upgrades from FHA)

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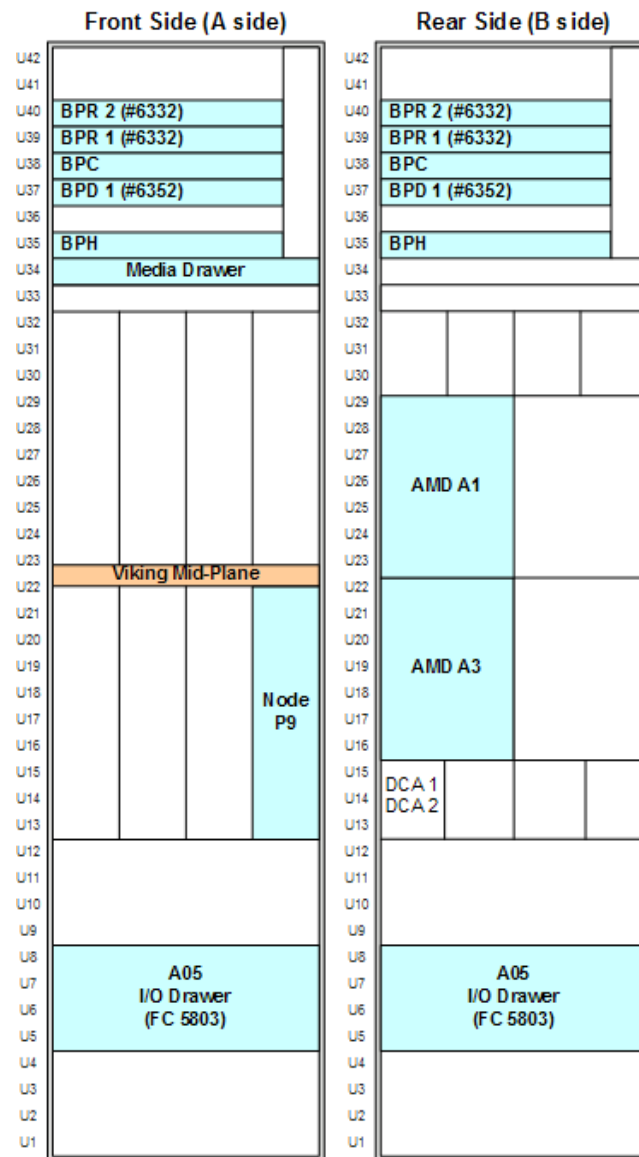
Power 795 Upgrade Components

Retained

Replaced

Frame

Bulk Power Controllers (2)

Bulk Power Supply

Light Panel

Network Switch

Processor Books (up to 8)
- CPUs
- Memory
- Node Controllers (2)
- DCA (2)
- Locking bracket

Media Drawer

Cables

Midplane

System Controllers (2)

System Clocks (2)

I/O Hub cards
Up to 4 per node

12X I/O Drawers

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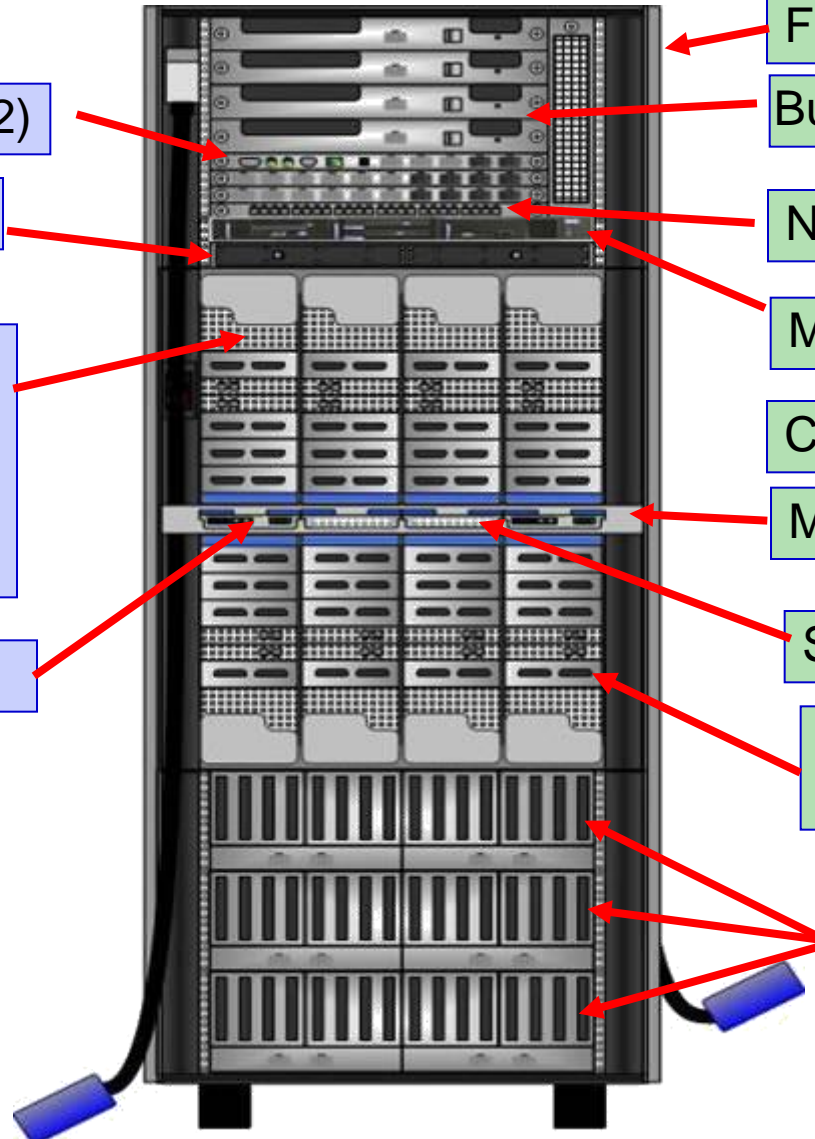
Power 520 to Power 720 Upgrades

Consistent Power 520 to Power 720 Upgrade Offerings

9407-M15

9408-M25

POWER6

Power 520
8203-E4A

4.2GHz 2c #5634

4.2GHz 4c #5635

4.7GHz 2c #5577

4.7GHz 4c #5587

POWER7

Power 720
8202-E4C

3.0GHz 6c #EPC6

3.0GHz 8c #EPC7

Power 720
8202-E4B

3.0GHz 6c #8351

3.0GHz 8c #8352
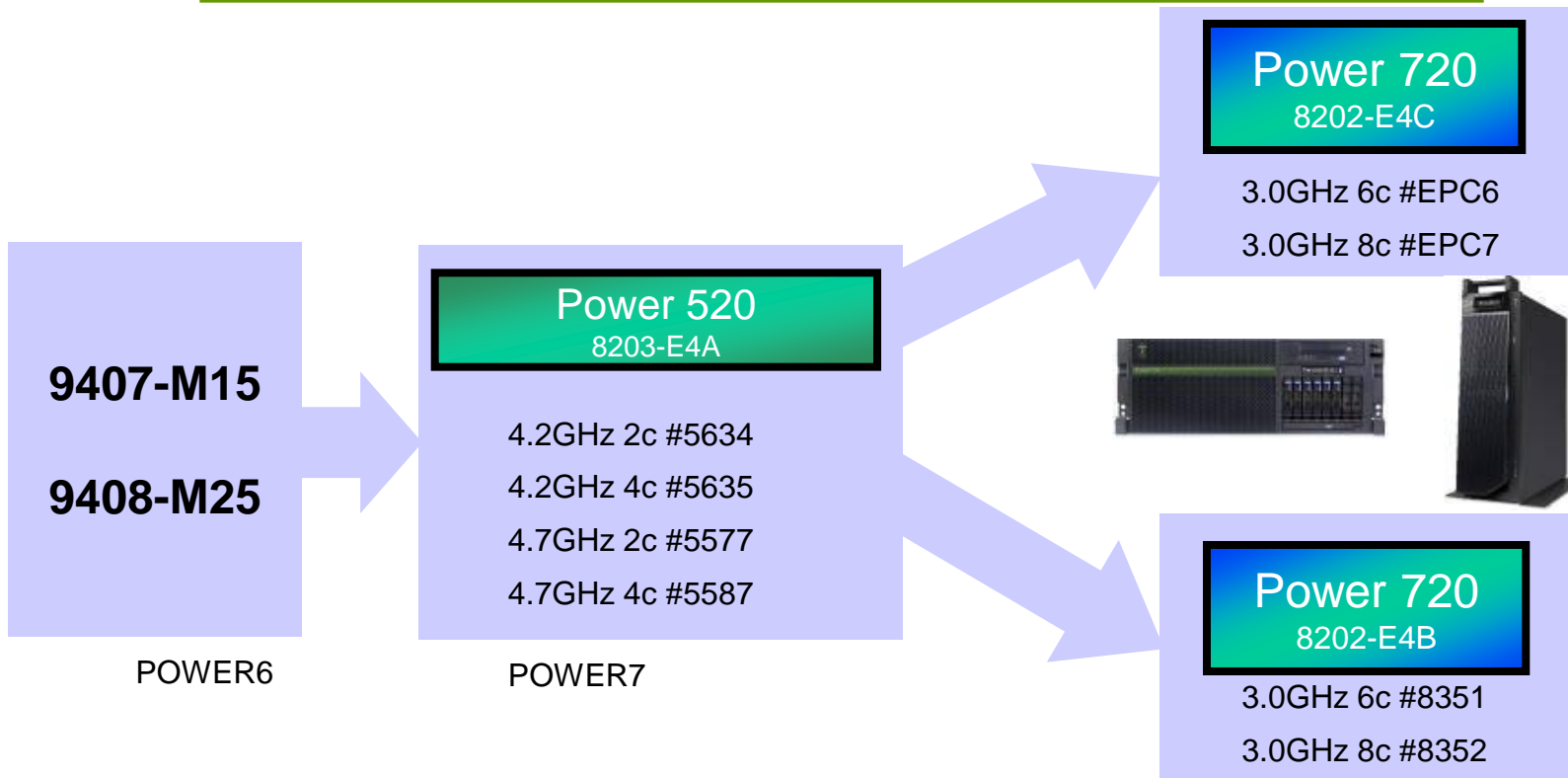
Notes:

- **POWER6 to POWER6 conversions 9407-M15 and 9408-M25 to 8203-E4A still available**
- **No same-serial-number upgrades from 8202-E4B to 8202-E4C**
- **No same-serial-number upgrades from 8205-E6B to 8205-E6B**

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System i Life Cycle Plans

System i HW Model Marketing Life
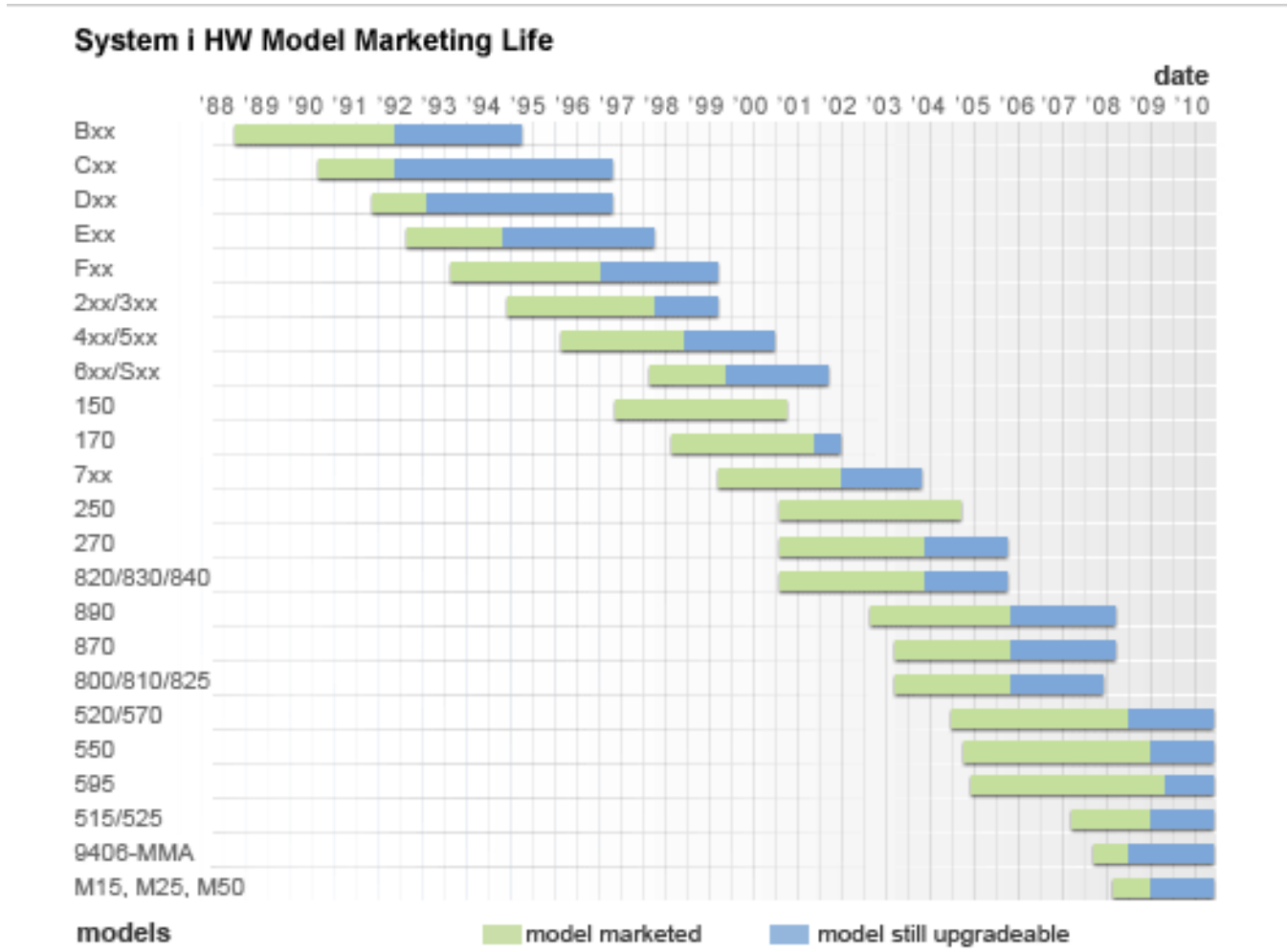
IBM Maintenance Agreements continue to be available after models and upgrades are withdrawn from marketing.
Dates on individual models may vary by country

Power is performance redefined http://www-947.ibm.com/systems/support/i/planning/upgrade/hwlifecycle.html **© 2011 IBM Corporation**

Model Life Spans

http://www-03.ibm.com/systems/i/hardware/life.html

System i Model Lifecycles

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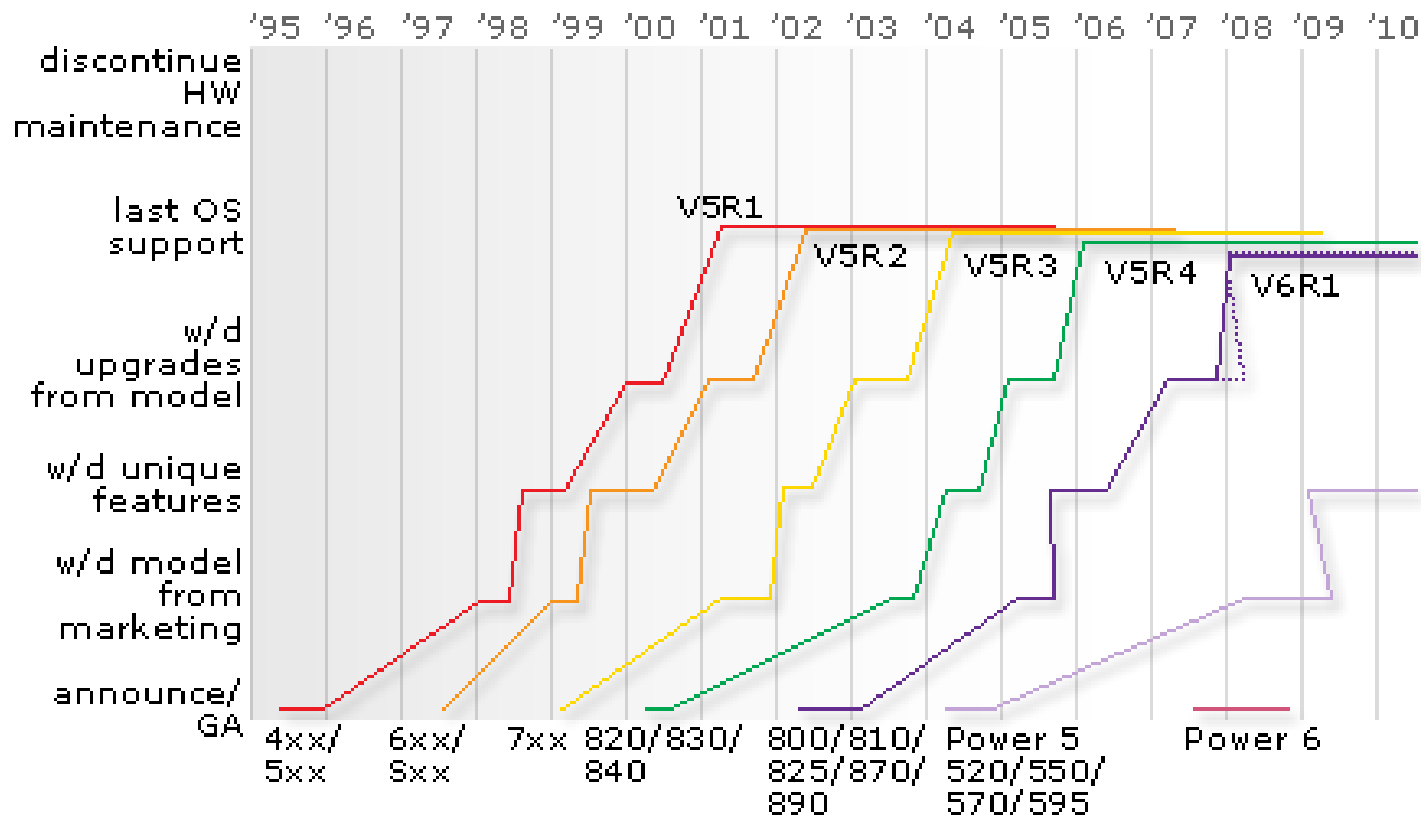
Hardware Considerations

POWER6 - Memory

- DDR2 memory
- No re-use except 9117-MMA and 9119-FHA (See details next slides)

POWER7 - Memory

- New DDR3 Memory
- No re use of DDR2

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Memory Conversion

POWER6 to POWER7 770 & 780 Memory Conversion

Conversion = feature code changes
- Memory card conversions essentially is a "trade in", IBM sells new memory features at a lower price.   Customer returns existing memory DIMMs to IBM. Trade DDR2 memory for DDR3 buffered memory DIMMs.

POWER6 to POWER7 795 Memory Conversion

Conversion = feature code changes
- Memory card conversions essentially is a "trade in", IBM sells new memory features at a lower price.   Customer returns existing memory DIMMs to IBM. Trade DDR2 memory for DDR3 buffered memory DIMMs.

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Hardware Considerations

Disk Drives
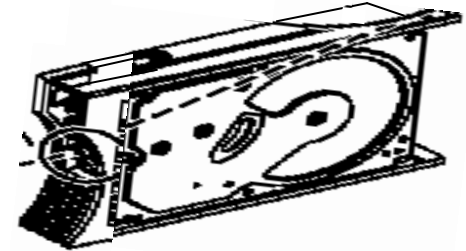
Any version, release, or modification levels of IBM i / i5/OS or Licensed Internal Code beyond V5R3 will require a **load source of at least 17GB (This would include V5R3M5, V5R4, and V6R1)**

- **Require IBM i V6R1 for load source using 282GB or greater**

- **POWER6 minimum of 35GB drive**

- **POWER7 minimum of 70GB drive**

POWER6 Supported integrated disk drives

POWER6 IBM i integrated storage:
- SCSI/SAS drives must have storage protection
  - ❖ **MUST** be mirrored or RAID 5/6 with Aux Cache
- 15k rpm 3.5-inch **SAS** disk drives
  - ❖ 69.7 GB   #3676   (CCIN 433B)
  - ❖ 139.5 GB   #3677   (CCIN 433C)
  - ❖ 283.7 GB   #3678   (CCIN 433D) **can be load source at V6R1**
  - ❖ 428   GB   #3658   (CCIN 198E) **requires V6R1 & can be load source at V6R1**
- 10K & 15K **SCSI** disk drives supported:

15k rpm IBM i disk	CCIN	Feat # for 5094/5294, 0595/5095, 5xx CEC	Feat # for EXP24 Disk Enclosure
35GB (10k)	6719	#4319	n/a
35GB	4326	#4326	#1266
70GB	4327	#4327	#1267
141GB	4328	#4328	#1268
282GB	4329	Not supported	#1269

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POWER6 IBM i Load Source options

http://publib.boulder.ibm.com/infocenter/iseries/v5r4/index.jsp?topic=/rzahc/rzahcdmodeiplvpd.htm

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SAS Hard Disk Drive (HDD)

3.5"	512-byte sectors AIX/Linux formatted		528-byte sectors IBM i formatted	
15k	73 GB	#3646 wfm	69 GB	#3676 wfm
15k	**146 GB**	**#3647**	**139 GB**	**#3677**
15k	**300 GB**	**#3648**	**283 GB**	**#3678**
15k	**450 GB**	**#3649**	**428 GB**	**#3658**

SFF-1	512-byte sectors AIX/Linux formatted		528-byte sectors IBM i formatted	
10k	73 GB	#1881 wfm	n/a	
10k	146 GB	#1882 wfm	n/a	
10k	**300 GB**	**#1885**	**283 GB**	**#1911**
10k	**600 GB**	**#1790**	**571 GB**	**#1916**
15k	73 GB	#1883 wfm	69 GB	#1884 wfm
15k	**146 GB**	**#1886**	**139 GB**	**#1888**
15k	**300 GB**	**#1880**	**283 GB**	**#1879**

New

SFF-2	512-byte sectors AIX/Linux formatted		528-byte sectors IBM i formatted	
10k	**300 GB**	**#1925**	**283 GB**	**#1956**
10k	**600 GB**	**#1964**	**571 GB**	**#1962**
15k	**146 GB**	**#1917**	**139 GB**	**#1947**
15k	**300 GB**	**#1880**	**283 GB**	**#1879**

New

Power is performance redefined   wfm = withdrawn from marketing   **© 2011 IBM Corporation**

177GB SSD for SAS Bay

69GB SFF SSD

177GB SFF SSD

Greener
- 177GB SSD is 2.5x more GB per SAS bay vs older 69GB

Better Price
- 30% lower list price per SAS-bay-based drive
  - ❖ $4700 per drive vs existing $6882 per drive
- Nearly 75% lower list price per GB
  - ❖ $26.6/GB vs existing $100/GB

SSD	AIX/Linux feat code	IBM i feat code
Fast!	69 GB #1909	69 GB #1890
	177GB #1775, #1793	177GB #1787, #1794

Prices are USA suggested list prices as of April 2011. Prices and are subject to change without notice.   Reseller prices may vary.

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Storage Planning for Upgrades

All integrated storage must have its write cache protected with either mirroring or aux write cache

What protection will you use on the POWER6?

- Always look at mirroring first
- Next RAID-6 or RAID-5 options
- If using RAID consider Hot Spare

What disk drives are in the old CEC

- Are they supported and will you move them forward?
- Where will you put them? New tower/drawer or open space in existing tower/drawers
- What disk protection are they using? Mirrored/RAID?
- Can I move them to a new location and maintain protection ?
- Where will you move them for cache protection?
- Do you need to plan for slots for adding Aux cache cards?

What disk drives are in the towers/drawers?

- Same questions as in the CEC

Will you be replacing old towers/drawers?

Will you be replacing disk drives?

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Storage Planning for Upgrades

Where are your IBM i / i5/OS load source drives?
- Single image/Non HMC was defined by a specific disk slot
- Pre-POWER systems used primary LPAR and iNav to setup
- POWER6 systems can use HMC to tag Load Source
- POWER6 systems can use Non HMC remote load source process to tag Load Source

External Storage
- Upgrade to Boot from SAN feature?
  - ❖ FC 2847 PCI IOP for SAN Load Source
  - ❖ IOPless 4G Fibre cards FC 5749 (PCI-X) , FC 5774 (PCI-E)* or 8GB 5735

What tape drives are supported
- Do I move from SCSI to Fibre? ….. Or a new tape library

Several older tape drives/media not supported on POWER6
- 9348 Tape Drive (½-inch reels)
- 3570 & 3575 Tape Drives
- 3490 Tape Drives when attached via #2749 HVD SCSI Tape Controller
- 358x LTO-1 Tape Drives when attached via #2749
- 4GB, 16GB, 25GB QIC tape drives
- All VXA tape drives

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Hardware Considerations

I/O Towers and Drawers

- Power Systems PCI I/O towers/drawers support varies

- Support for copper HSL-2 cabling for max speed
  10 meter segments or less > the 10M link runs at HSL-1 speeds
- No Optical HSL support for Power Systems

- Introduction of 12X 8 meter segments or less

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POWER6 System 12X I/O

Next generation of I/O drawer attachment
- Up to 50% more bandwidth than HSL-2
- 12X refers to number of wires in cables – not performance
- 4 drawer addresses per loop

12X I/O loop can <u>co-exist</u> with HSL-2 I/O loops (1 of each type)
- Can not mix 12X and HSL-2 I/O units on the same loop

HSL = RIO
HSL-2 = RIO-2
RIO-2 = RIO-g
12X = 12X

24" 5797/5798 12X for Power 595

2-5796's PCI-X DDR

12X cables

2-5796's PCI-X DDR

12X cables

12X Loop

POWER6 Server

12X cables

5786 EXP24 Disk Drawer

0595 PCI-X

HSL-2 RIO-2

5790 PCI-X

5786 EXP24 Disk Drawer

12X (green)

logo

logo

HSL-2 (black)

HSL-1 (yellow)

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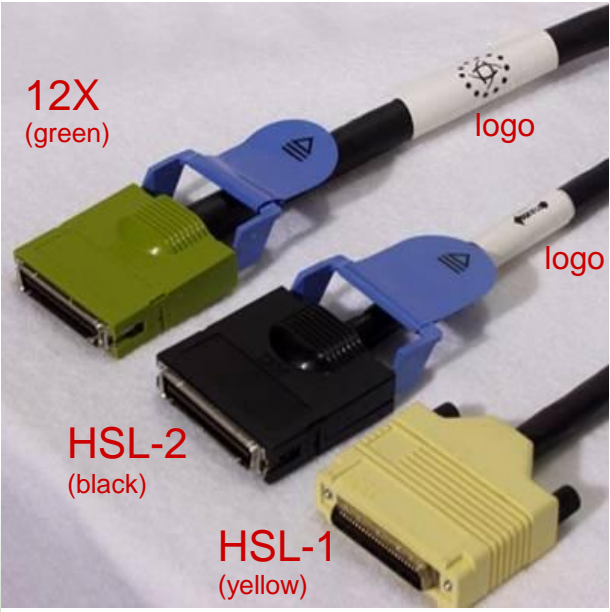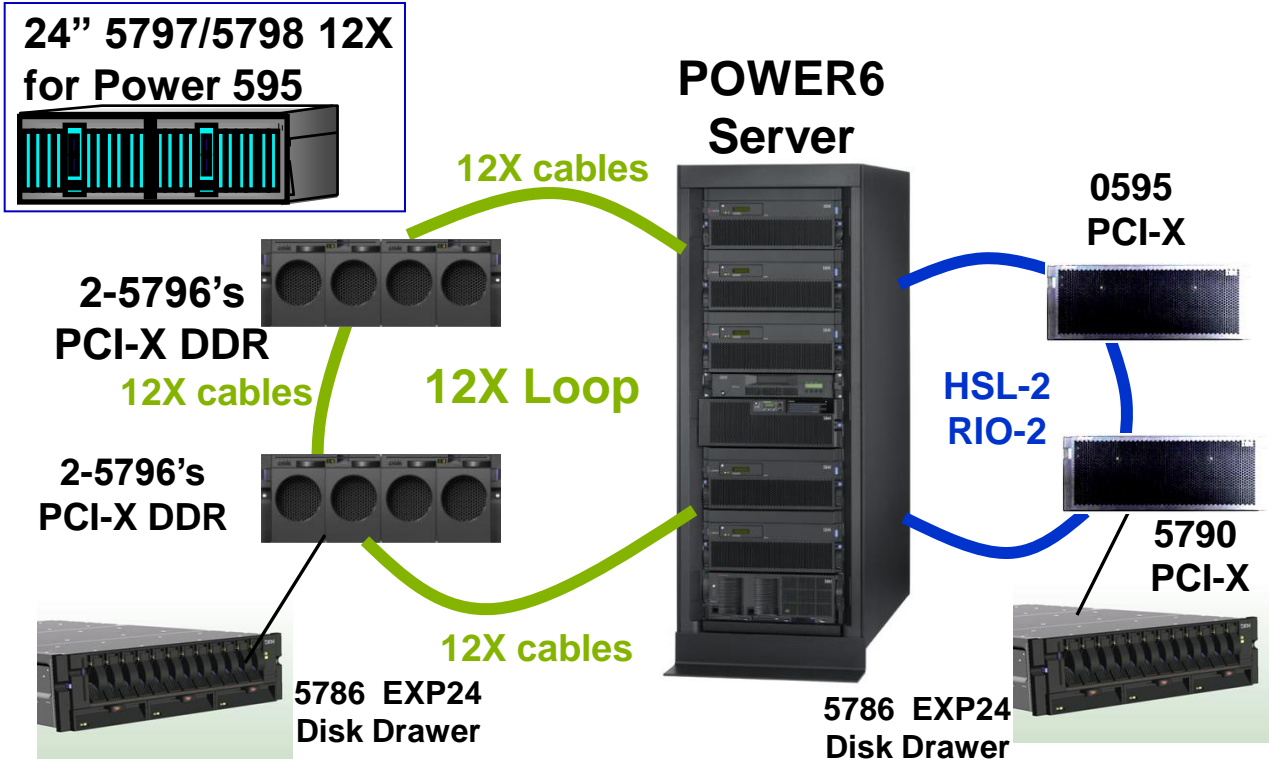
POWER7 System 12X I/O

Next generation of I/O drawer attachment
- 12X refers to number of wires in cables – not performance
- 4 drawer addresses per loop for SDR
- 2 drawer addresses per loop for DDR

12X I/O loop support DDR
- Can not mix 12X SDR and DDR drawers on the same loop

**12X SDR
12 X DDR**

**24" 5797/5798 12X
for Power 595**

**POWER7
Server**

12X SDR

12X DDR

**2-5796's
PCI-X DDR**

12X cables

12X Loop

**2-5796's
PCI-X DDR**

**2-5802's
PCIe**

12X cables

**5786 EXP24
Disk Drawer**

12X
(green)

logo

logo

HSL-2
(black)

HSL-1
(yellow)

34   **Power is performance redefined**
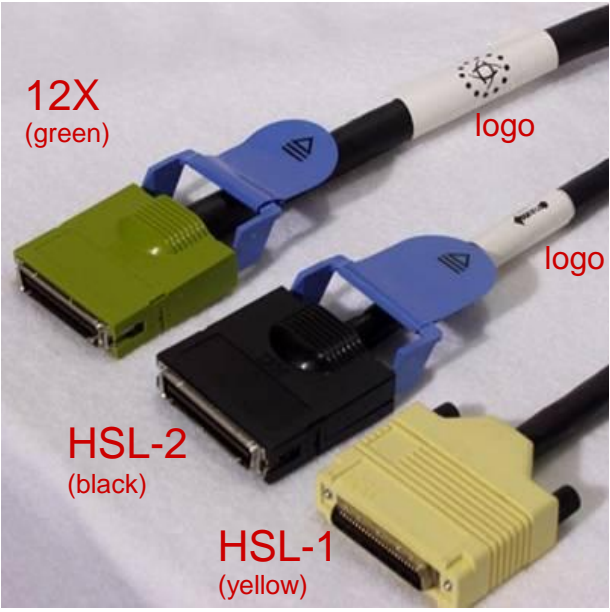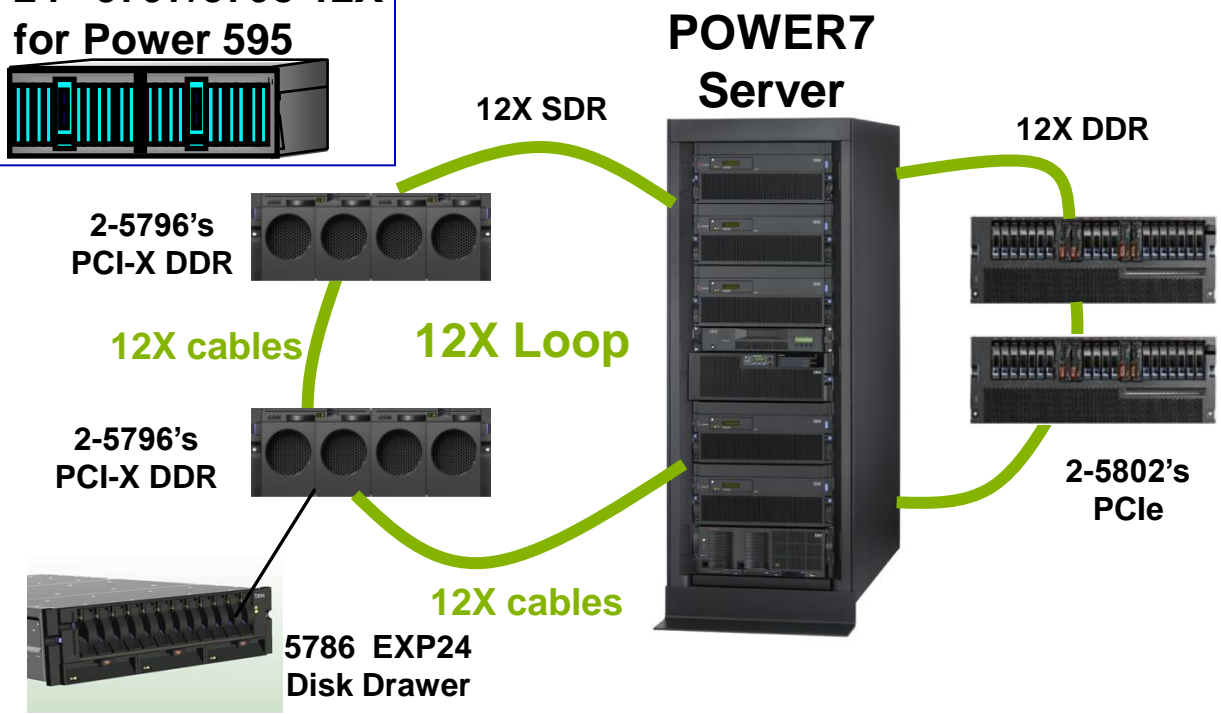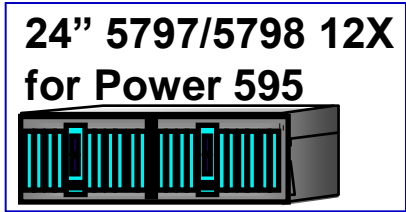
POWER7 19-inch IO and Storage Drawers

Order Number	Description	Status	Interface
#5796	PCI-X I/O Drwr	Available	12X
#5802	PCIe I/O Drwr (w/ SFF Bays)	Available	12X
#5877	PCIe I/O Drwr (No SFF Bays)	Available	12X
#5886	EXP12S SAS Disk Drwr	Available	SAS
7314-G30	PCI-X I/O Drwr	Supported	12X
#5786	EXP24 SCSI Disk Drwr	Supported	SCSI
7031-D24 7031-T24	EXP24 SCSI Disk Drwr EXP24 SCSI Disk Tower	Supported	SCSI

Note: no RIO/HSL drawers
Note: tape/removable media not shown

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Connection to Expansion Units, Towers and Drawers

POWER7 Supports 12X
No RIO/HSL

12X = GX+ = 12X SDR = IB1

12X+ = GX++ = 12X DDR = IB2

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I/O Upgrade Considerations for POWER7

Review expansion units and I/O drawers, disk, SSD and PCI adapters used on POWER6 to verify support on POWER7 systems
- Or replace with PCIe & SAS
- May need to move 3.5-inch SCSI drives and PCI-X adapters from RIO/HSL I/O Expansion units to 12X expansion units and disk drawers

Older I/O on POWER6 servers, but <u>not</u> on POWER7 servers
- RIO/HSL I/O drawers
- SCSI disk smaller than 69GB or SCSI drives slower than 15k rpm
- QIC tape drives
- IOPs and IOP-based PCI adapters (IBM i)
    2749, 5702, 5712, 2757, 5581, 5591, 2780, 5580, 5590, 5704, 5761, 2787, 5760, 4801, 4805, 3709, 4746, 4812, 4813
- Older LAN adapters: #5707, 1984, 5718, 1981, 5719, 1982, (3709?was 2849 on i)
- Older SCSI adapters: #5776, 5583, 5777
- Telephony adapter: #6312
- See planning web page

http://www-03.ibm.com/systems/power/hardware/sod2.html

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I/O Upgrade Considerations for POWER7 continued

Consider replacing PCI-X adapters with PCIe adapters and PCIe based I/O expansion units.

Review loop design for performance and availability considerations
- Consider placing fiber cards on different 12X loops on different processor books (this allows for higher availability should a processor book fail while maintaining a path to the external storage device)

Check cable runs for SDR and DDR cables
- DDR cables are currently the only new cables being sold.
- DDR cables can be used to cable SDR and DDR drawers

Use the HMC to verify that each segment is running at rated speed for the I/O expansion unit that is attached

Review all Communications adapters
- Replace hardware adapter driven SNA with Enterprise Extender

Review and replace any IOP required hardware (IBM i)
- Create plan to replace any IOP based adapters
  - ❖ Tape Libraries
  - ❖ Protectier Virtual Tape
- Consider using VIOS with NPIV fiber cards for Virtual Tape
- Create plan to replace any IOP based Storage
- No 5250 Twinax Console support
  - ❖ Replace with HMC or LAN Console

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IBM Power Systems planning statements

http://www-03.ibm.com/systems/power/hardware/sod2.html

I/O Drawers (posted August 2009, updated December 2009)

- IBM plans that the POWER7 based systems will support the existing 12X I/O drawers currently supported on POWER6 systems. These include the #5796/7314-G30, #5797/5798, #5802/5877, and #5803/5873. The older/slower RIO/HSL-attached I/O drawers will not be supported. POWER6 clients should consider replacing RIO/HSL I/O drawers with newer technology drawers to smooth eventual adoption of POWER7 servers. RIO/HSL I/O drawers include: #0595/5095/7311-D20, #5790/7311-D11, #5094/5294/5096/5296, #5088/0588 and #5791/5794/7040-61D.

This site provides information on IBM plans regarding supported hardware products or features on IBM Power Systems servers. All such statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice. Any reliance on these statements of general direction is at the relying party's sole risk and will not create liability or obligation for IBM.

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POWER6 I/O Expansion Units

Contents

Systems Hardware information

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POWER6 information

Enclosures and expansion units

You can attach your expansion units to system units using either remote input/output (RIO), also known as high-speed link (HSL), adapters (RIO/HSL), (12X adapters), 12X adapter Double Data Rate (12X DDR), Serial-attached SCSI (SAS) adapters, or SCSI adapters.

Note: The terms *enclosure* and *expansion unit* are synonymous.

Important: You can add your expansion units concurrently. This means you can add or install the expansion units with the server at firmware running state. Active partitions do not have to be shut down. **Only in the following situations must the server be shut down (powered off) to add expansion units:**

- The expansion units are being added to an IBM® Power Systems™ server that is not managed by an Hardware Management Console (HMC).

- GX adapters (I/O hub cards) must be added to accommodate the new expansion units.

- The existing RIO/HSL/12X or 12X DDR fabric must be redistributed across the GX adapters to accommodate the new expansion units as determined in the planning steps for adding the expansion units.

- The system firmware level is equal to or less than EM320_040_031 or EM310_069_048 and the loop you are adding expansion units to currently has one or more 5796 or 7314-G30 expansion units.

If you are adding a new expansion unit or migrating expansion units from another IBM Power Systems server, you may not be able to allocate the expansion unit resources to logical partitions on the new server until an SPCN firmware update is completed for the expansion units.

http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/index.jsp?topic=/ipham/expansionunit.htm

POWER7 I/O Expansion Units

Contents

- Systems Hardware information
  - Power Systems information
    - POWER7 systems
      - 8233-E8B (IBM Power 750 Express)
        - PDF files for the IBM Power 750 Ex
        - System overview
        - Planning for the system
        - Installing and configuring the syste
          - Installing the IBM Power 8233-
          - Upgrading the system and dat
          - Backplanes
          - Cabling your server
          - Control panel and signal cables
          - Disk drives
          - Enclosures and expansion units
          - Fans
          - Host Ethernet Adapters
          - Managing devices
          - Media devices
          - Memory modules
          - PCI adapters
          - Power supplies
          - Racks and rack features
          - GX 12X channel adapters
          - SAS RAID enablement
          - System processor assembly
          - Thermal power management c
          - Voltage regulators
          - Common procedures for install

Systems Hardware information

Subscribe to this information

POWER7 information

Connecting and configuring I/O expansion units

Use this information to learn about connecting and configuring Input/Output (I/O) expansion units to system units.

5786, 5787, 7031-D24, and 7031-T24 disk drive enclosure

Provides users and service providers with installation and maintenance information for the 5786, 5787, 7031-D24, and 7031-T24 disk drive enclosures. This information also includes reference, parts, and service information for the expansion units.

5796 and 7314-G30 expansion units

Provides users and service providers with installation and maintenance information for the 5796 and 7314-G30. This information also includes reference, parts, and service information for the expansion units.

5802 and 5877 expansion units

Provides users and service providers with installation and maintenance information for the 5802 and 5877 expansion units. This information also includes reference, parts, and service information for the expansion units.

5886 disk drive enclosure

Provides users and service providers with installation and maintenance information for the 5886 disk drive enclosure. This information also includes reference, parts, and service information for the expansion units.

http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/index.jsp?topic=/p7ham/expansionunit.htm

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Hardware Considerations

I/O Adapters / Cards

- No IOP support in the CEC
- No twinax support in the CEC
- No SNA IOP/IOA support in the CEC

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Adapter Technology Transitions

NO IOP-based* adapters on POWER7

April 2010 Announce Withdrawal from Marketing
Effective November 2010
- #2844/2847 IOPs
- #5760/5761 IOP-based Fibre Channel Controllers (tape/disk)
  - ❖ Note – for IOP-less FC adapters need IBM i 6.1 or later

Older I/O on POWER6 servers, but not on POWER7 servers
- 2749, 5702, 5712, 2757, 5581, 5591, 2790, 5580, 5590, 5704, 5761, 2787, 5760, 4801, 4805, 3709, 4746, 4812, 4813

Older LAN adapters: #5707, 1984, 5718, 1981, 5719, 1982
Older SCSI adapters: #5776, 5583, 5777

IBM i*

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I/O Adapters

Review twinax requirements
- Consider OEM offerings
- Bosnova - http://www.bosanova.net/twinaxcontroller/index.html
- Pearl - http://www.perle.com/products/AS400.shtml

No support for SNA IOP/IOA in the CEC
- Consider Enterprise Extender

Review Supported Tape Adapters and Tape Drives

Review Power Systems supported IOP/IOAs
- To review unsupported PCI adapters & controllers consult the Upgrade Planning Site:
- Review announcement letters

IBM Systems support	Upgrade planning
BladeCenter	**Planning** **Upgrade planning**
Power	
System i	V6R1 | V5R4 | V5R3 | Future SW/HW | Release life cycle
• Support search	This site provides information on IBM System i5 and eServer i5 products or features which may not be supported in future releases of i5/OS®, the latest generation of the OS/400™ operating system or on future product offerings. This site is intended to provide advanced planning information. Clients may choose to use this information to plan future solutions as they enhance, upgrade or replace their servers with new operating system releases and/or hardware offerings.
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IntelliStation Pro	**Additional information**
IBM Monitors	→ Hardware and software upgrade information
Systems Management software	Locate information for migrating or upgrading your system, capacity

http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/index.html

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Console Options

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POWER6 IBM i Console Choices

Types of consoles that can be used to control IBM i / i5/OS
on Power Systems:

1. Hardware Management Console (HMC)

2. Operations Console LAN-connect

3. Twinax

4. Operation Console Direct-connect

POWER7 IBM i Console Choices

Types of consoles that can be used to control IBM i / i5/OS
on Power Systems:

1. Hardware Management Console (HMC)

2. System Director Management Console (SDMC)

3. Operations Console LAN-connect

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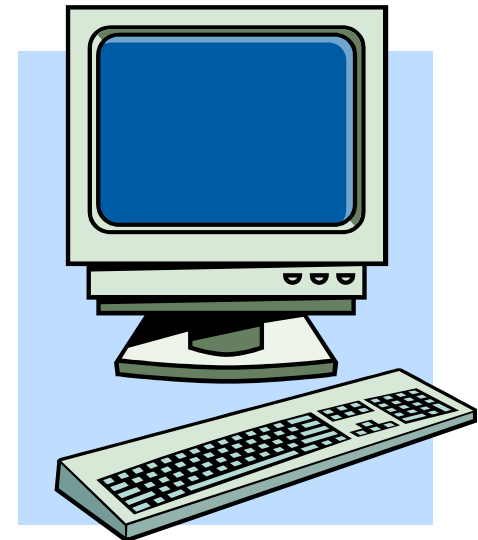
Reference Information - Where do you find help

"First, they do an on-line search."

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IBM Power Systems Hardware Planning

Hardware Planning
- IBM Power Systems
  - http://www-03.ibm.com/systems/power/
- Hardware Support Planning Site
  - http://www-304.ibm.com/systems/support/
- Hardware Information Center
  - http://publib.boulder.ibm.com/infocenter/systems/scope/hw/index.jsp
- IBM eServer Prerequisite tool
  - http://www-912.ibm.com/e_dir/eServerPrereq.nsf
- See Announcement Letters & Sales Manual
  - http://www-01.ibm.com/common/ssi/index.wss

- **IBM ITSO Redpapaers & Redpieces** - http://www.redbooks.ibm.com/
  - Search on POWER6
  - Power 520 - **IBM Power 520 Technical Overview and Introduction**
    - http://www.redbooks.ibm.com/redpieces/abstracts/redp4403.html?Open
  - Power 550 - **IBM Power 550 Technical Overview and Introduction**
    - **http://www.redbooks.ibm.com/redpieces/abstracts/redp4404.html?Open**
  - REDP4412 – **IBM Power 520/550 System Builder**
    - http://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/redp4412.html?Open"
  - Power 570 - **IBM Power 570 Technical Overview and Introduction**
    - **http://www.redbooks.ibm.com/redpieces/abstracts/redp4405.html?Open**
  - Power 595 - **IBM Power 595 Technical Overview and Introduction**
    - http://www.redbooks.ibm.com/abstracts/redp4440.html?Open
  - REDP4439 - 570/595 System Builder
    - http://www.redbooks.ibm.com/abstracts/redp4439.html?Open

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Support for IBM Power Systems http://www-304.ibm.com/systems/support/

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IBM Power Systems

http://publib.boulder.ibm.com/infocenter/systems/scope/hw/index.jsp

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IBM Prereq tool

http://www-912.ibm.com/e_dir/eServerPrereq.nsf

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IBM **Redbooks.**   **http://**www.redbooks.ibm.com/cgi-bin/searchsite.cgi?query=Power+AND+Systems

Thank You!

From IBM Rochester

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