

IBM zEnterprise BladeCenter Extension (zBX) Hardware Overview

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IBM

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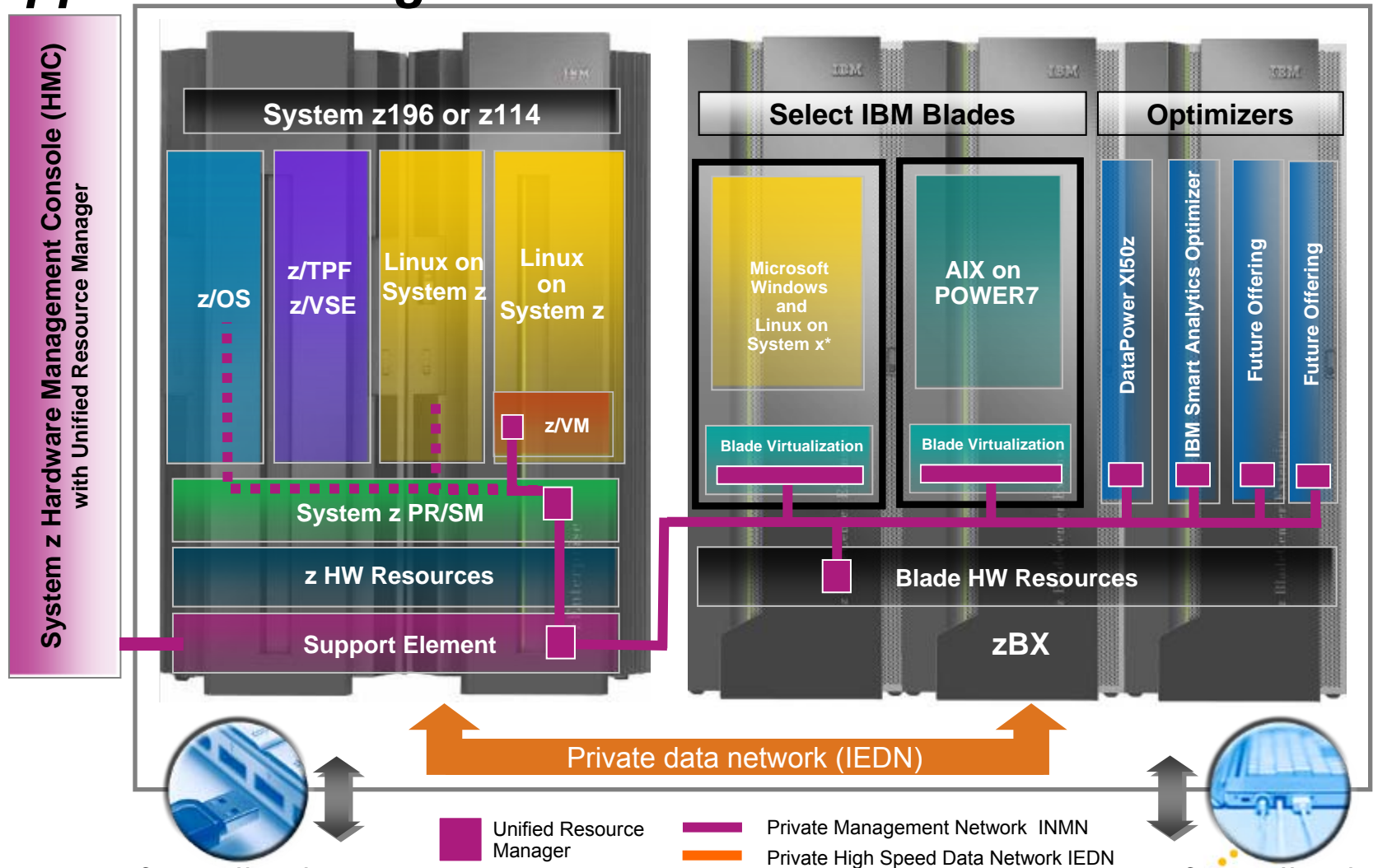
Agenda



- Hardware Overview
 - 2458-002
- Networking
- Disk/Storage Considerations
 - IBM Smart Analytics Optimizer
 - IBM POWER7 Blades
 - IBM System x
- Hardware Management Console
- Reference

Putting zEnterprise System to the task

Use the smarter solution to improve your application design



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

zBX Hardware Components

zBX Infrastructure



Rack

Top-of-Rack Switch

BladeCenter Chassis

Ethernet & FC Cables

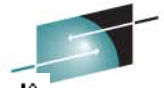
BC Switches

Power Dist. Units

Opt: Heat Exchanger,
Power cord types

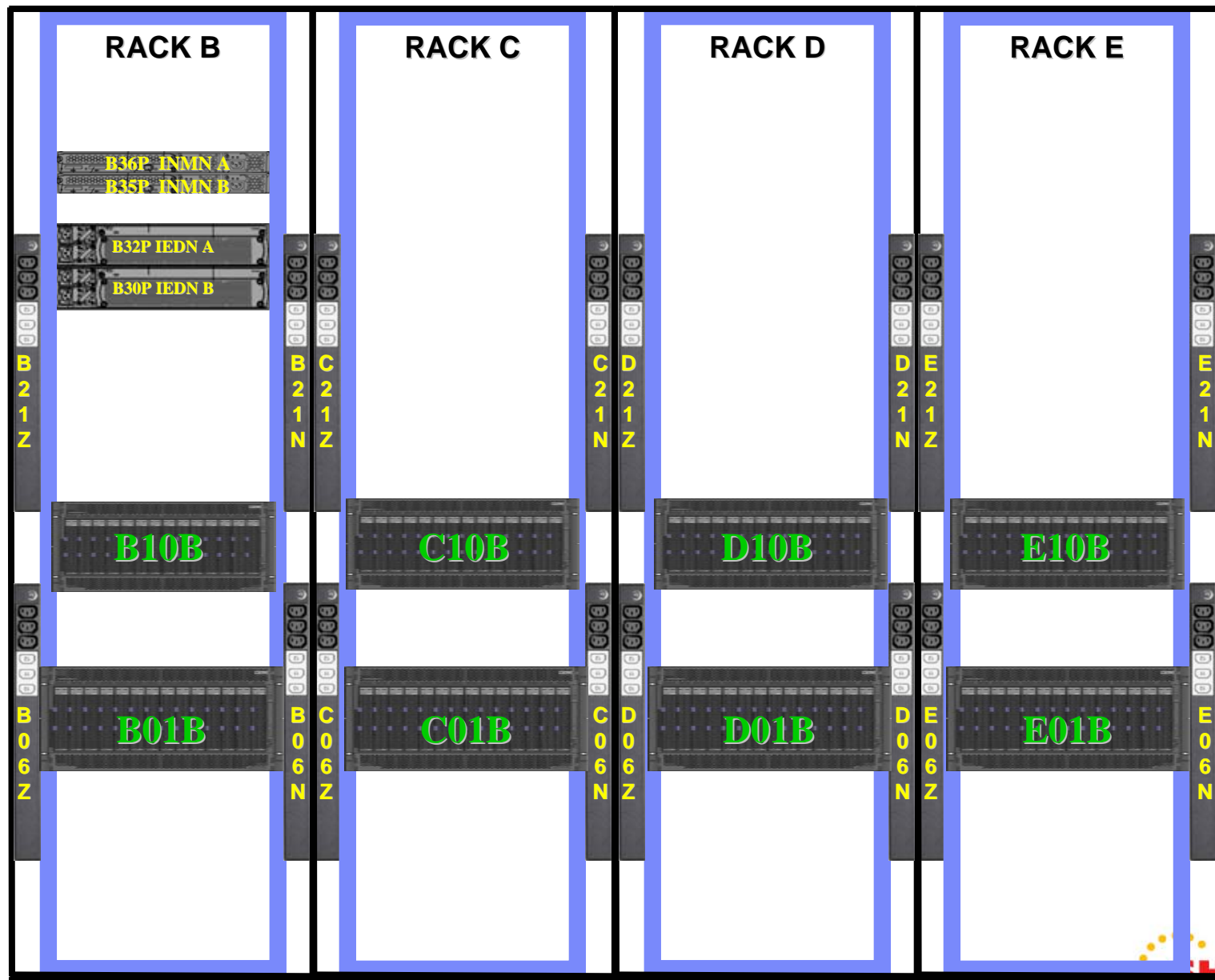
Blades





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zBX Door - options

- Option 1 – Standard door
- Option 2 – Rear Door Heat Exchanger - Feature Code #0540
 - Requires customer conditioned water
 - Refer to the Heat Exchanger Rear Door Planning Guide to ensure that the heat is properly dissipated.
http://publib.boulder.ibm.com/infocenter/systems/scope/hw/index.jsp?topic=/iphad_p5/iphadexchangeroverview.htm.
 - When at that link, just search on 7014-T42
- There are two circumstances which can be considered for the Rear Door Heat eXchanger (RDHX).
 1. Order the RDHX as part of the initial order for the zBX.
 2. If not sure if an RDHX is needed, contact IBM Systems & Technology Group (STG) Lab Services.
<http://www.coolcentric.com/>
- Option 3 – Noise Reduction Door - Feature Code #0543

Rear Door Heat eXchanger (option)



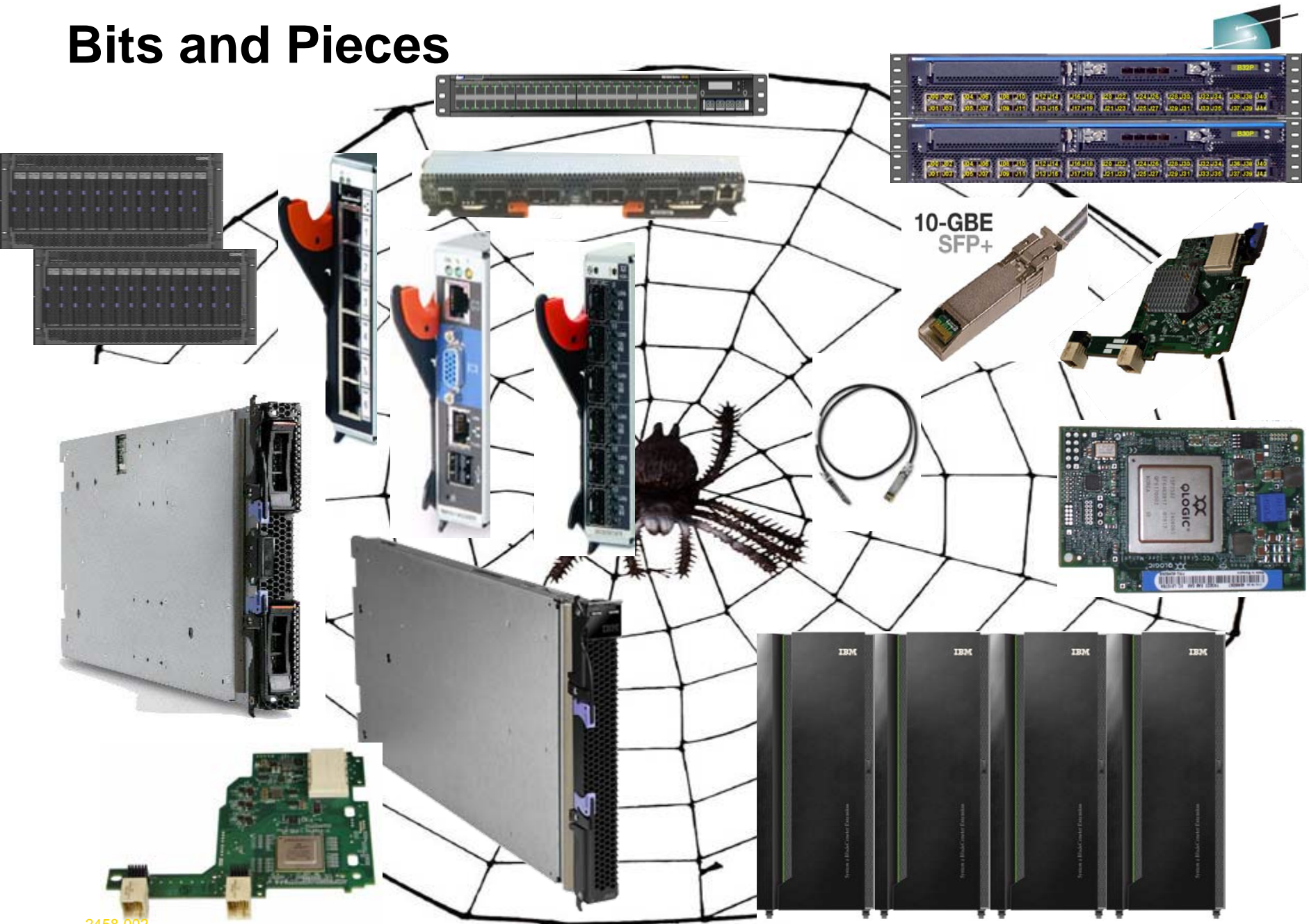
2458-002 Ordering (who does what?)

- zBX is ordered via the zEnterprise eConfig, by specifying the number of blades
 - IBM Smart Analytics Optimizer
 - IBM POWER7 blades
 - DataPower XI50z
 - IBM System x blades
- System z e-Config drives out all required infrastructure (BladeCenters, switches, racks, etc)
 - System z representative is responsible for getting the connectivity (OSA's and optics) right
- Only one zBX per controlling CPC
 - Controlling CPC must be a zEnterprise 196 or zEnterprise 114
 - z10 can attach with OSA-Express3 (OSD) 10 GbE connections, and can access the solutions/workloads
- zBX must be adjacent to the controlling CPC
 - within what a 26 meter (85 feet) cable allows
- **Customer provides**
 - All 10 Gb Ethernet Optical Cables
 - OSA to zBX
 - zBX to zBX
 - zBX to existing customer network
 - IBM Smart Analytics Optimizer
 - Private DASD (DS5020)
 - All Disk Optical Cables
 - IEDN optical cables
 - IBM System x Blades
 - All blades (from supported list)
 - DASD
 - All Disk Optical Cables
 - IEDN Optical Cables
 - IBM POWER7 Blades
 - All blades (from supported list)
 - DASD (from supported list)
 - All Disk Optical Cables
 - IEDN optical cables
 - IBM DataPower XI50z
 - IEDN optical cables

Bits and Pieces

- Internal Recipe
 - Represented by various feature codes within the 2458-002
 - Generated by the zEnterprise eConfig tool
 - Internal connections pre built and wired in IBM manufacturing ← Huge Benefit
 - External connections performed by IBM during installation
 - Optical cables and labels provided by the customer
 - Disk provided by an alternate means – not supplied with the zBX
 - IBM POWER7 Blades and IBM System x Blades provided by an alternate means – not supplied with the zBX
 - *Blade entitlement provided via eConfig*
 - *Unused slots determine by VPD*
- BladeCenters
- Blades
- Internal bits and pieces
 - Redundant network components and paths
 - Redundant power
 - Redundant disk connections and paths
 - Redundant Top of Rack (TOR) switches
 - INMN
 - IEDN

Bits and Pieces



10-GBE SFP+											
100.1.1.1	100.1.1.2	100.1.1.3	100.1.1.4	100.1.1.5	100.1.1.6	100.1.1.7	100.1.1.8	100.1.1.9	100.1.1.10	100.1.1.11	100.1.1.12
101.1.1.1	101.1.1.2	101.1.1.3	101.1.1.4	101.1.1.5	101.1.1.6	101.1.1.7	101.1.1.8	101.1.1.9	101.1.1.10	101.1.1.11	101.1.1.12

10-GBE SFP+

Adding new blades – “enablement”

Perform Model Conversion - P00MNXXK4

Use this function to add, remove, or update system hardware and features. The system model identification may change if require a Book related selection. Select an option:

- ⊕ Hardware upgrades
- ⊕ Permanent upgrades
- ⊕ Temporary upgrades
- ⊖ Features
 - Add Flexible Memory Option feature
 - Remove Flexible Memory Option feature
 - Add STP feature
 - Add or Update RPQ 8P2333
 - Remove RPQ 8P2333 feature
 - Add or Update OSA 3215
 - Remove OSA 3215 feature
 - Add or Update zBX feature
 - Remove zBX feature
 - Add Alternate CP Assignment feature
 - Remove Alternate CP Assignment feature

- zBX is an MES
- Media is used to add the feature to the VPD configuration
- The zBX media feature contains information regarding MTMS of the zBX, maximum entitlements (ISAO only) and hardware features.
- Upon installing the feature, the zBX is enabled throughout the system.
- This will require an SE reboot.

2458-002 Blades



IBM Smart Analytics Optimizer
Pre-packaged



IBM Power7 Blade
Separately ordered



DataPower XI50z
Pre-packaged
Double Wide



IBM System x Blade
Separately ordered

IBM Smart Analytics Optimizer

Delivering powerful analytics to existing System z customers



- Creates new opportunities for existing systems by using new technology approaches
- High performance
 - Significantly improve query-intensive workloads on IBM data systems
 - Improved query performance
- Requires no change to existing applications
- Lower administration costs
- Better decisions
- No changes to DB2 query application



2458-002 - IBM Smart Analytics Optimizer



- Pre-packaged and pre-tested
- zBX components are a logical extension to System z as a new System z Machine Type/Model.
 - Machine Type 2458
 - Model 002
- Used for specialized workload processing which can be handled more economically than if those workloads were processed directly in the System z server
- zBX processing components are provided using standard BladeCenter[®] components.
- Impressive Performance
 - Compressed DB2 data
 - Parallel file system
 - In memory execution

IBM Smart Analytics Optimizer - Sizing



- How do I size the right machine?
 - Watch this space, things may change
 - Initially, go here
- For requests outside of North America and Business Partners
 - dwhz@de.ibm.com
- For requests in North America
 - Forward the sizing request to the BI Swat team under Beth Hamel
 - [DW on System z/Silicon Valley/Contr/IBM](#)
- <https://w3.tap.ibm.com/w3ki08/display/isao/Home>
<https://w3.tap.ibm.com/w3ki08/display/isao/Process>
 - Download an off-line version of the questionnaire ([ISAO_Assessment_Questionnaire.doc](#)) from <https://w3.tap.ibm.com/w3ki08/display/isao/Process>
 - Complete Questionnaire
 - System Environment and Data Warehouse workload (to make sure that the customer meets the requirements)
- Send the completed Questionnaire to the User ID dwhz@de.ibm.com or to BI Swat team under Beth Hamel in North America [DW on System z/Silicon Valley/Contr/IBM](#) or use dwonz@us.ibm.com.
 - It is not recommended that you approach the customer until you have had feed back on the ISAO Assessment
 - a quick analysis of real workload should be performed (Quick Workload test)
- Down load the [ISAO Assessment Description.zip](#) from the <https://w3.tap.ibm.com/w3ki08/display/isao/Process>

zBX - Five Smart Analytics solution sizes for System z



1

7 Blades

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9u 7 Blades
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14 Blades

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9u 14 Blades
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28 Blades

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9u 14 Blades

4

42 Blades

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56 Blades

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9u 14 Blades	9u 14 Blades
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9u 14 Blades	9u 14 Blades

zBX ISAOPT Offering Upgrades



Number of Blades	7	14	28	42	56
7		Yes	Yes	Yes add storage	Yes add storage
14			Yes	Yes add storage	Yes add storage
28				Yes add storage	Yes add storage
42					Yes add storage
56					

IBM Blade based on Power7



- MT 8406-71Y (PS701)
 - Power7 8 Core Processor
 - 8 Processor Cores activated
 - 1 Processor socket
 - Single wide Blade only
 - 3.0GHz
 - 16 dimm slots (4, 8, & 16 GB/core)
 - 300GB HDD Internal Disk
- 3 Configurations are supported.
- IBM POWER7 supports the 10GbE IEDN.
- IBM Blade Chassis attach to the INMN TOR via 1 GbE.

- Blades acquired by the customer through existing channels or through IBM (not from System z).
- A PowerVM Enterprise Edition licence and Software Maintenance Agreement is required for all 8 Cores, and must be maintained for the duration of use.
- AIX 5.3+, 6.1+

Customer procured
With AIX and PowerVM EE Licenses!

Blade	FC#	Config 1	Config 2	Config 3
Processor 3.0GHz@150W		1	1	1
Processor Activations (8)	8411 8412	4 4	4 4	4 4
Memory kits8 GB (2 x 4 GB) 16 GB (2 x 8 GB)	8208 8209	32 GB 4 0	64 GB 8 0	128 GB 0 8
HDD 300GB	8274	1	1	1
CFFh 10GbE	8275	1	1	1
CIOv 8Gb FC	8242	1	1	1
PowerVM Enterprise Edition	5228	8	8	8

Hardware Warranty and Maintenance

24x7 on-site support for parts and service during the 1 year System z warranty and subsequent post warranty maintenance terms. Do not purchase a separate blade warranty. Provided as part of the zBX warranty and terms.

<http://www.ibm.com/systems/z/hardware/zenterprise/zbx.html>

Sizing POWER7™ blades



- Size the z196 portion or z114 portion
 - Engage a Techline specialist to help you collect the data and do the sizing via Deal Hub Connect
 - Use zPCR or zCP3000
 - Use CP2KEXTR and CP3KVMXT to create an EDF file for z/OS and z/VM
 - Complete data collection guides located here:
<http://w3.ibm.com/techdocs/PRS2664> - for z/OS <http://w3.ibm.com/techdocs/PRS2875> - for z/VM
 - IBM Business Partners will be able to obtain the tools directly from Partner World.
- Size the **POWER7™** portion – allow at least one week.
 - Currently a manual process
 - 20-50 LPARS should take a week
 - More complex environments would take longer
 - Working towards a more automated process
- Sizing when migrating from competitive machines to **POWER7™** blades
 - Engage a Techline specialist via Deal Hub Connect to help you collect the data and do the sizing
 - Identify which machines and which time periods the customer would like to consider
 - Collect data from the competitive machines covering the time frames
 - Server consolidation data collection guidance located here:
<http://w3-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS1423>
- Sizing new applications running on **POWER7™** blades
 - Engage Global Techline Solutions Sizing Support via Deal Hub Connect
 - Software sizing questionnaires located here:
http://w3-03.ibm.com/support/techline/sizing/tg_im_sizing.html



Sizing POWER7™ blades



- Sizing when the customer has an existing set of IBM servers they would like to migrate to **POWER7™** blades (go ahead and collect the data now)
 - Identify which machines and which time periods the customer would like to consider in the proposal
 - Collect data from AIX covering the time frames
 - Work hand in hand with a POWER7 Specialist to collect the data and do the sizing
 - OR
 - Engage a Techline specialist via Deal Hub Connect to help you collect the data and do the sizing
 - Sizing questionnaires located here:
 - <http://w3-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS4034>
- We're working with the WLE (Workload Estimator) team for support
 - Targeted to be available at announce
 - Techline will deliver World Wide education when the support is available
- IBM Business Partners
 - PWCS (PartnerWorld Contact Services)

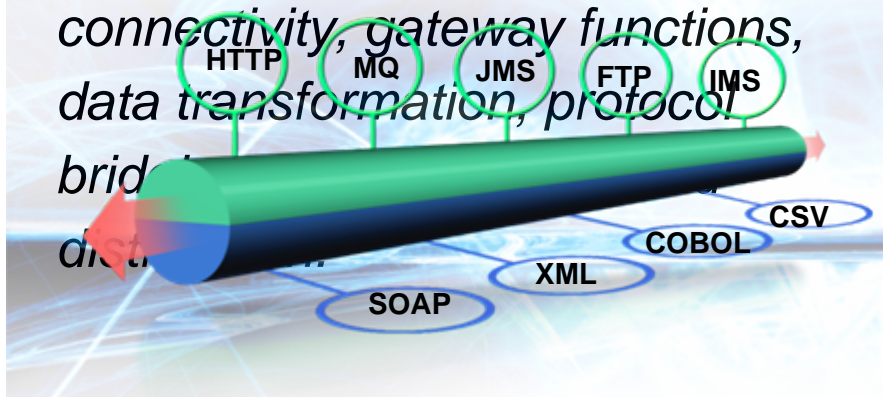


IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise helps extend the value of zEnterprise

Purpose-built hardware for simplified deployment and hardened security helps businesses quickly react to change and reduce time to market

What is it?

The IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise can help simplify, govern, secure and integrate XML and IT services by providing connectivity, gateway functions, data transformation, protocol



How is it different?

- **Security:** VLAN support provides enforced isolation of network traffic with secure private networks.
- **Improved support:** Monitoring of hardware with “call home” for current/expected problems and support by System z Service Support Representative.
- **System z packaging:** Increased quality with pre-testing of blade and zBX. Upgrade history available to ease growth.
- **Operational controls:** Monitoring rolled into System z environment from single console. Consistent change management with Unified Resource Manager.

System x Blade Orderings

- Use The IBM Standalone Solutions Configuration Tool (SSCT)
 - <https://www-947.ibm.com/support/entry/myportal/docdisplay?brand=5000008&Indocid=MIGR-62168>
- Will release four hardware configurations with Operating System choices.
 - Only two configurations are available on the zBX initially.
- The supported System x blades (new model numbers) will be available using the IBM SSCT configuration tool on August 30, 2011.

The IBM Standalone Solutions Configuration Tool (SSCT)


Standalone Configuration - Preferences

Welcome to the Standalone Solutions Configuration Tool (SSCT)
Please, select the desired start option

- Wizard: A novice user will have the ability to easily create a valid server configuration via a guided step-by-step process.
- Configuration Mode: An intermediate or expert user is supplied a server centric view of the SSCT enabling them to configure servers and manipulate prices. The generated reports are aimed at pre-sales quotes.
- Solution Mode: An intermediate or expert user is supplied a rack centric view of the SSCT enabling them to configure both racks and servers in complex solutions. The generated reports are aimed at rack content, layouts, resources, and cabling.

Region: Country:

Solution Type: Language:



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Standalone Solutions Configuration Tool Version: 1.42
Data Update File Version: 2.07.1103 - 11/07/2011
cfgtools@us.ibm.com

This tool is designed as an aid only and is distributed on a periodic basis. Please verify all configurations with trained Technical Personnel. The data contained in this tool is distributed AS IS without certification. The use of the data is for information and planning purposes only, and does not constitute a representation or warranty by IBM regarding the verification results.

IBM zEnterprise™ BladeCenter® Extension (zBX) IBM System x® Blades



After August 30th, new models will be preconfigured for you in SSCT.
This table is useful for pricing today.

MT 7873 (HX5)
July 12th Announce
GA September 26th

Customer Configuration

- Intel 8 core Processor
- 2 Processor sockets
- 2.13 GHz 105W
- Max 14 A16M's per BC-H
- Memory 1066 Mhz with 6.4 GTs
- 16 DIMM slots
- 100GB SSD Internal Disk

- Blades acquired by the customer through existing channels or through IBM.

- Virtualization: Integrated Hypervisor supplied by Unified Resource Manager

Description	Part Number	Option Part Number	Feature Code	Config 0	Config 1
Blade Base	69Y3056	69Y3056	A16M	1	1
Initial Processor 2.13 GHz 105W (E7-2830 8C)	69Y3071	69Y3071	A16S	1	1
Additional Processor 2.13 GHz 105W (E7-2830 8C)	69Y3072	69Y3074	A179	1	1
# Intel Processors (Sockets)				2	2
Blade Width				Single	Single
Total Cores				16	16
Memory 8GB 1333 MHz	46C0558	46C0570	A17Q	64GB 8	128GB 16
GB/core				4	8
Speed Burst	46M6843	59Y5889	1741	1	1
SSD Expansion Card	46M6906	46M6908	5765	1	1
50 GB SSD MLC	46W7727	43W7726	5428	2	2
No Internal RAID			9012	1	1
CFFh 10 GbE	46M6170	46M6168	0099	1	1
CIOv 8Gb FC	44X1946	44X1945	1462	1	1

<http://www.ibm.com/systems/z/hardware/zenterprise/zbx.html>



zBX - Linux on System x Operating Systems



- For HX5 7873 blades in the zBX, Linux must be 64 bit support only
- The supported HX5 7873 is a single wide two socket blade.
- Red Hat
With RHEL 5.5 you should order the feature for 2 sockets.

Please select the years of support that matches your company's Linux support direction. Our recommendation is to order the selection that supports unlimited guests but you can order the feature that best meets your planned requirements.

See the Red Hat website for more information – www.redhat.com.

- Novell
For Novell SLES 11 SP1 you should select 'SUSE Linux Enterprise Server' with 1-32 sockets.

Please select the years of support (1 or 3) that matches your company's Linux software support direction. You may choose the Add on for Standard or Priority Novell Support if you want.

See the Novell website for more information - <http://www.novell.com/products/server/>

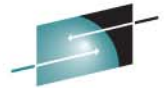
zBX Microsoft Windows



- NOTE that this information is ***a statement of direction only***.
- IBM's intent is to support
 - Microsoft Windows Server 2008 – Datacenter Edition on the HX5 7873 blades installed in the zBX, 64 bit version only.

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





SHARE



Networking



- 1 intra-node management network
- 2 intra-ensemble data network
- 3 existing customer network



Ensemble networking

- 1 • IntraNode Management Network (OSM)
 - 2 ports from 2 different OSA Express-3 1000BaseT Ethernet adapters, for redundancy.
 - Note: There is no OSA-Express4S 1000Base-T feature today.
 - Allows the HMC/SE to manage components within the ensemble.
- 2 • IntraEnsemble Data Network (OSX)
 - A pair of OSA-Express3 and/or OSA-Express4S 10 GbE adapters, for redundancy.
 - To allow the zEnterprise applications to communicate between OS images to share data.
 - To allow the zEnterprise applications to communicate to the zBX
 - Ensemble zBX to zBX communications.
- 3 • Existing customer network
 - 10 GbE connections in the zBX TOR Switch
 - For CPC's or switches not in the ensemble

- | | |
|---|------------------------------|
| 1 | intranode management network |
| 2 | intraensemble data network |
| 3 | existing customer network |

OSA-Express CHPID Types

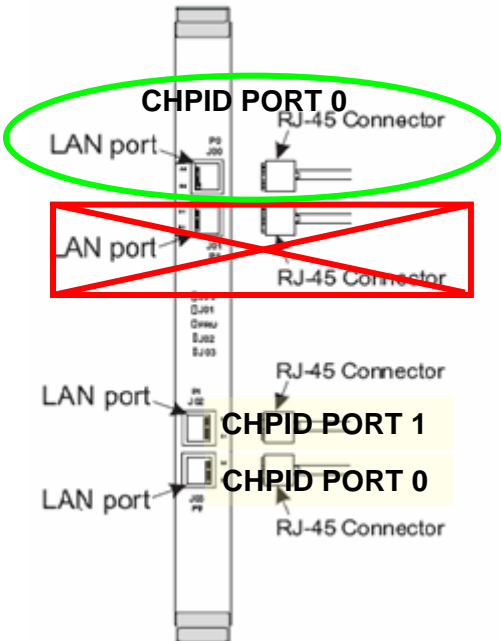
- Two new OSA CHPID types are created to support the new zBX networks.
- There are now up to 6 types of NETWORK OSA CHPID's.
- Existing data networks - defined as OSC, **OSD**, OSE, and OSN CHPID's
 - Existing customer provided and managed OSA ports used for access to the current customer external networks. (no changes)
- 1 • Intra-Node Management Network – defined as OSM CHPID's
 - OSA-Express3 1000base-T
 - Configured as an OSM CHPID port for Node Management Network to be connect to zEnterprise Ensemble CPC via a new ethernet switch A/B J07.
- 2 • Intra-Ensemble Data Networks – defined as OSX CHPID's
 - OSA-Express3 10 GbE (LR or SR) configured as an OSX CHPID, fiber port for IEDN.
 - OSA-Express4S 10 GbE (LR or SR) configured as an OSX CHPID, fiber port for IEDN.

- | | |
|---|-------------------------------|
| 1 | intra-node management network |
| 2 | intra-ensemble data network |
| 3 | existing customer network |

CHPID Types OSX and OSM

1 OSM (INMN)

FC 3367
OSA-Express3 1000BASE-T Ethernet



OSA Express3
1GbE
2 CHPIDS
2 PORTS/CHPID

FC3367



CAT 6 ETH CABLE

**MUST USE
CHPID PORT 0**

Supports IOCP CHPID types:
OSC, OSD, OSE, OSN, and **OSM (ONLY 1000BASE-T).**

OSM IOCDs EXAMPLE:

- CHPID PCHID=191,PATH=(CSS(0,1,2,3),23),TYPE=OSM,CHPARAM=01,SHARED, ...
- CNTLUNIT CUNUMBR=0910,PATH=((CSS(0),23)),UNIT=OSM
- IODEVICE ADDRESS=(0910,15),CUNUMBR=(0910),UNIT=OSA,UNITADD=00, *
MODEL=M,DYNAMIC=YES,LOCANY=YES

2 OSX (IEDN)



OSA Express3
10 GbE
2 CHPIDS
1 PORT/CHPID

FC3370 (LR)
Single Mode 9 micron LC duplex



FC3371 (SR)
Multi Mode 50/62.5 micron LC duplex



Supports IOCP CHPID types:
OSD and **OSX (ONLY 10 GbE).**

IEDN Distances

- SM (Long Reach Optics) 10 km (6.2 miles)
- MM (Short Reach Optics)
50 micron at 2000 MHz-km: 300 meters (984')
50 micron at 500 MHz-km: 82 meters (269')
62.5 micron at 200 MHz-km: 33 meters (108')

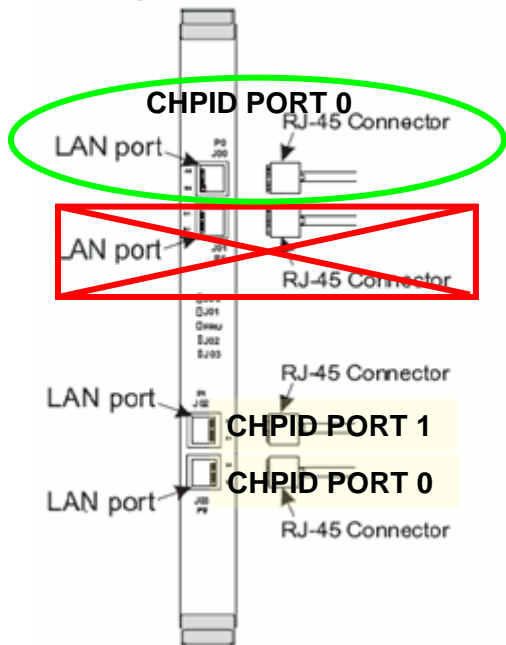
OSX IOCDs EXAMPLE:

- CHPID PCHID=5E1,PATH=(CSS(0,1,2,3),2F),TYPE=OSX,SHARED, ...
- CNTLUNIT CUNUMBR=09F0,PATH=((CSS(0),2F)),UNIT=OSX
- IODEVICE ADDRESS=(09F0,15),CUNUMBR=(09F0),UNIT=OSA,UNITADD=00, *
MODEL=X,DYNAMIC=YES,LOCANY=YES

CHPID Types OSX and OSM

1 OSM (INMN)

FC 3367
OSA-Express3 1000BASE-T Ethernet



OSA Express3
1GbE
2 CHPIDS
2 PORTS/CHPID

FC3367



CAT 6 ETH CABLE

**MUST USE
CHPID PORT 0**

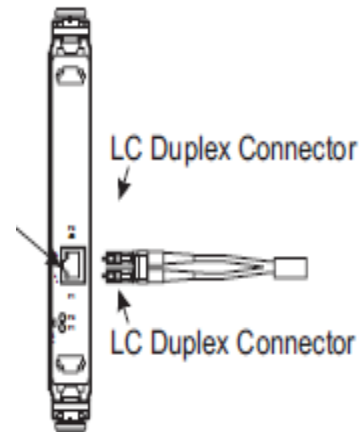
Supports IOCP CHPID types:
OSC, OSD, OSE, OSN, and **OSM (ONLY 1000BASE-T).**

OSM IOCDs EXAMPLE:

- CHPID PCHID=191,PATH=(CSS(0,1,2,3),23),TYPE=OSM,CHPARG=01,SHARED, ...
- CNTLUNIT CUNUMBR=0910,PATH=((CSS(0),23)),UNIT=OSM
- IODEVICE ADDRESS=(0910,15),CUNUMBR=(0910),UNIT=OSA,UNITADD=00, *
MODEL=M,DYNAMIC=YES,LOCANY=YES

2 OSX (IEDN)

FCs 0406/0407
OSA Express4S 10 Gigabit Ethernet LR/SR



NEW:
OSA-Express4S 10 GbE
One port per feature.

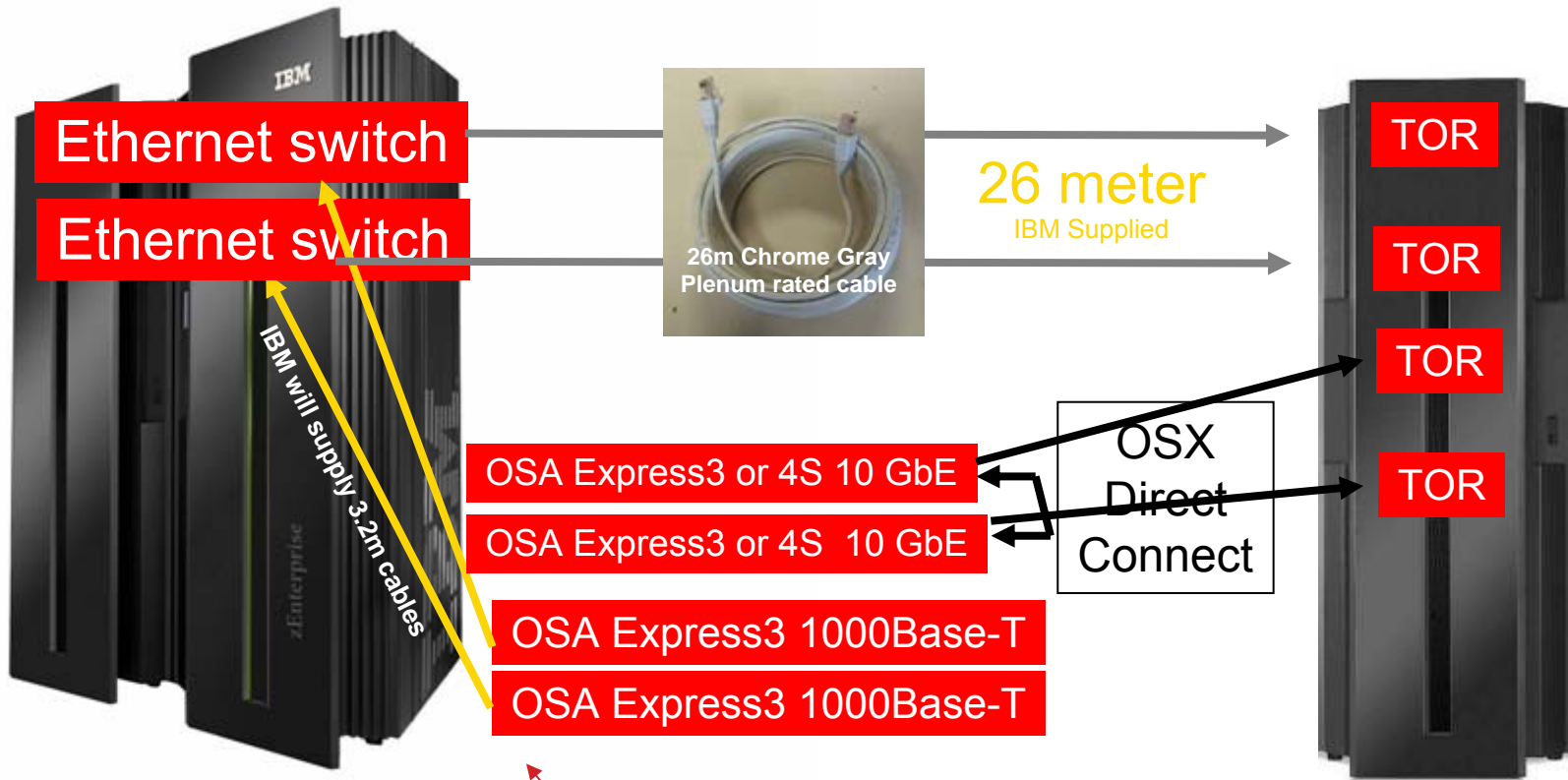
OSX IOCDs EXAMPLE:

- CHPID PCHID=5E1,PATH=(CSS(0,1,2,3),2F),TYPE=OSX,SHARED, ...
- CNTLUNIT CUNUMBR=09F0,PATH=((CSS(0),2F)),UNIT=OSX
- IODEVICE ADDRESS=(09F0,15),CUNUMBR=(09F0),UNIT=OSA,UNITADD=00, *
MODEL=X,DYNAMIC=YES,LOCANY=YES

2458-002 Networks

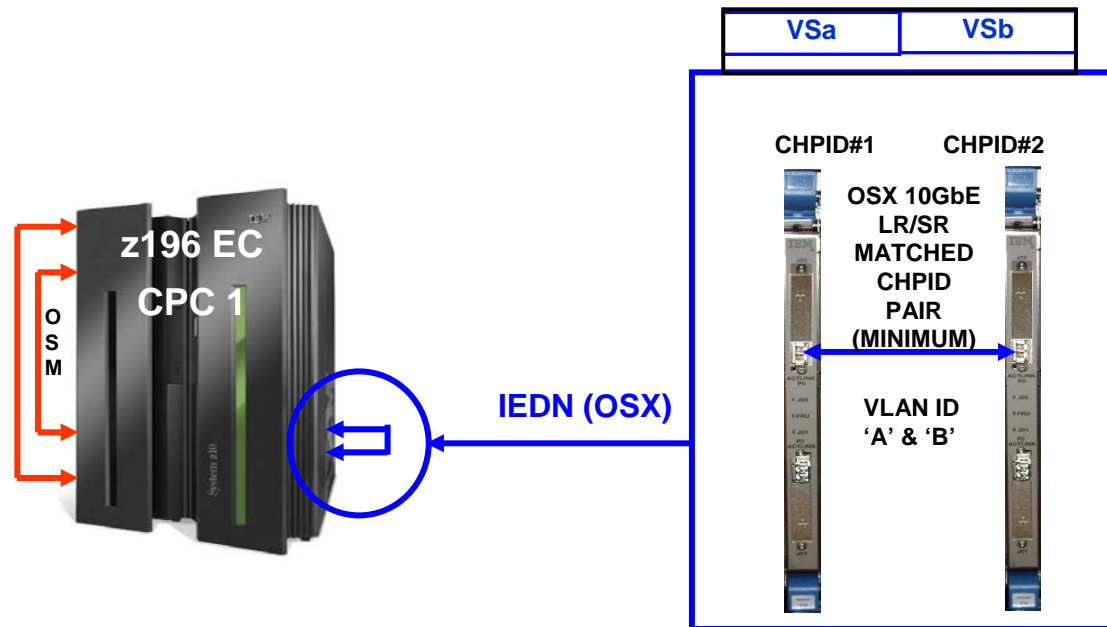
zEnterprise

zBX



Required if IBM Unified Resource Manager (FC0025), even if no zBX

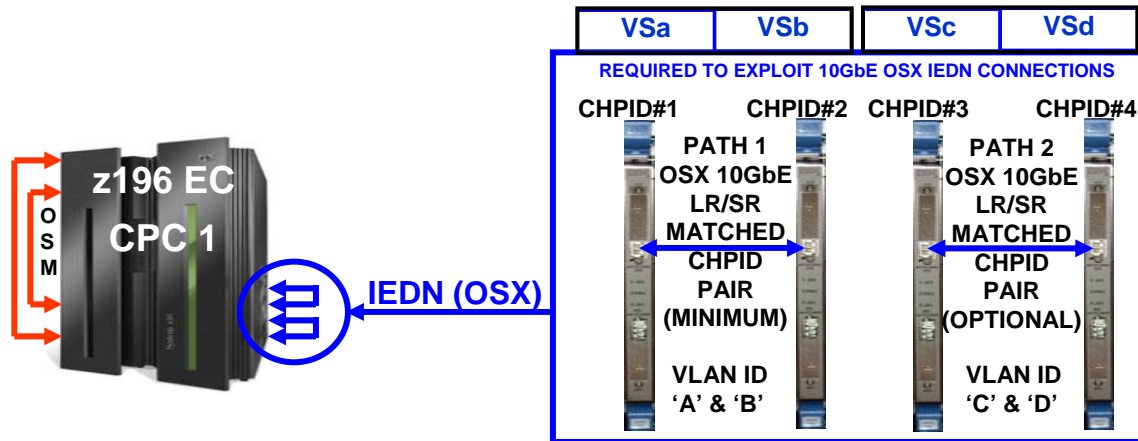
2458-002 IEDN, no zBX



Customer supplied directly connected LC DUPLEX cable (IEDN) between the 2 OSX CHPID pair.
Use 'ONE' OSX CHPID per card, located on different physical H/W cards/ports.

2458-002 IEDN, no zBX

Concerned about IEDN LAN performance?



Separate VLAN groups are assigned to each PATH CHPID PAIR and to separate Virtual Server groups.

A “zero zBX” solution may have no more than two OSX IEDN ports for a unique group of Virtual Servers attached to a unique set of VLAN IDs (and IP Subnets). Example:

VLANs ‘A’ and ‘B’ on CHPIDs #1 and #2 for Virtual Servers ‘A’ and ‘B’ (‘VSa’ and ‘VSb’)

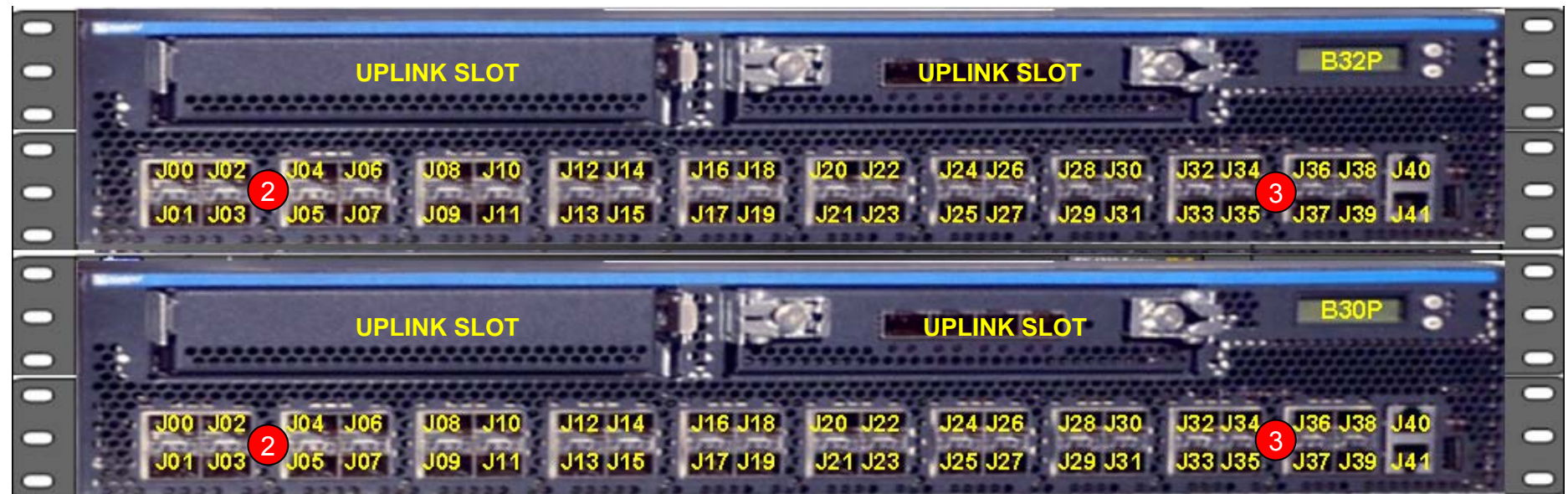
VLANs ‘C’ and ‘D’ on CHPIDs #3 and #4 for Virtual Servers ‘C’ and ‘D’ (‘VSc’ and ‘VSd’)

2458-002 Top of Rack (TOR) Switches



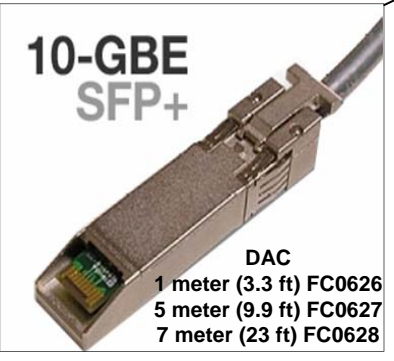
INMN TOR SWITCH

1. Intra-Node Management Network
2. Intra-Ensemble Data Network
3. Existing Customer Network



IEDN TOR SWITCH

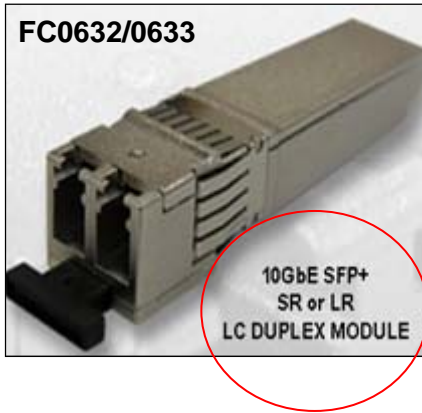
2458-002 IEDN Redundant Top of Rack (TOR) Switch Connections



- EX4500**
- SFP+ = 10GbE Optical SR or LR
 - DAC = 10GbE Direct Attach Cables.
 - **SWITCH JACK PLUGGING RULES:**
 - J00 - J07 are SFP+ reserved for Host OSX IEDN connections.
 - J08 - J23 are DAC reserved for BC IEDN, SM07/SM09 connections.
 - J22 / J23 are 1 Meter DAC for Switch to Switch
 - J24 - J30 are SFP+ reserved for zBX to zBX IEDN connections.
 - J31 - J39 are SFP+ reserved for customer (PINK) IEDN connections.
 - J40 Console Port
 - J41 IEDN Switch Management Port

Optic p/n 45W4743 - 10GE sfp+ SR - has a black handle
 Optic p/n 45W4744 - 10GE sfp+ LR - has a blue handle

Optics Ordering - FC0632 (LR) or FC0633 (SR)



Up to 8x2=16

Up to 7x2=14

Up to 9x2=18

2458-002 ZBX1 - ISAO Blade(112) - Options

Blades Options Power HMC Language

Options

- 0540 - Rear Door Heat Exchanger
- 0543 - Acoustic Door Set
- 0570 - Rack height reduction

- Intra-Node Management Network
- Intra-Ensemble Data Network
- Existing Customer Network

Customer Optics	Proposed	
0632 - To OSA OSX 10Gb LR (0 - 16 By 2)	2	z196 to zBX
0633 - To OSA OSX 10Gb SR (0 - 16 By 2)	0	
0632 - Intra-Ensemble Data Network 10Gb LR (0 - 14 By 2)	2	zBX to zBX
0633 - Intra-Ensemble Data Network 10Gb SR (0 - 14 By 2)	0	
0632 - External Data Network 10Gb LR (0 - 18 By 2)	3	zBX to existing
0633 - External Data Network 10Gb SR (0 - 18 By 2)	0	

Additional optic features will be added depending on the configuration.

< Previous Next > OK Cancel Reset Page

OSA Ordering

Note: At GA2,
OSA-Express4S
10 GbE SR/LR
available, one
port per feature.

CEC 1 of 2817-M32 NEW1 - OSA Express

CP Processor Usage ODC Memory IFB ISC FICON **OSA Express** Channels Crypto TKE STP

OSA Express	Proposed	
0406 - OSA Express4S 10GbE (0 - 46 By 1 Ports)	0	OSA to TOR OSX
0407 - OSA Express4S 10GbE SR (0 - 48 By 1 Ports)	2	
0405 - OSA Express4S GbE SX (0 - 92 By 2 Ports)	0	OSA to BPH OSM
0404 - OSA Express4S GbE LX (0 - 92 By 2 Ports)	0	
3367 - OSA Express3 1000BASET-EN (0 - 96 By 4 Ports)	8	

WARNING: Determine the transceiver/feature on the director, server, switch, or router BEFORE ordering the feature. SX and LX features are NOT compatible with one another.

The SX feature supports multimode fiber optic cables only. Choose the SX feature to "talk" to the SX feature on a director, server, switch, or router with the SX feature.

The LX feature uses single mode fiber optic cables, but accommodates data center infrastructures with 50 or 62.5 multimode fiber optic cables. Choose the LX feature to "talk" to the LX feature on a director, server, switch, or router with the LX feature.

If the LX feature is used with a multimode fiber infrastructure, a pair of Mode Conditioning Patch (MCP) cables will be required for each link.

< Previous Next > OK Cancel Reset Page

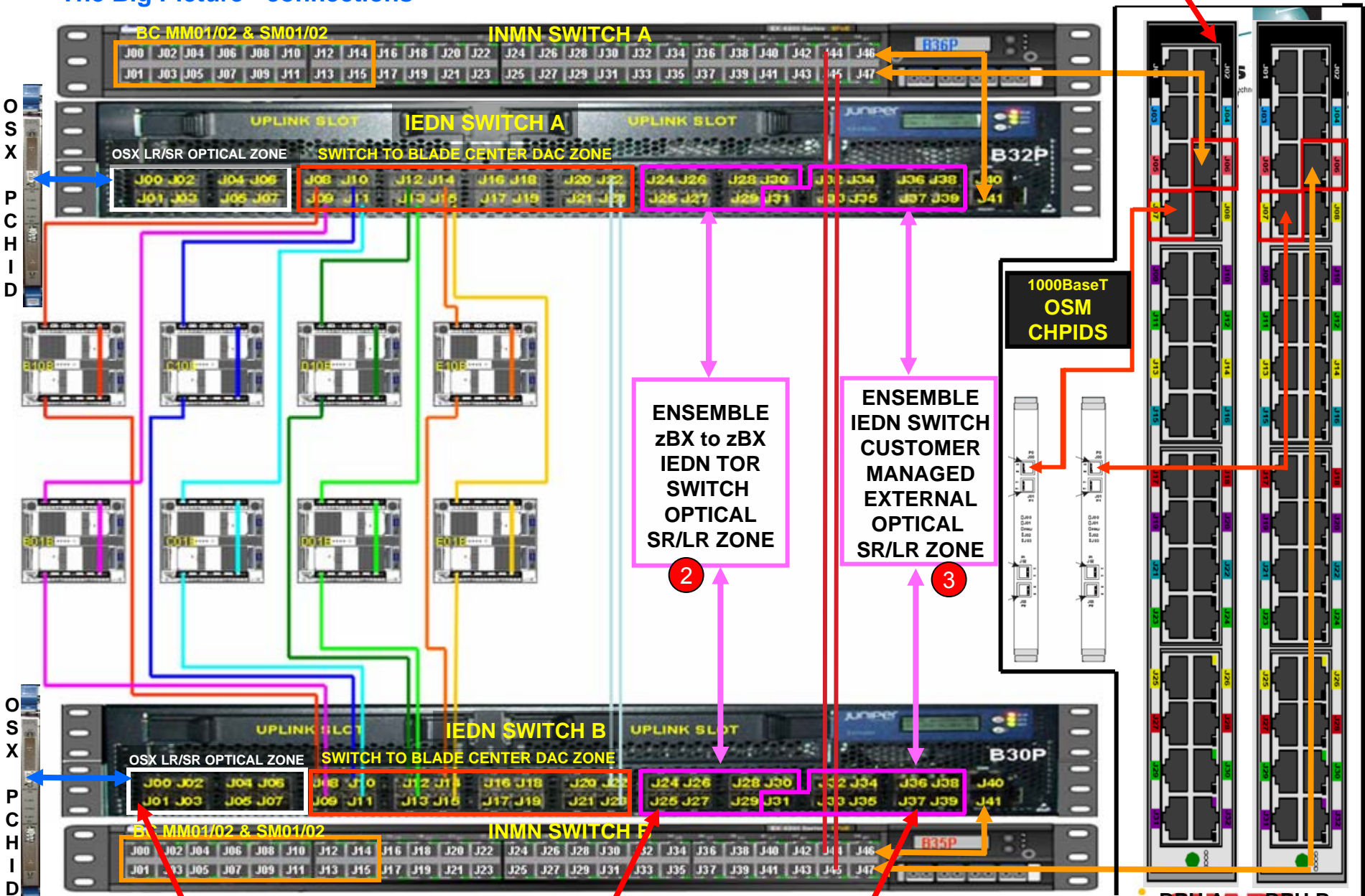
2 3

1

1

1000Base-T to BPH

The Big Picture - connections



ENSEMBLE
zBX to zBX
IEDN TOR
SWITCH
OPTICAL
SR/LR ZONE

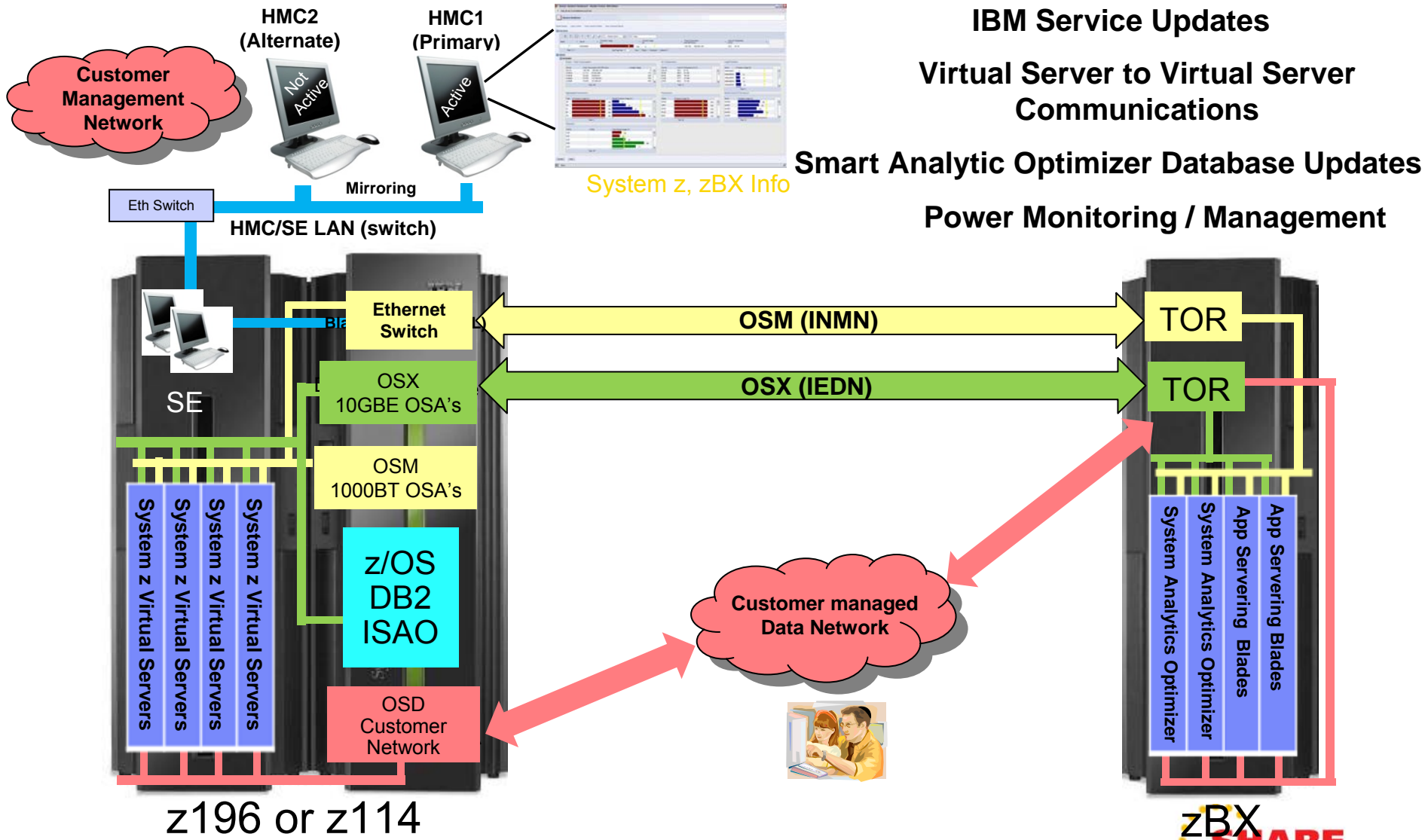
ENSEMBLE
IEDN SWITCH
CUSTOMER
MANAGED
EXTERNAL
OPTICAL
SR/LR ZONE

2 Up to 8 CPCs

0 if only one zBX

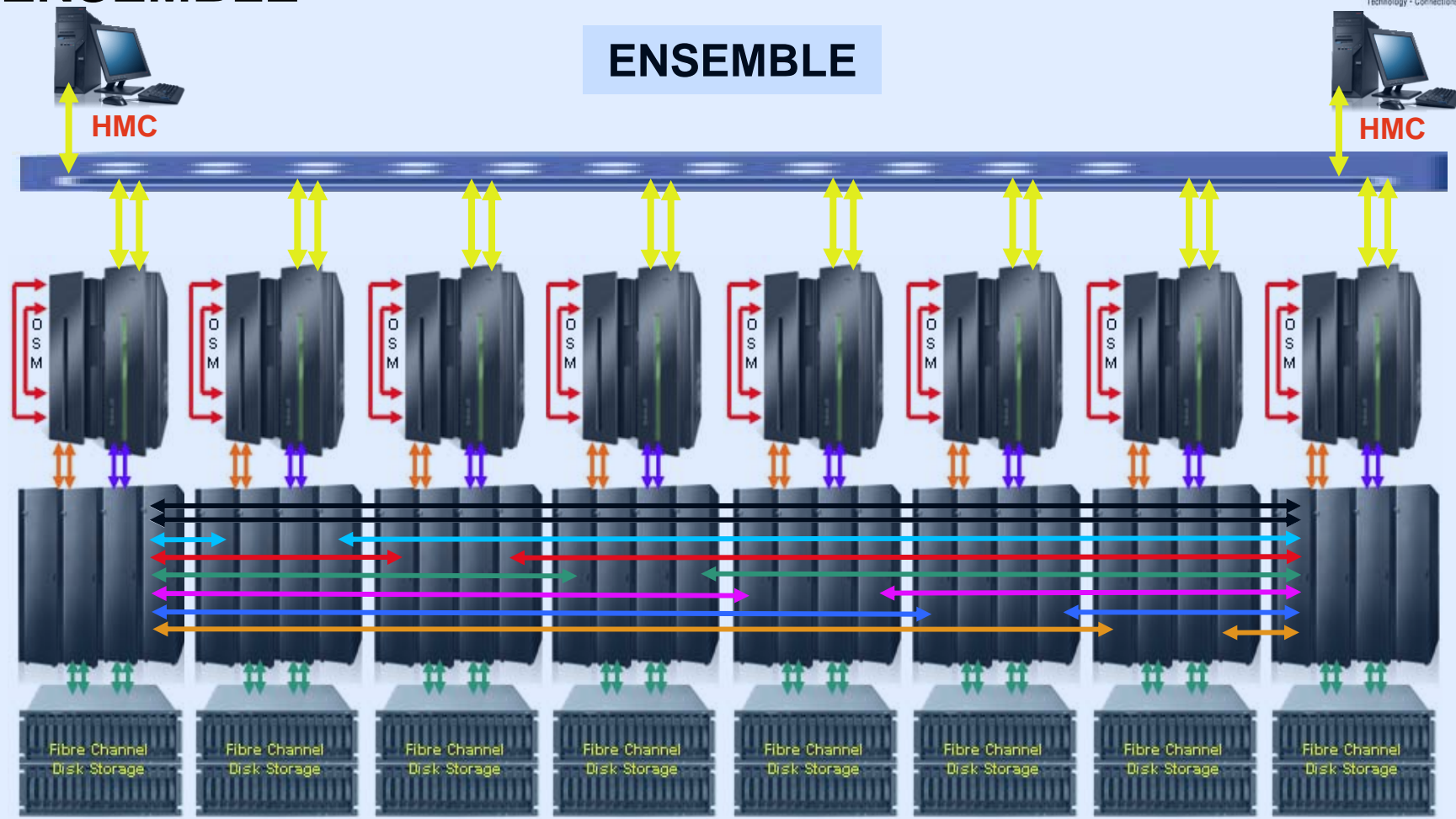
0 if not on existing

zEnterprise and zBX Model 002 – Communications



zEnterprise/2458-002 MAX CPC/NODE ENSEMBLE

ENSEMBLE



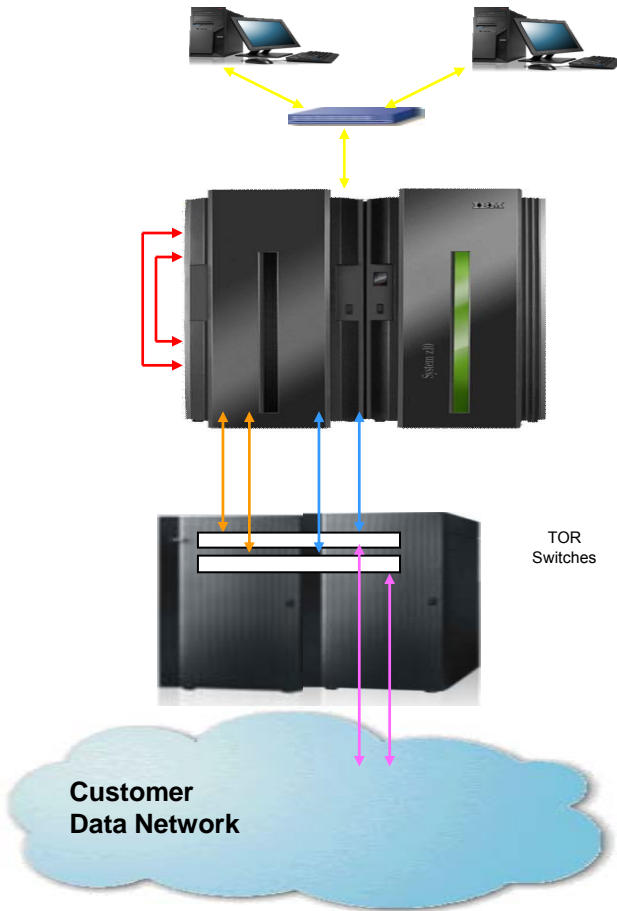
- Node1-B32PJ24 to Node2-B32PJ24
- Node1-B32PJ25 to Node3-B32PJ25
- Node1-B32PJ26 to Node4-B32PJ26
- Node1-B32PJ27 to Node5-B32PJ27
- Node1-B32PJ28 to Node6-B32PJ28
- Node1-B32PJ29 to Node7-B32PJ29
- Node1-B32PJ30 to Node8-B32PJ30

zBX to zBX IEDN Connections 2

1. Intra-Node Management Network
2. Intra-Ensemble Data Network
3. Existing Customer Network

- Node8-B30PJ24 to Node1-B30PJ24
- Node8-B30PJ25 to Node2-B30PJ25
- Node8-B30PJ26 to Node3-B30PJ26
- Node8-B30PJ27 to Node4-B30PJ27
- Node8-B30PJ28 to Node5-B30PJ28
- Node8-B30PJ29 to Node6-B30PJ29
- Node8-B30PJ30 to Node7-B30PJ30

1 CEC, 1 Ensemble, 1 zBX



intra-node management network
intra-ensemble data network
existing customer network

Additional Content

- **HMC** (2 per Ensemble)
 - **Ethernet Cables**
- **INMN** (2 per Controlling CEC)
 - **26 meter 1000BaseT cables (BPH to Switch)**
- ① • **OSM** (2 per each CEC in Ensemble)
 - **OSA Express-3 1000BaseT Ethernet to BPH**
 - **3.2 meter Ethernet Cables**

Connections

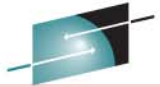
1 to 8 redundant connections of each type, per Ensemble

- ② • **OSX** (2 per CEC Connection)
 - **OSA Express3 10GbE, SR or LR**
 - **OSA Express4S 10GbE, SR or LR**
 - **Optic modules, SR or LR**
 - **Customer provided 10GbE cables, SR or LR**

Optional connections, depending on access to Customers network

- ③ • **External data network** (2 per connection)
 - **Optic modules, SR or LR**
 - **Customer provided 10 GbE cables, SR or LR**

8 CEC, 1 Ensemble, 1 zBX



SHARE
Technology · Connections · Results

Additional Content

- **HMC** (2 per Ensemble)
 - **Ethernet Cables**
- **INMN** (2 per Controlling CEC)
 - **26 meter 1000BaseT cables (BPH to Switch)**
- ① • **OSM** (2 per each CEC in Ensemble)
 - **OSA Express-3 1000BaseT Ethernet to BPH**
 - **3.2 meter Ethernet Cables**

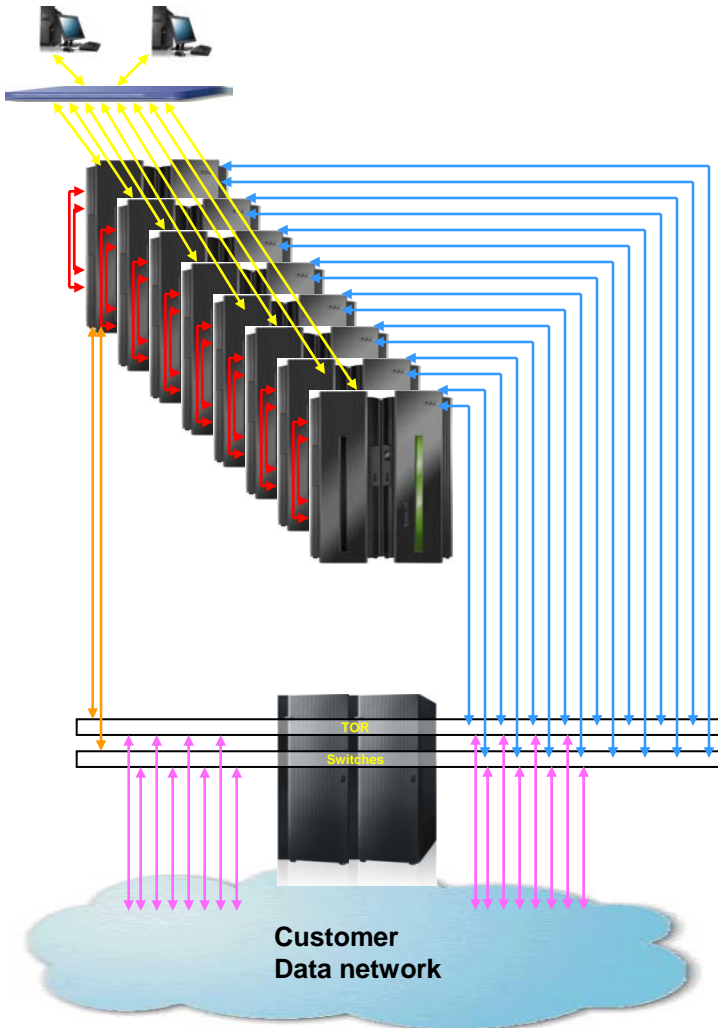
Connections

1 to 8 redundant connections of each type, per Ensemble

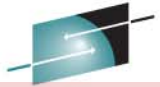
- ② • **OSX** (2 per CEC Connection)
 - **OSA Express3 10GbE, SR or LR**
 - **OSA Express4S 10GbE, SR or LR**
 - **Optic modules, SR or LR**
 - **Customer provided 10GbE cables, SR or LR**

Optional connections, depending on access to Customers network

- ③ • **External data network** (2 per connection)
 - **Optic modules, SR or LR**
 - **Customer provided 10 GbE cables, SR or LR**



8+ CEC, 1 Ensemble, 1 zBX



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Additional Content

- **HMC** (2 per Ensemble)
 - **Ethernet Cables**
- **INMN** (2 per Controlling CEC)
 - **26 meter 1000BaseT cables (BPH to Switch)**
- ① • **OSM** (2 per each CEC in Ensemble)
 - **OSA Express-3 1000BaseT Ethernet to BPH**
 - **3.2 meter Ethernet Cables**

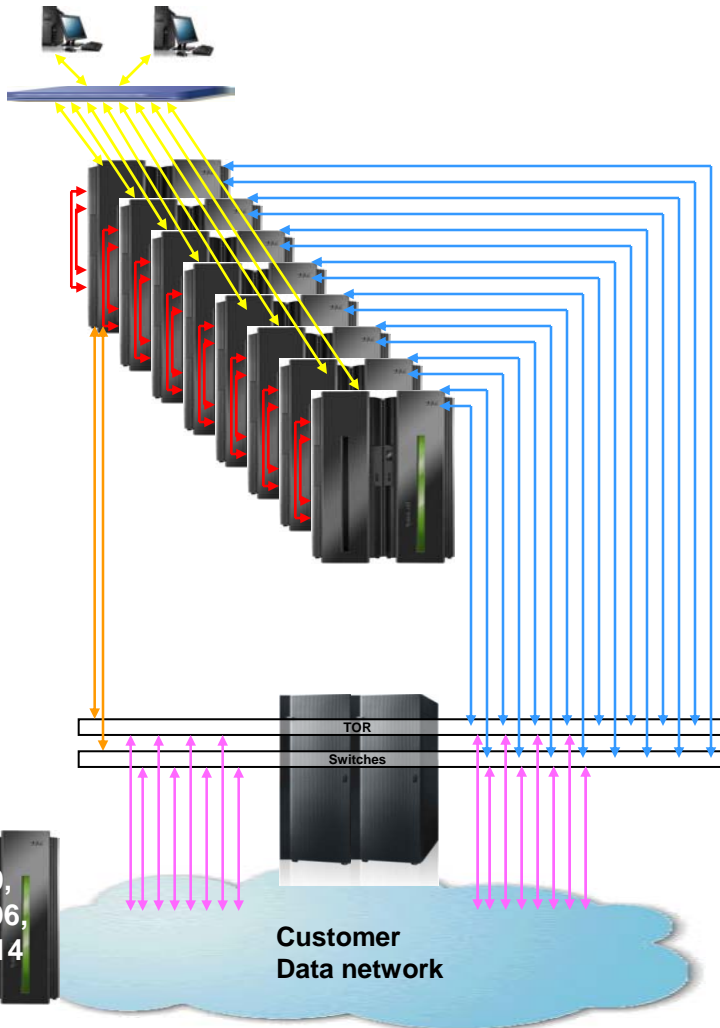
Connections

1 to 8 redundant connections of each type, per Ensemble

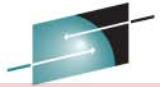
- ② • **OSX** (2 per CEC Connection)
 - **OSA Express3 10GbE, SR or LR**
 - **OSA Express4S 10GbE, SR or LR**
 - **Optic modules, SR or LR**
 - **Customer provided 10GbE cables, SR or LR**

Optional connections, depending on access to Customers network or from CECs not in the Ensemble

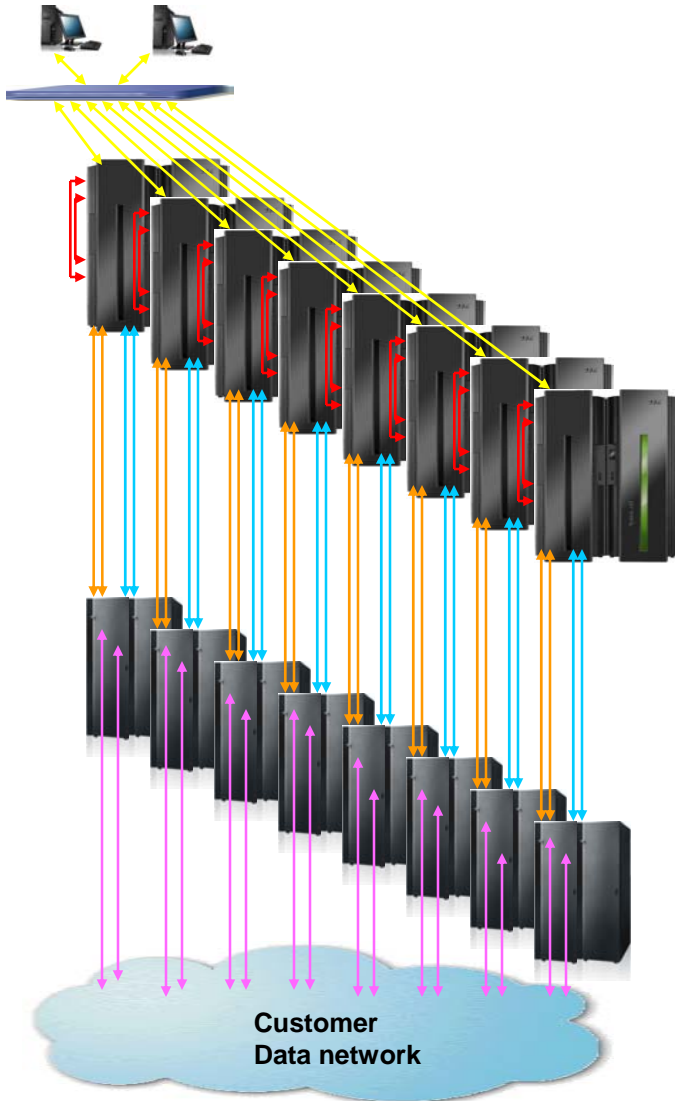
- ③ • **External data network** (2 per connection)
 - **Optic modules, SR or LR**
 - **Customer provided 10 GbE cables, SR or LR**



8 CEC, 1 Ensemble, 8 zBX



SHARE
Technology - Connections - Results



Additional Content

- **HMC** (2 per Ensemble)
 - **Ethernet Cables**
- **INMN** (2 per Controlling CEC)
 - **26 meter 1000BaseT cables (BPH to Switch)**
- **OSM** (2 per each CEC in Ensemble)
 - **OSA Express-3 1000BaseT Ethernet to BPH**
 - **3.2 meter Ethernet Cables**

Connections

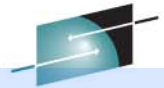
1 to 8 redundant connections of each type, per Ensemble

- **OSX** (2 per CEC Connection)
 - **OSA Express3 10GbE, SR or LR**
 - **OSA Express4S 10GbE, SR or LR**
 - **Optic modules, SR or LR**
 - **Customer provided 10GbE cables, SR or LR**
(4 x zBX) - 2 per Ensemble) (zBX to zBX)
 - **Customer provided 10 GbE cables, SR or LR**
 - **Optic modules, SR or LR**

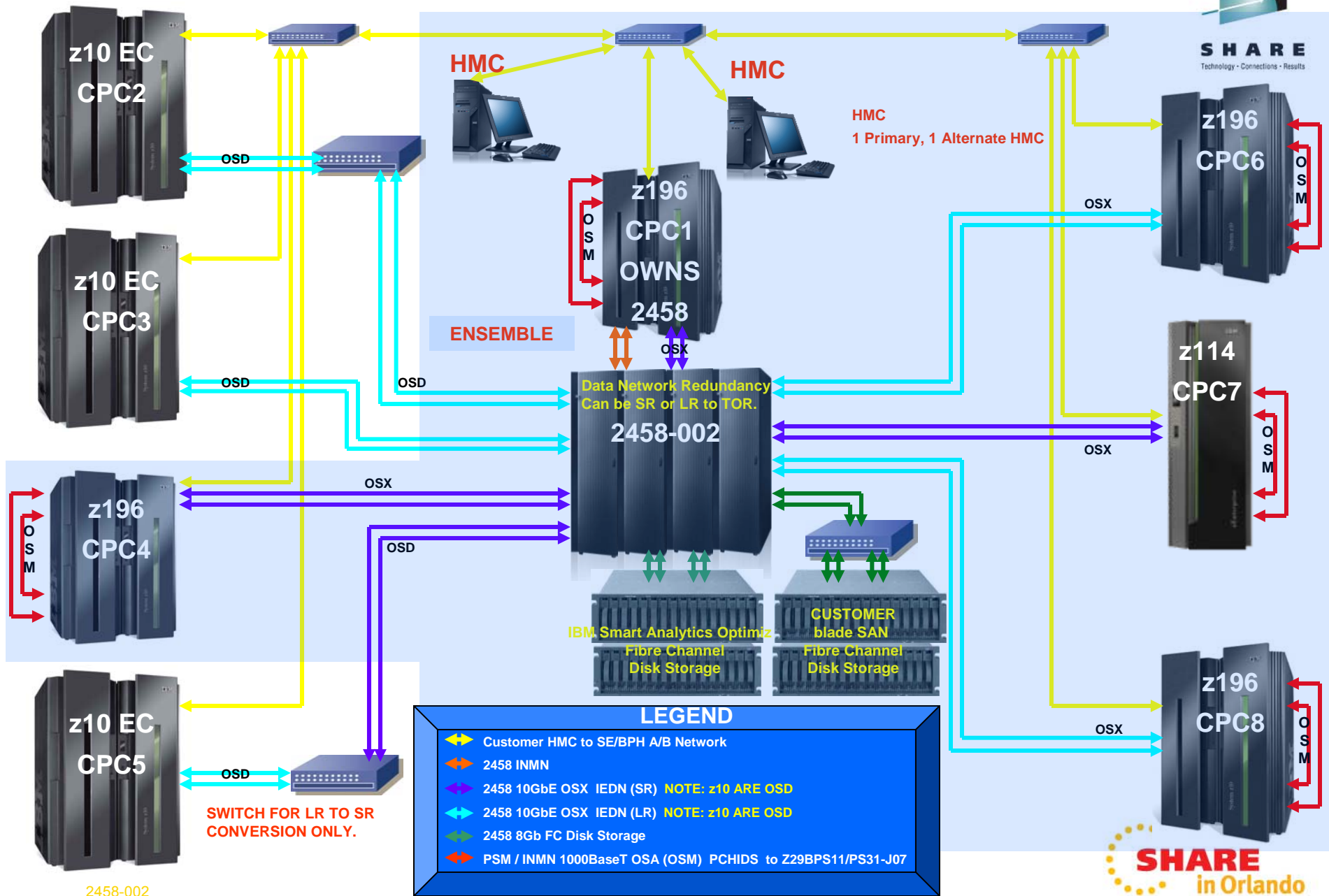
Optional connections, depending on access to Customers network

- **External data network** (2 per connection)
 - **Optic modules, SR or LR**
 - **Customer provided 10 GbE cables, SR or LR**

Big Picture 2458-002 Configuration



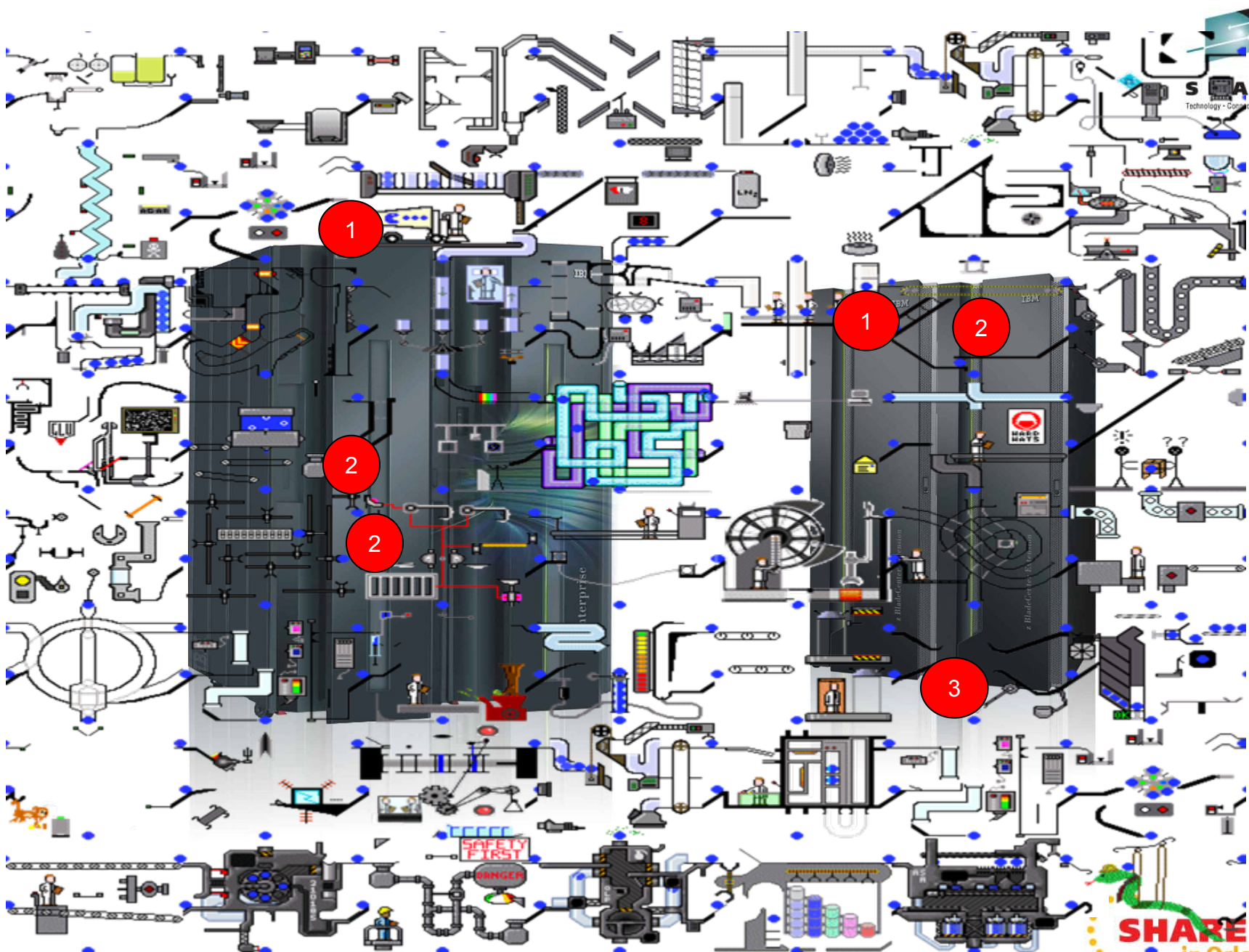
SHARE
Technology - Connections - Results



SWITCH FOR LR TO SR CONVERSION ONLY.

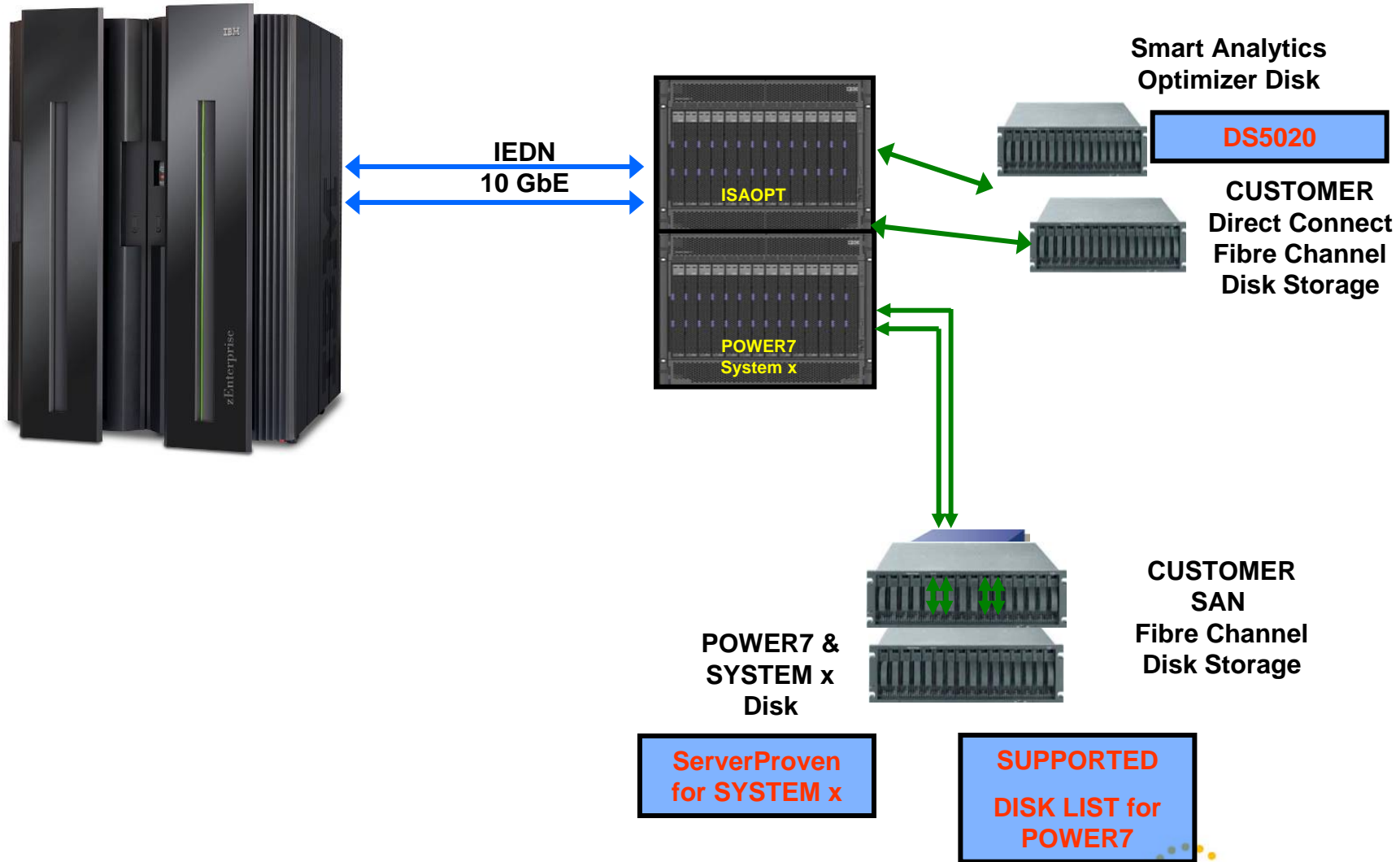
2458-002





Storage for IBM Smart Analytics Optimizer

IBM Smart Analytics Optimizer, IBM POWER7 and System x Disk Storage



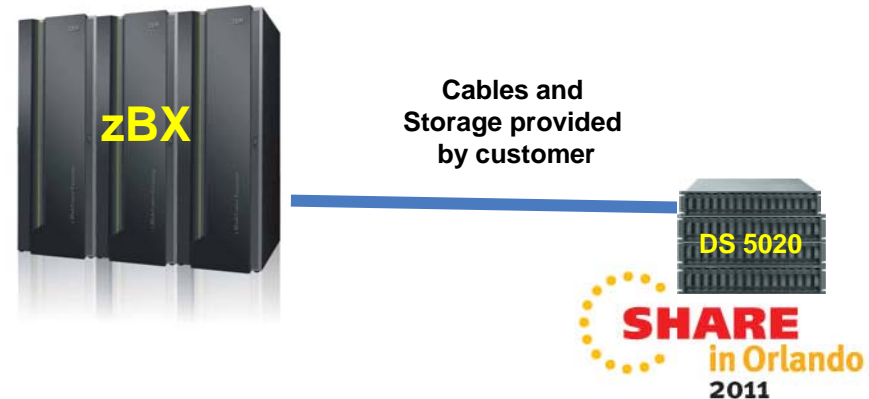
IBM Smart Analytics Optimizer Disk Attachment Details



- Includes two 20 port – 8 Gb FC switches in each BladeCenter to allow connectivity to disk
 - Must be directly attached
 - Supports 8 Gbps, 4 Gbps, 2 Gbps
 - 1 Gbps is NOT supported
 - Allows for connectivity to:
 - DS5020 with 1 TB HDD

	7	14	28	42	56
<i>Intended to handle up to x TBs of DB2 data</i>					
<i>0.5 TB</i>	<i>1 TB</i>	<i>2 TB</i>	<i>3 TB</i>	<i>4 TB</i>	
<i>16 Drives</i>	<i>16 Drives</i>	<i>16 Drives</i>	<i>32 Drives</i>	<i>32 Drives</i>	
<i>8 ports</i>	<i>8 ports</i>	<i>8 ports</i>	<i>8 ports</i>	<i>8 ports</i>	<i>8 ports</i>

- Disk is not part of the integrated Smart Analytics Optimizer offering
 - Customer is responsible for:
 - supplying disk (separate order)
 - disk cabling
 - disk configuring



IBM Smart Analytics Optimizer Disk e-Config output



**7, 14, 28
Blades**

1	1814-20A	DS5020 Midrange Disk (Dual Controllers)
1	FC2080	2-Dual 8Gbps Host Pt Cards
16	FC4001	DS5020 1 TB/7.2 SATA DDM
4	FC5605	5m Fiber Optic Cable LC-LC
1	FC7802	DS5020 Linux/Intel Host Kit
1	FC8700	DS5020 2 Stg Partiti. IPO
1	FC9202	Field Integrated
1	FC9800	Power Cord 125V/10A, Group 1

**42, 56
Blades**

plus

1	1814-52A	EXP520
16	FC4001	DS5020 1 TB/7.2K SATA DDM
4	FC5605	5m Fiber Optic Cable FC-FC
1	FC9021	Attach to DS5020
1	FC9202	Field Integrate
1	FC9800	Power Cord 125V/10A 2.8m, (Group 1)

Notes:

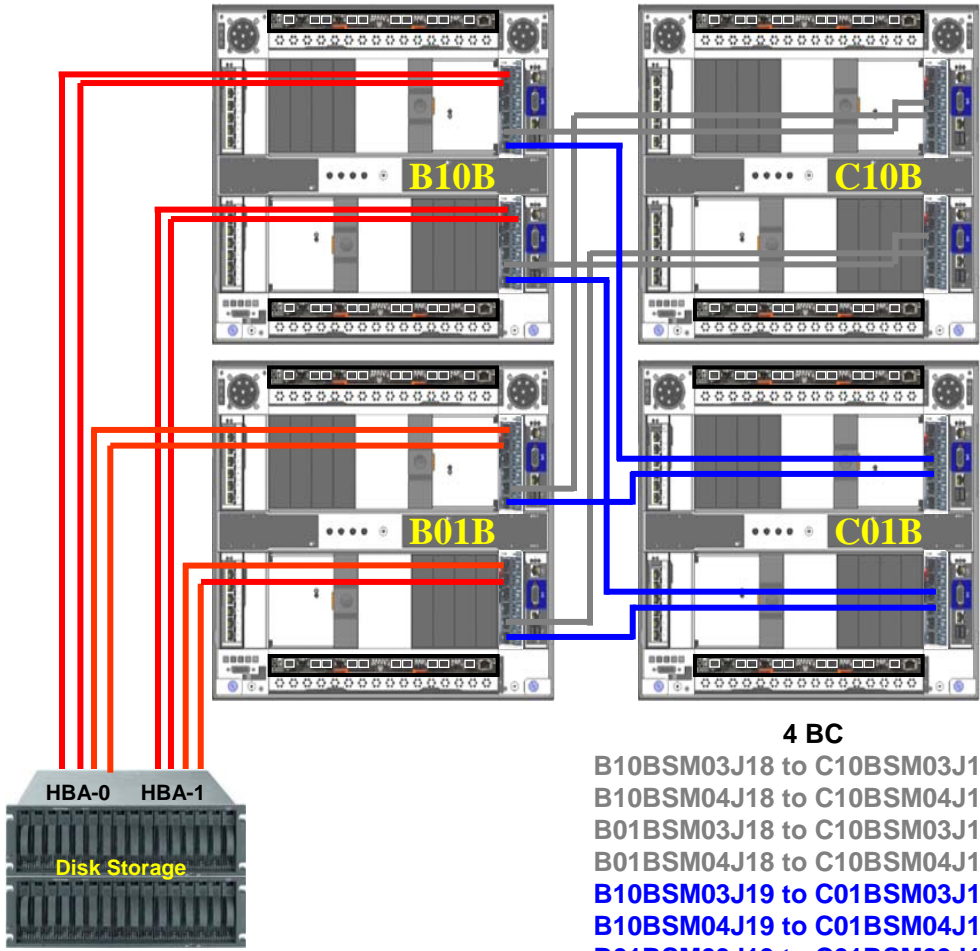
- Four attachment ports are standard and no charge. FC2080 adds an additional four ports (charged).
Order FC2080 in every order because it can not be MES'ed later.
- 5m Fiber Optic Cable LC-LC (can order 1m or 25m also for attachment to a patch panel).

zBX 4 BLADECENTER FC CONNECTIONS



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Solutions - Results

4 BLADECENTER, Smart Analytics Optimizer ONLY FC DISK STORAGE CASCADE CONNECTIONS

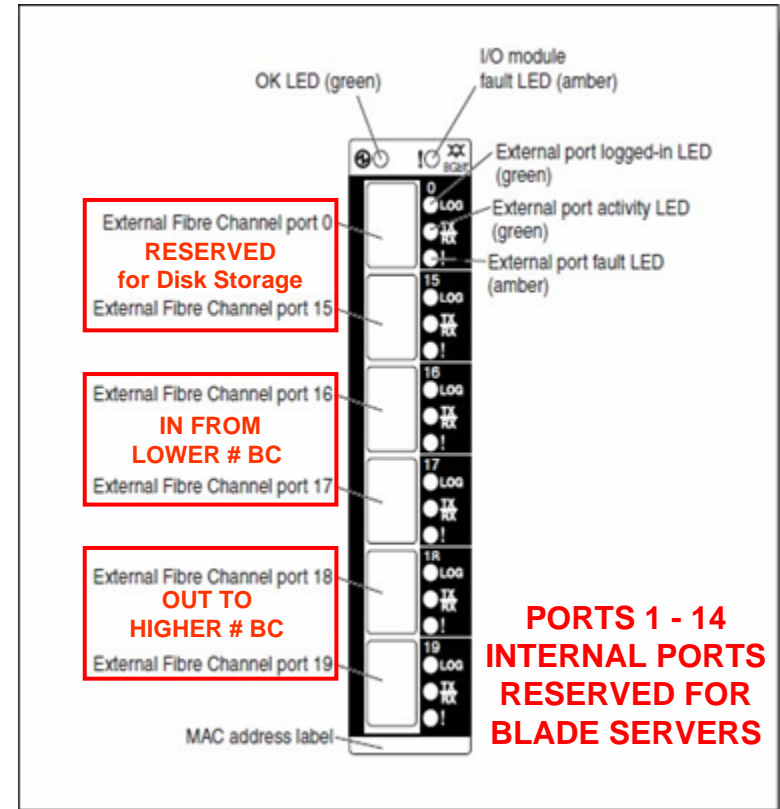


4 BC

- B10BSM03J18 to C10BSM03J16
- B10BSM04J18 to C10BSM04J16
- B01BSM03J18 to C10BSM03J17
- B01BSM04J18 to C10BSM04J17
- B10BSM03J19 to C01BSM03J16
- B10BSM04J19 to C01BSM04J16
- B01BSM03J19 to C01BSM03J17
- B01BSM04J19 to C01BSM04J17

FC INTERCONNECT CABLES
5M LC DUPLEX SR ONLY (FC 0621)

SM03/04 JACK LOCATIONS



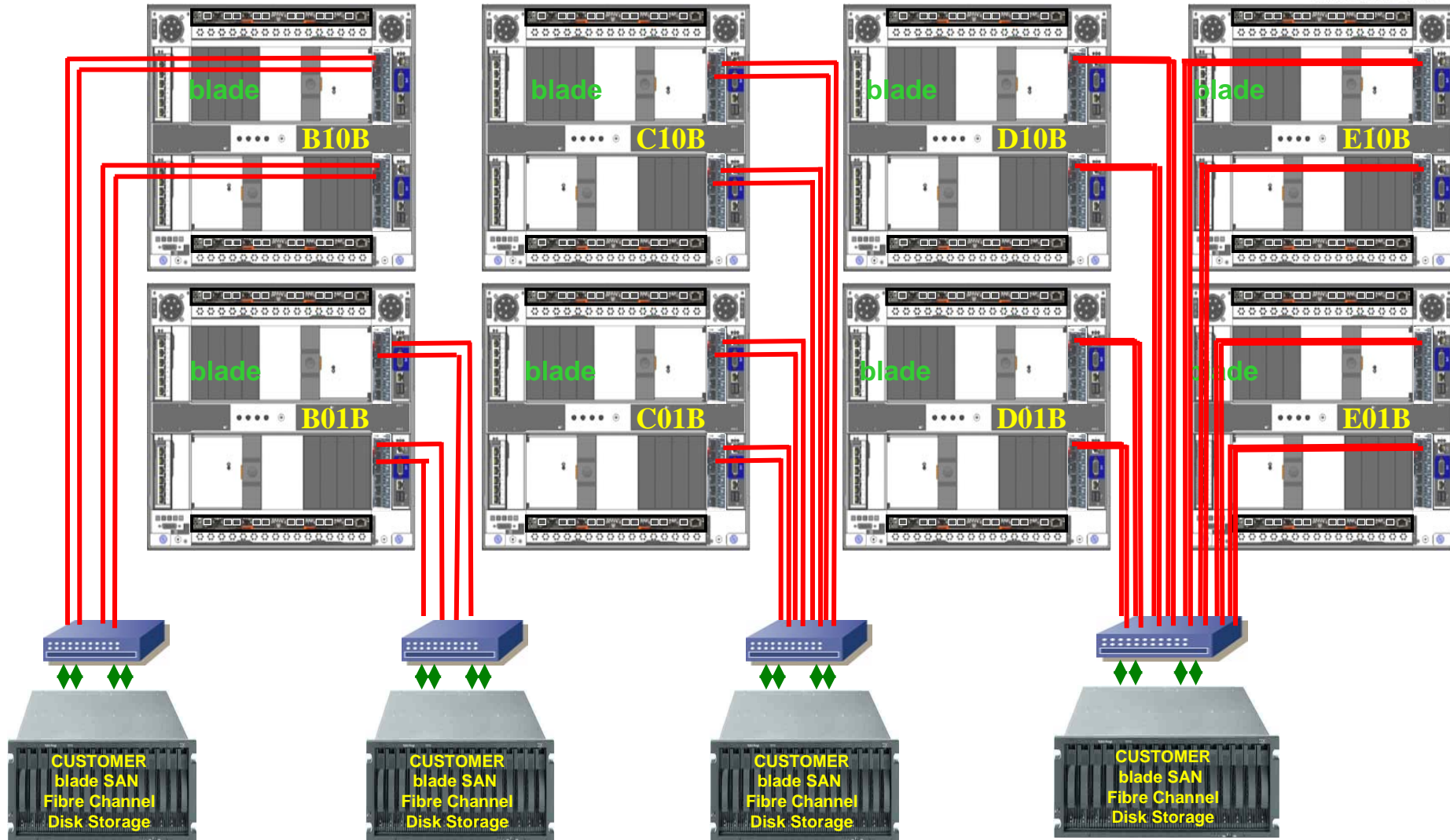
USING TOP/DOWN - LEFT/RIGHT RULES
1ST AVAILABLE J18/J19 TO NEXT BC AVAILABLE J16/J17.

CUSTOMER SUPPLIED

- *CBL HBA0J00 to B10BSM03J00
- *CBL HBA1J00 to B10BSM04J00
- *CBL HBA0J01 to B01BSM03J00
- *CBL HBA1J01 to B01BSM04J00

Storage for zBX and POWER7

FC DISK STORAGE CONNECTIONS FOR Power7 blades



Separately provided disk and cables. No BladeCenter interconnect.

Blade chassis DOES NOT cable to the same Disk Storage as Smart Analytics Optimizer chassis

List of Storage Devices Supported by PS701 IBM BladeCenter Express in IBM zEnterprise System*

- **IBM**
 - DS3400, DS3500, DS3950
 - DS4100, DS4200, DS4700, DS4800
 - DS5020, DS5100, DS5300
 - DS6000™
 - DS8100, DS8300, DS8700, DS8800
 - SVC 2145
 - XIV®
 - 2105, 2107
 - Storwize® v7000
 - N-series²
- **EMC**
 - Symmetrix 3300, 5000 , 8000
 - Symmetrix V-MAX
 - DMX 800, 1000, 1000P, 2000, 2000P, 3000
 - DMX -3, DMX-4
 - Clariion CX3 all models, CX4 all models, CX300, CX400, CX500, CX600, CX700, AX4-5
- **Hitachi**
 - Lightning 9910, 9960, 9970, 9980
 - USP 100, 600, 1100
 - NSC55
 - USP, USP-V
 - VSP
- **HP**
 - EVA 3, 4X, 5, 6X, 8X
 - XP 10K, 12K, 24K, 48, 128, 512, 1024
 - HP P9500
- **NetApp**
 - FAS2050³

¹ default MPIO Path Control Module support only

The customer Fibre Channel (FC) switches that connect to the zBX BladeCenter FC switches must support NPIV and must use shortwave (multimode) ports that support either 2,4 or 8 Gbps link speeds. Each BladeCenter requires four connections to the customer SAN. LUNS can be shared.

¹ Default MPIO Path Control Module support only
² Need specific model for verification of qualification
³ Other NetApp models may also be qualified

<http://www.ibm.com/systems/z/hardware/zenterprise/zbx.html>

Select Support Storage Devices

Storage for zBX and IBM System x

Storage Devices and System x

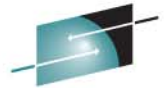


- Open Storage to support the HX5 7873
- For IBM open storage information you can use the IBM System Storage® Interoperation Center (SSIC) web site –
<http://www.ibm.com/systems/support/storage/ssic/interoperability.wss>.
- For information on support from other industry leaders you can use the IBM Server Proven web site –

<http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/>.
- Your IBM storage specialist (FTSS – Field Technical Support Specialist) or BP storage specialist can also assist you in finding an open storage product to support the IBM BladeCenter HX5 7873.

Hardware Management Consoles

Third Party Maintained zEnterprise



The image shows two overlapping configuration windows from the zEnterprise management interface. The top window is titled "2817-M32 NEW1 - HMC" and has tabs for "Proposed Model", "PPM/Ensemble", "CEC", "zBX", "Power/Cooling", "Cables", "HMC", "Monitor", "Language", "Service", and "SO". The bottom window is titled "2458-002 ZBX1 - Pwr Blade Enablement(4) - HMC" and has tabs for "Enablement", "Blades", "Options", "Power", "HMC", and "Language". A red arrow points from the "zBX" tab in the top window to the "HMC" tab in the bottom window.

2817-M32 NEW1 - HMC

Proposed Model	PPM/Ensemble	CEC	zBX	Power/Cooling	Cables	HMC	Monitor	Language	Service	SO

2458-002 ZBX1 - Pwr Blade Enablement(4) - HMC

Enablement	Blades	Options	Power	HMC	Language
HMC		Proposed			
0091 - HMC w/Dual EN (0 - 1)					
Monitor		Proposed			
6096 - Flat-panel display (0 - 0)		0			

A dedicated HMC for pulling zBX related MCLs/PTFs is required when the controlling CEC for the zBX is no longer under warranty but the zBX still is. The HMC connected to the zBX can not be used for ensemble management or for basic system management tasks on the CEC.

Buttons: < Previous, Next >, OK, Cancel, Reset Page

How is the Role of the HMC Changing?



- Prior to the ensemble management functions in z196, HMC availability was not a critical concern
 - HMC was not the authoritative holder of any configuration or state information other than configuration info for the HMC itself
 - HMC was not involved in any flows supporting ongoing operation other than call-home, for which redundancy was provided
 - You could turn the HMC off and there would be no effect on operations of the managed systems
- Addition of ensemble-related function in z196 changes this:
 - The HMC will now be authoritative holder of some ensemble-scoped configuration not held by any of the Nodes in the ensemble
 - Some configuration actions will be available ONLY from the HMC managing the ensemble, not the SE
 - HMC will have a role in monitoring of Workload performance
- This change in role drives a need to provide some additional redundancy in the HMC configuration to improve availability

HMC (Primary and Alternate Requirements)

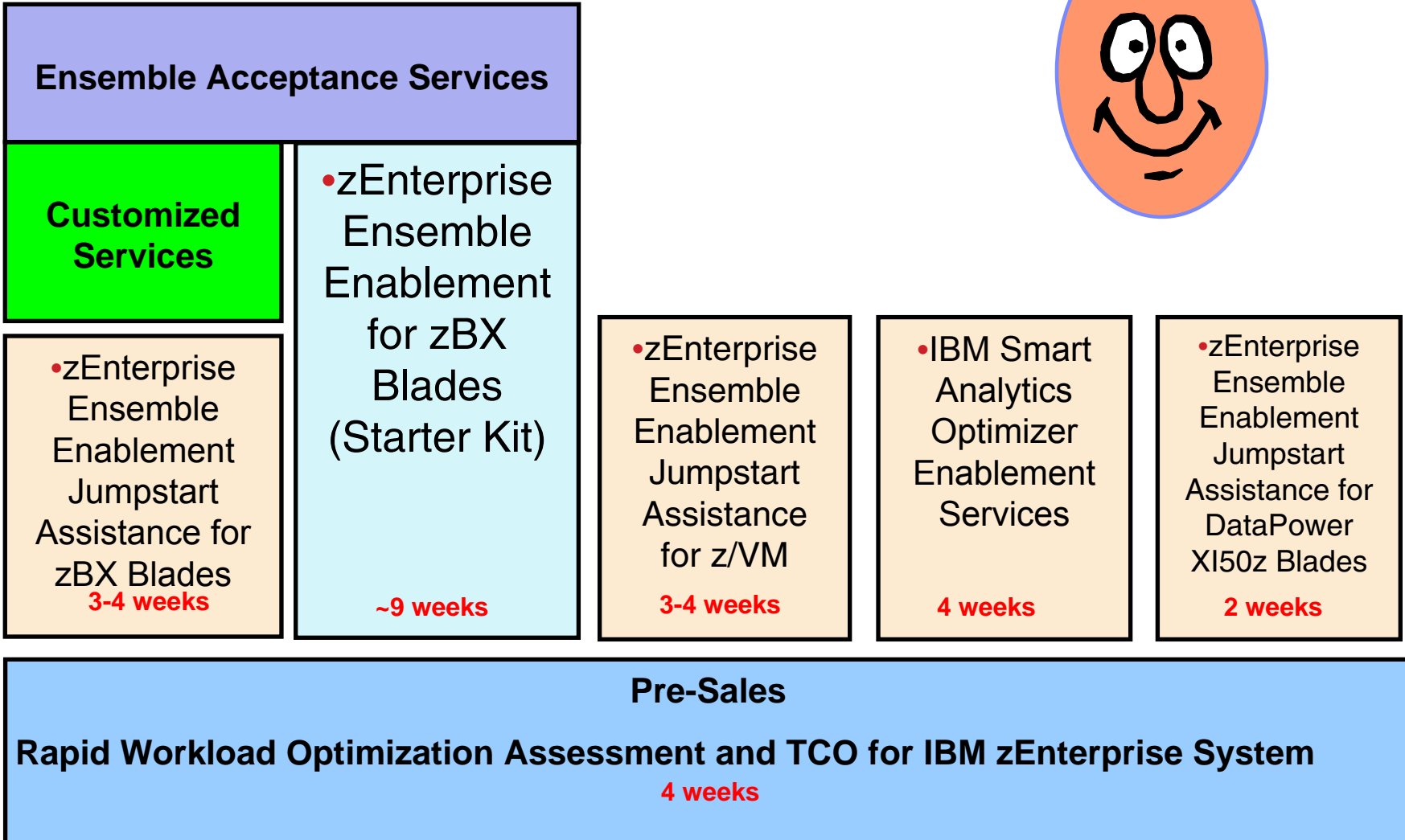
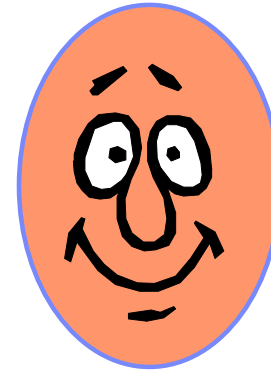
- Both Hardware Management Consoles must be....
 - Feature Code 0091/0091 pair
or
 - Feature Code 0090/0090 pair
 - Same PC machine type/model.
 - Same LIC level
 - Same Ethernet configuration
 - identical attachment adapters & same subnet
 - Same modem settings
 - If a zBX is to be installed, USE BROADBAND connections to IBM Retain.

Primary and Alternate Hardware Management Consoles



- Any V2.11.0/V2.11.1 HMC can become the Primary HMC that controls the ensemble.
 - The Primary HMC can perform all non-ensemble HMC functions on CPCs that aren't members of the ensemble.
- The HMC that creates an ensemble (the HMC that performed the "Create Ensemble" wizard) becomes the Primary HMC.
- The Alternate HMC is specified when executing the "Create Ensemble" wizard.
 - Any V2.11.0/V2.11.1 HMC is eligible to be an Alternate HMC after running the "Manage Alternate Hardware Management Console task".
- The title of Primary Hardware Management Console and Alternate Hardware Management Console will appear on the Login HMC panel and the title line once you are logged in.
 - The default HMC titles will change to these titles when the ensemble is created.
 - The titles will revert back to the default if the ensemble is deleted.
- A Primary HMC is the only HMC that can perform ensemble related management tasks (create virtual server, manage virtual networks, create workload)

Lab Services zEnterprise Offerings Roadmap



http://www.ibm.com/systems/services/labservices/



The screenshot shows a Mozilla Firefox browser window displaying the IBM Systems Lab Services and Training website. The browser's address bar shows the URL <http://www-03.ibm.com/systems/services/labservices/>. The website header includes the IBM logo, a search bar, and navigation links for Home, Solutions, Services, Products, Support & downloads, and My IBM. A welcome message for Mr. Gregory Hutchison is visible. The main content area features a large banner with the text "Why get smarter now? Because we want to." and an image of a globe. Below the banner, there is a section titled "Why IBM Systems Lab Services and Training" with a paragraph describing IBM's vision. To the left, a sidebar lists various services and training options. To the right, there are sections for "We're here to help" (with links to contact, flyers, and Adobe Reader) and "IBM Systems Technical Universities and more" (with a link to explore options). At the bottom, there are sections for "IBM Systems Technical Conference Series" (with a link to enhance skills) and "IBM Systems Lab Services and Consulting" (with a list of services including Power Services, System x Services, Mainframe Services, Storage Services, Systems Software Services, Systems Agenda Consulting, Data Center Services, and IT Optimization Consulting).

Reference

- zBX Publications
 - zBX Service Guide GC28-6884-01
 - zBX Installation Manual (2458-002) GC27-2610-00
 - zBX IMPP (2458-002) GC27-2611-00
 - zBX Service Education SE245800
 - zBX Safety Inspection GC28-6889-00
 - IBM License Agreement for Machine Code SC28-6872-00
 - Systems Environmental Notices and User Guide Z125-5823-02
 - Systems Safety Notices G229-9054-02
- Redbooks
 - IBM zEnterprise 196 Technical Guide, SG24-7833
 - IBM zEnterprise 114 Technical Guide, SG24-9754
 - IBM zEnterprise System Technical Introduction, SG24-7832-01
 - IBM System z Connectivity Handbook, SG24-5444-12
 - IBM zEnterprise Configuration Setup, SG24-7834
 - IBM zEnterprise Unified Resource Manager, SG24-7921
- zBX SAPR Guide
 - SA10-006
 - 2458 TDA Confirmation Form
 - SA10-018
 - zEnterprise Unified Resource Manager Pre-Sales Checklist

End of Presentation

Dank u

Dutch

Merci

French

С п а с и б

о

감사합니다

Korean

Tack så mycket

Swedish

Gracias

Spanish

شكراً

Arabic

धन्यवाद

Hindi

תודה רבה

Hebrew

Obrigado

Brazilian
Portuguese

Dankon

Esperanto

Thank You

谢谢

Chinese

ありがとうございます

Japanese

Trugarez

Breton

Danke

German

Tak

Danish

Grazie

Italian

நன்றி

Tamil

děkuji

Czech

ขอบคุณ

Thai

go raibh maith agat

Gaelic

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