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Session Title: IBM® zEnterprise™ BladeCenter® Extension (zBX) Hardware Overview

Session 9025

Speaker Name: Gregory Hutchison

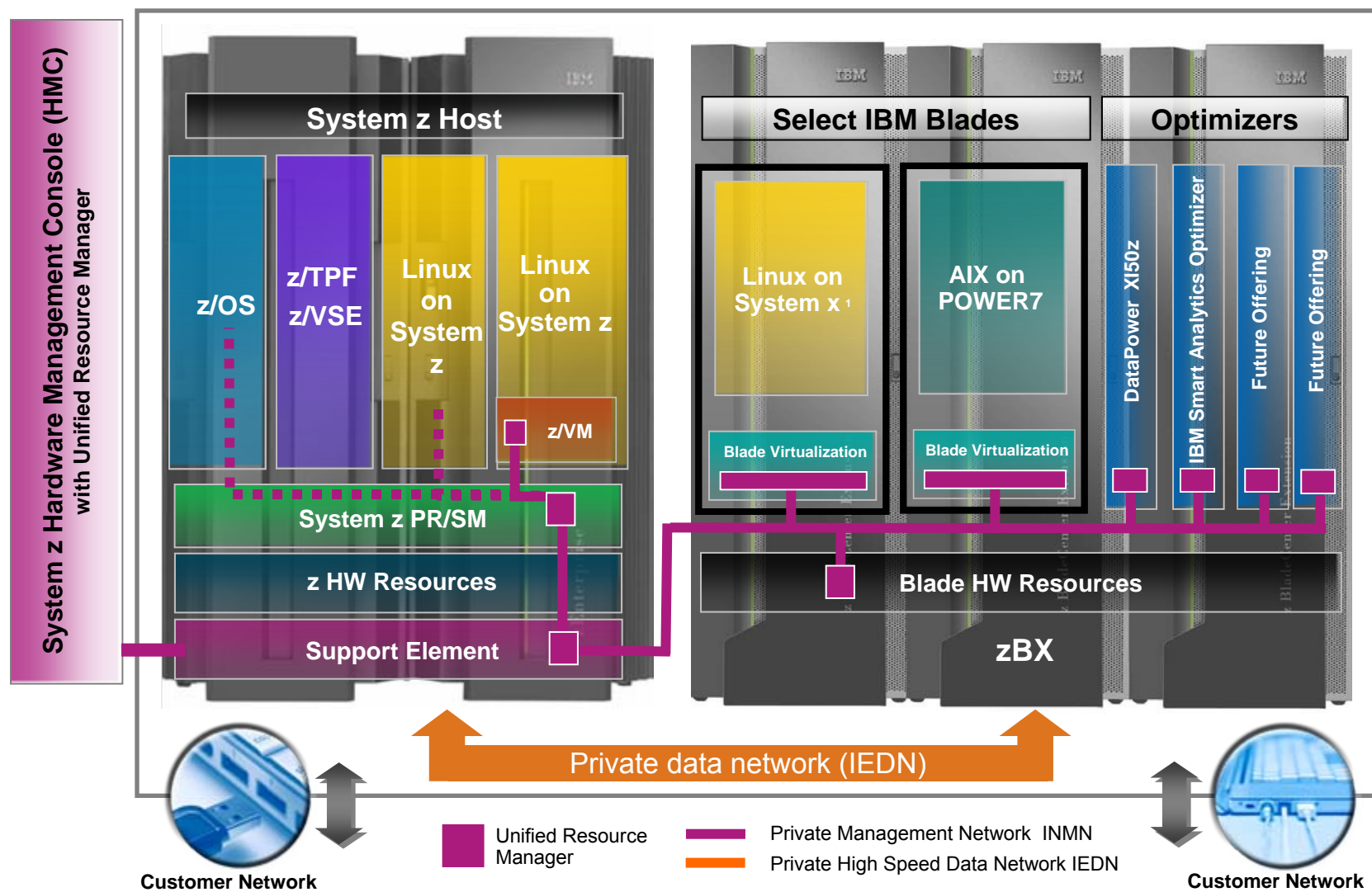
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in Anaheim
2011

Agenda 2458-002

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

Putting zEnterprise System to the task

Use the smarter solution to improve your application design



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



Smart Analytics Optimizer



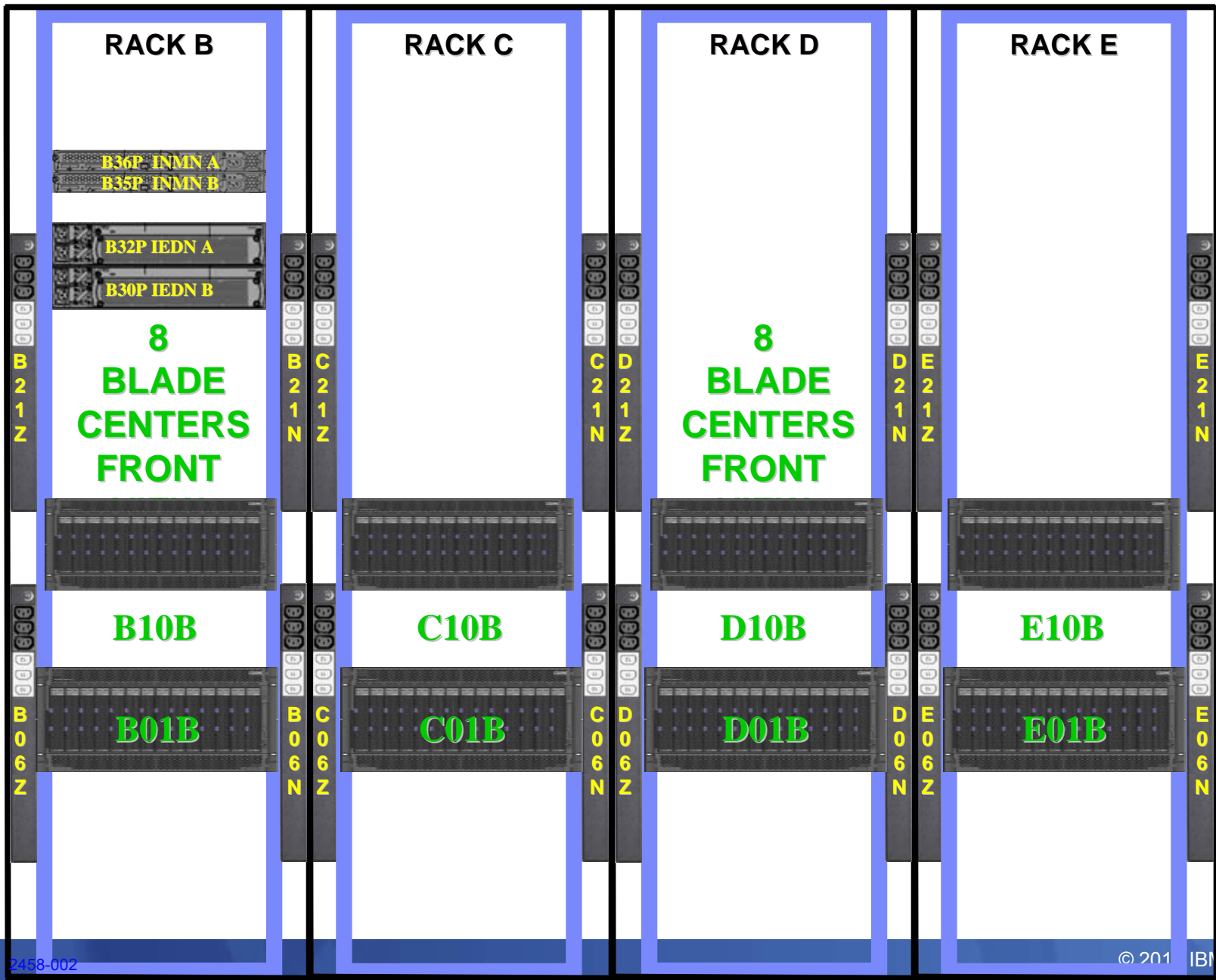
IBM Blades



DataPower
XI50z

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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.

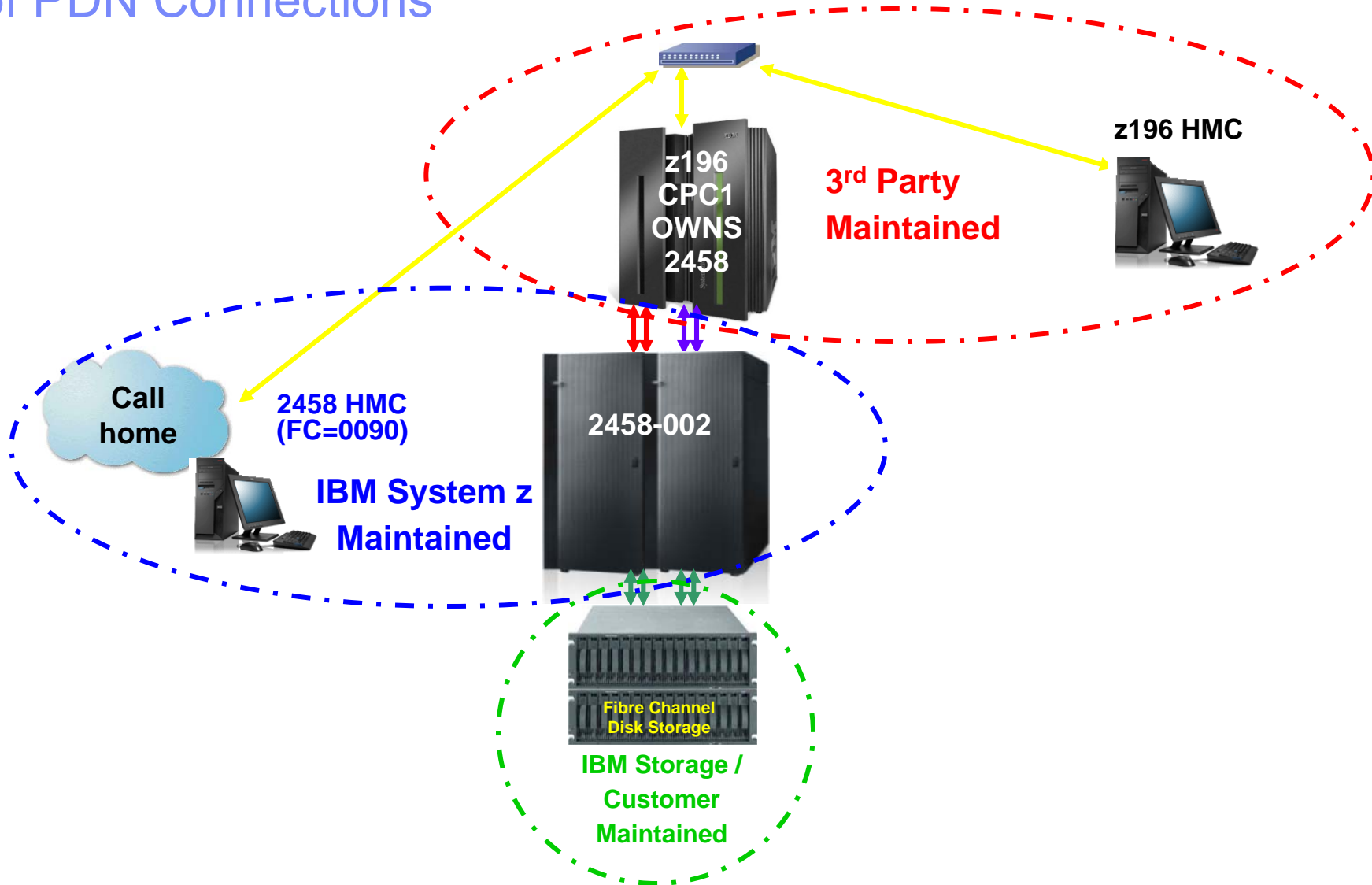
<http://www.coolcentric.com/>

- **Option 3 – Noise Reduction Doors - Feature Code #0543**

Rear Door Heat eXchanger (option)



Third Party Maintained z196 - Configuration, 1 CPC/1 PAIR of PDN Connections



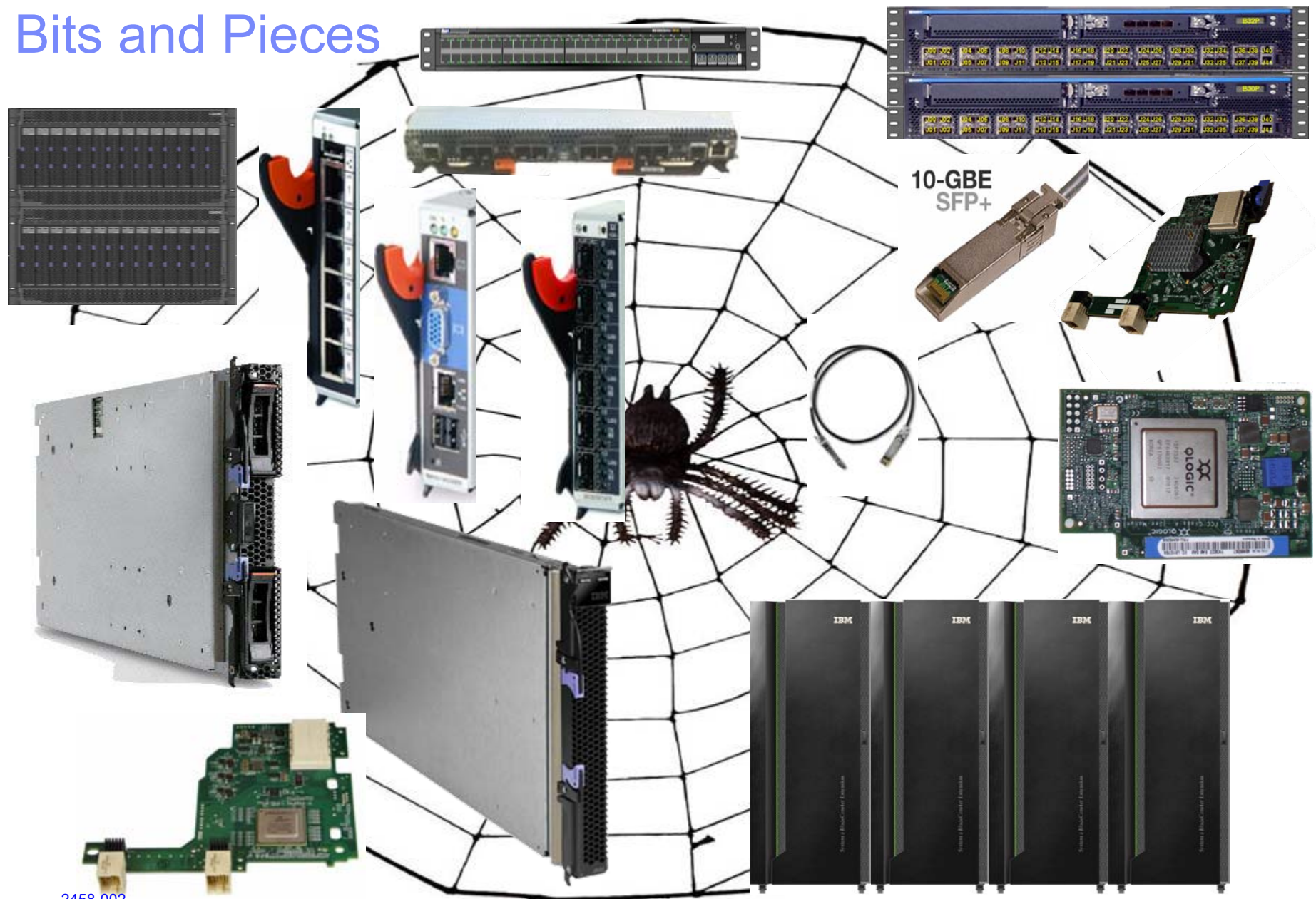
2458-002 Ordering (who does what?)

- zBX is ordered via the zEnterprise eConfig, by specifying the number of blades
 - IBM Smart Analytics Optimizer
 - IBM POWER7 Blades
 - DataPower XI50z
- 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
 - 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 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
 - Nice to know, but not essential to know.
 - Represented by various feature codes within the 2458-002
 - Generated by the zEnterprise 196 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 provided by an alternate means – not supplied with the zBX
 - POWER7 Blade entitlement provided via eConfig
- 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+											
PA0P221	PA0P221	PA0P221	PA0P221	PA0P221	PA0P221	PA0P221	PA0P221	PA0P221	PA0P221	PA0P221	PA0P221
001_001	002_002	003_003	004_004	005_005	006_006	007_007	008_008	009_009	010_010	011_011	012_012

10-GBE SFP+

2458-002 Blades



IBM Smart Analytics Optimizer
Pre-packaged



IBM Power7 Blade
Separately ordered



DataPower XI50z
Pre-packaged

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**

zBX - Five Smart Analytics Solutions for System z

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7 Blades

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56 Blades

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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 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**
 - 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>

IBM Blade based on Power7

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

- **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!

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.

Power ASB	Feature Code	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 kits 8 GB (2 x 4 GB) 16 GB (2 x 8 GB)	8208 8209	32GB 4 0	64GB 8 0	128GB 0 8
HDD 300GB	8274	1	1	1
8406-8275 QLogic 2-port 10Gb Converged Network Adapter (CFFh)	8275	1	1	1
8406-8242 QLogic 8Gb Fibre Channel Expansion Card (CIOv)	8242	1	1	1
PowerVM EE	5228	8	8	8
Required SW	PID			
SW License PID 5765-PVE	0001	8	8	8
1 YR SWMA PID 5771-PVE	1191	Choose Qty 8 of 1 YR or 3 YR		
3 YR SWMA PID 5773-PVE	0999			

Adding new IBM POWER7 blades – “enablement”

Blades really are
part of the z196

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 (ISA0 only) and hardware features.
- Upon installing the feature, the zBX is enabled throughout the system.
- This will require an SE reboot.

Cross Platform sizing including POWER7™ blades

- Size the z196 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
<http://partners.boulder.ibm.com/src/atmastr.nsf/WebIndex/PRS2664> <http://partners.boulder.ibm.com/src/atmastr.nsf/WebIndex/PRS2875>
 - Size the **POWER7™** portion – allow at least one week.
1. **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>
<http://partners.boulder.ibm.com/src/atmastr.nsf/WebIndex/PRS1423>
 2. **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
https://www-304.ibm.com/partnerworld/mem/support/trs_techline_sizing_info.html
 - Sizing when the customer has an existing set of IBM servers they would like to migrate to **POWER7™** blades
 - 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: (will be published soon)
<http://w3-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS4034>

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 bridging, and intelligent load distribution.



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.

IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise (DataPower XI50z)

- DataPower XI50z (2462-4BX)
 - Same hardware as DataPower XI50B (4195-4BX)
 - “Double-wide” Blade: 2 BladeCenter slots
 - IBM HS22 Blade + DataPower expansion unit
 - Same DataPower firmware (v3.8.1)
 - Same ESB, Security, and Integration capabilities
- Can coexist with POWER7 blades in the same zBX BladeCenter (Also planned to coexist with future general purpose x86 blades – Statement of Direction)
- Leverages advanced zBX BladeCenter networking infrastructure
 - 2 x 1 GbE interfaces to zBX 1 GbE top of rack switches (zManager - INMN)
 - 2 x 10 GbE interfaces to zBX 10 GbE top of rack switches (IEDN)
- Ordering, configuration and installation
 - Hardware and firmware are configured and ordered by eConfig as zBX features
 - Ships installed in a new-build zBX or field installed by IBM service as an MES
- Tightly integrated with zEnterprise
 - Unified hardware and firmware management by zManager
 - Inherits zEnterprise Ensemble serviceability, monitoring and reporting capabilities





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.
 - To allow the HMC, to talk to the System z hypervisors, within the ensemble.

- 2
 - **IntraEnsemble Data Network (OSX)**
 - A pair of OSA-Express3 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-Express3 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.

3

- 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.

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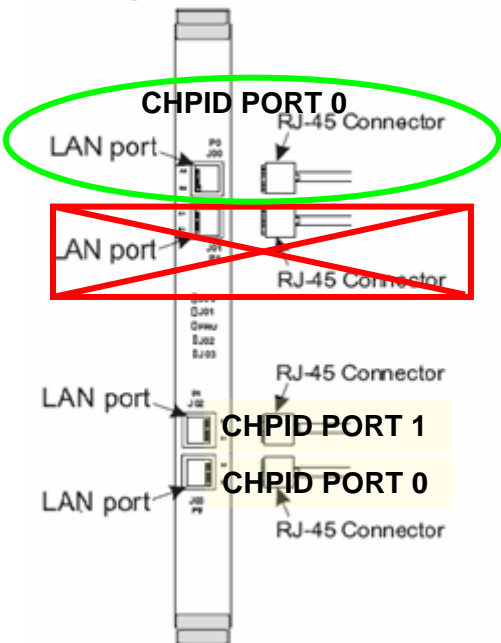
3

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

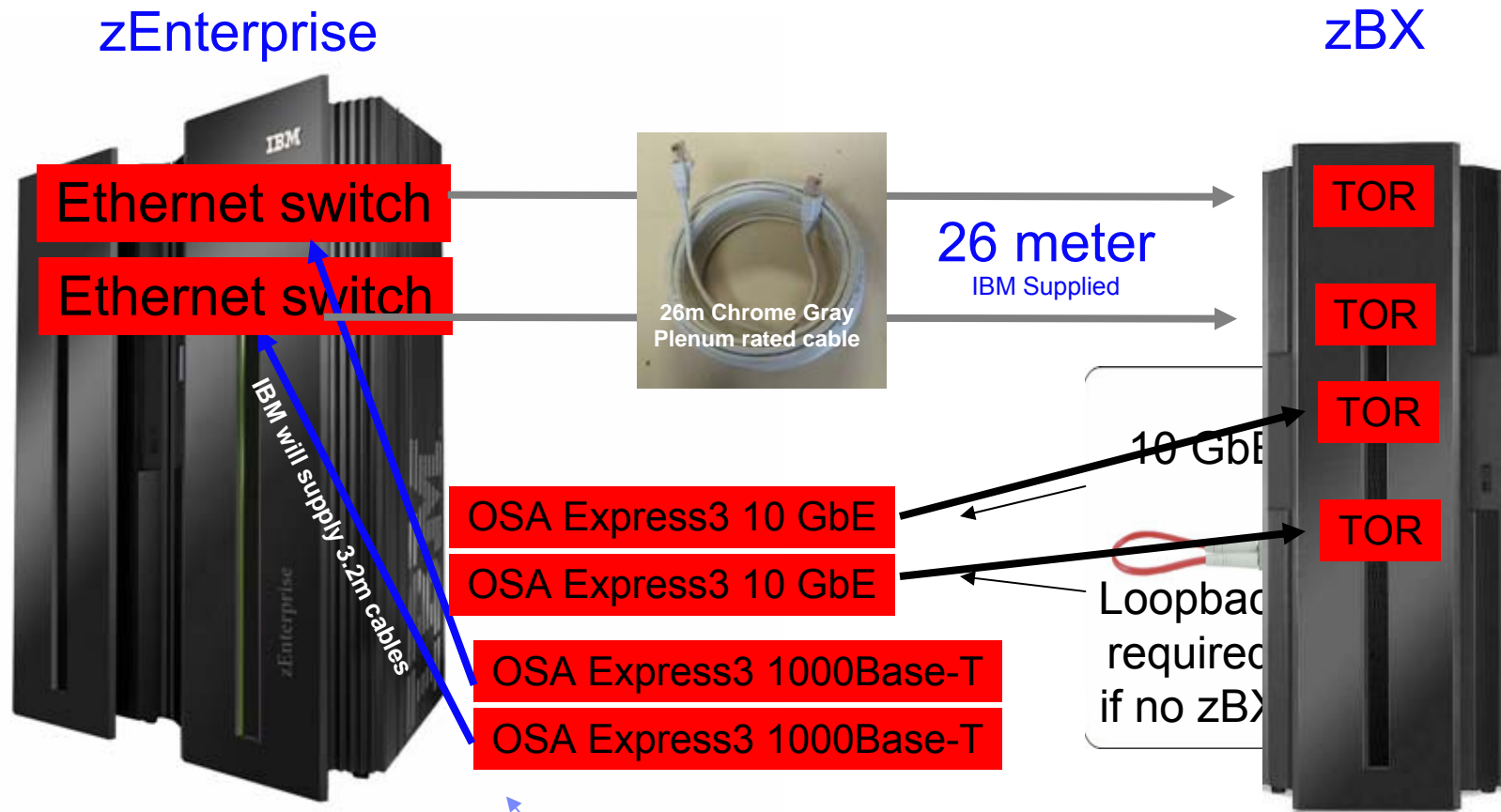
- SM (Long Reach Optics) 10 km (6.2 miles)
- MM (Short Reach Optics)
50 micron at 2000 MHz-km: 300 meters (984')
50 micron at 500 MHz-km: 82 meters (269')
62.5 micron at 200 MHz-km: 33 meters (108')

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

2458-002 Intra-Node Management Network

1



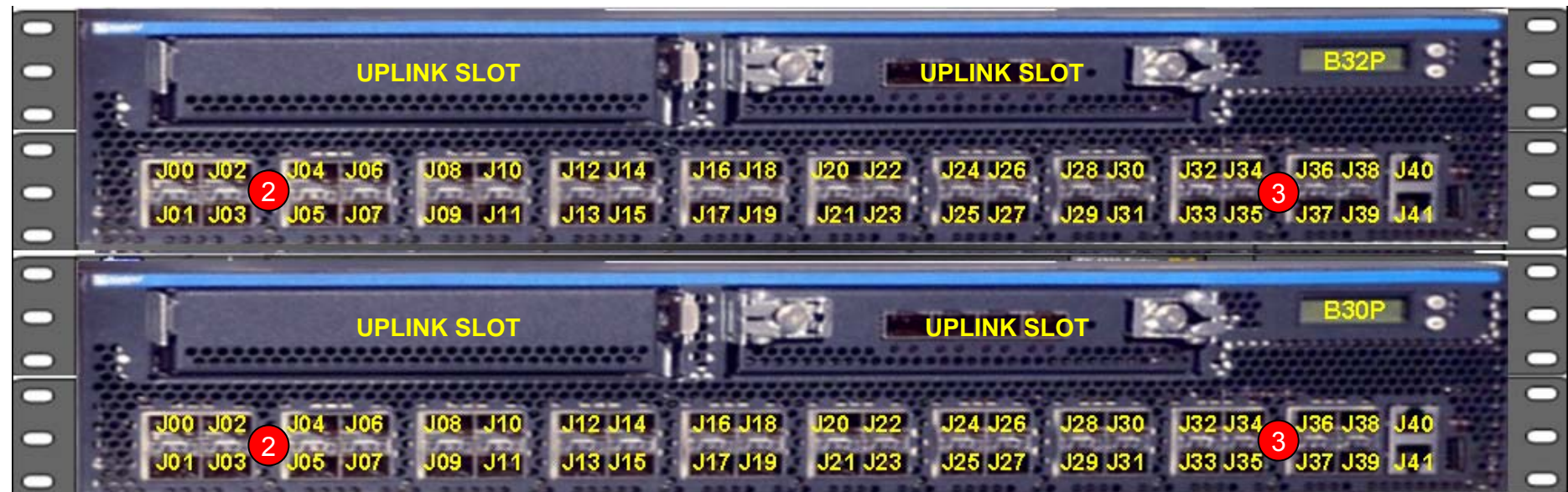
Required if IBM Unified Resource Manager (FC0025), even if no zBX

2458-002 Top of Rack (TOR) Switches



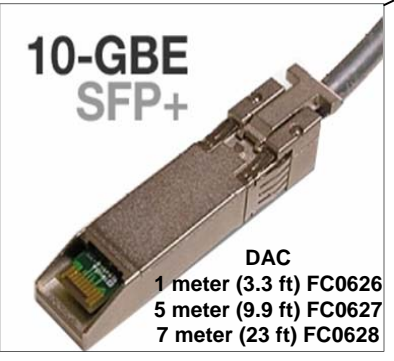
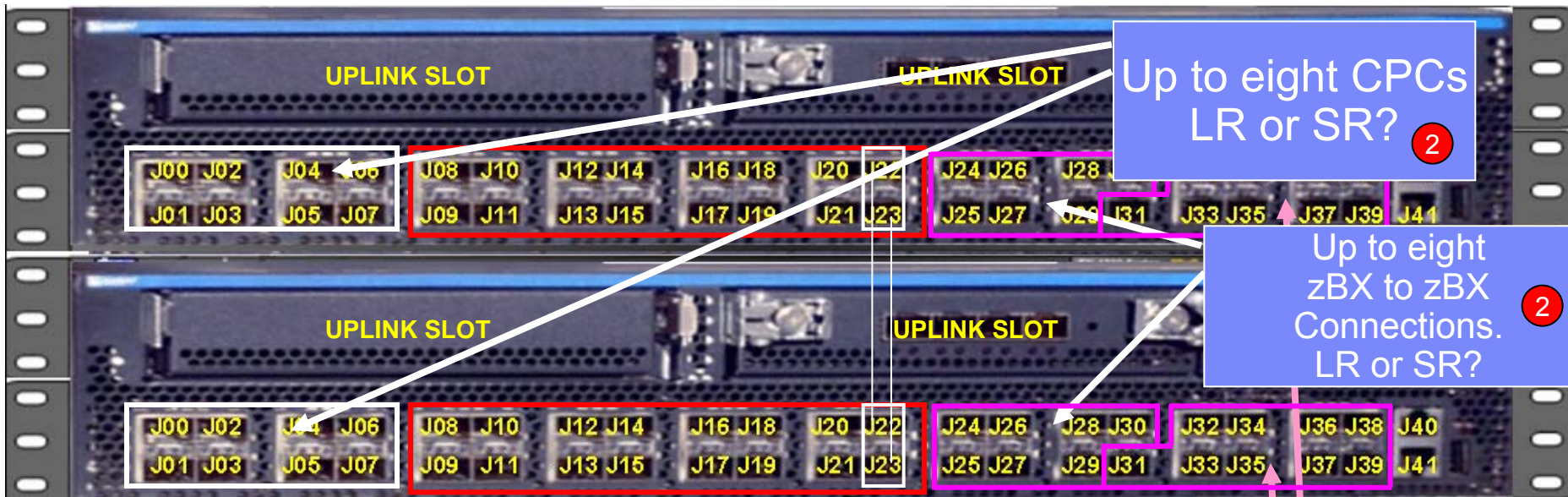
INMN TOR SWITCH

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



IEDN TOR SWITCH

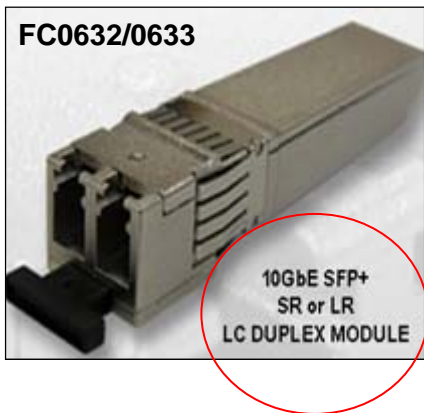
2458-002 IEDN Redundant Top of Rack (TOR) Switch Connections



- 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

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

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	
3371 - OSA Express3 10 GbE SR (0 - 40 By 2 Ports)	0	OSA to TOR OSX 2 3
3370 - OSA Express3 10 GbE LR (0 - 44 By 2 Ports)	4	
3363 - OSA Express3 GbE SX (2 PCHID) (0 - 80 By 4 Ports)	0	
3362 - OSA Express3 GbE LX (2 PCHID) (0 - 80 By 4 Ports)	0	
3367 - OSA Express3 1000BASE T (2 PCHID) (0 - 88 By 4 Ports)	8	OSA to BPH OSM 1

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.

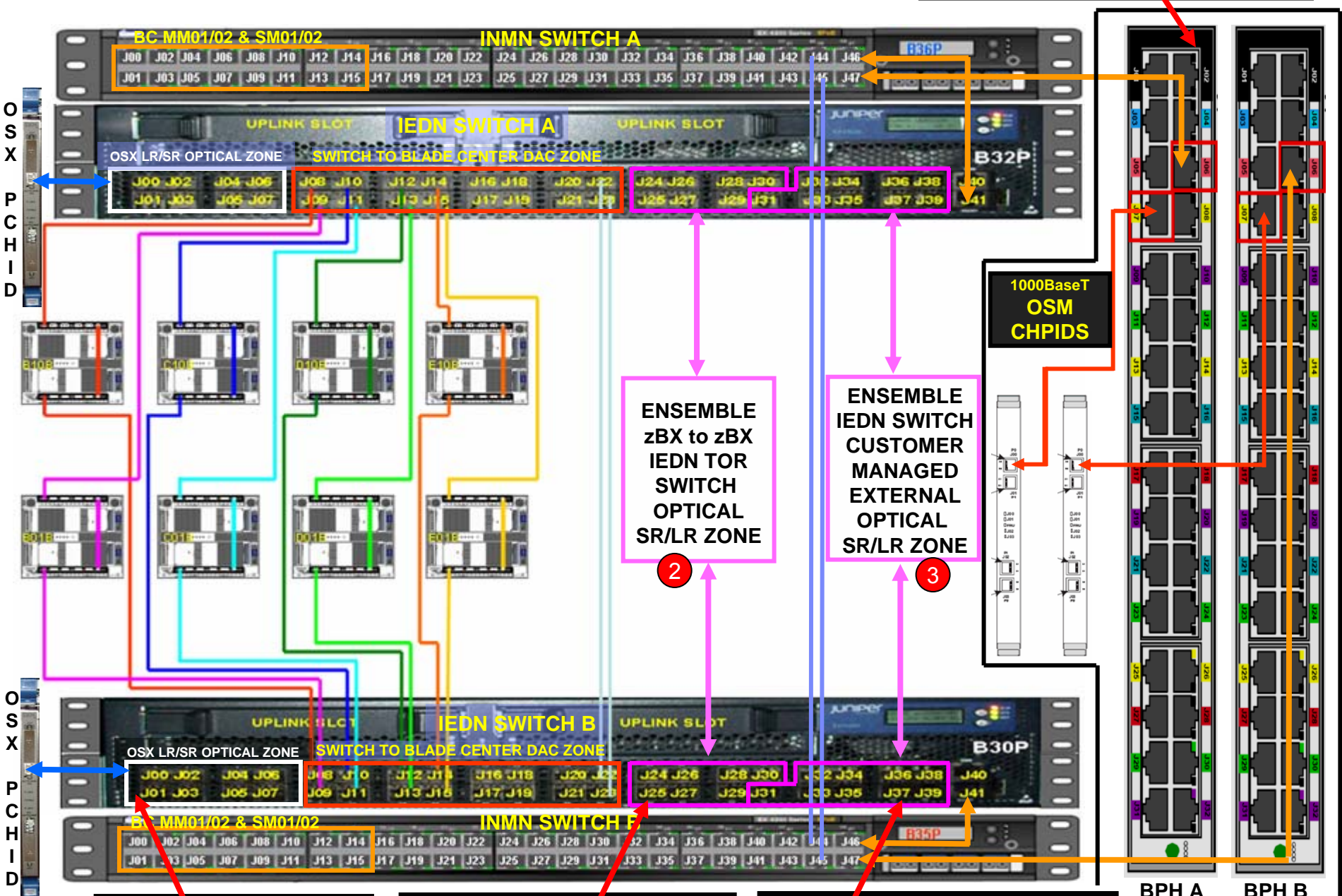
The LX feature uses single mode fiber optic cables, but accommodates data center infrastructures with 50 or 62.5 multimode fiber optic cables. Choose the LX feature to "talk" to the LX feature on a director, server, switch, or router with the LX feature.

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.

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1

1000Base-T to BPH

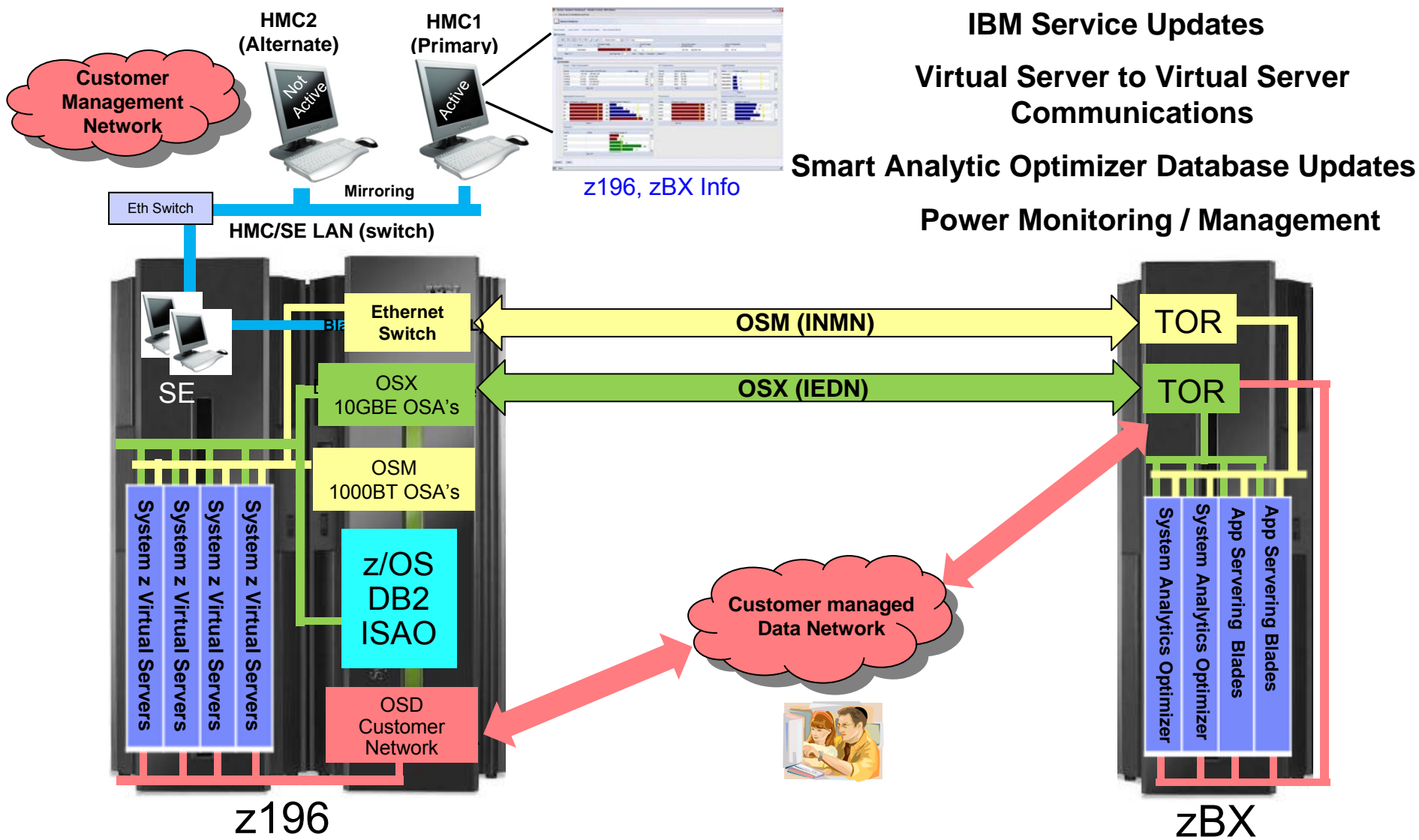


2 Up to 8 CPCs

0 if only one zBX

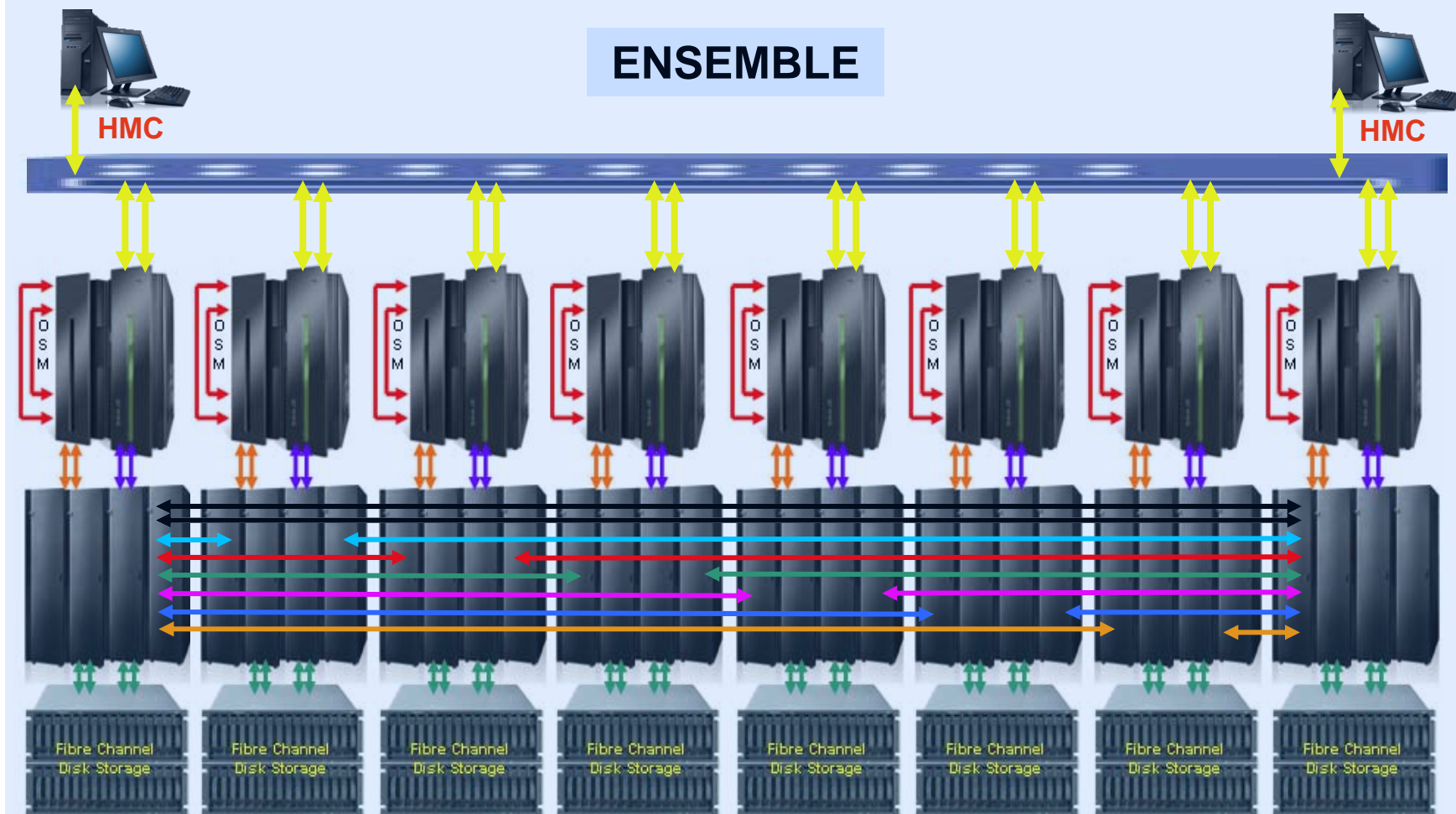
0 if not on existing

Z196 & zBX Model 002 – Communications



zEnterprise/2458-002 MAX CPC/NODE ENSEMBLE

ENSEMBLE



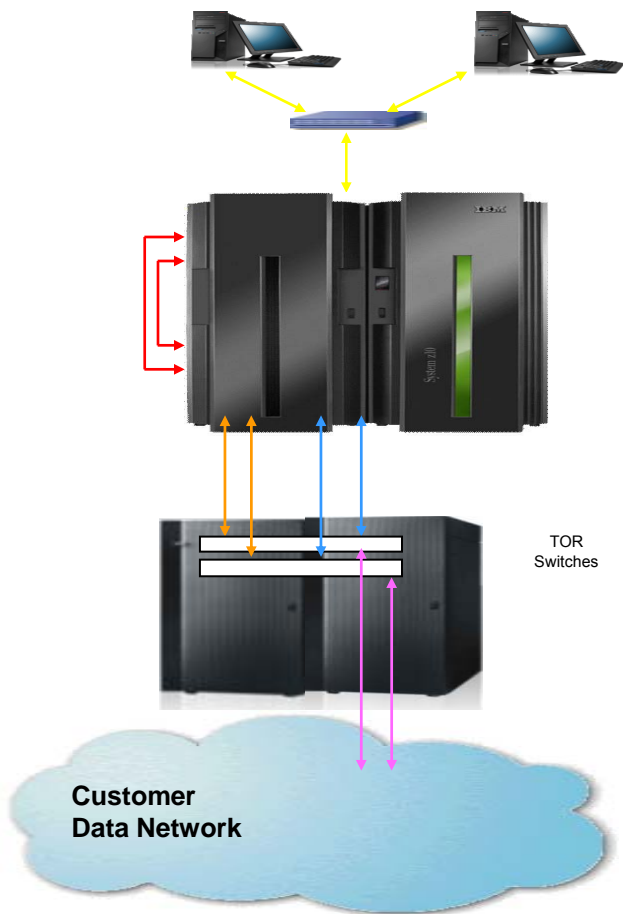
Node1-B32PJ24 to Node2-B32PJ24
 Node1-B32PJ25 to Node3-B32PJ25
 Node1-B32PJ26 to Node4-B32PJ26
 Node1-B32PJ27 to Node5-B32PJ27
 Node1-B32PJ28 to Node6-B32PJ28
 Node1-B32PJ29 to Node7-B32PJ29
 Node1-B32PJ30 to Node8-B32PJ30

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**
- 1 ▪ **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

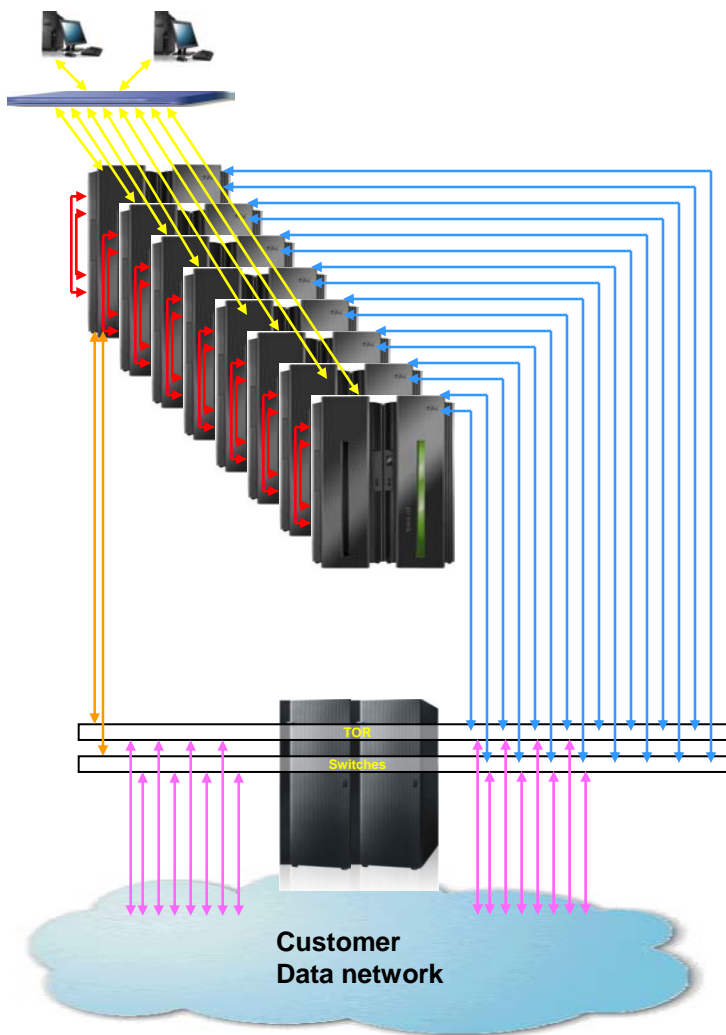
1 to 8 redundant connections of each type, per Ensemble

- 2 ▪ **OSX** (2 per CEC Connection)
 - **OSA Express-3 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



Additional Content

- **HMC** (2 per Ensemble)
 - **Ethernet Cables**
- 1 ▪ **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

- 2 ▪ **OSX** (2 per CEC Connection)
 - **OSA Express-3 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

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**

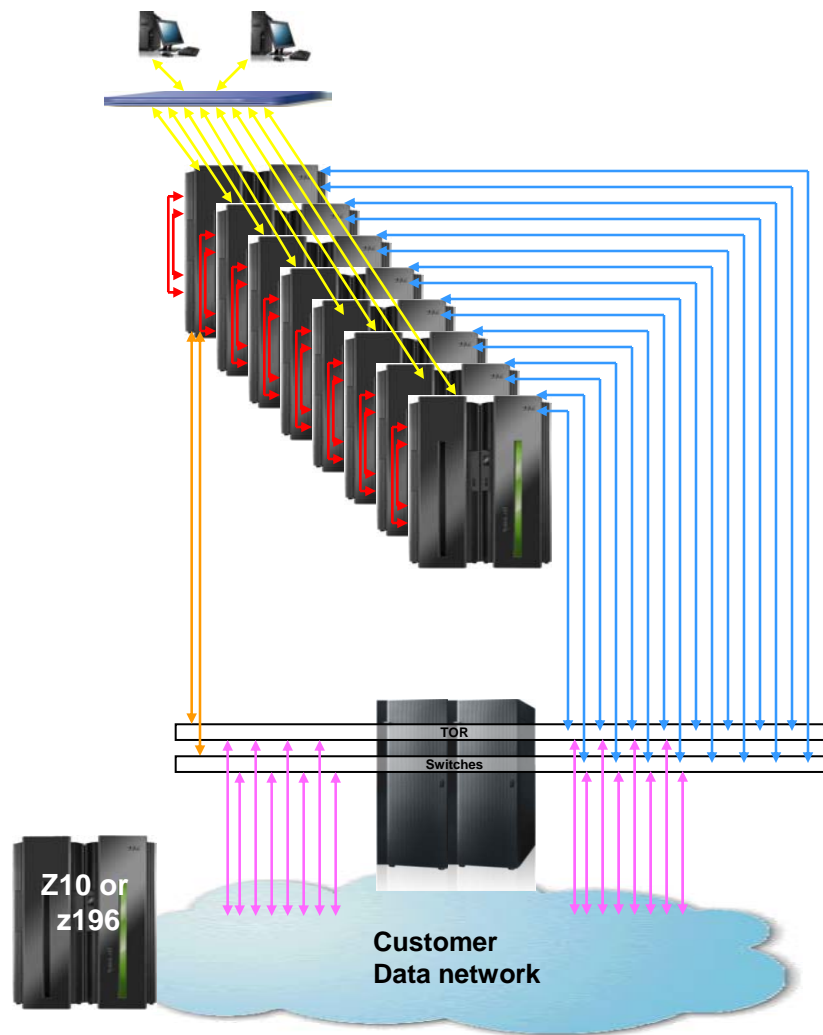
Connections

1 to 8 redundant connections of each type, per Ensemble

- **OSX** (2 per CEC Connection)
 - **OSA Express-3 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

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

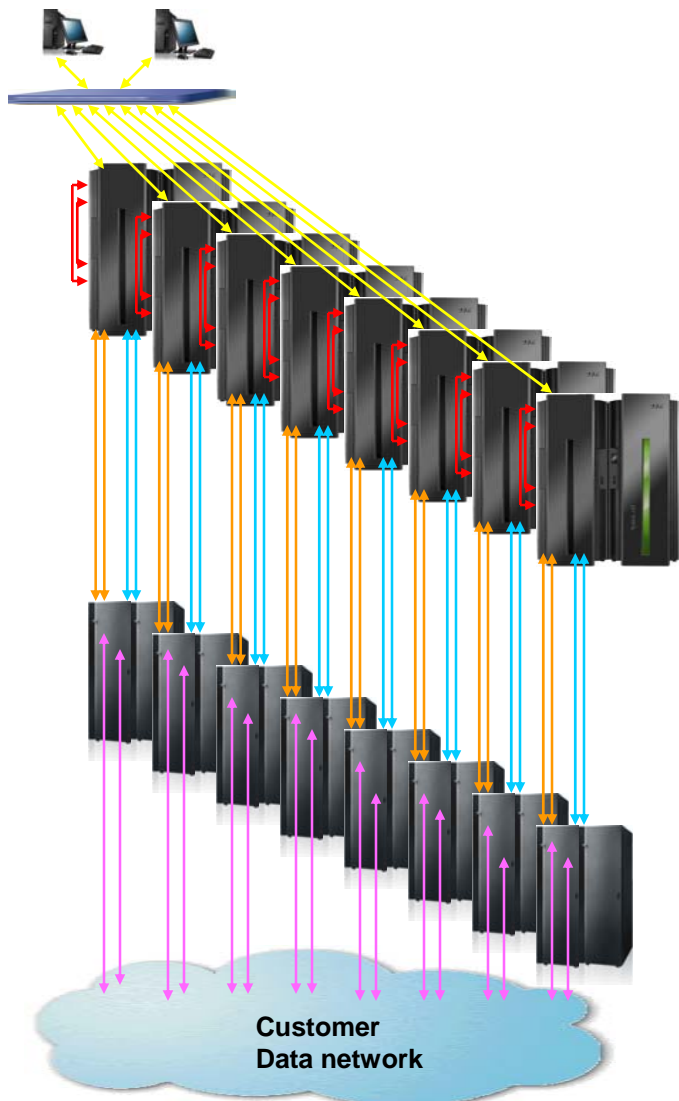


1

2

3

8 CEC, 1 Ensemble, 8 zBX



Additional Content

- **HMC** (2 per Ensemble)
 - **Ethernet Cables**
- 1 **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

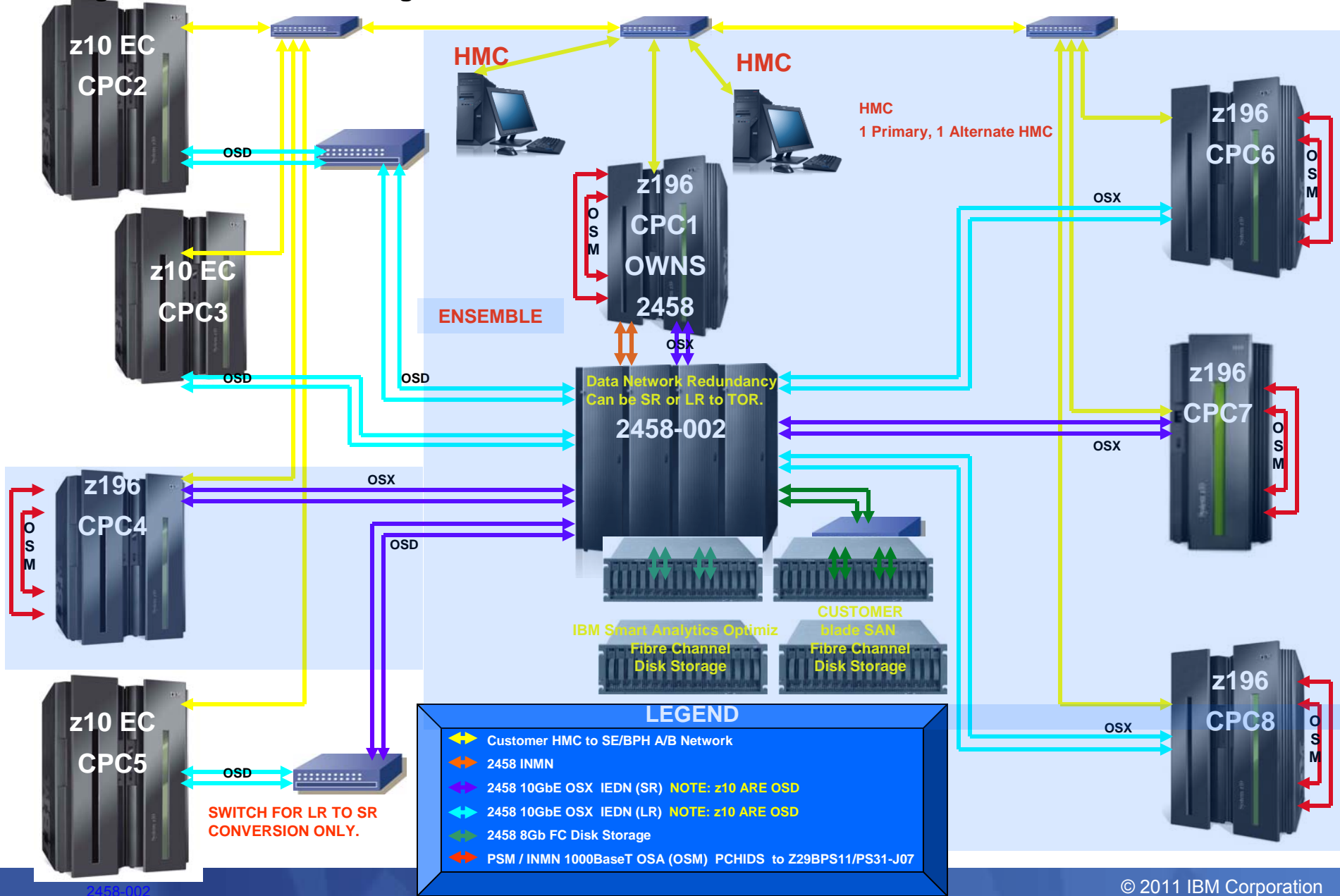
1 to 8 redundant connections of each type, per Ensemble

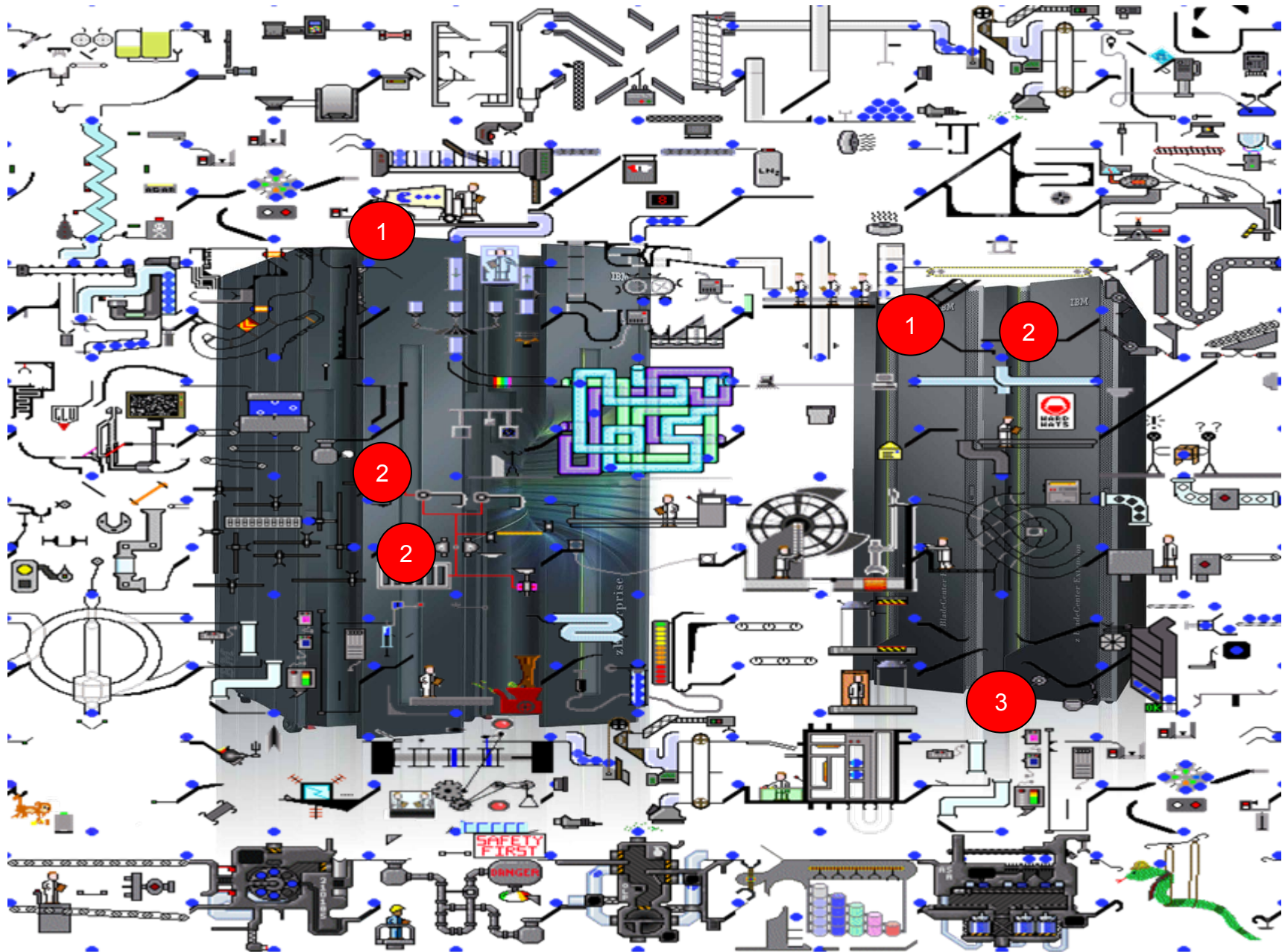
- 2 **OSX** (2 per CEC Connection)
 - **OSA Express-3 10GbE, SR or LR**
 - **Optic modules, SR or LR**
 - **Customer provided 10GbE cables, SR or LR**
 - ((4 x zBX) - 2 per Ensemble) (zBX to zBX)
 - **Customer provided 10 GbE cables, SR or LR**
 - **Optic modules, SR or LR**

Optional connections, depending on access to Customers network

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

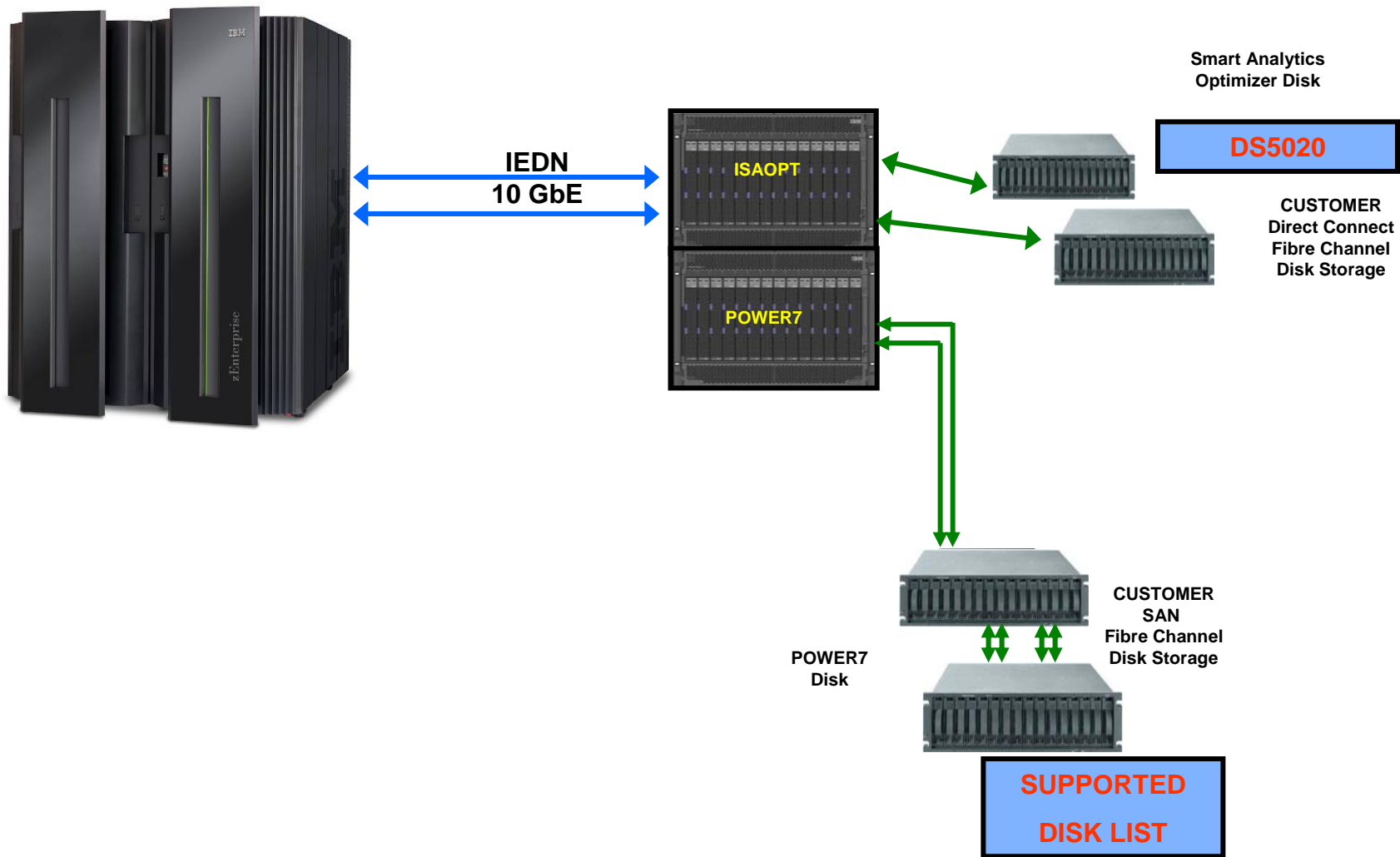
Big Picture 2458-002 Configuration 8 CPC's / 8 PAIR OF SR/LR MIX IEDN CONNECTIONS.





Storage for IBM Smart Analytics Optimizer and IBM POWER7

IBM Smart Analytics Optimizer & IBM POWER7 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

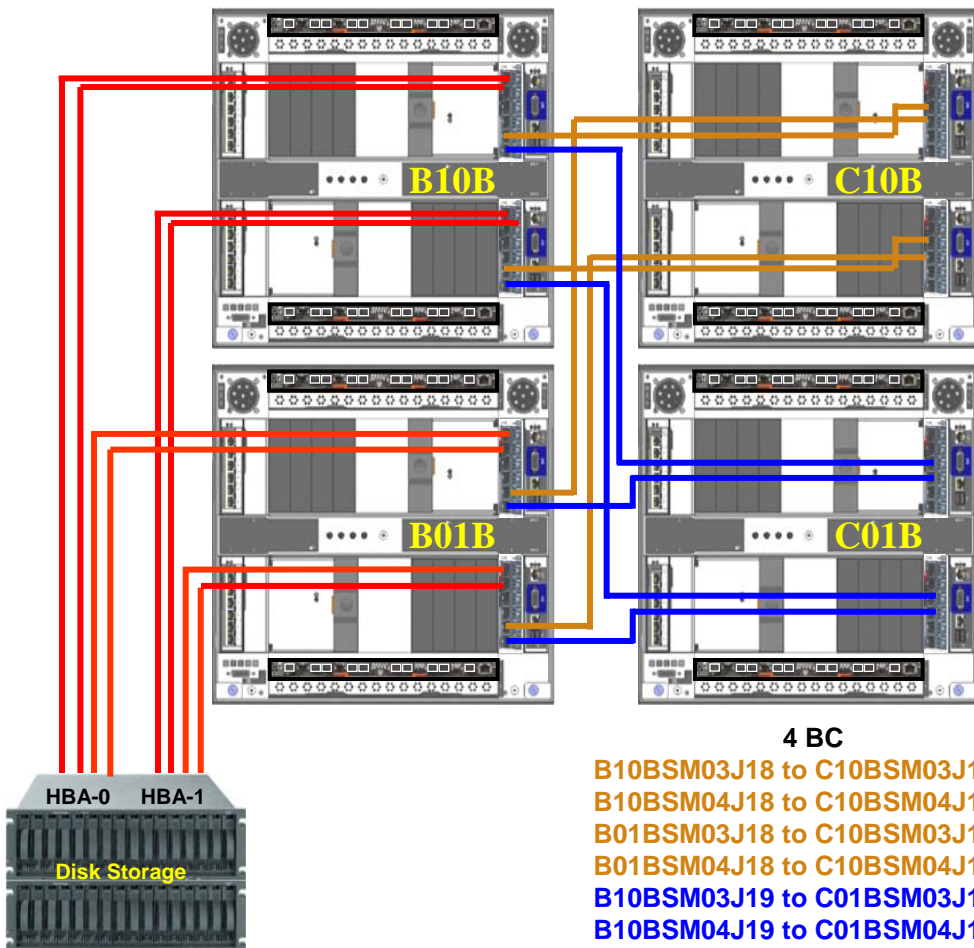
1	1814-52A	EXP520
16	FC4001	DS5020 1 TB/7.2K SATA DDM
4	FC5605	5m Fiber Optic Cable FC-FC
1	FC9021	Attach to DS5020
1	FC9202	Field Integrate
1	FC9800	Power Cord 125V/10A 2.8m, (Group 1)

Notes:

1. 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.
2. 5m Fiber Optic Cable LC-LC (can order 1m or 25m also for attachment to a patch panel).

zBX 4 BLADECENTER FC CONNECTIONS

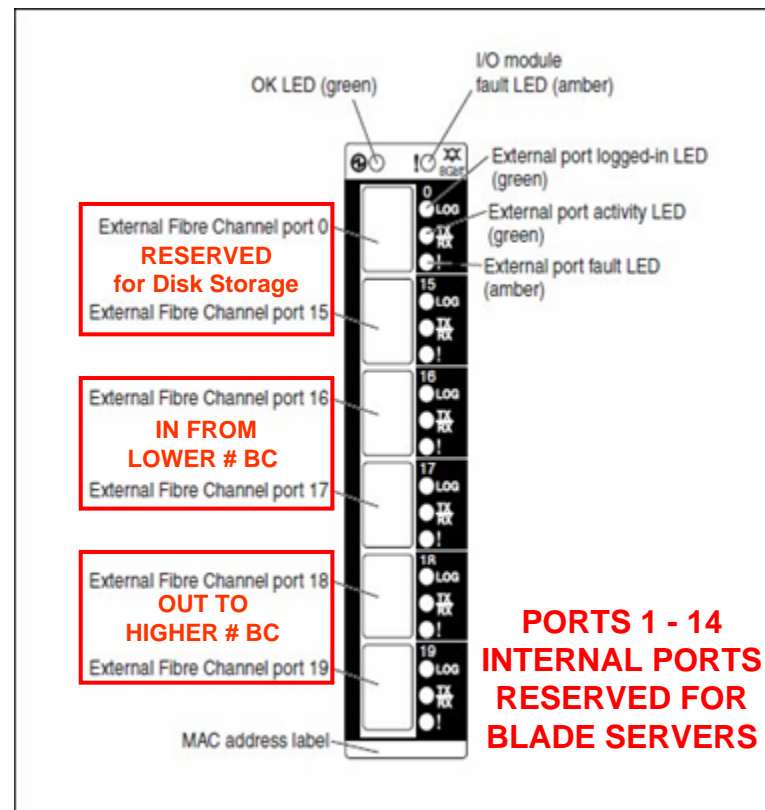
4 BLADECENTER, Smart Analytics Optimizer ONLY FC DISK STORAGE CASCADE CONNECTIONS



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

SM03/04 JACK LOCATIONS



CUSTOMER SUPPLIED

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

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

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

Storage for zBX and IBM POWER7

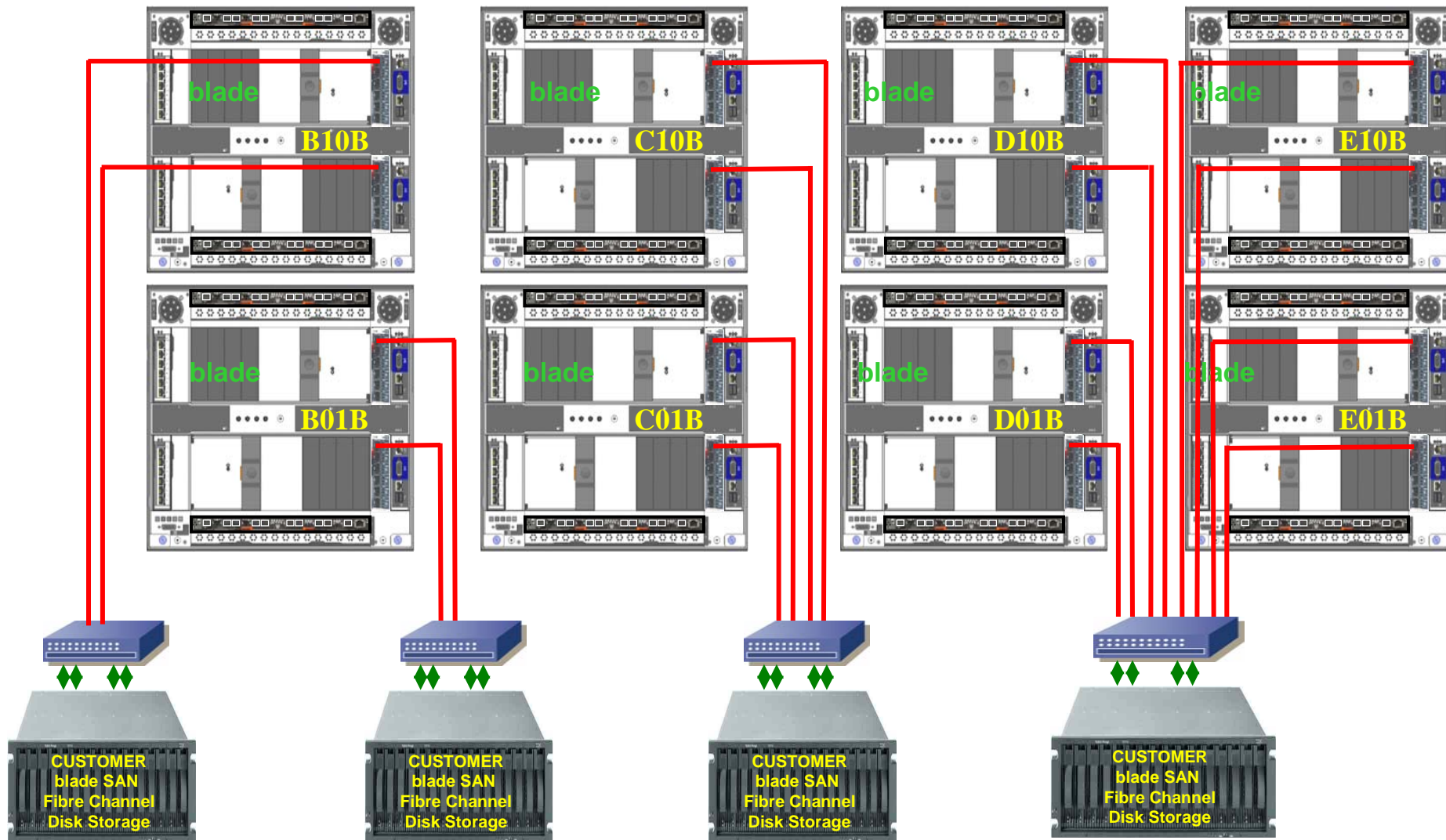
IBM POWER7 Disk Storage Connections

- Physically each BladeCenter chassis (up to 14 blades) has two 8 Gb SX ONLY (multimode) fibre channel ports in two different internal FC switches to connect outbound to storage.
- Cabled 2, 4 or 8 Gbps SX ports to the SAN infrastructure
- Two paths to each storage LUN – managed by the blade hypervisor



8Gb FC Switch Modules (FC0606)

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
 - SVC 2145
 - XIV®
 - 2105, 2107
 - Storwize v7000
- **EMC**
 - Symmetrix 3300, 5000 , 8000
 - Symmetrix V-MAX
 - DMX 800, 1000, 1000P, 2000, 2000P, 3000
 - DMX -3, DMX-
 - 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 V
- **HP**
 - EVA 3, 4X, 5, 6X, 8X
 - XP 10K, 12K, 48, 128, 512, 1024

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

Select Support Storage Devices

* - default MPIO Path Control Module support only

Hardware Management Consoles

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 & Alternate Requirements)

- Both Hardware Management Consoles must be....
 - Feature Code 0090 or 0091
 - Same PC machine type/model.
 - Same LIC level
 - Same Ethernet configuration
 - identical attachment adapters & same subnet
 - Same modem settings

Primary and Alternate Hardware Management Consoles



- Any V2.11.0 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.
 - Available in November 2010 when the zBX becomes available.
- The Alternate HMC is specified when executing the "Create Ensemble" wizard.
 - Any V2.11.0 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)

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 (for mod 1 and 2) 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 Technical Introduction, SG24-7832
 - IBM zEnterprise Technical Guide, SG24-7833
 - IBM zEnterprise Configuration Setup, SG24-7834
 - IBM zEnterprise Platform Management, SG24-7835
 - IBM zEnterprise Unified Resource Manager, SG24-7921
- zBX 2458-002 SAPR Guide
 - SA10-006
 - 2458 TDA Confirmation Form

End of Presentation

Dank u

Dutch

Merci

French

С п а с и б

0

Gracias

Spanish

شكراً

Arabic

감사합니다^{Russian}

Korean

Tack så mycket

Swedish

धन्यवाद

Hindi

תודה רבה

Hebrew

ObrigadoBrazilian
Portuguese

谢谢

Chinese

Dankon

Esperanto

Thank You

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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