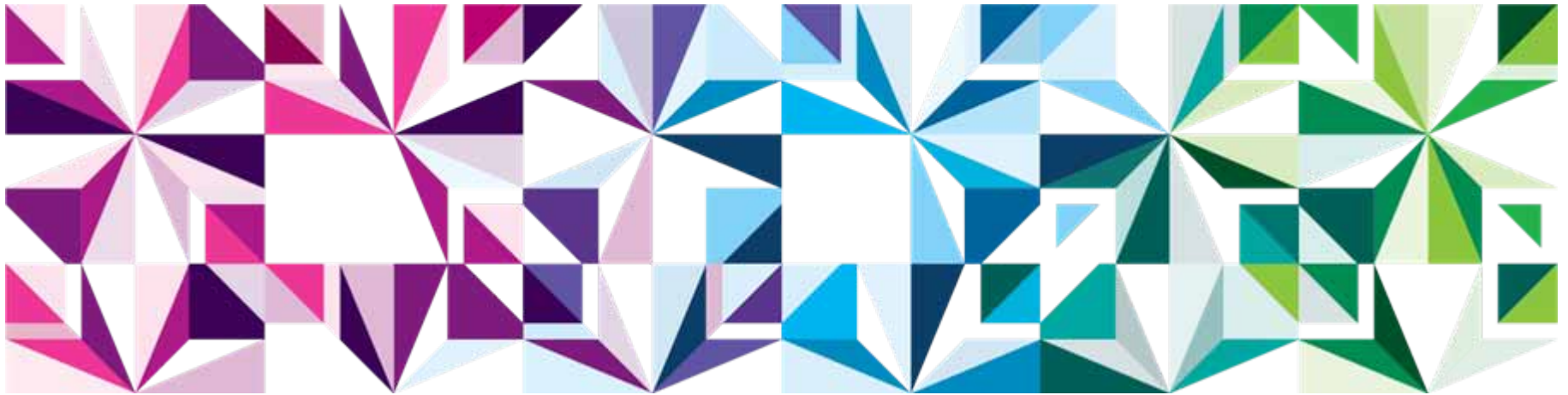


IBM PureSystems

A New Family of Expert Integrated Systems

Doug Herman
Power Systems CTS
Hermantd@us.ibm.com



What if this new class of systems leveraged expertise and best practices from the industry to intelligently tune and manage

What if this new class of systems helps a client to ...

... **get up and running in hours**, cutting months off deployment time of new application projects



That's
Agility



... deploy **twice as many applications per square foot** of data center space



That's
Efficiency



... **free up time** from procuring, supporting, testing & deploying assets



That's
Simplicity



... **lower risk and costs** with automated provisioning and seamless scalability with security and resiliency



That's
Control



The time has come for a new breed of system

Combining the flexibility of a general purpose system, the elasticity of cloud and the simplicity of an appliance

Built-in Expertise

Capturing and automating what experts do – from the infrastructure to the application



Integration by Design

Deeply integrating and tuning hardware and software – in a ready-to-go workload optimized system

Simplified Experience

Making every part of the IT lifecycle easier
Integrated management of the entire system
A broad open ecosystem of optimized solutions

Announcing the first two members of the IBM PureSystems family

IBM PureFlex System

Infrastructure System:
*Expert at sensing and
anticipating resource
needs to optimize your
infrastructure*



IBM PureApplication System

Platform System:
*Expert at optimally
deploying and running
applications for rapid
time-to-value*



- The world's first expert integrated systems.
- Each of the systems leverage the expertise and best practices from decades of client engagements and optimizations around the world to address complex tasks with patterns of expertise.
- They are fully integrated by design and tuned by IBM labs and factories.

- Built-in expertise
- Simplified experience
- Integration by design

IBM PureFlex System

A leap in capability for infrastructure systems; combining servers, storage, networking, virtualization and management



Built-in Expertise

- ✓ **Management integration across physical and virtual resources** with automation expertise
- ✓ **Designed for multiple generations of technology** with engineering expertise
- ✓ **Extreme density of virtual machines across multiple hypervisors** with utilization expertise

Simplified Experience

- ✓ **System pooling** simplifies workload management and provisioning
- ✓ **Investment protection** with upgradeability to future technology
- ✓ **Automated and simplified maintenance modes**

Integration by Design

- ✓ **Integrated Storage** with virtualization and expert tiering
- ✓ **Integrated Networking** with industry leading performance
- ✓ **Integrated Security** with presets based on expertise

IBM PureApplication System

Builds on the PureFlex Systems, to provide pre-integrated, and optimized middleware



Built-in Expertise

- ✓ **Expert designed balanced system**, from silicon to application platform layer, for Web and Database applications
- ✓ **Factory secured, virtualized and fault tolerant** design
- ✓ **Expert based application patterns** and an ecosystem of application pattern providers

Simplified Experience

- ✓ **Unified application-centric provisioning, management and monitoring** user experience across the entire system
- ✓ **Automated lifecycle maintenance** across the system and capacity upgrades without application outage
- ✓ **Single part ordering across 4 configurations**, single point of support and simplified_content acquisition experience

Integration by Design

- ✓ **Integrated and optimized system** arrives ready to run
- ✓ **Integrated across the virtualization, storage, and middleware layers** for application performance and density
- ✓ **Integrated intelligent and dynamic application-centric resource allocation** based on application pattern requirements and business policies



IBM PureSystems “patterns of expertise”



Patterns of Expertise: Proven best practices and expertise for complex tasks learned from decades of client and partner engagements that are captured, lab tested and optimized and then built into the system

Patterns deliver superior results:

- **Agility:** Faster time-to-value
- **Efficiency:** Reduced costs and resources
- **Simplicity:** Simpler skills requirements
- **Control:** Lower risk and errors

Through *unmatched expertise* in:

- System design
- Infrastructure management
- Application deployment
- Data management
- Datacenter management
- Application management
- High availability and scalability
- Security
- Storage optimization
- Networking
- Cloud



IBM PureSystems “patterns of expertise”

Example: Web Application Deployment Pattern



IBM Captured:

- IBM’s decades of experience in helping clients design, build and deploy new business applications

What is it?

- Codified best practices for presetting configuration options by type of selected Web application (e.g., high availability, high security, etc.)

What do you do?

- Bring your data and application code, select the type of application you want and everything else is handled for you in the background

What do you NOT have to do?

- Understand the interdependencies and connections between your database, application server, management, security, and the rest of the middleware
- Manually engage in the real-time management of your infrastructure

Result: Speed deployment of Web applications by 20-30x!

IBM PureSystems simplified experience



New simplified client experience

- Single product streamlines ordering, tracking, receiving, installing and running
- Factory installed, fully packaged solutions drive simple setup (pull it out of the box, plug it in and boot it up)
- Management integration across system
- Single point of contact for support
- Upgrade with zero downtime based on integrated patches and system design
- PureSystems Centre – an online catalog of applications and patterns.
- A broad open ecosystem of optimized solutions

IBM PureSystems Centre



- Optimized solutions from 100+ leading ISV partners
- Search by solution area, industry or system.
- Gain access to ISV application patterns for trial and production.

- Certified through

‘Ready for IBM PureSystems’
program.



- All of your existing AIX, IBM i, Linux and Windows applications will run on IBM PureSystems





IBM PureFlex Systems Power DeepDive



Integration by Design



Optimizes the complete solution stack:

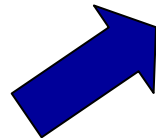
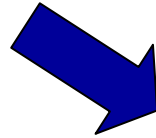
- All hardware and software components factory integrated and optimized
- Born virtualized and ready for cloud
- Storage tuned to data needs
- Hardware directly tuned to the software
- System resource allocation uniquely optimized per selected pattern for each application workload

The Path.....



Rack Servers Technology

Processor Options
IO Capabilities
Memory Options
Power & Cooling



Blade Technology



Modular
Packaging Density

IBM PureFlex System

Enhanced Integration / Management

- Hardware
- Networking / Storage
- Operating Systems
- Virtualization
- Workloads



Processor Options
Modular
IO Capabilities
Packaging Density
Memory Options
Power & Cooling

New System Designed.....

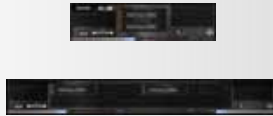
Building Blocks

Chassis

14 half-wide bays



Compute Nodes

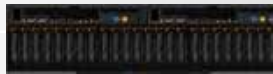


Management Appliance



Storage Node

V7000
Expansion inside or outside chassis



Networking

10/40GbE, FCoE, IB
8/16Gb FC



Expansion

PCIe / Storage



PureFlex Systems

Pre-configured, pre-integrated **infrastructure systems** with compute, storage, networking, physical and virtual management, and entry cloud management



Optimized Application System

Pre-configured, pre-integrated **platform systems** with middleware designed for transactional web applications and enabled for cloud



PureFlex System Configurations Offerings....



IBM PureFlex System Express

- For smaller installations

IBM PureFlex System Standard

- For application systems

IBM PureFlex System Enterprise

- For scalable cloud deployments
- Includes redundancy for resilient operation

Starting Configurations.....

Pre-configured, Pre-integrated systems with Servers, Storage and Networking

Express

- Flex System p260
- CMM (2)
- Management Node (Standard Software)
- 10Gb Network Switch
- 8Gb Fibre Channel Switch
- V7000 Storage w/2 SSD
Power +8 HDD
- 2 PS 4 fans
- Rack w/Gray door
- Chassis
- SCE (default off)
- Lab Services (3 days)
- MTS Base warranty
+3 yrs w/1 microcode/yr

Selectable Nodes

- Power or x Compute Node
Operating System+ Virtualization

Standard

- Flex System p260 or p460
- CMM (2)
- Management Node (Advanced Software)
- 10Gb Network Switch
- 2 x 8 Gb Fibre Channel Switch
- V7000 Storage w/2 SSD
Power +16 HDD
- 4 P/S 6 fans
- Rack w/Gray door
- Chassis
- SCE (default on)
- Lab Services (5 days)
- MTS Base warranty
+3yrs w/1 microcode/yr
+ WSU to 24x7 same day
+ 3 yrs 9x5 Acct Advocate

Selectable Nodes

- Power or x Compute Node
Operating System+ Virtualization

Enterprise

- Two Flex System p460
- CMM (2)
- Management Node (Advanced Software)
- 2 x 10Gb Network Switch
- 2 x 8 Gb Fibre Channel Switch
- Power only TOR = 2 Eth, 2 FC
- V7000 Storage w/ 4 SSD
Power +16 HDD
- 6 PS 8 fans
- Rack w/Gray door
- Chassis
- SCE (default on)
- Lab Services (7 days)
- MTS Base warranty
+ 3yrs w/2 microcode/yr
+WSU 24x7 same day
+3 yrs 24x7 Acct Advocate

Selectable Nodes

- Two Power or x Compute Node
Operating System + Virtualization

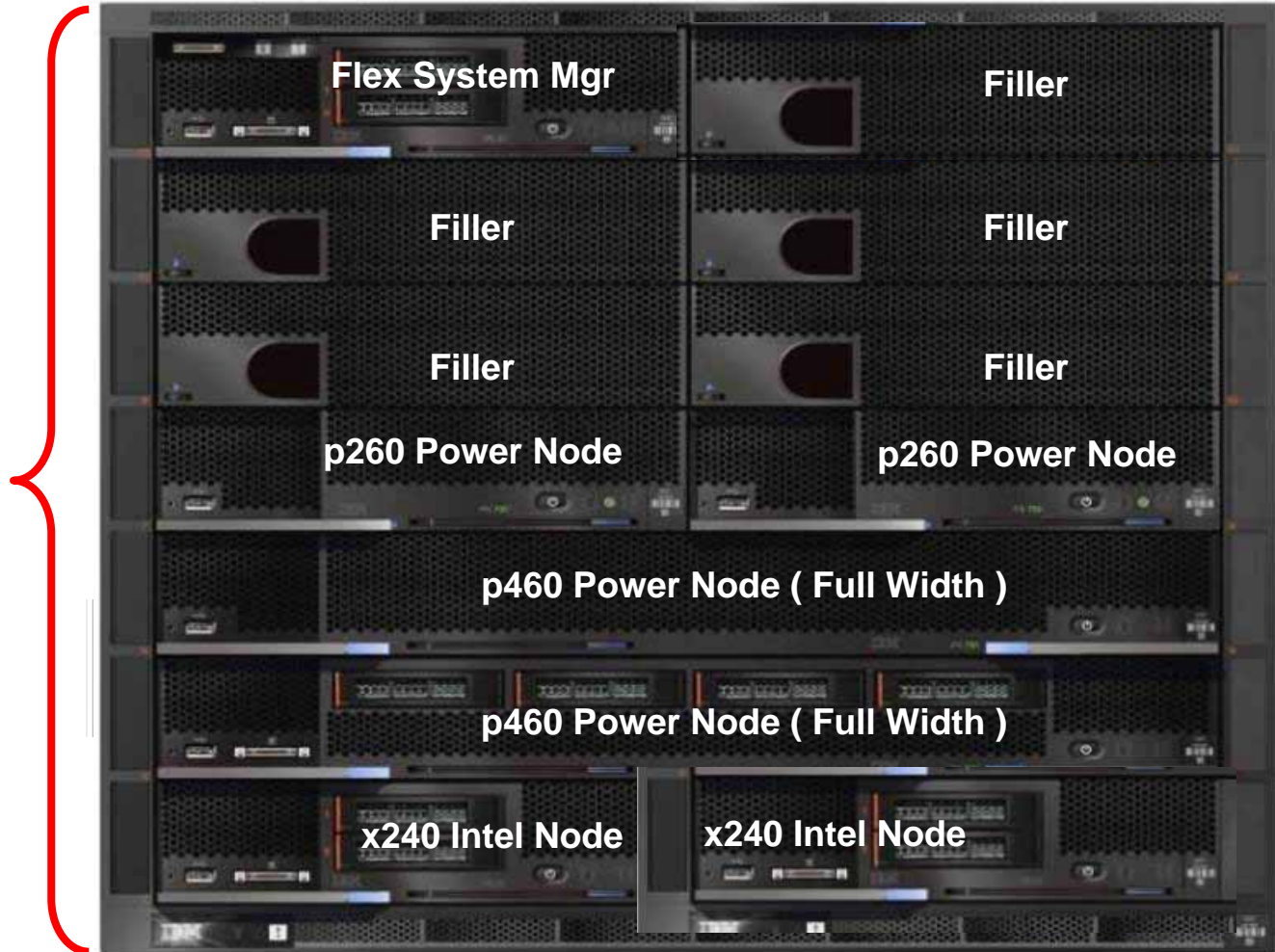
Flex System Enterprise Chassis View

Size: 10 U
19" Rack

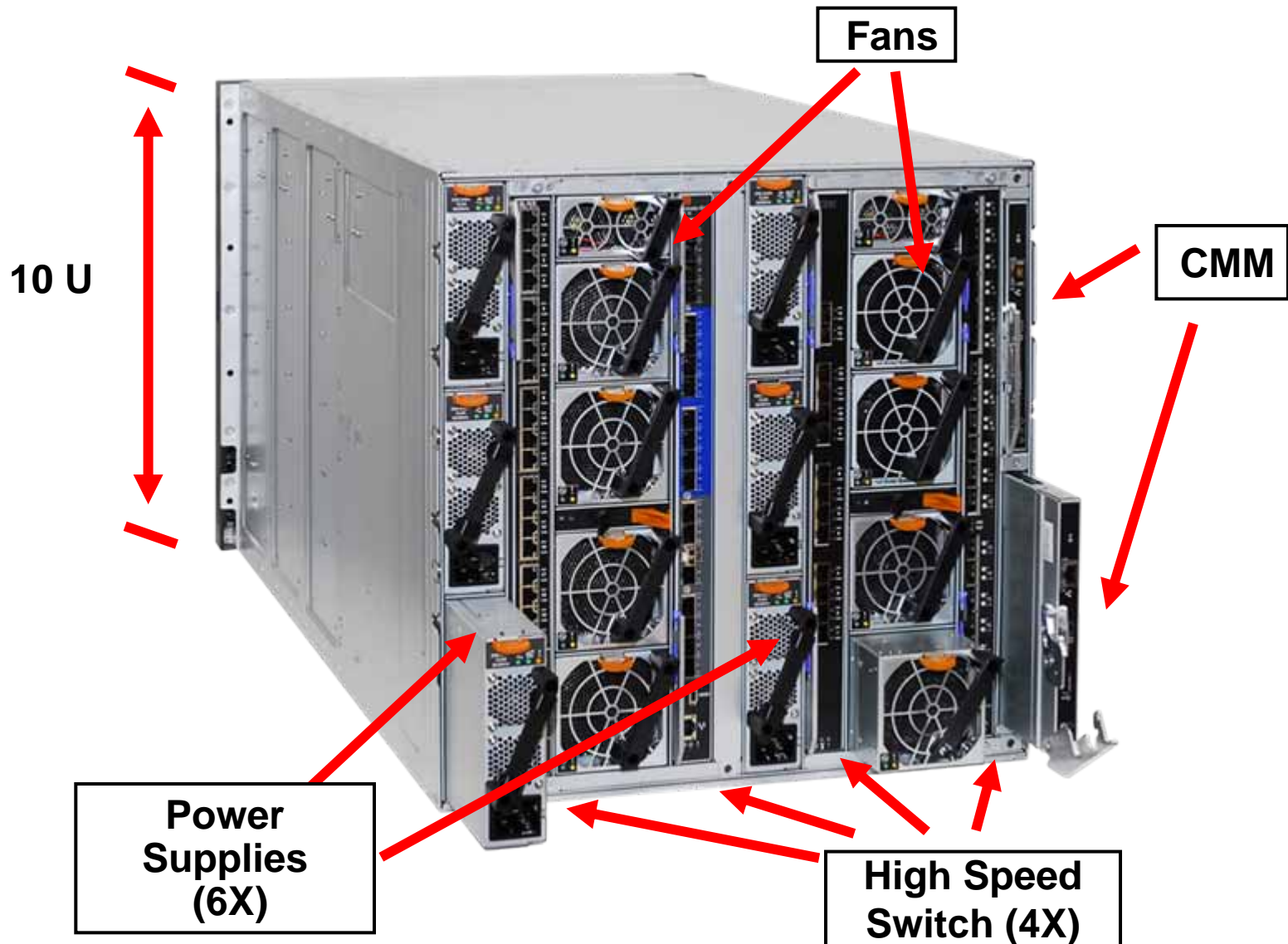
14 Node Bays
(7 Full Wide)

Nodes:

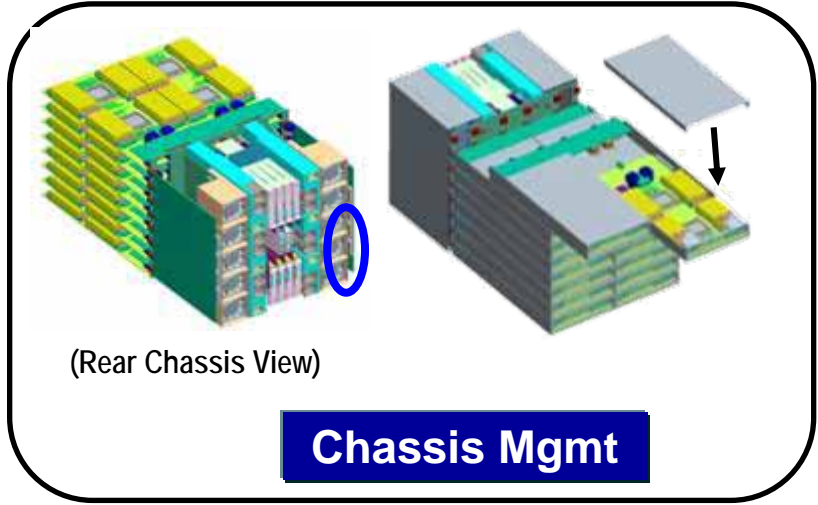
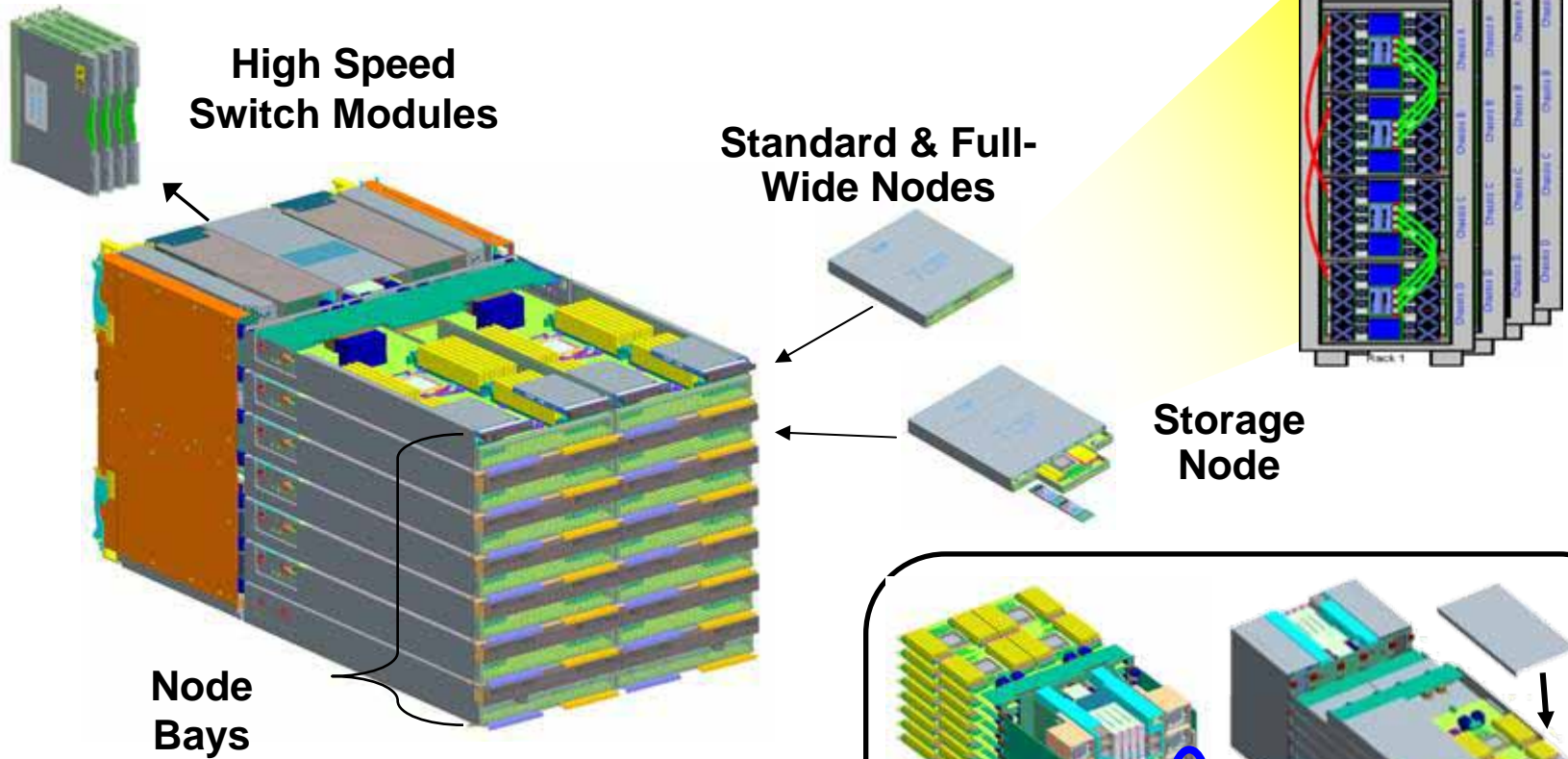
- Power
- Intel
- Flex System Mgr



Chassis: Rear View



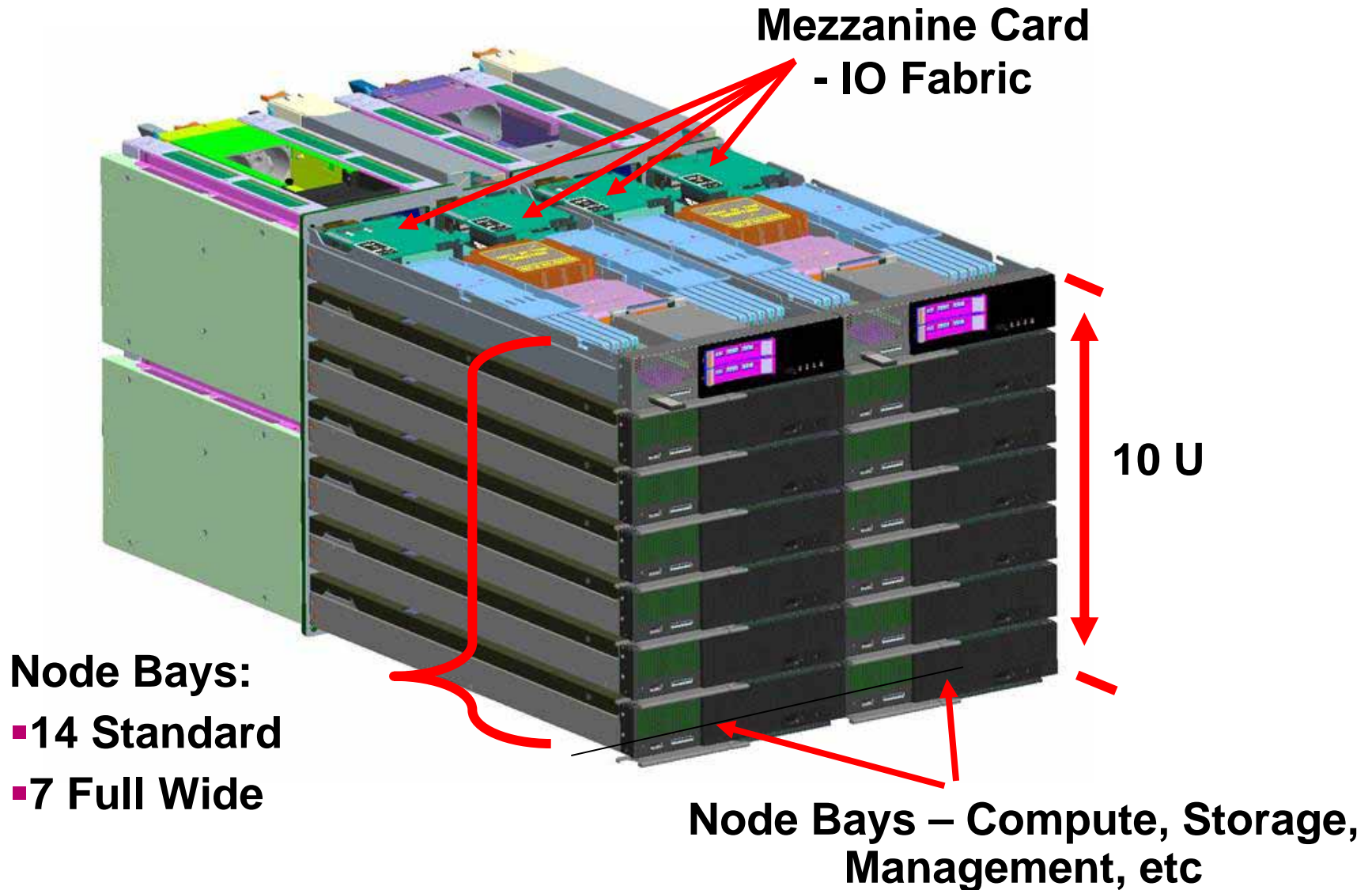
Hardware Offering At-a-Glance



Integration of:

- Servers
- Networking
- Storage

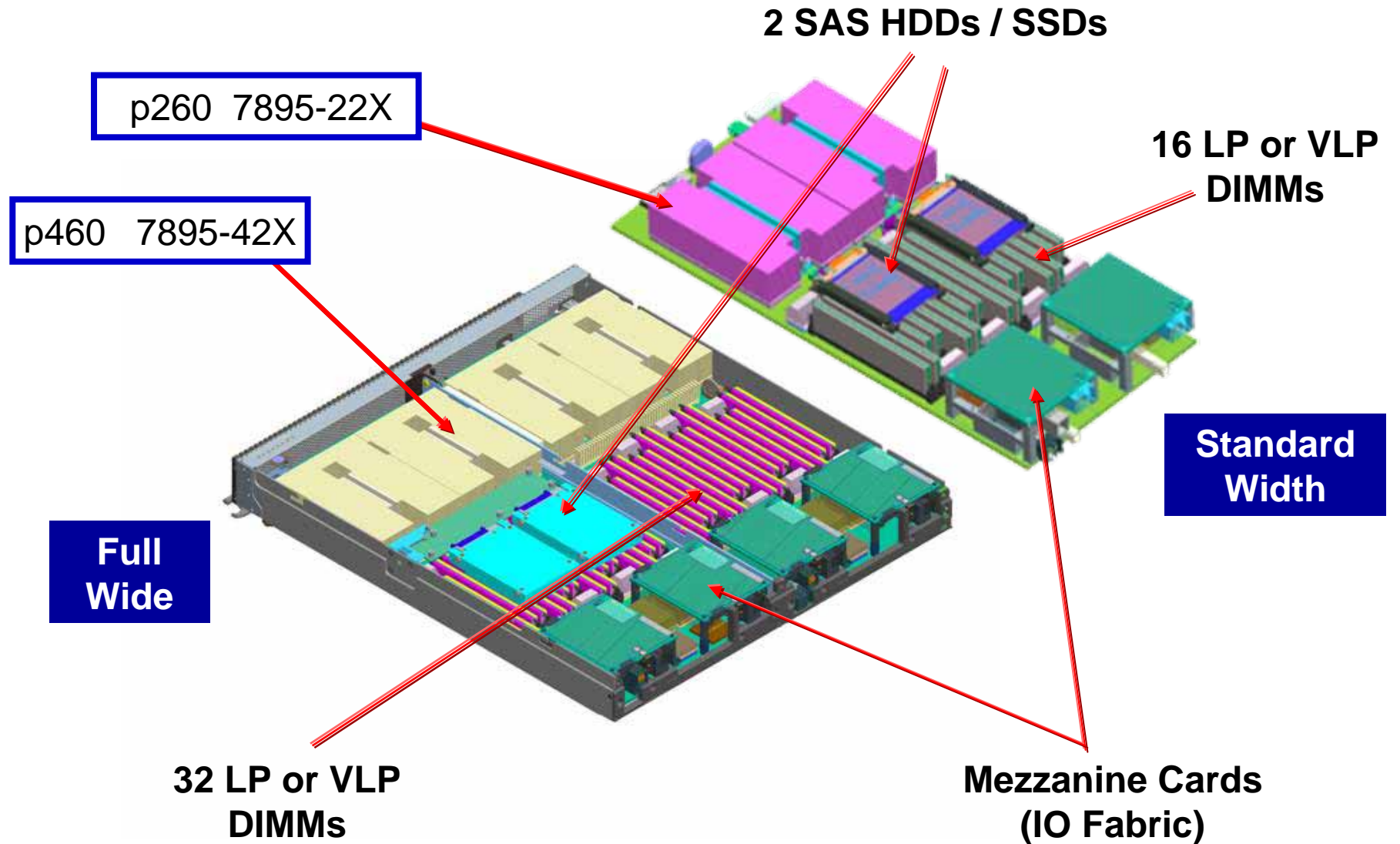
Flex System Enterprise Chassis Overview: Front View



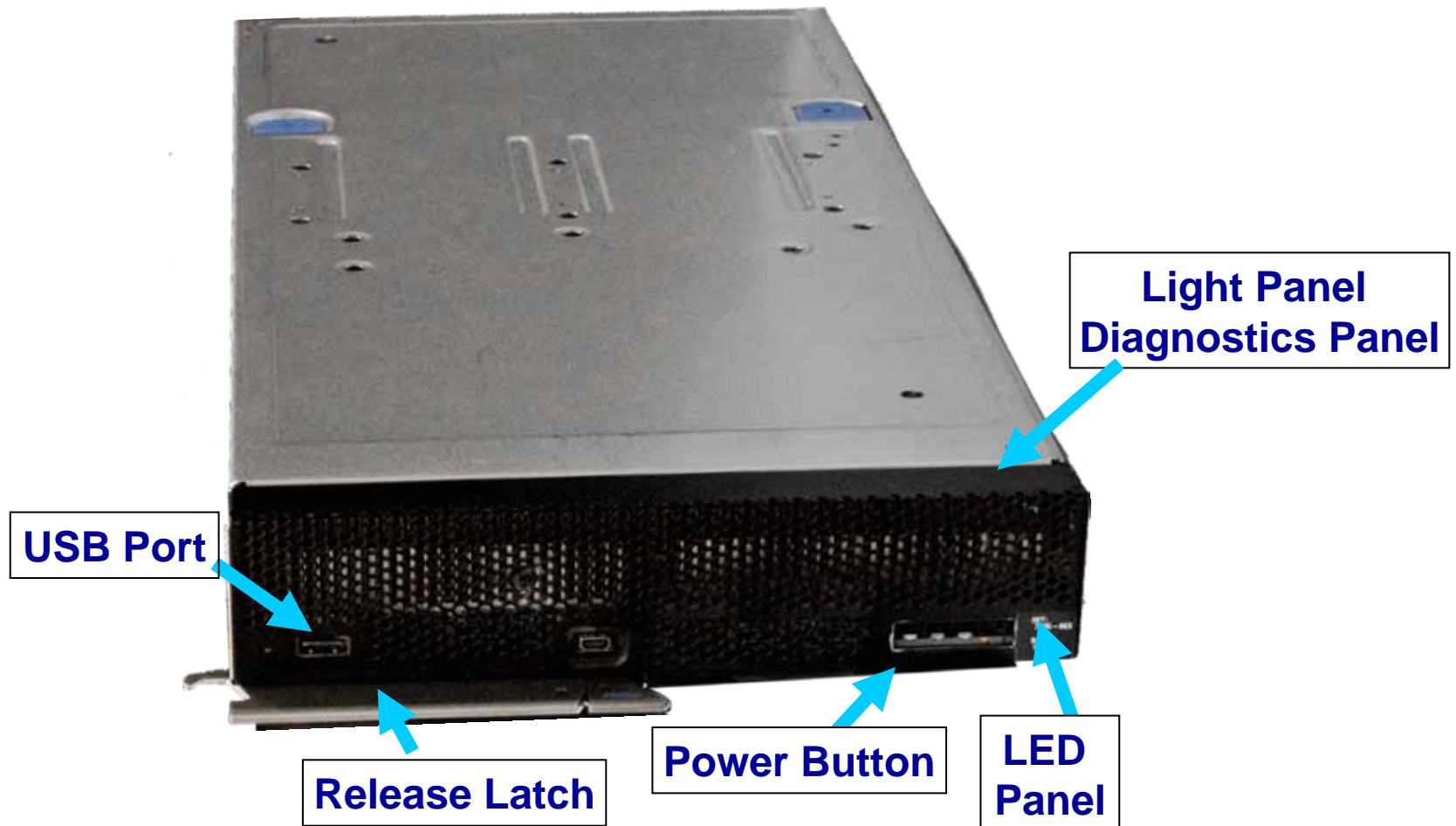


Compute Nodes

Flex System Compute Nodes



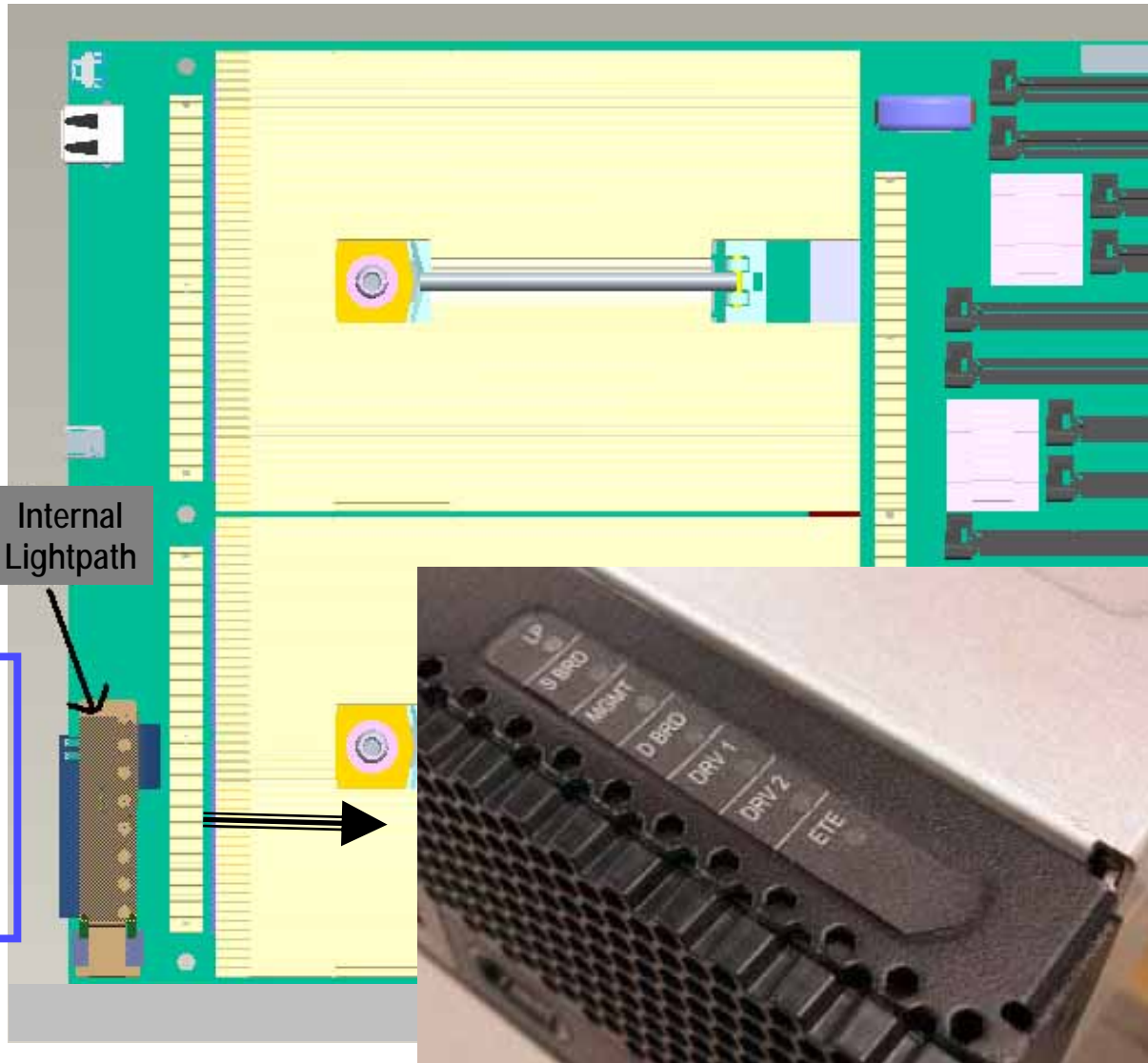
Flex System p260 (7895-22X) Enclosure: Dual Socket



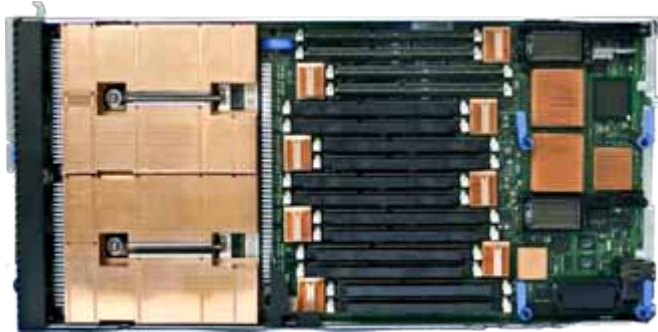
Flex System p460 (7895-42X) Enclosure: Quad Socket



Light path Area



Flex System p260 / p460 Compute Node



8 / 16 Core

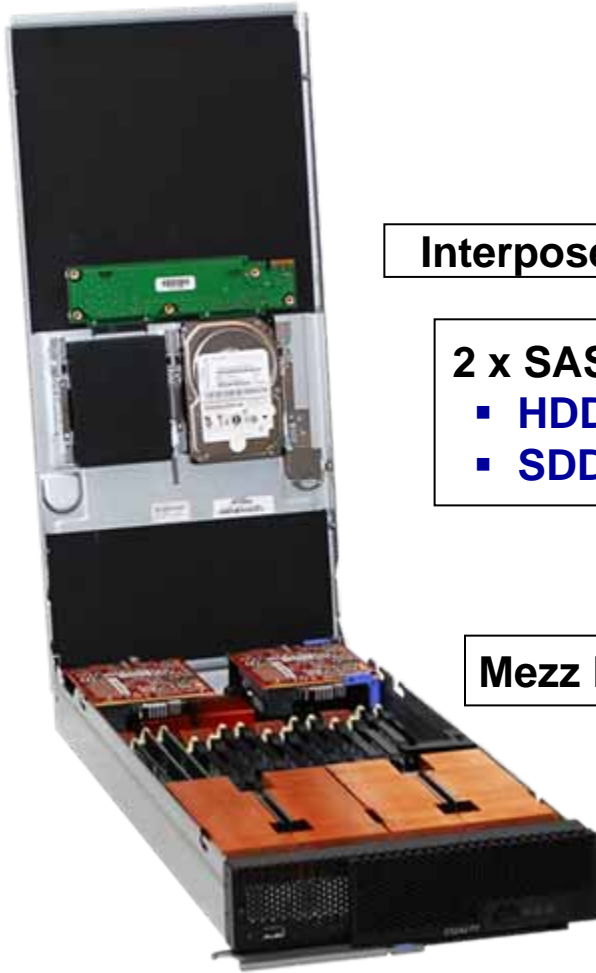


16 / 32 Core

POWER7 Architecture	Dual Socket 4 Cores @ 3.3 GHz 8 Cores @ 3.2 / 3.55 GHz
DDR3 Memory	Up to 256 GB
DASD / Bays	0 – 2 SAS (300 / 600 / 900 GB) 0 – 2 SSD (177 GB)
Mezzanine Card I/O Options	2

POWER7 Architecture	Quad Socket 4 Cores @ 3.3 GHz 8 Cores @ 3.2 / 3.55 GHz
DDR3 Memory	Up to 512 GB
DASD / Bays	0 – 2 SAS (300 / 600 / 900 GB) 0 – 2 SSD (177 GB)
Mezzanine Card I/O Options	4

Internal Storage Bays..



Interposer

2 x SAS 2.5" HDD or SDD drives

- **HDD:** 300 / 600 / 900 GB
- **SDD:** 177 GB

Mezz IO Adapters

USB Port

Two Drive Bays per node

- Standard Node or Full Width Node

Memory DIMMs (GB)

- HDD Nodes: 4 or 8 GB DIMMs
- SSD Nodes: 2 / 4 / 8 / 16 DIMMs.

Flex System p260 shown

USB Support

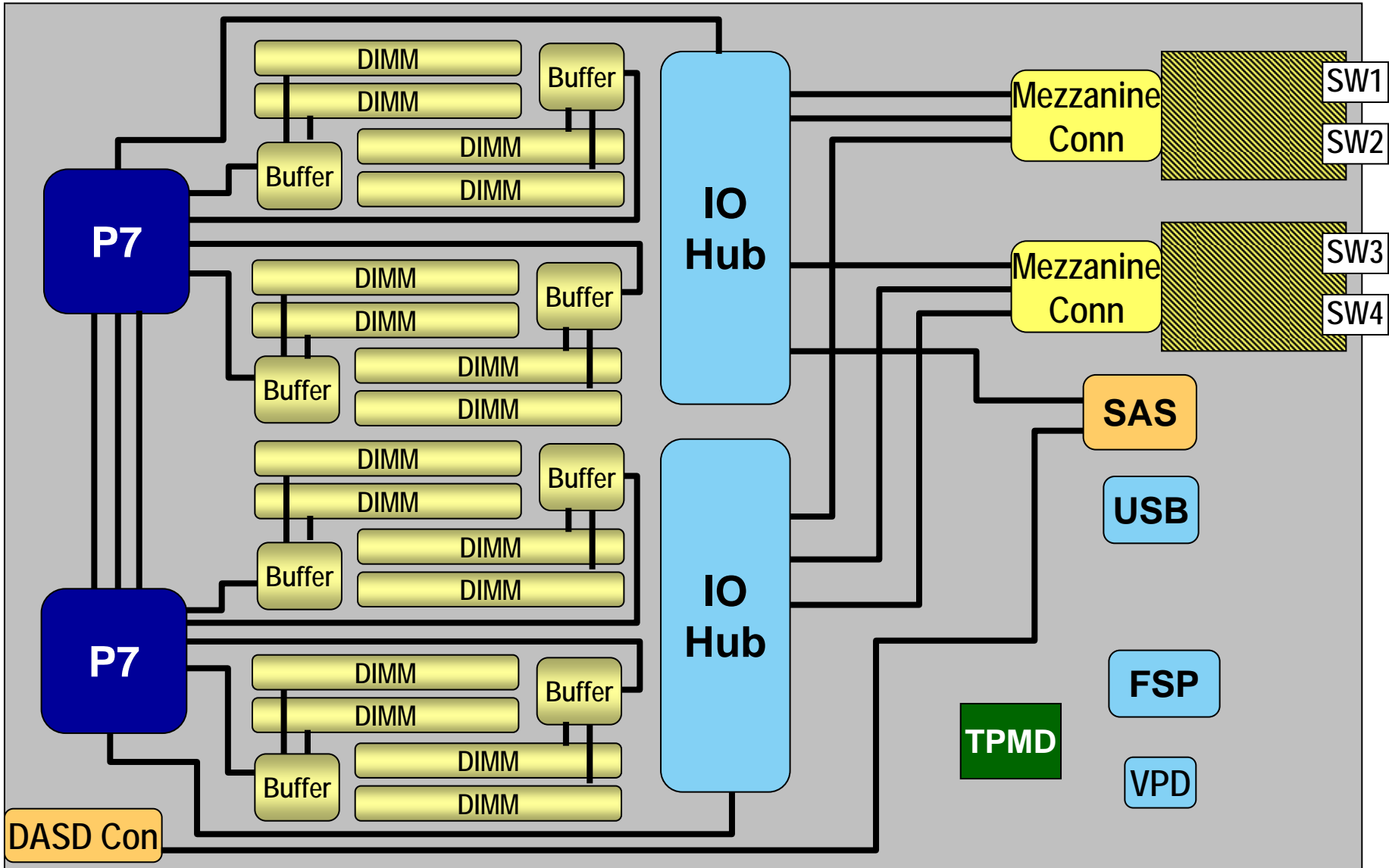
RDD / Removable Disk Drive Docking Station

FC #1104	USB External Docking Station
----------	------------------------------

RDD / Removable Disk Drive Cartridges

FC #1106	USB 160 GB Cartridge
FC #1107	USB 500 GB Cartridge
FC #EU01	USB 1 TB Cartridge

Flex System Compute Node Layout.....



Memory Options.....



2 GB LP DIMMs



4 GB VLP DIMMs



8 GB VLP DIMMs



16 GB LP DIMM

**SSD Installed or
No Storage Media installed**



4 GB VLP DIMMs



8 GB VLP DIMMs

HDD Installed

Memory Feature Codes

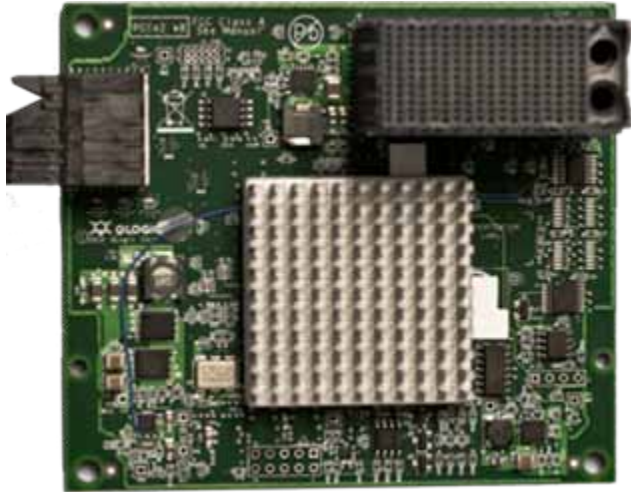
FC EM04 (2 x 2GB)

FC #8196 (2 x 4GB)

FC #8199 (2 x 8GB)

FC #8145 (2 x 16GB)

Mezzanine Adapter Options...



IBM Flex System IB6132 2-port QDR InfiniBand Adapter

- FC #1761

IBM Flex System EN4054 4-port 10Gb Ethernet Adapter

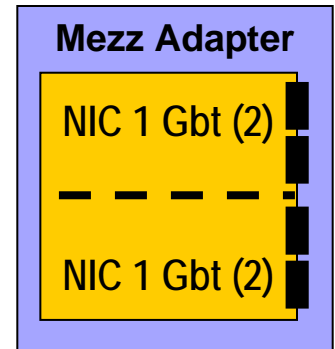
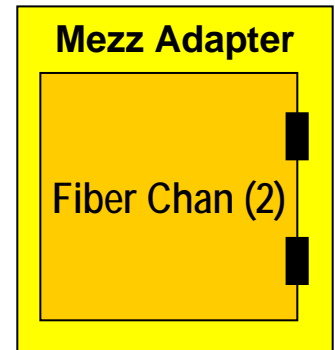
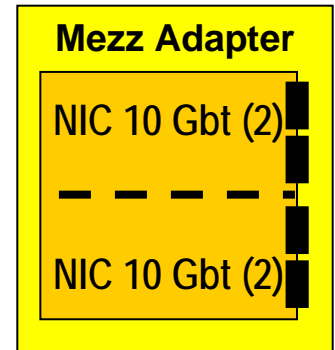
- FC #1762

IBM Flex System EN2024 4-port 1Gb Ethernet Adapter

- FC #1763

IBM Flex System FC3172 2-port 8Gb Fibre Channel Adapter

- FC #1764



IBM Flex System x240

Enterprise Class 2S EP Compute Node

Compute



Standard Width compute node

2-socket Sandy Bridge-EP

24 LP DDR3 DIMMs /
1333MHz / 1600MHz

10Gb Converged LOM

2 hot swap 2.5" SAS/SATA
SSDs or HDDs

Dual Enabled Hypervisor -
ESXi on Flash Key Option



IBM Flex System x240

*Uncompromised Compute, IO, and Storage performance,
designed for mainstream virtualization, and a broad
range of workloads*

2x IO Mezzanine Cards

2x Intel E5 2600
Processors

24 LP
DIMMs

Keyboard, Mouse,
Video Dongle
connector

Release latch

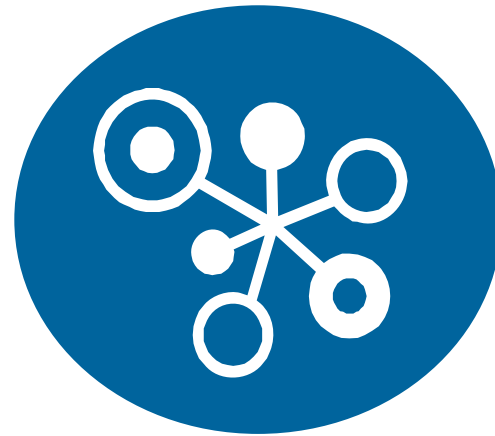
2x Hot Swap, Small
Form Factor HDDs

System infrastructure

IBM Flex System x240 – Models, Processor Options



MTM # - HVEC	GAV/SEO # - Xcc	Processor - Intel Xeon (Sandybridge EP)	Processor Sockets	Memory (DDR3)	Max DIMM Sockets	Max HDD Bays	Additional Info
8737R2x	8737R2Y	1 x E5-2690 8C 2.9GHz 20MB Cache 1600MHz 135W	2	2 x 4GB (1Rx4, 1.5V) 1600MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737Q2x	8737Q2Y	1 x E5-2667 6C 2.9GHz 15MB Cache 1600MHz 130W	2	2 x 4GB (1Rx4, 1.5V) 1600MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737N2x	8737N2Y	1 x E5-2643 4C 3.3GHz 10MB Cache 1600MHz 130W	2	2 x 4GB (1Rx4, 1.5V) 1600MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737M2x	8737M2Y	1 x E5-2680 8C 2.7GHz 20MB Cache 1600MHz 130W	2	2 x 4GB (1Rx4, 1.5V) 1600MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737M1x	8737M1Y	1 x E5-2680 8C 2.7GHz 20MB Cache 1600MHz 130W	2	2 x 4GB (1Rx4, 1.5V) 1600MHz	24	2	integrated RAID 0,1 (opt flash cache)
8737L2x	8737L2Y	1 x E5-2660 8C 2.2GHz 20MB Cache 1600MHz 95W	2	2 x 4GB (1Rx4, 1.5V) 1600MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737J1x	8737J1Y	1 x E5-2670 8C 2.6GHz 20MB Cache 1600MHz 115W	2	2 x 4GB (1Rx4, 1.5V) 1600MHz	24	2	integrated RAID 0,1 (opt flash cache)
8737H2x	8737H2Y	1 x E5-2640 6C 2.5GHz 15MB Cache 1333MHz 95W	2	2 x 4GB (1Rx4, 1.35V) 1333MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737H1x	8737H1Y	1 x E5-2640 6C 2.5GHz 15MB Cache 1333MHz 95W	2	2 x 4GB (1Rx4, 1.35V) 1333MHz	24	2	integrated RAID 0,1 (opt flash cache)
8737G2x	8737G2Y	1 x E5-2630 6C 2.3GHz 15MB Cache 1333MHz 95W	2	2 x 4GB (1Rx4, 1.35V) 1333MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737F2x	8737F2Y	1 x E5-2620 6C 2.0GHz 15MB Cache 1333MHz 95W	2	2 x 4GB (1Rx4, 1.35V) 1333MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737D2x	8737D2Y	1 x E5-2609 4C 2.40GHz 10MB Cache 1066MHz 80W	2	2 x 4GB (1Rx4, 1.35V) 1333MHz	24	2	LOM, integrated RAID 0,1 (opt flash cache)
8737A1x	8737A1Y	1 x E5-2630L 6C 2.0GHz 15MB Cache 1333MHz 60W	2	2 x 4GB (1Rx4, 1.35V) 1333MHz	24	2	integrated RAID 0,1 (opt flash cache)



Networking

Flex System Switches



**1 & 10 Gbt
Ethernet**



**Fibre
Channel**

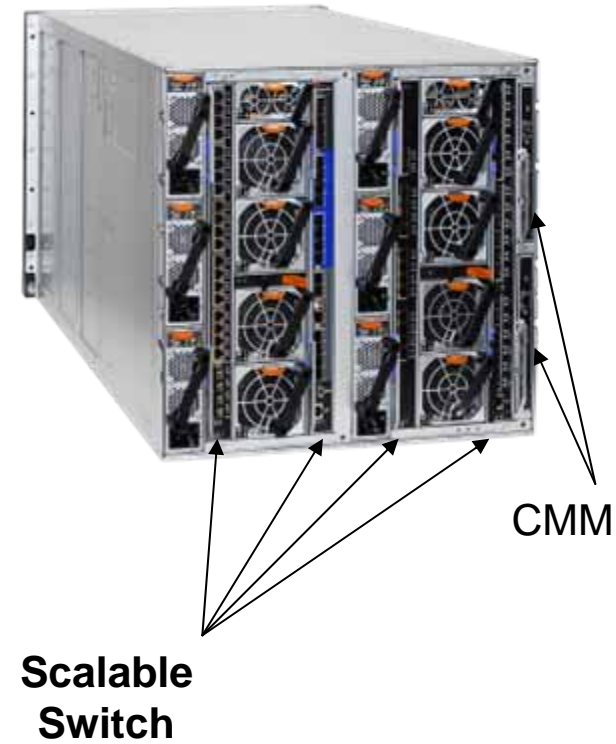
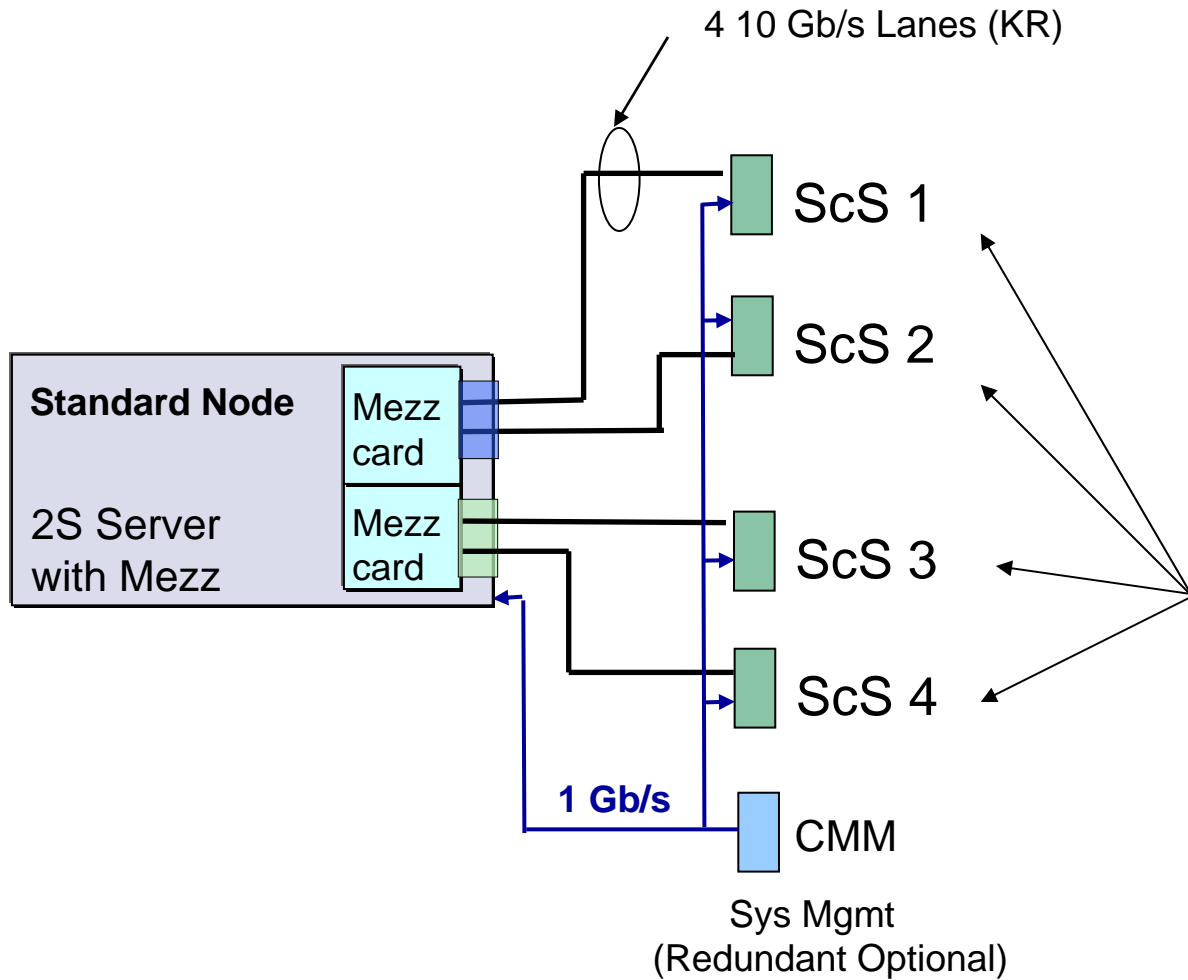
IBM Fiber Channel Scalable switches

Multiple selections

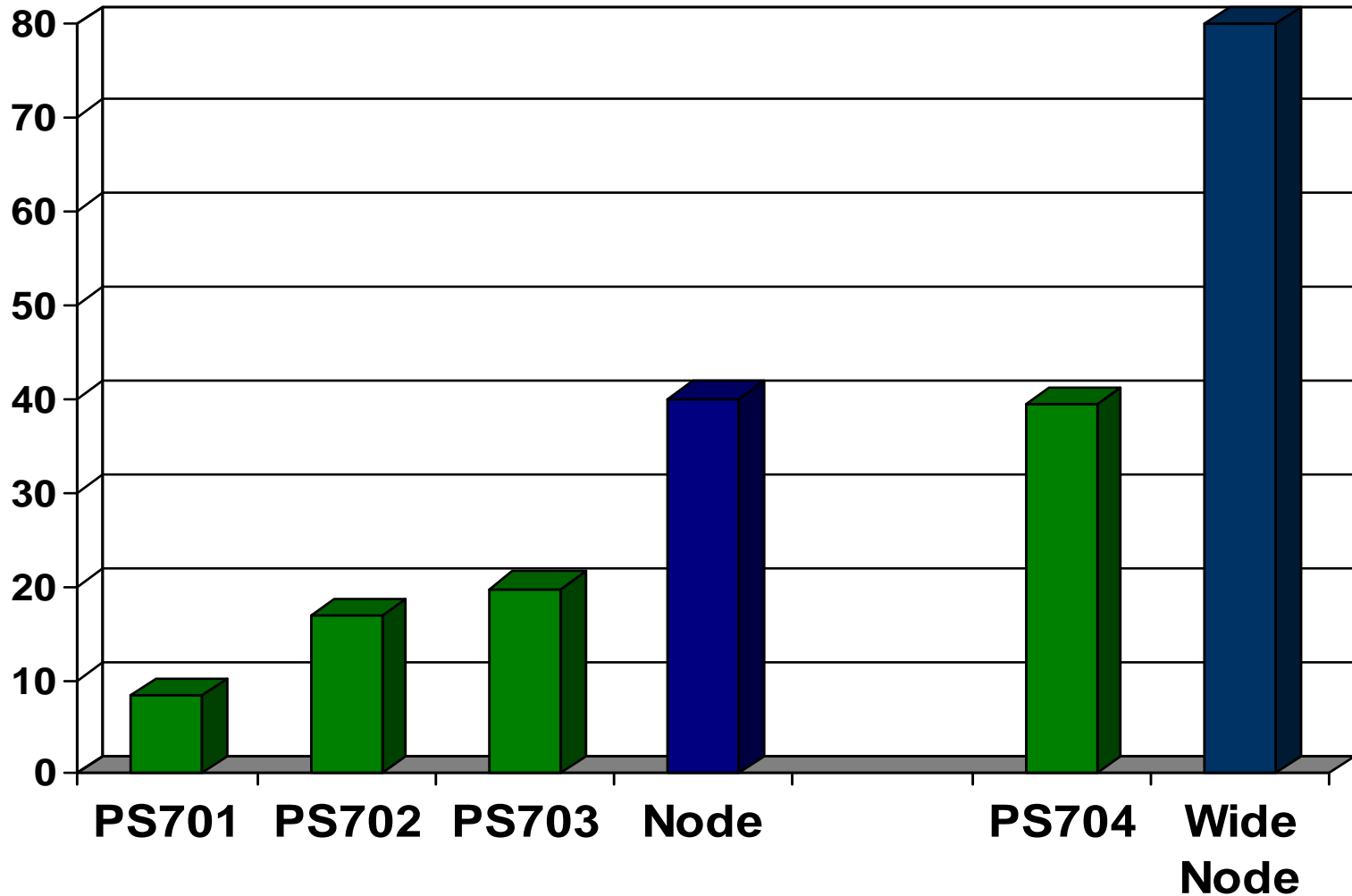
- Two types: QLogic and Brocade
- QLogic: 8 Gbt Fibre Channel Switch
 - Feature Codes: #3591 and #3595
 - 14 Internal & 6 External
 - Two options: Configurable or Passthru
 - Base Configuration
- Brocade: 16 Gbt Fibre Channel Switch
 - Feature Codes: #3770 and #3771
 - 12 Port (Combination of Internal or External)
 - 24 Port (Max of 20 External ports)



Compute Node I/O – Mezz Card to Switch



POWER7 Node IO Bandwidth





Operating Systems Virtualization

Operating System Support

IBM AIX operating system:

AIX V7.1 with TL01 with Service Pack 3 with APAR IV14284, or later

AIX V7.1 with TL00 with Service Pack 6, or later

- **Planned availability: June 13, 2012**

AIX V6.1 with TL07, with Service Pack 3 with APAR IV14283, or later

AIX V6.1 with TL06 with Service Pack 8, or later

- **Planned availability: June 13, 2012**

AIX V5.3 with TL12 with Service Pack 6, or later

- **Planned availability: June 13, 2012**

- AIX Service Extension is required

IBM i operating system (Requires VIOS):

IBM i 6.1 with i 6.1.1 machine code, or later

IBM i 7.1, or later

VIOS:

VIOS 2.2.1.4, or later

Linux:

Novell SUSE Linux Enterprise Server 11 Service Pack 2 for POWER

- With current maintenance updates available from Novell

Red Hat Enterprise Linux 5.7, for POWER, or later

Red Hat Enterprise Linux 6.2, for POWER, or later

Virtualization Offerings

Virtualization Options

FC #5225 PowerVM Express Edition
FC #5227 PowerVM Standard Edition
FC #5228 PowerVM Enterprise Edition
FC #ELPM Trial PowerVM Live Partition Mobility

FC #4796 Active Memory Expansion Enablement

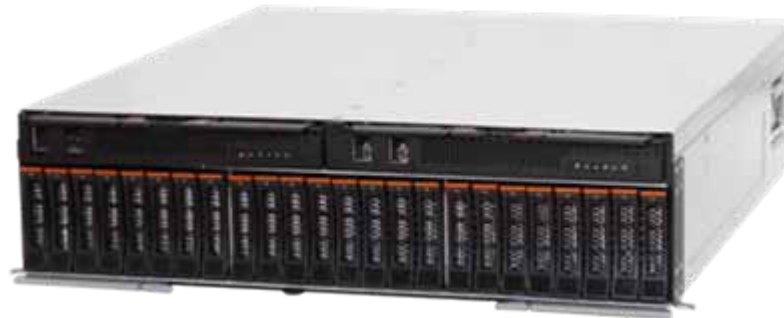
Processor Tier: Small
PowerVM Editions: Small Tier

Single VIOS support on p260
Dual VIOS Support on p460



Storage

Flex System Storage Node / Storwize V7000



Offering Description

- Highly available shared storage, Dual controller, up to 240 SFF (HDD & SSD)
- Performance and features to support single to multiple chassis
- PureFlex Platform Node form factor and JBOD expansion module
- FC, iSCSI, & FCoE host protocol options
- Integrated Storage Management

Key Features

- High Performance Block Storage
- Thin Provisioning and Flash Copy
- Metro / Global Mirroring
- Integrated PureFlex Platform management
- Supports PureFlex Platform Compute Nodes
- Scalable within the chassis as well as to external chassis to 240 HDD
- Cluster-able to 480 HDDs and 2x the bandwidth performance

PureSystems Platform and the Storwize combinations

Internal Chassis Storage



Rack with External Storage

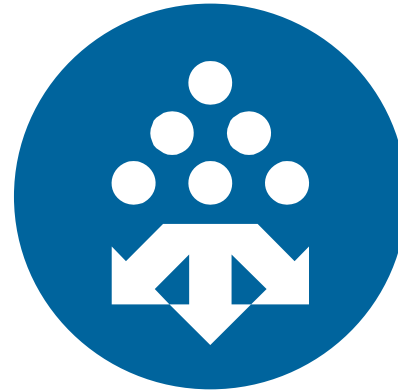


Rack with Internal & External Storage



Separate Servers & Storage Racks





Management

Management Models

Chassis Management Module Standalone: Deliver cost-competitive single-chassis management, compatible with BladeCenter / AMM paradigm.

Flex System Management Appliance: Provide integrated, scalable management appliance in a compute node form-factor for managing chassis, servers, storage, network and virtualization.

External Director Server: Add IBM PureFlex Platform chassis to existing Systems Director management domain

- IBM Systems Director Managing CMM standalone
- IBM Systems Director Hierarchically managing the Management Appliance

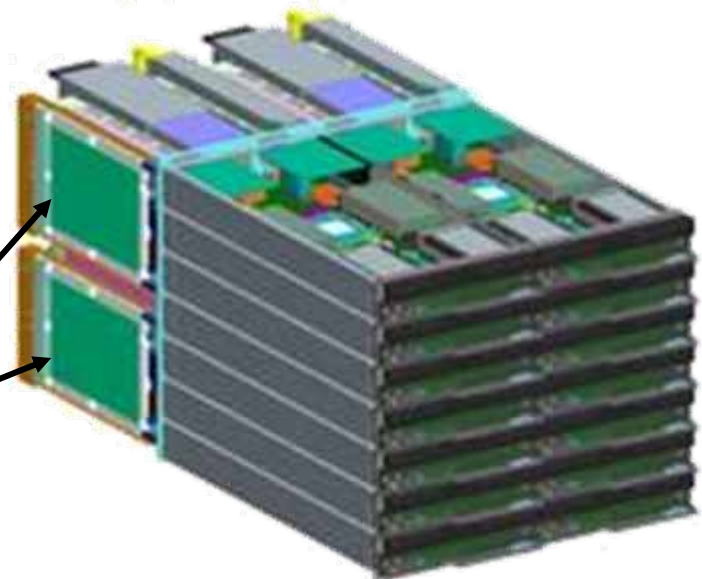
Integrated Chassis Management

Chassis Management Module

- ✓ Provides BladeCenter customers **Straight-forward transition** from familiar “Chassis Level” management model
- ✓ Provides **Backward compatibility** w/ BladeCenter **AMM** Commands
- ✓ **New** Easy-to-use chassis management **Look & feel**
- ✓ Enables **Robust Security** using Industry Standards (TCG)
- ✓ Leverages core SW Stack from Advanced Management Module
- ✓ Upward integration into Flexible System Mgr., Director & Tivoli

**Chassis
Management**

CMM
Single Chassis Management

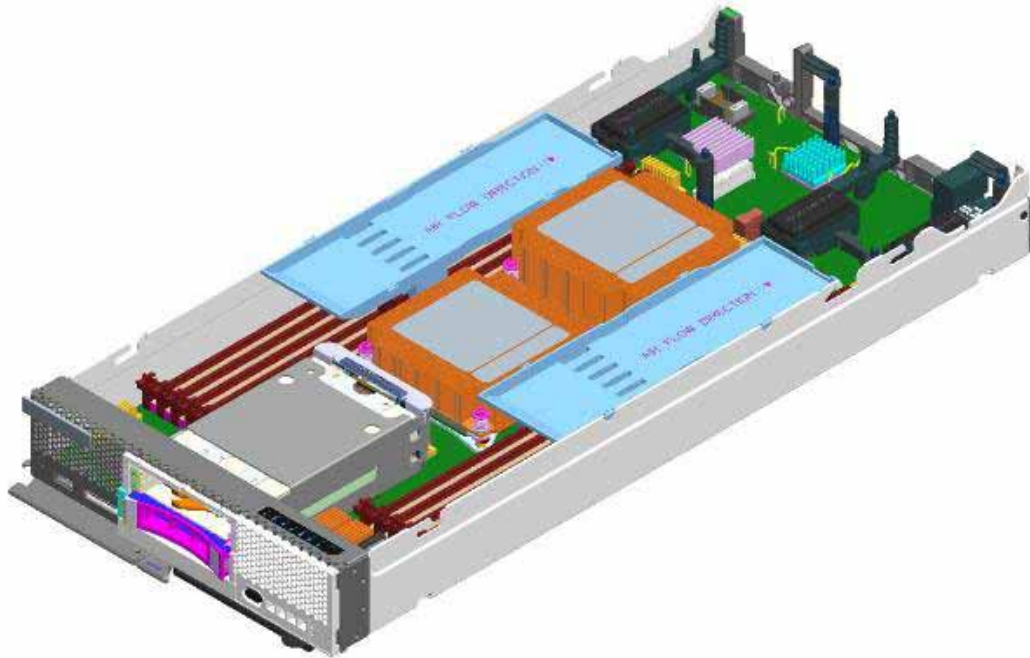


Flex System Manager: Integrated Platform Management

- **Single-point-of-control**, reducing IT management complexity & cost
- **Provides the building block** for virtualization and integrated services management
- **Heterogeneous management** across server, storage and networks
- **improves IT efficiency**, for better service and time to market
- **Delivered as an appliance** built into the platform



FSM Management Node



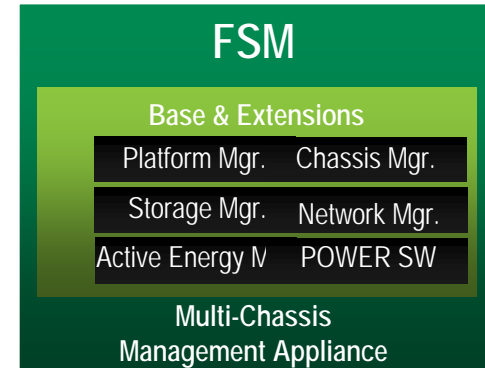
Key Features:

- Based on Director 6.3. hierarchical mgmt, active-passive failover,
- Scalability to multiple chassis's
- Base life-cycle mgmt of all resources
- Security-signed FW, single sign-on, audit logging, role-based access control, key mgmt
- Advanced Managers: VMcontrol, network control, storage control, advanced Open Fabric Mgr, active energy mgr, Service & support mgr – priced upgrades which are enabled via Feature on Demand, (FoD)

FSM Integrated Management Appliance

Flex System Manager Appliance

- **All basic and advanced functions preloaded as an appliance**
- **Adds easy-to-use multi-chassis management**
 - Quick Start Wizards with automated discovery
 - Advanced remote presence console across multiple chassis
 - License key management
- **Integrated x86 & Power servers, Storage & Network management**
- **Includes SDMC for full POWER Node functionality (e.g. live partition migration, redundant VIOS, concurrent firmware updates)**
- **Network fabric management (Port Profiles, VM Priority, Rate Limiting)**
- **Virtualization Management including resource pools**
- **Robust security (Centralized User Management, Security Policy, Certs)**
- **Integrated LDAP and NTP servers for private management network**
- **Energy Monitoring and Management**
- **Active/Passive Failover to redundant Management appliance**
- **Advanced management capabilities available thru priced add-ons**
- **Upward integration into Systems Director, Tivoli and 3rd party enterprise managers**



Single Point of Management Control

Optimization



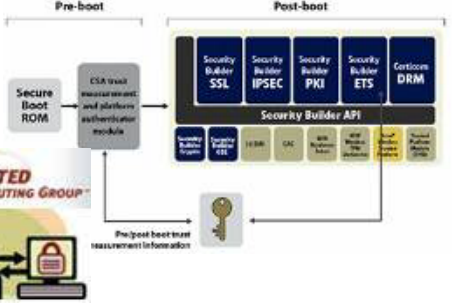
- Dynamic allocation of virtual server, storage and network resources.
- Optimized based on efficiency, density, performance
- Virtual Machine relocation based on customer based policies

Integration



- Single pane-of-glass for managing Servers, Storage, Network and Virtualization
- Placement services and advisors
- Integration with Tivoli & 3rd Party Managers

Security

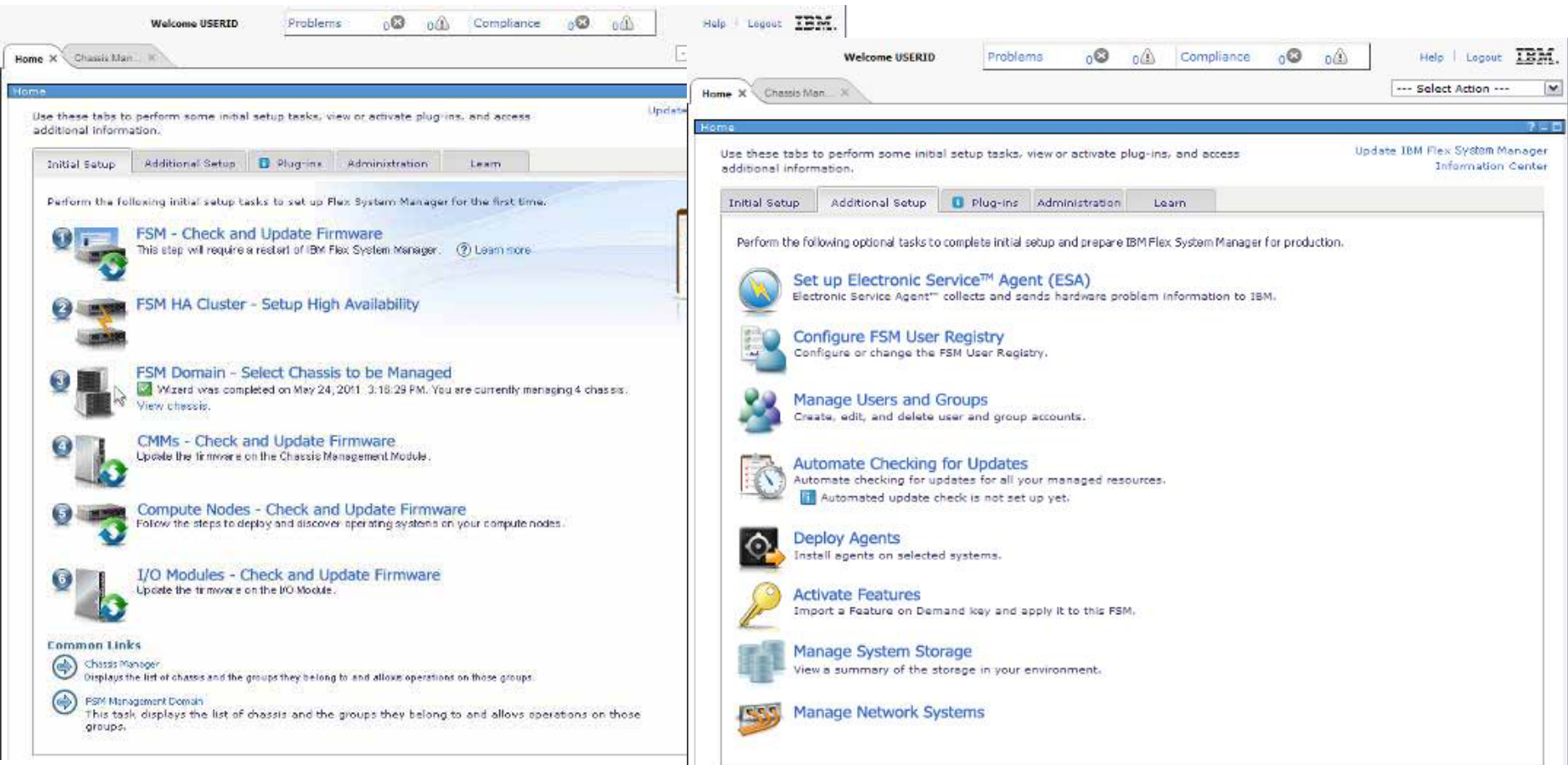


- Trusted Computing Group (TCG) standards
- Secure Boot
- New user and group management utilities

Welcome Experience

Systems Management Setup Experience

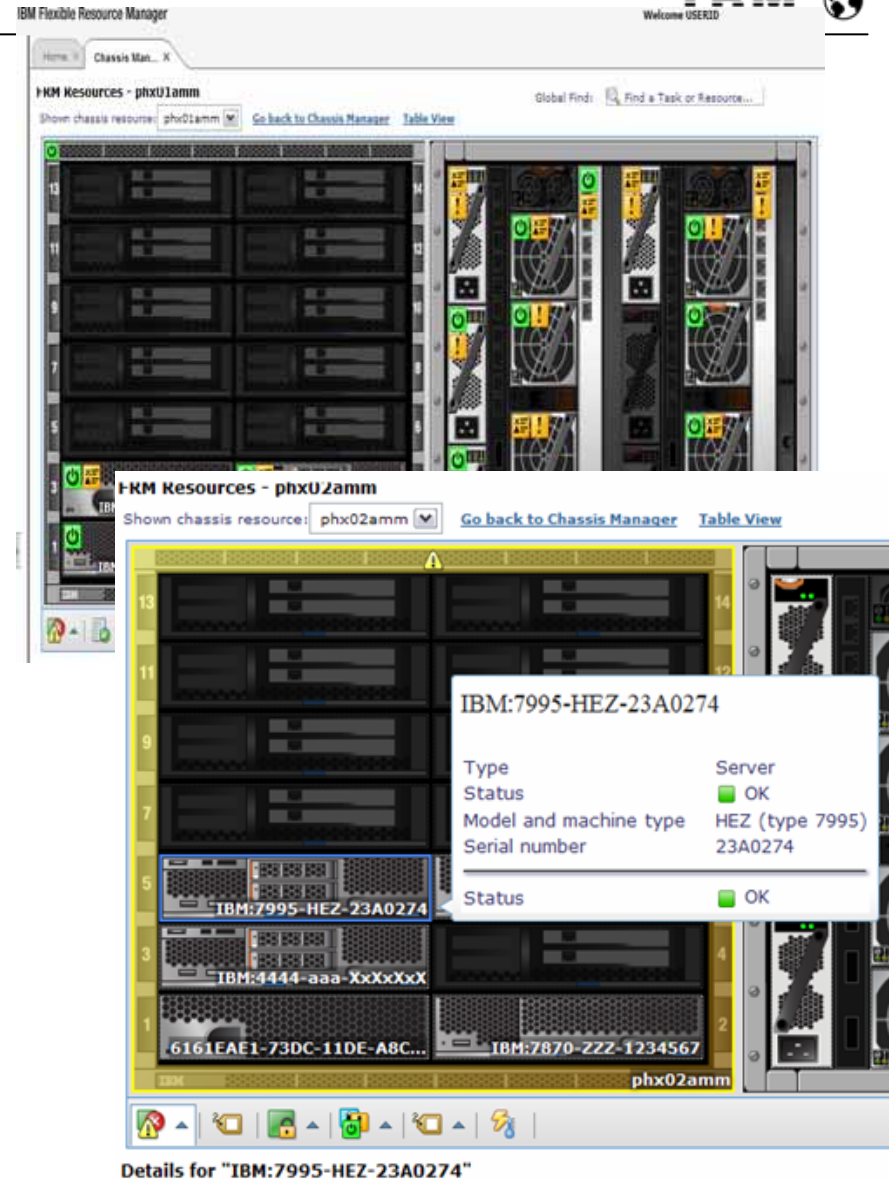
- Complete - Full Suite of setup wizards to ensure a complete and successful user setup
- Automation: (e.g., Software Management integrated with the Hardware)
- Object oriented steps and iconic



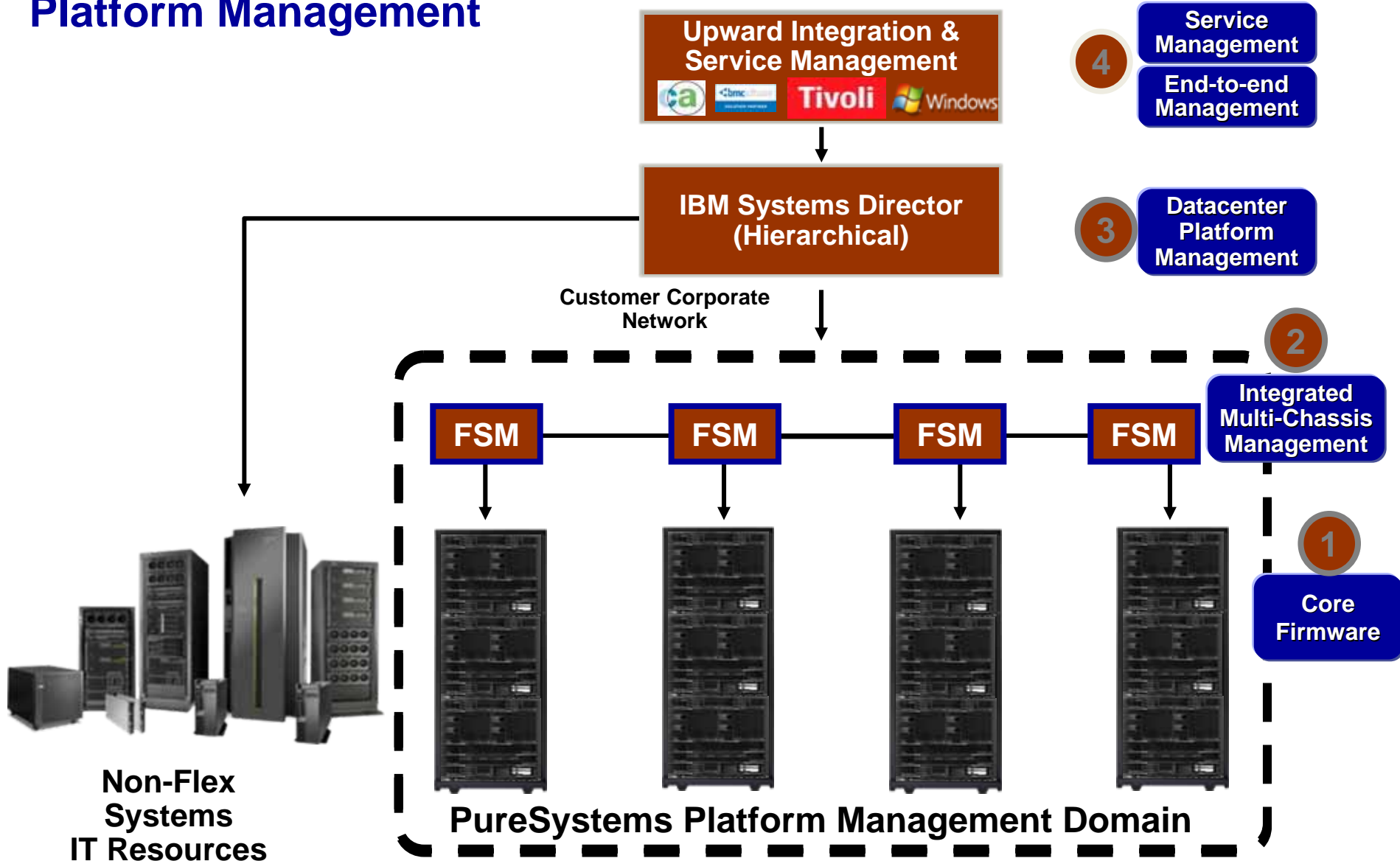
Chassis Management

Systems Management Appliance

- **Single focus point** for seamless multi-chassis management providing an instant resource oriented view of chassis and chassis resources
- **Multiple view overlays** to monitor system health, work with firmware inventory, and view environmental status including thermal and power metrics
- **Chassis views** to view and label hardware, OS, and firmware inventory
- **Quick finder** to launch to common management tasks (a value add for admin's to quickly perform management tasks)
- **Launch point** for remote access tools to work with OS, etc. on individual nodes
- Add system to data center monitoring infrastructure



Platform Management



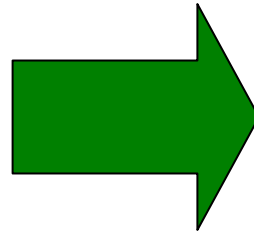
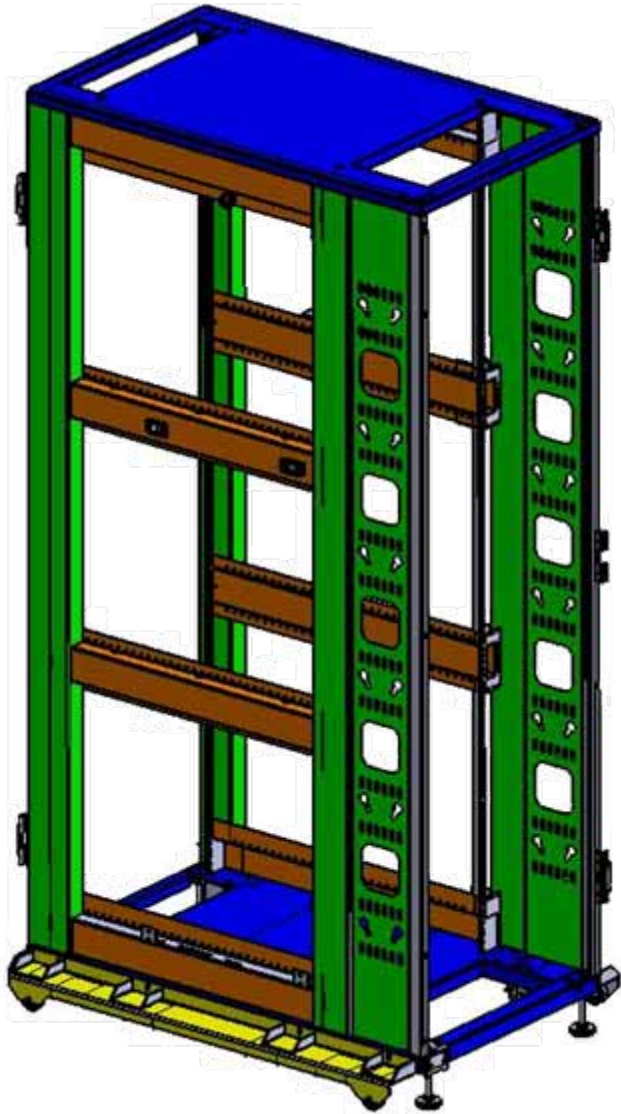


Energy Scale

EnergyScale Features....

Feature	AEM	Function
Power Trending	Yes	Collects and reports power consumption information
Thermal Reporting	Yes	Collects and reports inlet and exhaust temperatures
Static Power Saver	No	Provides predictable with definite power savings by reducing CPU frequency a fixed amount
Dynamic Power Saver	Yes	Allows a system to implement algorithms to adjust processor core frequency to favor system performance or to balance
Power Capping	Yes	Enforces a user specified power budget for a system
Energy Optimized Fans	No	System fans respond dynamically to temperatures of system components
Processor Core Nap	No	Enables low power mode In POWER7 when cores are not used
Processor Folding	No	Dynamically re-allocates which processor cores execute a task to optimize the energy efficiency of the system
EnergyScale for IO	No	Power on IO slots when needed
Server Power Down	Yes	Provides insight necessary to dynamically migrate workloads off of lightly utilized systems, allowing the entire system to be powered off.

IBM PureFlex System 42U Rack (7953-94X)

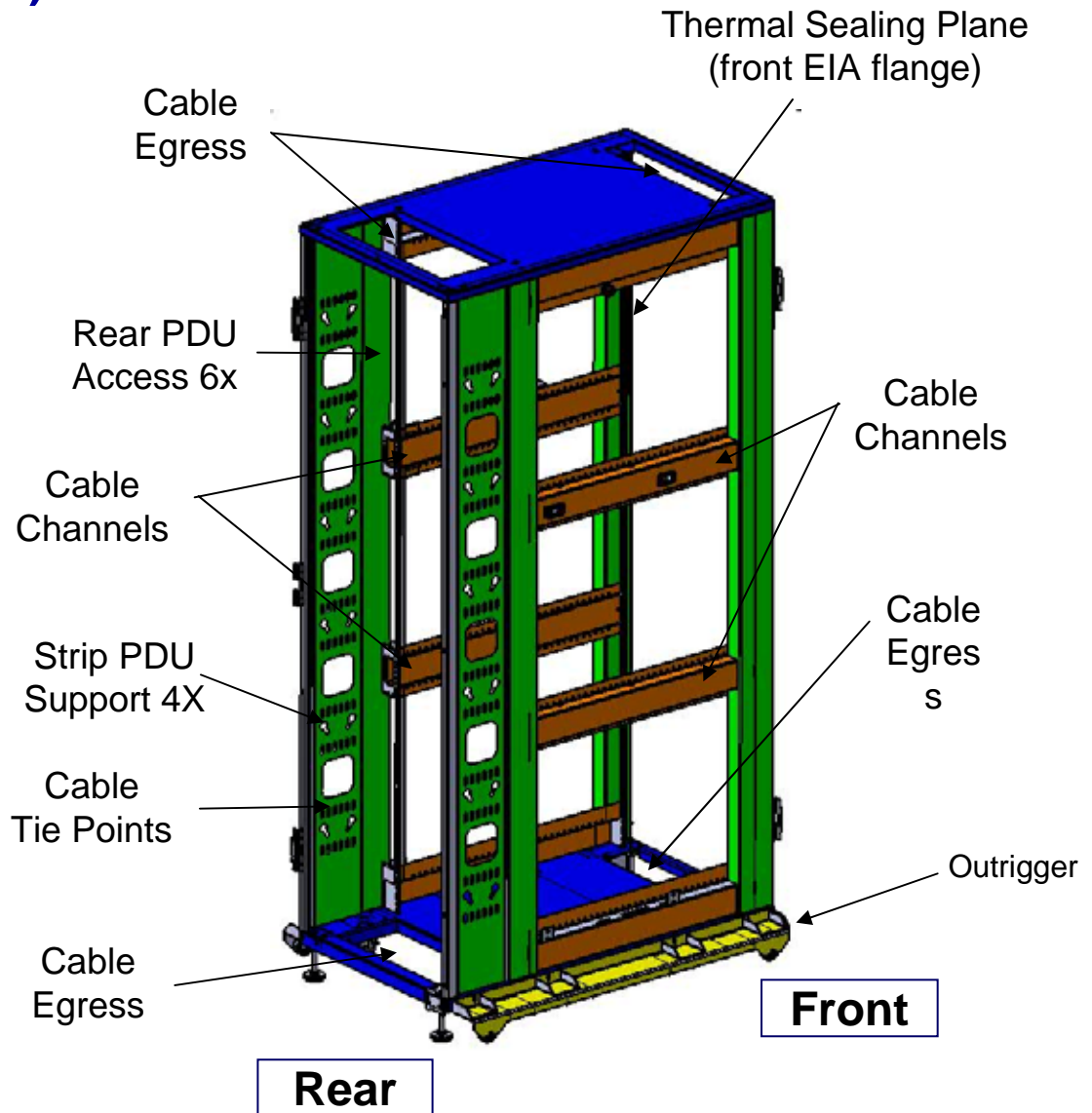


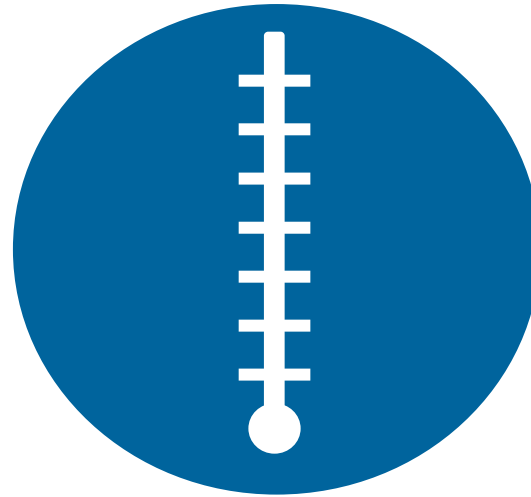
IBM 42U Slim Rack (7953-94X)

Optimized for Enhanced Cooling and Cable Management

Key Design Features

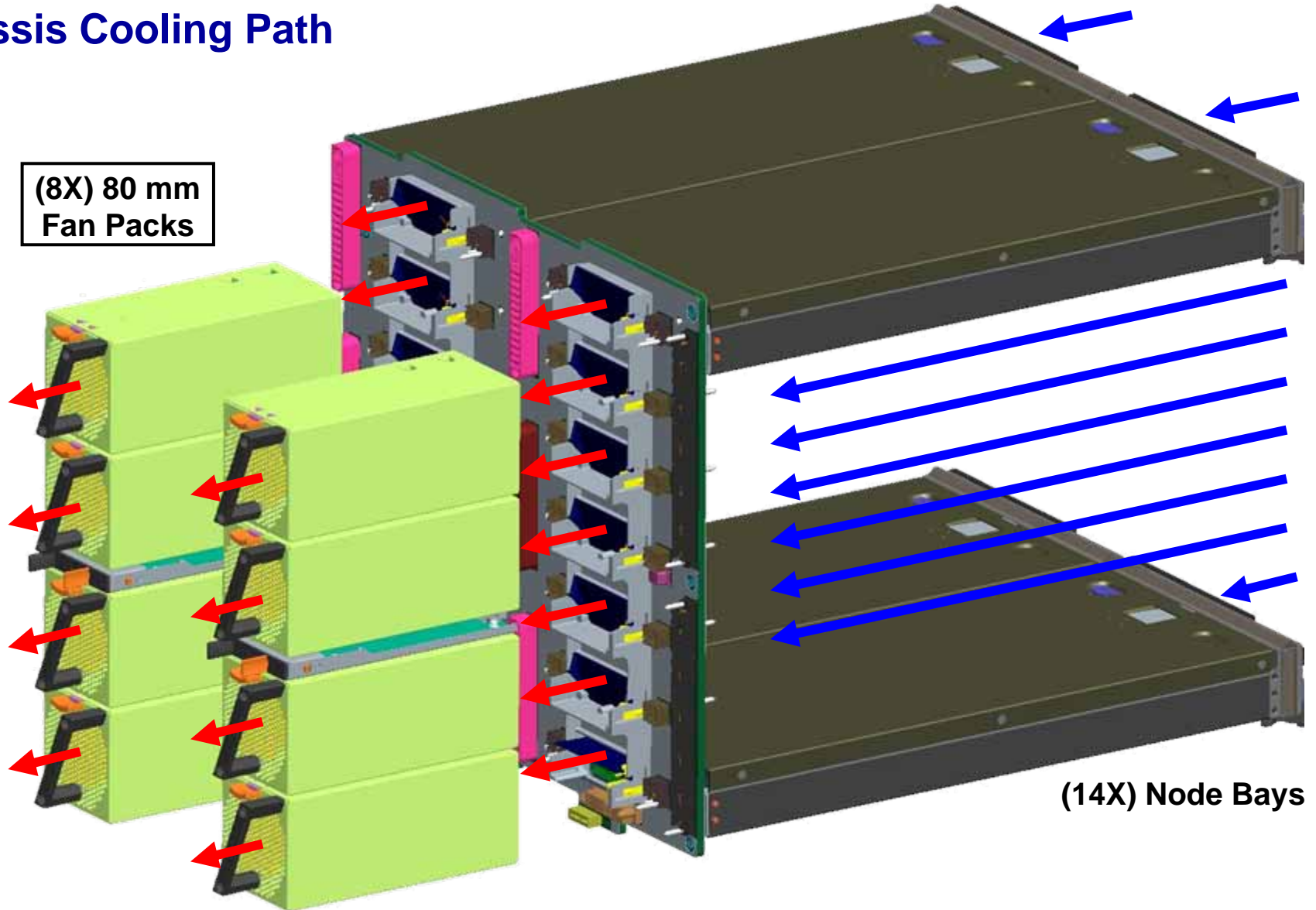
- 42U height
- 600 mm width x 1100 mm depth
 - 1200 mm deep with rear door
 - water cooled heat exchanger
- 50 lbs/EIA weight capacity
- Ship-loadable via outriggers
- Square EIA rail mount points
- Supports 4 strip (zero U) PDUs
- 3 PDU pockets per side, 6 per rack
- Plentiful cable egresses
- Cable trays front to back
- Support RDHx





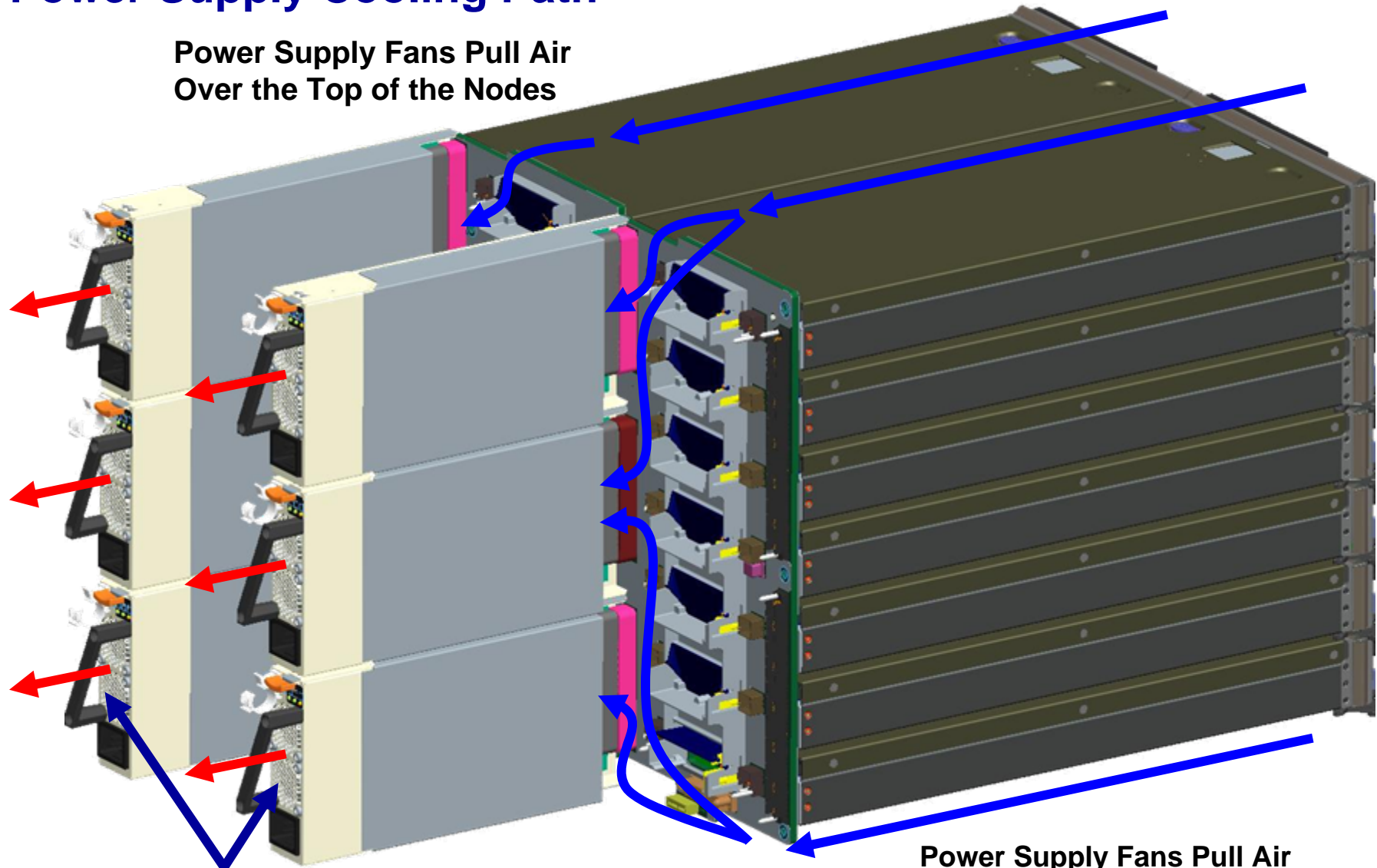
Cooling

Chassis Cooling Path



Power Supply Cooling Path

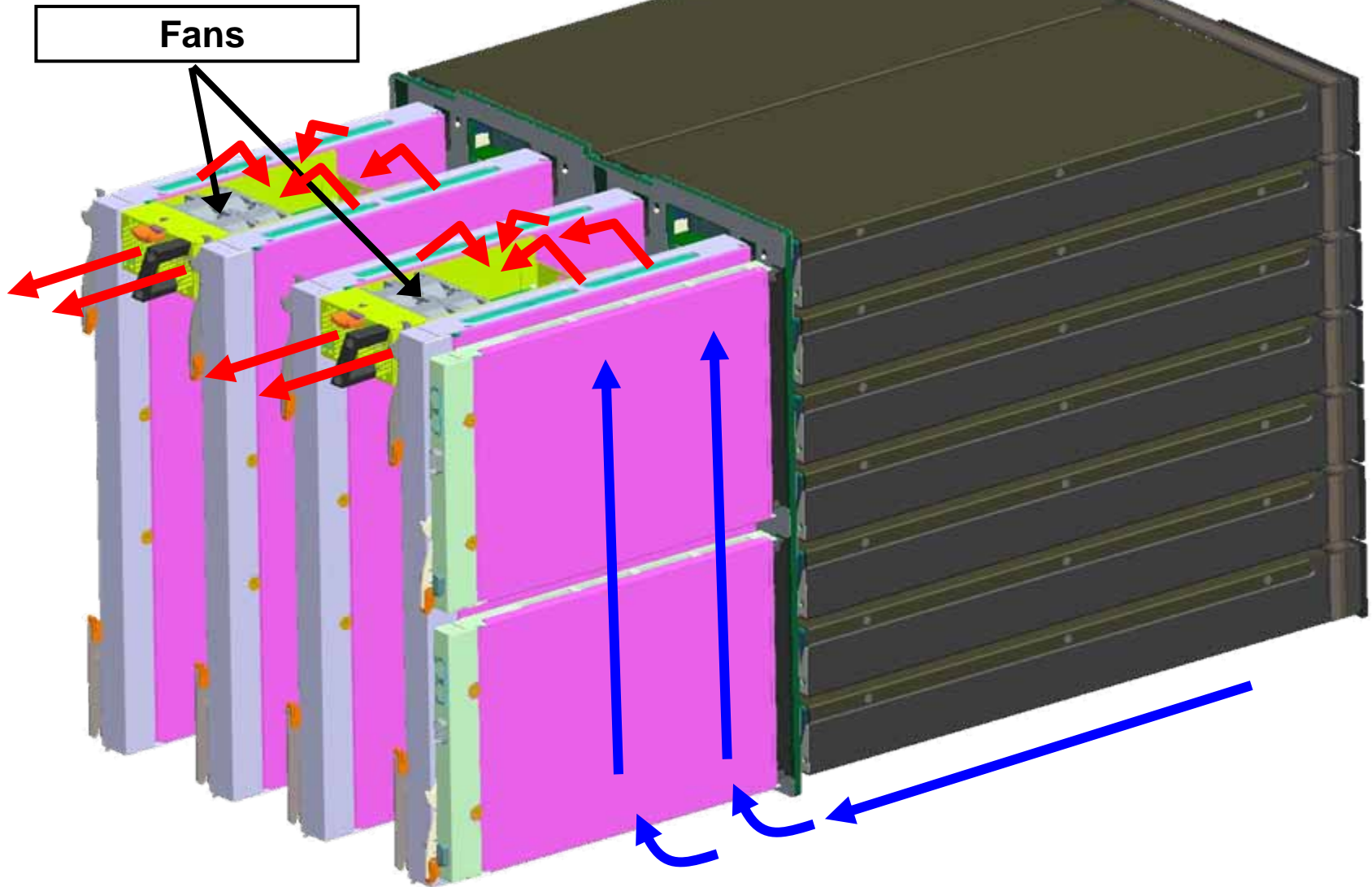
Power Supply Fans Pull Air
Over the Top of the Nodes



Power Supply Fans Pull Air
under the Bottom of the Nodes

Power Supply Fans

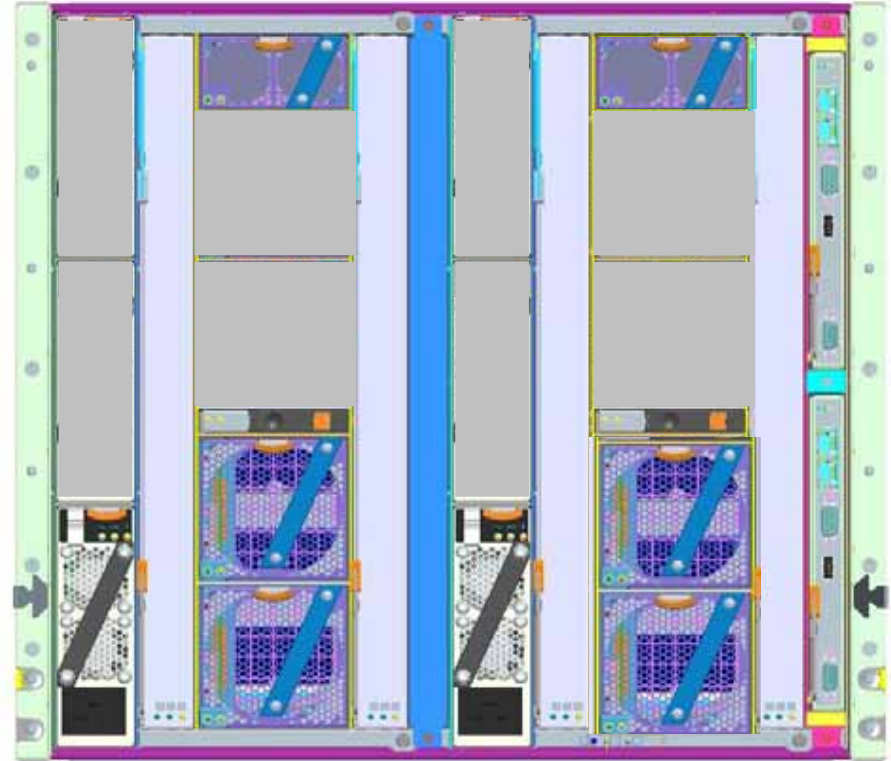
Switch Cooling Path



Chassis Cooling Fan & Power Supply population order



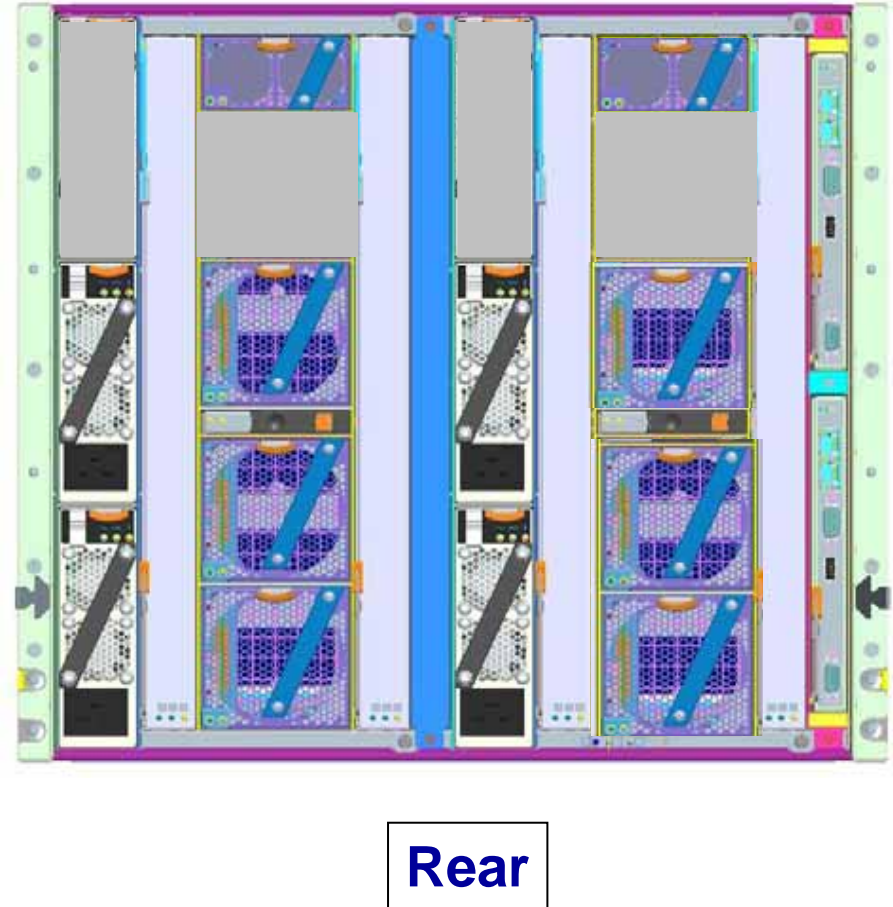
Front



Rear

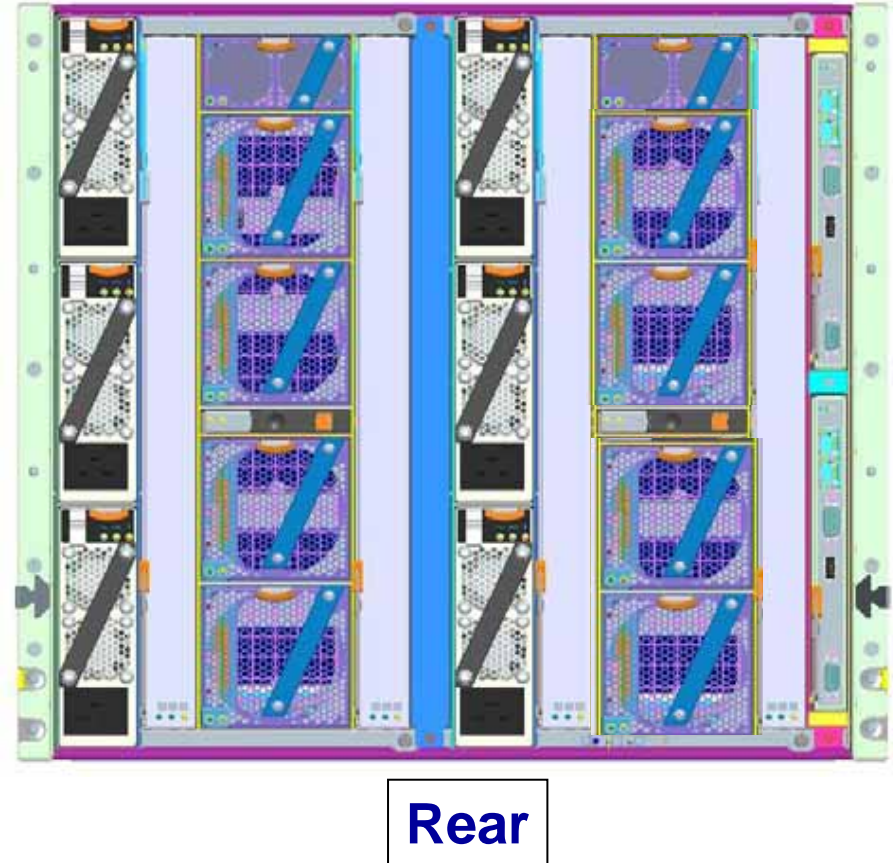
Power Supplies: N+N Redundant

Chassis Cooling Fan & Power Supply population order



Power Supplies: N+N Redundant

Chassis Cooling Fan & Power Supply population order



Power Supplies: N+N Redundant

IBM Rear Door Heat Exchanger (1164-95X)



IBM Rear Door Heat Exchanger (RDHX)(1164-95X)

- Extremely efficient option to air cooling PureFlex System Rack
- Capacity:30,000 watts (30 kVA or 102,000 BTU per hour) .
- Depending on the configuration, can **remove 100% of the heat**

Copper tubes attached to the rear door circulate chilled water.

- Chilled water removes heat from the exhaust air form servers and attachments
- Water lines in the door attach to the customer-supplied secondary water loop
- Uses industry- standard quick couplings.

Dimensions: 123 mm or 5 inches deep

- Standard #EC02 door: 25 mm or 1 inch depth
- Rack Dimensions: Overall depth is 1196 mm
- Fits onto the standard data center floor tile of 1200 mm.

Understand the IBM top line portfolio positioning

zEnterprise

Power 795

Power 770

Power 4S
Power 2S

Power
Blades

x Blades

x High End

x Volume
Rack

x Volume
Tower

PureApplication System
•WebSphere, DB2

PureFlex System

- Power 4S and 2S
- X86 4S and 2S
- Storage
- Networking

Expert integrated systems:
combine the flexibility of a
general purpose system, the
elasticity of cloud and the
simplicity of an appliance.



IBM PureFlex System



IBM PureApplication System

The integrated infrastructure market

Customers are hearing very similar claims

Converged
Systems

HP

“ . . . the industry’s first portfolio of pre-integrated, precision tuned, and optimized infrastructure solutions, delivering the fastest path to agile and efficient virtualized applications.

Unified
Systems

CISCO

“ . . . beyond convergence, delivering the first truly unified system with a flexible pool of compute, network, storage resources and embedded management to simplify operations, reduce costs, and achieve business agility.

Engineered
Systems

ORACLE

“ . . . easier to buy, own, and operate . . . integrated, tuned, optimized, identical . . . pre-assembled & pre-configured HW & SW bundles that reduce cost and ORACLE complexity of IT and increase productivity & performance.

How IBM PureSystems beat the competitors

Against:

IBM Advantages:



CISCO

- ✓ More integration, flexibility, and choice
- ✓ Single, consolidated view with intuitive GUI for all infrastructure components
- ✓ More workloads & applications – both types and quantity

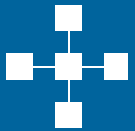



HP

- ✓ No compromise design for the next decade, not last decade
- ✓ Only UNIX / x86 consolidation platform for the future
- ✓ More than one-size-fits all

ORACLE

- ✓ Flexible and open vs. vendor lock-in up to application
- ✓ Integrates well vs. new islands
- ✓ Best software running on best hardware

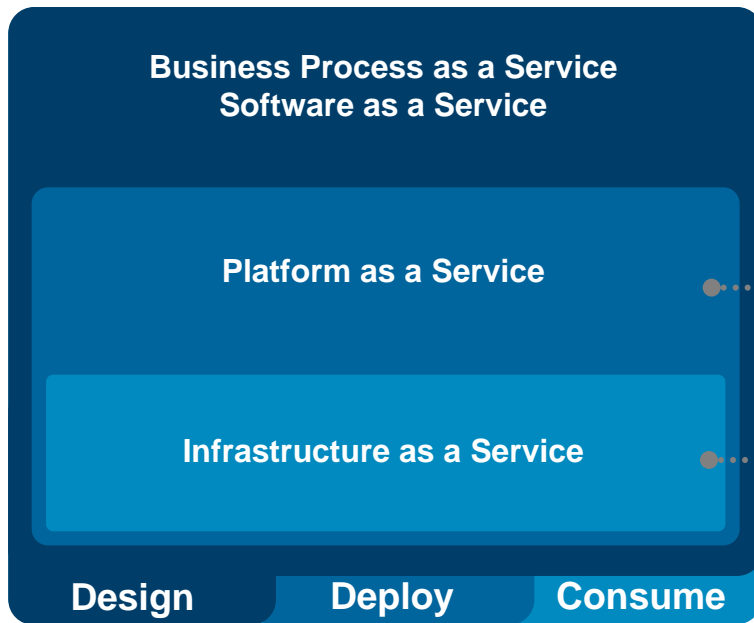
Examples of IBM PureSystems use cases

Initiative	Use Case EXAMPLE	PureSystems Value
 Consolidate	Consolidate infrastructure to a single infrastructure system	PureFlex System can deploy more than twice as many virtualized applications per square foot of data center
 Optimize	Support reallocation of compute, storage and network resources on demand	Improved agility to handle demand spikes across workloads and drive greater utilization – improve system utilization by up to 2X
 Innovate	Deploy new web application	PureApplication System with web application deployment pattern of expertise can yield up to 20-30X faster deployment with reduced risk
 Accelerate Cloud	Deliver IT services	Deeply integrated Cloud deployment and application infrastructure and server virtualization can reduce time to provision from 45 days to minutes

* Achievements to be confirmed at announcement

Built for cloud and part of IBM SmartCloud Foundation

IBM SmartCloud



IBM PureApplication System



20-30X faster deployment with application patterns expertise

IBM PureFlex System



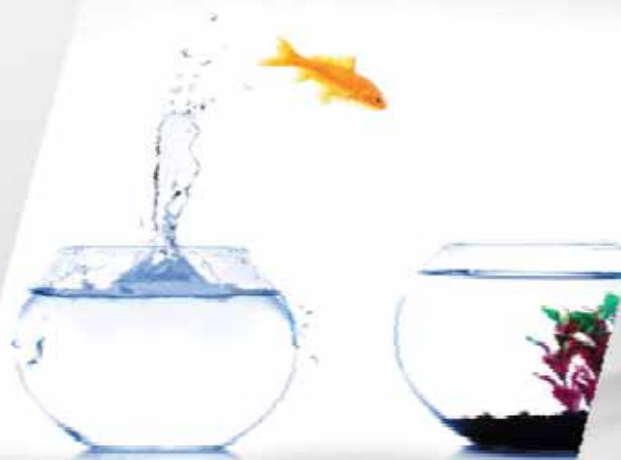
Accelerate adoption of private clouds with built-in virtualization and superior automation

Why choose IBM & IBM PureFlex Systems?

Unique Integration and Optimization



Complete systems that
are easy to develop,
deploy and manage



Enable workloads to run
efficiently in an agile
business environment



Integrate into your current IT
infrastructure through open
standards

The world's premier single-
source provider for IT
solutions



100 years in the making

- Unparalleled expertise and level of investment
- Market leading systems and software
- Commitment to open standards
- Broadest ecosystem
- Unique ability to integrate
- Unwavering commitment to client success



PureSystems

Thank You