

IBM Has Announced That ESCON Is Being Phased Out.....So what should I do now?!

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SHARE in Boston

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Agenda

- IBM System z ESCON Roadmap (*Patty Driever*)
- Intro to Managed Evolution for System z (*Mike Dailey*)
 - Mainframe evolution survey results
 - What is Managed Evolution?
- The Managed Evolution solution (*Mike Dailey & Bob Nusbaum*)
 - Managed Evolution architecture and topology
 - Managed Evolution applications
 - Customer examples
 - Managing your evolution with Optica's PRIZM FICON Converter
 - Managing your evolution with Cisco's MDS 9000 Directors
- Questions?

System z ESCON Roadmap

Patty Driever
System z I/O and Networking Technologist



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ESCON Statement of Direction

- **ESCON channels to be phased out**
 - It is IBM's intent for ESCON channels to be phased out. System z10 EC and System z10 BC will be the last server to support greater than 240 ESCON channels.
- Released April 28, 2009
- Currently, 1024 channels are supported on z10 EC and 480 channels are supported in the z10 BC

ESCON Statement of Direction

- **ESCON channels to be phased out**
 - The IBM zEnterprise 196 will be the last high-end server to offer ordering of ESCON channels.
- Released July 22, 2010
- Enterprises should begin migrating from ESCON to FICON
- IBM Global Technology Services offers an ESCON to FICON Migration solution, Offering ID #6948-97D, to help facilitate migration from ESCON to simplify and manage a single physical and operational environment while maximizing green-related savings.



ESCON Facts

- ESCON cards support ESCON (CNC), ESCON CTC (CTC), Block Multiplexor (CVC) and Byte (CBY) channel types
- Approximately 1/3 of z9 and z10 systems have CVC and CBY channels defined
- Over ¾ of System z machines currently in the field have CNC channel types defined

Managed Evolution for System z

- **What is Managed Evolution for System z?**
 - Managed Evolution for System z is a strategic infrastructure simplification solution that aligns with IBM's **New Enterprise Data Center** and **Green Leadership** initiatives.
- **Managed Evolution *conditions the System z environment* enabling customers to:**
 - Simplify the cutover to a new z platform while becoming “new workload ready”
 - **System z Recommended Best Practice:** Deploy 100% FICON channels on the host and exploit the full benefits of FICON:
 - Improved workload management
 - I/O start rate and bandwidth performance
 - In band I/O measurements
 - Extended distance
 - Multiplexing of mixed workloads of an all FICON
 - Maintain access to ESCON and Bus and Tag devices required to support key applications
 - Consolidate ESCON infrastructure and operations
- **IBM System z and Optica Technologies have collaborated to deliver the exclusive technology (Prizm) required to support this strategy**

Strategic Investments in FICON

- Continued FICON investment in the SAN infrastructure
 - Optica's Prizm solution
 - Prizm has completed a System z qualification for all ESCON devices in July 2009
 - Prizm works direct attached to a System z or with any System z qualified director
 - High Performance FICON for System z (zHPF)
 - FICON Express8 released July 31, 2009
 - I/O start rate performance improvement of 40-70% compared to FICON Express4
 - Bandwidth performance improvement of 45-100% compared to FICON Express4
 - Extended distance (i.e. XRC Acceleration)
 - 8Gb FICON support
 - New FICON product qualifications

Introduction to Managed Evolution

Mike Dailey
Vice President Sales



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zJournal Mainframe Evolution Survey

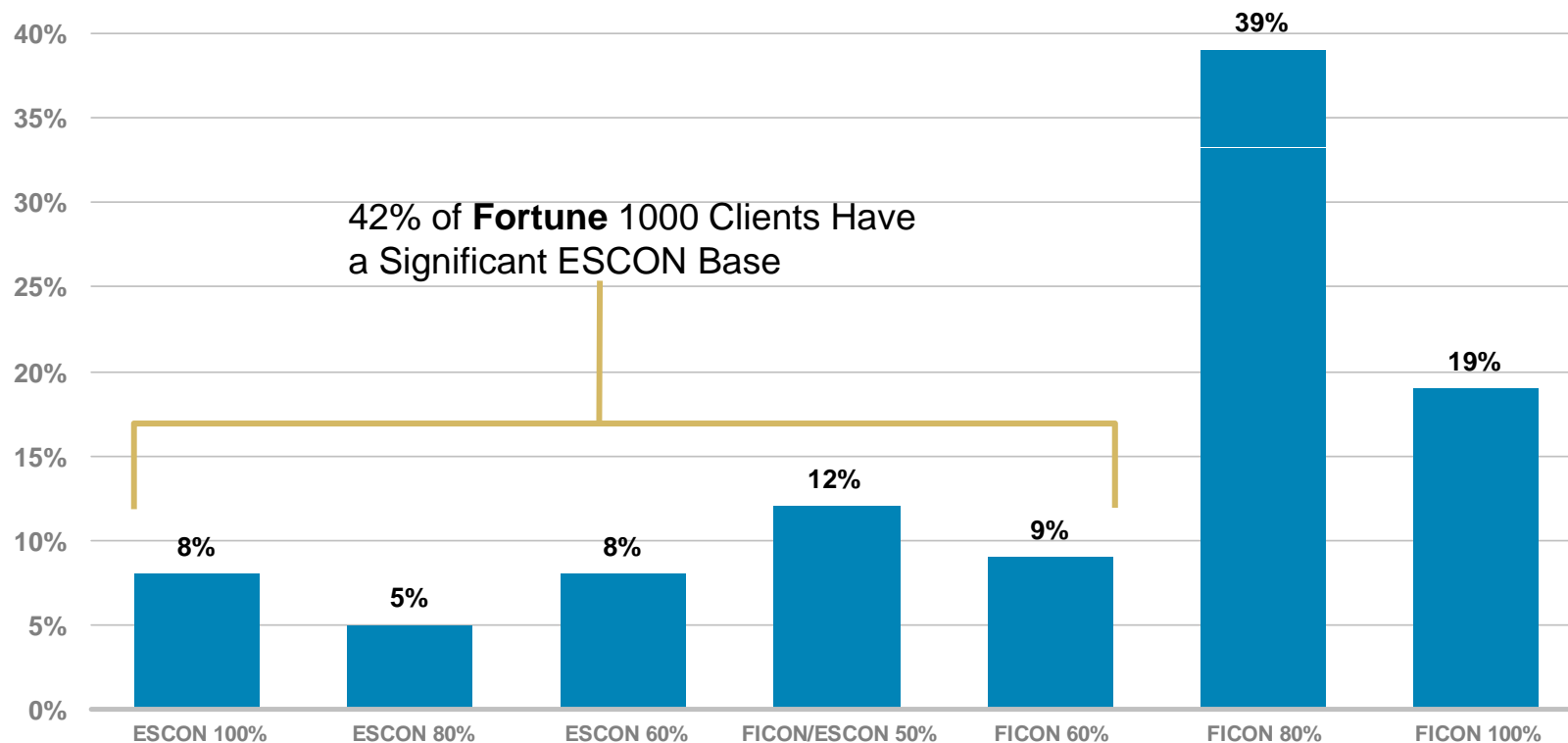


- Objective
 - To understand the FICON/ESCON usage characteristics of large enterprises utilizing System z solutions
- Demographics
 - Fortune 1000 mainframe clients
 - North America (United States and Canada only)
 - Industries: Finance, Government, Healthcare, Utilities
 - IT manager, IT staff
 - Interests: z/OS, z/VM, z/VSE, storage, networking, disaster recovery, capacity planning, performance management
- Results include channel mix, new and mature workload growth characteristics, device types, and other related infrastructure findings

You Are Not Alone...



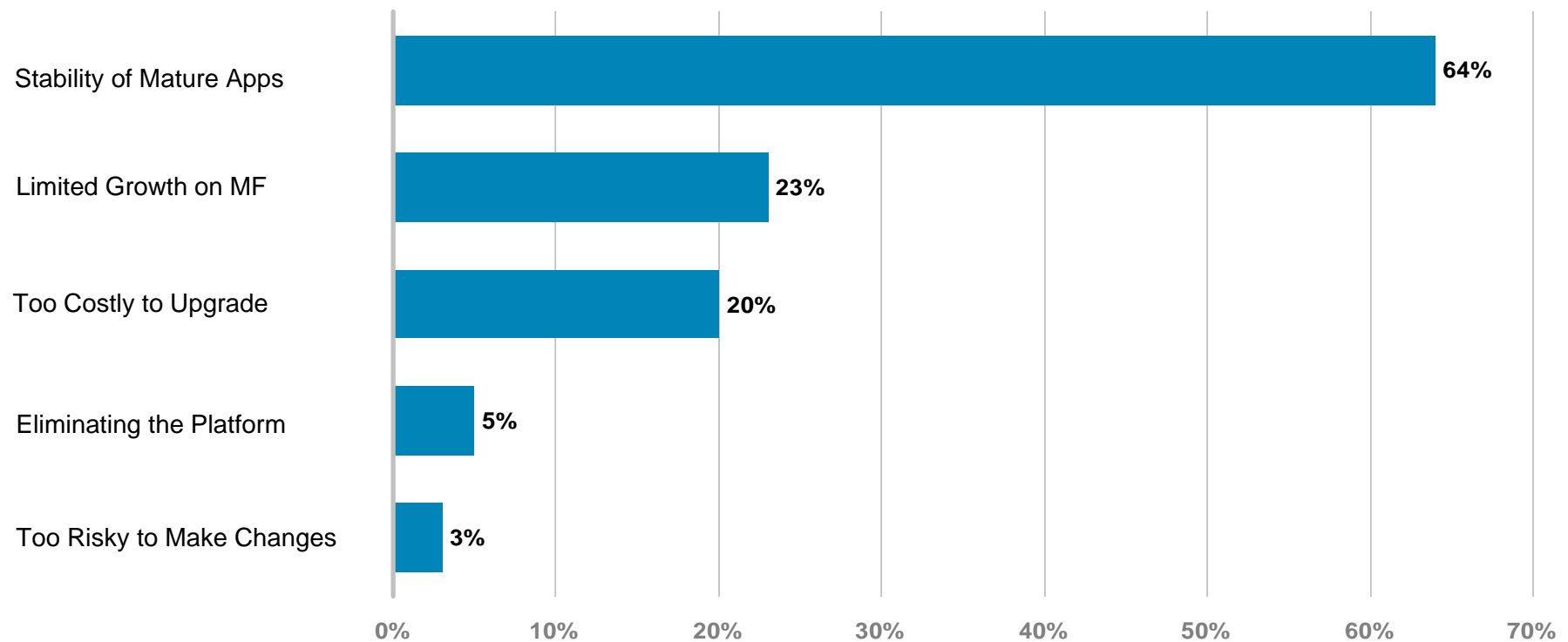
Results indicate customers are required to manage a blend of FICON and ESCON infrastructures and device types



Stable, Mission Critical Applications Remain on ESCON



What factors compel you to preserve investments in ESCON applications and device types?



Survey Conclusions

- **Conclusions**

- 8 out of 10 customers still have ESCON deployed
- Managing dual FICON and ESCON infrastructures is costly and inefficient
- The benefits of an “all FICON” on System z are significant, and not being fully exploited

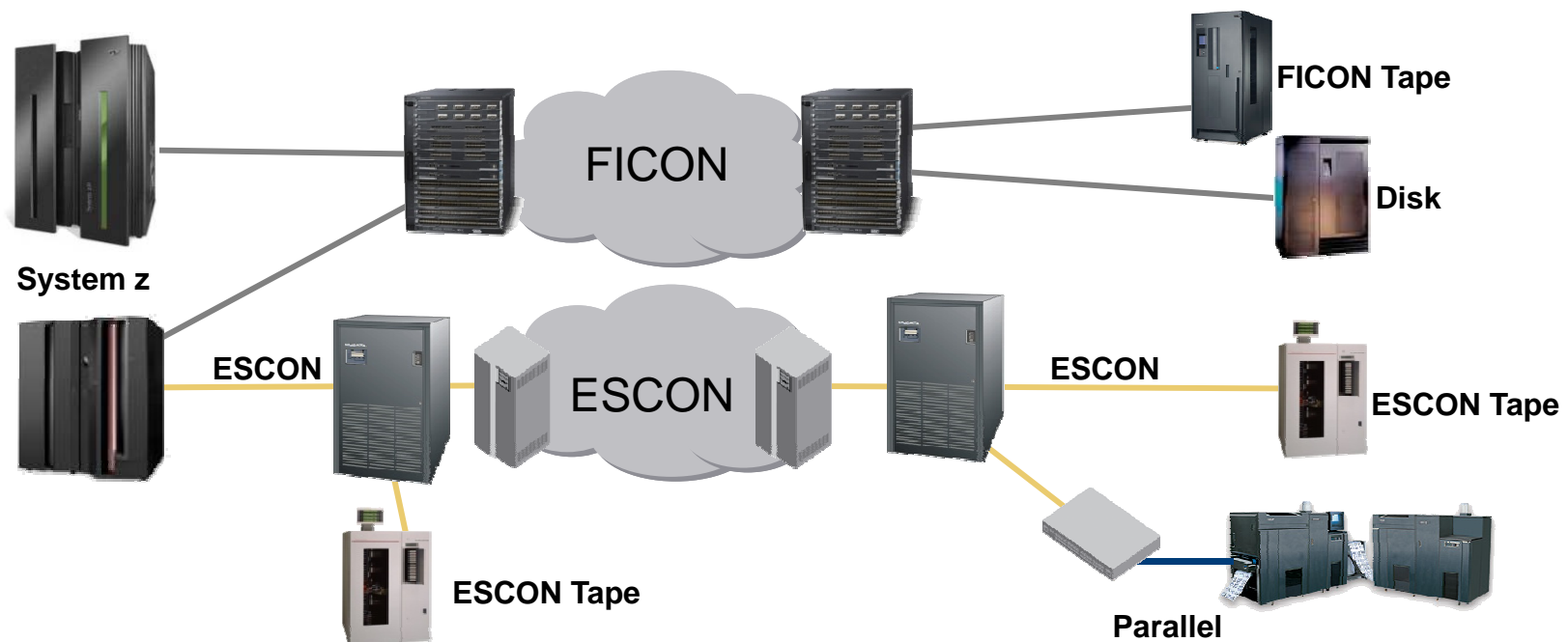
- **Challenge**

- Is there a way modernize on System z today while retaining access to mature applications and devices (ESCON and B/T)?

Today: Two Infrastructures

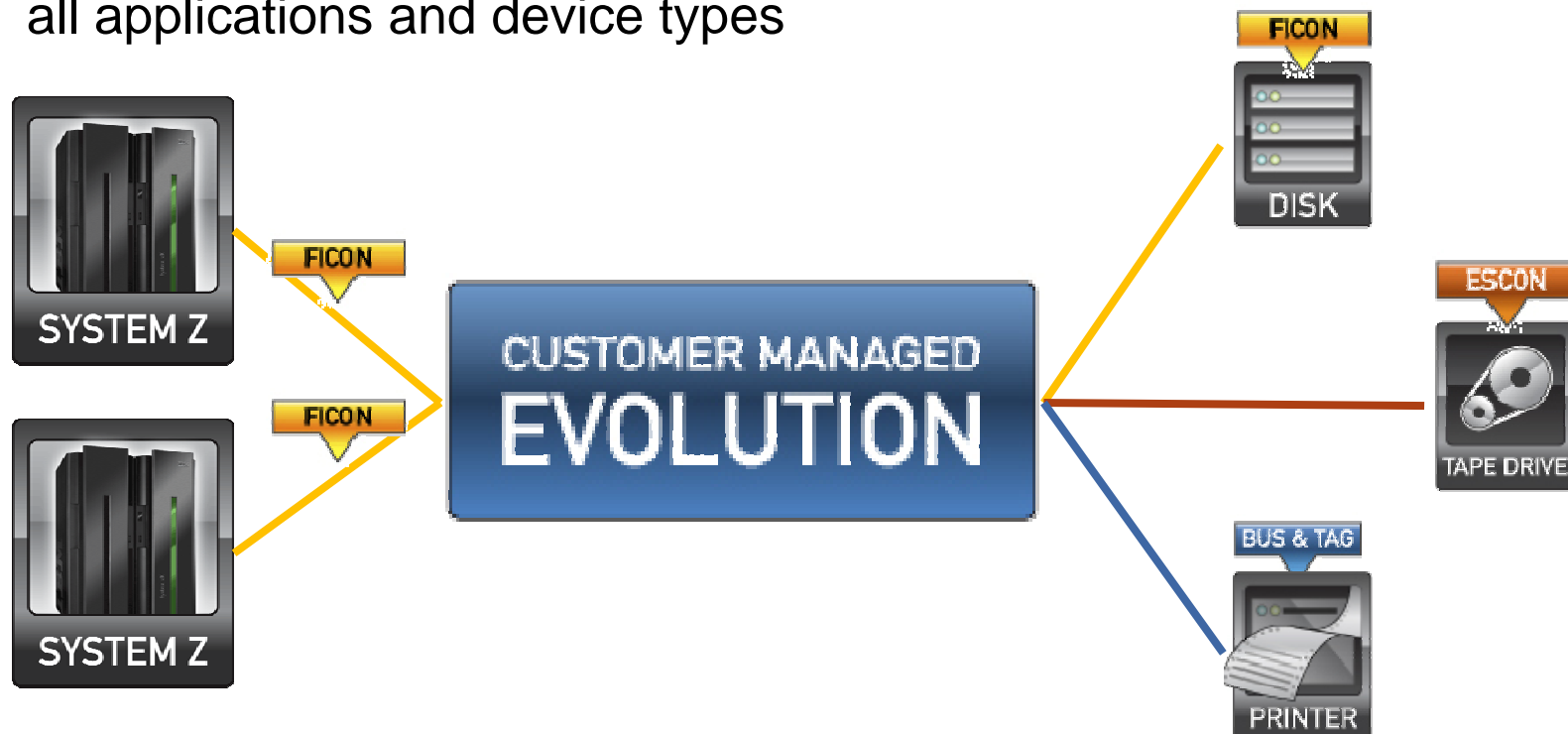
Current environment

- Dual infrastructures (FICON and ESCON)
- Local and extended distance (ESCON)
- FICON Disk and Tape
- ESCON Tape/Controllers
- Parallel Printers/Controllers



Managed Evolution for System z

- Strategically invest in System z / FICON host infrastructure modernization
- Manage your storage and other device types based on application characteristics (FICON, ESCON, Parallel)
- Migrate to a simplified host-based FICON infrastructure supporting all applications and device types



Prizm is the building block



- Prizm is a purpose built appliance designed **exclusively** for IBM System z
- Prizm converts native FICON (FC) protocol to native ESCON (CNC) protocol allowing ESCON and B/T devices to connect to FICON channels



Front View

PRIZM[™]

Rear View



2U

FICON
Ports:
LC Duplex

ESCON
Ports:
MT-RJ

Prizm Basics

- Prizm is a 2u high rack mountable system which converts 1 or 2 FICON channels into 4, 8 or 12 ESCON channels.
- Prizm is available in the following configurations:
 - 1 FICON (IN) to 4 ESCON (OUT) = 1:4
 - 2 FICON (IN) to 8 ESCON (OUT) = 2:8
 - 2 FICON (IN) to 12 ESCON (OUT) = 2:12
 - Available with long-wave (LX) or short-wave (SX) optics
- Prizm is easy to configure and install and will attach to a broad array of ESCON (and Bus / Tag) devices.

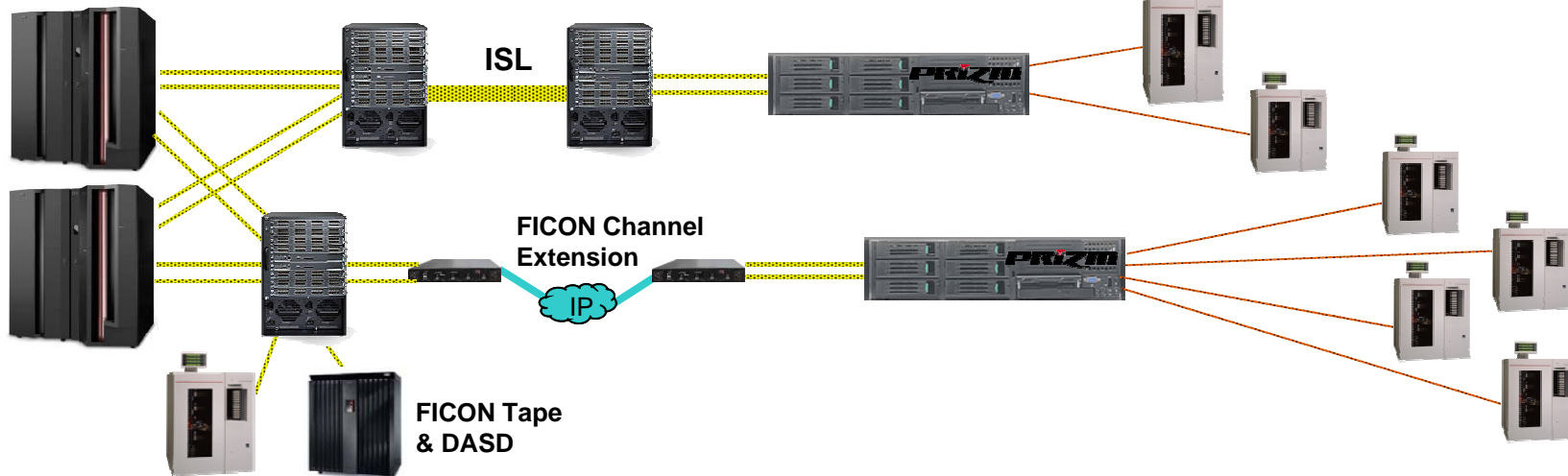
Where does Prizm fit in the data center?

1. Point to Point



2. Switched

3. Cascaded and Channel Extended

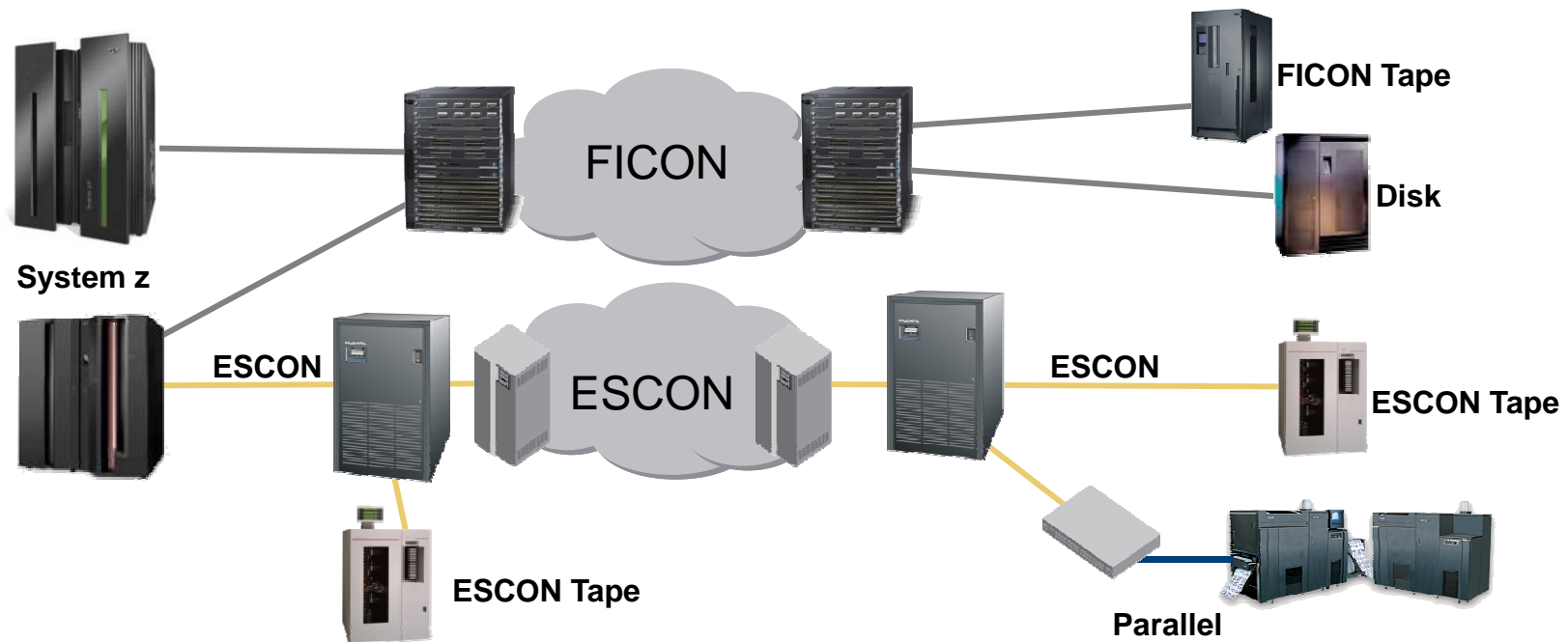


4. Support for a broad set of ESCON and B/T devices: Tape, Printers, Com Devices, FEPs etc.

Today: Two Infrastructures

Current environment

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- ESCON Tape/Controllers
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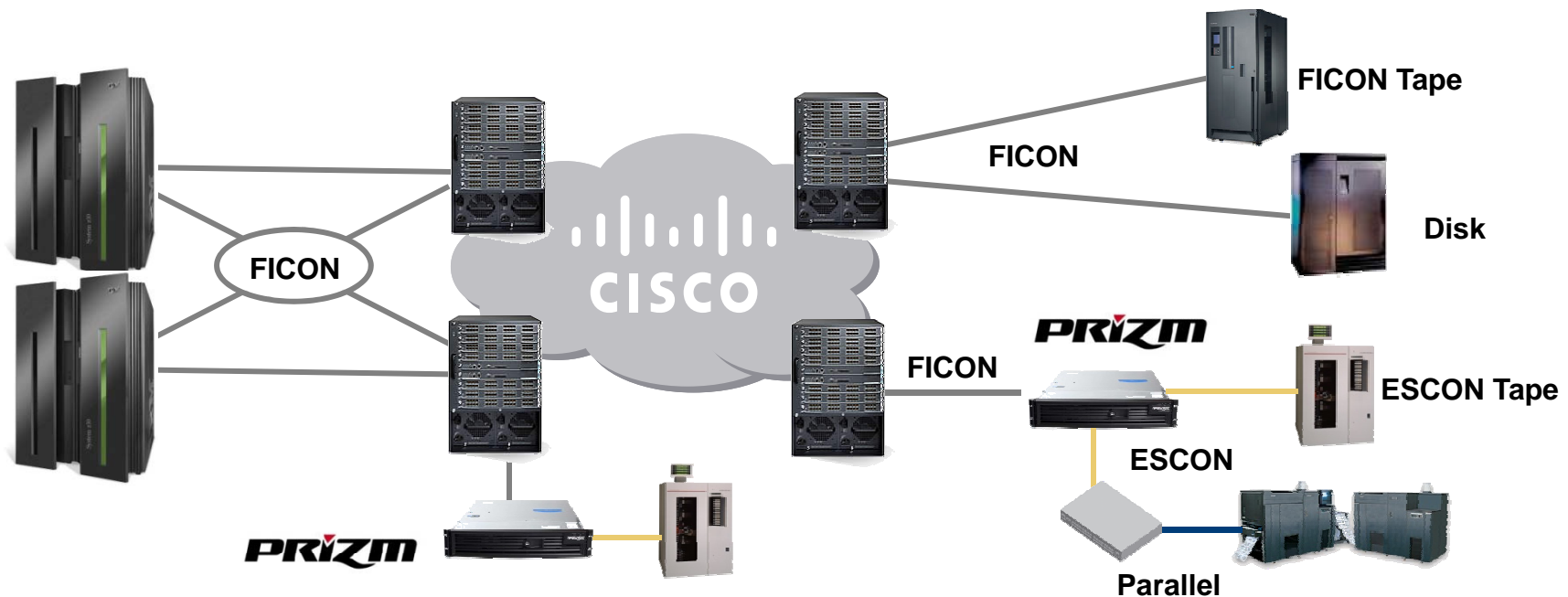


Managed Evolution Architecture



Unified, Thoughtfully Planned Migration Management

- Unified Cisco FICON MDS infrastructure
- Optica PRIZM FICON to ESCON/parallel solutions
- Turnkey Managed Evolution migration management services (EFM)
 - Planning, design, implementation and maintenance

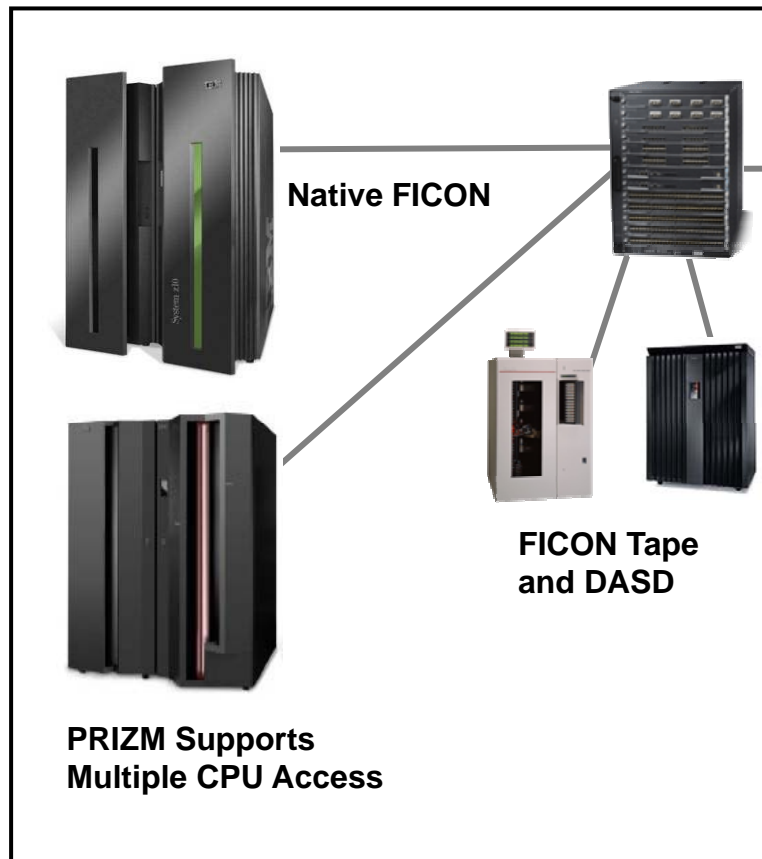


Managed Evolution Applications

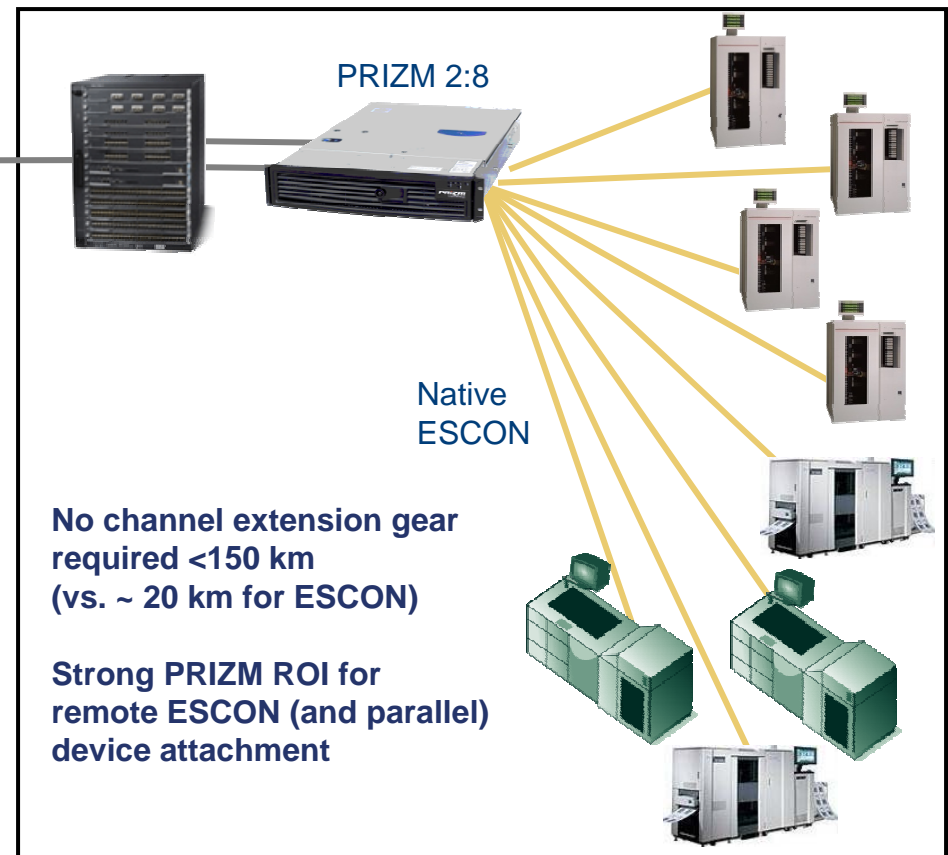
ESCON Device Extension via FICON Infrastructure



Local Site

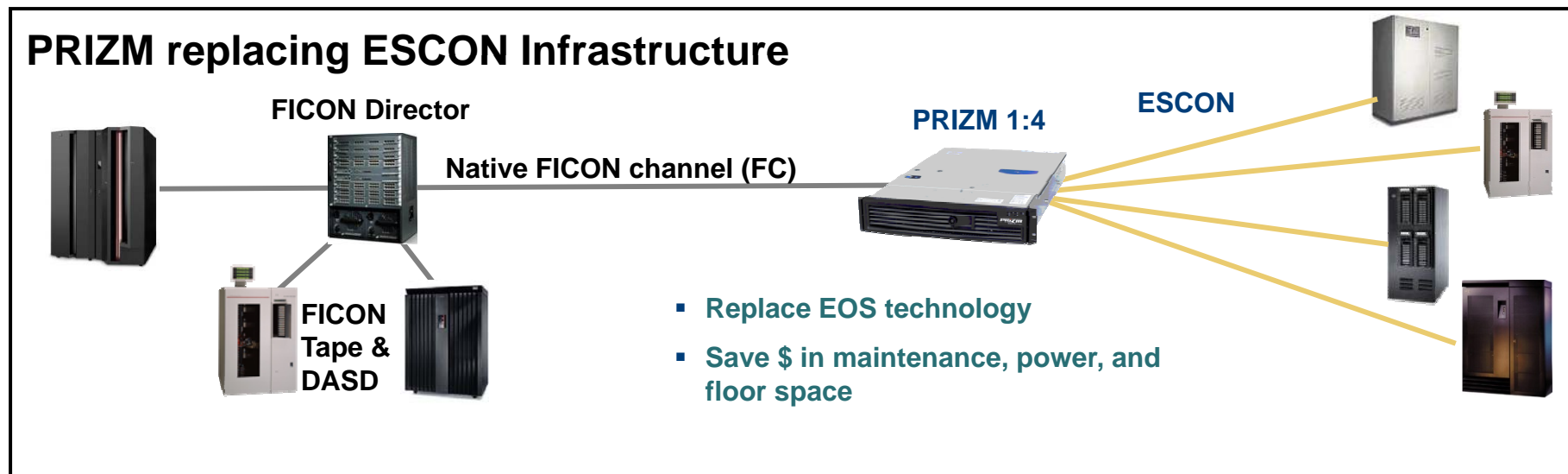
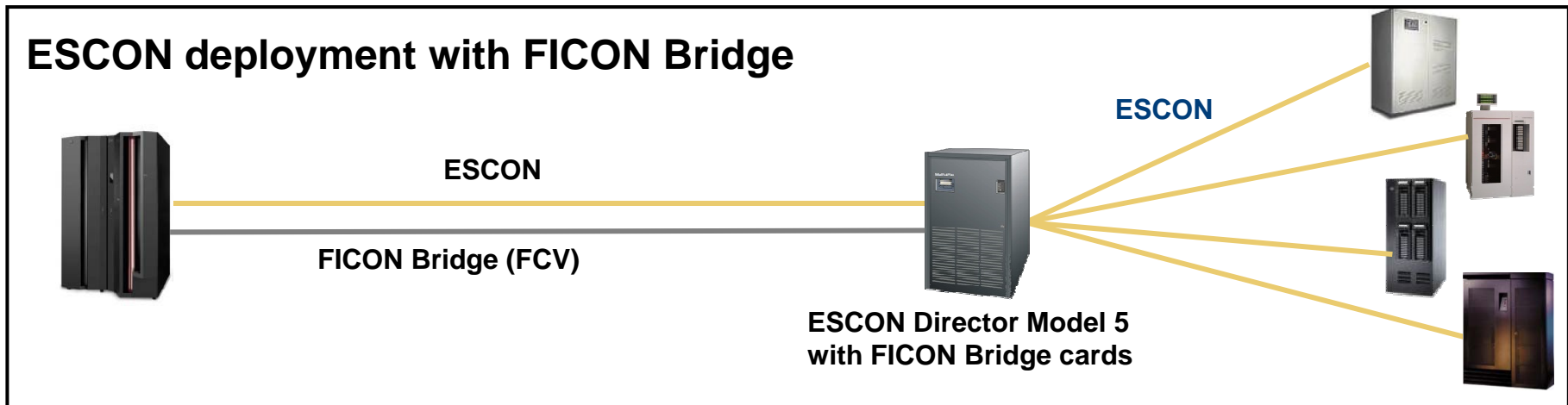


Remote Site



Managed Evolution Applications

ESCON Director and FICON Bridge Replacement





FICON to ESCON Converter



➤ Prizm – ESCON Director Plus/Minus

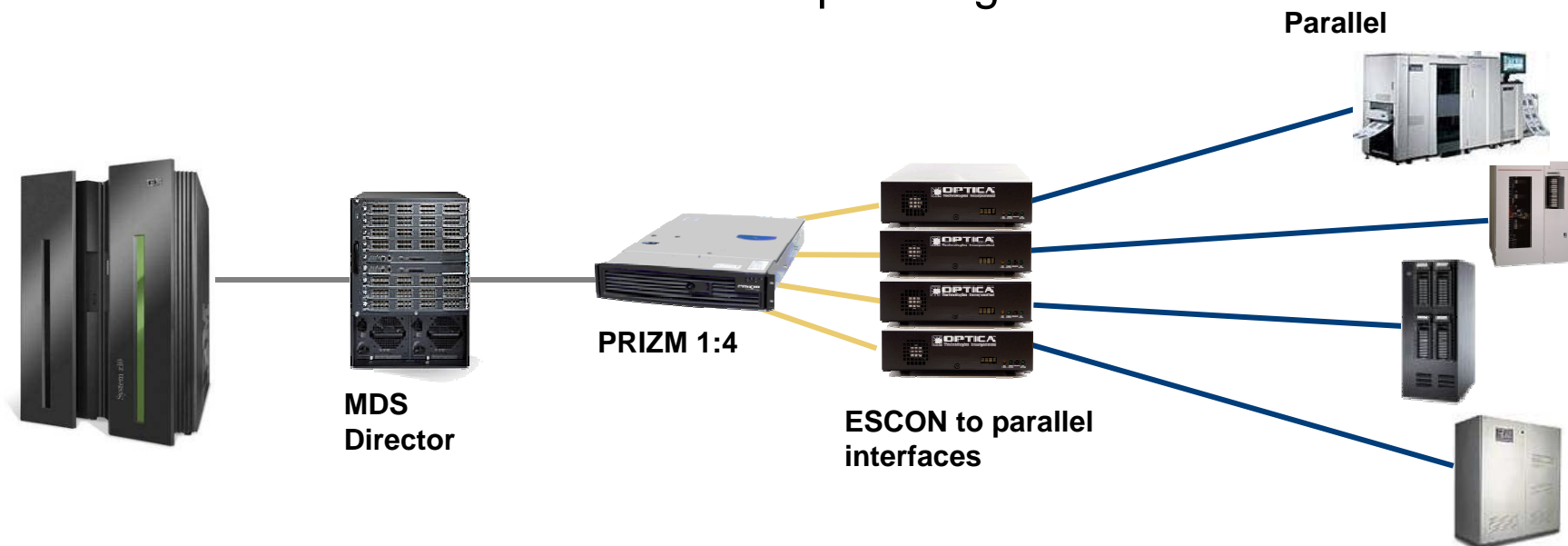
1. Native Operating Speed
2. Power Utilization (Savings)
3. Heat Dissipation (BTU)
4. Floor Space
5. Maintenance Capability
6. Maintenance Cost
7. Maintenance Status
8. GUI Management
9. Connectivity Verification Tool
10. LPAR Support
11. Current Technology Support

	ESCON Director	PRIZM
	17 MB	2 GB
	100%	7%
	6390	750
	8 Sq Ft.	2U
	Best Effort	Yes
	High	Lower
	EOS?	Open
	Yes	Yes
	No	Yes
	16	64
	EOL	10+ Years

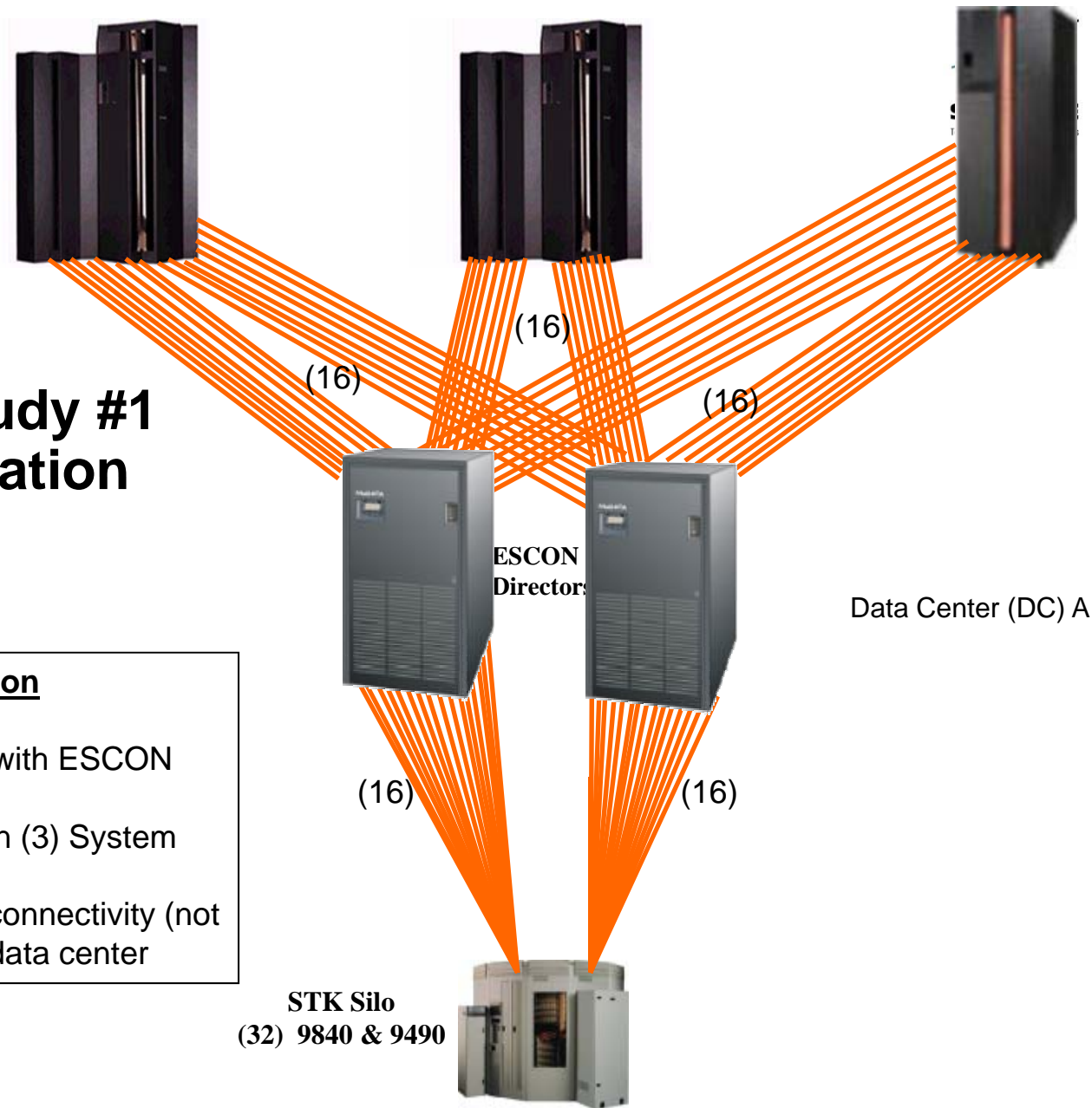
Managed Evolution Applications

Parallel device attachment to FICON channels

- Maintain installed parallel devices and applications while migrating to FICON on the host
- Parallel device channel extension via FICON
 - Attach parallel devices in remote data centers using FICON InterSwitch Links (ISLs)
- Provides infrastructure options and flexibility for mainframe refresh and new site planning



Customer Case Study #1 System z Consolidation

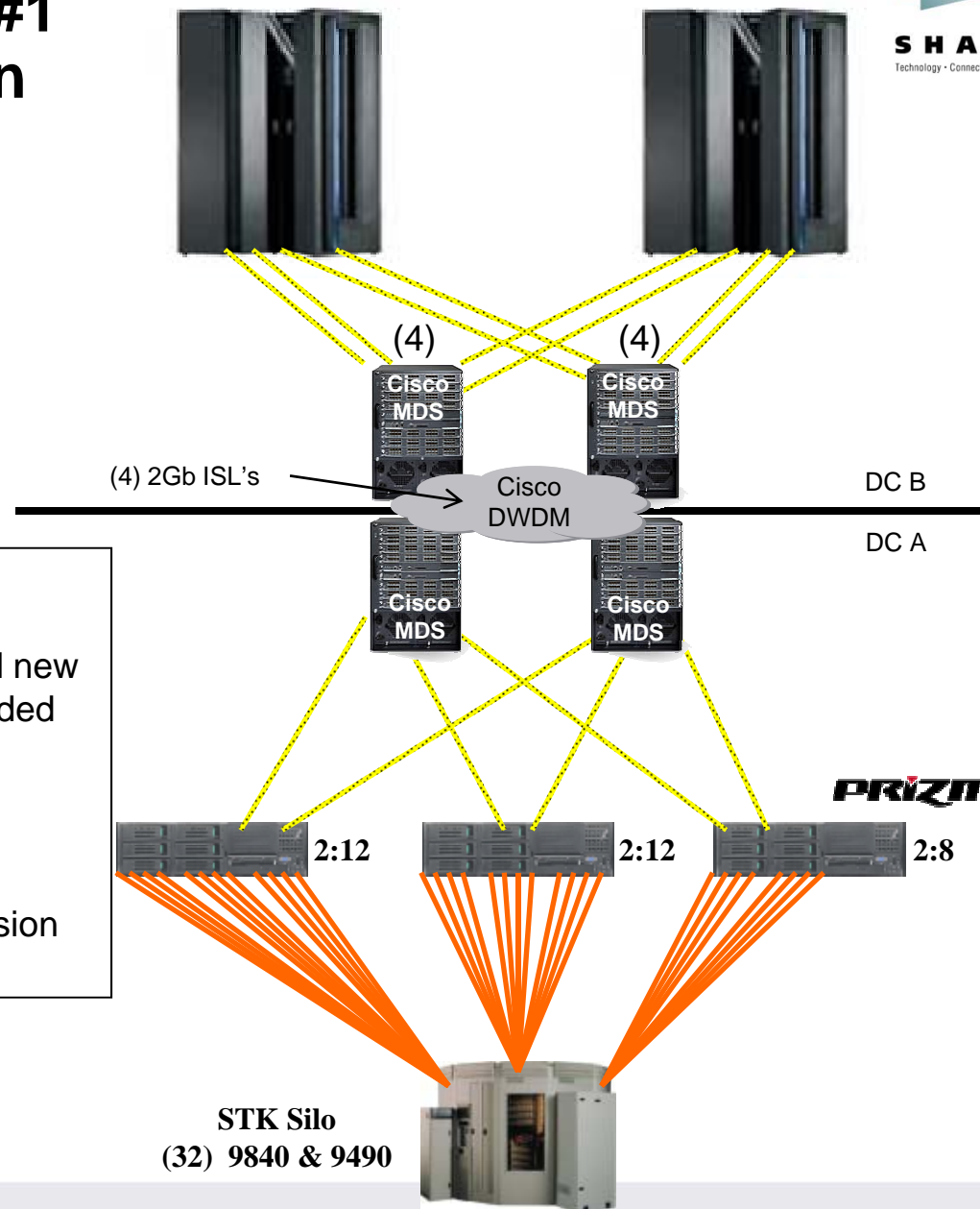


Original ESCON Configuration

- Pure ESCON infrastructure with ESCON directors in data center A
- 48 local ESCON channels on (3) System z's
- ESCON channel extension connectivity (not shown) from existing remote data center

Customer Case Study #1

System z Consolidation



Prizm Configuration

- Opened new data center (DC B), Installed new System z mainframes w/ FICON and extended FICON infrastructure to tape in DC A.
- Replaced ESCON directors
- Replaced existing ESCON channel extension to old data center

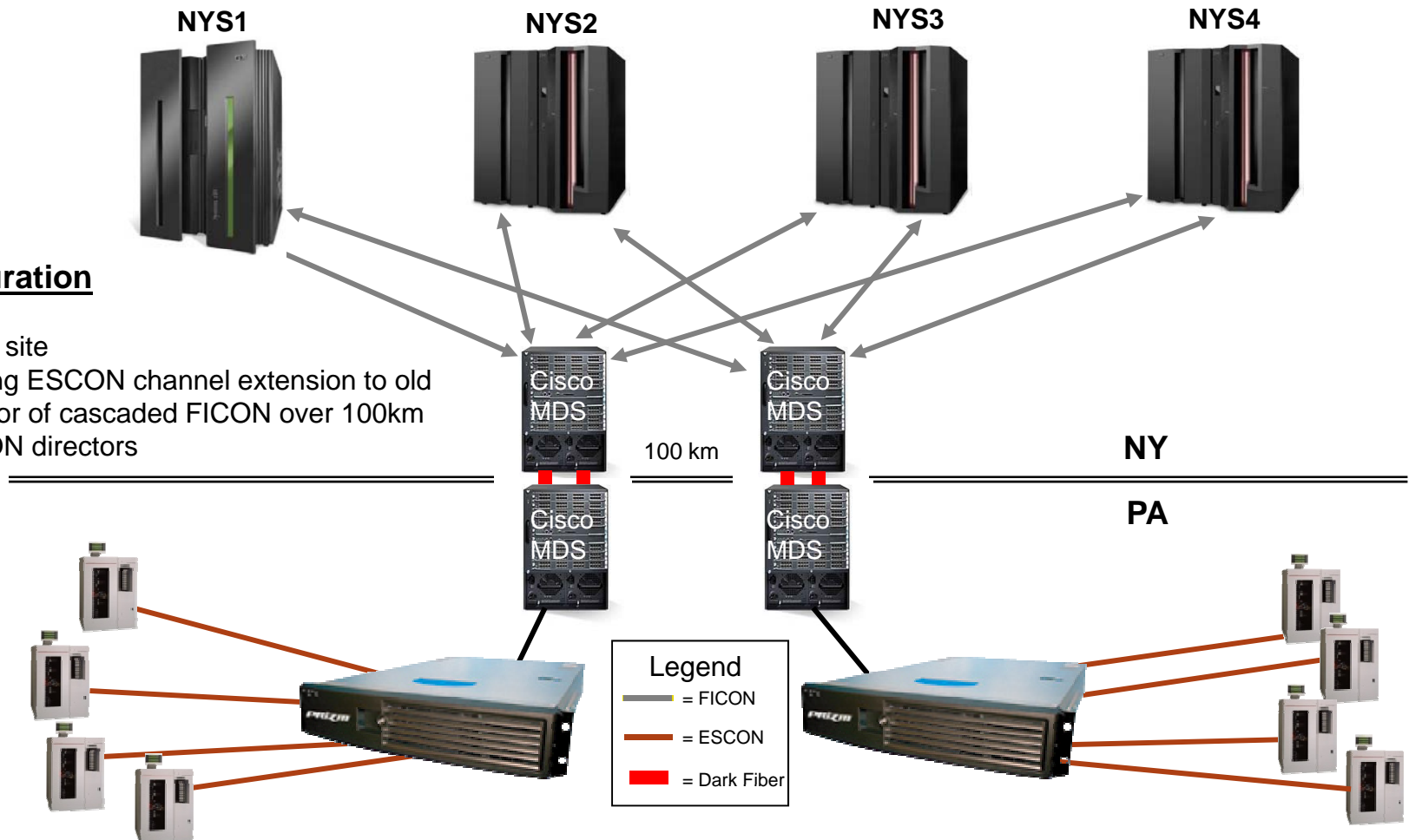
Customer Case Study #2

ESCON Channel Extension Replacement



Prizm Configuration

- Opened new DR site
- Replaced existing ESCON channel extension to old data center in favor of cascaded FICON over 100km
- Replaced ESCON directors



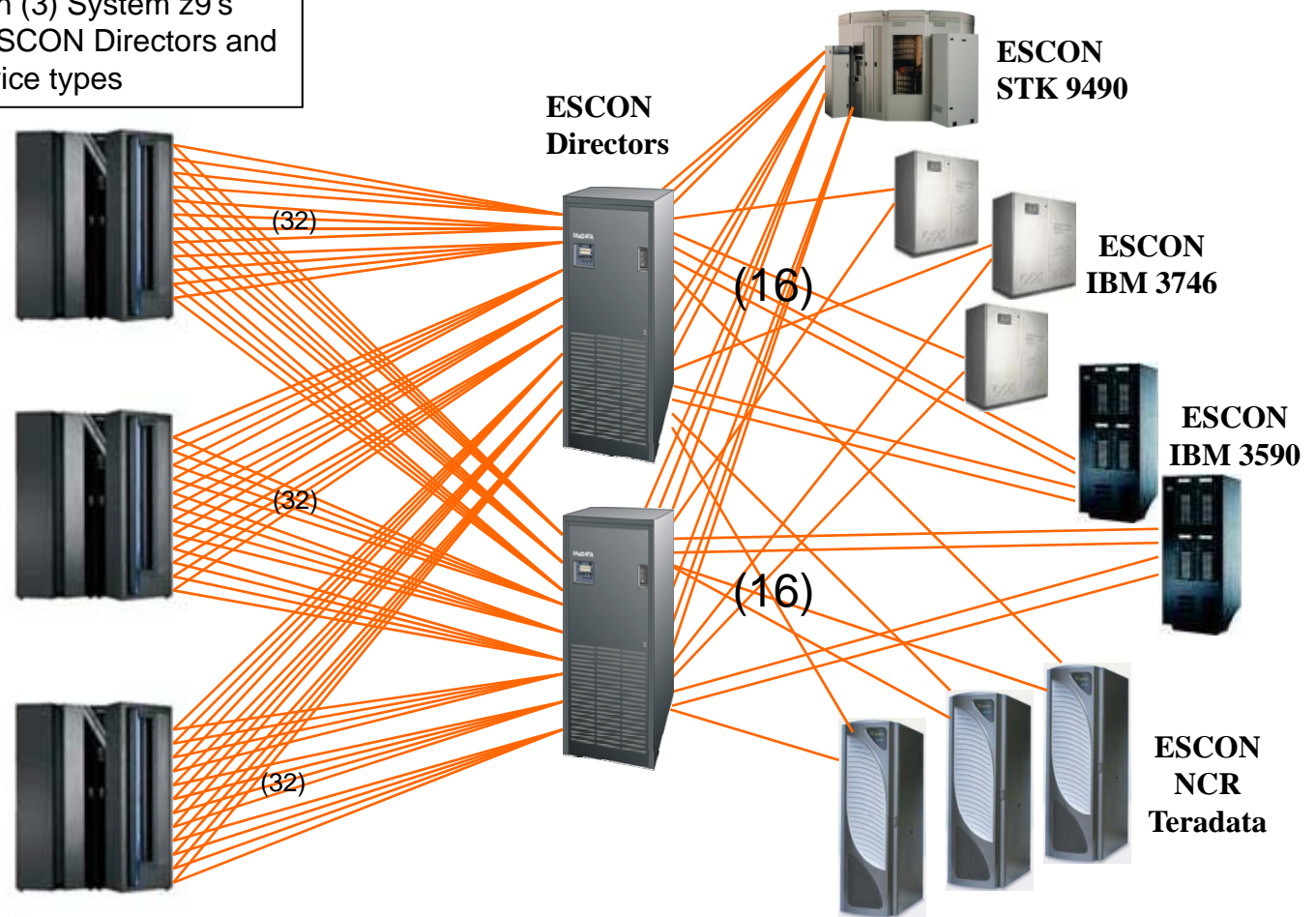
Customer Case Study #3

ESCON Infrastructure Replacement



Original ESCON Configuration

- Host: 96 ESCON channels on (3) System z9's
- ESCON infrastructure with ESCON Directors and a wide variety of ESCON device types



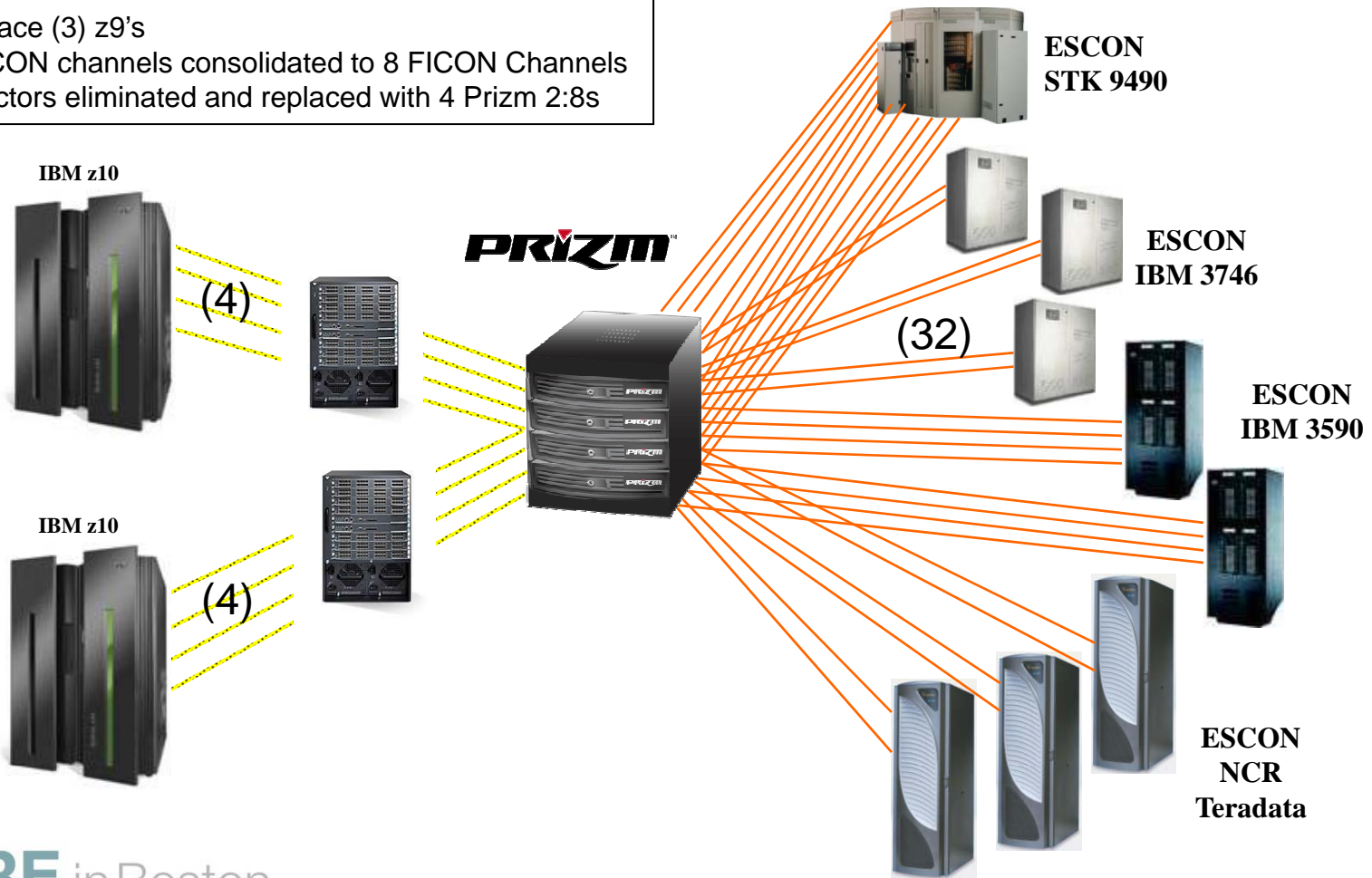
Customer Case Study #3

ESCON Infrastructure Replacement



Prizm Configuration

- (2) z10's replace (3) z9's
- Host: 96 ESCON channels consolidated to 8 FICON Channels
- ESCON Directors eliminated and replaced with 4 Prizm 2:8s



Customer Benefits

- Maximizes value of System z consolidation while reducing the “cutover” risk
- Leverages the value of FICON
- Simplifies I/O and Operations
- Eliminates ESCON as a planning consideration for System z
- Savings on ESCON director maintenance, power, cooling and floor space supports the case for transition

Predominant ESCON Applications for Prizm...



- **Tape Backup/Tape Exchange**
 - Tape has major operational infrastructure and change is expensive
- **SNA Networks/VTAM**
 - Either 37XX or CIP Networks with older ATM Technologies
- **Database Machines**
 - Teradata
- **Print**
 - Print can be ESCON or B/T – major infrastructure – collation, bursting, stacking

NONE of these applications require greater performance

What Events Drive the Change?



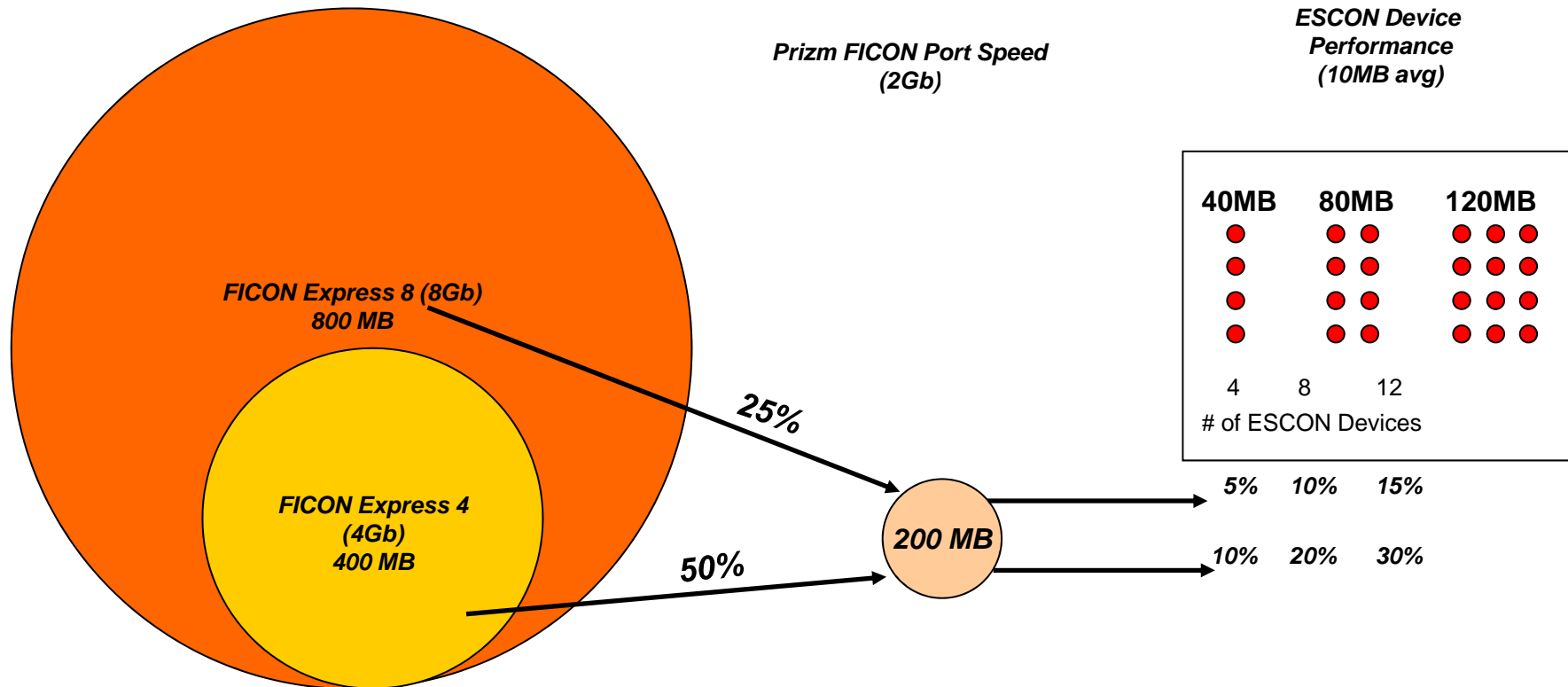
- **System z – zEnterprise 196 Planning and Upgrades**
 - 88% of Mainframe customers have ESCON or a mix of ESCON and FICON today*
 - System z recommends customers plan/move now
- **ESCON Director - Replacement**
 - 1000's of ESCON directors are still in production***
 - Plan for end of service
- **ESCON Channel Extension – Replacement**
 - Over 12,000 nodes deployed***
 - End of service is here
 - Prizm allows customer to leverage the value of FICON while reducing the cost and complexity of managing ESCON over long distances

Sources: *System z brand, ***Optica estimates

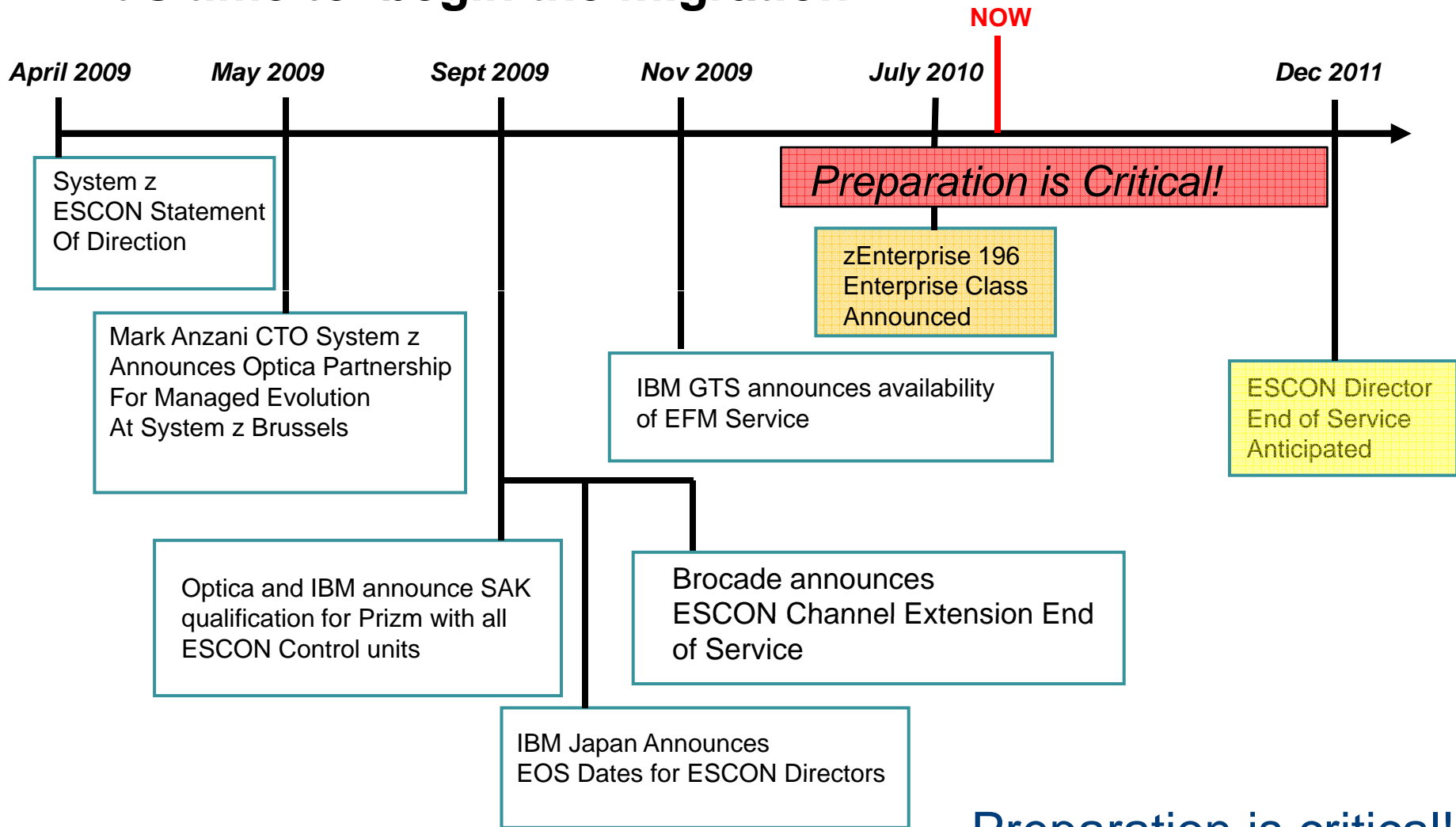
Planning for Prizm (ESCON) Bandwidth is easy!



- System z customers provision I/O with high levels of resiliency
 - 50% I/O headroom or more is the norm to deliver consistent application performance
- Prizm allows customers to share FICON CHIPIDs to service ESCON device requirements and uses a small percentage of available bandwidth
- FICON Express 8 enables customers to eliminate ESCON and consolidate FICON while increasing I/O headroom

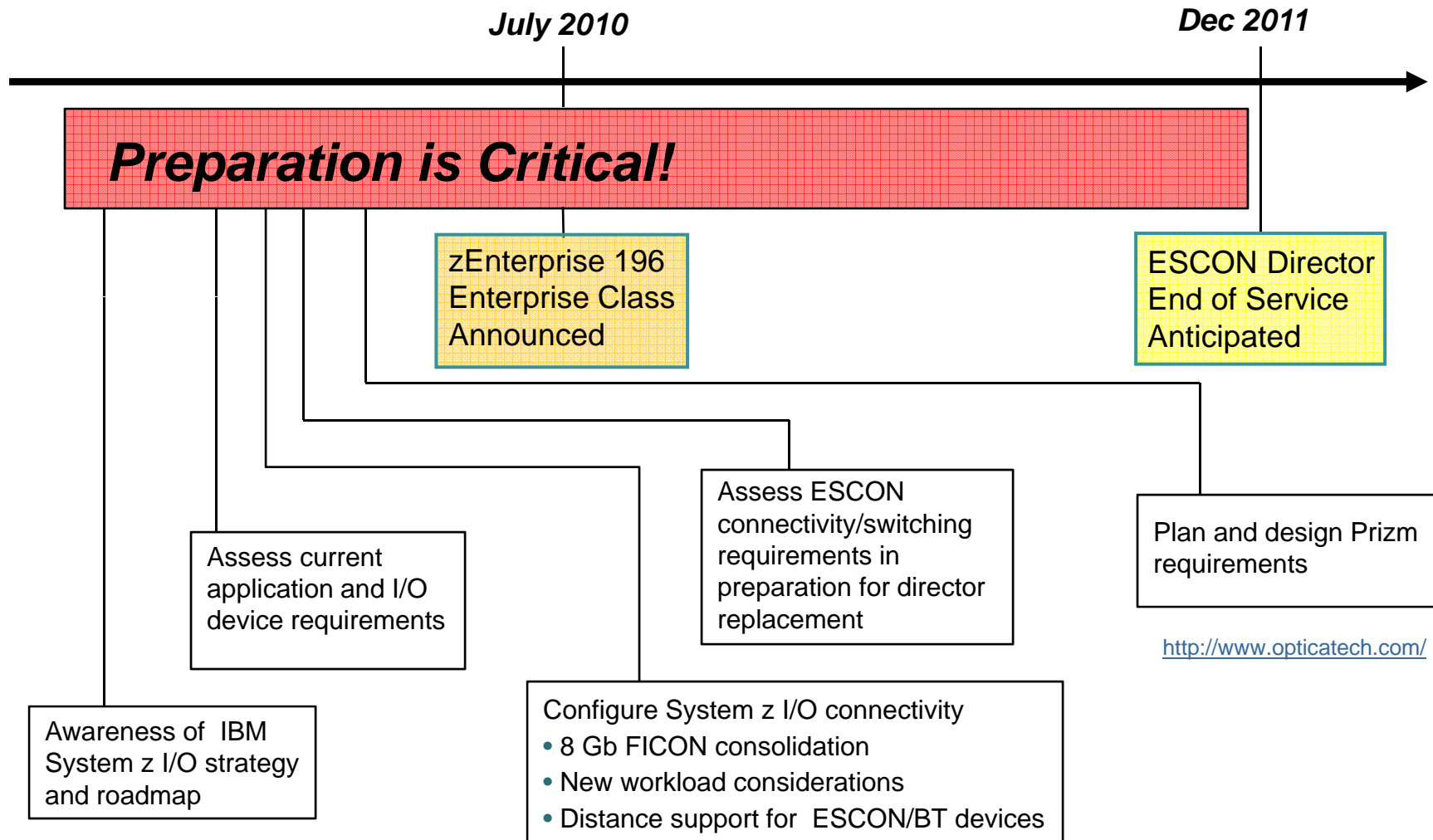


Connect the dots and the message is clear - It's time to begin the migration



Preparation is critical!

Carry On, Don't Carry Forward – Let's plan together



Managed Evolution for Your Directors

Bob Nusbaum, Cisco Software Product Line Manager,
Data Center Switching Technology Group (DCSTG)



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MDS 9500: Architected to Evolve

The Only Switches/Directors with Proven Investment Protection



Gen 1 2G Modules

FC-16 FC-32

MPS-14/2 SSM

Backward and forward compatible switching modules



Gen 2 4G Modules

FC-12 FC-24 FC-48

MSM-18/4 FC-4 (10G)

Non-disruptive upgrades



Gen 3 8G Modules

FC-24 FC-48 FC-4/44

SSN-16

Unified NX-OS with consistent features



MDS 9200 Fabric Switches

MDS 9222i
(66 ports)

MDS 9500 Directors

MDS 9513
(528 ports)

MDS 9509
(336 ports)

MDS 9506
(192 ports)

Customer Managed Director Evolution: Growing with Cisco

When you need more ports

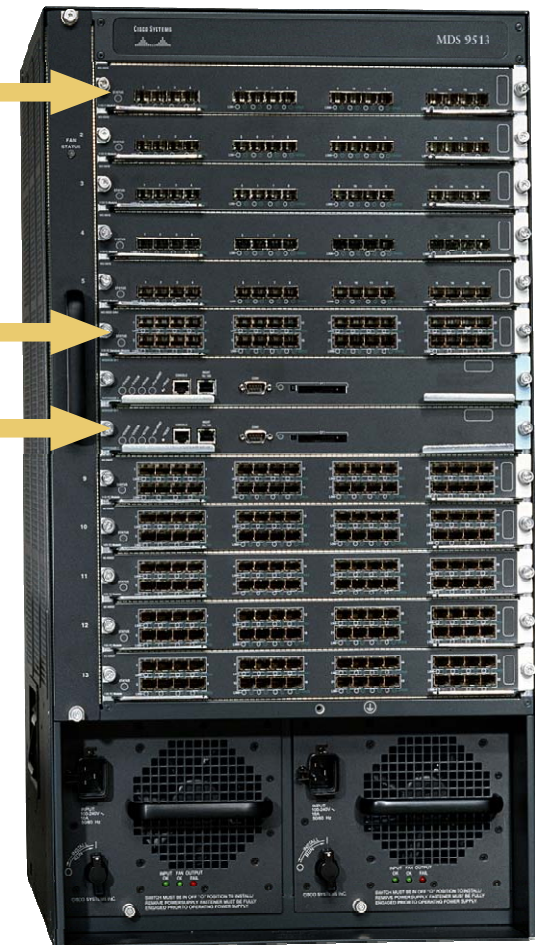
- Add a line card
- License more ports (on fabric switches)

When you need faster ports

- Add a next generation line card

When you need more processing power

- Upgrade the supervisor cards



Customer Managed Director Evolution: Growing with Cisco

When You Need More Ports

- Add a line card
- License more ports (on fabric switches)

When You Need Faster Ports

- Add a next generation line card

When You Need More Processing Power

- Upgrade the supervisor cards

When You Need More Slot Bandwidth

- Upgrade the fabric cards



Cisco Innovations Driving TCO Reductions



Scalability and Performance	Up to 528 FC Ports/Chassis and 2.2 Tbps Switching Bandwidth
Investment Protection	Seamless Speed Transition from 2G to 4G, 8G, 10G in the Same Chassis
Virtual SAN (VSAN)	Consolidation, Reduced TCO, Fault and Management Isolation
Integrated C/DWDM Optics	Reduced Costs for MAN BC/DR Applications
Multi-Protocol Support	FC, iSCSI, FICON, FCIP
Secure SAN Extension	Built-In Compression/Encryption
Unified Management	Fabric and Device Manager
Built-In Diagnostic Tools	Fabric Analyzer, FCPING, FC Trace Route, (R)SPAN
Integrated Security	ACLs, FC-SP, RBAC, RADIUS, TACACS+

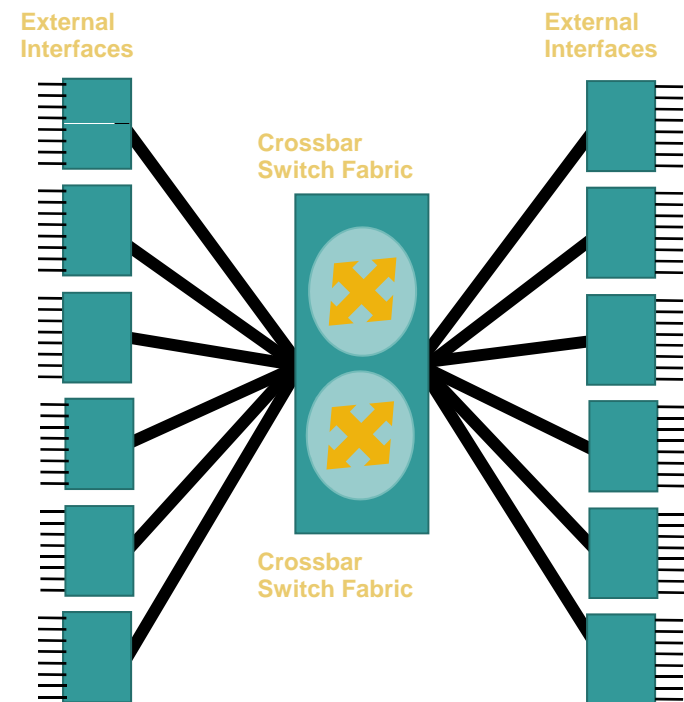
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Delivering Predictable Performance

Centralized Crossbar Switch Architecture
Evolved by McDATA, Cisco and others

Performance Features:

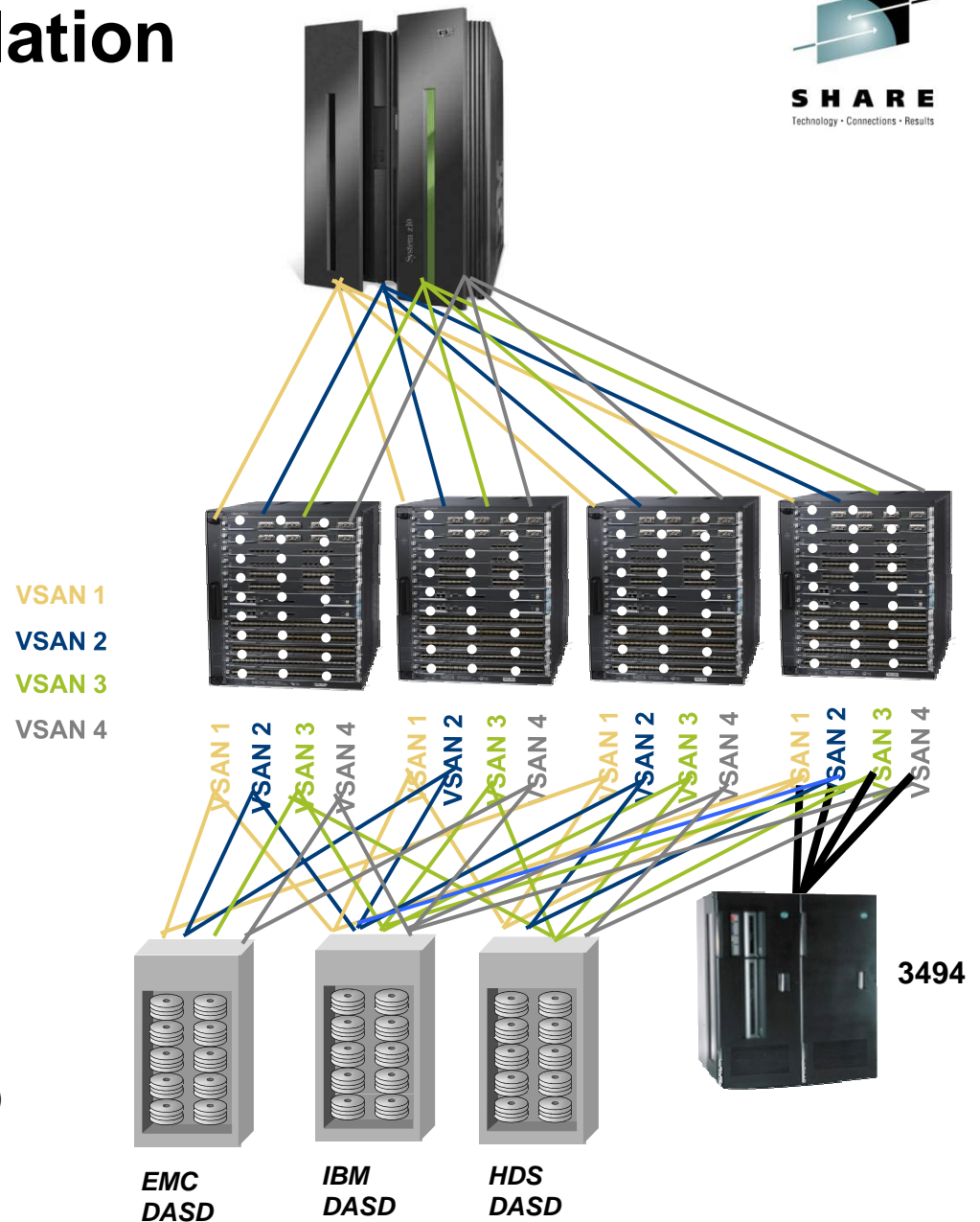
- Consistent deterministic latency—simplifies installation and change
- Any port to any port—**NO** “local switching” dependencies
- Virtual Output Queues prevent Head-of-Line blocking
- Precise Quality of Service (QoS) levels per VSAN



VSANs: End-to-End Isolation of Workloads



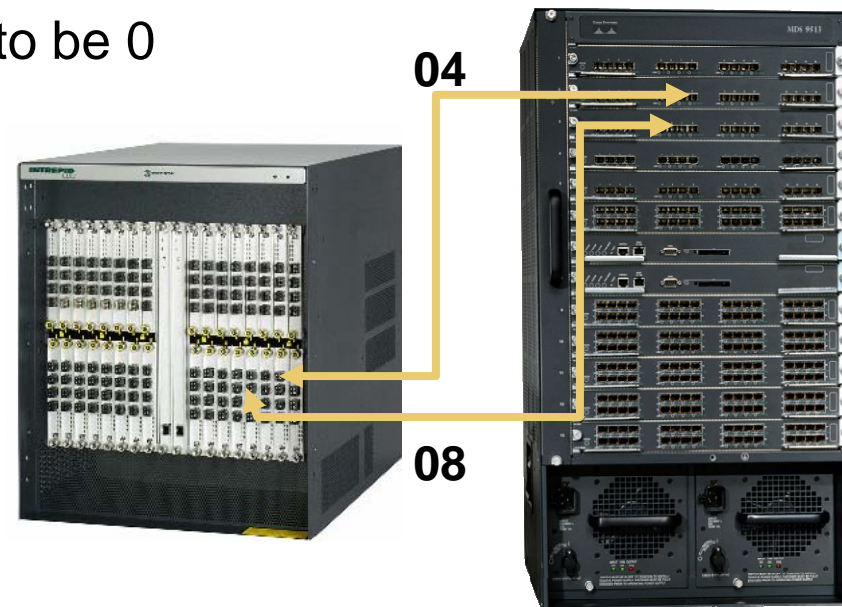
1. Scale hardware up to 528 ports (MDS 9513)
 - Even multiple ESCON CUs won't stress a FICON port
2. Create FICON VSANs (like LPARs on the switch)
 - Hardware-isolated partitions of ports from one or more switches
 - One to 250 ports per VSAN (FICON architectural limit)
 - Up to eight FICON VSANs per chassis
 - NO special hardware required
3. Virtualized resources in VSANs
 - Each VSAN has its own fabric services:
 - Domain ID, CUP, QoS, etc.
 - FICON port addresses assigned to each interface can be re-used across VSANs (e.g., port 0x1C in domains 0x19 and 0x12)



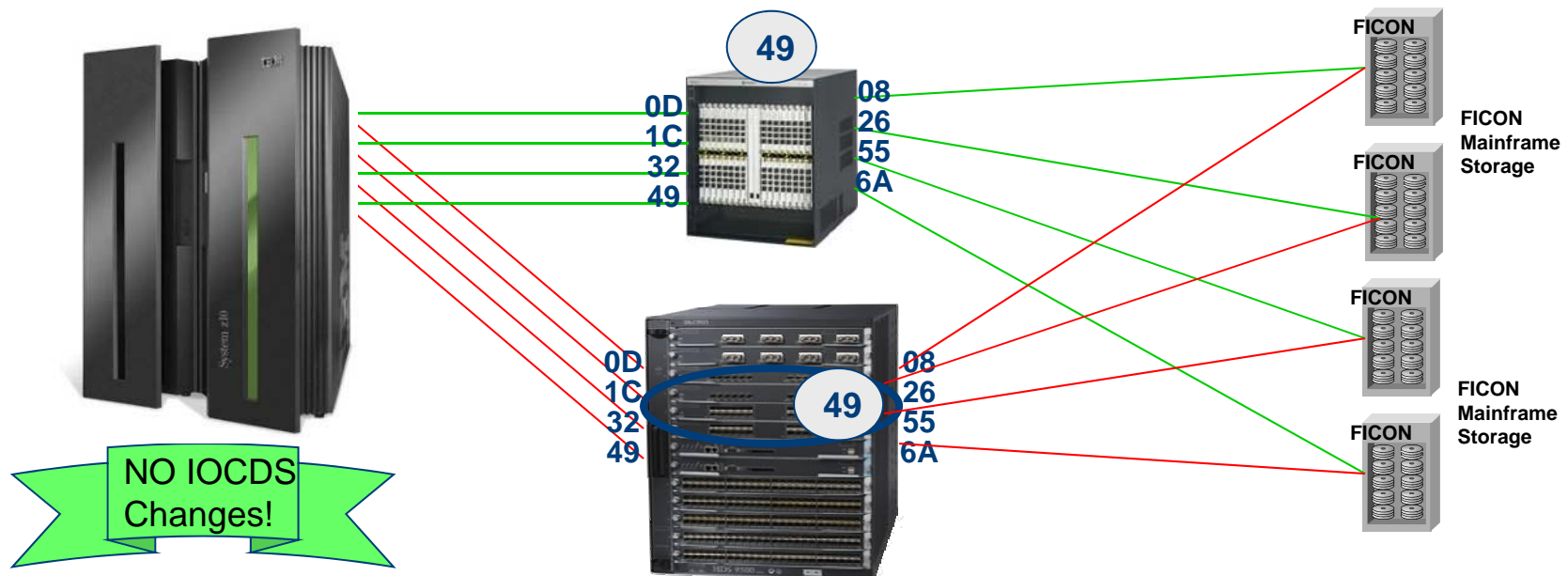
Port Remapping

Port Remapping:

- Any FICON port address on any slot/port
Since SAN-OS 3.0
- Reduce number of HCD / IOCDs changes needed for migration
- First port address does not have to be 0

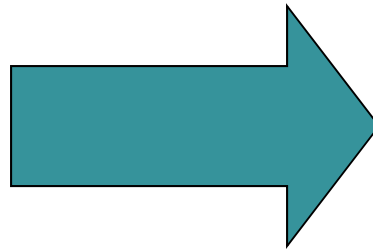


Evolution Made Simple: Old to New FICON



1. Install MDS 95xx in parallel to old director
2. Create VSAN w/ same switch # (domain ID) on MDS 95xx
3. Assign same FICON port numbers as director to be retired
4. Vary ALL devices offline
5. Move each cable to port with same FICON port #
6. Vary ALL devices online

Evolve Your Channel Extension



MSM 18/4 line card for
MDS 9500 directors

Integrated Channel Extension for XRC and tape based on director line card saves:

- Floor / rack space
- Power and cooling
- DWDM Transponder equipment (via integrated optics)
- Expensive service contracts
- Management complexity

Meet the New Box – Same as the Old Box!



MDS 9506



MDS 9509



MDS 9513



Questions?



Managed Evolution

Parallel, ESCON, and FICON Co-existence

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