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

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Session # 8183

Tony Almeida
Cisco

Patty Driever
IBM

Sean Seitz
Optica

Speakers

Tony Almeida

Consulting SE
Data Center Switching

Cisco

Patty Driever

System z I/O and
Networking Technologist
IBM

Sean Seitz

Vice President

Technical Services
Optica Technologies

Agenda

- IBM System z ESCON Roadmap *(Patty Driever)*
- Intro to Managed Evolution for System z *(Sean Seitz)*
  - Mainframe evolution survey results
  - What is Managed Evolution?
- The Managed Evolution solution *(Sean Seitz & Tony Almeida)*
  - 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

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 systems and 480 channels are supported in the z10 BC. z196 EC supports a maximum of 240 ESCON channels

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 Statement of Direction

- **ESCON channels to be phased out**
  - **The IBM zEnterprise 196 (z196) will be the last high-end server to support ESCON channels**: IBM plans not to offer ESCON channels as an orderable feature on high-end System z servers which follow the z196 (machine type 2817). In addition, ESCON channels **cannot be carried forward** on an upgrade to such a follow-on server. This plan applies to channel path identifier (CHPID) types CNC, CTC, CVC, and CBY and to feature code numbers 2323 and 2324. **System z customers should continue migrating from ESCON to FICON**. Alternate solutions are available for connectivity to ESCON devices.
- Released February 15, 2011
- 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.
- Notes:
  - This new Statement of Direction supersedes the previous ESCON SOD in Announcement letter 110-170 of July 22, 2010. It also confirms the SOD in Announcement letter 109-230 of April 28, 2009 that "ESCON Channels will be phased out."
  - This SOD does **NOT** say that the z10 BC will be the last midrange server to support ESCON channels or the last to offer ESCON channels as an orderable feature.

ESCON Facts

- ESCON cards support ESCON (CNC), ESCON CTC (CTC), Block Multiplexor (CVC) and Byte (CBY) channel types

- The majority of System z installs include some amount of ESCON channels
  - Configured as one of the above channel types
  - Block Multiplexor and Byte channels are not extinct

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 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)
    - Initially released on z10 systems
    - Supported by major enterprise-class DASD control unit vendors
  - 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

Sean Seitz
VP Technical Services

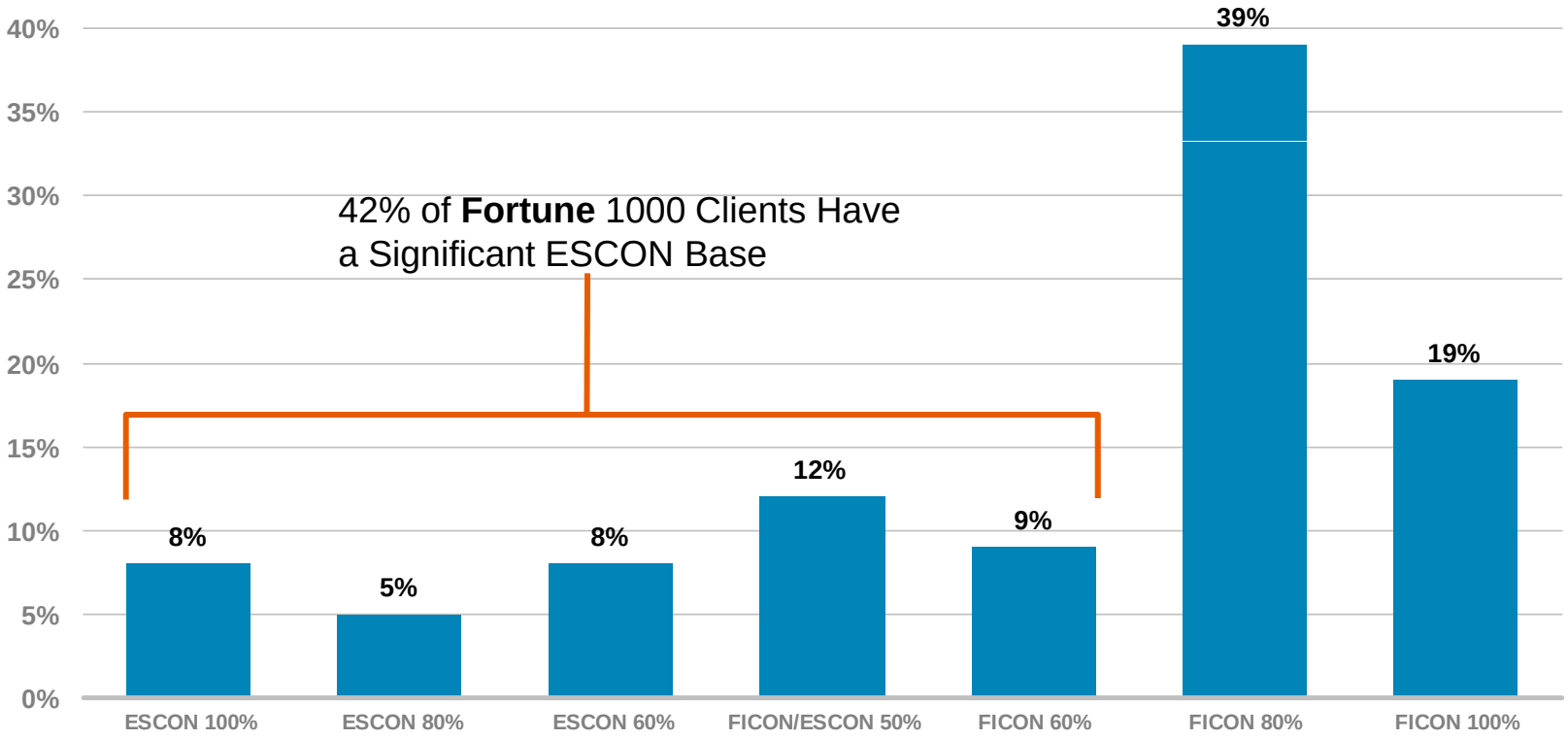
OPTICA™

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…

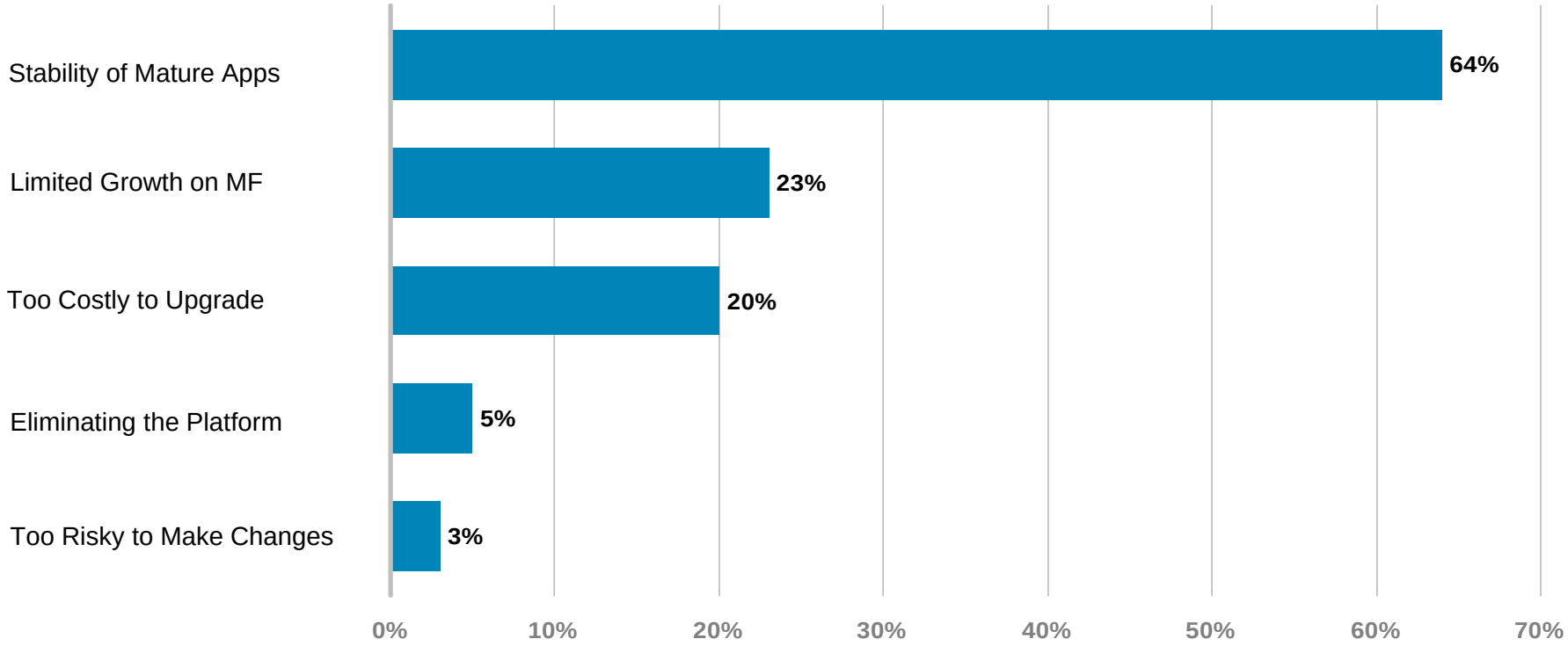
Results indicate customers are required to manage a blend of FICON and ESCON infrastructures and device types



Source: zJournal "Mainframe Evolution Survey"

Stable, Mission Critical Applications Remain on ESCON

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



Source: zJournal “Mainframe Evolution Survey”

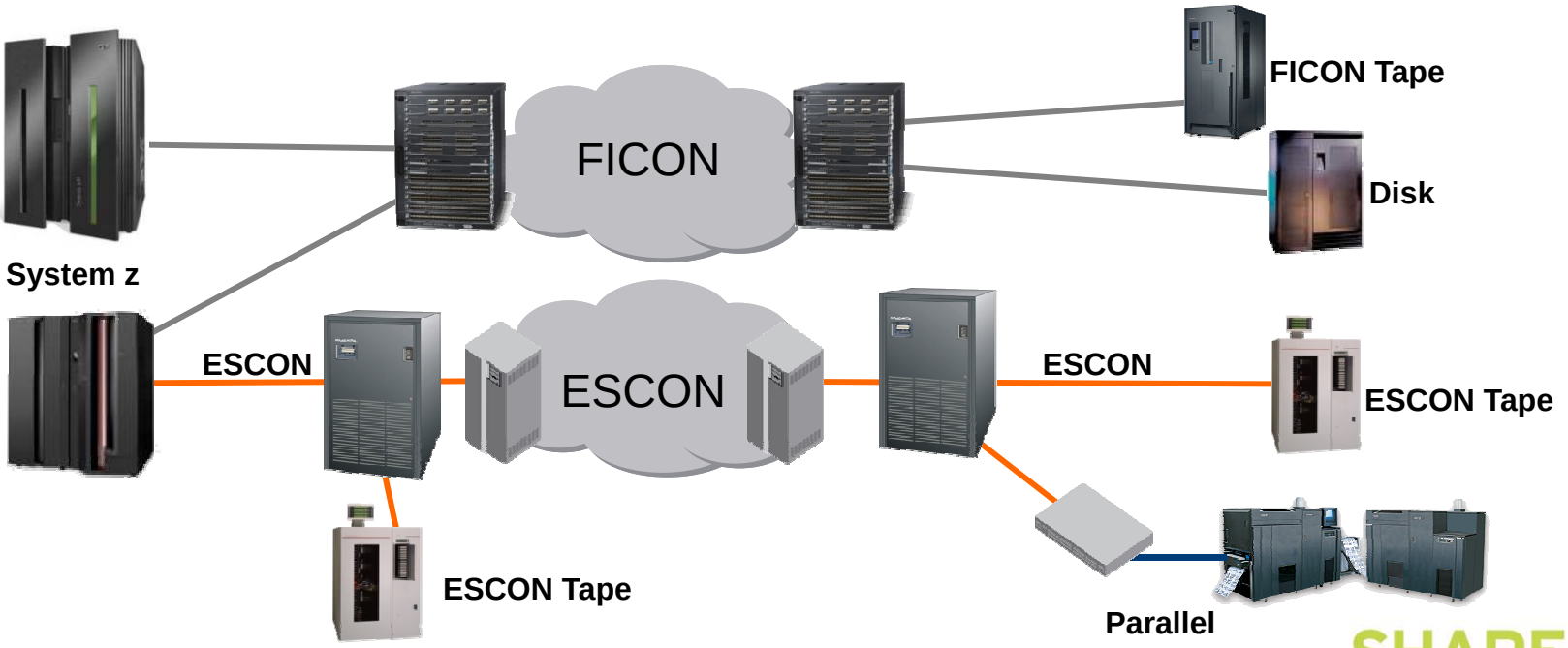
Survey Conclusions

- **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

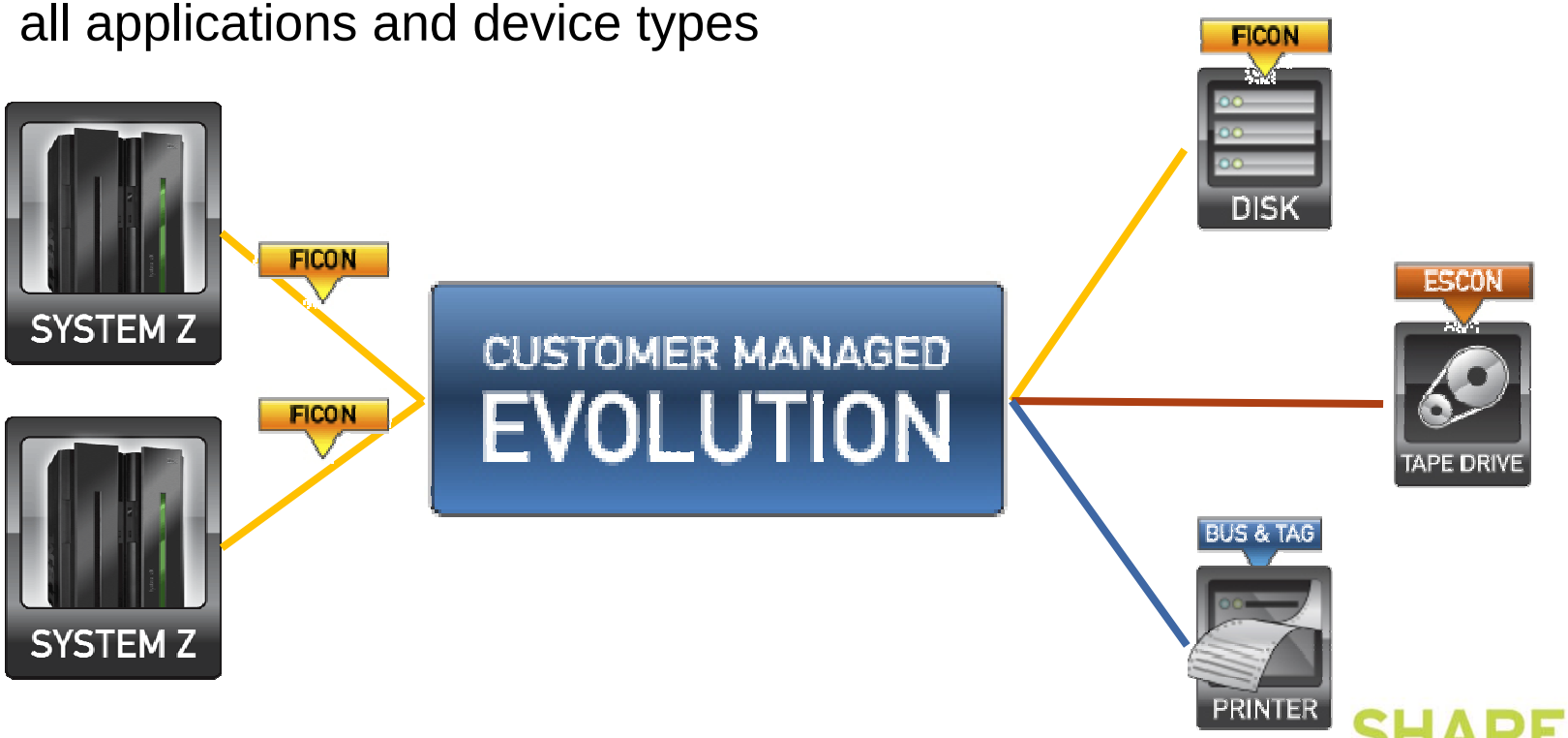
Current environment

- 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™

FICON Ports: LC Duplex

ESCON Ports: MT-RJ

Rear View

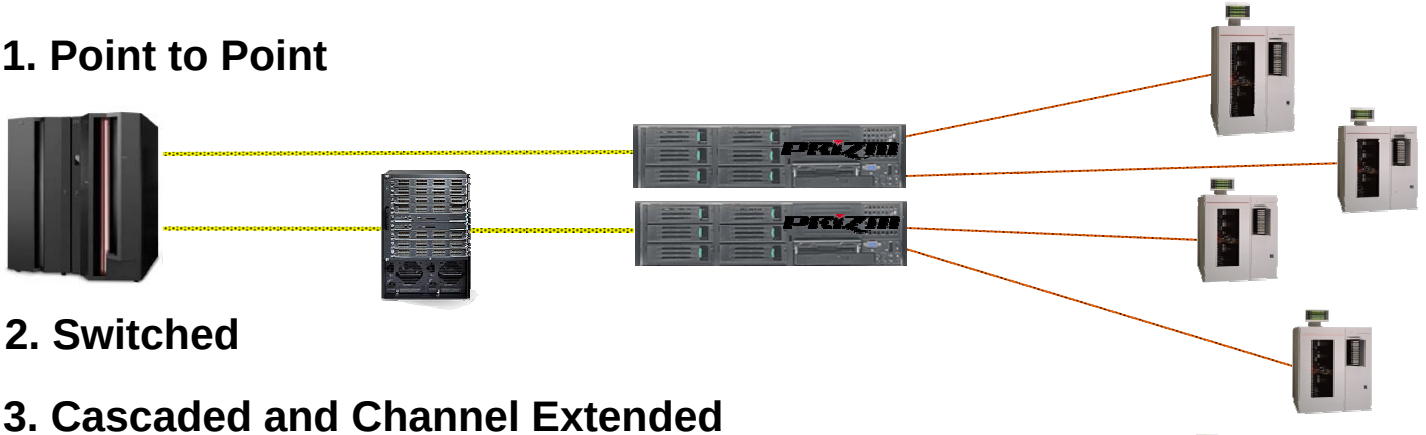
Prizm Basics

- Prizm is a 2u rack mountable system which converts 1 or 2 FICON channels into 4, 8 or 12 ESCON channels.
  - Prizm also supports bus/tag device attachment via ESBT module
- 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) FICON optics
- Prizm is easy to configure and install and will attach to a broad array of ESCON (and Bus / Tag) devices.
  - Qualified in the IBM Vendor Solutions Lab in Poughkeepsie, NY

Where does Prizm fit in the data center?

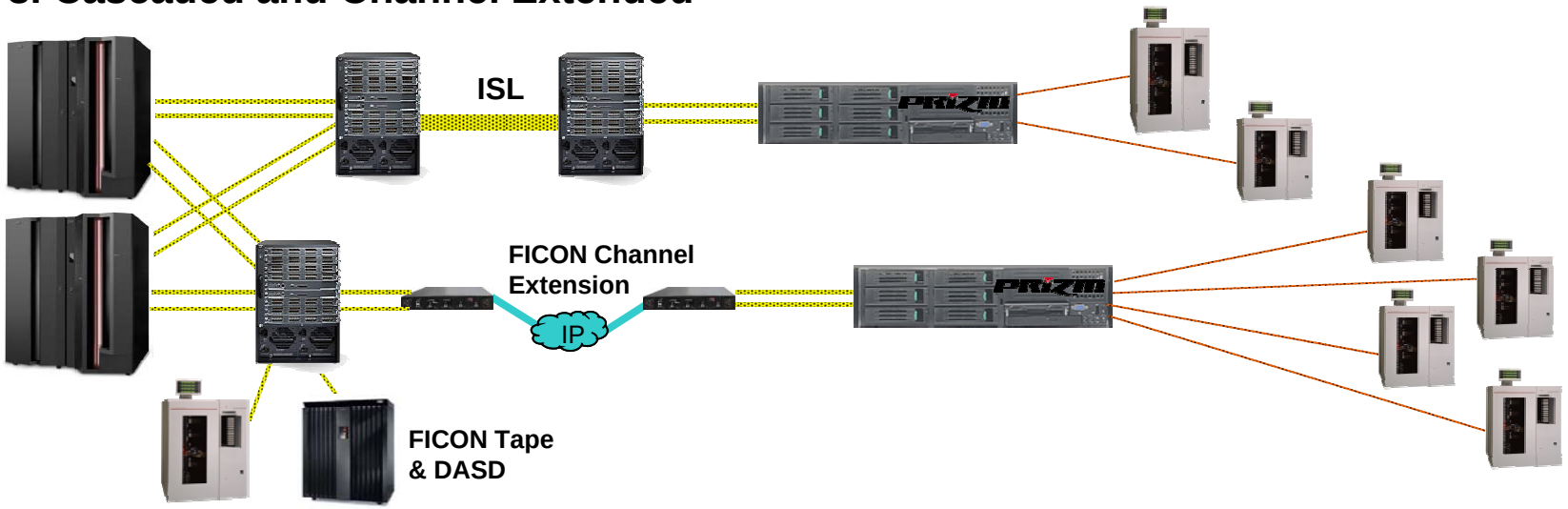
SHARE
Technology · Connections · Results

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.

SHARE in Anaheim 2011

Today: Two Infrastructures

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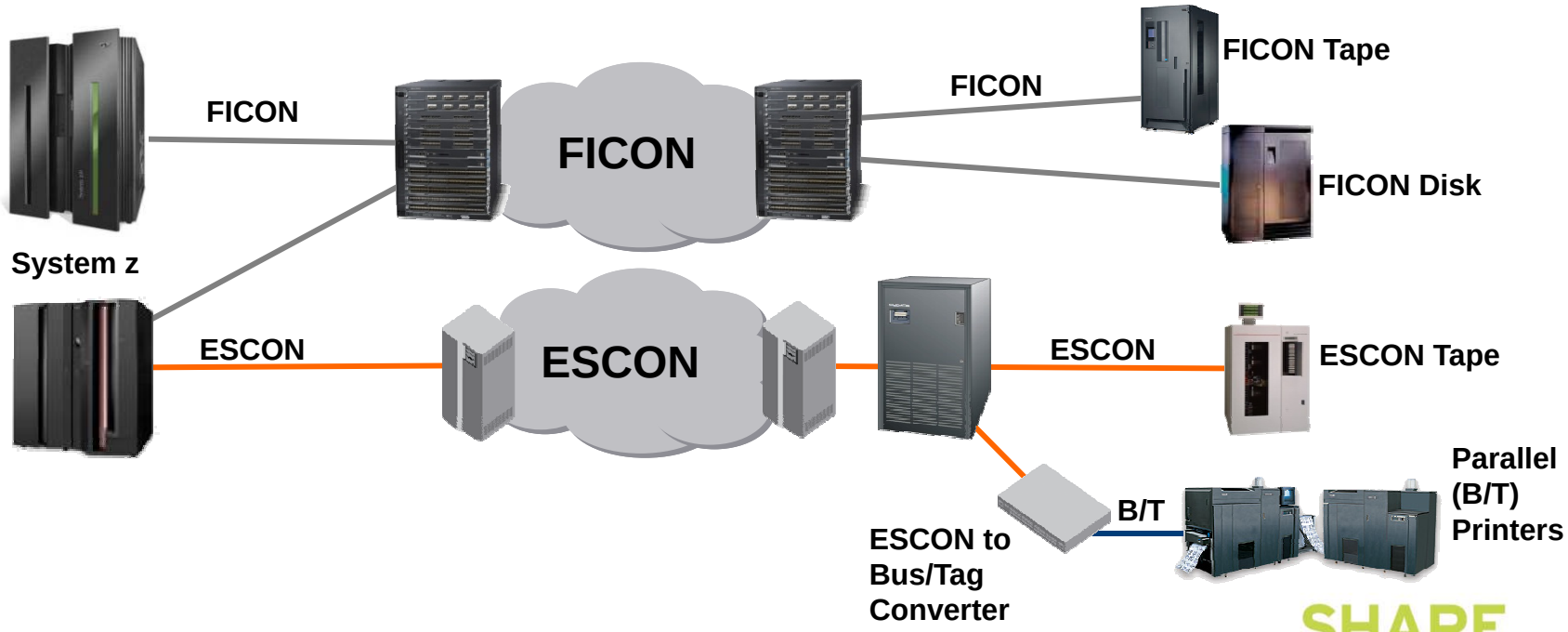
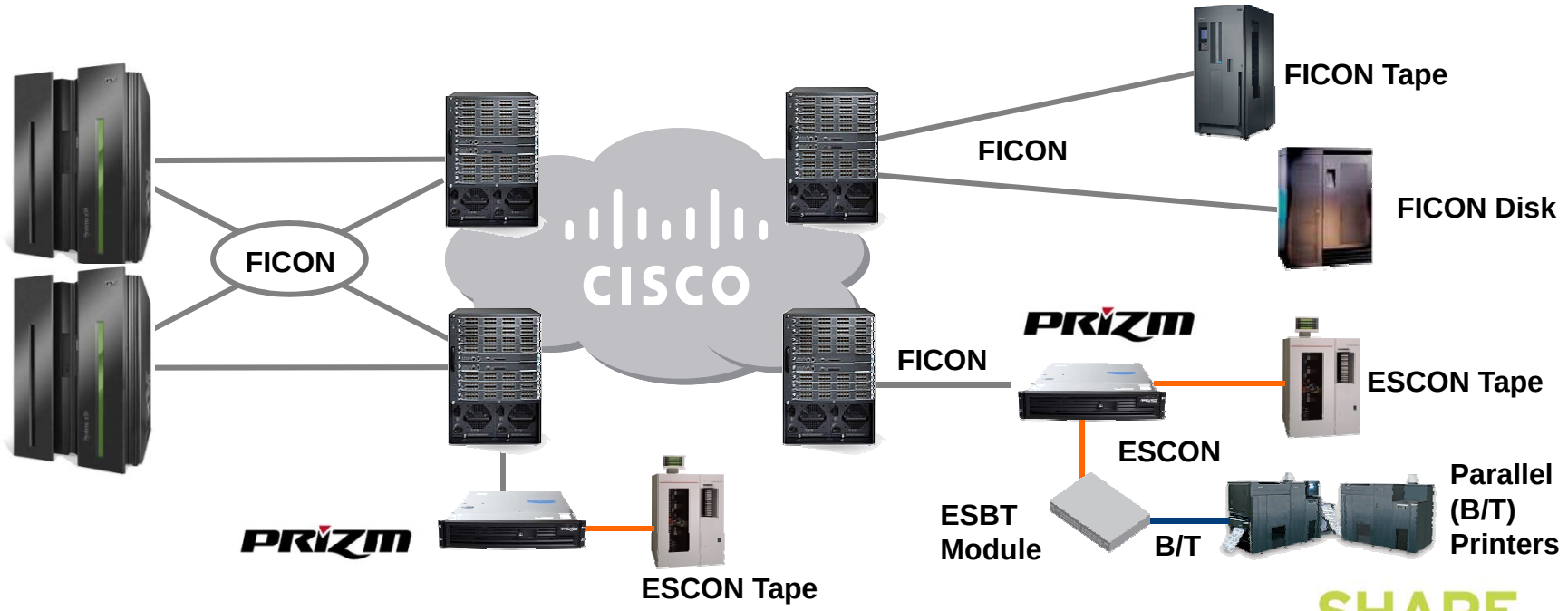
- Parallel Printers/Controllers



Managed Evolution Architecture

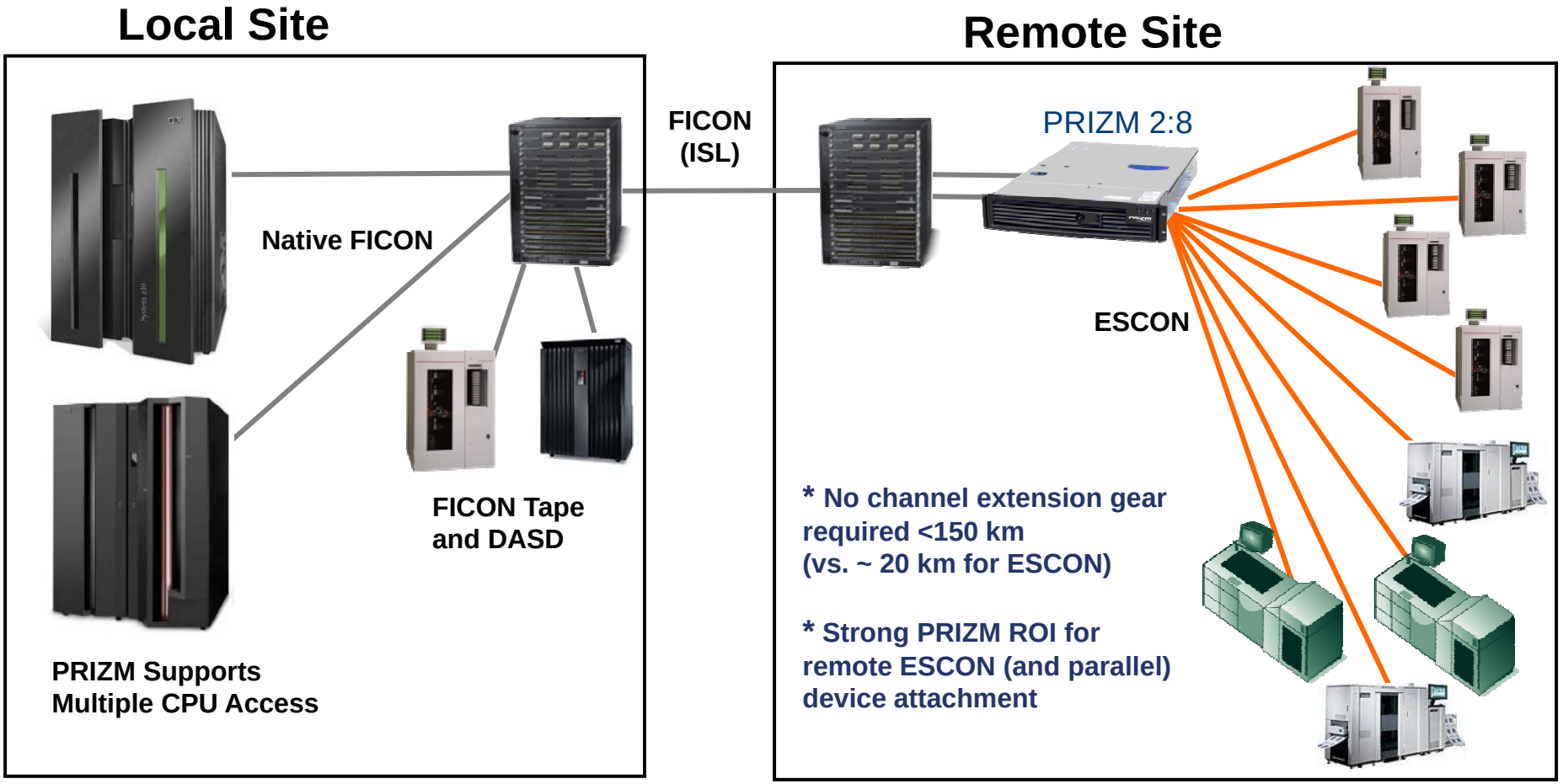
Unified, Thoughtfully Planned Migration Management

- 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

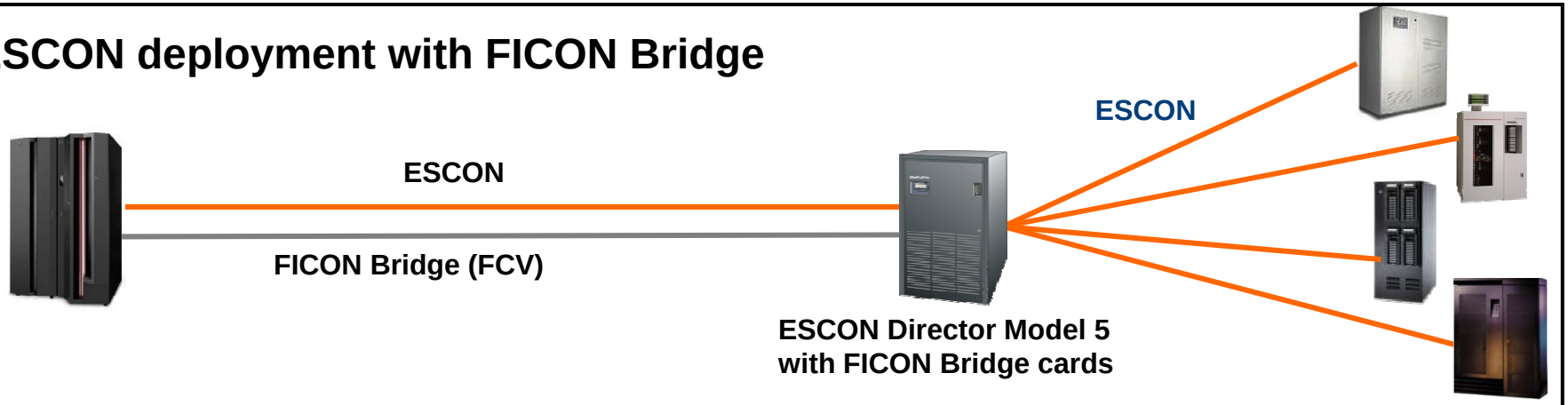
ESCON Device Extension via FICON Infrastructure



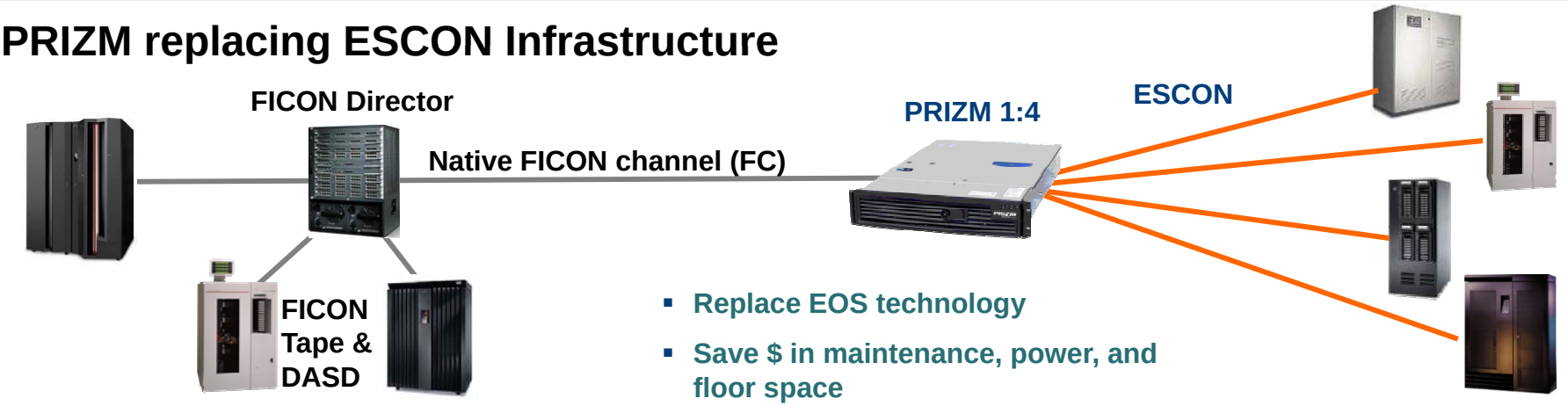
Managed Evolution Applications

ESCON Director and FICON Bridge Replacement

ESCON deployment with FICON Bridge



PRIZM replacing ESCON Infrastructure



- Replace EOS technology
- Save $ in maintenance, power, and floor space

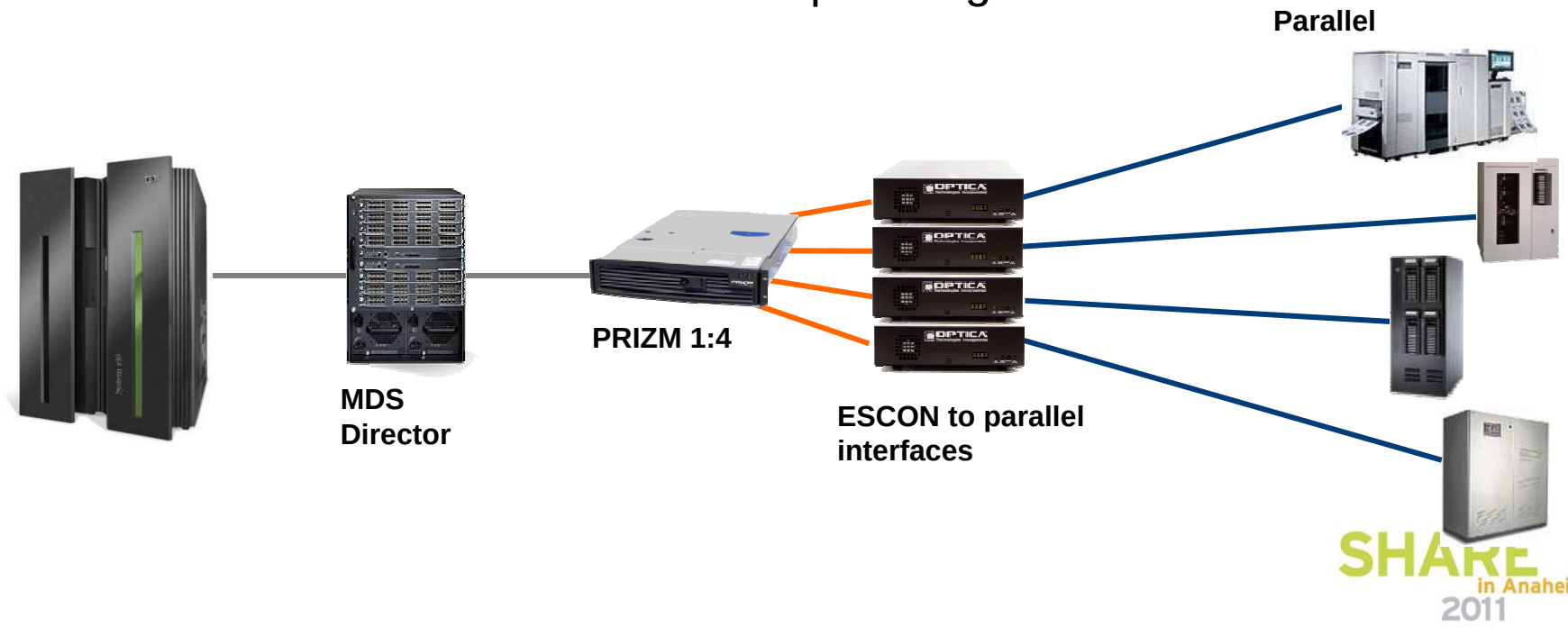
Prizm vs. ESCON Director

	ESCON Director	PRIZM
1. Native Operating Speed	17 MB	8/4/2 GB
2. Power Utilization (Savings)	100%	7%
3. Heat Dissipation (BTU)	6390	750
4. Floor Space	8 Sq Ft.	2U
5. Maintenance Capability	Best Effort	Yes (IBM)
6. Maintenance Cost	High	Lower
7. Maintenance Status	EOS?	Supported
8. GUI Management	Yes	Yes
9. Connectivity Verification Tool	No	Yes
10. LPAR Support	16	64
11. Current Technology Support	EOL	10+ Years

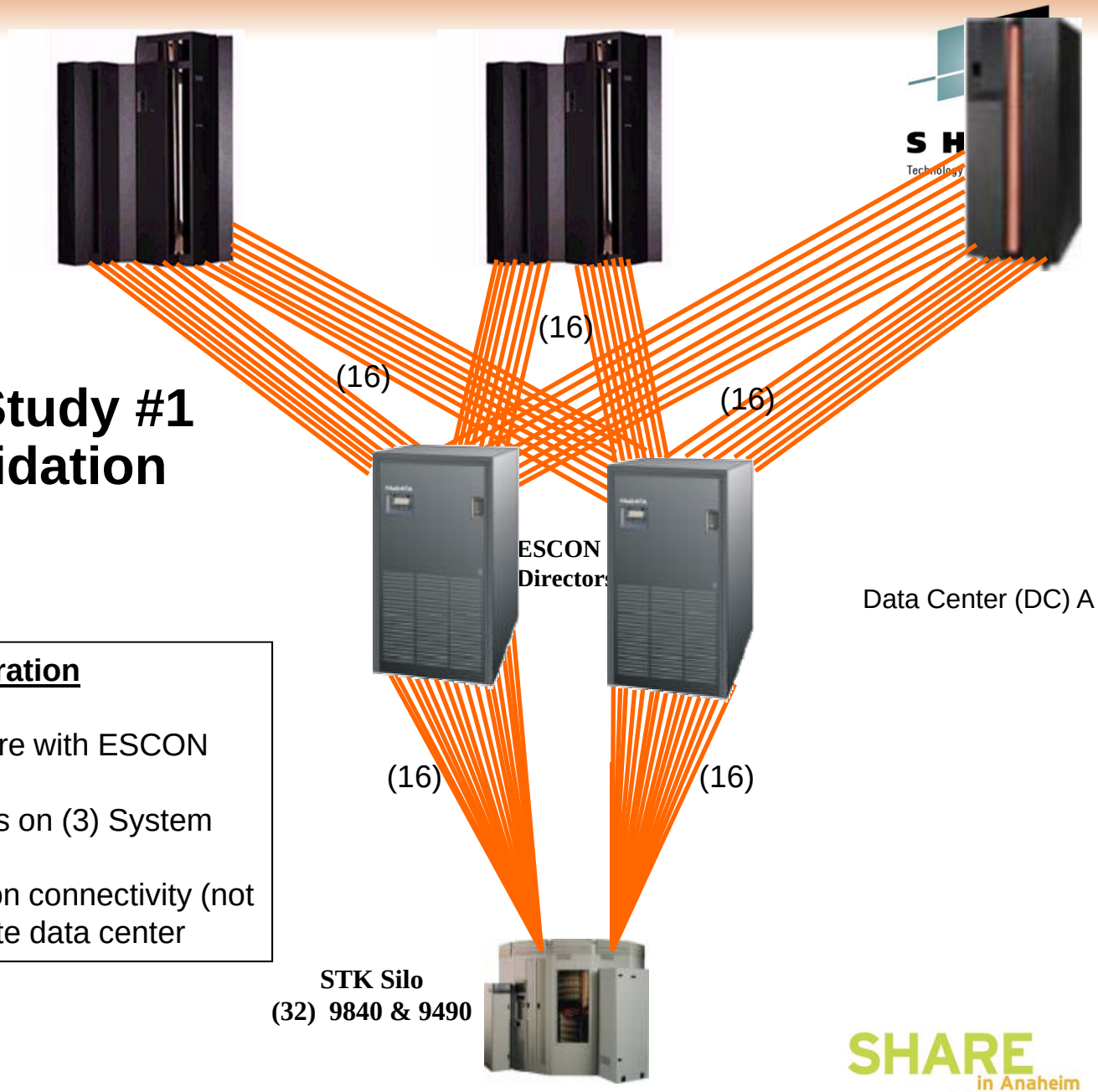
Managed Evolution Applications

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



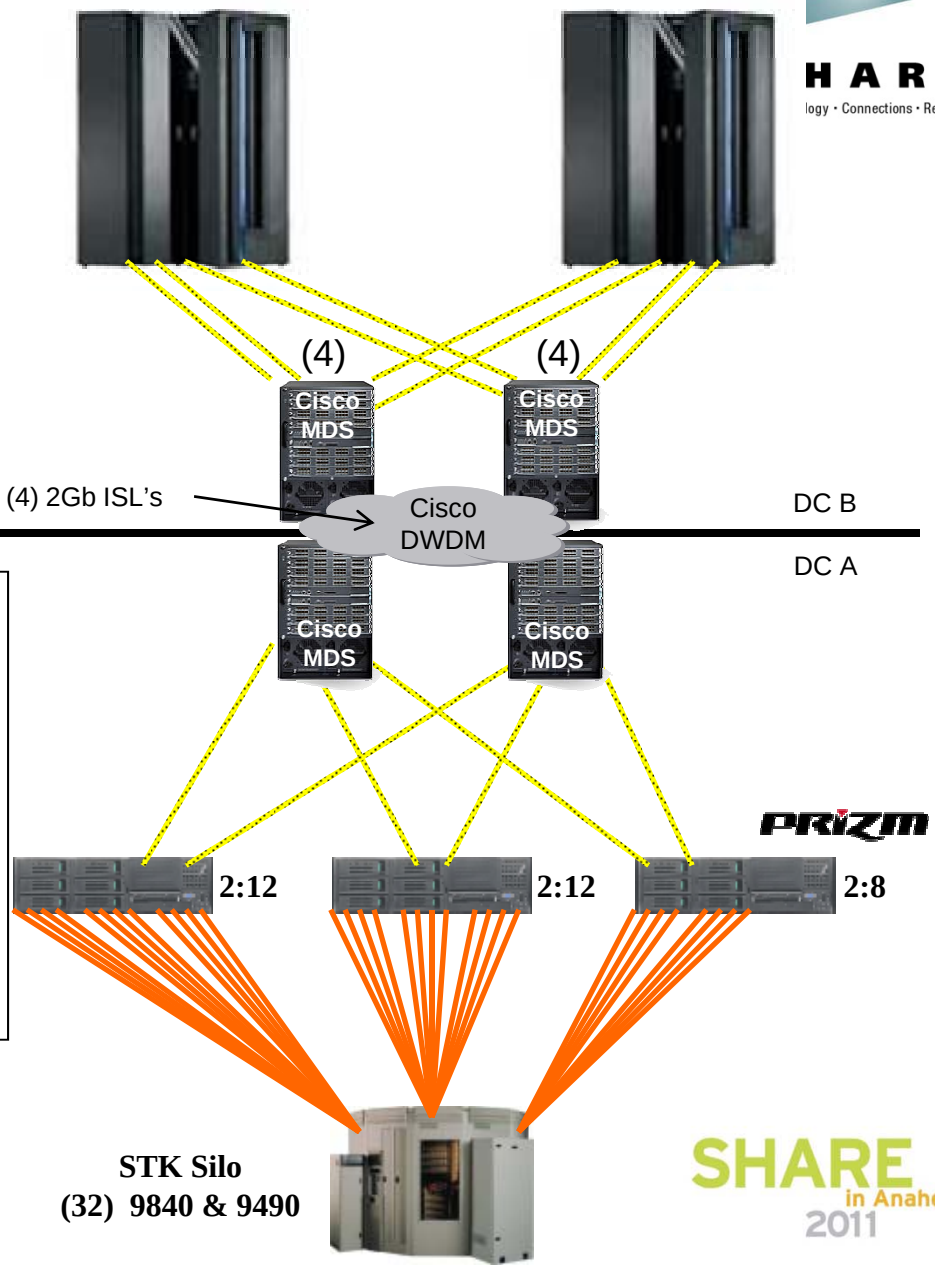
Customer Case Study #1
System z Consolidation



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

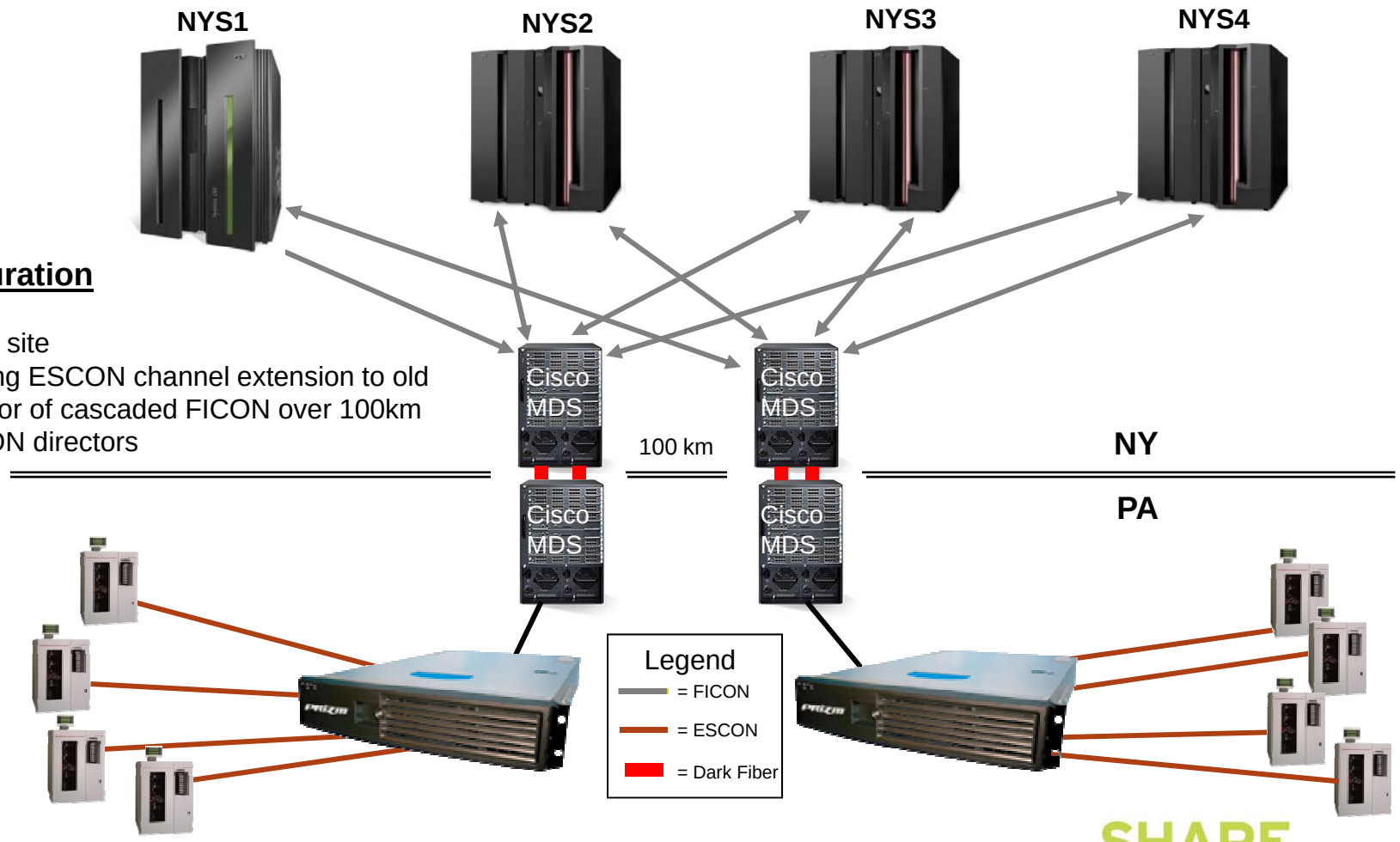
Customer Case Study #1
System z Consolidation



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



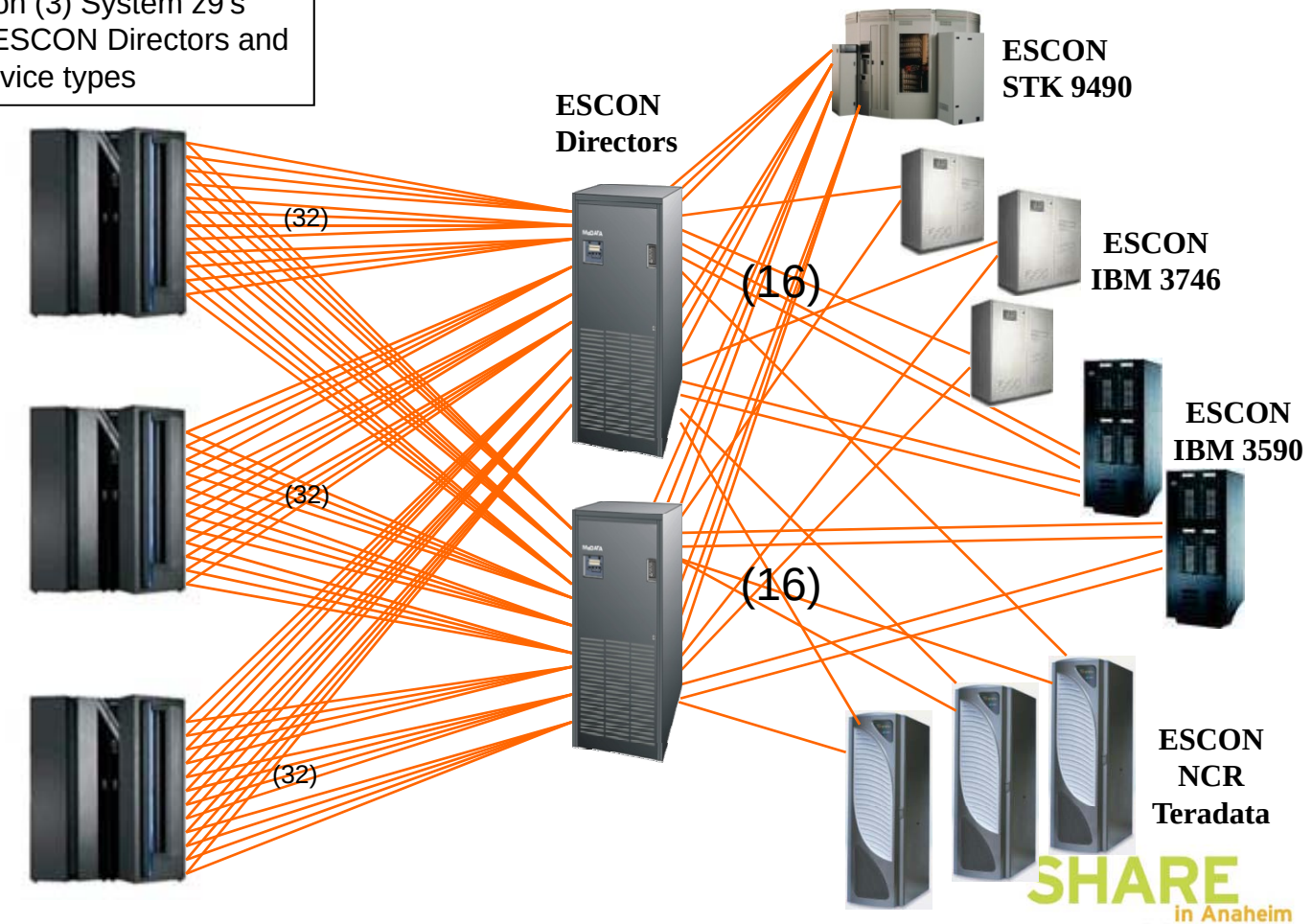
Prizm Configuration

•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

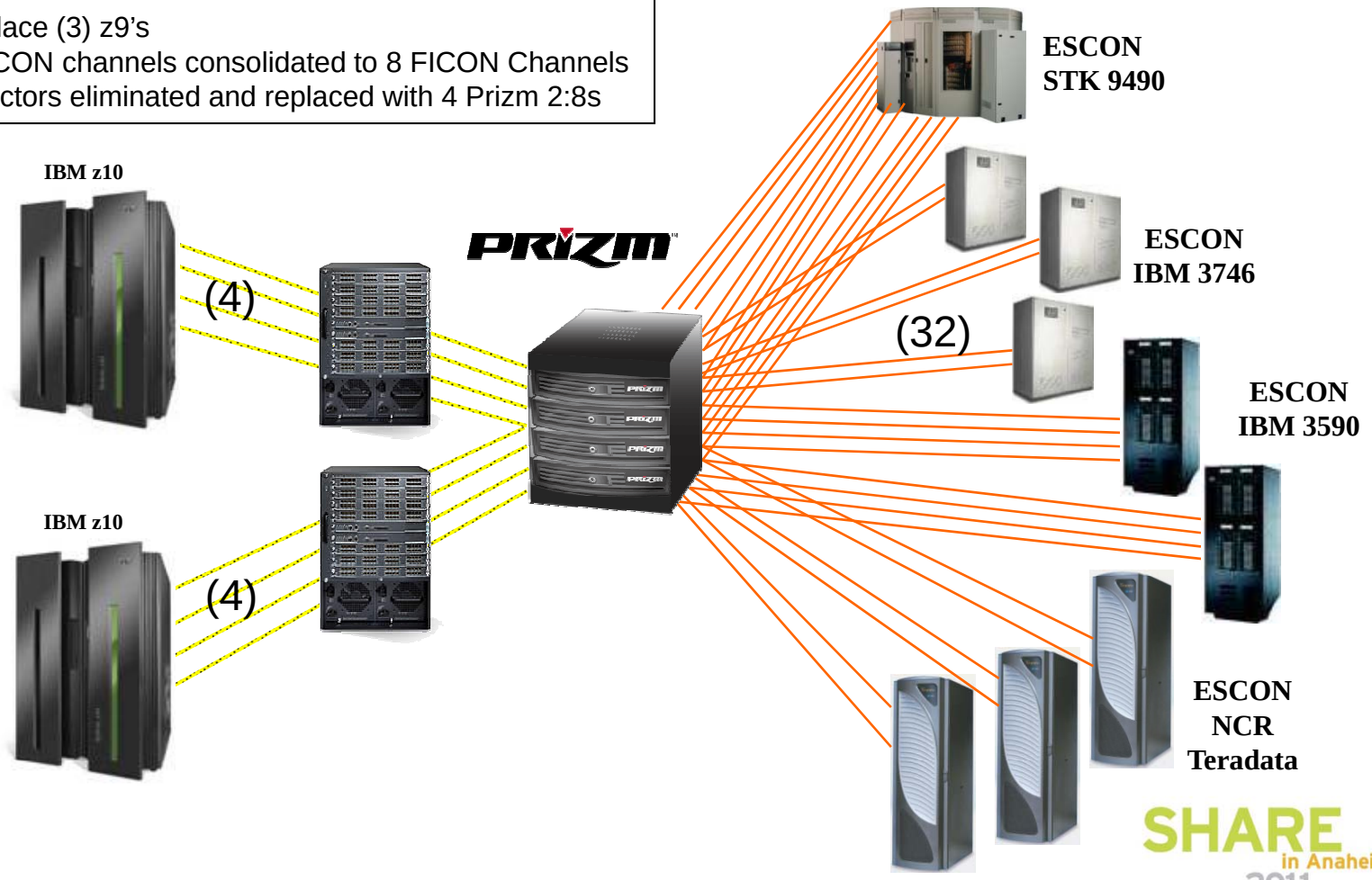
- Host: 96 ESCON channels on (3) System z9's
- ESCON infrastructure with ESCON Directors and a wide variety of ESCON device types



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

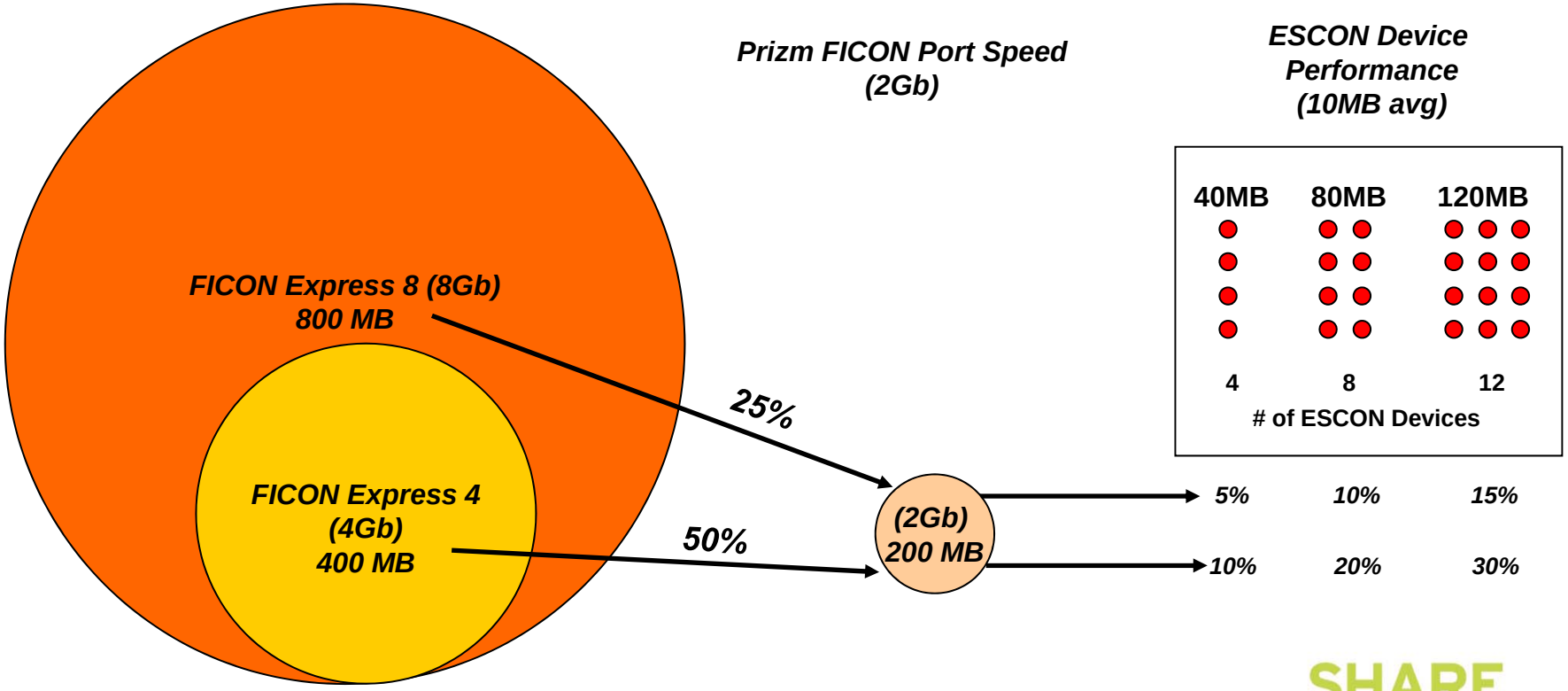
- **ESCON Director - Replacement**
  - 1000's of ESCON directors are still in production**
  - Plan for end of service

- **ESCON Channel Extension – Replacement**
  - Over 12,000 nodes deployed**
  - End of Life and Support is here
  - Prizm allows customer to leverage the value of FICON while reducing the cost and complexity of managing ESCON over long distances

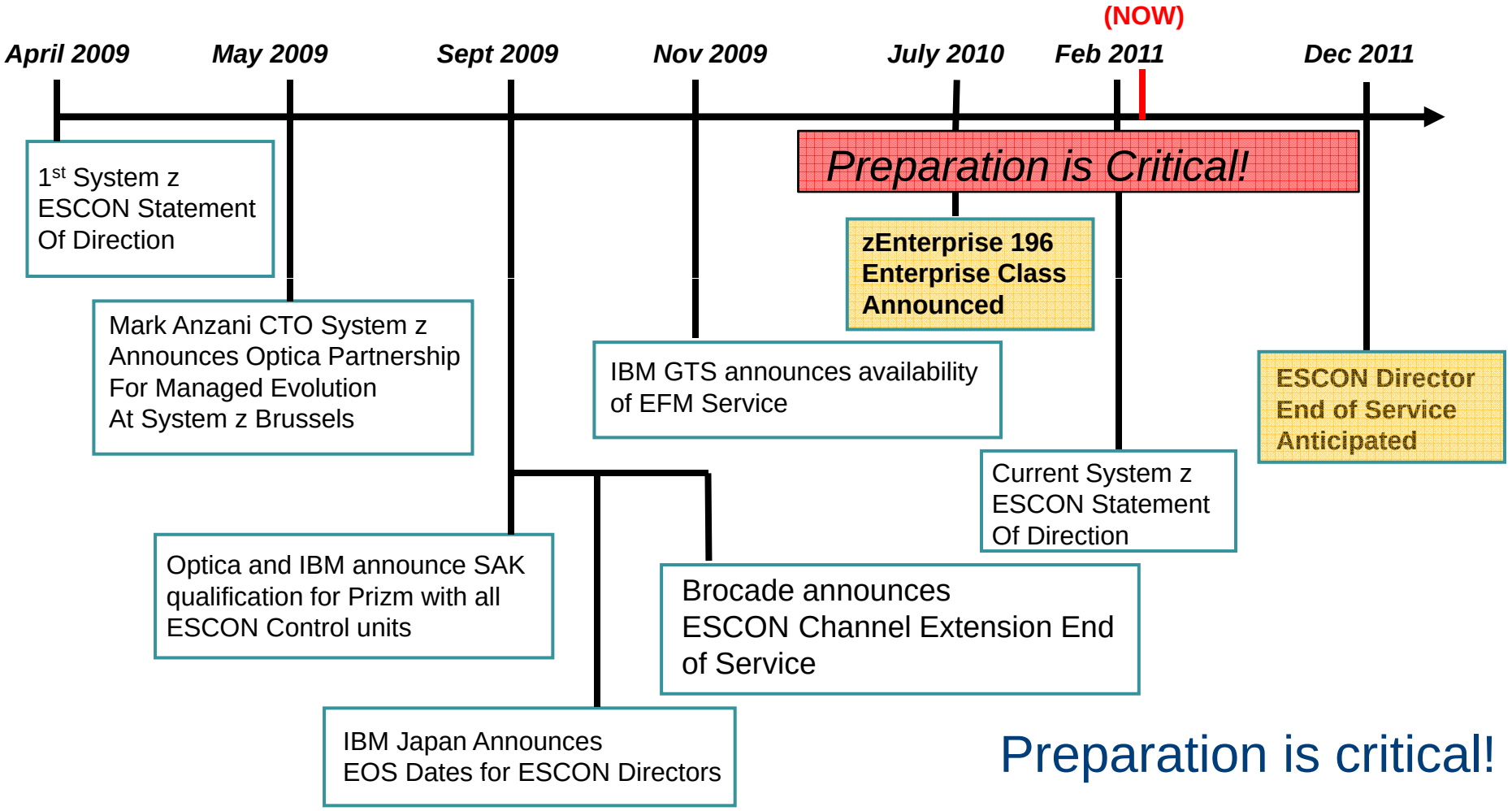
Sources:
*System z brand
**Optica estimates

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

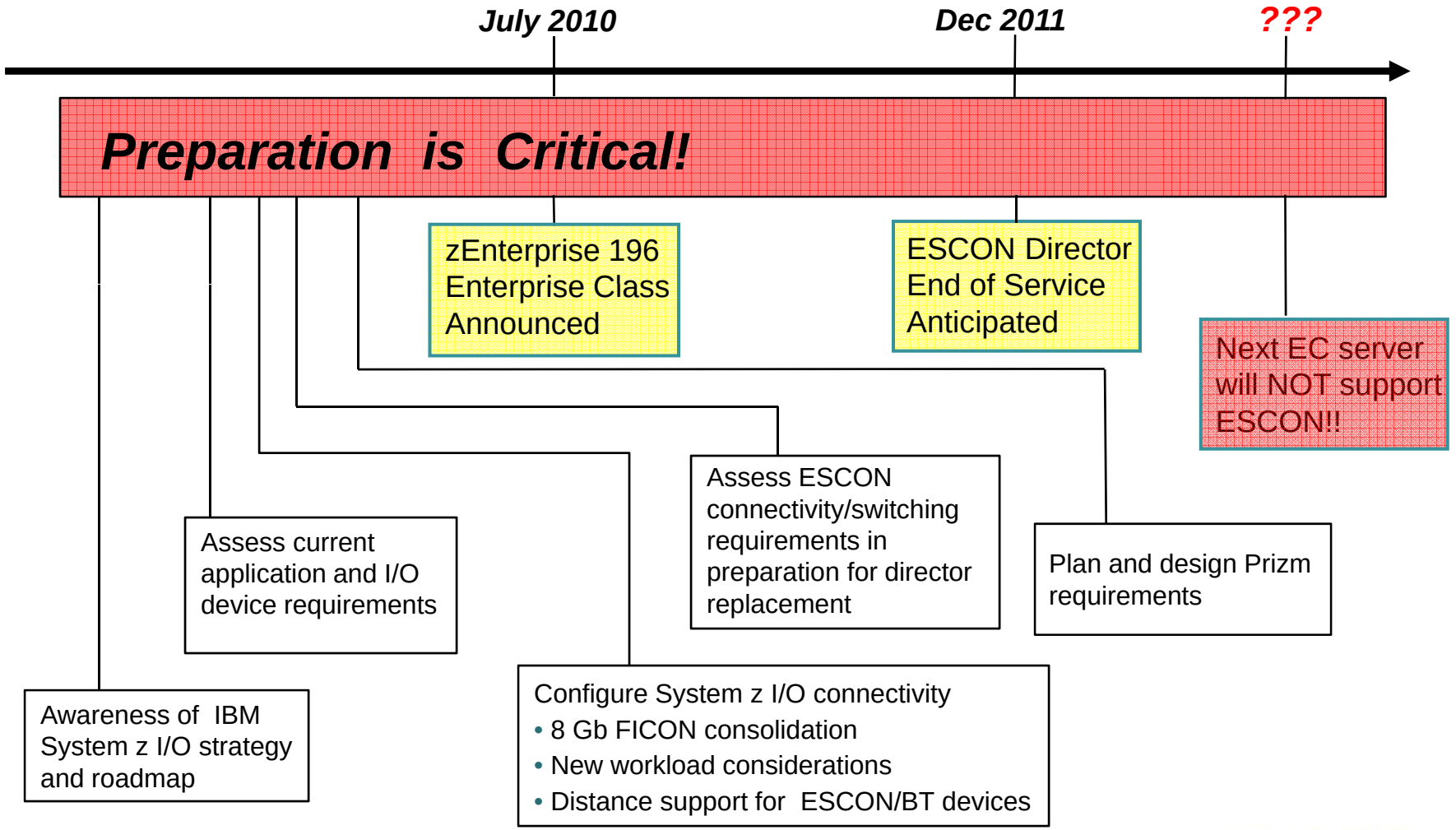


Connect the dots and the message is clear - It's time to begin the migration



Preparation is critical!

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



Managed Evolution Makes it Easy! http://www.opticatech.com/

Managed Evolution for Your Directors

Tony Almeida, Consulting SE

Data Center Switching Technology Group (DCSTG)

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

Gen 2 4G Modules

FC-12 FC-24 FC-48


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


Gen 3 8G Modules

FC-24 FC-48 FC-4/44



SSN-16

Backward and forward compatible switching modules

Non-disruptive upgrades

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

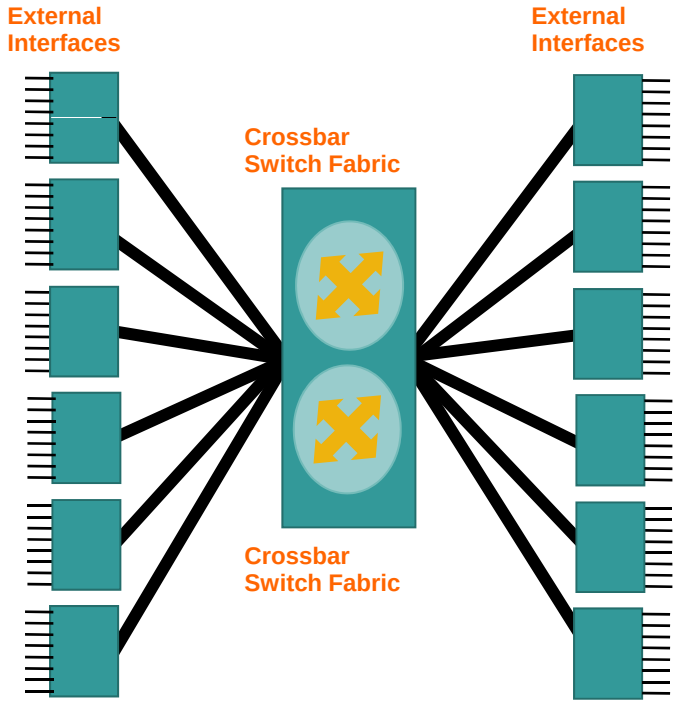
Scalability and Performance	Up to 528 FC Ports/Chassis and 2.2 Tbps Switching Bandwidth
Investment Protection	Seamless Speed Transition from 2G to 4G, 8G, 10G in the Same Chassis
Virtual SAN (VSAN)	Consolidation, Reduced TCO, Fault and Management Isolation
Integrated C/DWDM Optics	Reduced Costs for MAN 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+

Delivering Predictable Performance

Centralized Crossbar Switch Architecture
Evolved by McDATA, Cisco and others

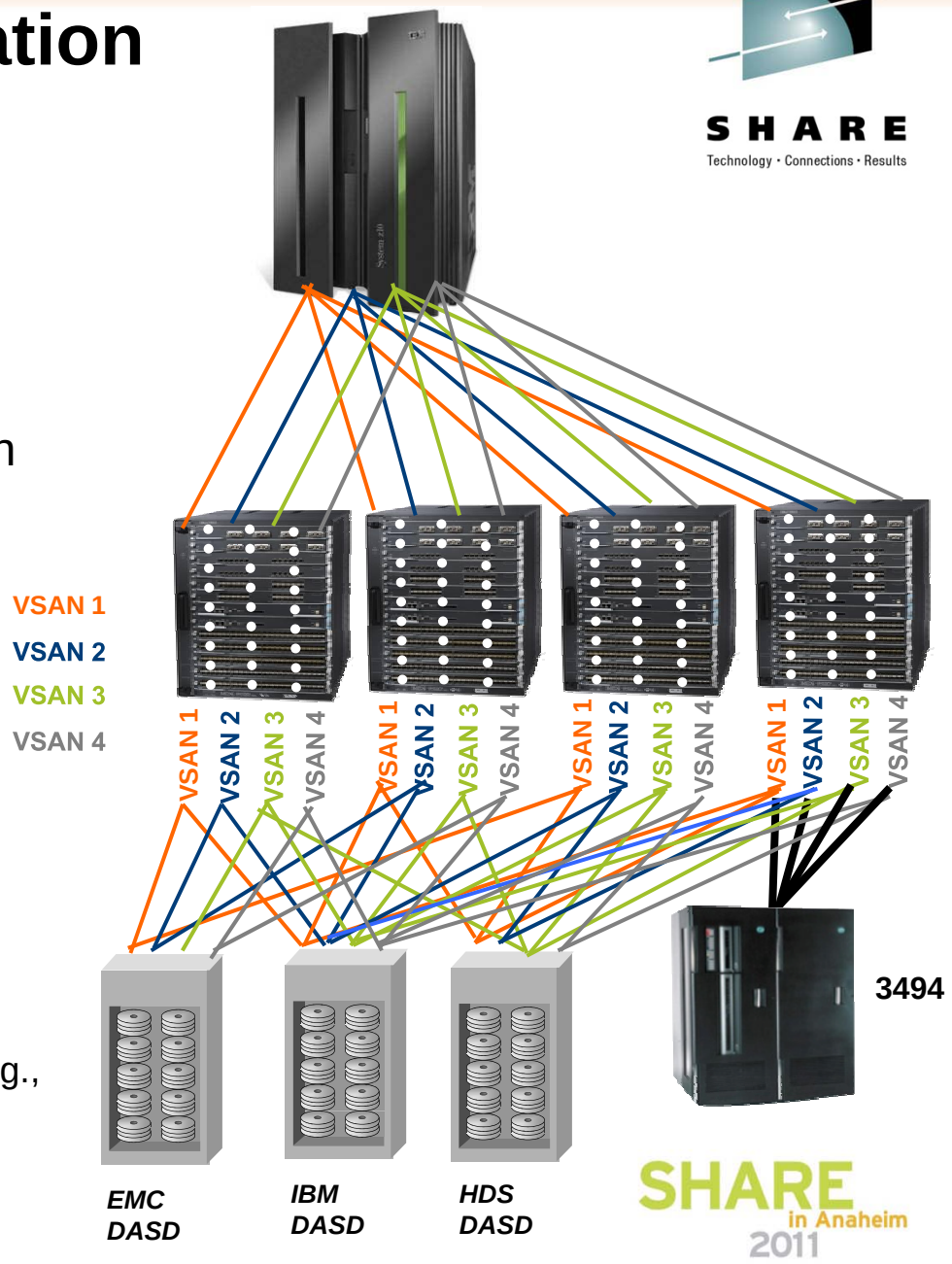
Performance Features:

- 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

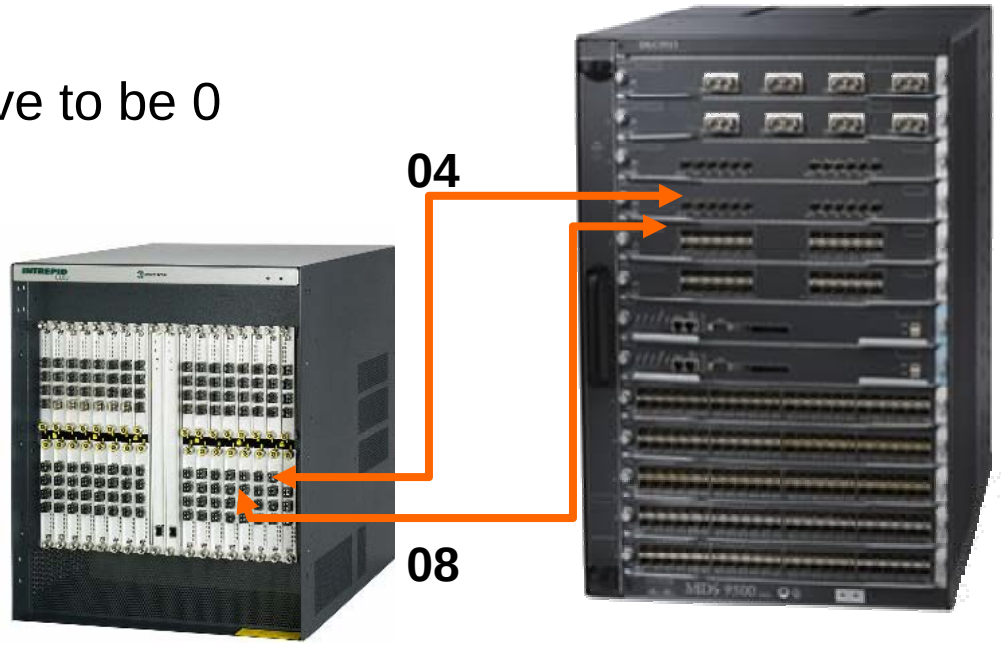
1. Scale hardware up to 528 ports (MDS 9513)
   - Even multiple ESCON CUs won't stress a FICON port
2. Create FICON VSANs (like LPARs on the switch)
   - Hardware-isolated partitions of ports from one or more switches
   - One to 250 ports per VSAN (FICON architectural limit)
   - Up to eight FICON VSANs 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)



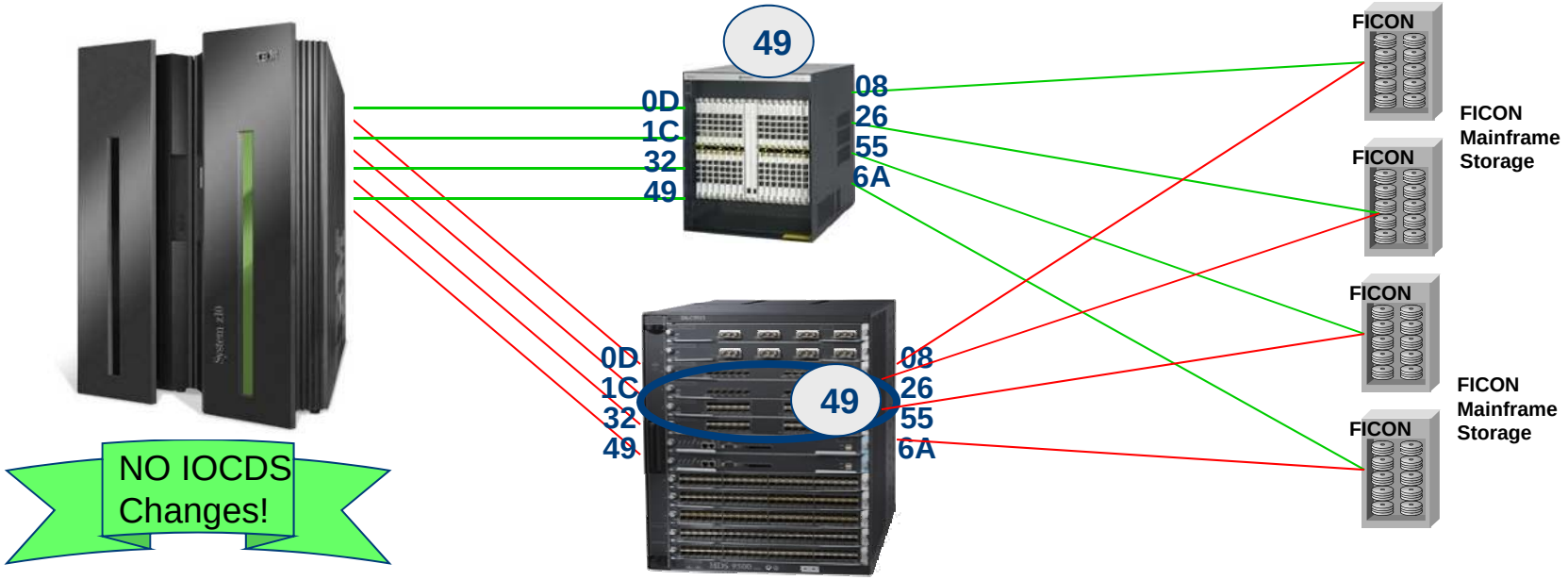
Port Remapping

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

Cisco's 2G Platforms

Cisco's 4G Platforms

Cisco's 8G Platforms

FCoE …

Questions?

Managed Evolution

Parallel, ESCON, and FICON Co-existence

March 2, 2011
Session # 8183

SHARE in Anaheim 2011