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Mainframe Storage Best Practices Utilizing Oracle's Virtual Tape Technology

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9959: Mainframe Storage Best Practices Utilizing Oracle's Virtual
Tape Technology

Introduction



“The selection of storage technologies has never been greater. Today’s choices range from ultrahigh capacity, low cost, low performance storage at one end to highly advanced data management functionality and very high levels of performance at the other.” - Tiered Storage Takes a Center Stage, Horizon, Inc, April 2011

“Tiered storage allows an organization to optimize its data storage infrastructure using a combination of storage solutions to lower costs, increase performance and scale technology to address growing storage demands” - Tiered Storage Takes a Center Stage, Horizon, Inc, April 2011

- **In this presentation we will show you how Virtual Tape can address these challenges utilizing disk and tape storage tiers**
- **Effective use of the these technologies can significantly reduce data storage costs**



“BIG Data” Is Getting BIGGER!!!

- 50% Per Year Growth Rate

2009
Digital Data



0.8
Zettabytes

2010
Digital Data



1.2
Zettabytes

2020
Digital Data

35
Zettabytes
(44x growth)

- IT budgets and headcounts can't keep up with this growth
- Budgets growing 2-3%/yr*
- Disk prices are not declining fast enough
- Customers can't afford to simply “put everything on disk”

**Source: SearchStorage Magazine, July 2011*

*Source: IDC, White Paper Sponsored by EMC, The Digital Universe
Decade - Are You Ready? Doc.# IDC_925, May 2010*

Different Data Categories/Different Use Cases

Put Data On The Right Technology



• **Current - operational**

- Current month's statement
- Current year tax withholding
- Next appointment health info



• **Business critical**

- Any loss can result in significant business impact
- High legal liability

• **Recent - active**

- Last 3 months statements
- Last 6 months patient visit data



• **Business continuity**

- Protected with backup
- Data needs to be recoverable

• **Archival – inactive**

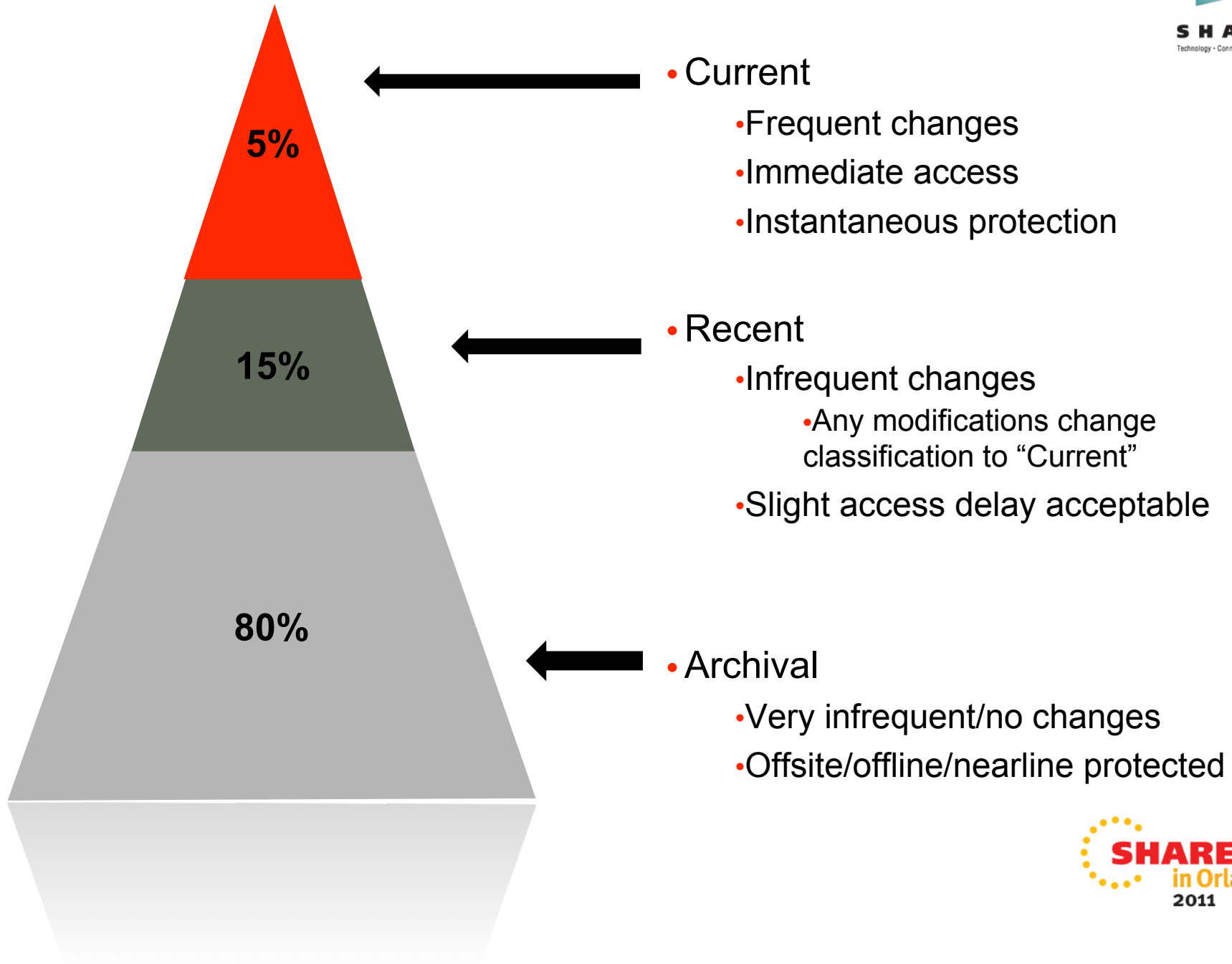
- Statements older than 3 months
- Lifetime X-rays and health records
- Former employees data



• **Historical info**

- Required for auditing
- Governed by data retention regulations

Data Classification & Usage Patterns

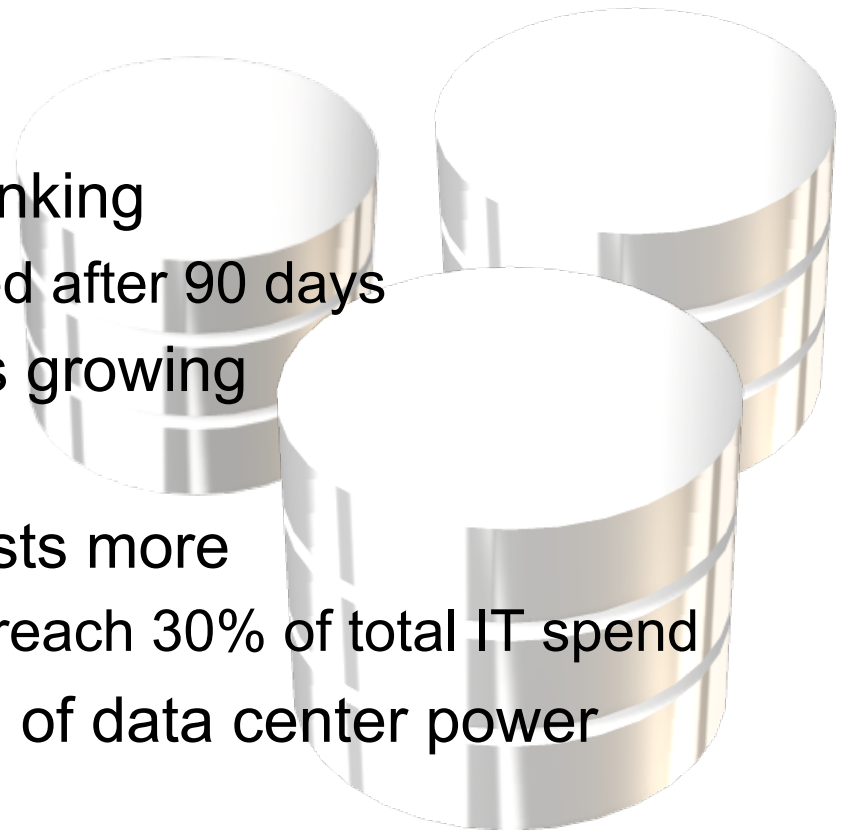


Challenge: The Nature of Data is Changing

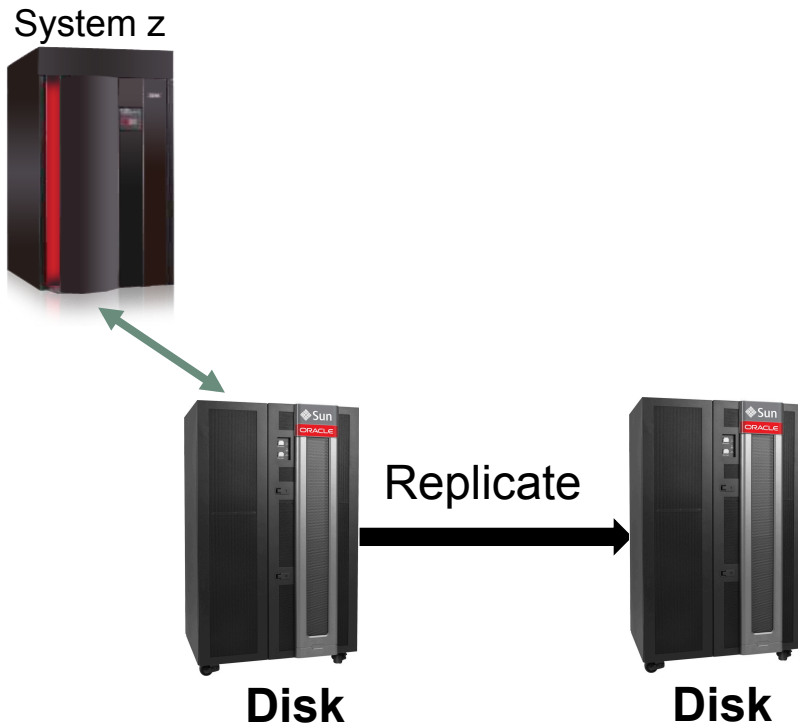
Align value of data with storage capabilities and cost



- The re-use of data is shrinking
 - 80% of data is never used after 90 days
- But the need to archive is growing
 - 100-year archives
- Storage management costs more
 - Left unchecked, it could reach 30% of total IT spend
- Storage consumes ~40% of data center power
 - Growing at 20% CAGR

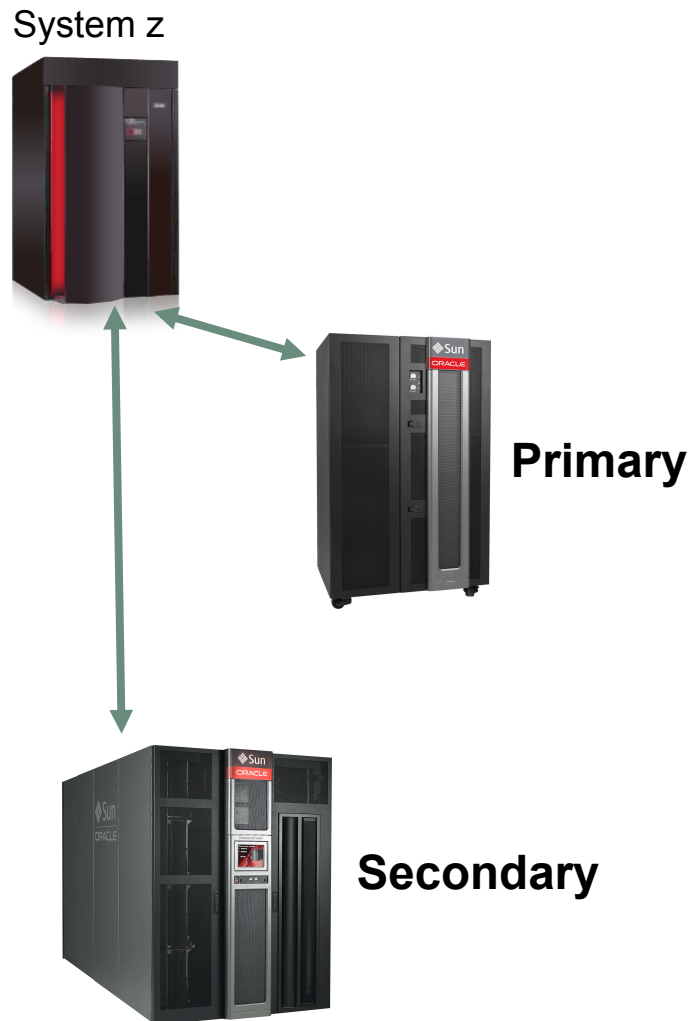


Single Tier Architecture



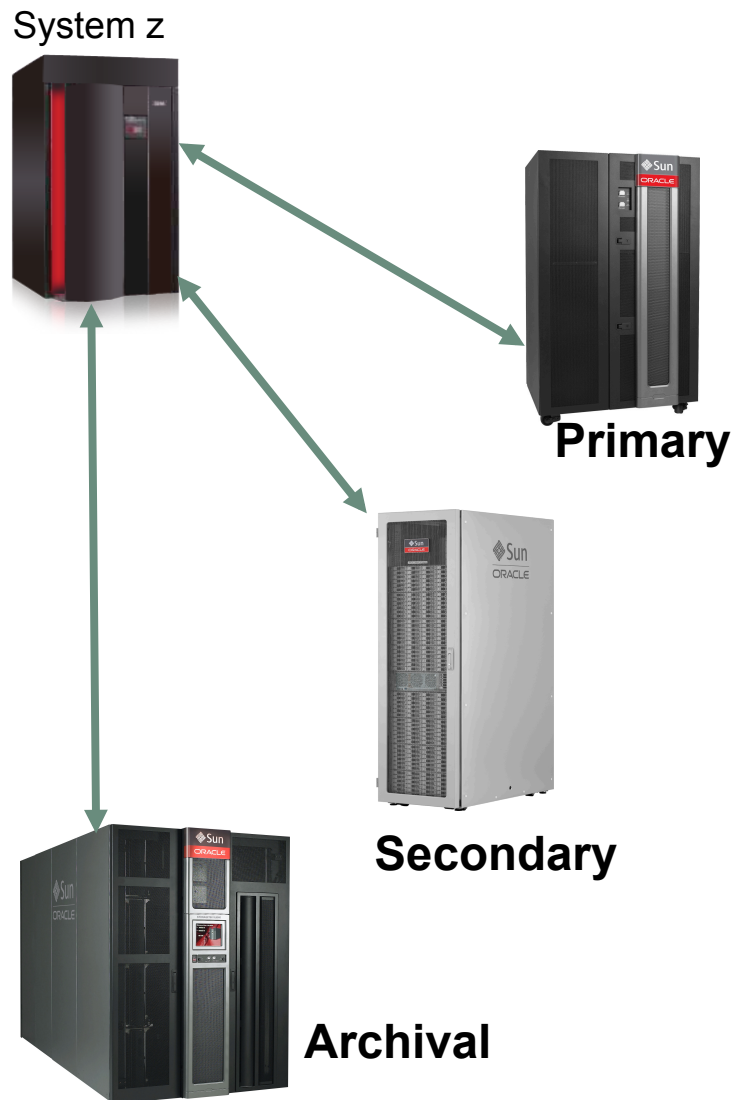
- Primary storage – 100% of data
 - High performance disk
 - Instantaneous data access
- Spare capacity
 - Provision extra capacity to maintain system stability
- Data protection
 - Secondary disk system
 - Double capacity requirement
 - Can be lower performance
- Technology migration
 - Every 4-5 years
- Archive?

Two Tier Architecture



- Primary - Current
 - High performance disk
 - Instantaneous data access
- Secondary – Recent/Archival
 - Capacity disk or tape
- Spare capacity
 - Overflow to secondary storage
- Data protection
 - Secondary disk or tape
- Technology migration
 - Primary - every 4-5 years
 - Secondary – every 10 years

Multi-Tier Architecture

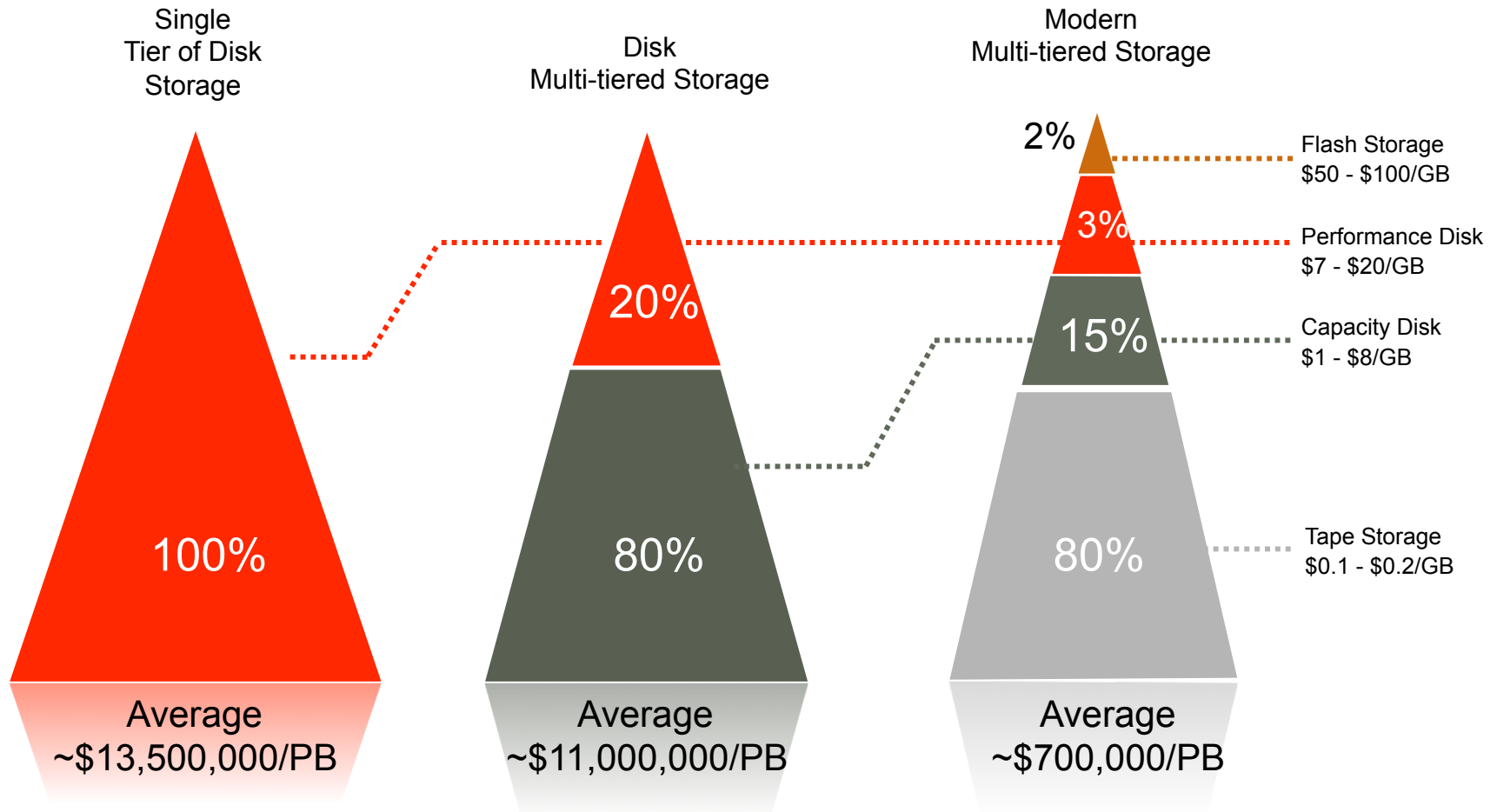


- Primary – Current data
 - High performance disk
 - Instantaneous data access
- Secondary – Recent
 - Capacity disk
- Archival
 - Tape
- Spare capacity
 - Overflow to secondary or archive
- Data protection
 - Disk and/or tape
- Technology migration
 - Current data - every 4-5 years
 - Archival – every 10 years

Data Center Best Practices: Tiered Storage



- Tape Is The Foundation Layer: Most of the data; at the lowest cost



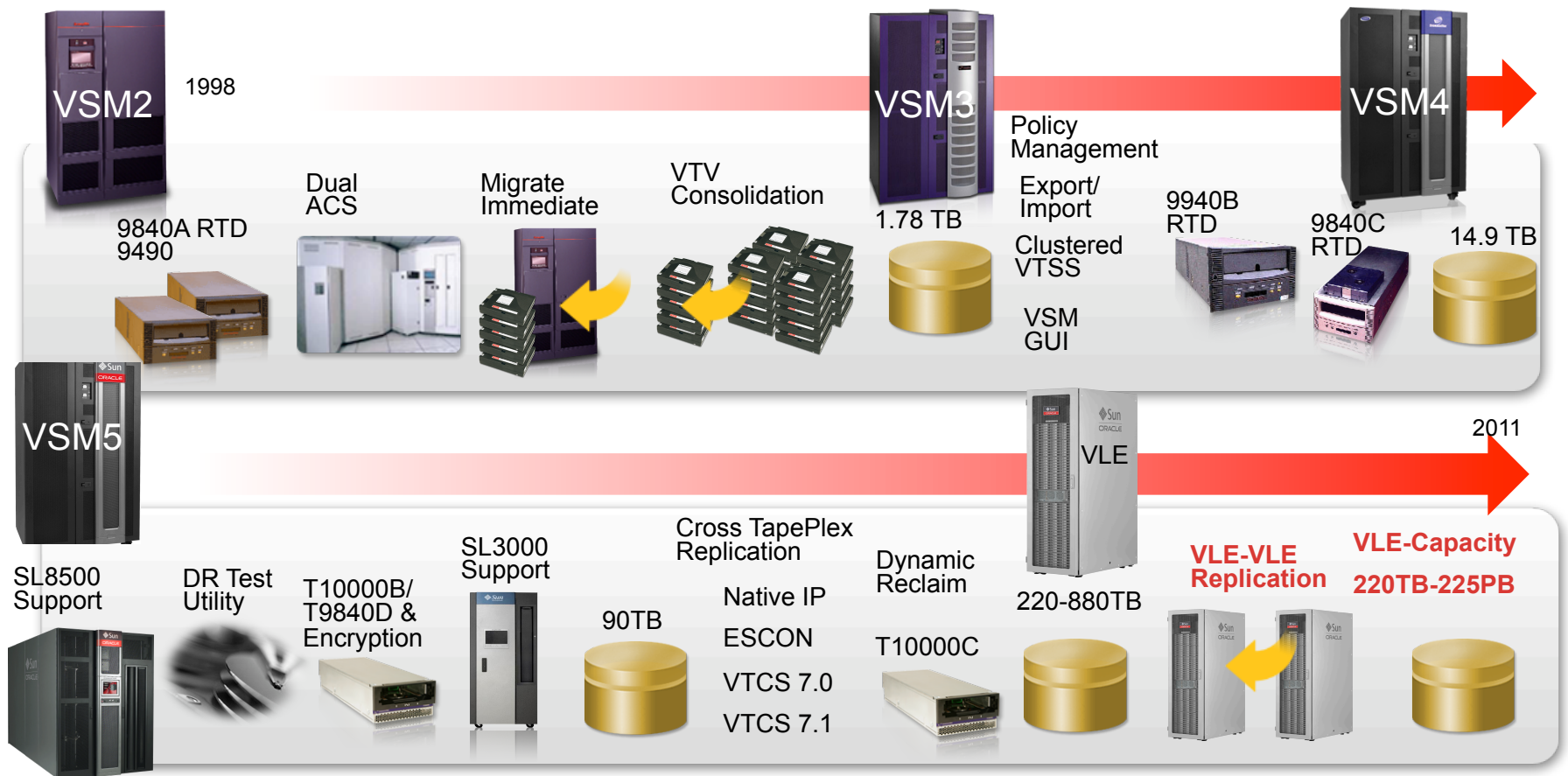
Source: Horison Information Strategies,
Digital Curator Paper, April 2010, updated with T1000C



Virtual Storage Manager (VSM)



Oracle/StorageTek™ Virtual Architecture

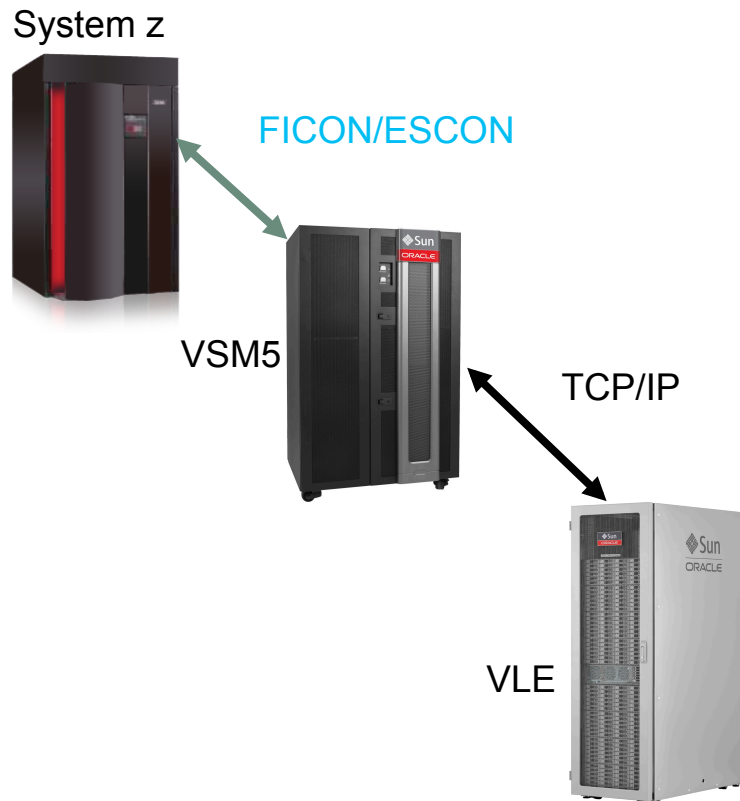


Oracle Virtual Storage Manager (VSM)



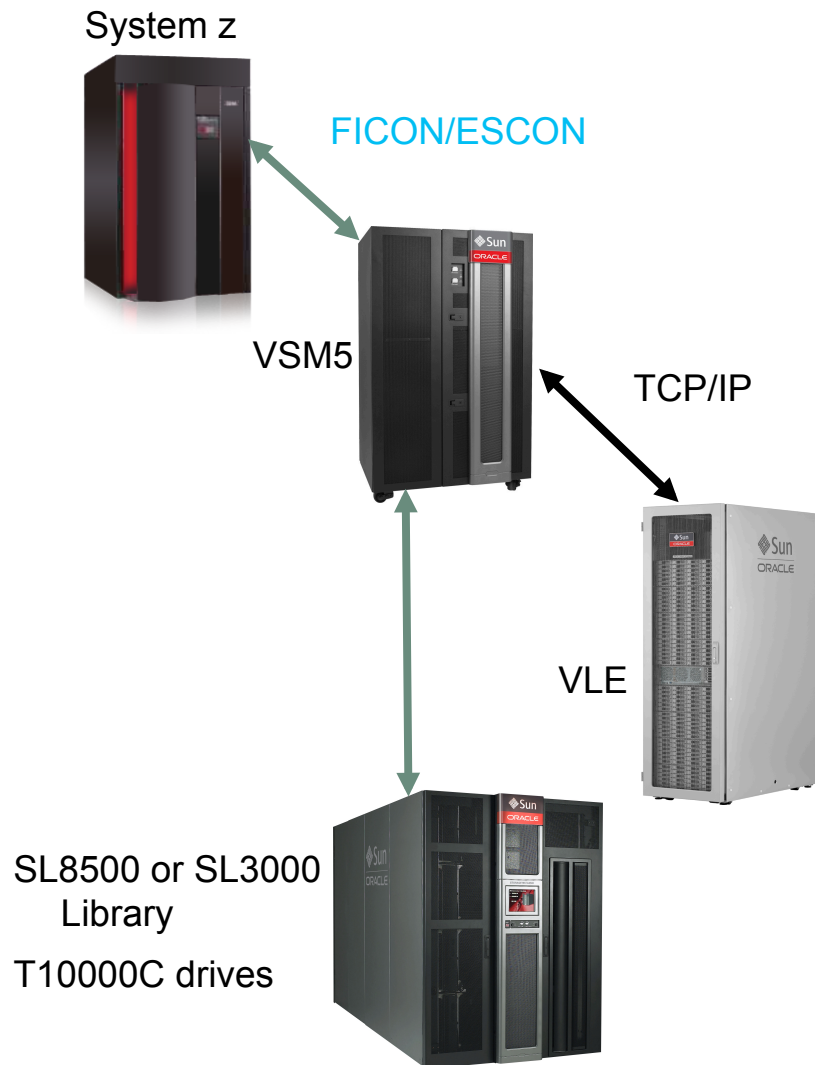
- Centralized management for all parts of storage system
 - Seamless integration
- Performance and cost of storage closely matched to type of data
 - High performance disk buffer
 - up to 90TB per VSM5
 - Can have up to 256

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 - High performance disk buffer –
– Up to 90TB per VSM5
– Have up 256
 - High capacity disk virtual tape
– Up to 880TB per VLE
– Up to 256 racks of storage

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 - High capacity disk virtual tape
 - Up to 880TB per VLE
 - Up to 256 racks of storage
 - **Ultra high capacity tape system**
 - up to 1 EB with T10000C drive

Highly Scalable Solution

System z



FICON/ESCON

VSM5



TCP/IP

VLE



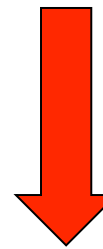
FICON/ESCON

SL8500 or SL3000
9840 (A-D)
T10K (A-C)

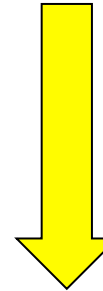


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 - Seamless integration
- Performance and cost of storage closely matched to type of data

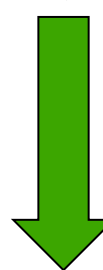
Cost / GB



- Tier 1 (0.8 – 23PB)

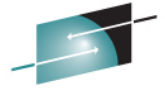


- Tier 2 (220TB – 225PB)



- Tier 3 (TBs to PBs to EBs)

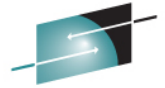
What's new!! (GA July 29, 2011)



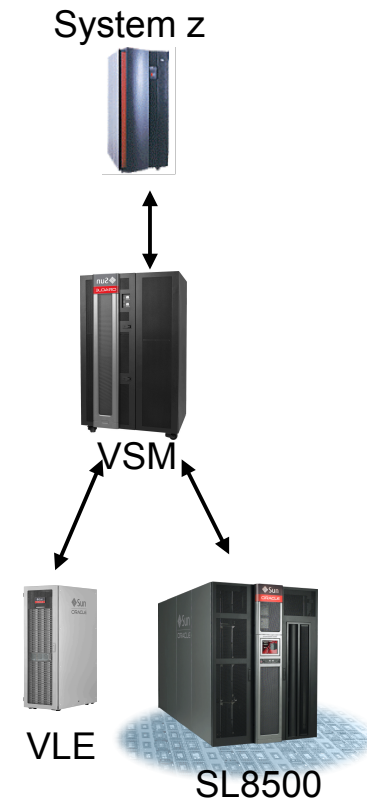
- Massive Scalability
 - A single VLE can have up to 256 racks of storage
 - Each VLE can access any other VLE in complex
 - 225 PB Effective Capacity
- VLE to VLE Copy
 - Manage data transfer independent of VSM5
 - Housekeeping tasks like reclaim and audit no longer consume VSM5 resources
 - High Speed (10 GigE)



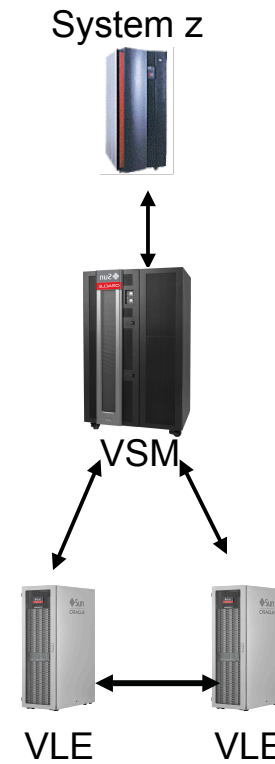
Options: Easy Storage Transitions



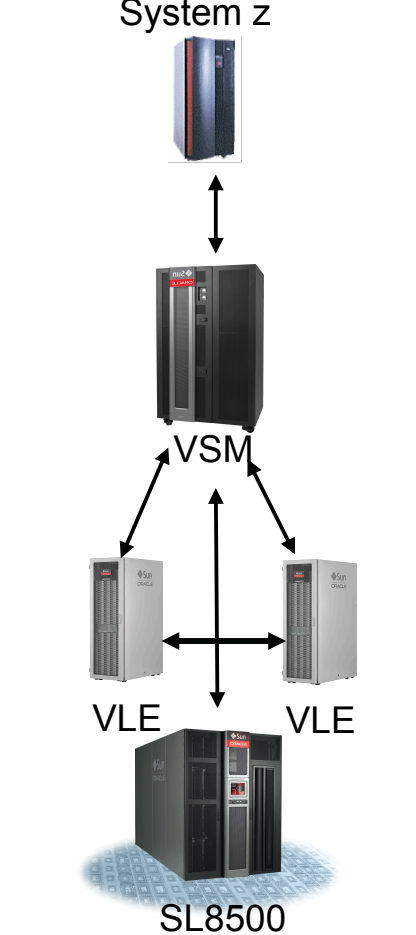
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VLE is added to existing config



VLE is expanded to replace physical tape



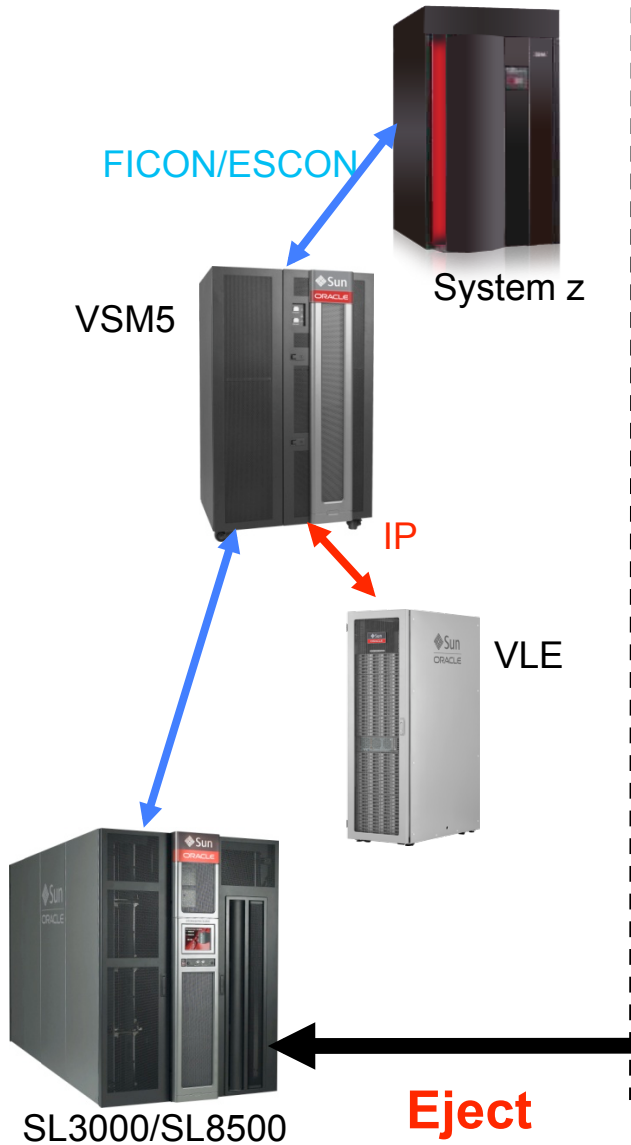
Physical tape easily added

Oracle VSM/VLE – Data Protection



Production

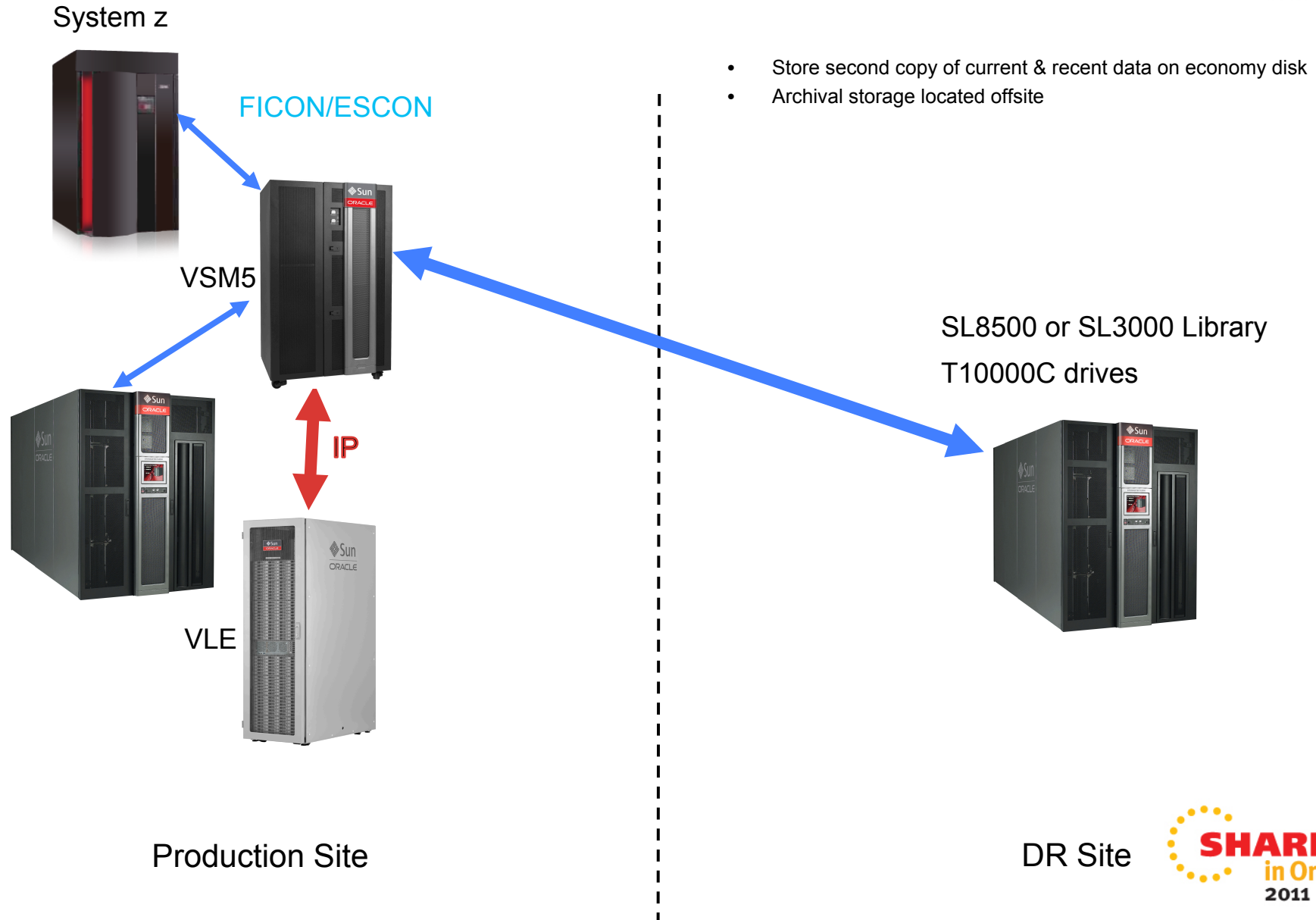
Disaster
Recovery



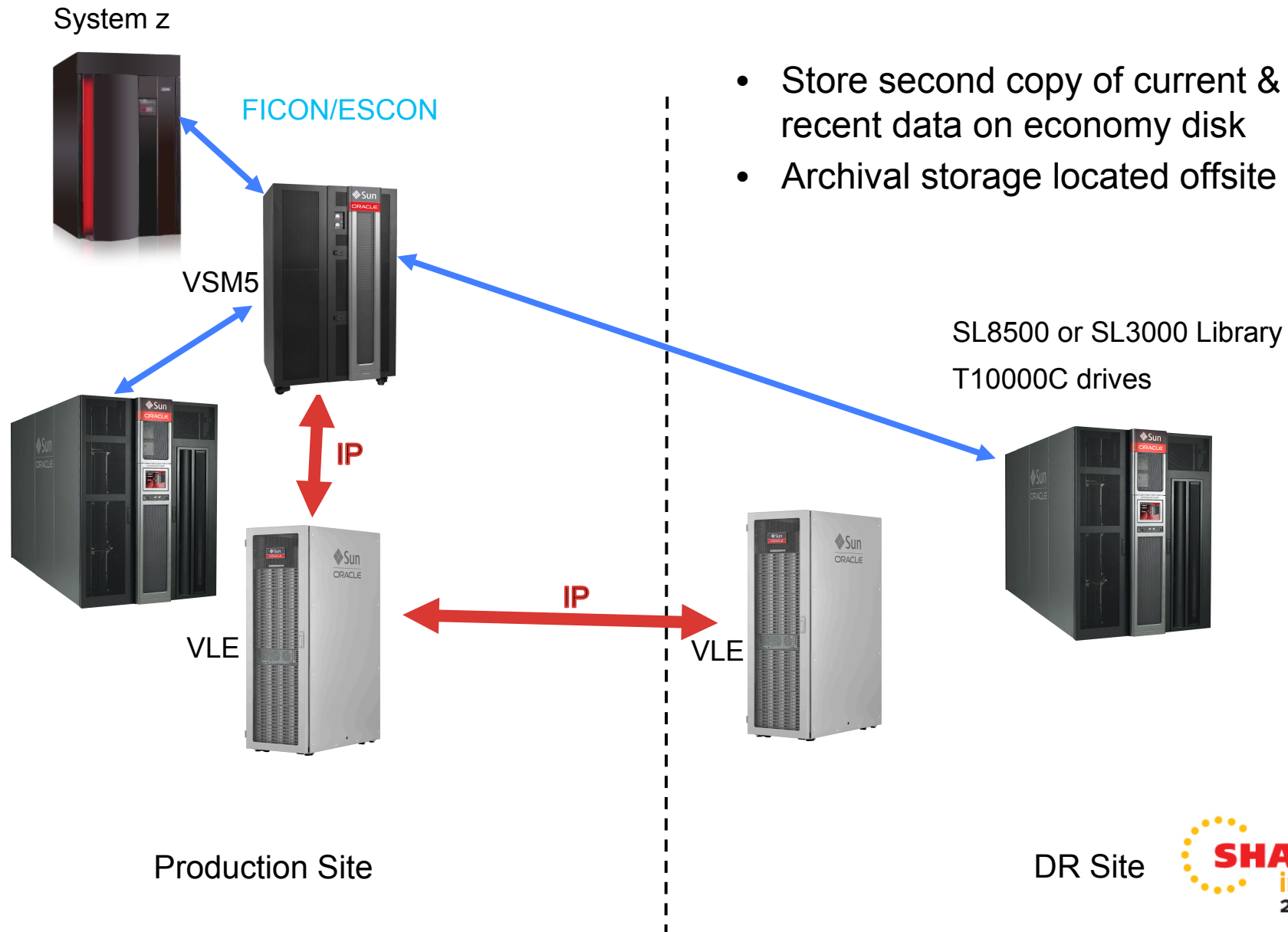
Vault



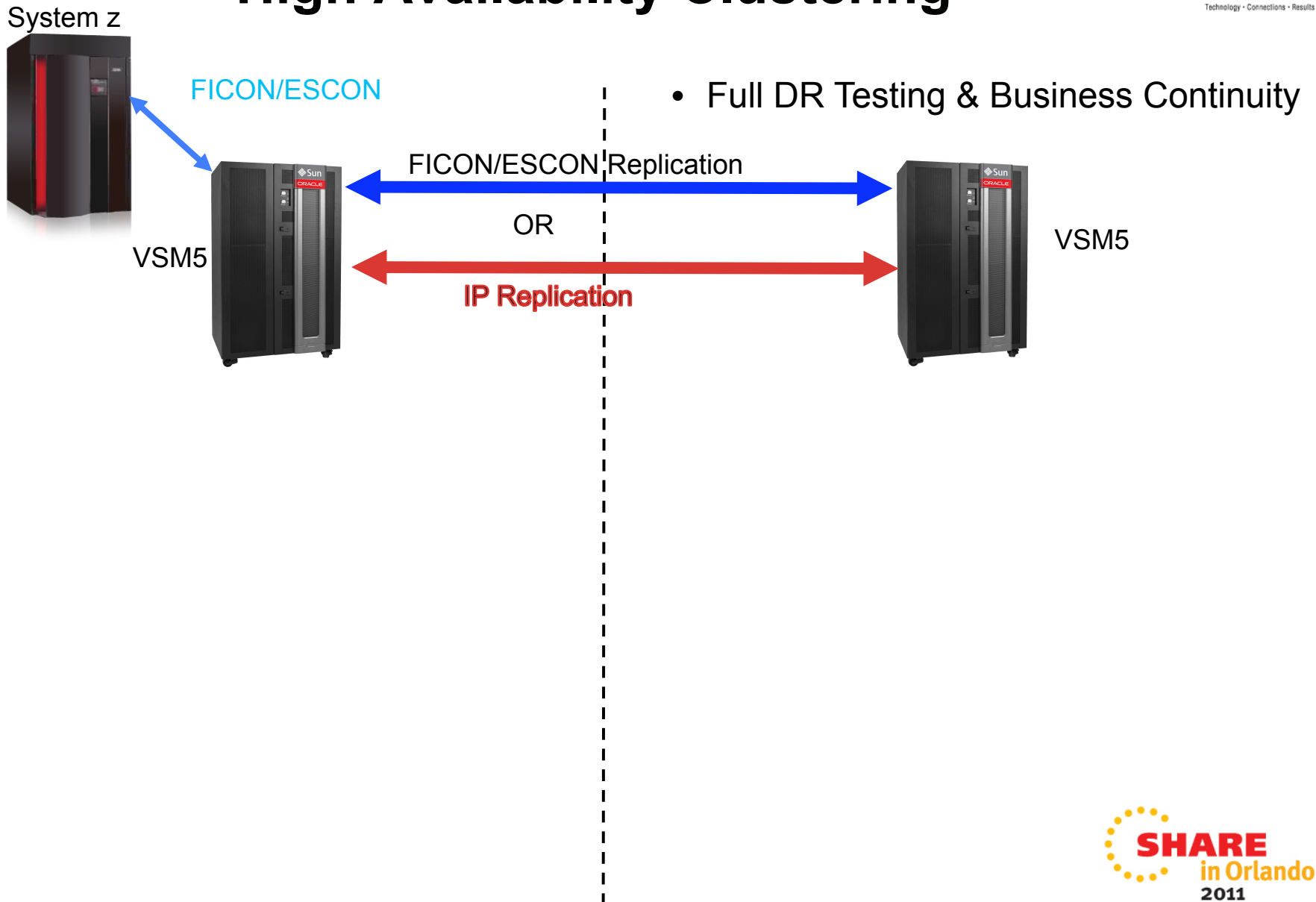
Oracle VSM/VLE – Data Protection Offsite Archival



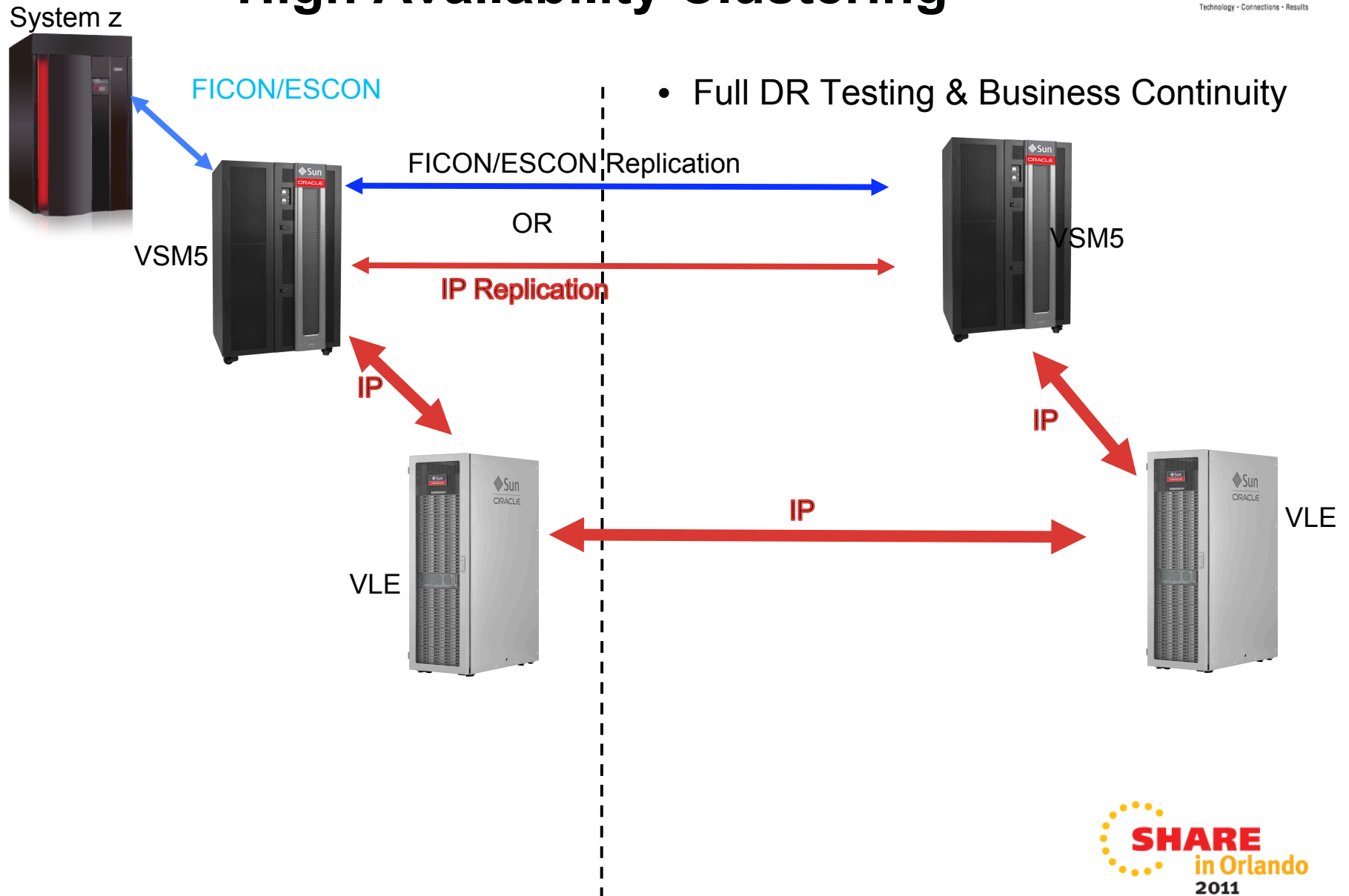
Oracle VSM/VLE – Data Protection Offsite Archival



Oracle VSM/VLE – Data Protection High Availability Clustering



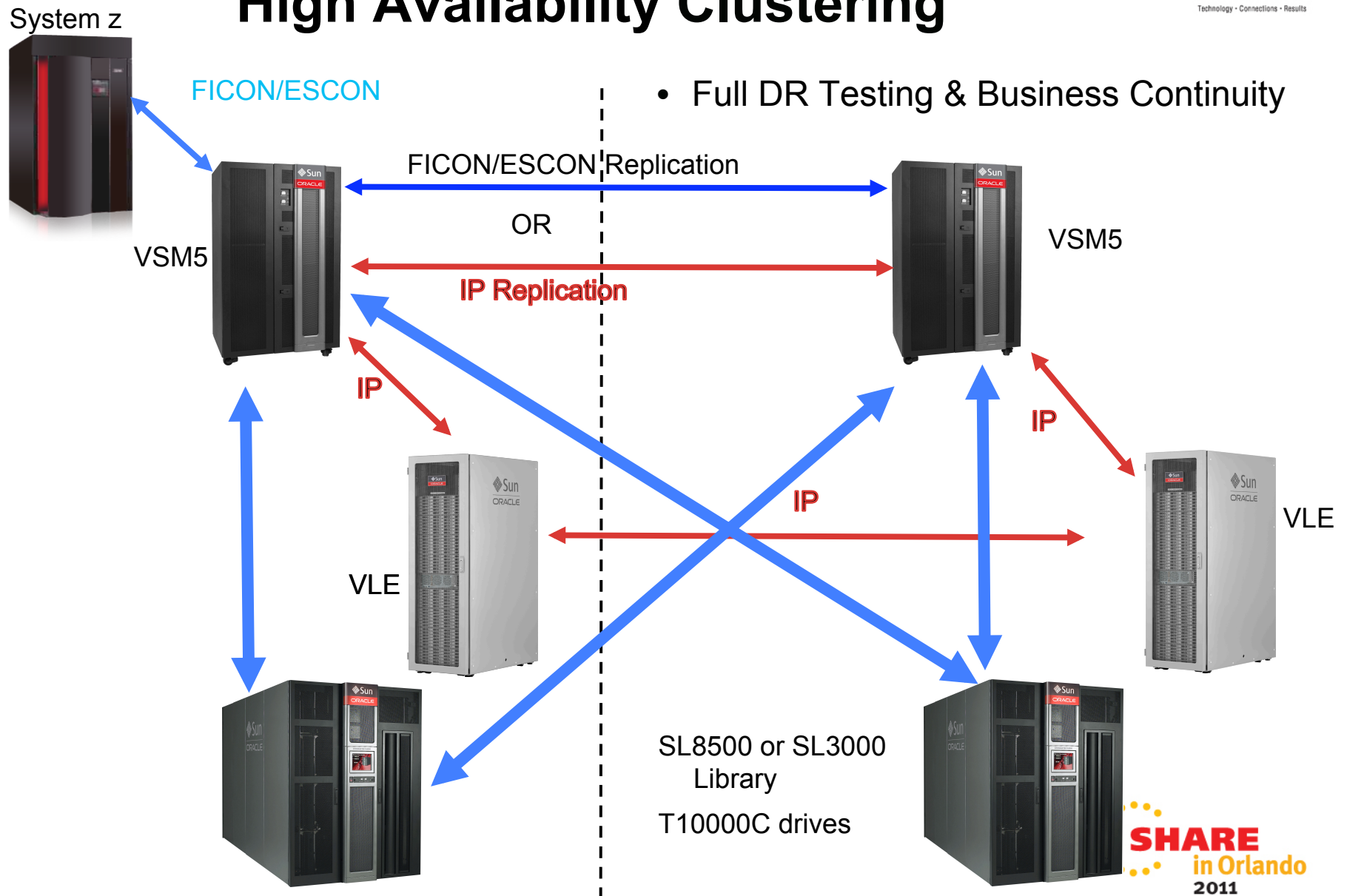
Oracle VSM/VLE – Data Protection High Availability Clustering



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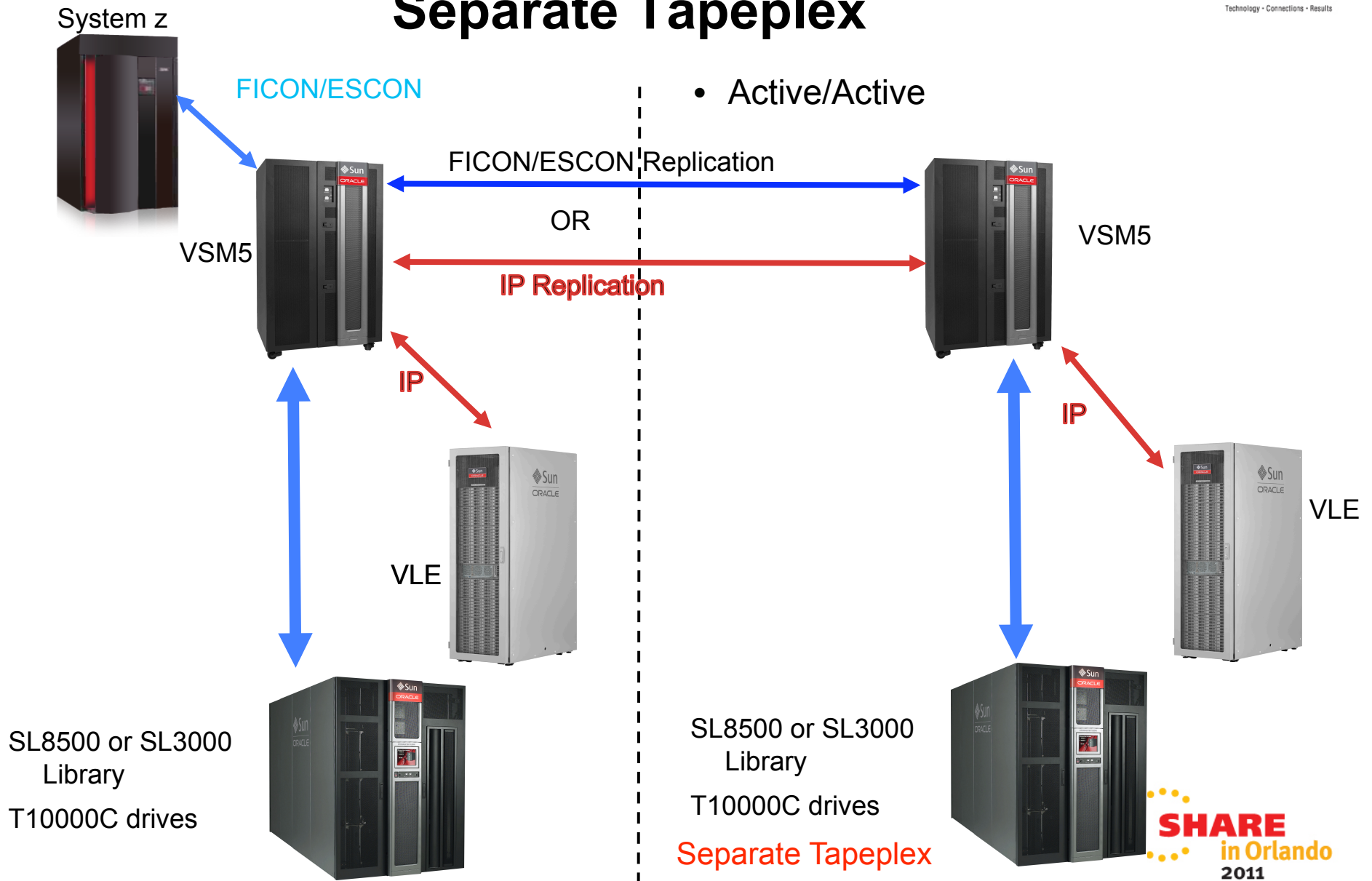


- Full DR Testing & Business Continuity



Oracle VSM/VLE – Data Protection Separate Tapeplex

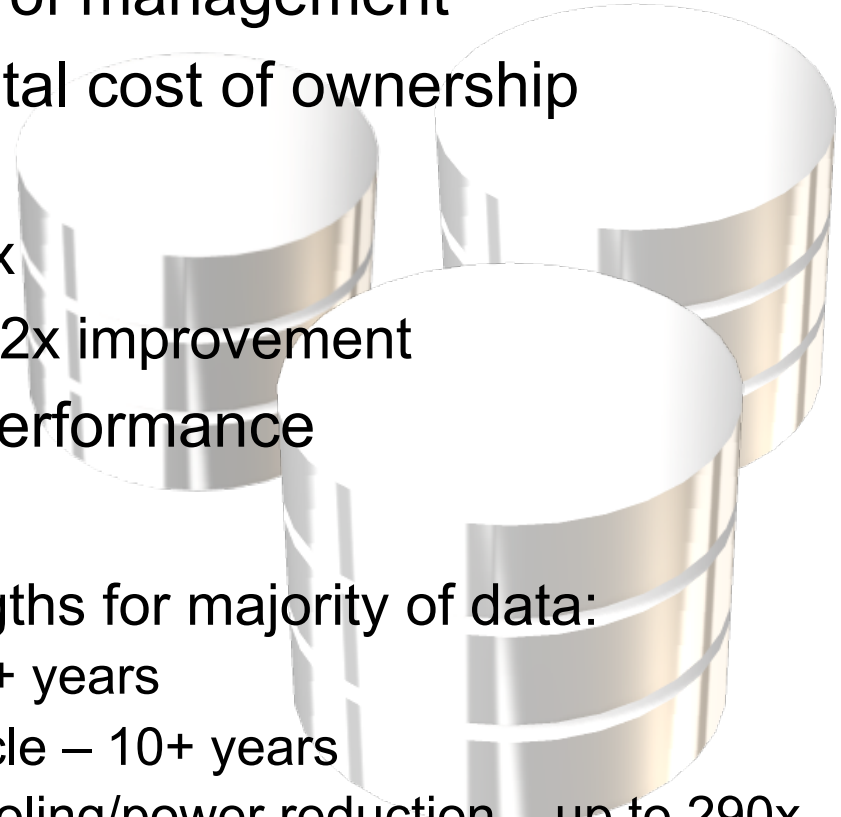
- Active/Active



Enhanced Virtual Tape Benefits



- Leverage central, single point of management
- Significantly drive down the total cost of ownership
 - Acquisition – up to 10x
 - Power and cooling – up to 20x
 - Technology migration – up to 2x improvement
- Improve recent data access performance
- Optimization of physical tape
 - Leverage physical tape strengths for majority of data:
 - Long term data retention – 30+ years
 - Long technology migration cycle – 10+ years
 - Environmental – significant cooling/power reduction – up to 290x
 - More efficiently utilize physical tape
 - Reducing tape recall
 - Reduce tape space reclamation



Summary

- Match data type and usage patterns closely to type of storage to provide the best performance/cost
- Automated tiered storage reduces overall storage management costs
- Configuration is dependent upon your BC/DR requirements
- Consider “peripheral” factors
 - Expected “shelf life”
 - Technology migration
 - Cooling and power consumption
 - Footprint
- Questions?