



VM-Aware SANs



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Why Virtualize Servers / HBAs / SAN Fabrics / Storage?

Virtualization enables:

- Pooling resources across physical units
- Allocating / re-allocating resources as needed
- Assignment based on class of service required
- Improving resource utilization
- Scaling without regard to physical system limits
- Mobility of virtualized objects across resource pool
- Changing physical infrastructure without disruptions

The Value of Virtualization: Virtualization is Like Anesthesia

Traditional IT Practice



With Virtualization



MDS Meets VM Storage Networking Challenges

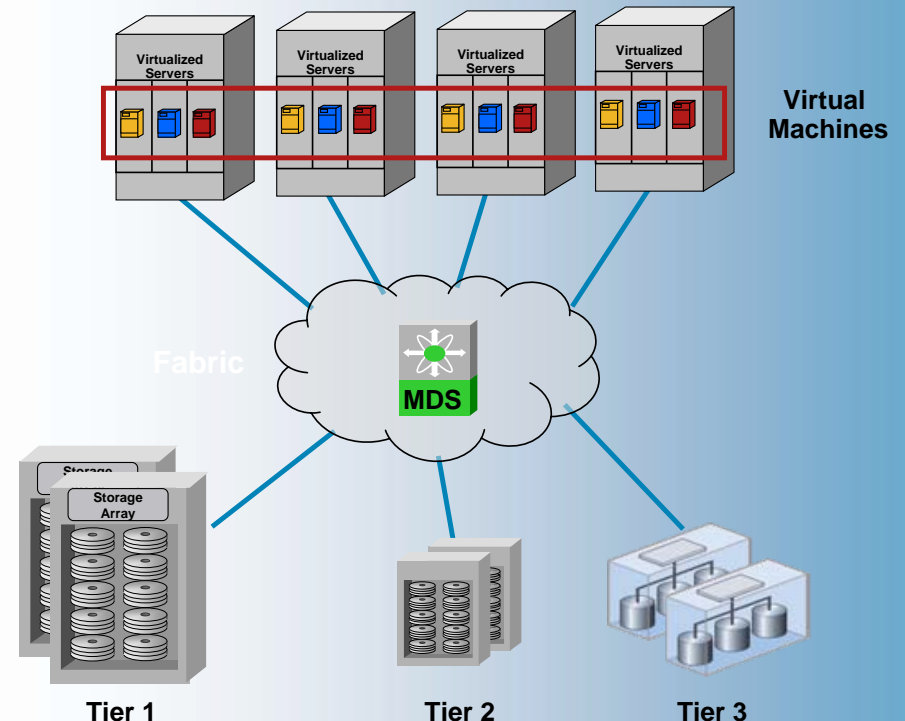
Cisco MDS 9000 complies to the new requirements posed by Virtual Machines

Switching Performance Requirements

- MDS Supports complex, unpredictable, dynamically changing traffic patterns
- MDS Provides fabric scalability for higher workload
- MDS Differentiates Quality of Service on a per VM basis

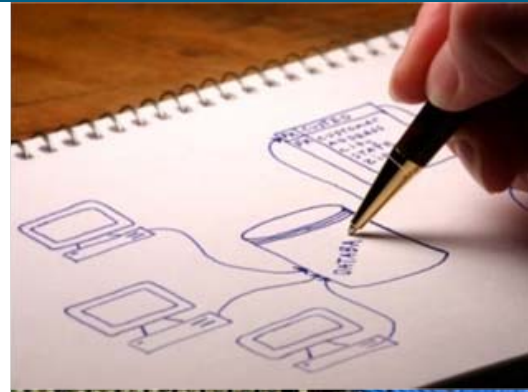
Deployment, Management, Security Requirements

- MDS VSANs are flexible and isolated SAN sections, support management Access Control
- MDS provides performance monitoring, trending, and capacity planning up to each VM
- MDS holistic security allows VM mobility without compromising security



Virtual Machine Aware MDS 9000 SAN

- Switching Infrastructure supports growing VM Bandwidth
Flexibility, Performance, Density and Security
8 Gbps Fibre Channel → FCoE and 16 Gbps
Investment Protection
- VN-Link Storage Services enable VM interfaces (vHBA) to be individually
 - Identified > vHBA (NPIV)
 - Configured > VSAN, Zoning, QoS, LUN Mapping/Masking
 - Monitored > Login Status and Location, Performance Counters
 - Migrated > vHBA pWWN constant across vMotion, port security
 - Diagnosed > FCping, FCtraceroute



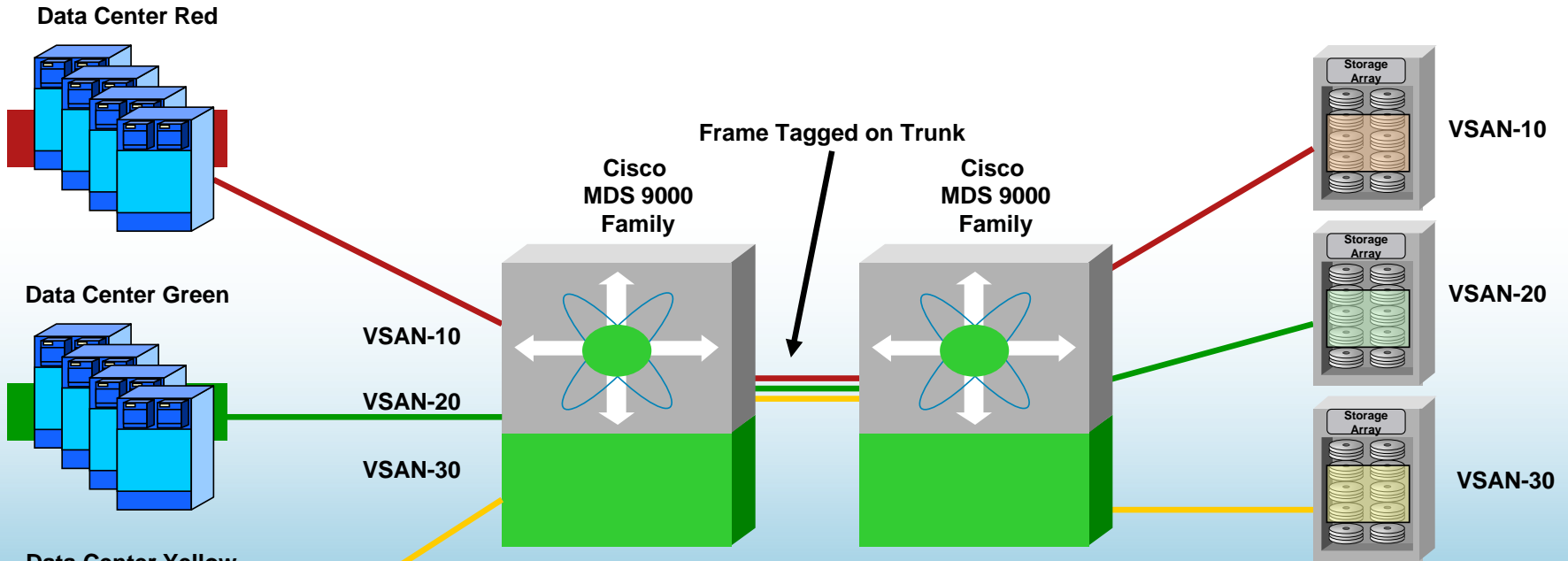
Virtualization Goals Achieved Using VSAN

Similar to the drivers for adopting Virtual Machines

- Consolidation
 - Drive SAN utilization and reduce over provisioning
- High Availability
 - Isolation prevents any undesired access across VSANs
 - Isolation improves Data Security Standards and Regulation compliance
 - Faults and mis-configurations contained to a given VSAN
- Performance
 - QoS, SLA provided at the desired level independently for each VSAN
- Easy management
 - No wiring reconfiguration
 - Individual administration for each VSAN using RBAC (Role Based Access Control)

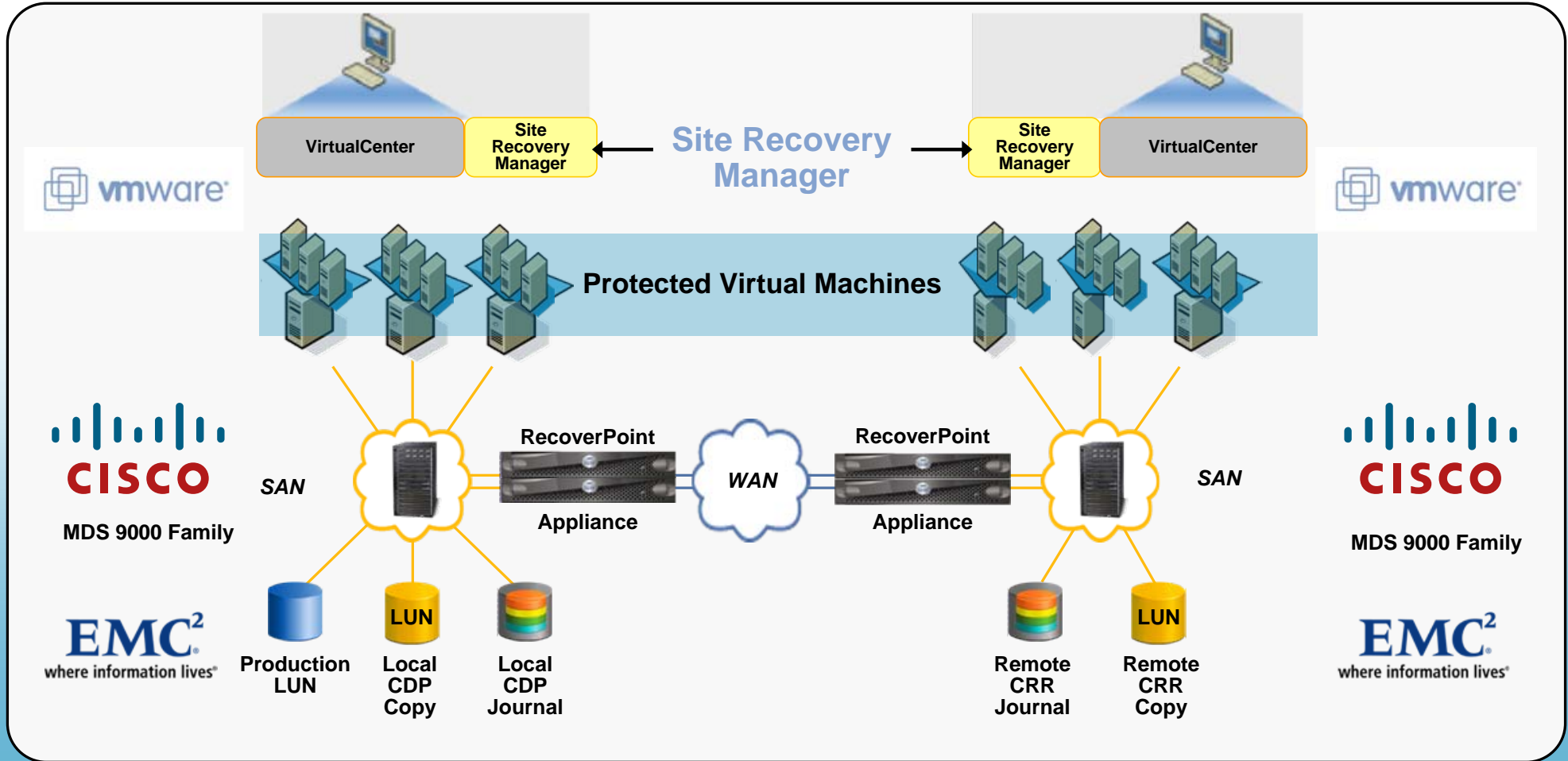
Virtualization Infrastructure and Management

Example: Mapping Virtual Center 'Data Centers' to VSAN



Administrator Privileges			
Administrative Team	Virtual Machines	Storage Network	Storage
Red	Data Center Red	VSAN-10	Array Red
Green	Data Center Green	VSAN-20	Array Green
Yellow	Data Center Yellow	VSAN-30	Array Yellow

Protect VM Production Site using EMC RecoverPoint, VMware Site Recovery Manager, and Cisco SANTap Traffic Splitter



New Cisco Hardware Supported in EMC RecoverPoint 3.1 SP1

MDS 18/4-Port Multiservice Module (MSM-18/4)

- 18 x 4G FC + 4 x GE ports
- 12.5 Gbps throughput on a single DPP for service traffic
- No chassis port count restriction/ no front panel port restrictions
- Director-class scalability



Available Now!

MDS 9222I Multiservice Modular Switch

- Modular Switch can be used as both edge switch and services node for fabric traffic splitting using Cisco SANTap
- Expansion Slot can fit MSM-18/4 module
- With MSM-18/4 module, MDS 9222i can be configured with 25Gbps throughput on two DPPs dedicated to SANTap service traffic

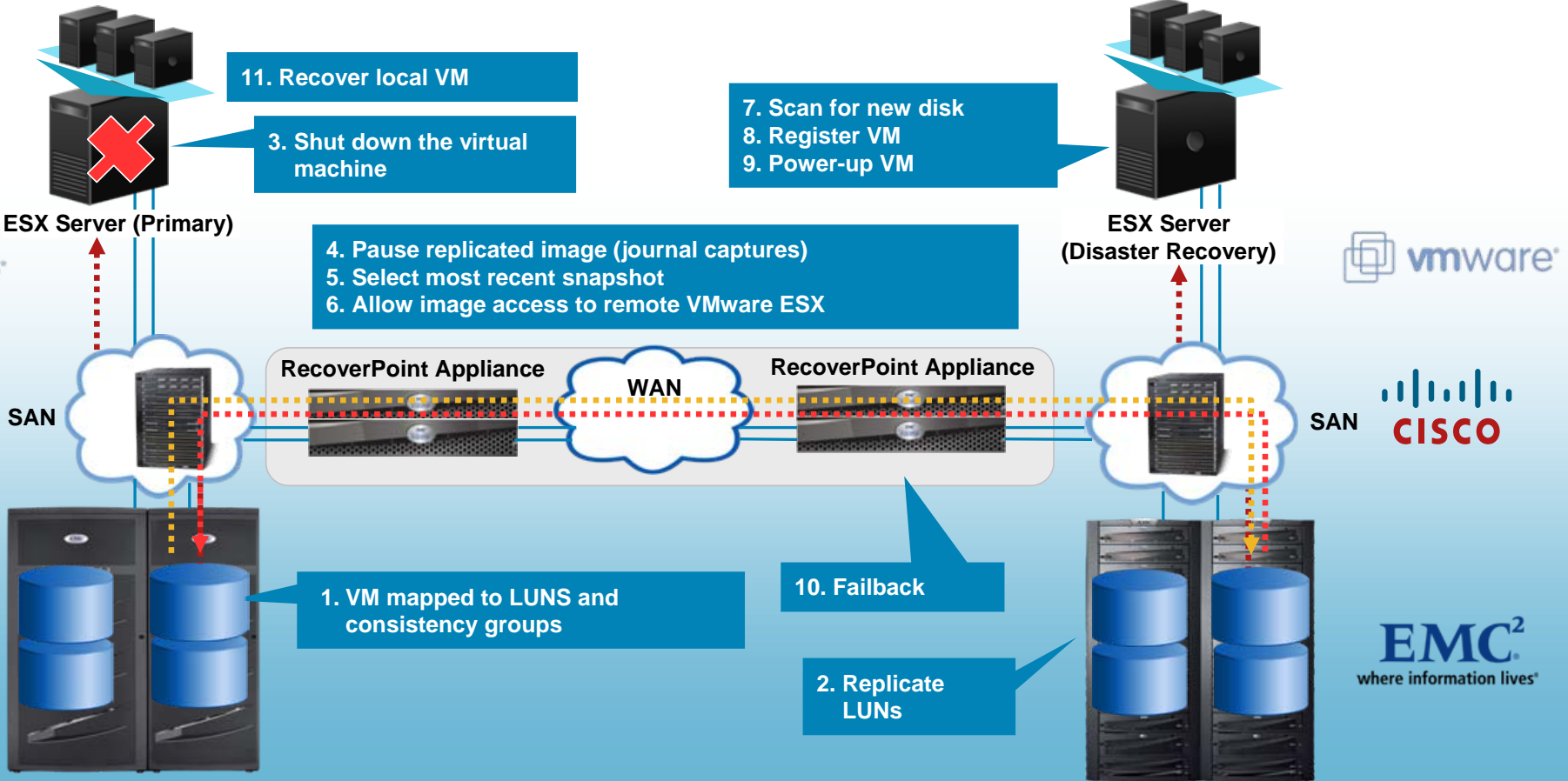


Introducing NX-OS 4.X

- **Improved Scalability:** Cisco SANTap service Fabric Splitter now supported for highly scalable EMC RecoverPoint solutions
- **More Simplicity:** Fewer variables to configure by separating DPP service traffic from L2 fabric traffic
- **Investment Protection:** Cisco Data Center 3.0 ready through fabric agnostic platform (supports FC-4, FC-8, FC-16, FCoE independently)

Virtual Machine (VM) Failover without VMware Site Recovery Manager

Manual Administrator Tasks

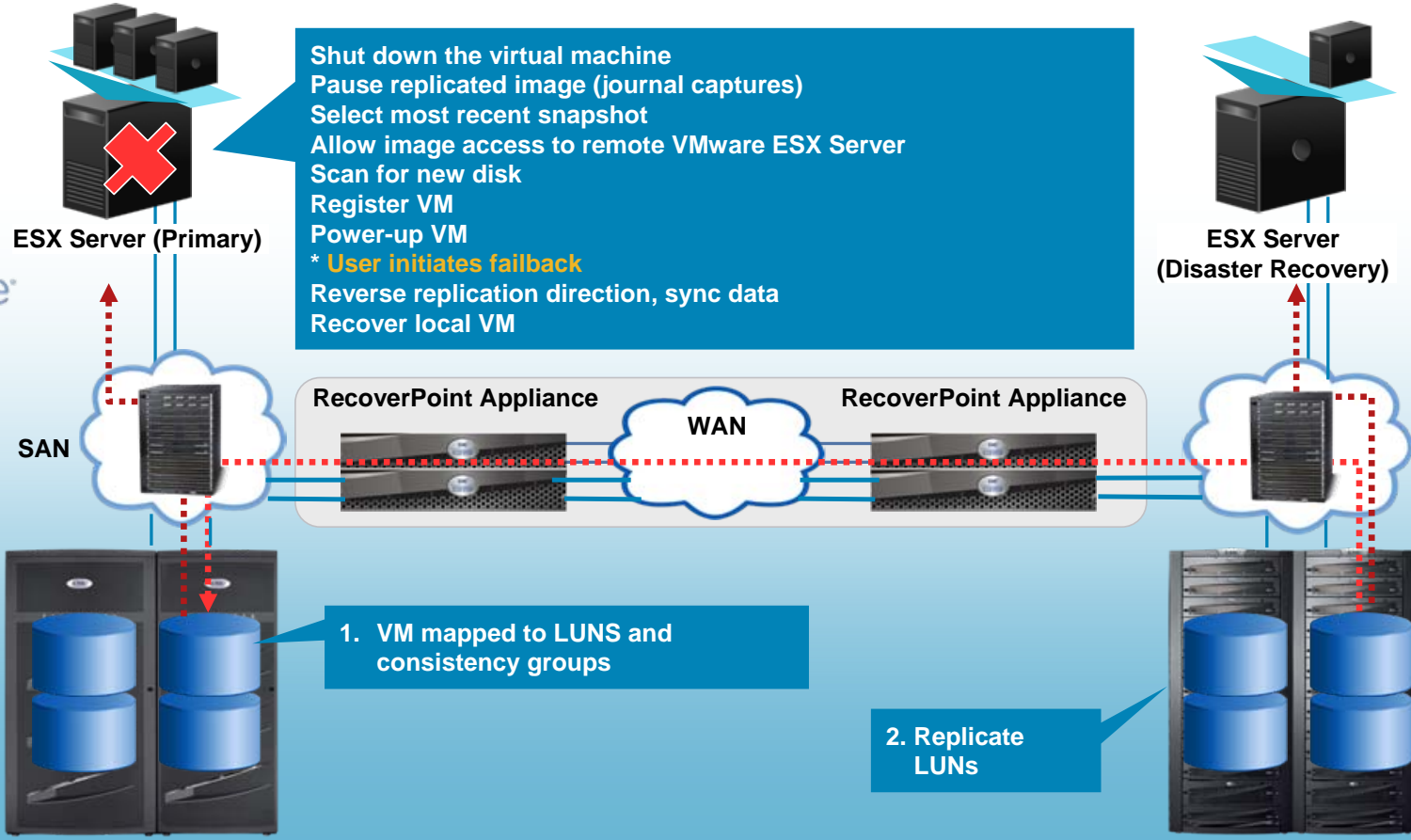


Virtual Machine (VM) Failover with VMware Site Recovery Manager

Automated Tasks



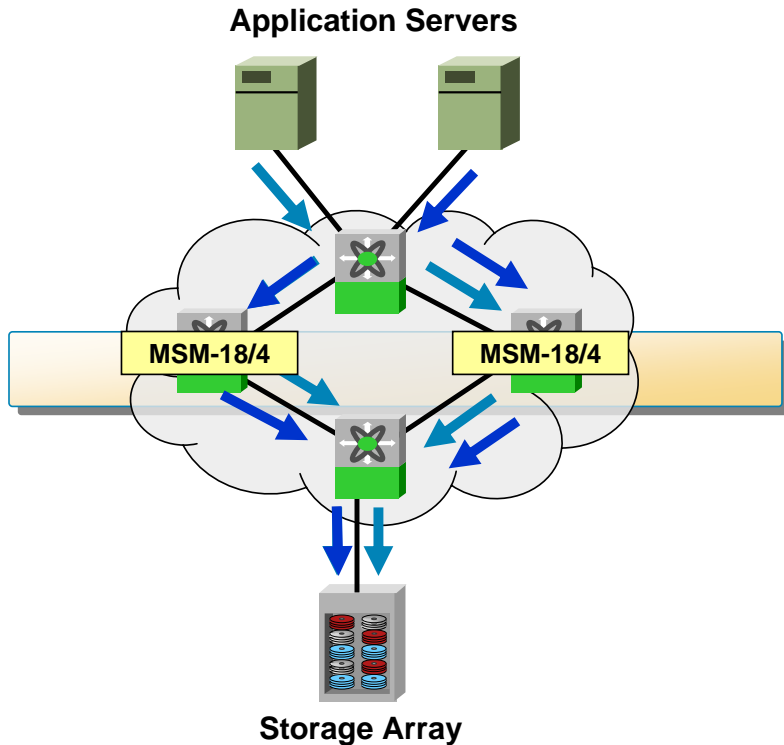
Shut down the virtual machine
 Pause replicated image (journal captures)
 Select most recent snapshot
 Allow image access to remote VMware ESX Server
 Scan for new disk
 Register VM
 Power-up VM
 * User initiates fallback
 Reverse replication direction, sync data
 Recover local VM



1. VM mapped to LUNS and consistency groups

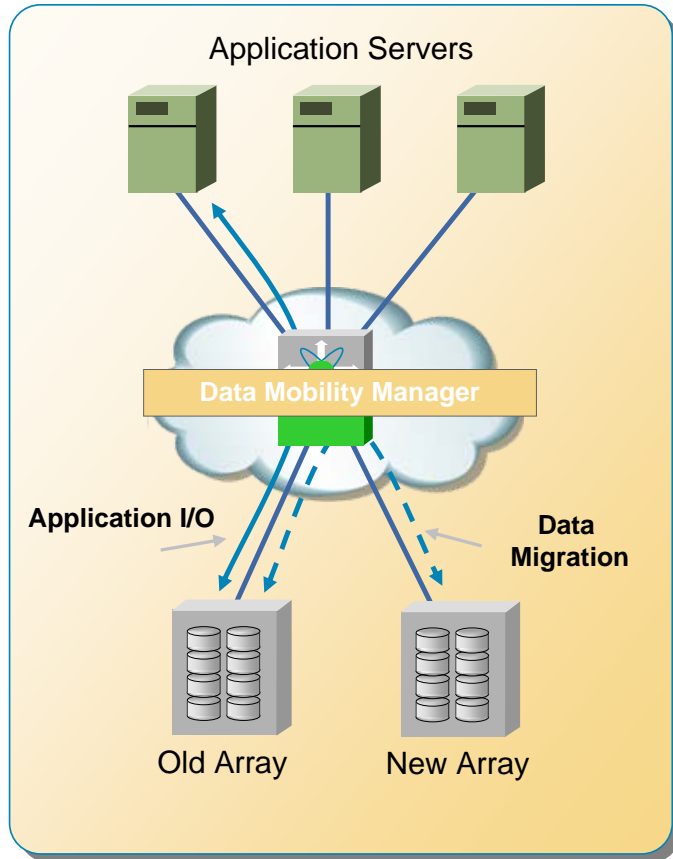
2. Replicate LUNS

Intelligent Storage Applications: Delivered as a Transparent Fabric Service

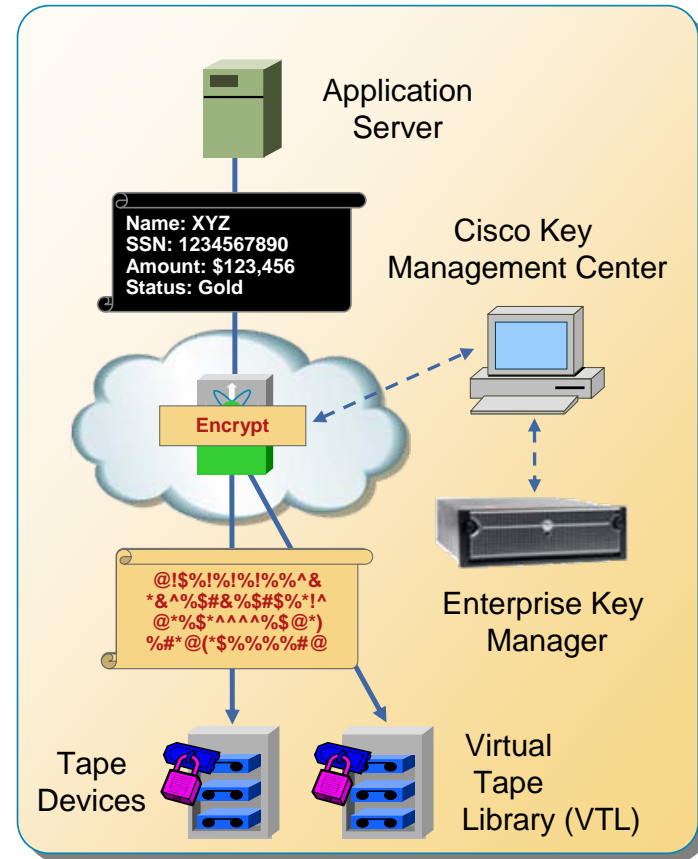


- Extend storage services to any device in the SAN
- Transparent to applications
- Non-disruptive deployment
 - No SAN re-configuration
 - No re-wiring to insert appliances
- Highly scalable performance
- Automatic load balancing
- Reliable, highly available service
- Wizard-based provisioning

Intelligent Storage Applications Portfolio



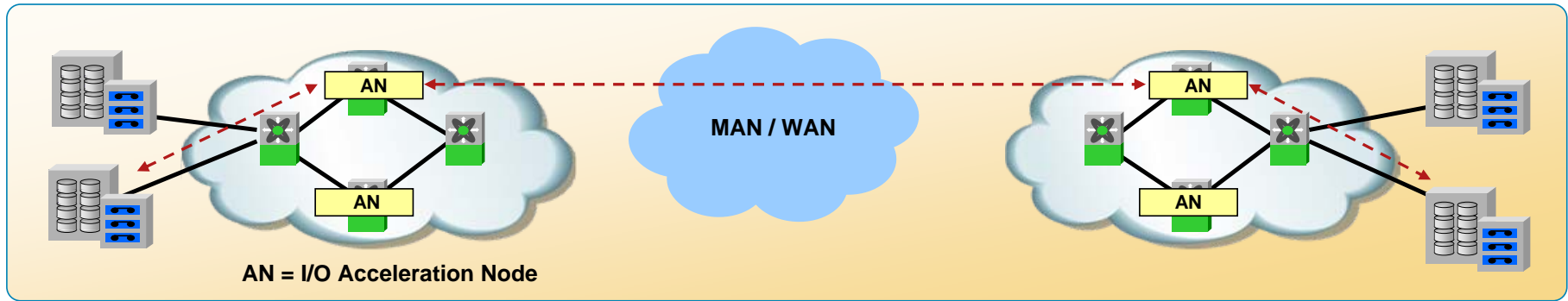
Data Mobility Manager



Storage Media Encryption

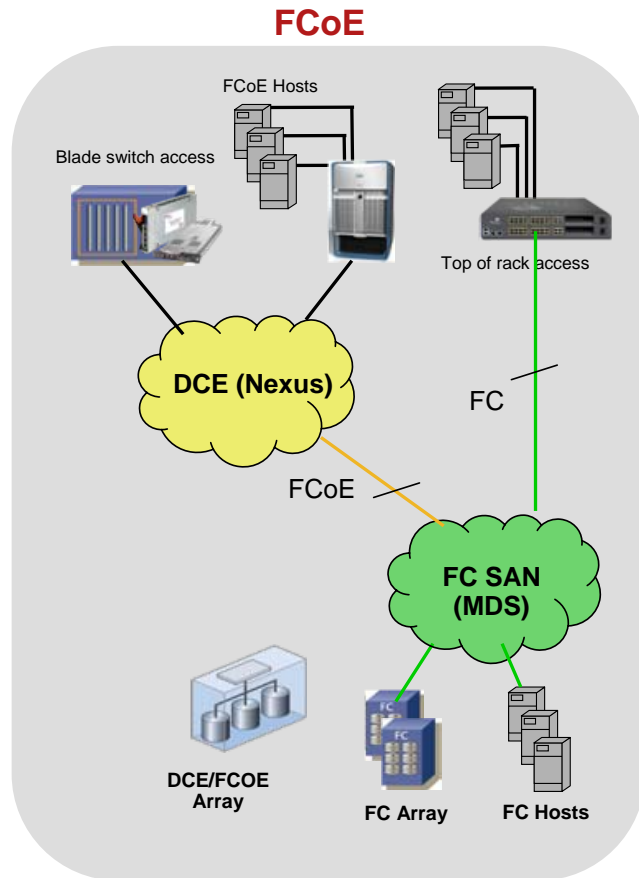
I/O Accelerator

NX-OS 4.2



- Extends I/O acceleration service to any device in fabric
- Provides unified, transport-agnostic solution for disk and tape I/O acceleration over FC (MAN) and FCIP (WAN)
- Offers acceleration with high-availability PortChannels and ECMP over both FC and FCIP
- Adds compression for FC
- I/O Accelerator Node platforms: MDS 9222i, MSM-18/4, SSN-16

Moving Forward to FCoE



- **Server Savings**
 - Fewer adapters
 - Less cabling
 - Fewer access layer switches
 - Universal SAN enablement
- **SAME NX-OS on Nexus & MDS**
- **Services on MDS available to FCoE servers**
- **Will run in a MDS 9509 chassis we sold in 2002!**

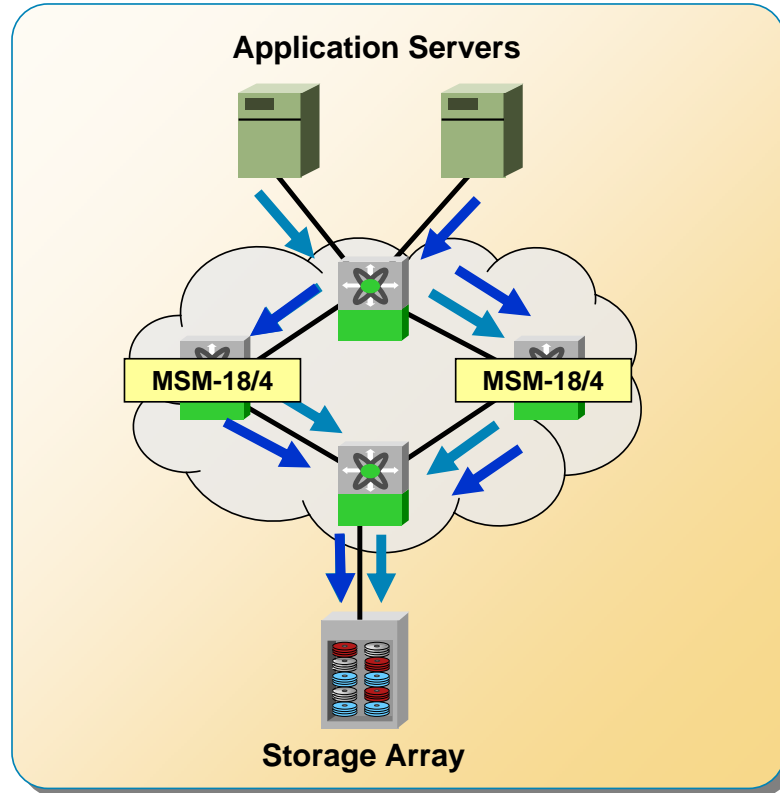
Meet...



Summary



Virtualization:
Easing the Pain



Services-Oriented
SANs



Investment
Protection



For more information visit:
www.cisco.com/go/vmworld09



