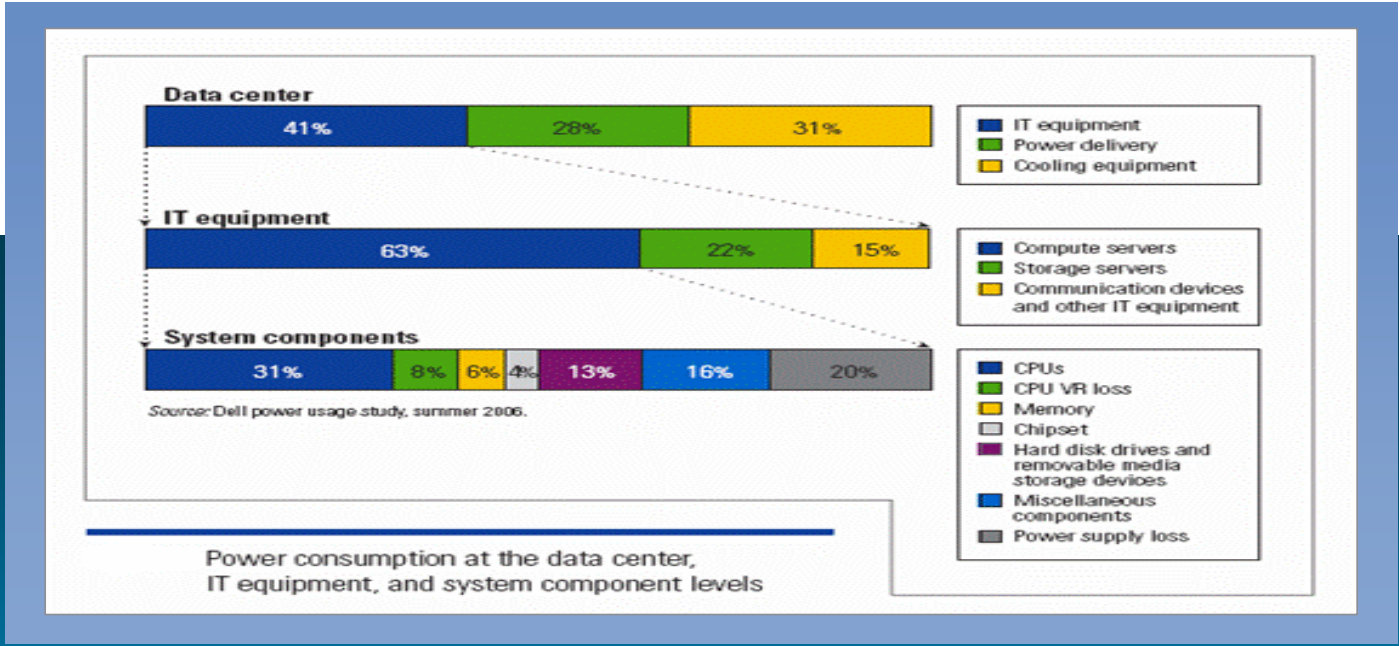
Designing Green SANs

Richard Rose

Product Manager, Data Center Switching Technology Group, Cisco

rirose@cisco.com

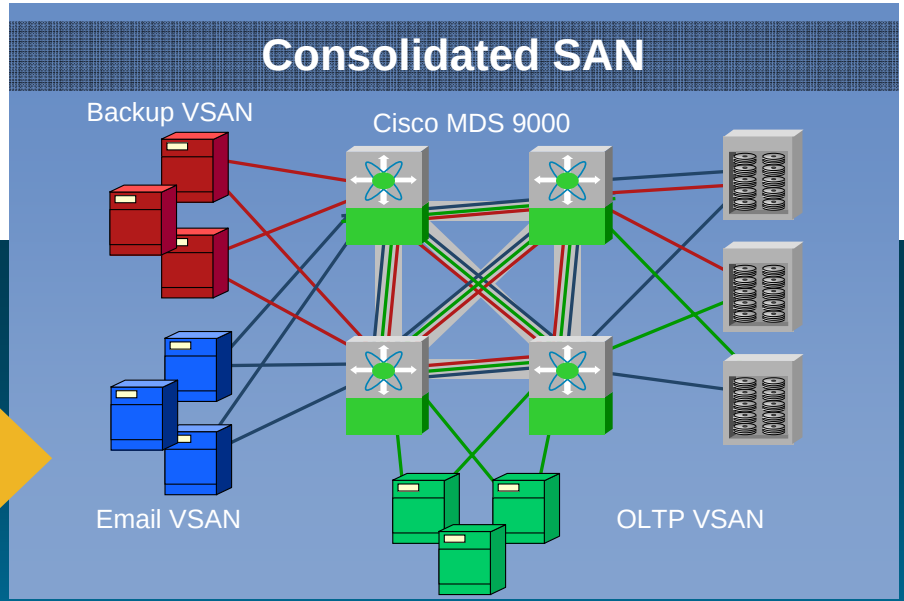
Power Consumption in the Data Center



- While networking devices consume only 15% of total power in data center…
- …SAN switches help reduce overall power in data center through Server Consolidation, Unified I/O, SAN Virtualization, and Storage Virtualization

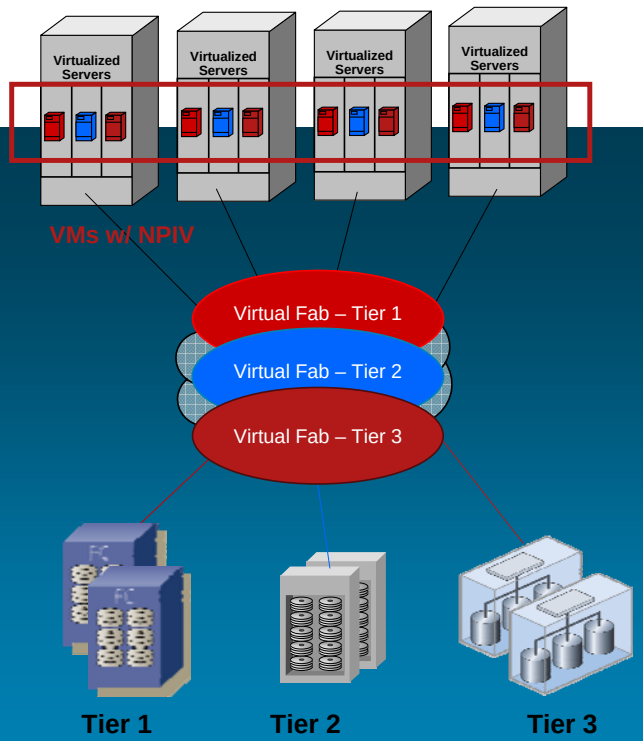
Consolidate SAN Islands with VSANs

Overlay isolated virtual fabrics (VSANs) on same physical infrastructure



With VSANs	
Number of Switches	Fewer
Switch Utilization	Optimal
Simplified Management	Yes
On-demand Flexibility	Yes
Power Consumption	Lower
Overall TCO	Low

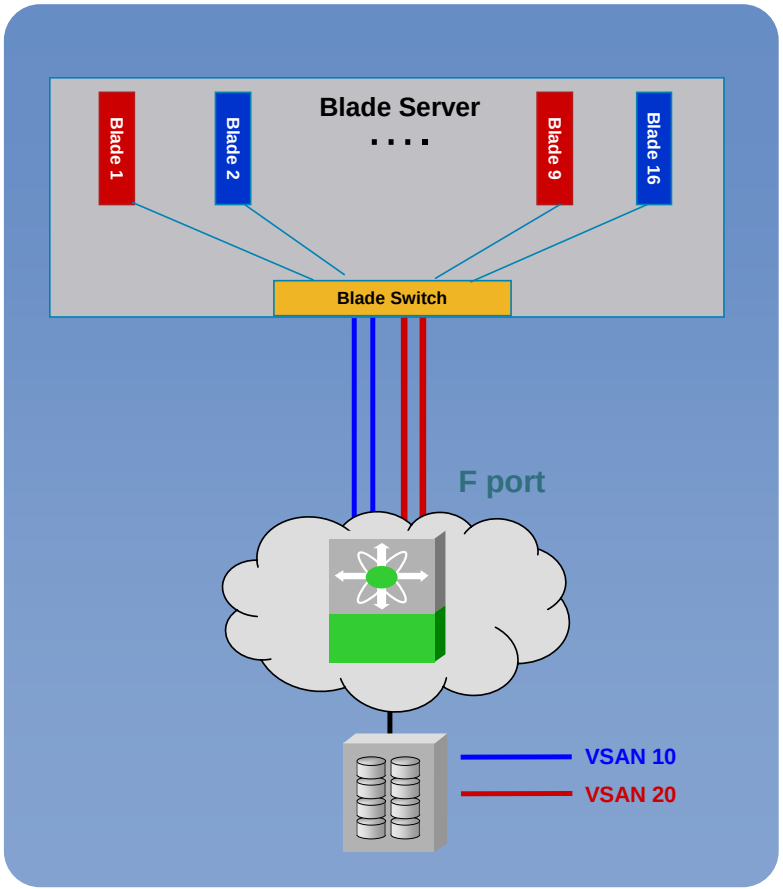
Accelerate Virtual Machine Deployment
VM-Aware SANs



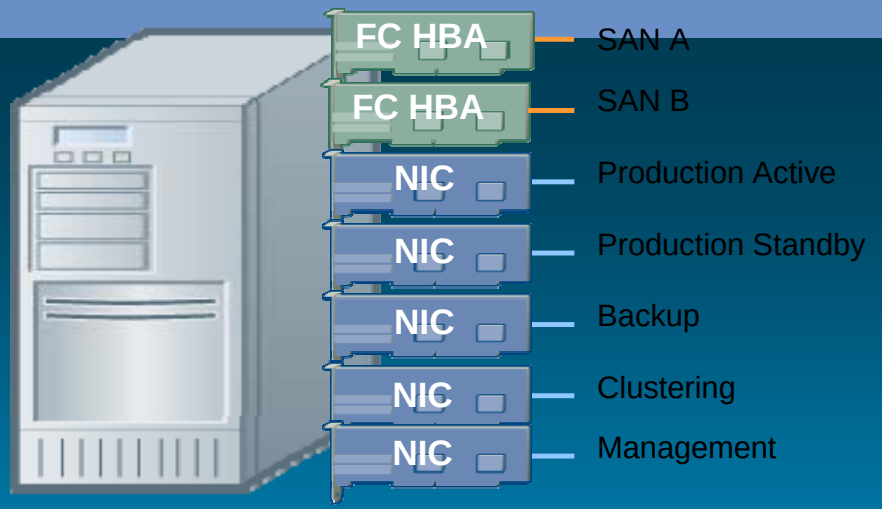
- Fabric Scalability and Performance
  - Resilient, deterministic, high performance fabric to support large, dense VM environments
- Mobility with Security
  - VM fabric access, VM-granular zoning, Virtual Fabric RBAC
- VSANs Isolate Fault Domains
  - Increase availability, simplify troubleshooting, improve security & compliance
- Management and Troubleshooting
  - VM-granular Quality of Service (QOS), performance monitoring and trending
- Storage Services
  - VM-granular Storage Tiers, Virtualization, Continuous Data Protection (CDP), Continuous Remote Replication (CRR)

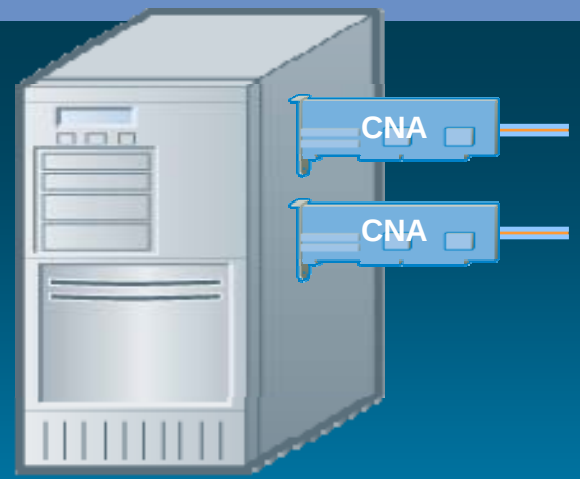
Enable Large Scale Blade Server Deployments

- HBA mode for FC Blade Switch
  - Enables large scale SAN deployment of Blade Servers
- Flexibility for Blade Server Mobility across Blade Chassis
  - No SAN re-configuration required when blade servers are added, swapped, or moved
  - Eliminates need for Server and SAN teams to coordinate changes
- HA for Blade Servers
  - Bundle multiple ports into one logical link
  - Transparent to cable, port, or line-card failure



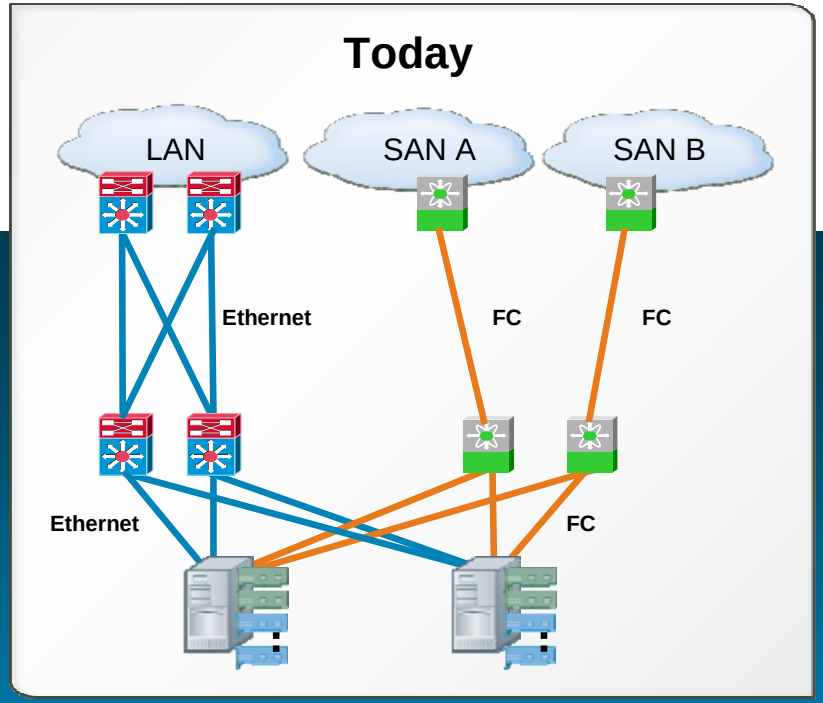
Consolidate I/O in the Server

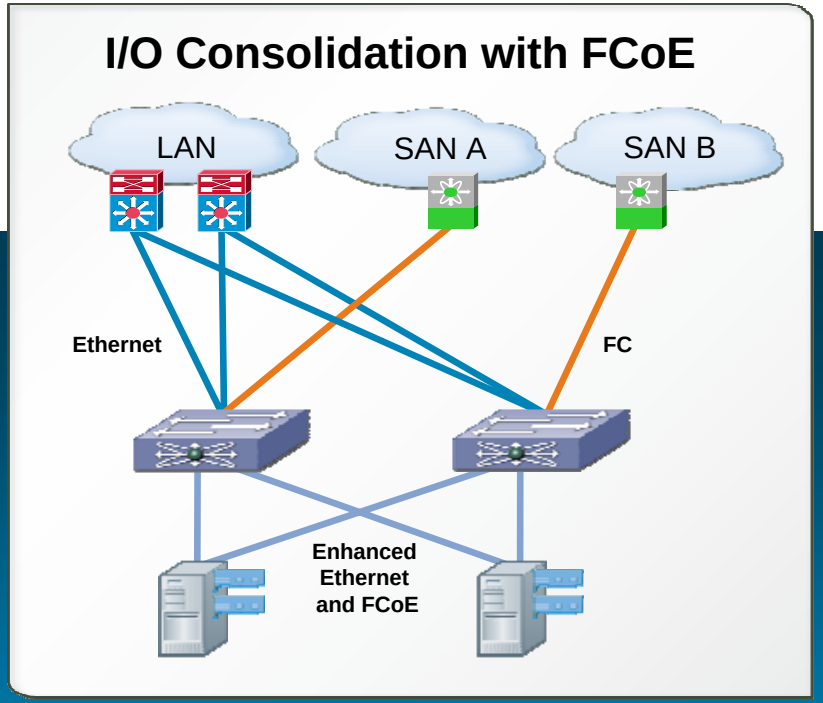




All traffic goes over 10GE

Unified I/O Power Savings Example

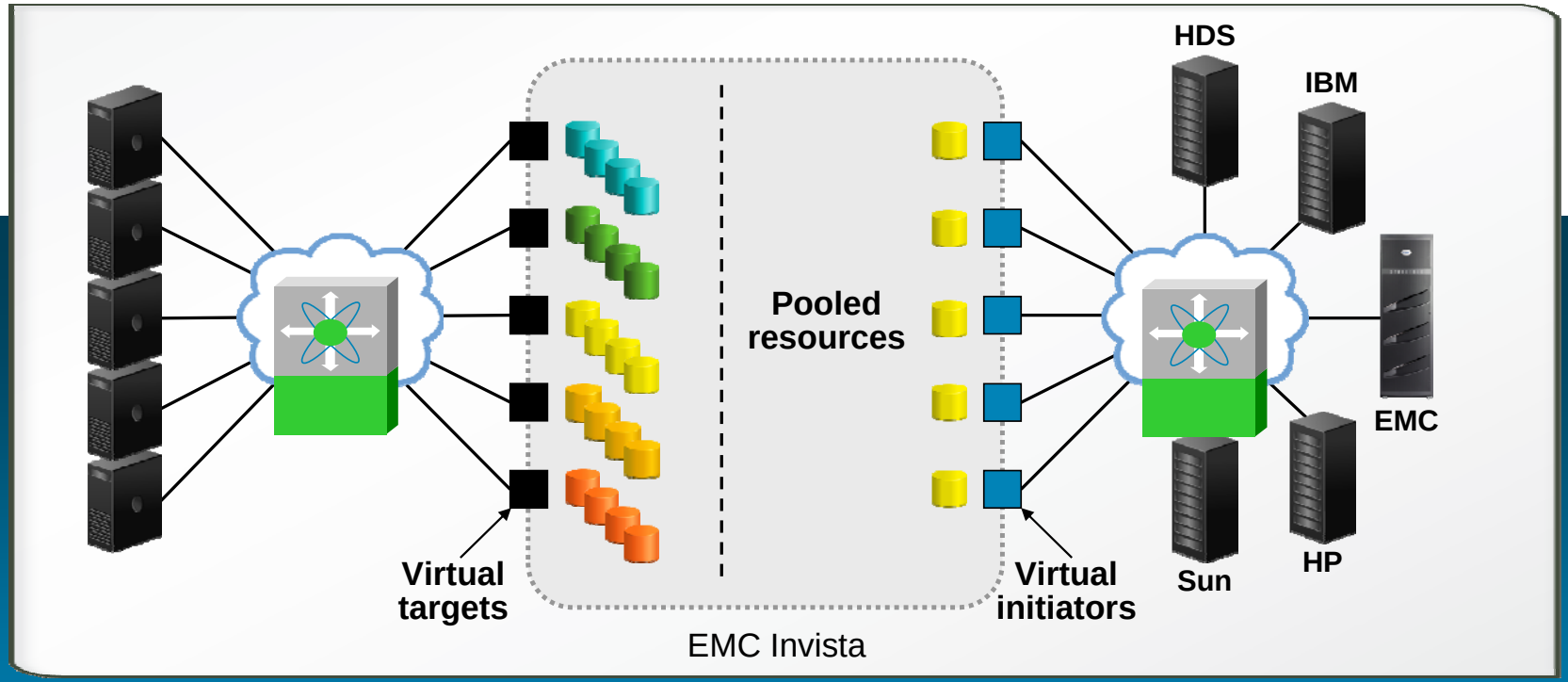




- Example
  - 1,000 servers with 2 HBAs and 6 Network connections each
  - 55% power savings in LAN/SAN network by deploying Unified I/O1

1: Nexus 5000 TCO Calculator (http://www.cisco.com/cdc_content_elements/flash/dataCenter/nexus5k_tco_calc/cisco.html)

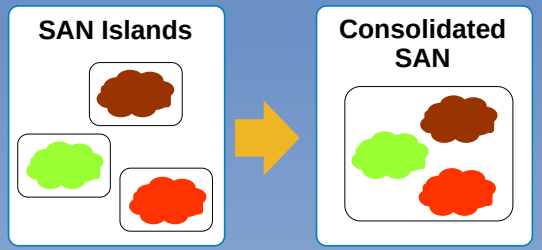
Virtualize Pooled, Tiered Storage



- Logically pool storage resources across heterogeneous arrays
- Flexible storage allocation increases utilization

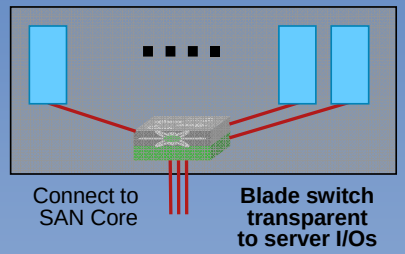
Green SAN Technologies

Virtual SANs



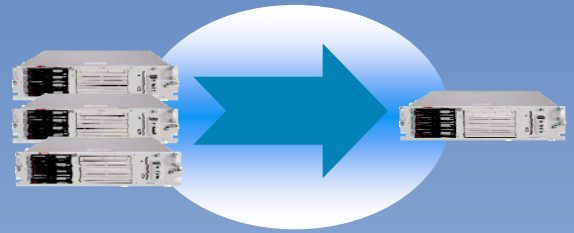
Enable scalable SAN design, growth, and consolidation of storage and network resources

Blade Servers



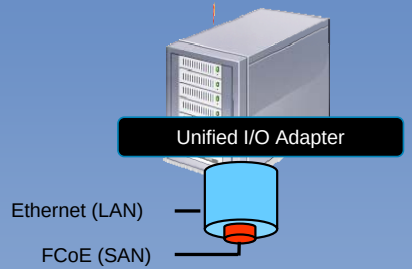
Enable large-scale server deployment, simplified management, multi-vendor SAN connectivity

Server Virtualization



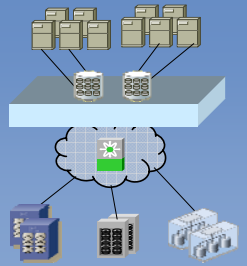
Enable mobility with security, fault-isolation, QoS, Performance monitoring, troubleshooting

Unified I/O



Unified I/O by extending FC SANs to servers using FC over Ethernet (FCoE)

Storage Virtualization



Enable tiered storage services, online data migration, and heterogeneous copy services

Q&A

Learn More:
www.cisco.com/go/datacenter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