Touch Cisco Webinare

Trends im Datacenter:
Die neuen, zukunftssicheren Systeme und Architekturen

EinwahlNummer: 06196 – 773 9002

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V5

“Trends im Datacenter: Die neuen, zukunftssicheren Systeme und Architekturen“

Der technische Vortrag beschäftigt sich mit der Infrastruktur im Datacenter. Verkabelungs-Systeme mit „End-of-Row“, „Mid-of-Row“, „Top-of-Rack“ oder Blade-Switches bestimmen die Auswahl der aktiven Komponenten und der DC-Aggregation. Die Präsentation zeigt neue Trends und erweiterte Techniken im Datacenter. An Hand der neuen Cisco Nexus und der Catalyst 6500 Familie werden beispielhaft die integrierte Sicherheit mit CTS (Cisco Trusted Security) und den L2-Transport zwischen Datacentern mit OTV (Over-the-Top-Virtualization) diskutiert.

Der Vortrag wendet sich an alle Datacenter- und Netzwerkplaner und –Techniker, die sich mit neuen Techniken im Datacenter beschäftigen und an technischen Details von Nexus und Catalyst interessiert sind.

Agenda

- Cisco Datacenter 3.0 Strategie
- Verkabelungssysteme und die aktiven Komponenten
- Integration von Virtual Switch System (VSS) im Datacenter
- Überblick Cisco Trusted Security (CTS)
- DC-L2-Koppelung mit Over-the-Top-Virtualization (OTV)
- Q&A

Servers

CPU Density, Blade Systems, Cloud Computing, 10GE

Virtual Machines

Changes the business model for the Data Center

Storage

Paradigm Shift to FCoE/NAS

Power, Cooling, Cabling

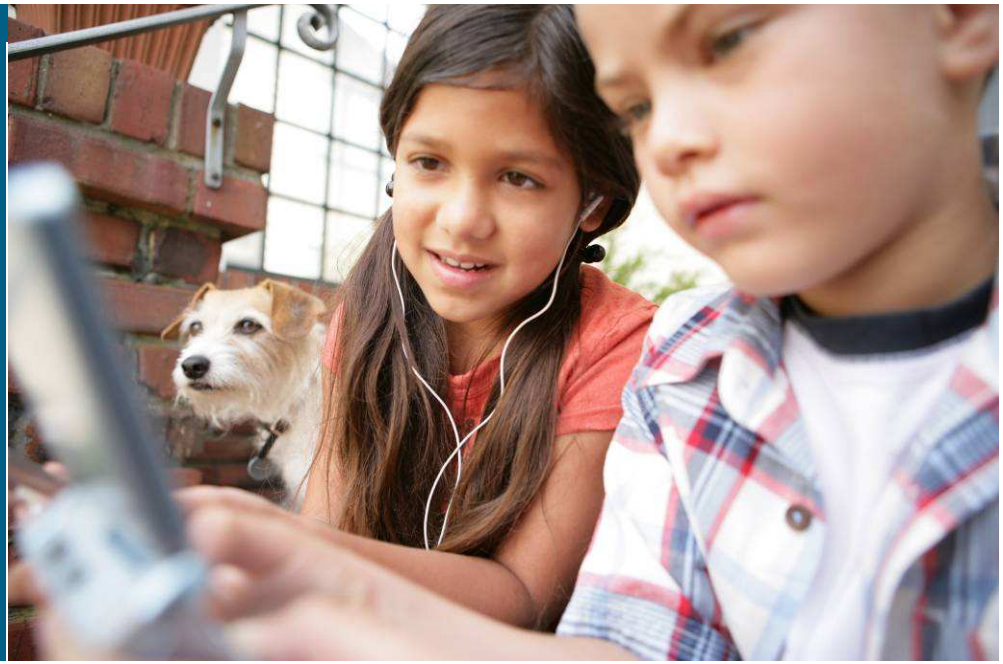
$$$, Top of Mind...

Operations

Automation, Management, Consolidation

Data Center 3.0 Technology Plan
Continuous Innovation and Execution

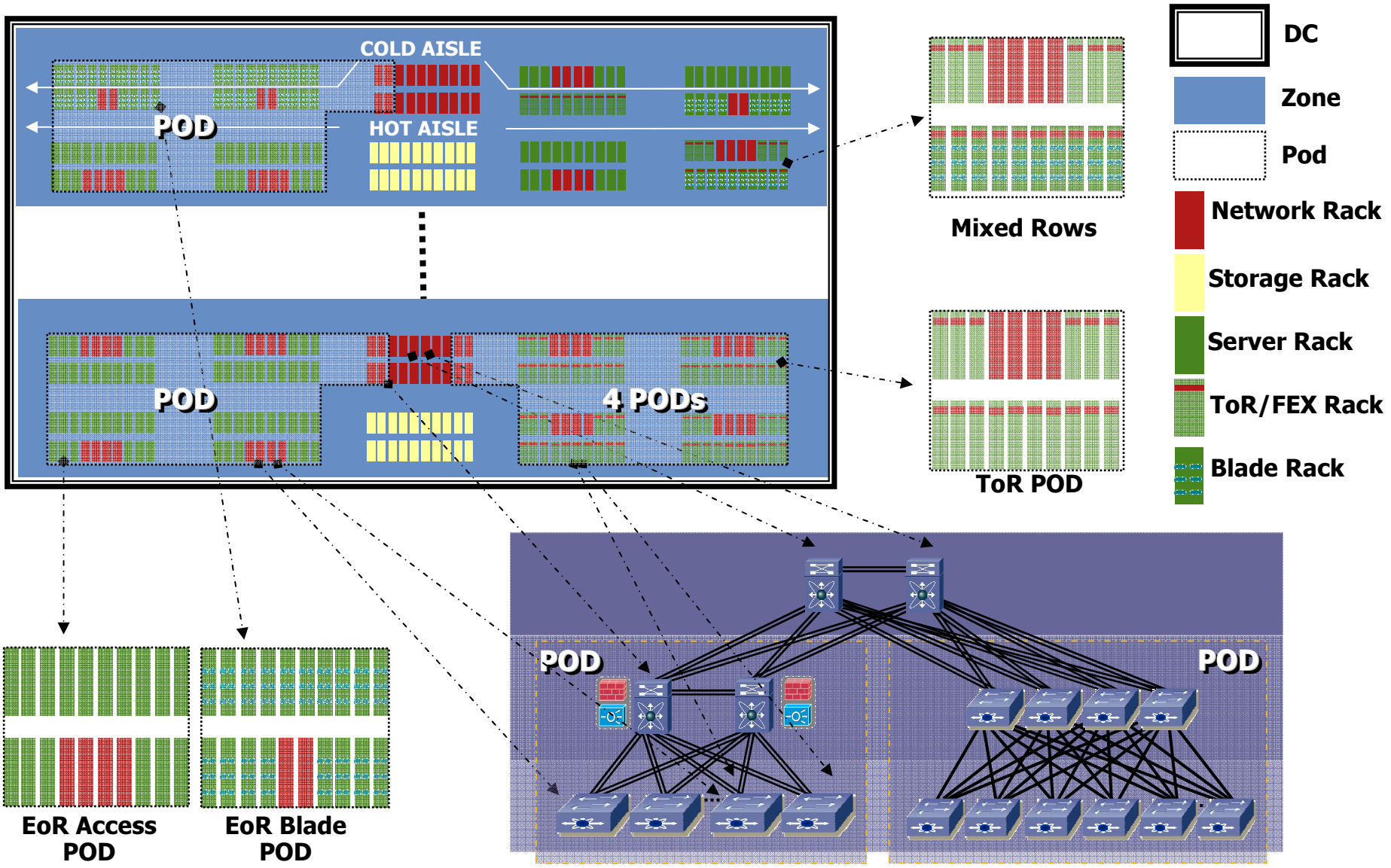
Server Networking	Storage Networking	Unified Lossless Fabric	VM-Aware Networking	Transparent Virtualization
				
• Nexus/Catalyst Switching • 1G to 10G Migration	• MDS Directors • Intelligent Storage Apps • Fabric SAN • FCoE • 8G/10G FC • OSMs	• Lossless 10G & DCE, FCoE • NX-OS • Nexus 5000 • Nexus 7000 • Road to 40/100GbE	• VN-Link • Nexus 1000v • Nexus 5000 NIV • Per-VM Services • VM Mobility	• Agility through IT Automation • Stateless Computing & Virtualization



Verkabelungssysteme und die aktiven Komponenten

Physical Infrastructure and Network Topology

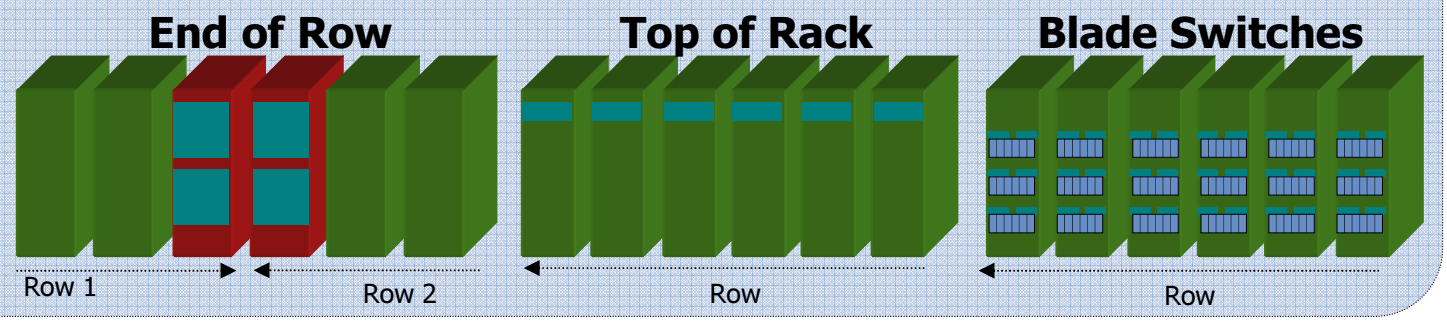
Network Equipment and Zones



Access Layer Network Model

End of Row, Top of Rack & Blade Switches

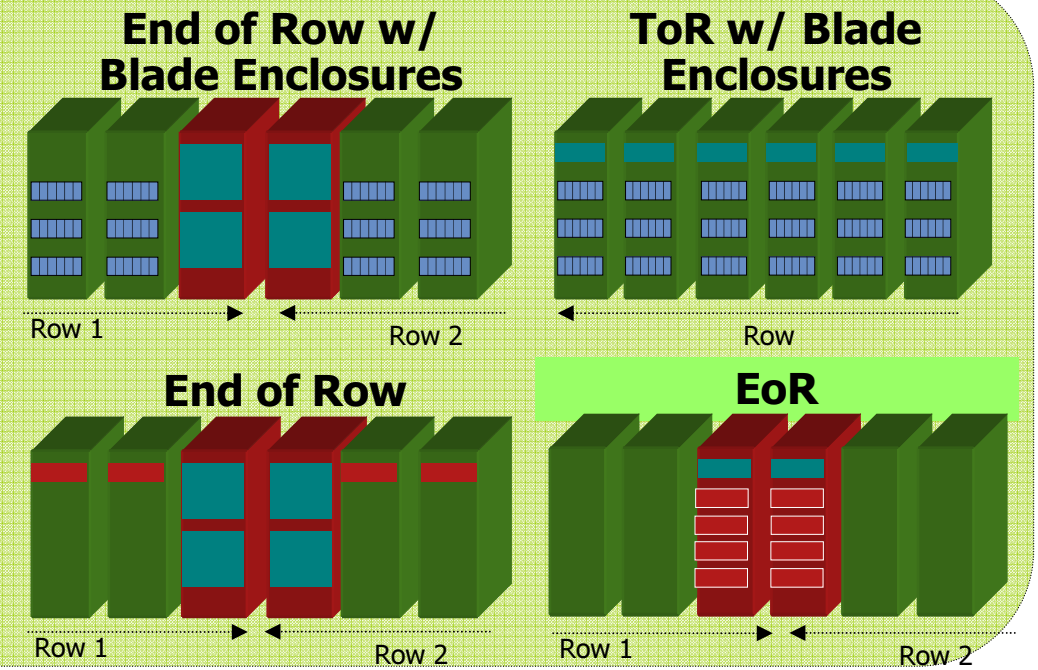
What it used to be…



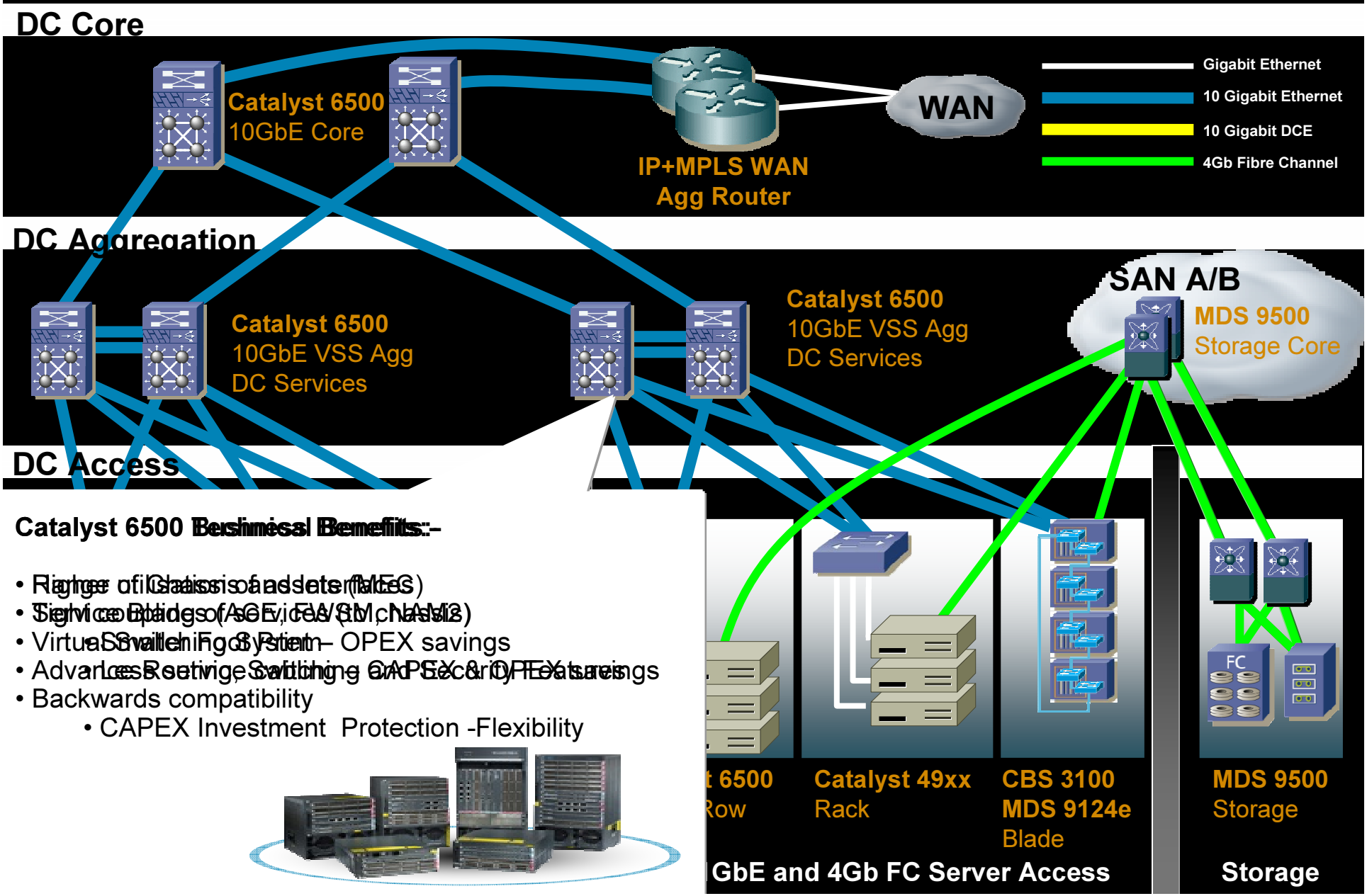
What else is coming…

What influences the physical layout…

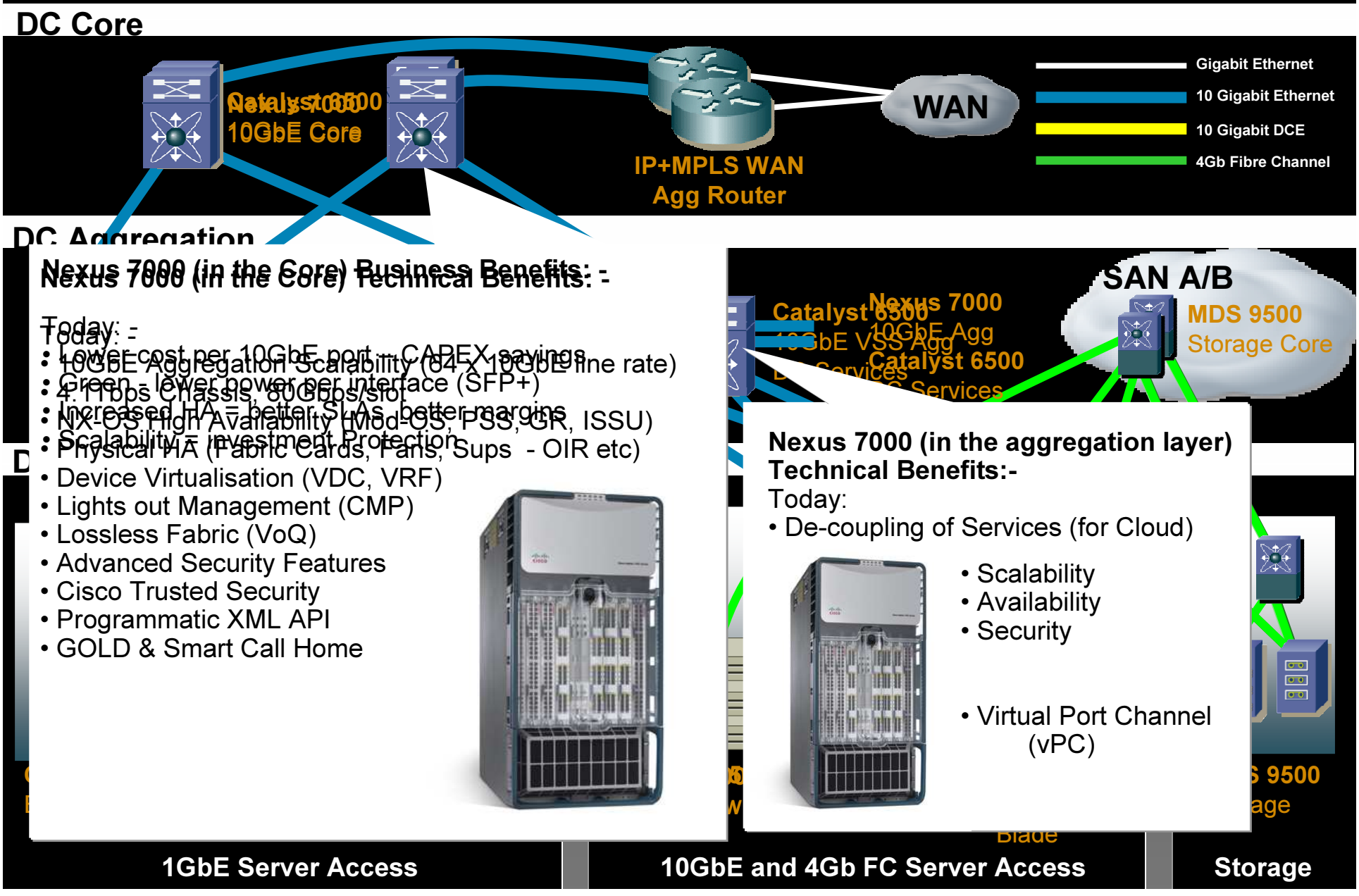
- **Primarily:**
  - **Power**
  - **Cooling**
  - **Cabling**
- **Secondarily**
  - **Access Model**
  - **Port Density**



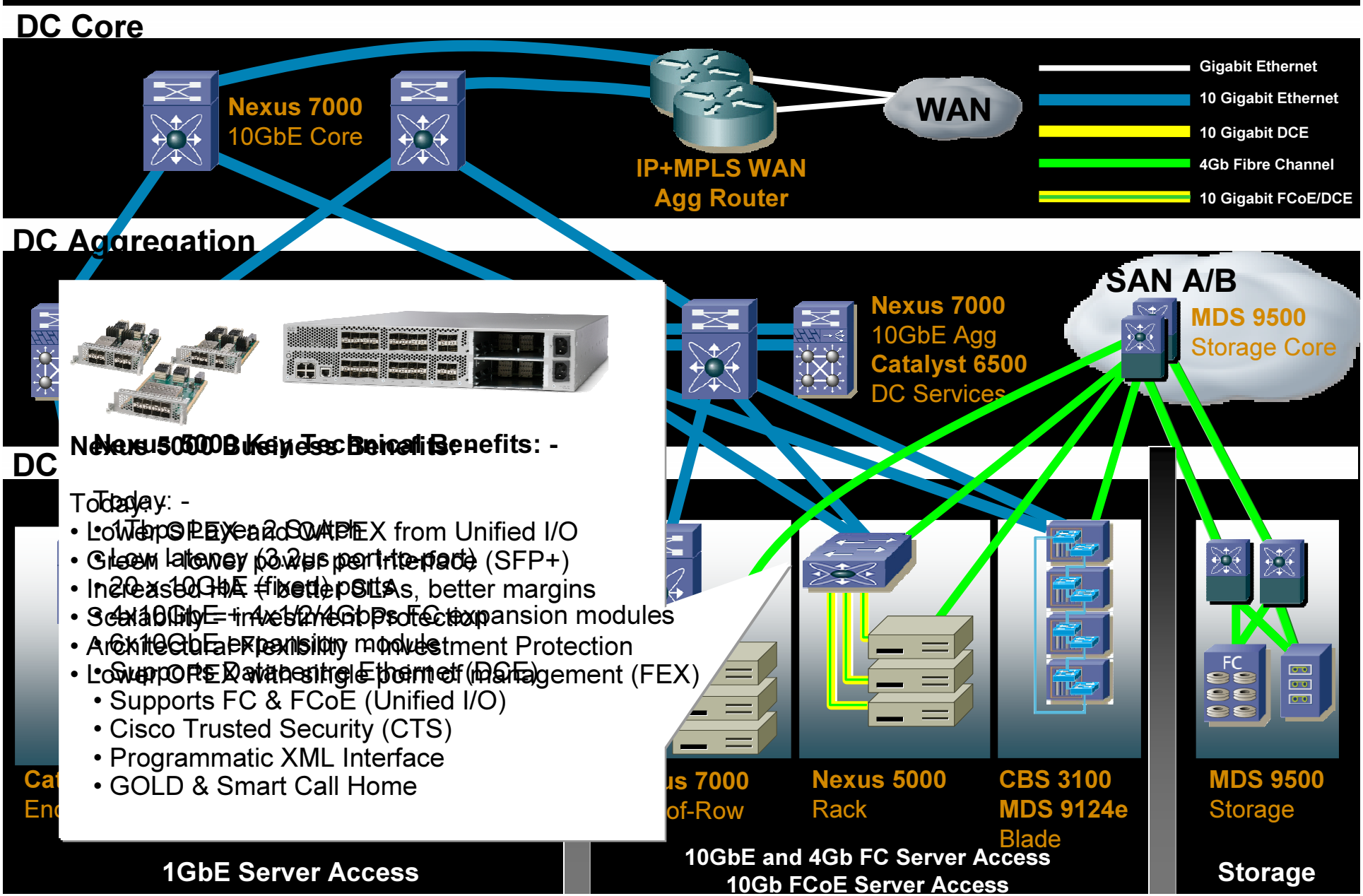
Unified Fabric Evolution (the story so far…)



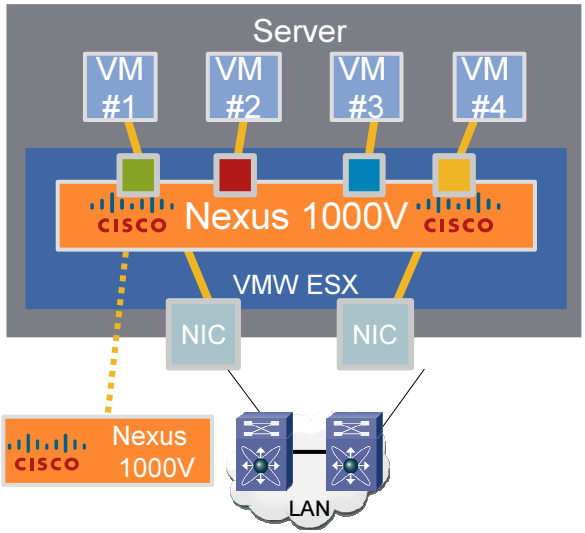
Unified Fabric Evolution (today)

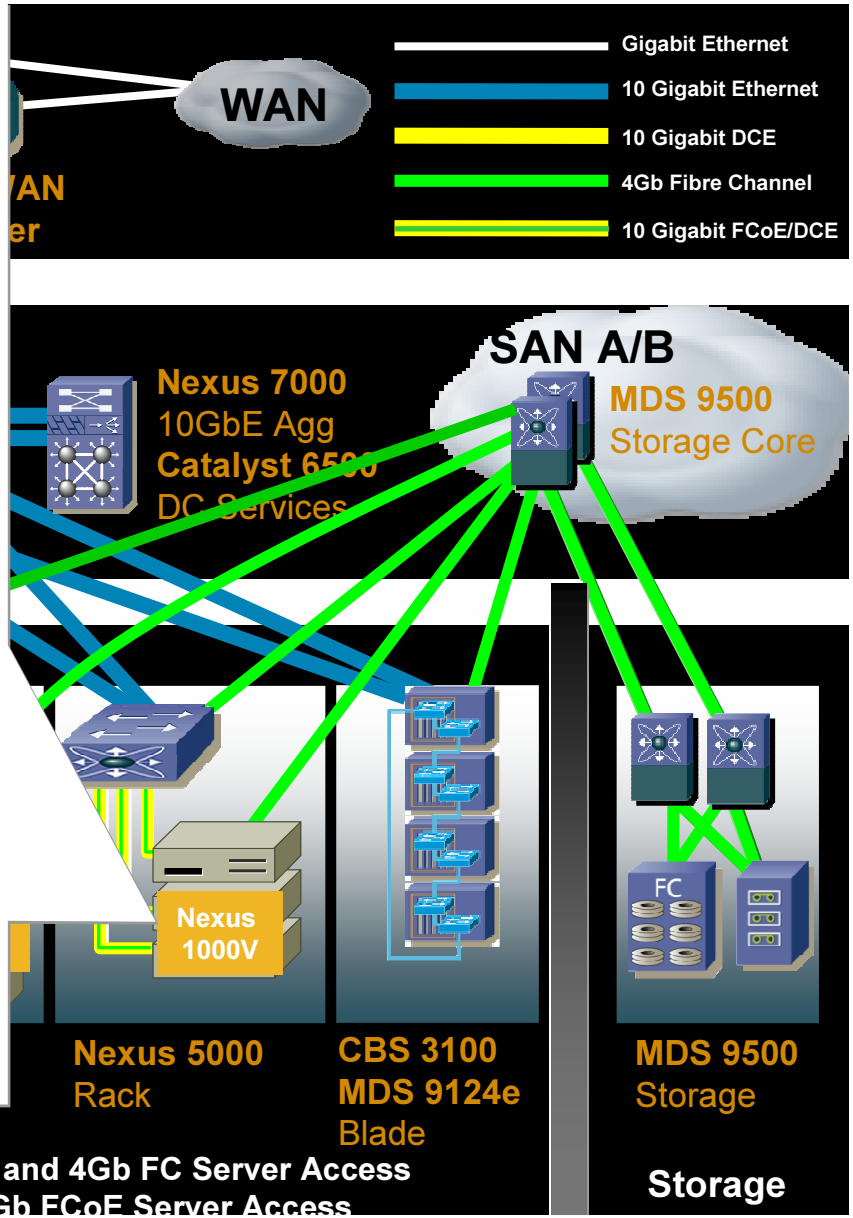


Unified Fabric Evolution (today)



Unified Fabric Evolution (early 2009)





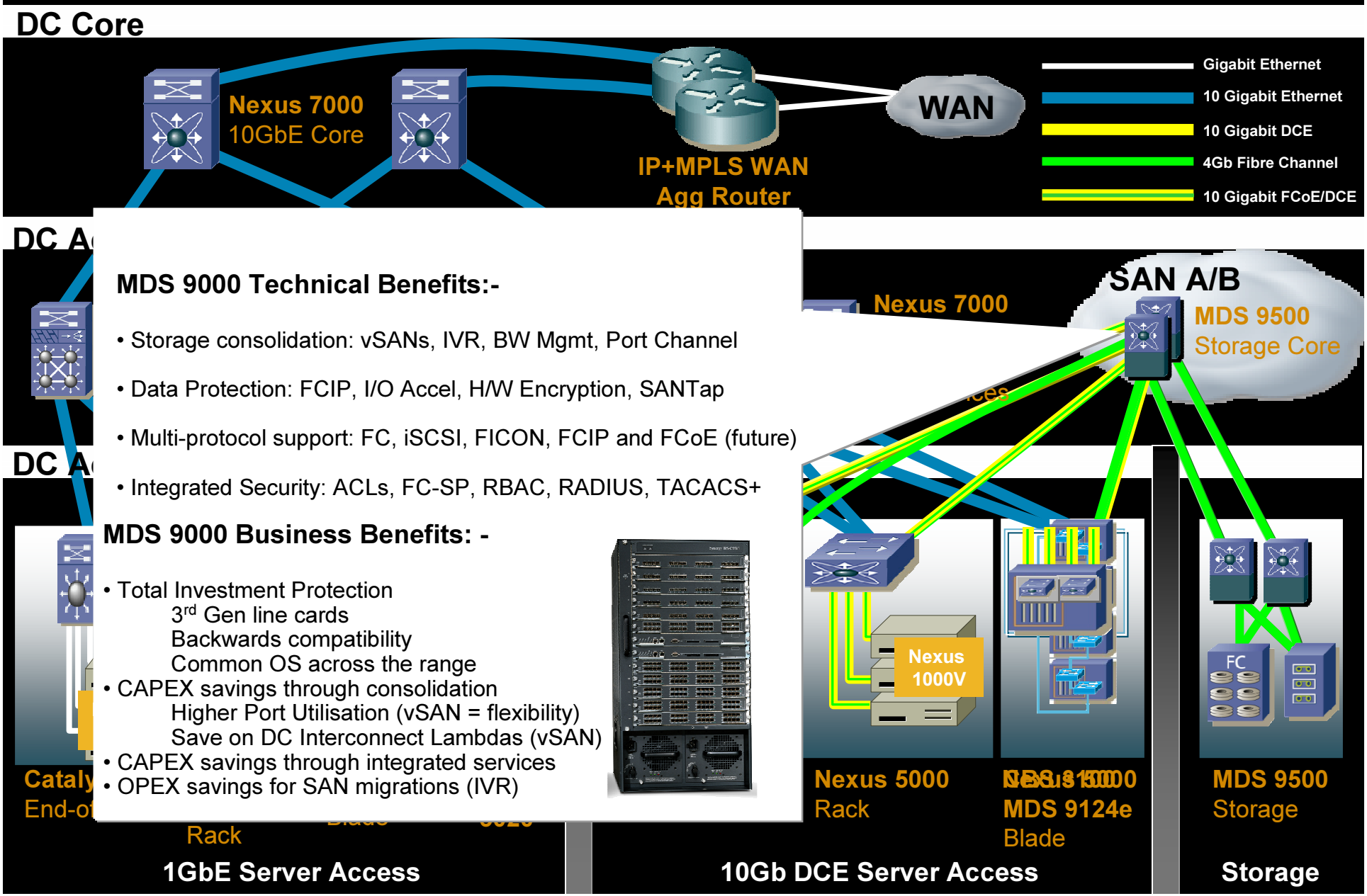
Nexus 1000V Business Benefits:-

- Reduced OPEX for change management
- Net-Admin visibility into the physical server and hosted VMs
- Better control over policies = better SLAs, increased margins

Nexus 1000V Technology Benefits:-

- Cisco "feature richness" on the hypervisor
  - QoS, ACLs, SPAN, Netflow etx
- Virtual Supervisor Module & Virtual Centre API (one way)
  - Port profiles = Port Groups on VMWare VC
  - VSM deployed on N5k, a VM or Cisco Appliance
- Allows for coupling of policy to VM for mobility

Unified Fabric Evolution (2010)



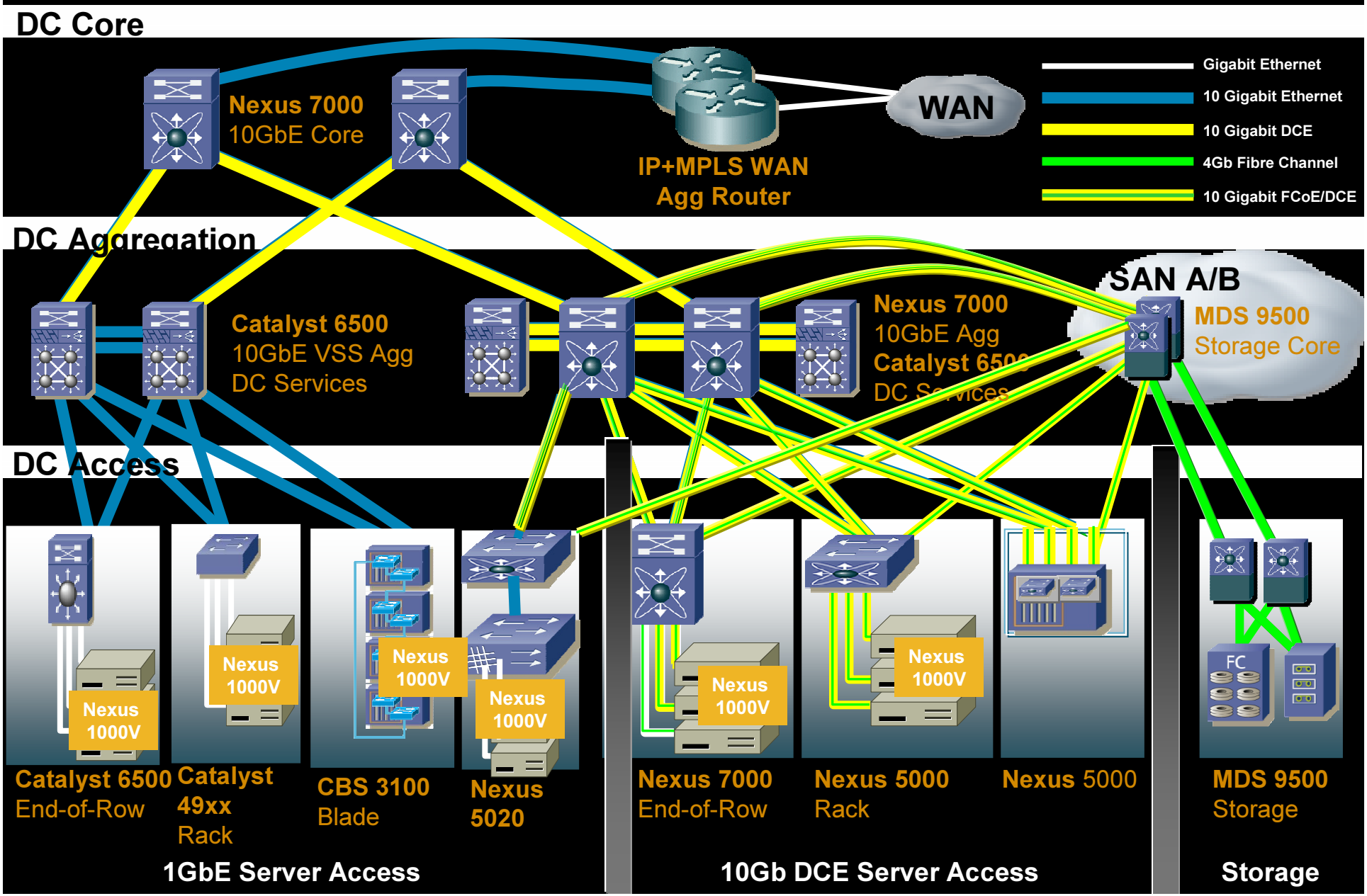
MDS 9000 Technical Benefits:-

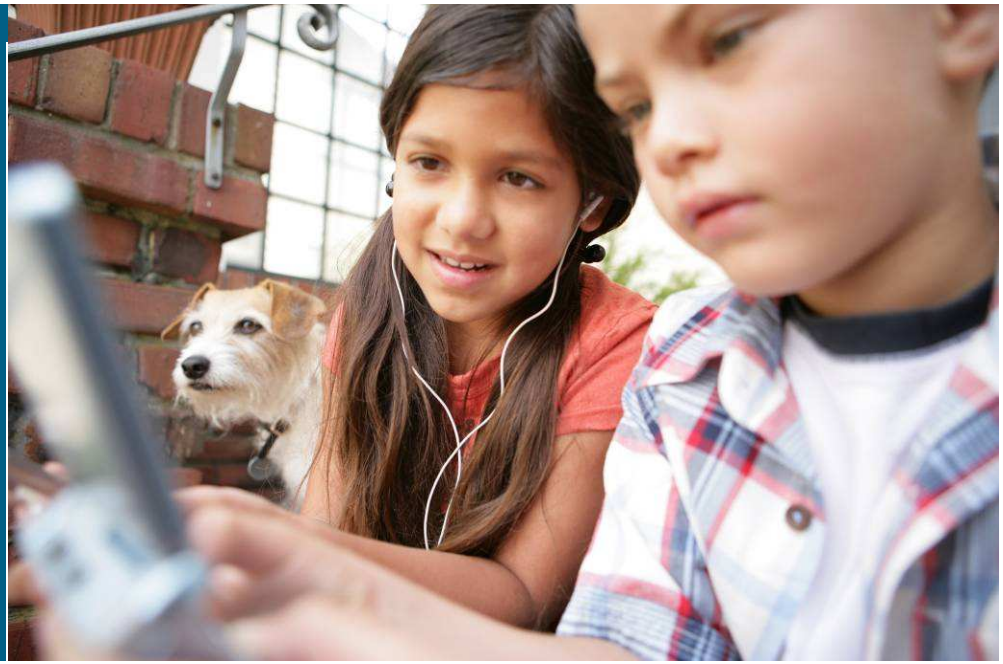
- Storage consolidation: vSANs, IVR, BW Mgmt, Port Channel
- Data Protection: FCIP, I/O Accel, H/W Encryption, SANTap
- Multi-protocol support: FC, iSCSI, FICON, FCIP and FCoE (future)
- Integrated Security: ACLs, FC-SP, RBAC, RADIUS, TACACS+

MDS 9000 Business Benefits: -

- Total Investment Protection
  - 3rd Gen line cards
  - Backwards compatibility
  - Common OS across the range
- CAPEX savings through consolidation
  - Higher Port Utilisation (vSAN = flexibility)
  - Save on DC Interconnect Lambdas (vSAN)
- CAPEX savings through integrated services
- OPEX savings for SAN migrations (IVR)

Unified Fabric Evolution (2009/2010)

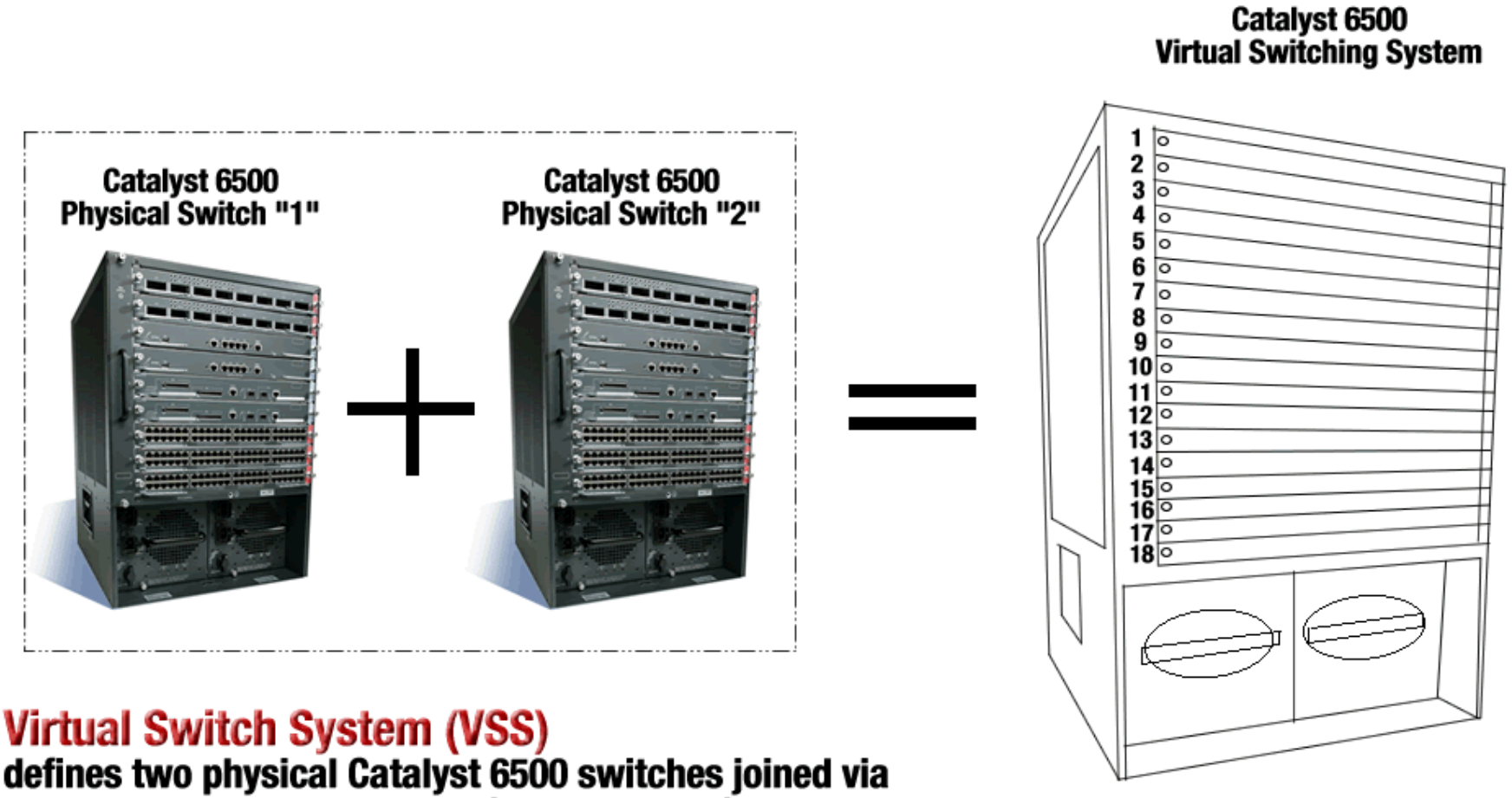




Integration von VSS im Datacenter

Virtual Switching System

Virtual Switch System is a new technology break through for the Catalyst 6500 family…



Virtual Switch System (VSS)
defines two physical Catalyst 6500 switches joined via a special link called a Virtual Switch Link (VSL) running special hardware and software that allows them to operate as a single logical switch

Virtual Switching System – Roadmap

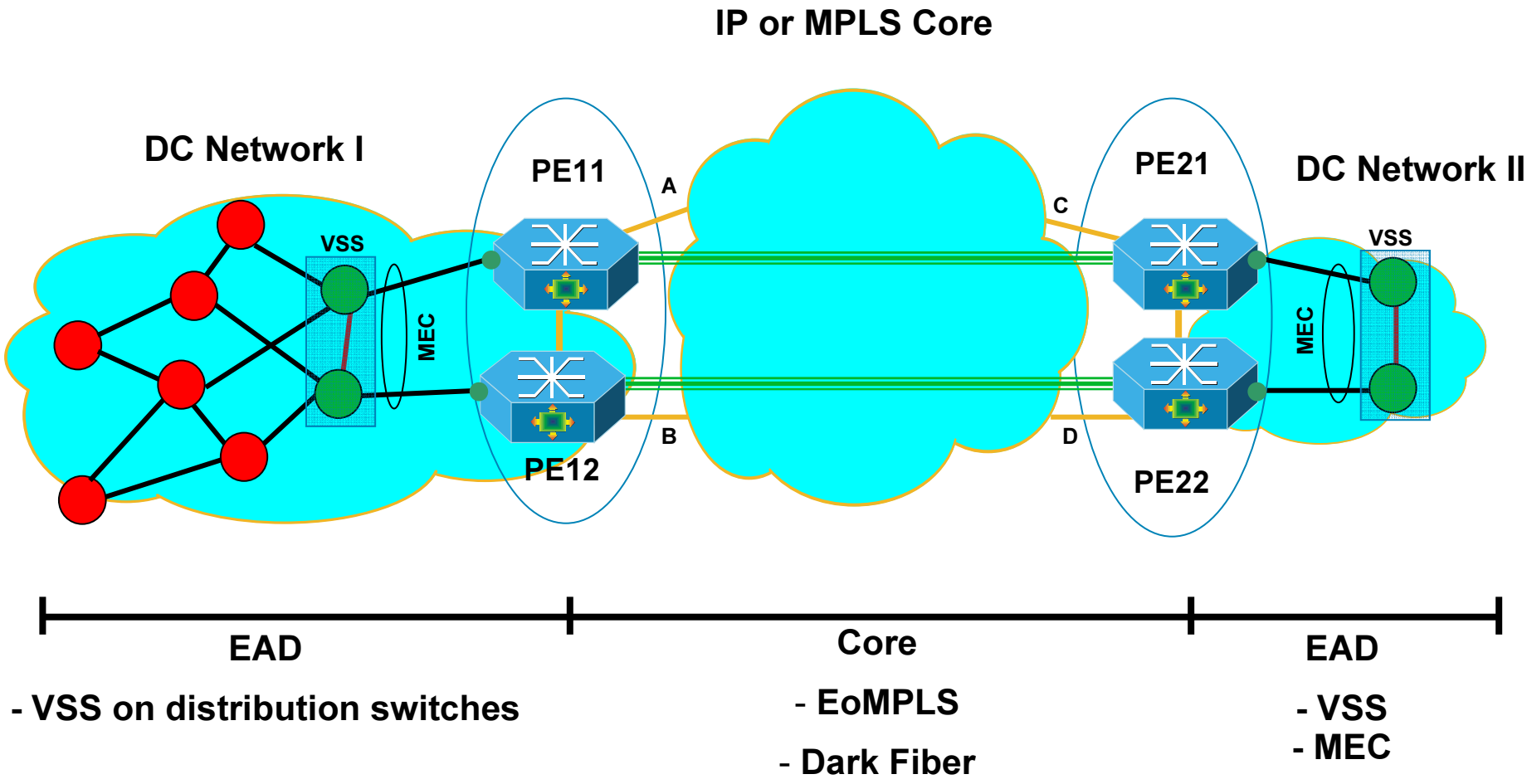
Deployment Consideration for VSS Mode Only

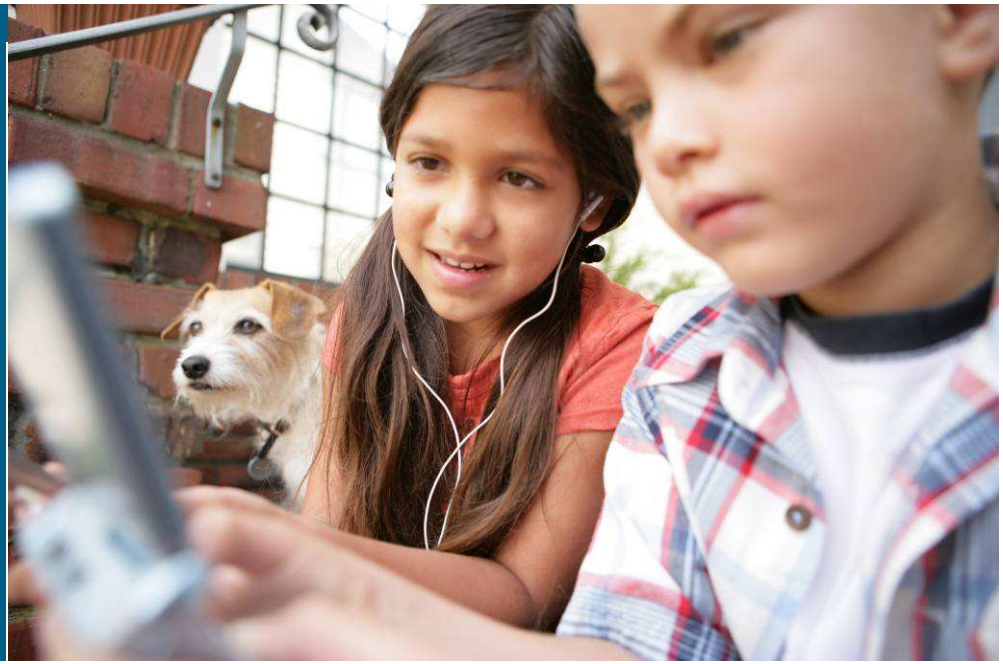
12.2(33)SXH1	12.2(33)SXI	Planning
• 67xx Card with CFC/DFC3C • Single Supervisor per Chassis • Any 2 Chassis (E or Non-E) • NAM 1 & 2 • Hitless IOS Patching[1] • Sub200ms Failover • 128 Multi-chassis Etherchannel (MEC)	• ISSU – Hitless Full IOS Upgrade • ACE, FWSM, WiSM, IDSM • PACL support • VSL support on 6716-10GE • 512 MEC • MPLS, IPv6[2]	• VSS Value-add features • Dual Supervisor per System • Dual Supervisor with “Intra and Inter” chassis SSO • VPN SPA • 4 chassis VSS

[1] Full IOS upgrade will require up to 1-2 minutes outage.

[2] First Rebuild 12.2(33)SXIx

Data Center Interconnect with VSS





Ueberblick CTS

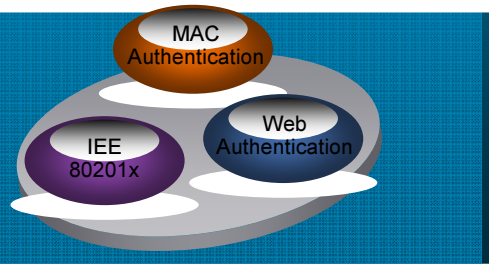
Cisco TrustSec (Trusted Security)

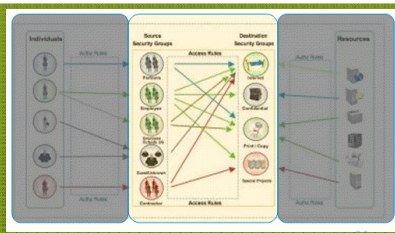
Seamless Authentication for Various Access Types

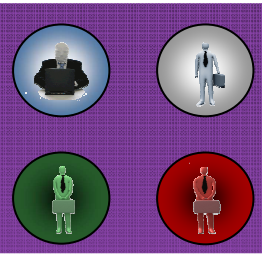
Secure Campus Access Control

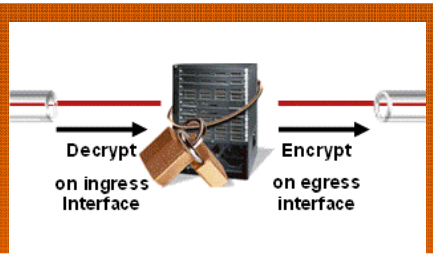
Converged Policy Framework

Converged Policy Definition for Different Access Types Policy Enforced Throughout the Network









Transforming From Topology-aware to Role-aware Access Control

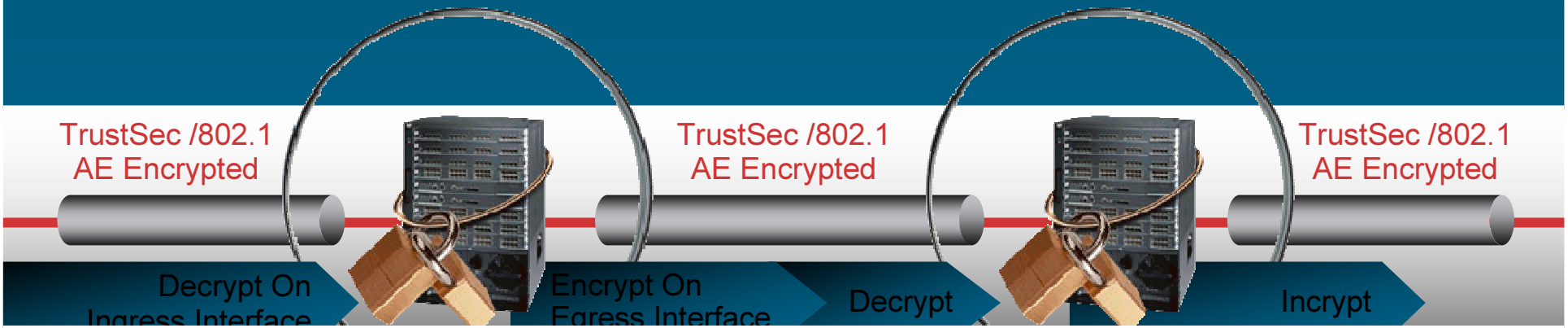
Role Aware Network

Integrity & Confidentiality

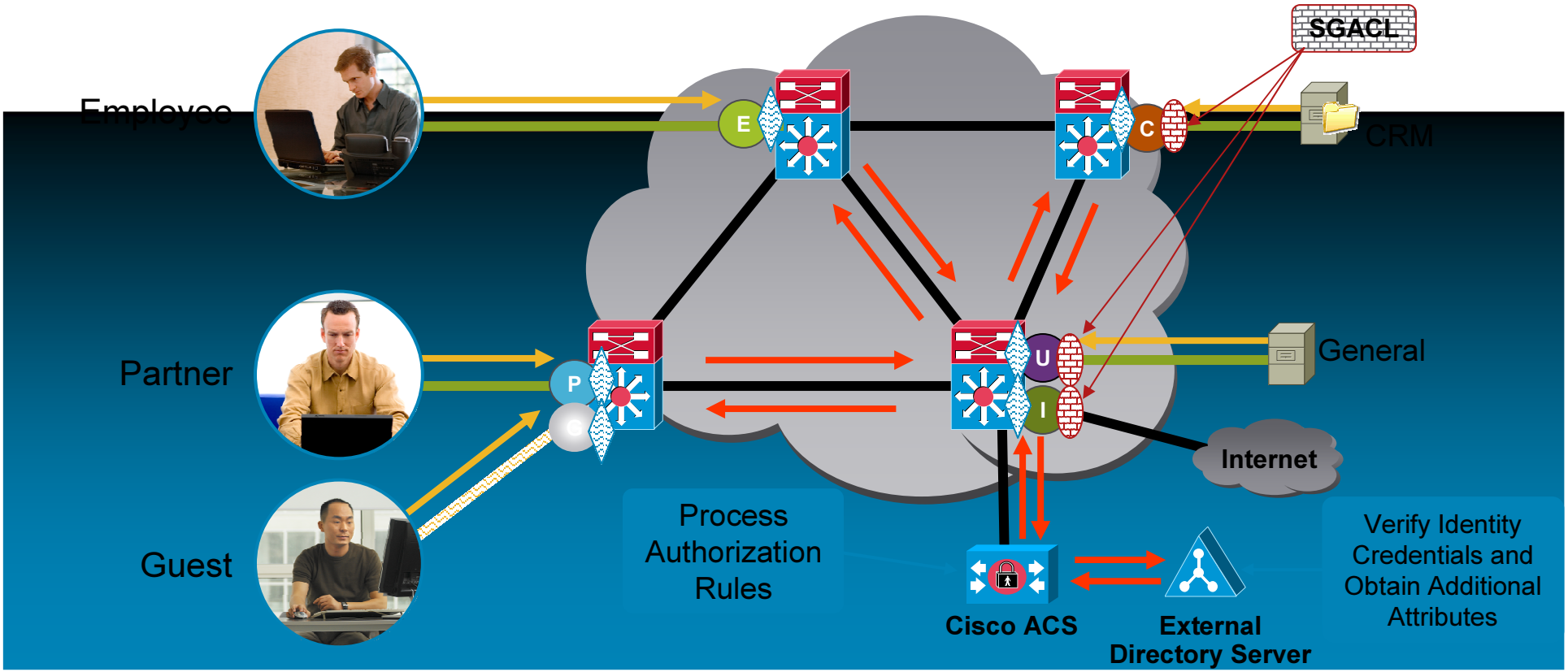
Prevent Data Sniffing and Tampering with Line-rate Hop-by-hop Encryption

Link Layer Encryption

- Hop-by-Hop packet confidentiality and integrity via IEEE 802.1AE
- "Bump-in-the-wire" model
  - Packets are encrypted on egress
  - Packets are decrypted on ingress
  - Packets are in the clear in the device
- Allows the network to continue to perform all the packet inspection features currently used
- Can be incrementally deployed depending on link vulnerability



Policy Enforcement Throughout the Network:
Role Based Access Control Set-up



Legend

Link/Port Status

- Unauthenticated
- Failed Authentication
- Authenticated
- Shutdown

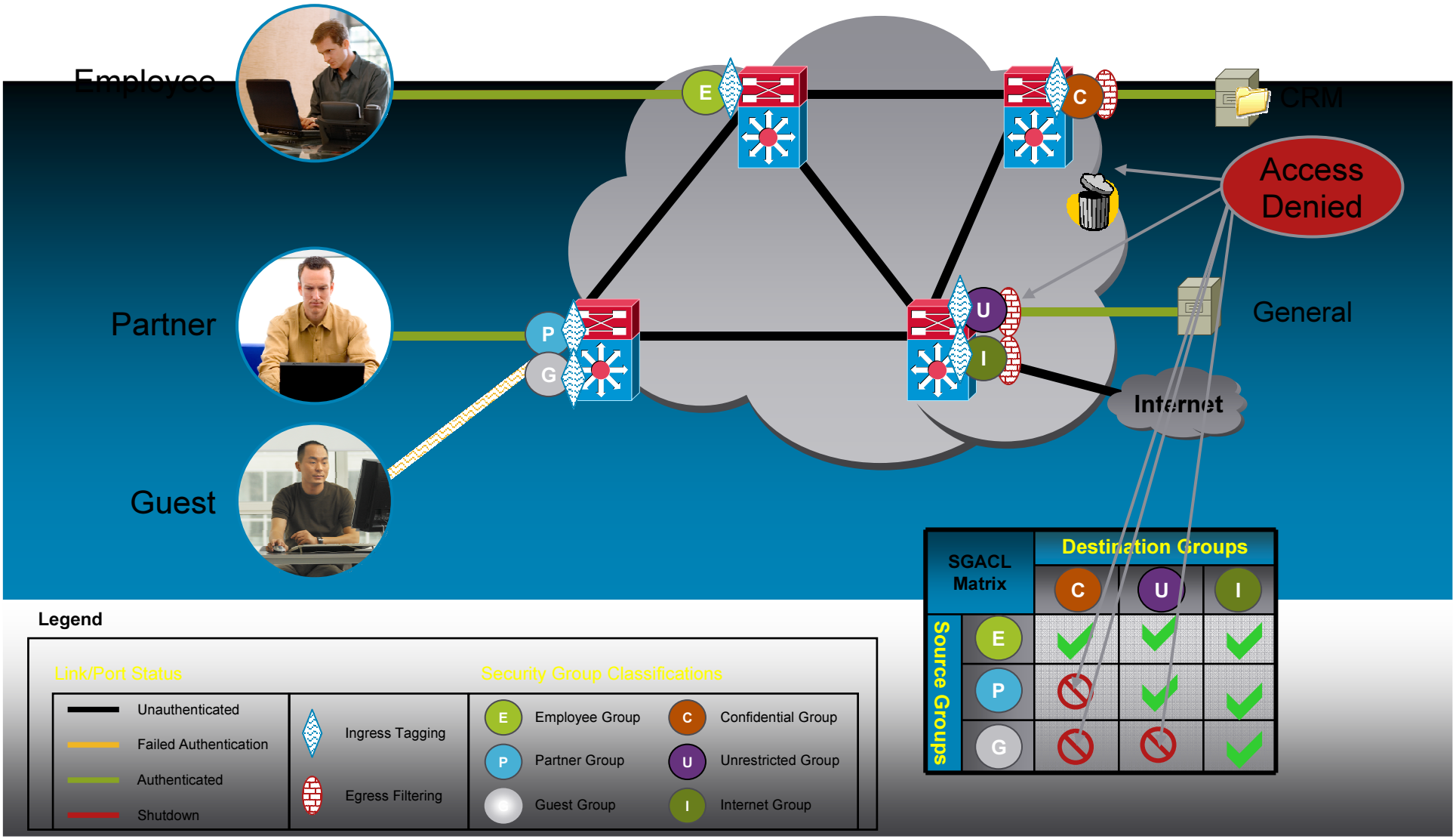
- Ingress Tagging
- Egress Filtering

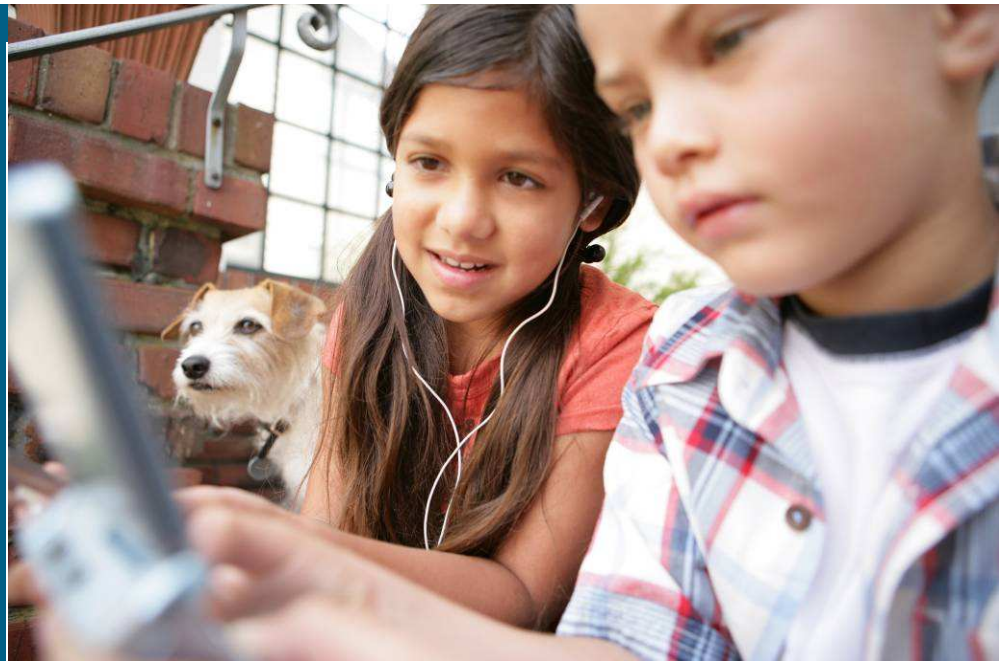
Security Group Classifications

- E — Employee Group
- P — Partner Group
- Guest Group
- C — Confidential Group
- U — Unrestricted Group
- I — Internet Group

1. **Authentication Request**
2. **Radius and AD Authc/Authz**
4. **Group Membership Dynamically Assigned**
5. **SGACL Dynamically Applied**
6. **Links Up**

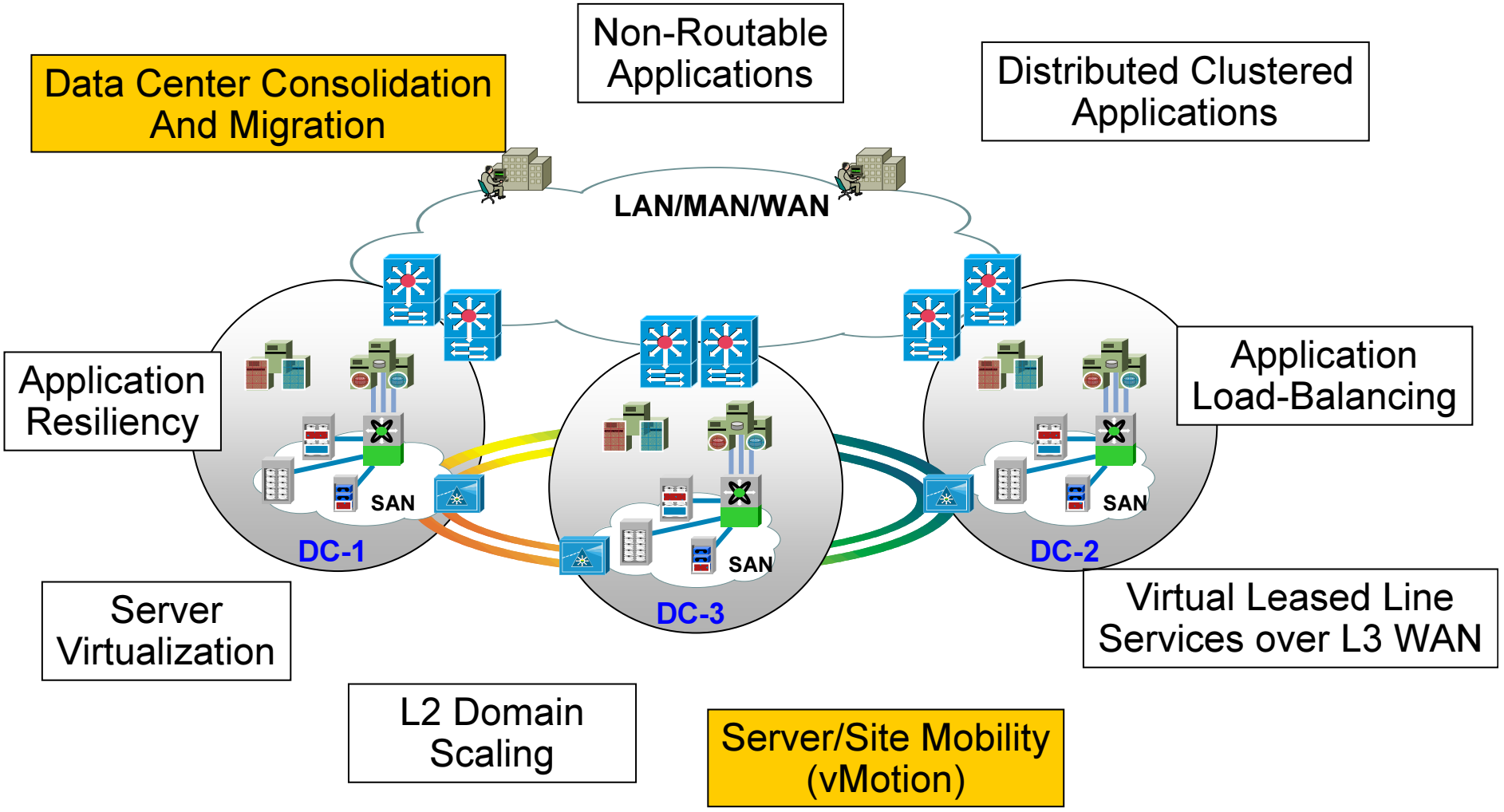
Policy Enforcement Throughout the Network:
Role Based Access Control Deployment



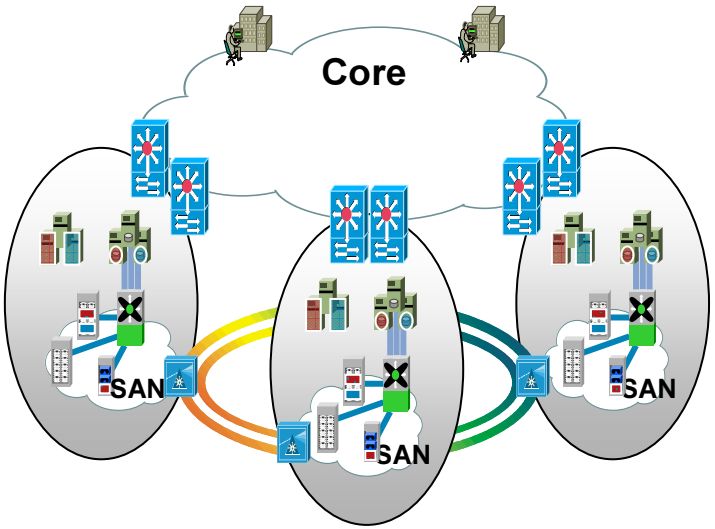


DC-L2-Koppelung mit OTV

Layer 2 VPNs in the Data Center
Use Cases



Existing L2 Solutions



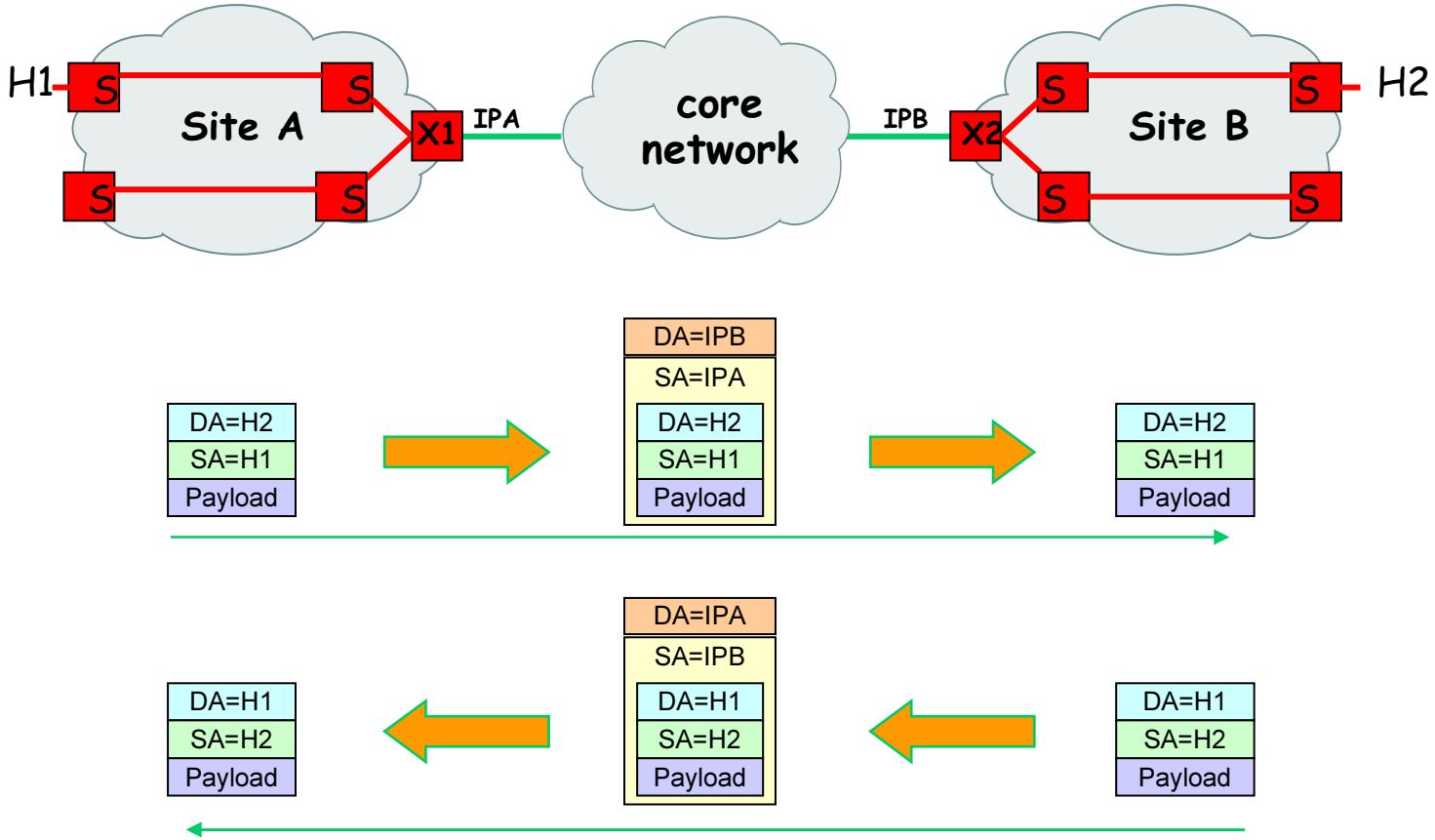
- **Leased Dark Fiber**
  - Expensive
  - Not always available
  - One large spanning tree domain
  - Resiliency doubles cost, but no increase in available bandwidth
- **VPLS**
  - Requires MPLS
  - Head-end replication and flooding
  - Large Spanning Tree domain
  - Complex
- **EoMPLS**
  - Requires MPLS
  - Point-to-Point
  - Head-end replication and flooding
  - Large Spanning Tree domain
  - Complex resilient deployments
- **L2TPv3**
  - Point-to-point
  - Requires full mesh
  - Large Spanning Tree domain
  - Head-end replication and flooding

Desirable Attributes in an Enterprise Layer 2 Solution

- Core Transparency
- Site Transparency
- Multi-point capable
- Limit Spanning Tree Protocol to separate domains
- Optimal Traffic Handling
  - Unicast & Multicast
  - Control Flooding
- Multi-Homing
- Load-Sharing
- Fast Resiliency
- Scalability
- Manageability

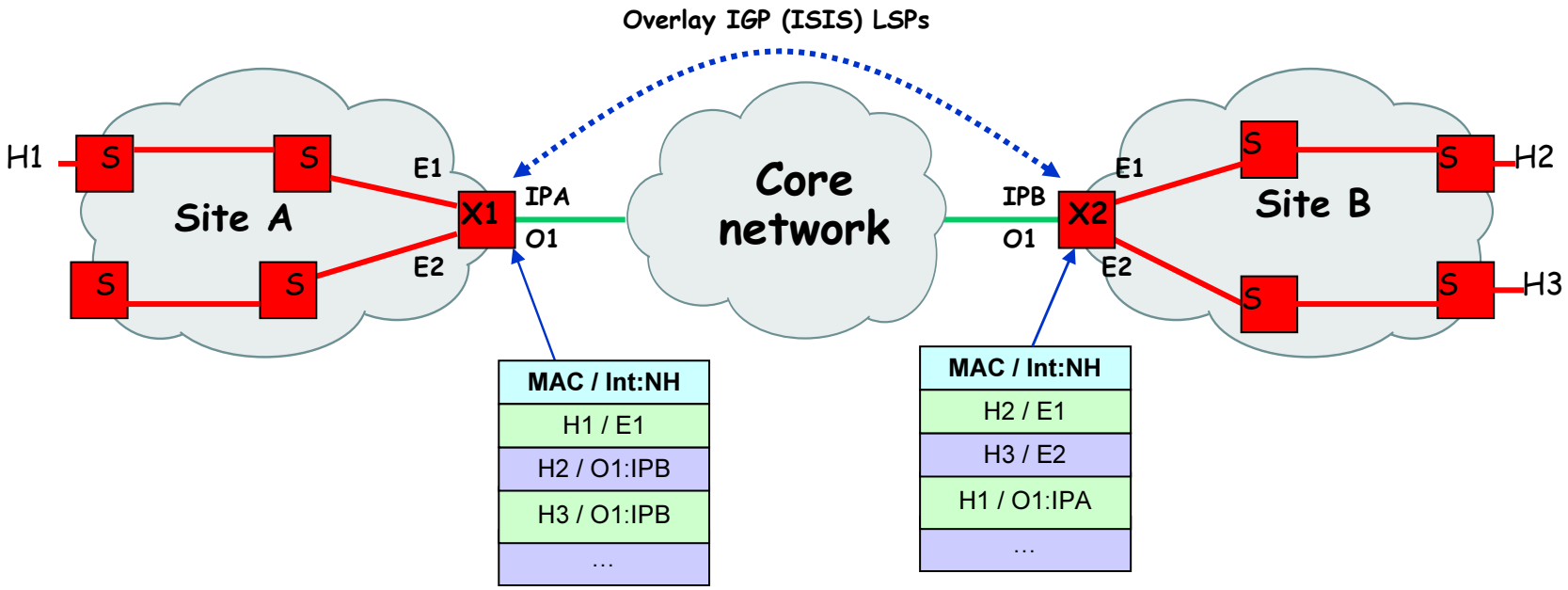
OTV uses “MAC in IP” encapsulation

- IP encapsulation → Core Transparency



OTV – MAC Bridging + MAC routing

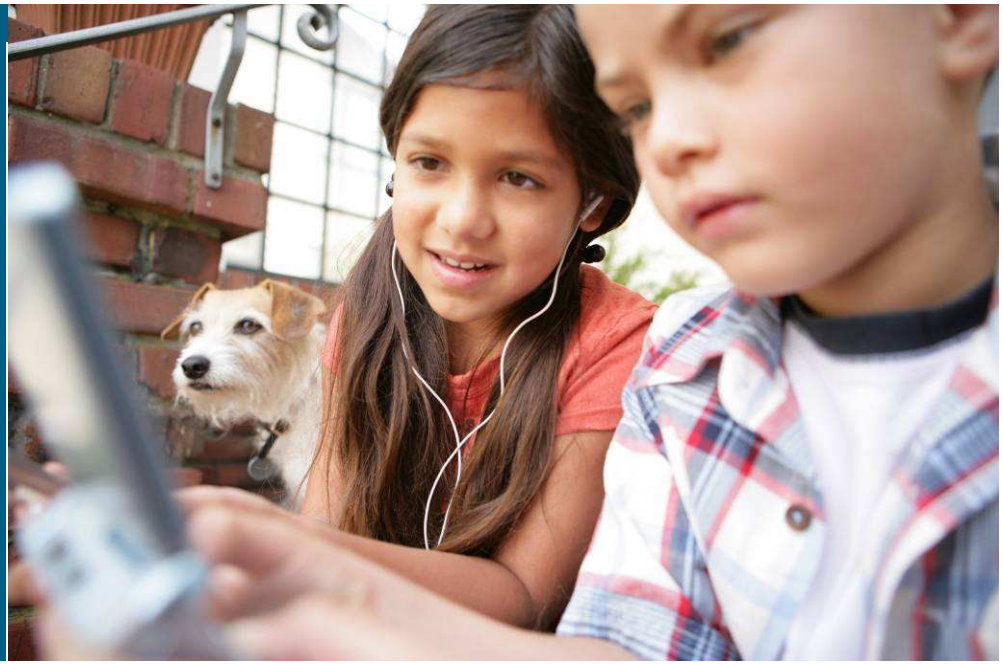
- Sites: MAC Bridging
- Core: “MAC routing” via “overlaid IGP”
- MAC table: “destination ports” and “IP routes”



“Trends im Datacenter: Die neuen, zukunftssicheren Systeme und Architekturen“

Take-aways:

- Einblick in das umfassendes Cisco DC-Produkt-Portfolio inkl. Infrastruktur- und Virtualisierungs-Loesungen
- Kennenlernen der Cisco Strategie zu I/O Konsolidierung fuer Ethernet, FibreChannel u. iSCSI
- Validierung von VSS, CTS und OTV als Innovation im DC



Fragen???

Die Mikros sind offen!!!