Come Nexus e Catalyst coesistono nel Data Center

Alessandro Barbieri

Product Manager ISBU

Cisco

Agenda

- Catalyst 6500 Data Center roadmap update

- Catalyst 4900M and Virtual Blade Switch update

- Catalyst 6500 and Nexus 7000 complementary focus in Cisco Data Center portfolio

Cisco Catalyst 6500 16-port 10GbE Module

Cisco Expo 2008

NEW

Target Deployments

- 10GbE Access and Switch Aggregation
- Blade Chassis Aggregation
- 10GbE High-Performance Hosts and NAS Filers

Transport Flexibility

- Up to 130 ports of 10GbE in a single chassis
- Balance performance and density
- 10GbE Module compatible with all existing chassis

Operational Continuity

- Virtual switching system enabled
- Integrated Cable Management

Infrastructure Scalability

- Reduces power consumption 30-40% per port

Data Center Chassis – 6509-V-E
Enhanced Vertical Chassis with Investment Protection

- Enhanced Chassis similar to 6503-E, 6506-E and 6509-E

- Supports Native Front to Back Airflow

- 9 Vertical Slots

    80 Gbps/Slot Capable

- Enhanced System Capacity

    1440 Gbps per chassis

- 21 RU (2 Chassis in a 42RU Rack)

- Supports both Supervisor 32 and Supervisor 720 Family and all associated linecards

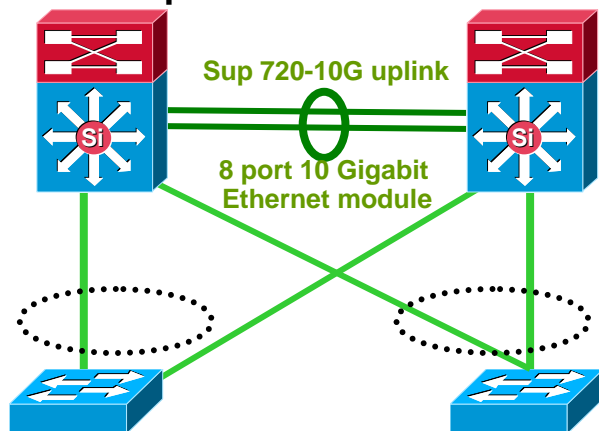**NEW**

NEBS L3 Compliant

12.2(18)SXF10 or later

Virtual Switching System 1440
Network System Virtualization

NEW

Physical View

**Active control plane
Active data plane**

**Hot-standby control plane
Active data plane**

Sup 720-10G uplink

8 port 10 Gigabit
Ethernet module

Logical View

CLEAR CHOICE TEST

"Cisco's virtual switch
smashes throughput records"
David Newman, January 08,
Network World
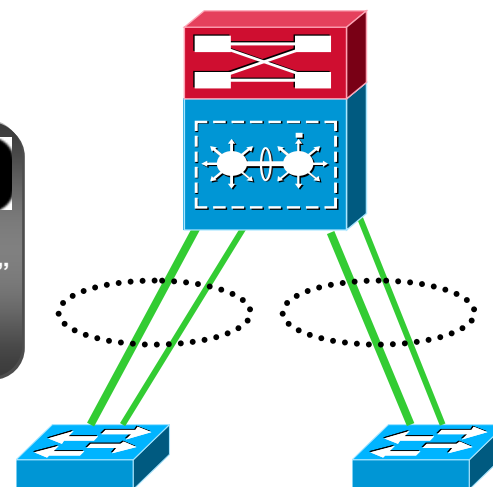
Features

Network System Virtualization

Multi-Chassis EtherChannel
(MEC)

Non-Stop Forwarding / Inter-
Chassis Stateful Switch Over
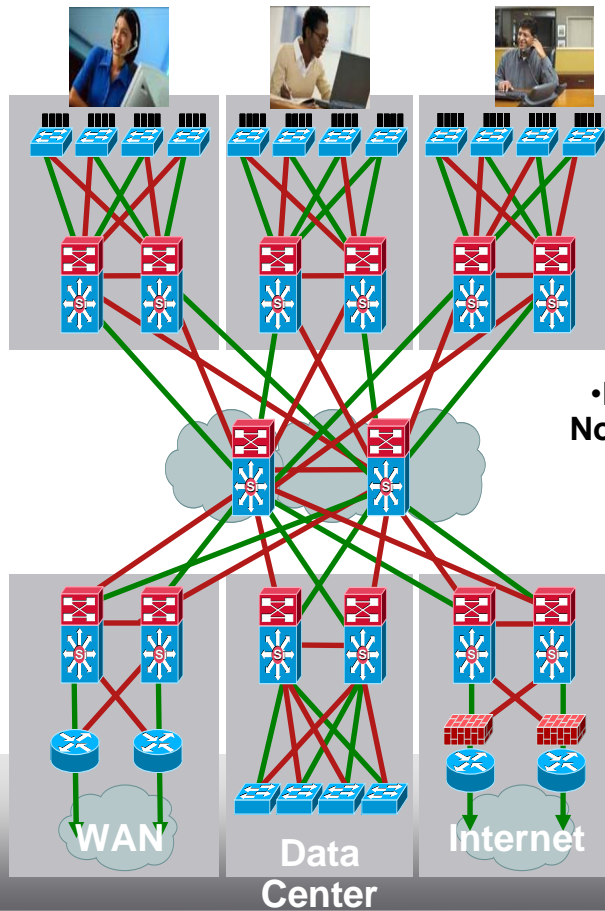(NSF/SSO)

Benefits of VSS

Increased Operational Efficiency
via Simplified Network

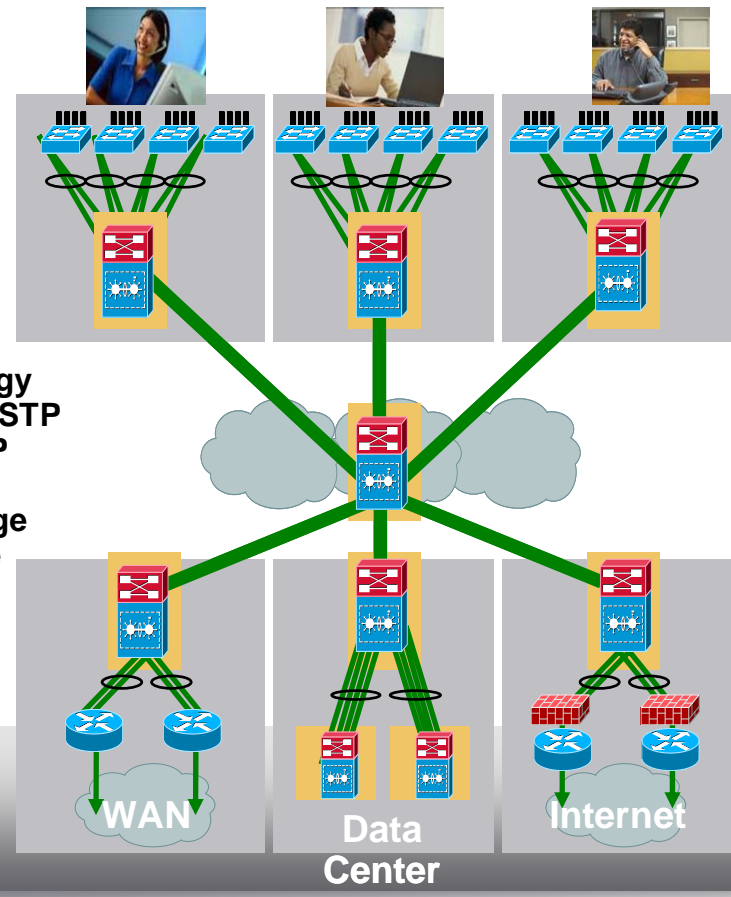Scale the System Bandwidth
Capacity to 1.4 Tbps

Boost Non-stop Communication

Cisco Catalyst 6500 VSS 1440
Network Simplification Example

Before

After

- Loop-free topology Non dependent on STP
- No HSRP/VRRP
- 1 IP address
- 1 node to manage
- All links active

WAN

Data Center

Internet

WAN

Data Center

Internet

Catalyst 6500 Data Center Technology Roadmap

Cat6K

Phase I
- Netflow
- MPLS
- IPV6
- Mod IOS
- Gold
- EEM

Phase II
- ISSU
- VSS
- Cisco TrustSec Phase1

Phase III
- Cisco TrustSec Phase 2
- System scale (ACL, Netflow, policers etc.)

Phase IV
- 2T Scale (4T w/ VSS)
- L2 scalability w/ L2MP
- Port based Application Security
- 40GE 100GE (uplinks)

Port Densities:

66 x 10GE	130 x 10GE	130 x 10GE	44X40GE
384 x 1GE	384 x 1GE	768 x 1GE	272 x 10GE
			1056 x 1GE

Cisco Catalyst 4900M Rack Switch

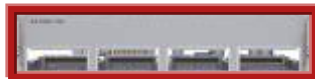**8x10GE wire speed (X2 modules) base unit**

Half Cards

20 Port 10/100/1000 (Wire Speed)

8 Port 10GE (X2 or TwinGig) (2:1)

4 Port 10GE (X2) (wire speed)

Transport Flexibility

- 320 Gbsps, 250Mpps, 2RU

- Up to 40 ports of 10/100/1000 and 24 10GbE ports

- IP Base incl., IP Services option

Infrastructure Scalability

- Wire rate and low latency forwarding (<5us)

- **Reduces power consumption per port**

Operational Continuity

- Redundant power and fans

Catalyst 4900 Data Center Positioning

1GbE and 10 GbE Access
10GbE Uplinks

Catalyst 4900M

320G

40-port 10/100/1000
Upto 24 10 GbE

1GbE Access
10 GbE Uplinks

Catalyst 4948-10GE

136G

48-port 10/100/1000
+ two 10 GbE

1GbE Access
1 GbE Uplinks

Catalyst 4948

96G

44-port 10/100/1000
+ four GbE

 Cisco Public 55

Cisco Catalyst Blade Switch 3100

Target Deployments

- GbE Blade-Server Access with 10GbE Uplinks

- Blade-Server Deployments

- Uplink Reduction with Virtual Blade-Switch Technology

NEW

Transport Flexibility

- Eases GbE to 10GbE migration

Infrastructure Scalability

- Virtual Blade Switch technology allows up to 8 switches to be managed as one logical switch

- Traffic within the Virtual Blade Switch cluster stays local

Operational Continuity

- Increases server availability through link virtualization

- Reduces management and infrastructure complexity

"Single Switch" Solution—Easy to Manage
Cuts Down Switches to Manage by Factor of 8
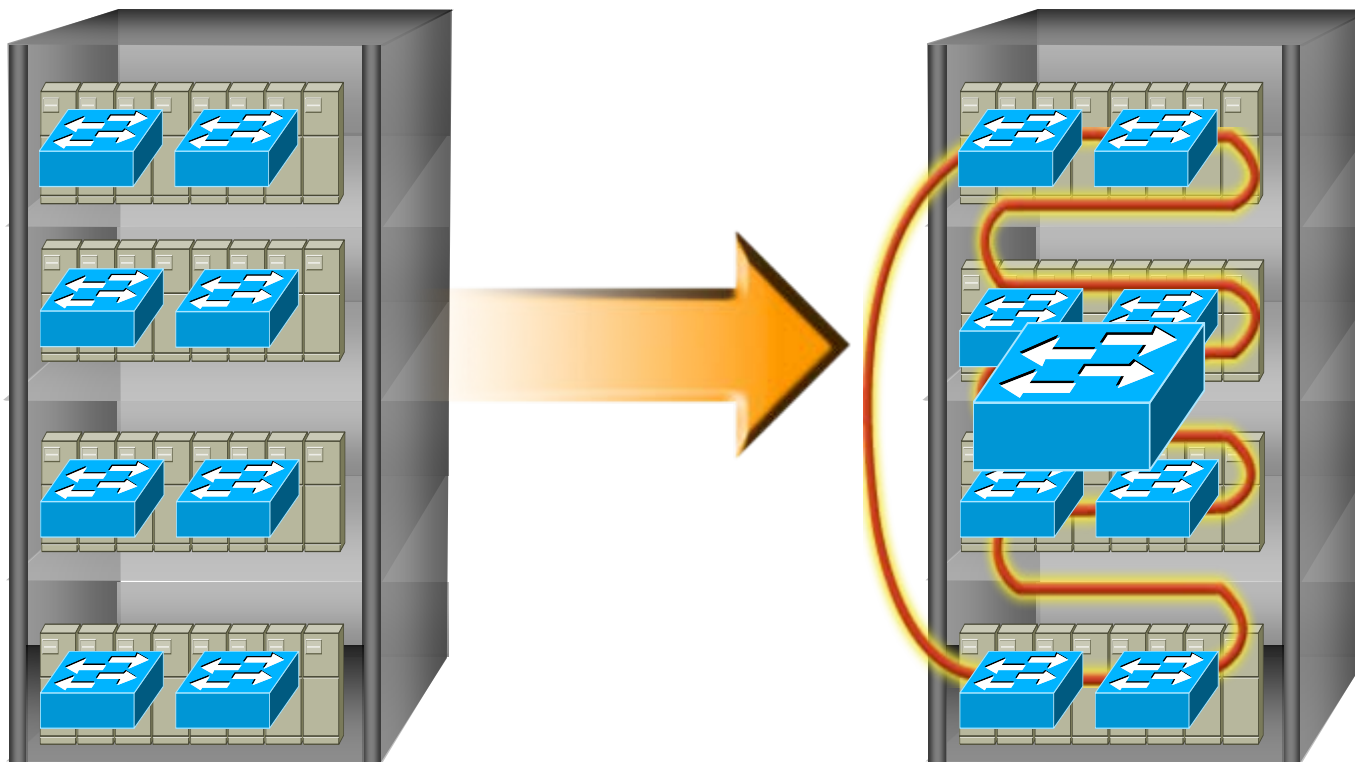
- One logical switch now (instead of 8)
- Single IP address for entire rack (for management, MIBs etc)
- 1 Node for Spanning Tree (Layer 2)
- 1 Node for Routing (Layer 3)

Agenda

- Catalyst 6500 Data Center roadmap update

- Catalyst 4900M and Virtual Blade Switch update

- Catalyst 6500 and Nexus 7000 complementary focus in Cisco Data Center portfolio

Catalyst 6500 and Nexus 7000 positioning in the Data Center

Moving the Decimal Point
1G->10G->40G/100G
Multi-terabit switch fabrics

Operational Continuity
Modular OS; In Service Software Upgrade, Integrated Diagnostics

Nexus 7000

Catalyst 6500

L2 scalability
Server virt., Switch, Network
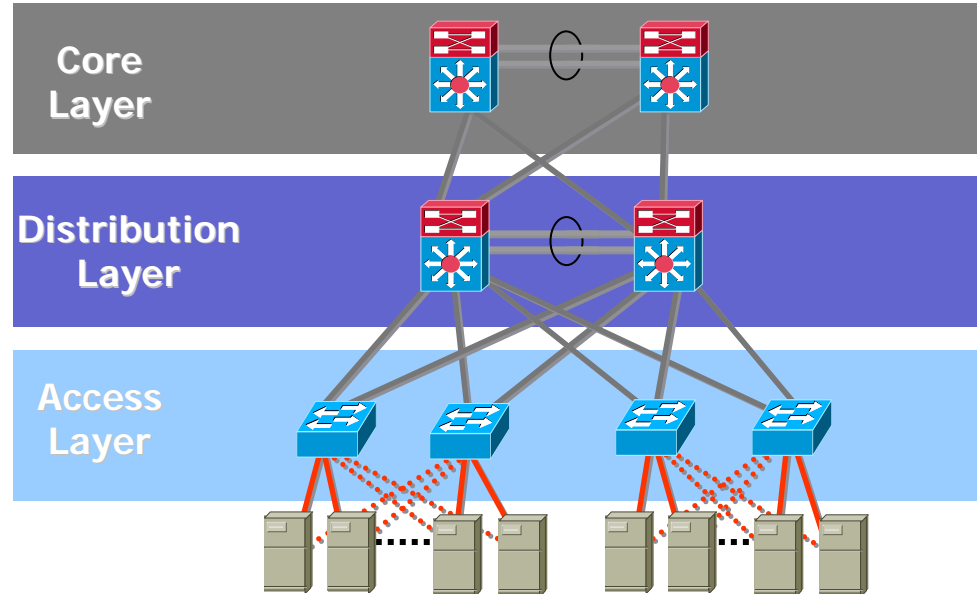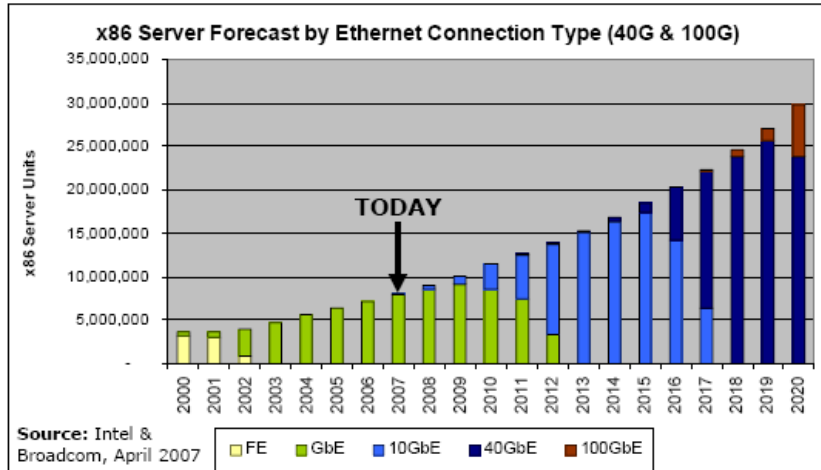
Fabric Convergence
One network for storage, IP, and HPC traffic

Computing and Networking bandwidth trends
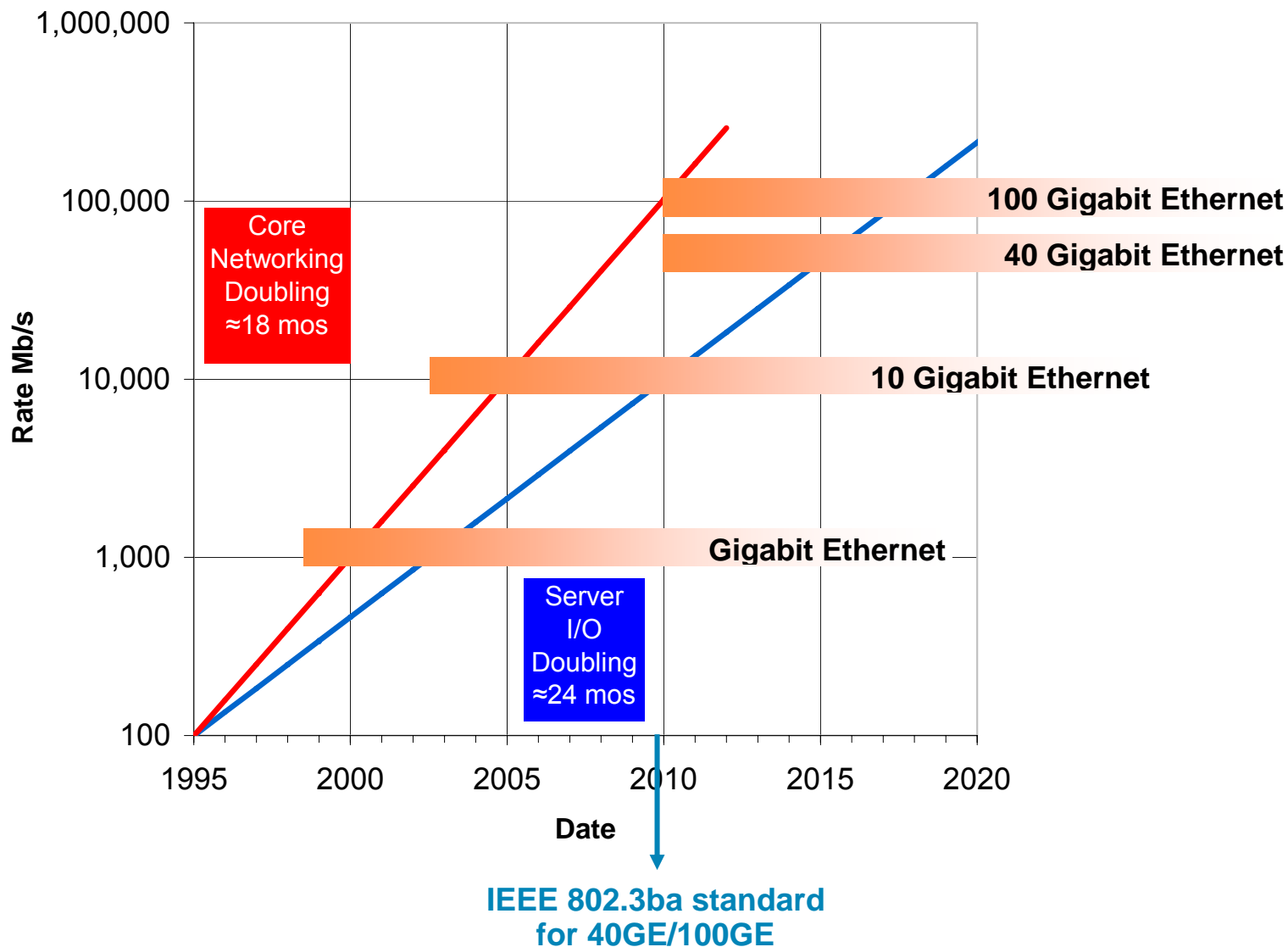
Server Speed impact on networks

x86 Server Ethernet Connection Speeds with 40GbE & 100GbE

x86 Server Forecast by Ethernet Connection Type (40G & 100G)

Source: Intel & Broadcom, April 2007

□ FE ■ GbE ■ 10GbE ■ 40GbE ■ 100GbE

Base Server Connection: 10 year transition GbE | 5 years 10GbE | 5 years 40GbE

IEEE 802.3 HSSG April 2007 Interim Meeting 7

BROADCOM

intel

Core Layer

Distribution Layer

Access Layer

	1998/2002	2003/2010	2010 +
Server interface	100M	1G	10G
Access-to-Distr	1G	10G	40G/100G
Distr-to-Core	1G	10G	40G/100G

Moving the decimal point: Catalyst 6500 and Nexus 7000

Fabric Switching Capacity

15 Tb/s

8 Tb/s

4 Tb/s

2 Tb/s

720 Gb/s
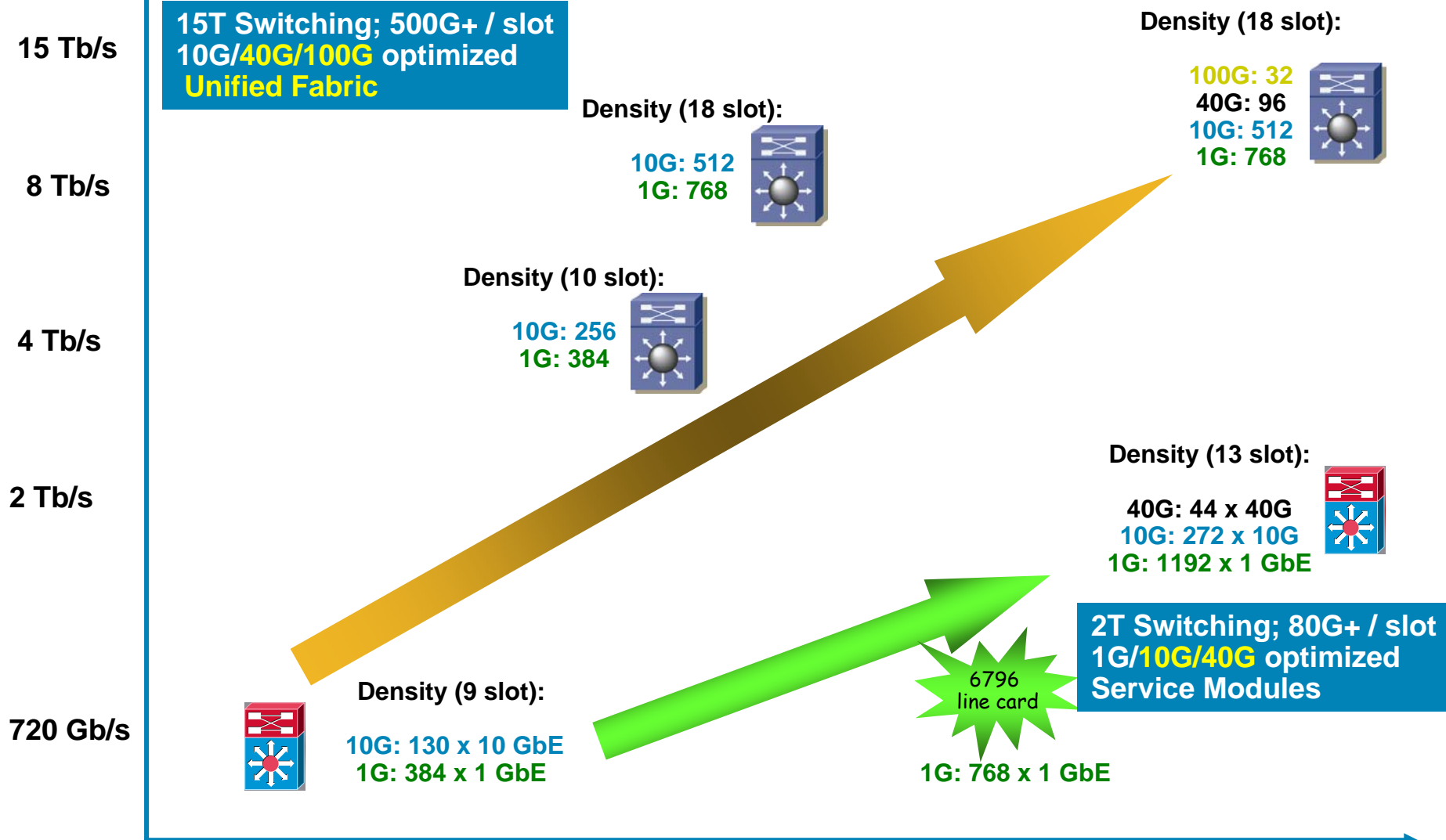
**15T Switching; 500G+ / slot
10G/40G/100G optimized
Unified Fabric**

Density (18 slot):
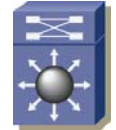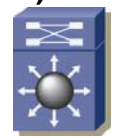
100G: 32
40G: 96
10G: 512
1G: 768

Density (18 slot):

10G: 512
1G: 768

Density (10 slot):

10G: 256
1G: 384

Density (13 slot):

40G: 44 x 40G
10G: 272 x 10G
1G: 1192 x 1 GbE

**2T Switching; 80G+ / slot
1G/10G/40G optimized
Service Modules**

6796 line card

Density (9 slot):

10G: 130 x 10 GbE
1G: 384 x 1 GbE

1G: 768 x 1 GbE

2007   **2008**   **2009**   **2010**

Scaling Layer 2 networks with Catalyst 6500 and Nexus 7000

Multi-Chassis Ether Channel (Nexus 7000)

VSS (Catalyst 6500)
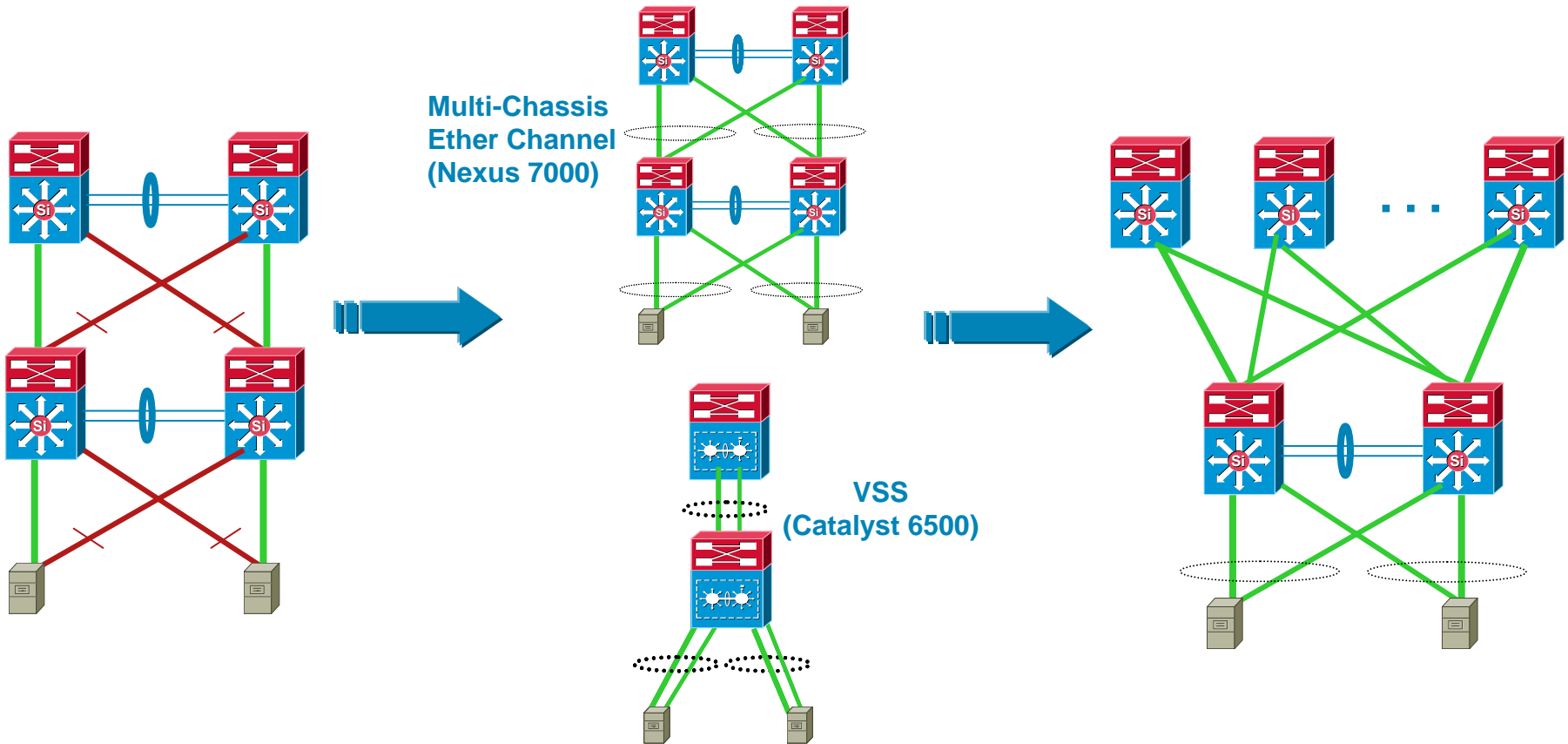
Traditional Network

➢Limited L2 Scalability
➢Loops Exist
➢Heavy STP dependence

Virtual Port Channel with MCEC or VSS

➢High L2 Scalability
➢Loop Free
➢STP as safe guard

L2 Multipathing (Future)

➢Massive L2 Scalability
➢Loop Free
➢No STP

Cisco NX-OS and 6500 IOS Modularity
Supporting Mission Critical Deployments

Cisco Expo 2008

Shared Innovations
Forwarding Engines, Security (CTS, NAC, 802.1x),
Modularity, Memory protection, Fault containment,
Process restartability, ISSU,
EEM, GOLD, Smart Call Home, Common look and feel,
Interoperability assured (DCAP)

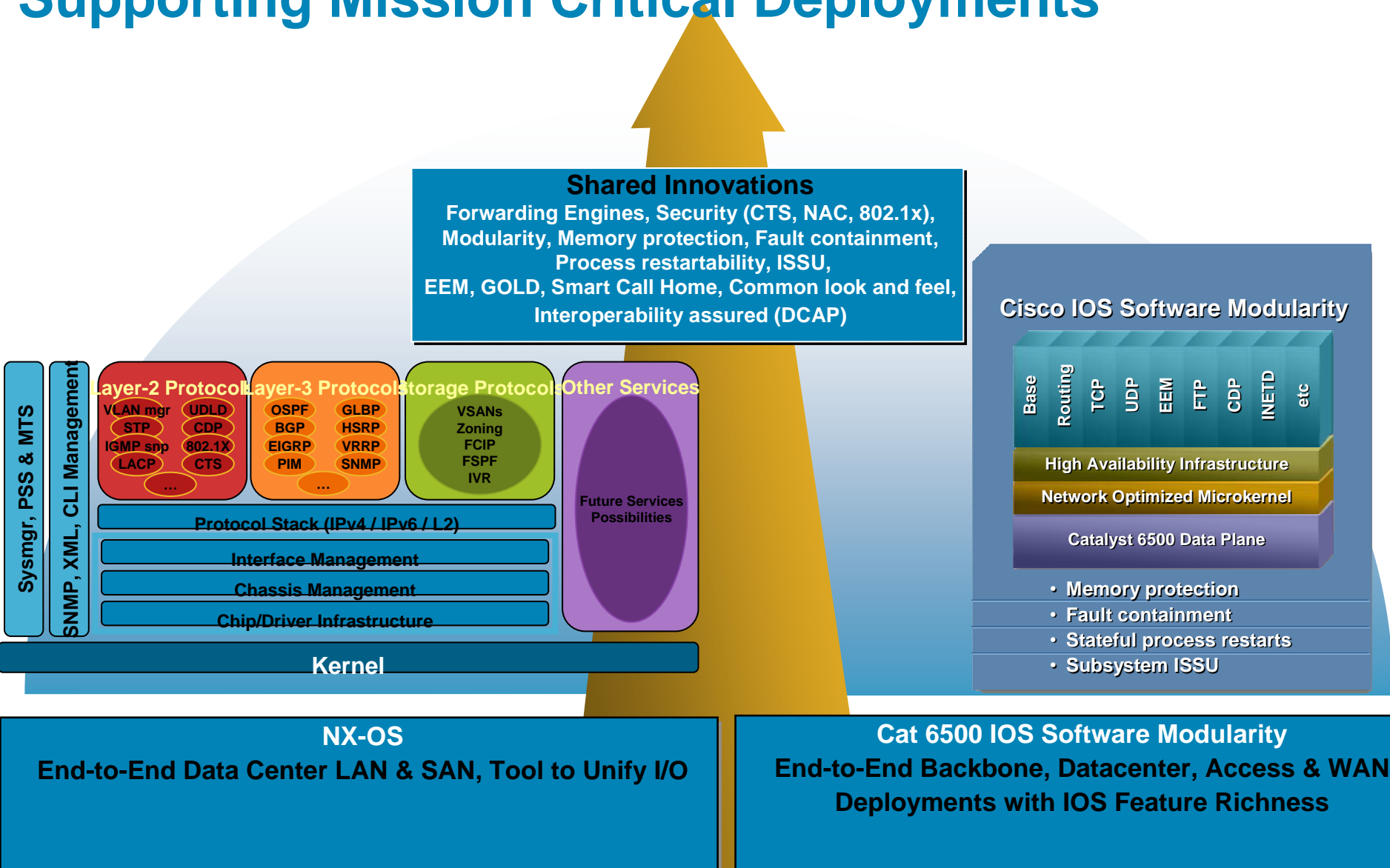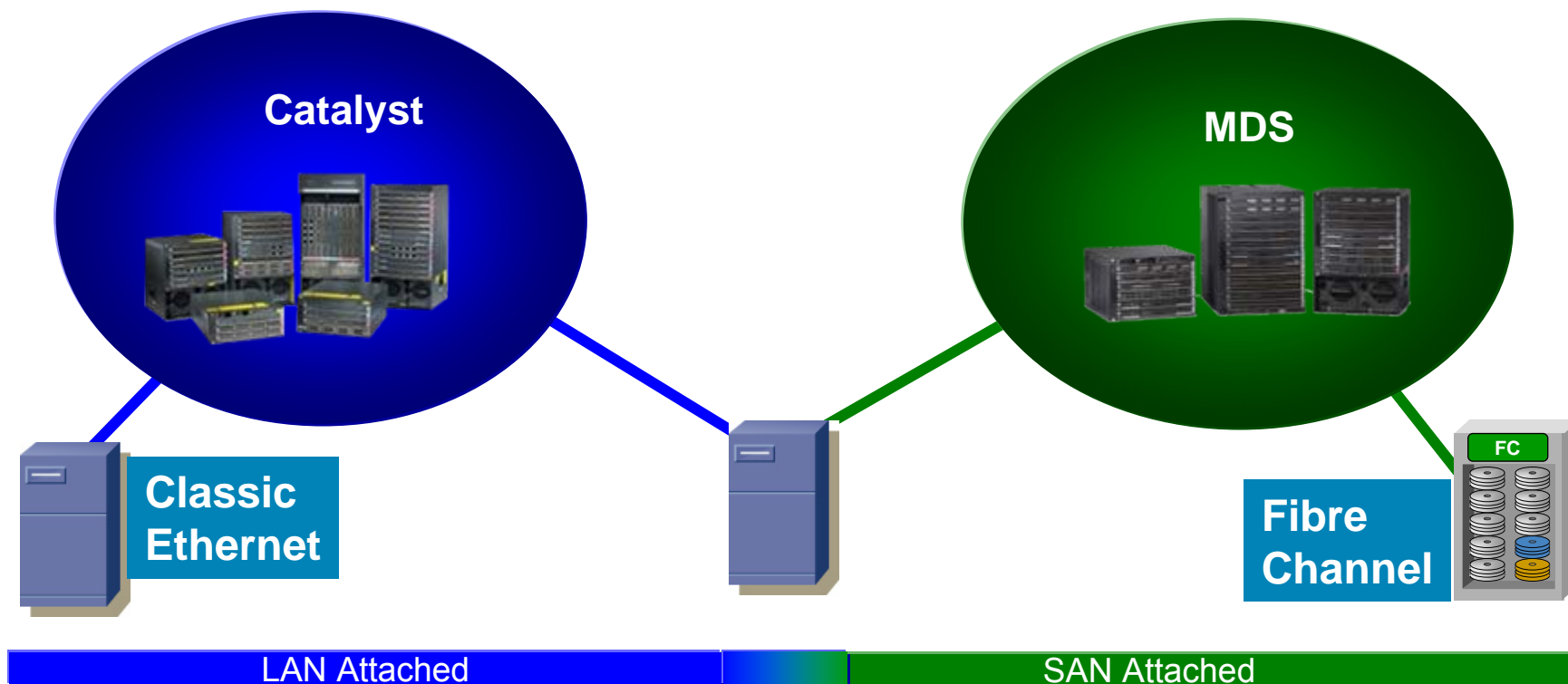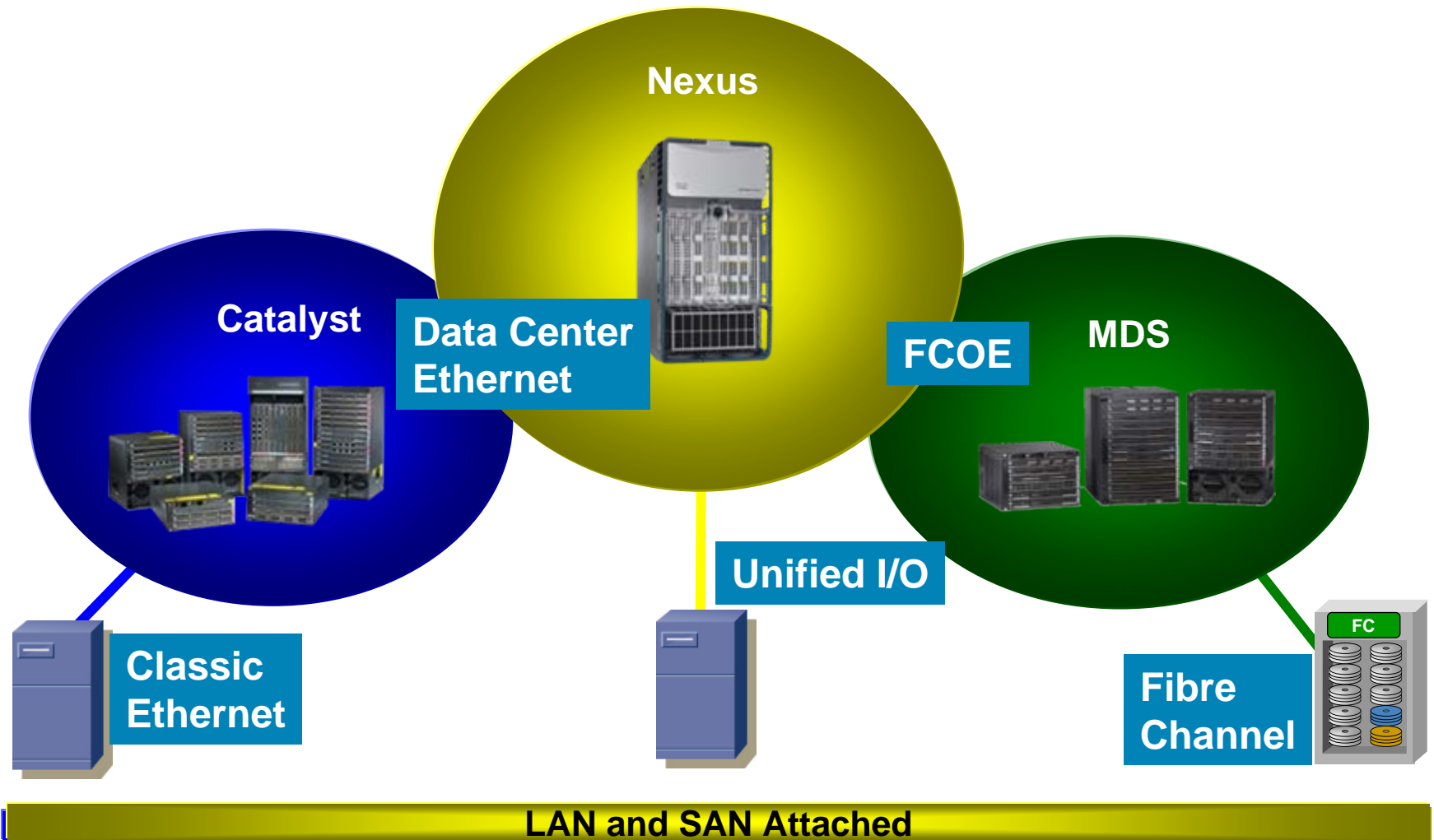**Cisco IOS Software Modularity**

Base | Routing | TCP | UDP | EEM | FTP | CDP | INETD | etc

High Availability Infrastructure
Network Optimized Microkernel
Catalyst 6500 Data Plane

- Memory protection
- Fault containment
- Stateful process restarts
- Subsystem ISSU

Sysmgr, PSS & MTS

SNMP, XML, CLI Management

Layer-2 Protocol
VLAN mgr | UDLD
STP | CDP
IGMP snp | 802.1X
LACP | CTS
...

Layer-3 Protocol
OSPF | GLBP
BGP | HSRP
EIGRP | VRRP
PIM | SNMP
...

Storage Protocols
VSANs
Zoning
FCIP
FSPF
IVR

Other Services
Future Services
Possibilities

Protocol Stack (IPv4 / IPv6 / L2)
Interface Management
Chassis Management
Chip/Driver Infrastructure

Kernel

NX-OS
End-to-End Data Center LAN & SAN, Tool to Unify I/O

Cat 6500 IOS Software Modularity
End-to-End Backbone, Datacenter, Access & WAN
Deployments with IOS Feature Richness

Catalyst 6500 and Nexus 7000 positioning in a unified fabric (1/2)

Catalyst

MDS

Classic Ethernet

Fibre Channel

FC

LAN Attached

SAN Attached

Catalyst 6500 and Nexus 7000 positioning in a unified fabric (2/2)

Nexus

Catalyst

Data Center Ethernet

FCOE

MDS

Unified I/O

Classic Ethernet

FC

Fibre Channel

LAN and SAN Attached

Nexus 7000 and Catalyst 6500 complementary focus in the Data Center
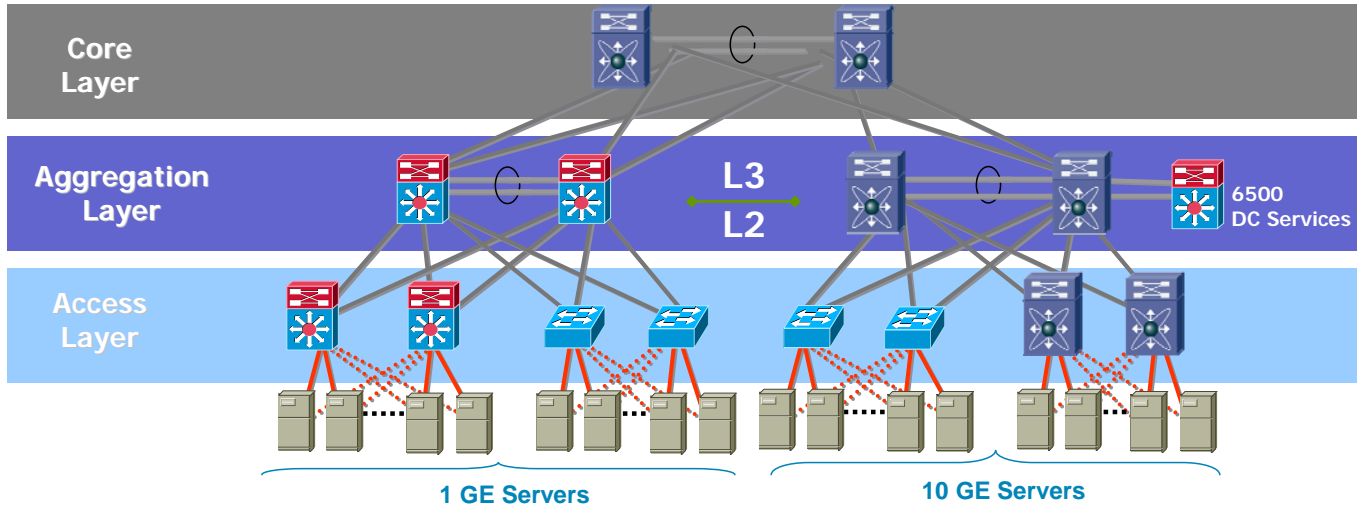
	Nexus 7000	Catalyst 6500
Core	*	
High*-Density 10G aggregation	*	
1G/10G ToR/Blade aggregation		*
1 G Server Access End of Row		*
10G Server Access End of Row	*	
Integrated services		*
Unified Fabric	*	

*> and 64 ports line rate, or > 128 ports 4-1 oversubscribed

Q and A