Cisco Webinar

Catalyst 6500 und Nexus 7000 ein Überblick

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Disclaimer

“Many of the products and features described herein remain in varying stages of development and will be offered on a when-and-if-available basis. This roadmap is subject to change at the sole discretion of Cisco, and Cisco will have no liability for delay in the delivery or failure to deliver any of the products or features set forth in this document.”

Session Abstract

At the end of this session the Customer will have a brief overview of both Cisco core solutions – Nexus 7000 and Catalyst 6500 and how to differentiate and integrate these into the network

Agenda

- Catalyst 6500 Overview
- Nexus 7000 Overview
- Differentiation of the Solutions

Getting the Best Value from Your Network Investments

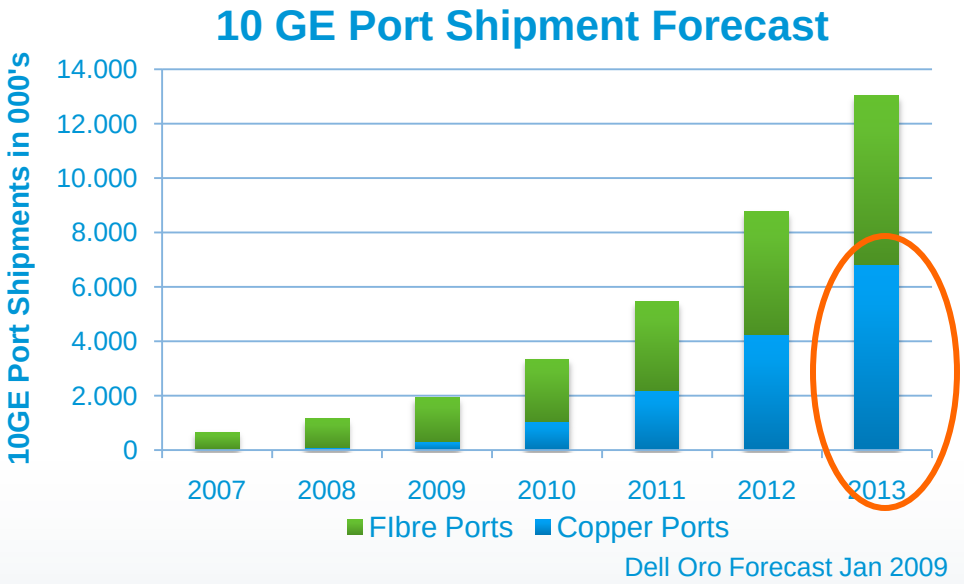
Today's Network Deployments Are Expected to Last Longer Than Ever Before

- How long do you expect your investment to last?
- What applications and services will you be deploying over that timeframe?
- Today's investments will determine the success level of tomorrow's services and applications

Effective Investments Today Provide Greater Long-term Value

- Minimize disruptive network upgrades
- Minimize operational costs
- Position your business to quickly take advantage of new business opportunities

Market Transition from 1GE to 10GE



6M+ 10GBase-T by 2013

2 – 3 years timeframe for new server migration to 10GBase-T

Greenfield DC's must support high density 10GE capacity

Key Technology Drivers for 1GE to 10GE Migration

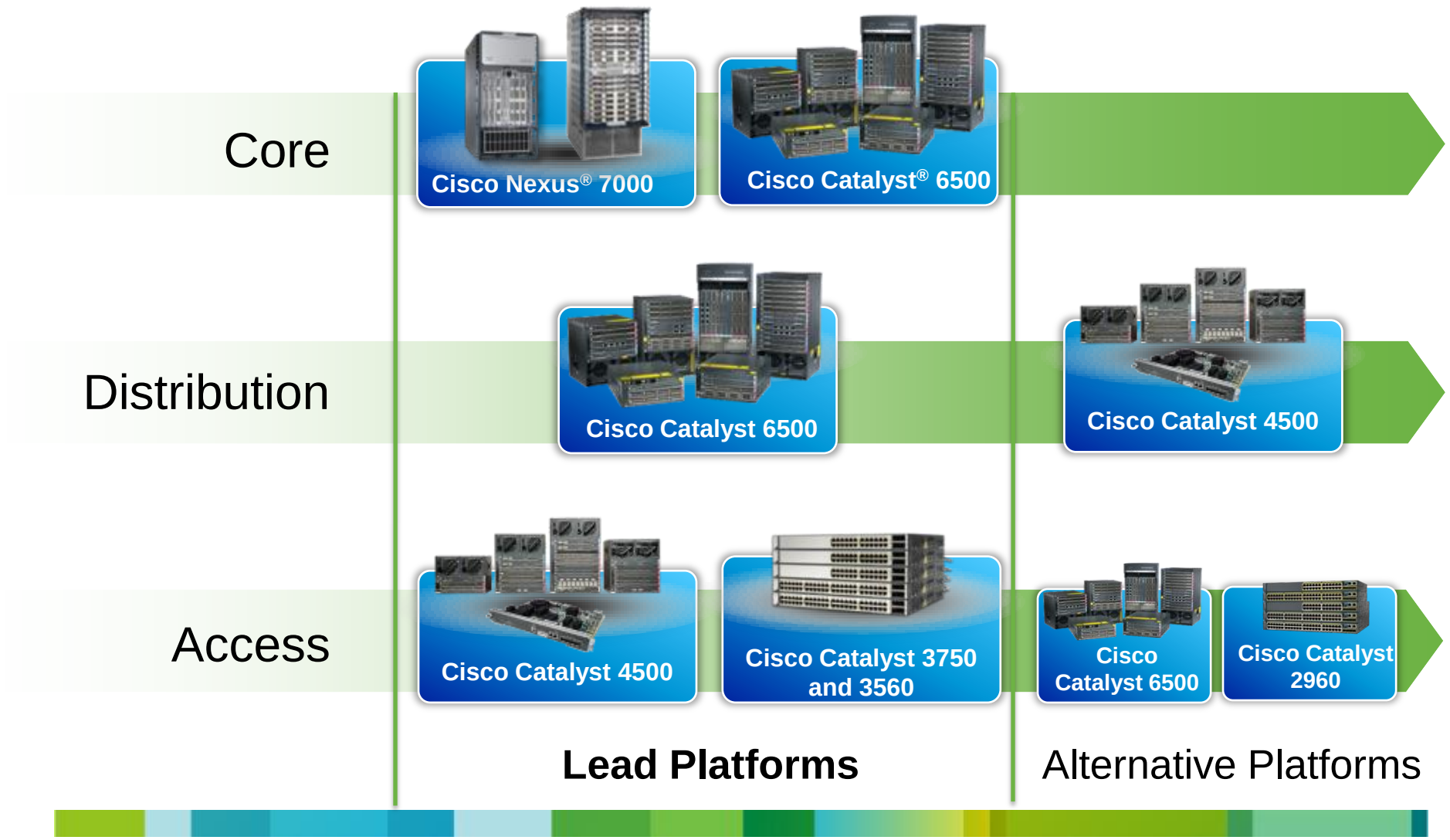
Server / NIC Technology

Nexus 7000 and Catalyst 6500 Plans

10GBase-T Interface LOM standard by 2010 – 2011 → **10GBase-T Switch Modules in 2011**

Reduction in price points and power usage of 10GE Interfaces in servers → **Minimize price gap between 1 GE and 10GE**

Cisco Borderless Networks:
Enterprise Switching Portfolio



CATALYST 6500 OVERVIEW

Catalyst 6500 Next Generation Platform

Supervisors & chassis

SUP2T
80G/slot

2 Terabit Switching

High Performance Service Modules

ASM-SM

Next Gen Services

Line cards

10 & 40G interfaces

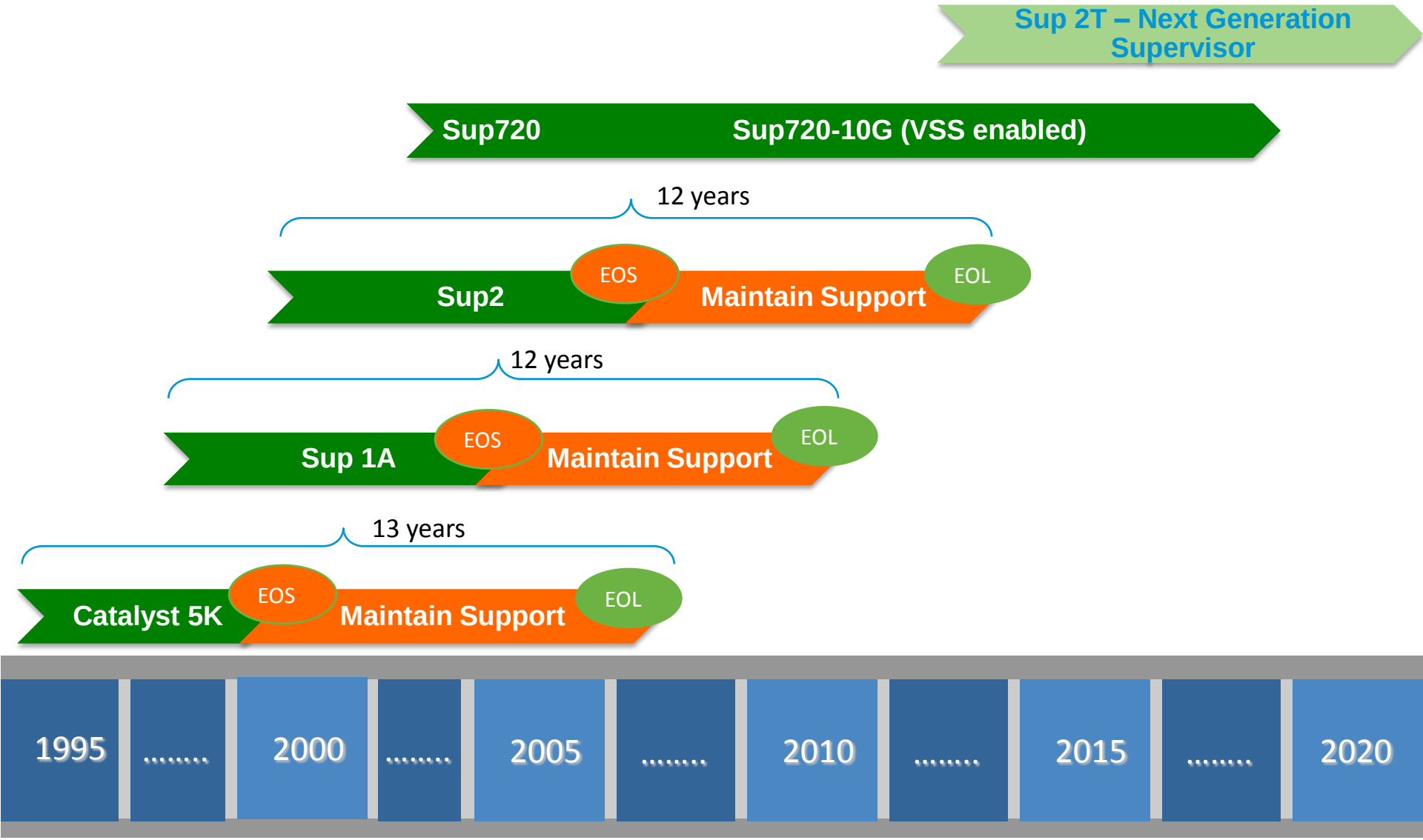
8 p 10GbE nce card
16 p 10Gbase- performance card
67xx Series line card compatibility

ASIC Innovations

Feature Flexibility

with N7K

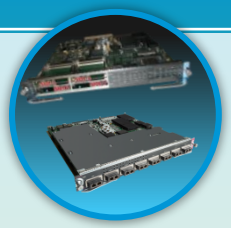
Unprecedented Switching Lifecycle



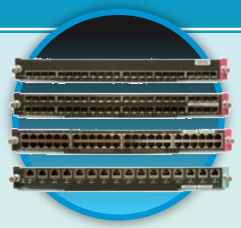
The New 2 Terabit Catalyst 6500-E

Innovation

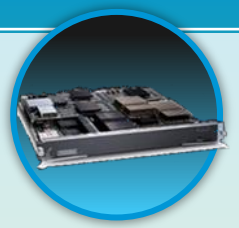
Sup2T and 6513-E



69xx Series 80Gbps
8p 10G
Built-in DFC4



68xx/67xx
Series 40Gbps
1GbE Fiber: 24p/48p
10/100/1000: 48p
10GBASE-T: 16p
10G Fiber: 16p
Built-in DFC4



Service Modules
WiSM-2
ASM-SM
NAM-3
ACE-30

Cat6500-E

Investment Protection

ALL E-Series Chassis

Upgrade Option for 67xx Line Cards

All 61XX POE/ POE+

Legacy Service Modules

E-Series Systems for the “2T” Family

Unlock 80G/slot across ALL E-Series Chassis

6503-E	6504-E	6506-E	6509-E	6513-E	6509-V-E
34x10GE	50x10GE	82x10GE	130x10GE	180x10GE	130x10GE
96x1GE	144x1GE	240x1GE	384x1GE	528x1GE	384x1GE
150Mpps	210Mpps	330Mpps	510Mpps	720Mpps	510Mpps

Sup720 - Sup2T Comparision

Feature	Sup720-10G	Sup2T
CPU Speed	**SP CPU @ 600Mhz RP CPU @ 600Mhz**	**Dual-Core CPU Each Core @ 1.5Ghz**
Number of CPU cores	1	2
DRAM	SP CPU – Up to 1GB RP CPU – Up to 1GB	2 x 2GB (XL) 1 x 2GB (Non-XL)
Connectivity Management Processor (CMP)	**No**	**Single CPU @ 266Mhz 32MB Boot Flash 256MB System Memory**
NVRAM	2MB	4MB
OBFL Flash	No	4MB
Bootflash / Bootdisk	SP CPU – 1GB (CF) RP CPU – 64MB (flash)	1GB (CF)
Backplane Capacity	40 Gig	80 Gig

68xx and 69xx Series Line Cards

1GbE Fiber and Copper

- Distributed Forwarding Card (DFC4)
- Two SKUs: Regular and XL tables
- 24 ports 1 GbE fiber
- 48 ports 1 GbE fiber and 10/100/1000
- 40G backplane

- WS-X6824-SFP-2T
- WS-X6848-GE-TX-2T

10Gbe Fiber and Cooper

- Distributed Forwarding Card (DFC4)
- Two SKUs: Regular and XL tables
- 16 ports 10GbE Fiber (X2 transceivers)
- 16 ports 10GBASE-T
- 40G backplane

WS-X6816-SFP-2T
WS-X6816-10T-2T

10Gbe Fiber

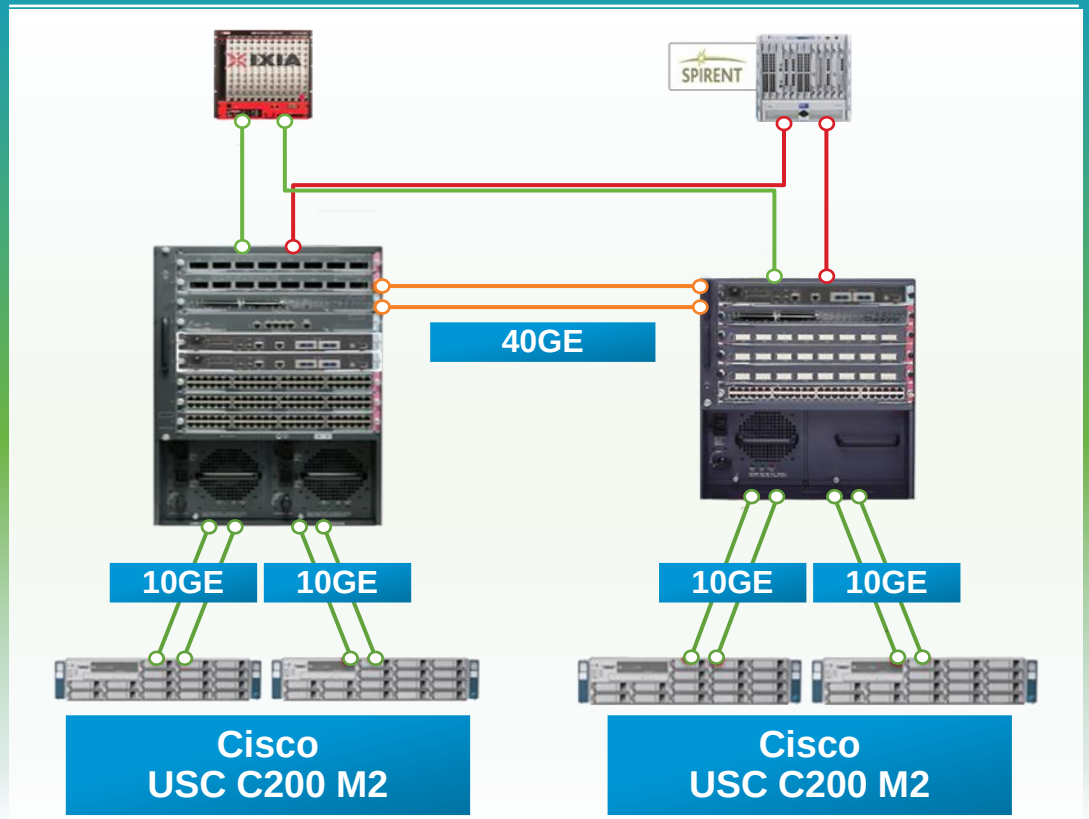
- Two SKUs: regular and XL tables (DFC4)
- X2 Transceiver or SFP+ w/ adapter
- Wire Rate MacSec (IEEE 802.1AE)
- Large packet buffers (256MB/port)
- Virtual Switch Link (for VSS)
- 80G backplane

WS-X6908-10G-2T

Catalyst 6500 40 GbE Ready

Successfully Completed High Speed Ethernet Plug-Fest
September, 2010

First Ethernet Modular Switching Platform to Demonstrate 40G



- Showcased industry's first modular 40GE with Cat 6500 at the Nov. 2010 Supercomputing show
- Showcased industry first 100GE with CRS-3
- Demonstrated interoperability with 40 GE Server as well as with variety of cable and transceivers

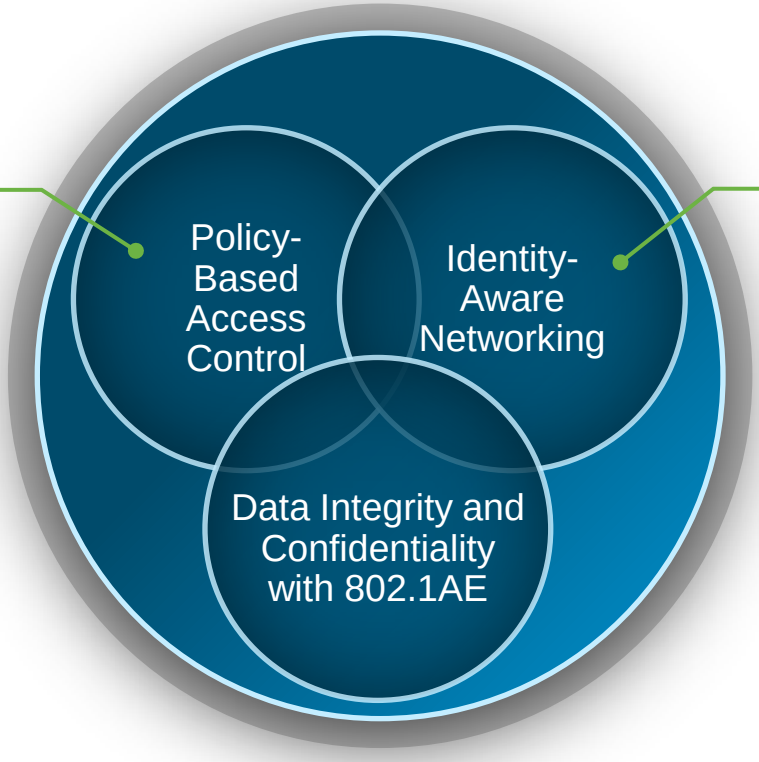
Reference: http://www.ethernetalliance.org/files/static_page_files/2Ethernet_Alliance_Demonstration_at_SC10.pdf

Key Packaging Changes for Software

* Roadmap New at FCS

TrustSec Overview

- Consistent policy for users and devices
- Distributed Policy enforcement
- Topology-independent access control via Security Group Access Control (SGAC)

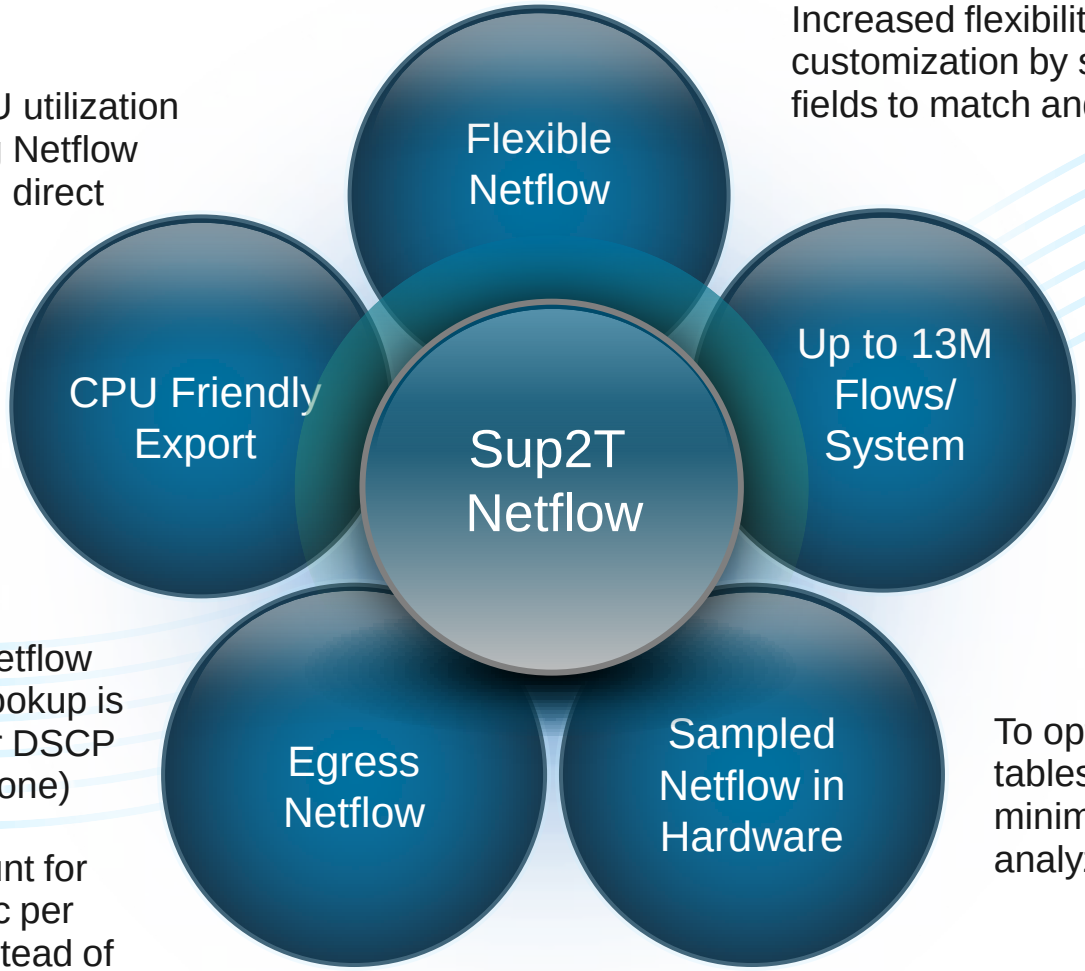


Cisco TrustSec

- Controls based on user/device identity and attributes (time, location, access methods)
- Support for Cisco Medianet and QoS for business-critical applications associated with users in specific roles

Sup2T Netflow Innovations

Fits All the Needs for High-Flow Backbone Environments



Optimal CPU utilization with Yielding Netflow Data Export, direct export from linecard

Increased flexibility and customization by selecting the fields to match and collect

Bigger tables mean more entries per DFC. Up to 13 million entries with a 13 slot chassis. You can get better visibility in your network

Allow to use netflow after ingress lookup is done (ex: after DSCP remarking is done)

Allow to account for multicast traffic per destination instead of per group

To optimize the Netflow tables utilization and minimize load on analyzers

Innovation in Control Plane Security

Protect Your Most Important CPUs of Your Infrastructure

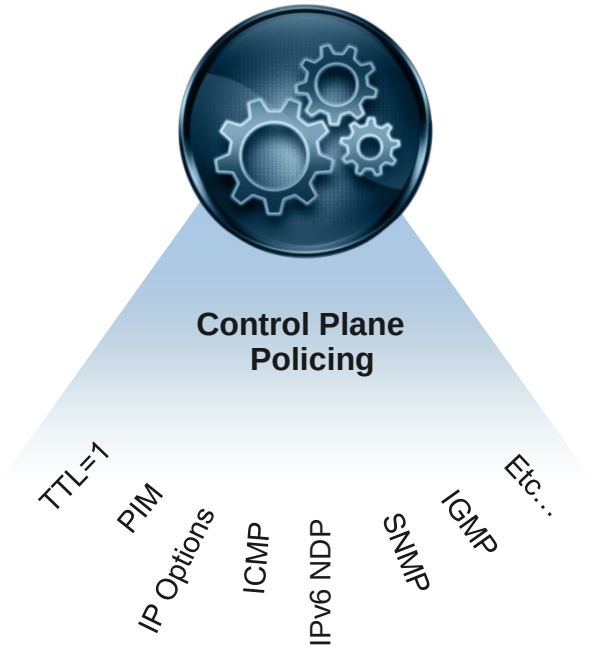
Why it matters?

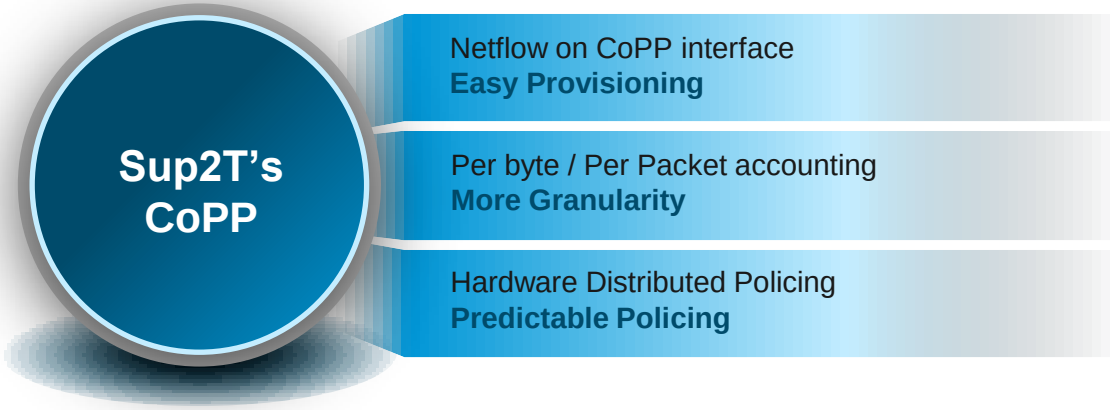
- When under a DOS attack, you want to avoid network meltdown, so you need to keep control on your network

How it protects the CPU?

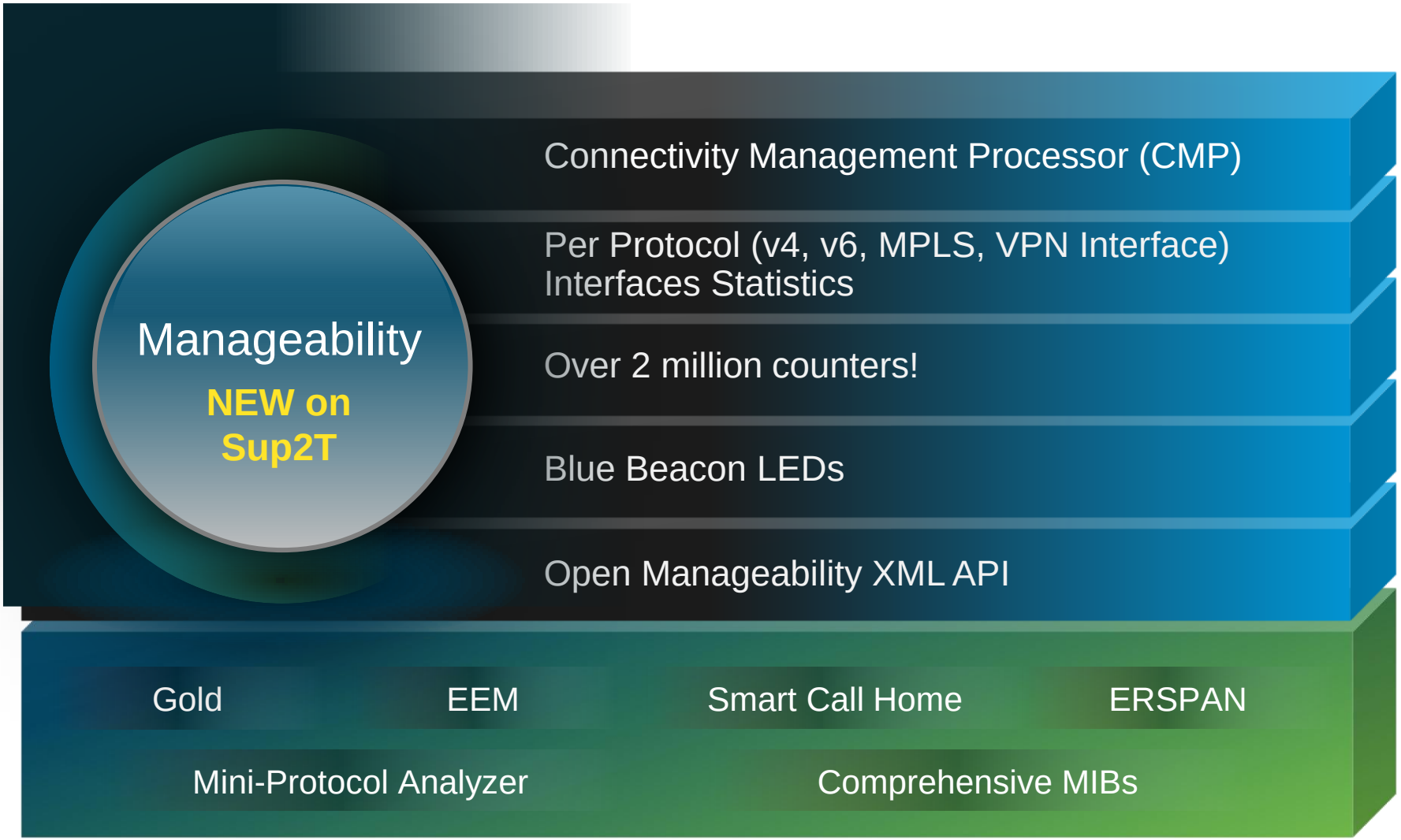
- Control Plane Policing protects the Switch Control Plane from being Compromised from excessive traffic loads
- Select and limit the traffic that will hit your CPU

What's new with Sup2T?





Simplified Operations with Sup2T



NEXUS 7000 OVERVIEW

Nexus 7000: Innovations and Differentiators

Built to Scale

- **FASTEST Nexus**
  15+Tbps Switching Capacity
- 512 10GbE, 768 GbE, 1536 1GE ports per system – FEX
- Dense 40GbE/100GbE Read
- 1M routes, 1K vrfs and MPLS
- vPC and FabricPath

Cisco Nexus 7000

- Extended Lifecycles
- Investment Protection

High Availability

- **Modular Operating System**
- Hitless In Service Software Upgrades
- Stateful Process Restart
- Lossless Fabric
- HA – Graceful Restart
- NSF Extensions

Operations Excellence

- Network Segmentation – vrf, VDC, MPLS
- EEM, GOLD and SmartCallHome
- Netflow v9, L2 Netflow, ERSPAN
- Integrated Wireshark packet capture
- CoPP
- Atomic ACLs

Fabric Innovations

- Virtual Device Contexts
- Overlay Transport Virtualization
- FabricPath
- LISP
- Multi-Hop FCoE
- Nexus 2K Fabric Extender

Designed to Deliver Unified Networks for Next 10 Years

* Roadmap

Nexus 7000 Platform Overview

Nexus 7000 and NX-OS

- 9, 10 & 18 Slot Chassis
- 15+ Terabit System (18 Slot)
- Unified Fabric
- Modular NX-OS
- Device Virtualization
- Hitless ISSU
- Highest Availability Ethernet Switch and Director Class SAN

Linecard Modules

Supervisor

10G Ethernet – M Series

- 32 Port SFP+ 10G - XL
- *8 Port X2 10G - XL*

1G Ethernet – M Series

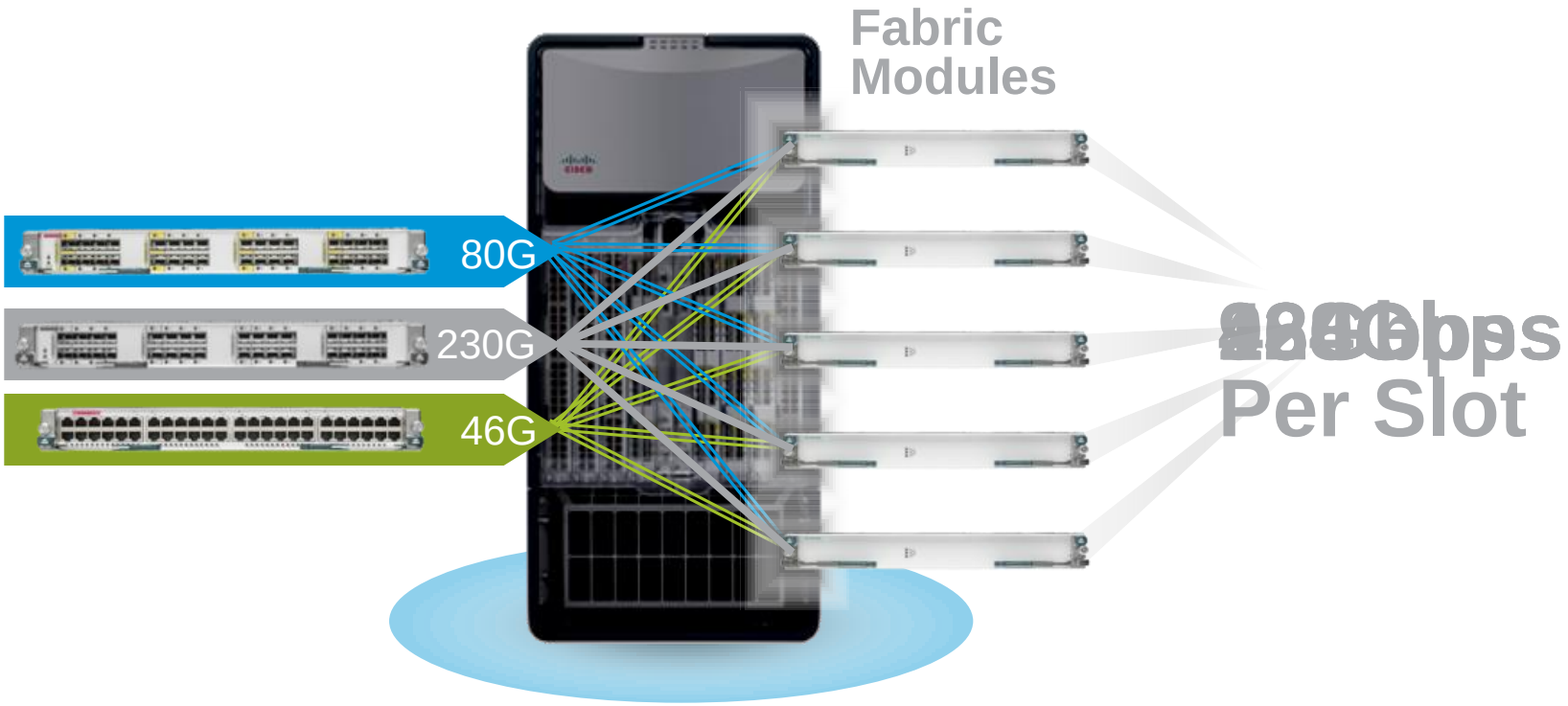
- 48 Port 10/100/1000 -XL
- 48 Port 1G - XL

10G Ethernet – F Series DCB/FabricPath/FCoE

- *32 Port SFP+ 10G*

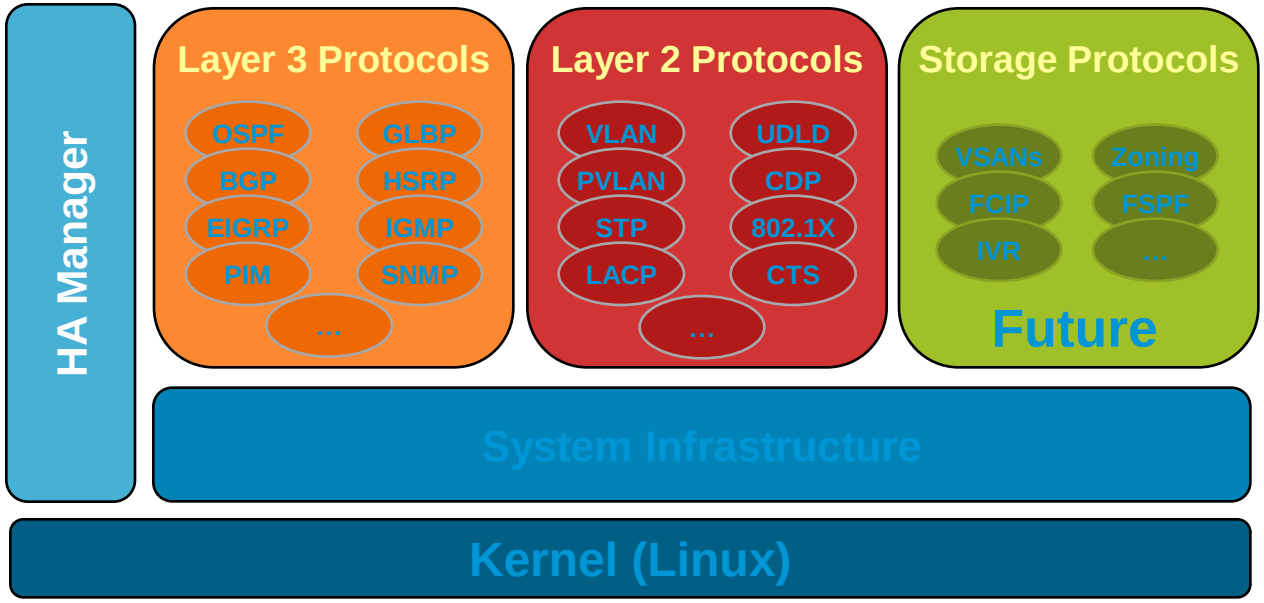
Cisco NX-OS Multi-protocol Operating System

15Tb+ System Performance
Bandwidth Scales with Each Fabric Module



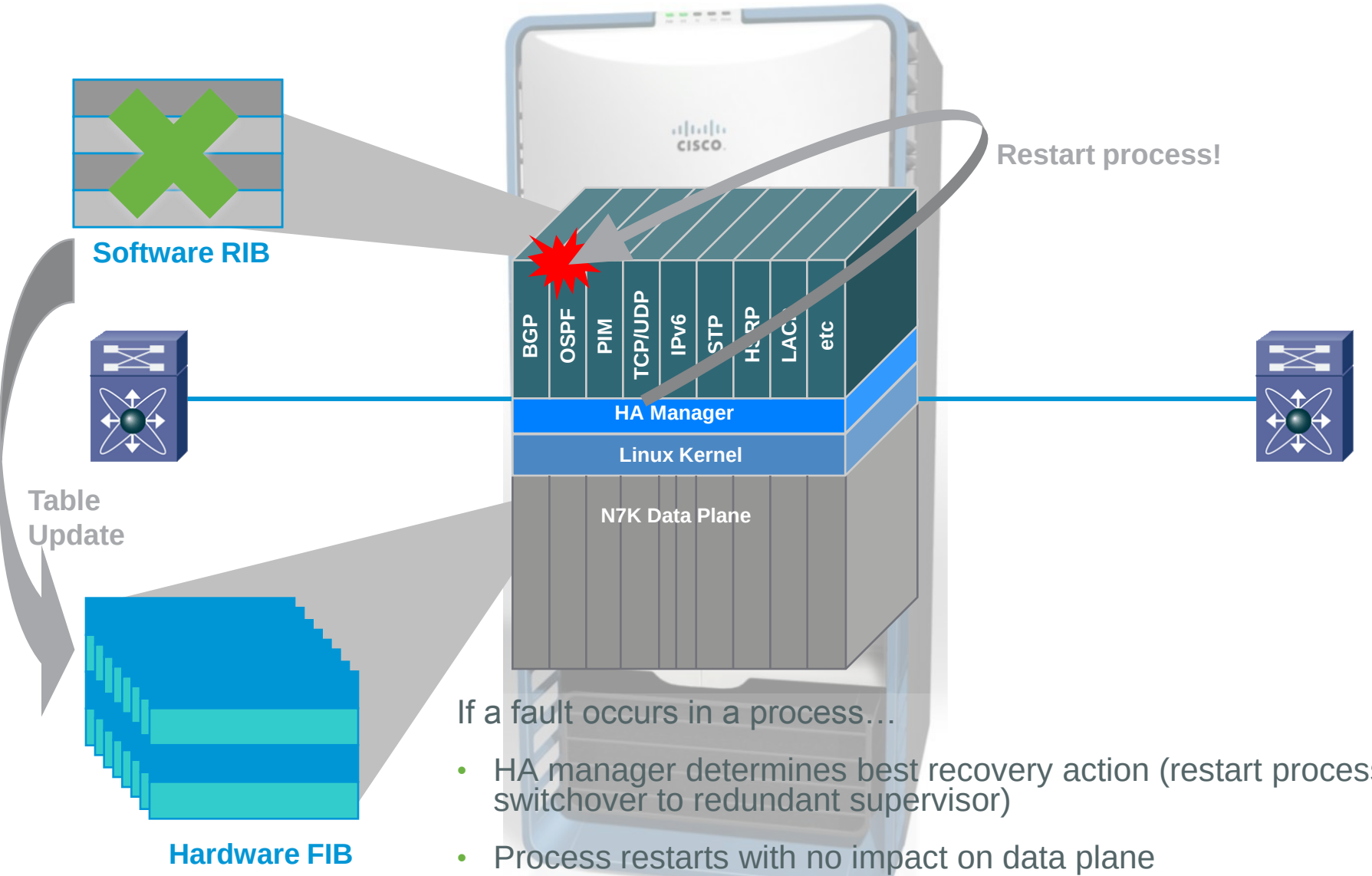
Investment Protection and Unified Fabric

NX-OS Modular Architecture



- Based on MDS-9000 Series SAN-OS 3.1
- Every process runs in protected memory for fault containment
- Automatic stateful process restart
- Modular code only runs in DRAM when invoked

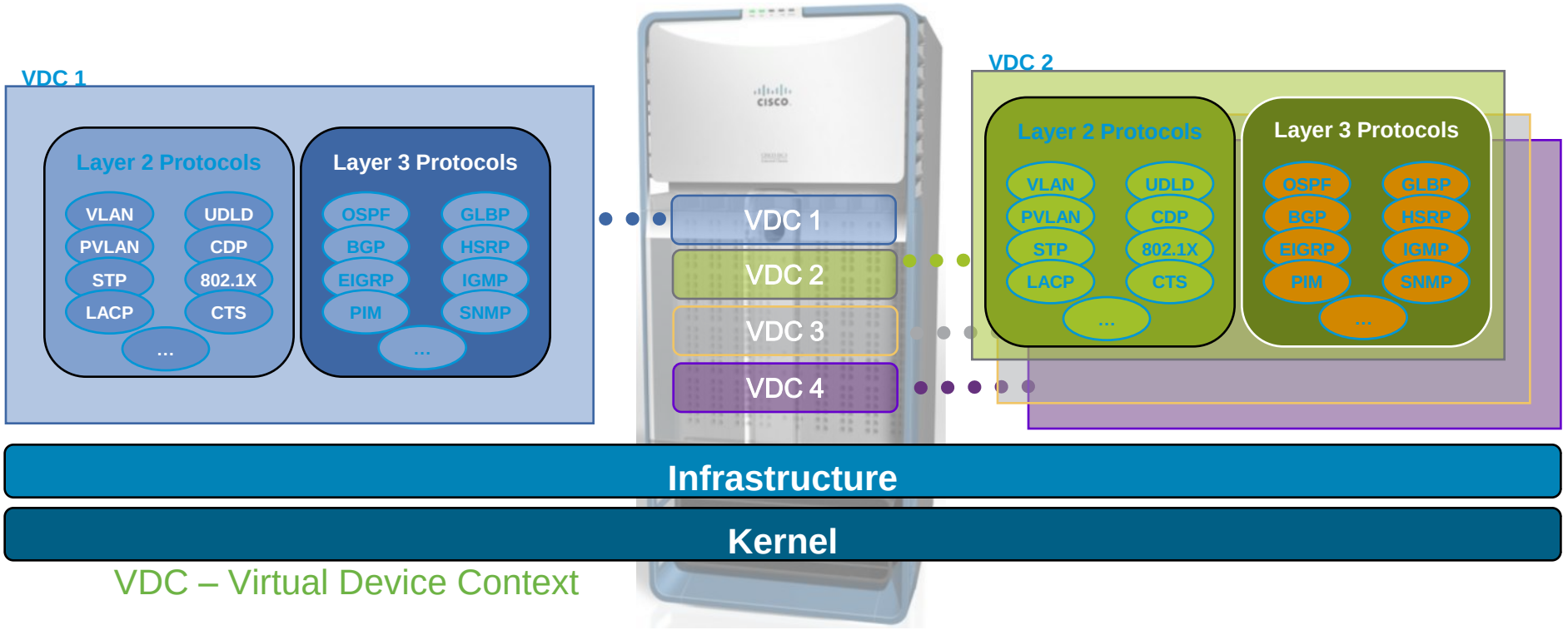
Stateful Fault Recovery



If a fault occurs in a process…

- HA manager determines best recovery action (restart process, switchover to redundant supervisor)
- Process restarts with no impact on data plane
  - State checkpointing (PSS) allows instant, stateful process recovery
  - Software utilizes Graceful Restart where appropriate

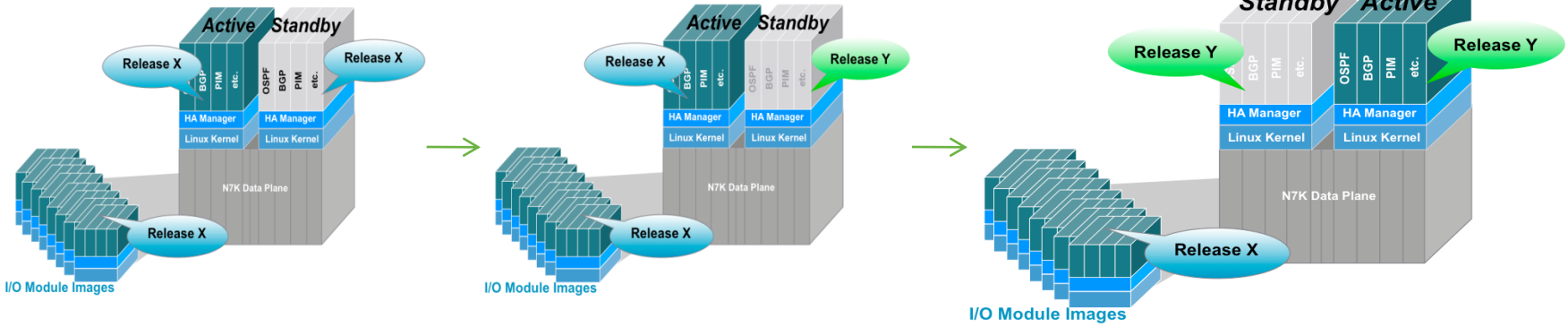
Nexus 7000 Virtualization with VDCs



VDC – Virtual Device Context

- Flexible separation/distribution of hardware resources and software components
- Complete data plane and control plane separation
- Complete software fault isolation
- Securely delineated administrative contexts
- Forwarding engine scalability with appropriate interface allocation

Nexus 7000 High Availability
NX-OS – Hitless ISSU Process



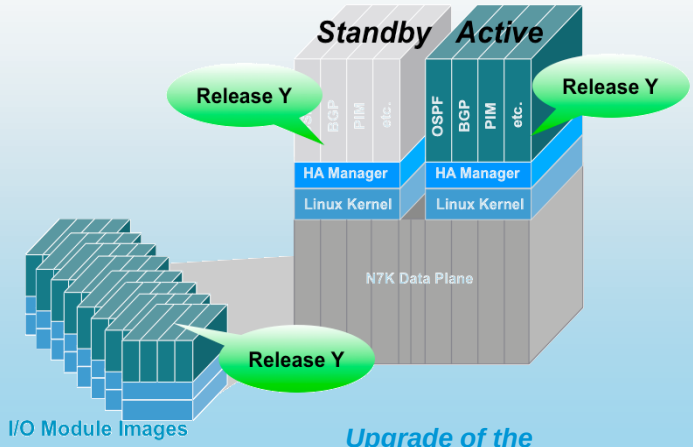
Reload and Upgrade of the Standby Supervisor

Switchover: Standby Supervisor takes over as Active

Upgrade the previously Active Supervisor

Hitless ISSU Capabilities of Nexus 7000

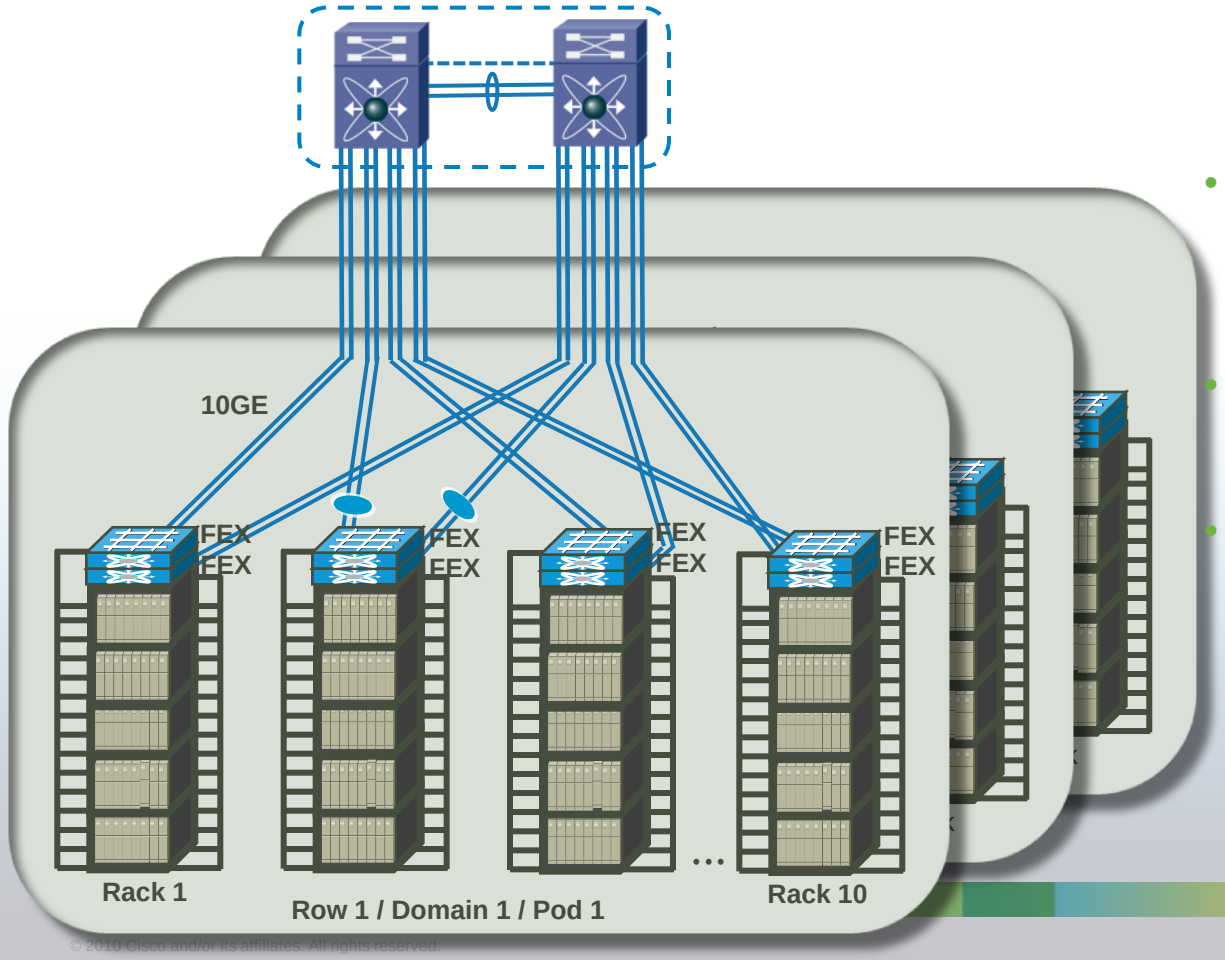
- Simple one line command for ISSU procedure
- Stateful Supervisor switchover
- Completely non-disruptive software upgrades / downgrade
- Zero packet-loss during ISSU Upgrade or Downgrade Process



Upgrade of the I/O modules

Support for Virtualized Access Layer (FEX)

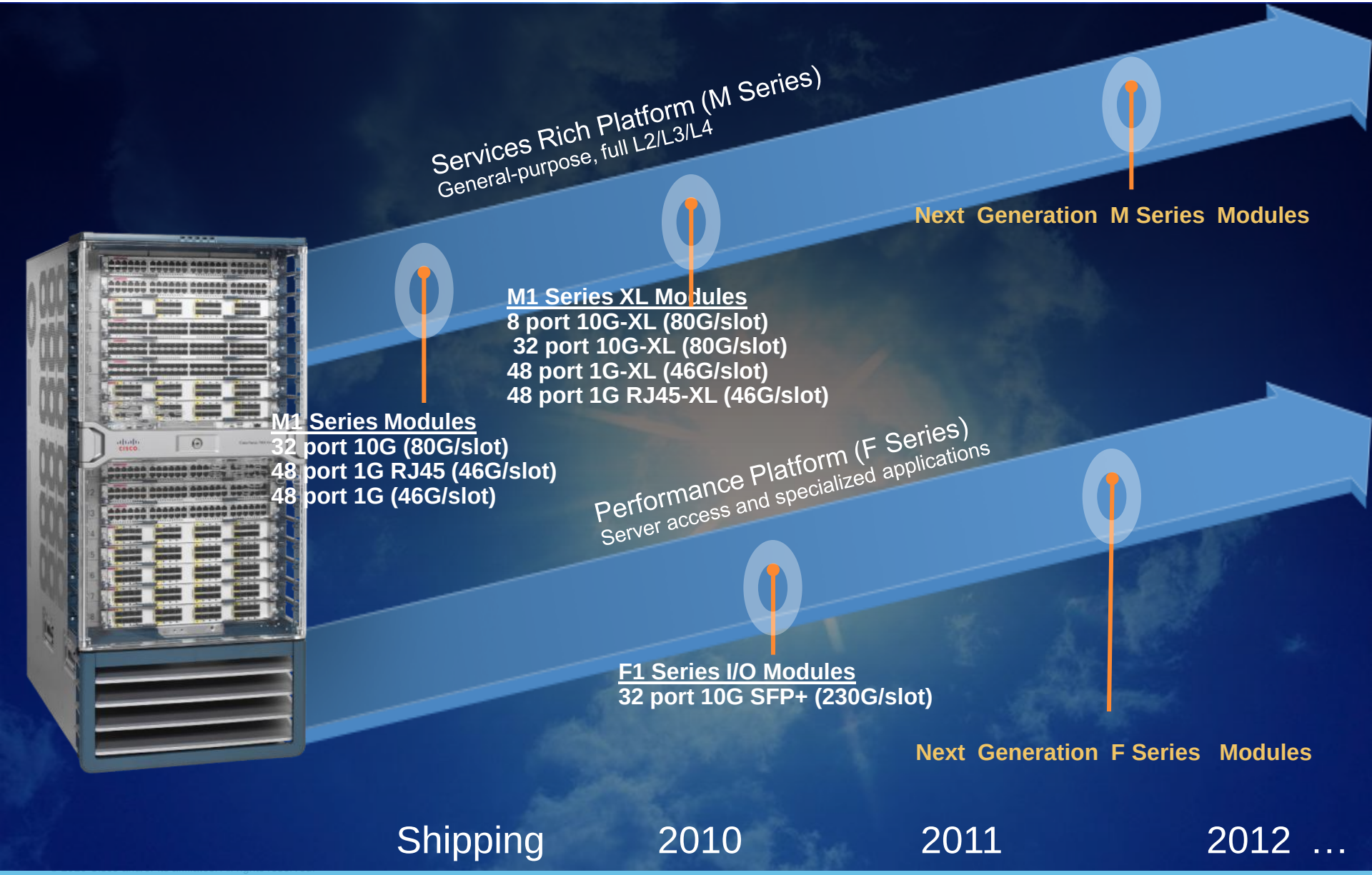
Deployment Scenario: Nexus 2000 + Nexus 7000



- Nexus 2000 Fabric Extenders can be connected directly to Nexus 7000
- Simplifying management domain – 1000+ ports managed centrally
- Benefits of ToR Cabling with Modular Chassis Features
- Software update only on Nexus 7000

  Supported on N7K-M132XP12

Nexus 7000 I/O Module Family Roadmap



DIFFERENTIATION OF THE SOLUTIONS

Borderless Architecture Positioning

Enterprise Campus

Cisco Catalyst 3K/4500/

Virtualized campus

MPLS, MVPN, VSS, Integrated Service Modules (WiSM, NAM, FW)

Cisco Catalyst 6500

Cisco Catalyst 3K/4500

Intelligent campus

Video-ready (medianet), energy efficient, operational efficiency, (EEM, Cisco Smart Call Home, IP SLA)

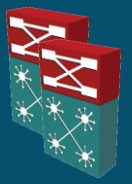
Cisco Catalyst 6500 4500

Cisco Catalyst 2000 or Catalyst 4500 Layer 2

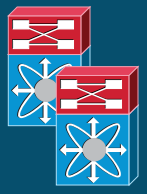
Campus with ready-to-use network

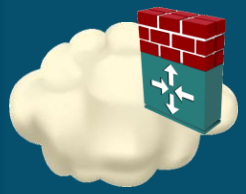
Multicast, NSF/SSO, security, PVST+/RPVST+, AutoQos, POEP, IPv6)

Cisco Catalyst 6500 4500



Nexus 7000 Catalyst 6500





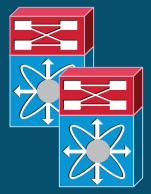
Cisco Catalyst 6500 WAN/DCI

Access **Distribution** **Core**

Data Center Positioning

Cisco CRS-1/Cisco Nexus 7000 WAN/DCI

Cisco Nexus 7000



Cisco Catalyst 6500 WAN/DCI

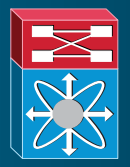
Data Center

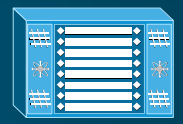
Unified Computing

- Unified IO with FCOE
- DCB
- Stateless computing
- Bandwidth scale: 40G/100G

Cisco Nexus 7000

Cisco Nexus Switch + Cisco Unified Computing System





Cisco Unified Computing System

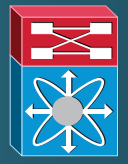
Cisco Nexus 5000

Cisco Nexus 2000

Virtualization

- VM mobility: VSS/VPLS, VN-Link Ready
- VM scalability: Large Layer 2 tables
- 1-GE → 10-GE server transition: 10 GE-T
- Virtualized services

Cisco Nexus 7000



Cisco Catalyst 6500

Cisco Catalyst + Cisco Nexus Switches

Traditional Computing

- Layer 3 segmentation: MPLS, VRF-Lite
- iSCSI and NAS: Layer 3 switching/QoS
- GE performance: Latency, buffers
- Grid ToR: Commodity switching

Cisco Catalyst 6500

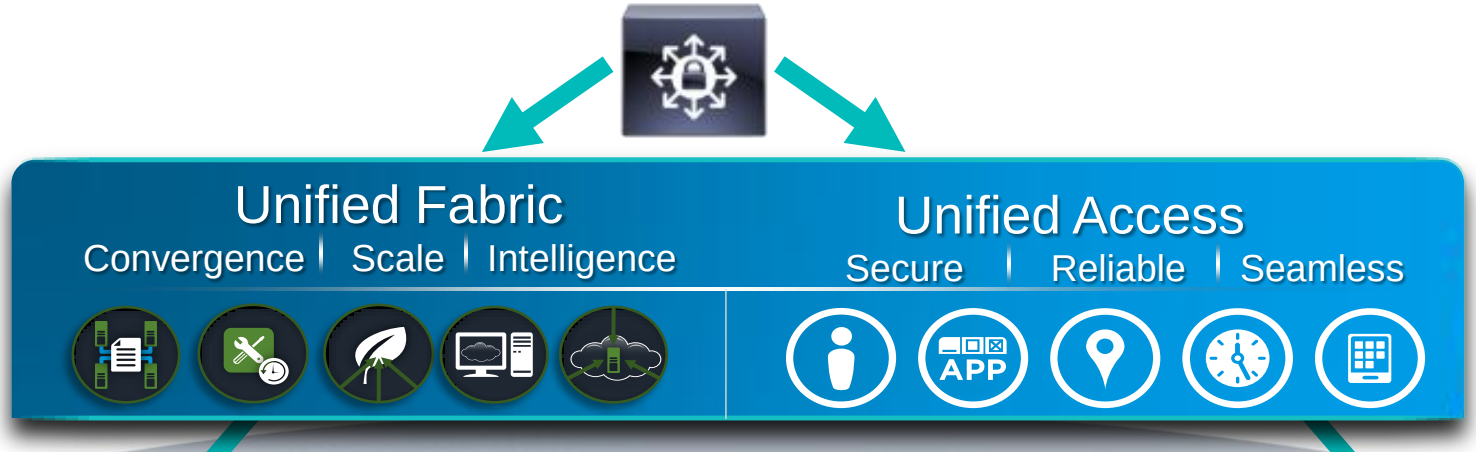
Cisco Catalyst 4900

Cisco Catalyst Switches

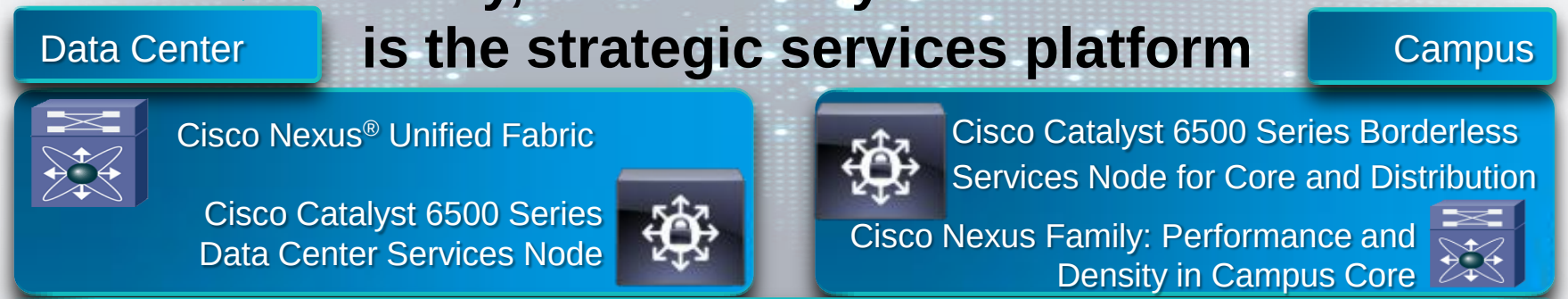
Core

Cisco Catalyst 6500 Series in the Enterprise Next-Generation Network

In the past, Cisco® Catalyst 6500 Series was everywhere



Today, Cisco Catalyst 6500 Series is the strategic services platform



Cisco Commitment to Switching Services Is Our Core Differentiation

Enterprise Switching: Campus Core

Customer Requirements: Decision Points

✓ Virtualization	✓ Scalability	✓ Borderless Services
✓ Security	✓ High Availability	✓ Investment Protection

Cisco® Borderless Networks: Decision Criteria in the Campus Core

Borderless Core Services

- LAN and WAN flexibility
- Integrated borderless services
- Virtual switching system (VSS)
- MPLS (L3VPN and L2VPN)
- 4-terabit scalability

Cisco Catalyst® 6500 Series

Borderless Core Performance

- 10 GE port density
- Software high availability: hitless ISSU, NX-OS
- Segmentation (VDCs)
- MPLS (L3VPN) and OTV
- 15-terabit scalability

Cisco Nexus® 7000 Series

Common features: Robust layer 2 and 3, IPv6, scalable multicast, advanced QoS, SPAN and ERSPAN, WCCP, Cisco TrustSec®, Flexible NetFlow, Cisco GOLD, Cisco EEM, and Smart Call Home

Cisco Borderless Networks -- Switching CORE

Cisco Nexus® 7000 Series
New deployments focused on scale and data center convergence

Cisco Catalyst® 6500 Series
Upgrades and deployments for enhanced network services

Performance-Led Deployment

Nexus 7000
- **15-TB+ scalability**
- **10 GE port density**
- **Hitless ISSU**
- **Segmentation: VDC**
- **Virtualization: OTV**
- **FabricPath**
- **Operations and management excellence**

Lead Performance Platform

Services-Led Deployment

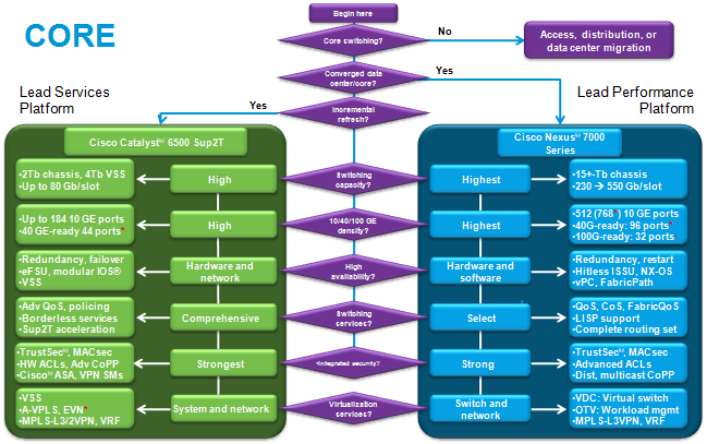
Catalyst 6500 Sup2T
- **Video optimization**
- **Cisco® EnergyWise**
- **Advanced security**
- **Service Modules**
- **IPv6/v4 hardware parity**
- **Investment protection**
- **Seamless migration**

Lead Services Platform

Core: Platform Comparison

Features	*Lead Performance Platform* Cisco Nexus® 7000 Series	*Lead Services Platform* Cisco Catalyst 6500® Sup2T
Switch capacity	15+ Tb	2 Tb per switch, 4Tb per VSS
Bandwidth/slot	230 Gbps	80 Gbps
1/10/40/100 GE ports	768/512	528/184/TBD/No
Routing entries (IPv4/IPv6)	1 million/350,000	1 million/512,000
High availability (platform)	Redundant supervisors, power supplies, fans, fabric modules, modular Cisco® NX-OS	Redundant supervisors, power supplies, fans, fabric modules, modular Cisco IOS® Software
Virtual chassis/multipathing	vPC , FabricPath	VSS (Layer 2 and 3)
Security, QoS hardware entries	256,000	256,000
Packet buffer	100 MB (ingress)/112 MB (egress) on M-Series I/O modules	256 MB/port (WS-X6908)
Service modules	NA	Cisco WiSM2, NAM-3, ASA-SM, ACE-30,
Tunneling	LISP, OTV, GRE, 6PE, 6VPE	MoGRE, mGRE, IPv4 in IPv6 and IP in IP, 6PE, 6VPE
NetFlow	Full, sampled, Layer 2, Layer 3 and bridged, TCP flags aware, VRF exporting, 512,000 entries/module	Full, sampled, flexible, TCP flags aware, VRF exporting, CPU friendly, 1 million entries/module
SPAN	2 bidirectional, VACL, ERSPAN	2 bidirectional and 14Tx, VACL, ERSPAN
Aggregate policers	16,000	16,000
Shared NetFlow policers	Yes	Yes

Cisco Borderless Networks - Switching



- Make the best decision for your deployment
- your Cisco team will support you

Thank you.