Cisco Connect

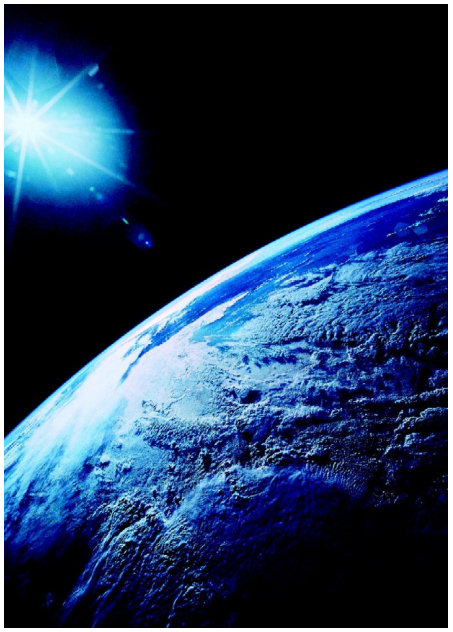
Praha, hotel Clarion
10. – 11. dubna 2013

Catalyst slaví dvacáté narozeniny

Novinky a rozvoj v řadách přepínačů

T-NET1/ L2

Jaromír Pilař, Consulting Systems Engineer, CCIE 2910
Lukáš Pleva, Expert, Nextira One



Acquisition Summary

Acquisition Summary – switching related

1993
CRESCENDO COMMUNICATIONS

1994
LightStream
Kalpana

1995
GRAND JUNCTION

1996
NASHOBA NETWORKS
GRANITE Systems

1997

1998

1999

1999(cont)
Aironet

2000

2000(cont)

2001

2002
andiamo

2003

2004
PROCKET NETWORKS
perfigo

2005
TOPSPIN

2005(cont)
netsift
Nemo
The Network Memory Company

2006
Greenfield NETWORKS

2007
cognio

2008
NUOVA SYSTEMS

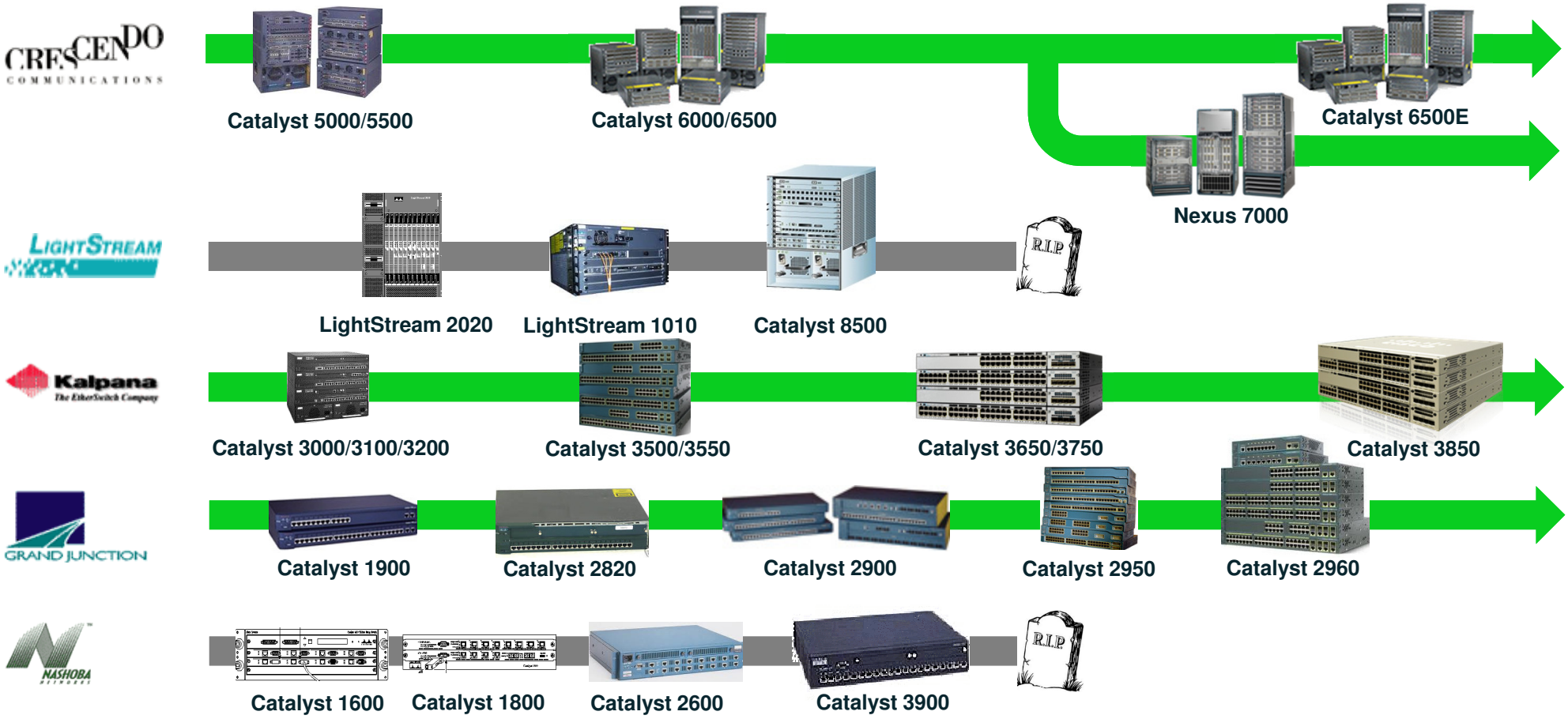
2009
RICHARDS | ZETA

2010

2011

2012
LIGHTWIRE

And where is it today? (1/2)



And where is it today? (2/2)

GRANITE Systems

Catalyst 4000

Catalyst 4500

Catalyst 4500E

andiamo

MDS 9100/9200/9500

TOPSPIN

SFS 3012

SFS 7000

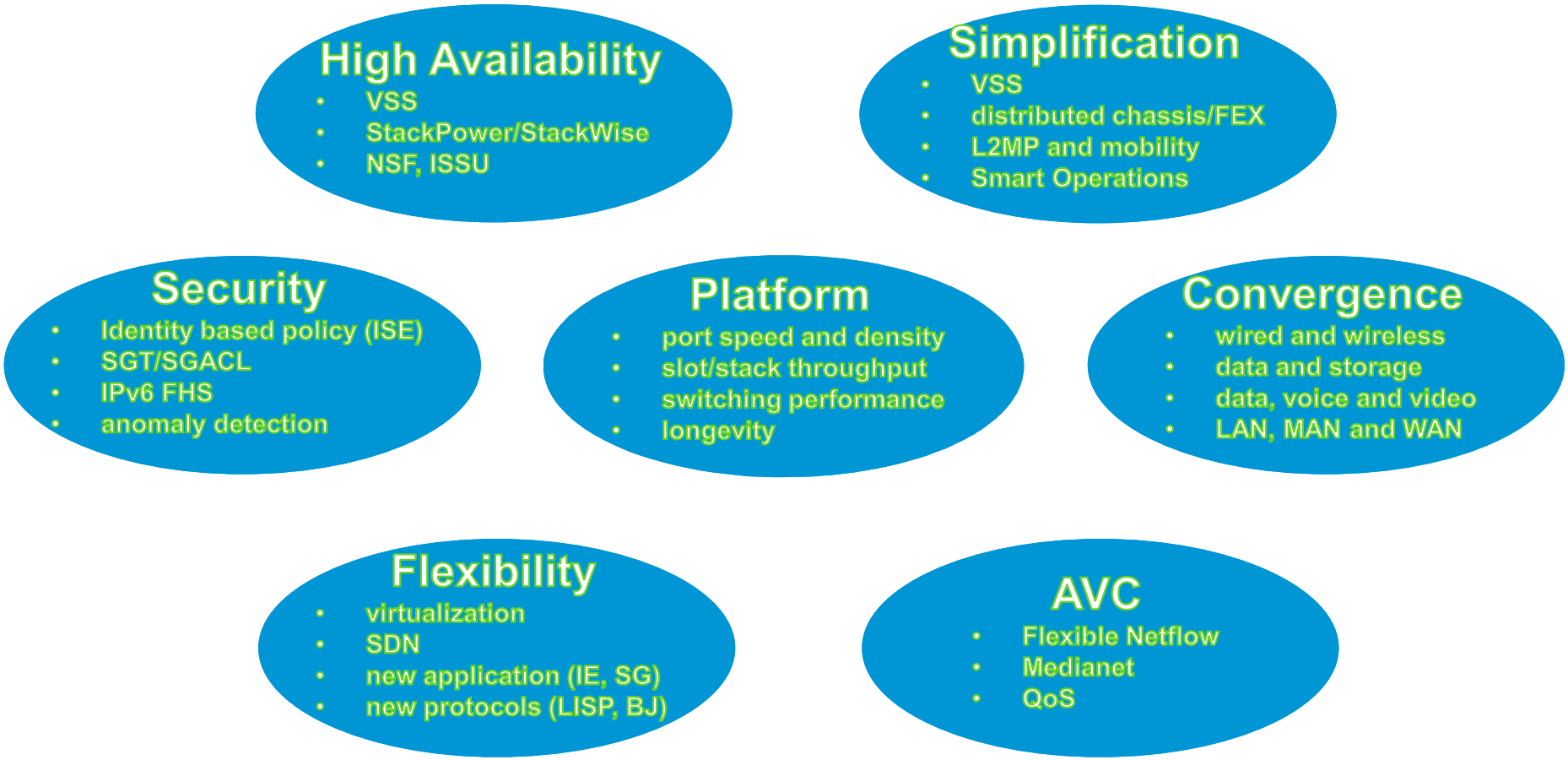
NUOVA SYSTEMS

Nexus 5000 and Nexus 2100

Nexus 5500 and Nexus 2200

Nexus 6000

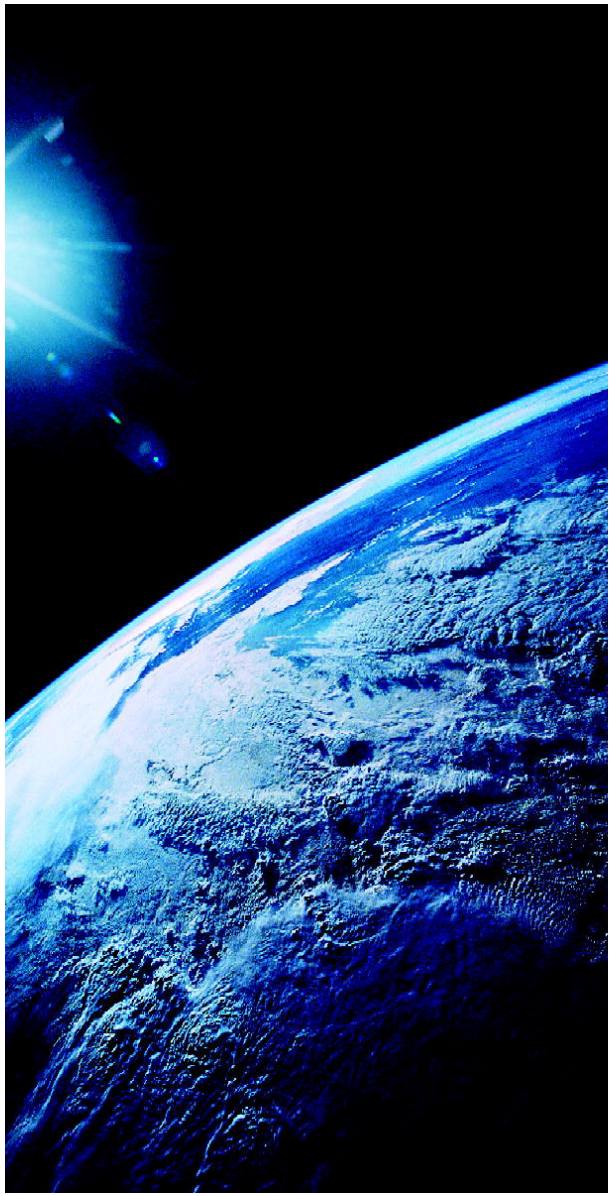
What are the areas of future development



Platform

Platform

- port speed and density
- slot/stack throughput
- switching performance
- longevity



100GE pluggable modules

Platform
- port speed and density
- slot/stack throughput
- switching performance
- longevity

CFP Modules

CXP Modules

CPAK Modules

LIGHTWIRE

CFP Modules

- 100GE LR4
- 100GE SR10
- Considering 100GE ER4
- Up to 24W per port

CXP Modules

- 100GBASE-SR10
- No other PMD's available
- Infiniband 'heritage'
- ~ 6W per port

CPAK Modules (Planned)

- 100GE LR
- 100GE SR10
- Others like 100GE ER4 and 10x10GLR investigated
- ~ 8.5W max per module
- 12 Modules Single Row

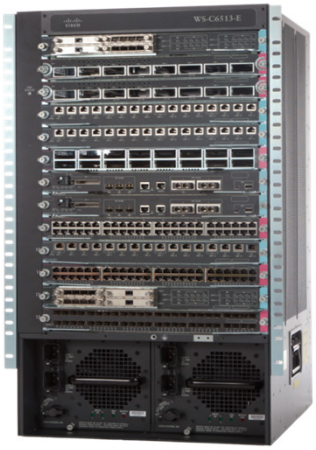
Platform
- port speed and density
- slot/stack throughput
- switching performance
- longevity

Bandwidth per slot

Catalyst 6500 non-E

40 Gbps

Catalyst 6500-E



80 Gbps

Bandwidth within stack

Platform
- port speed and density
- slot/stack throughput
- switching performance
- longevity

Catalyst 3750

StackWise
- no spatial reuse
- source strip

32 Gbps

Catalyst 3750-X

StackWise Plus
- spatial reuse
- destination strip

64 Gbps

Catalyst 3850

StackWise 480
- 6 rings @ 40Gbps
- spatial reuse
- destination strip

480 Gbps

Catalyst 6500 evolution

Platform
- port speed and density
- slot/stack througput
- switching performance
- longevity

1999 2011

10/100 Mb Ethernet → 1 Gigabit Ethernet → 10 Gigabit Ethernet → 40 Gigabit Ethernet → 100 Gigabit Ethernet

Central Forwarding | Distributed Forwarding

16 Gbps Shared Bus Architecture	16 Gbps per slot	40 Gbps per slot	80 Gbps per slot
EARL 5	EARL 6	EARL 7	EARL 8

Catalyst 4000 evolution

Platform
- port speed and density
- slot/stack througput
- switching performance
- longevity

Catalyst 4000 | Catalyst 4500 | Catalyst 4500E | Catalyst 4500R+E

1999 — 2013

10/100 Mb Ethernet → 1 Gigabit Ethernet → 10 Gigabit Ethernet

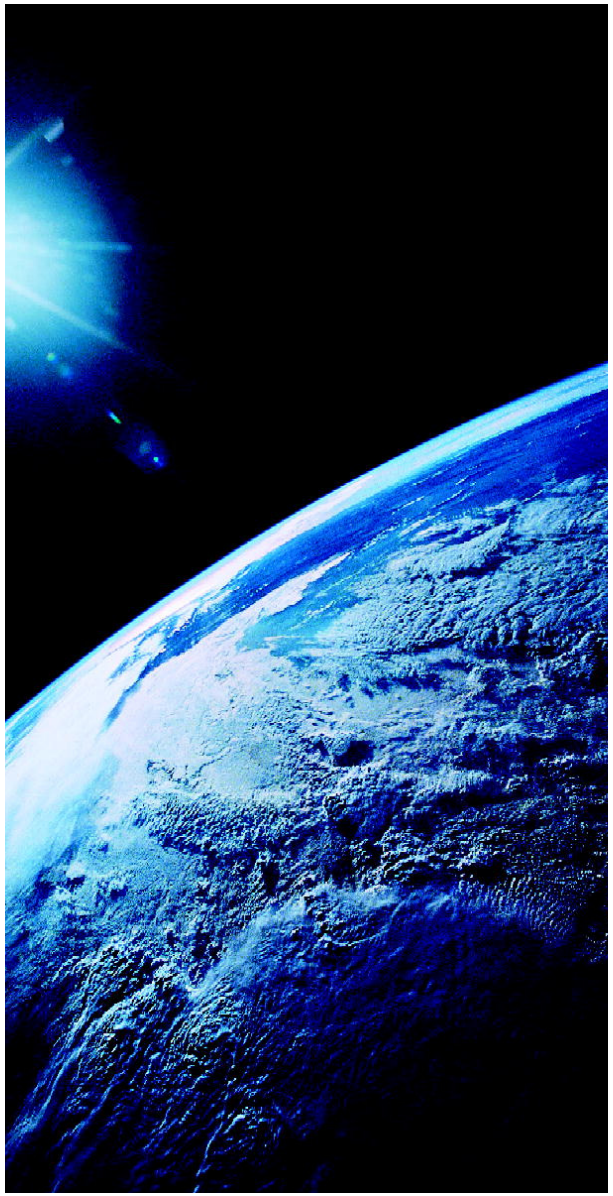
Central Forwarding

Sup 1/Sup 2	Sup 3	Sup IV	Sup V	Sup 6-E	Sup 7-E	Sup 8
6 Gbps/slot 24Gbps / 18Mpps L2	6 Gbps/slot 64Gbps / 48Mpps L2/L3/L4	6 Gbps/slot 64Gbps / 48Mpps Netflow	6 Gbps/slot 96Gbps / 72Mpps Netflow	24 Gbps/slot 320Gbps / 250Mpps L2/L3/L4	48 Gbps/slot 848Gbps / 250Mpps Flexible Netflow	Wireless/Wired convergence

High Availability

High Availability

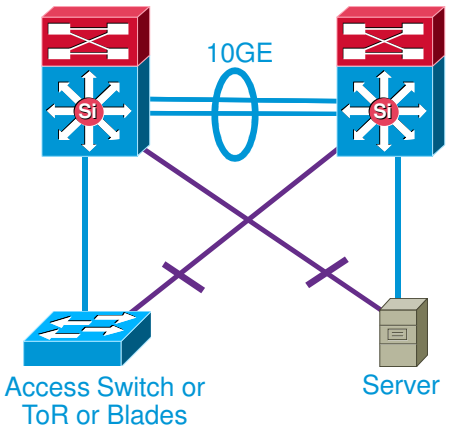
- VSS
- StackPower/StackWise
- NSF, ISSU



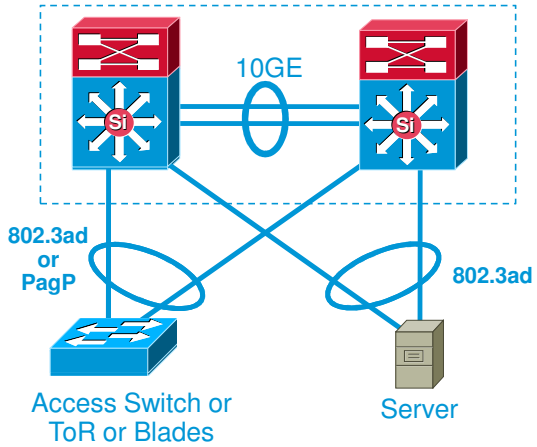
Virtual Switching System

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

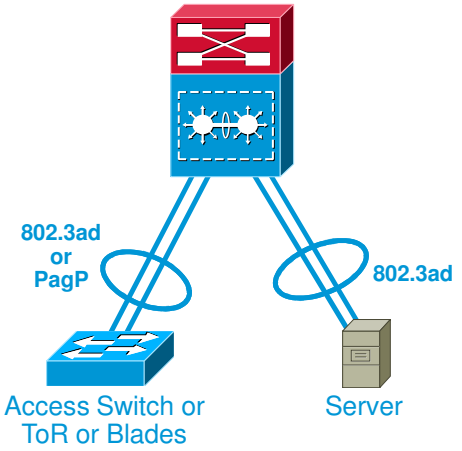
Spanning Tree



VSS (Physical View)



VSS (Logical View)



Simplifies operational Manageability via Single point of Management, Elimination of STP, FHRP etc

Doubles bandwidth utilization with Active-Active Multi-Chassis Etherchannel (802.3ad/PagP) Reduce Latency

Minimizes traffic disruption from switch or uplink failure with Deterministic subsecond Stateful and Graceful Recovery (SSO/NSF)

4500E/X VSS – Requirements

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

Platform	LAN Base	IP base	Enterprise Services
Catalyst 4500E (Sup7E)		✓	✓
Catalyst 4500E (Sup7L-E)		✗	✓
Catalyst 4500-X		✓	✓

- VSS is supported beginning in IOS XE 3.4.0SG – Dec 2012
- Both 4500E chassis need symmetrical chassis and Sup
- You can combine 4500E Sup ports and line-card ports on one VSL or MEC as long as they are the same speed
- 4500X VSS peers need to have same baseboard (16/24 or 32/40)
- A VSL bundle can consist of up to 8 x 10GbE or 8 x 1GE links

No Separate Feature License required for VSS

Reference slide

VSS Supported Supervisor & Line Cards

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

Supervisor	47xx Linecards	46xx Linecards	Legacy Linecards*
			
Supervisor 7-E	WS-X4748-RJ45V+E	WS-X4606-X2-E	WS-X4548-GB-RJ45V
Supervisor 7L-E	WS-X4712-SFP+E	WS-X4648-RJ45V-E & +E	WS-X4548-RJ45V+
	WS-X4748-UPOE+E	WS-X4648-RJ45-E	WS-X4548-RJ45V+
	WS-X4748-RJ45-E	WS-X4640-CSFP-E	WS-X4548-GB-RJ45
		WS-X4624-SFP-E	WS-X4448-GB-SFP
		WS-X4612-SFP-E	WS-X4248-RJ45V
			WS-X4248-FE-SFP
			WS-X4148-FX-MT
			WS-X4148-RJ

4500-X: VSL support on all 1GE/10GE links

1G/ 10G ports on Sup Uplink, 46xx, 47xx can be config as VSL Link

* Classic Linecards will be Supported in Phase II. However, they cannot be configured as VSL Links

VSS Phase 1 and Phase 2 comparison

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

Capability	Catalyst 4500E/X Phase I (Shipping Now)	Catalyst 4500E/X Phase II (IOS-XE3.5.0E - 3QCY2013)
Single-sup cross-chassis VSS support	✓	✓
Quad Sup Forwarding Uplinks	✓	✓
L2-based Multi-chassis EC	✓	✓
L3 based Multi-chassis EC	✗	✓
Split Brain Detection (Dual Active)	ePAgP	Fast-Hello, ePAgP
Cross-chassis NSF/SSO	✓	✓
Cross-chassis ISSU	✓	✓
PoE LC support in VSS*	✓	✓
Support for Classic Line Cards	✗	✓
Asymmetric chassis (VSL between different slot chassis)	✗	✓ (E series)
Smart Install Director w/VSS	✗ (Standalone only)	✓

Reference slide

Feature Gaps - Standalone vs. VSS mode

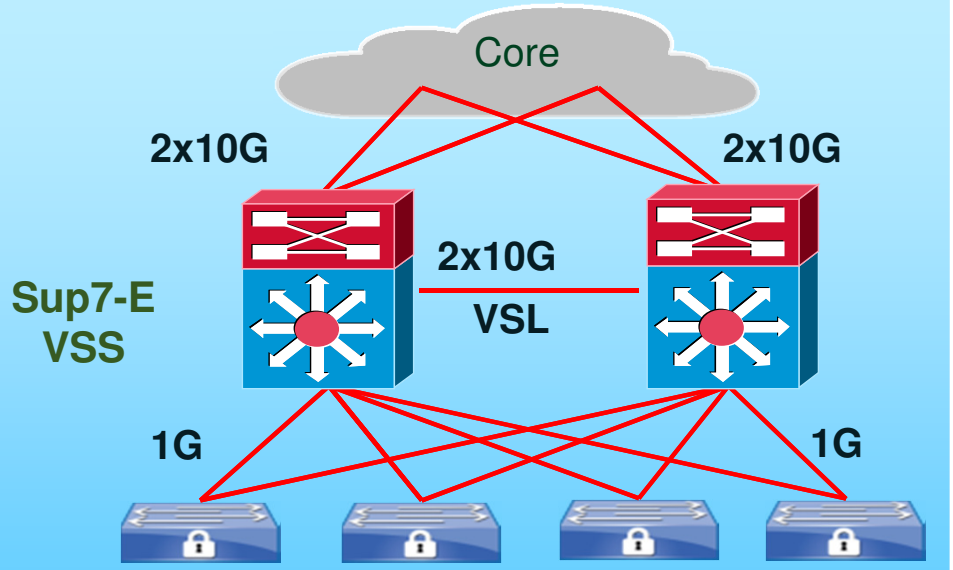
High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

Features	Standalone	VSS
VLAN Management Policy Server (VMPS) Client	✓	✗
Unidirectional Ethernet (UDE)	✓	✗
CFM D8.1	✓	✗
REP and associated features	✓	✗
Flexlinks	✓	✗
PVL,L2PT, Fast UDLD	✓	✗
WCCP	✓	✗
Dot1q Tunnel (Dot1Q tunnel)	✓	✗
Vlan Translation (1:1, 1:2-Selective QinQ)	✓	✗
Mediatrace and Metadata	✓	✗
EnergyWise	✓	✗
Smart Install Director	✓	✗

Price Optimized Modular 1G Aggregation

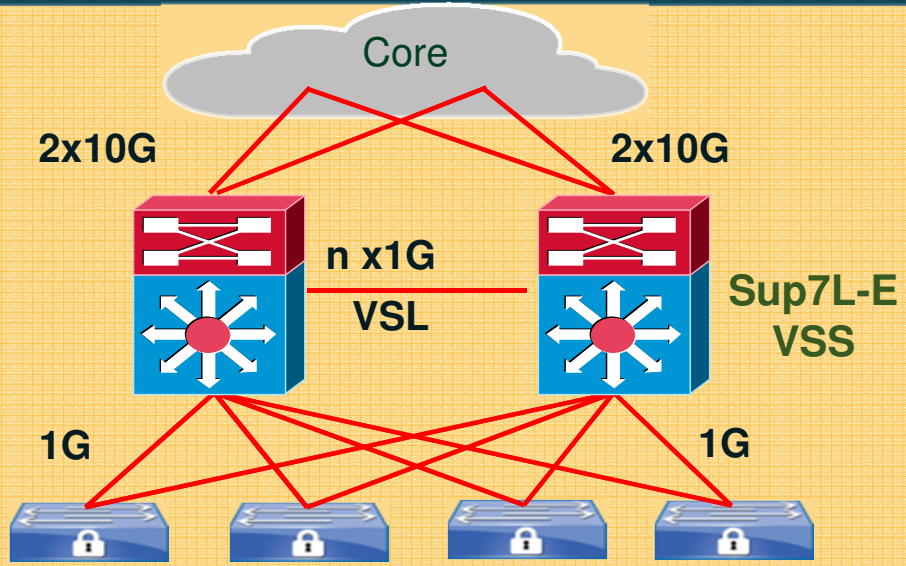
High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

10G Core - 10G VSL



Optimal Configuration
- Sup7-E has 4x10G Uplinks
- 10G Line Card NOT required

10G Core - 1G VSL

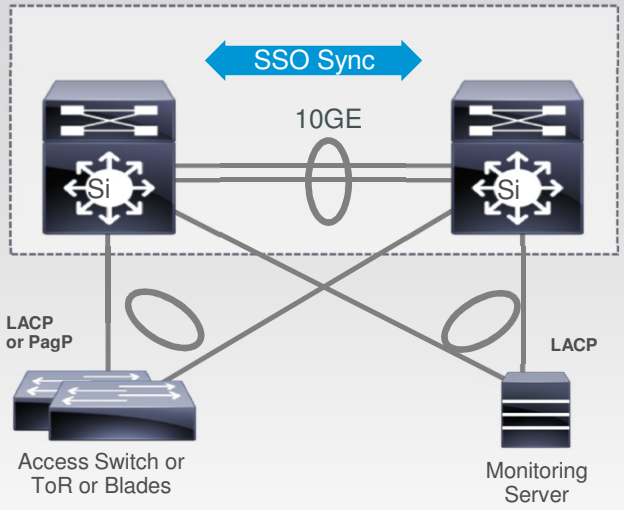


Optimal Configuration
- VSL Link now possible over 1G
- Up to 8x1G VSL links (Fiber/Copper)
- 10G Line Card NOT required

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

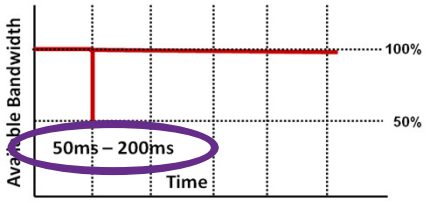
Quad Sup VSS SSO with Sup2T *

Traditional VSS



Simplified Network Design

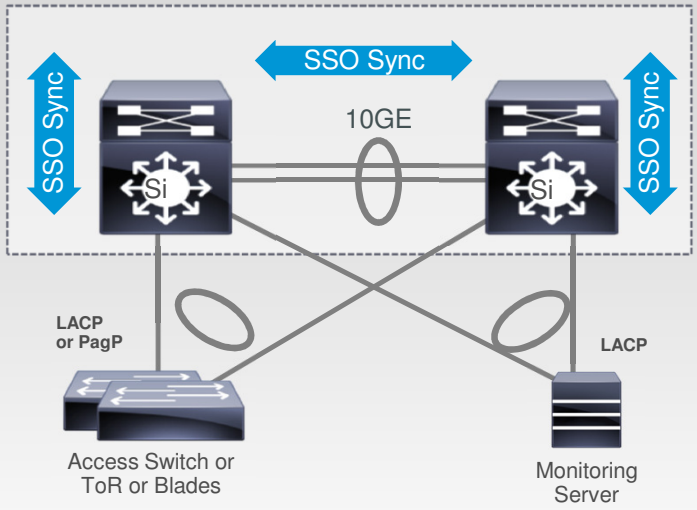
- Spanning Tree and First-Hop redundancy protocols eliminated
- Single touchpoint manageability



Double Bandwidth Utilization

- With Active-Active Multichassis EtherChannel (LACP/ PagP)
- 1+1 Supervisor redundancy for dual-attached devices

VSS Quad SUP SSO



Deterministic and Automated Recovery

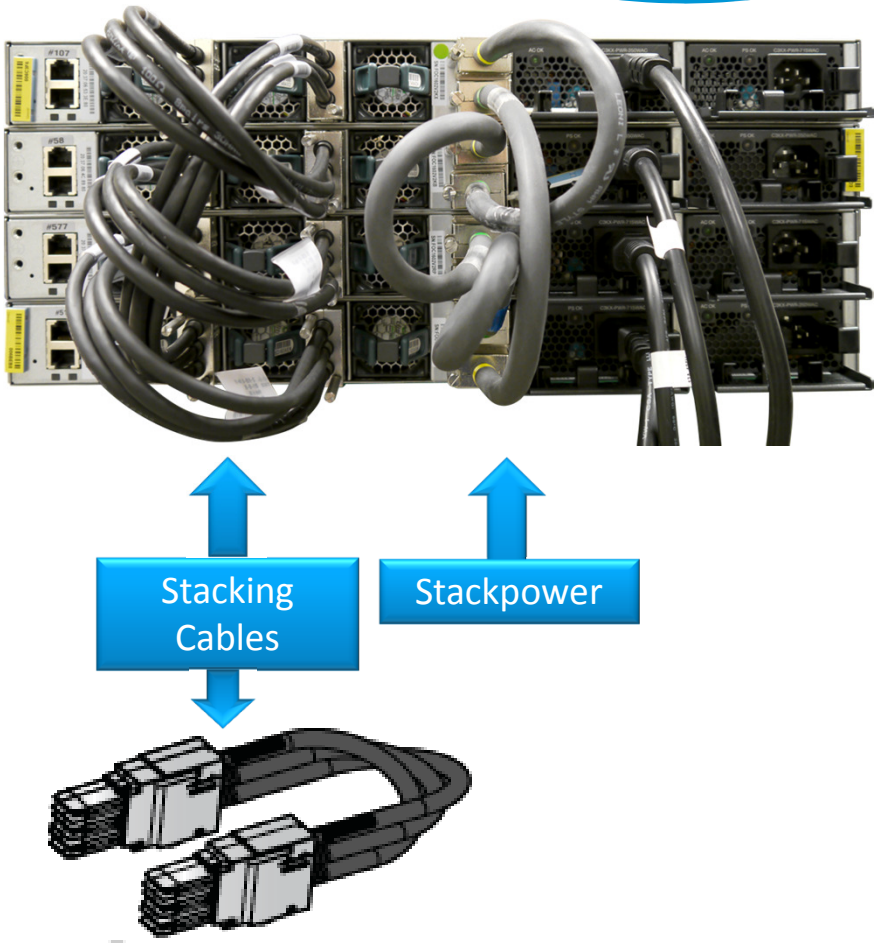
- Maximize network throughput with VSS Quad Sup SSO
- 1:1 (active/standby) supervisor redundancy for single and dual attached devices

* Coming in 15.1(1)SY1

Catalyst 3850 – Stacking & Stack Power

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

- StackWise for stack redundancy
  - Redundant physical connection
  - Active/Standby switch (similar to Active/Standby supervizor in chassis)
  - 1+1 Stateful redundancy (unlike 3750X which is N+1 Stateless)
  - State synchronization between Active and Standby
- StackPower for Power redundancy
  - Identical to 3750X



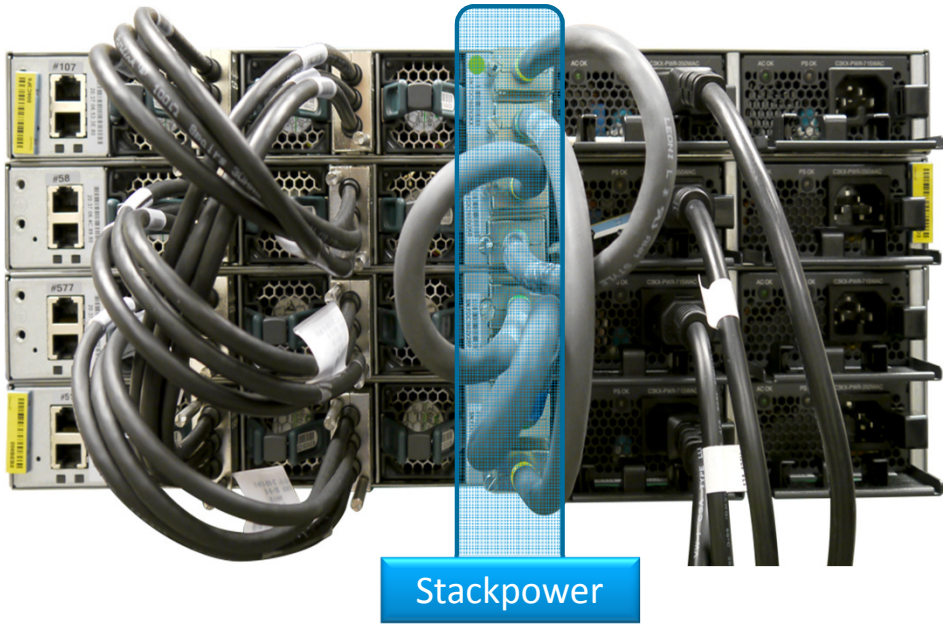
High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

StackPower modes of operation

StackPower operates in two modes:

- Power share (Loose or Strict mode)
- Redundant (Loose or Strict mode)

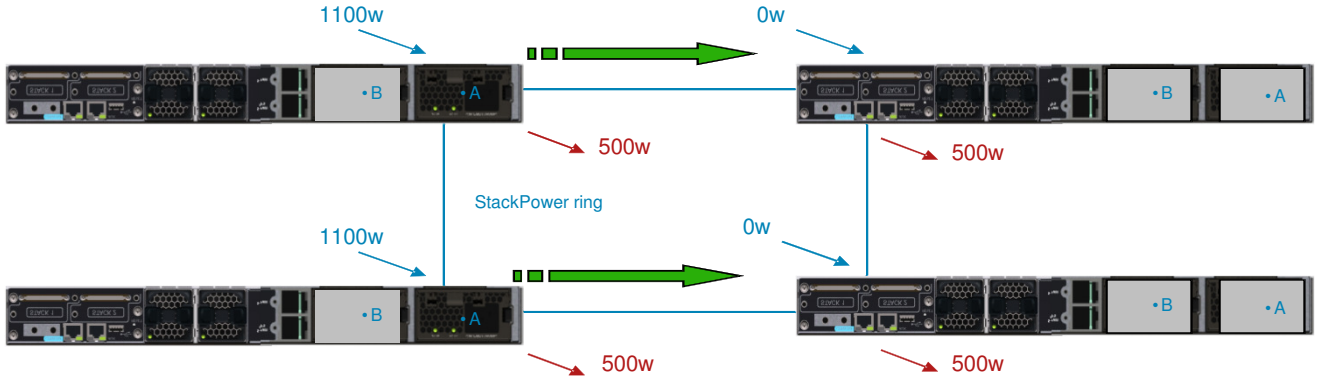
Up to four switches can be participate in a power stack



StackPower - Power share Mode

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

- All available input power is allocated, no reservation is made!
- Treats all input power as one big power supply
- No power reserved for PS failures
- Allows for a negative power budget (Loose mode)
- Default mode

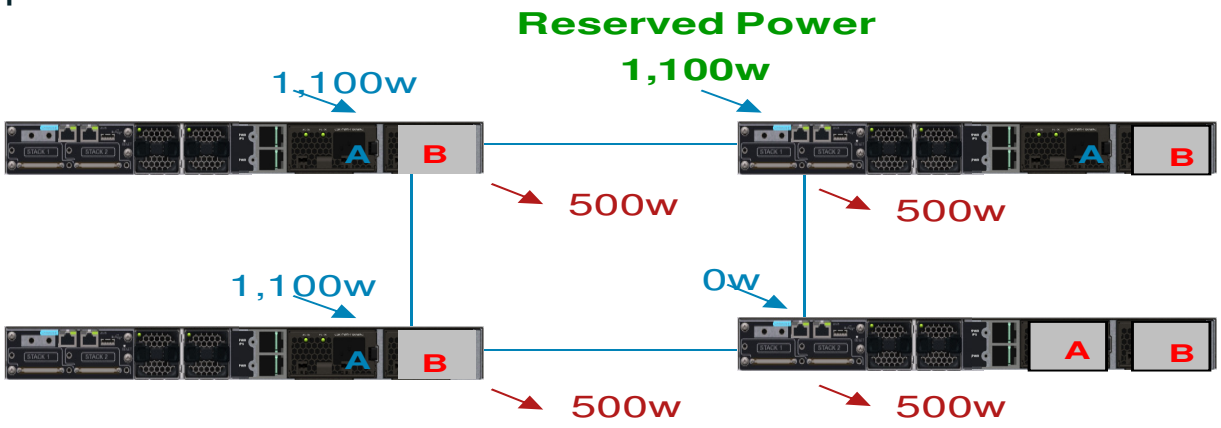


Available Pwr	Allocated Pwr	Unused Pwr
2,200 W	2,000 W	200 W

Redundant Mode

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

- Load sharing along with redundancy
- Available power – reserved power = Power to be shared
- Reserves 1 power supply worth of power from the budget
- In mixed PS types, the largest PS capacity is reserved
- Zero footprint RPS



Available	Allocated	Unused	RESERVED
3,300 W	2,000 W	200W	1,100 W

Loose and Strict modes

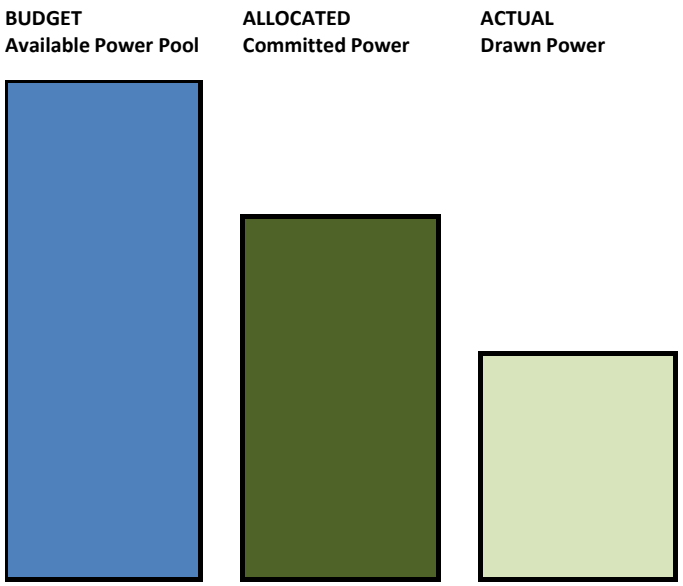
High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

Loose mode allows for a negative power budget

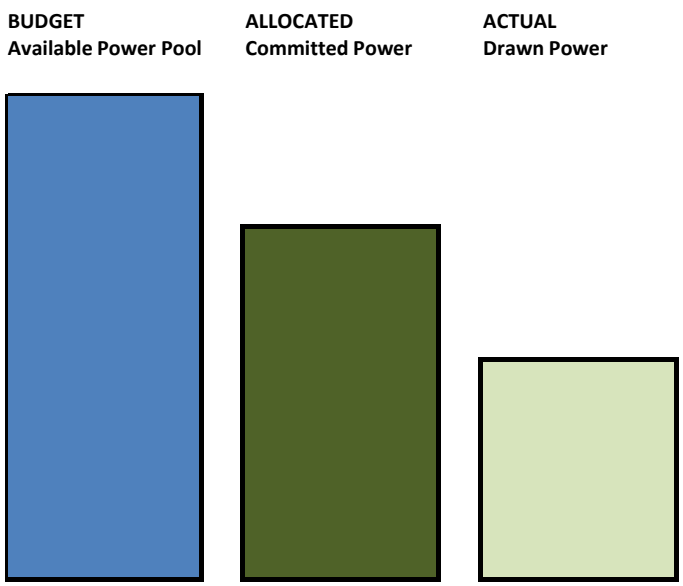
Controling the behavior of power shed

Strict mode sheds load as soon as the power budget goes below the Allocated power level

Power-sharing Loose mode Default



Power-sharing Strict mode



Switch & Port Priority

High Availability
- VSS
- StackPower/StackWise
- NSF, ISSU

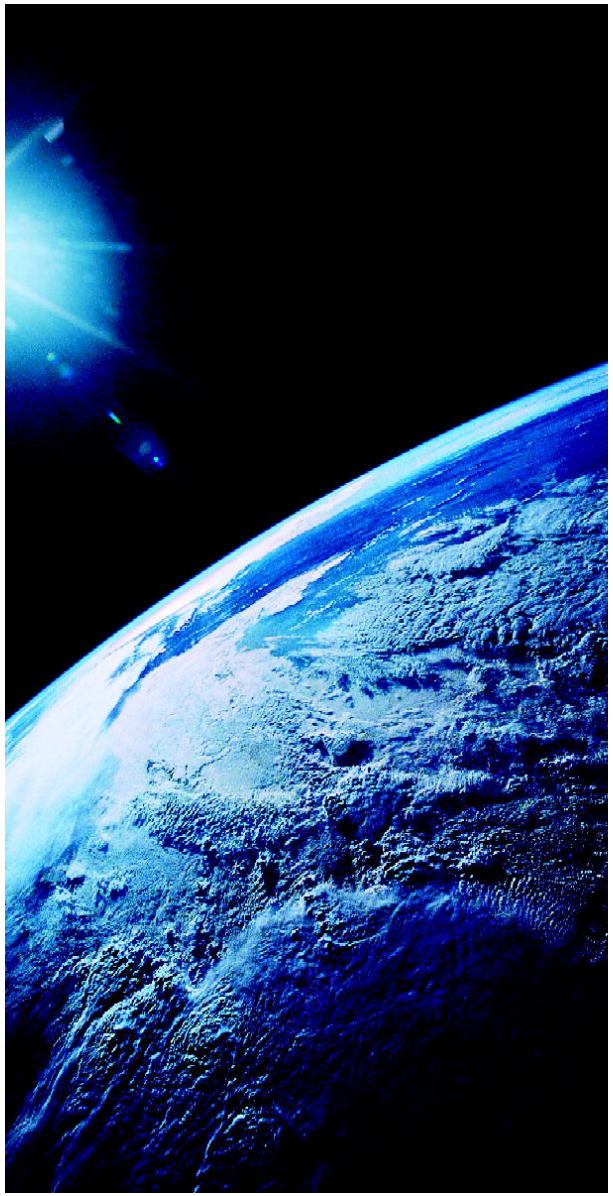
Default StackPower Priorities																										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Switches									High Priority Group									Low Priority Group								

- Hardware uses a register to group ports in a High or Low priority group for each switch
- All ports are part of the Low priority group by default
- Stackpower has 27 priority levels
- Default priority per group can be re-programmed
- Users may re-program the priority level for the group

Simplification

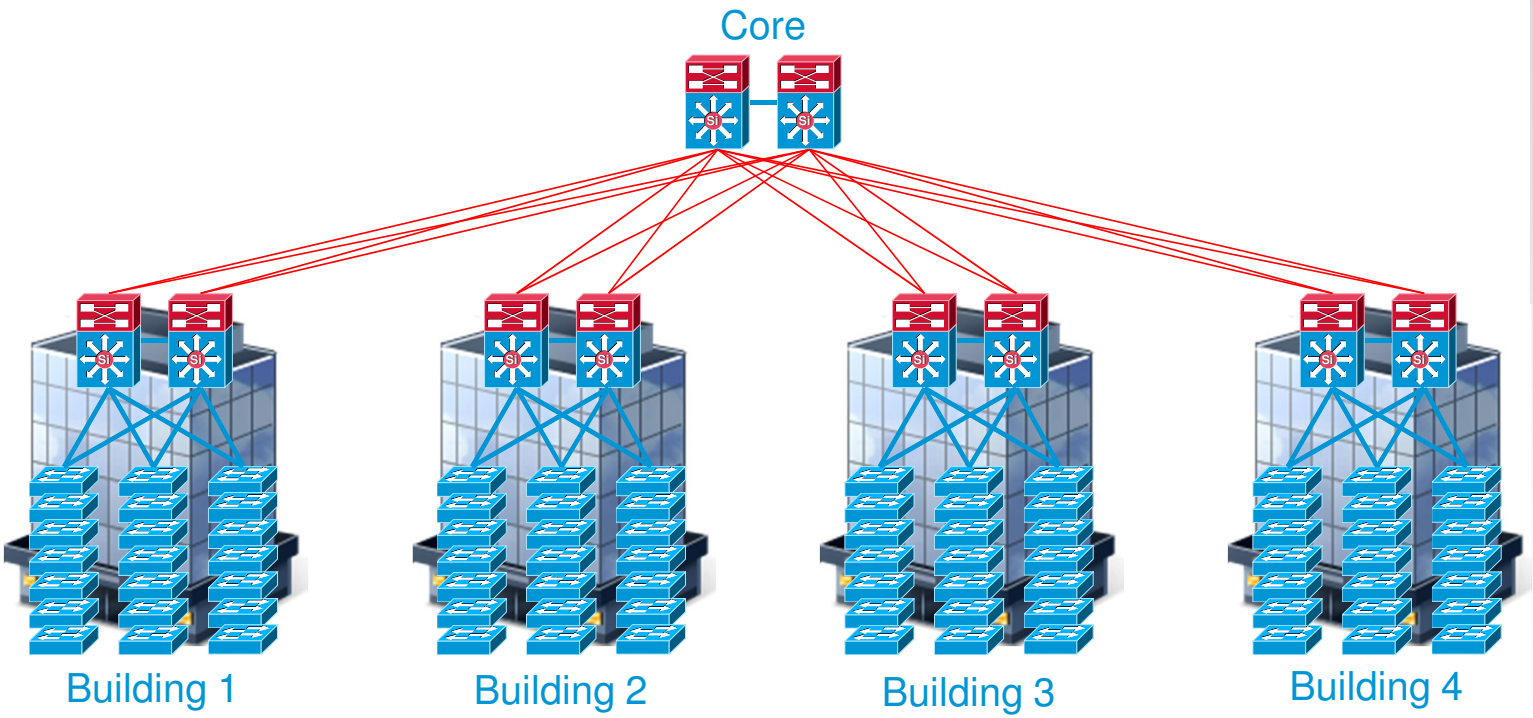
Simplification

- VSS
- distributed chassis/FEX
- L2MP and mobility
- Smart Operations



Traditional L2 or L3 Campus

Simplification
- VSS
- distributed chassis/FEX
- L2MP and mobility
- Smart Operations



94 Total Devices for Image and Configuration Management

168 Access Trunks/Port-Channels

4032 User Ports

Considerations:

STP Loop Prevention

FHRP Tuning

CAM/ARP Tunings

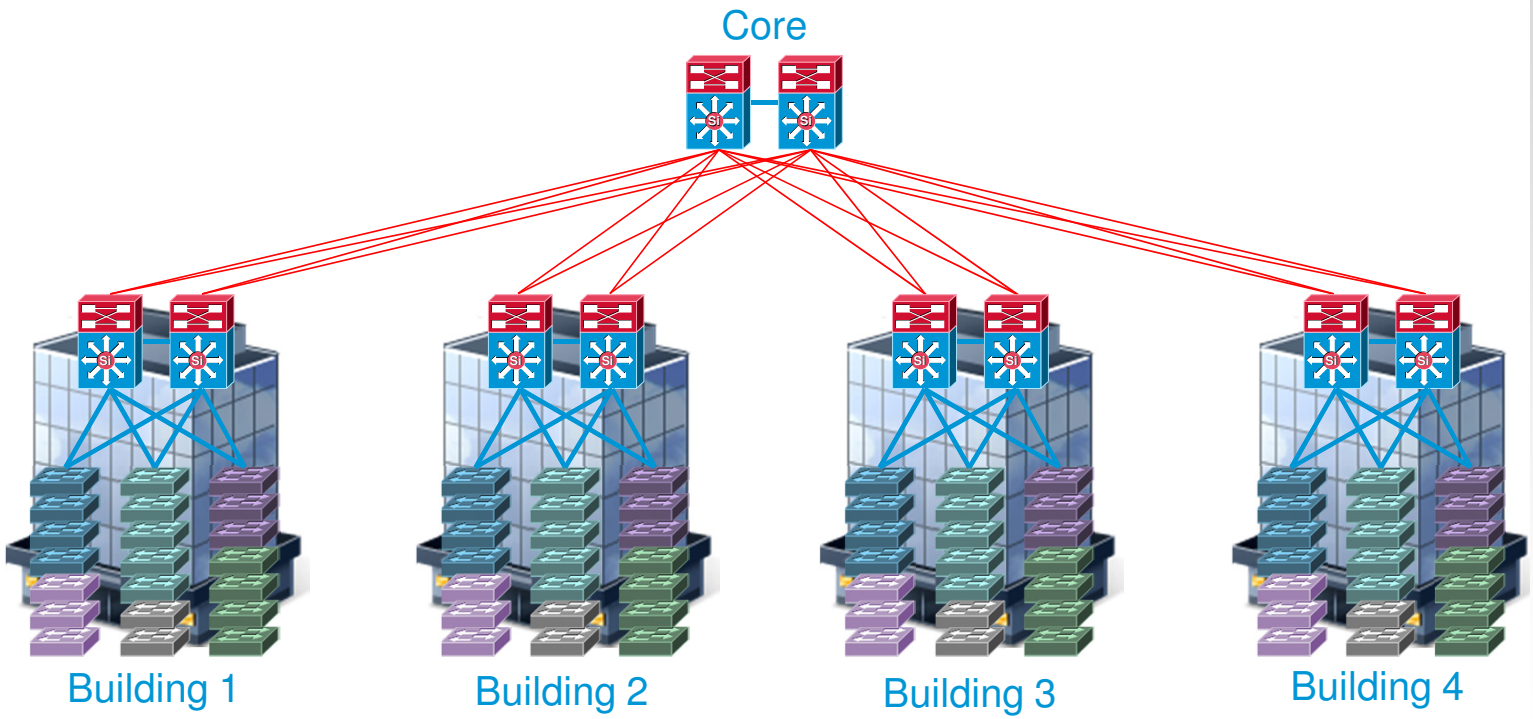
PIM Tuning/DR priority

Routing Protocol Tuning

94 Separate Configurations of SNMP, NTP, TACACS, Banner, vty, VLAN DB, Mgmt IP/GW, Hostname

Traditional L2 or L3 Campus with Stacking

Simplification
- **VSS**
- **distributed chassis/FEX**
- **L2MP and mobility**
- **Smart Operations**



34 Total Devices for Image and Configuration Management

48 Access Trunks/Port-Channels

4032 User Ports

Considerations:

STP Loop Prevention

FHRP Tuning

CAM/ARP Tunings

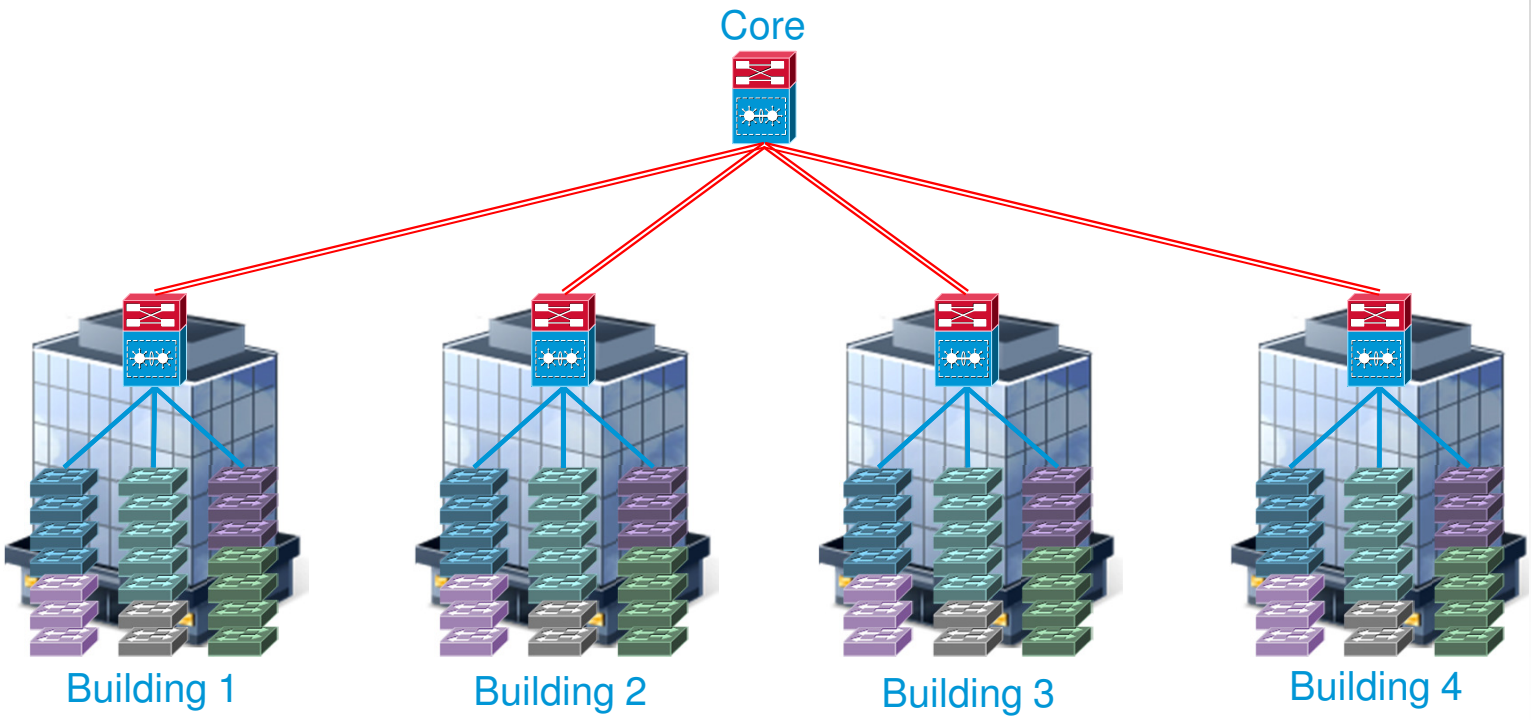
PIM Tuning/DR priority

Routing Protocol Tuning

34 Separate Configurations of SNMP, NTP, TACACS, Banner, vty, VLAN DB, Mgmt IP/GW, Hostname

VSS Campus with Stacking

Simplification
- VSS
- distributed chassis/FEX
- L2MP and mobility
- Smart Operations



29 Total Devices for Image and Configuration Management

48 Access Trunks/Port-Channels

4032 User Ports

Considerations:

~~STP Loop Prevention~~

~~FHRP Tuning~~

~~CAM/ARP Tunings~~

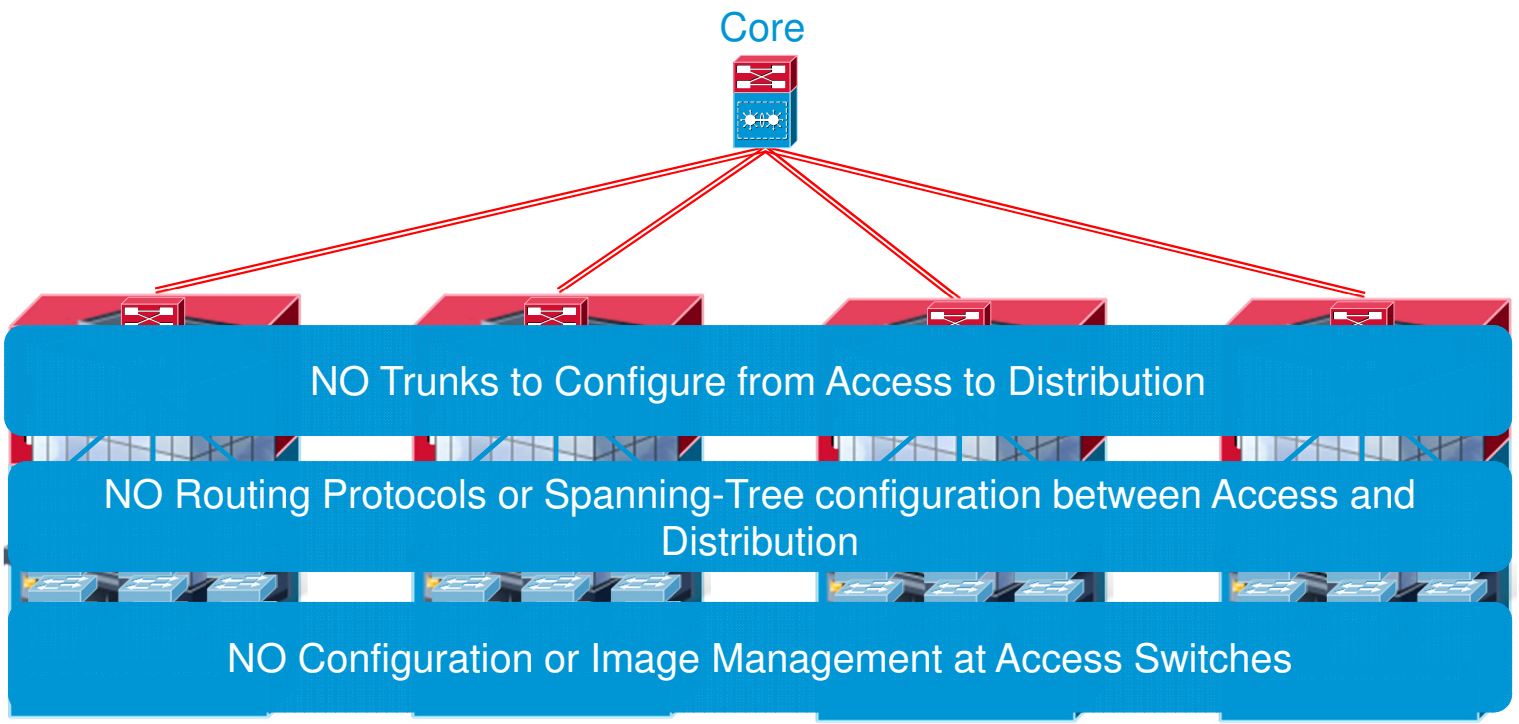
~~PIM Tuning/DR priority~~

~~Routing Protocol Tuning~~

29 Separate Configurations of SNMP, NTP, TACACS, Banner, vty, VLAN DB, Mgmt IP/GW, Hostname

VSS Campus with Stacking and VNTAG

Simplification
- VSS
- distributed chassis/FEX
- L2MP and mobility
- Smart Operations



5 Total Devices for Image and Configuration Management

Automated Trunk Configuration

4032 User Ports

Considerations:

~~STP Loop Prevention~~

~~FHRP Tuning~~

~~CAM/ARP Tunings~~

~~PIM Tuning/DR priority~~

~~Routing Protocol Tuning~~

5 Separate Configurations of SNMP, NTP, TACACS, Banner, vty, VLAN DB, Mgmt IP/GW, Hostname

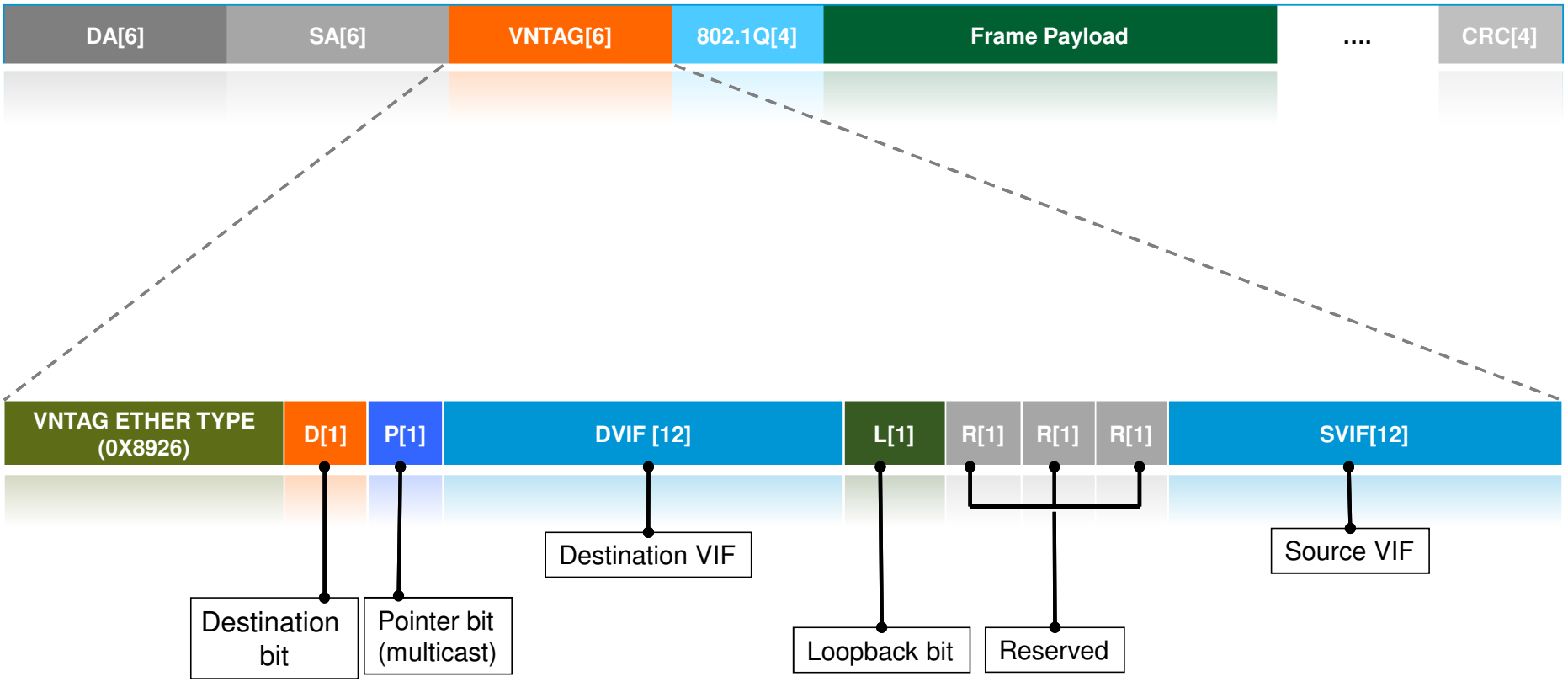
Reference slide

VNTAG

802.1Qbh -> 802.1QBR

Simplification

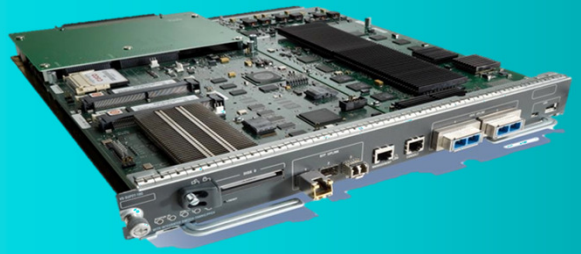
- VSS
- distributed chassis/FEX
- L2MP and mobility
- Smart Operations



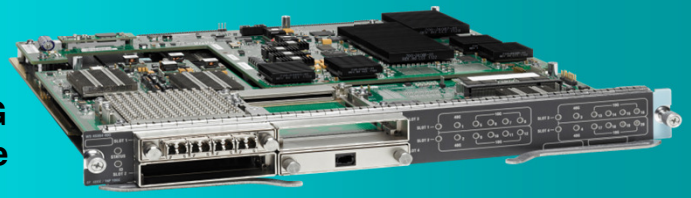
Hardware requirements

Simplification
- VSS
- distributed chassis/FEX
- L2MP and mobility
- Smart Operations

Virtual Switching System (VSS)



Supervisor 2T



WS-X6904-40G
VNTAG capable

New hardware

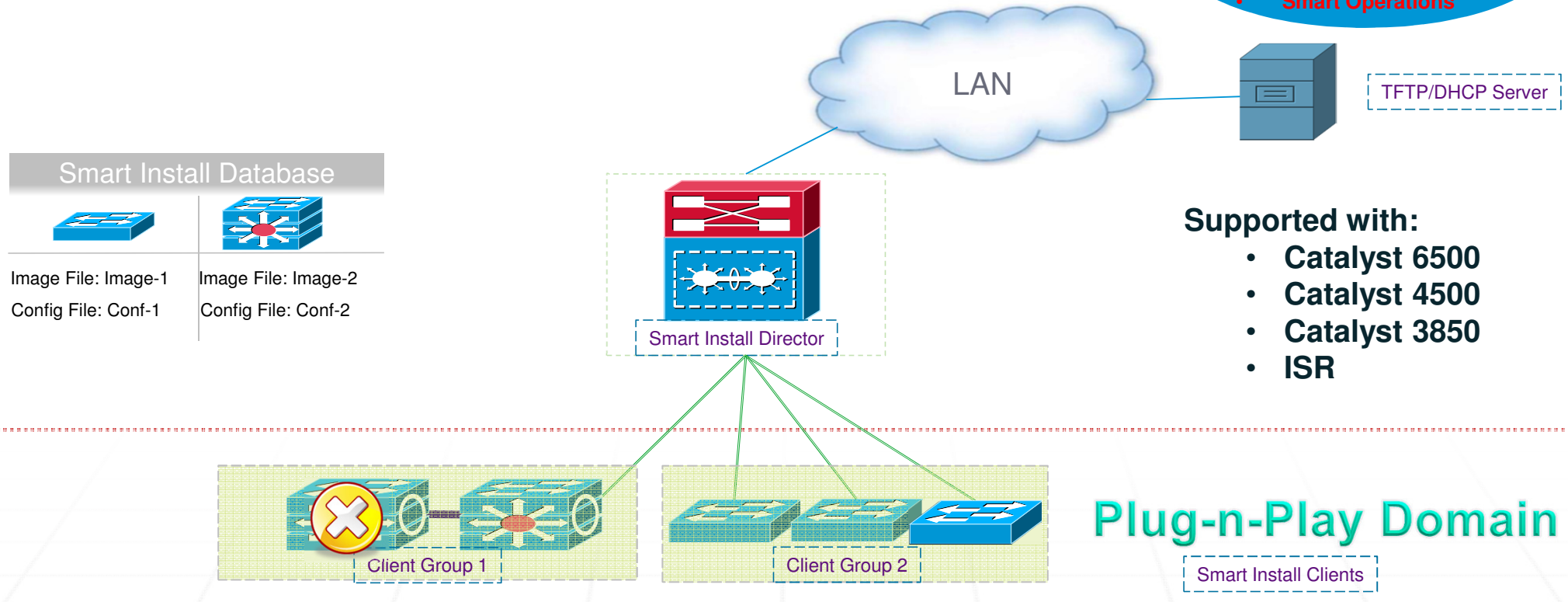
Stacking Module

Parent switch requirements

Client requirements

Smart Install Director

Simplification
- VSS
- distributed chassis/FEX
- L2MP and mobility
- Smart Operations



Supported with:
- Catalyst 6500
- Catalyst 4500
- Catalyst 3850
- ISR

Smart Install Benefits

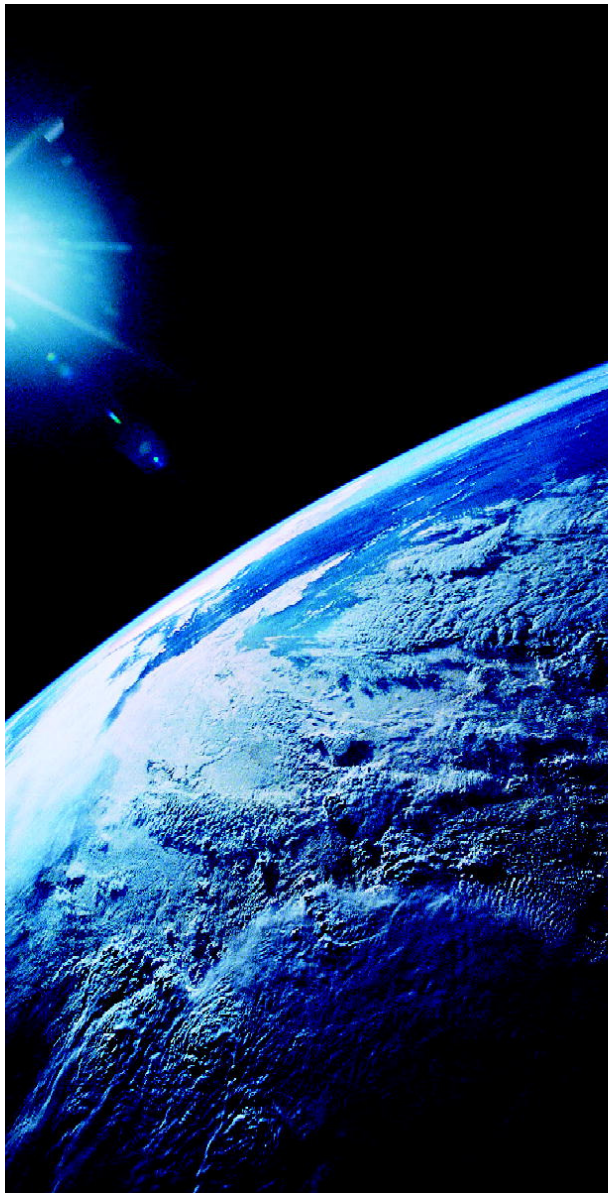
Centralized Management **Zero Touch Installation** **Minimize Downtime**

Supported with Cisco Prime

Application visibility and control

AVC

- Flexible Netflow
- Medianet
- QoS



Flexible NetFlow

AVC
- Flexible Netflow
- Medianet
- QoS

Broad platform support:

Next Generation Application, Performance, Security, and Visibility

- **High performance**

  Next-gen ASIC enables scalable and high-performance NetFlow monitoring

- **Flexibility**

  User-defined flow records reusable in different flow monitors for different applications with per-port, per-VLAN, or per-port-per-VLAN granularity

- **Extensibility**

  In-depth traffic visibility allows monitoring extensive key and non-key fields, including Layer 2, Layer 3 (IPv4 or IPv6), Layer 4 header fields.

- **Intelligent Customizable Event Policies**

  Integration with EEM faciliates highly customizable event-driven policies

- **Broad Partner Ecosystem**

  Standard v5 (the most used) and v9 (the most flexible) format exported to a wide range of industry netflow collectors

Traditional NetFlow vs. Flexible NetFlow

AVC
- Flexible Netflow
- Medianet
- QoS

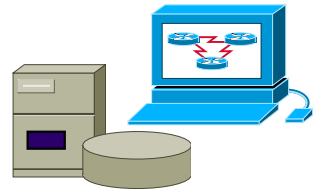
Traditional NetFlow

Fixed 7 keys

SrcIf	SrcIPadd	DstIf	DstIPadd	Protocol	SrcPort	DstPort
Fa1/0	173.100.21.2	Fa0/0	10.0.227.12	11	00A2	00A2
Fa1/0	173.100.3.2	Fa0/0	10.0.227.12	6	15	15
Fa1/0	173.100.20.2	Fa0/0	10.0.227.12	11	00A1	00A1
Fa1/0	173.100.6.2	Fa0/0	10.0.227.12	6	19	19

NetFlow Cache

Export



Flexible NetFlow

Flow Monitor 1

Flow cache 1

DstIPadd	Protocol	TOS
10.0.227.12	11	80
10.0.227.12	6	40
10.0.227.12	11	80
10.0.227.12	6	40

Flow Monitor 2

Flow cache 2

Protocol	TOS	Flgs
11	80	10
6	40	0
11	80	10
6	40	0

Flow Monitor 3

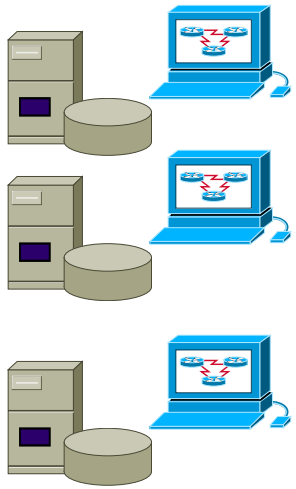
Flow cache 3

SrcIf	SrcIPadd	DstIf
Fa1/0	173.100.21.2	Fa0/0
Fa1/0	173.100.3.2	Fa0/0
Fa1/0	173.100.20.2	Fa0/0
Fa1/0	173.100.6.2	Fa0/0

Export → Destination 1

Export → Destination 2

Export → Destination 3



Flexible NetFlow
Multiple Monitors with Unique Key Fields

AVC
- Flexible Netflow
- Medianet
- QoS

Traffic

Flow Monitor 1: traffic analysis

Key Fields	Packet 1	Non-Key Fields
Source IP	3.3.3.3	Packets
Destination IP	2.2.2.2	Bytes
Source Port	23	Timestamps
Destination Oort	22078	Next Hop Address
Layer 3 Protocol	TCP - 6	
TOS Byte	0	
Input Interface	Ethernet 0	

Flow Monitor 2: security analysis

Key Fields	Packet 1	Non-Key Fields
Source IP	3.3.3.3	Packets
Dest IP	2.2.2.2	Timestamps
Input Interface	Ethernet 0	
SYN Flag	0	

Traffic Analysis Cache

Source IP	Dest. IP	Source Port	Dest. Port	Protocol	TOS	Input I/F	…	Pkts
3.3.3.3	2.2.2.2	23	22078	6	0	E0	…	1100

Security Analysis Cache

Source IP	Dest. IP	Input I/F	Flag	…	Pkts
3.3.3.3	2.2.2.2	E0	0	…	11000

Flexible Netflow – security use case

AVC
- Flexible Netflow
- Medianet
- QoS

srcIf	SrcIPadd	DstIf	DstIPadd	MAC	TCP Flags	bytes
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	....	....	3465
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	....	....	300
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	....	....	1000

Anomalous traffic rate !

Policy Action:
Shutdown port
ACL, QoS

Customized Syslog

- Leveraging Hardware FnF to monitoring endpoint and application behavior
- L2 (MAC, VLAN) to L4 (TCP Flags) visibility
- On-box, customizable event correlation to detect anomalies
- Customizable policy actions upon anomaly detection:
  - Alarm with Syslog, SNMP
  - Action with ACL, QoS etc

Flexible NetFlow Integration with EEM

AVC
- Flexible Netflow
- Medianet
- QoS

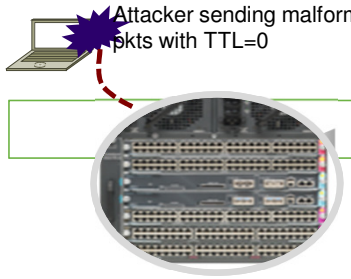
✓ **Quick**
Instant, on-board traffic anomaly detection and reaction

✓ **Detailed**
Granular view of flow info enables a wide range of applications

✓ **Flexible**

✓ **Event-driven**
NF event detector triggers policies locally on network devices instead

Example I: Malformed Packets Detection & Reporting



Attacker sending malformed pkts with TTL=0

Netflow cache

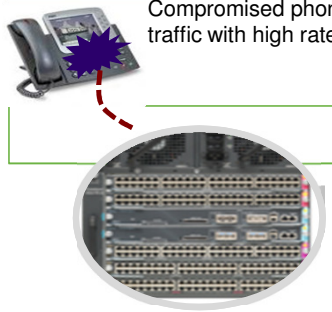
srcIf	SrcIPadd	DstIf	DstIPadd	TTL
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	0
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	10
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	200

TTL = 0 triggers an EEM event

```
*MAR 29 2010 12:29:02.604 UTC: %HA_EM-6-LOG:
my-ttl-applet: flow record with zero TTL
```

syslog message generated based on pre-configured policies

Example II : Anomaly Flow Detection and Mitigation



Compromised phone sending traffic with high rate

Netflow cache

srcIf	SrcIPadd	DstIf	DstIPadd	bytes
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	34346
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	300
Fa1/0	173.1.1.2	Fa0/0	10.0.277.1	1000

NetFlow ED triggers policies to monitor flow rate. Typically, voice conversations are 64kbps

```
*Feb 18 01:24:30.455: %LINK-5-CHANGED:
Interface FastEthernet 1/0, changed state to
administratively down
```

interface Fa1/0 is shut down when the flow rate exceeds 1Mbps

Flexible NetFlow Top Talkers

AVC
- Flexible Netflow
- Medianet
- QoS

```
# show flow monitor <monitor> (incomplete output)
```

SrcIPadd	DstIPadd	TOS	pkts	bytes
10.1.0.5	172.16.10.19	0x00	1	64
10.1.0.5	172.16.0.20	0x00	10	800
10.1.0.95	172.16.10.19	0x00	200	16000
10.1.0.34	172.16.10.4	0x0	100	4500
10.1.0.121	172.16.10.4	0x00	1	64

Top Talkers provide quick, easy, and granular traffic analysis by displaying a subset of flow monitor in real time

Benefits and Applications

Security
See if traffic patterns are consistent with a DoS or other undesirable behavior

Traffic load
Identify heavily used parts of the network so you can redistribute load accordingly

Traffic analysis
Baseline network traffic for capacity planning and network engineering

Granularity
Flow information displayed per monitor and per interface (port or VLAN)

enable users to aggregate on a subset of the key and non-key fields

- Top 4 IPv4 destinations sorted by number of bytes:

```
Switch# show flow monitor <monitor>
        aggregate ipv4 destination address
        sort counter bytes top 4
```

DesIPadd	flows	bytes	pkts
172.16.10.2	12	1358370	6708
172.16.10.19	2	44640	1116
172.16.10.20	2	44640	1116
172.16.10.4	1	22360	559

enable users to select flows based on specific values for any fields

- Top 5 sources of 1-packet flows:

```
Switch# show flow monitor <monitor> cache
        filter counter packet 1
        aggregate ipv4 source address
        sort highest flow packet top 5
```

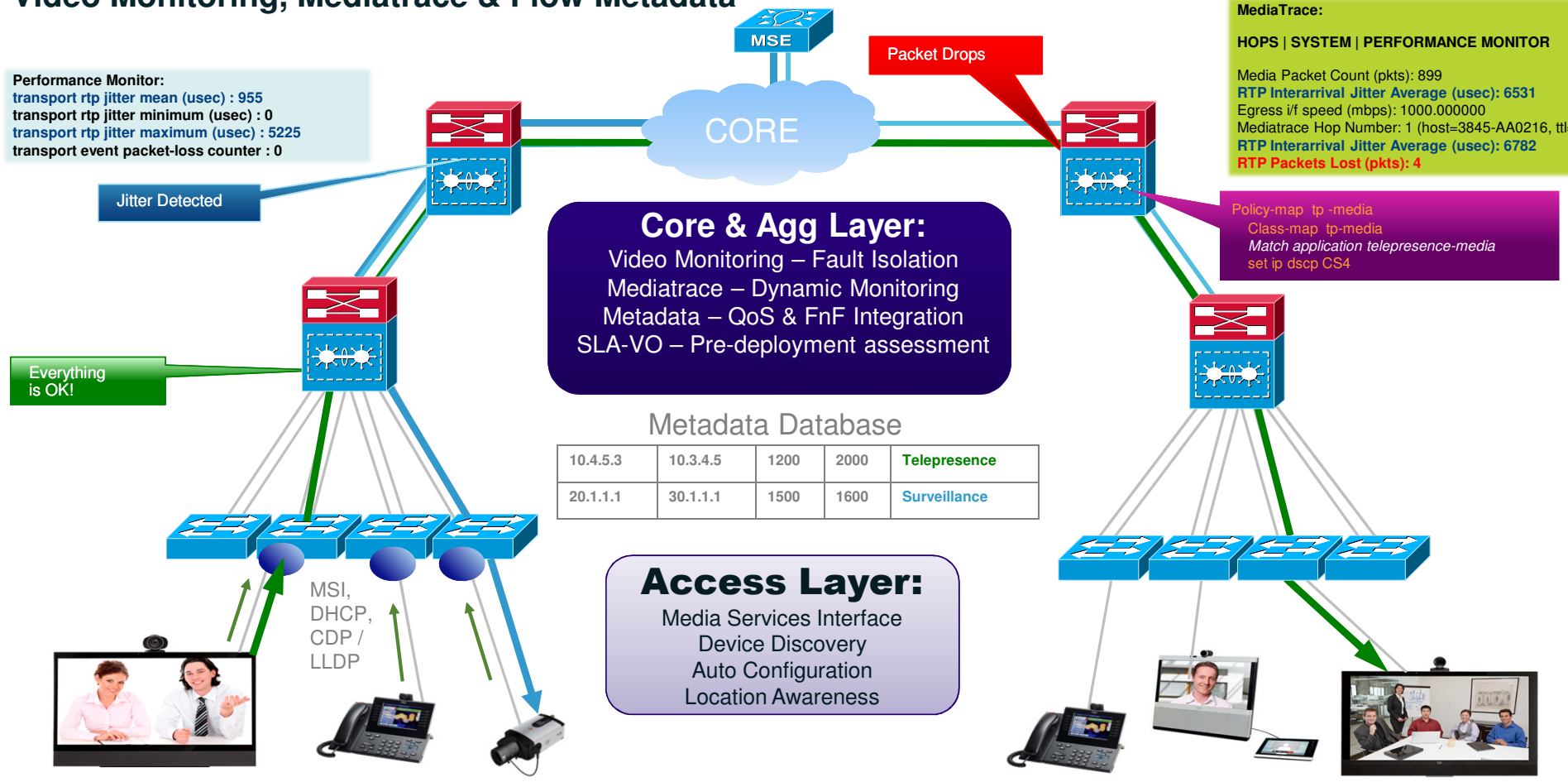
SrcIPadd	flows	bytes	pkts
10.1.0.5	135	8640	135
10.1.0.100	100	6400	100
10.1.0.95	95	6080	95
10.1.0.121	80	5120	80
10.1.0.34	79	5056	79

enable users to control how the displayed cache entries are sorted on any field and show in order or reverse order

Medianet Deployment

AVC
- Flexible Netflow
- Medianet
- QoS

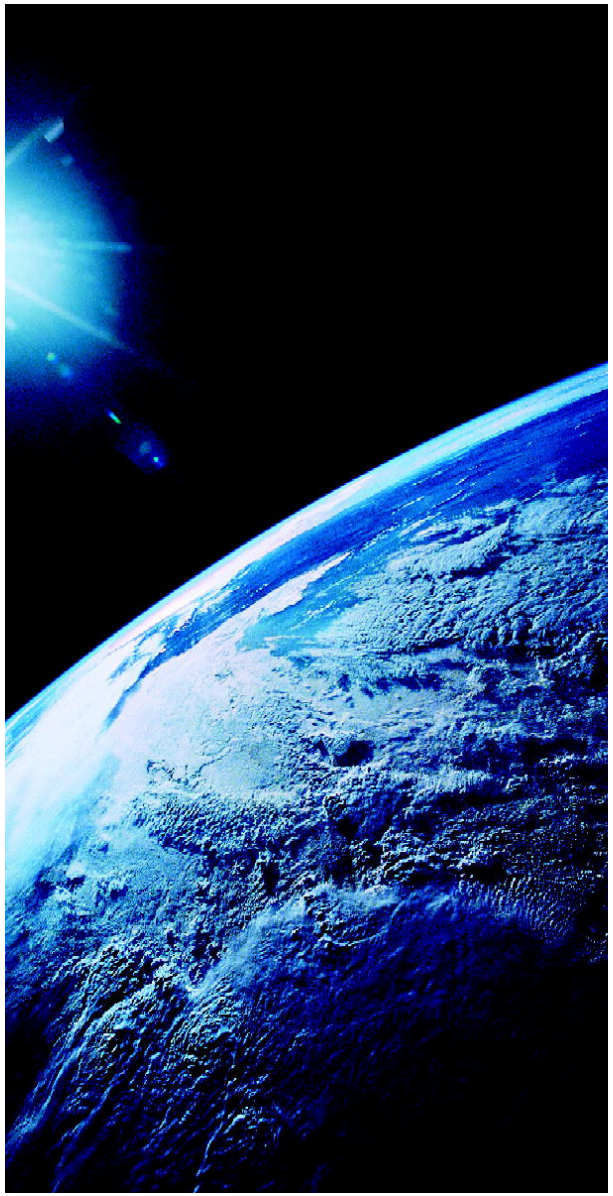
Video Monitoring, Mediatrace & Flow Metadata



Flexibility

Flexibility

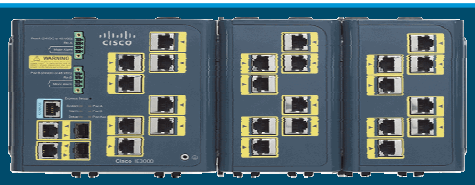
- virtualization
- SDN
- new application (IE, SG)
- new protocols (LISP, BJ)



Industrial Ethernet Switching Portfolio

Flexibility
- virtualization
- SDN
- new applications (IE, SG)
- new protocols (LISP,BJ)

- Industrial-grade, Catalyst-based switches
- IE SwapDrive for “Zero-Config” replacement
- Ideal for manufacturing, mass transit, oil and gas, mining, and more
- Also co-sold with Rockwell as Stratix-branded Allen Bradley switches
- Similar portfolio exist for Smart Grid applications (CSG product line)



IE 3000

- Modular/Scalable
- L2/L3
- Access/Aggregation
- DIN Rail
- PoE
- PTP / IEEE 1588

IE 2000

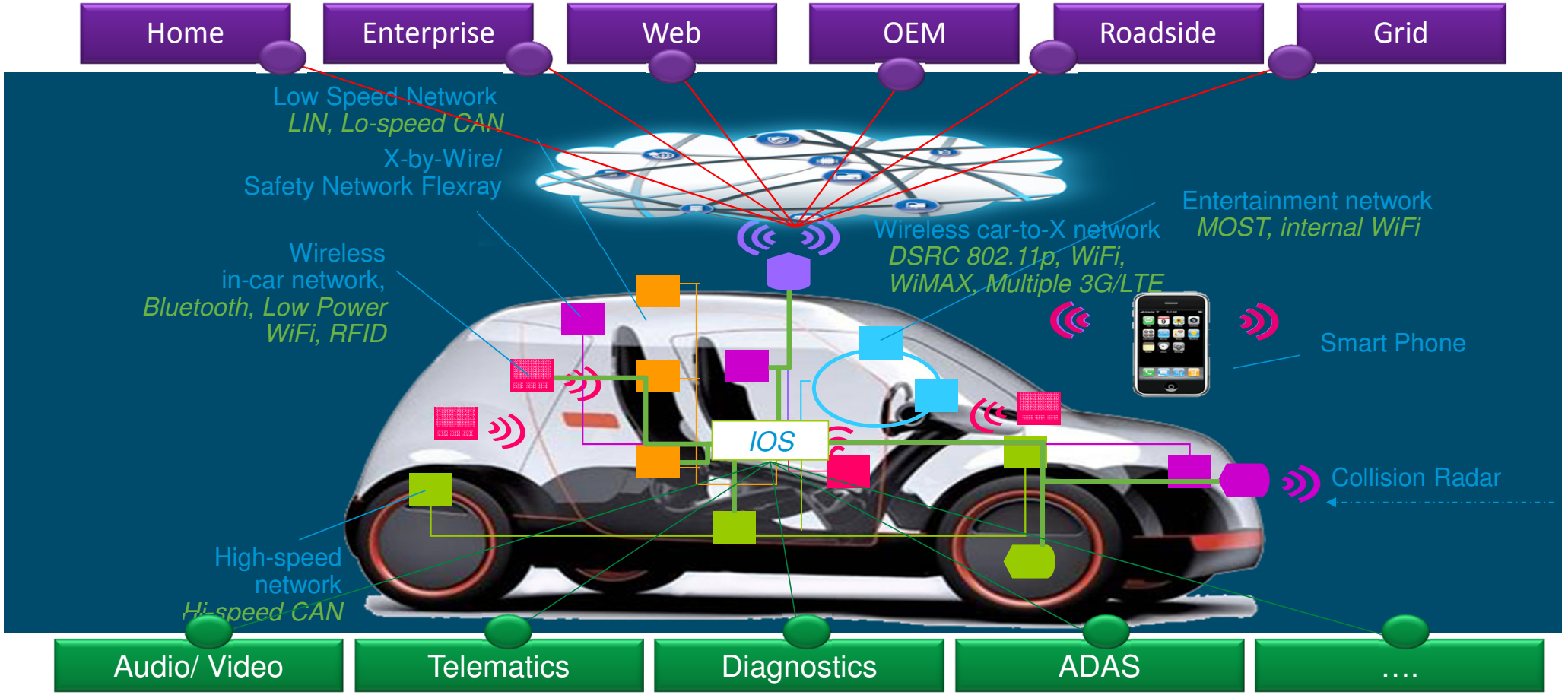
- Fixed/Compact
- L2
- Access
- DIN Rail
- PoE
- PTP / IEEE 1588
- NAT

IE 3010

- Fixed
- L2/L3
- Access
- 1 RU
- PoE and Fiber

Is this just a dream?

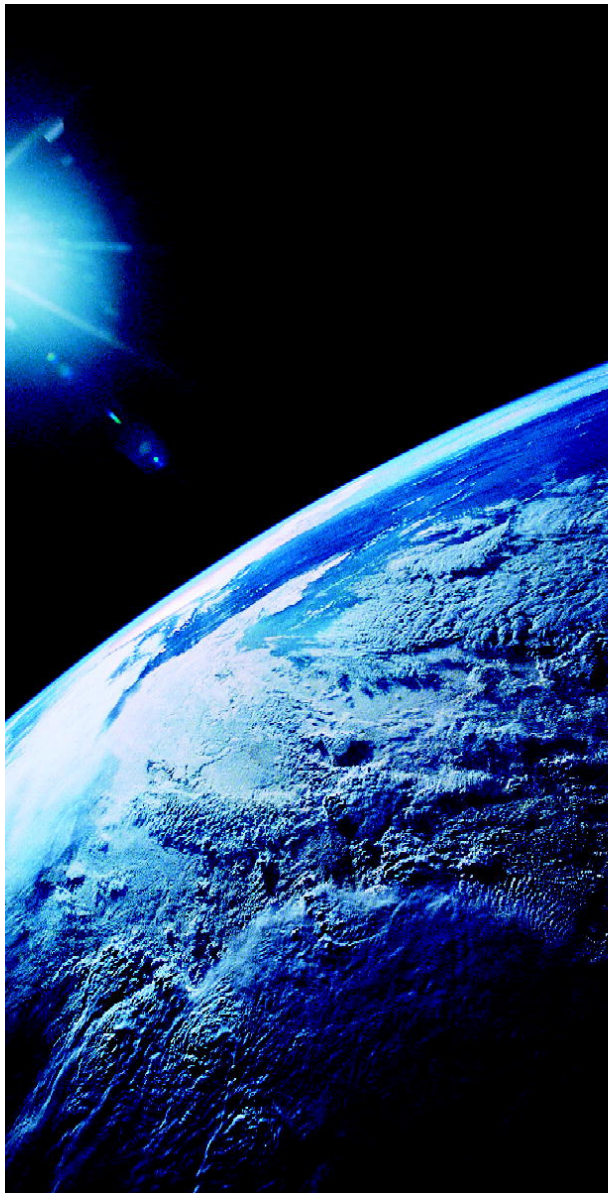
Flexibility
- virtualization
- SDN
- new applications (IE, SG)
- new protocols (LISP,BJ)



Convergence

Convergence

- wired and wireless
- data and storage
- data, voice and video
- LAN, MAN and WAN



Evolving User Workspace

Convergence
- wired and wireless
- data and storage
- data, voice and video
- LAN, MAN and WAN

Megatrends

BYOD
- Secure access
- Customized experience
- Guest access

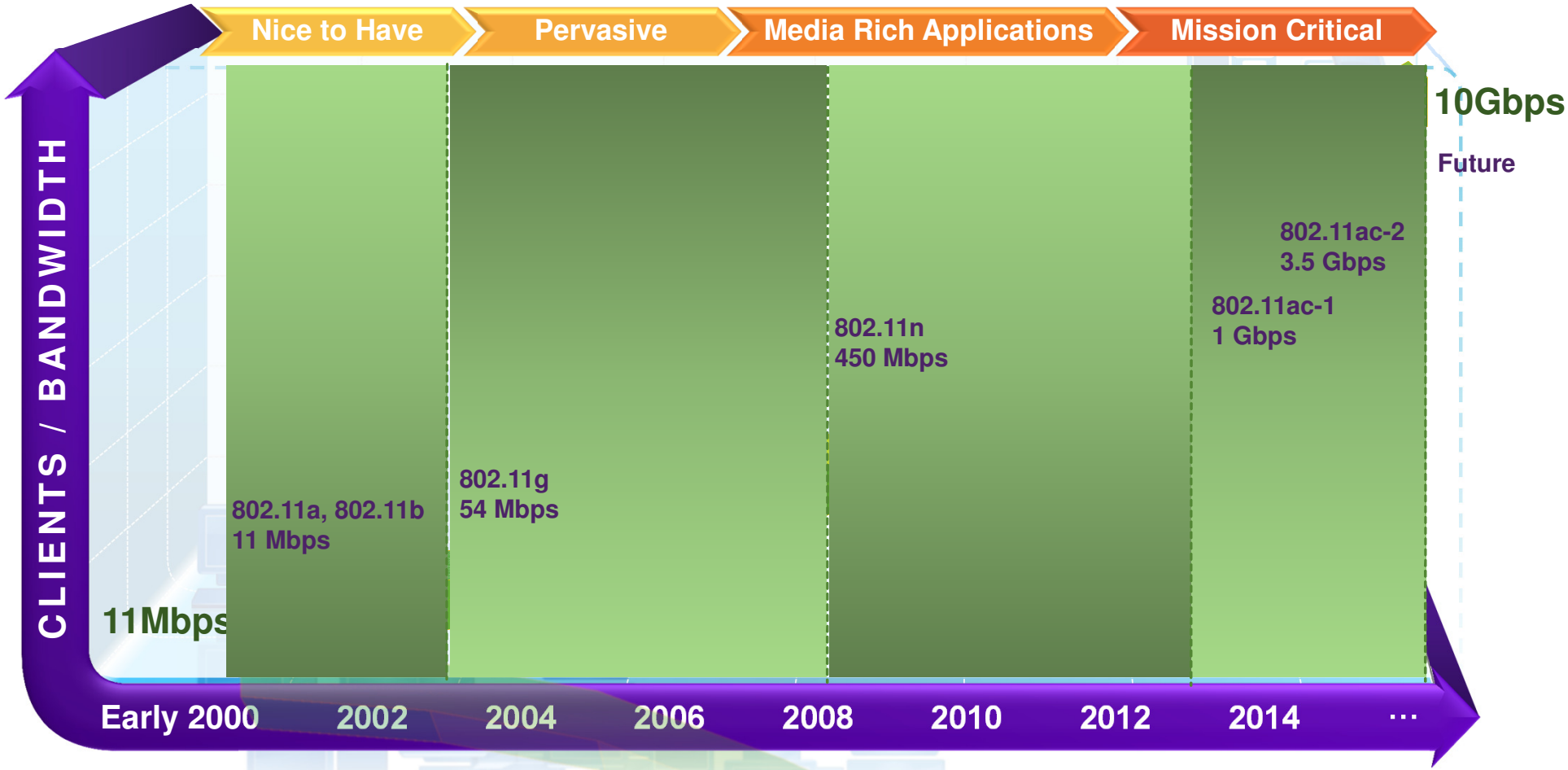
Mobility
- Seamless roaming
- Optimal client performance
- Cloud access/VXI

Video
- Multicast streaming
- Video conferencing
- Reliable performance

IT Requirement

Deliver an Uncompromised User Experience on Any Workspace

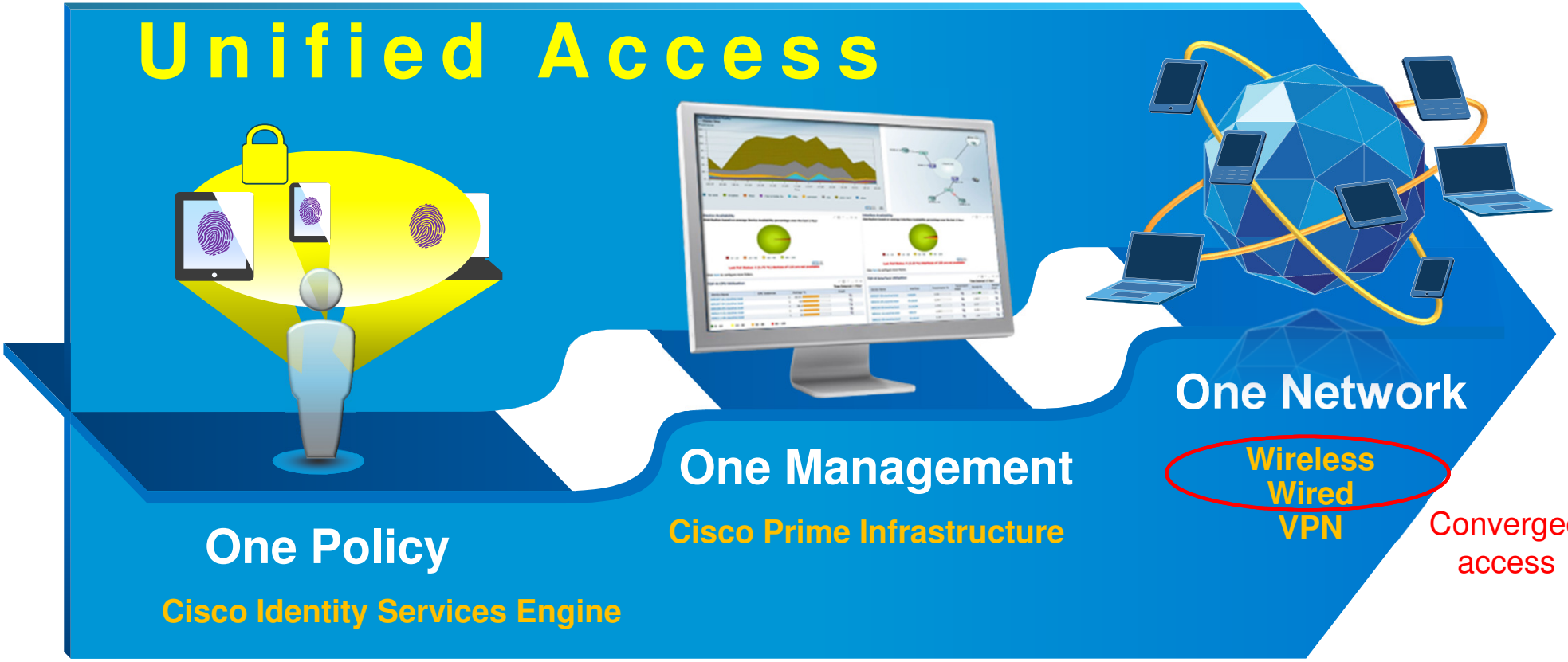
Wireless Perception Evolution



Unified Access

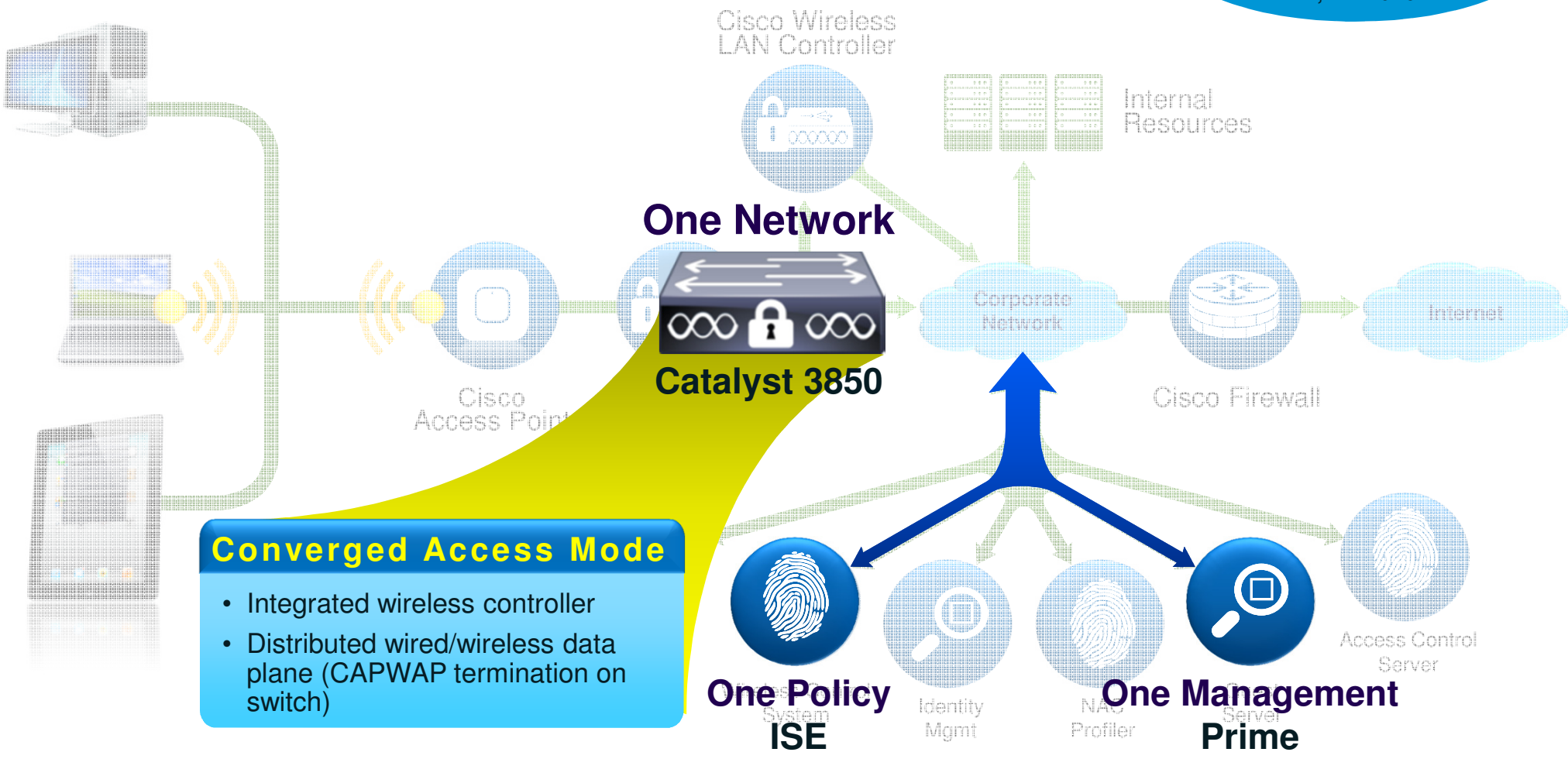
Convergence
- wired and wireless
- data and storage
- data, voice and video
- LAN, MAN and WAN

Uncompromised User Experience on Any Workspace



One Network with Converged Access

Convergence
- wired and wireless
- data and storage
- data, voice and video
- LAN, MAN and WAN



Converged Access Mode
- Integrated wireless controller
- Distributed wired/wireless data plane (CAPWAP termination on switch)

Catalyst 3850 Platform Overview

Convergence
- wired and wireless
- data and storage
- data, voice and video
- LAN, MAN and WAN

Wireless CAPWAP Termination

Integrated Controller: Up to 50 APs

Up to 2000 Clients per Stack

480 Gbps Stacking Bandwidth

Full POE+

40 Gbps Uplink Bandwidth

Stackpower

FRU Fans, AC or DCPower Supplies: (350, 715, or 1100 W AC or 440 W DC)

Granular QoS/Flexible NetFlow

Line Rate on All Ports
Two versions:
- 24 ports
- 48 ports

Built on Cisco's Innovative "UADP" ASIC

Catalyst 3850 Network Modules

Convergence
- wired and wireless
- data and storage
- data, voice and video
- LAN, MAN and WAN

WS-C3850-NM-4-1G
- 4 x 1G
- SFP
- Supported on WS-C3850-24 & WS-C3850-48

WS-C3850-NM-2-10G
- 4 x 1G or 2 x 10G or 2 x 1G + 1 x 10G
- SFP & SFP+
- Supported on WS-C3850-24 & WS-C3850-48

WS-C3850-NM-4-10G
- Auto-sensing – All Combinations
- SFP & SFP+
- Supported on WS-C3850-48 only

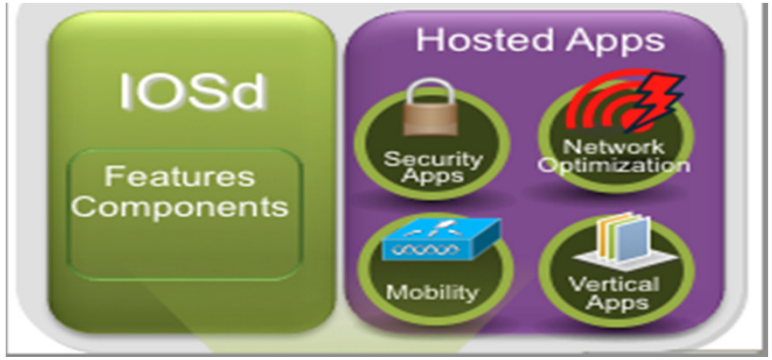
Catalyst 3850 Highlights

Convergence
- wired and wireless
- data and storage
- data, voice and video
- LAN, MAN and WAN

Integrated Wireless LAN Functionality
- Integrated Wireless LAN Controller
- CAPWAP tunnel termination in the switch
- Common features across wired and wireless

New differentiated services
- IOS XE – Extensible Modular Operating System
- Flexible Netflow
- Granular QoS
- TrustSec*
- SDN Ready (OnePK and Openflow)

Best-in-class stackable switch
- Performance – Line rate 480G Stackwise Technology
- Full POE+ support, UPOE option*
- Modular Network Modules – up to 4x10G
- High Availability with Stack SSO and StackPower
- Multi-core CPU
- EEE
- UADP ASIC



* Roadmap

Converged Wired/Wireless Access Benefits

Convergence
- **wired and wireless**
- **data and storage**
- **data, voice and video**
- **LAN, MAN and WAN**

Single platform for wired and wireless

Common IOS, same administration point, one release

Network wide **visibility** for faster troubleshooting

Wired and wireless traffic visible at every hop

Consistent security and quality of service **control**

Hierarchical bandwidth management and distributed policy enforcement

Maximum **resiliency** with fast stateful recovery

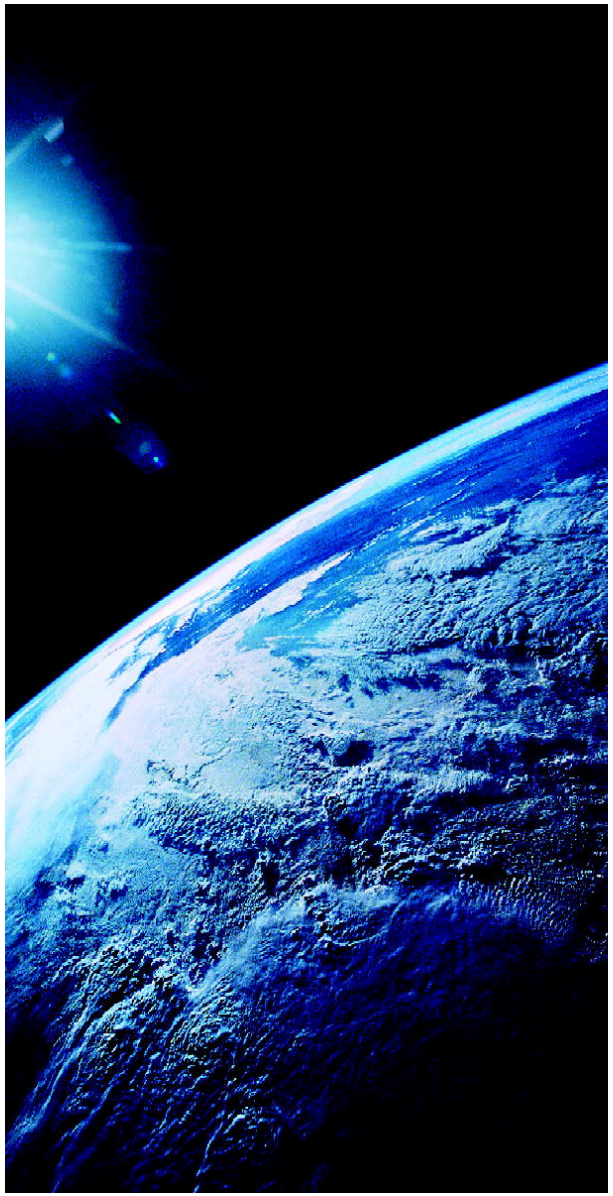
Layered network high availability design with stateful switchover

Scale with distributed wired and wireless data plane

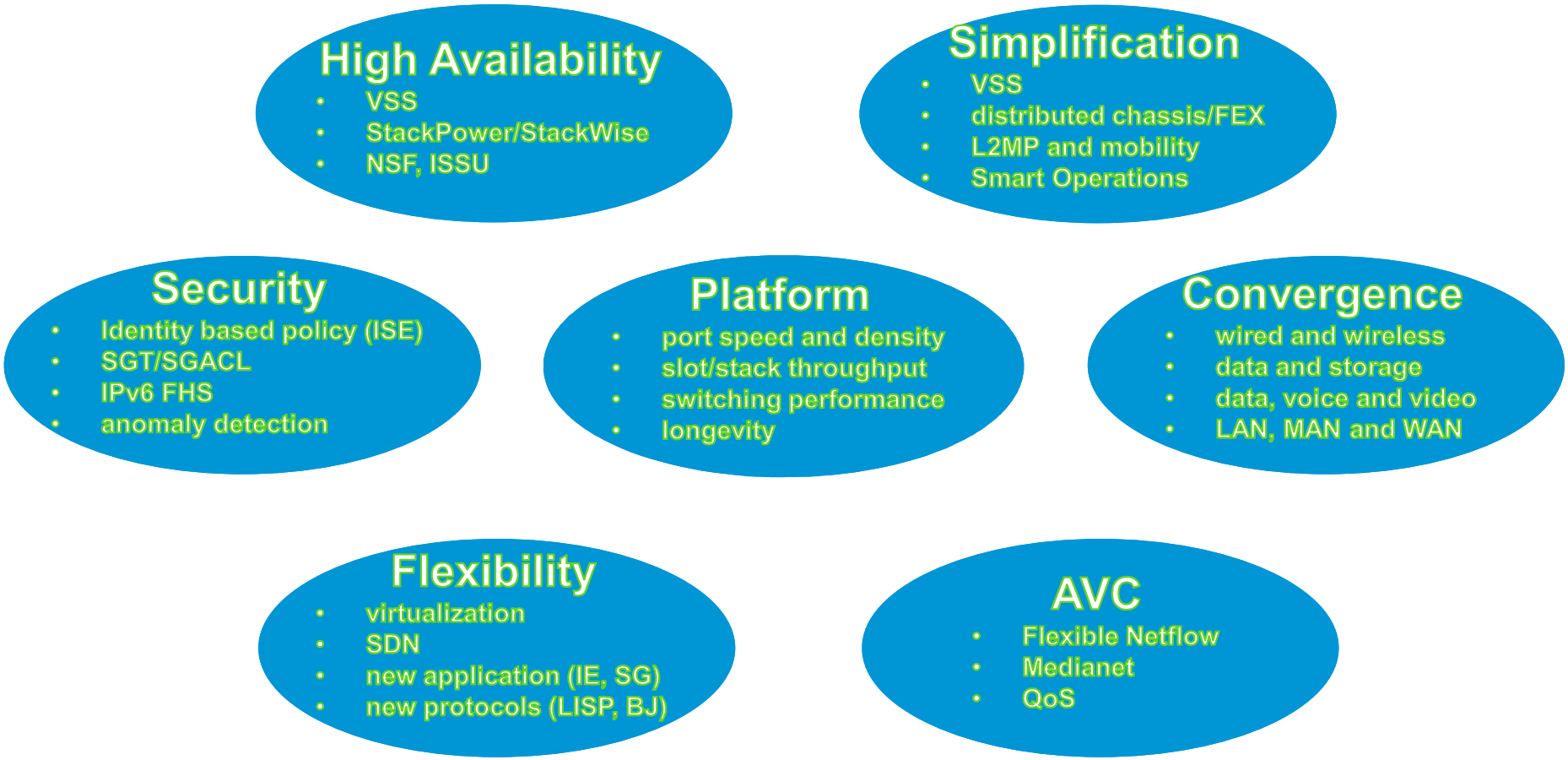
480G stack bandwidth; 40G wireless/switch

Unified Access - One Policy | One Management | One Network

Summary



The one is young when 20 and still can do a lot ☺



Otázky a odpovědi

Prosíme, ohodnoťte tuto přednášku.

Děkujeme za pozornost.