

Novosti s segmenta Brezmejnih omrežij

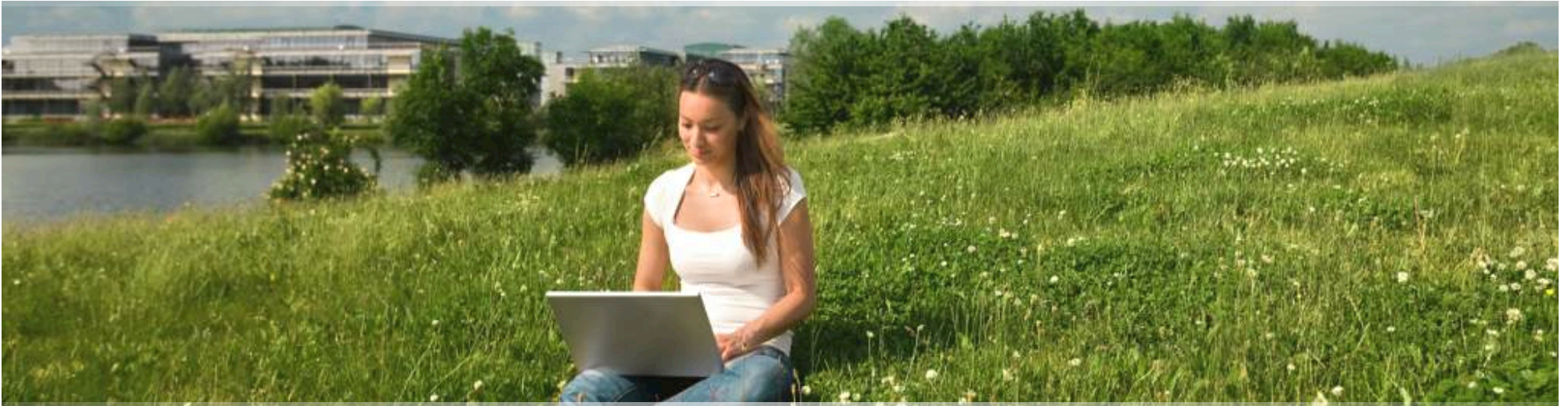


Dejan Miletić, univ.dipl.inž.el.
CCNP, CCDP, CCIP, CCSP

Portorož, 10.03.2011

Agenda

- Why Borderless Networks?
- Cisco's Architectural Approach
- Cisco's Borderless Portfolio update
 - Switching
 - Routing
 - Security
- Q&A

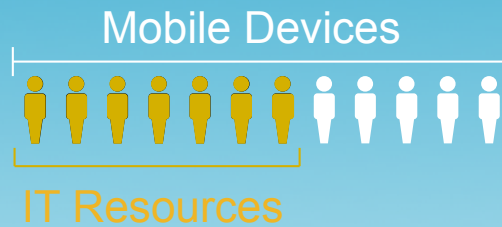


Why Borderless Networks?

Major Trends Impacting the Network

Mobility

- 1.3 billion new networked mobile devices in next 3 years



Workplace Experience

- Blurring the borders:
Consumer ↔ Workforce
Employee ↔ Partner

Anyone, Anything,
Anywhere,
Anytime

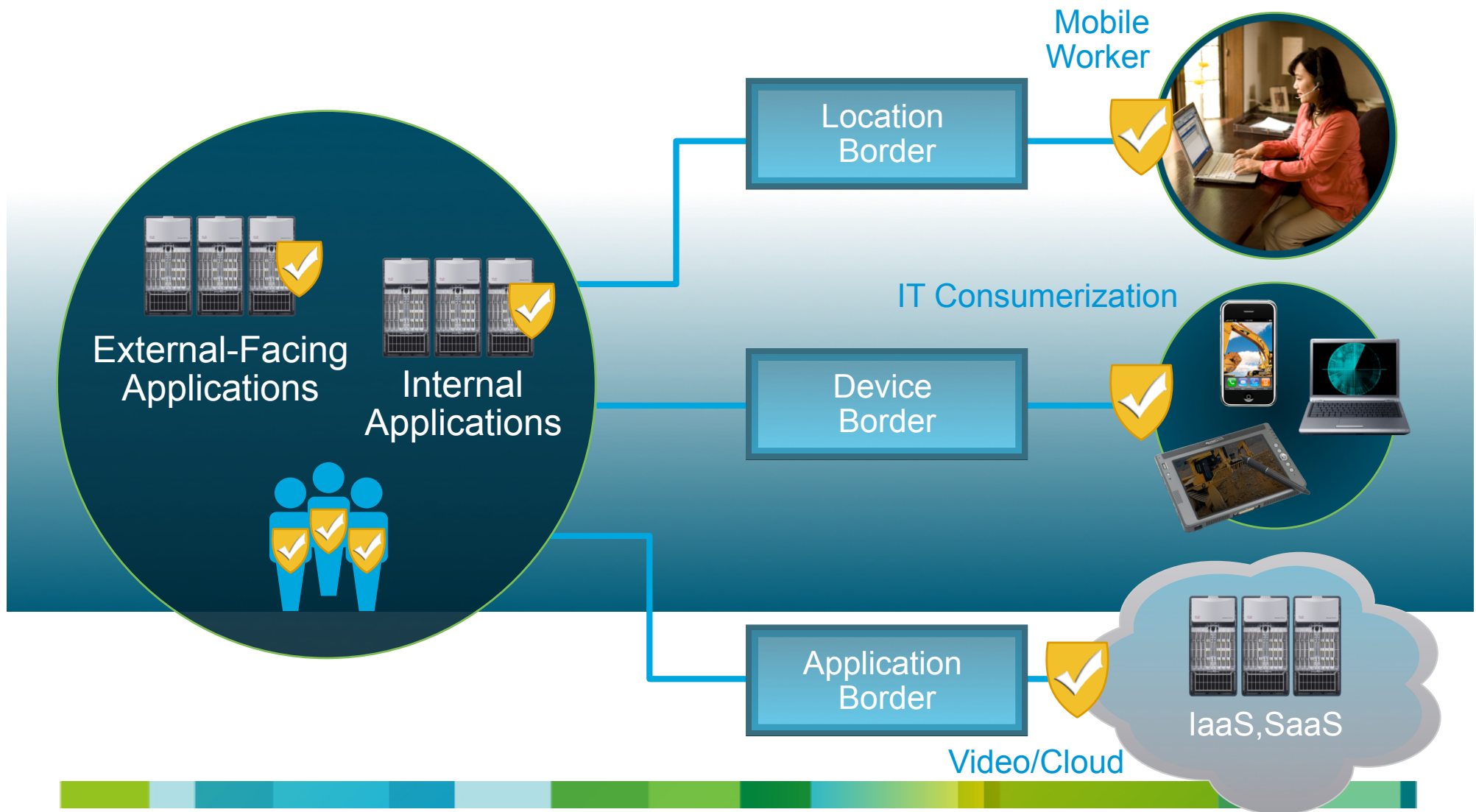


Video

- 50% of all Cisco network traffic today is video



Changing Environment - Shifting Borders

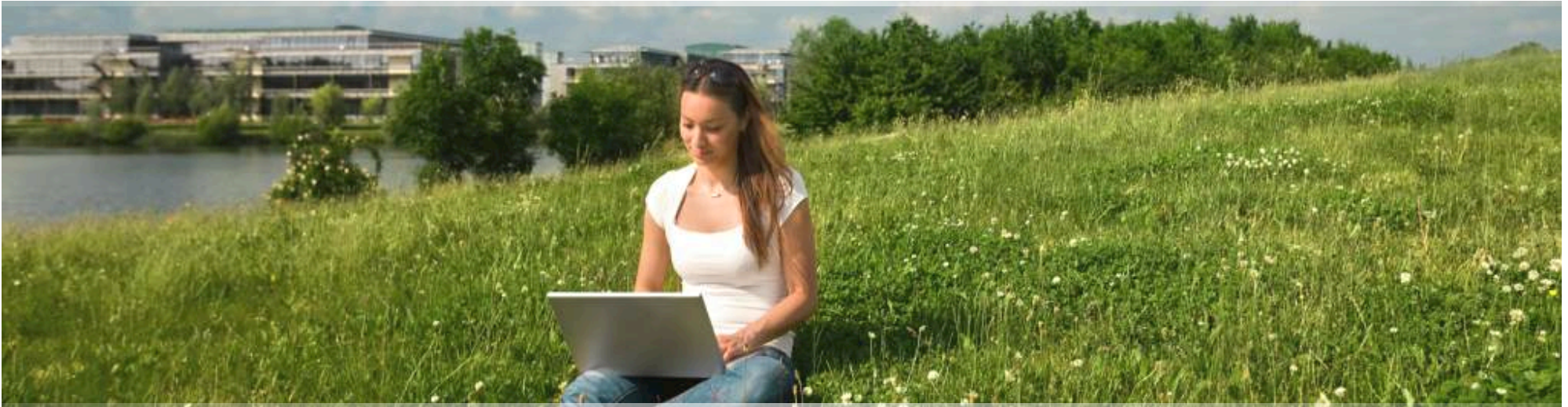


The New Borderless Organization

Borderless Experience

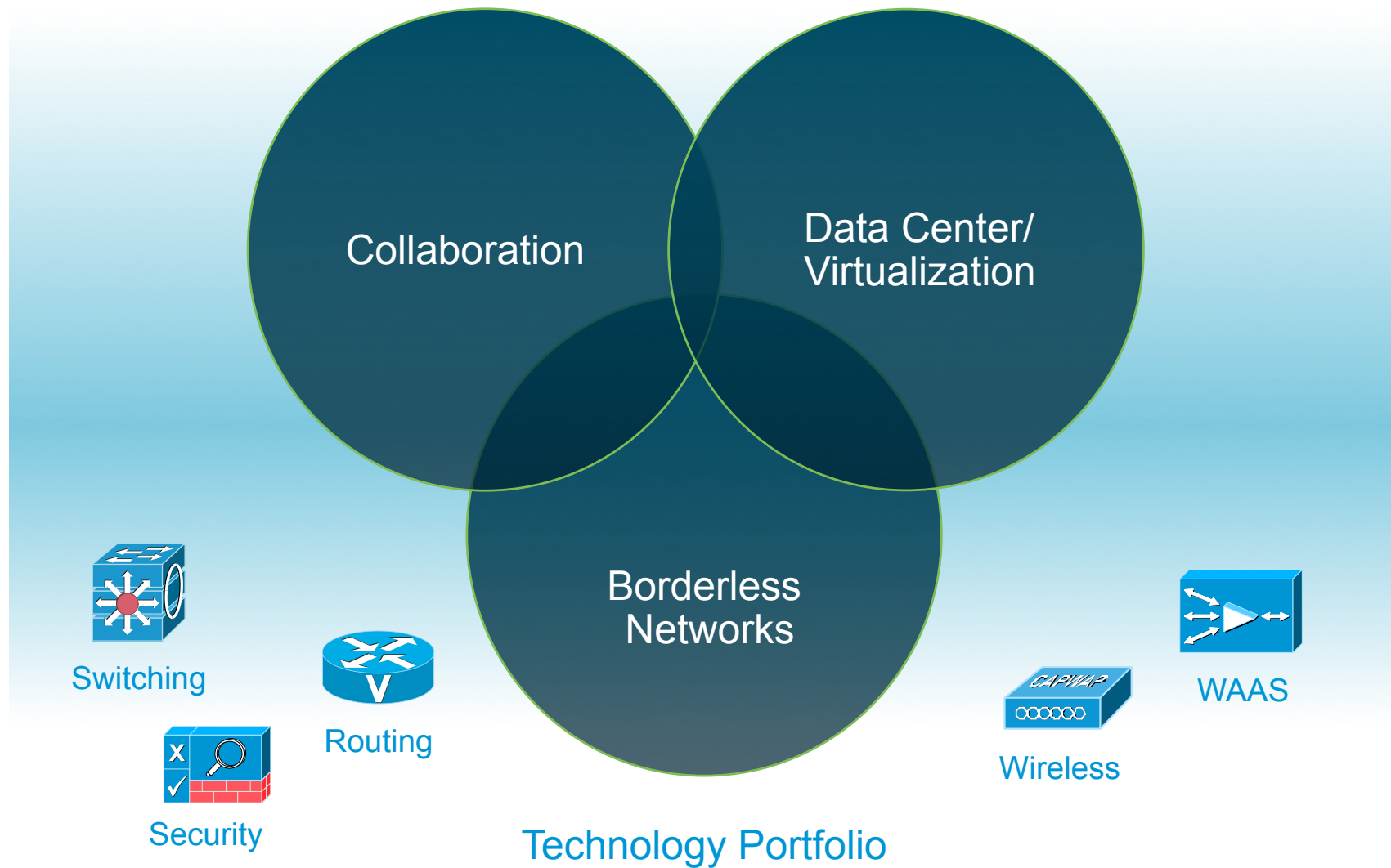


Securely, Reliably, Seamlessly



Cisco's Architectural Approach

Cisco's Architectural Approach



Borderless Network Architecture

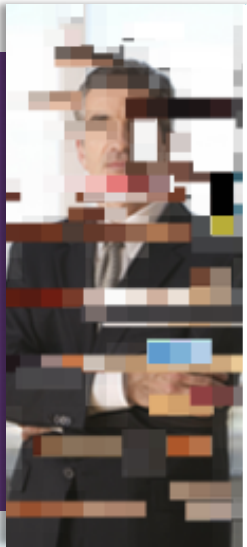
Architecture for Agile Delivery of the Borderless Experience



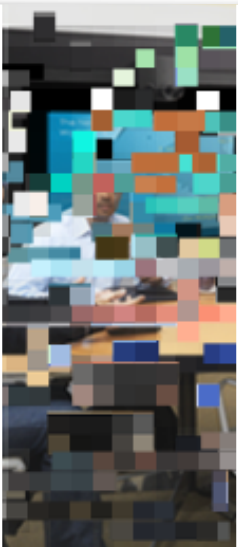
Medianet:

Transform Voice and Video Experiences

No Resource Reservation,
Degraded Voice and Video



CEO
Meeting



M&A
Negotiation



Sports
Event



Global Business,
Worldwide Offices

Context-Aware, Prioritized,
High-Quality Voice and Video



CEO
Meeting



M&A
Negotiation



Sports
Event

Cisco EnergyWise:

Reducing Energy Costs

No Energy Management



Annual Energy Costs
\$770,000



County Offices
10,000 PCs

Countywide Office
Energy Management



Managed Nightly Shutdown
\$280,000

Additional Energy Policies
\$150,000

Total Savings \$430,000

Cisco TrustSec Technology



Policy-based access control for

- Users
- Endpoint devices (posture)
- Networking infrastructure



Identity-aware networking

- Identity information for granular controls
- Role-based business service delivery



Data integrity and confidentiality

- Securing data path in the switching environment
- IEEE 802.1AE standard encryption

Cisco AnyConnect Secure Mobility

Unmanaged Devices, Risk of Data Loss, and Lack of Access

Seamless, Persistent Services for Flexible Security Policy



Mobile Business Executive



Acceptable Use



Access Control



Data Loss Prevention



Cisco Motion: Clean Air Technology

802.11n Performance Protection

RF interference impacting Wi-Fi network performance

Automated RF interference avoidance and air quality insight



PERFORMANCE



Inconsistent, unpredictable mobility experience



Mobile Workforce

AIR
QUALITY

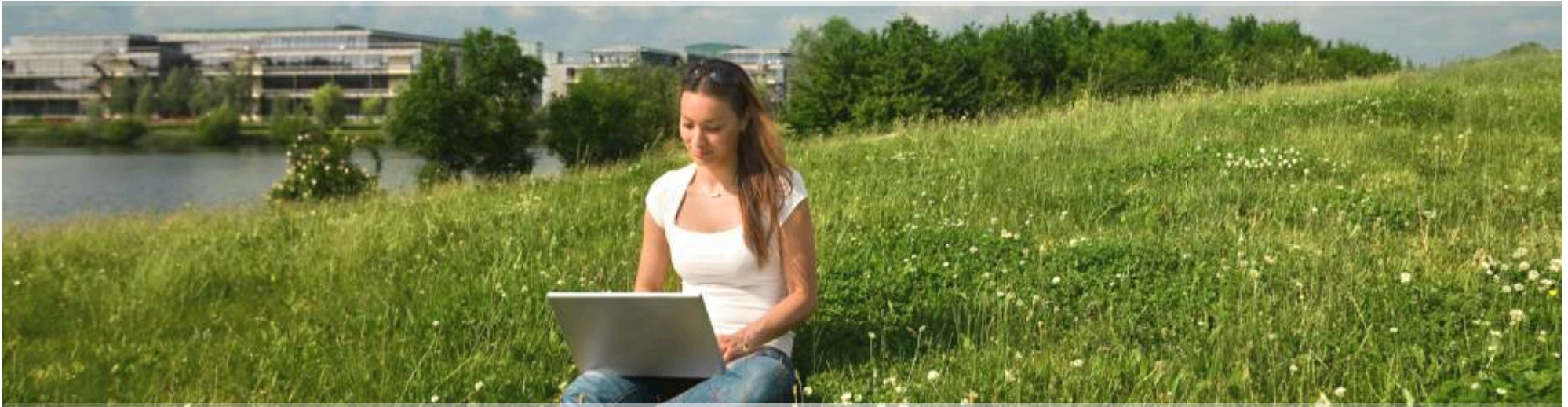


HIGH
PERFORMANCE



Business quality mobility experience





Cisco's Borderless Portfolio update (switching)

Catalyst for Borderless Access

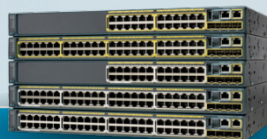
Switching Systems Matched to Customer Needs

Connectivity



Catalyst Compact Switches

Deployable outside the wiring closet with Borderless Network Services and Smart Operations



Catalyst 2960-S

Fixed switch with Smart Operations and select Borderless Network Services



Catalyst 3750-X, 3560-X

Industry leading fixed feature set, resiliency, upgradeability and full Borderless Network Services



Catalyst 4500E

Industry leading modular access with full BN services, superior scalability & resiliency, operational simplicity, investment protection

Performance

Cisco Catalyst Compact Switches

New Solutions for New Access Requirements

New Switches

Five new models – Quiet compact design

Major Features

Connectivity – 8-12 FE/GE, Dual GE uplinks

Power – PoE+ powered, delivered (30W/port)

HW Acceleration – IPv6, IP multicast, ACLs

Security – TrustSec, MACSec, PCI DSS

EnergyWise – Integrated energy management

Management – Smart Operations, SmartPorts



Cisco Catalyst 3560-C and 2960-C

Key Benefits

Reduced wiring and energy requirements

Zero-touch deployment, quick troubleshooting

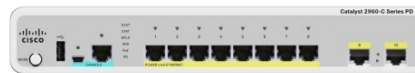
Ready for business and technology shifts

New Cisco Catalyst Compact Switches

Access Extension for Borderless Networks



Compact, quiet design
Size (in): 1.75 x 10.6 x 6.8 to 9.4



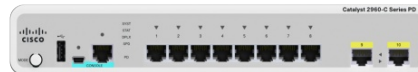
8 10/100 ports, 2 PoE
2 GE PoE+ input ports

**2960-C
PD/PSE**



**3560-C
GE PoE**

8 10/100/1000 ports, 4 PoE+
2 GE uplink ports



**2960-C
PD**

8 10/100 ports
2 GE PoE+ input ports



**3560-C
GE**

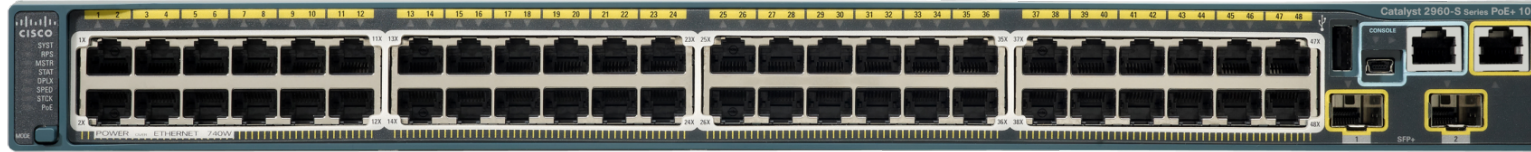
8 10/100/1000 ports
2 GE uplink ports



**2960-C
GE**

8 10/100/1000 ports
2 GE uplink ports

Catalyst 2960-S



- 24/48 10/100/1000 ports with fixed uplinks
 - Fixed Uplink Options: 4x1G or 2x10G SFP+
 - FlexStack Technology
 - Brings stackable ease-of-use features to the 2960 family, features 20G stacking links
 - Power over Ethernet
 - Full standards-based PoE on every port
 - PoE+ support for next-generation high-power devices
 - Sustainability - GREEN
 - Very low power for Gigabit Ethernet Switch
 - New EnergyWise functionality to control PHY power
 - Half the power of Catalyst 2960G
 - E-LLW, NBD and 90 day TAC support
- LAN Lite and LAN Base Software Options
 - LAN Lite option provides entry-level Gig-E platform

Catalyst 2960-S FlexStack



- FlexStack available with optional Module
Hot Swappable with two wire-speed 10G ports
- Up to 4 switches in a stack
- Unified management, control, and data plane (similar look and feel as StackWise)
- 3 FlexStack Cable lengths supported
0.5 meters, 1.0 meter, 3.0 meter

FlexStack Architecture Overview

- Not a Ring Architecture!

Packets traverse stack members hop by hop

Local switching of unicast packets

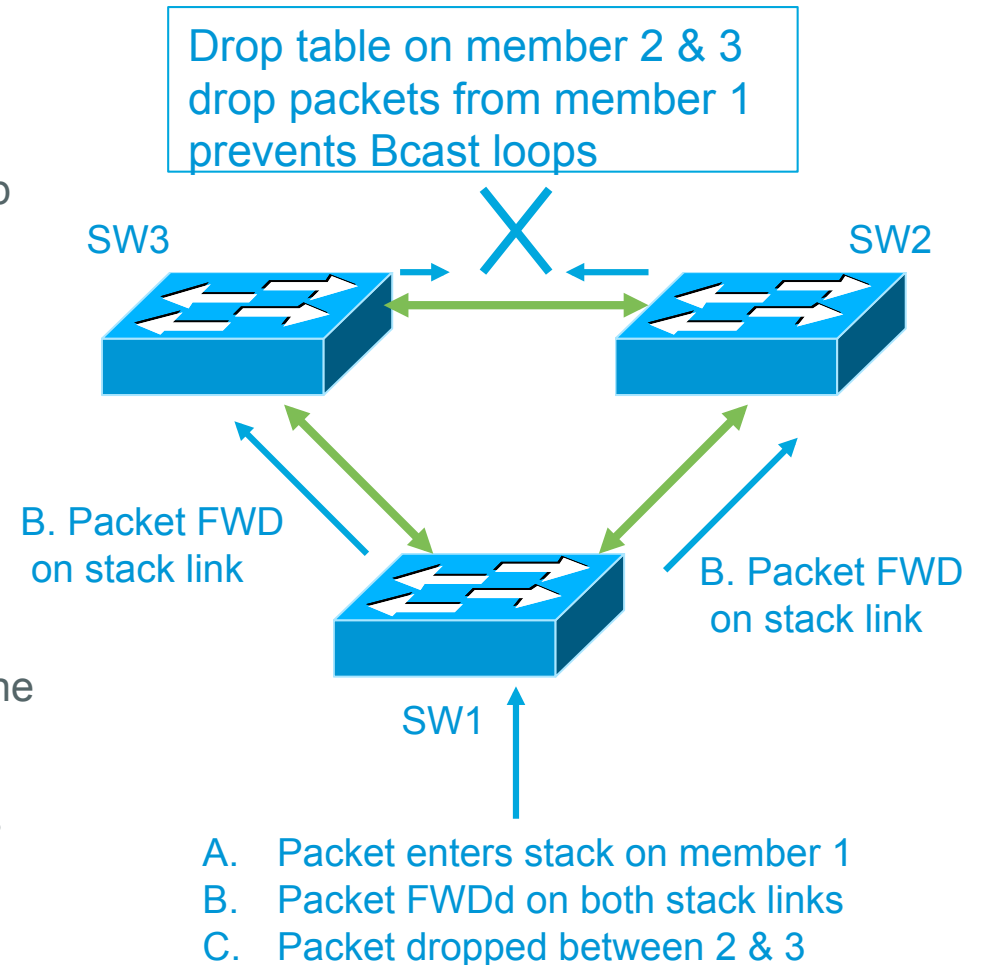
- Both Stack Links active and Fwd

- HW Drop Table to stop Broadcasts

Shortest path algorithm used to determine drops

Drop table uses ingress member to determine drop

All members see the Bcast & Mcast packets



3 Member Broadcast Packet Example

	2960-S Stacking Ease of Use	3750-X StackWise Plus Ease of Use and High Availability
Device Limit	4 units	9 units
Stack Bandwidth	10G / 20G	32G / 64G
Architecture	HW Drop Table	Ring (Destination stripping)
Dynamic Ring Load Balancing	No	Yes
Stack Convergence	1-2 seconds	Few milliseconds
Stack QoS	Applied hop by hop	Applied on ingress
Management	Single IP address, SNMP, SYSLOG	Single IP address, SNMP, SYSLOG
Configuration	Single config and CLI, auto image and config update	Single config and CLI, auto image and config update
Show and Debug Commands	Unified	Unified
Single Forwarding and Control Plane	Synchronize ARP, MAC Address, IGMP, VLAN tables	Synchronize ARP, MAC Address, IGMP, VLAN, Routing tables
Cross-Stack Features	Yes	Yes
Single Bridge-ID	Yes	Yes
Preprovision members	Yes	Yes
Redundancy	Stack master 1:N redundancy	Stack master 1:N redundancy
Easy member replacement	Yes	Yes

Catalyst 3750-X and 3560-X

Catalyst 3750-X Series



Catalyst 3560-X Series

- StackPower – Power aggregation
- Network Modules – Field replaceable uplink
- Full 802.3at PoE+ Support
- Three IOS feature sets
- Dual redundant power supplies and fans
- MACsec – Hardware encryption
- E-LLW
- Full Energy Wise support

Catalyst 3750 Models comparison

	3750-X	3750-E	3750G
StackPower	Yes	No	No
FRU Network Module	Yes	No	No
FRU Power Supplies	Yes, Dual PS	Yes	No
Encryption	Yes (Downlink)	No	No
PoE+ 30W/port	Yes	No	No
IOS LAN Base Option	Yes	No	No
Management Options	Console RJ45, USB console , and Out of band Ethernet	Console RJ45 and Out of Band Ethernet	Console RJ45
RPS / XPS	XPS	RPS	RPS
EnergyWise	Report Actual Power use PoE & System	Report Actual Power use PoE	Report Budgeted Power

StackPower

Main features

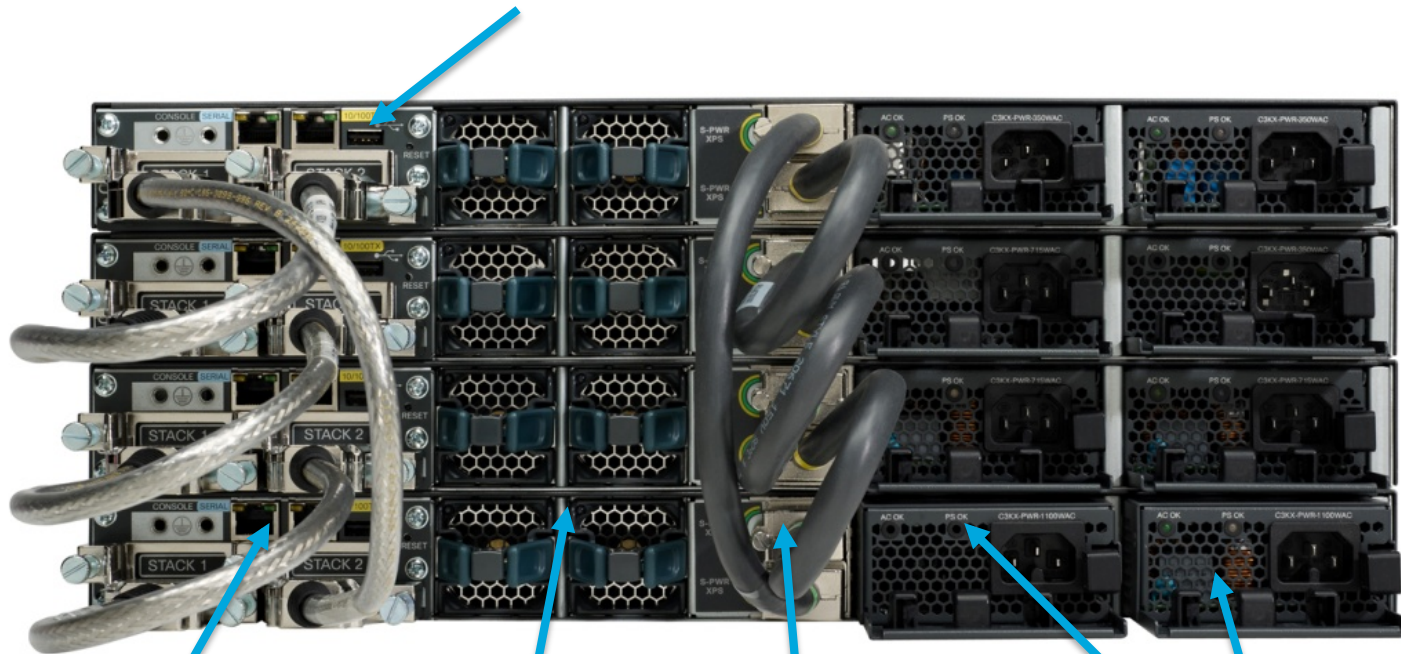
Industry Leadership

- Innovative technology, aggregates and shares available input power capacity in a Stack
- Flexible arrangement of power supplies in a stack
Up to 8.8Kw power in a stack
- Supports a “zero-footprint” RPS deployment
- Intelligent power shedding
- Stackpower **decouples a PS from its physical location** in the stack!
- Up to 4 switches can be part of Stackpower
Independent from Stackwise (Stackwise Plus)
- No need for RPS though an XPS is available!



StackPower Close up

Console, 10/100 port, and USB type A



Stackwise Plus
4 Switches

FRU Dual
Redundant Fans

StackPower
Cables

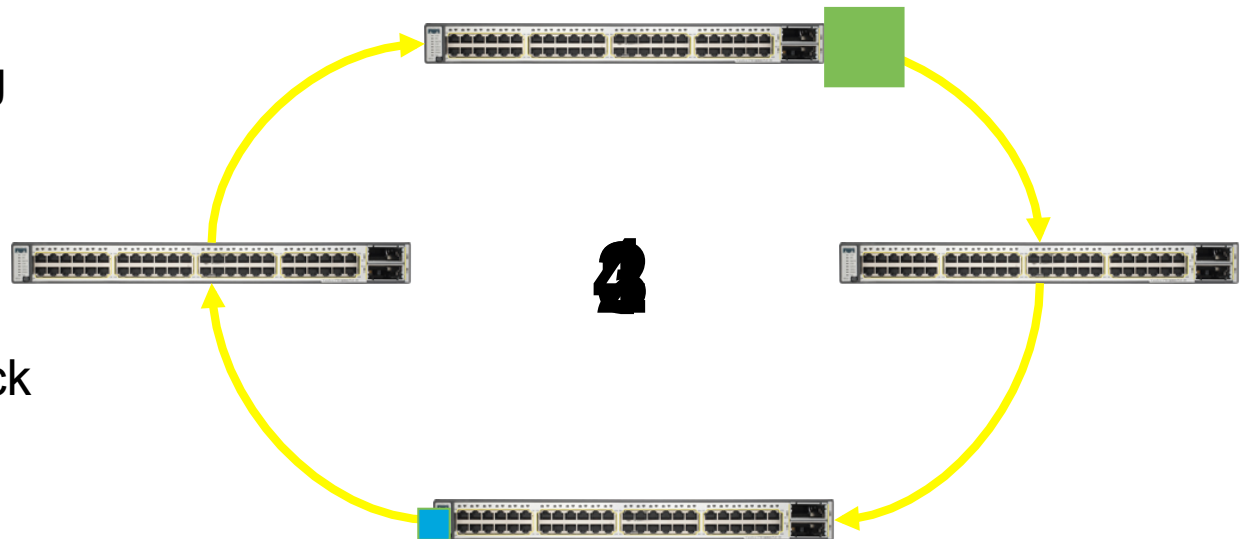
Redundant, Dual PS, either
AC/AC, AC/DC, AC, or DC
combinations

StackWise Plus

- StackWise Plus increases the effective stacking throughput to 64Gbps using spatial reuse
- Same great features as the original StackWise

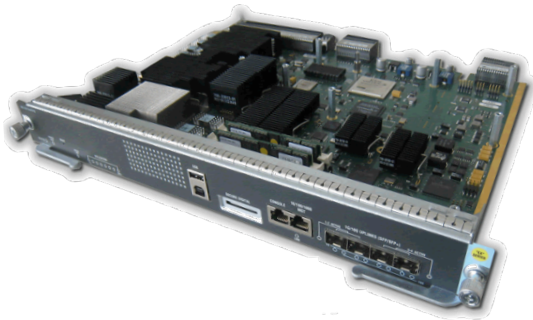
StackWise Plus

1. Packet travels along the ring and is copied to destination switch
2. Packet travels back to ring at destination switch where it is stopped from being sent back to source
3. Packet travels along the ring and is copied to destination switch



Cat45k - Supervisor 7-E System

Supervisor 7-E



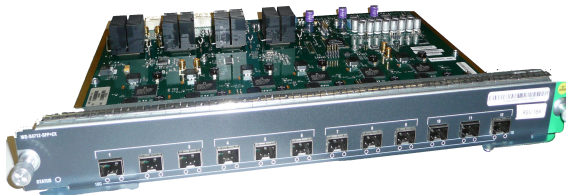
848Gbps Switching Capacity
48G/slot
Rich hardware features
(FnF, TrustSec, Wireless, ERSPAN,
Tunneling, VRF-NG, VSS and more...)

WS-X4748-RJ45V+E



48p 10/100/1000 non-blocking
48Gbps/Slot
30W/port (PoE+) on all 48 ports
Cisco TrustSec in Hardware
Jumbo frame support

WS-X4712-SFP+E

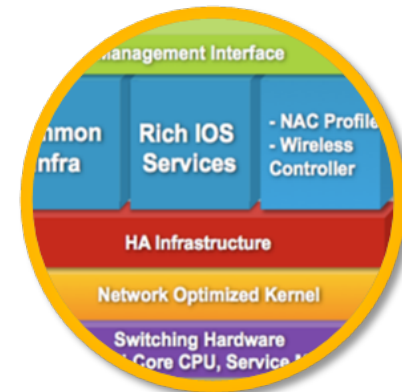


12 PORT 10GE 2.5:1 Line Card
Cisco Trustsec in Hardware
Jumbo Frame support



Catalyst 4500E and 4500E+ Chassis

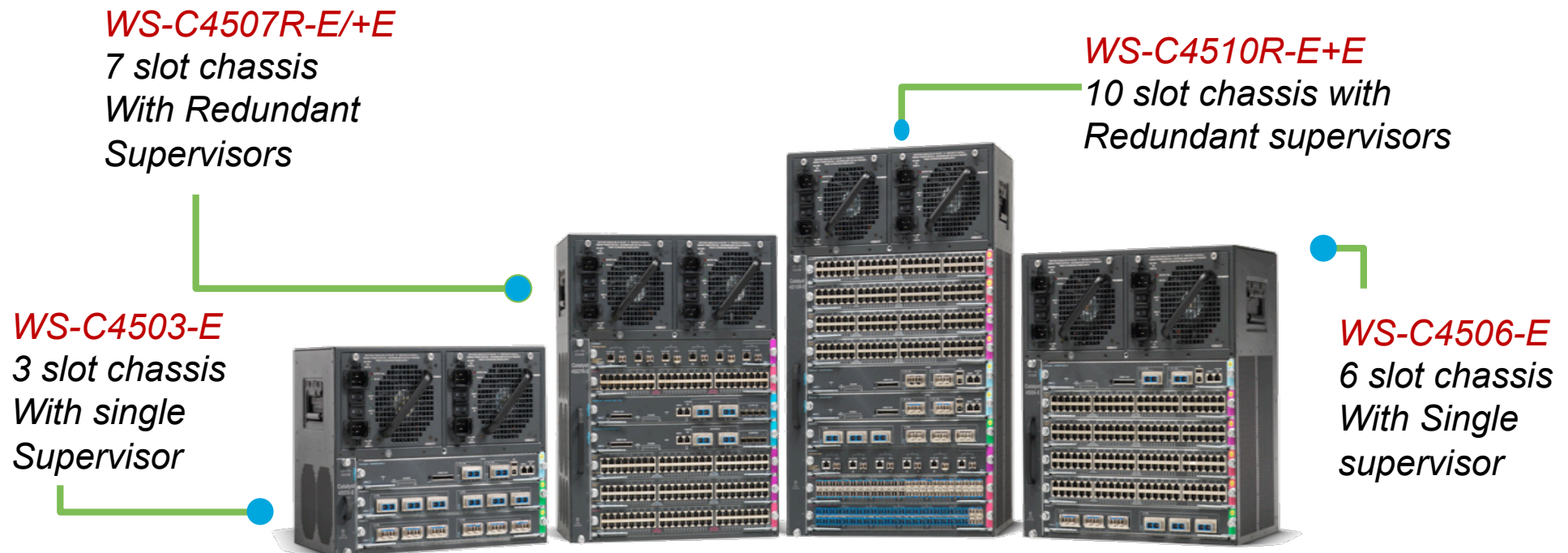
Cisco IOS-XE



Modern OS to leverage next-gen
switching HW
Enabling Open Service Platform

Catalyst 4500E and 4500E+ Chassis

E Series chassis designed to support higher bandwidth per slot line cards . The chassis provides 24G to 48G of bandwidth per slot with next generation supervisor providing **Investment Protection**



- WS-C4507R+E and WS-C4510R+E chassis add support for 48G/slot
- Existing supervisors also support the E+ chassis

Catalyst for Borderless Core

Customer Requirements

BASE

- Scalability / wirespeed
- High availability
- Network segmentation

- Core outside data center
- VPLS/MPLS
- WAN services

Decision
Criteria

- Core inside data center
- High 10GE density
- OTV

- Cisco IOS consistency
- Two terabit scalability
- Borderless service modules
- Virtual switching (VSS)



Cisco Catalyst 6500 Series

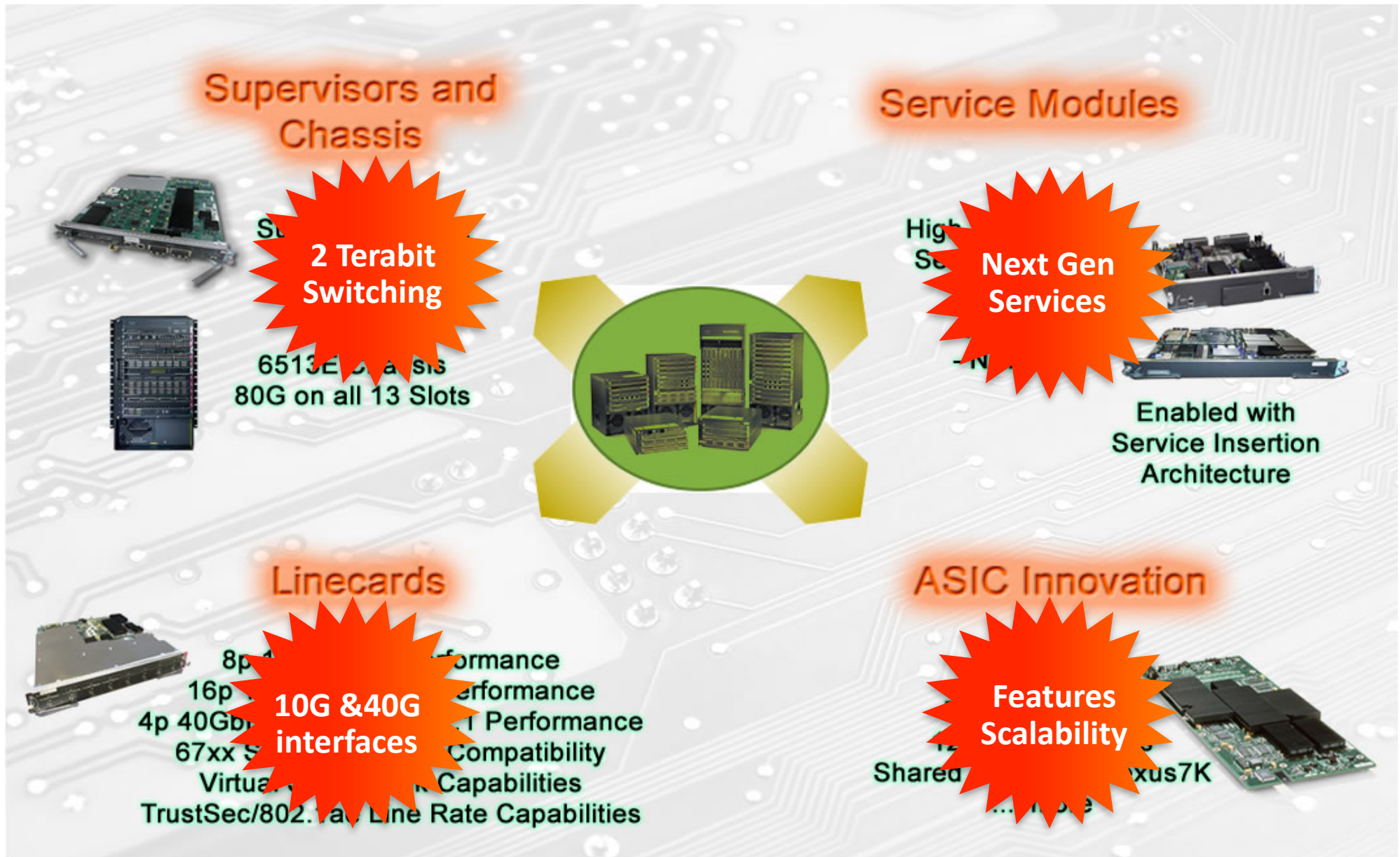
- NX-OS capabilities
- Highest scalability
- Resiliency (hitless ISSU)
- Virtual Device Contexts (VDCs)



Nexus 7000 Series

• EXTENDED

Catalyst 6500 Next Generation Platform



Next-Generation 6500 Platform Components

Sup 2T

Single Compact Flash Slot

3 x GE SFP Ports

Connectivity Management Processor (CMP)

Console Port

2 x 10GE X2 Based Ports

2 x USB Ports
1 x Type-A
1 x Type-B

Sup2T Target Release 2QCY2011

8 Port 10GbE 1:1 (2QCY2011)

- ☐ 80 Gbps Backplane
- ☐ Earl 8 Lite and Heavy Versions
- ☐ X2 Transceiver Form Factor or SFP+ with OneX Adapter
- ☐ CTS and L2 Encryption IEEE 802.1ae on all ports - wire speed
- ☐ Virtual Switch Link supported on all ports
- ☐ OTV and LISP Ready



Target Release 2HCY2011

- ☐ IEEE 802.3ba Standard Compliant
- ☐ 80Gbps Backplane
- ☐ CFP Transceiver Form Factor
- ☐ Earl8 Lite and Heavy Versions
- ☐ Convertible to 16p 10GbE ports via SFP+ via FourX Adapter
- ☐ CTS and line rate 10G/40G L2 encryption
- ☐ Virtual Switch Link supported on all ports
- ☐ OTV and LISP ready

4p 40GbE or 16p 10GbE 2:1

Cisco Catalyst 6513-E Series Switch

**Shipping
today !**



Density & Scalability (w/Sup2T)

- 80 Gbps on all 13 slots
- 2 Tbps system performance scaling to 4 Tbps with VSS
- Up to 180 ports of 10G and 534 ports of 1G per System



Superior PoE/ePoE Capacity

- 500+ PoE/ePoE Support per System
- Maximum Power 14,500 W



Ease of Manageability

- Rear-serviceable fan tray
- Ideal for deployment in 2-post racks



Providing Next-Generation Virtualization Services

Today

CY11

Catalyst 6500
(Sup720 Family)

Catalyst 6500
(Sup2T – 80G/Slot)

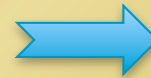
Cloud Services

FWSM

- 5G Firewall
- Different SW from ASA

ACE20 SM

- 16G Load Balancer



ASA-SM (Mid CY 2011)

- 10+G on x86 Blade
- Architecture Consistency
- IPv6 Support

ACE30 SM (Nov 2010)

- 2X SSL
- 60% higher L4-7 CPS
- HTTP Compression

OPEN Application
Hosting Platform

NAM

- 1G Monitoring
- NetQoS SuperAgent



NAM10

AVM

**3rd party
Apps**

**Medianet
2.0**

**x86 Platform (20Gbps)
(pre-CC)**

Virtual Services Engine (VSE) Mid CY2011

Mobility

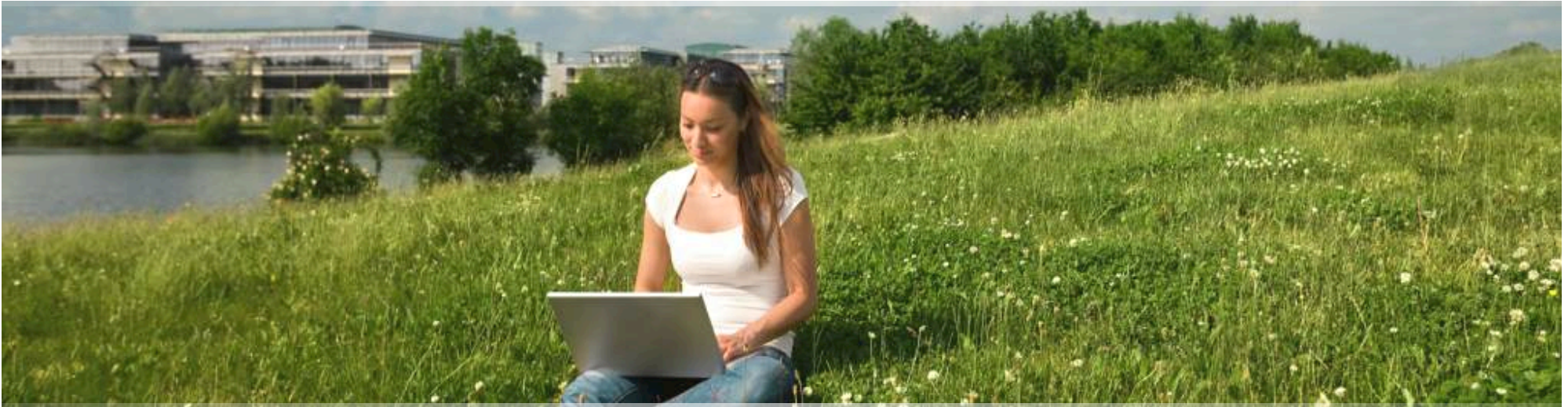
WiSM

- 5G Wireless Controller
- 300AP/Module



Next Gen. WiSM (Q1 CY 2011)

- 10G Wireless Controller
- 500 AP/Module



Cisco's Borderless Portfolio update (routing)

Borderless Routing Infrastructure (Branch)

Cisco Integrated Services Router Generation 2 Portfolio

Performance, Scalability, Availability

NEW

887VA*, 886VA*,
892F

860, 880, 890



Virtual
Office



1921,
1941, 1941W



Secure
Mobility



Customizable
Applications



2901, 2911,
2921, 2951



Secure
Collaboration



3925E, 3925
3945E, 3945



Scalable Rich-
Media Services



Enhancing the Borderless Experience



* New Platforms

Borderless Routing Infrastructure (WAN)

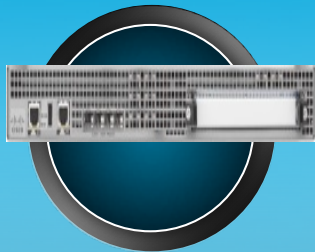
Cisco ASR 1000 Series Portfolio

- On-Demand Service Delivery
- Service Resiliency
- Operational Excellence

Performance, Scalability, Availability



**ASR 1001
(ESP 2.5 – 5 G)**



**ASR 1002-F
(ESP-2.5G)**



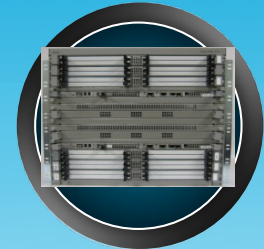
**ASR 1000 with
ESP-5G or 10G**



**ASR 1000 with
ESP-20G**



**ASR 1013 with
ESP-40G**

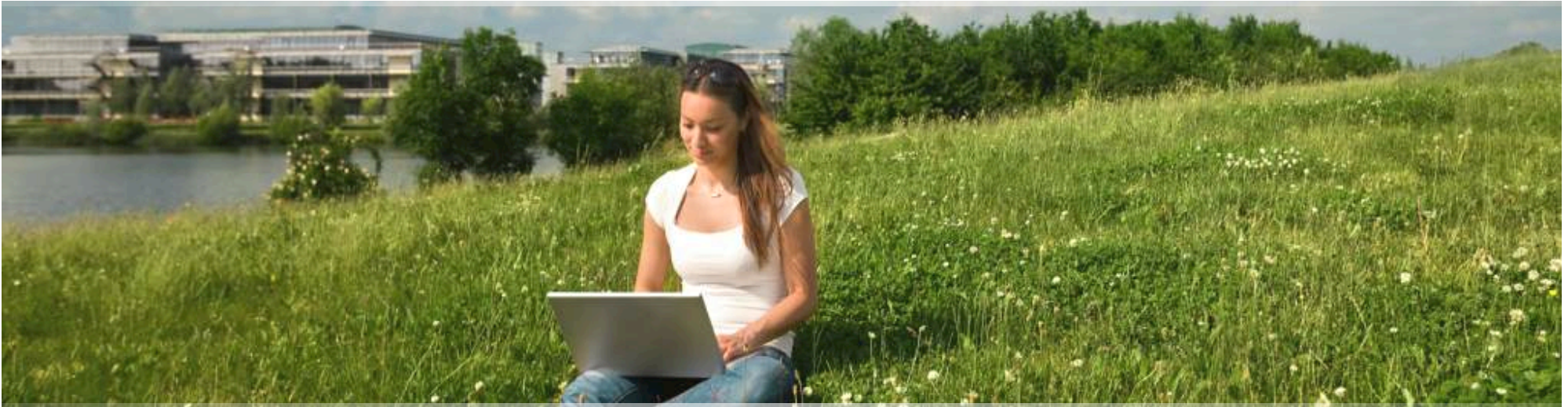


High-performance Embedded Services, Services Flexibility

Hardware/Software Resiliency, Modular Software

Secure, Reliable, Concurrent WAN Services Aggregation

Head Office/WAN Aggregation



Cisco's Borderless Portfolio update (security)

High Performance Multi-Service ASA 5585-X

Marketing Leading Firewall, IPS and VPN Services

MultiScale™ Performance

- Provides up to 35 Gbps of firewall throughput
- Extends firewall and IPS throughput to 10 Gbps
- Scales up to 10,000 users of remote access VPN

Investment Protection

- Scalable chassis that grows with your business

Industry-Leading Multi-Service Security

- Advanced threat protection with Botnet Traffic Filtering and hardware-accelerated IPS with Global Correlation
- Leading-edge remote access with Cisco AnyConnect™
- Built upon 15 years of security innovation



High Performance Multi-Service Cisco ASA 5585-X Series

2 RU Chassis

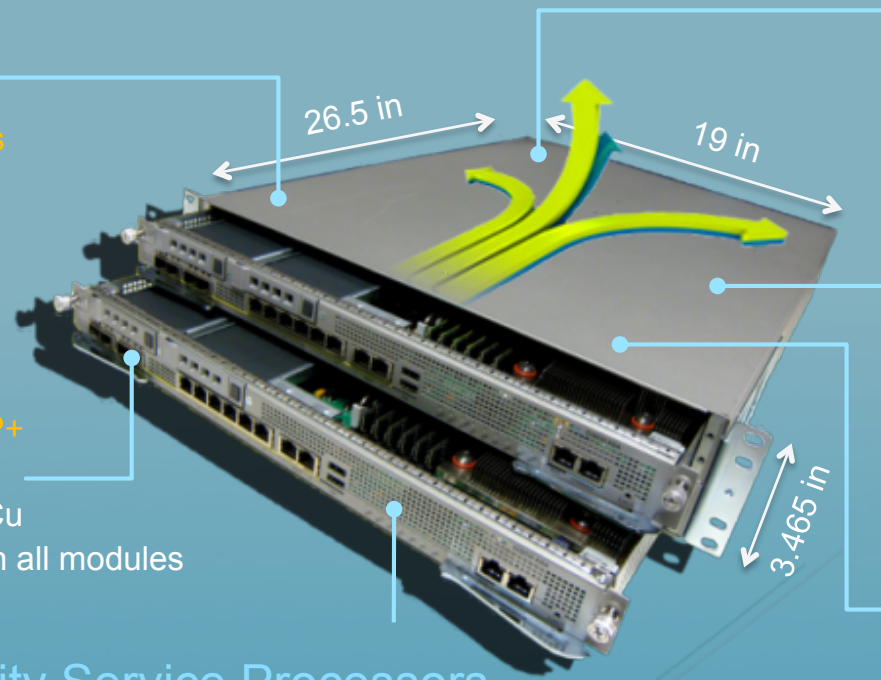
- 2 x full-slot modules
- 1 x full-slot + 2 x half-slot modules
- OIR capable

GE Ports

- Up to 8 x 10G SFP+ with OIR support
- Up to 16 x 1GbE Cu
- SFP/SFP+ slots on all modules

Security Service Processors

- Multi-services capable
- Dedicated 64bit multi-core processors
- Future-proof hardware



Redundant Hot Swappable Power Supply Units

- Front to back air flow

Multi Gigabit Fabric

- Passive backplane
- Module to module communications
- Packet prioritization and shaping

eUSB

- 2 GB internal
- Convenience storage
- Security credentials

Cisco ASA 5500 Series Portfolio

Comprehensive Solutions from SOHO to the Data Center

Performance and Scalability

Multi-Service (Firewall/VPN and IPS)

ASA 5505
(150 Mbps, 4K cps)

ASA 5510
(300 Mbps, 9K cps)

ASA 5520
(450 Mbps, 12K cps)

ASA 5540
(650 Mbps, 25K cps)

ASA 5585 SSP-10
(4 Gbps, 50K cps)

ASA 5585 SSP-20
(10 Gbps, 125K cps)

ASA 5585 SSP-40
(20 Gbps, 200K cps)

ASA 5585 SSP-60
(35 Gbps, 350K cps)

ASA 5580-40
(20 Gbps, 150K cps)

ASA 5580-20
(10 Gbps, 90K cps)

ASA 5550
(1.2 Gbps, 36K cps)

SOHO

Branch Office

Internet Edge

Campus

Data Center

Firewall and VPN
Appliance

NEW

NEW

NEW

NEW

Cisco ASA 5500 Series High-End Lineup Solutions

NEW



Network Location	Internet Edge/ Campus ASA 5585 SSP-10	Internet Edge/ Campus ASA 5585 SSP-20	Campus/ Data Center ASA 5585 SSP-40	Data Center ASA 5585 SSP-60
Performance				
Max Firewall	4 Gbps	10 Gbps	20 Gbps	35 Gbps
Max IPS	2 Gbps	3 Gbps	5 Gbps	10 Gbps
Max IPSec VPN	1 Gbps	2 Gbps	3 Gbps	5 Gbps
Max IPSec/SSL VPN Peers	5000	10,000	10,000	10,000
Platform Capabilities				
Max Firewall Conns	750,000	1,000,000	2,000,000	2,000,000
Max Conns/Second	50,000	125,000	200,000	350,000
Packets/Second (64 byte)	1,500,000	3,000,000	5,000,000	9,000,000
Base I/O	8 GE + 2 10 GE	8 GE + 2 10 GE	6 GE + 4 10GE	6 GE + 4 10GE
Max I/O	16 GE + 4 10 GE	16 GE + 4 10 GE	12 GE + 8 10GE	12 GE + 8 10GE
VLANs Supported	250	250	250	250
HA Supported	A/A and A/S	A/A and A/S	A/A and A/S	A/A and A/S

Q & A

dmiletic@cisco.com



Thank you.

