

Borderless novosti Routing & switching

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Tatjana Bošković, Channel SE
tboskovi@cisco.com

Agenda

ISR G2 pregled

Novi model licenciranja IOS-a

Catalyst 3750-X, 3560-X,
2960-S pregled

Q&A





The Integrated Services Routers Generation 2

Cisco Integrated Services Router Brand

Seven Million and Counting...!

100+ Network Interfaces
and Modules

Broadest Range
of Services

Up to 70% in Operational
Cost Reduction

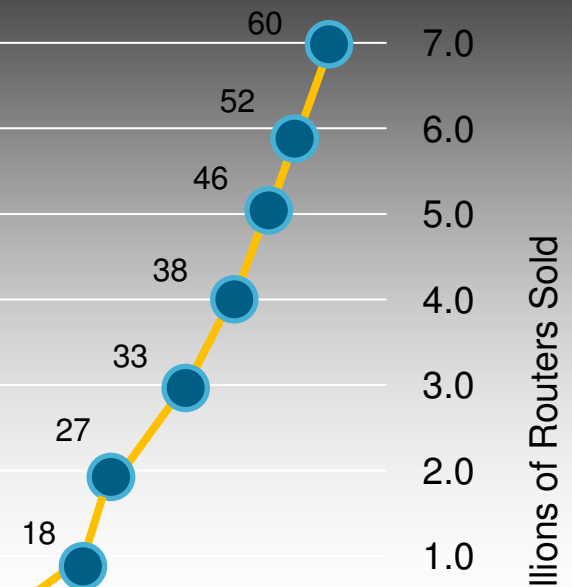
2005–09
Market share

#1

Access Routing

Source: Dell 'Oro

ISR Units (in Millions)



Coca-Cola Enterprises Inc.

 carrier2carrier

 verizon wireless

Balfour Beatty

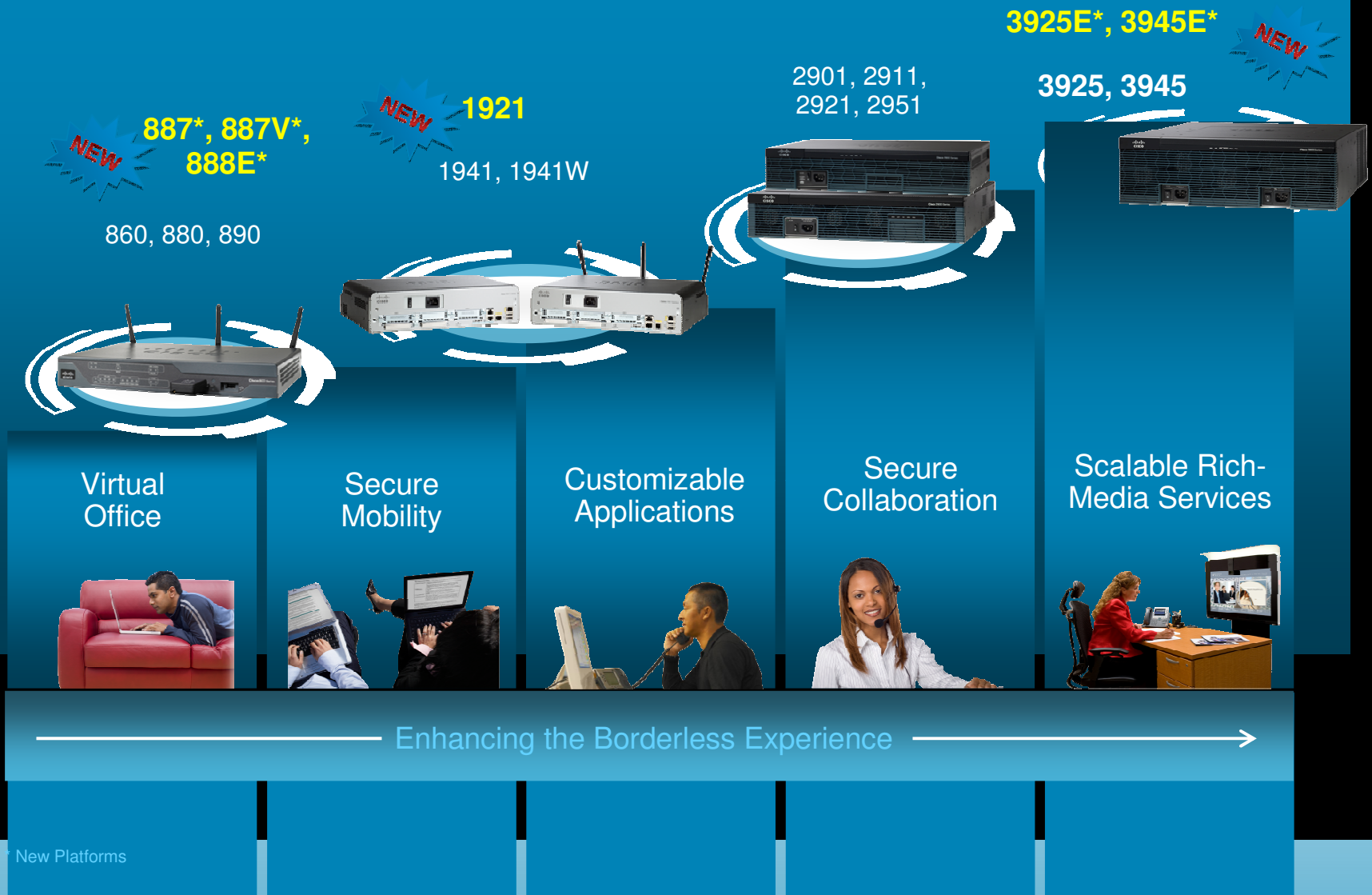
 COUNCIL ROCK
SCHOOL DISTRICT

usbank
Five Star Service Guaranteed

Branch Infrastructure

Evolving Cisco Integrated Services Router Generation 2 Portfolio

Performance, Scalability, Availability



Next Generation Integrated Services Routers

Under the Covers

Services Performance Engine (3900)

- Upgradeable with newer engines in the future

Multi-core Network Processor

- Up to 5x performance increase

Multi Gigabit Fabric

- Module to module communications
- Packet prioritization and shaping

NG DSP Modules

- Video ready DSP modules
- 4x increase in audio conferencing and transcoding
- Configurable power savings modes

EHWIC

- 2x performance increase
- HWIC/WIC/VWIC/VIC support natively
- EPoE capable

GE Ports

- Plus GE ports (3 on 2911+)
- SFP slots on 2921 and above

Service Modules

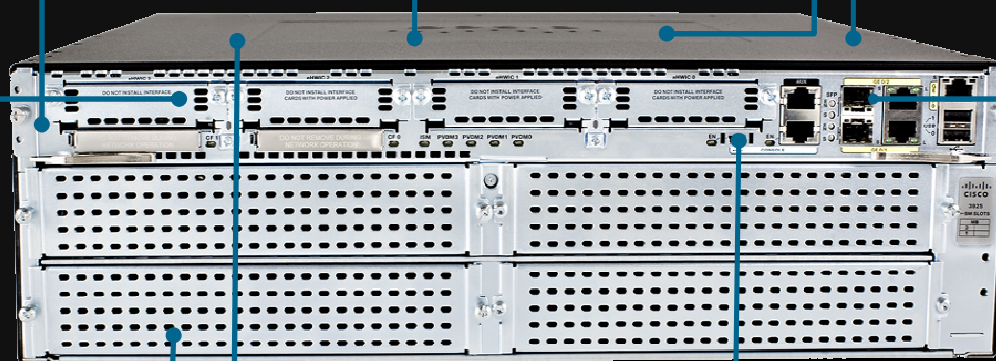
- 3x-7x increase in service module performance
- Existing NM support through adapter
- EPoE capable

Internal Services Module

- 3x increase in service module performance
- Configurable power savings mode
- 802.11n Option on 19xx

USB

- Console over USB
- Convenience storage
- Security credentials



Cisco 800 Series

Integrated Services Routers



	890	880G	880	860
10/100/1000 WAN	✓			
10/100 WAN		✓	✓	✓
ADSL2/2+ WAN		✓	✓	✓
VDSL WAN		✓	✓	
G.SHDSL WAN		✓	✓	
LAN Interfaces	8x 10/100	4x 10/100	4x 10/100	4x 10/100
802.11n (a/b/g/n)	✓			
802.11n (b/g/n)		✓	✓	✓
SRST (4 users)			✓*	
3G Wireless		✓		
Backup	V.92 modem or ISDN BRI	3G or ext. modem	ISDN BRI or ext. modem	ext. modem

* SRST available with 10/100 or G.SHDSL WAN

Secure Mobility Platform

- Very small offices, Cisco Virtual Office (teleworkers)
- Up to 15 Mbps WAN Access with Security
- Fixed configurations:
Pick your:
 1. WAN interface(s)
 2. 802.11 Wireless (Y/N)
 3. SRST* (Y/N)
 4. Backup Interface

Cisco 1900 Series

Integrated Services Routers



	1941W	1941
SM Slots	0	0
ISM Slots	Fixed 802.11n Radio	1
EHWIC Slots	2	2
Onboard WAN Ports	2 GE	2 GE
Onboard DSP Slots	0	0
Default Flash	256 MB	256 MB
Default DRAM	512 MB	512 MB
Form Factor	2RU	2RU

Secure Mobility Platform

- 25Mbps WAN Access with Services
- Factory selectable Integrated wireless 802.11n option
- Desktop form factor with Double Wide HWIC Support

Cisco 2900 Series

Integrated Services Routers



	2951	2921	2911	2901
SM Slots	2	1	1	0
ISM Slots	1	1	1	1
EHWIC Slots	4	4	4	4
Onboard DSP Slots	3	3	2	2
Onboard WAN Ports	3 GE (1 SFP)	3 GE (1 SFP)	3 GE	2 GE
Default Flash	256 MB	256 MB	256 MB	256 MB
Default DRAM	512 MB	512 MB	512 MB	512 MB
Form Factor	2RU	2RU	2RU	1RU

Secure Collaboration Platform

- Up to 75Mbps WAN Access with Services
- Video-ready DSP support
- Increased service density with Second Services module Slot
- 12 Inch Depth on 2911

Cisco 3900 Series

Integrated Services Routers



	3945	3925
SM Slots	4	2
ISM Slots	1	1
EHWIC Slots	4	4
Onboard DSP Slots	4	4
Field Upgradeable Motherboards	SPE-150	SPE-100
Integrated Redundant PS	Yes	Yes
Onboard WAN	3GE (2 SFP)	3GE (2 SFP)
Default Flash	256MB	256MB
Default DRAM	1 GB	1 GB
Form Factor	3RU	3RU

Scalable Rich-media Services Platform

- Up To 150Mbps WAN Access With Services
- Upgradeable services performance engine (SPE) for future expansion
- Configurable dual Integrated Redundant Power supplies
- 2x Default Memory

Borderless Branch

New ISR G2 Platforms

Cisco 3925E, 3945E

- New Services Performance Engine 200s:
- Up To 350Mbps WAN Access With Services
- High Scale UC Services



Cisco 1921

- Small form factor – modular platform
- Supports wide range of WAN and LAN interfaces



Cisco 887, 887V, 888E

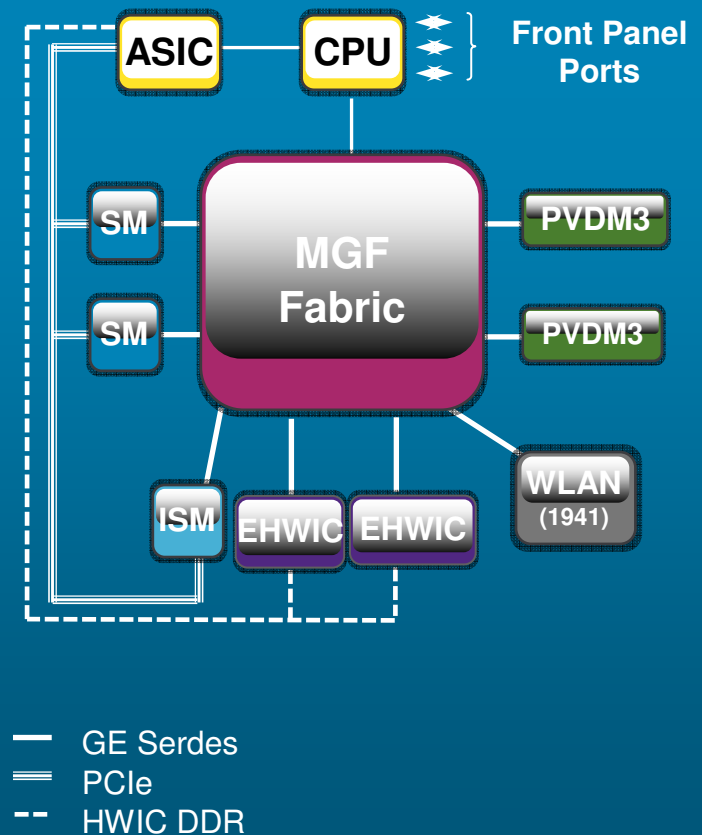
- Integrated 3G + VDSL
- Remote Management (3G MIB)
- Ethernet over SHDSL
- VoIP Support over 3G



High Performance Solutions
for Rich Media Services Delivery

Introducing The Multi Gigabit Fabric (MGF)

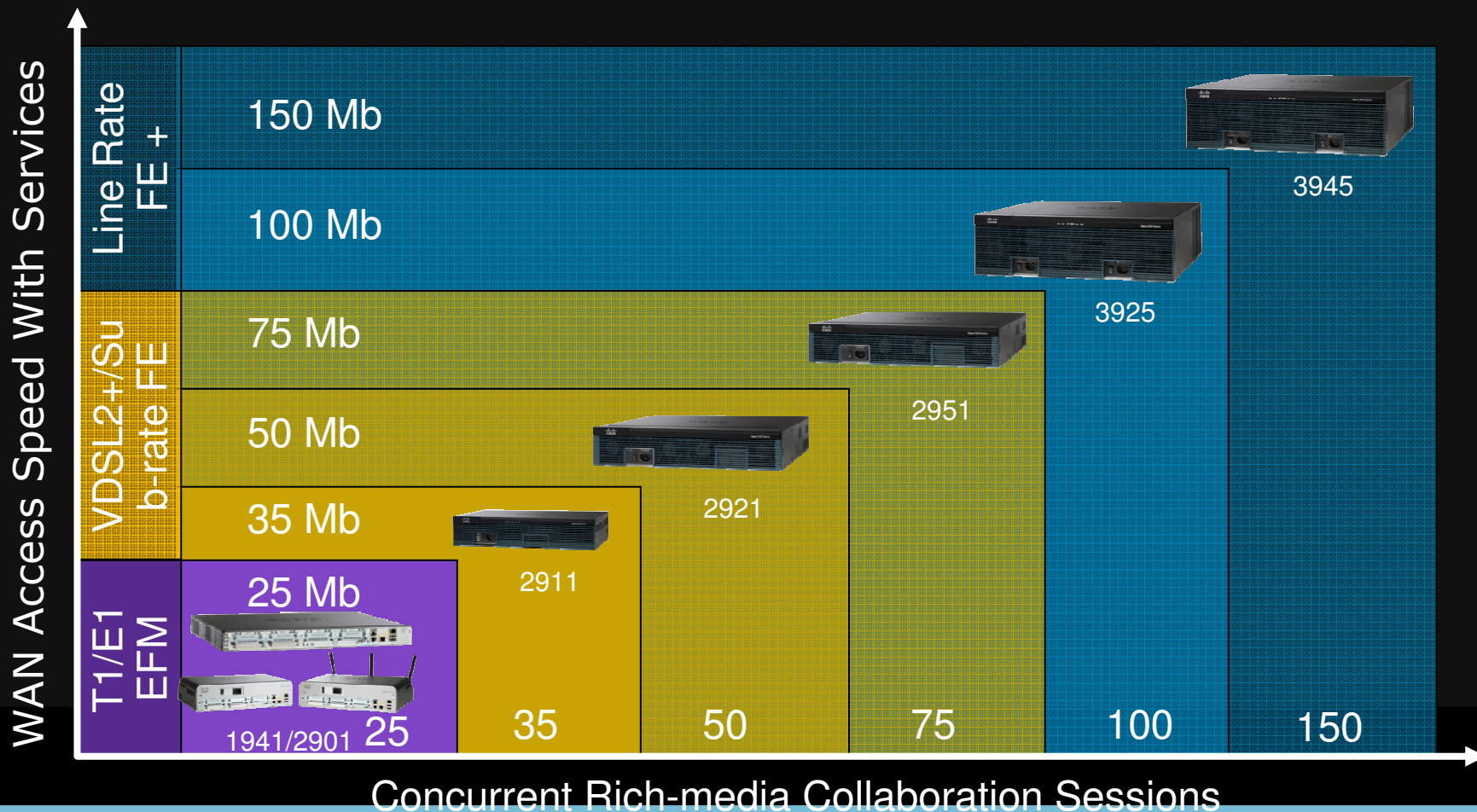
- Superior scalability by providing direct high-performance connectivity between services and modules
 - Provides connectivity between EHWICs, PVDM3s, SMs and ISMs through the backplane
- Offload the CPU when providing connectivity to internal modules or between services
 - There will be no CPU involvement when providing the service integration and traffic redirection as mentioned above
- Legacy interface modules do not benefit from the MGF and connect directly to the system CPU



Note: Not all possible modules are shown

ISP C2 Performance Positioning

WAN Access and Collaboration



Platform Module Slot Evolution

WIC

Supports VIC,
VWIC



NM



AIM



HWIC

Supports WIC,
VWIC, VIC



NME,EVM

Supports NM,
NME-X,NME-XD



AIM



PVDM2



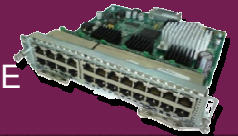
EHWIC

Supports WIC,
VWIC, VIC



SM

Supports NM,NME



ISM



PVDM3

Supports PVDM2
Via Adapter Card



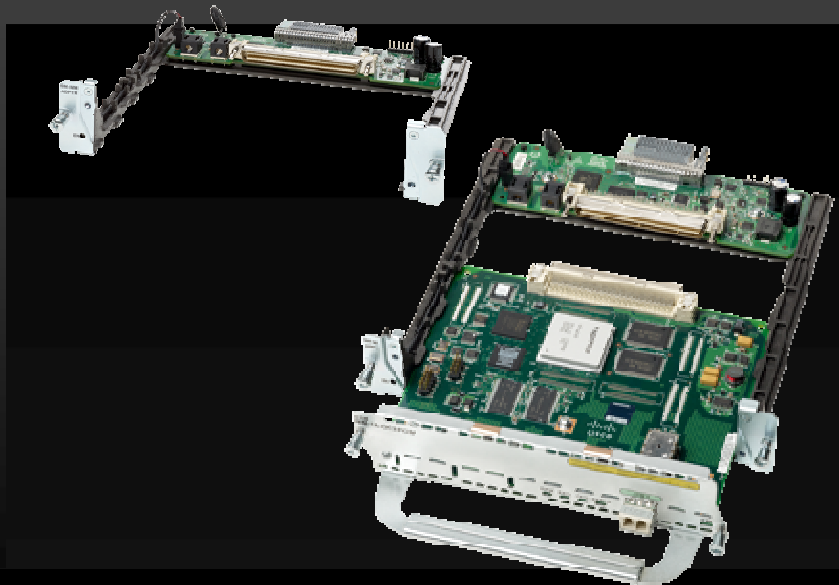
Pre-ISR

ISR

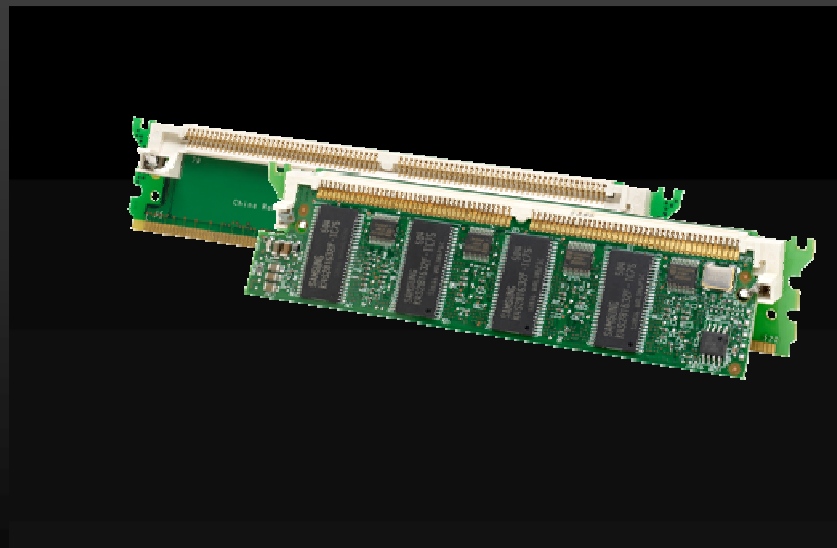
ISR G2

Adapters

- Maximize investment protection, while allowing for platform evolution
- Provide maximum interface coverage at platform FCS



**NM to
SM Adapter**

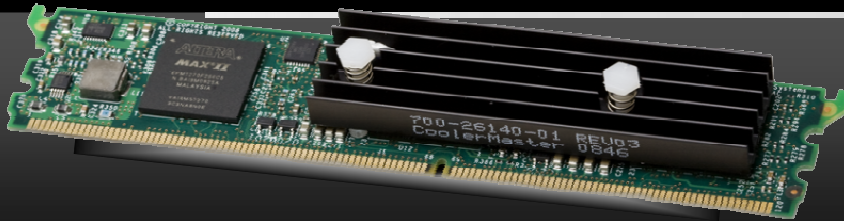


**PVDM2 to PVDM3
Adapter**

PVDM3 DSPs

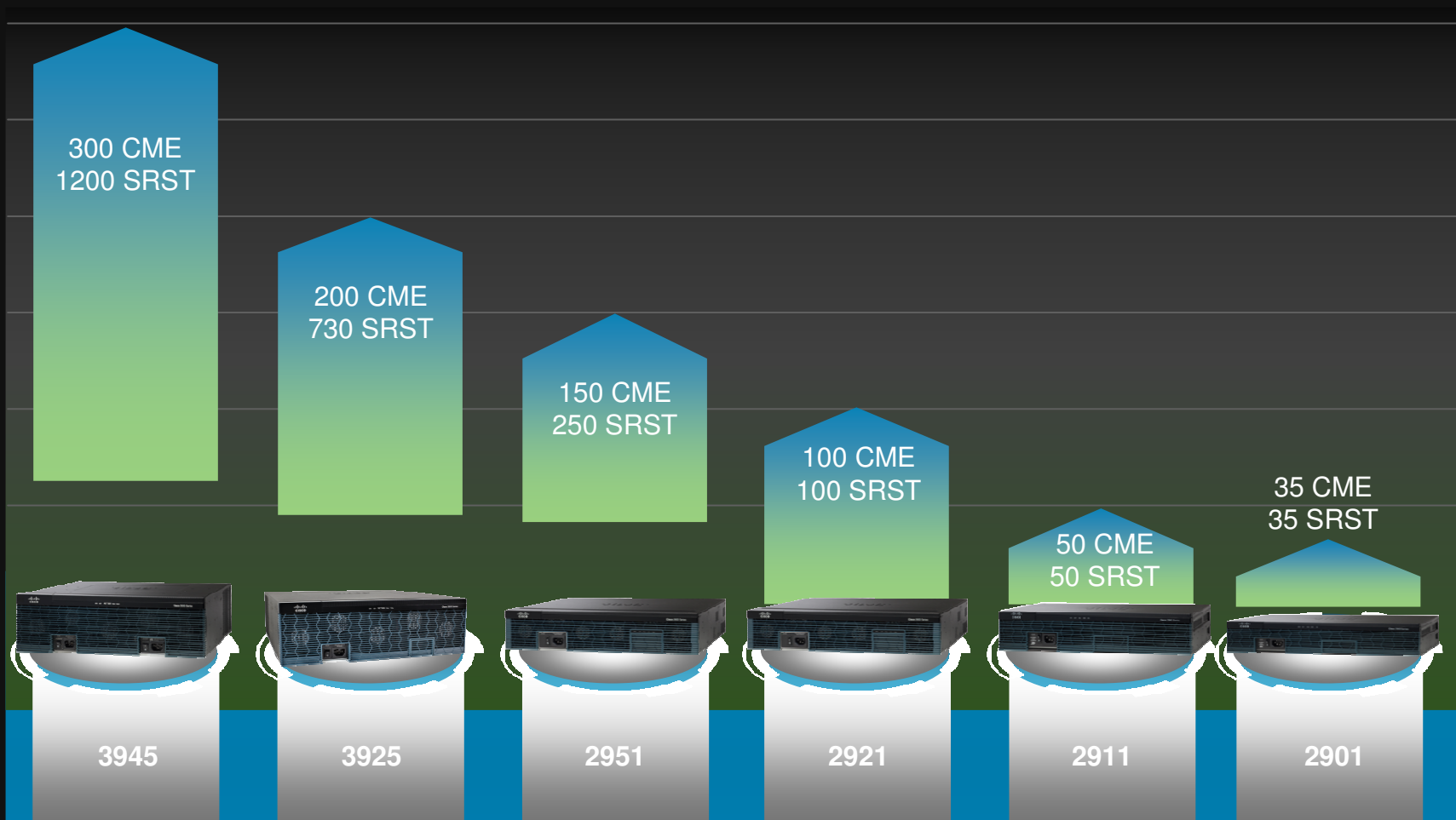
- All PVDM3 SKUs supported on all Cisco 2900 and 3900 series platforms
- Up to 4X voice channel density per slot
GE backplane interface with for increased IP throughput
- Enhanced multi-core DSP architecture optimized for rich-media UC applications
- Feature parity with the PVDM2s
- Video feature ready
- Migration enabled by support for the co-existence of PVDM2, PVDM2-DM and PVDM3 on the Cisco 2900 and 3900 series platforms

PVDM3 SKUs	G.711 Channels
PVDM3-256	256
PVDM3-192	192
PVDM3-128	128
PVDM3-64	64
PVDM3-32	32
PVDM3-16	16

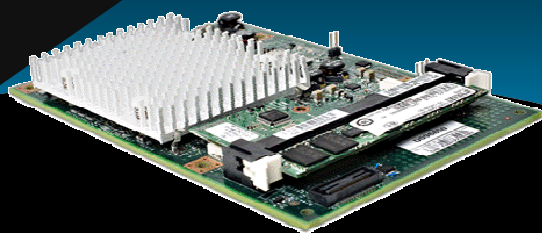


Video Ready DSP

Unified Communications Max User Counts



ISR Generation 2 Services Ready Engines (SRE)



Internal Service Module (ISM)

Single Core x86
512MB RAM, 4GB Flash

Available on 1941 & above—Selected Services



Service Module (SM)

Dual Core High Performance x86
2–4GB RAM, 500GB–1TB HDD

Available on 2811 and above—Full Range of Services

Up to 7x Performance Improvement Compared to Previous Generation

Support for EnergyWise®—Reduces Power Consumption,

High Capacity Storage, RAID Capable and FRU Disks—Enable HA Deployments

Integrated Management, Troubleshooting, on-board HW Diagnostics Tool

Flexible “Service Ready” Deployment Model

- Deploy HW with router—SW can be deployed remotely saving truck roll costs
- Available Services: Application eXtension Platform, Cisco Unity Express
- Roadmap: WAAS, Wireless LAN Controller, Video Surveillance, Network Analysis, Server Virtualization, Windows Server

ISR G2 Services Portfolio

Network and Security Services

Collaboration Services

Compute Services and Applications

Network Services

Network and Physical Security

Unified Communications

Application Infrastructure

Industry Applications



Branch IT Infrastructure and Management

- Cisco Wide Area Application Services (WAAS)
- Cisco Wireless LAN Controller (WLC)
- Cisco Network Analysis Module
- Infoblox core network services on AXP



Secure, Protect, Compliance

- Cisco Video Surveillance
- Cisco Intrusion Prevention System



High-performance Communication and Collaboration

- Cisco Unity® Express (Voicemail, IVR)
- NICE Voice Recording on AXP
- Sagem Interstar Fax over IP on AXP
- SingleWire Informacast on AXP



Consolidate Branch Servers and Applications

- Cisco Application Extension Platform (AXP)
- Cisco Integrated Storage System
- Industry standard virtualization
- Windows Server

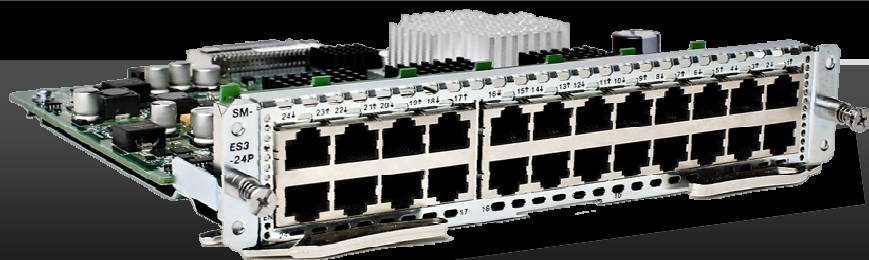


Customized Vertical Solutions

- Tiani Medical Data Exchange on AXP
- Global Protocols Skipware on AXP

New Enhanced EtherSwitch Service Modules (ESM)

- 16, 24, and 48 ports of GE or FE LAN
- Feature parity with Catalyst 3560-E and 2960
- Local Line-rate Layer 2/3 switching
- Supports Cisco EnergyWise for green IT
- Integration with MGF for LAN traffic performance optimization between modules, with no impact on CPU/WAN performance
- Integrates the latest enterprise switch features into the router, with the same features and configurations that are in the headquarters
- Industry Leading Power Over Ethernet
 - Enhanced POE (ePOE) Up to 20 watts per port
 - Takes advantage of 2900/3900 increased power levels offering up to 1040 watts per chassis
 - Per port autosensing and configuration of power levels
- Industry leading security and authentication
- Auto Smartports for plug and play port configuration



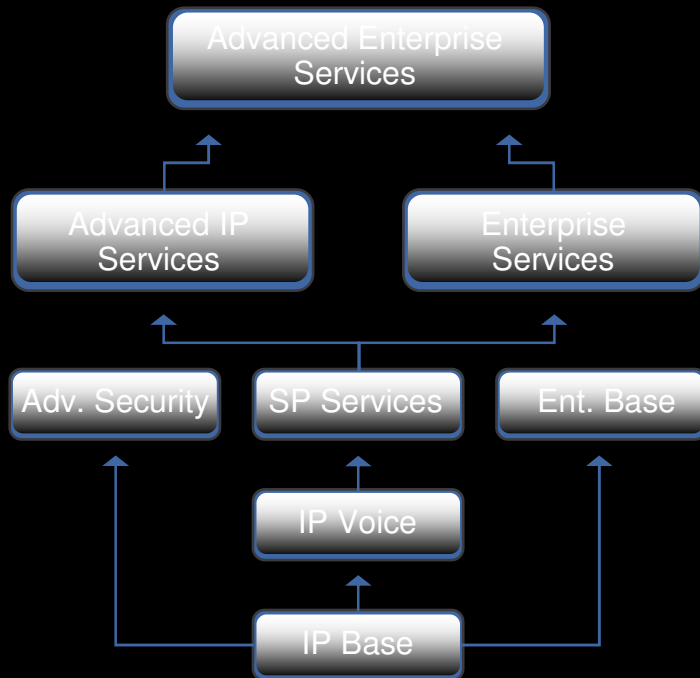
Gigabit Ethernet



IOS Software Evolution

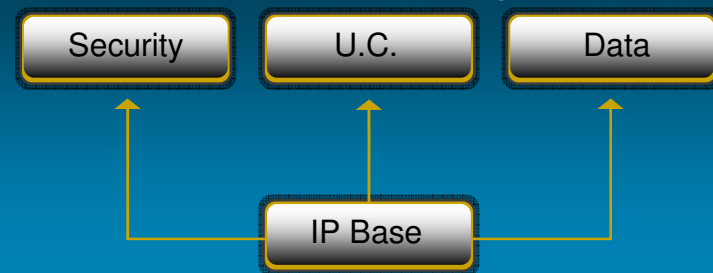
IOS Software Packaging Evolution Summary

Current



New

Universal Image



○ Simplified Software Management

A single IOS Universal Image will ship with all ISR G2 platforms

Four IOS enforceable licenses enable full suite of functionality that were previously offered in eight images

○ Less Costly Software Upgrades

IOS feature upgrades can be done by enabling a new license key, reducing the need for truck-roll to remote offices

○ Enable Development of New Software Based Business Models

Services on Demand—purchase upgrades as you need them via Cisco licensing

Right to Use Feature Licences

- SSLVPN
- Intrusion Prevention (S)
- Content Filtering (S)

- MLPP
- LMR [Land Mobile Radio]
- CME: Voice and Video (C)
- SRST : Voice and Video (C)
- VXML/IVR Gateway (C)
- CUBE[IPIP Gateway] (C)
- CUBE[IP Trunk] (C)

- CUBE [Gatekeeper] (C)

- SNA switch

- IKE v1 / IPsec / PKI
- IPsec/GRE
- Easy VPN w/ DVTI
- DMVPN
- Static VTI
- Firewall
- Network Foundation Protection
- GETVPN

- TDM/PSTN Gateway
- Video Gateway[H320/324]
- Voice Conferencing
- Cod ec Transcoding
- Secure Voice/ SRTP
- RSVP Agent (voice)
- FAX T.37/38
- CAC/QOS
- Hoot-n-Holler

- MPLS BFD RSVP
- L2VPN
- L2TPv3
- Layer 2 Local Switching
- Mobile IP
- Multicast Authentication
- FHRP—GLBP
- ISIS IPv6 OSPFv6
- ISIS IPv6 OSPFv6
- IP SLAs PfR NTPv4
- DECnet ALPS
- AppleTalk RSRB BIP
- DLSw+ FRAS
- Token Ring
- ISL IPX STUN
- SNTD SDLC QLLC
- LAT

SEC

UC

Data

IP Base

AAA BGP, OSPF, EIGRP, ISIS, RIP PBR IGMP, Multicast DHCP HSRP,
GLBP NHRP HTTP HQF QoS ACL, NBAR GRE CDP, ARP NTP PPP
PPPoA PPPoE RADIUS TACACS SCTP SMDS SNMP STP VLAN DTP IGMP Snooping
SPAN WCCP ISDN ADSL over ISDN NAT - Basic X.25, RSVP, Flexible Netflow

When available an IPV6 feature will follow IPV4 of same feature.

New Model

- Each device is loaded with a universal IOS image
- A Software Activation License enables specific functionality
- Each SAL is unique to a particular device

A Feature Set is purchased via a “Product Activation Key” (PAK)

Product ID + Serial Number +
PAK = Software Activation License

- New devices are shipped with the Software Activation License pre-installed
- New functionality can be “switched on” with a new SAL

Simply order a PAK for the desired Feature Set



Summary Review

What's New with Cisco ISR G2?

Cisco ISR		Cisco ISR G2
Up to 45 Mbps with Services	WAN Performance	
Single	Network processor	
X with 160GB	Service Module	
	Performance and Capacity	
	Onboard DSPs	
	Switch Modules	
	IOS Images	
	Service Delivery	
	Redundancy	
	Energy Efficiency	



Up to 5X the Performance. Similar price points.



Borderless access Catalyst 3750-X, 3560-X, 2960-S

Introducing Catalyst 3750-X & 3560-X

Innovation Leadership: What's New

- 24/48 10/100/1000 ports
- Seamless upgrades from 4x1G to 2x10G
No special hardware required, just replace the optics
- StackPower Technology – Industry First
Distributes power in the stack where it is needed
- Dual Field Replaceable Power Supplies/Fans
Switch can be upgraded and serviced in the field
- TrustSec Enabled
Provides advanced authentication and adds encryption on user-facing ports
- Full 802.3at PoE+ Support
Standards based power delivery up to 30 watts per port supporting next-generation high-power devices
- Enhanced Limited Lifetime Hardware Warranty
NBD delivery where available
90-day 8x5 TAC support

New



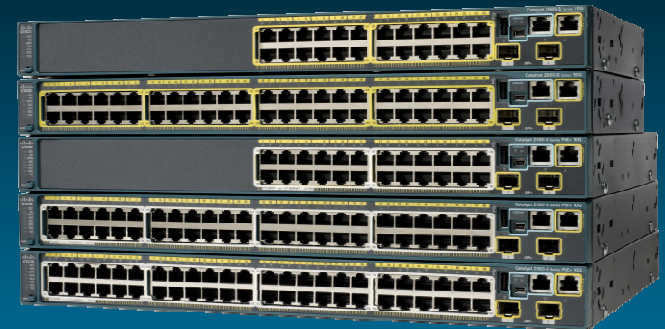
- **3 Software Options: LAN Base, IP Base, IP Services**
Flexible software features and lower entry level pricing

Introducing Catalyst 2960-S

Mainstream Features in a Cost Optimized Platform

- 24/48 10/100/1000 ports with fixed uplinks
- Fixed Uplink Options: 4x1G or 2x10G SFP+
10 Gigabit Ethernet in a cost optimized platform
- 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
- Cisco Online Diagnostics & Onboard Fault Logging
Hardware innovations that deliver preventative early fault detection
- Enhanced Limited Lifetime Hardware Warranty
NBD delivery where available
90-day 8x5 TAC support

New



▪ **LAN Lite and LAN Base Software Options**

- **LAN Lite option provides entry-level Gig-E platform**

Key LAN Lite vs LAN Base Highlights

Key LAN Lite vs LAN Base Highlights

Catalyst 2960, 2960-S



Functionality	LAN Lite	LAN Base
Layer 2	<ul style="list-style-type: none"> • Entry-level Access Layer 2 Basic L2 access features including 802.1Q trunking, (M)STP, STP extensions, CDP, DTP, UDLD, VTPv2, PAGP/LACP, LLDP, Storm control 	<ul style="list-style-type: none"> • Enterprise Access Layer 2 Wide range of L2 access features for enterprise deployments, including FlexLinks, VTPv3, LLDP MED
Layer 3	<ul style="list-style-type: none"> • No Routing Support Support for L3 management interface 	<ul style="list-style-type: none"> • No Routing Support Support for SVI with no IP routing support
Manageability	<ul style="list-style-type: none"> • Entry-level Manageability Express Setup, Cisco Device Manager, SNMPv3 (w/crypto), RMON, SPAN, TDR, Auto Smart Ports, Smart Install client 	<ul style="list-style-type: none"> • Basic Manageability Support for a wider range of MIBs, IPSLA Responder, RSPAN
Security	<ul style="list-style-type: none"> • Entry-level Access Security SSH v2 server, SSL, HTTPS, SCP, TACACS+, RADIUS, Port Security, 802.1x (w/ Guest VLAN), MAB, Private VLAN Edge 	<ul style="list-style-type: none"> • Enterprise Access Security DHCP Snooping, IPSG, DAI, PACLs, Cisco Identity 4.0, NAC and 802.1x features
QoS	<ul style="list-style-type: none"> • Entry-level Access QoS Ingress and egress queuing, Scheduling, Priority queuing, SRR 	<ul style="list-style-type: none"> • Enterprise Access QoS Ingress policing, Trust Boundary, AutoQoS, DSCP mapping

Note: LAN Base feature set includes all LAN Lite features.

LAN Base vs. IP Base and IP Services Highlights

New

**Catalyst® 3750-X
and Catalyst 3560-X**



**Catalyst 3750 and Catalyst
3560, Including E and X Series**



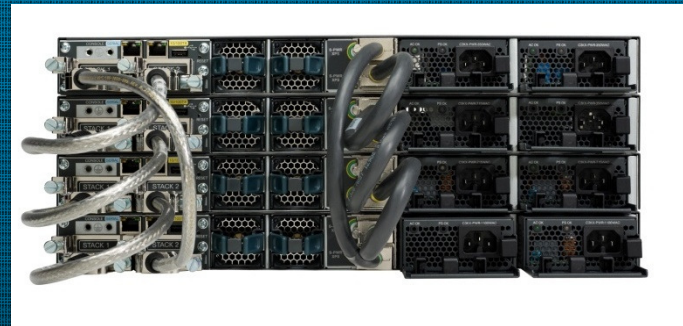
Functions	LAN Base	IP Base	IP Services
Layer 2+	<ul style="list-style-type: none"> • Enterprise access Layer 2 Wide range of Layer 2 access features for enterprise deployments 	<ul style="list-style-type: none"> • Complete Access Layer 2 Supports all Cisco Catalyst 2000 and Catalyst 3000 Layer 2 features, including hot standby protocols; supports Cisco StackPower™ technology (Cisco Catalyst 3750-X) 	
Layer 3	<ul style="list-style-type: none"> • No routing support Support for SVI with no IP routing support 	<ul style="list-style-type: none"> • Enterprise access Layer 3 RIP, static and stub PIM, and EIGRP 	<ul style="list-style-type: none"> • Complete access Layer 3 OSPF, EIGRP, BGP, IS-IS VRF-lite, WCCP, and PBR
Manageability	<ul style="list-style-type: none"> • Basic manageability Support for a wide range of MIBs, IPSLA Responder, and RSPAN 	<ul style="list-style-type: none"> • Enterprise access Layer 3 Gold-Lite and Smart Install Director 	<ul style="list-style-type: none"> • Complete access Layer 3 EEM and IPSLA Initiator
Security	<ul style="list-style-type: none"> • Enterprise access security DHCP Snooping, IPSG, DAI, PACLs, Cisco Identity 4.0, NAC and 802.1x features 	<ul style="list-style-type: none"> • Complete access security Router and VLAN ACLs, private VLANs, complete identity and security, TrustSec SXP, and IEEE 802.1AE (Cisco Catalyst 3560-X and Catalyst 3750-X) 	
QoS	<ul style="list-style-type: none"> • Enterprise access QoS Ingress policing, Trust Boundary, AutoQoS, and DSCP mapping 	<ul style="list-style-type: none"> • Complete access QoS Support for all Cisco Catalyst 2000 and Catalyst 3000 QoS features, including per-VLAN policies 	

Note: IP Services feature set includes all IP Base features. IP Base feature set includes all LAN Base features.

StackWise Plus vs. FlexStack

Ease of Operations

- **Catalyst 3750-X StackWise Plus**
 - High performance – 64G stacking
 - Non Stop, Self Healing – seamless recovery
 - Unified management, control & data plane
 - Bandwidth optimization – dynamic ring load balancing
 - Traffic prioritization – Built in QoS
 - Up to nine switches in a stack
- **Catalyst 2960-S FlexStack**
 - Module with two wire-speed 10G ports
 - Unified management, control & data plane
 - Up to four switches in a stack



When
the Network
KNOWS

You Have
MORE OPTIONS

Catalyst 2960-S FlexStack - Details

- Not a ring Architecture. Packets traverse stack Hop by Hop
- Local switching of unicast packets
- Not switched to Stack ports unnecessarily
- Proprietary header of 32Bytes pre-pended on all stack packets
- Packet path determined using “OSPF” like algorithm based on Ingress member.

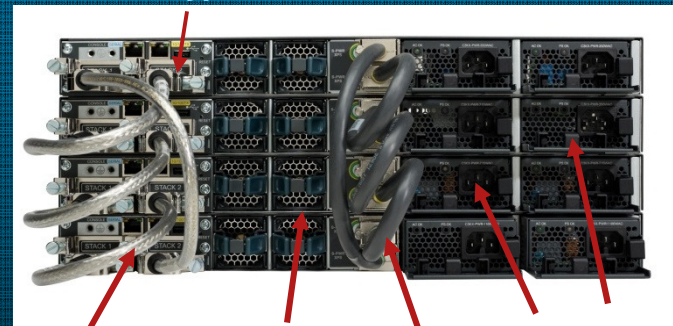
StackPower

Industry
Leadership

Ease of Operations And High Availability

- Adaptable – “pool of power” across the stack
- Flexibility and sustainability with zero to 2.2kW per switch
- Intelligent power shedding – turn off low priority PDs
- Supports mix of AC/DC power supplies in a stack
- “Zero-footprint” RPS deployment

Console, 10/100 port
& USB type A



StackWise+ FRU Dual Redundant Fans Dual Power supply

StackPower

When
the Network
KNOWS

Your Productivity
Is ENHANCED

StackPower

Capabilities Overview

Switch A

Full POE on 48-ports 740w PoE
Need = 986w

Switch B

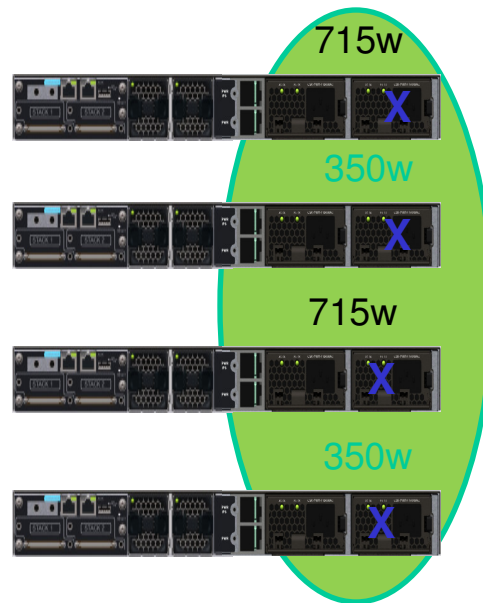
48-ports, Data Only,
Needs 246w

Switch C

Full POE+ on 48-ports 1,440w PoE
Needs 1,686w

Switch D

48-ports, Data Only,
Needs 246w



Power requirements:

$$246w * 4 + 740 + 1440 = 3,172w$$

$$\text{Available Power} = 2,130w$$

$$\text{Deficit} = 1,042w$$

Options:

1) Add one 1,100w PS slot B of any switch to cover the deficit.

2) Add two 1,100w PS to any two switches in slot B to cover 1,042w deficit plus 1,100w for redundancy. Extra capacity for zero-footprint RPS functionality.

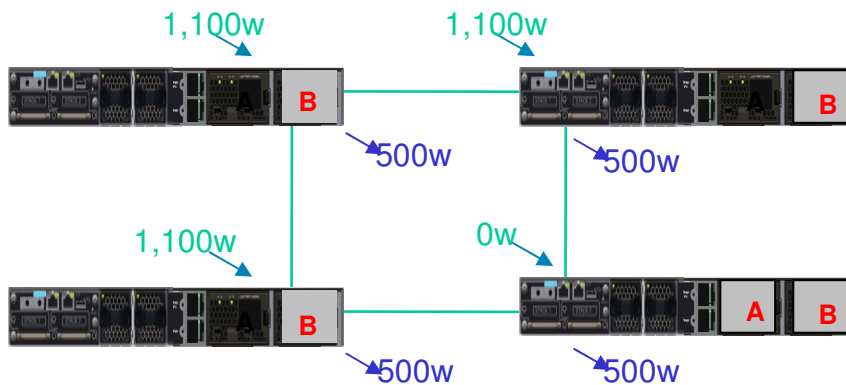
Note capability to boot up a switch that doesn't have a PS and even provide PoE+ on that switch.

Stackpower can provide complementary power as well as Redundant power depending on requirements and configuration.

StackPower Modes

Power share, Redundant, RPS modes

Power Sharing mode

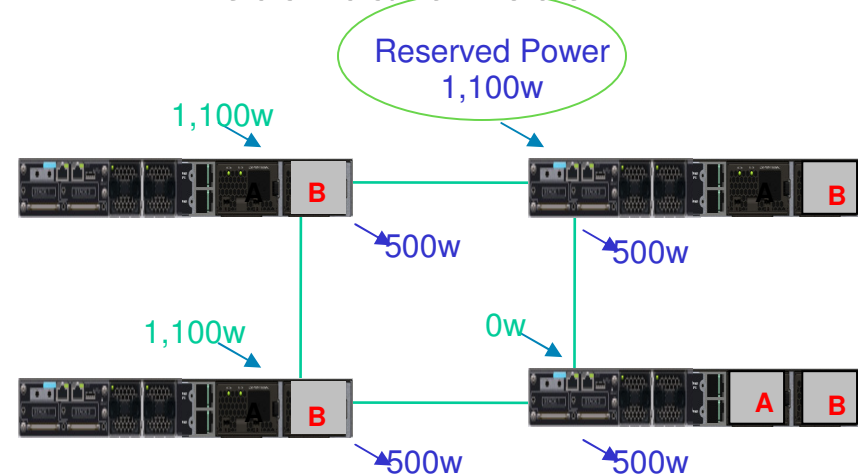


Available Pwr	Allocated Pwr	Unused Pwr
3,300 W	2,000 W	1,300 W

Entire available power of 3,300w is available to the system.

Switch and PD requests for more power is granted until all 3,300w are used. No redundancy

Redundant mode



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

Overall capacity is 3,300w – 1,100w is reserved for redundancy.

Available Power to share is 2,200w and there is an extra 200 W available for allocation.

Should a PS fail, then the reserved power is made available for the stack.

StackPower Modes & Topology

Power Share, Redundant Modes, & RPS mode

The Catalyst 3750-X supports **Power share, Redundant, & RPS modes**

Includes power sharing across Cat3750X switches

Ring & Star topologies

Ring is Stackpower & Star is XPS

XPS (future availability) can Not be deployed in a Ring topology

The power shelf can not be part of a Stackpower ring

The Catalyst 3560-X ONLY supports RPS mode with an XPS

In the Star Topology, a XPS must be the hub

Up to nine switches can be connected to the power shelf

Either Catalyst 3750-X, Catalyst 3560-X or a combination of switches.

XPS detects Catalyst 3750-X Vs. Catalyst 3560-X

Positioning Cisco Warranty and Service Options

Service Element	Warranty	Cisco® Smart Foundation	Cisco SMARTnet® Service
Duration of Coverage	As long as the original End User continues to own or use the Product, provided that: fan and power supply warranty is limited to five (5) years.	Renewable 1-, 3-, and 5-year contracts	Renewable 1 year and multi-year contracts, depending on product family
Cisco Technical Assistance Center (TAC) Support	LLW: Not included E-LLW: Business hours access for 90-days	Business hours access to SMB TAC (access levels vary by region)	24x7 coverage
Online Support / Web Access	Unregistered access only	Available through Smart Foundation Portal	Direct 24x7 registered access
Advance Hardware Replacement	LLW: 10 business days* E-LLW: Next business day**	Next business day as available, otherwise same day ship	Next business day, 8x5x4, 24x7x4, 24x7x2 delivery options as available
On-site Support	No	No	SMARTnet Onsite service options available

•Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working after receipt of the RMA request. Actual delivery times may vary depending on Customer location.

** Where next business day delivery is available, Cisco will use commercially reasonable efforts to ship a replacement for next business day delivery provided Cisco's determination of the hardware failure has been made before 3 p.m. depot time. If a request is made after 3 p.m. depot time, Cisco will ship the advance replacement on the next business day. Actual delivery times may vary depending on Customer location.

