



# The Borderless Network The Integrated Services Routers Generation 2 **Transforming your Branch Experience**

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# Agenda

**Borderless Network Overview**

**Integrated Services Router Generation 2 Overview**

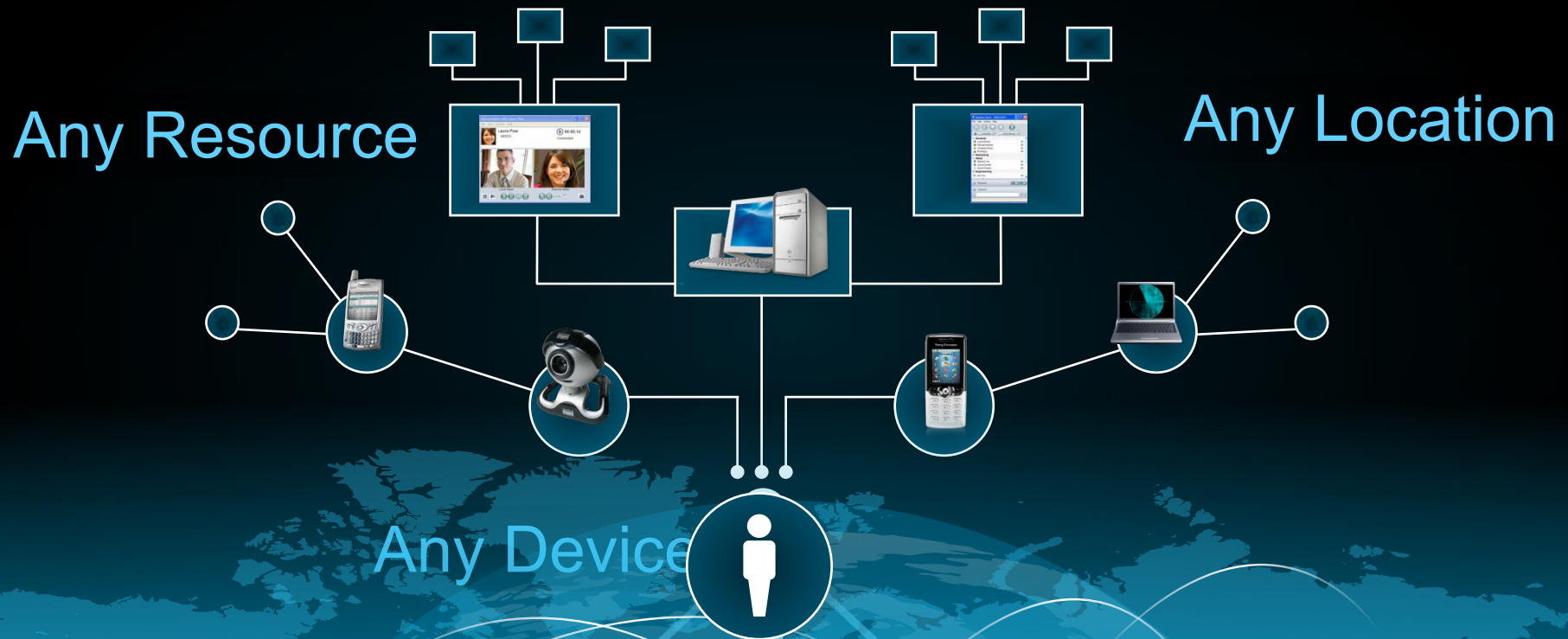
**Collaboration, Services Virtualization, Security**

**Operational Efficiency**

**Software Delivery Model**



# The Transformation: The World Is Our New Workspace



## The **BORDERLESS NETWORK**

A Next Generation Architecture to Deliver  
the New Workspace Experience

# Borderless Networks

## New Business Architecture Approach



- Accelerate growth by integrating **innovations** into the business process—bringing interactions faster to the customer.



- Harness Video as the agent of change to realize closer customer contact, enhance **customer experience** and customer loyalty.

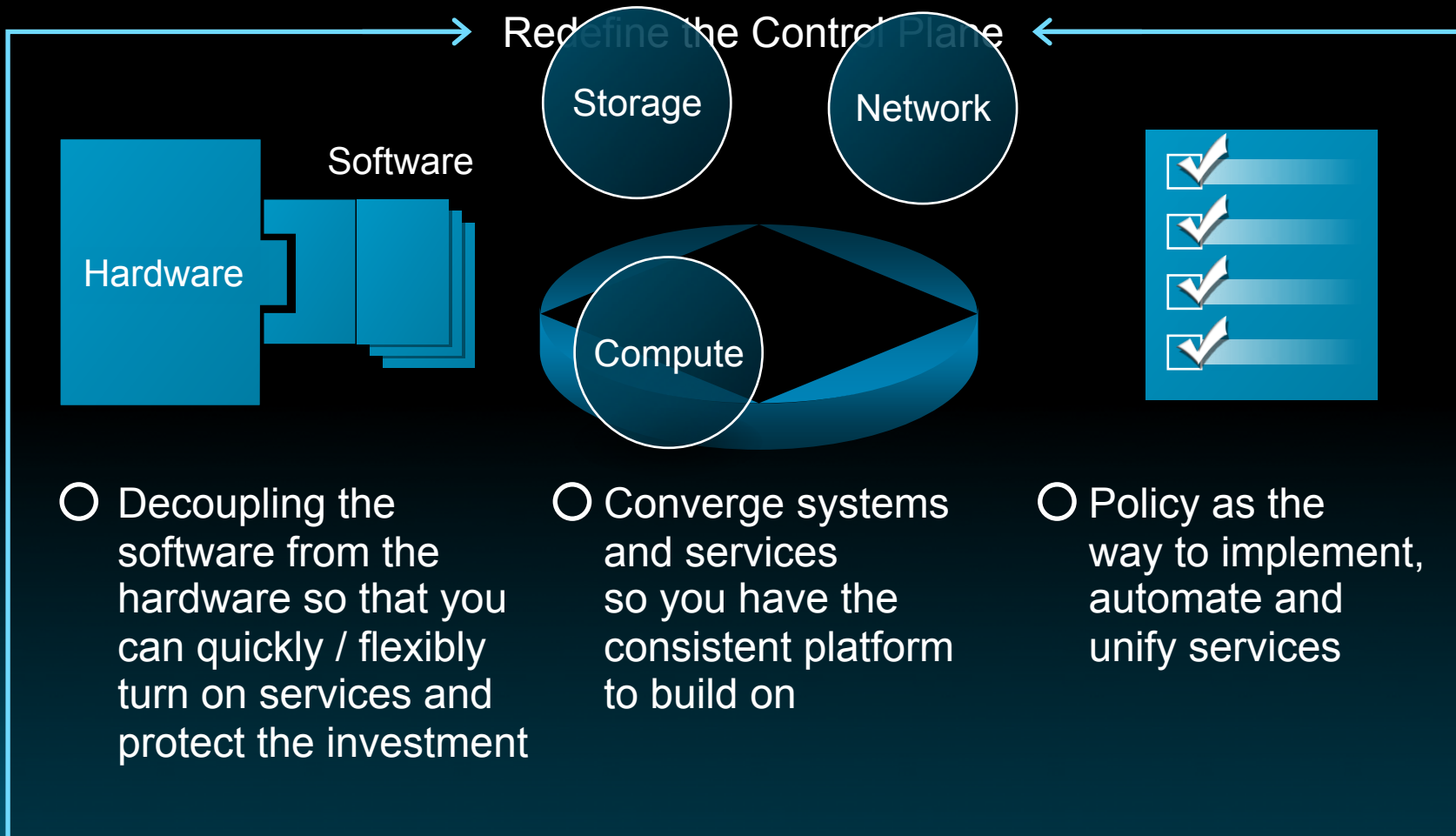


- Transform the workspace experience and increase productivity. Automate business processes to **drive down costs**.

Connect More Closely with Your Customer, Partner, Workforce

# Borderless Networks

## New Technical Architecture Approach



# Borderless Branch

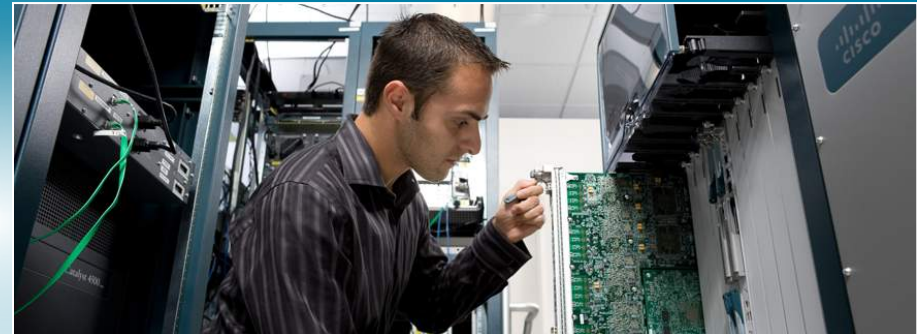
## 17% Growth Projected by 2010

### Workspace Experience



- Drastic increase in video adoption. 75% organizations strive for increased productivity via video

### Operational Efficiency



- Centralized Data and Distributed Interactions are driving operational simplicity, cost savings and ROI

## Branches Are the Windows to Customer Experience



Bank



Retail Store



Clinic



Classroom

# Borderless Branch with ISR G2



## Video-Ready

- Rich-media applications
- High performance
- Application optimization

Customer  
Experience



## Service Virtualization

- Services “On-Demand”
- Customized Applications
- Cloud extension

Business  
Innovation



## Operational Excellence

- Greener technology
- Operational Simplicity
- Rapid ROI with Investment Protection

Lowest  
TCO



# Integrated Services Routers Generation 2 Overview

# Introducing: Cisco Integrated Services Router Generation 2

Performance, Scalability, Availability

860, 880, 890



Virtual Office



1941, 1941W



Secure Mobility



Customizable Applications



2901, 2911,  
2921, 2951



Secure Collaboration



3925, 3945



Scalable Rich-Media Services



← Enhancing the Customer Experience →

# 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/VVIC/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 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



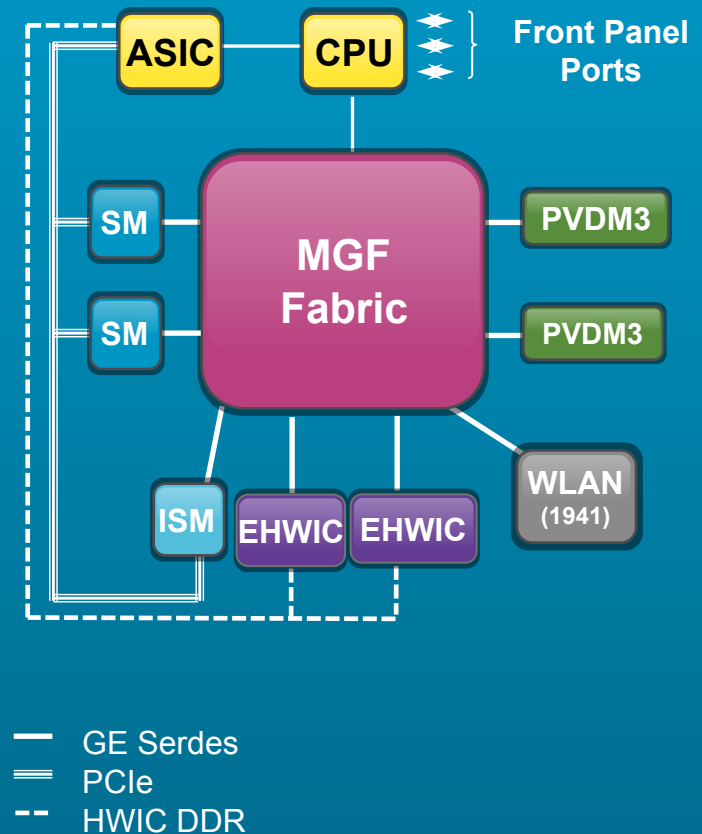
	3945	3925
SM Slots	4	2
ISM Slots	1	1
EHWIC Slots	4	4
Onboard DSP Slots	4	4
Field Upgradeable Motherboards	SPE-150	SPE-100
Integrated Redundant PS	Yes	Yes
Onboard WAN	3GE (2 SFP)	3GE (2 SFP)
Default Flash	256MB	256MB
Default DRAM	1 GB	1 GB
Form Factor	3RU	3RU

### 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

# Introducing The Multi Gigabit Fabric (MGF)

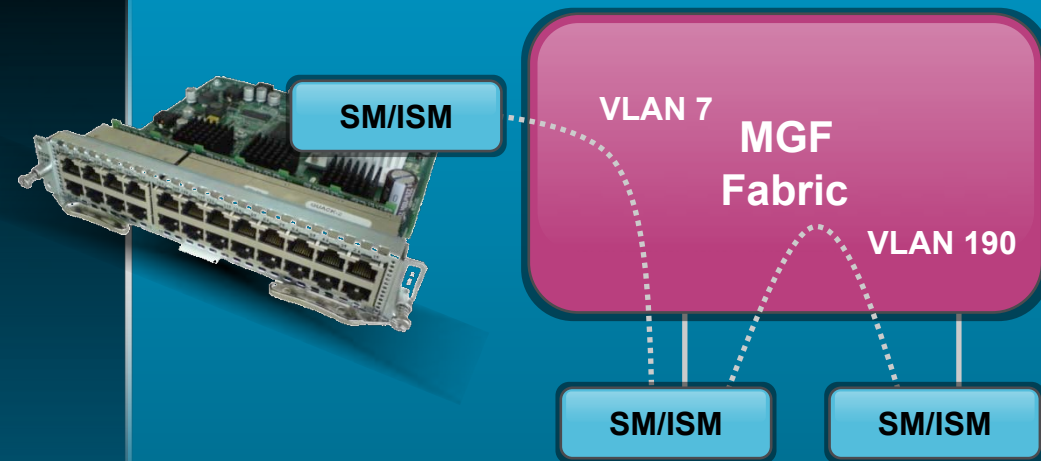
- Superior scalability by providing direct high-performance connectivity between services and modules
  - Provides connectivity between EHWICs, PVDM3s, SMs and ISMs through the backplane
- Offload the CPU when providing connectivity to internal modules or between services
  - There will be no CPU involvement 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

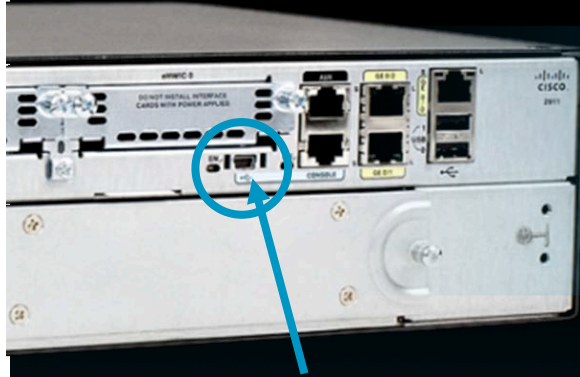
# VLAN Connect for Intra Chassis Module Interconnect

- VLAN connect enables traffic in a certain VLAN from one Module to be directed to another Module
- Multiple VLANs can be connected from the source module



Model	3945	3925	2951	2921	2911	2901	1941
VLAN Connection	11	7	7	5	5	3	3

# USB Console



New Type B mini USB Console Port

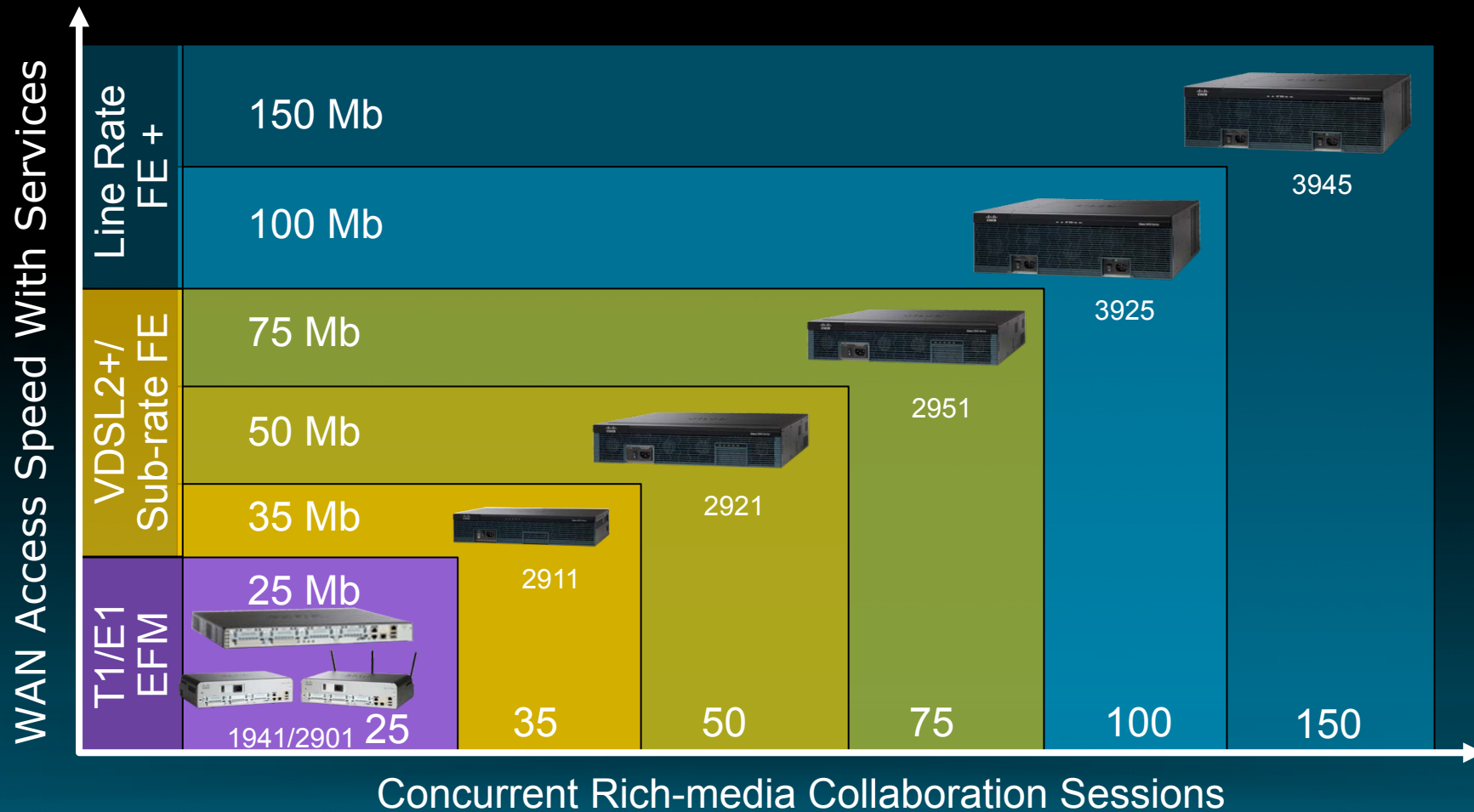
- Any Mini USB cable is supported
- As an environmental measure, Cisco no longer ship console cables by default. \*

- Enables use of a Mini USB cable for console access in addition to the Cisco console cable
- Mini USBs are commonly used for cell phones and digital cameras and offers a more flexible console access by not being limited to the Cisco console cable
- **Only one console can be active at a time; USB cable always takes precedence**

\* Console cables in shipment of new router are an option that need to be configured at time of ordering

# ISR G2 Performance Positioning

## WAN Access and Collaboration



# Service Modules and Interface Cards

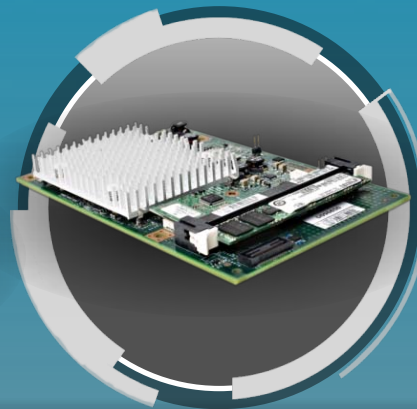
Interface Cards  
(WAN or LAN)



**EHWIC**

Enhanced High Speed  
WAN Interface Card

Internal Module for  
Running Services  
That Don't Require  
Interface Ports,  
Dedicated CPU  
and Memory

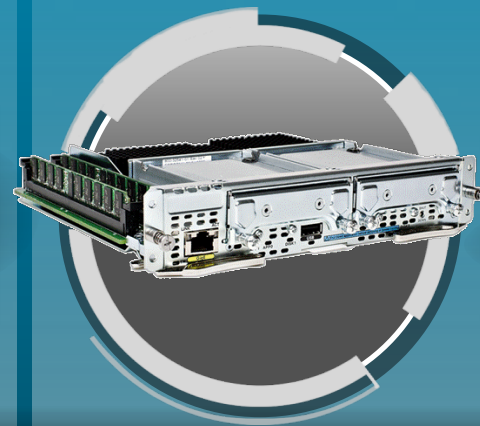


**ISM**

Internal Service  
Module

Independent CPU  
and Memory for  
Hosting Services *or*  
High Density  
Interface Ports.

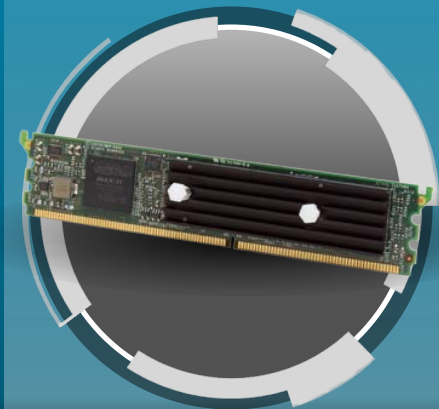
Examples: Wireless LAN  
Controller, WAN  
Optimization, Etherswitch  
Module



**SM**

Service  
Module

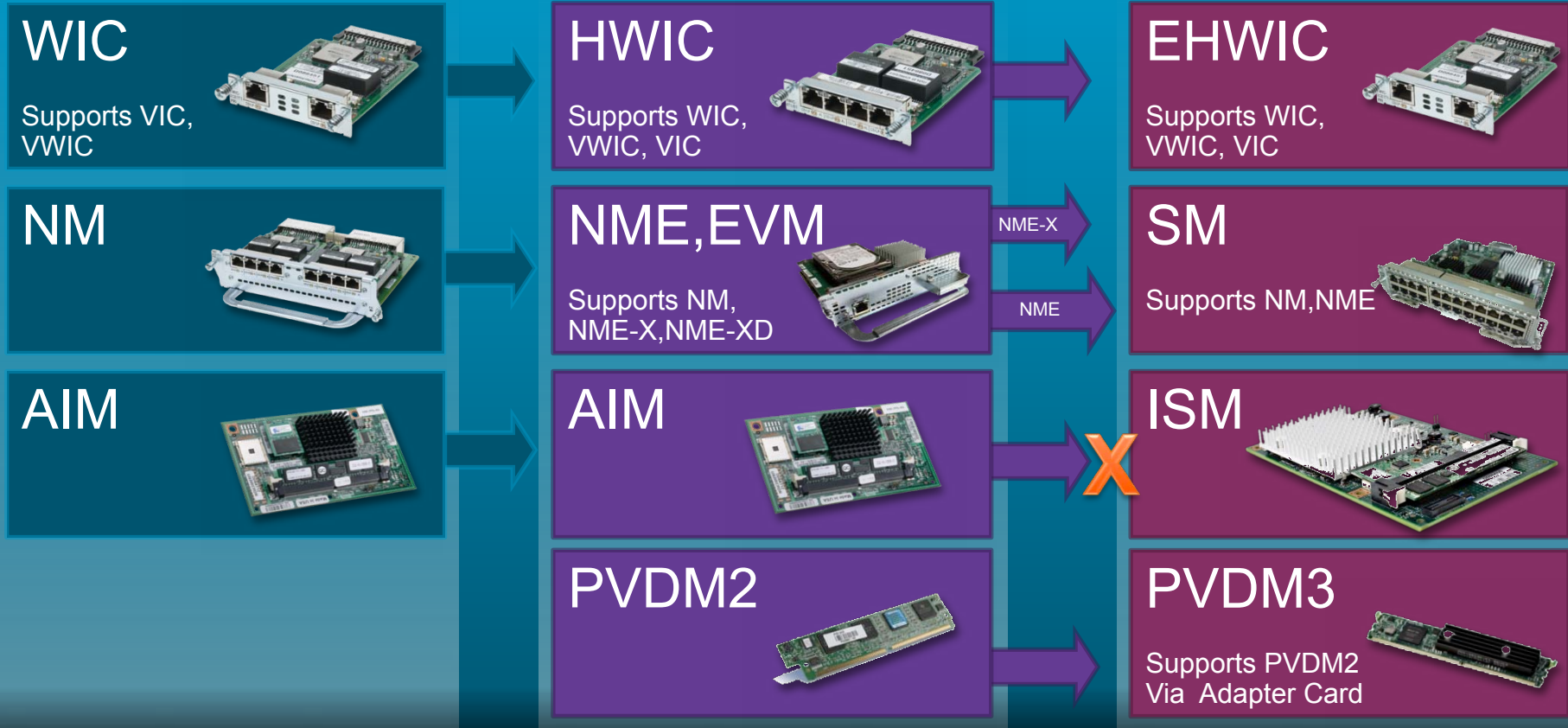
High Density  
Rich-Media Voice  
and Video DSP  
Modules



**PVDM3**

Packet Voice/  
Data Module

# Platform Module Slot Evolution



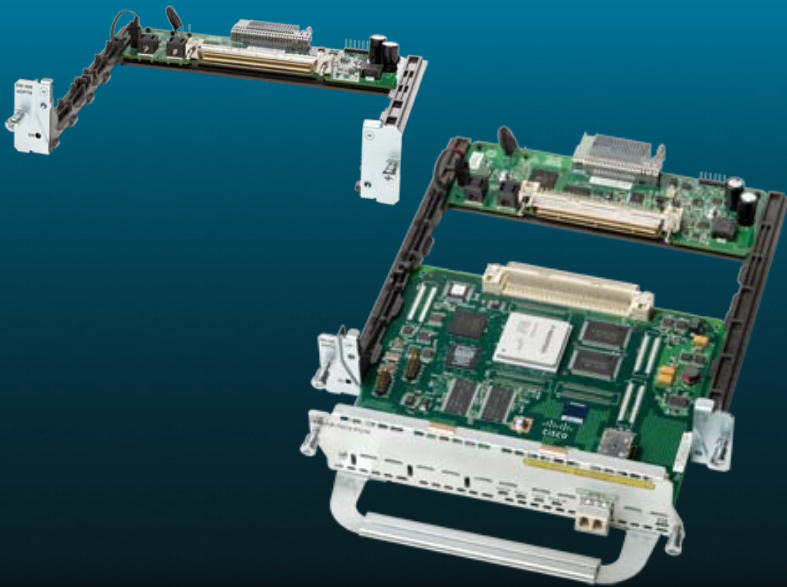
**Pre-ISR**

**ISR**

**ISR G2**

# Adapters

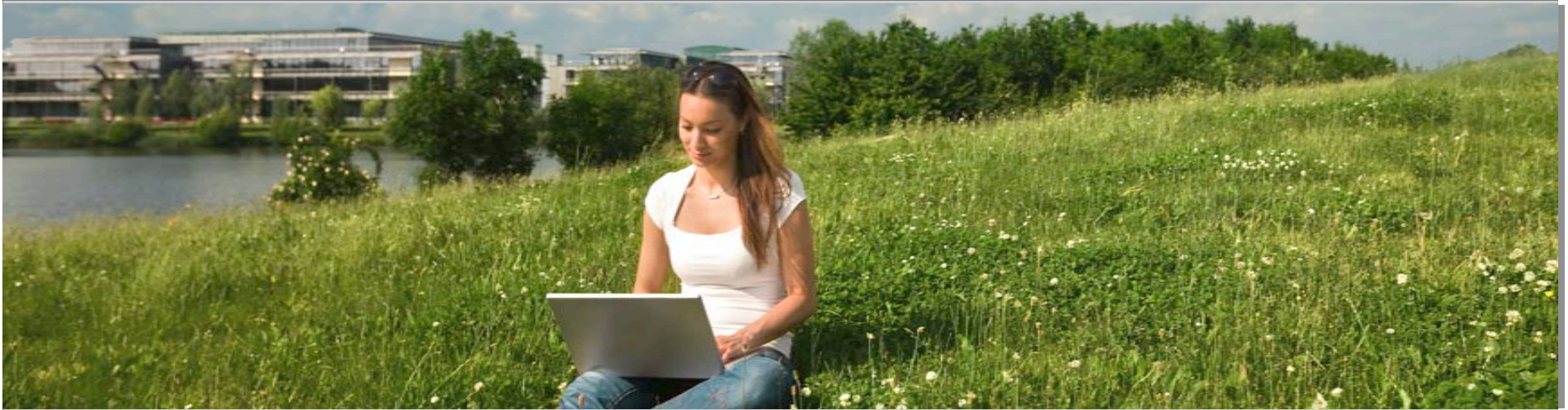
- Maximize investment protection, while allowing for platform evolution
- Provide maximum interface coverage at platform FCS



**NM to  
SM Adapter**



**PVDM2 to PVDM3  
Adapter**



Collaboration , Services Virtualization, Security,

# Video-Ready



## Rich-media Services with Medianet

- Video-Ready Media Engine (PVDM3)
- Scalable audio-conferencing
- Increased Video Storage (Up to 1TB per module)
- Multi-Gigabit Fabric for hi-performance connectivity
- WAN Optimization and Application Acceleration

Superior Customer Experience  
with up to 150 Concurrent Rich-Media Collaboration Sessions



Telepresence  
to Mid-Size  
Branch Offices



Secure IP Video  
Surveillance



High-scale Webex  
and desktop video  
collaboration



Streaming  
video / Digital  
Signage

# PVDM3 DSPs

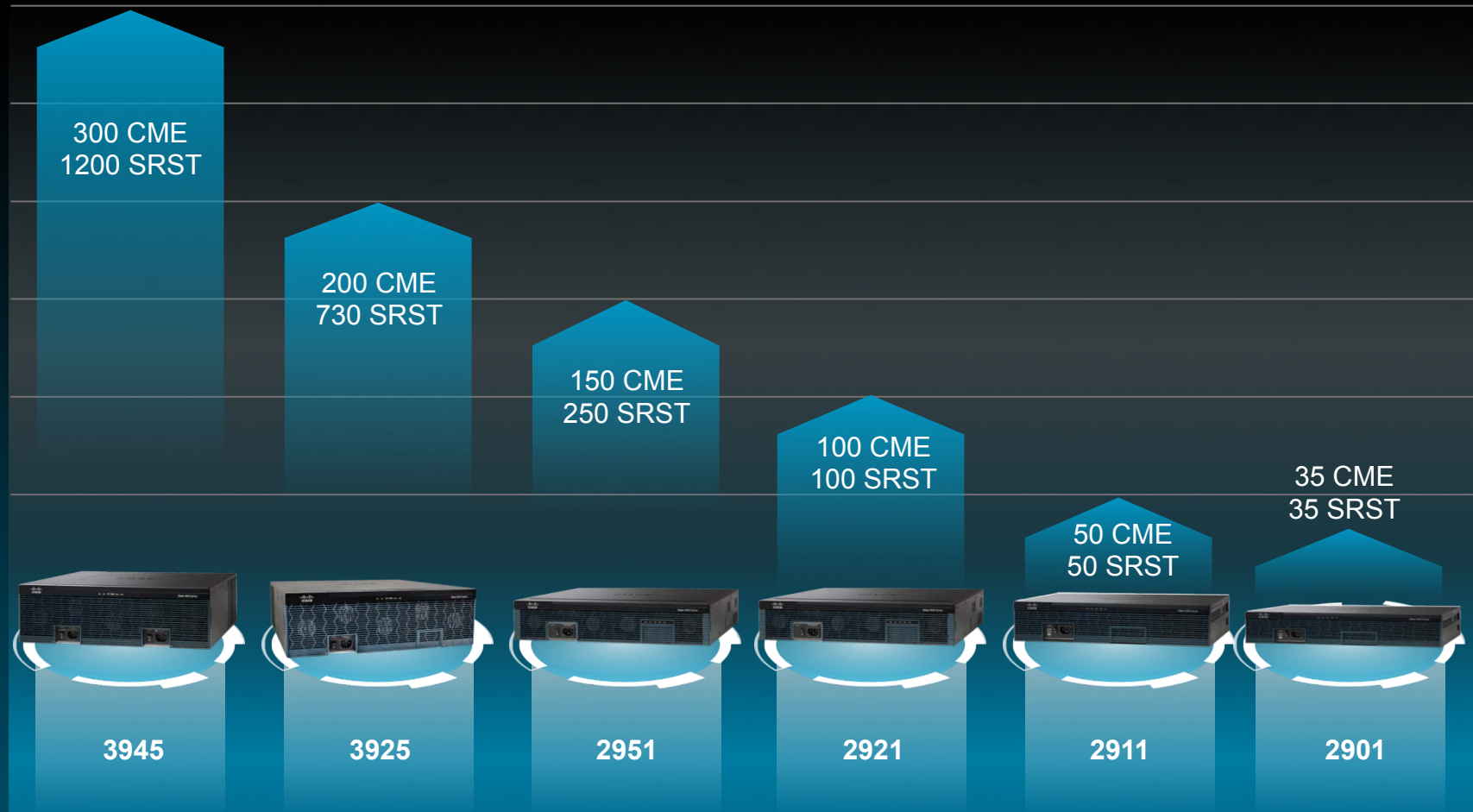
- All PVDM3 SKUs supported on all Cisco 2900 and 3900 series platforms
- Up to 4X voice channel density per slot
  - GE backplane interface with for increased IP throughput
- Enhanced multi-core DSP architecture optimized for rich-media UC applications
- Feature parity with the PVDM2s
- Video feature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

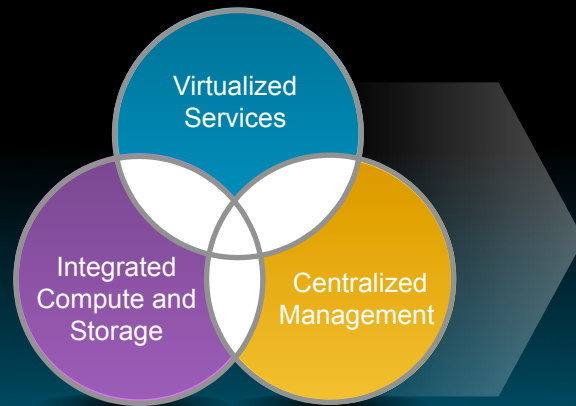


**Video Ready DSP**

# Unified Communications Max User Counts



# Service Virtualization



## Cisco Services Ready Engine

- Service modules with integrated compute & storage in small, router integrated footprint
- Range of virtualized services and applications to meet branch needs
- Centralized deployment and management of services with flexibility to change without truck rolls

## Any Service, Any Branch, Any Where



Network and  
Collaboration  
Services

Optimized Branch  
Experience



Custom  
Applications for  
any Deployment

Network-aware Lean  
Applications



Industry Standard  
Server  
Virtualization

Server Consolidation



Cloud / Data  
Center  
Survivability

Business Continuity

# Virtual Service Delivery Model

## Virtualized Services

### Cisco Network & Collaboration Services

WAN Optimization  
Voice Mail  
Video Surveillance  
Network Analysis  
WLAN Control  
Etc.

Or

### Compute Services & Third Party Applications

Application Extension Platform (AXP)  
General Purpose Server with Virtualization  
Windows Services  
Vertical applications  
Etc.

## Management

Central Management for Remote Provisioning

### Third Party\* Server Management Tools

Server Lifecycle Management

Application Management

### CiscoWorks Tools

Deployment and Provisioning of virtualized services

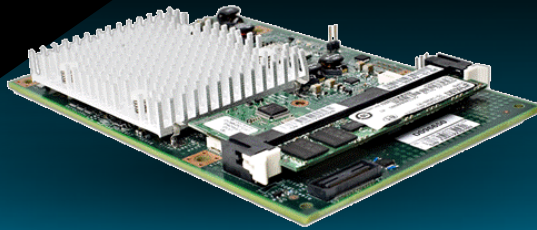
Domain specific management

## Integrated Compute and Storage Hardware

Services Ready Engines—ISM or SM

\* Roadmap

# 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 2911 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

### Network Services



#### 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

### Network and Physical Security



#### Secure, Protect, Compliance

- Cisco Video Surveillance
- Cisco Intrusion Prevention System

## Collaboration Services

### Unified Communications



#### 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

## Compute Services and Applications

### Application Infrastructure



#### Consolidate Branch Servers and Applications

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

### Industry Applications



#### Customized Vertical Solutions

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

# Security for the Borderless Branch



## Secure collaboration with video integration

- Integrated IPsec acceleration
- One touch PSIRT update
- Advanced Management and Instrumentation
- Hardened Foundational security, Compliance
- Up to 5X performance increase over the ISRs

## Comprehensive, Secure Services for the Borderless Branch



Secure Cloud  
Computing  
Architecture



Secure Unified  
Mobile  
Architecture



Secure  
Connectivity with  
Cisco TrustSec



Advanced  
Security  
Services

# Secure Mobility



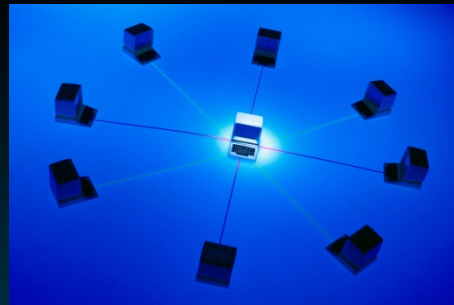
## High-performance mobility and wireless solutions

- Integrated 802.11n Unified Wireless Network Architecture
- Enterprise Class 3G Wireless WAN Solution
- Secure, Scalable, Centralized Mgmt. & Monitoring of Wireless LAN and Wireless WAN
- Wireless WAN Optimization and Application Acceleration

## Converged wired and wireless networks for Borderless Mobility



User Mobility & Guest Access



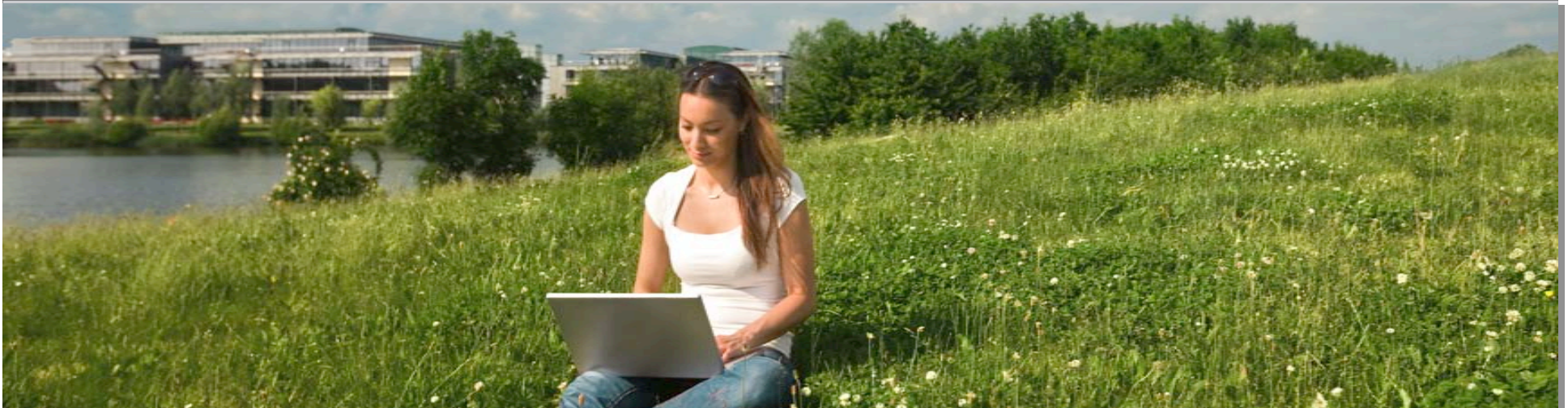
Broadest range of wireless devices



Reduce OPEX with Remote Management



Seamless Redundant Connectivity = Business Uptime



# Operational Excellence

# Operational Excellence



## Operational Efficiency through Innovation

- Remote deployment, management and monitoring
- Gigabit Ethernet Switching Modules with Enhanced POE
- EnergyWise Support with configurable slot controls
- Field upgradeable motherboard for performance growth
- Increased redundancy across portfolio
- Single Universal IOS Image with Cisco IOS 15.0(1)M

## New Business Innovations Drive Lowest TCO



Operational  
Simplicity—No  
Truck Rolls!



Energy Efficiency  
and Savings



Hardware Re-usability  
with Investment  
Protection



Business  
Uptime

# New Enhanced EtherSwitch Service Modules (ESM)

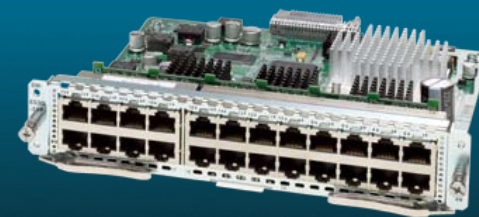
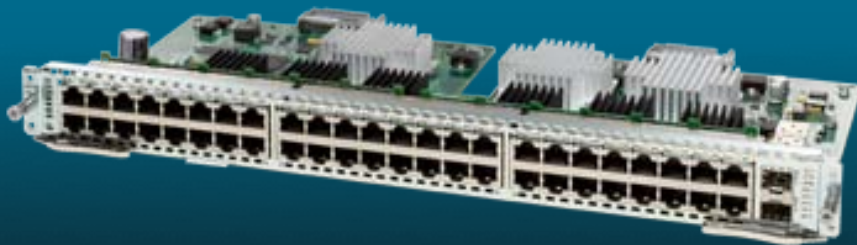
- 16, 24, and 48 ports of GE or FE LAN
- Feature parity with Catalyst 3560-E and 2960
- Local Line-rate Layer 2/3 switching
- Supports Cisco EnergyWise for green IT
- Integration with MGF for LAN traffic performance optimization between modules, with no impact on CPU/WAN performance
- Integrates the 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



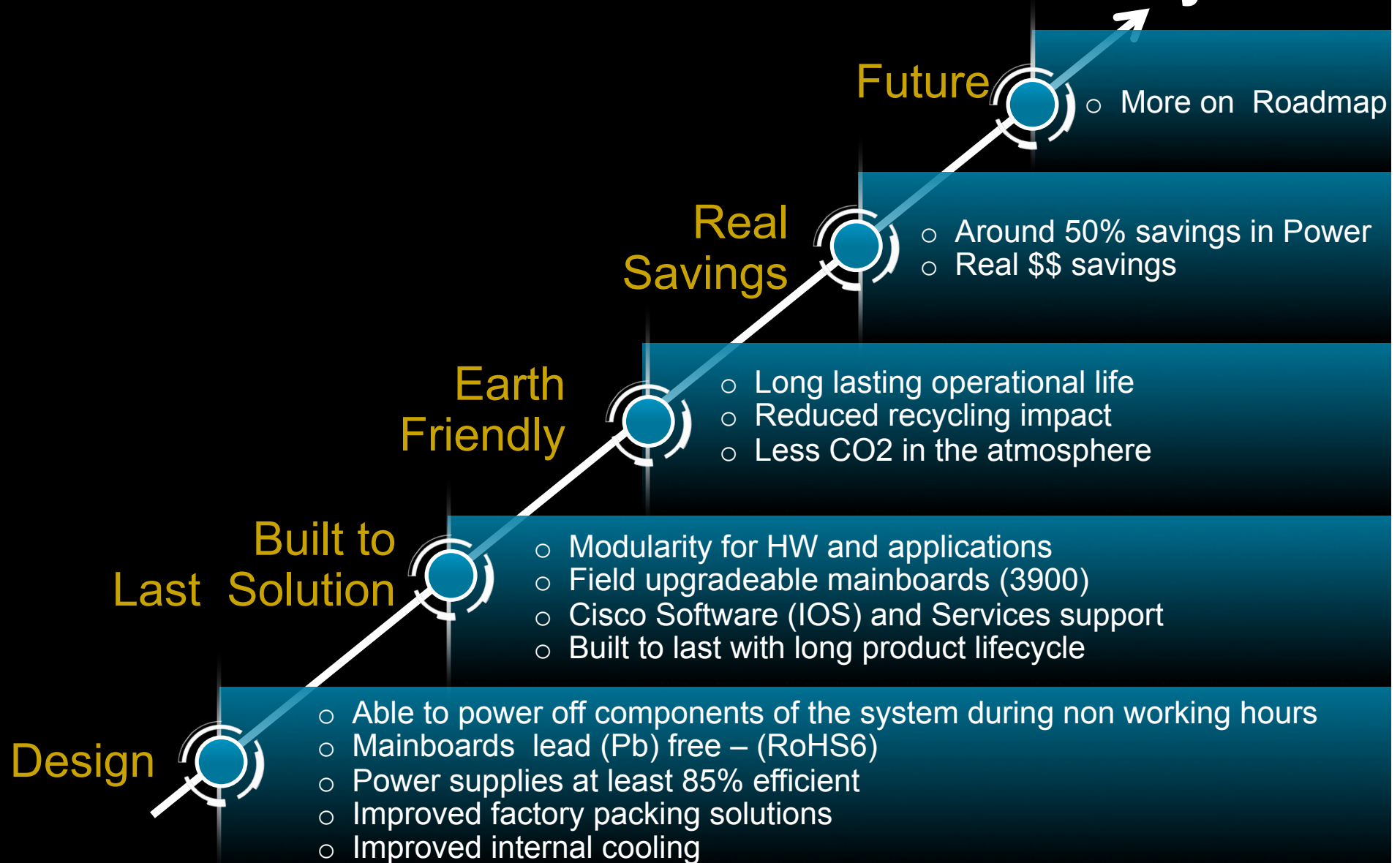
**Gigabit Ethernet**

# Switch Types

Model	Layer	FE Ports	GE Ports	SFP	POE	Width
SM-D-ES3G-48-P	L2/L3		48	2	Yes	Double
SM-D-ES3-48-P	L2/L3	48	1	2	Yes	Double
SM-ES3G-24-P	L2/L3		24		Yes	Single
SM-ES3-24-P	L2/L3	23	1		Yes	Single
SM-ES3G-16-P	L2/L3		16		Yes	Single
SM-ES3-16-P	L2/L3	15	1		Yes	Single
SM-D-ES2-48	L2	48	1	2		Double
SM-ES2-24-P	L2	23	1		Yes	Single
SM-ES2-24	L2	23	1			Single
SM-ES2-16-P	L2	15	1		Yes	Single



# ISR G2—Earth and Customer Friendly

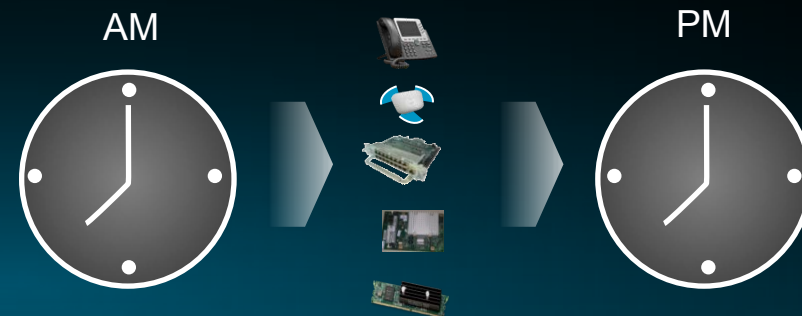


# Power Management Modules and Scenario

## Support Available in:

- ISM (SRE)
- SM (SRE—EtherSwitch)
- PVDM3
- EHWICs

Policy : 12 Hours on per Working Day



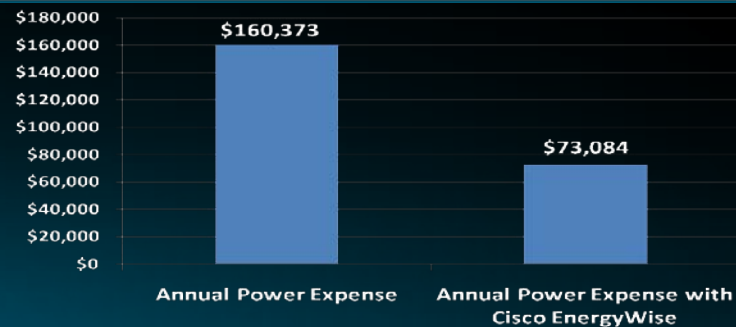
	Hours	Days	Hours	Total
ON	Working days Mon-Fri	251 (x 12h)	3012	5748
OFF	Working days Mon-Fri	251 (x 12h)	3012	
OFF	Weekends	104 (x 24h)	2496	
OFF	Holidays	10 (x 24h)	240	
Total		365	8760	8760







66% of the  
Time It  
Could Be  
Off

# Energy Efficiency = Real Results



## 5 Year Results



Per Site/Year - 50 Sites	Total Devices	kWh Saved	\$\$ Saved
1—Cisco 3945	50	0%	0%
4 —Wireless AP 	200	66%	66%
20 —IP Phones 	1000	66%	66%
1 —SRE 	300	66%	66%
1—EtherSwitch 			
3 —SRE 			
1—PVDM3 			
Total		54%	54%



\$ 87 K in Savings



54% Savings in Energy



451 Tons of CO2



83 Cars Removed



# IOS Software Evolution

# Evolution of Software Packaging and Activation

1990s



**IOS**

Many Images,  
Feature Upgrades  
Complex to Support

2004+



**IOS Reformation**

Introduced with ISRs  
Reduced Complexity/  
Images  
Some SW Licensing

2010

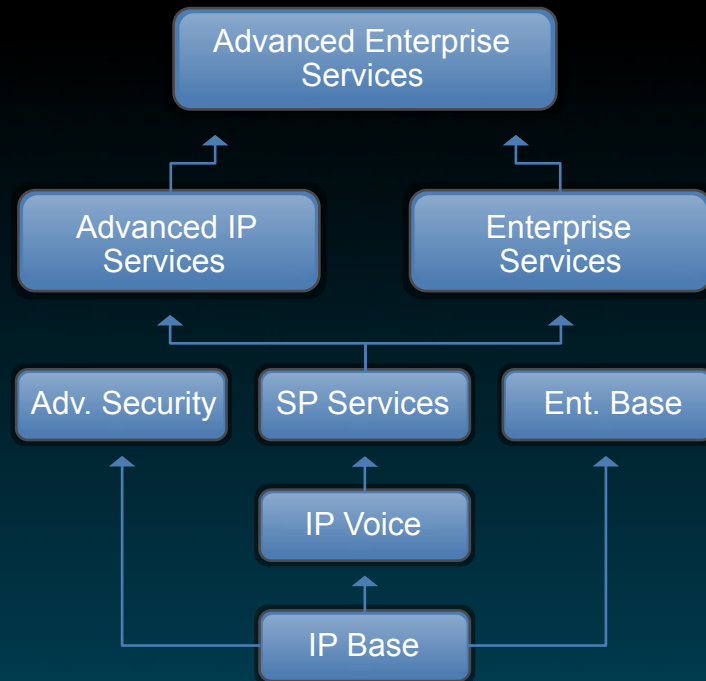


**Licensed**

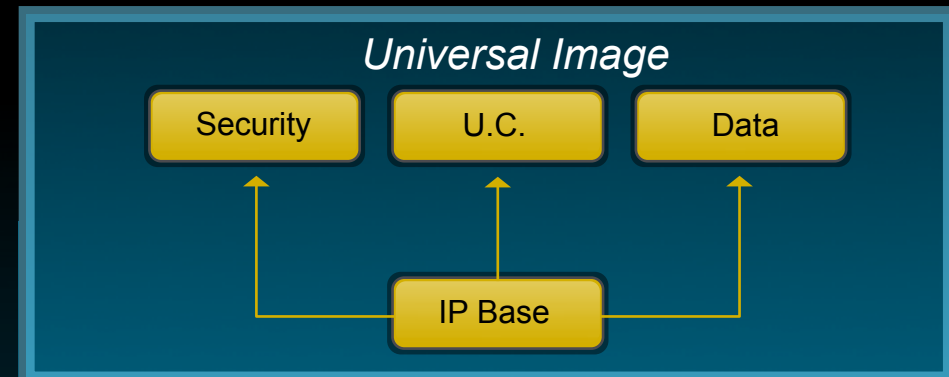
Ease Of Ordering  
Operational Simplicity  
Services On Demand

# IOS Software Packaging Evolution Summary

## Current



## New



### ○ 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 Activation Feature Licences

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

- CME: Voice and Video (C)
- SRST : Voice and Video (C)
- VXML Gateway (C)
- CUBE (C)
- LMR [Land Mobile Radio]

- SNA switch

- CUBE [Gatekeeper] (C)

- IKE v1
- IPsec
- Easy VPN
- DMVPN
- GETVPN
- Firewall
- Network Foundation Protection
- Flexible Packet Matching

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

- MPLS
- BFD
- L2VPN
- L2TPv3
- Layer 2 Local Switching
- Mobile IP
- Multicast Authentication
- IP SLAs PfR
- DECnet ALPS
- AppleTalk RSRB BIP
- DLSw+ FRAS
- Token Ring
- ISL IPX STUN
- SNTP 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

# 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



# IOS Software Activation

## Software Activation After Product Order

1. Customer purchases product activation keys (PAKs) for desired feature set and obtains Unique Device Identifier (Product ID + Serial Number), for the device he wants to upgrade
2. Using the Cisco website, the customer can purchase and generate a license for a feature set on that specific device
3. License is installed and activated using Cisco License Manager, Router Call-Home, or manual copy and install
4. These steps are the same for additional feature sets



Unique Device Identifier



Previously Purchased Router



# Introducing Cisco IOS Release 15 M and T

- New release strategy with feature delivery in a shorter amount of time
- Proactive support policies, consistent release numbering, clearer software deployment and migration guidance
- Predicable new feature release and rebuild schedules



# Release 15 M and T

- Follow-on to Release 12.4 Mainline and 12.4T
- Features and platform support inheritance from Release 12.4T
- Proactive release support policies and software migration guidelines
  - Extended Maintenance M releases for long-term support
  - Standard Maintenance T releases between EMs for faster Cisco feature delivery
- Predictable release and maintenance rebuild schedules with measurable milestones
- New release three times/year; Extended Maintenance (EM) release every 18–20 months
- Initial rollout, **Release 15.0(1)M**, with 1941, 2900, and 3900

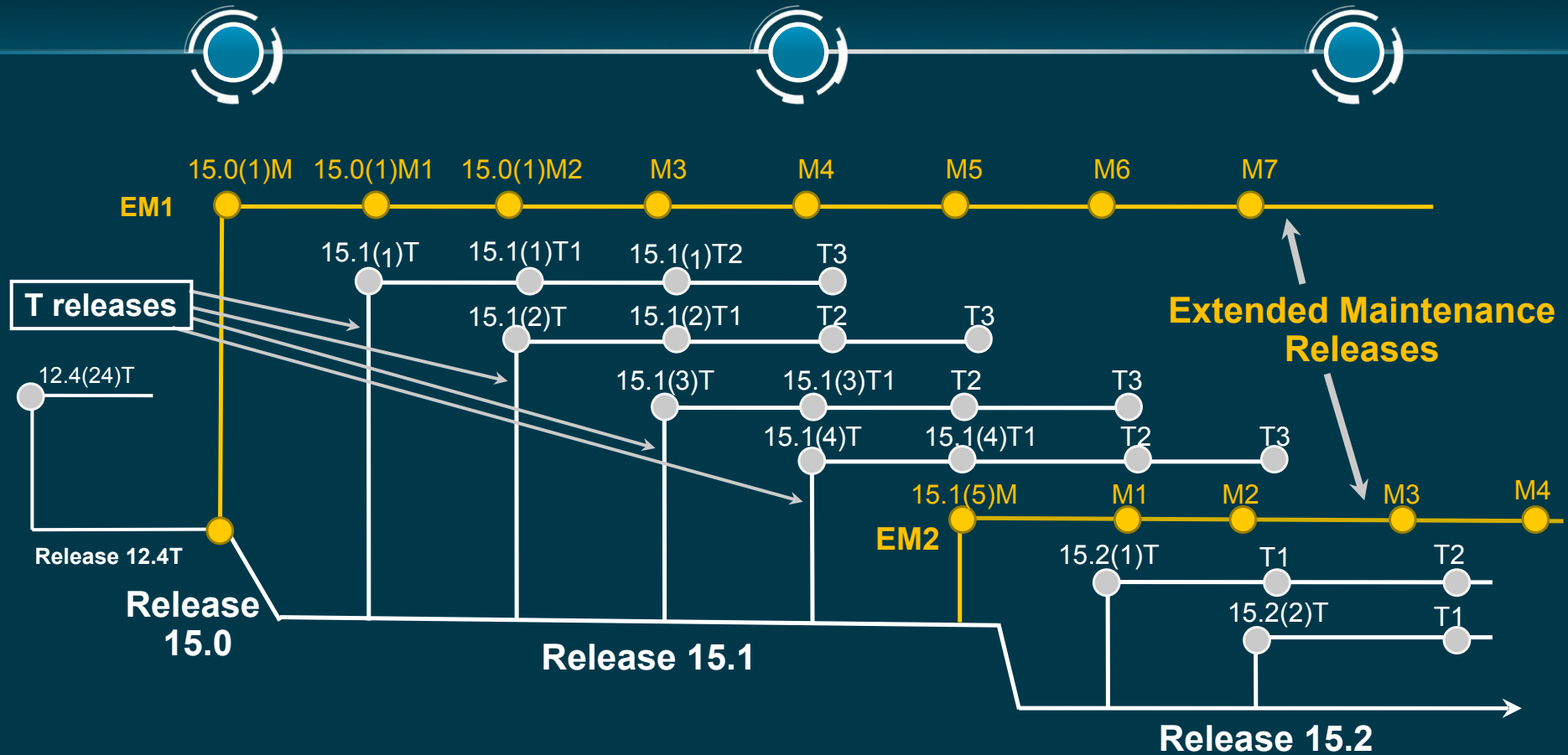


# Release 15.0 Numbering and Delivery

Single Train  
Release Model

Improved Quality  
and Management

Predictable  
Schedules



# Summary Review

## What's New with Cisco ISR G2?

Cisco ISR		Cisco ISR G2
Up to 45 Mbps with Services	<b>WAN Performance</b>	Up to 150 Mbps with Services
Single	<b>Network processor</b>	Multi-core
X with 160GB	<b>Service Module Performance and Capacity</b>	Up to 7X with Dual Core and 1TB storage
Voice Only	<b>Onboard DSPs</b>	Voice + Video
Fast Ethernet with PoE. Based on Catalyst 3560/3750	<b>Switch Modules</b>	FE/Gigabit Ethernet with PoE+ Based on Catalyst 3560-E/2960
Multiple	<b>IOS Images</b>	Single Universal IOS Image
Hardware Coupled	<b>Service Delivery</b>	Virtual Services "On-demand"
Single Motherboard	<b>Redundancy</b>	Redundant power supplies. Field-upgradeable motherboard
EnergyWise	<b>Energy Efficiency</b>	EnergyWise with slot based controls.



Up to 5X the Performance. Similar price points.

# The New Branch Experience

## Integrated Services Routers Generation 2

### Service Virtualization



- Services on demand
- Customized services
- Cloud extension



**Business  
Innovation**

### Video-Ready



- Rich media applications
- High performance
- Application optimization




**Customer  
Experience**

### Operational Excellence



- Greener technology
- Operational simplicity
- Investment protection



**Lowest  
TCO**

