Cisco Expo 2009

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

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CISCO Access Routing Technology Group

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Agenda

- Borderless Network Overview
- Integrated Services Router Generation 2 Overview
- Collaboration, Services Virtualization, Security
- Operational Efficiency
- Software Delivery Model

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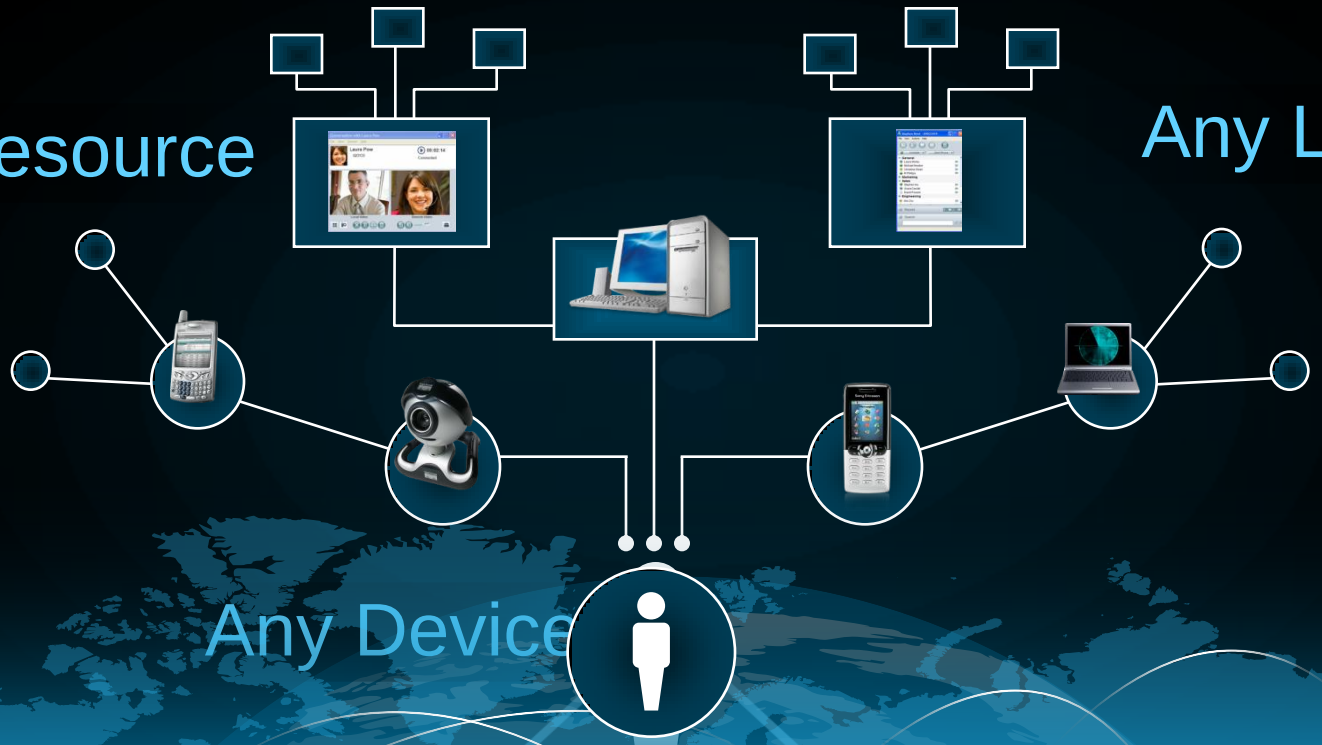
The Transformation:
The World Is Our New Workspace



The BORDERLESS NETWORK

A Next Generation Architecture to Deliver the New Workspace Experience

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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

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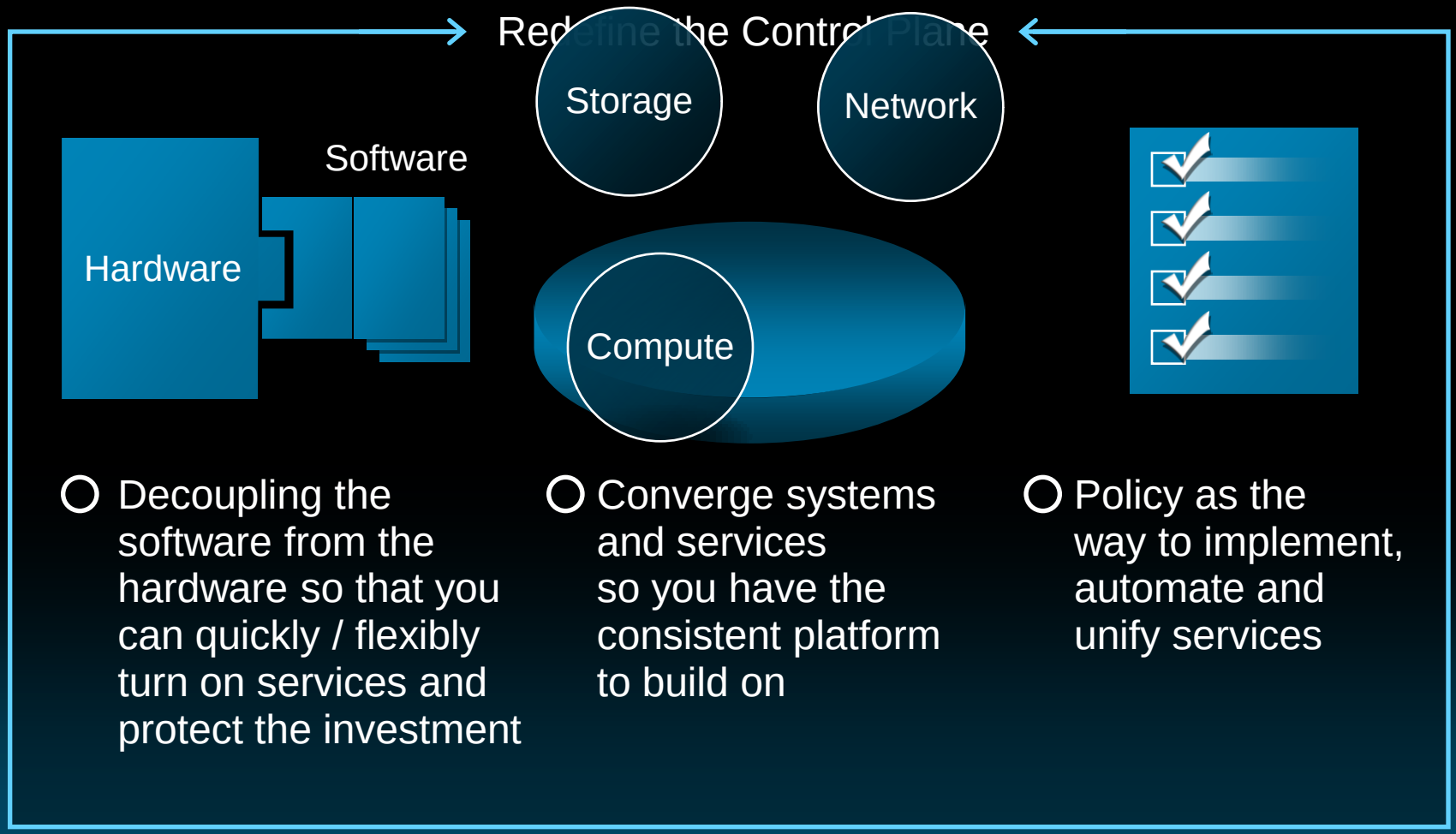
Borderless Networks

New Technical Architecture Approach



- Decoupling the software from the hardware so that you can quickly / flexibly turn on services and protect the investment
- Converge systems and services so you have the consistent platform to build on
- Policy as the way to implement, automate and unify services

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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

Source: Nemertes Research

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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

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Integrated Services Routers Generation 2 Overview

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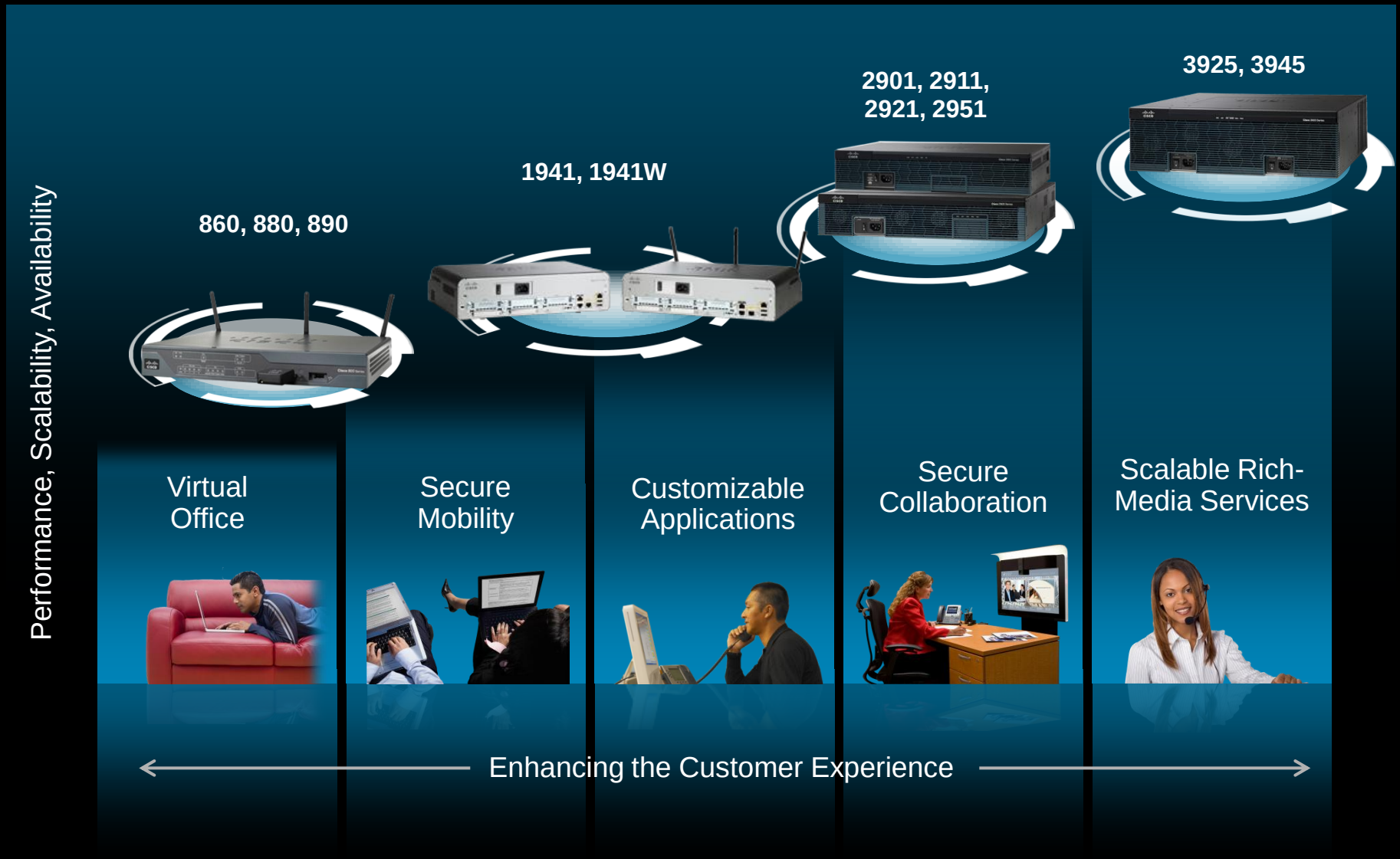
Introducing: Cisco Integrated Services Router Generation 2



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Next Generation Integrated Services Routers

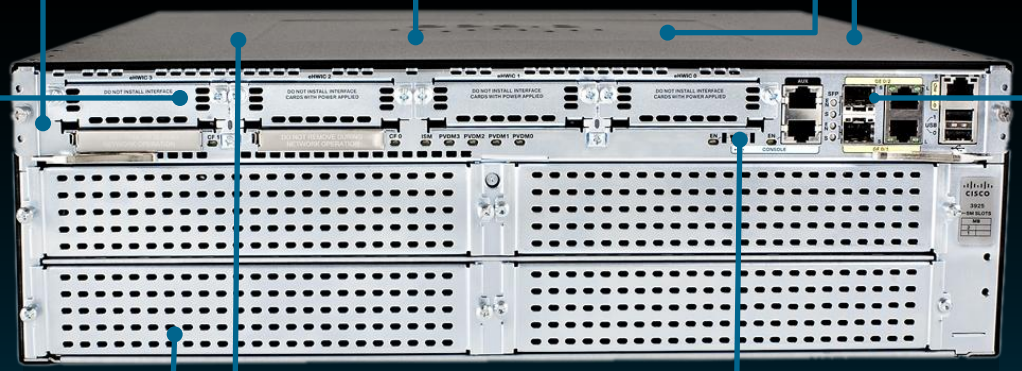
Under the Covers

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

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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

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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

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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

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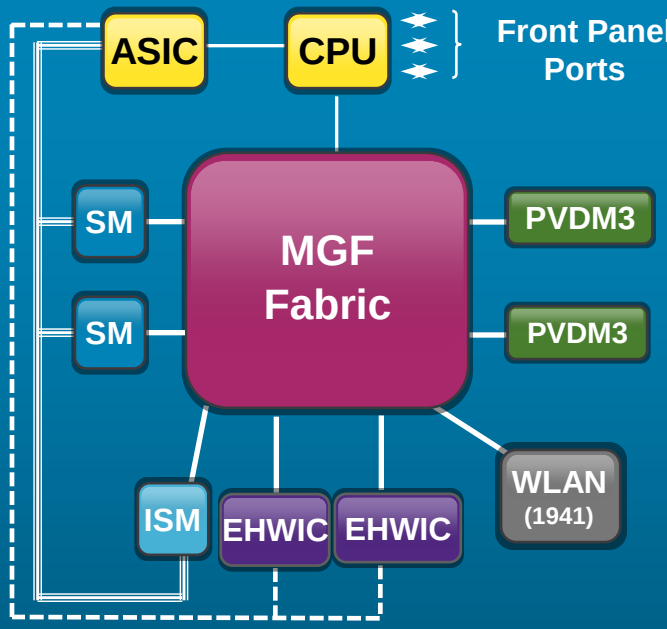
Introducing The Multi Gigabit Fabric (MGF)

- 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

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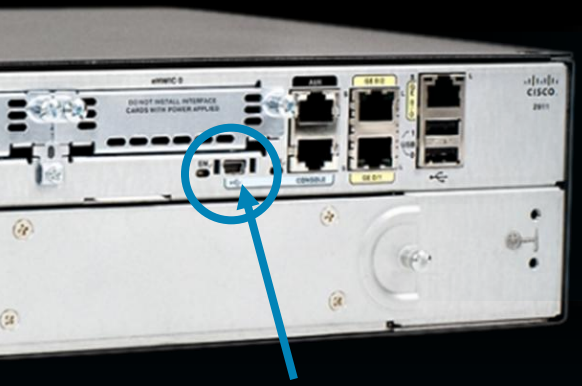
USB Console



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

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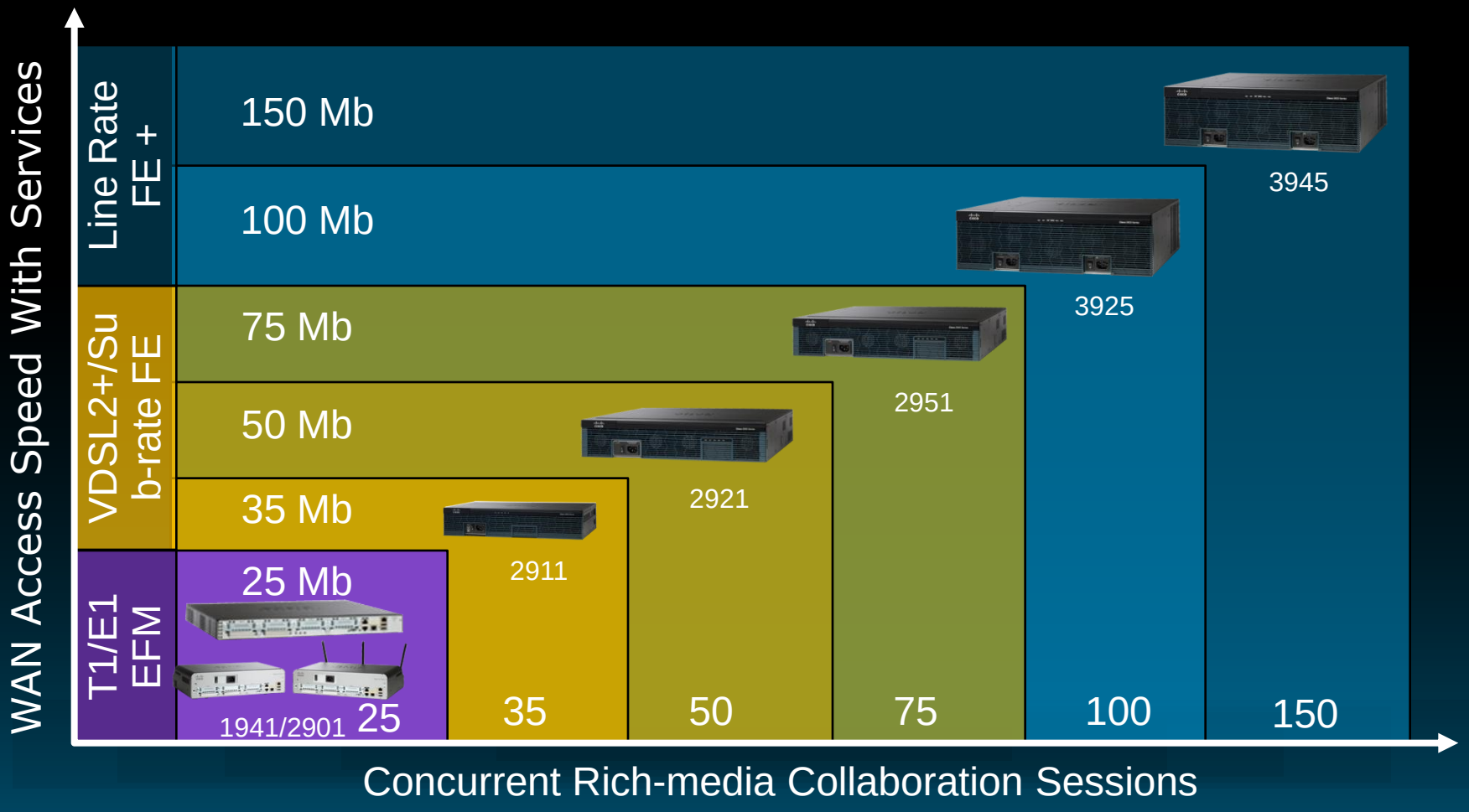
ISR G2 Performance Positioning

WAN Access and Collaboration



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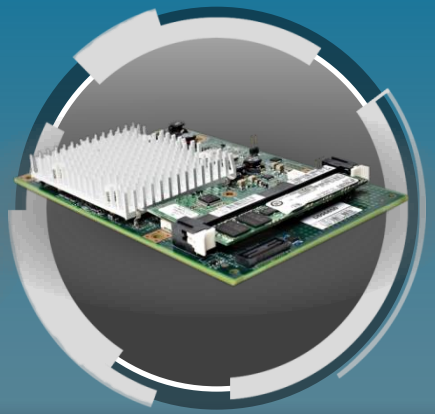
Service Modules and Interface Cards

Interface Cards (WAN or LAN)

EHWIC
Enhanced High Speed WAN Interface Card

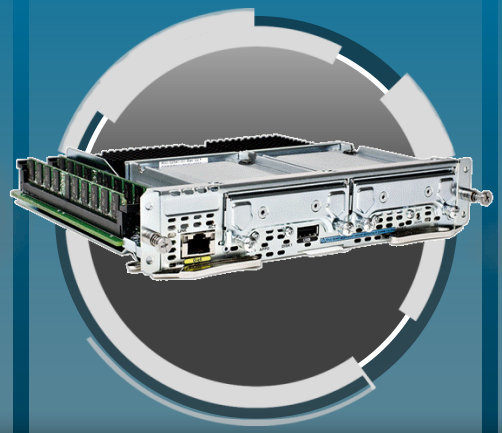
Internal Module for Running Services That Don't Require Interface Ports, Dedicated CPU and Memory



ISM
Internal Service Module

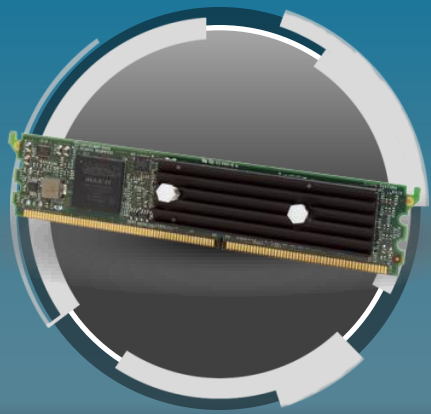
Independent CPU and Memory for Hosting Services *or* High Density Interface Ports.

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

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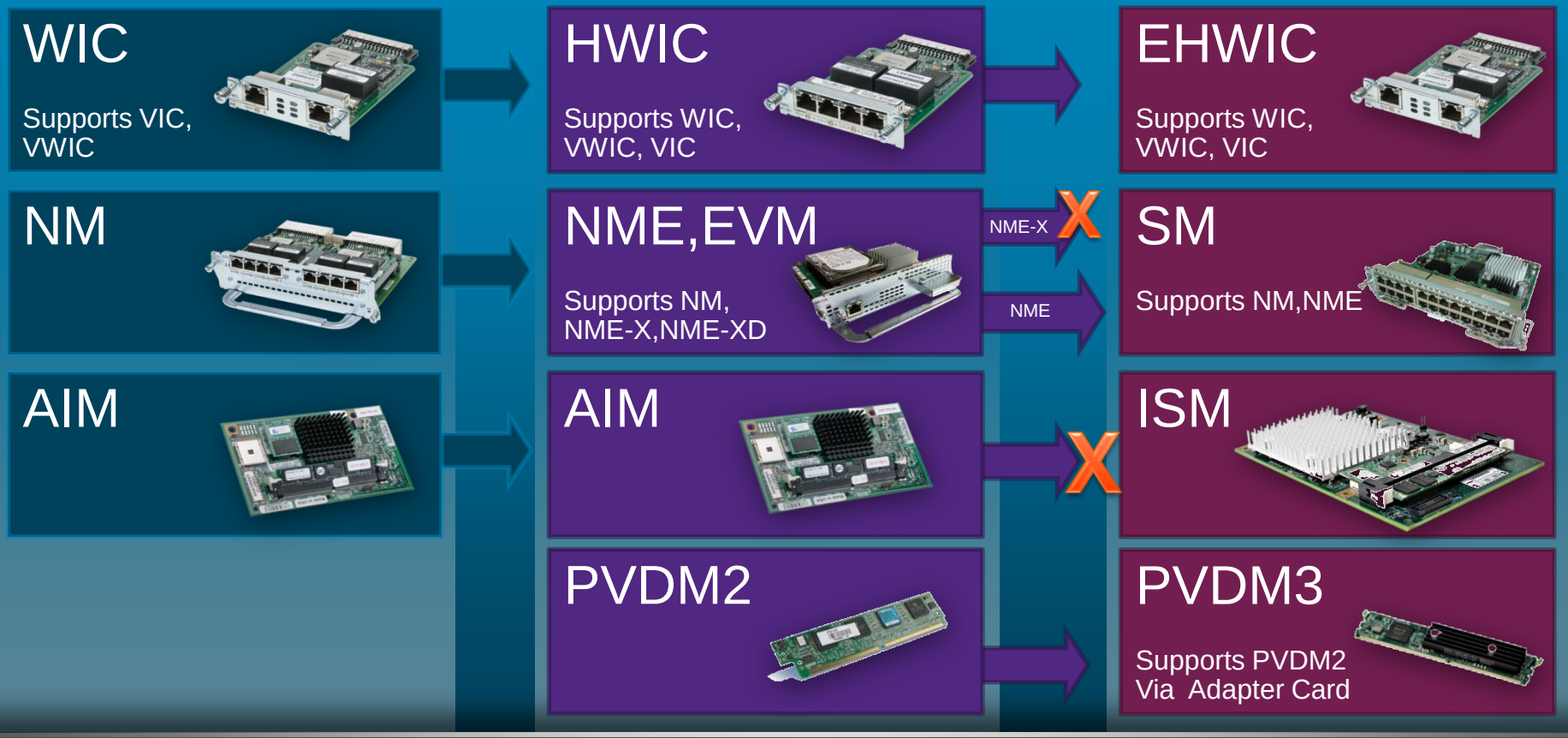
Platform Module Slot Evolution



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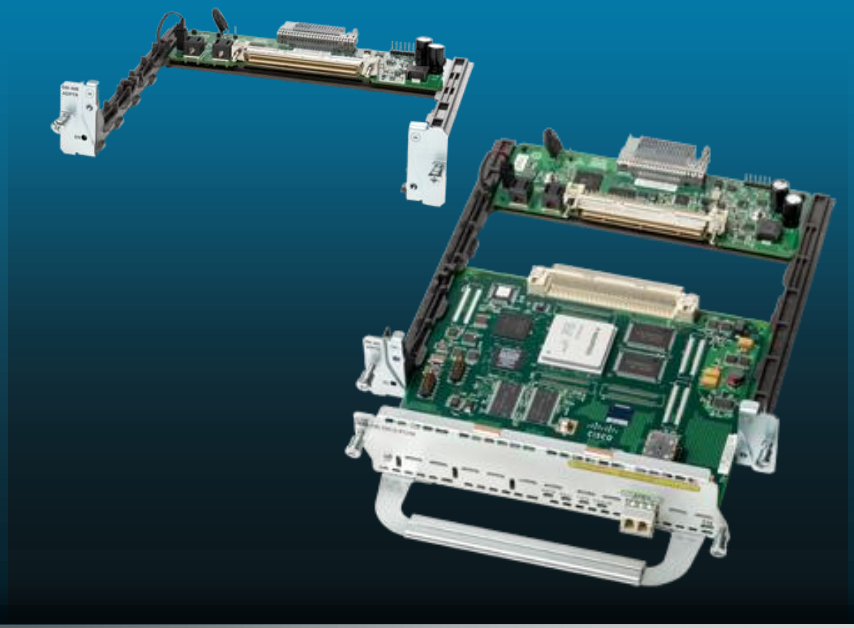
Adapters

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



NM to SM Adapter

PVDM2 to PVDM3 Adapter

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Collaboration , Services Virtualization, Security,

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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 to150 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

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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

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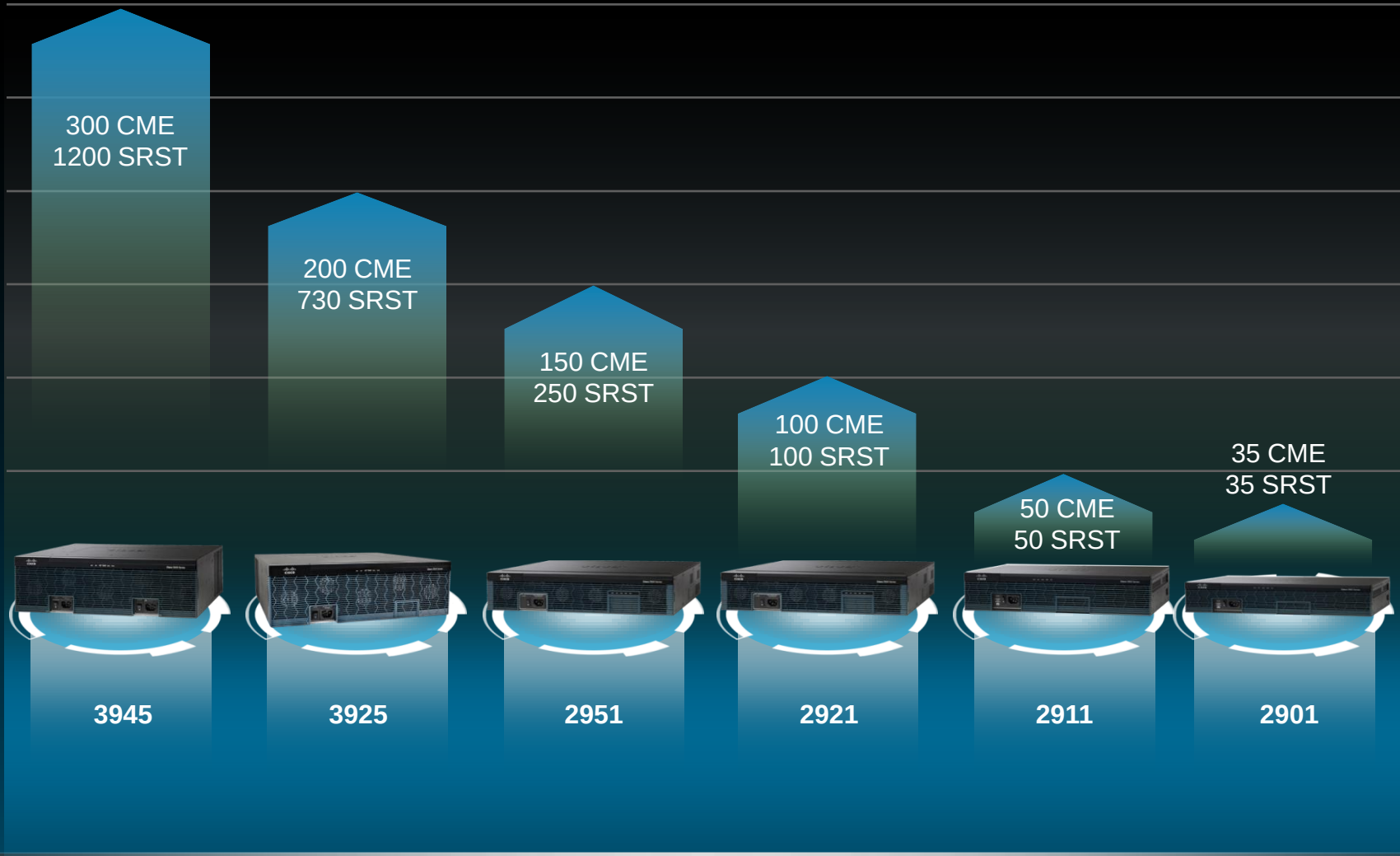
Unified Communications Max User Counts



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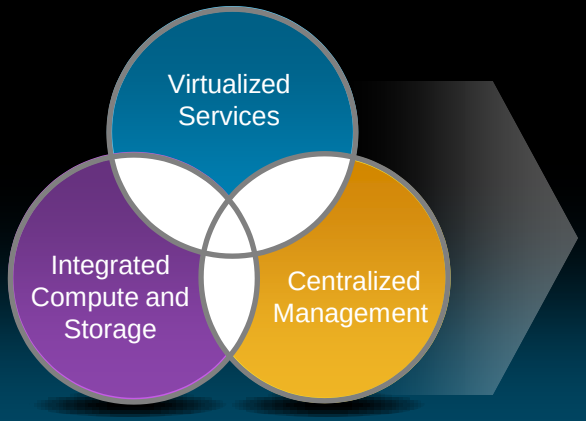
Service Virtualization



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

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Virtual Service Delivery Model

Virtualized Services

Software can be deployed and managed remotely without truck-rolls

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.

Integrated Compute and Storage Hardware

Services Ready Engines—ISM or SM

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

* Roadmap

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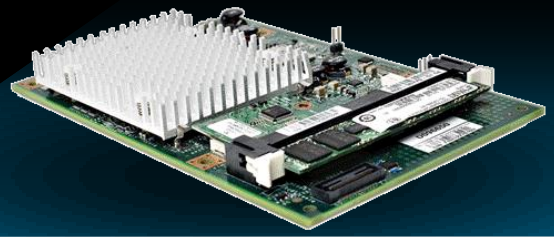
ISR Generation 2
Services Ready Engines (SRE)



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

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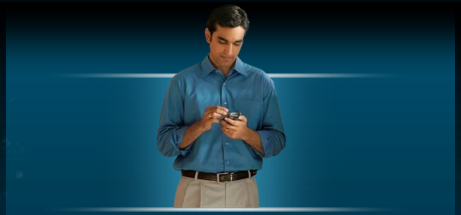
Security for the Borderless Branch

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

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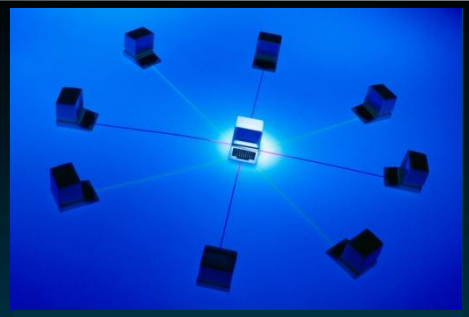
Secure Mobility

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

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Operational Excellence

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Operational Excellence

Operational Efficiency through Innovation

- Remote deployment, management and monitoring
- Gibabit 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

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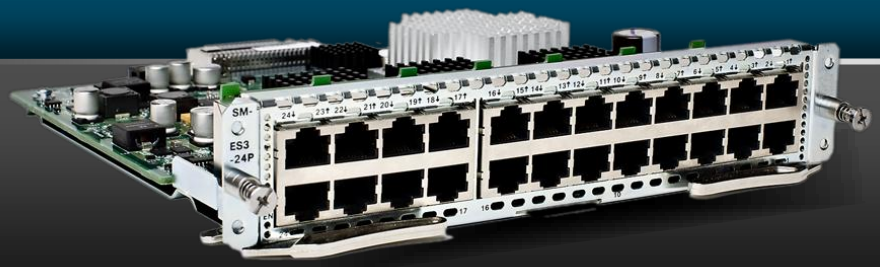
New Enhanced EtherSwitch Service Modules (ESM)

- 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

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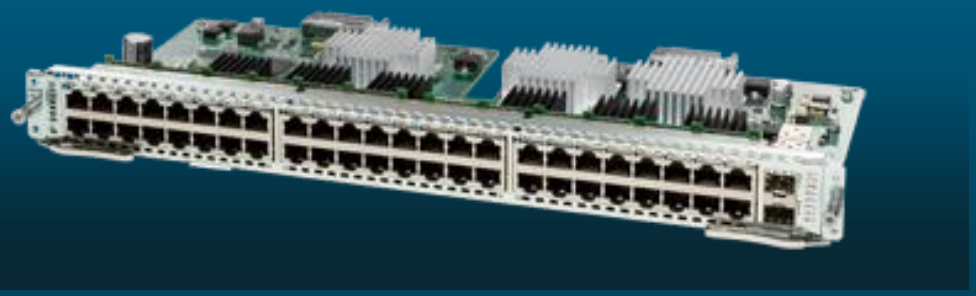
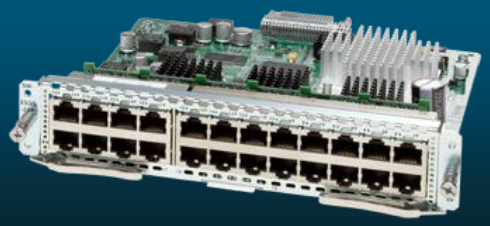
Switch Types

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





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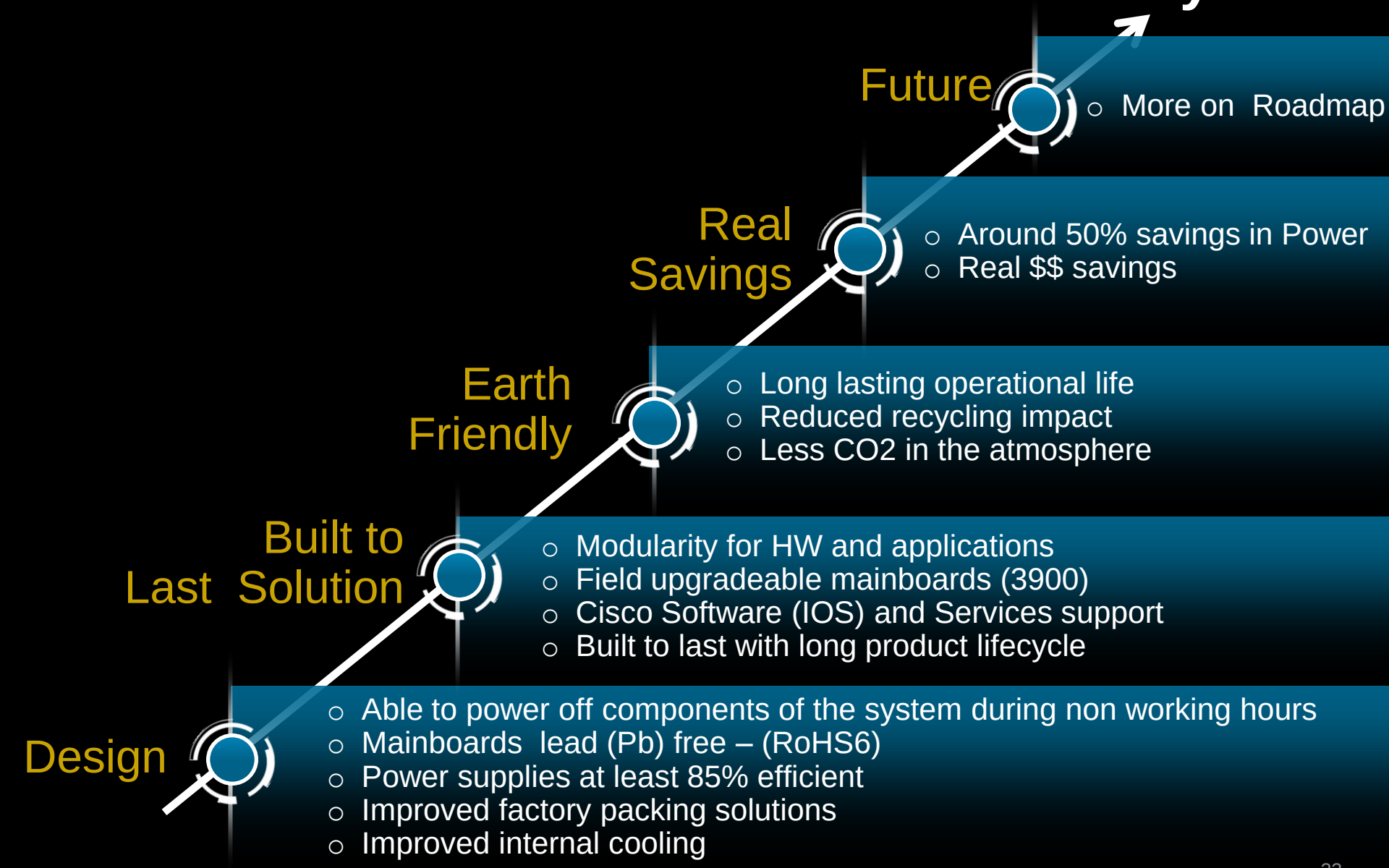
ISR G2—Earth and Customer Friendly



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Power Management
Modules and Scenario

Support Available in:

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

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

66% of the Time It Could Be Off

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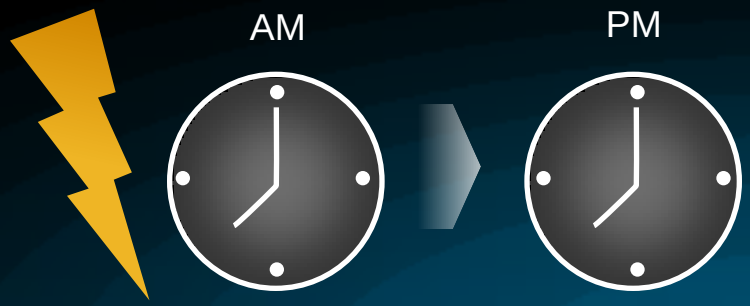
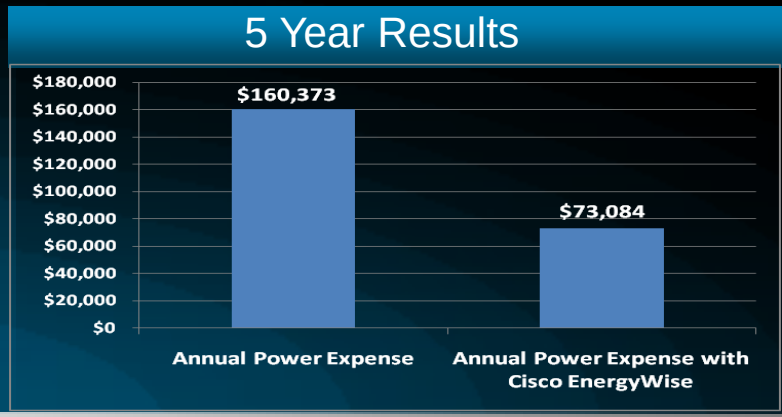
Energy Efficiency = Real Results



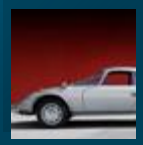


Per Site/Year - 50 Sites	Total Devices	kWh Saved	$$ Saved
1—Cisco 3945	50	0%	0%
4 —Wireless AP	200	66%	66%
20 —IP Phones	1000	66%	66%
1 —SRE 1—EtherSwitch 3 —SRE 1—PVDM3	300	66%	66%
	Total	54%	54%

$ 87 K in Savings

54% Savings in Energy

451 Tons of CO2



83 Cars Removed

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IOS Software Evolution

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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

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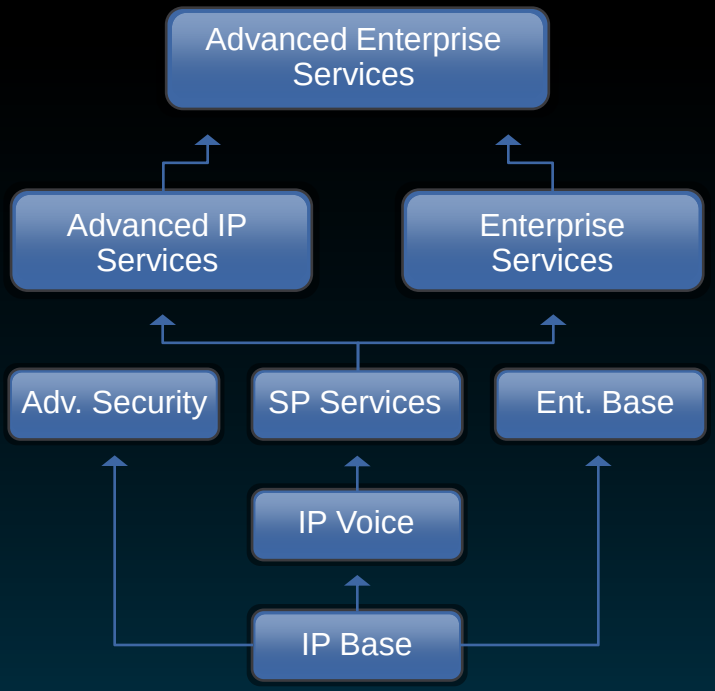
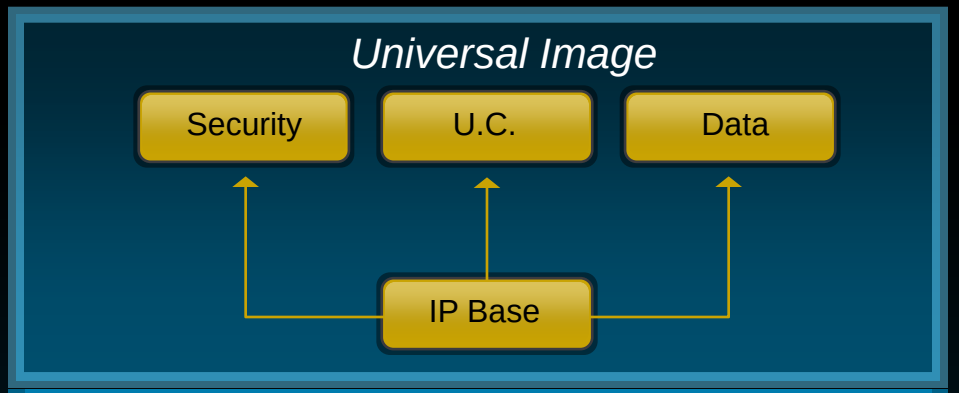
IOS Software Packaging Evolution Summary

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

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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

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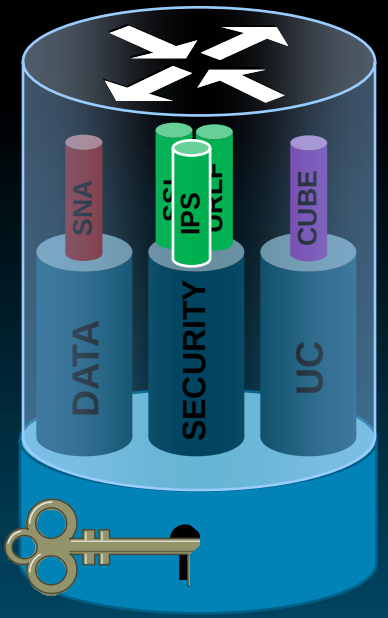
IOS Software Activation
Software Activation After Product Order

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

Previously Purchased Router



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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

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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

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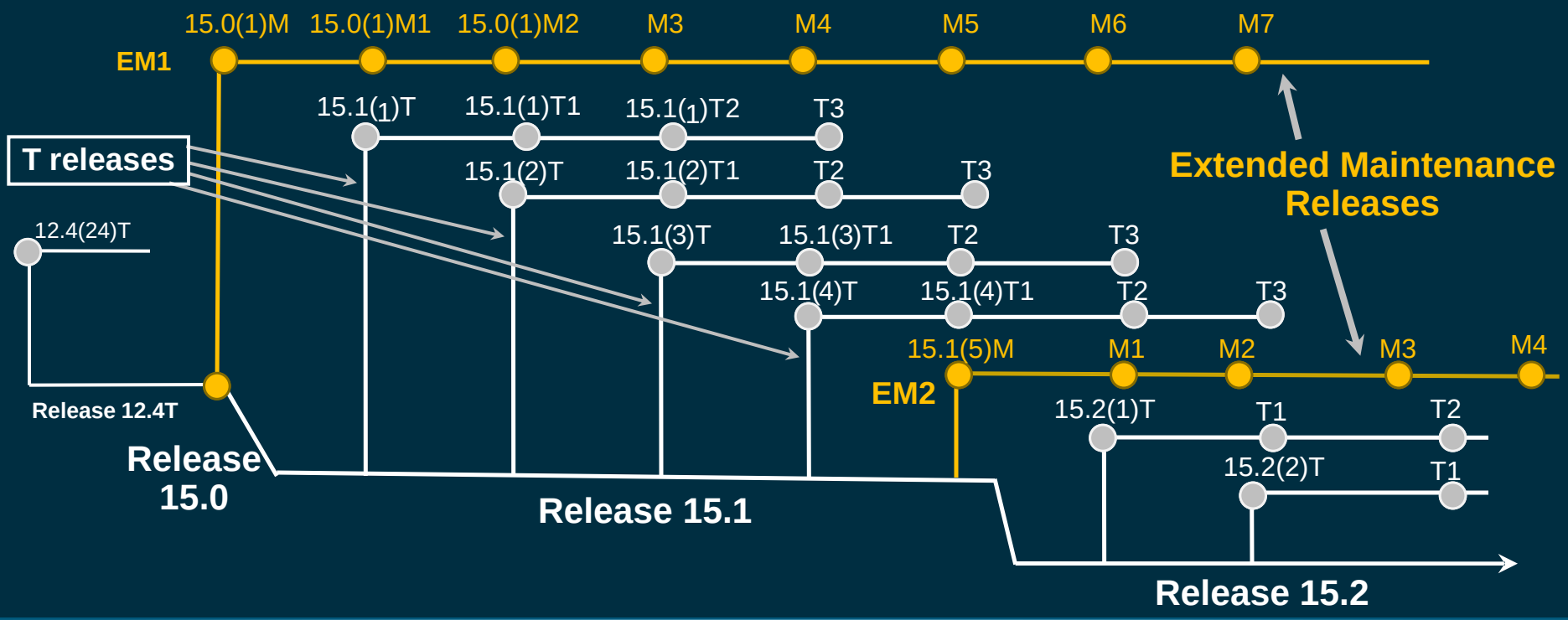
Release 15.0 Numbering and Delivery

Single Train Release Model

Improved Quality and Management

Predictable Schedules



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Summary Review
What's New with Cisco ISR G2?

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

Up to 5X the Performance. Similar price points.

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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

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