



Cisco Enhances IP Routing & Services,  
Embedded Management Intelligence, and  
Unified Communications with Cisco IOS  
Software Release 12.4(24)T



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**February, 2009**

# Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(24)T
- Cisco IOS Packaging
- Upgrade Paths and Migration Considerations
- Summary

# Cisco IOS Software Release 12.4T

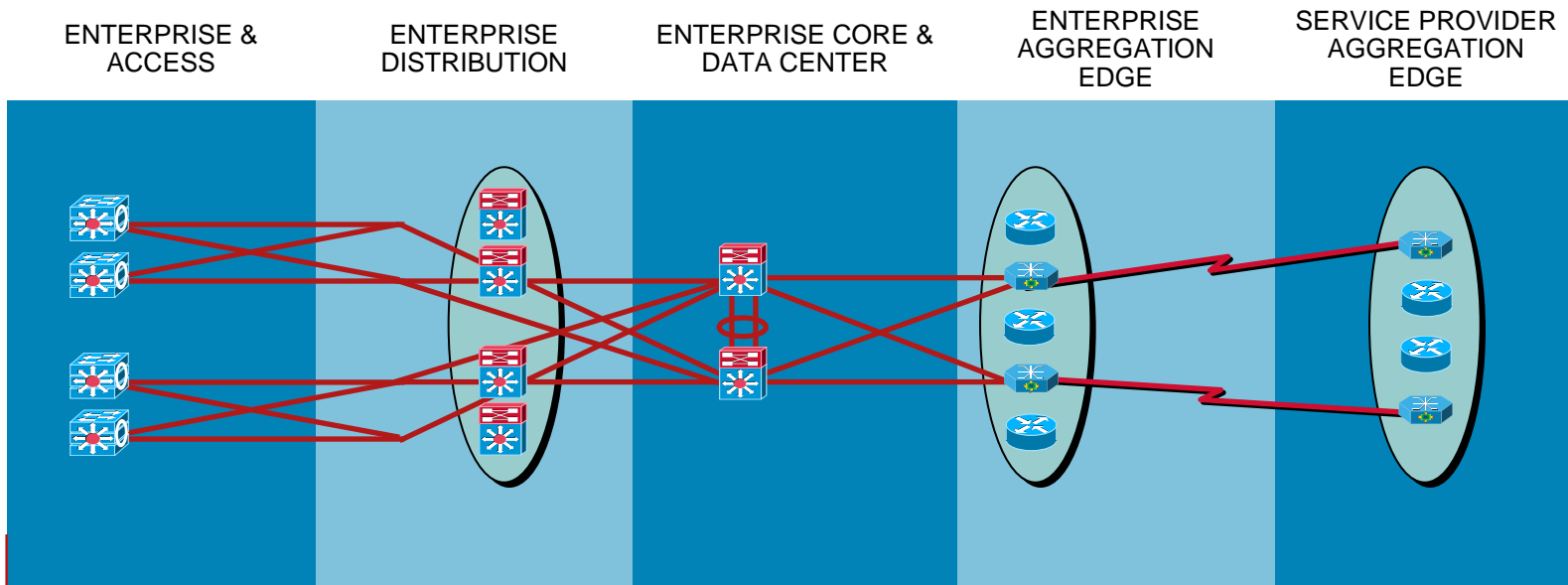
## Extending Security, Voice, MPLS, and IP Services

Integrates a portfolio of new capabilities, including security, voice, and IP services, with powerful hardware support

Delivers advanced services for Enterprise and access customers

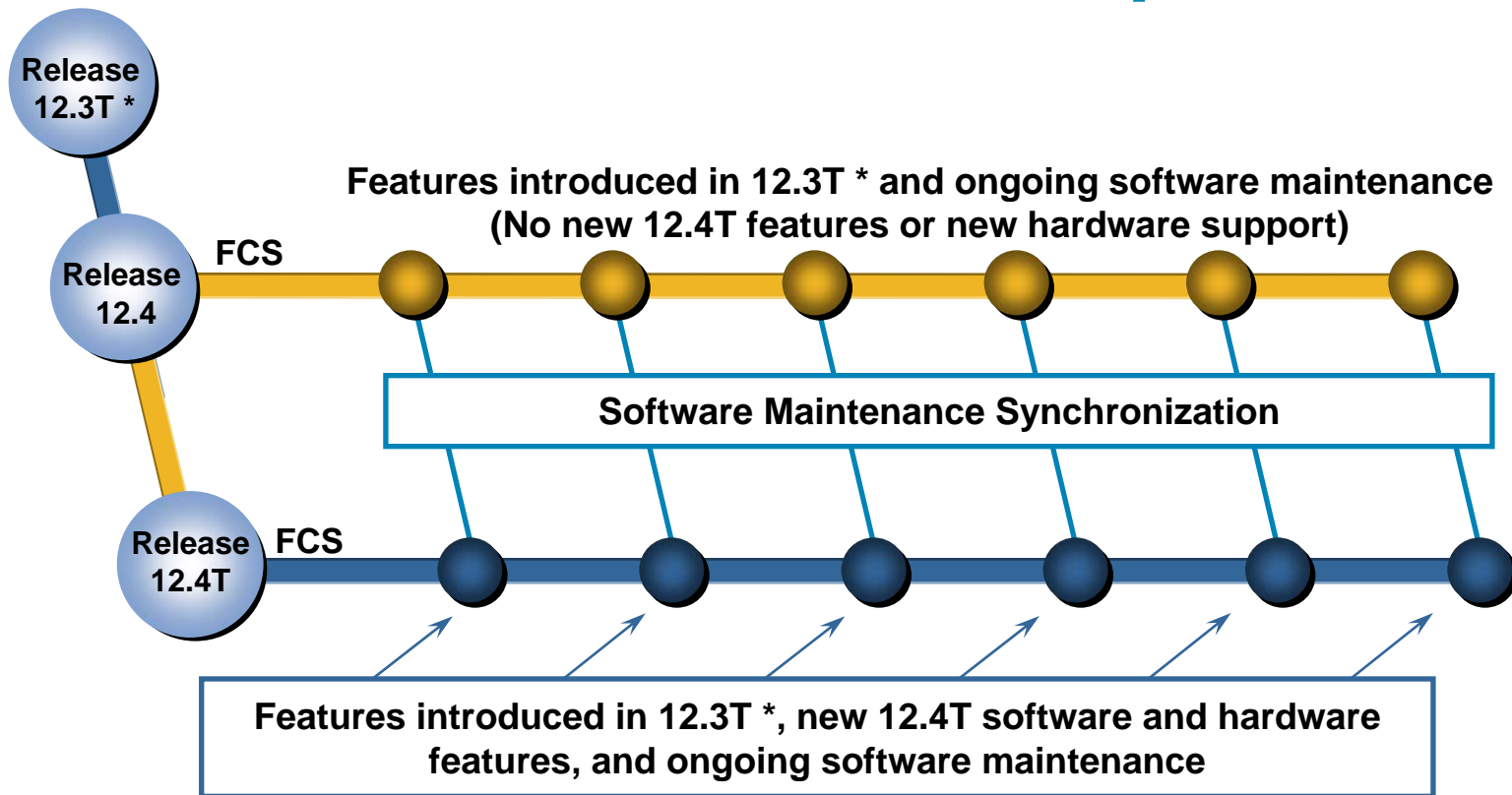
Series of regularly scheduled individual technology releases, each of which delivers aggregate functionality via its predecessor, and introduces new technology and features

# Release 12.4T Within the Cisco IOS Software Release Portfolio



	ENTERPRISE & ACCESS	ENTERPRISE DISTRIBUTION	ENTERPRISE CORE & DATA CENTER	ENTERPRISE AGGREGATION EDGE	SERVICE PROVIDER AGGREGATION EDGE
<b>Release 12.4T</b> Enterprise & Access, Managed Services	✓				
<b>Release 12.2SB</b> Broadband & Leased-Line Aggregation, MPLS PE					✓
<b>Release 12.2SR</b> Metro Ethernet, MPLS PE				✓	✓
<b>Release 12.2SX</b> High-end Ethernet LAN switching, Metro Ethernet	✓	✓	✓	✓	✓
<b>Release 12.2SE &amp; 12.2SG</b> Mid-range and Low-end Ethernet LAN Switching	✓	✓			

# Cisco IOS Software Release 12.4T and 12.4 Relationship

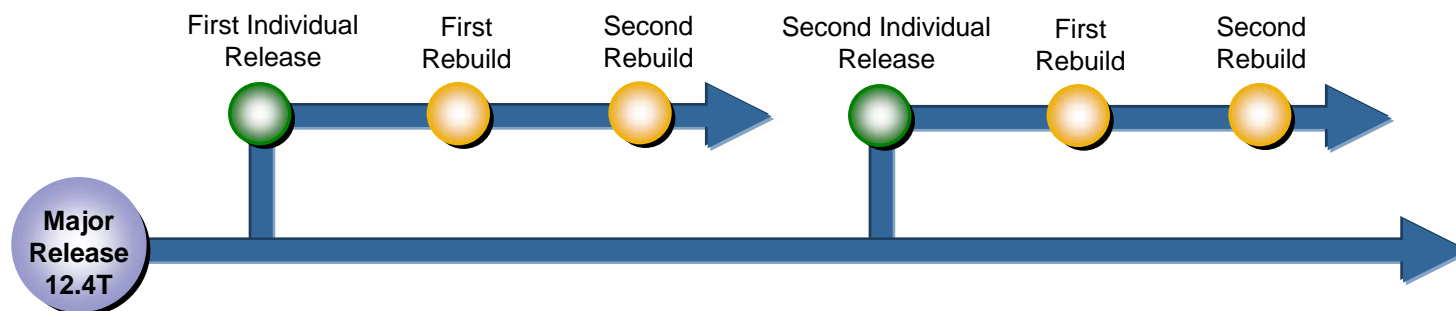


- Release 12.4T: integrates new technologies and features, new hardware support, and ongoing software maintenance
- Release 12.4: consolidation of features & hardware support introduced in the previous IOS T technology release (12.3T \*), and ongoing software maintenance

• Cisco IOS Software Release 12.3T has reached End of Software Maintenance:

[http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6947/ps5187/prod\\_end-of-life\\_notice0900aecd8052e110.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6947/ps5187/prod_end-of-life_notice0900aecd8052e110.html)

# Cisco IOS Software Major Release 12.4T & Individual 12.4(n)T Release Relationship



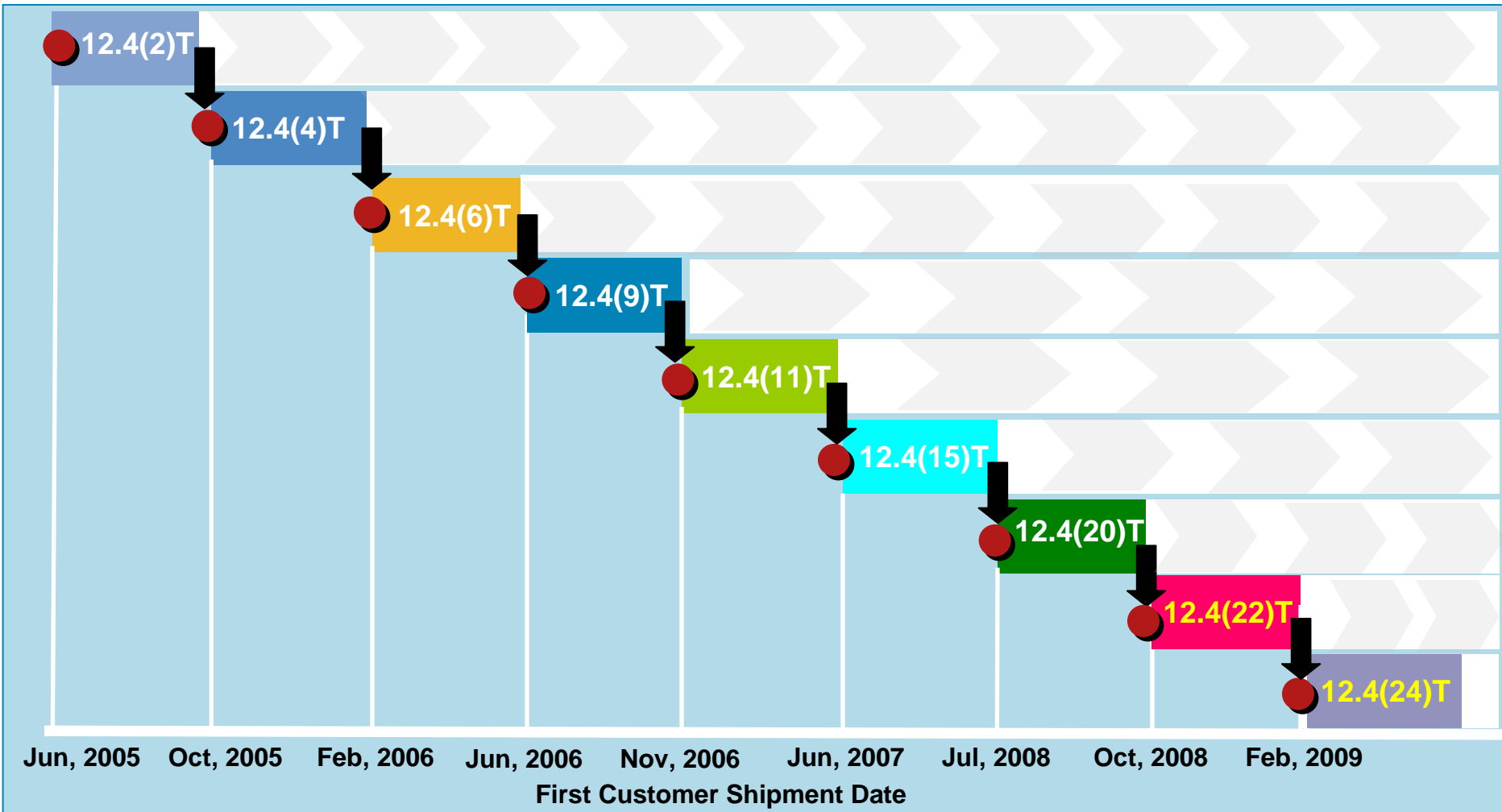
**New hardware and software features, and software fixes**



**Additional software fixes**

- Each Major release of Release 12.4T consists of periodic, individual releases
- Each individual release of Release 12.4T, such as Release 12.4(22)T, includes new hardware and/or software features, and software fixes
- After its initial introduction, each individual release receives ongoing maintenance (additional software fixes) through release rebuilds

# Release 12.4T Family Feature Inheritance



**Each release inherits the functionality  
of its predecessor in the Release 12.4T family**

# Release 12.4T Family: Key Features in Release 12.4(2)T

## Hardware

- Cisco 850 Series Integrated Services Routers
- Cisco 870 Series Integrated Services Routers
- Cisco 1800 Series Integrated Services Routers - Fixed Configuration Models
- Cisco High-Speed Intra Chassis Module Interconnect
- Inline Power Auto Negotiation

## Cisco IOS Security

- Cisco Router and Security Device Manager 2.1.2
- Transparent Cisco IOS Intrusion Prevention System
- EasyVPN Dynamic Virtual Tunnel Interfaces
- Other EasyVPN Enhancements
- Certificate Authority Key Rollover
- Configurable Certificate Storage Location
- NAT Optimize Media Path for SIP Traffic

## Cisco IOS Infrastructure

- Cisco IOS EEM Version 2.2

## Voice

- SIP Support of Resource Priority Header and Reason Header
- SIP: User Agent MIB
- Configurable Hostname in Locally Generated SIP Headers
- Secure Communication between IP-STE Endpoint and STE Endpoint
- Land Mobile Radio over IP Enhancement
- MGCP Controlled Backhaul of Basic Rate Interface Signaling
- SCCP Analog (FXS) Ports Supplementary Feature Support for Cisco VG 224
- E1 R2 Collect Call Blocking

## Quality of Service

- BitTorrent PDLMS Native Implementation
- Citrix ICA Published Applications Native Implementation
- Multiple Matches Per Port
- MQC Policy Map Support on Configured Virtual Circuit Range ATM

## Access Technology

- AAA CLI Stop Record Enhancement
- Calling Number Suppression for L2TP Setup
- Multilink Frame Relay (FRF.16.1) Variable Bandwidth Class Support
- SSG - Configurable Maximum Number of Allowed Subscribers
- SSG Support for WISPr RADIUS Attributes
- Routed Bridge Encapsulation Client Side Encapsulation with QoS
- Define Interface Policy-Map AV Pairs AAA

## Management Instrumentation

- Cisco IOS IP SLAs Random Scheduler
- NetFlow Top Talker CLI - Phase 2
- AES and Triple-Data Encryption Standard Algorithm Encryption Support for SNMPv3

## IP Services

- IPv6 ACL Extensions for Mobile IPv6
- IPv6 Default Router Preference
- Foreign Agent Local Route Optimization

## IP Routing

- Application-Aware Routing: Policy Based Routing
- TCP Show Extension
- ICMP Unreachable Rate Limiting User Feedback
- "Clear IP Traffic" CLI

## IP Multicast

- Multicast Listener Discovery Group Limits
- IPv6 Boot Strap Router—Ability to Configure Rendezvous Point Mapping
- IPv6 Source Specific Multicast Mapping
- Multicast Source Discovery Protocol MD5 Password Authentication



Cisco IOS  
Software  
Release  
12.4(2)T

# Release 12.4T Family: Key Features in Release 12.4(4)T

## Cisco IOS Security

- Flexible Packet Matching
- Application Firewall – Instant Message Traffic Enforcement
- VRF aware DNS
- EasyVPN Enhancements
- Control Plane Protection
- VRF Aware IPsec MIB
- IPV6 support for Site-Site IPsec VPN
- DMVPN QoS Support

## Management Instrumentation

- NetFlow Top Talkers CLI

## High Availability

- HSRP for IPv6
- NetFlow Reliable Export (SCTP)

## IP Routing

- BDF Detection Standard Implementation
- BGP Route-Map Continue Support for Outbound Policy
- BGP Selective Next-Hop Route Filtering

## Quality of Service

- Skype Classification vis NBAR PDLMS
- DirectConnect PDLMS



## Broadband

- Multicast User Authentication & Profile Support
- PPPoE Circuit-ID Tag Processing

## Hardware

- Cisco 1801, 1802, and 1803 Integrated Services Routers
- Multi-Processor Forwarding for Broadband LAC, LNS, and PTA
- ADSL2/ADSL2+ Support for Integrated Service Routers

## Voice

- Cisco IOS IP SLAs for VoIP with RTP
- Cisco CallManager Express 3.4
- Survivable Remote Site Telephony 3.4
- Secure Communication Between IP-STE and Lineside STE Endpoints
- Interoperability Enhancements to the Cisco Multiservice IP-IP Gateway
- Identify Alternate Endpoint Call Attempts in RADIUS Call Accounting Records
- Cisco Modem Relay
- SIP:CLI for Passing Calling Name when Privacy Exists
- Fax Relay Support for SG3 Fax Machines at G3 Speeds
- Basing SIP-SIP Support on the Cisco Multiservice IP-to-IP Gateway

# Release 12.4T Family: Key Features in Release 12.4(6)T

## Cisco IOS Security

- Cisco IOS Firewall Enhancements- Firewall Stateful Failover, Zone-based Policy Configuration, Cisco Unified Firewall MIB
- Cisco IOS WebVPN Enhancements
- Complete Certificate Chain Validation in Cisco IOS Public Key Infrastructure
- Enhanced Online Certificate Status Protocol in Cisco IOS Public Key Infrastructure
- EasyVPN Password Aging via Authentication, Authorization, and Accounting
- EasyVPN Dynamic Firewall / ACL Policy Push to Cisco VPN Software Client
- Secure Multicast
- Control Plane Logging
- Management Plane Protection
- ANI Suppression During L2TP Set-Up for Cisco AS5000 Series

## Management Instrumentation

- Cisco IOS IP Service Level Agreements – LSP HealthMonitor
- Cisco IOS Service Level Agreements ICMP Jitter Operation

## Hardware

- G.SHDSL WAN Interface Card

## Broadband

- ATM Oversubscription for DSL
- Private VLAN Edge on Cisco 1800 Fixed Configuration Routers



# Cisco IOS Software Release 12.4(6)T

## High Availability

- Cisco Gateway Load Balancing Protocol for IPv6
- Hot Standby Router Protocol – Multiple Group Optimization

## Voice

- Resource Reservation Protocol Agent for Call Admission Control
- Cisco Text Relay for Baudot Text Phones
- Extended Session Initiation Protocol-Session Initiation Protocol Support on the Cisco Multiservice IP-to-IP Gateway
- In Service Updates to Gatekeeper Zone Prefix Configuration
- Packet Mode Service on D Channel
- Skinny Client Control Protocol Private Line Automatic Ringdown with DTMF Out Pulse Digits for FXS Analog Phones
- Session Initiation Protocol Gateway Support for Busy Out
- Session Initiation Protocol Transport Layer Security Support

## IP Routing

- Enhanced Interior Gateway Routing Protocol for IPv6
- Dynamic Host Configuration Protocol Option 82 Per Interface
- RIPv2 : RFC1724 MIB Extension
- Open Shortest Path First version 2 RFC 3623 Graceful Restart – Helper Mode

# Release 12.4T Family: Key Features in Release 12.4(9)T

## Cisco IOS Security

- Cisco IOS Firewall- HTTP Application Inspection and Control, Session Policing and Ingress Rate Policing based on Firewall Policies, P2P Application Filtering
- Cisco EasyVPN 7.1
- DMVPN Manageability Enhancements
- Virtual Private Network (VPN) Advanced Integration Module (AIM) for Cisco 1841/2800/3800 Integrated Services Routers (ISRs)
- Cisco IOS WebVPN – Auto-Applet Port Forwarding Download, HTTP Authentication, RADIUS Accounting

## Management Instrumentation

- Flexible NetFlow
- Cisco Networking Services (CNS) Security Enhancements
- Netconf Access for Configuration over SSH and BEEP

## Mobility

- Mobile IP- Mobile Router Multi-Path Support

## High Availability

- Hot Standby Router Protocol – HSRP Group Shutdown

## Voice

- Cisco Unified CallManager Express 4.0
- Cisco Multiservice IP-to-IP Gateway – Hosted NAT Traversal
- Skinny Call Control Protocol (SCCP) Controlled Analog (FXS) Ports with Supplementary Features In Cisco IOS Gateway
- High-Density Packet Voice for Cisco AS5400XM and AS5350XM Universal Gateways

## IP Routing

- Bidirectional Forwarding Detection (BFD) Echo Mode
- ACL-based Rate Based Satellite Control Protocol (RBSCP)
- Open Shortest Path First version 3 (OSPFv3) IPsec ESP Encryption and Authentication

## IP Services

- Enhanced Object Tracking (EOT) Support for Carrier Delay
- Domain Name Service – Split DNS



Cisco IOS  
Software  
Release  
12.4(9)T

# Release 12.4T Family: Key Features in Release 12.4(11)T

## Cisco IOS Security

- Group Encrypted Transport VPN
- Cisco IOS SSLVPN – Application ACL, Netegrity Single Sign-on support, Port-forwarding enhancements, Debug infrastructure, URL obfuscation
- RFC 2547 over DMVPN
- Easy VPN Manageability Enhancements
- Easy VPN Identical Addressed spokes
- IOS Firewall and Voice support enhancements

## Layer 2 VPN

- Any Transport over MPLS (AToM) L2 VPN encapsulation
- AToM Pseudowire Redundancy
- AToM Interworking
- Multilink Frame Relay over MPLS
- AToM High Availability
- Layer 2 Local Switching with Interworking

## MPLS Management

- MPLS LSP Ping for Layer 2 VPN Pseudowires (RFC4379)
- MPLS OAM support for Pseudowire (PW) VCCV validation
- MPLS Pseudowire MIBs

## IP Mobility & Wireless

- Mobile IPv6 Authentication Option Support



## QoS

- ATM QoS Features for the ADSL2 and ADSL2+ High-Speed WAN Interface Card for Cisco 1800, 2800, and 3800 Series Integrated Services Routers

## Voice

- VoiceXML Browser Enhancements for the ISR and AS5000
- Enhancements to Cisco IOS Session Border Controller (SBC)- Cisco Multiservice IP-to-IP Gateway

## IP Services

- Cisco Express Forwarding (CEF) L4 Port Load Balancing
- DHCP Class support for Option 60, 77, 124, 125
- DHCP Relay Per interface VPN ID support

## Hardware

- 7200VXR Series NPE-G2 Network Processing Engine
- VPN Service Adapter for Cisco 7200 Series Router

# Release 12.4T Family: Key Features in Release 12.4(15)T

## Cisco IOS Security

- Flexible Packet Matching – Full Packet Filtering Enhancement
- IPS Support Enhancements:
  - NDA (encrypted) signature support and native support for MSRPC and MS SMB signatures
  - Risk Rating value in IPS alarms based on signature severity, fidelity, and target value rating
  - Signature Event Action Processor (SEAP) support
  - Automated signature updates from a local TFTP or HTTP(S) server
  - IDCONF (XML) signature provisioning mechanism
  - Individual and category-based signature provisioning through Cisco IOS CLI
  - Same signature format as the latest Cisco IPS appliances and modules
- Cisco IOS SSLVPN Enhancements
- Cisco IOS Support for AnyConnect Client

## Management & User Interface

- Cisco IOS Auto-Upgrade Manager
- Embedded Resource Manager (ERM)
- TCL Signing Support

## Routing & High Availability

- BFD Support for Cisco Integrated Services Routers (ISR)
- OER Application Aware Routing



## Mobility

- Mobile Ad Hoc Networking (MANET) Enhancements for Router Radio Links

## IP Services

- GLBP Client Cache
- DHCPv6 Server auto-configuration
- Multiple PPPoE Clients per VC
- L2TP Forwarding of PPPoE Tags

## Wireless LAN (WLAN)

- Access Point Link Role Flexibility for Cisco Integrated Services Routers (ISR):
  - 802.11i/AES-CCMP/WPAv2 compliance, WiFi Interoperability certified with WPA v.2, increased number of encrypted Wireless VLANs (varies by model), multiple Basic Service Set IDs (BSSIDs), EAP-TTLS, EAP-SIM, EAP-MD5, EAP-FAST Local Authentication, 802.11e WMM, SSID Globalization, VLAN by Name, L2 NAC, Universal Client Mode, Station Role Root Bridge, Non-Root Bridge (HWIC-AP)

## Hardware

- Cisco 7201 Series Router
- Cisco 1- and 2-Port Enhanced Capability Clear Channel Port Adapters for the Cisco 7200 Series Routers
- ATM T3/E3 Network Module for Cisco 3800 Series Routers
- USB eToken 64KB
- Boot from USB Flash Support

# Release 12.4T Family: Key Features in Release 12.4(20)T

## Cisco IOS Security

- GET VPN VSA Support for Cisco 7200 NPE-G2
- Content Filtering
- VRF-Aware IPS
- User-based IOS Firewall
- Enhanced IOS Firewall for Secure Unified Communications
- ACL Object Groups
- IOS SSL VPN Enhancements
- DMVPN Enhancements
- GET VPN Support for VRF-Lite
- GET VPN Support for VPN Services Adapter
- cTCP Support for Easy VPN Hardware Clients
- IPSec Usability Enhancements
- SDP Connect Template
- Trust and Identity Feature Enhancements

## IPv6

- 6VPE
- Extended ACL Support for IPv6 IPSec AH
- Mobile Network v6 – Basic NEMO Support

## MPLS

- Lossless MD5 LDP Session Authentication
- MPLS Traffic Engineering (TE) Support

## Quality of Service

- Hierarchical Queuing Framework (HQF)
- RSVP PHOP Overwrite

## Management & User Interface

- Embedded Event Manager Version 2.4
- Embedded Packet Capture (EPC)
- Cisco IOS Service Diagnostics
- Embedded Menu Manager (EMM)
- Flexible NetFlow for IPv6
- Flexible NetFlow Exporter Feature Enhancements
- MPLS LSP Multipath Tree Trace
- Expression MIB
- Event MIB
- Data Collection Agent



## Cisco IOS Software Release 12.4(20)T

## Voice

- Cisco Unified Communications Manager Express 7.0
- Cisco Unified Border Element (CUBE) 1.2
- Cisco Unified Voice Gateway Enhancements

## IOS Infrastructure Enhancements

- Cisco Express Forwarding Scalability and Selective Rewrite (CSSR)
- Network Time Protocol (NTP) Version 4

## Hardware

- Cisco 1861 ISR
- Cisco 860 & 880 Fixed-Function ISRs
- IPS Advanced Integration Module
- Cisco Network Capacity Expansion (NCE)
- Channelized and Clear Channel T1/E1 and PRI VIC3 and EM3 Voice Modules

# Release 12.4T Family

## Key Features in Release 12.4(22)T

### Cisco IOS Security

- IOS Firewall Trusted Relay Point
- Certificate IP Address Extension Support
- Time-Based Anti-Replay Support on VSA
- GET VPN Enhancements
- IOS SSL VPN Localization
- ACL Syslog Correlation
- IOS Support for Lawful Intercept

### Hardware

- Cisco 880G Integrated Services Router
- Cisco 880 SRST Integrated Services Router
- Cisco VG202 & VG204 Analog Voice Gateways
- Cisco IAD2435-8FXS Integrated Access Device
- IPS Enhanced Network Module

### Quality of Service

- Per IPsec Tunnel Quality of Service (QoS)

### Management & User Interface

- Embedded Event Manager Version 3.0
- Flexible NetFlow v5 Export Format
- Flexible NetFlow IPv4 Multicast Support
- Flexible NetFlow TopTalkers

### Voice

- RSVP Preconditions (RFC3312)
- Audio RSVP enhancements to support reINVITE or 302 based supplementary services on gateway
- RSVP support on the SIP trunk of SCCP-CUCME
- SIP SRTP Fallback to Non-secure RTP and SRTP over sip: scheme for CUBE
- SIP Diversion Header Enhancements
- SIP History INFO
- SIP Multicast Music on Hold



Cisco IOS  
Software  
Release  
12.4(22)T

# Release 12.4T Family

## Key Features in Release 12.4(24)T



### IP Routing

- Application-Based Routing for Mobile Router (MR) Multi-Path Support
- BGP Support for 4-byte ASN

### IP Services

- Secure Neighbor Discovery (SeND)
- DHCPv6 Server auto-configuration
- DHCPv6 Individual Address Assignment

### Embedded Management

- Web Services Management Agent (WSMA)
- Smart Call Home Support for Cisco 7200 Series Router

Cisco IOS  
Software  
Release  
12.4(24)T

### Voice Enhancements

- Cisco Unified Communications Manager Express and Cisco Unified SRST 7.1
  - Single Number Reach (SNR) in IOS
  - Whisper Intercom
  - SIP Line Side enhancements; Shared lines, SIP Shared Line Barge with privacy release, call park and pickup with feature access codes
  - CME/CUE user name/password synchronization
  - MLPP over PRI
  - Enhanced BLF monitoring, SIP line side DND update
  - Video across SIP trunks between CME's

# Agenda

- Cisco IOS Software Release 12.4T Family
- **Introducing Release 12.4(24)T**
- Cisco IOS Packaging
- Upgrade Paths and Migration Considerations
- Summary

# Introducing Release 12.4(24)T

## Cisco IOS Software Release 12.4(24)T

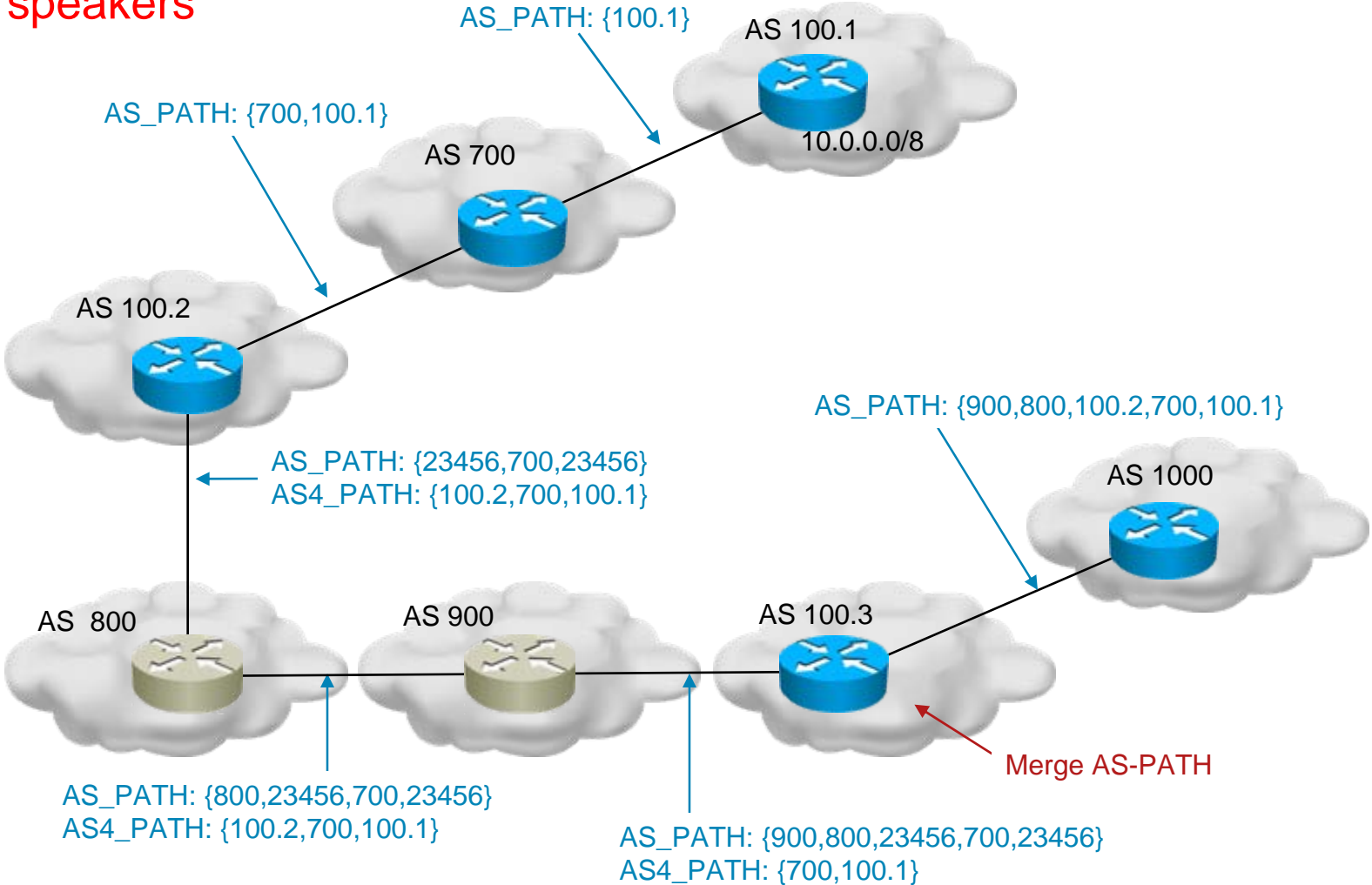
- **Latest in a series of individual Release 12.4T releases, each of which delivers aggregate functionality via its predecessor, and introduces new technology and hardware:**
  - ❖ **Cisco IOS BGP Support for the 4-byte Autonomous System Number (ASN)**
  - ❖ **Application-Based Routing for Mobile Router (MR) Multi-Path Support, which extends existing MR Multi-Path routing support to enable static Access Control Lists (ACLs) and dynamic Policy-Based Routing (PBR) route-map commands to define unique traffic types and route these traffic classes over specified interfaces or paths**
  - ❖ **Web Services Management Agent (WSMA), which provides advanced embedded capabilities to provision, manage, configure and adapt a Cisco device using open, industry standard Web Services protocols and transports**
  - ❖ **Smart Call Home Support for the Cisco 7200 Series Router**
  - ❖ **Cisco Unified Communications Manager Express and Cisco Unified SRST 7.1 enhancements**

# BGP Support for the 4-byte ASN

- **Allows BGP to carry the Autonomous System Number (ASN) encoded as a 4-byte entity. The addition of this feature allows an operator to use an expanded 4-byte AS number granted by the IANA as the existing 2-byte ASN pool is close to exhaustion**
- **Implementation includes the following enhancement to ensure smooth migration from a 2-byte to 4-byte ASN environment:**
  1. **Advertisement via standard based BGP capability code**
  2. **Two new “optional transitive” attributes: AS4\_AGGREGATOR and AS4\_PATH**
  3. **A newly reserved AS TRANS#: 23456 for interoperability between 4 byte ASN capable and non-capable BGP speakers**
- **To further reduce the operation change requirement when an operator is migrating from a 2 byte to a 4 byte ASN environment, the implementation provides a default “asplain” and an optional “asdot” AS output format**
- **Release 12.4(24)T supports all existing BGP features (IPv4, IPv6, VPNv4, and VPNv6 address, and sub address families) with the exception of support for IOS NetFlow**
- **Implementation is in compliance with RFC 5396 and RFC 4893**

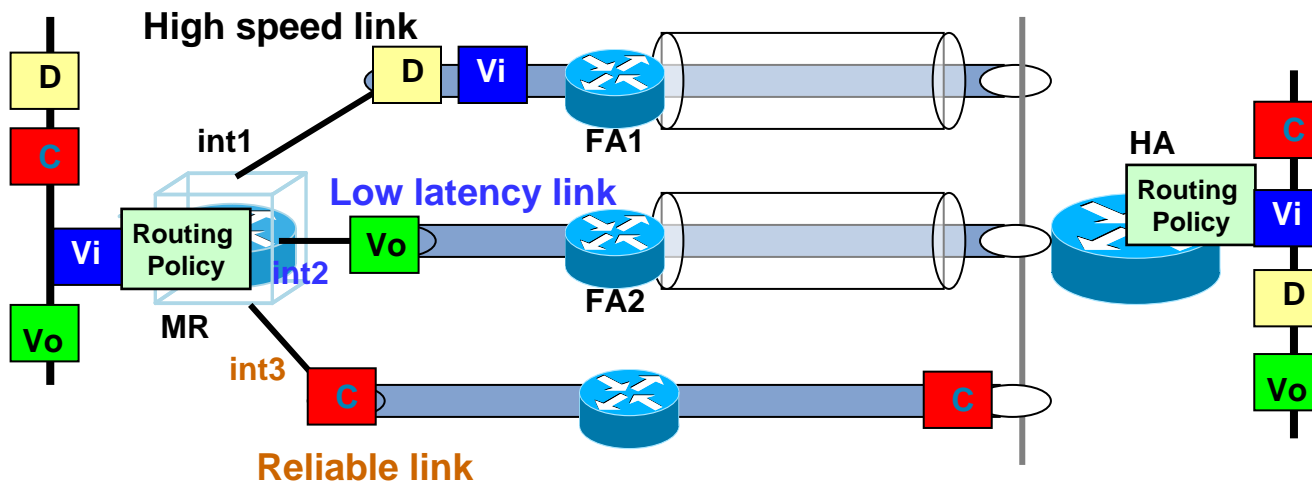
# BGP Support for the 4-byte ASN

A use case with both 4-byte capable and 2-byte ASN BGP speakers



# Application-Based Routing for Mobile Router (MR) Multi-Path Support

- Enables user-definable policies to route traffic to a specific mobile path (tunnel) via:
  - Static ACL
  - Dynamic PBR
- Application classification based on port number, DSCP, protocol type, IP addresses
- Available on both Home Agent (HA) and Mobile Router (MR)

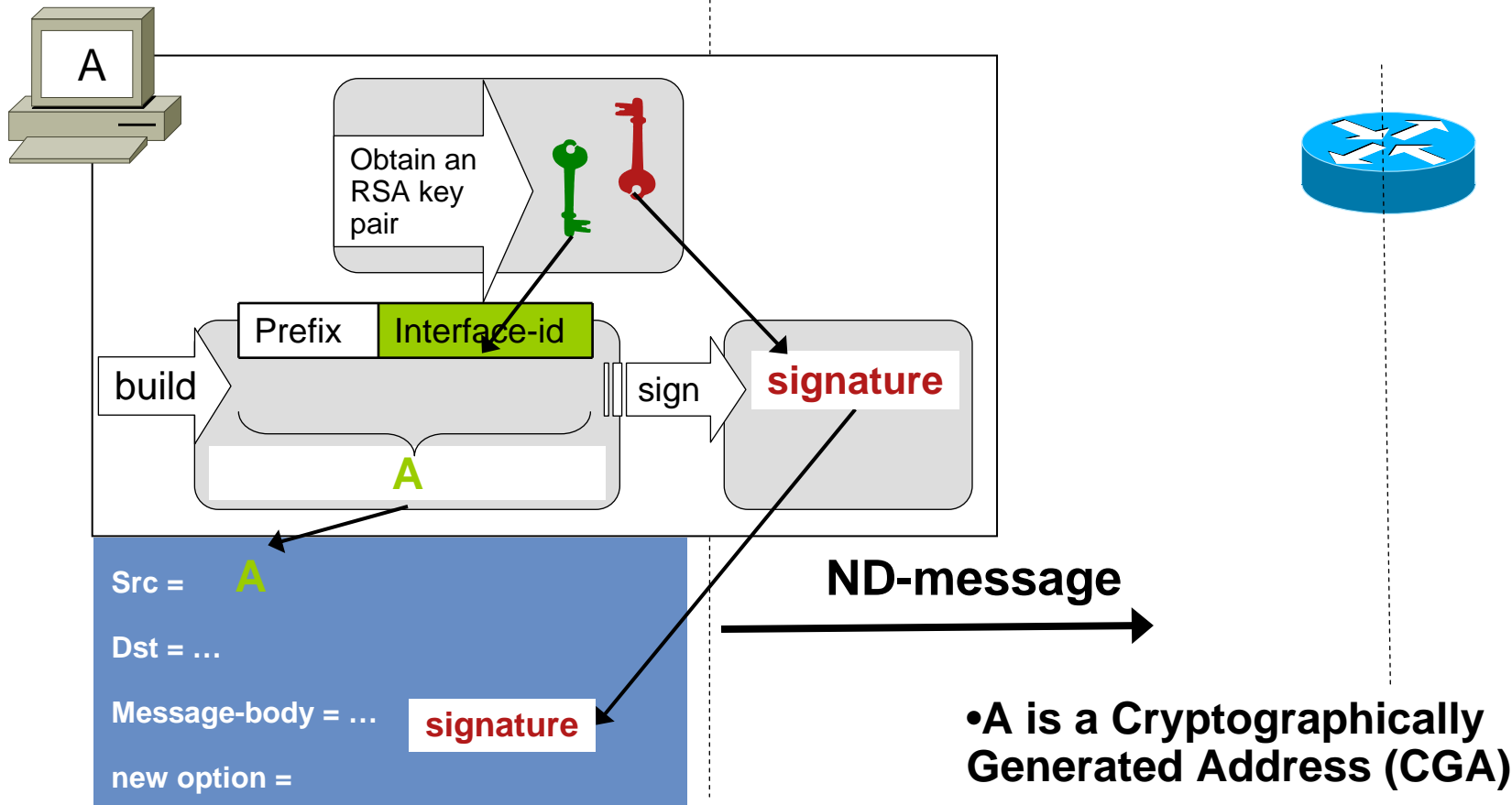


- **Protect business important applications**
- **Better application performance**
- **Control wireless cost**

# Secure Neighbor Discovery (SeND)

The Cisco implementation is fully compliant with RFC 3971 / 3972

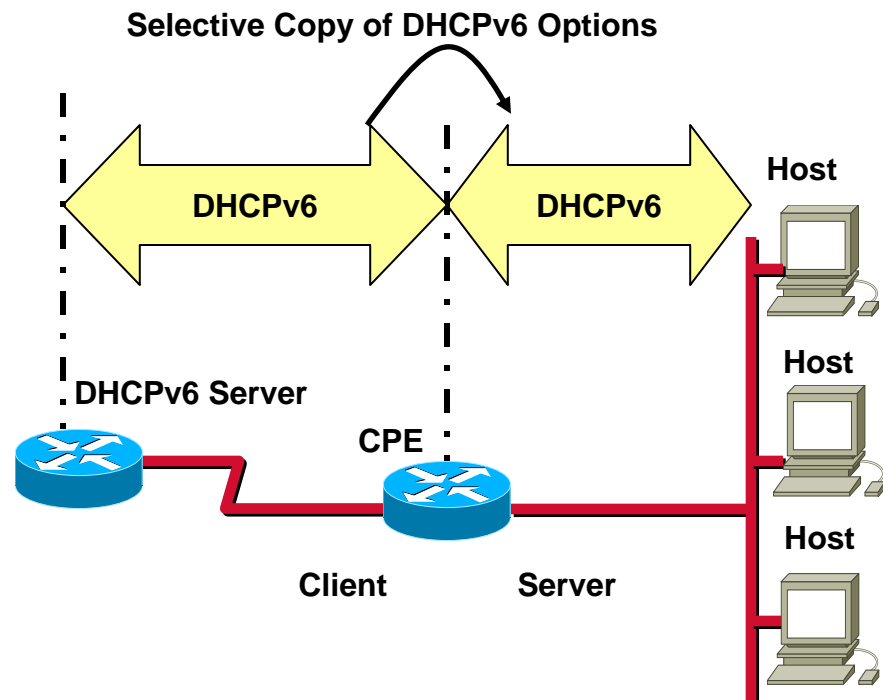
- Cryptographically Generated addresses (CGA)
- Router authorization through X.509 certificates
- Prefixes embedded in certificates
- Transitioning situation, giving preference to SeND peers over ND peers



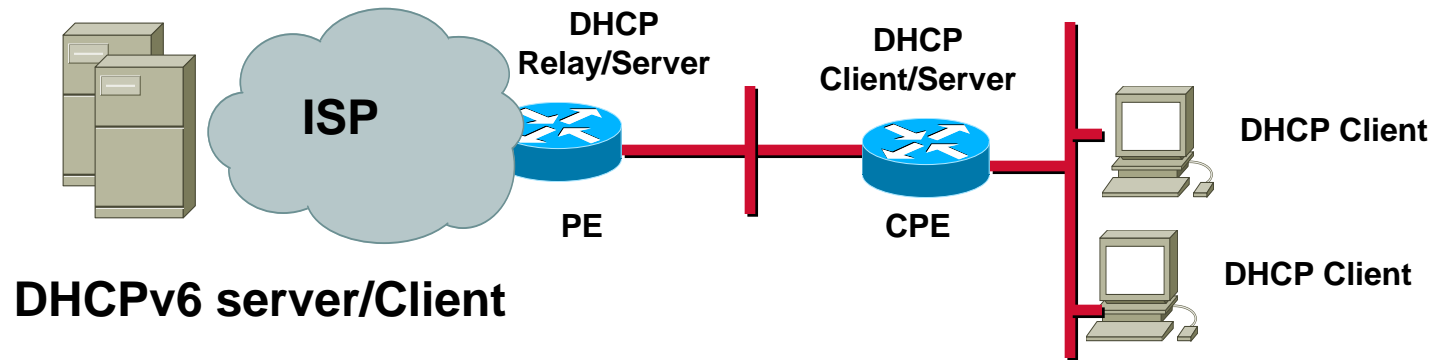
# DHCPv6 Server Auto-configuration

- DHCPv6 Stateless Options are selectively copied from the Client to the Server
- DHCPv6 stateless options are now regularly updated taking into account INFORMATION\_REFRESH\_TIME option
- Newly supported options

- NIS SERVERS
- NISP SERVERS
- NIS DOMAIN\_NAME
- NISP DOMAIN\_NAME
- SNTP SERVERS
- INFORMATION REFRESH TIME



# DHCPv6: Assigning Individual Addresses



- IA\_NA Identity association for non-temporary addresses [RFC3315]
- One or multiple addresses per interface
- Privacy extensions support [RFC3041]
- Server support of Vendor-Specific Information Option

# DHCPv6 for Individual Addresses

- **DHCP for IA on Client, Relay and Server**

## **Client**

**One or multiple addresses**

**Rapid Commit - The Rapid Commit option is supported**

**Works in a IPv6 VRF environment**

## **Server**

**Assign RFC3041 based address**

**Rapid Commit - The Rapid Commit option is supported**

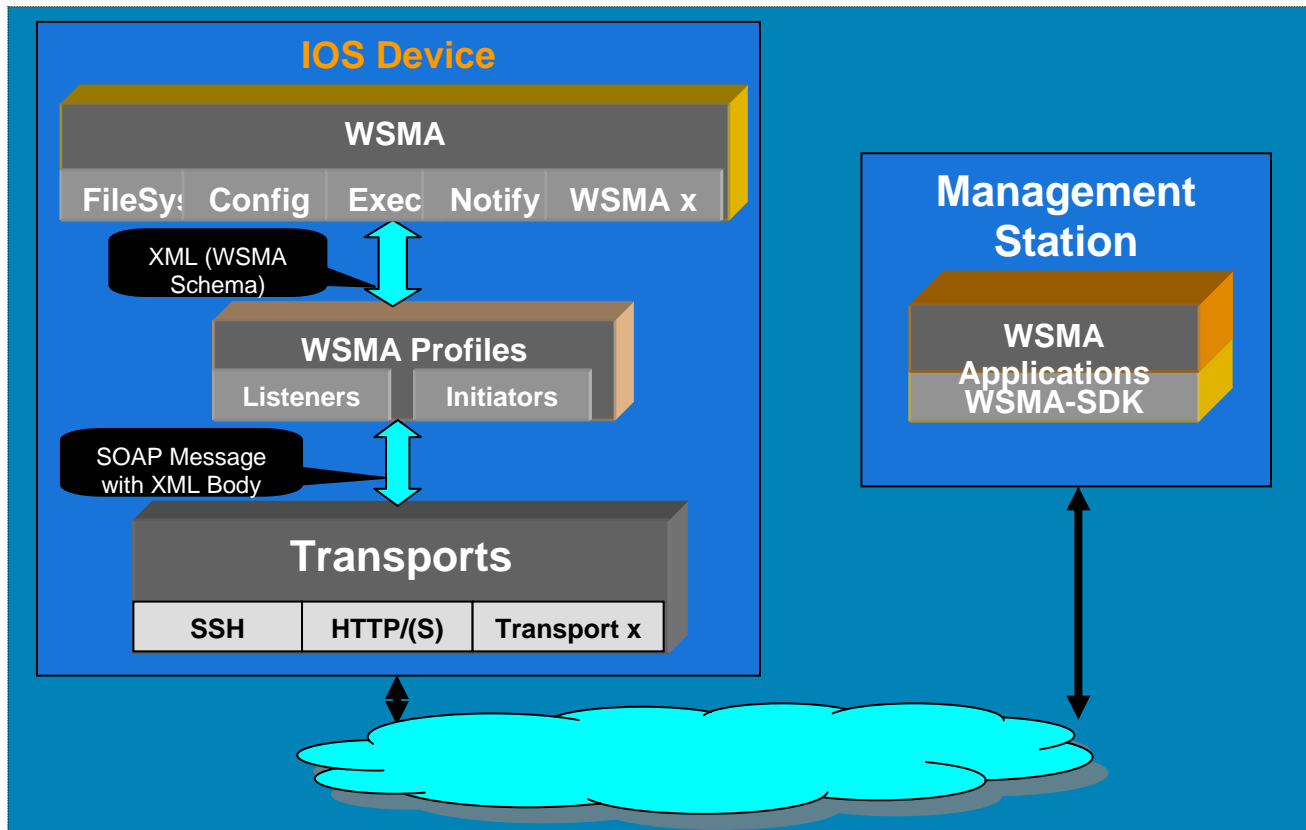
**Works in a IPv6 VRF environment**

**Support of Vendor-Specific Options**

# Web Services Management Agent Overview/Architecture

Embedded Management & Instrumentation

Web Services Management Agent (WSMA) provides advanced embedded capabilities to provision, manage, configure and adapt a Cisco device using open, industry standard Web Services protocols and transports.



# Web Services Management Agent Capabilities

Embedded  
Management &  
Instrumentation

**With WSMA, Cisco customers, partners and value added developers can build highly secure applications to deploy, configure and control Cisco devices including:**

- Retrieve configuration information in tagged XML**
- Retrieve “show” command output in tagged XML output**
- Change the configuration of a device using Web Services and XML**
- Run a program or execute a command**
- Receive notifications of configuration changes**
- Bulk up multiple config operations into a single WSMA transaction**
- Support for atomic operations including roll-back and return codes**
- Profile driven services allowing different services to use different transports and protocols**
- Copy files in and out allowing image and configuration upgrades**
- Test a configuration before applying it**

# Web Services Management Agent Transports

Embedded  
Management &  
Instrumentation

WSMA can be used over one of three profile-driven transports

- SSH – Using existing SSH capabilities, WSMA provides reliable and secure communication using the protocols most used by existing operators and administrators
- HTTPs – WSMA allows communication using traditional HTTPs (HTTP with SSL certificates) method used by most Web Services systems
- Transport Layer Security (TLS) – The next generation of SSL certificates provides the highest level of flexibility and security

# Web Services Management Agent Modes

WSMA provides two modes of operation; listener and initiator

- Listener Mode – for customers wanting traditional client/server operation, listener mode provides standard Web Services operation. Security is ensured using built-in SSH, HTTPs or TLS transports.
- Initiator Mode – for customers wanting a higher level of security, Initiator Mode allows the Cisco device to establish an outbound Web Services connection eliminating the need to punch holes in firewalls or allowing inbound router connections.

# Smart Call Home Support for Cisco 7200 Series Router

Embedded  
Management &  
Instrumentation

Proactive, real-time  
diagnostics and alerts

Automatic generation  
of Cisco service  
requests

Personalized web  
reports

Secure, reliable  
data transport

## Smart Call Home

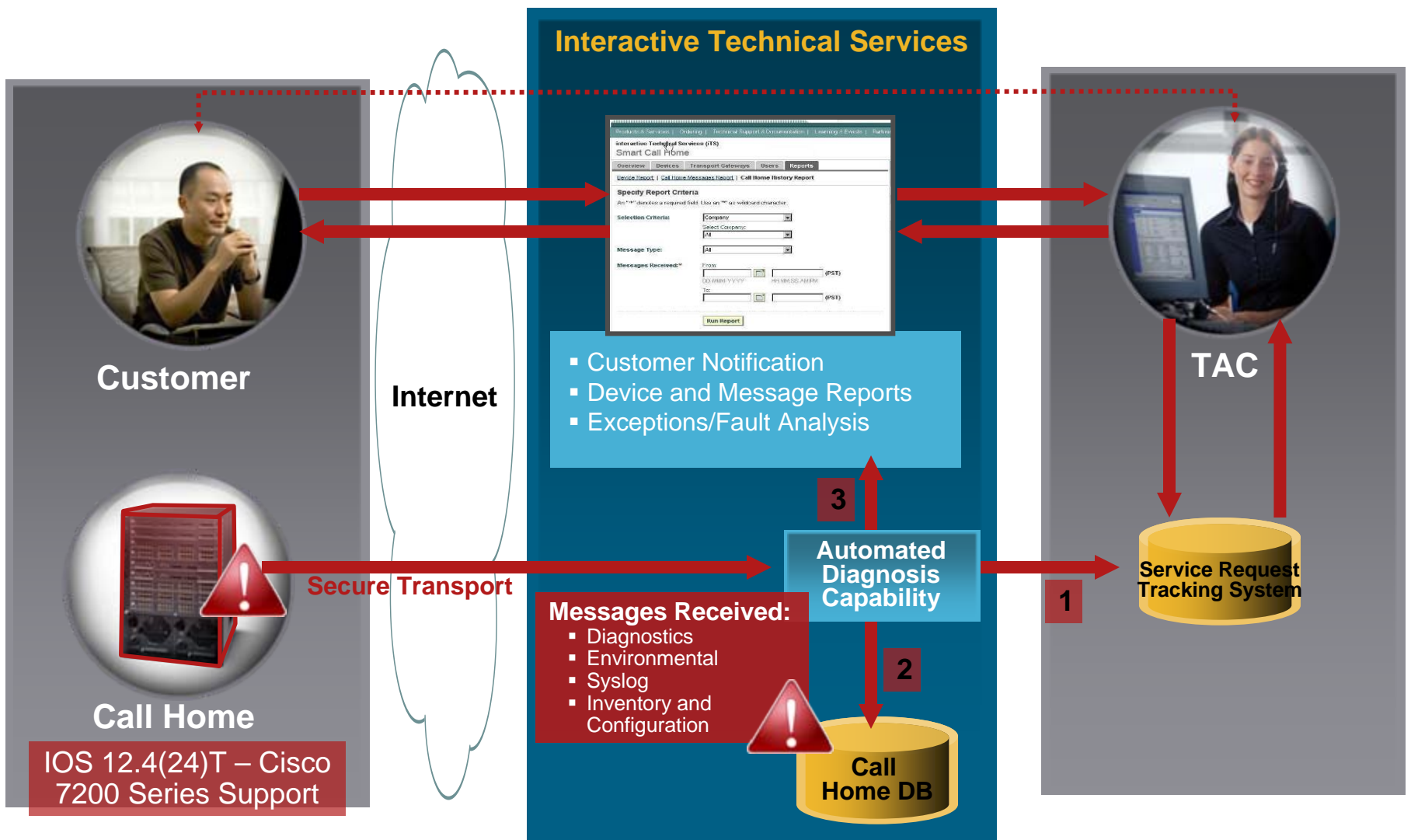


Cisco  
SMARTnet  
Service

[www.cisco.com/go/smartcall](http://www.cisco.com/go/smartcall)

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# Smart Call Home Architecture



# Increased Value Proposition for Cisco Customers

Embedded Management & Instrumentation

## Smart Call Home

### Higher Network Availability

#### Proactive, fast issue resolution

- Devices continually monitored with secure, connected service
- Real-time alerts for early detection of potential network problems
- Automatic, accurate fault diagnosis

### Increased Operational Efficiency

#### Less time troubleshooting

- Automated Service Request (SR) creation
- Detailed diagnostics attached to SR
- Routed to correct TAC team

### Fast Access to Information

#### Fast, web-based access to information

- Call Home messages, diagnostics and recommendations
- Inventory and configuration for all Call Home devices
- Security alerts, Field and End-of-life Notices

# Cisco Unified Communications Manager Express and Cisco Unified SRST 7.1

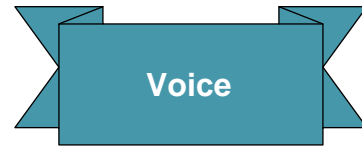
Voice

## New Capabilities

- Single Number Reach (SNR) in IOS
- Whisper Intercom
- SIP Line Side enhancements; Shared lines, SIP Shared Line Barge with privacy release, Call park and pickup with feature access codes
- CME/CUE User Name/Password Synchronization
- MLPP over PRI
- Enhanced BLF monitoring, SIP line side DND update
- Video across SIP trunks between CME's



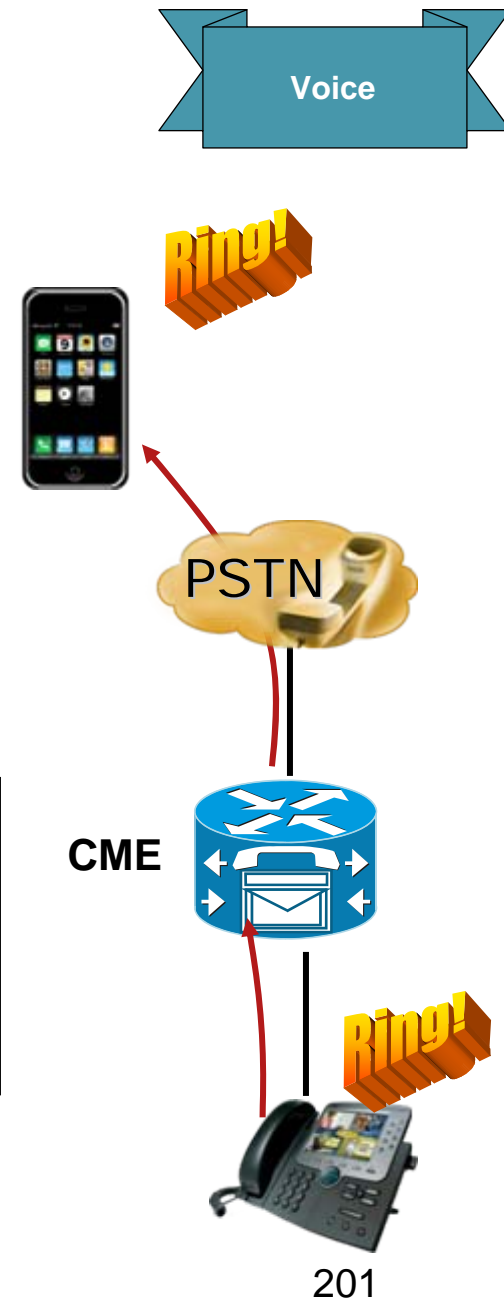
# Cisco Unified Communications Manager Express Cisco Unified SRST 7.1



<b>Feature</b>	<b>Benefit</b>
<b>Single Number Reach</b>	<b>Increases mobility for workforce, reduces missed opportunities and provides communication continuity</b>
<b>Whisper Intercom</b>	<b>Improves end user experience and productivity</b>
<b>SIP Line Side Enhancements</b>	<b>Increased capabilities for SIP endpoints include having shared lines, call-barge with privacy and call-park and pickup</b>
<b>MultiLevel Precedence and Preemption</b>	<b>Support for Public Safety and Department of Defense customers</b>
<b>Video over SIP trunks</b>	<b>Expands support for video deployments to improve collaboration</b>

# Single Number Reach (SNR)

- Allows calls to the Enterprise number to simultaneously ring a desk phone and a cell phone and can be answered at either
  - Calls can be switched from cell phone to IP Phone with one button press
  - Toggle SNR functionality on/off with touch of a button
- Mobile phone rings if 201 doesn't answer in pre-configured time
  - Calls not answered are pulled back to CUE voicemail (with PRI connection)



# Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(24)T
- Cisco IOS Packaging
- Upgrade Paths and Migration Considerations
- Summary

# Cisco IOS Packaging Introduction and Benefits

- **Simplification**

Minimize user disruption during the software selection process

- **Consolidation**

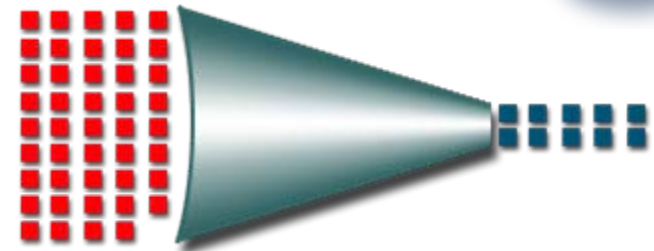
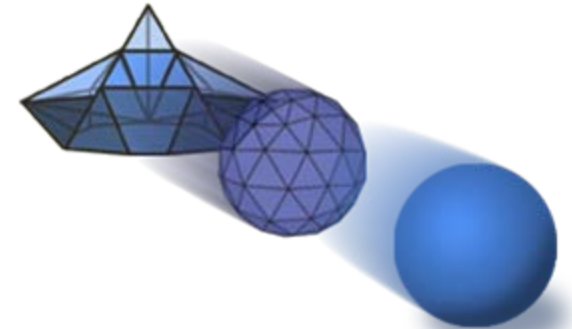
Streamline packaging across hardware that runs Cisco IOS Software

- **Consistency**

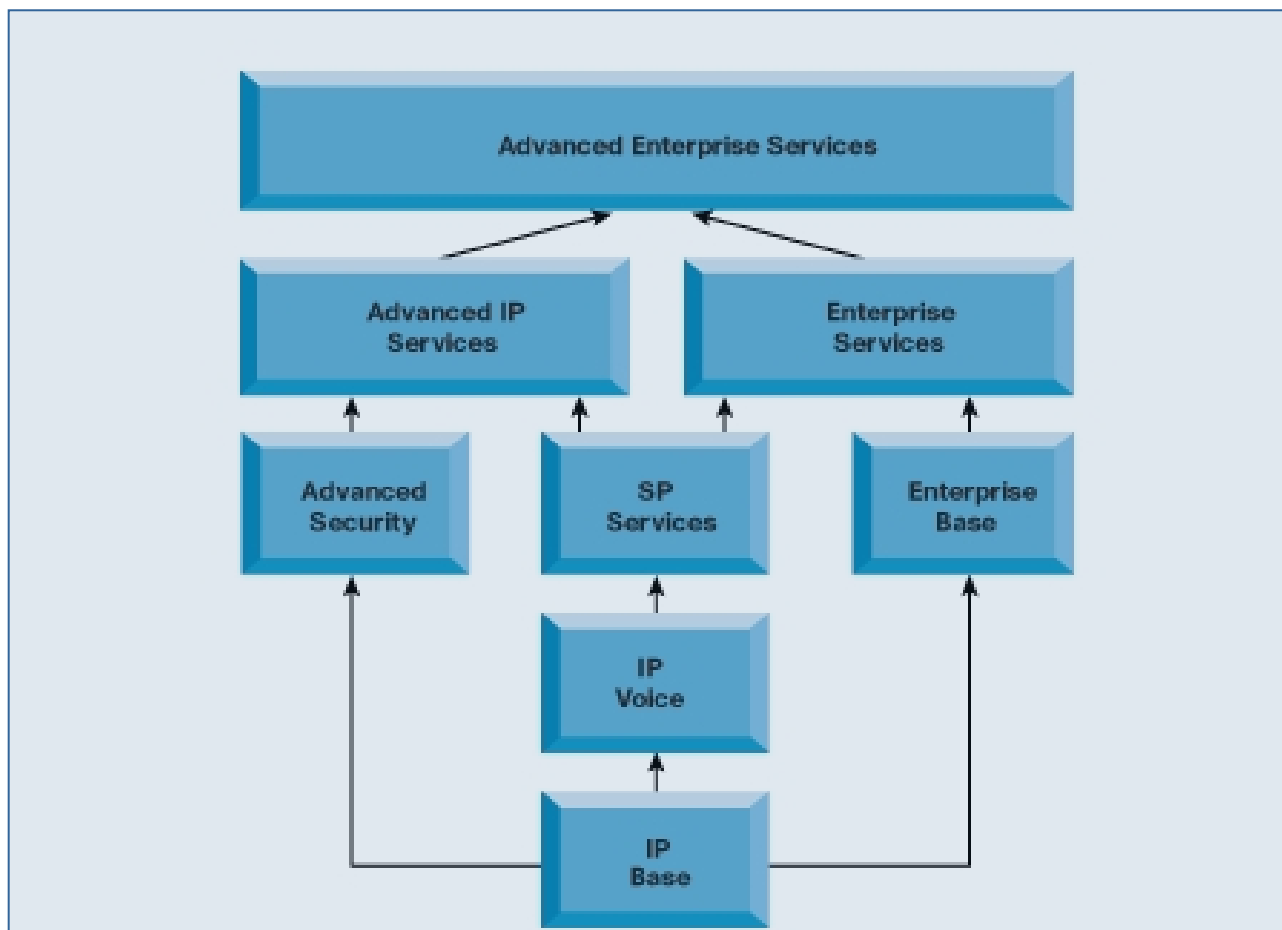
Consistent image names

Consistent functionality across hardware that runs Cisco IOS Software

Consistent Cisco IOS Software pricing



# Cisco IOS Packaging for Cisco Routers



<http://www.cisco.com/en/US/products/sw/iosswrel/ps5460/index.html>

# Packaging and Feature Changes in Release 12.4T

- **AppleTalk features will no longer be available after Cisco IOS Software Release 12.4(24)T. Refer to the following product bulletin for more details:**

[http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps5460/product\\_bulletin\\_c25-520459.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps5460/product_bulletin_c25-520459.html)

- **The Cisco Service Selection Gateway (SSG) feature will no longer be available after Cisco IOS Software Release 12.4(24)T. Refer to the following product bulletin for more information:**

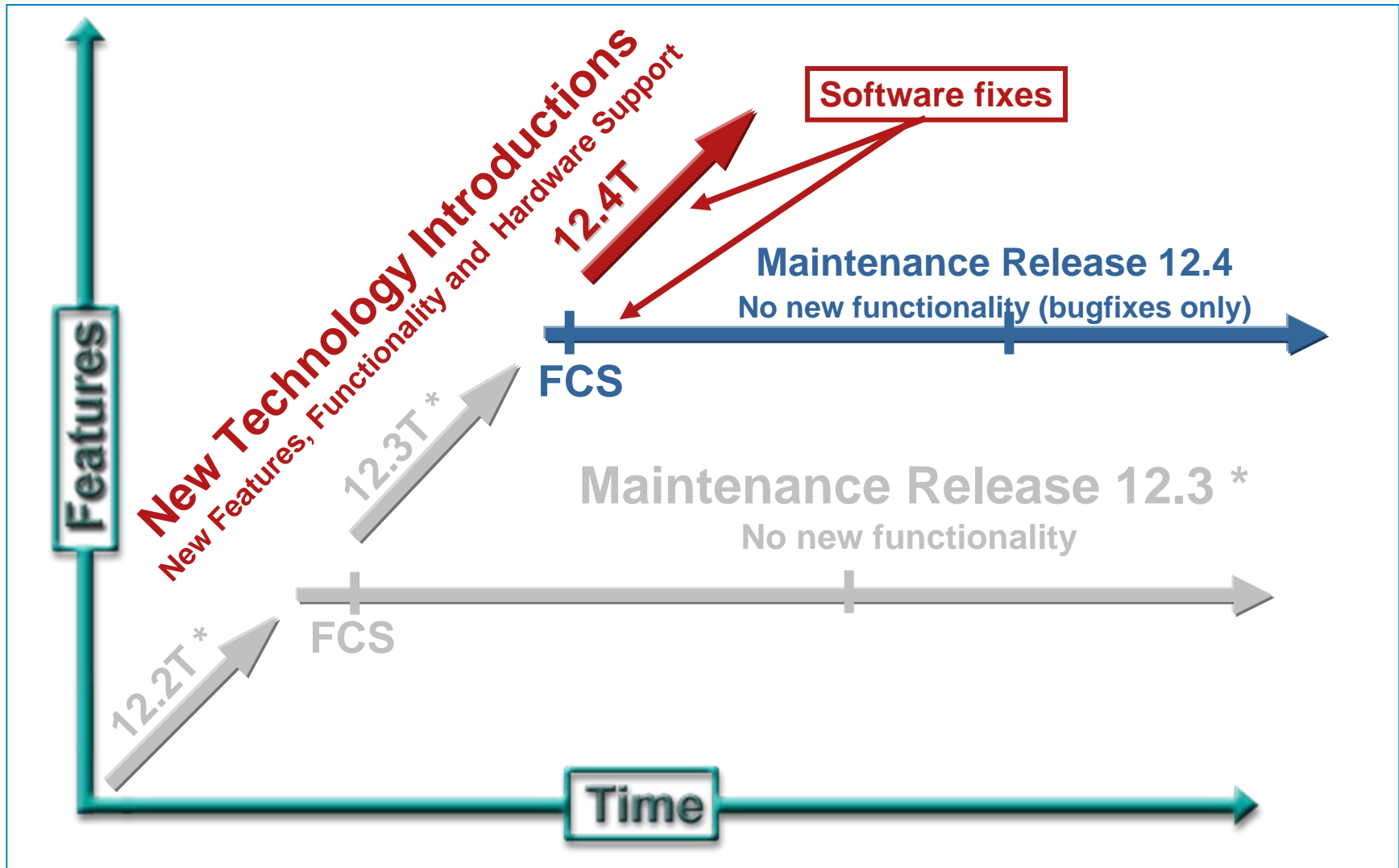
[http://www.cisco.com/en/US/prod/collateral/routers/ps341/end\\_of\\_life\\_notice\\_c51-501483.html](http://www.cisco.com/en/US/prod/collateral/routers/ps341/end_of_life_notice_c51-501483.html)

- **Beginning with Cisco IOS Release 12.4(20)T, NetFlow for IPv6 is no longer available in Cisco IOS Release 12.4T**  
NetFlow for IPv6 is being replaced by Flexible NetFlow for IPv6
- **Beginning with Cisco IOS Release 12.4(20)T, IPv4 Unicast Fast Switching path is deprecated; Switching paths are either process or Cisco Express Forwarding switched for both IPv4 and IPv6 traffic**  
This does not impact IP Multicast Fast Switching, or non-IP Fast Switching
- **Beginning with Cisco IOS Release 12.4(11)T, the IP BASE image for Cisco Integrated Services Router (ISR) platforms includes Border Gateway Protocol (BGP) Support**  
**BGP is not supported for non-ISR routers in IP BASE images**
- **Beginning with Cisco IOS Release 12.4(4)T, the Advanced Security image includes the BGP feature**  
Prior to Release 12.4(4)T, users needed Advanced IP Services in order to deploy both Security and BGP in the same image

# Agenda

- Cisco IOS Software Release 12.4T Family
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# Evolution to Release 12.4T

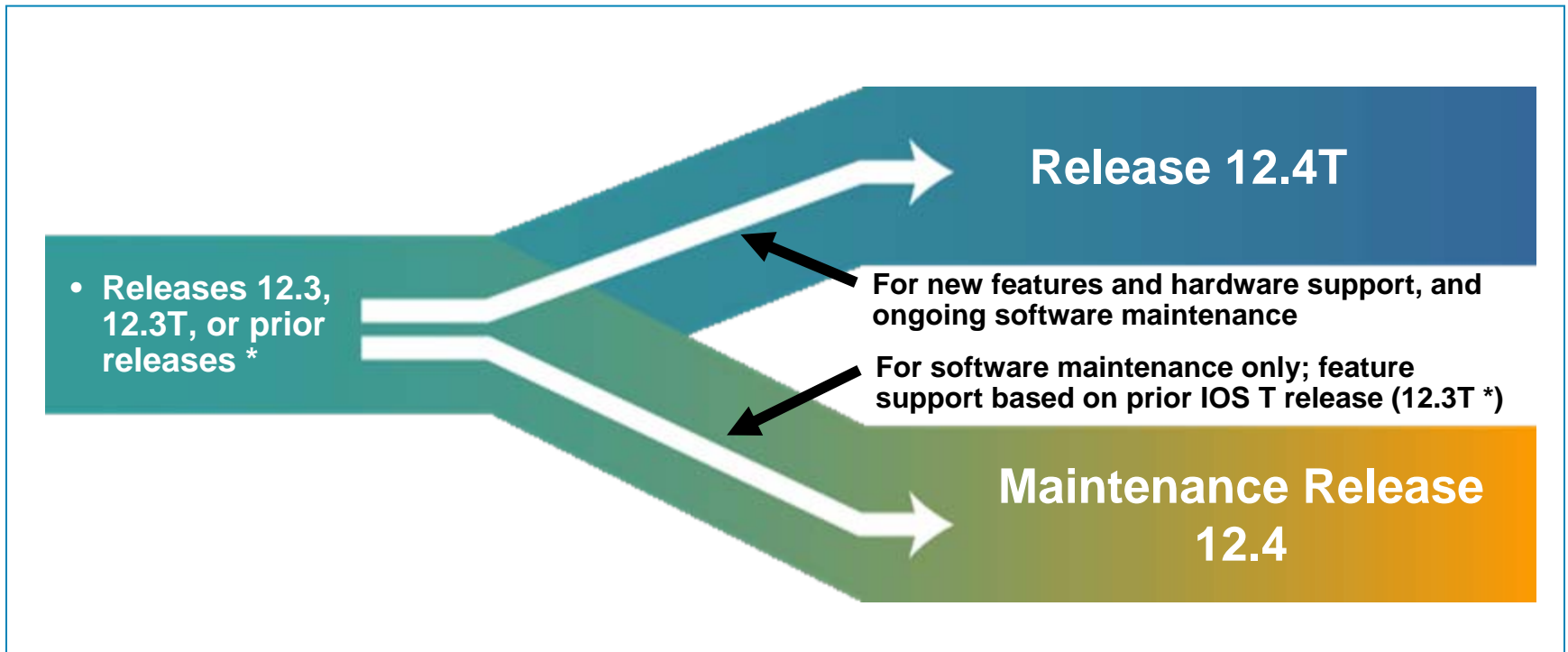


\* Cisco IOS Software Release 12.2T, 12.3T, and 12.3 have reached End of Software Maintenance:  
[http://www.cisco.com/en/US/products/sw/iosswrel/products\\_ios\\_cisco\\_ios\\_software\\_releases.html](http://www.cisco.com/en/US/products/sw/iosswrel/products_ios_cisco_ios_software_releases.html)

Cisco has announced extended support for Release 12.4(15)T:

[http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6968/ps6441/ps8258/product\\_bulletin\\_c25-496283.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6968/ps6441/ps8258/product_bulletin_c25-496283.html)

# Release 12.4T Upgrade Paths



\* Cisco IOS Software Release 12.3 and 12.3T have reached End of Software Maintenance:

[http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6947/ps5187/prod\\_end-of-life\\_notice0900aecd8052e110.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6947/ps5187/prod_end-of-life_notice0900aecd8052e110.html)

[http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6947/ps5207/prod\\_bulletin0900aecd803a0ffe.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6947/ps5207/prod_bulletin0900aecd803a0ffe.html)

# Release 12.4(24)T Platform Support Considerations

- Several Cisco hardware platforms that were supported in Release 12.4(15)T (and prior) are not supported in Release 12.4(20)T onward:
  - Cisco SOHO 90 Series
  - Cisco 831, 836, 837, and 850 Series
  - Cisco 1701, 1711, 1712, 1721, 1751, 1751-V, and 1760 Series
  - Cisco 2610XM-2611XM, 2620XM-2621XM, 2650XM-2651XM, and 2691 Series
  - Cisco 3631 and 3660 Series
  - Cisco 3725 and 3745 Series
  - Cisco 7400 Series
  - Cisco AS5850 Universal Gateway
- These platforms will be supported by Release 12.4(15)T via regularly scheduled software maintenance rebuilds and bug fix support until the end of software maintenance date for the respective platform is reached
- For more information please visit:  
[http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6968/ps6441/pr oduct\\_bulletin\\_c25\\_466578.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6968/ps6441/pr oduct_bulletin_c25_466578.html)

# Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(24)T
- Additional Features and Enhancements
- Cisco IOS Packaging
- Upgrade Paths and Migration Considerations
- **Summary**

# Summary

## Cisco IOS Software Release 12.4(24)T

- **Latest in a series of individual 12.4T releases, each of which delivers aggregate functionality via its predecessor, and introduces new technology and hardware:**
  - ❖ **Cisco IOS BGP Support for the 4-byte Autonomous System Number (ASN)**
  - ❖ **Application-Based Routing for Mobile Router (MR) Multi-Path Support, which extends existing MR Multi-Path routing support to enable static Access Control Lists (ACLs) and dynamic Policy-Based Routing (PBR) route-map commands to define unique traffic types and route these traffic classes over specified interfaces or paths**
  - ❖ **Web Services Management Agent (WSMA), which provides advanced embedded capabilities to provision, manage, configure and adapt a Cisco device using open, industry standard Web Services protocols and transports**
  - ❖ **Smart Call Home Support for the Cisco 7200 Series Router**
  - ❖ **Cisco Unified Communications Manager Express and Cisco Unified SRST 7.1 Enhancements**

# References – Release 12.4T

- Release 12.4T, New Features and Hardware Support, Product Bulletin No. 3001

[http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6968/ps6441/product\\_bulletin\\_c25-409474.html](http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6968/ps6441/product_bulletin_c25-409474.html)

- Cisco IOS Software Release 12.4T

<http://www.cisco.com/en/US/products/ps6441/index.html>

- Cisco IOS Packaging

<http://www.cisco.com/en/US/products/sw/iosswrel/ps5460/index.html>

- Download Cisco IOS Software Releases (Cisco.com login access required)

<http://www.cisco.com/kobayashi/sw-center/index.shtml>

- Cisco Feature Navigator – A web-based application that quickly matches Cisco IOS Software release features to supported hardware

<http://tools.cisco.com/ITDIT/CFN/jsp/index.jsp>

