



Cisco Enhances per- IPsec Tunnel QoS, IOS Firewall Security for Unified Communications, and Embedded Management with Cisco IOS Software Release 12.4(22)T



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Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(22)T
- Cisco IOS Packaging
- Upgrade Paths and Migration Considerations
- Summary

Cisco IOS Software Release 12.4T

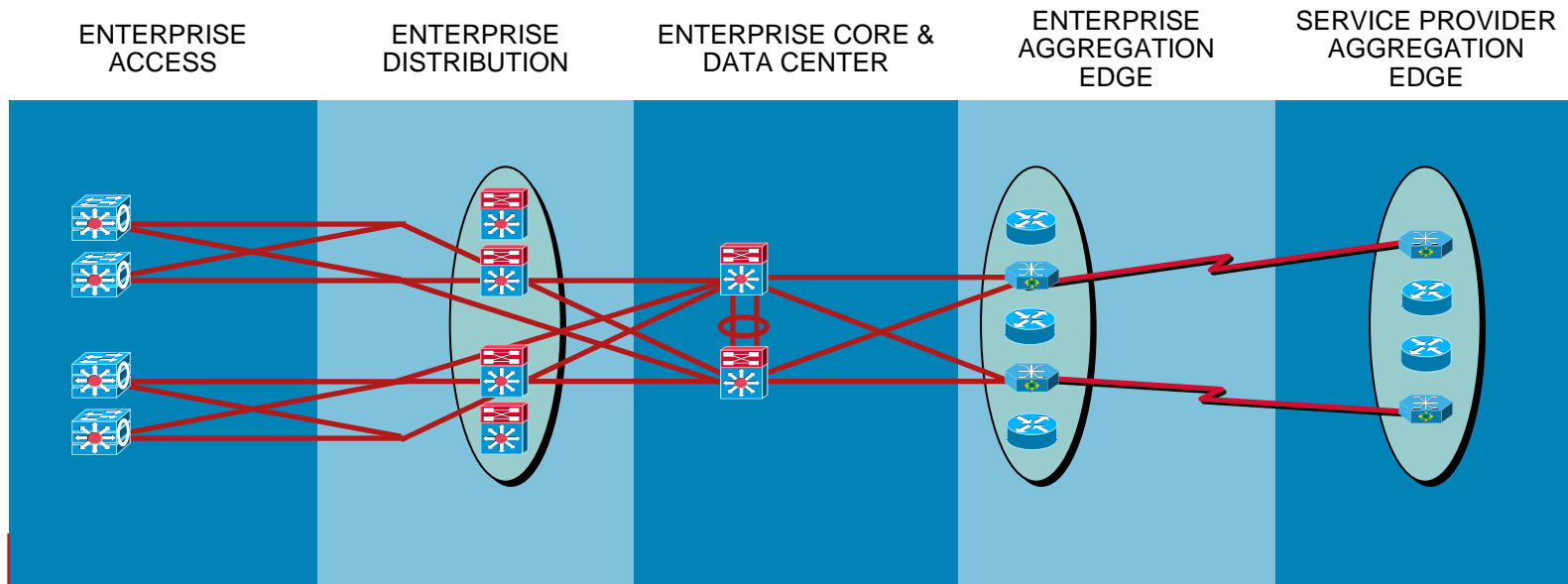
Extending Security, Voice, MPLS, and IP Services

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

Delivers advanced services for Enterprise and access customers

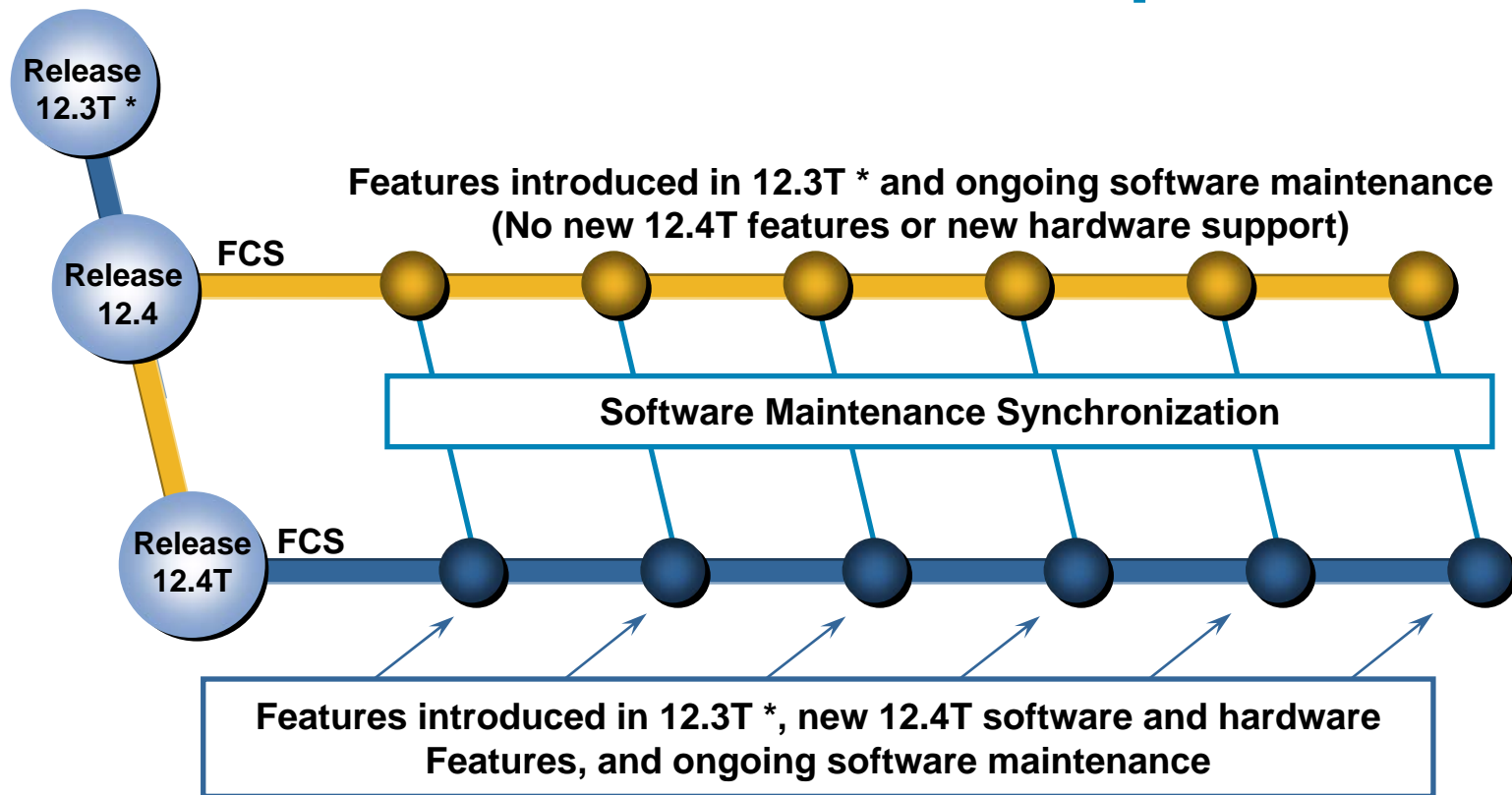
Series of regularly scheduled individual technology releases, each of which delivers aggregate functionality via its predecessor, and introduces new technology and features

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
Release 12.4T Enterprise & Access	✓				
Release 12.2SB Broadband & Leased-Line Aggregation, MPLS PE					✓
Release 12.2SR Metro Ethernet, MPLS PE				✓	✓
Release 12.2SX High-end Ethernet LAN switching, Metro Ethernet	✓	✓	✓	✓	✓
Release 12.2SE & 12.2SG Mid-range and Low-end Ethernet LAN Switching	✓	✓			

Cisco IOS Software Release 12.4T and 12.4 Relationship

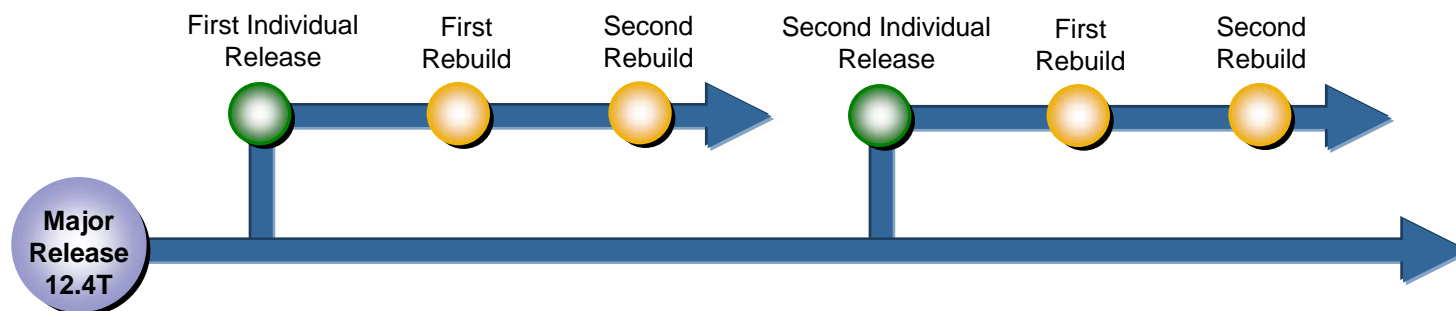


- Release 12.4T: integrates new technologies and features, new hardware support, and ongoing software maintenance
- Release 12.4: consolidation of features & hardware support introduced in the previous IOS T technology release (12.3T *), and ongoing software maintenance

• 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

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



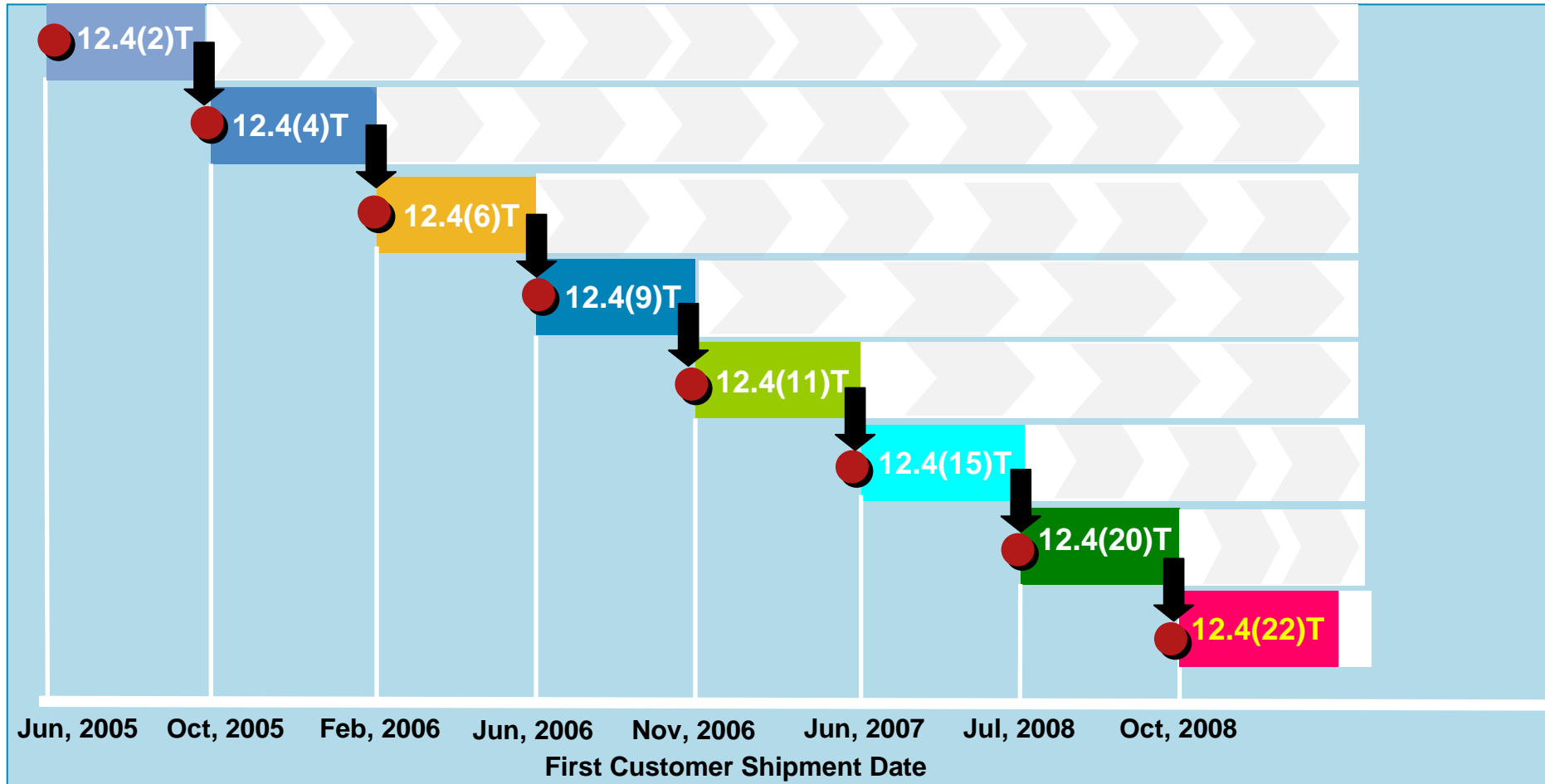
New hardware and software features, and software fixes



Additional software fixes

- Each Major release of 12.4T consists of periodic, individual releases
- Each individual release of 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

Voice

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



IOS Infrastructure Enhancements

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

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

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)



Cisco IOS
Software
Release
12.4(22)T

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

Agenda

- Cisco IOS Software Release 12.4T Family
- **Introducing Release 12.4(22)T**
- Cisco IOS Packaging
- Upgrade Paths and Migration Considerations
- Summary

Introducing Release 12.4(22)T

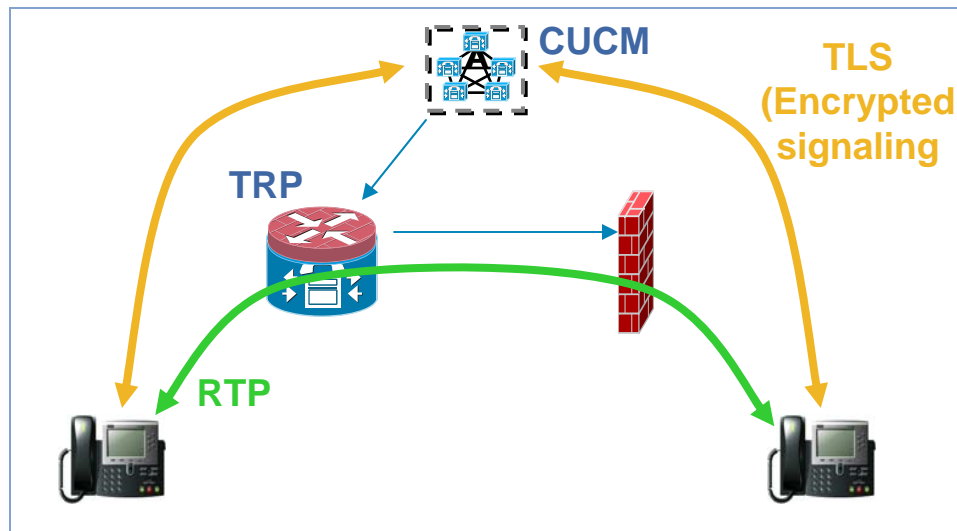
Cisco IOS Software Release 12.4(22)T

- **Latest in a series of individual 12.4T releases, each of which delivers aggregate functionality via its predecessor, and introduces new technology and hardware:**
 - ❖ **Per Dynamic Multipoint VPN (DMVPN) tunnel Quality of Service (QoS), which enables the DMVPN hub to dynamically allocate QoS service policies to each spoke**
 - ❖ **Enhanced Cisco IOS firewall security for Unified Communications by supporting Trusted Relay Point (TRP)**
 - ❖ **Flexible NetFlow support for v5 export format, TopTalkers, and multicast statistics for IPv4**
 - ❖ **Time-based Anti-replay (TBAR) support for the VPN Services Adapter (VSA) on Cisco 7200 Series Routers with Network Processing Engine (NPE)-G2**
 - ❖ **Support for the Cisco 880 SRST and 880G Integrated Services Routers**

Cisco IOS Firewall Trusted Relay Point

Delivering **Secure** Unified Communications

- Provides authentication of firewall open port requests
- Handles asymmetric signaling/media paths
- Provides encrypted signaling
- FW ports open only for session length



Trust and Identity Features

Feature	Benefit
Certificate IP Address Extension Support	<ul style="list-style-type: none">▪ Secures Neighbor Discovery Protocol (NDP)▪ Allows for stronger control on prefix advertisements

Time-Based Anti-Replay Support on VPN Services Adapter (VSA)

- Time-based anti-replay is used to detect replay attacks
 - Prevents 'man in the middle' attacks
- Designed for Group Encrypted Transport VPN (GET VPN) solutions
 - Created for private WAN environments to secure branch-to-branch communications without having to incur the cost of establishing and maintaining full mesh connections
- Standard sequence-based anti-replay is not supported due to GET VPN's group communication model
- Cisco VSA is supported on the Cisco 7200 Series Router with the Network Processing Engine (NPE)-G2

Group Encrypted Transport VPN (GET VPN) Enhancements

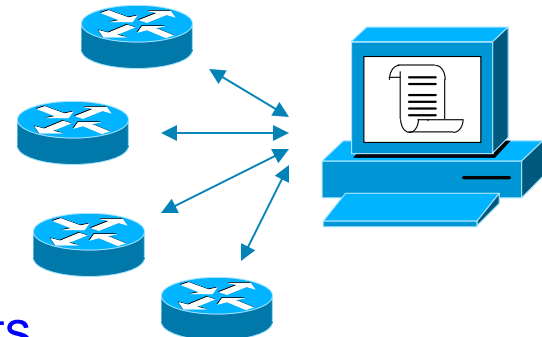
Feature	Benefit
Passive Security Association (SA)	Allows group member routers to modify the SA's downloaded from the key server; Enables transitions in large scale deployments
Fail-Close	Prevents GET VPN group member routers from sending out packets in the clear
Change Key Server Role	Allows a manual start to the election process of the primary key server
Cooperative Key Servers : Sharing Keys	Optimizes the number of rekeys that are sent in the event of a network split, allowing the network to stabilize rapidly
Re-key from Secondary on Merge	Reduces communications burden of the primary key server

ACL Syslog Correlation Simplifies ACL Monitoring

- Provides a consistent monitoring solution for IOS Access Control Lists (ACL), allowing network management tools to easily correlate Access Control Entry (ACE) rules with their corresponding syslog events
- Reduces complexity of managing and monitoring ACL rules
- Helps network administrators troubleshoot issues with ACE rules and allows them to monitor ACE rules effectiveness

Define TAG to Configured ACE Rules

```
ip access-list extended access-control
 permit ip any host 10.10.10.100 log red-server
 permit ip any host 10.10.10.200 log blue-server
 permit ip any any
```

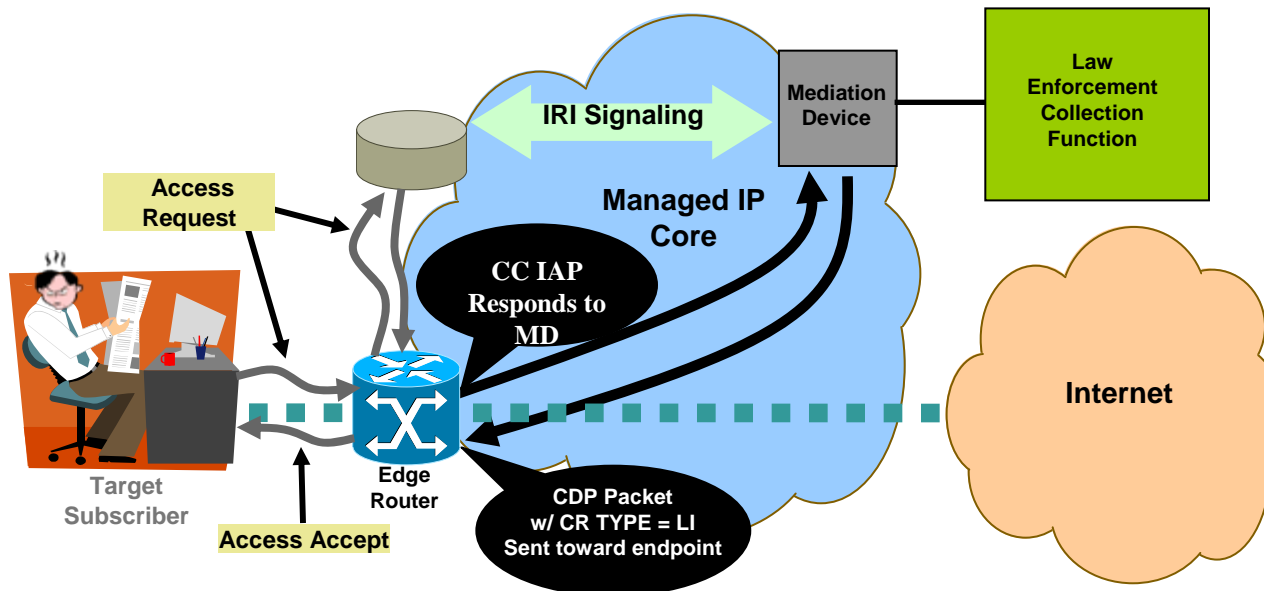


Tags are Appended to Generated Syslog Events

```
Sep 3 16:31:18.958: %SEC-6-IPACCESSLOGDP: list access-control permitted icmp
 192.168.1.100 -> 10.10.10.100 (0/0), 11 packets [ red-server ]
Sep 3 16:32:18.953: %SEC-6-IPACCESSLOGDP: list access-control permitted icmp
 192.168.1.100 -> 10.10.10.200 (0/0), 3 packets [ blue-server ]
```

Cisco IOS Support for Lawful Intercept

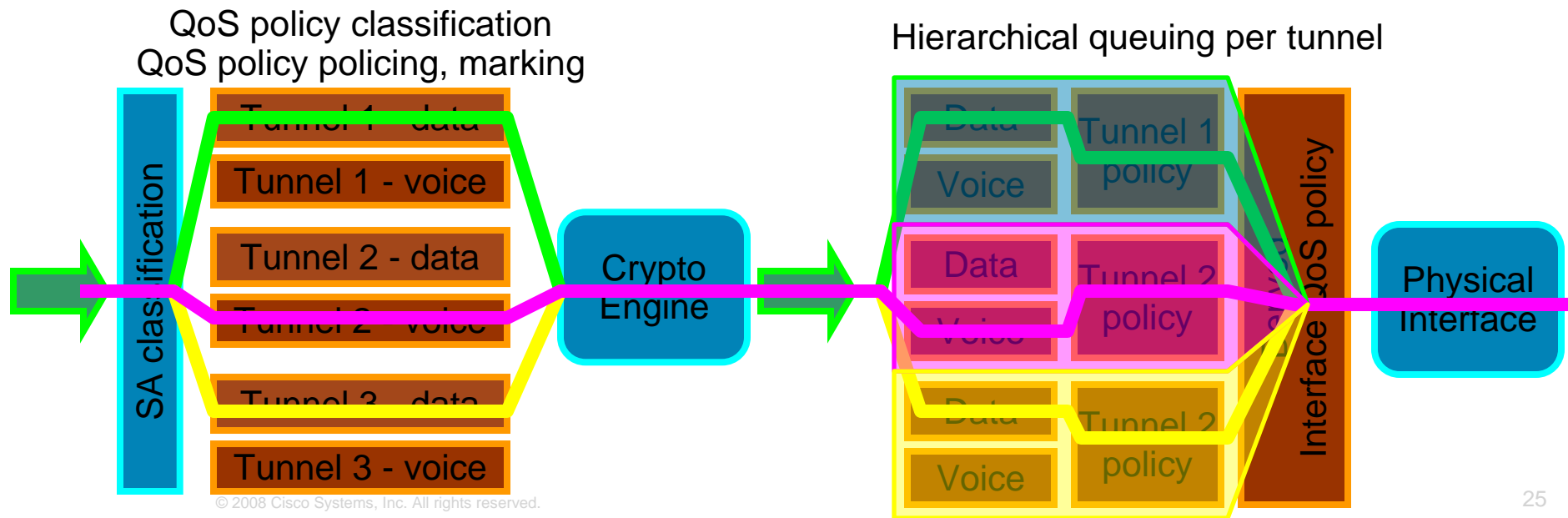
- The Cisco Lawful Intercept solution provides an effective, powerful solution for organizations looking to comply with CALEA requirements
- Cost effective way to leverage existing infrastructure to meet Lawful Intercept (LI) regulatory obligations
- Provides an easy proactive compliance and offers quick deployment



Per IPsec Tunnel Quality of Service (QoS)

Quality of Service

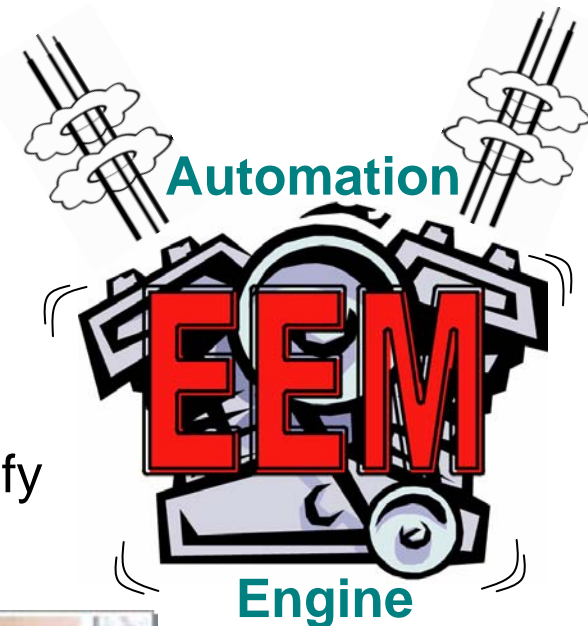
- Quality of Service (QoS) shapes and applies bandwidth guarantees to mission critical application traffic in VPN networks**
 - QoS classification happens before encryption
 - Shaping/queuing happens at the physical interface
 - QoS policy is possible in both tunnel and physical interface
- Enhancement simplifies QoS enablement in VPN networks**
 - Dynamic QoS on hub device ensures optimal spoke to hub traffic flow
 - More efficient use of internal resources such as Crypto Engines in VPN gateways



Cisco IOS Embedded Event Manager Version 3.0

Embedded Management

- Four new Event Detectors (ED):
 - Routing Event Detector*
 - Flexible NetFlow Event Detector*
 - IP SLA Event Detector*
 - Enhanced CLI Event Detector
- High performance “Turbo” Tcl policies
 - Up to 150 events per second**
- SNMP Tcl Extensions (Get, Set and Notify for local and remote hosts)
- More powerful, interactive Applets
- CLI library - XML PI support
- And more ease-of-use enhancements and extensions



Plus, don't forget about [Cisco Beyond](http://cisco.com/go/ciscobeyond)

<http://cisco.com/go/ciscobeyond>

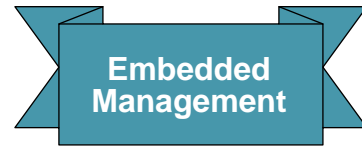
For script sharing, samples to download and modify

Share yours with the community!

* Where integration is available, included in Release 12.4(22)T

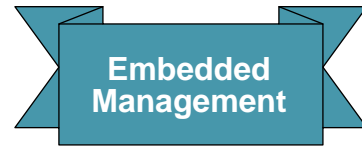
** Performance is product specific

Flexible NetFlow (FNF) NetFlow v5 Export Format



- Prior Release 12.4(22)T FNF only supported NetFlow v9 format
 - Migration from traditional NetFlow to FNF required customers to simultaneously change IOS configuration and upgrade collectors to NetFlow v9 format
- Most customers today export flow records using NetFlow v5 export format
- Release 12.4(22)T enables smooth migration to FNF while exporting flow records with NetFlow v5 format and eliminating the need for collector upgrades

Flexible NetFlow IPv4 Multicast Support



- Multicast FNF provides the ability to collect specific characteristics of Multicast Flows:

- Support for IPv4 Multicast Flows

- Account for replicated packets in both ingress and egress directions

- Capture ingress reverse path forwarding (RPF) drops

- Export multicast related information in V9 format

- Allow replication factor to be collected as both a key and non-key field

Flexible NetFlow TopTalkers

- Flexible NetFlow allows users to gather extensive information about the network traffic characteristics
- To facilitate troubleshooting, users need advanced filtering capabilities to display a subset of flow monitor cache in real time
- Flexible NetFlow TopTalkers is a generic instrumentation capability for displaying Flow Monitor content

Works with any type of Flows/Fields (IPv4, IPv6, L2, etc.)

Flexible NetFlow TopTalkers

- Flexible NetFlow TopTalkers introduces advanced search capabilities
 - Flow Filtering:** enables users to select flows based on specific values for any fields that are defined for that cache
 - Flow Aggregation:** enables users to aggregate on a subset of the key and non-key fields present in the Flows of an FNF Cache
 - Flow Sorting:** enables users to control how the displayed cache entries are sorted on any field present in the flows of an FNF Cache and show in order or reverse order
- Flow Filtering, Flow Aggregation and Flow Sorting can be combined to select what and how information will be displayed

Cisco 880G Integrated Services Router Enterprise 3G WWAN Data Market

Hardware



**For Small Branch and Small Office
requiring true multi-path back up**

**Cisco 880—3G WAN:
EVDO and UMTS/HSDPA Versions Available**
ExpressCard form factor, with EM 597e (EVDO) and EM
880e (UMTS/HSPA*)

External indoor 3G antenna with 4.5 feet cable

**At FCS HSDPA, post FCS HSPA*

- Combines Internet access, security and wireless services onto a single device with true multi-path business continuity
- WAN/LAN Technologies
 - 3G, Fast Ethernet, G.SHDSL, ADSL2+*, VDSL2*
 - 802.11n WLAN and Unified Management
- Comprehensive security
 - IPSec VPN acceleration: DMVPN, GET VPN, Easy VPN
 - Firewall, IPS, Content Filtering, SSL-VPN
- Comprehensive Routing and QoS
- Ease of Management
 - Cisco Configuration Professional
 - CiscoWorks
 - Unified Wireless Management

Cisco 880 SRST Integrated Services Router

Hardware



For Small Branch, Enterprise Teleworker or Remote Call Center Agent

- Desktop form factor
- WAN Interfaces: FE, VDSL2*, G.SHDSL
- PSTN Fallback: BRI, FXO
- Voice Ports: Four FXS
- Four-port FE Managed Switch with PoE
- Voice Protocols: H.323, SIP, MGCP, SCCP
- Software: Advanced IP Services

- **Adds Voice with Survivability Features**
Best-in-class integration of data and toll-quality analog/digital voice services for Enterprise Teleworker
- **WAN/LAN Technologies**
Fast Ethernet, G.SHDSL, ADSL2+*, VDSL2*
802.11n WLAN and Unified Management
- **Comprehensive security**
IPSec VPN acceleration: DMVPN, GET VPN, Easy VPN
Firewall, IPS, Content Filtering, SSL-VPN
- **Comprehensive Routing and QoS**
- **Ease of Management**
Cisco Configuration Professional
CiscoWorks
Unified Wireless Management

*Future Support

Cisco VG202 & VG204 Analog Voice Gateways

Hardware



For Enterprise Branch Offices
and Small & Medium
Businesses

Analog Voice Gateway with 2 & 4 FXS Ports
2 FastEthernet Ports
Desktop, Wall-Mount or Rack-Mount

- Unified Communication Analog Gateway solution for Enterprise Branch office and SMBs
 - Ease of operation—Cisco IOS-based
 - Provides consistent usability with the rest of the Voice Gateway Integrated Services Routers (Cisco 2800, 3800 Series)
 - Next-generation platform architecture supports SCCP, SIP and Secure Voice
 - Desktop form factor with fanless design
- Best of Breed Hardware
 - Robust Analog Interfaces
 - Two 10/100 Mbps ports for dual homing
 - Proven and consistent DSP technology used across Cisco Platforms

Cisco IAD2435-8FXS Integrated Access Device

Hardware



Target Market
SP Managed CPE for Small
Medium Business

- **Desktop form factor**
- **WAN – 1 T1/E1**
- **LAN – 2 10/100 Mbps ports**
- **Voice – 8 FXS Voice Ports**
- **Protocol Support – SIP, MGCP, H.323**

- **Managed Service Provider solution for small and medium business**
 - Best-in-class integration of data & toll-quality analog/digital voice services for a customer-premises solution
 - Offers right level of flexibility for managed data and voice services
 - Lowers capital and operational costs
- **Desktop form factor with fanless design**
- **Comprehensive security**
 - IPSec VPN, Firewall, IPS, NAT/PAT ALG
 - CUBE-Lite (SBC Functionality)
- **Routing and QoS**
 - Routing: RIP v1/v2, OSPF, static
 - QoS (IP): LLQ, DSCP, IP Precedence, CAR

Intrusion Prevention System (IPS) Enhanced Network Module

Hardware



NME-IPS-K9

**Accelerated Threat
Control for Cisco ISR**

**Supported on Cisco 2811,
2821, 2851, and 3800 Series
Routers**

**Requires IOS Advanced
Security image or higher**

**Inline and promiscuous Intrusion
Prevention (IPS)**

**Same software (CIPS 6.1) and features
as Cisco IPS 4200**

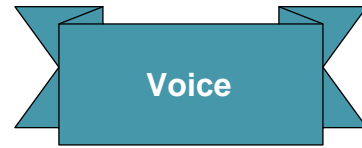
**Performance Improvement by hardware
acceleration**

Dedicated CPU and DRAM to offload host CPU

**Device management: Cisco IPS Device
Manager (IDM), Cisco Configuration
Professional (CCP); Network wide
management through Cisco Security
Manager (CSM)**

**IPS Manager Express (IME) and CS-
MARS on event monitoring and
correlation**

Leadership in Session Initiation Protocol (SIP)



For Branch Offices and Enterprise Businesses

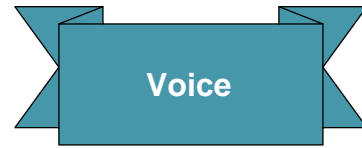
- Extends negotiation of RSVP CAC/QoS across CUCM clusters*, Gateways, CUCME and CUBE
- More SIP supplementary services
- Better interoperability with CUCM

* CUCM dependency

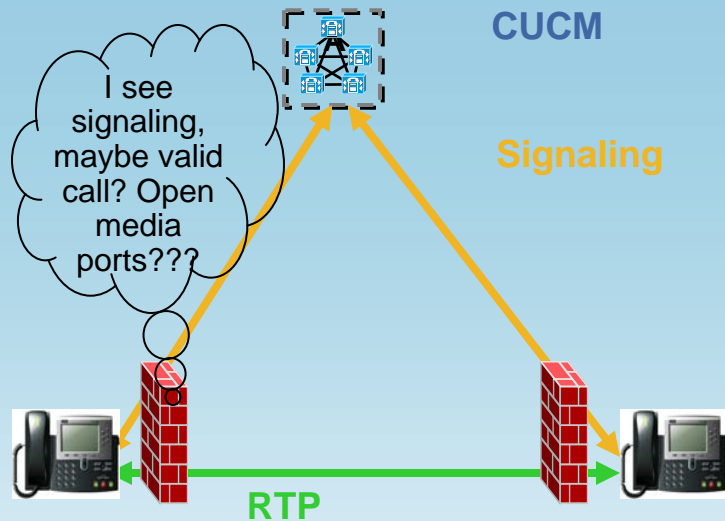
- RSVP Preconditions (RFC3312)
TDM Gateway
Cisco Unified Communications Manager Express
- Audio RSVP enhancements to support reINVITE or 302 based supplementary services on gateway
- RSVP support on the SIP trunk of SCCP-CUCME
- SIP SRTP Fallback to Non-secure RTP and SRTP over sip: scheme for CUBE
-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

Threat Defense

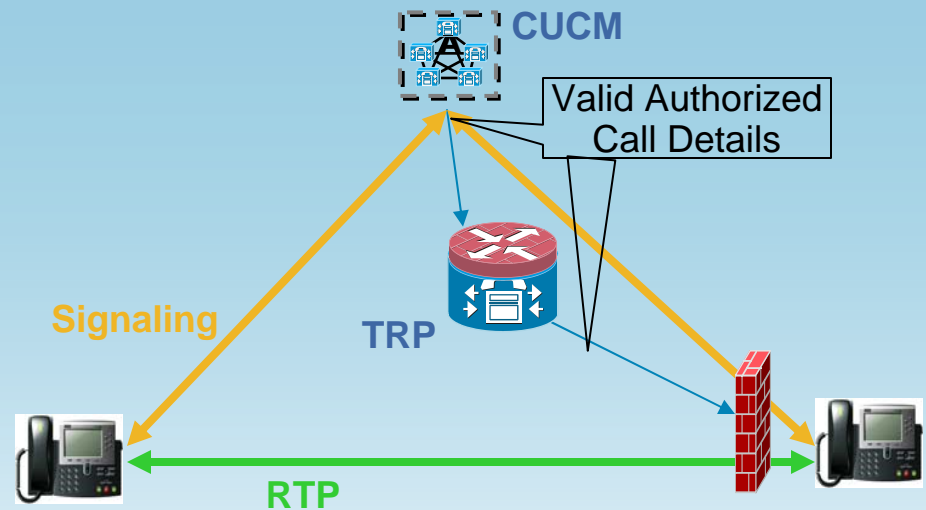
UC Trusted Firewall Control



FW Application Layer Gateway



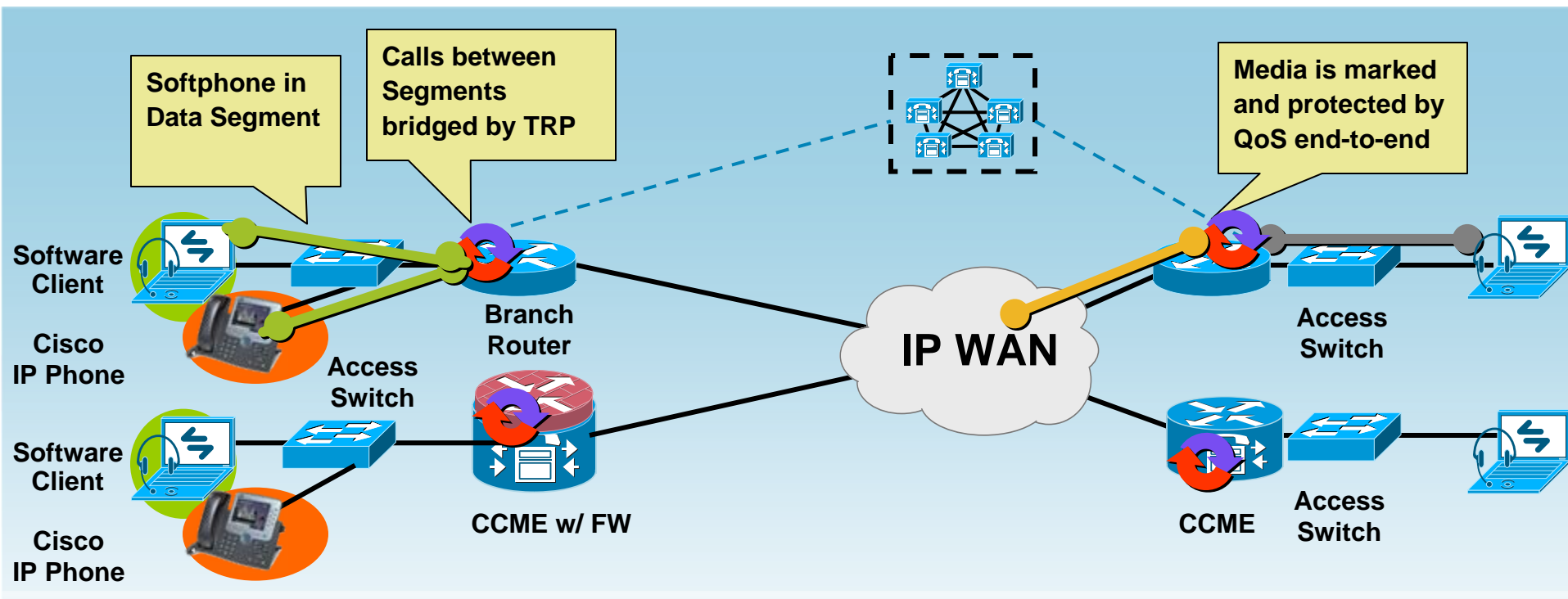
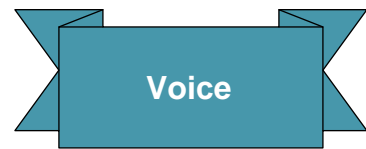
UC Trusted Firewall Control



- Firewall looks at the signaling to determine what ports media will flow through; FWs also have the ability to create zones for this protection
- If you upgrade a voice application server the firewall might be affected
- If the FW does not see signaling (encrypted, asymmetrical path) then media ports cannot be opened

- Firewall receives a hashed STUN message with details of an authorized call
- Protocol version independent
- Secures Encrypted Signaling
- Secures asymmetrical signaling and media paths

Secure Softphone Connectivity with Trusted Relay Point (TRP)



- Trusted Relay Points enable Secure IP Phone Connectivity from Data VLANs/VRFs by securely bridging media from the data segment to the voice segment
- Trusted Relay Point remark the QoS for “authorized traffic” from the softphone
- Requires UCM 7.0 and UCME 4.0

Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(22)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**

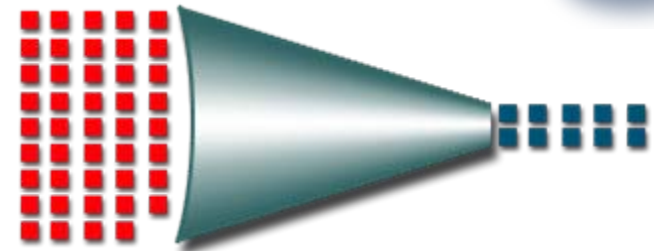
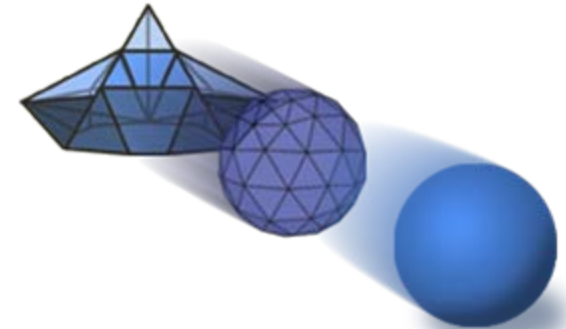
Streamline packaging across hardware that runs Cisco IOS Software

- **Consistency**

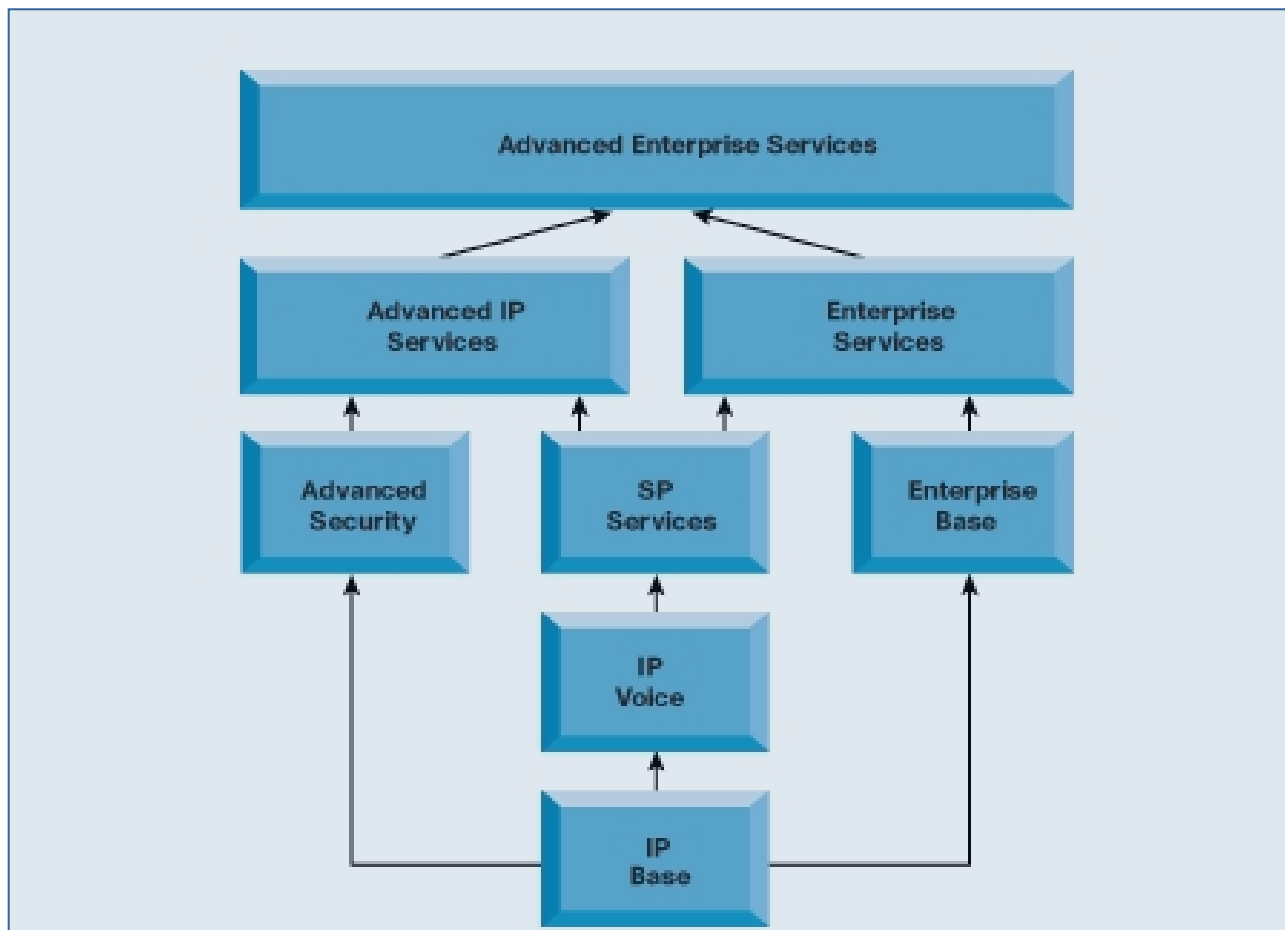
Consistent image names

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>

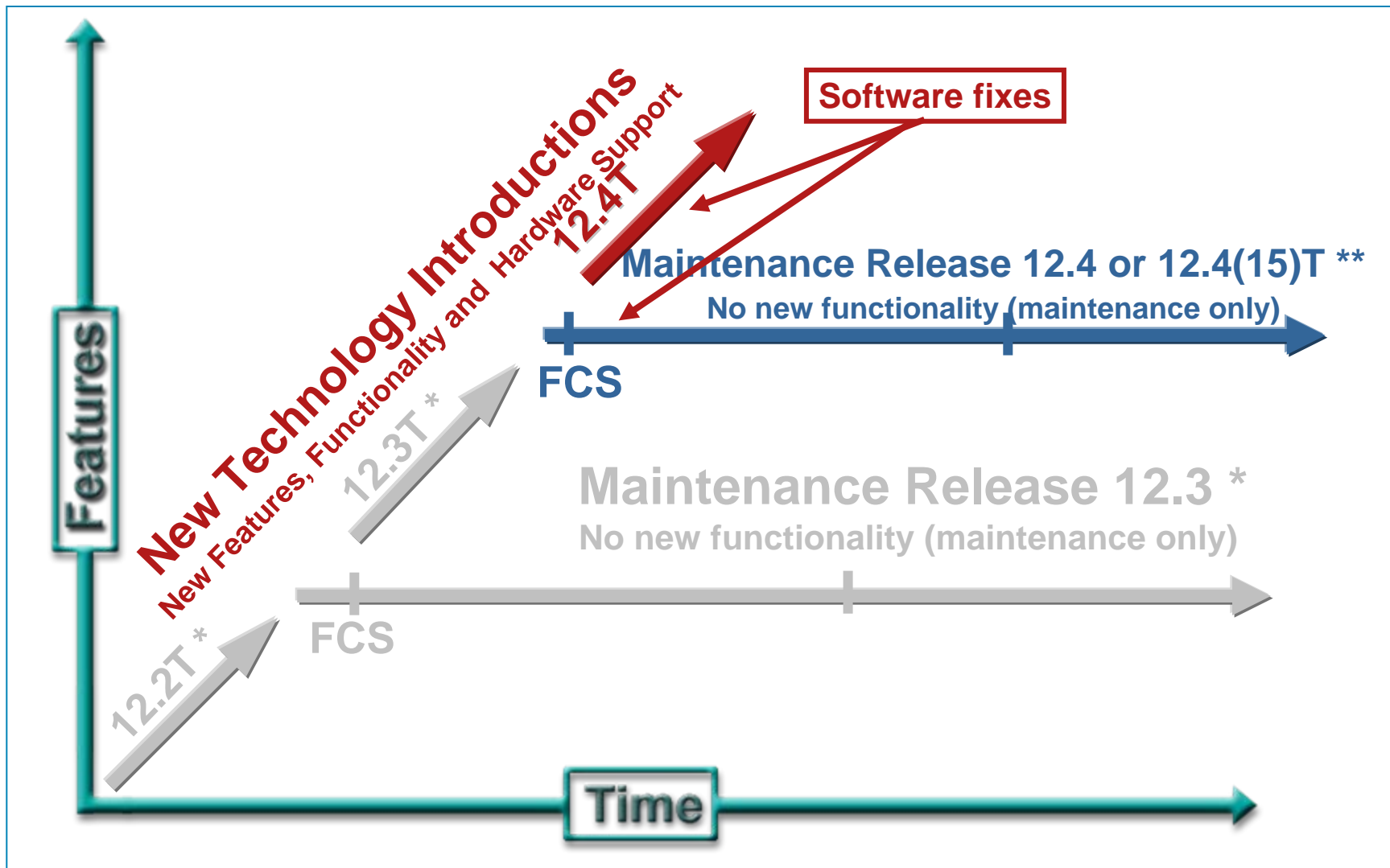
Packaging and Feature Changes in Release 12.4T

- 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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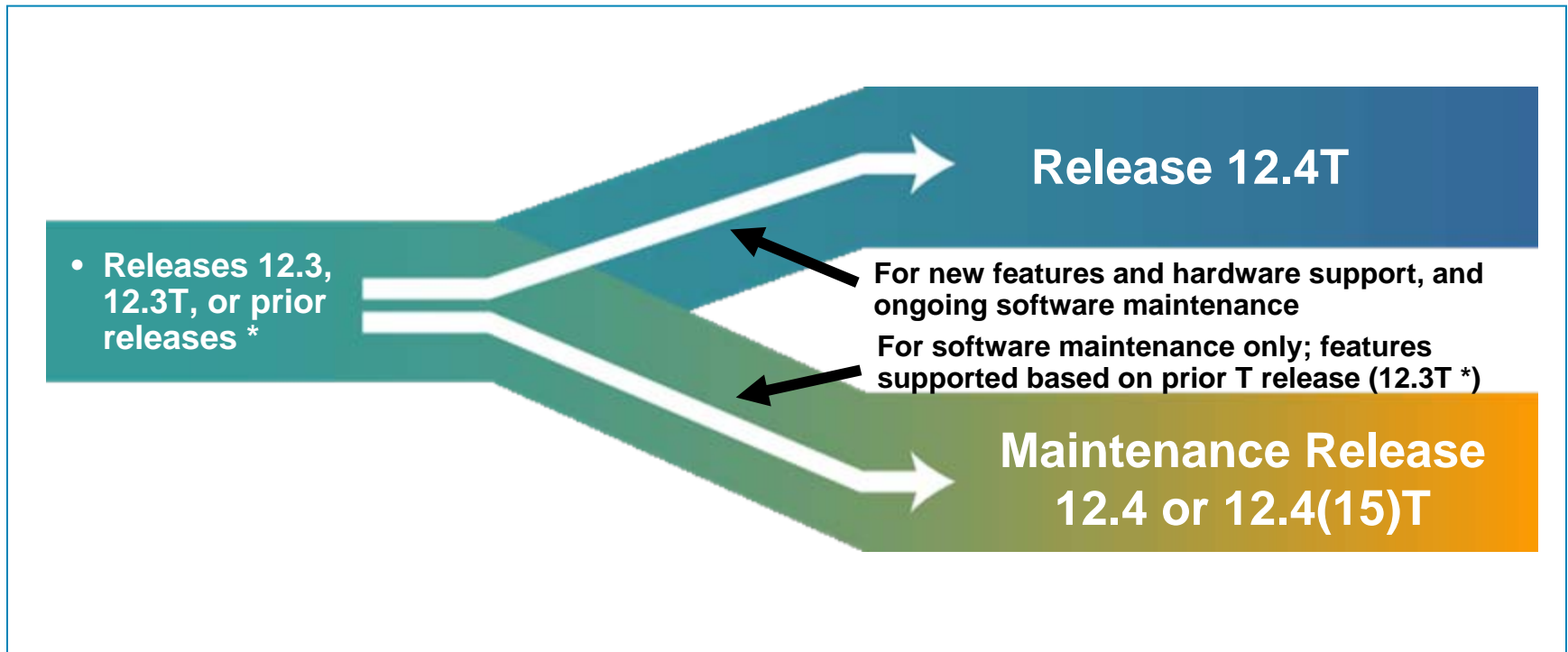
Evolution to Release 12.4T



* 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

** 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

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/ps5207/prod_bulletin0900aecd803a0ffe.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

12.4(22)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, and 837 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/product_bulletin_c25_466578.html

Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(22)T
- Additional Features and Enhancements
- Cisco IOS Packaging
- Upgrade Paths and Migration Considerations
- **Summary**

Summary

Cisco IOS Software Release 12.4(22)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:**
 - ❖ **Per Dynamic Multipoint VPN (DMVPN) Tunnel Quality of Service (QoS), which enables the DMVPN hub to dynamically allocate QoS service policies to each spoke**
 - ❖ **Enhanced Cisco IOS firewall security for Unified Communications by supporting Trusted Relay Point (TRP)**
 - ❖ **Flexible NetFlow support for v5 export format, TopTalkers, and multicast statistics for IPv4**
 - ❖ **Time-based Anti-replay (TBAR) support for the VPN Services Adapter (VSA) on Cisco 7200 Series Routers with Network Processing Engine (NPE)-G2**
 - ❖ **Support for the Cisco 880 SRST and 880G Integrated Services Routers**

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

- 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 and Upgrade Planners

www.cisco.com/public/sw-center/sw-ios.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>

