Video Services for the Cisco Integrated Services Router Platforms

The Cisco[®] Integrated Services Router is the ideal platform for delivering video services in enterprise branch offices, commercial offices, and small or medium-sized business offices. Video services on the integrated services router platforms consists of video-enabled Cisco Unified CallManager Express, Cisco Unified Survivable Remote Site Telephony with Integrated ISDN Video Gateway, and Cisco Video Session Border Controller. Through the integration of security, video gateway, and call-processing capabilities, Cisco Integrated Services Router platforms deliver a complete office video services solution (Figure 1).

Figure 1.   Cisco Integrated Services Routers

Product Overview

Customers of all sizes want opportunities to converge best-of-class data, voice, video, and security services into a single system that enables rapid services deployment, as well as opportunities to protect, grow, and optimize their businesses. With Cisco Integrated Services Router platforms, enterprise branch offices, commercial offices, and small or medium-sized offices can use the industry's broadest, most comprehensive voice, video, and security services, directly embedded and integrated inside the industry's leading routing platform for maximum performance and resiliency. Cisco Integrated Services Router platforms (Cisco 2801, 2811, 2821, 2851, 3825, and 3845) provide the appropriate-sized solution for the smallest to largest customers, scaling to meet the most demanding enterprise environments while providing the performance and architecture for services available today and in the future.

The first company to offer a converged voice, video, security, and data solution engineered from the beginning for wire-speed concurrent services, Cisco Systems[®] delivers to customers of all sizes the IP communications and security services and densities they need, specifically sized for their data requirements.

Cisco Integrated Services Router platforms embed video functions directly inside the router, enabling customers to deploy advanced services simply by installing digital signal processors (DSPs) for video gateways. For video call processing, customers can enable the company's award-winning Cisco Unified CallManager Express solution as part of Cisco IOS[®] Software, and easily reconfigure the same software at any time to support Cisco Survivable Remote Site Telephony (SRST) for centralized call processing with Cisco Unified CallManager, the industry's leading solution for enterprise-class unified communications with video.
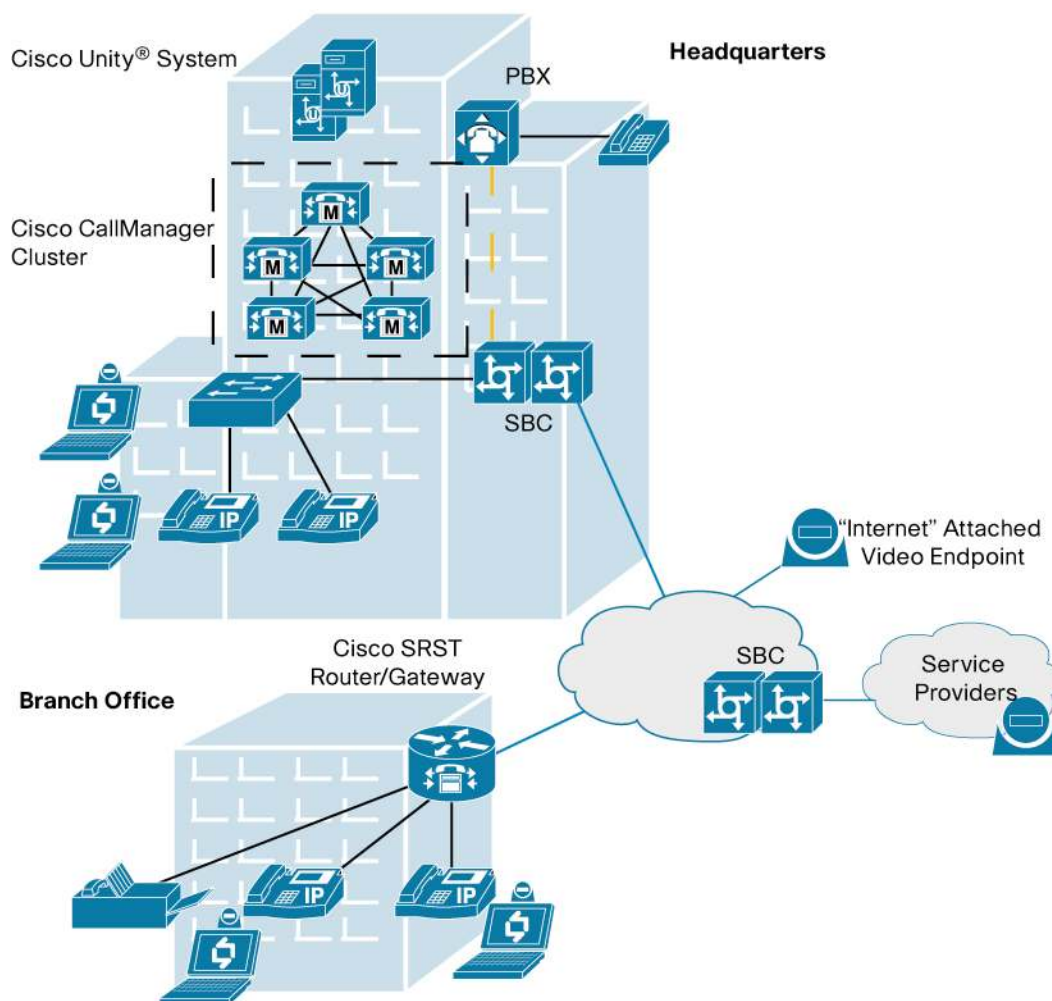
With Cisco Integrated Services Router platforms and the company's systems approach to video services, enterprises can easily implement tiered services, including security, voice, and data, immediately or build video services incrementally without sacrificing performance or room for future growth. Small and medium-sized businesses now can deploy data, security, and video service requirements in a single system that is easy to install and configure for reduced cost and complexity. Service providers can extend managed voice, video, and data services to customers of all sizes in a single routing system that scales as customer needs change.

Only Cisco provides customers with a complete, converged solution built on more than 20 years of IP innovation and leadership and proven data, voice, video, and security solutions.

Applications

Cisco Integrated Services Router platforms operate as Internet video session border controllers (SBCs) to enable rich-media business-to-business communications. This application of integrated video technologies allows businesses to securely and reliably extend their rich-media communications beyond the boundaries of their own internal network. As a result, enhanced communications is enabled to business partners, vendors, and ultimately customers, ensuring that communications experiences are conducted as effectively and efficiently as possible. Figure 2 shows Cisco Integrated Services Router platforms used in an Internet video calling network.

Figure 2. Internet Video Calling with the Cisco Session Border Controller

Cisco Integrated Services Router platforms are the foundation for enterprise branch offices and commercial offices deploying IP video telephony. With video-enabled Cisco Unified CallManager Express or Cisco SRST for failover call processing, the Cisco Integrated Services Router delivers a rich-media experience while also providing security and routing requirements. Figure 3 shows the Cisco Integrated Services Router platforms used for video services in the branch, commercial, or small offices. Video-enabled Cisco Unified CallManager Express also can be transparently integrated with a central Cisco Unified CallManager for maximum configuration flexibility.

Figure 3. Video Communication Services for Branch, Commercial, or Small Offices
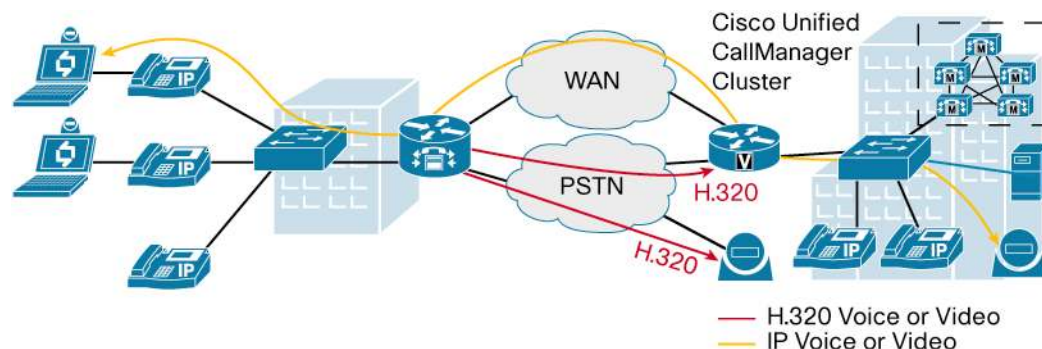
Key Features And Benefits

PVDM Slots on Motherboard

Embedded modularity using any Cisco Packet Voice/Fax DSP Module 2 (PVDM2) product (PVDM2-8, PVDM2-16, PVDM2-24, PVDM2-32, or PVDM2-64) on any Cisco Integrated Services Router platform motherboard delivers ISDN video termination without the need to use a network module or advanced integration module (AIM). Installing Cisco PVDM2 products inside the Cisco Integrated Services Router provides these video services by using Basic Rate Interface (BRI) voice interface cards (VICs) and E1/T1 voice/WAN interface cards (VWICs) installed natively on the Cisco Integrated Services Router.

Video-Enabled Cisco Unified CallManager Express

Cisco Unified CallManager Express provides call processing for Cisco IP phones for small or branch-office environments. It enables the large portfolio of Cisco Integrated Services Routers to deliver IP telephony features that are commonly used by business users to meet the voice and video communications requirements of the small or medium-sized office. Cisco Unified CallManager Express enables the deployment of a cost-effective, highly reliable communications system using a single Cisco Integrated Services Router using Cisco IOS Software.

IP telephony is currently undergoing tremendous growth, accelerated by access to value-added features and applications only IP telephony can provide to the end user. Additionally, the cost benefits of converging data, voice, and video onto a single network are adding to the rapid acceptance of this technology. Because it is integrated into a router, Cisco Unified CallManager Express enhances the advantages of convergence by offering the following unique benefits:

- **Cost-effective operations through a single, integrated voice-and-data platform for all branch-office needs**—Highly reliable routers, including the Cisco 2800 and 3800 Series Integrated Services Router platforms, provide robust quality of service (QoS), network security, encryption, firewall, and network modules that deliver content networking and enhanced VPN services to address branch- and small-office business needs. The system

delivers integrated IP telephony, voicemail, and automated-attendant functions, allowing customers to deploy one device to address all their business needs; simplifying management, maintenance, and operations; and delivering a lower total cost of ownership (TCO).

- **Sophisticated key system and private-branch-exchange (PBX) capabilities**—Small offices have different workflows and require specialized features to support their work practices. Cisco Unified CallManager Express delivers a robust set of telephony features for the small office, and delivers unique value-added capabilities through Extensible Markup Language (XML) that enhance the productivity of the end user and the business—and these capabilities cannot be delivered by traditional systems.

- **Interoperability with Cisco Unified CallManager**—Customers can deploy Cisco Unified CallManager at larger sites and deploy Cisco Unified CallManager Express at branch-office locations where local call processing is required. Using H.323 or Session Initiation Protocol (SIP), trunking calls can be routed over the WAN with calling party name and number information, plus compressed voice for better WAN bandwidth usage.

- **Investment protection and ease of upgrade to centralized call-processing systems**—Through a simple software configuration change on the router, a system with Cisco Unified CallManager Express can be converted to a highly available survivable telephony gateway for a remote site in a centralized Cisco Unified CallManager deployment architecture. This flexibility helps ensure full investment protection for successful businesses that might outgrow the system capacity.

- **Remote maintenance and troubleshooting**—Customers can use the industry-standard Cisco IOS Software command-line interface (CLI) or user-friendly GUI to configure and administer Cisco Unified CallManager Express.

Cisco Unified CallManager Express allows a Cisco Integrated Services Router to provide call processing for locally attached IP and analog phones. All the necessary files and configurations for IP phones are stored internally on the router, providing a single platform solution. In addition, the solution offers a robust set of public-switched-telephone-network (PSTN) interfaces, a wide selection of WAN interfaces, integrated voicemail and automated attendant, and a full phone portfolio. Cisco IOS Software offers industry-leading voice features designed for IP-based telephony systems, such as H.323 and SIP signaling, advanced QoS, and interworking with an H.323 gatekeeper or SIP proxy server—all available for use with Cisco Unified CallManager Express deployments. In addition, integrated functions such as channel service unit/digital service unit (CSU/DSU) and Network Termination 1 (NT1) devices are available with digital PSTN interface cards to provide flexible and robust voice services.

Table 1 lists the video features for Cisco Unified CallManager Express.

Table 1.   Cisco Unified CallManager Express Video Features

Features	Support Details
Media support	Real-Time Transport Protocol (RTP) and Real-Time Control Protocol (RTCP)
Call Admission Control (CAC)	Configurable maximum and minimum call bandwidths
QoS	IP Precedence and differentiated-services-code-point (DSCP) marking
Billing	Standard call detail records (CDRs) for accurate billing
Endpoints	Cisco Unified Video Telephony Advantage with both Cisco IP phones and Cisco IP Communicator
Video codecs supported	H.261 and H.263
Trunk-side protocols	H.323

For more information about Cisco Unified CallManager Express, please visit
http://www.cisco.com/go/ccme

If you have questions send e-mail to access-ccme-cue@cisco.com.

Cisco Unified SRST Video Gateway

The Cisco Unified Communications system uses Cisco Unified CallManager in combination with Cisco Unified SRST, which is embedded within Cisco IOS Software, to help provide high-availability IP telephony to branch offices. When access to Cisco Unified CallManager from the branch office is impeded, for example, as a result of a WAN link failure, Cisco Unified SRST provides voice and video telephony backup services to help ensure that the branch office has continuous telephony service over the Cisco network infrastructure deployed in the branch. To provide the video survivability services, an ISDN H.320 video gateway function has been added to the existing voice DSP and interface technology on the integrated services router platform. This new gateway function allows for video calls to use the existing ISDN interfaces for simultaneous and ISDN video functions. The enhanced reliability provided by Cisco Unified SRST makes the Cisco Unified Communications system a cost-effective solution to help ensure telephony operation to all users in an organization, whether they are located in the headquarters or in a branch office. Table 2 lists the features of the Cisco Unified SRST Video Gateway.

Table 2.   Cisco Unified Survivable Remote Site Telephony Video Gateway Features

Features	Support Details
Media support	RTP and RTCP
CAC	Configurable maximum and minimum call bandwidths
QoS	IP Precedence and DSCP marking
Authentication, authorization, and accounting (AAA)	AAA with RADIUS
Billing	Standard CDRs for accurate billing
ISDN	Px64 protocol support
Video call speeds	Up to 1024 kbps per call
Video codecs supported	H.261, H.263, H.263(+), and H.264
Voice-over-IP (VoIP) protocols	H.323

For more information about the Cisco Unified SRST product and technical information, visit
http://www.cisco.com/go/srst.

Video Services with the Cisco Session Border Controller

The Cisco Multiservice IP-to-IP Gateway is a SBC that interconnects independent IP networks for data, voice, and video transport. SBCs are critical components for scaling networks from islands

within a single customer network to an end-to-end IP community. The Cisco Multiservice IP-to-IP Gateway is an integrated Cisco IOS Software application that runs on the Cisco 2800 and 3800 Series Integrated Services Routers and the Cisco 2600XM Series, 3700 Series, 7200 Series, 7301 Series Routers, and the Cisco AS5350XM and AS5400XM Universal Gateways. Today, the Cisco IP-to-IP Gateway is used by service provider, enterprise, and commercial customers to interconnect H.323 voice and video networks.

The Cisco Multiservice IP-to-IP Gateway is a simple and cost-effective solution that provides a network-to-network demarcation interface for signaling interworking, media interworking, address and port translations, billing, security, and QoS and bandwidth management. The Cisco Multiservice IP-to-IP Gateway performs the same breadth of functions as a Cisco public switched telephone network (PSTN)-to-IP gateway, only now it also joins two video call legs without the need for the PSTN.

Cisco IOS Software helps enable the simultaneous operation of the following:

- **Cisco Multiservice IP-to-IP Gateway**—Application that terminates and reoriginates both signaling and media streams while performing services of an SBC between IP networks
- **Cisco IOS H.323 Gatekeeper**—Application that acts as point of control for a variety of voice and video components that can be attached to an IP network such as IP telephony devices, IP-PSTN gateways, H.323 videoconferencing endpoints, and H.323 multipoint control units while facilitating build-out of large-scale multimedia service networks
- **Cisco TDM Gateway**—Application that allows time-division multiplexing (TDM) switching between TDM interfaces or TDM-to-IP interfaces

Table 3 lists the video-specific features of this product.

Table 3. Cisco Multiservice IP-to-IP Gateway Video Features

Features	Support Details
Media support	RTP and RTCP
CAC	- Resource Reservation Protocol (RSVP) - Maximum number of calls per trunk (max calls) - CAC based on IP circuits
QoS	IP Precedence and DSCP marking
Network hiding	- IP network privacy and topology hiding - IP network security boundary - Intelligent IP address translation for call media and signaling
Number translation	- Number translation rules for VoIP numbers - ENUM support for E.164 number mapping into Domain Name System (DNS)
AAA	AAA with RADIUS
Billing	Standard CDRs for accurate billing
Protocols	H.323 and SIP
Rich media	Simultaneous support for data, audio, and video
CAC	RSVP, including audio and video reservation synchronization
QoS	DSCP markings to prioritize video streams as they traverse the network
Data support	T.120 data collaboration flow-around only
Camera control	Far-end camera control (FECC)
Codecs	- H.261 - H.263 (+,++) - H.264

For more information about the Cisco Multiservice IP-to-IP Gateway, visit
http://www.cisco.com/go/sbc or contact your local Cisco account representative or
cs-ipipgw@cisco.com.

Feature Availability

Table 4 lists IP communications features available on Cisco Integrated Services Router platforms.

Table 4.   IP Communications Feature Availability on Cisco Integrated Services Router Platforms

Feature	Platform Support	Availability	Cisco IOS Software (Internal Use Only)
PVDM2 with integrated video gateway	Cisco 2801 (2 slots on board) Cisco 2811 (2 slots on board) Cisco 2821 (3 slots on board) Cisco 2851 (3 slots on board) Cisco 3825 (4 slots on board) Cisco 3845 (4 slots on board)	Now	12.4(11)T
Video-enabled Cisco Unified CallManager Express	Cisco 2801, 2811, 2821, 2851, 3825, and 3845	Now	12.4(9)T
Video SBC	Cisco 2801, 2811, 2821, 2851, 3825, and 3845, 5350, and 5400	Now	12.3(2)T

Summary

The Cisco Integrated Services Router platforms are ideal platforms for implementing video services in enterprise branch offices and small and medium-sized businesses. Their ability to deliver wire-speed video services is the result of a high-performing processor, innovative analog and BRI interface capabilities, embedded modular DSPs, and advanced video telephony services such as Cisco Unified CallManager Express. With room for services growth and scalable options for integrated modularity, Cisco Integrated Services Router platforms are the platforms for video services that protect future investments.

To Download the Software

Visit the Cisco Software Center to download Cisco IOS Software:

http://www.cisco.com/public/sw-center/index.shtml

Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, refer to Cisco Technical Support Services, Cisco Advisory Services, or Cisco Advanced Services: http://www.cisco.com/en/US/support/index.html

For More Information

For more information about Cisco Integrated Services Router platforms, visit
http://www.cisco.com/go/isr or contact your local Cisco account representative.