

# Cisco IP Communication Solutions

## Optimizing Business Communications with Proven Return on Investment

### Cisco IP Communications

Cisco Systems, the worldwide leader in networking for the Internet, leads the way with innovative, reliable networking solutions that enable optimized communications. Cisco is the leader in network convergence—the combination of voice, video and data applications onto a single, integrated network environment. With convergence, mainstream corporate networks are becoming the foundation for exciting new ways to communicate. That is what Cisco IP Communications is all about—more effectively and easily sharing ideas and information over converged networks.

Cisco IP Communication solutions leverage a single network infrastructure to enhance organizational and employee productivity, improve customer service, deliver significant ROI, and maintain your company's distinctive advantages in today's competitive global economy. Those solutions include IP telephony, multi-channel contact centers, unified communications, and IP-enabled video.

Cisco IP Communications meets today's requirements for scalability, productivity, and interoperability while preserving your investment for future innovations. It offers your organization several advantages:

- An open, fully-integrated architecture enabled by Cisco AVVID (Architecture for Voice, Video, and Integrated Data), with the flexibility of a comprehensive solution portfolio that interoperates with existing technologies
- A flexible, interoperable communication strategy that allows you to choose IP Communication solutions that meet your needs, so you can proceed at your own pace
- A strong foundation for innovative, convergence-based applications, available both today and in the future, that leverage voice, video and data in compelling new ways to enhance productivity and improve customer loyalty
- Proven return on investment (ROI)
- A comprehensive security solution that includes call-processing security, physical security, network access security, and secure network design recommendations
- Quality of service (QoS) mechanisms that assure high voice quality through tight control of delay, loss, and jitter
- Network management products that provide network administration, operations, troubleshooting, configuring, fault monitoring, and element management

Discover how Cisco IP Communications helps you realize the benefits of next-generation communications technologies for your business through Cisco IP Telephony, Cisco Contact Centers, Cisco Unified Communications, and Cisco IP Video. These are cost-effective, reliable solutions that scale with the needs of your organization and are available today.

## Cisco IP Telephony

A converged network environment should provide a superior level of business resilience and agility. Cisco IP Telephony solutions do just that. Designed from the ground up for converged network environments, the IP-based Cisco IP Telephony solutions dramatically enhance communications flexibility and effectiveness.

Based on Cisco AVVID, Cisco IP Telephony solutions provide a flexible foundation for powerful new applications that extend the limits of traditional telephony. They communicate with traditional private branch exchange (PBX) and voice-mail systems to enable smooth transitions from legacy systems. With application programming interfaces (APIs), it is easy to add standards-based third-party equipment and applications.

Figure 1: Cisco IP Communications: Optimize Business Communications



IP telephony refers to the technology for transmitting voice communications over a network using IP standards. Cisco AVVID provides the infrastructure and feature set for creating a single converged network that can handle voice, video, and data traffic simultaneously. It provides this capability while maintaining a high level of availability, QoS, and security for your network.

Built on the Cisco AVVID network infrastructure, a Cisco IP Telephony solution delivers high-quality IP voice and fully integrated communications by allowing the transmission of voice, video and data over a single network infrastructure. Leveraging the framework provided by Cisco AVVID, the Cisco IP Telephony solutions deliver unparalleled performance and capabilities to address current and emerging communications needs in the enterprise environment. Cisco IP Telephony solutions are designed

to optimize feature functionality, reduce configuration and maintenance requirements, and provide interoperability with a wide variety of applications.

The architecture of the Cisco IP Telephony solution consists of four primary components:

- Cisco AVVID Network Infrastructure

The network infrastructure includes Public Switched Telephone Network (PSTN) gateways, analog phone support, and digital signal processor (DSP) farms. The infrastructure can support multiple client types such as hardware phones, software phones, and video devices. Infrastructure also includes the interfaces and features necessary to integrate legacy PBX, voice-mail, and directory systems. Typical products used to build the infrastructure include Cisco voice gateways (non-routing, routing, and integrated), Cisco Catalyst® switches, Cisco routers, and call processing platforms. High-performance Media Convergence Servers provide reliable, highly available support for Cisco CallManager and other IP Telephony software applications. Media Convergence Servers scale to meet a customer's size, price and performance needs. See "Cisco Contact Centers" for a sample list of infrastructure products.

- Communication endpoints

A communication endpoint is a user instrument—either a desk phone or a software phone application that runs on a PC. In the IP environment, each phone has an Ethernet connection. IP phones have all functions you expect from a telephone as well as more complicated features, such as the ability to access WWW sites.

In a Cisco IP Telephony network, users can choose between familiar desk sets such as Cisco IP phones and PC-based phones such as the Cisco SoftPhone. Unlike traditional PBX systems, the moves, adds, and changes are virtually instantaneous. Users just take their IP phone with them to their new location, plug it into the Ethernet jack, and the phone registers itself with Cisco CallManager. All user privileges and settings are automatically reestablished. Such functionality eliminates the cost and delay of sending technicians to wiring closets. Another helpful feature is extension mobility, which allows users to log into any Cisco IP phone and receive their own phone number and privileges.

- Call-processing agent

At the heart of the IP telephony system is Cisco CallManager, the call-processing agent. Cisco CallManager software extends enterprise telephony features and capabilities to packet telephony network devices such as IP phones, media processing devices, voice-over-IP (VoIP) gateways, and multimedia applications. Additional voice, video and data services such as unified messaging, multimedia conferencing, collaborative

contact centers, and interactive multimedia response systems interact with the IP telephony solution through the open telephony APIs of Cisco CallManager.

When a central Cisco CallManager cluster also handles call processing for users at distributed sites, administrators can assure continuous phone service if a WAN link fails through Cisco Survivable Remote Site Telephony (SRST), a Cisco IOS® Software image for Cisco routers. If a link goes down, Cisco SRST in the router provides basic Cisco CallManager functionality until the link is restored.

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In case of emergency, Cisco Emergency Responder correctly identifies the caller's location to a 911 dispatcher. This is a key capability in a centrally managed, highly dispersed network design where a Cisco CallManager cluster may be processing calls for a user in another city or state.

- Voice Applications

As defined by Cisco AVVID, voice applications are physically independent from the call processing and voice processing infrastructure, and they may reside anywhere within your network. Leveraging a single network infrastructure, provides an open platform for powerful productivity applications, and serves as a solid foundation for future convergence-based applications that will continue to advance enterprise communications.

## Cisco Contact Centers

The contact center has great strategic value to organizations that provide customer care or in-house consulting services. Contact centers can be mission-critical and thus are an integral part of many voice infrastructure decisions. The contact center often generates revenue through direct sales or protects revenue with customer service or technical support. However, it also requires cost containment, which could include network hosting, agent administration, agent location changes, and integration costs between front-end call treatment and agent queuing.

A contact center should focus on creating and sustaining customer satisfaction and loyalty. Using IP technologies and solutions, a contact center can create a more enriching customer experience through intelligent features such as click to talk, intelligent routing to the right agent, and integrating Web and voice communications. Also, a centrally managed contact center can make it much easier for companies to do business any time, from anywhere. To meet these requirements, Cisco contact center solutions provide robust IP-based customer response functionality while allowing you to control costs and make changes without interrupting service.

Figure 2: Multi-Channel Contact Centers



The Cisco contact center architecture is based on Cisco AVVID, so that organizations can take advantage of converged IP networks to perform typical contact center functions and deploy new applications that integrate many resources in exciting new ways. For single site, voice-only “mid-market” contact centers with up to 75 agents, Cisco offers Cisco IP Integrated Contact Distribution (ICD), part of Cisco Customer Response Solutions (CRS) platform. For multiple-site contact centers that require Web integration along with voice, Cisco offers the Cisco IP Contact Center (IPCC). Unlike proprietary legacy automated call distributor (ACD) systems, Cisco IP ICD and Cisco IPCC are scalable, open systems platforms, allowing ease of configuration in creating simple to complex customer interactions and incorporating third-party components and back-end systems.

### Cisco IP Telephony Products

- Cisco MCS 7800 Series media convergence servers
- Cisco CallManager
- Cisco IP phones
- Cisco IP SoftPhone
- Cisco CallManager Attendant Console
- Cisco Emergency Responder
- Cisco Conference Connection
- Cisco Survivable Remote Site Telephony (SRST)
- Cisco Integrated Communication System (ICS)

For More Information About Cisco IP Telephony:

[http://www.cisco.com/warp/public/779/largeent/avvid/solutions/ip\\_tel.html](http://www.cisco.com/warp/public/779/largeent/avvid/solutions/ip_tel.html)

Contact center deployments often require both ACD and interactive voice response (IVR) functionality. The ACD function answers incoming calls and routes callers to the appropriate and available agent. The IVR function allows callers to directly interact via touchtone or speech recognition with back-end database systems to obtain information. For example, if you call your bank, you could be prompted for your account number and PIN, then the system gives you information about your balances and recent transactions. At the agent desktop, computer telephony integration (CTI) capabilities enable “screen pops” for more efficient call handling, delivering customer information as agents answer a call. Cisco contact center products support all these technologies and more.

#### Cisco Contact Center Products

Cisco Customer Response Solution (CRS) platform, which includes:

- Cisco Integrated Contact Distribution (ICD)
- Cisco IP Interactive Voice Response (IVR)
- Cisco Queue Manager
- Cisco IP Contact Center (IPCC)
- Cisco Computer Telephony Integration (CTI)
- Cisco Intelligent Contact Management (ICM)

For More Information About Cisco Contact Centers:

[http://www.cisco.com/warp/public/779/largeent/avvid/solutions/call\\_center.html](http://www.cisco.com/warp/public/779/largeent/avvid/solutions/call_center.html)

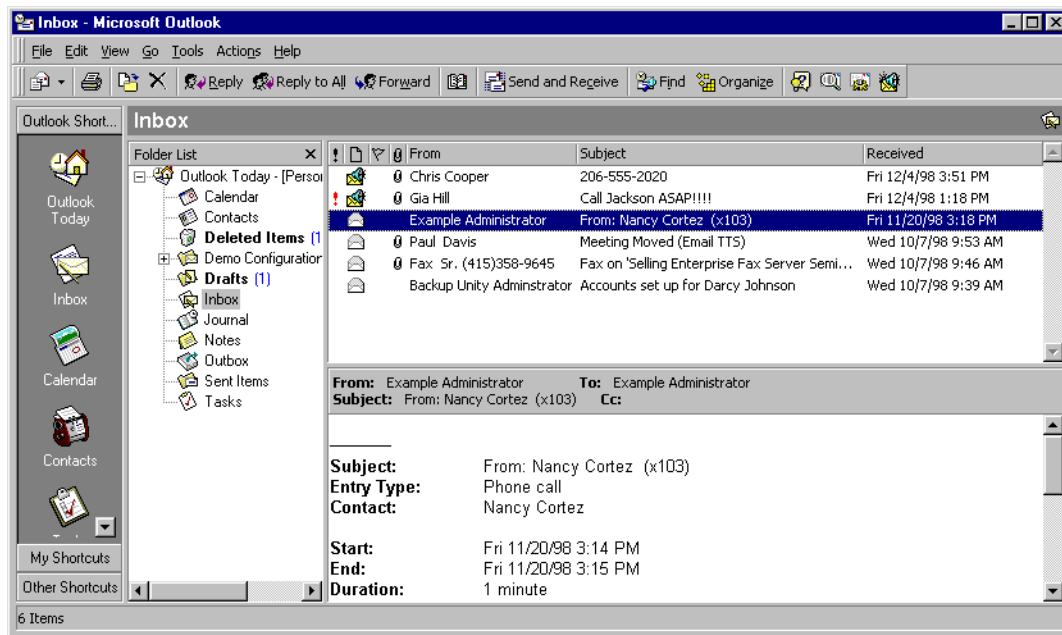
#### Cisco Unified Communications

The technology age has given us the telephone, faxes, voicemail, e-mail, pocket pagers, mobile phones, and personal digital assistants (PDAs). With so many ways to communicate, keeping track of incoming calls and messages can seem like a full-time job! That is why unified communications is such an important innovation.

Cisco Unified Communications solutions bring together personal productivity management tools—including Cisco Unity™ and Cisco Personal Assistant—to optimize business communications by increasing organizational productivity, enhancing customer care, and leveraging a single database and message store.

Cisco Unity—the premier Unified Communications solution for enterprise-scale organizations—provides powerful unified messaging (e-mail, voice, and fax messages sent to one inbox) and intelligent voice messaging (full-featured voice mail with advanced functionality) on a platform that offers the utmost in reliability, scalability, and performance. With Cisco Unity Unified Messaging, you can listen to your e-mail over the telephone, check voice messages from the Internet, and—when integrated with a supported third-party fax server—forward faxes to any local fax machine. Unified messaging is only possible over a converged network—such as Cisco AVVID—that supports both voice and data.

Figure 3: Unified Messaging: One Inbox For Every Message



Cisco Unity makes enterprise migration toward converged networking much easier with a highly scalable (up to 250,000 users), flexible system that uses a single database and message store to simplify administration. Based on Microsoft Exchange technology, Cisco Unity integrates with Cisco IP Telephony systems as well as traditional PBX and voice messaging systems.

Cisco Personal Assistant is a new-world telephony application that streamlines communications—with features such as rules-based call routing, simplified contact management, and speech recognition—to help users manage how and where they want to be reached. With Cisco Personal Assistant, users can link their calendars with a server, and then customize call screening and forwarding features so they do not miss important calls—all without asking the IT department for help.

#### Cisco Unified Communications Products

- Cisco Unity
- Cisco Personal Assistant

For More Information About Cisco Unified Messaging:

<http://www.cisco.com/warp/public/779/largeent/avvid/solutions/unity.html>

#### Cisco IP Video

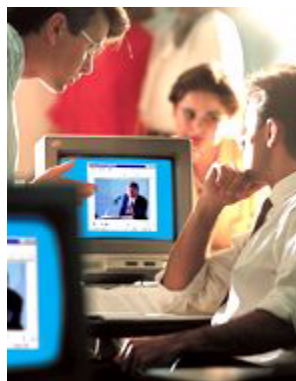
Video makes communication compelling. It transcends the verbal limitations of telephony and the static nature of data. With a human touch, video significantly enhances the effectiveness of corporate training and meetings.

Cisco IP Video solutions effectively eliminate the barriers of time, distance, and resources to increase productivity, profitability, and competitive capability. The Cisco IP/TV<sup>®</sup> Solution brings live or stored video to viewers on their PC. Cisco IP/VC is a videoconferencing solution that permits people around the world to behave as if they were in the same room. Using Cisco IP Video solutions, enterprises can integrate telecommuters into day-to-day activities, arrive at decisions more quickly, and train employees more effectively. Educational institutions can disseminate knowledge through an interactive forum that incorporates students outside the traditional classroom, creating a virtual “campus without walls.” Doctors can consult specialists from any part of the world to provide the best patient care while controlling communications costs. Organizations can use Cisco IP Video solutions to “humanize” their communications while reducing administrative costs.

Multicast-based video streaming software makes video-conferencing, video-based training, and video-based corporate communications both scalable and affordable. Unlike legacy H.320 conferencing systems that require dedicated

equipment and real estate, Cisco technologies enable users to participate from the convenience of a PC desktop. Standards-based multicast capabilities in Cisco AVVID devices offer a highly scalable solution by allocating bandwidth and preventing broadcast floods common to unicast video applications. One to thousands of users can participate in a multicast event without overwhelming the network. Video streaming servers can be housed in the data center for easier administration and management.

Figure 4: IP Video: Humanizing Communications



#### Cisco IP Video Products

- Cisco IP/TV Streaming Video
- Cisco IP/VC Videoconferencing Series
- Cisco Multimedia Conference Manager

For More Information About Cisco IP Video:

<http://www.cisco.com/warp/public/779/largeent/avvid/products/videoclient.html>

#### The Power of Cisco AVVID

The foundation of Cisco networking solutions for enterprise customers is Cisco AVVID. This architecture presents an infrastructure and environment specifically designed to enable powerful converged networking, an environment that carries any combination of voice, video and data packets across the same links and through the same devices. This architecture includes infrastructure components such as switches, routers, and call-processing gear; client devices such as PCs and IP phones; and applications such as Cisco Unity Software or Cisco IP ICD.

#### Proven Return on Investment (ROI)

Organizations that use Cisco IP Communications enjoy a ROI, as proven in real customer deployments. For example, enterprises realize significant cost savings for inter-office calls, especially between international locations. One major U.S. city realized a \$5M saving per year in voice circuit costs.

Enterprises can also save money through reduced equipment and maintenance costs. The City of Dallas, Texas, expects to save \$21M over a ten-year period after it converged five incompatible data networks. Cisco itself saved \$1.5M on wiring costs across six new facilities because the phone and PC share the same Ethernet port at each desktop.

Cisco IP Communications can also reduce network administration costs by improving the productivity of network support staff. Cray Inc. increased its productivity by 33 percent just by converging its network. The Ministry of Social Policy in New Zealand added 2,500 users without increasing the size of its network staff. Savings in moves, adds, and changes can save a typical enterprise \$105 per move.

The enhanced mobility features of a converged network allow call agents to be located at remote sites. This setup can reduce overall labor costs and increase employee quality by allowing organizations to recruit on a regional, national, or even international basis rather than within one market. This can have a positive impact on customer satisfaction because organizations can establish contact centers in other countries and route customers to an agent that speaks their native language.

Although unified messaging technology has existed for over five years—demonstrating tangible productivity benefits along the way—it's still a relatively undiscovered technology. A converged network provides the necessary platform to make unified messaging a reality for many organizations. Employees can easily access their e-mail, voice and fax messages from wherever they may be, and respond to time-sensitive items quickly. A study done by The Radicati Group, Inc. found that unified messaging systems generate 25 to 40 minutes of additional productivity per employee per day and can reduce IT support and administrative costs up to 70 percent.

A converged network puts the power of videoconferencing into everyone's hands by providing companies with a more cost-effective model that's also easy to deploy. The primary benefit of videoconferencing is its ability to save on travel costs, minimize downtime due to travel, and provide a richer, real-time, face-to-face form of communication between people at different locations.

IP Communications enables employees to be as productive out of the office as they are when they're in the office. Solutions like IP telephony, unified messaging, IP contact center and IP Video have been designed to provide an ideal foundation to support today's increasingly mobile workforce. This is especially important for salespeople, consultants, telecommuters, and computer technicians who spend much of their time away from their office, but still need access to the same network capabilities regardless of where they are.

## Security

The Cisco AVVID IP Telephony solution addresses security in the following ways:

- Physical security for restricting physical access to important application servers and network components
- Network access security to prevent hostile logins or attacks
- Careful network design and management to enhance security
- Security measures for Cisco CallManager

## Quality of Service

Voice, as a class of IP network traffic, has strict requirements concerning packet loss, delay, and delay variation (also known as jitter). To meet these requirements for voice traffic, the Cisco IP Telephony solution includes QoS features such as classification, queuing, traffic shaping, Compressed Real-Time Transport Protocol (CRTP), and TCP header compression. The QoS components of the Cisco AVVID IP Telephony solution are provided through the rich IP traffic management, queuing, and shaping capabilities of the Cisco AVVID network infrastructure.

Key elements of this infrastructure that enable QoS for IP telephony include:

- Traffic marking
- Enhanced queuing services (Cisco Catalyst 3500 and 4000 switches)
- Link fragmentation and interleaving (LFI)
- CRTP
- Low-latency queuing (LLQ)
- Link efficiency
- Traffic shaping
- Call admission control

## Network Management

The Cisco AVVID network infrastructure offers numerous network management, QoS, and security management tools that support Cisco IP Communications. CiscoWorks includes numerous network management tools to manage the configuration, operations, administration, and maintenance of IP telephony networks. These tools include CiscoWorks QoS Policy Manager, Network Analysis Module, and VoIP Health Monitor. Cisco CallManager also offers enhanced software and configuration management tools that take advantage of the strength and flexibility of IP networks. The Cisco CallManager user interface simplifies the most common subscriber and telephony configuration tasks by building upon legacy telephony administration systems and adding software and Web-based applications.

## Cisco AVVID Open Standards Architecture and Ecosystem of Partners

The Cisco AVVID Partner Program and the Cisco IP Telephony Specialization foster innovation, drive industry standards, and accelerate the integration of business-critical technologies with an open, standards-based network architecture.

Cisco AVVID Partner solutions are tested and verified to interoperate with Cisco IP Communication solutions, increasing the choice and flexibility of Cisco customers to do the following:

- Accelerate deployment of e-business solutions
- Implement a standards-based, open architecture
- Deploy verified solutions for voice, video, and data
- Extend investment in Cisco network infrastructure

For More Information About Cisco AVVID and Telephony Partners:

<http://www.cisco.com/warp/public/779/largeent/partner/esap/voice.html>

## Cisco Service and Support

Cisco IP Communications services reduce the cost, time, and complexity of implementing a converged network, and they can help you create a resilient Cisco IP Communications infrastructure that meets your business needs today and in the future.

Cisco and its partners have designed and implemented some of today's largest IP-based network deployments, meaning that they understand how to integrate Cisco IP Communication solutions into your network environment. Cisco IP Communications services can help you more quickly realize business results—ensuring that you gain a competitive advantage. Cisco provides the flexibility you need to employ a service strategy that meets your specific requirements.

Cisco designs tools and best practices ensure a solution that best fits your business needs from the start, eliminating costly redesigns and downtime. Proven Cisco methods ensure a sound implementation that delivers the on-time functions and features you expect. Support services include remote network operations, network management tools to administer the converged application and network infrastructure, and technical support services.

For More Information about Service and Support:

<http://www.cisco.com/warp/public/779/largeent/avvid/solutions/support.html>

## Cisco—Your IP Communications Partner

When it comes to IP communications, no one does it better than Cisco Systems. Cisco IP Communication solutions deliver proven ROI by leveraging a single, converged network, enhancing organizational and employee productivity, and improving customer service and loyalty.

With Cisco IP Communications, enterprises can be assured that they are investing in a scalable, open, and fully integrated architecture enabled by Cisco AVVID that provides the flexibility of a comprehensive solutions portfolio that interoperates with existing technology.

Designed to help enterprises migrate from traditional to IP-based communications at a pace that is right for them, Cisco IP Communications lets enterprises choose to deploy the applications they need when they need them.

When it comes to IP, Cisco is the undisputed leader. Let Cisco be your IP Communications partner, and put Cisco expertise to work for you.



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