



Websology Consulting

Cisco VoIP Telephony

Introduction

IP Telephony transfers voice communications over your current network using open-standards-based Internet Protocol. Whether your employees are at their desk, another office, working remotely, or are mobile they can be reached with consistent Cisco Unified Communications services.

Users can communicate in any workspace using any device, media, or operating system. This results in cost savings through personal productivity improvements and more efficient decision-making. Using your network as the platform, Cisco IP telephony solutions provide greater security, resilience, and scalability that take advantage of your LAN and WAN. By implementing Unified Communications functionality directly into your business processes such as ERP, CRM, and SCM your company can build bottom line benefits and transform processes greater than the personal productivity alone.

Cisco software applications such as Unified Communications Manager, Unity Connection, Unified Presence, Unified Mobility, WebDialer, and third-party applications allow users to determine where when and how they will be reached. The ability to reach mobile colleagues and key decision makers quickly means your employees can make the right decisions the first time. On-demand collaborations can be achieved by integrating user-controlled audio, Web and video conferencing through Microsoft Outlook calendar. This integration will eliminate bottlenecks and facilitate collaboration across every workspace.

Migrating to a Cisco VoIP system improves your competitiveness while reducing your TCO and providing a substantial ROI.

Solution

We are recommending the following software and hardware solutions.

Software:

- Unified Communications CallManager 7.0
- Unity Connection 7.0
- Unified Presence 7.0
- Unified Mobility 1.2
- WebDialer
- InformaCast

Hardware:

Server

- Cisco MCS 7816-H3 Media Convergence Server

Routers

- Cisco 2801 Integrated Services Router
- Cisco 3725G-12s Modular Access Router

Switches

- Cisco Catalyst 2960 LAN Base Series

Phones

- Cisco Unified IP Phone 7961G
- Cisco Unified IP Phone 7941G

Cisco Software Solutions

Unified Communications CallManager 7.0

The CallManager component of the Cisco software solution is central to the call processing aspect of a Cisco IP phone system capable of supporting 7500 IP Phones per server. Key to this central function is interoperability with Cisco partners and third-party software providers. Thus, there is a high interoperability with partners such as IBM and Microsoft, as well as Microsoft

software such as Exchange and Active Directory. CallManager additionally allows syncing of Outlook and Outlook Express to the Cisco Unified IP Phone address book. CallManager also provides multi-language support for the end-users. This includes translation of text as well as country specific ring tones. Additionally, all web user interfaces are provided in multiple languages.

Cisco CallManager, as with all Cisco software, is scalable to allow for future growth. Maintenance can be done either through a Graphical User Interface (GUI) or Command Line Interface (CLI). Simple programming interfaces are available providing the ability to easily add, edit or delete records. Additionally, bulk-loading tools are available to facilitate mass data updates. All configuration and maintenance functions can be accessed via Cisco's Unified IP Phone Configuration website. The number dialer analyzer feature allows managers to develop dialing plans based on individual users' usage and dialing patterns.

Cisco CallManager provides many key features for system monitoring and fault recovery. Utilizing the Simple Network Monitoring Protocol (SNMP) scheduled and real-time event monitoring is possible. Email and pager alerts can be enabled to notify administrators when event thresholds are present. Administrators can enable Call Admission Control (CAC), which provides Quality of Service (QoS) monitoring over the wide area network (WAN). In the event the WAN becomes unavailable or fails to achieve minimum bandwidth requirements automatic call diversion to the local public switched telephone network (PSTN) is initiated.

All IP traffic from the CallManager is encrypted at the transport layer utilizing a NULL-SHA cipher. This hash ensures that the data has not been altered on the wire. All media is encrypted before being set on the WAN adding an additional layer of security. Additionally, even the phones are certified via a certification of trust list, without which an IP phone is unable to access the CallManager. Toll fraud prevention prevents trunk-to-trunk transfers and all calls are ID and tracing information is available.

Unity Connection 7.0

Cisco Unity Connection 7.0 is a secure and reliable voice-messaging platform that allows users to access their voice messages using Cisco Unified Personal Communicator, and use the display on their Cisco Unified IP Phone to view, search, sort, and play messages. Cisco Unity Connection can be customized to increase collaboration in any size business large or small.

Using Unity Connection one can collaborate anywhere at any time. To assist the user with collaboration, Unity Connection provides access to voice messages from email inbox, web browser, instant messaging, cell phone and visual voicemail on the telephone. This can assist with improving the productivity of mobile workers. Cisco Unity Connection also offers a speech activated user interface. This allows you to



browse and manage voice mails and call others using speech commands further enhancing collaboration. The speech commands can also be used to browse the Exchange calendar to accept, decline or cancel appointments.

With Unity Connection, one can also customize settings from a web browser using the Cisco Personal Communication Assistant (PCA) (Cisco Unity Connection Data Sheet). Using PCA, one can establish or change personal settings such as voicemail options, security codes, distribution lists and delivery options.

Finally with Unity Connection, employees can control communications from anywhere. This will assist with increasing productivity and customer satisfaction.

Unified Presence 7.0

Unified Presence 7.0 allows a willing business to unify voice, video, data, and mobile applications on fixed and mobile networks (Cisco Unified Presence Data Sheet). This enables businesses to collaborate from any workspace. Unified Presence is scalable and easy to manage and delivers a consistent presence enabled communication experience across Cisco Unified Communications. It takes advantage of Session Initiation Protocol (SIP) technology to support new voice services in the enterprise environment for instant messaging.

With SIP, Unified Presence collects user real time information from multi sources to determine user availability and/or willingness to communicate before you try to contact them. This allows for businesses of any size to increase production. Unified Presence works well with Cisco Unified Personal Communicator, Cisco Unified IP Phones, Microsoft Exchange calendar and other business applications. Other business applications include IBM Lotus Sametime and Microsoft Office Communicator.

With Unified Presence, one can also exchange or join together and send instant messages to individuals in other businesses who are using Unified Personal Communicator or Microsoft Office Communicator. Unified Presence also makes it easy to expose presence information in corporate directories or point of sale applications to improve customer satisfaction and enhance collaboration.

Unified Mobility 1.2

Unified Mobility allows direct, uninterrupted, indistinguishable access to the Cisco CallManager and other Cisco technology from remote locations and while using mobile devices such as cell phones and PDA's. Using Unified Mobility a mobile user can redirect inbound business calls to a mobile device or external IP phone. They can also initiate outbound calls as if at their Unified Phone.

By utilizing these features a mobile user has access to a single corporate voicemail, the ability to block or filter calls based on established rules or caller ID, as well as call screening and diverting. The use of Unified Mobility allows users to switch seamlessly between mobile and desktop phone even during conversation without losing connections. Users are able to add new devices through a simple wizard and rule creation through a web interface.

Mobile users can be assured of secure communication because they are now utilizing the CallManager and its encryption technology. Internally, desktop phone deactivation prevents unauthorized persons from listening in on mobile calls.

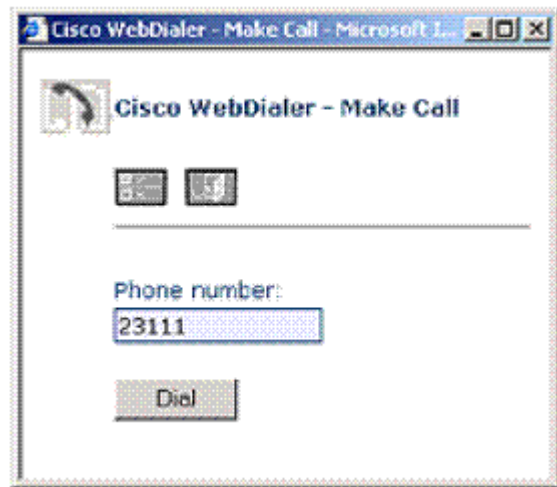
Administrators and managers will have easy access to QoS statistics per call for monitoring. For businesses requiring customization XML API's are available for IP Phones and LDAP support is available through active directory and Netscape directory services. Costs are more tightly managed by utilizing the company's in-house PBX and WAN structure.

In order to implement Unified Mobility, Cisco media converged server must be implemented, consisting of Unified Mobility Server Software, Unified Communication Manager Compatibility, Multiservice router and voice gateway.

WebDialer

The WebDialer software allows a user to access a corporate directory or contact information from Outlook and by simply clicking a link the software dials their phone. This is especially useful when dialing a long sequence of numbers, international calls or dialing with access codes. When a mistake is made in any of the previous procedures, the result is lost performance time as well as the cost associated with misrouted calls. Users have, with the increase in sophistication of cell technology, reduced reliance on number memorization and have increased reliance on selectable directories.

The WebDialer interface allows for easy access to data via HTTP or Simple Object Access Protocol (SOAP). By utilizing these well known protocols Cisco has allowed end users to create custom interfaces to interact with either the WebDialer software or directly with the CallManager Server. Through these easy to understand interfaces any CallManager user has access to any number in any WebDialer enabled directory. WebDialer also provides searchable access as well as predictive dialing to speed access to directory information.



As with all Cisco solutions, the WebDialer interface is scalable to allow for future growth. The API's provided allow for easy creation of custom interfaces through HTTP or SOAP and Cisco provides full support and documentation via the web.

In order to implement the WebDialer software the server side must include Cisco's CallManager server and any software certified to run under CallManager. Each client must meet the following requirements: Microsoft 2000 operating system or later, Netscape 4.7 or later or Microsoft Internet Explorer 5.5 or later browser software and finally a Cisco CallManager controlled IP Phone or IP Softphone.

InformaCast

InformaCast is perfect for large and small school districts, hospitals, government agencies or any business that has multiple sites. With InformaCast, an organization can send emergency broadcast to alert individuals of potential threats. In the case of school districts, InformaCast can assist with large-scale paging and with the addition of the Bell Scheduler; organizations can also centralize all their paging, clocks, and bells on a single server.

In one such school district in California, InformaCast was ideal for them.



San Ramon Valley Unified School District (SRVUSD) is a growing school district that needed to save time and money as their growth forced them to modernize their aging schools and build eight new schools (CDW.com, 2008). With their budgets already tight and facing high construction cost, InformaCast allowed SRVUSD to capture substantial cost savings and take their multi-wired communication center into a single-wired phone, data, and speaker system that is easy to expand if needed in the future.

Other features include email and SMS messaging, Direct Observation and Real-time Alerting (DORA) and Contact Closure Devices, Intercom service and a High-Quality Audio option. In light of the tragic events at Virginia Tech on April 16, 2007, the email and SMS messaging feature could be ideal for college campuses across America to warn students of potential danger. The Direct Observation and Real-time Alerting (DORA) allow systems to talk to InformaCast while the contact closure devices can be used to send messages to InformaCast paging groups at scheduled times throughout the day.

Cisco Hardware Solutions

Cisco MCS 7816-H3 Media Convergence Server

At the heart of the Cisco VoIP system is a Cisco MCS 7816-H3 Unified Communications Appliance. The server is preinstalled with an OS and Cisco Unified Communications Manager 7.0 software. This robust solution is highly cost effective, easy to deploy, and delivers high-end performance and availability.

The Cisco MCS 7816-H3 comes equipped with an Intel Celeron D 352, 3.2-GHz processor, with a 533-MHz front-side bus (FSB) and 2-GB (two 1-GB) of DDR2 Ram. It also includes one 160-GB SATA 2.5 inch cold-swap drive, which is accessible through openings in the front bezel of the appliance.

Expansion can be achieved by adding an additional SATA drive, 6-GB of Ram and a 36/72-GB USB external Digital Audio Tape (DAT) drive can be

connected through one of four USB 2.0 ports to facilitate daily backups of all critical files.

Router and Switch Hardware

Our recommendation for the backbone of Cisco's VoIP Telephony is provided through 2800 and 3700 series routers. Cisco 2900 and 3500 series switches provide additional support. This hardware will provide your employees with the functionality, versatility, and the productivity necessary to realize your business objectives.

Cisco 2801 Integrated Services Router

Data, voice, and wireless are seamlessly incorporated to provide secure reliable delivery. The 2801 Integrated Services Router borrows from the best of the Cisco 2800 Series.

Along with voice, data and wireless, the Cisco 2800 Series have been beefed up to provide wire speeds up to T1/E1/xDSL, embedded encryption acceleration, Digital Signal Processing, Intrusion Protection Systems, Integrated Call Processing, and Voice Mail Support. Cisco 2801 Integrated Services Routers are slotted for expansion, and capable of supporting a wide variety of wired and wireless protocols. Expansion and advanced applications are paramount as they relate to the 2801 Integrated Services Routers.

Security

Security is crucial to the effectiveness and efficiency of enterprise level networks. The Cisco 2801 Series embed security throughout the network providing end-to-end security. Cisco IOS Software provides an array of security features namely Cisco OOS Software firewall, intrusion prevention, IPSec VPN, and advanced application inspection and control, SSH protocol, and SNMP v3 in one solution set. Custom Applications integrated directly to the router provide unique intelligent security solutions that other devices in the same class cannot.

For example, network admissions control, voice and video VPN, V3PN for combining voice and video are all provided.

Cisco 2801 Integrated Services Routers will provide your organization the ability to deliver mission critical voice, data, and even video communications securely from end-to-end at wire speed performance.

IP Communication

The Cisco 2800 Series can facilitate IP Communications needs. Cisco CallManager can be delivered simultaneously while Cisco IOS Software provides functionality for Cisco IP Phones. Core IP phone features are provided for your organization on the enterprise level. Voice and video mail are simultaneously provided to your communications devices, cellular phones, pda's, and etc. Cisco 2801 Integrated Services Routers streamline enterprise level business processes by utilizing a wide array of communications devices on a single platform to facilitate meeting business objectives.

Wireless Services

Wireless is deployed seamlessly using Cisco 2801 Integrated Services Routers. Your entire Enterprise will benefit from secured wireless that facilitates greater mobility for your organization and it's shareholders. The Cisco 2800 Series support integrated access points for wireless LAN, WiFi hotspot services for public access, wireless infrastructure services for cordless, WLAN Telephony, and land mobile radio over IP. All of these services will make your organization more efficient.

Integrated Services

The architecture of the Cisco 2800 Series gives customers a secure IP Communications platform, easy integration of services and standalone networks. Services are permitted to run on separate hard-drives making them more secure and fail safe. These functions expand the Cisco 2801 beyond traditional routing. Faster deployment, lower research and solution costs are some of the benefits.

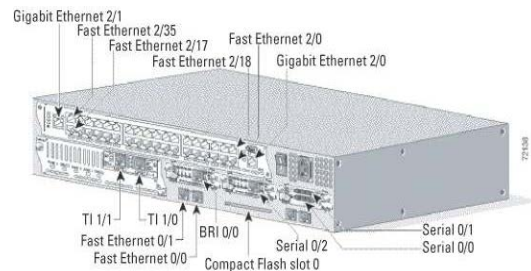
The integrated services architecture is the next generation technology that will propel your organization to the next level of profitability, security and efficiency.

Cisco 3725G-12s Modular Access Router

This router is a modular hardware device. The 3725's form factor is built specifically for high-density service modules (HDSM's). The HDSM's allow for higher-level routing support. Enabling the following services, WAN Access, Voice Gateway, Security, Content, Circuit Emulation, and Dial applications.

Key features of the Cisco 3725:

- Two Integrated 10/100 LAN ports
- Two Integrated Advanced Integration Modules (AIM) slots
- Three Integrated WAN Interface Card (WIC) slots
- Two Network Module (NM) slots
- One High Density Service Module (HDSM)-capable slot
- 32MB Compact Flash/256MB DRAM default
- Cisco 3725 has two 128 MB SDRAM DIMM modules and a single 32 MB Compact Flash module by default
- Optional In-Line Power for 16-port EtherSwitch NM, 36-port EtherSwitch HDSM and wireless access points
- Support for all major WAN protocols and media: leased line, Frame Relay, ISDN, X.25, ATM, fractional T1/E1, T1/E1, xDSL, T3/E3, HSSI
- Support for selected NMs, WICs and AIMs from the Cisco 1700, 2600 and 3600 Series
- 2 RU Rack-mountable chassis
- 24V to 60V Universal DC power supply
- NEBS Level 3 compliance



Integration of 2801 and 3725 Routers

The features of these routers as standalone devices are incredibly robust. When paired their functions are limitless. Your organization will be running state of the art routers that will increase productivity lower cost and save your organization money while realizing company objectives.

Cisco Catalyst 2960 LAN Base Series Switches

Cisco Catalyst 2960 Series Switches with PoE and LAN based software offer select configurations that span the network. Desktop Fast Ethernet, Gigabit Ethernet, Enhanced LAN Services, Network Admission Control, and QoS control are all services offered on this hardware.

Power over Ethernet

2960 Series Switches offer PoE to provide simple and easy connectivity to Ethernet powered devices. The Cisco Catalyst 2960-PC-L can support 24 simultaneous full-powered PoE ports at 15.4W eliminating the need for wall power and power cabling through panels. This limits interference and power failures.

Gigabit Ethernet

Moving at speeds of 1000 Mbps across the network and supporting all data transmissions seamlessly, Gigabit Ethernet provides the bandwidth to scale and meet new network demands while functioning efficiently on an enterprise level. Videoconferencing, Spreadsheets you name it Gigabit has the pipe to move it.

Intelligent Network

Cisco Catalyst 2960 Series Switches with PoE and LAN based software offer intelligent network solutions that help enterprises desktop computers meet and exceed their computing capacity based on network optimization and intelligence.

- Increase in desktop computing power
- Introduction of bandwidth-intensive applications
- Expansion of highly sensitive data on the network
- Presence of multiple device types, such as IP phones, WLAN access points, and IP video
- Cameras

Quality of Service

Network traffic is classified through Cisco's Multi-Layer QoS. The 2960 Series identifies packet groups and traffic flows minimizing collisions and loss of data. This ensures delivery to recipients across the enterprise and beyond.

Management of 2960 Series Switches

These switches come packed with the express setup features that streamline the whole setup process. Express setup helps IT infrastructure personnel deploy quickly and easily.

Additional 2960 Series features:

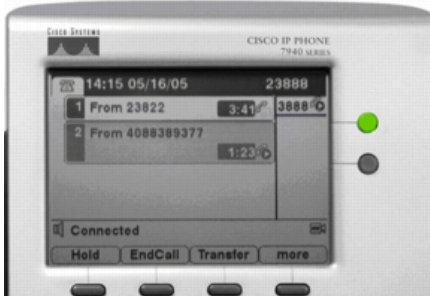
- Network discovery, topology views, end-station tracking, and VLAN management
- Real-time network fault analysis with easy-to-deploy device-specific best-practice templates
- Hardware and software inventory management, centralized configuration tools, and Syslog monitoring
- Network response time and availability monitoring and tracking
- Real-time device, link, and port traffic management, analysis, and reporting

Cisco Unified IP Phones 7961G & 7941G

The Cisco Unified IP Phones 7961G & 7941G are full-featured, award winning,



enhanced manager IP phones. The 7961G provides six programmable backlit line/feature buttons that are designed to meet the needs of managers and administrative assistants. The 7941G provides two programmable backlit



line/feature buttons. The following features are standard on both phones. Four interactive soft keys that guide a user through call functions and three audio control buttons enable high-quality duplex speakerphone, handset, and headset. A built-in headset port and an integrated Ethernet

switch are also standard. An award winning higher-resolution grayscale pixel-based LCD display provides features such as calling party name, calling party number, digits dialed, and date and time. The graphic capability of the display allows for visibly rich Extensible Markup Language (XML) applications and double byte languages.

Cisco Unified IP Phones are designed to grow with your system capabilities. No hands-on changes and moves are required. The end-user can simply unplug and plug the phone in at a new location anywhere on your network. Firmware changes are downloadable from Cisco Unified CallManager and Cisco.com. New features and changes are enabled through software updates to the phone flash memory. Personal user settings and services can be saved on each phone.

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