

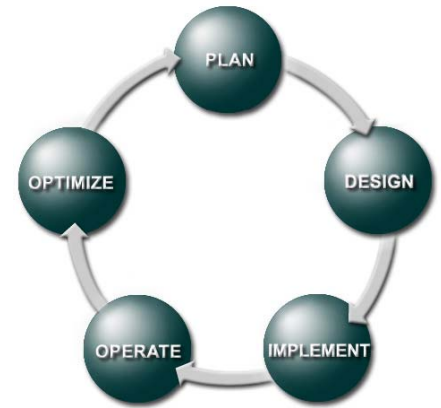
Service Overview

Technology Application Support for Internet Protocol Telephony

Internet Protocol Telephony (IPT) replaces standard public switched telephone networks by using the network infrastructure to send audio between two or more users in real time while allowing users to communicate via an IP-based telephone.

IP phones register themselves whenever they are moved, allowing users to take their phones with them, creating a virtual office by plugging into spare data wall jacks and receiving calls regardless of their current location. . Because IP Telephony uses the same standards as data communications, both PCs and phones can access voice mail, check email, and enable other IP Telephony applications on the same network.

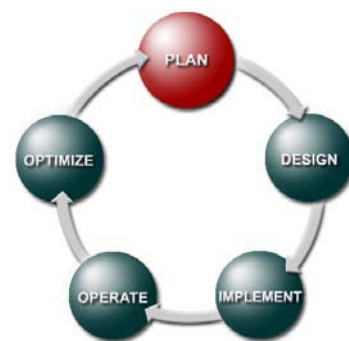
Centralized voice services provide the ability to extend the features and efficiency of the corporate IP voice and data solutions to remote office locations without having to invest heavily in additional network infrastructure and software for the remote offices aiding network managers in the process of managing a converged voice and data network. The cost of relocating a phone or changing phone numbers when an employee moves—a significant expense that can range up to \$150 per phone—is eliminated. The central office also gains a greater degree of control over what is added to the network to help ensure greater systems integration and security. In addition, since IP Telephony is a software application, enhancing capabilities in a production environment is now just a matter of upgrading software on the server platform.



SERVICE	STANDARD SERVICES	OPTIONAL SERVICES	A LA CARTE
PLANNING			
IP Telephony Network Readiness Assessment	Y		Y
DESIGN			
IP Telephony Detailed Design Collaboration	Y		Y
IP Telephony Software Release Recommendations	Y		
IP Telephony Proof of Concept Support		Y	
IP Telephony Detailed Design Development		Y	Y
IMPLEMENTATION			
IP Telephony Implementation Plan Review	Y		
IP Telephony Remote Deployment Support	Y		
IP Telephony Acceptance Test Plan Review	Y		
IP Telephony Implementation Engineering		Y	Y
IP Telephony Deployment Project Management Support		Y	Y
OPERATIONAL AND OPTIMIZATION			
IP Telephony Ongoing Software Releases Assessment	Y		
IP Telephony Ongoing Design Support	Y		
IP Telephony Ongoing Network Application Performance and Optimization	Y		
IP Telephony Knowledge Transfer	Y		
IP Telephony Onsite Support		Y	

- Technology Application Support IP Telephony core subscription services are annuity based.
 - Technology Application Support IP Telephony subscription options are available with the purchase of a Technology Application Support IP Telephony subscription. These options are annuity based.
- Technology Application Support IP Telephony a la Carte services are available without a subscription to any service program. A la Carte services are not annuity based.

IP Telephony Network Readiness Assessment evaluates your existing services and how they relate to your business goals as well as technical objectives. An evaluation of an existing defined network environment as well as an evaluation of proposed network changes will help align the proposed network with your business needs and requirements, improve resiliency and availability in your network, and lead to higher productivity. In addition, this service can help you identify correct resource needs for the successful implementation and operation of new technologies or service leading to faster speed to migration



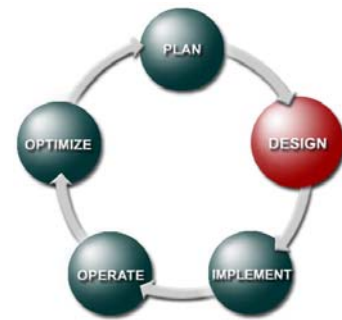
IP Telephony Network Readiness Assessment provides you with a report detailing the ability of the existing (or planned) data networks to carry additional voice traffic, along with the overall resiliency of the data architecture in relation to voice. The report is generated by having the Cisco Advanced Services team review the existing network infrastructure and planned IP telephony along with onsite interviews, to identify gaps in your current network infrastructure that need to be addressed to support the voice rollout. In particular, the report is tailored to review your infrastructure elements in relation to voice readiness and includes hardware, software, network design, IP Telephony solution security, IP addressing, links and cabling, power, and existing network services such as Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP). Additionally, based on an analysis of both existing PBX information and current utilization of the network, potential future performance issues are highlighted.

Key Activities and Deliverables	Value/benefit
<p>Formal Assessment of network readiness to support additional voice traffic. Assessment typically includes:</p> <ul style="list-style-type: none"> • An analysis of customer’s hardware, software, network design, IP addressing, links/cabling, power and existing network services (including but not limited to DNS and DHCP) as it relates to planned IP Telephony implementation • Analyze performance related information in respect of customer’s network • Gain an understanding of customer’s organization and IP Telephony solutions requirements and goals <p>Develop IPT Network Readiness Assessment Report, which typically includes recommendations relating to,</p> <ul style="list-style-type: none"> ▪ Network design changes needed to accommodate IP Telephony ▪ Network hardware changes needed to enable IP Telephony ▪ Network software changes required to enable IP Telephony ▪ Power/Environmental changes required to enable IP Telephony ▪ LAN/WAN bandwidth changes required to enable IP Telephony) <p>Deliver report and present a summary of recommendations typically within 30 days delivering the IPT Network Readiness Assessment</p>	<ul style="list-style-type: none"> • Improve speed of migration by helping you to identify, understand, and plan for network infrastructure changes that may be required to meet network asset and bandwidth requirements to support your new IP telephony solution • Align the proposed IPT network with your business needs and requirements • Avoids additional planning cycles by identifying gaps and risks in the earliest phase of the planning process, letting you draw benefits of the IP telephony as you intended • Helps improve resiliency and availability in your network, leading to higher productivity • Helps you identify correct resource needs for the successful implementation and operation of your IP telephony solution, leading to faster speed to migration • Reduces the risk of IP Telephony application downtime due to a breach in security. • Assists you in comparing existing telecom features with IP telephony features to help ensure the final solution meets functional expectations; this helps determine the final architecture and plan for user migration

This service provides you with the following deliverable: IP Telephony Network Readiness Assessment Report. IP Telephony Network Readiness Assessment is available as a service in TAS IP Telephony subscription as well as a la carte. If purchased “a la carte,” the engagement is for a limited-duration.

Detailed Design Collaboration minimizes costly and time-consuming redesign work by integrating your technical requirements and design goals throughout the collaboration process. Cisco Advanced Services engineers provide you direction with regular feedback during the entire design development process

Through the design process, the Cisco Advanced Services teams collaborate with your staff in order to develop a comprehensive understanding of your IP telephony solution requirements, the number of phones, features needed, dial plans, voice mail and unified messaging issues, emergency services (for example, E911 in the United States), Cisco Emergency Responder, conferencing, IPCC Express, and power are all considered. A review of potential Cisco software releases for your IP Telephony solution is also included in the review.



The Cisco Advanced Services team can help you

- Identify changes that may be required in your routing infrastructure in order to support a new IP telephony application
- Identify wide area network (WAN) AN bandwidth requirements for the new IP telephony solution, including remote and branch offices
- Identify routing protocol and IP address tuning requirements needed to support IP telephony devices
- Cisco CallManager design options and gateway/gatekeeper sizing based on your requirements
- Identify devices such as IP phones, voice-mail ports, JTAPI (Java Telephony Application Programming Interface) devices, security devices such as firewalls, intrusion detection, and gateways registered to the Cisco CallManager
- Assess requirements and make recommendations on Cisco CallManager sizing in order to help ensure stable operation and scalability to allow more users in the future
- Assess requirements and make recommendations based on IP telephony gateway/gatekeeper sizing loading and feature needs
- Integration of Lightweight Directory Access Protocol (LDAP) by helping you to understand your global directory structure.
 - Assess requirements and make recommendations on integrating the LDAP global directory with IP telephony embedded directory to help consolidate all user information and ease integration with existing and future applications (for example, IP interactive voice response [IVR])
 - Assess requirements and makes recommendations to dial plans, call routing schemas, any special dial string considerations, dial-plan groups, and emergency services requirements
 - Help define simple provisioning of new users as the user base expands
- Assess requirements and makes hardware, software, and configuration recommendations to help you successfully integrate analog phone, fax, and modem together with digital IP telephony technology
- Assess specific conferencing needs and make recommendations to help ensure that you correctly plan and provision enough digital signal processing (DSP) resources to adequately support the organization's conferencing requirements
- Provide Cisco best-practice recommendations for integrating telephony applications with the IP telephony solution to help you understand application requirements with respect to current and future call manager resource and application device capacity; also ensures a predictable and scalable integration
- Provide Cisco leading-practice guidelines to help you implement correct procedures and policies to protect (for example, authentication mechanisms when introducing IP phones, security for dial plans and emergency services, IP telephony application data confidentiality, etc.) and manage the IP telephony solution
- Review Cisco operating system and application software versions in existing IPT network and create software referrals for appropriate versions

To fully meet your business and technical objectives an optional IP Telephony Detailed Design Development service is available. The Cisco Advanced Services team can take responsibility for developing your IP Telephony detailed design. For more information about IP Telephony Detailed Design Development please refer to the TAS IP Telephony Program Enhancements section of this document.

Table 3 IP Telephony Detailed Design Collaboration

Key Activities/Deliverables	Value/Benefit
<p>Conduct an onsite Detailed Design Workshop to gather data and initiate the network Detailed Design Collaboration process, which may include:</p> <ul style="list-style-type: none"> • Review and evaluation of customer network documentation, and existing network designs – if available • Collaboration with the customer/partner to verify that the chosen platform, features and functionality will meet the design objectives • Collaboration with the customer/partner to complete the Detailed Design Discovery Checklist – where applicable - to integrate technical requirements and design goals into the network Low Level Design • Collaboration with the customer/partner to gather network Detailed Design requirements <p>Prepare up to 3 sections of the customer-created Low Level Design document, as identified and prioritised during the Detailed Design Workshop, which may include:</p> <ul style="list-style-type: none"> • Logical and Physical Topology • Addressing and Routing Strategy • Scalability and Redundancy • Features and Functionality Recommendation • Software Version Referral • Identification of required changes to the network infrastructure to accommodate the Low Level Design – if applicable <p>Provide direction and feedback on the customer-created Low Level Design during the 3-4 months duration of the project. Participate in a review of the customer-created Low Level Design and provide feedback.</p>	<ul style="list-style-type: none"> • Integrate technical requirements and design goals throughout the steps of the network Detailed Design Collaboration process through Cisco participation and proven design principles • Accelerate the adoption of leading edge technology by providing knowledge exchange and leading practices on network design principles • Help minimize expensive, time consuming, and network intrusive re-design by ensuring proper design early in the lifecycle • Improve your staff proficiency by providing continuous knowledge exchange throughout the Detailed Design Collaboration process • Identify Quos configurations and other design parameters and enable IPT voice applications to meet voice quality expectations and requirements • Help ensure proper bandwidth provisioning for anticipated call volumes, conferencing requirements, V-Mail traffic, etc. • Lowers network management costs by helping streamline provisioning process • Helps ensure that possible IPT security risks have been evaluated and that the correct procedures are followed to mitigate these risks.

IP Telephony Network Readiness Assessment is available as a service in TAS IP Telephony subscription as well as a la carte. If purchased “a la carte,” the engagement is for a limited-duration.

IP Telephony Software Release Recommendations

Improve your network performance by using the correct set of operating systems and application software releases, each major software release introduces a new set of IPT features, these features may be important in helping you meet users needs or introduces new voice capabilities. IP Telephony Software Release Recommendations includes a review of Cisco software releases along with a set of recommendations for your IP Telephony solution.

Table 4 IP Telephony Software Release Recommendations

Key Activities/Deliverables	Value/Benefit
<ul style="list-style-type: none"> • Assess Cisco operating system and application software releases in the existing network • Create software selection criteria based on protocol and feature requirements • Provide backup and restore procedures for risk management • Provide a report with software recommendations for Cisco IP telephony components based on your detailed network design 	<ul style="list-style-type: none"> • Lowers operating costs by reducing your staff hours needed to identify correct Cisco software releases for your network • Improves network performance by ensuring the utilization of correct set of operating systems and application software releases • Helps lower deployment risks by careful software release planning

This service provides you with the following deliverable: IP Software Release Recommendations report
IP Telephony Software Release Recommendation is available as a service in TAS IP Telephony subscription

IP Telephony Proof of Concept Support Working with a single point of contact during the pilot phase of your design development will help to ensure the design can be implemented in the production environment

Table 12 IP Telephony Proof of Concept Support

Key Activities/Deliverables	Value/Benefit
<p>Delivers onsite technical assistance during pilot via an onsite visit ranging from one to two weeks, depending on the scale of pilot project:</p> <ul style="list-style-type: none"> • Pilot test plan review and recommendations: Reviews and makes recommendations to the pilot test plan to help ensure that it adequately tests the IP telephony solution for design, scalability, and deployability. • Review configuration templates for the pilot sites: Reviews and makes recommendations to the IP telephony-related hardware and software configuration templates (e.g., Cisco CallManager, IP phone, gateway) to help ensure that you create correct and complete standard configuration templates that will ensure a scalable final deployment rollout. 	<ul style="list-style-type: none"> • Provides you with an IP telephony expert, familiar with the planning and design of your IP telephony solution, to help ensure that the pilot process verifies that the design can be implemented in the production environment • Provides you with a single point of contact for IP telephony design issues that may arise during the pilot • Lets you take advantage of Cisco best practices and expertise

This service provides you with the following deliverables: IP Telephony Application Proof of Concept Report, Up to two weeks of onsite support

IP Telephony Detailed Design Development will help to accelerate the adoption of leading edge technology by providing knowledge exchange and leading practices on network design principles through an evaluation of existing network infrastructure

Helping you to minimize IP Telephony design risks by engaging engineers who have prior hands-on experience as well as a repository of proven designs to reference can minimize expensive, time consuming, and network intrusive re-design. As the innovator of many new applications and technologies being implemented, Cisco is a key source of IP Telephony design capabilities, and customers often look to Cisco to provide leadership for their network designs.

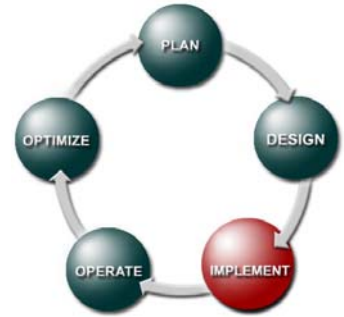
IP Telephony Detailed Design Development option is an extension of the IP Telephony Detailed Design Collaboration. Adding the dimension of Cisco leading of producing the IP Telephony detailed design document by using Cisco templates, leading practices, and lessons learned. Cisco Advanced Services engineers will validate and summarize your design requirements to help ensure alignment around your business and network objectives. Feedback sessions are conducted to allow for midstream input before the final design is produced.

Table 14 IP Telephony Detailed Design Development

Key Activities/Deliverables	Value/Benefit
<p>Conduct an onsite Detailed Design Workshop to gather data and initiate the network Detailed Design Development process, which may include:</p> <ul style="list-style-type: none"> • Review and evaluation of customer network documentation, and existing network designs – if available • Verification that the chosen platforms, features and functionality will meet the design objectives • Completion of the Detailed Design Discovery Checklist - where applicable - to integrate technical requirements and design goals into the Low Level Design • Gathering network Detailed Design requirements <p>Develop and review the Low Level Design, which may include:</p> <ul style="list-style-type: none"> • Network Logical and Physical Topology • Addressing and Routing Strategy • Scalability and Redundancy • HW/SW Protocols, Features and Functionality Recommendation • Software Version Referral • Required changes to NI to accommodate Low Level Design - If applicable <p>Present and discuss the Low Level Design onsite, typically within 30 days of delivering the final LLD</p>	<ul style="list-style-type: none"> • Integrate technical requirements and design goals throughout the steps of the network Detailed Design Development process through Cisco leadership and proven design principles • Accelerate the adoption of leading edge technology by providing knowledge exchange and leading practices on network design principles • Minimize expensive, time consuming, and network intrusive re-design by ensuring proper design early in the lifecycle • Improve your staff proficiency by providing continuous knowledge exchange throughout the Detailed Design Development process • Identify QoS configurations and other design parameters enable IPT voice applications to meet voice quality expectations and requirements • Help to ensure proper bandwidth provisioning for anticipated call volumes, conferencing requirements, V-Mail traffic, etc.

This service provides you with the following deliverable: IP Telephony Low-Level Design

IP Telephony Implementation Plan Review relies on industry leading best practices and expert consultation in order to help you deliver a speedy and successful implementation. By ensuring your hardware, software, and network deployment plans are optimized you will minimize disruption to your existing network, reduce maintenance windows, and reduce the chance of downtime



Your IPT Implementation Plan will come from you, Cisco Advanced Services engineers will review the plan in order to help ensure a successful implementation.

Your implementation plan should include

-
- List of all Cisco networking devices to be implemented,
- Hardware and software configurations
- IPT Implementation plan dependencies
- Dial Plans
- Interconnection Plans
- IPT Services to be Implemented
- Availability metrics and measurements
- Network maps & topology diagrams
- Installation and commissioning tests
- Site survey results

Table 5 IP Telephony Implementation Plan Review

Key Activities/Deliverables	Value/Benefit
<p>•Provide a formal assessment of customer’s implementation plan and report on recommendations. The assessment typically includes a review of:</p> <ul style="list-style-type: none"> –Proposed hardware and software configurations such as Call Manager, Gateway, Gate keepers, IPCC Express, and Unity –Installation and Commissioning test cases –Impact to existing infrastructure and operations –Network Addressing Plan and Dial Plan –Migration Plan from legacy systems to new IP-based systems <p>Provide and Present summary of recommendations typically within 30 days of providing IPT Implementation Plan Review report</p>	<ul style="list-style-type: none"> • Helps speed successful implementation by helping to avoid potential implementation issues by leveraging Cisco Leading Practices • Improve your team’s ability to meet an aggressive deployment schedule with a comprehensive review of your Network Implementation Plan • Helps minimize disruption to existing network during deployment by proactively identifying potential risks before the network is deployed. • Potentially reduces the duration of maintenance windows <p>Helps enable your Network Implementation Plan is complete and contains the critical elements that are required for predictable deployment</p>

The Cisco Advanced Service team will review and evaluate the information contained in your IPT Implementation Plan and provide a report with recommendations that will assist in improving your deployment strategy. IPT Implementation Plan Review is an option and has a pre-requisite of IPT Detailed Design Collaboration (a la carte), or IPT Detailed Design Development (a la carte).

IP Telephony Remote Deployment Support Issue resolution can mean the difference between unlocking the power of your network and costly deployment delays. By leveraging Cisco Advanced Services engineers familiar with your network, Cisco Remote Deployment Support helps your engineers manage and resolve technical challenges quickly and efficiently.

Remote Deployment Support can augment the Cisco Total Implementation Solutions (TIS) program, which addresses timely deployment of network installation and implementation by providing skilled, global installation and implementation resources on all Cisco technologies. Contact your account team if the Cisco TIS service is needed.

Table 6 IP Telephony Remote Deployment Support

Key Activities/Deliverables	Value/Benefit
<ul style="list-style-type: none"> • Scheduled remote deployment support (24 x 7 standby basis, 21 days prior written request) • Support for up to two events per month, requiring up to 10 hours of support per month for all hardware, software, and configuration events combined • Weekly status update on outstanding technical issues 	<ul style="list-style-type: none"> • Speeds issue resolution by providing quick access to knowledgeable technical deployment assistance from engineers who understand your design and implementation plan • Minimizes deployment errors by taking advantage of the wealth of Cisco expertise gained in similar deployments • Helps to ensure that your technical deployment issues are properly raised, escalated, and resolved in a timely manner, ensuring that the entire Cisco team is focused on achieving your business goals • Facilitates rapid resolution of deployment-related network issues, assuring minimal impact on deployment schedule and network stability

IP Telephony Acceptance Test Plan Review How do you prepare for the unexpected? Gaps in your network test plan can lead to costly delays and business impacting outages. The Cisco Network Acceptance Test plan Review allows you to apply Cisco deployment expertise and industry leading best practices to your test plan, ensuring you've planned for the expected and unexpected alike.

IPT Acceptance Test Plan Review will assist in confirming the number of tests required to adequately demonstrate your network functions and operates in the way it was designed. The Cisco Advanced Services team breadth of knowledge, subject matter expertise, and ability to draw upon previous experiences will aid in identifying the appropriate testing that should be performed in your network.

An IPT Acceptance Test Plan may include the following information:

- A Network Test Plan that may outline:
 - ✓ Test scope
 - ✓ Test components
 - ✓ Acceptance criteria matrix
 - ✓ Test procedure
 - ✓ Test setup
 - ✓ Test results matrix
- A set of IPT Test Cases, where each test case may include:
 - ✓ Test requirements
 - ✓ Test scenarios
 - ✓ Parameters for each test scenario
- A list of IPT network services to be implemented, such as:
 - ✓ Call Manager

- ✓ Emergency Numbers
- ✓ Applications
- ✓ Unified messaging
- ✓ Auto attendant

The Cisco Advanced Service team will review and evaluate the information contained in your IPT Acceptance Test Plan and provide a report with recommendations that will assist in improving your testing strategy. The IPT Acceptance Test Plan Review Report will be delivered to your team upon the completion of the review process.

Table 7 IP Telephony Acceptance Test Plan Review

Key Activities/Deliverables	Value/Benefit
<ul style="list-style-type: none"> • Provide a formal assessment of customer-developed Acceptance Test Plan for IP Telephony solutions and a report detailing recommendations. The report typically includes a review and recommendations on: <ul style="list-style-type: none"> – Test Cases which are critical to IPT test plans, additional features, and Cisco applications such as IP Auto Attendant, IVR, Unity applications, Call Manager, and gateways – Test cases for IPT related infrastructure features such as end to end QOS • Present summary of recommendations typically within 30 days of providing the IPT Acceptance Test Plan Report 	<ul style="list-style-type: none"> ▪ Provides a comprehensive review of your testing strategy to enable your team to deliver test coverage that is complete and without redundancy ▪ Improve testing efficiency and quality by providing a report detailing recommended testing approaches and test enhancements ▪ Leverages leading practices that facilitate quick and more accurate diagnosis of network issues; while helping reduce the time to deploy the network

This service provides you with the following deliverables: IP Telephony Acceptance Test Plan Review Report

IP Telephony Implementation Engineering Put Cisco expertise to work on your network implementation with Cisco Implementation Engineering. Cisco Advanced Services engineers will help your network support team develop the plans critical to the success of your network deployment, in addition to being onsite during cutover to minimize impact to your live network

The IP Telephony Implementation Engineering is an extension to the IP Telephony Implementation Plan Review service. Cisco will take the lead of producing a network staging plan –if applicable–, network implementation plan, and network ready for use plan by leveraging Cisco templates, leading practices, and lessons learned. Cisco Advanced Services engineers will work with your team to perform the first few site surveys and actively help you manage the remainder. Cisco Advanced Services engineers will also be available onsite to provide cutover support during initial integration with your live network. This service is available for a fixed duration engagement from one to twelve months depending on your needs and the complexity of your project.

Customers that may or may not already have a TAS IPT subscription may purchase the IP Telephony Implementation Engineering.

Table 8 IP Telephony Implementation Engineering

Key Activities/Deliverables	Value/Benefit
<ul style="list-style-type: none"> • Team with customer engineers to perform site surveys for up to 3 representative sites¹ • Team with customer engineers to develop the network staging plan which typically includes: <ul style="list-style-type: none"> – Physical and logical topologies – Configurations – Testing scripts – Acceptance criteria • Team with customer engineers to develop network implementation plans (NIP) for up to 3 representative sites. A NIP typically includes: <ul style="list-style-type: none"> – Site-specific installation tasks and checklists – Documentation of node and site specific information – Guidelines for the Implementation Engineer – Installation and site commissioning tests • Team with customer engineers to develop the Network Ready For Use plan • Assist with execution of the Network Implementation Plan and the Network Ready For Use Plan for up to 3 representative sites, which may include: <ul style="list-style-type: none"> – Assisting customer engineers with loading device configurations – Assisting customer engineers with executing test plans and documenting results – Assisting customer engineers with resolving implementation issues • Provide remote support for customer engineers during execution of the Network Ready for Use Plan • Provide consultative, onsite support at customer's one central location during integration with live network during one Maintenance window. Team with customer engineers to perform post-implementation verification testing and one day of onsite "day 2" support. • IP Telephony Implementation Engineering is provided for a predetermined period of time, between 1 and 12 months in one-month increments. 	<ul style="list-style-type: none"> • Avoids costly disruptions during implementation due to previously unattended site rendition • Uses Cisco best practices and implementation lessons learned to help ensure thorough description of technical specifications and procedures prior to starting physical implementation • Facilitates smooth execution of implementation activities through side-by-side coaching and written procedures • Improves the productivity of the implementation team by reducing unknowns encountered during the implementation process • Help to ensure that upon completion of the implementation the network delivers the expected features, functionality, capacity, and reliability.

This service provides you with the following deliverables: Site Requirements Specification, Site Survey Form, Network Staging Plan (if applicable), Network Implementation Plan, Network Ready For Use plan.

TAS IP Telephony Deployment Project Management Support

- Taking advantage of lessons learned from prior Cisco Advanced Services deployments helps to ensure that project plans are comprehensive and potential deployment risks are minimized. As your IP Telephony network becomes more critical to your business goals, the margin for error on IP Telephony deployment projects becomes dramatically smaller. IP Telephony deployments need to minimize potential risks and deliver the benefits that prompted initiation of the project. Also, business necessities dictate that deployments cannot disrupt ongoing usage of existing network applications

The IP Telephony Deployment Project Management Support is designed for customers who require experienced network project management assistance during the planning, design, and implementation of a IP Telephony

¹ Support for additional sites is available upon request.

deployment project. This service provides that added measure of predictability that can be obtained by engaging experienced Cisco project managers to guide your project managers during a critical deployment project.

IP Telephony Deployment Project Management Support is a fixed-duration engagement that provides you with access to a Cisco Advanced Services project management specialist who will work with your deployment team (direct or outsourced) and utilize Cisco leading practices to guide deployment projects during the engagement period. Cisco project management specialists bring to the table project management expertise that is tailored to network implementation initiatives versus generalist project management skills. They focus on assisting your project management team with setting up and coordinating tasks, schedules, budgets, and resources to efficiently accomplish deployment objectives as well as mentoring your team in the execution of the deployment project plan.

In cases where the Deployment Project Management Support offering does not fulfill your project management requirements, Cisco can support you through a custom defined project management service offering. Customers that may or may not already have a TAS IPT subscription may purchase this service. This service is available for a fixed duration engagement from one to twelve months, depending on your needs and complexity of your deployment project. Availability varies by region. Please check with your account team for details.

Table 9 IP Telephony Deployment Project Management Support

Key Activities/Deliverables	Value/Benefit
<p>Assist Customer in their development of a comprehensive “PMP” (Project Management Plan) for rolling out new Hardware, Software or configurations which include:</p> <ul style="list-style-type: none"> • Detailed set of deployment tasks (Work Breakdown Structure) • Schedules including critical dependencies (Project schedule) • Identification of significant risk factors (Risk Mitigation Plan) • Procedures for managing project documentation, assets, and issues • Processes for project reporting • Contact lists, escalation lists <p>Provide project management expertise to the assist Customer’s management team’s execution of its “PMP”, including assistance in the following areas:</p> <ul style="list-style-type: none"> • Kick-off/status meeting (s) • Customer project documentation • Planning, Design & Implementation activities • General communications • Ongoing mentoring of customer project management team on project management methodology 	<ul style="list-style-type: none"> ▪ Giving the customer an opportunity to benchmark their existing practices against Cisco Advanced Services’ project management framework, templates and tools, thus giving the customer insight for potential improvement. ▪ Takes advantage of lessons learned from prior Cisco Advanced Services deployments to help ensure that project plans are comprehensive and potential deployment risks are minimized. ▪ Provide assistance to your escalation of any issues pertaining to Cisco products.

IP Telephony Ongoing Software Release Assessment

Achieve productivity gains by operating a seamless network. The Cisco Advanced Services team proactively reviews upcoming releases with you and makes recommendations on the selection of software releases that are most beneficial to your unique environment. This way you are never caught unprepared, and your application is always up-to-date.

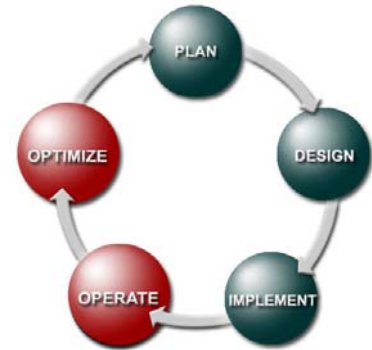


Table 10 IP Telephony Ongoing Software Release Assessments

Key Activities/Deliverables	Value/Benefit
<ul style="list-style-type: none"> Proactively identifies and recommends applicable Cisco IP telephony software releases that address your ongoing feature introduction and functional requirements Provides you with the summary of changes that took place in the recent software releases for IP telephony; makes recommendations on what software to upgrade Provides risk analysis of software releases, based on Cisco best practices and your particular environment's needs 	<ul style="list-style-type: none"> Expert risk analysis of your IPT software Environment reduces the possibility of network outages, and helps you simplify your software selection process Provides optimal feature set recommendations to maintain a robust network and meet your requirements Helps you achieve productivity gains by Operating a seamless network

This service provides you with the following deliverables: IP Telephony Software Release Assessment Report delivered via quarterly meetings with your staff.

IP Telephony Ongoing Design Support

Keep your network design up-to-date with the needed changes, avoiding obsolescence, The Cisco Advanced Services engineering team will work with you avoiding potential outages when making changes to your network or IPT infrastructure.

Please refer to Appendix A for a sampling of technological details that are considered in this service's delivery. These include PSTN/legacy PBX integration and migration, dial plan changes, adding new IPT applications, and unified messaging considerations.

Table 11 IP Telephony Ongoing Design Support

Key Activities/Deliverables	Value/Benefit
Reviews and makes recommendations on design changes to the network that will result from: <ul style="list-style-type: none"> Ongoing IP telephony feature and functionality requirement changes or additions, covering new hardware functionality, new integration capabilities, or changes / additions in the reference architectures Additions or changes to the overall network design 	<ul style="list-style-type: none"> Keeps the network design up-to-date with the needed changes, avoiding obsolescence Provides Cisco Advanced Services team's assistance when making the changes, avoiding potential outages. This yields a robust network with satisfied and productive users.

IP Telephony Ongoing Network Application Performance and Optimization

Help ensure your network infrastructure achieves performance objectives through quarterly network performance analysis and ongoing informal performance-tuning checks.

Our goal is to help decrease the number of network issues dramatically, resulting in less network downtime and consequently reducing cost of ownership while improving your profitability. In delivering this service. The Cisco Advanced Services team will utilize automated tools², methods and procedures to inspect your IP Telephony network to validate the configuration of devices, identify network congestion, and voice quality issues. By

² One of the tools used, IPT Audit, may require Cisco Network Analysis Toolkit (also known as "Natkit") to be installed in customer's network. The audit uses Natkit as the data collection vehicle; hence Natkit must stay operational throughout the audit's data collection process (which is seven days under normal circumstances). The AS team will accommodate installation of a NatKit if there is not one in the network. Contact your account representative if you have questions related to Natkit.

proactively identifying and correcting potential issues, this service helps ensure that the network is performing at its peak, stable, reliable, secure and manageable. The service provides a report that, among other optimization recommendations, lists an inventory of IP phones, gateways, routers and switches as well as a complete picture of Cisco software that is running on the current IP Telephony network.

Table 12 IP Telephony Ongoing Network Application Performance and Optimization

Key Activities/Deliverables	Value/Benefit
<p>This service provides customers with the following activities and deliverables:</p> <ul style="list-style-type: none"> • Quarterly solution-level meeting to review a written report delivered to your staff • IP Telephony solution-level Operational Assessment Report detailing: <ul style="list-style-type: none"> – Recommendations for tuning product configuration templates – Recommendations for proper test procedures – Recommendations for changes in scripts, command changes in Cisco IOS® Software devices, QoS adjustments – Recommendations on required skill sets – Recommendations for new standards and protocols • Consultative support: <ul style="list-style-type: none"> – Recommendations concerning customized solutions, where the required functionality falls outside the reference IPT architectures. – Notification and analysis of network alerts (such as IPT product related notices, security warnings, changes in best practices and recommended architectures) 	<ul style="list-style-type: none"> • Helps you lower total cost of ownership by preventing solution-level issues through proactive support focused on keeping applications running at optimal capacity • Simplifies network expansion and optimization by providing ongoing network configuration updates and recommendations • Helps ensure network and application quality verification, thereby limiting end-user callbacks • Helps ensure optimal expansion planning through proactive consulting and application technology expertise • Helps focus on staffing and training on required areas; Helps enhances your networking staff job satisfaction and performance, increasing productivity • Helps ensure proper network evolution through proactive operational consulting that offers the use of new capabilities in provisioning and network management (when available in the solution) • Helps lower operational costs and provides for less business interruption by helping you identify how to respond to performance-degrading events, resolve issues faster, and root cause analysis of issues • Keeps pace with Cisco product evolution, not only from the solution and product standpoint, but also at the most detailed application level • Shortens the development cycle of custom approaches by leveraging the expertise of the AS team. • Pro-active review of the latest recommended products and architectures allows you to stay ahead on change planning, thereby limiting downtime • Automated verification of configuration and critical resources for large number of IP telephony devices, shortening any manual processes significantly.

Please refer to Appendix B if you would like to get more information on the automated tools that we use.

IP Telephony Knowledge Transfer

Improve staff knowledge and productivity while helping to reduce your overall training costs by supplementing the formal classroom environment with informal training sessions focused on providing timely technical information relevant to your network infrastructure environment

When introducing a new technology into your network, your staff must be comfortable with the technology as soon as possible—within reasonable cost. With Cisco IP Telephony Application Knowledge Transfer, the Cisco Advanced Services engineer meets with your staff to transfer information on selected areas of IP telephony. Your needs determine the topics of these sessions.

Table 13 IP Telephony Knowledge Transfer

Key Activities/Deliverables	Value/Benefit
<p>Focuses participation of Cisco Advanced Services IP telephony engineer(s) to:</p> <ul style="list-style-type: none"> • Delivers highly technical educational sessions conducted in an informal delivery format 	<ul style="list-style-type: none"> • Improves IP telephony knowledge base and troubleshooting techniques of your staff, targeting to minimize the possibility of outages during operation • Provides customized format that fits your individual needs

- Identifies class subjects ahead of time, at your request and suggestions (example subjects may be emergency services handling, dialing plans, unified messaging, and so on)

- Improves ability to solve small problems proactively before they become major issues, saving operating expenses in the long term

Example subjects of IPT Knowledge Transfer include:

- IPT Infrastructure
- IPT Dial Plan Architecture
- IPT DSP Resources Provisioning
- IPT Music On Hold
- IPT Gateway Selection
- IPT WAN Bandwidth Provisioning/CAC
- IPT SRST (Survivable Remote Site Telephony)
- IPT Emergency Services Content
- IPT CallProcessing Provisioning
- IPT Voicemail
- IPT Fax/Modem over IP
- IPT Extension Mobility
- IPT Legacy Migration
- IPT Security
- IPT Disaster Recovery
- VVT310 Troubleshooting Call Manager

IP Telephony Onsite Support

Faster implementation of Cisco recommendations for your network application

Can be achieved through onsite assistance of a Cisco Advanced Services engineer, helping your staff to absorbing and implement the numerous design, implementation, performance and optimization recommendations provided as part of the standard services of the TAS IPT program. The Cisco Advanced Services engineer can also assist in gathering information needed to conduct design reviews, implementation plan reviews, and performance analyses.

Although the Cisco Advanced Services engineer is primarily at the customer's site, they are part of the larger Advanced Services team and can leverage the expertise of that team when providing technical assistance and guidance to your engineering and operations staff.

The service can be provided in two variations, depending on your need: up to 2 days a week or up to 5 days a week (excluding holidays, vacation, and training).

Table 14 IP Telephony Onsite Support

Key Activities/Deliverables	Value/Benefit
<ul style="list-style-type: none"> • Local³ Cisco Advanced Services engineer to facilitate customer responsibilities related to proactive TAS IPT deliverables, that may include: <ul style="list-style-type: none"> – Directing collection of information for IPT assessment, design or implementation reviews – Driving data collection activities for performance and optimization • Ongoing technical leadership from local Cisco Advanced Services engineer in planning and executing TAS IPT Network Readiness Assessment, design, implementation, software and performance and optimization recommendations. 	<ul style="list-style-type: none"> • Technical leadership focused on maximizing benefits of a proactive approach to design, implementation, and network optimization • Faster implementation of Cisco recommendations for your network application • Additional opportunities for knowledge sharing with your staff

³ Availability of local Cisco Advanced Services engineer is limited. Please contact your account team for more information.

IP Telephony Network Deployment Mentoring (NDM) Boot Camps

When companies deploy advanced technologies to meet business and growth needs, IT and network operations personnel often face with challenges with respect to new technology implementation and its integration to the corporate networks. Deploying IPT solutions is no exception. Customers often work with a partner to mitigate risks and ensure a successful deployment. However, customer's own IT organization may lack the most up-to-date knowledge, hands-on experience, or testing facilities necessary to ensure efficient and successful deployment; or may struggle with the inherent complexities of technology integration. To address these needs Cisco has developed Network Deployment Mentoring (NDM) Boot Camps—hands-on, multi-day, lab-intensive classroom training sessions, led by Cisco Advanced Services networking experts. These instructor-led training sessions focus on the deployment and integration of advanced technologies, with an emphasis on the implementation and operation phases of the network lifecycle.

Through Cisco NDM Boot Camps, customer's personnel have direct access to Cisco Advanced Services subject matter experts who are leaders in their respective fields. These expert instructors help participants gain the knowledge and skills they need to configure, integrate, verify, and troubleshoot today's complex networks. With the guidance and training they receive, participants are better able to streamline the actual deployment process, improve network operations, and more effectively meet changing business and customer requirements. Multi-day sessions and small class sizes enable instructors to mentor individual students and carefully examine the issues related to deployment and integration. Each session is comprised of in-depth lab exercises and coursework—with approximately 70 percent of the time spent in the lab—allowing participants to take part in numerous activities that speed and enhance the learning process. Cisco NDM Boot Camp participants are not only able to experiment with difficult tasks, such as the seamless integration of equipment and technologies, they can also prepare for, manage, and resolve complex networking issues in a “safe” and structured environment.

For further information on IP Telephony NDM Boot Camps, please contact your services account manager.

IP Telephony Services Summary and Availability

Summary

The standard TAS IPT subscription is a recommended selection of services that can help you with the successful deployment and operation of your IP Telephony network. Adding or deleting services from it in order to meet your specific network needs can further modify this recommendation.

The main goal of Cisco Advanced Services is to deliver the right services to our valued customers, TAS for IP Telephony ensures that you are successful migrating from traditional telephony to IP telephony by providing experience and expertise through a consistent, designated contact at critical stages during the technology life cycle.

TAS for IP Telephony delivers:

- Full PDIO life-cycle support from Cisco
- Collective implementation expertise from some of the largest IP telephony deployments
- Team of IP telephony experts, who understand your IP telephony needs throughout planning, design, implementation, operation and optimization
- Limited onsite support at every critical juncture of service life cycle
- IP telephony service deliverables tailored to your specific needs
- Proven methodologies

With the TAS for IP Telephony, you will:

- Realize predictable and fast speed of migration
- Migrate to IP telephony technology with minimized risk
- Increase the availability of your IP telephony solution and enhance performance
- Realize planned functionality
- Scale your IP telephony solution as your company grows

APPENDIX A

Additional Information and Examples on IP Telephony Ongoing Design Support (Supplement to Table 9)

When adding new applications to your basic IP Telephony solution, or enhancing your initial IPT design, following items need to be considered in detail:

Dial plan

An effective Dial Plan balances user experience simplicity with administrative efficiency. These requirements may be at odds with each other. As features and reference architectures are constantly evolving, Dial Plan consulting services are applicable to established systems where new functionality or efficiencies are desired.

Our consultative approach is based on first establishing your business drivers, and translating them into recommendations on such elements as:

- On-net / Off-net dial access codes
- Dial Plan quantity of digits
- Tail-End Hop Off functionality
- Gatekeeper / Directory Gatekeeper designs
- Gateway access sharing across multiples clusters
- Integration of dial plan with off-net telephony systems (such as legacy PBXs)
- Integration of Dial Plan with Applications
- User Classes of Service

PSTN/Legacy PBX integration and migration

Designers are very seldom faced with a totally “green field” situation when planning an IP Telephony system. Integrating IP technology with existing TDM-based telephony systems is a requirement. This integration must be as seamless as possible, and allow for the migration from one system to the other with minimal user impact.

As a wealth of new gateway protocols become available and as customers constantly expand the IPT integration and migration coverage, this service applies to pre-existing networks.

The elemental issues to be considered include:

- Signaling protocols
- Codec choices
- Electrical and line protocol considerations
- Answer and release supervision
- Migration of user Directory Numbers across system boundaries

Network topology/architecture

IP telephony can be viewed as an application deployed on top of a converged network. The requirements of availability and reliability of voice telephony are more stringent than those of the typical data-only network. Reference models are available, describing the typical configuration of a small branch office, a large remote office or a main hub site, but there translation from generic to customer-specific topologies require engineering expertise.

The TAS IPT program focuses its review on the IPT implications of certain infrastructure elements such as:

- SRST functionality of Branch Routers
- Failure domains (VLAN/Subnet scope and topology)
- DHCP server topology design
- DNS server topology design
- TFTP server topology design
- Power availability

Hence, together with NOS and FTS services the resulting package takes care of the whole Cisco network and IP Telephony infrastructure.

Quality of Service

One element of particular interest to IP telephony is QoS. The proper implementation of end-to-end QoS has far reaching implications spanning multiple network elements and technologies. Not only do all the IP telephony nodes in the network need to be QoS enabled (and configured), the network infrastructure elements (such as routers and switches) must also satisfy QoS requirements.

For pre-existing IPT deployments, new network transformations (e.g. implementation of a new backbone technology such as MPLS, or expansion of IPT coverage into new areas of a network) represent new projects where QoS needs to be planned for.

There are many ways in which a QoS strategy can be implemented.

Elements such as:

- Layer 2 Class Of Service
- Layer 3 Type Of Service (IP Precedence / DSCP)
- Establishing trust boundaries based on
 - Broadcast domain / Layer 2 topology
 - Access Control Lists
 - Ports
- Call Manager configuration
- Gateway configuration must all be coordinated such that the QoS strategy is both effective and maintainable.

Adding new IP Telephony applications

There are multiple applications that extend the power of AVVID (Architecture for Voice and Video) beyond fundamental telephony functionality. As such applications become required, the IPT TAS service offers design engagements to address their integration into existing AVVID deployments. For example, the following applications could be the subject of such an engagement:

- IP/Interactive Voice Response (IVR)
- Personal Assistant
- Extension Mobility
- Cisco Conference Connection
- Attendant Console
- Phone Productivity Services (PPS)
- IPCC Express
- Phone Services
- Auto Attendant
- Music On Hold

Unified Messaging

The deployment of Unified messaging functionality as part of an IPT system can provide business efficiencies through the integration of email, voice mail and voice communications. Cisco's Unity product can be integrated into an existing environment; Cisco's Advanced Services can proactively consult with a customer's engineers in designing

messaging elements such as:

- Unified messaging functional block fundamental design
- Integration with multi-vendor message stores
- Integration with pre-existing voice mail systems (AMIS/VPIM)

Network Management Systems Design

Every IPT deployment must be manageable. The Call Manager, routers, switches, Gateways and phones should be collectively covered by an NMS system. The IPT TAS service can help design an NMS approach for an existing AVVID network, based on:

- Cisco Works 2000
- SNMP-based NMS products
- Voice Health Monitor

Legacy application integration

Existing applications, such as Voice Mail, Paging Systems, and Toll Bypass networks can be integrated with AVVID. Taping into the efficiency potential of new technologies cannot be done in a vacuum: existing business practices rely on the current set of business applications that an enterprise uses. New technologies must therefore not only provide a better way of doing things, but also smooth path to new applications.

Emergency Services design

The design of any telephony solution must account for emergency call handling. Whether it is 9-1-1 in North America, or any of the emergency numbers in use throughout the world, it is incumbent on the System Designer to allow for the proper routing of emergency calls. Some of the aspects to be evaluated in the design include:

- Selection of gateway type, location and quantity
- Dial Plan impact of emergency call routing
- Evaluation of local requirements vis-à-vis off-net emergency call routing
- Call back functionality
- On-site and remote notification of emergency calls.

Cisco's Emergency Responder application is targeted toward satisfying the emergency call routing needs of AVVID. Our AS engineers can assist in the configuration & deployment of this application

IP Telephony Ongoing Network Application Performance and Optimization (Supplement to Table 10)

Some specific IP telephony examples of this proactive service are as follows:

Unified Messaging

Unified Messaging systems typically need to adapt to the usage patterns of users; as more reliance is placed on unified messaging, it is common to see a system which was adequate upon initial implementation require configuration changes to adapt to new requirements.

The design of Unified Messaging functionality may be optimized with regard to:

- Disk space allocation
- Redundancy
- Port capacity Configuration
- Backup strategy
- Codec/Transcoding functionality

User migration

In many environments, user migration between legacy Telephony systems and AVVID, or even migration between clusters of IP Telephony is inevitable. Departments are moved, new office locations become part of the scope of AVVID, and in general the IPT networks must adapt to the movements of the user population.

This poses the need for the efficient transfer of Directory numbers, users and devices to/from AVVID clusters.

TAS can provide consultative services required to:

- Export users from a cluster
- Import users into a cluster
- Allow for the migration process to be planned such that it takes full advantage of automated mechanisms such as the Bulk Administration Tool (BAT)

Configuration parameter evaluation and recommendations

As an end-to end solution, AVVID features a great number of service parameters, options and controls that need to be evaluated and adjusted in function of the evolving reality of network utilization and changes.

The following AVVID elements present such controls:

- Call Managers
 - Service Parameters

- IOS/Cat OS based Telephony devices
 - Gateways
 - Gatekeeper/Directory GK
 - SRST routers
 - ITS servers
 - Conference and transcoding resources
- Applications servers
- API Interfaces
 - TAPI
 - JTAPI

WAN branch call admission control optimization

Locations Call Admission Control (CAC) is used to control the quantity of simultaneous calls allowed between a branch and its hub site. Assessing the utilization of the branch WAN links can reveal if the links are under or over provisioned, therefore allowing for the adjustments in provisioned bandwidth or provisioning to take place.

Network management systems optimization

The Cisco Voice Health Monitor, CiscoWorks 2000, and SNMP-based network monitoring platforms typically needs to be optimized such that it adapts to changes in:

- Available data points of existing network elements (e.g. SNMP MIBs)
- Newly introduced network elements to be monitored (e.g. after the implementation of a new application server)

APPENDIX B

The IP Telephony Net Audit tool has been developed by Cisco engineering, and takes advantage of proven tools that have been in use for years.

The purpose of this audit tool is to inspect the IPT network and help Cisco AS team make recommendations based on findings and trends. It is designed to provide a meaningful stability reporting methodology on the IPT network health for both customer and Cisco.

The IP Telephony Net Audit identifies and measures the performance, capacity, configuration and fault parameters on the selected IP Telephony devices. It also helps Cisco provide observations and recommendations that may be used by the customer for current impact areas that should be investigated and may also be used as guidelines by the customer for future design, capacity and scalability issues.

The specific IP Telephony related devices that are supported by the tool:

- Cisco Voice Gateways, Gatekeepers
- Catalyst 2900XL, 3500XL, 4000(CatOS), 500, 6000 and 6500(CatOS)
- Cisco 8XX, 16XX, 17XX, 25XX, 26XX, 36XX, 38XX, 4XXX, 10XXX
- Cisco Call Manager
- Cisco IP Telephone
- Voice-enabled Cisco routers, switches (voice related aspects only)

The IP Telephony Net Audit inspects the above listed devices from an IP Telephony / voice features point of view. Likewise, the recommendations provided will cover the network from an IP voice angle. This service does not replace (or include) any other Cisco service that might utilize similar audit tools.



Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS
(6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International
BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on **the Cisco Web site at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2003, Cisco Systems, Inc. All rights reserved. Cisco, Cisco Systems, and the Cisco Systems logo are trademarks or registered trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. or certain other countries. All other trademarks mentioned in this document or Web site are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0304R)