



Preface

This guide describes Cisco-supported configurations for IP-based extranet Virtual Private Networks (VPNs) for an IP Security Protocol (IPSec) tunnel between a Cisco Secure VPN Client (VPN Client) and a Cisco IOS router or Cisco Secure PIX Firewall (gateway). The VPN Client acts as an IPSec peer that uses Internet Key Exchange (IKE) protocol and IPSec to negotiate, then establish an encrypted tunnel to another IPSec peer. Each configuration can consist of various Cisco IOS IPSec features including manual configuration, dynamic IP addressing, pre-shared keys, wildcard pre-shared keys, and digital certification.

This preface contains the following sections:

- Scope
- Audience
- New and Changed Information
- Document Organization
- Case Study Presented in This Solutions Guide
- Related Documentation
- Conventions
- Obtaining Documentation
- Obtaining Technical Assistance

Scope

This guide does not cover every available feature for the Cisco Secure VPN Client; it is not intended to be a comprehensive VPN configuration guide. Instead, this guide simply describes the Cisco-supported configurations for VPNs using the Cisco Secure VPN Client.

The business scenarios introduced in this guide include specific tasks and configuration examples. The examples are the recommended methods for configuring the specified tasks. Although they are typically the easiest or the most straightforward method, they are not the only methods of configuring the tasks.

Audience

This solutions guide often refers to device-specific administrators, which can consist of any combination of the following audiences:

- Network administrators who are responsible for defining network security policies and distributing them to the end users within their organization
- System administrators who are responsible for installing and configuring internetworking equipment, are familiar with the fundamentals of router-based internetworking, and who are familiar with Cisco IOS software and Cisco products
- System administrators who are familiar with the fundamentals of router-based internetworking and who are responsible for installing and configuring internetworking equipment, but who might not be familiar with the specifics of Cisco products or the routing protocols supported by Cisco products
- Customers with technical networking background and experience

New and Changed Information

The following is new or changed information since the last release of the *Cisco Secure VPN Client* solutions guide:

- For the latest system requirements, feature and version specifications, sample VPN configurations, technical tips, and product bulletins for IPsec and the Cisco Secure VPN Client, this information will be maintained ongoing at the following URLs:
 - Sample configurations are available for non-registered users on CCO:
http://www.cisco.com/warp/public/700/tech_configs.html#SECURITY
 or **Service & Support>Technical Assistance Center>Documents>Sample Configurations>Security**
 - Sample configurations and technical tips are available for registered users on CCO:
http://www.cisco.com/cgi-bin/Support/PSP/psp_view.pl?p=Internetworking:IPsec&s=Implementation_and_Configuration#Samples_%26_Tips
 or **Service & Support>Technical Assistance Center>Technologies>IP Security (IPsec)**
 - Product literature is available for both non-registered and registered users on CCO:
<http://www.cisco.com/warp/public/cc/cisco/mkt/security/vpncli/prodlit/>
 or **Products & Technologies>Cisco Secure>Security Products and Technologies>Cisco Secure VPN Client>Product Literature**
- A chapter titled “Case Study for Layer 3 Authentication and Encryption” has been added. This chapter provides a case study overview, a description of encryption and authentication features, site profile characteristics, and basic configuration tasks of IPsec tunneling between a VPN Client and a gateway.
- All chapters titled “Using...” have been changed to “Configuring...”
- All chapters previously documented as individual business cases are now configuring tasks, which can exist as standalone or combined tasks in the business case, “Case Study for Layer 3 Authentication and Encryption.”
- A chapter titled “Configuring Manual Configuration” has been added. This chapter describes how to configure a static IP address on your VPN Client.

- The chapter titled “Configuring Dynamic IP Addressing” has been modified to include illustrations of how this feature works, and protocol negotiation sequence.
- A chapter titled “Configuring a Pre-Shared Key or Wildcard Pre-Shared Key” has been added. This chapter describes how to configure a pre-shared key to authenticate a VPN Client or how to configure a wildcard pre-shared key to authenticate a pool of VPN Clients.
- The chapter on Entrust digital certificates has moved to the appendix titled Appendix A, “Configuring Entrust Digital Certificates.”
- An appendix titled Appendix B, “Configuring Microsoft Certificate Services” has been added.
- The chapter on VeriSign digital certificates has moved to the appendix titled Appendix C, “Configuring VeriSign Digital Certificates.”

Document Organization

The major elements of this guide are as follows:

Table 1 Document Organization

Chapter	Title	Description
Chapter 1	Access VPNs and IP Security Protocol Tunneling Technology Overview	Provides a physical overview of different types of VPNs, and VPN Client-specific details.
Chapter 2	Case Study for Layer 3 Authentication and Encryption	Provides a case study overview, site profile characteristics, and basic configuration tasks of IPSec tunneling between a VPN Client and a gateway.
Chapter 3	Configuring Manual Configuration	Shows how a static IP address is configured on a VPN Client for an IPSec tunnel between the VPN Client and a gateway.
Chapter 4	Configuring Dynamic IP Addressing	Shows how a static IP address is configured on a VPN Client for an IPSec tunnel between the VPN Client and a gateway.
Chapter 5	Configuring a Pre-Shared Key or Wildcard Pre-Shared Key	Shows how regular and wildcard pre-shared keys are generated for an IPSec tunnel between the VPN Client and a gateway.
Chapter 6	Configuring Digital Certification	Shows how digital certification is set up and maintained for an IPSec tunnel between the VPN Client and a gateway.
Appendix A	Configuring Entrust Digital Certificates	Shows how to request digital certification from the Entrust CA server and configure the CA server identity on your gateway.

Table 1 Document Organization (continued)

Chapter	Title	Description
Appendix B	Configuring Microsoft Certificate Services	Shows how to request digital certification using Microsoft Certificate Services and configure the CA server identity on your gateway.
Appendix C	Configuring VeriSign Digital Certificates	Shows how to request digital certification from the VeriSign CA server and configure the VeriSign CA identity on your gateway.
None	Glossary	Provides a list of terms and definitions related to the VPN configurations in this guide.
None	Index	Provides a list of terms found throughout this guide.

Case Study Presented in This Solutions Guide

Most chapters in this solutions guide focus on configuring possible features within one business case, “Case Study for Layer 3 Authentication and Encryption.” This business case explains the basic tasks for configuring an extranet VPN using a VPN Client to initiate an IPSec tunnel to the gateway of an enterprise network.

Related Documentation

The following sections describe the documentation available for the Cisco Secure VPN Client. Documentation is available as printed manuals and/or electronic documents.

Use this solutions guide with these documents:

- Product-Specific Documents
- Platform-Specific Documents
- Technology-Specific Documents
- Feature Modules
- Cisco IOS Software Documentation Set



Note

This document is not a comprehensive guide to all VPNs. The following aspects of VPN configuration are not covered in this guide: NAS-initiated VPNs (Internet service provider VPN solutions), Cisco IOS software configuration, Cisco IOS router or access server installation and configuration.

Product-Specific Documents

Product-specific documents in this section include software that is a part of the Cisco Secure product family. These products include, but are not limited to, the following:

- Cisco Secure Policy Manager Documentation
- Cisco Secure VPN Client Documentation

Cisco Secure Policy Manager Documentation

These software documents are available for the Cisco Secure Policy Manager on CCO and the Documentation CD-ROM:

- On CCO: <http://www.cisco.com/univercd/cc/td/doc/product/ismg/policy/index.htm>
or **Service & Support>Technical Documents>Documentation Home Page>Internet Services Management Group>Cisco Secure Policy Manager**
- On the Documentation CD-ROM: **Cisco Product Documentation>Internet Services Management Group>Cisco Secure Policy Manager**



Note

Cisco Secure Policy Manager Version 2.0 is supported on the Cisco Secure VPN Client Version 1.0, but is not interoperable with Cisco Secure VPN Client Version 1.1. To avoid complications, make sure you have the compatible version of the Cisco Secure Policy Manager installed.

Table 2 Cisco Secure Policy Manager 2.0 Documentation

Document Titles	Chapter Topics	Customer Order Number
<i>Configuring Cisco Secure Policy Manager</i>	Getting Started Representing Your Network Populating the Network Topology Tree Configuring the Device-Specific Settings of Network Objects Configuring Monitoring and Reporting Working With Security Policies Generating, Verifying, and Publishing Command Sets Maintaining Cisco Secure Policy Manager	DOC-7810296
<i>Installation Guide</i>	Preface Planning Your Installation Installation Procedures Meeting the Prerequisites Working with Cisco Secure Policy Manager	DOC-786782
<i>IPSec Tunnel Implementation</i>	IPSec Tunnels Authentication Server Panel IPSec Tunnel Templates IPSec Tunnel Groups Configuring Policy Enforcement Points IPSec Tunnel Policy	OL-0426

Table 2 Cisco Secure Policy Manager 2.0 Documentation (continued)

Document Titles	Chapter Topics	Customer Order Number
<i>Network Topology Definition</i>	Understanding the Network Topology Tree Guidelines and Techniques for Defining Your Network Topology Representing Your Network Topology Populating the Network Topology Tree Configuring the Global Policy Override Settings for Policy Enforcement Points Configuring Administrative Control Communications Defining Traffic Flows and Shaping Rules	OL-0426
Upgrade Notes	Introduction System Requirements Upgrade the License Where To Go Next Related Documentation Obtaining Documentation Obtaining Technical Assistance	DOC-786808
<i>Release Notes for Cisco Secure Policy Manager Version 2.0</i>	Introduction Features and Functionality Changes System Requirements Installation Notes Limitations and Restrictions Caveats Related Documentation Obtaining Documentation Obtaining Technical Assistance	DOC-786781

Cisco Secure VPN Client Documentation

These software documents are available for the Cisco Secure VPN Client are on CCO and the Documentation CD-ROM:

- On CCO: <http://www.cisco.com/univercd/cc/td/doc/product/iaabu/csvpnc/index.htm>
or **Service & Support>Technical Documents>Documentation Home Page>Internet Service Unit Documentation>Cisco Secure VPN Client**
- On the Documentation CD-ROM: **Cisco Product Documentation>Internet Service Unit Documentation>Cisco Secure VPN Client**

Table 3 Cisco Secure VPN Client Documentation

Document Titles	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Cisco Secure VPN Client Version 1.0 Quick Start Guide</i> • <i>Cisco Secure VPN Client Version 1.1 Quick Start Guide</i> 	Audience System Requirements Installing Cisco Secure VPN Client Roles in Cisco Secure VPN Client Operation Additional Information Configuring a Custom Installation Obtaining Documentation Ordering Documentation Obtaining Technical Assistance Documentation Feedback	DOC-786898 for Version 1.0 DOC-7810787 for Version 1.1
<ul style="list-style-type: none"> • <i>Release Notes for Cisco Secure VPN Client Version 1.0/1.0a</i> • <i>Release Notes for Cisco Secure VPN Client Version 1.1</i> 	Introduction System Requirements Network Requirements Installation Notes Limitations and Restrictions Important Notes Caveats Related Documentation Cisco Connection Online Documentation CD-ROM	DOC-786929 for Versions 1.0/1.0a OL-0458 for Version 1.1
<i>Cisco Secure VPN Client Solutions Guide</i>	Preface Access VPNs and IP Security Protocol Tunneling Technology Overview Case Study for Layer 3 Authentication and Encryption Configuring Manual Configuration Configuring Dynamic IP Addressing Configuring Pre-shared Key or Wildcard Pre-shared Key Configuring Digital Certification Configuring Entrust Digital Certification Configuring Microsoft Certificate Services Configuring VeriSign Digital Certification Glossary	OL-0259

Platform-Specific Documents

Platform-specific documents include documents that are related to specific hardware platforms. A hardware platform is grouped as a set of models, or a series.

This section includes platform-specific documents, as follows:

- Cisco 1720 VPN Router Documentation
- Cisco 7100 VPN Router Documentation
- Cisco Secure PIX Firewall Documentation
- Access Router Documentation
- Access Server Documentation
- Core/High-End Router Documentation

Cisco 1720 VPN Router Documentation

These hardware and software documents are available for the Cisco 1720 VPN routers on CCO and the Documentation CD-ROM:

- On CCO: http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/cis1700/index.htm
or **Service & Support>Technical Documents>Documentation Home Page>Access Servers and Access Routers>Modular Access Routers>Cisco 1720 Router**
- On the Documentation CD-ROM: **Cisco Product Documentation>Access Servers and Access Routers>Modular Access Routers>Cisco 1720 Router**

Table 4 Cisco 1720 VPN Router Documentation

Document Title	Chapter Topics	Customer Order Number
<i>Cisco 1700 Series Quick Start Guide</i>	Unpack the Box Install the Router Verify the Installation	DOC-785406
Cisco 1720 Router Release Notes, • Cisco IOS Release 12.0 T • Cisco IOS Released 12.1 T	Early Deployment Releases System Requirements New and Changed Information Limitations and Restrictions Important Notes Caveats Related Documentation Obtaining Documentation Obtaining Technical Assistance	DOC-786238 for Release 12.0 DOC-7810842 for Release 12.1 T
<i>Cisco 1720 Router Hardware Installation Guide</i>	About This Guide Overview of the Cisco 1700 Router Installing the Cisco 1700 Router Troubleshooting the Cisco 1700 Router Cisco 1700 Technical Specifications Cable Pinouts and Cabling Guidelines Installing and Upgrading Memory in the Cisco 1700 Router Ordering and Configuring an ISDN Line	DOC-785405

Table 4 *Cisco 1720 VPN Router Documentation (continued)*

Document Title	Chapter Topics	Customer Order Number
<i>Cisco 1720 Software Configuration Guide</i>	About This Guide Introduction to Configuring the Cisco 1700 Router Cisco IOS Software Skills Configuring a Leased Line Configuring Frame Relay Configuring ISDN Configuring Asynchronous Connections Configuring X.25 ROM Monitor Software Networking Concepts for the Cisco 1700 Router	DOC-785407
<i>Regulatory Compliance and Safety Information for Cisco 1600 Routers and Cisco 1700 Routers</i>	Electro-Magnetic Compatibility Compliance Operating Conditions for Canada Operating Conditions for the European Community Operating Conditions for the United Kingdom Agency Approvals Declaration of Conformity Conformit Europenne Marking Directive Translated Safety Warnings	DOC-786739
Cisco 1700 Series Configuration Notes	See CCO or Documentation CD-ROM	DOC-785977

Cisco 7100 VPN Router Documentation

These hardware and software documents are available for the Cisco 7100 series routers on CCO and the Documentation CD-ROM:

- On CCO: <http://www.cisco.com/univercd/cc/td/doc/product/core/7100/index.htm>
or **Service & Support>Technical Documents>Documentation Home Page>Core/High-End Routers>Cisco 7100**
- On the Documentation CD-ROM: **Cisco Product Documentation>Core/High-End Routers>Cisco 7100**

Table 5 Cisco 7100 VPN Router Documentation

Document Title	Chapter Topics	Customer Order Number
<i>Cisco 7100 Series Quick Start Guide</i>	Prepare for Installation Rack-Mount the Router Connect the Router to the Network Connect the Power Start the System	DOC-786343
Cisco 7000 Family Routers Release Notes • Cisco IOS Release 12.0 T • Cisco IOS Release 12.1 T	System Requirements New and Changed Information Important Notes Caveats Related Documentation Service and Support Cisco Connection Online Documentation CD-ROM	DOC-786055 for Release 12.0 T DOC-7810811 for Release 12.1 T
<i>Cisco 7100 Series Installation and Configuration Guide</i>	Preface Cisco 7100 Series Product Overview Preparing for Installation Installing Cisco 7100 Series Routers Performing a Basic Startup Configuration Troubleshooting the Installation Modular Port Adapter Configuration Guidelines System Specifications Cable Specifications	DOC-786341
<i>Cisco 7100 Series VPN Configuration Guide</i>	Preface Using Cisco IOS Software Before You Begin Intranet and Extranet VPN Business Scenarios Remote Access VPN Business Scenario	DOC-786342

Table 5 *Cisco 7100 VPN Router Documentation (continued)*

Document Title	Chapter Topics	Customer Order Number
<i>Regulatory Compliance and Safety Information for Cisco 7100 Series VPN Routers</i>	If You Need More Information Cisco 7100 Series Overview Compliance with U.S. Export Laws and Regulations Regarding Encryption Standards Compliance Installation Requirements Safety Information Translated Safety Warnings Cisco Connection Online Documentation CD-ROM	DOC-786345
Port and Service Adapters	See CCO or Documentation CD-ROM	See CCO or Documentation CD-ROM
Field Replaceable Units	Using the Flash Disk Installing and Removing the Power Supply in Cisco 7100 Series Routers Installing Field-Replaceable Units Installing and Removing the Boot ROM in Cisco 7100 Using the Flash Disk	See CCO or Documentation CD-ROM

Cisco Secure PIX Firewall Documentation

These hardware and software documents are available for the Cisco Secure PIX Firewall on CCO and the Documentation CD-ROM:

- On CCO: <http://www.cisco.com/univercd/cc/td/doc/product/iaabu/pix/index.htm>
or **Technical Documents>Documentation Home Page>Internet Service Unit>Cisco Secure PIX Firewall**
- On the Documentation CD-ROM: **Cisco Product Documentation>Internet Service Unit>Cisco Secure PIX Firewall**



Note

Cisco Secure PIX Firewall Version 5.0 is supported on the Cisco Secure VPN Client Version 1.0. Cisco Secure PIX Firewall Versions 5.1 and later are supported on the Cisco Secure VPN Client Version 1.1. To avoid complications, make sure you have the compatible version of the Cisco Secure PIX Firewall installed.

Table 6 Cisco Secure PIX Firewall Documentation

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Configuration Guide for the Cisco Secure PIX Firewall Version 5.1</i> • <i>Configuration Guide for the Cisco Secure PIX Firewall Version 5.0</i> 	About This Manual Introduction Configuring the PIX Firewall Advanced Configurations Configuring IPSec Configuration Examples Command Reference PIX 515 Configuration Configuration Forms Acronyms and Abbreviations Configuring for MS-Exchange Use Subnet Masking and Addressing	DOC-7810392 DOC-787134
<ul style="list-style-type: none"> • <i>Release Notes for Cisco Secure PIX Firewall Version 5.1</i> • <i>Release Notes for Cisco Secure PIX Firewall Version 5.0</i> 	System Requirements New and Changed Information Installation Notes Limitations and Restrictions Important Notes Caveats Related Documentation Cisco Connection Online Documentation CD-ROM	DOC-7810391 DOC-787133

Table 6 Cisco Secure PIX Firewall Documentation (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> <i>Installation Guide for the Cisco Secure PIX Firewall Version 5.1</i> <i>Installation Guide for the Cisco Secure PIX Firewall Version 5.0</i> 	About This Manual Introduction Installing a PIX Firewall Installing Failover Installing the PIX Firewall Syslog Server Opening a PIX Firewall Chassis Installing a Memory Upgrade Installing a Circuit Board Installing a DC Voltage Installing the PIX Firewall Setup Wizard	DOC-7810394 DOC-787135
<ul style="list-style-type: none"> <i>Regulatory Compliance and Safety Information for the Cisco Secure PIX Firewall Version 5.1</i> <i>Regulatory Compliance and Safety Information for the Cisco Secure PIX Firewall Version 5.0</i> 	Agency Approvals Directives Compliance Safety Information Related Documentation Obtaining Documentation/Cisco Connection Online Obtaining Technical Assistance/Documentation CD-ROM	DOC-7810397
<ul style="list-style-type: none"> <i>System Log Messages for the Cisco Secure PIX Firewall Version 5.1</i> <i>System Log Messages for the Cisco Secure PIX Firewall Version 5.0</i> 	About this Manual/About This Guide Introduction System Log Messages Messages Listed by Severity Level	OL-0249 See CCO or Documentation CD-ROM

Access Router Documentation

These hardware and software documents are available for modular access routers on CCO and the Documentation CD-ROM:

- On CCO: **Service & Support>Technical Documents>Documentation Home Page>Access Servers and Access Routers>Modular Access Routers**
- On the Documentation CD-ROM: **Cisco Product Documentation>Access Servers and Access Routers>Modular Access Routers**

Access Server Documentation

These hardware and software documents are available for access servers on CCO and the Documentation CD-ROM:

- On CCO: **Service & Support>Technical Documents>Documentation Home Page>Access Servers and Access Routers>Access Servers**
- On the Documentation CD-ROM: **Cisco Product Documentation>Access Servers and Access Routers>Access Servers**

Core/High-End Router Documentation

These hardware and software documents are available for core/high-end routers on CCO and the Documentation CD-ROM:

- On CCO: **Service & Support>Technical Documents>Documentation Home Page>Core/High-End Routers**
- On the Documentation CD-ROM: **Cisco Product Documentation>Core/High-End Routers**

Technology-Specific Documents

Technology-specific documents include internetworking solutions guides, data sheets, white papers, design implementation guides, technical tips, and product bulletins. The technology-specific documents in this section are specific to VPN. For additional technology-specific documents, refer to “Cisco IOS Software Documentation Set.”

- A list of the available Cisco VPN documentation is available at the following site:
<http://www.cisco.com/warp/public/779/largeent/vpne/vpndocs/vpndoc.html>
- Sample configurations and technical tips are available at the following site:
http://www.cisco.com/cgi-bin/Support/PSP/psp_view.pl?p=Internetworking:IPSec&s=Implementation_and_Configuration#Samples_%26_Tips
- For additional information on configuring the VPN Client, refer to the following documents:
 - “Configuring IPsec” chapter in the *Configuration Guide for the Cisco Secure PIX Firewall Version 5.1*
 - “Configuration Examples” chapter in the *Configuration Guide for the Cisco Secure PIX Firewall Version 5.1*

Feature Modules

Feature modules describe new features and are an update to the Cisco IOS software documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. The feature module information is incorporated in the next printing of the Cisco IOS software documentation set.

- On CCO: <http://www.cisco.com/univercd/cc/td/doc/product/iaabu/newsecf/index.htm>
or **Technical Documents>Documentation Home Page>Internet Service Unit>Cisco Security Features>Cisco IOS Release-Specific Security Features** or **Cisco IOS Technology-Specific Security Features**
- On the Documentation CD-ROM: **Cisco Product Documentation>Internet Service Unit>Cisco Security Features>Cisco IOS Release-Specific Security Features** or **Cisco IOS Technology-Specific Security Features**

Cisco IOS Software Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents that are shipped with your order in electronic form on the Documentation CD-ROM—unless you specifically ordered the printed versions.

Each module in the Cisco IOS software documentation set consists of two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, and Cisco IOS software functionality and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. You can use each configuration guide in conjunction with its corresponding command reference.

On CCO and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set.

- Release 12.0 Documentation Set
- Release 12.1 Documentation Set

Release 12.0 Documentation Set

Documentation modules for Cisco IOS Release 12.0 are located on CCO and the Documentation CD-ROM:

- On CCO: <http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/12cgcr/index.htm> or **Technical Documents>Documentation Home Page>Cisco IOS Software Configuration>Cisco IOS Release 12.0>Configuration Guides and Command References**
- On the Documentation CD-ROM: **Cisco Product Documentation>Cisco IOS Software Configuration>Cisco IOS Release 12.0>Configuration Guides and Command References**

Table 7 Cisco IOS Release 12.0 Documentation Set

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Configuration Fundamentals Configuration Guide</i> • <i>Configuration Fundamentals Command Reference</i> 	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management	DOC-785829 DOC-785830
<ul style="list-style-type: none"> • <i>Bridging and IBM Networking Configuration Guide</i> • <i>Bridging and IBM Networking Command Reference</i> 	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ STUN and BSTUN LLC2 and SDLC IBM Network Media Translation DSPU and SNA Service Point SNA Frame Relay Access Support APPN Cisco Database Connection NCIA Client/Server Topologies Cisco Mainframe Channel Connection Airline Product Set	DOC-785850 DOC-785851

Table 7 Cisco IOS Release 12.0 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> <i>Dial Solutions Configuration Guide</i> <i>Dial Solutions Command Reference</i> 	X.25 over ISDN Appletalk Remote Access Asynchronous Callback, DDR, PPP, SLIP Bandwidth Allocation Control Protocol ISDN Basic Rate Service ISDN Caller ID Callback PPP Callback for DDR Channelized E1 & T1 Dial Backup for Dialer Profiles Dial Backup Using Dialer Watch Dial Backup for Serial Lines Peer-to-Peer DDR with Dialer Profiles DialOut Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Dialup Networks Dial Business Solutions and Examples	DOC-785846 DOC-785847
<ul style="list-style-type: none"> <i>Cisco IOS Interface Configuration Guide</i> <i>Cisco IOS Interface Command Reference</i> 	Interface Configuration Overview LAN Interfaces Logical Interfaces Serial Interfaces	DOC-785905 DOC-785906
<ul style="list-style-type: none"> <i>Network Protocols Configuration Guide, Part 1</i> <i>Network Protocols Command Reference, Part 1</i> 	IP Overview IP Addressing and Services IP Routing Protocols	DOC-785831 DOC-785834
<ul style="list-style-type: none"> <i>Network Protocols Configuration Guide, Part 2</i> <i>Network Protocols Command Reference, Part 2</i> 	AppleTalk Novell IPX	DOC-785832 DOC-785835
<ul style="list-style-type: none"> <i>Network Protocols Configuration Guide, Part 3</i> <i>Network Protocols Command Reference, Part 3</i> 	Network Protocols Overview Apollo Domain Banyan VINES DECnet ISO CLNS XNS	DOC-785833 DOC-785840
<ul style="list-style-type: none"> <i>Security Configuration Guide</i> <i>Security Command Reference</i> 	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options	DOC-785843 DOC-785845

Table 7 Cisco IOS Release 12.0 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Cisco IOS Switching Services Configuration Guide</i> • <i>Cisco IOS Switching Services Command Reference</i> 	Switching Services Switching Paths for IP Networks Virtual LAN (VLAN) Switching and Routing	DOC-785848 DOC-785849
<ul style="list-style-type: none"> • <i>Wide-Area Networking Configuration Guide</i> • <i>Wide-Area Networking Command Reference</i> 	Wide-Area Network Overview ATM Frame Relay SMDS X.25 and LAPB	DOC-785838 DOC-785839
<ul style="list-style-type: none"> • <i>Voice, Video, and Home Applications Configuration Guide</i> • <i>Voice, Video, and Home Applications Command Reference</i> 	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Frame Relay-ATM Internetworking Synchronized Clocks Video Support Universal Broadband Features	DOC-785854 DOC-785855
<ul style="list-style-type: none"> • <i>Quality of Service Solutions Configuration Guide</i> • <i>Quality of Service Solutions Command Reference</i> 	Policy-Based Routing QoS Policy Propagation via BGP Committed Access Rate Weighted Fair Queueing Custom Queueing Priority Queueing Weighted Random Early Detection Scheduling Signaling RSVP Packet Drop Frame Relay Traffic Shaping Link Fragmentation RTP Header Compression	DOC-785852 DOC-785853
<ul style="list-style-type: none"> • <i>Cisco IOS Software Command Summary</i> • <i>Dial Solutions Quick Configuration Guide</i> • <i>System Error Messages</i> • <i>Debug Command Reference</i> 		DOC-785859 DOC-785894 DOC-785860 DOC-785858

Release 12.1 Documentation Set

The Cisco IOS Release 12.1 software documentation set is located on CCO and the Documentation CD-ROM:

- On CCO: <http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/index.htm>
or **Technical Documents>Documentation Home Page>Cisco IOS Software Configuration>Cisco IOS Release 12.1**
- On the Documentation CD-ROM: **Cisco Product Documentation>Cisco IOS Software Configuration>Cisco IOS Release 12.1**

Table 8 Cisco IOS Release 12.1 Documentation Set

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Cisco IOS Configuration Fundamentals Configuration Guide</i> • <i>Cisco IOS Configuration Fundamentals Command Reference</i> 	Configuration Fundamentals Overview Using the Command-Line Interface Using Configuration Tools Configuring Operating Characteristics Managing Connections, Menus, and System Banners Using the Cisco Web Browser Using the Cisco IOS File System Modifying, Downloading, and Maintaining Configuration Files Loading and Maintaining System Images Maintaining Router Memory Rebooting a Router Configuring Additional File Transfer Functions Monitoring the Router and Network Troubleshooting a Router Performing Basic System Management System Management Using System Controllers Web Scaling Using WCCP Managing Dial Shelves	DOC-7810222 DOC-7810223
<ul style="list-style-type: none"> • <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide</i> • <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference</i> 	Overview of Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuring Apollo Domain Configuring Banyan VINES Configuring DECnet Configuring ISO CLNS Configuring XNS	DOC-7810241 DOC-7810245
<ul style="list-style-type: none"> • <i>Cisco IOS AppleTalk and Novell IPX Configuration Guide</i> • <i>Cisco IOS AppleTalk and Novell IPX Command Reference</i> 	AppleTalk and Novel IPX Overview Configuring AppleTalk Configuring Novell IPX	DOC-7810240 DOC-7810267

Table 8 Cisco IOS Release 12.1 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Cisco IOS Bridging and IBM Networking Configuration Guide</i> • <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume I</i> • <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume II</i> 	Overview of SNA Internetworking Overview of Bridging Configuring Transparent Bridging Configuring Source-Route Bridging Configuring Token Ring Inter-Switch Link Configuring Token Ring Route Switch Module Overview of IBM Networking Configuring Remote Source-Route Bridging Configuring Data-Link Switching Plus+ Configuring Serial Tunnel and Block Serial Tunnel Configuring LLC2 and SDLC Parameters Configuring IBM Network Media Translation Configuring Frame Relay Access Support Configuring NCIA Server Configuring the Airline Product Set Configuring DSPU and SNA Service Point Support Configuring SNA Switching Services Configuring Cisco Transaction Connection Configuring Cisco Mainframe Channel Connection Adapters Configuring CLAW and TCP/IP Offload Support Configuring CMPC and CSNA Configuring CMPC+ Configuring the TN3270 Server	DOC-7810256 DOC-7810257 DOC-7810520

Table 8 Cisco IOS Release 12.1 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Cisco IOS Dial Services Configuration Guide: Terminal Services</i> 	Large-Scale Dial Solutions	DOC-7810251
<ul style="list-style-type: none"> • <i>Cisco IOS Dial Services Configuration Guide: Network Services</i> 	Cost-Control Solutions	DOC-7810252
<ul style="list-style-type: none"> • <i>Cisco IOS Dial Services Command Reference</i> 	Virtual Private Networks	DOC-7810253
	X.25 on ISDN Solutions	
	Telco Solutions	
	Dial-Related Addressing Services	
	Internetworking Dial Access Scenarios	
	Preparing for Dial Access	
	Modem Configuration and Management	
	ISDN and Signalling Configuration	
	PPP Configuration	
	Dial-on-Demand Routing Configuration	
	Dial-Backup Configuration	
	Terminal Service Configuration	
<ul style="list-style-type: none"> • <i>Cisco IOS Interface Configuration Guide</i> 	Interface Configuration Overview	DOC-7810224
<ul style="list-style-type: none"> • <i>Cisco IOS Interface Command Guide</i> 	Configuring LAN Interfaces	DOC-7810238
	Configuring Serial Interfaces	
	Configuring Logical Interfaces	
<ul style="list-style-type: none"> • <i>Cisco IOS IP and IP Routing Configuration Guide</i> 	IP Overview	DOC-7810592
<ul style="list-style-type: none"> • <i>Cisco IOS IP and IP Routing Command Reference</i> 	Configuring IP Addressing	DOC-7810239
	Configuring DHCP	
	Configuring IP Services	
	Configuring Mobile IP	
	Configuring On-Demand Routing	
	Configuring RIP	
	Configuring IGRP	
	Configuring OSPF	
	Configuring IP Enhanced IGRP	
	Configuring Integrated IS-IS	
	Configuring BGP	
	Configuring Multicast BGP (MBGP)	
	Configuring IP Routing	
	Protocol-Independent Features	
	Configuring IP Multicast Routing	
	Configuring Multicast Source Discovery Protocol	
	Configuring PGM Router Assist	
	Configuring Unidirectional Link Routing	
	Using IP Multicast Tools	

Table 8 Cisco IOS Release 12.1 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Cisco IOS Multiservice Applications Configuration Guide</i> • <i>Cisco IOS Multiservice Applications Command Reference</i> 	Multiservice Applications Overview Configuring Voice over IP Configuring Gatekeepers (Multimedia Conference Manager) Configuring Voice over Frame Relay Configuring Voice over ATM Configuring Voice over HDLC Configuring Voice-Related Support Features Configuring PBX Signalling Configuring Store and Forward Fax Configuring Video Support Configuring Head-End Broadband Access Router Features Configuring Subscriber-End Broadband Access Router Features Configuring Synchronized Clocking	DOC-7810258 DOC-7810259

Table 8 Cisco IOS Release 12.1 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> <i>Cisco IOS Quality of Service Solutions Command Reference</i> 	Quality of Service Overview Classification Overview Configuring Policy-Based Routing Configuring QoS Policy Propagation via Border Gateway Protocol Configuring Committed Access Rate Congestion Management Overview Configured Weighted Fair Queueing Configuring Custom Queueing Configuring Priority Queueing Congestion Avoidance Overview Configuring Weighted Random Early Detection Policing and Shaping Overview Configuring Generic Traffic Shaping Configuring Frame Relay and Frame Relay Traffic Shaping Signalling Overview Configuring RSVP Configuring Subnetwork Bandwidth Manager Configuring RSVP-ATM Quality of Service Interworking Link Efficiency Mechanisms Overview Configuring Link Fragmentation and Interleaving for Multilink PPP Configuring Compressed Real-Time Protocol IP to ATM CoS Overview Configuring IP to ATM CoS QoS Features for Voice Introduction	DOC-7810260 DOC-7810261

Table 8 Cisco IOS Release 12.1 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> • <i>Cisco IOS Security Configuration Guide</i> 	Security Overview	DOC-7810248
<ul style="list-style-type: none"> • <i>Cisco IOS Security Command Reference</i> 	AAA Overview Configuring Authentication Configuring Authorization Configuring Accounting Configuring RADIUS Configuring TACACS+ Configuring Kerberos RADIUS Commands TACACS+ Commands Access Control Lists: Overview and Guidelines Cisco Secure Integrated Software Firewall Overview Configuring Lock-and-Key Security (Dynamic Access Lists) Configuring IP Session Filtering (Reflexive Access Lists) Configuring TCP Intercept (Prevent Denial-of-Service Attacks) Configuring Context-Based Access Control Configuring Cisco Secure Integrated Software Intrusion Detection System Configuring Authentication Proxy Configuring Port to Application Mapping IP Security and Encryption Overview Configuring IPSec Network Security Configuring Certification Authority Interoperability Configuring Internet Key Exchange Security Protocol Configuring Passwords and Privileges Neighbor Router Authentication: Overview and Guidelines Configuring IP Security Options	DOC-7810249

Table 8 Cisco IOS Release 12.1 Documentation Set (continued)

Document Title	Chapter Topics	Customer Order Number
<ul style="list-style-type: none"> <i>Cisco IOS Switching Services Configuration Guide</i> <i>Cisco IOS Switching Services Command Reference</i> 	Cisco IOS Switching Services Overview Switching Paths Overview Configuring Switching Paths Cisco Express Forwarding Overview Configuring Cisco Express Forwarding NetFlow Switching Overview Configuring NetFlow Switching MPLS Overview Configuring MPLS Configuring IP Multilayer Switching Configuring IP Multicast Multilayer Switching Configuring IPX Multilayer Switching Configuring Multicast Distributed Switching Routing Between VLANs Overview Configuring Routing Between VLANs with ISL Encapsulation Configuring Routing Between VLANs with IEEE 802.10 Encapsulation Configuring Routing Between VLANs with IEEE 802.1Q Encapsulation LAN Emulation Overview Configuring LAN Emulation Configuring Token Ring LANE MPOA Overview Configuring the MPOA Client Configuring the MPOA Server Configuring Token Ring LANE for MPOA	DOC-7810254 DOC-7810255
<ul style="list-style-type: none"> <i>Cisco IOS Wide-Area Networking Configuration Guide</i> <i>Cisco IOS Wide-Area Networking Command Reference</i> 	Wide-Area Networking Overview Configuring ATM Frame Relay Frame Relay-ATM Interworking Configuring SMDS Configuring X.25 and LAPB	DOC-7810246 DOC-7810247
<ul style="list-style-type: none"> <i>Cisco IOS Configuration Guide Master Index</i> <i>Cisco IOS Command Reference Master Index</i> <i>Cisco IOS Command Summary</i> <i>Cisco IOS Debug Command Reference</i> <i>Cisco IOS Dial Services Quick Configuration Guide</i> <i>Cisco IOS System Error Messages</i> 		DOC-7810242 DOC-7810266 DOC-7810262 DOC-7810265 DOC-7810263

Conventions

Command Conventions

Command descriptions use the following conventions:

Convention	Description
Click Window1>Window 2>Window3	The > symbol represents a direction in which you are to navigate from one window to the next, using your mouse to click the windows in the order from first to last.
boldface font	Commands, keywords, menus, menu items, and options are in boldface .
<i>italic font</i>	Arguments or terms for which you supply values are in <i>italics</i> .
[]	Elements in square brackets are optional.
{x y z}	Alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
screen font	Terminal sessions and information the system displays are in screen font.
boldface screen font	Information you must type is in boldface screen font . Terminal sessions and console screens are in this font.
^	The symbol ^ represents the key labeled Control—for example, the key combination ^D in a screen display means hold down the Control key while you press the D key.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.



Note

Means *reader take note*. Notes contain helpful suggestions or reference to material not contained in this manual.



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss.

Document Conventions

Figure 1 Commonly Used Graphical User Interface Conventions

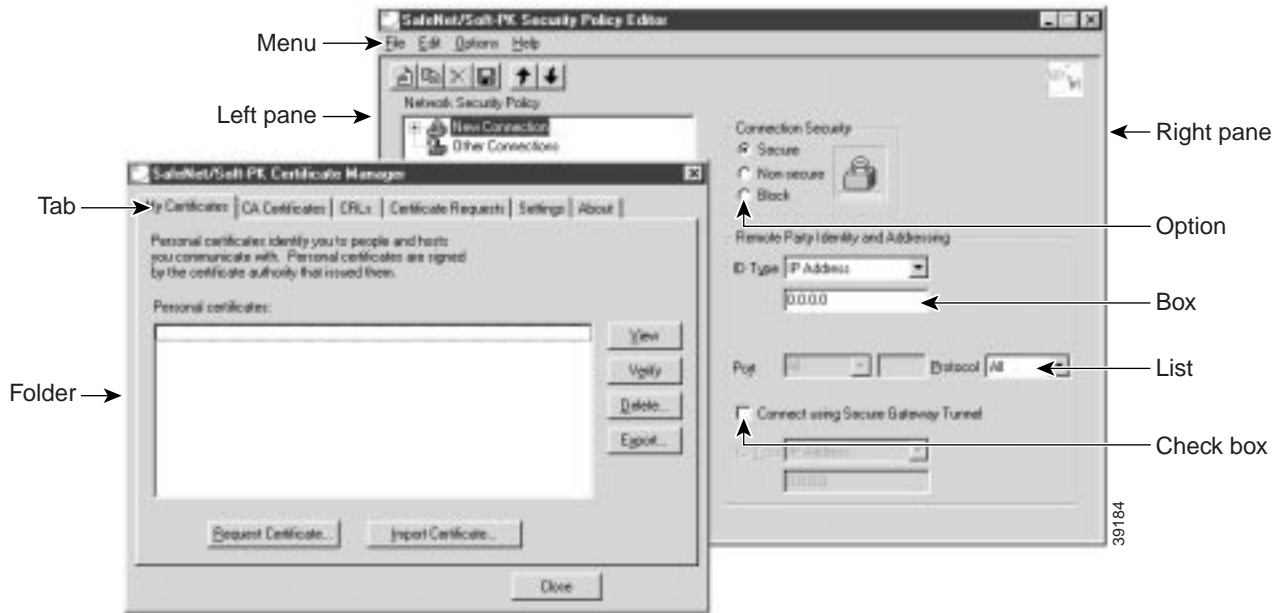
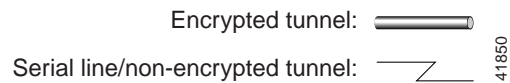





Figure 2 Commonly Used Images



 **Note** Throughout this guide, there are numerous configuration examples that include unusable IP addresses, passwords, and public key examples. Be sure to use your own IP addresses, passwords, and public keys when configuring your VPN Clients and gateway.

 **Note** The Cisco Secure VPN Client is also referenced as SafeNet/Soft-PK throughout this guide and in the software. Also, the SafeNet icon appears as the graphical user interface icon in the Windows taskbar. Unless the taskbar is changed, this icon appears in lower right corner of the screen.

 **Note** For brevity, the Cisco Secure VPN Client is referred to as the generic term *VPN Client* throughout this guide. A Cisco IOS router or Cisco Secure PIX Firewall is referred to as the generic term *gateway* throughout this guide.

**Note**

Throughout this guide, the standard pre-shared key authentication method is called *pre-shared keys*. Also, the wildcard pre-shared key authentication method is called *wildcard pre-shared key*. Unless otherwise specified, the single term *pre-shared keys* may apply to both pre-shared keys and wildcard pre-shared keys.

**Note**

For a listing and description of the terms frequently used in this guide, refer to the “Glossary” at the end of this guide.

Obtaining Documentation

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You can access the most current Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

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Cisco Connection Online

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- WWW: www.cisco.com
- Telnet: cco.cisco.com
- Modem using standard connection rates and the following terminal settings: VT100 emulation; 8 data bits; no parity; and 1 stop bit.
 - From North America, call 408 526-8070
 - From Europe, call 33 1 64 46 40 82

You can e-mail questions about using CCO to cco-team@cisco.com.

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To contact by e-mail, use one of the following:

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Kanji (Japanese)	japan-tac@cisco.com
Hangul (Korean)	korea-tac@cisco.com
Spanish	tac@cisco.com
Thai	thai-tac@cisco.com

In North America, TAC can be reached at 800 553-2447 or 408 526-7209. For other telephone numbers and TAC e-mail addresses worldwide, consult the following web site:
<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>.

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