



# Cisco **PIX Firewall Software** Version 6.3

**The world-leading Cisco PIX<sup>®</sup> Firewall Series of purpose-built security appliances provides robust, enterprise-class, integrated network security services, including stateful inspection firewalling, virtual private networking (VPN), intrusion protection, and much more—in cost-effective, easy-to-deploy solutions. Ranging from compact, “plug-and-play” desktop firewalls for small and home offices to carrier-class gigabit firewalls for the most demanding enterprise and service-provider environments, Cisco PIX Firewalls provide robust security, performance, and reliability for network environments of all sizes.**

## **Advanced Firewall Technologies Provide Enterprise-Class Network Security**

Cisco PIX Firewalls deliver a broad range of advanced firewall services that protect enterprise networks from threats lurking on the Internet and in today’s network environments. The state-of-the-art Cisco Adaptive Security Algorithm (ASA) provides rich stateful inspection firewall services, tracking the state of all authorized network communications and preventing unauthorized network access.

Cisco PIX Firewalls deliver an additional layer of security through intelligent, “application-aware” security services that examine packet streams at Layers 4–7, using inspection engines specialized for many of today’s popular applications. Administrators can also easily create custom security policies for firewall traffic by using the flexible access control methods and the more than 100 predefined applications, services, and protocols that Cisco PIX Firewalls provide.

Access to network resources can also be strongly authenticated through the Cisco PIX Firewall’s local user database or through integration with enterprise databases, either directly using TACACS+/RADIUS or indirectly with Cisco Secure Access Control Server (ACS). Cisco PIX Firewalls provide extensive logging, URL filtering, content filtering, and more, when combined with Cisco AVVID (Architecture for Voice, Video and Integrated Data) partner solutions.

## **Market-Leading Voice-over-IP Security Services Protect Next-Generation Converged Networks**

Cisco PIX Firewalls provide market-leading protection for a wide range of voice-over-IP (VoIP) standards and other multimedia standards, including H.323 Version 4, Session Initiation Protocol (SIP), Cisco Skinny Client Control Protocol (SCCP), Real Time Streaming Protocol (RTSP), and Media Gateway Control Protocol (MGCP).



Additionally, Cisco PIX Firewalls provide security services for Telephony Application Programming Interface (TAPI) and Java Telephony Application Programming Interface (JTAPI)-based applications, when these applications use Computer Telephony Interface Quick Buffer Encoding (CTIQBE) as the network transport mechanism – such as Cisco SoftPhone and Cisco Customer Response Solution (CRS).

This allows businesses to securely take advantage of the many benefits that converged data, voice, and video networks provide, including improved productivity and competitive advantages. By combining VPN with the rich stateful inspection firewall services that Cisco PIX Firewalls provide for these converged networking standards, businesses can securely extend voice and multimedia services to home office and remote office environments for additional cost savings and the other benefits converged networks bring.

### **Site-to-Site VPNs Extend Networks Economically to Remote Sites and Business Partners**

Using the standards-based site-to-site VPN capabilities provided by Cisco PIX Firewalls, businesses can securely extend their networks across low-cost Internet connections to business partners and remote and satellite offices worldwide. Built upon the Internet Key Exchange (IKE) and IP Security (IPSec) VPN standards, Cisco PIX Firewalls encrypt data using 56-bit Data Encryption Standard (DES), 168-bit Triple DES (3DES), or up to 256-bit Advanced Encryption Standard (AES) encryption.

Cisco PIX Firewalls can also participate in X.509-based Public Key Infrastructures (PKIs), and provide easy, automated certificate enrollment using the Simple Certificate Enrollment Protocol (SCEP)—another Internet standard Cisco Systems helped pioneer. Certain Cisco PIX Firewall models also support hardware VPN acceleration, delivering up to 440 megabits per second (Mbps) of 256-bit AES encrypted throughput, as well as support for up to 2000 IKE security associations.

### **Cisco Easy VPN Enables Highly Scalable, Easy-to-Manage VPN Deployments**

The innovative Easy VPN capabilities found in Cisco PIX Firewalls and other Cisco solutions—such as Cisco IOS® routers and Cisco VPN 3000 Series Concentrators—deliver a uniquely scalable, cost-effective, and easy-to-manage remote-access VPN architecture. Built upon the foundation of dynamic policy distribution and effortless provisioning, Easy VPN eliminates the operational costs associated with maintaining remote-device configurations typically required by traditional VPN solutions.

Easy VPN enables Cisco customers to enjoy the numerous benefits that VPNs provide—increased employee productivity by taking advantage of high-speed broadband connectivity, and significantly reduced operational costs by eliminating expenses associated with legacy dialup architectures—without the problems commonly found with other remote-access VPN solutions.

Using the Cisco PIX Firewall robust, remote-access VPN concentrator services, enterprises can securely extend their networks to traveling employees, teleworkers, and remote offices for anytime, anywhere access to vital corporate resources. Acting as Cisco Easy VPN Servers, Cisco PIX Firewalls support the wide range of software- and hardware-based Cisco Easy VPN Remote products. Cisco PIX Firewalls enforce the latest VPN security policies by dynamically pushing these policies to Easy VPN Remote users as they connect.

Certain models of Cisco PIX Firewalls can also act as “hardware VPN clients” using innovative, embedded Easy VPN Remote features, transparently providing secure access to a corporate network for all devices in a remote network protected by a Cisco PIX Firewall. This dramatically simplifies the initial deployment and ongoing management of



VPNs deployed to remote offices and teleworker environments by eliminating the need to install and maintain VPN client software on the individual devices protected by a remote Cisco PIX Firewall. Advanced client-side resiliency features help ensure maximum VPN uptime by providing automatic failover to backup Easy VPN Servers in the event of a network or service failure.

### **Integrated Intrusion Protection Guards Against Popular Internet Threats**

The integrated intrusion-protection capabilities in Cisco PIX Firewalls protect today's networks from many popular forms of attacks, including Denial-of-Service (DoS) attacks and malformed packet attacks. Using a wealth of advanced intrusion-protection features, including DNSGuard, FloodGuard, FragGuard, MailGuard, IPVerify and TCP intercept, in addition to looking for more than 55 different attack "signatures," Cisco PIX Firewalls keep a vigilant watch for attacks, can optionally block them, and can notify administrators about them in real time.

Additionally, Cisco PIX Firewalls support virtual packet reassembly, searching for attacks that are hidden over a series of fragmented packets. Strong integration with Cisco Intrusion Detection Systems (IDS) sensors enables Cisco PIX Firewalls to automatically shun (block) network nodes identified as being hostile by Cisco IDS sensors.

### **Enterprise-Class Resiliency Provides Maximum Business Uptime**

Select Cisco PIX Firewall models provide award-winning stateful failover capabilities that ensure resilient network protection for enterprise network environments. Employing a cost-effective, active-standby, high-availability architecture, Cisco PIX Firewalls that are configured as a failover pair continuously synchronize their connection state and device configuration data. Synchronization can take place over a high-speed LAN connection, providing another layer of protection through the ability to geographically separate the failover pair. In the event of a system or network failure, network sessions are automatically transitioned between firewalls, with complete transparency to users.

### **Robust Remote-Management Capabilities Lower Total Cost of Ownership**

Cisco PIX Firewalls deliver a wealth of remote-management methods for configuration, monitoring, and troubleshooting. Management solutions range from an integrated, Web-based management application to highly scalable multi-firewall management tools to support remote-monitoring protocols such as Simple Network Management Protocol (SNMP) and syslog.

Cisco PIX Firewalls additionally provide up to 16 levels of customizable administrative roles, so that enterprises can grant administrators and operations personnel the appropriate level of access to each firewall (for example monitoring only, read-only access to the configuration, VPN configuration only, firewall configuration only, and so on). Cisco PIX Firewalls also include robust Auto Update capabilities, a set of revolutionary secure remote-management services that ensure firewall configurations and software images are kept up to date.

The integrated Cisco PIX Device Manager provides an intuitive, Web-based management interface for remotely configuring, monitoring, and troubleshooting a single Cisco PIX Firewall—without requiring any software (other than a standard Web browser) to be installed on an administrator's computer. Alternatively, through methods including Telnet and Secure Shell (SSH), or out of band through a console port, administrators can remotely configure, monitor, and troubleshoot Cisco PIX Firewalls using a command-line interface (CLI).



Administrators can easily manage a large number of remote Cisco PIX Firewalls using the combination of the CiscoWorks Management Center for Cisco PIX Firewalls and Auto Update Server Software—both are components of the CiscoWorks VPN/Security Management Solution (VMS) network management suite. This powerful combination provides a highly scalable, next-generation, three-tier management solution that includes the following features:

- Comprehensive configuration and software image management
- Device hierarchy with “Smart Rules”-based configuration inheritance
- Customizable administrative roles and access privileges
- Workflow-based enterprise change management
- Support for the new Auto Update capabilities in Cisco PIX Firewalls
- Support for dynamically addressed firewalls

Additional integrated event management and inventory solutions are also available as part of the CiscoWorks VMS network management suite.

### **New Features Found in Cisco PIX Firewall Software Version 6.3**

Cisco PIX Firewall Software Version 6.3 provides a wealth of new features, including those detailed below. A complete list of features is available in the Cisco PIX Firewall Software Version 6.3 Release Notes.

**Table 1** New Features and Benefits

New Features	Benefits
<b>Enterprise-Class Security</b>	
Virtual LAN (VLAN)-based virtual interfaces	<ul style="list-style-type: none"><li>• Provides increased flexibility when defining security policies and eases overall integration into switched network environments by supporting the creation of logical interfaces based on IEEE 802.1q VLAN tags, and the creation of security policies based on these virtual interfaces</li><li>• Supports multiple virtual interfaces on a single physical interface through VLAN trunking</li><li>• Supports multiple VLAN trunks per Cisco PIX Firewall</li><li>• Supports up to eight VLANs on Cisco PIX 515 and 515E Firewalls, 10 VLANs on Cisco PIX 520 and 525 Firewalls and 22 VLANs on Cisco PIX 535 Firewalls</li></ul>
Open Shortest Path First (OSPF) dynamic routing	<ul style="list-style-type: none"><li>• Provides comprehensive OSPF dynamic routing services, on Cisco PIX Firewalls using technology based on world-renowned Cisco IOS Software</li><li>• Offers improved network reliability through fast route convergence and secure, efficient route distribution</li><li>• Delivers a secure routing solution in environments using Network Address Translation (NAT) through tight integration with Cisco PIX Firewall NAT services</li><li>• Supports MD5-based OSPF authentication, in addition to plaintext OSPF authentication, to prevent route spoofing and various routing-based DoS attacks</li><li>• Provides route redistribution between OSPF processes, including OSPF, static, and connected routes</li><li>• Supports load balancing across equal-cost multipath routes</li></ul>



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New Features	Benefits
Secure Hypertext Transfer Protocol (HTTPS) authentication proxy	<ul style="list-style-type: none"> <li>Offers a secure, Web-based method for user authentication to the firewall prior to allowing any of the user's network traffic to traverse the firewall</li> </ul>
Local user authentication database	<ul style="list-style-type: none"> <li>Enables administrators to define usernames and associated passwords locally on a Cisco PIX Firewall, which can then be used to authenticate users prior to allowing them network and VPN access</li> <li>Provides a cost-effective alternative for storage of user authentication information</li> </ul>
HTTPS and FTP Web request filtering via enhanced Websense integration	<ul style="list-style-type: none"> <li>Extends integration with Websense-based employee web usage management solutions by adding support for filtering of users' HTTPS and FTP Web requests</li> </ul>
Advanced Encryption Standard (AES)	<ul style="list-style-type: none"> <li>Adds support for securing site-to-site and remote access VPN connections with new international encryption standard, Advanced Encryption Standard (AES)</li> <li>Provides software-based AES support on all supported Cisco PIX Firewall models and hardware-accelerated AES via the new VAC+ card on select Cisco PIX Firewall models</li> <li>Supports all standard AES key sizes: 128, 192 and 256</li> </ul>
VPN Acceleration Card+ (VAC+)	<ul style="list-style-type: none"> <li>Delivers up to 440 Mbps of hardware-accelerated 168-bit 3DES and 256-bit AES encryption (on select Cisco PIX Firewall models) for highly scalable site-to-site and remote access VPN services</li> <li>Provides hardware acceleration of 56-bit DES, 168-bit 3DES and all standard AES key sizes (128, 192, and 256)</li> <li>Supports up to 2000 concurrent IKE associations</li> </ul>
VPN NAT transparency	<ul style="list-style-type: none"> <li>Extends support for site-to-site and remote access IPSec-based VPNs to network environments that implement NAT or Port Address Translation (PAT), such as airports, hotels, wireless hot spots, and broadband environments</li> <li>Supports automatic discovery of NAT/PAT environments during VPN tunnel negotiation and can dynamically encapsulate VPN traffic using an Internet Engineering Task Force (IETF)-based UDP wrapper mechanism for safe traversal through NAT/PAT boundaries</li> </ul>
Custom IKE port numbers	<ul style="list-style-type: none"> <li>Enables IKE sessions to be accepted on administrator-specified UDP ports, providing additional flexibility for enterprise network environments</li> </ul>
Integrated Dynamic Host Configuration Protocol (DHCP) server support on multiple interfaces	<ul style="list-style-type: none"> <li>Extends integrated DHCP server to provide DHCP services on one or more administrator-specified interfaces concurrently, each with a separate DHCP address pool</li> </ul>
<b>Management</b>	
Syslog by access control list (ACL) entry	<ul style="list-style-type: none"> <li>Introduces powerful new reporting and troubleshooting capabilities that enable detailed statistics to be gathered on which ACL entries are triggered by network traffic attempting to traverse a Cisco PIX Firewall</li> <li>Gives precise control over which ACL entry-related syslog events are generated</li> </ul>



**Table 1** New Features and Benefits

New Features	Benefits
Assignable syslog levels by message	<ul style="list-style-type: none"> <li>Provides administrators tremendous flexibility and control over which syslog messages Cisco PIX Firewalls generate</li> </ul>
ACL editing	<ul style="list-style-type: none"> <li>Provides capabilities for inserting and deleting individual ACL entries without deleting and re-creating the entire ACL</li> </ul>
Comments for ACL entries	<ul style="list-style-type: none"> <li>Introduces the ability to associate detailed descriptions with individual ACL entries and store these descriptions as part of the overall product configuration</li> </ul>
Interface name as address in ACLs and conduits	<ul style="list-style-type: none"> <li>Enables the creation of security policies based on interface name instead of IP address, which is especially useful in broadband environments where the outside interface is typically assigned a dynamic IP address</li> </ul>
Custom administrative access banner messages	<ul style="list-style-type: none"> <li>Provides facility to define custom messages that will appear when anyone attempts to access the CLI interface, after successful login and when entering "exec mode" of Cisco PIX Firewalls via console port, telnet, or SSH</li> </ul>
Console connection inactivity timeout	<ul style="list-style-type: none"> <li>Protects console from unauthorized administrative access by automatically logging out sessions after a configurable period of inactivity</li> </ul>
<b>Show</b> command output filter	<ul style="list-style-type: none"> <li>Provides tools to customize the output of CLI-based show commands, such as filtering using Cisco IOS Software style regular expressions</li> </ul>
Custom logging identifier	<ul style="list-style-type: none"> <li>Allows a custom firewall identifier to be selected, such as an interface IP address, that will be included in all syslog messages to improve the centralized reporting of firewall events</li> </ul>
Remote management enhancements	<ul style="list-style-type: none"> <li>Supports secure remote management of Cisco PIX Firewalls through a VPN tunnel to their inside interface IP address; especially useful in broadband network environments where firewalls outside interface addresses are typically assigned dynamically</li> </ul>
<b>Small Office and Home Office</b>	
Cisco Easy VPN Remote (hardware VPN client) enhancements	<ul style="list-style-type: none"> <li>Introduces ability to authenticate individual users behind a Cisco PIX Firewall through an easy-to-use, Web-based interface with support for standard and one-time passwords (including authentication tokens)</li> <li>Allows certain network devices, such as printers and IP phones, to pass through a VPN tunnel using authentication based on the devices' Media Access Control (MAC) addresses and/or their IP addresses</li> <li>Provides robust client-side VPN resiliency with support for dynamic downloading of backup Easy VPN Server information and automatic failover, in the event of a VPN link failure</li> <li>Supports VPN 3000 Series Concentrator load balancing with automatic redirection to the least utilized concentrator</li> <li>Provides new, easy-to-use Web interface for manual VPN tunnel control, user authentication, and tunnel status information</li> <li>Introduces method to specify the networks and individual IP addresses that can manage a Cisco PIX Firewall securely via its outside interface, regardless if the VPN tunnel is up or down</li> </ul>



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DHCP relay	<ul style="list-style-type: none"> <li>• Forwards DHCP requests from devices on specific interfaces to an administrator-specified DHCP server</li> <li>• Provides method for enterprises to centrally distribute, track, and maintain IP addresses</li> </ul>
PAT for Point-to-Point Tunneling Protocol (PPTP)	<ul style="list-style-type: none"> <li>• Enhances the rich PAT functionality in Cisco PIX Firewalls to enable multiple PPTP sessions to traverse firewall</li> </ul>
PAT for IPSec	<ul style="list-style-type: none"> <li>• Supports IPSec passthrough services, enabling a single device behind the Cisco PIX Firewall to establish a VPN tunnel through the firewall to a VPN peer</li> </ul>
Increased number of IPSec VPN peers supported on Cisco PIX 501 Firewalls	<ul style="list-style-type: none"> <li>• Increases number of site-to-site and remote access VPN peers supported on Cisco PIX 501 Firewalls from five to 10, enabling greater VPN scalability in home office and small office environments</li> </ul>
<b>Voice over IP (VoIP) and Multimedia</b>	
H.323 Version 3 and 4	<ul style="list-style-type: none"> <li>• Extends Cisco PIX Firewall market-leading VoIP security by adding support for the latest versions of the H.323 standard, which is used by numerous applications and millions of users worldwide</li> <li>• Adds support for many new H.323 features, including the ability to handle multiple calls that use the same call signaling channel</li> </ul>
TAPI and JTAPI over CTIQBE	<ul style="list-style-type: none"> <li>• Supports inspection of various Cisco TAPI and JTAPI based applications that use CTIQBE, including Cisco IP SoftPhone and Cisco Customer Response Solution (CRS)</li> </ul>
MGCP	<ul style="list-style-type: none"> <li>• Inspects MGCP messages passing between call agents, media gateways, and other components in production VoIP environments</li> </ul>
PAT for SCCP	<ul style="list-style-type: none"> <li>• Extends market-leading VoIP support and enables SCCP (the call-signaling protocol used by Cisco IP phones) to work in PAT environments; typically found in home offices and remote offices</li> </ul>

**Technical Specifications**

**VPN Client Compatibility**

Cisco PIX Firewalls support a wide variety of software- and hardware-based VPN clients, which include the following:

Software IPSec VPN clients	Cisco Secure VPN Client, Version 1.1 Cisco VPN 3000 Concentrator Client, Version 2.5 and later Cisco VPN Client for Windows, Version 3.0 and later Cisco VPN Client for Linux, Version 3.5 and later Cisco VPN Client for Solaris, Version 3.5 and later Cisco VPN Client for Mac OS X, Version 3.5 and later
Hardware IPSec VPN clients	Cisco VPN 3002 Hardware Client, Version 3.0 and higher Cisco IOS Software Easy VPN Remote, Release 12.2(8)YJ Cisco PIX Firewall, Version 6.2 and higher



Layer 2 Tunneling Protocol (L2TP)/IPSec VPN clients	Microsoft Windows 2000
Point-to-Point Tunneling Protocol (PPTP) VPN clients	Microsoft Windows 95 Microsoft Windows 98 Microsoft Windows NT 4.0 Microsoft Windows 2000

### Easy VPN Server Compatibility

Cisco PIX Firewalls can now act as hardware-based VPN clients, taking advantage of the new Cisco Easy VPN Remote capabilities in Cisco PIX Firewall Software. The following Cisco Easy VPN Server platforms are supported for this deployment scenario:

Cisco IOS Routers	Release 12.2(8)T and later
Cisco PIX Firewalls	Version 6.0(1) and later
Cisco VPN 3000 Series Concentrators	Version 3.1 and later

### Cisco Site-to-Site VPN Compatibility

In addition to providing interoperability for many third-party VPN products, Cisco PIX Firewalls interoperate with the following Cisco VPN products for site-to-site VPN connectivity:

Cisco IOS Routers	Release 12.1(6)T and later
Cisco PIX Firewalls	Version 5.1(1) and later
Cisco VPN 3000 Concentrators	Version 2.5.2 and later

### Cryptographic Standards Supported

Cisco PIX Firewalls support numerous cryptographic standards and related third-party products and services, including the following:

Asymmetric (public key) encryption algorithms	RSA (Rivest, Shamir, Adelman) public/private key pairs, 512 bits to 2048 bits
Symmetric encryption algorithms	AES: 128, 192, and 256 bits DES: 56 bits 3DES: 168 bits RC4: 40, 56, 64, and 128 bits
Perfect Forward Secrecy (Diffie-Hellman key negotiation)	Group 1: 768 bits Group 2: 1024 bits Group 5: 1536 bits
Hash algorithms	MD5: 128 bits SHA-1: 160 bits



X.509 certificate authorities	Baltimore UniCERT Entrust Authority Microsoft Windows 2000 Certificate Services VeriSign OnSite
X.509 certificate enrollment protocols	SCEP

### System Requirements

Platforms supported	Cisco PIX 501 Firewall Cisco PIX 506 Firewall Cisco PIX 506E Firewall Cisco PIX 515 Firewall Cisco PIX 515E Firewall Cisco PIX 520 Firewall Cisco PIX 525 Firewall Cisco PIX 535 Firewall
Minimum RAM	32 megabytes (MB), except the Cisco PIX 501 Firewall, which requires 16 MB
Minimum Flash memory	16 MB, except the Cisco PIX 501, 506, and 506E Firewall models, which require 8 MB
Expansion cards supported	Single-port 10/100 Fast Ethernet card Four-port 10/100 Fast Ethernet card Single-port Gigabit Ethernet, multimode (SX) SC, card VPN Acceleration Card (Cisco VAC) VPN Acceleration Card+ (Cisco VAC+)

### Product Ordering Information

PIX-SW-UPGRADE=	Cisco PIX Firewall Software one-time upgrade for customers without a current Cisco SMARTnet™ support contract
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### Support Services

Support services are available from Cisco and Cisco partners. Cisco SMARTnet service augments customer support resources, and provides anywhere, anytime access to technical resources (both online and by telephone), the ability to download updated system software, and hardware advance replacement.



## Additional Information

For more information, please visit the following links:

Cisco PIX Firewall Series:

<http://www.cisco.com/go/pix>

Cisco PIX Device Manager:

<http://www.cisco.com/en/US/products/sw/netmgmtsw/ps2032/index.html>

Cisco Secure ACS:

<http://www.cisco.com/go/acs>

CiscoWorks VPN Security Management Solution (VMS), CiscoWorks Management Center for Cisco PIX Firewalls, and CiscoWorks Auto Update Server Software:

<http://www.cisco.com/go/vms>

SAFE Blueprint from Cisco:

<http://www.cisco.com/go/safe>

Cisco Easy VPN Solution

[http://www.cisco.com/en/US/netsol/ns110/ns170/ns171/ns27/networking\\_solutions\\_package.html](http://www.cisco.com/en/US/netsol/ns110/ns170/ns171/ns27/networking_solutions_package.html)

To download the latest Cisco PIX Firewall Software and Cisco PIX Device Manager (with a valid Cisco.com login), visit: <http://www.cisco.com/cgi-bin/tablebuild.pl/pix>



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