

Addresses, Protocols, and Ports

This appendix provides a quick reference for IP addresses, protocols, and applications. This appendix includes the following sections:

- IPv4 Addresses and Subnet Masks, page 50-1
- IPv6 Addresses, page 50-5
- Protocols and Applications, page 50-11
- TCP and UDP Ports, page 50-11
- Local Ports and Protocols, page 50-14
- ICMP Types, page 50-15

IPv4 Addresses and Subnet Masks

This section describes how to use IPv4 addresses in the ASA. An IPv4 address is a 32-bit number written in dotted-decimal notation: four 8-bit fields (octets) converted from binary to decimal numbers, separated by dots. The first part of an IP address identifies the network on which the host resides, while the second part identifies the particular host on the given network. The network number field is called the network prefix. All hosts on a given network share the same network prefix but must have a unique host number. In classful IP, the class of the address determines the boundary between the network prefix and the host number.

This section includes the following topics:

- Classes, page 50-1
- Private Networks, page 50-2
- Subnet Masks, page 50-2

Classes

IP host addresses are divided into three different address classes: Class A, Class B, and Class C. Each class fixes the boundary between the network prefix and the host number at a different point within the 32-bit address. Class D addresses are reserved for multicast IP.

- Class A addresses (1.xxx.xxx.xxx through 126.xxx.xxx.xxx) use only the first octet as the network prefix.

- Class B addresses (128.0.xxx.xxx through 191.255.xxx.xxx) use the first two octets as the network prefix.
- Class C addresses (192.0.0.xxx through 223.255.255.xxx) use the first three octets as the network prefix.

Because Class A addresses have 16,777,214 host addresses, and Class B addresses 65,534 hosts, you can use subnet masking to break these huge networks into smaller subnets.

Private Networks

If you need large numbers of addresses on your network, and they do not need to be routed on the Internet, you can use private IP addresses that the Internet Assigned Numbers Authority (IANA) recommends (see RFC 1918). The following address ranges are designated as private networks that should not be advertised:

- 10.0.0.0 through 10.255.255.255
- 172.16.0.0 through 172.31.255.255
- 192.168.0.0 through 192.168.255.255

Subnet Masks

A subnet mask lets you convert a single Class A, B, or C network into multiple networks. With a subnet mask, you can create an extended network prefix that adds bits from the host number to the network prefix. For example, a Class C network prefix always consists of the first three octets of the IP address. But a Class C extended network prefix uses part of the fourth octet as well.

Subnet masking is easy to understand if you use binary notation instead of dotted decimal. The bits in the subnet mask have a one-to-one correspondence with the Internet address:

- The bits are set to 1 if the corresponding bit in the IP address is part of the extended network prefix.
- The bits are set to 0 if the bit is part of the host number.

Example 1: If you have the Class B address 129.10.0.0 and you want to use the entire third octet as part of the extended network prefix instead of the host number, then you must specify a subnet mask of 11111111.11111111.11111111.00000000. This subnet mask converts the Class B address into the equivalent of a Class C address, where the host number consists of the last octet only.

Example 2: If you want to use only part of the third octet for the extended network prefix, then you must specify a subnet mask like 11111111.11111111.11111000.00000000, which uses only 5 bits of the third octet for the extended network prefix.

You can write a subnet mask as a dotted-decimal mask or as a */bits* (“slash *bits*”) mask. In Example 1, for a dotted-decimal mask, you convert each binary octet into a decimal number: 255.255.255.0. For a */bits* mask, you add the number of 1s: /24. In Example 2, the decimal number is 255.255.248.0 and the /bits is /21.

You can also supernet multiple Class C networks into a larger network by using part of the third octet for the extended network prefix. For example, 192.168.0.0/20.

This section includes the following topics:

- Determining the Subnet Mask, page 50-3
- Determining the Address to Use with the Subnet Mask, page 50-3

Determining the Subnet Mask

To determine the subnet mask based on how many hosts you want, see Table 50-1.

Table 50-1 Hosts, Bits, and Dotted-Decimal Masks

Hosts[1]	/Bits Mask	Dotted-Decimal Mask
16,777,216	/8	255.0.0.0 Class A Network
65,536	/16	255.255.0.0 Class B Network
32,768	/17	255.255.128.0
16,384	/18	255.255.192.0
8192	/19	255.255.224.0
4096	/20	255.255.240.0
2048	/21	255.255.248.0
1024	/22	255.255.252.0
512	/23	255.255.254.0
256	/24	255.255.255.0 Class C Network
128	/25	255.255.255.128
64	/26	255.255.255.192
32	/27	255.255.255.224
16	/28	255.255.255.240
8	/29	255.255.255.248
4	/30	255.255.255.252
Do not use	/31	255.255.255.254
1	/32	255.255.255.255 Single Host Address

1. The first and last number of a subnet are reserved, except for /32, which identifies a single host.

Determining the Address to Use with the Subnet Mask

The following sections describe how to determine the network address to use with a subnet mask for a Class C-size and a Class B-size network. This section includes the following topics:

- Class C-Size Network Address, page 50-3
- Class B-Size Network Address, page 50-4

Class C-Size Network Address

For a network between 2 and 254 hosts, the fourth octet falls on a multiple of the number of host addresses, starting with 0. For example, Table 50-2 shows the 8-host subnets (/29) of 192.168.0.x.

Table 50-2 Class C-Size Network Address

Subnet with Mask /29 (255.255.255.248)	Address Range[1]
192.168.0.0	192.168.0.0 to 192.168.0.7
192.168.0.8	192.168.0.8 to 192.168.0.15

Table 50-2 Class C-Size Network Address (continued)

Subnet with Mask /29 (255.255.255.248)	Address Range[1]
192.168.0.16	192.168.0.16 to 192.168.0.31
—	—
192.168.0.248	192.168.0.248 to 192.168.0.255

1. The first and last address of a subnet are reserved. In the first subnet example, you cannot use 192.168.0.0 or 192.168.0.7.

Class B-Size Network Address

To determine the network address to use with the subnet mask for a network with between 254 and 65,534 hosts, you need to determine the value of the third octet for each possible extended network prefix. For example, you might want to subnet an address like 10.1.*x*.0, where the first two octets are fixed because they are used in the extended network prefix, and the fourth octet is 0 because all bits are used for the host number.

To determine the value of the third octet, follow these steps:

Step 1 Calculate how many subnets you can make from the network by dividing 65,536 (the total number of addresses using the third and fourth octet) by the number of host addresses you want.

For example, 65,536 divided by 4096 hosts equals 16.

Therefore, there are 16 subnets of 4096 addresses each in a Class B-size network.

Step 2 Determine the multiple of the third octet value by dividing 256 (the number of values for the third octet) by the number of subnets:

In this example, 256/16 = 16.

The third octet falls on a multiple of 16, starting with 0.

Therefore, Table 50-3 shows the 16 subnets of the network 10.1.

Table 50-3 Subnets of Network

Subnet with Mask /20 (255.255.240.0)	Address Range[1]
10.1.0.0	10.1.0.0 to 10.1.15.255
10.1.16.0	10.1.16.0 to 10.1.31.255
10.1.32.0	10.1.32.0 to 10.1.47.255
—	—
10.1.240.0	10.1.240.0 to 10.1.255.255

1. The first and last address of a subnet are reserved. In the first subnet example, you cannot use 10.1.0.0 or 10.1.15.255.

IPv6 Addresses

IPv6 is the next generation of the Internet Protocol after IPv4. It provides an expanded address space, a simplified header format, improved support for extensions and options, flow labeling capability, and authentication and privacy capabilities. IPv6 is described in RFC 2460. The IPv6 addressing architecture is described in RFC 3513.

This section describes the IPv6 address format and architecture and includes the following topics:

- IPv6 Address Format, page 50-5
- IPv6 Address Types, page 50-6
- IPv6 Address Prefixes, page 50-10

Note This section describes the IPv6 address format, the types, and prefixes. For information about configuring the ASA to use IPv6, see Configuring IPv6 Addressing, page 15-14

IPv6 Address Format

IPv6 addresses are represented as a series of eight 16-bit hexadecimal fields separated by colons (:) in the format: x:x:x:x:x:x:x:x. The following are two examples of IPv6 addresses:

- 2001:0DB8:7654:3210:FEDC:BA98:7654:3210
- 2001:0DB8:0000:0000:0008:0800:200C:417A

Note The hexadecimal letters in IPv6 addresses are not case-sensitive.

You do not need to include the leading zeros in an individual field of the address, but each field must contain at least one digit. So the example address 2001:0DB8:0000:0000:0008:0800:200C:417A can be shortened to 2001:0DB8:0:0:8:800:200C:417A by removing the leading zeros from the third through sixth fields from the left. The fields that contained all zeros (the third and fourth fields from the left) were shortened to a single zero. The fifth field from the left had the three leading zeros removed, leaving a single 8 in that field, and the sixth field from the left had the one leading zero removed, leaving 800 in that field.

It is common for IPv6 addresses to contain several consecutive hexadecimal fields of zeros. You can use two colons (::) to compress consecutive fields of zeros at the beginning, middle, or end of an IPv6 address (the colons represent the successive hexadecimal fields of zeros). Table 50-4 shows several examples of address compression for different types of IPv6 address.

Table 50-4 IPv6 Address Compression Examples

Address Type	Standard Form	Compressed Form
Unicast	2001:0DB8:0:0:0:BA98:0:3210	2001:0DB8::BA98:0:3210
Multicast	FF01:0:0:0:0:0:0:101	FF01::101
Loopback	0:0:0:0:0:0:0:1	::1
Unspecified	0:0:0:0:0:0:0:0	::

Note Two colons (::) can be used only once in an IPv6 address to represent successive fields of zeros.

An alternative form of the IPv6 format is often used when dealing with an environment that contains both IPv4 and IPv6 addresses. This alternative has the format x:x:x:x:x:x:y.y.y.y, where x represent the hexadecimal values for the six high-order parts of the IPv6 address and y represent decimal values for the 32-bit IPv4 part of the address (which takes the place of the remaining two 16-bit parts of the IPv6 address). For example, the IPv4 address 192.168.1.1 could be represented as the IPv6 address 0:0:0:0:0:0:FFFF:192.168.1.1 or ::FFFF:192.168.1.1.

IPv6 Address Types

The following are the three main types of IPv6 addresses:

- **Unicast**—A unicast address is an identifier for a single interface. A packet sent to a unicast address is delivered to the interface identified by that address. An interface may have more than one unicast address assigned to it.
- **Multicast**—A multicast address is an identifier for a set of interfaces. A packet sent to a multicast address is delivered to all addresses identified by that address.
- **Anycast**—An anycast address is an identifier for a set of interfaces. Unlike a multicast address, a packet sent to an anycast address is only delivered to the "nearest" interface, as determined by the measure of distances for the routing protocol.

Note There are no broadcast addresses in IPv6. Multicast addresses provide the broadcast functionality.

This section includes the following topics:

- Unicast Addresses, page 50-6
- Multicast Address, page 50-8
- Anycast Address, page 50-9
- Required Addresses, page 50-10

Unicast Addresses

This section describes IPv6 unicast addresses. Unicast addresses identify an interface on a network node.

This section includes the following topics:

- Global Address, page 50-7
- Site-Local Address, page 50-7
- Link-Local Address, page 50-7
- IPv4-Compatible IPv6 Addresses, page 50-7
- Unspecified Address, page 50-8
- Loopback Address, page 50-8
- Interface Identifiers, page 50-8

Global Address

The general format of an IPv6 global unicast address is a global routing prefix followed by a subnet ID followed by an interface ID. The global routing prefix can be any prefix not reserved by another IPv6 address type (see IPv6 Address Prefixes, page 50-10, for information about the IPv6 address type prefixes).

All global unicast addresses, other than those that start with binary 000, have a 64-bit interface ID in the Modified EUI-64 format. See Interface Identifiers, page 50-8, for more information about the Modified EUI-64 format for interface identifiers.

Global unicast address that start with the binary 000 do not have any constraints on the size or structure of the interface ID portion of the address. One example of this type of address is an IPv6 address with an embedded IPv4 address (see IPv4-Compatible IPv6 Addresses, page 50-7).

Site-Local Address

Site-local addresses are used for addressing within a site. They can be used to address an entire site without using a globally unique prefix. Site-local addresses have the prefix FEC0::/10, followed by a 54-bit subnet ID, and end with a 64-bit interface ID in the modified EUI-64 format.

Site-local routers do not forward any packets that have a site-local address for a source or destination outside of the site. Therefore, site-local addresses can be considered private addresses.

Link-Local Address

All interfaces are required to have at least one link-local address. You can configure multiple IPv6 addresses per interfaces, but only one link-local address.

A link-local address is an IPv6 unicast address that can be automatically configured on any interface using the link-local prefix FE80::/10 and the interface identifier in modified EUI-64 format. Link-local addresses are used in the neighbor discovery protocol and the stateless autoconfiguration process. Nodes with a link-local address can communicate; they do not need a site-local or globally unique address to communicate.

Routers do not forward any packets that have a link-local address for a source or destination. Therefore, link-local addresses can be considered private addresses.

IPv4-Compatible IPv6 Addresses

There are two types of IPv6 addresses that can contain IPv4 addresses.

The first type is the IPv4-compatibly IPv6 address. The IPv6 transition mechanisms include a technique for hosts and routers to dynamically tunnel IPv6 packets over IPv4 routing infrastructure. IPv6 nodes that use this technique are assigned special IPv6 unicast addresses that carry a global IPv4 address in the low-order 32 bits. This type of address is termed an IPv4-compatible IPv6 address and has the format ::y.y.y.y, where y.y.y.y is an IPv4 unicast address.



Note The IPv4 address used in the IPv4-compatible IPv6 address must be a globally unique IPv4 unicast address.

The second type of IPv6 address, which holds an embedded IPv4 address, is called the IPv4-mapped IPv6 address. This address type is used to represent the addresses of IPv4 nodes as IPv6 addresses. This type of address has the format ::FFFF:y.y.y.y, where y.y.y.y is an IPv4 unicast address.

Unspecified Address

The unspecified address, 0:0:0:0:0:0:0:0, indicates the absence of an IPv6 address. For example, a newly initialized node on an IPv6 network may use the unspecified address as the source address in its packets until it receives its IPv6 address.

Note The IPv6 unspecified address cannot be assigned to an interface. The unspecified IPv6 addresses must not be used as destination addresses in IPv6 packets or the IPv6 routing header.

Loopback Address

The loopback address, 0:0:0:0:0:0:0:1, may be used by a node to send an IPv6 packet to itself. The loopback address in IPv6 functions the same as the loopback address in IPv4 (127.0.0.1).

Note The IPv6 loopback address cannot be assigned to a physical interface. A packet that has the IPv6 loopback address as its source or destination address must remain within the node that created the packet. IPv6 routers do not forward packets that have the IPv6 loopback address as their source or destination address.

Interface Identifiers

Interface identifiers in IPv6 unicast addresses are used to identify the interfaces on a link. They need to be unique within a subnet prefix. In many cases, the interface identifier is derived from the interface link-layer address. The same interface identifier may be used on multiple interfaces of a single node, as long as those interfaces are attached to different subnets.

For all unicast addresses, except those that start with the binary 000, the interface identifier is required to be 64 bits long and to be constructed in the Modified EUI-64 format. The Modified EUI-64 format is created from the 48-bit MAC address by inverting the universal/local bit in the address and by inserting the hexadecimal number FFFE between the upper three bytes and lower three bytes of the of the MAC address.

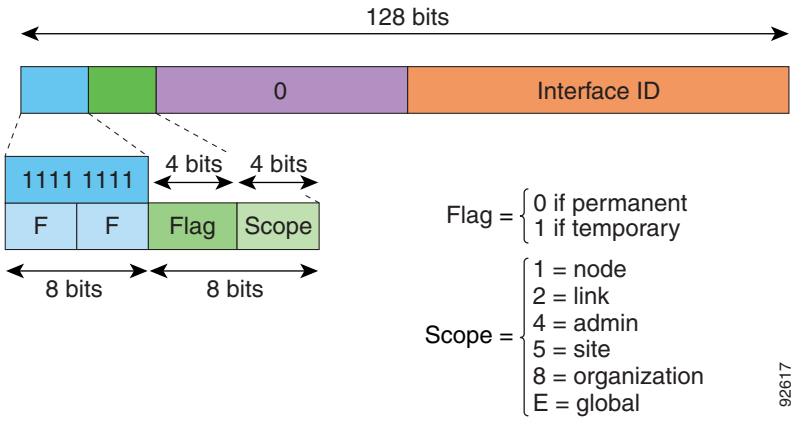
For example, and interface with the MAC address of 00E0.b601.3B7A would have a 64-bit interface ID of 02E0:B6FF:FE01:3B7A.

Multicast Address

An IPv6 multicast address is an identifier for a group of interfaces, typically on different nodes. A packet sent to a multicast address is delivered to all interfaces identified by the multicast address. An interface may belong to any number of multicast groups.

An IPv6 multicast address has a prefix of FF00::/8 (1111 1111). The octet following the prefix defines the type and scope of the multicast address. A permanently assigned (well known) multicast address has a flag parameter equal to 0; a temporary (transient) multicast address has a flag parameter equal to 1. A multicast address that has the scope of a node, link, site, or organization, or a global scope has a scope parameter of 1, 2, 5, 8, or E, respectively. For example, a multicast address with the prefix FF02::/16 is a permanent multicast address with a link scope. Figure 50-1 shows the format of the IPv6 multicast address.

Figure 50-1 IPv6 Multicast Address Format



IPv6 nodes (hosts and routers) are required to join the following multicast groups:

- The All Nodes multicast addresses:
  - FF01:: (interface-local)
  - FF02:: (link-local)
- The Solicited-Node Address for each IPv6 unicast and anycast address on the node: FF02:0:0:0:0:1:FFXX:XXXX/104, where XX:XXXX is the low-order 24-bits of the unicast or anycast address.

Note Solicited-Node addresses are used in Neighbor Solicitation messages.

IPv6 routers are required to join the following multicast groups:

- FF01::2 (interface-local)
- FF02::2 (link-local)
- FF05::2 (site-local)

Multicast address should not be used as source addresses in IPv6 packets.

Note There are no broadcast addresses in IPv6. IPv6 multicast addresses are used instead of broadcast addresses.

Anycast Address

The IPv6 anycast address is a unicast address that is assigned to more than one interface (typically belonging to different nodes). A packet that is routed to an anycast address is routed to the nearest interface having that address, the nearness being determined by the routing protocol in effect.

Anycast addresses are allocated from the unicast address space. An anycast address is simply a unicast address that has been assigned to more than one interface, and the interfaces must be configured to recognize the address as an anycast address.

The following restrictions apply to anycast addresses:

- An anycast address cannot be used as the source address for an IPv6 packet.

- An anycast address cannot be assigned to an IPv6 host; it can only be assigned to an IPv6 router.

Note Anycast addresses are not supported on the ASA.

Required Addresses

IPv6 hosts must, at a minimum, be configured with the following addresses (either automatically or manually):

- A link-local address for each interface
- The loopback address
- The All-Nodes multicast addresses
- A Solicited-Node multicast address for each unicast or anycast address

IPv6 routers must, at a minimum, be configured with the following addresses (either automatically or manually):

- The required host addresses
- The Subnet-Router anycast addresses for all interfaces for which it is configured to act as a router
- The All-Routers multicast addresses

IPv6 Address Prefixes

An IPv6 address prefix, in the format ipv6-prefix/prefix-length, can be used to represent bit-wise contiguous blocks of the entire address space. The IPv6-prefix must be in the form documented in RFC 2373 where the address is specified in hexadecimal using 16-bit values between colons. The prefix length is a decimal value that indicates how many of the high-order contiguous bits of the address comprise the prefix (the network portion of the address). For example, 2001:0DB8:8086:6502::/32 is a valid IPv6 prefix.

The IPv6 prefix identifies the type of IPv6 address. Table 50-5 shows the prefixes for each IPv6 address type.

Table 50-5 IPv6 Address Type Prefixes

Address Type	Binary Prefix	IPv6 Notation
Unspecified	000...0 (128 bits)	::/128
Loopback	000...1 (128 bits)	::1/128
Multicast	11111111	FF00::/8
Link-Local (unicast)	1111111010	FE80::/10
Site-Local (unicast)	1111111111	FEC0::/10
Global (unicast)	All other addresses.	
Anycast	Taken from the unicast address space.	

Protocols and Applications

Table 50-6 lists the protocol literal values and port numbers; either can be entered in ASA commands.

Table 50-6 Protocol Literal Values

Literal	Value	Description
ah	51	Authentication Header for IPv6, RFC 1826.
eigrp	88	Enhanced Interior Gateway Routing Protocol.
esp	50	Encapsulated Security Payload for IPv6, RFC 1827.
gre	47	Generic Routing Encapsulation.
icmp	1	Internet Control Message Protocol, RFC 792.
icmp6	58	Internet Control Message Protocol for IPv6, RFC 2463.
igmp	2	Internet Group Management Protocol, RFC 1112.
igrp	9	Interior Gateway Routing Protocol.
ip	0	Internet Protocol.
ipinip	4	IP-in-IP encapsulation.
ipsec	50	IP Security. Entering the ipsec protocol literal is equivalent to entering the esp protocol literal.
nos	94	Network Operating System (Novell's NetWare).
ospf	89	Open Shortest Path First routing protocol, RFC 1247.
pcp	108	Payload Compression Protocol.
pim	103	Protocol Independent Multicast.
pptp	47	Point-to-Point Tunneling Protocol. Entering the pptp protocol literal is equivalent to entering the gre protocol literal.
snp	109	Sitara Networks Protocol.
tcp	6	Transmission Control Protocol, RFC 793.
udp	17	User Datagram Protocol, RFC 768.

Protocol numbers can be viewed online at the IANA website:

http://www.iana.org/assignments/protocol-numbers

TCP and UDP Ports

Table 50-7 lists the literal values and port numbers; either can be entered in ASA commands. See the following caveats:

- The ASA uses port 1521 for SQL*Net. This is the default port used by Oracle for SQL*Net. This value, however, does not agree with IANA port assignments.
- The ASA listens for RADIUS on ports 1645 and 1646. If your RADIUS server uses the standard ports 1812 and 1813, you can configure the ASA to listen to those ports using the **authentication-port** and **accounting-port** commands.

- To assign a port for DNS access, use the **domain** literal value, not **dns**. If you use **dns**, the ASA assumes you meant to use the **dnsix** literal value.

Port numbers can be viewed online at the IANA website:

http://www.iana.org/assignments/port-numbers

Table 50-7 Port Literal Values

Literal	TCP or UDP?	Value	Description
aol	TCP	5190	America Online
bgp	TCP	179	Border Gateway Protocol, RFC 1163
biff	UDP	512	Used by mail system to notify users that new mail is received
bootpc	UDP	68	Bootstrap Protocol Client
bootps	UDP	67	Bootstrap Protocol Server
chargen	TCP	19	Character Generator
citrix-ica	TCP	1494	Citrix Independent Computing Architecture (ICA) protocol
cmd	TCP	514	Similar to **exec** except that **cmd** has automatic authentication
ctiqbe	TCP	2748	Computer Telephony Interface Quick Buffer Encoding
daytime	TCP	13	Day time, RFC 867
discard	TCP, UDP	9	Discard
domain	TCP, UDP	53	DNS
dnsix	UDP	195	DNSIX Session Management Module Audit Redirector
echo	TCP, UDP	7	Echo
exec	TCP	512	Remote process execution
finger	TCP	79	Finger
ftp	TCP	21	File Transfer Protocol (control port)
ftp-data	TCP	20	File Transfer Protocol (data port)
gopher	TCP	70	Gopher
https	TCP	443	HTTP over SSL
h323	TCP	1720	H.323 call signalling
hostname	TCP	101	NIC Host Name Server
ident	TCP	113	Ident authentication service
imap4	TCP	143	Internet Message Access Protocol, version 4
irc	TCP	194	Internet Relay Chat protocol
isakmp	UDP	500	Internet Security Association and Key Management Protocol
kerberos	TCP, UDP	750	Kerberos

Table 50-7 Port Literal Values (continued)

Literal	TCP or UDP?	Value	Description
klogin	TCP	543	KLOGIN
kshell	TCP	544	Korn Shell
ldap	TCP	389	Lightweight Directory Access Protocol
ldaps	TCP	636	Lightweight Directory Access Protocol (SSL)
lpd	TCP	515	Line Printer Daemon - printer spooler
login	TCP	513	Remote login
lotusnotes	TCP	1352	IBM Lotus Notes
mobile-ip	UDP	434	MobileIP-Agent
nameserver	UDP	42	Host Name Server
netbios-ns	UDP	137	NetBIOS Name Service
netbios-dgm	UDP	138	NetBIOS Datagram Service
netbios-ssn	TCP	139	NetBIOS Session Service
nntp	TCP	119	Network News Transfer Protocol
ntp	UDP	123	Network Time Protocol
pcanywhere-status	UDP	5632	pcAnywhere status
pcanywhere-data	TCP	5631	pcAnywhere data
pim-auto-rp	TCP, UDP	496	Protocol Independent Multicast, reverse path flooding, dense mode
pop2	TCP	109	Post Office Protocol - Version 2
pop3	TCP	110	Post Office Protocol - Version 3
pptp	TCP	1723	Point-to-Point Tunneling Protocol
radius	UDP	1645	Remote Authentication Dial-In User Service
radius-acct	UDP	1646	Remote Authentication Dial-In User Service (accounting)
rip	UDP	520	Routing Information Protocol
secureid-udp	UDP	5510	SecureID over UDP
smtp	TCP	25	Simple Mail Transport Protocol
snmp	UDP	161	Simple Network Management Protocol
snmptrap	UDP	162	Simple Network Management Protocol - Trap
sqlnet	TCP	1521	Structured Query Language Network
ssh	TCP	22	Secure Shell
sunrpc (rpc)	TCP, UDP	111	Sun Remote Procedure Call
syslog	UDP	514	System Log
tacacs	TCP, UDP	49	Terminal Access Controller Access Control System Plus
talk	TCP, UDP	517	Talk
telnet	TCP	23	RFC 854 Telnet

Table 50-7 Port Literal Values (continued)

Literal	TCP or UDP?	Value	Description
tftp	UDP	69	Trivial File Transfer Protocol
time	UDP	37	Time
uucp	TCP	540	UNIX-to-UNIX Copy Program
who	UDP	513	Who
whois	TCP	43	Who Is
www	TCP	80	World Wide Web
xdmcp	UDP	177	X Display Manager Control Protocol

Local Ports and Protocols

Table 50-8 lists the protocols, TCP ports, and UDP ports that the ASA may open to process traffic destined to the ASA. Unless you enable the features and services listed in Table 50-8, the ASA does *not* open any local protocols or any TCP or UDP ports. You must configure a feature or service for the ASA to open the default listening protocol or port. In many cases you can configure ports other than the default port when you enable a feature or service.

Table 50-8 Protocols and Ports Opened by Features and Services

Feature or Service	Protocol	Port Number	Comments
DHCP	UDP	67,68	—
Failover Control	105	N/A	—
HTTP	TCP	80	—
HTTPS	TCP	443	—
ICMP	1	N/A	—
IGMP	2	N/A	Protocol only open on destination IP address 224.0.0.1
ISAKMP/IKE	UDP	500	Configurable.
IPsec (ESP)	50	N/A	—
IPsec over UDP (NAT-T)	UDP	4500	—
IPsec over UDP (Cisco VPN 3000 Series compatible)	UDP	10000	Configurable.
IPsec over TCP (CTCP)	TCP	—	No default port is used. You must specify the port number when configuring IPsec over TCP.
NTP	UDP	123	—
OSPF	89	N/A	Protocol only open on destination IP address 224.0.0.5 and 224.0.0.6

Table 50-8 Protocols and Ports Opened by Features and Services (continued)

Feature or Service	Protocol	Port Number	Comments
PIM	103	N/A	Protocol only open on destination IP address 224.0.0.13
RIP	UDP	520	—
RIPv2	UDP	520	Port only open on destination IP address 224.0.0.9
SNMP	UDP	161	Configurable.
SSH	TCP	22	—
Stateful Update	8 (non-secure) 9 (secure)	N/A	—
Telnet	TCP	23	—
VPN Load Balancing	UDP	9023	Configurable.
VPN Individual User Authentication Proxy	UDP	1645, 1646	Port accessible only over VPN tunnel.

ICMP Types

Table 50-9 lists the ICMP type numbers and names that you can enter in ASA commands.

Table 50-9 ICMP Types

ICMP Number	ICMP Name
0	echo-reply
3	unreachable
4	source-quench
5	redirect
6	alternate-address
8	echo
9	router-advertisement
10	router-solicitation
11	time-exceeded
12	parameter-problem
13	timestamp-request
14	timestamp-reply
15	information-request
16	information-reply
17	mask-request
18	mask-reply

Table 50-9 ICMP Types (continued)

ICMP Number	ICMP Name
31	conversion-error
32	mobile-redirect