



Port to Application Mapping Commands

This chapter describes the commands used to configure Port to Application Mapping (PAM). PAM allows you to customize TCP or User Datagram Protocol (UDP) port numbers for network services or applications. PAM uses this information to support network environments that run services using ports that are different from the registered or well-known ports associated with an application.

For information on how to configure PAM, refer to the “Configuring Port to Application Mapping” chapter in the *Cisco IOS Security Configuration Guide*. For configuration examples using the commands in this chapter, refer to the “PAM Configuration Examples” section located at the end of the “Configuring Port to Application Mapping” chapter in the *Cisco IOS Security Configuration Guide*.

ip port-map

To establish Port to Application Mapping (PAM), use the **ip port-map** global configuration command. To delete user-defined PAM entries, use the **no** form of this command.

```
ip port-map appl_name port port_num [list acl_num]
```

```
no ip port-map appl_name port port_num [list acl_num]
```

Syntax Description

<i>appl_name</i>	Specifies the name of the application with which to apply the port mapping.
port	Indicates that a port number maps to the application.
<i>port_num</i>	Identifies a port number in the range 1 to 65535.
list	(Optional) Indicates that the port mapping information applies to a specific host or subnet.
<i>acl_num</i>	(Optional) Identifies the standard access control list (ACL) number used with PAM.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

The **ip port-map** command associates TCP or User Datagram Protocol port numbers with applications or services, establishing a table of default port mapping information at the firewall. This information is used to support network environments that run services using ports that are different from the registered or well-known ports associated with a service or application.

The port mapping information in the PAM table is of one of three types:

- System-defined
- User-defined
- Host-specific

System-Defined Port Mapping

Initially, PAM creates a set of system-defined entries in the mapping table using well-known or registered port mapping information set up during the system start-up. The Cisco IOS Firewall Context-based Access Control feature requires the system-defined mapping information to function properly. System-defined mapping information cannot be deleted or changed; that is, you cannot map HTTP services to port 21 (FTP) or FTP services to port 80 (HTTP).

[Table 23](#) lists the default system-defined services and applications in the PAM table.

Table 23 System-Defined Port Mapping

Application Name	Well-Known or Registered Port Number	Protocol Description
cuseeme	7648	CU-SeeMe Protocol
exec	512	Remote Process Execution
ftp	21	File Transfer Protocol (control port)
http	80	Hypertext Transfer Protocol
h323	1720	H.323 Protocol (for example, MS NetMeeting, Intel Video Phone)
login	513	Remote login
msrpc	135	Microsoft Remote Procedure Call
netshow	1755	Microsoft NetShow
real-audio-video	7070	RealAudio and RealVideo
smtp	25	Simple Mail Transfer Protocol
sql-net	1521	SQL-NET
streamworks	1558	StreamWorks Protocol
sunrpc	111	SUN Remote Procedure Call
tftp	69	Trivial File Transfer Protocol
vdolive	7000	VDOLive Protocol

**Note**

You can override the system-defined entries for a specific host or subnet using the **list** option in the **ip port-map** command.

User-Defined Port Mapping

Network applications that use non-standard ports require user-defined entries in the mapping table. Use the **ip port-map** command to create default user-defined entries in the PAM table.

To map a range of port numbers with a service or application, you must create a separate entry for each port number.

**Note**

If you try to map an application to a system-defined port, a message appears warning you of a mapping conflict.

Use the **no** form of the **ip port-map** command to delete user-defined entries from the PAM table.

To overwrite an existing user-defined port mapping, use the **ip port-map** command to associate another service or application with the specific port.

Host-Specific Port Mapping

User-defined entries in the mapping table can include host-specific mapping information, which establishes port mapping information for specific hosts or subnets. In some environments, it might be necessary to override the default port mapping information for a specific host or subnet, including a system-defined default port mapping information. Use the **list** option for the **ip port-map** command to specify an ACL for a host or subnet that uses PAM.



Note

If the host-specific port mapping information is the same as existing system-defined or user-defined default entries, host-specific port changes have no effect.

Examples

The following example provides examples for adding and removing user-defined PAM configuration entries at the firewall.

In the following example, non-standard port 8000 is established as the user-defined default port for HTTP services:

```
ip port-map http port 8000
```

The following example shows PAM entries establish a range of non-standard ports for HTTP services:

```
ip port-map http 8001
ip port-map http 8002
ip port-map http 8003
ip port-map http 8004
```

In the following example the command fails because it tries to map port 21, which is the system-defined default port for FTP, with HTTP:

```
ip port-map http port 21
```

In the following example, a specific host uses port 8000 for FTP services. ACL 10 identifies the server address (192.168.32.43), while port 8000 is mapped with FTP services:

```
access-list 10 permit 192.168.32.43
ip port-map ftp port 8000 list 10
```

In the following example, port 21, which is normally reserved for FTP services, is mapped to the RealAudio application for the hosts in list 10. In this configuration, hosts in list 10 do not recognize FTP activity on port 21.

```
ip port-map realaudio port 21 list 10
```

In the following example, the **ip port-map** command fails and generates an error message:

```
ip port-map netshow port 21
Command fail: the port 21 has already been defined for ftp by the system.
             No change can be made to the system defined port mappings.
```

The **no** form of this command deletes user-defined entries from the PAM table. It has no effect on the system-defined port mappings. This command deletes the host-specific port mapping of FTP.

```
no ip port-map ftp port 1022 list 10
```

In the following example, the command fails because it tries to delete the system-defined default port for HTTP:

```
no ip port-map http port 80
```

In the following example, a specific host uses port 8000 for FTP services. ACL 10 identifies the server address (192.168.32.43), while port 8000 is mapped with FTP services.

```
access-list 10 permit 192.168.32.43
ip port-map ftp port 8000 list 10
```

In the following example, a specific subnet runs HTTP services on port 8080. ACL 50 identifies the subnet, while the PAM entry maps port 8080 with HTTP services.

```
access-list 50 permit 192.168.92.0
ip port-map http 8080 list 50
```

In the following example, a specific host runs HTTP services on port 25, which is the system-defined port number for SMTP services. This requires a host-specific PAM entry that overrides the system-defined default port mapping for HTTP, which is port 80. ACL 15 identifies the host address (192.168.33.43), while port 25 is mapped with HTTP services.

```
access-list 15 permit 192.168.33.43
ip port-map http port 25 list 15
```

In the following example, the same port number is required by different services running on different hosts. Port 8000 is required for HTTP services by host 192.168.3.4, while port 8000 is required for Telnet services by host 192.168.5.6. ACL 10 and ACL 20 identify the specific hosts, while PAM maps the ports with the services for each ACL.

```
access-list 10 permit 192.168.3.4
access-list 20 permit 192.168.5.6
ip port-map http port 8000 list 10
ip port-map http ftp 8000 list 20
```

Related Commands

Command	Description
<code>show ip port-map</code>	Displays the PAM information.

show ip port-map

To display the Port to Application Mapping (PAM) information, use the **show ip port-map** privileged EXEC command.

```
show ip port-map [appl_name | port port_num]
```

Syntax Description		
<i>appl_name</i>	(Optional) Specifies the name of the application to which to apply the port mapping.	
port <i>port_num</i>	(Optional) Specifies the alternative port number that maps to the application.	

Command Modes	Privileged EXEC
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Command History	Release	Modification
	12.0(5)T	This command was introduced.

Usage Guidelines	Use this command to display the port mapping information at the firewall, including the system-defined and user-defined information. Include the application name to display the list of entries by application. Include the port number to display the entries by port.
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Examples	The following is sample output for the show ip port-map command, including system-defined mapping information:
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```
Router# show ip port-map

Default mapping: vdolive          port 7000          system defined
Default mapping: sunrpc           port 111           system defined
Default mapping: netshow          port 1755          system defined
Default mapping: cuseeme          port 7648          system defined
Default mapping: tftp             port 69            system defined
Default mapping: real-audio-video port 7070          system defined
Default mapping: streamworks      port 1558          system defined
Default mapping: ftp              port 21            system defined
Default mapping: h323             port 1720          system defined
Default mapping: smtp             port 25            system defined
Default mapping: http             port 80            system defined
Default mapping: msrpc            port 135           system defined
Default mapping: exec             port 512           system defined
Default mapping: login            port 513           system defined
Default mapping: sql-net          port 1521          system defined
Default mapping: tftp             port 70            user defined
Host specific:  ftp               port 1000         in list 10       user defined
Host specific:  netshow           port 70           in list 10       user defined
Host specific:  smtp              port 70           in list 50       user defined
```

The following example shows the port mapping information for file transfer protocol services:

```
show ip port-map ftp
Default mapping: ftp          port 21          system defined
Host specific:  ftp          port 1000   in list 10   user defined
```

The following example shows the ports associated with the NetShow application, including both the default and host-specific port mapping information:

```
show ip port-map netshow
Default mapping: netshow     port 1755         system defined
Host specific:  netshow     port 21          in list 10       user defined
```

The following example shows the applications associated with port 69, including both the default and host-specific port mapping information:

```
show ip port-map port 69
Default mapping: tftp        port 69          user defined
Host specific:  netshow     port 69          in list 50       user defined
Host specific:  smtp        port 69          in list 10       user defined
```

Related Commands

Command	Description
ip port-map	Establishes PAM.

■ show ip port-map