Firewall Authentication Proxy for FTP and Telnet Sessions

Before the introduction of the Firewall Authentication Proxy for FTP and Telnet Sessions feature, users could enable only HTTP when configuring authentication proxy. This feature introduces support for FTP and Telnet, providing users with three protocol options when configuring authentication proxy.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Restrictions for Firewall Authentication Proxy for FTP and Telnet Sessions

- Authentication proxy is an IP-only feature; thus, it comes with only -o3 images.

- "proxyacl#<n>" is the only supported attribute in the authentication, authorization, and accounting (AAA) server's user configuration.
- Authentication proxy is subjected only to the traffic that passes through the router; traffic that is destined for the router continues to be authenticated by the existing authentication methods that are provided by Cisco IOS.

Information About Firewall Authentication Proxy for FTP and Telnet Sessions

Feature Design for FTP and Telnet Authentication Proxy

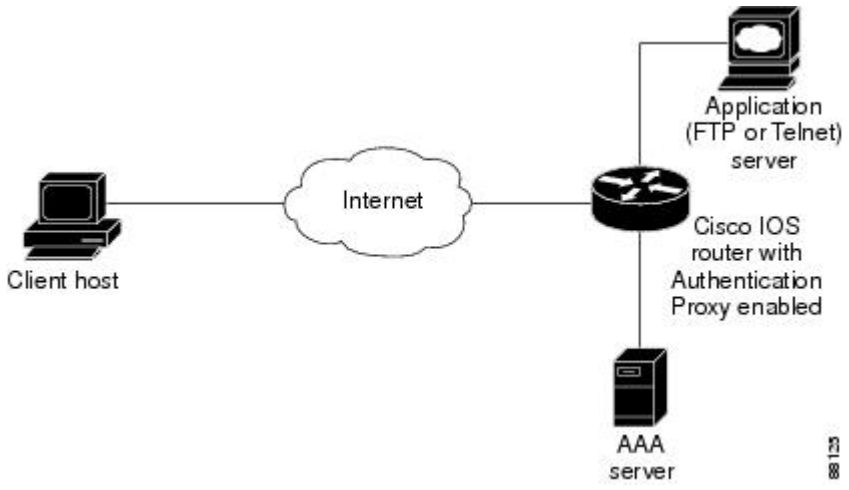
Authentication proxy for FTP and Telnet Sessions functions like authentication proxy for HTTP; that is, FTP and Telnet are independent components in the Cisco IOS software and can be enabled or disabled on the interface of an unauthenticated host.

Many of the authentication proxy for FTP or Telnet functions are similar to those used with HTTP, such as the interaction between the authentication proxy router and the AAA server during authentication. However, because of protocol differences, FTP and Telnet login methods are different from HTTP.

FTP and Telnet Login Methods

The figure below displays a typical authentication proxy topology.

Figure 1: Typical Authentication Proxy Topology



Just as with HTTP, the authentication proxy router intercepts traffic that is sent from the client host. Upon receiving a FTP or Telnet packet, the router will look into its authentication cache to check whether the client host has already been authenticated. If it has been authenticated, the router will forward the client host's traffic to the FTP or Telnet server for additional authentication. If the IP address of the client host is not in the cache

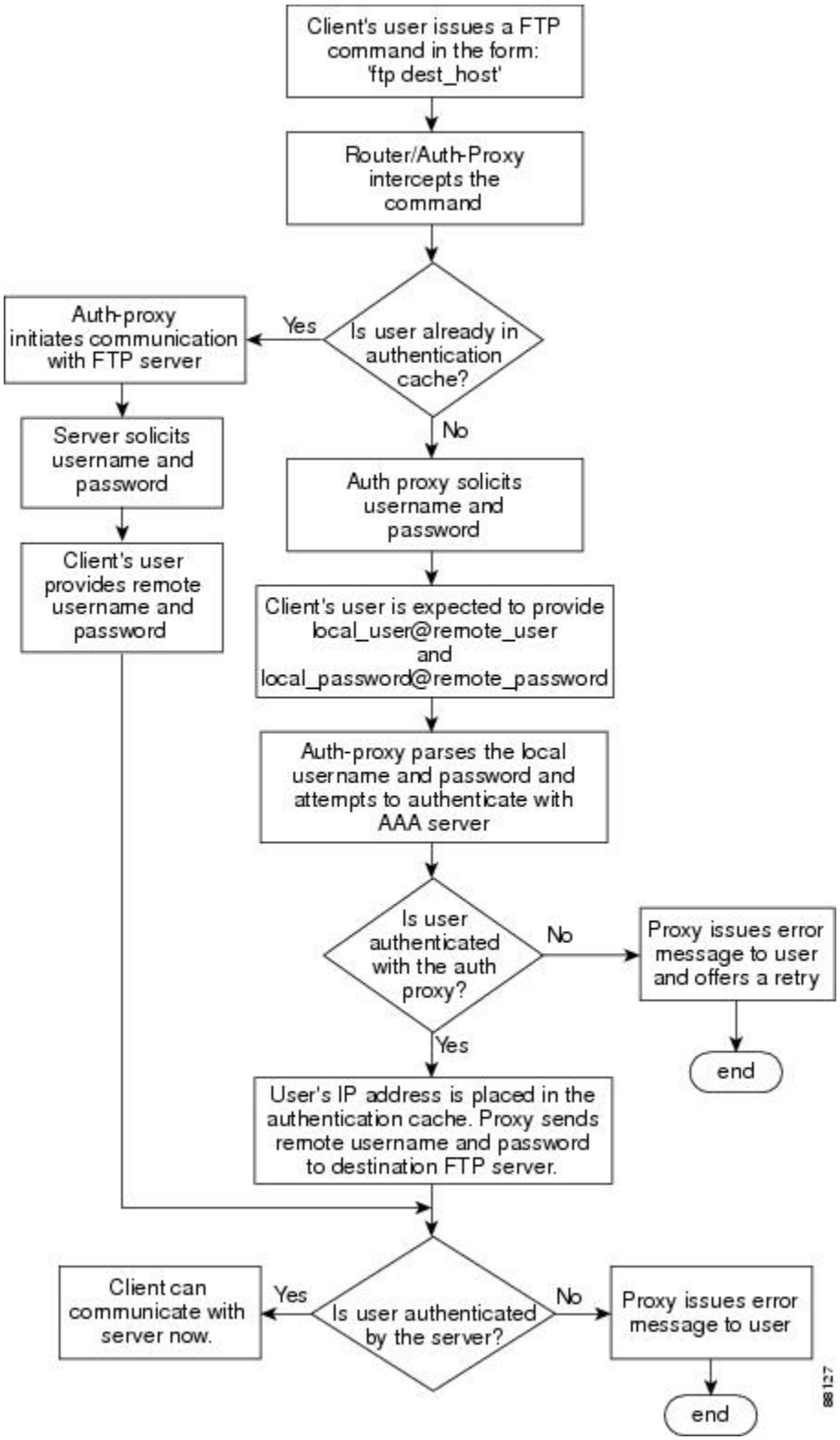
of the router, the router will try to authenticate the client host with the AAA server using the username and password of the router.

FTP Login

For FTP login, the client host will be prompted (by the authentication proxy router) for the username and password of the router; the client must respond with the username and password in the following format: “login: proxy_username@ftp_username” and “password: proxy_passwd@ftp_passwd :”. The authentication proxy will use the proxy username and password to verify the client’s profile against the AAA server’s user database. After the client is successfully authenticated with the AAA server, the authentication proxy will pass the FTP (remote) username and password to the FTP server (destination server) for the application server authentication.

A flow chart that depicts an overview of the FTP authentication proxy process is shown in the figure below.

Figure 2: FTP Authentication Proxy Overview

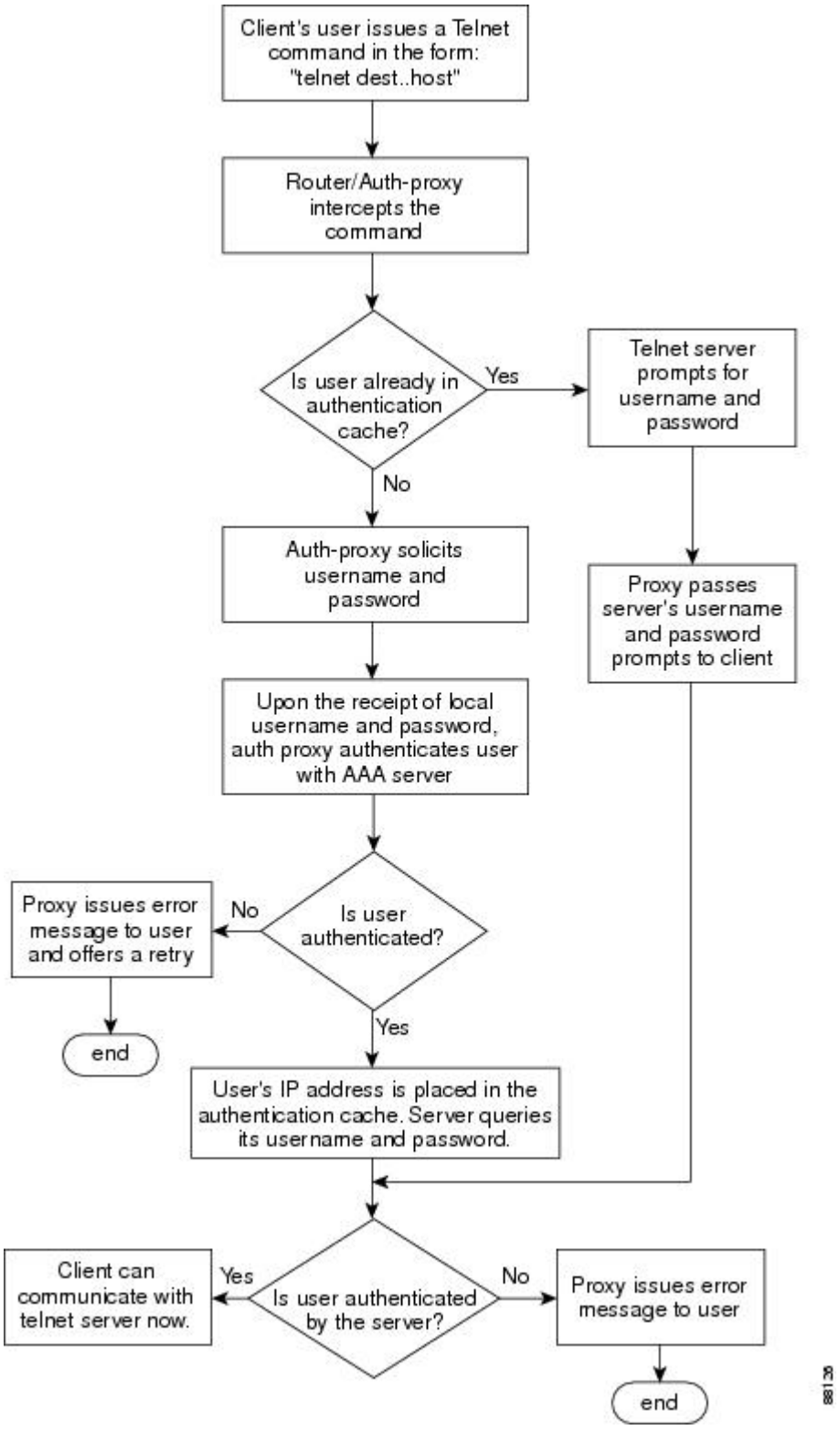

Client's user issues a FTP command in the form: 'ftp dest_host'
Router/Auth-Proxy intercepts the command
Is user already in authentication cache?
Yes
Auth-proxy initiates communication with FTP server
Server solicits username and password
Client's user provides remote username and password
No
Auth proxy solicits username and password
Client's user is expected to provide local_user@remote_user and local_password@remote_password
Auth-proxy parses the local username and password and attempts to authenticate with AAA server
Is user authenticated with the auth proxy?
No
Proxy issues error message to user and offers a retry
end
Yes
User's IP address is placed in the authentication cache. Proxy sends remote username and password to destination FTP server.
Is user authenticated by the server?
Yes
Client can communicate with server now.
No
Proxy issues error message to user
end
88127

Telnet Login

For Telnet login, the client host will be prompted (by the authentication proxy router) for the username, followed by the password; the client must respond with the username and password in the following format: “login: proxy_username:” and “password: proxy_passwd):”. The username and password will be verified against the AAA server’s user database. After the client is successfully authenticated with the AAA server, the Telnet server (destination server) will prompt the client for the username and password of the Telnet server.

A flow chart that depicts an overview of the Telnet authentication proxy process is shown in the figure below.

Figure 3: Telnet Authentication Proxy Overview



If authentication with the AAA server fails, the proxy will inform the client accordingly. With Telnet, the proxy does not have any interest in the Telnet server's username and password. If the client is authenticated

with the AAA server but fails with the Telnet server, the client will not have to authenticate with the AAA server the next time he or she logs into the network; the client's IP address will be stored in the authentication cache. The client will have to authenticate only with the Telnet server.

Note With FTP, the client must always reenter the local and remote username and password combination every time he or she tries to log into the network--regardless of a successful AAA server authentication.

Absolute Timeout

An absolute timeout value has been added to allow users to configure a window during which the authentication proxy on the enabled interface is active. After the absolute timer expires, the authentication proxy will be disabled regardless of any activity. The absolute timeout value can be configured per protocol (through the **ip auth-proxy name** command) or globally (through the **ip auth-proxy** command). The default value of the absolute timeout is zero; that is, the absolute timer is turned off by default, and the authentication proxy is enabled indefinitely and is subject only to the timeout specified by the **inactivity-timer**keyword.

Note The **inactivity-timer**keyword deprecates the **auth-cache-time** keyword in the **ip auth-proxy name** and the **ip auth-proxy** commands.

How to Configure FTP or Telnet Authentication Proxy

Configuring AAA

You must configure the authentication proxy for AAA services. To enable authorization and define the authorization methods, complete the following steps:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **aaa new-model**
4. **aaa authentication login default** *method1*[*method2*]
5. **aaa authorization auth-proxy default**
6. **aaa accounting auth-proxy default start-stop group tacacs+**
7. **tacacs-server host** *hostname*
8. **tacacs-server key** *key*
9. **access-list** *access-list-number*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**aaa new-model** **Example:** `Device(config)# aaa new-model`	Enables the AAA functionality on the device.
Step 4	**aaa authentication login default** *method1*[*method2*] **Example:** `Device(config)# aaa authentication login default TACACS+ RADIUS`	Defines the list of authentication methods at login.
Step 5	**aaa authorization auth-proxy default** **Example:** `Device(config)# aaa authorization auth-proxy default`	The **auth-proxy** keyword enables authentication proxy for AAA methods.
Step 6	**aaa accounting auth-proxy default start-stop group tacacs+** **Example:** `Device(config)# aaa accounting auth-proxy default start-stop group tacacs+`	Activates authentication proxy accounting. The **auth-proxy** keyword sets up the authorization policy as dynamic ACLs that can be downloaded.
Step 7	**tacacs-server host** *hostname* **Example:** `Device(config)# tacacs-server host host1`	Specifies an AAA server. For RADIUS servers, use the **radius server host** command.
Step 8	**tacacs-server key** *key* **Example:** `Device(config)# tacacs-server key key1`	Sets the authentication and encryption key for communications between the device and the AAA server. For RADIUS servers use the **radius server key** command.

	Command or Action	Purpose
Step 9	**access-list** *access-list-number* **Example:** `Device(config)# access-list accesslist1`	Creates an ACL entry to allow the AAA server to return traffic to the firewall.

What to Do Next

In addition to configuring AAA on the firewall device, the authentication proxy requires a per-user access profile configuration on the AAA server. To support the authentication proxy, configure the AAA authorization service **auth-proxy** on the AAA server as outlined here:

- Define a separate section of authorization for the **auth-proxy** keyword to specify the downloadable user profiles. This keyword does not interfere with other type of services, such as EXEC. The following example shows a user profile on a TACACS server:

```
default authorization = permit
key = cisco
user = newuser1 {
login = cleartext cisco
service = auth-proxy
{
priv-lvl=15
proxyacl#1="permit tcp any any eq 26"
proxyacl#2="permit icmp any host 10.0.0.2"
proxyacl#3="permit tcp any any eq ftp"
proxyacl#4="permit tcp any any eq ftp-data"
proxyacl#5="permit tcp any any eq smtp"
proxyacl#6="permit tcp any any eq telnet"
}
}
```

- The only supported attribute in the AAA server user configuration is proxyacl#n.Use the proxyacl#n attribute when configuring the access lists in the profile. The attribute proxyacl#n is for both RADIUS and TACACS+ attribute-value (AV) pairs.
- The privilege level must be set to 15 for all users.
- The access lists in the user profile on the AAA server must have access commands that contain only the **permit**keyword.
- Set the source address to the **any**keyword in each of the user profile access list entries. The source address in the access lists is replaced with the source address of the host making the authentication proxy request when the user profile is downloaded to the firewall.
- The supported AAA servers are:
  - CiscoSecure ACS 2.1.x for Windows NT
  - CiscoSecure ACS 2.3 for Windows NT
  - CiscoSecure ACS 2.2.4 for UNIX
  - CiscoSecure ACS 2.3 for UNIX
  - TACACS+ server (vF4.02.alpha)

- Ascend RADIUS server radius-980618 (required attribute-value pair patch)
- Livingston RADIUS server (v1.16)

What to Do Next

Ensure that your FTP or Telnet server is enabled and that the user credentials of the client (the username and password) are stored in the server's database.

Configuring the Authentication Proxy

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip auth-proxy auth-cache-time** *min*
4. **ip auth-proxy auth-proxy-banner**
5. **ip auth-proxy name** *auth-proxy-name* **http** [**auth-cache-time** *min*] [**list** {*acl acl-name*}]
6. **interface** *type number*
7. **ip auth-proxy** *auth-proxy-name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ip auth-proxy auth-cache-time** *min* **Example:** `Device(config)# ip auth-proxy auth-cache-time 5`	(Optional) Sets the global authentication proxy idle timeout value in minutes.
Step 4	**ip auth-proxy auth-proxy-banner** **Example:** `Device(config)# ip auth-proxy auth-proxy-banner`	(Optional) Displays the name of the firewall router in the authentication proxy login page. The banner is disabled by default.

	Command or Action	Purpose
Step 5	**ip auth-proxy name** *auth-proxy-name* **http** [**auth-cache-time** *min*] [**list** {*acl acl-name*}] **Example:** `Device(config)# ip auth-proxy name HQ_users http`	Creates authentication proxy rules.
Step 6	**interface** *type number* **Example:** `Device(config)# interface Ethernet0/0`	Enters interface configuration mode by specifying the interface type and number on which to apply the authentication proxy.
Step 7	**ip auth-proxy** *auth-proxy-name* **Example:** `Device(config-if)# ip auth-proxy HQ_users http`	Applies the named authentication proxy rule at the interface.

Verifying FTP or Telnet Authentication Proxy

To verify your FTP or Telnet authentication proxy configuration, perform the following optional steps:

SUMMARY STEPS

1. **enable**
2. **show ip auth-proxy configuration**
3. show ip auth-proxy cache

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables higher privilege levels, such as privileged EXEC mode. Enter your password if prompted.

Step 2	**show ip auth-proxy configuration**
	
	Example:
	
	`Router#`
	`show ip auth-proxy configuration`
		Displays the current authentication proxy configuration.

	Command or Action	Purpose

Step 3	show ip auth-proxy cache
	
	Example:
	
	`Router#`
	`show ip auth-proxy cache`
		Displays the list of user authentication entries.
		
		The authentication proxy cache lists the host IP address, the source port number, the timeout value for the authentication proxy, and the state of the connection. If the authentication proxy state is ESTAB or INTERCEPT, the user authentication was successful.

Monitoring and Maintaining FTP or Telnet Authentication Proxy Sessions

To monitor FTP or Telnet authentication proxy sessions, perform the following optional steps:

SUMMARY STEPS

1. **enable**
2. **debug ip auth-proxy detailed** | **ftp** | **function-trace** | **object-creation** | **object-deletion** | **telnet** | **timers**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables higher privilege levels, such as privileged EXEC mode. Enter your password if prompted.

Step 2	**debug ip auth-proxy detailed** | **ftp** | **function-trace** | **object-creation** | **object-deletion** | **telnet** | **timers**
	
	Example:
	
	`Router#`
	`debug ip auth-proxy ftp`
		Displays the authentication proxy configuration information on the router.

Configuration Examples for FTP and Telnet Authentication Proxy

Authentication Proxy Configuration Example

The following example shows how to configure your router for authentication proxy:

```
aaa new-model
aaa authentication login default group tacacs+
aaa authorization exec default group tacacs+
aaa authorization auth-proxy default group tacacs+
enable password lab
!
ip inspect name pxy_test ftp
ip auth-proxy name pxy auth-cache-time 1
!
interface Ethernet0/0
 ip address 209.165.200.225 255.255.255.224
 ip access-group 105 in
 no ip directed-broadcast
 ip inspect pxy_test in
 ip auth-proxy pxy
 no shut
!
interface Ethernet0/1
 ip address 209.165.200.225 255.255.255.224
 ip access-group 102 in
 no ip directed-broadcast
no shut
!
ip http authentication aaa
!
access-list 102 permit any
access-list 102 permit tcp host 209.165.200.234 eq tacacs any
access-list 102 deny   tcp any any
access-list 102 deny   udp any any
access-list 102 permit ip any any
access-list 105 permit tcp any any eq www
access-list 105 permit ip any any
access-list 105 deny   tcp any any
access-list 105 deny   udp any any
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
!
tacacs-server host 209.165.200.234
tacacs-server key cisco
!
line con 0
 transport input none
 login authentication special
line aux 0
line vty 0 4
 password lab
```

AAA Server User Profile Examples

This section includes examples of the authentication proxy user profile entries on the AAA servers. The “proxyacl” entries define the user access privileges. After the user has successfully used the authentication proxy to log in, these entries are transferred to the firewall router. Each entry in the profile must specify “permit” access for the service or application. The source address in each entry is set to “any”, which is replaced

with the IP address of the authenticating host when the profile is downloaded to the firewall. The privilege level must be set to 15 for all AAA users.

TACACS+ User Profiles Example

The following example are sample TACACS+ user profiles:

```
default authorization = permit
key = cisco
user = http_1 {
  default service = permit
       login = cleartext test
          service = exec
         {
                  priv-lvl = 15
                  inacl#4="permit tcp any host 209.165.200.234 eq 23"
                  inacl#5="permit tcp any host 209.165.200.234 eq 20"
                  inacl#6="permit tcp any host 209.165.200.234 eq 21"
                  inacl#3="deny -1"

         }
       service = auth-proxy
           {
               priv-lvl=15
               proxyacl#4="permit tcp any host 209.165.201.1 eq 23"
               proxyacl#5="permit tcp any host 209.165.201.1 eq 20"
               proxyacl#6="permit tcp any host 209.165.201.1 eq 21"
               proxyacl#7="permit tcp any host 209.165.201.1 eq 25"
           }

}
user = http {
           login = cleartext test
       service = auth-proxy
           {
               priv-lvl=15
               proxyacl#4="permit tcp any host 209.165.201.1 eq 23"
               proxyacl#5="permit tcp any host 209.165.201.1 eq 20"
               proxyacl#6="permit tcp any host 209.165.201.1 eq 21"
           }
}
 user = proxy_1 {
           login = cleartext test
       service = auth-proxy
           {
               priv-lvl=14
         }
}

user = proxy_3 {
           login = cleartext test
       service = auth-proxy
           {
               priv-lvl=15
         }
}
```

Livingston RADIUS User Profiles Example

The following examples are sample user profiles for the Livingston RADIUS server:

```
#--------------- Proxy user ---------------------------------

http                    Password = "test" User-Service-Type=Outbound-User
```

```
       cisco-avpair = “auth-proxy:priv-lvl=15”,
       cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq 23”

http_1                    Password = “test”
         User-Service-Type = Shell-User,
         User-Service-Type=Dialout-Framed-User,
         cisco-avpair = “shell:priv-lvl=15”,
         cisco-avpair = “shell:inacl#4=permit tcp any host 209.165.200.234
eq 23
         cisco-avpair = “auth-proxy:priv-lvl=15”,
         cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq 23”


http_fail               Password = “test” User-Service-Type=Outbound-User
       cisco-avpair = “auth-proxy:priv-lvl=14”,
       cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq 23”

proxy  Password = “cisco” User-Service-Type=Outbound-User       cisco-avpair =
“auth-proxy:proxyacl#4=permit tcp any any eq 20”
```

Ascend RADIUS User Profiles Example

The following examples are sample user profiles for the Ascend RADIUS server:

```
#--------------- Proxy user ---------------------------------

http                   Password = “test” User-Service=Dialout-Framed-User
       cisco-avpair = “auth-proxy:priv-lvl=15”,
       cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq 23”

http_2                   Password = “test”
User-Service=Dialout-Framed-User
       cisco-avpair = “auth-proxy:priv-lvl=15”,
       cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq 23”,
       cisco-avpair = “shell:inacl#4=permit tcp any host 209.165.200.234 eq 25”

http_1                    Password = “test”
         User-Service=Dialout-Framed-User,
         cisco-avpair = “shell:inacl#4=permit tcp any host 209.165.200.234 eq 23”,
         cisco-avpair = “auth-proxy:priv-lvl=15”,
         cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq 23”

http_fail               Password = “test” User-Service=Dialout-Framed-User
       cisco-avpair = “auth-proxy:priv-lvl=14”,
       cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq 23”

        cisco-avpair = “auth-proxy:proxyacl#1=permit tcp any any eq 23”,
       cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq ftp”,
       cisco-avpair = “auth-proxy:proxyacl#4=permit tcp any any eq 20”


#-------------------------------------------------------------
proxy Password = “cisco” User-Service = Dialout-Framed-User

       cisco-avpair = “auth-proxy:priv-lvl=15”,
       cisco-avpair = “auth-proxy:priv-lvl=15”,
       cisco-avpair = “auth-proxy:proxyacl#1=permit tcp any any eq 26”,
       cisco-avpair = “auth-proxy:proxyacl#3=permit tcp any any eq ftp”,
```

Additional References

The following sections provide references related to the Firewall Authentication Proxy for FTP and Telnet Sessions feature.

Related Documents

Related Topic	Document Title
Additional authentication proxy configuration tasks	Configuring Authentication Proxy
Additional authentication proxy commands	*Cisco IOS Security Command Reference*
RADIUS and TACACS+ configuration information	Configuring RADIUS and Configuring TACACS+
RADIUS and TACACS+ attribute information	RADIUS Attributes Overview and RADIUS IETF Attributes and TACACS+ Attribute-Value Pairs
Additional authentication proxy information	Firewall Support of HTTPS Authentication Proxy

Standards

Standards	Title
None	--

MIBs

MIBs	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
None	--

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for Firewall Authentication Proxy for FTP and Telnet Session

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Firewall Authentication Proxy for FTP and Telnet Sessions

Feature Name	Releases	Feature Information
Firewall Authentication Proxy for FTP and Telnet Sessions	12.3(1)	Before the introduction of the Firewall Authentication Proxy for FTP and Telnet Sessions feature, users could enable only HTTP when configuring authentication proxy. This feature introduces support for FTP and Telnet, providing users with three protocol options when configuring authentication proxy. This feature was introduced in Cisco IOS Release 12.3(1). The following commands were introduced or modified: **debug ip auth-proxy**, **ip auth-proxy**, **ip auth-proxy auth-proxy-banner**, **ip auth-proxy name.**