

Debug Authentications

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Introduction

Wireless communication uses authentication in many ways. The most common authentication type is Extensible Authentication Protocol (EAP) in different types and forms. Other authentication types include MAC address authentication and administrative authentication. This document describes how to debug and interpret the output from debug authentications. The information from these debugs is invaluable when you troubleshoot wireless installations.

Note: The portions of this document that refer to non–Cisco products are based on the experience of the author, not on formal training. They are intended for your convenience and not as technical support. For authoritative technical support on non–Cisco products, contact the technical support for that product.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Authentication as it relates to wireless networks
- Cisco IOS[®] software command–line interface (CLI)
- RADIUS server configuration

Components Used

The information in this document is based on these software and hardware versions:

- Cisco IOS software–based wireless products of any model and version
- Hilgraeve HyperTerminal

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Capture Debugs

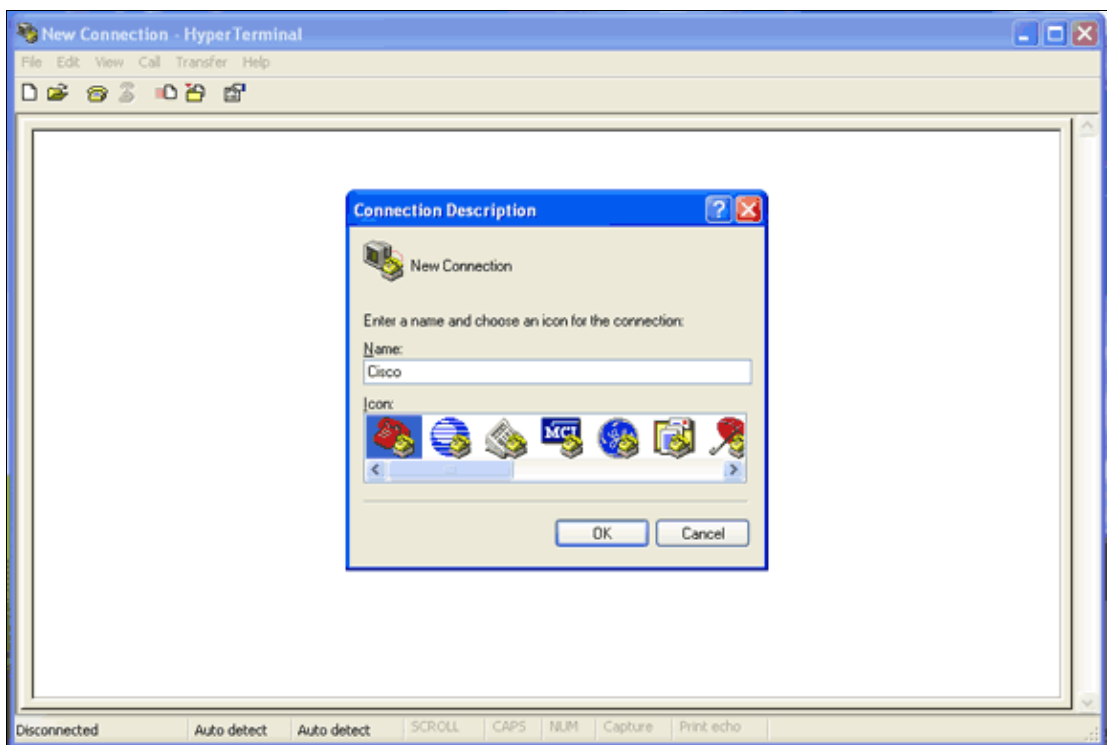
If you cannot capture and analyze debug information, the information is useless. The easiest way to capture this data is with a screen-capture function that is built into the Telnet or communications application.

This example describes how to capture output with the Hilgraeve HyperTerminal application. Most Microsoft Windows operating systems include HyperTerminal, but you can apply the concepts to any terminal emulation application. For more complete information on the application, refer to Hilgraeve .

Complete these steps in order to configure HyperTerminal to communicate with your access point (AP) or bridge:

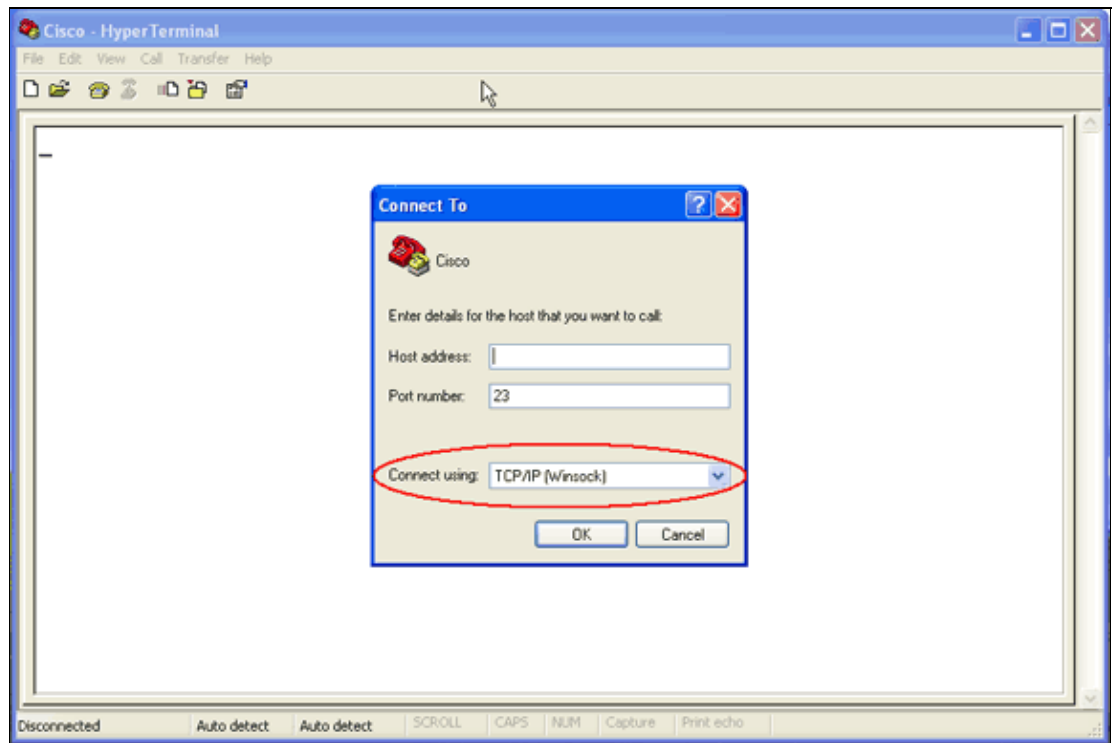
1. In order to open HyperTerminal, choose **Start > Programs > System Tools > Communications > HyperTerminal**.

Figure 1 HyperTerminal Launch



2. When HyperTerminal opens, complete these steps:
 - a. Enter a name for the connection.
 - b. Choose an icon.
 - c. Click **OK**.
3. For Telnet connections, complete these steps:
 - a. From the Connect Using drop-down menu, choose **TCP/IP**.
 - b. Enter the IP address of the device where you want to run the debugs.
 - c. Click **OK**.

Figure 2 Telnet Connection



4. For console connections, complete these steps:

- a. From the Connect Using drop-down menu, choose the COM port where the console cable is connected.
- b. Click **OK**.

The property sheet for the connection appears.

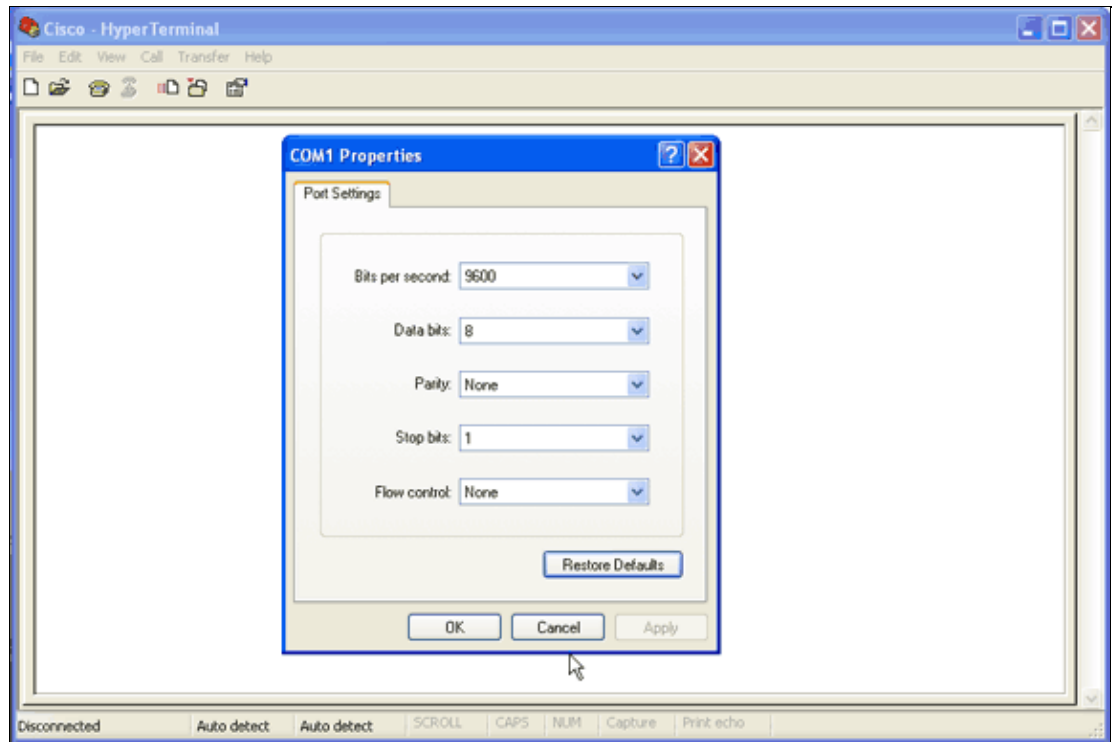
- c. Set the speed for the connection to the console port.
- d. In order to restore the default port settings, click **Restore Defaults**.

Note: Most Cisco products follow the default port settings.

The default port settings are:

- ◇ Bits per second 9600
- ◇ Data bits 8
- ◇ Parity None
- ◇ Stop bits;
- ◇ Flow control None

Figure 3 COM1 Properties



At this point, the Telnet or console connection establishes, and you are prompted for a user name and password.

Note: Cisco Aironet equipment assigns both a default user name and password of *Cisco* (case sensitive).

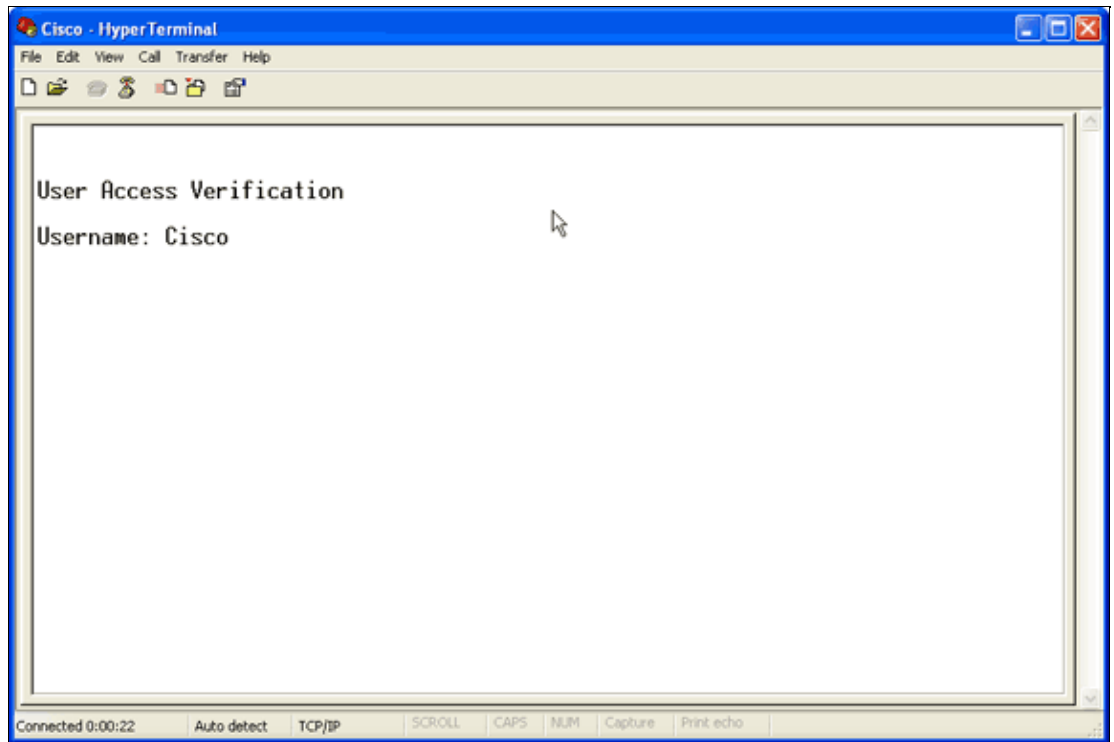
5. In order to run debugs, complete these steps:

- a. Issue the **enable** command in order to enter privileged mode.
- b. Enter the enable password.

Note: Remember that the default password for Aironet equipment is *Cisco* (case sensitive).

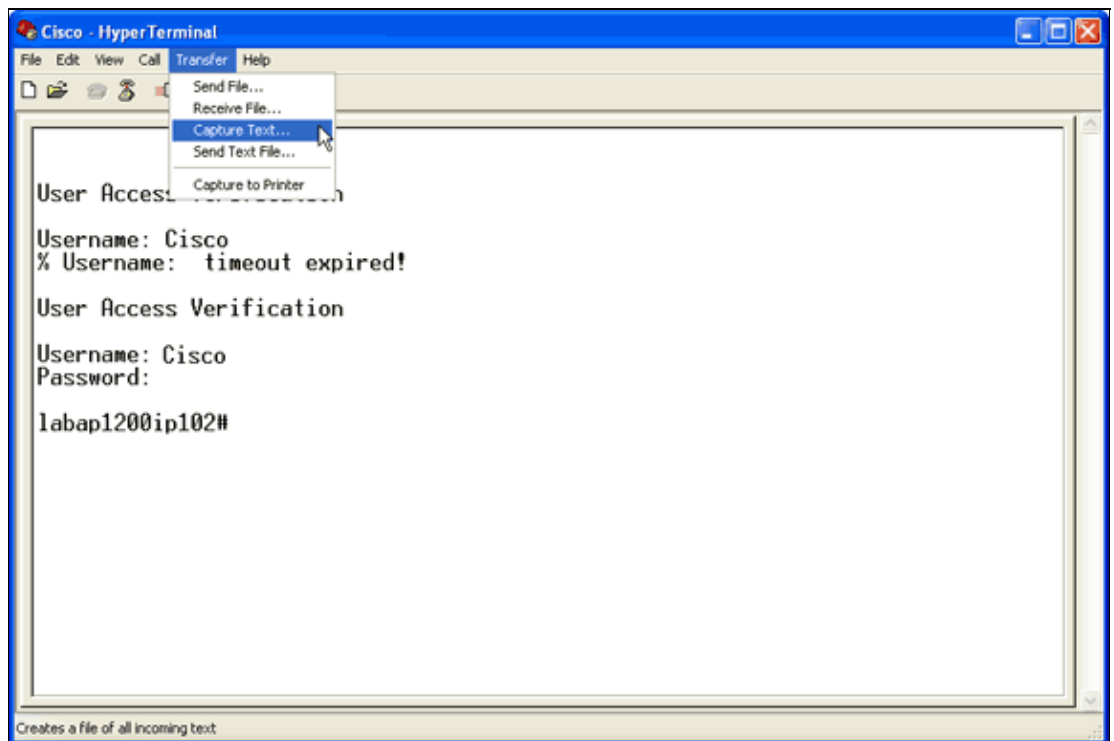
Note: In order to see the output of debugs from a Telnet session, use the **terminal monitor** or **term mon** command in order to turn on the terminal monitor.

Figure 4 Connected Telnet Session



6. After you establish a connection, complete these steps in order to collect a screen capture:
 - a. Choose **Capture Text** from the Transfer menu.

Figure 5 Save a Screen Capture



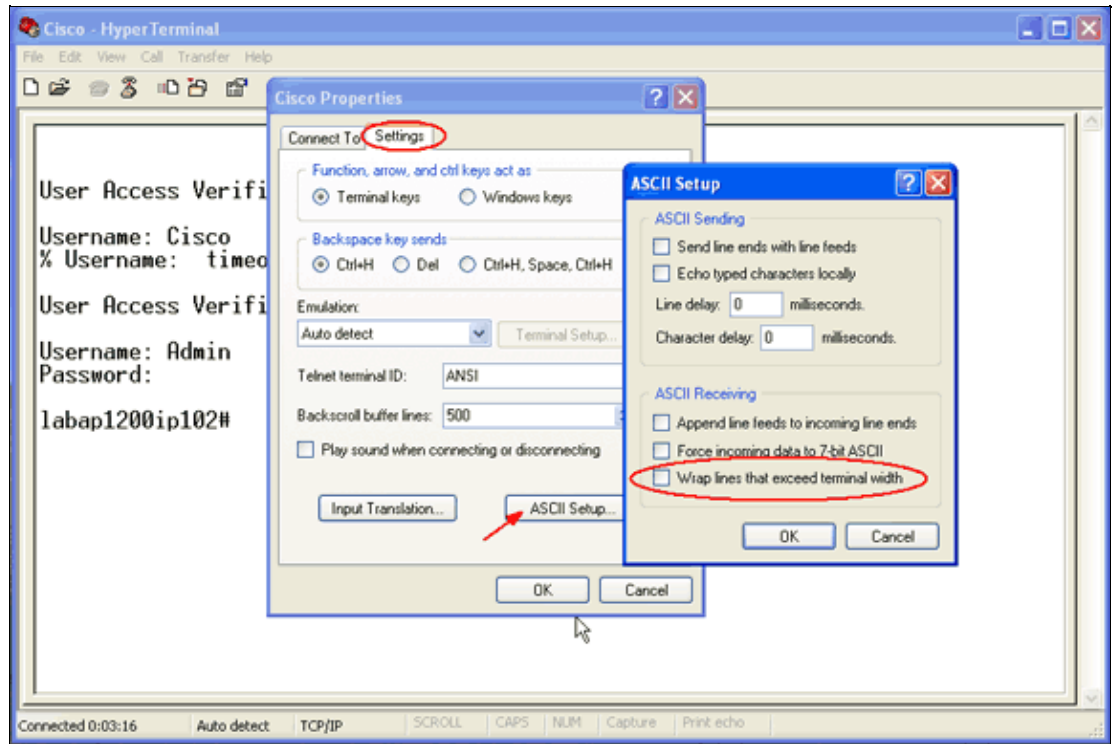
- b. When a dialog box opens that prompts you for a file name for the output, enter a file name.
7. Complete these steps in order to disable the screen wrap:

Note: You can read the debugs more easily when you disable the screen wrap.

- a. From the HyperTerminal menu, choose **File**.

- b. Choose **Properties**.
- c. On the connection property sheet, click the **Settings** tab.
- d. Click **ASCII Setup**.
- e. Uncheck **Wrap lines that exceed terminal width**.
- f. In order to close the ASCII Settings, click **OK**.
- g. In order to close the connection property sheet, click **OK**.

Figure 6 ASCII Settings



Now that you can capture any screen output to a text file, the debugs that you run depend on what is negotiated. The next sections of this document describe the type of negotiated connection provided by the debugs.

EAP

These debugs are the most helpful for EAP authentications:

- **debug radius authentication** The outputs of this debug start with this word: RADIUS.
- **debug dot11 aaa authenticator process** The outputs of this debug start with this text:
dot11_auth_dot1x_.
- **debug dot11 aaa authenticator state-machine** The outputs of this debug start with this text:
dot11_auth_dot1x_run_rfsm.

These debugs show:

- What is reported during the RADIUS portions of an authentication dialog
- The actions that are taken during that authentication dialog
- The various states through which the authentication dialog transitions

This example shows a successful Light EAP (LEAP) authentication:

Successful EAP Authentication Example

```

Apr  8 17:45:48.208: dot11_auth_dot1x_start: in the dot11_auth_dot1x_start
Apr  8 17:45:48.208: dot11_auth_dot1x_send_id_req_to_client:
    sending identity request for 0002.8aa6.304f
Apr  8 17:45:48.208: dot11_auth_dot1x_send_id_req_to_client:
    Started timer client_timeout 30 seconds
Apr  8 17:45:48.210: dot11_auth_parse_client_pak:
    Received EAPOL packet from 0002.8aa6.304f
Apr  8 17:45:48.210: dot11_auth_dot1x_run_rfsm:
    Executing Action(CLIENT_WAIT,EAP_START) for 0002.8aa6.304f
Apr  8 17:45:48.210: dot11_auth_dot1x_send_id_req_to_client:
    sending identity request for 0002.8aa6.304f
Apr  8 17:45:48.210: dot11_auth_dot1x_send_id_req_to_client:
    Started timer client_timeout 30 seconds
Apr  8 17:45:48.212: dot11_auth_parse_client_pak:
    Received EAPOL packet from 0002.8aa6.304f
Apr  8 17:45:48.212: dot11_auth_parse_client_pak:
    id is not matching req-id:lresp-id:2, waiting for response
Apr  8 17:45:48.213: dot11_auth_parse_client_pak:
    Received EAPOL packet from 0002.8aa6.304f
Apr  8 17:45:48.213: dot11_auth_dot1x_run_rfsm:
    Executing Action(CLIENT_WAIT,CLIENT_REPLY) for 0002.8aa6.304f
Apr  8 17:45:48.214: dot11_auth_dot1x_send_response_to_server:
    Sending client 0002.8aa6.304f data to server
Apr  8 17:45:48.214: dot11_auth_dot1x_send_response_to_server:
    started timer server_timeout 60 seconds
Apr  8 17:45:48.214: RADIUS: AAA Unsupported      [248] 14
Apr  8 17:45:48.214: RADIUS:  6C 61 62 61 70 31 32 30 30 69 70 31
    [labapl200ip1]
Apr  8 17:45:48.215: RADIUS: AAA Unsupported      [150] 2
Apr  8 17:45:48.215: RADIUS(0000001C): Storing nasport 17 in rad_db
Apr  8 17:45:48.215: RADIUS(0000001C): Config NAS IP: 10.0.0.102
Apr  8 17:45:48.215: RADIUS/ENCODE(0000001C): acct_session_id: 28
Apr  8 17:45:48.216: RADIUS(0000001C): Config NAS IP: 10.0.0.102
Apr  8 17:45:48.216: RADIUS(0000001C): sending
Apr  8 17:45:48.216: RADIUS(0000001C): Send Access-Request
    to 10.0.0.3:1645 id 21645/93, len 139
Apr  8 17:45:48.216: RADIUS:  authenticator 92 26 A8 31 ED 60 6A 88
    - 84 8C 80 B2 B8 26 4C 04
Apr  8 17:45:48.216: RADIUS:  User-Name           [1]  9  "aironet"
Apr  8 17:45:48.216: RADIUS:  Framed-MTU         [12] 6  1400
Apr  8 17:45:48.217: RADIUS:  Called-Station-Id  [30] 16 "0005.9a39.0374"
Apr  8 17:45:48.217: RADIUS:  Calling-Station-Id [31] 16 "0002.8aa6.304f"
Apr  8 17:45:48.217: RADIUS:  Service-Type       [6]  6  Login [1]
Apr  8 17:45:48.217: RADIUS:  Message-Authenticato[80] 18  *
Apr  8 17:45:48.217: RADIUS:  EAP-Message       [79] 14
Apr  8 17:45:48.218: RADIUS:  02 02 00 0C 01 61 69 72 6F 6E 65 74
    [?????aironet]
Apr  8 17:45:48.218: RADIUS:  NAS-Port-Type      [61] 6   802.11
    wireless      [19]
Apr  8 17:45:48.218: RADIUS:  NAS-Port         [5]  6   17
Apr  8 17:45:48.218: RADIUS:  NAS-IP-Address  [4]  6  10.0.0.102
Apr  8 17:45:48.218: RADIUS:  Nas-Identifier  [32] 16 "labapl200ip102"
Apr  8 17:45:48.224: RADIUS: Received from id 21645/93 10.0.0.3:1645,
    Access-Challenge, len 69
Apr  8 17:45:48.224: RADIUS:  authenticator C8 6D 9B B3 67 60 44 29
    - CC AB 39 DE 00 A9 A8 CA
Apr  8 17:45:48.224: RADIUS:  EAP-Message       [79] 25
Apr  8 17:45:48.224: RADIUS:  01 43 00 17 11 01 00 08 63 BB E7 8C 0F AC EB 9A
    [?C?????c??????]
Apr  8 17:45:48.225: RADIUS:  61 69 72 6F 6E 65 74
    [aironet]
Apr  8 17:45:48.225: RADIUS:  Session-Timeout  [27] 6   20
Apr  8 17:45:48.225: RADIUS:  Message-Authenticato[80] 18  *
Apr  8 17:45:48.226: RADIUS(0000001C): Received from id 21645/93

```

```
Apr 8 17:45:48.226: RADIUS/DECODE: EAP-Message fragments, 23, total 23 bytes
Apr 8 17:45:48.226: dot11_auth_dot1x_parse_aaa_resp:
Received server response: GET_CHALLENGE_RESPONSE
Apr 8 17:45:48.226: dot11_auth_dot1x_parse_aaa_resp: found eap pak in
server response
Apr 8 17:45:48.226: dot11_auth_dot1x_parse_aaa_resp: found session timeout
20 sec
Apr 8 17:45:48.227: dot11_auth_dot1x_run_rfsm:
Executing Action(SERVER_WAIT,SERVER_REPLY) for
0002.8aa6.304f
Apr 8 17:45:48.227: dot11_auth_dot1x_send_response_to_client:
Forwarding server message to client 0002.8aa6.304f
Apr 8 17:45:48.227: dot11_auth_dot1x_send_response_to_client:
Started timer client_timeout 20 seconds
Apr 8 17:45:48.232: dot11_auth_parse_client_pak:
Received EAPOL packet from 0002.8aa6.304f
Apr 8 17:45:48.232: dot11_auth_dot1x_run_rfsm: Executing Action
(CLIENT_WAIT,CLIENT_REPLY) for 0002.8aa6.304f
Apr 8 17:45:48.232: dot11_auth_dot1x_send_response_to_server:
Sending client 0002.8aa6.304f data to server
Apr 8 17:45:48.232: dot11_auth_dot1x_send_response_to_server:
Started timer server_timeout 60 seconds
Apr 8 17:45:48.233: RADIUS: AAA Unsupported [248] 14
Apr 8 17:45:48.234: RADIUS: 6C 61 62 61 70 31 32 30 30 69 70 31
[labapl200ip1]
Apr 8 17:45:48.234: RADIUS: AAA Unsupported [150] 2
Apr 8 17:45:48.234: RADIUS(0000001C): Using existing nas_port 17
Apr 8 17:45:48.234: RADIUS(0000001C): Config NAS IP: 10.0.0.102
Apr 8 17:45:48.234: RADIUS/ENCODE(0000001C): acct_session_id: 28
Apr 8 17:45:48.234: RADIUS(0000001C): Config NAS IP: 10.0.0.102
Apr 8 17:45:48.234: RADIUS(0000001C): sending
Apr 8 17:45:48.234: RADIUS(0000001C): Send Access-Request to
10.0.0.3:1645 id 21645/94, len 166
Apr 8 17:45:48.235: RADIUS: authenticator 93 B5 CC B6 41 97 A0 85
- 1B 4D 13 0F 6A EE D4 11
Apr 8 17:45:48.235: RADIUS: User-Name [1] 9 "aironet"
Apr 8 17:45:48.235: RADIUS: Framed-MTU [12] 6 1400
Apr 8 17:45:48.236: RADIUS: Called-Station-Id [30] 16 "0005.9a39.0374"
Apr 8 17:45:48.236: RADIUS: Calling-Station-Id [31] 16 "0002.8aa6.304f"
Apr 8 17:45:48.236: RADIUS: Service-Type [6] 6 Login [1]
Apr 8 17:45:48.236: RADIUS: Message-Authenticato[80] 18 *
Apr 8 17:45:48.236: RADIUS: EAP-Message [79] 41
Apr 8 17:45:48.236: RADIUS: 02 43 00 27 11 01 00 18 30 9F 55 AF 05 03 71 7D
[?C?'???0?U???q]
Apr 8 17:45:48.236: RADIUS: 25 41 1B B0 F4 A9 7C EE F5 51 24 9A FC 6D 51 6D
[?A????]?Q$?mQm]
Apr 8 17:45:48.237: RADIUS: 61 69 72 6F 6E 65 74 [aironet]
Apr 8 17:45:48.237: RADIUS: NAS-Port-Type [61] 6 802.11
wireless [19]
Apr 8 17:45:48.237: RADIUS: NAS-Port [5] 6 17
Apr 8 17:45:48.238: RADIUS: NAS-IP-Address [4] 6 10.0.0.102
Apr 8 17:45:48.238: RADIUS: Nas-Identifier [32] 16 "labapl200ip102"
Apr 8 17:45:48.242: RADIUS: Received from id 21645/94 10.0.0.3:1645,
Access-Challenge, len 50
Apr 8 17:45:48.243: RADIUS: authenticator 59 2D EE 24 CF B2 87 AF
- 86 D0 C9 00 79 BE 6E 1E
Apr 8 17:45:48.243: RADIUS: EAP-Message [79] 6
Apr 8 17:45:48.243: RADIUS: 03 43 00 04
[?C??]
Apr 8 17:45:48.244: RADIUS: Session-Timeout [27] 6 20
Apr 8 17:45:48.244: RADIUS: Message-Authenticato[80] 18 *
Apr 8 17:45:48.244: RADIUS(0000001C): Received from id 21645/94
Apr 8 17:45:48.244: RADIUS/DECODE: EAP-Message fragments, 4, total 4 bytes
Apr 8 17:45:48.244: dot11_auth_dot1x_parse_aaa_resp:
Received server response: GET_CHALLENGE_RESPONSE
Apr 8 17:45:48.245: dot11_auth_dot1x_parse_aaa_resp:
```

```

found eap pak in server response
Apr  8 17:45:48.245: dot11_auth_dot1x_parse_aaa_resp:
found session timeout 20 sec
Apr  8 17:45:48.245: dot11_auth_dot1x_run_rfsm:
Executing Action(SERVER_WAIT,SERVER_REPLY)
for 0002.8aa6.304f
Apr  8 17:45:48.245: dot11_auth_dot1x_send_response_to_client:
Forwarding server message to client 0002.8aa6.304f
Apr  8 17:45:48.246: dot11_auth_dot1x_send_response_to_client:
Started timer client_timeout 20 seconds
Apr  8 17:45:48.249: dot11_auth_parse_client_pak:
Received EAPOL packet from 0002.8aa6.304f
Apr  8 17:45:48.250: dot11_auth_dot1x_run_rfsm:
Executing Action(CLIENT_WAIT,CLIENT_REPLY) for 0002.8aa6.304f
Apr  8 17:45:48.250: dot11_auth_dot1x_send_response_to_server:
Sending client 0002.8aa6.304f data to server
Apr  8 17:45:48.250: dot11_auth_dot1x_send_response_to_server:
Started timer server_timeout 60 seconds
Apr  8 17:45:48.250: RADIUS: AAA Unsupported [248] 14
Apr  8 17:45:48.251: RADIUS: 6C 61 62 61 70 31 32 30 30 69 70 31
[labap1200ip1]
Apr  8 17:45:48.251: RADIUS: AAA Unsupported [150] 2
Apr  8 17:45:48.251: RADIUS(0000001C): Using existing nas_port 17
Apr  8 17:45:48.252: RADIUS(0000001C): Config NAS IP: 10.0.0.102
Apr  8 17:45:48.252: RADIUS/ENCODE(0000001C): acct_session_id: 28
Apr  8 17:45:48.252: RADIUS(0000001C): Config NAS IP: 10.0.0.102
Apr  8 17:45:48.252: RADIUS(0000001C): sending
Apr  8 17:45:48.252: RADIUS(0000001C): Send Access-Request to
10.0.0.3:1645 id 21645/95, len 150
Apr  8 17:45:48.252: RADIUS: authenticator 39 1C A5 EF 86 9E BA D1
- 50 FD 58 80 A8 8A BC 2A
Apr  8 17:45:48.253: RADIUS: User-Name [1] 9 "aironet"
Apr  8 17:45:48.253: RADIUS: Framed-MTU [12] 6 1400
Apr  8 17:45:48.253: RADIUS: Called-Station-Id [30] 16 "0005.9a39.0374"
Apr  8 17:45:48.253: RADIUS: Calling-Station-Id [31] 16 "0002.8aa6.304f"
Apr  8 17:45:48.254: RADIUS: Service-Type [6] 6 Login [1]
Apr  8 17:45:48.254: RADIUS: Message-Authenticato[80] 18 *
Apr  8 17:45:48.254: RADIUS: EAP-Message [79] 25
Apr  8 17:45:48.254: RADIUS: 01 43 00 17 11 01 00 08 50 9A 67 2E 7D 26 75 AA
[?C?????P?g.}&u?]
Apr  8 17:45:48.254: RADIUS: 61 69 72 6F 6E 65 74
[aironet]
Apr  8 17:45:48.254: RADIUS: NAS-Port-Type [61] 6 802.11
wireless [19]
Apr  8 17:45:48.254: RADIUS: NAS-Port [5] 6 17
Apr  8 17:45:48.255: RADIUS: NAS-IP-Address [4] 6 10.0.0.102
Apr  8 17:45:48.255: RADIUS: Nas-Identifier [32] 16 "labap1200ip102"
Apr  8 17:45:48.260: RADIUS: Received from id 21645/95 10.0.0.3:1645,
Access-Accept, len 206
Apr  8 17:45:48.260: RADIUS: authenticator 39 13 3C ED FC 02 68 63
- 24 13 1B 46 CF 93 B8 E3
Apr  8 17:45:48.260: RADIUS: Framed-IP-Address [8] 6 255.255.255.255
Apr  8 17:45:48.261: RADIUS: EAP-Message [79] 41
Apr  8 17:45:48.261: RADIUS: 02 00 00 27 11 01 00 18 FA 53 D0 29 6C 9D 66 8E
[????'?????S?)l?ff?]
Apr  8 17:45:48.262: RADIUS: C4 A3 CD 54 08 8C 35 7C 74 0C 6A EF D4 6D 30 A4
[???T??5|t?j??m0?]
Apr  8 17:45:48.262: RADIUS: 61 69 72 6F 6E 65 74 [aironet]
Apr  8 17:45:48.262: RADIUS: Vendor, Cisco [26] 59
Apr  8 17:45:48.262: RADIUS: Cisco AVpair [1] 53
"leap:session-key=G:3asil;mwerAEJNYH-JxI,"
Apr  8 17:45:48.262: RADIUS: Vendor, Cisco [26] 31
Apr  8 17:45:48.262: RADIUS: Cisco AVpair [1] 25
"auth-algo-type=eap-leap"
Apr  8 17:45:48.262: RADIUS: Class [25] 31
Apr  8 17:45:48.263: RADIUS: 43 49 53 43 4F 41 43 53 3A 30 30 30 30 31 64 36

```

```

[CISCOACS:00001d6]
Apr  8 17:45:48.263: RADIUS:    33 2F 30 61 30 30 30 30 36 36 2F 31 37
[3/0a000066/17]
Apr  8 17:45:48.263: RADIUS:  Message-Authenticato[80] 18 *
Apr  8 17:45:48.264: RADIUS(0000001C): Received from id 21645/95
Apr  8 17:45:48.264: RADIUS/DECODE: EAP-Message fragments, 39, total 39 bytes
Apr  8 17:45:48.264: found leap session key
Apr  8 17:45:48.265: dot11_auth_dot1x_parse_aaa_resp:
Received server response: PASS
Apr  8 17:45:48.265: dot11_auth_dot1x_parse_aaa_resp:
found eap pak in server response
Apr  8 17:45:48.265: dot11_auth_dot1x_parse_aaa_resp:
found leap session key in server response
Apr  8 17:45:48.265: dot11_auth_dot1x_parse_aaa_resp:
leap session key length 16
Apr  8 17:45:48.266: dot11_auth_dot1x_run_rfsm:
Executing Action(SERVER_WAIT,SERVER_PASS) for 0002.8aa6.304f
Apr  8 17:45:48.266: dot11_auth_dot1x_send_response_to_client:
Forwarding server message to client 0002.8aa6.304f
Apr  8 17:45:48.266: dot11_auth_dot1x_send_response_to_client:
Started timer client_timeout 20 seconds
Apr  8 17:45:48.266: %DOT11-6-ASSOC: Interface Dot11Radio0,
Station RKIBBE-W2K4 0002.8aa6.304f Associated KEY_MGMT[NONE]

```

Notice the flow in the **state-machine** debugs. There is a progression through several states:

1. EAP_START
2. CLIENT_WAIT
3. CLIENT_REPLY
4. SERVER_WAIT
5. SERVER_REPLY

Note: As the two negotiate, there can be several iterations of CLIENT_WAIT and CLIENT_REPLY, as well as SERVER_WAIT and SERVER_REPLY.

6. SERVER_PASS

The **process** debug shows each individual step through each state. The **radius** debugs show the actual conversation between the authentication server and the client. The easiest way to work with EAP debugs is to watch the progression of state machine messages through each state.

When something fails in the negotiation, the **state-machine** debugs show why the process stopped. Watch for messages similar to these examples:

- **CLIENT TIMEOUT** This state indicates that the client did not respond within an appropriate amount of time. This failure to respond can occur due to one of these reasons:
 - ◆ There is a problem with the client software.
 - ◆ The EAP client timeout value (from the EAP Authentication subtab under Advanced Security) has expired.

Some EAPs, particularly Protected EAP (PEAP), take longer than 30 seconds to complete authentication. Set this timer to a higher value (between 90 and 120 seconds).

This is an example of a CLIENT TIMEOUT attempt:

CLIENT TIMEOUT Example	
Apr 12 17:51:09.373:	dot11_auth_dot1x_start: in the dot11_auth_dot1x_start
Apr 12 17:51:09.373:	dot11_auth_dot1x_send_id_req_to_client: sending identity request for 0040.96a0.3758

```

Apr 12 17:51:09.374: dot11_auth_dot1x_send_id_req_to_client:
    Started timer client_timeout 30 seconds
Apr 12 17:51:39.358: dot11_auth_dot1x_run_rfsm:
    Executing Action(CLIENT_WAIT, TIMEOUT) for 0040.96a0.3758
Apr 12 17:51:39.358: dot11_auth_dot1x_send_client_fail:
    Authentication failed for 0040.96a0.3758
Apr 12 17:51:39.358: %DOT11-7-AUTH_FAILED:
    Station 0040.96a0.3758 Authentication failed

```

Note: Watch for any system error messages that are similar to this message:

```

%DOT11-4-MAXRETRIES: Packet to client xxxx.xxxx.xxxx reached
max retries, removing the client

```

Note: Such error messages can indicate a radio frequency (RF) problem.

- **Shared secret mismatch between the AP and the RADIUS server** In this example log, the RADIUS server does not accept the authentication request from the AP. The AP continues to send the request to the RADIUS server, but the RADIUS server rejects the request because the shared secret is mismatched.

In order to resolve this problem, be sure to check that the shared secret on the AP is the same one that is used in the RADIUS server.

Shared Secret Mismatch Between AP and RADIUS Server

```

Jun  2 15:58:13.553: %RADIUS-4-RADIUS_DEAD:
    RADIUS server 10.10.1.172:1645, 1646 is not responding.
Jun  2 15:58:13.553: %RADIUS-4-RADIUS_ALIVE: RADIUS server
    10.10.1.172:1645,1646 has returned.
Jun  2 15:58:23.664: %DOT11-7-AUTH_FAILED: Station 0040.96a0.3758
    Authentication failed

```

- **server_timeout** This state indicates that the authentication server did not respond in an appropriate amount of time. This failure to respond occurs because of a problem on the server. Verify that these situations are true:

- ◆ The AP has IP connectivity to the authentication server.

Note: You can use the **ping** command in order to verify connectivity.

- ◆ The authentication and accounting port numbers are correct for the server.

Note: You can check the port numbers from the Server Manager tab.

- ◆ The authentication service is running and functional.

This is an example of a `server_timeout` attempt:

server_timeout Example

```

Apr  8 20:02:55.469: dot11_auth_dot1x_start:
    in the dot11_auth_dot1x_start
Apr  8 20:02:55.469: dot11_auth_dot1x_send_id_req_to_client:
    sending identity request for 0002.8aa6.304f
Apr  8 20:02:55.469: dot11_auth_dot1x_send_id_req_to_client:
    Started timer client_timeout 30 seconds
Apr  8 20:02:55.470: dot11_auth_parse_client_pak:
    Received EAPOL packet from 0002.8aa6.304f
Apr  8 20:02:55.470: dot11_auth_dot1x_run_rfsm:
    Executing Action(CLIENT_WAIT, EAP_START) for 0002.8aa6.304f
Apr  8 20:02:55.470: dot11_auth_dot1x_send_id_req_to_client:
    sending identity request for 0002.8aa6.304f
Apr  8 20:02:55.470: dot11_auth_dot1x_send_id_req_to_client:

```

```

Started timer client_timeout 30 seconds
Apr  8 20:02:55.471: dot11_auth_parse_client_pak:
Received EAPOL packet from 0002.8aa6.304f
Apr  8 20:02:55.472: dot11_auth_parse_client_pak:
id is not matching req-id:lresp-id:2, waiting for response
Apr  8 20:02:55.474: dot11_auth_parse_client_pak:
Received EAPOL packet from 0002.8aa6.304f
Apr  8 20:02:55.474: dot11_auth_dot1x_run_rfsm:
Executing Action(CLIENT_WAIT,CLIENT_REPLY) for 0002.8aa6.304f
Apr  8 20:02:55.474: dot11_auth_dot1x_send_response_to_server:
Sending client 0002.8aa6.304f data to server
Apr  8 20:02:55.475: dot11_auth_dot1x_send_response_to_server:
Started timer server_timeout 60 seconds
Apr  8 20:02:55.476: RADIUS: AAA Unsupported [248] 14
Apr  8 20:02:55.476: RADIUS: 6C 61 62 61 70 31 32 30 30 69 70 31
[labap1200ip1]
Apr  8 20:02:55.476: RADIUS: AAA Unsupported [150] 2
Apr  8 20:02:55.476: RADIUS(00000031): Storing nasport 32 in rad_db
Apr  8 20:02:55.476: RADIUS(00000031): Config NAS IP: 10.0.0.102
Apr  8 20:02:55.476: RADIUS/ENCODE(00000031): acct_session_id: 49
Apr  8 20:02:55.477: RADIUS(00000031): Config NAS IP: 10.0.0.102
Apr  8 20:02:55.477: RADIUS(00000031): sending
Apr  8 20:02:55.477: RADIUS(00000031): Send Access-Request
to 10.0.0.3:1234 id 21645/145, len 139
Apr  8 20:02:55.478: RADIUS: authenticator B6 F7 BB 41 0E 9F 44 D1
- 9A F8 E2 D7 5D 70 F2 76
Apr  8 20:02:55.478: RADIUS: User-Name [1] 9 "aironet"
Apr  8 20:02:55.478: RADIUS: Framed-MTU [12] 6 1400
Apr  8 20:02:55.478: RADIUS: Called-Station-Id [30] 16 "0005.9a39.0374"
Apr  8 20:02:55.478: RADIUS: Calling-Station-Id [31] 16 "0002.8aa6.304f"
Apr  8 20:02:55.478: RADIUS: Service-Type [6] 6 Login [1]
Apr  8 20:02:55.478: RADIUS: Message-Authenticato[80] 18 *
Apr  8 20:02:55.478: RADIUS: EAP-Message [79] 14
Apr  8 20:02:55.479: RADIUS: 02 02 00 0C 01 61 69 72 6F 6E 65 74
[?????aironet]
Apr  8 20:02:55.479: RADIUS: NAS-Port-Type [61] 6 802.11
wireless [19]
Apr  8 20:02:55.479: RADIUS: NAS-Port [5] 6 32
Apr  8 20:02:55.479: RADIUS: NAS-IP-Address [4] 6 10.0.0.102
Apr  8 20:02:55.480: RADIUS: Nas-Identifier [32] 16 "labap1200ip102"
Apr  8 20:03:00.478: RADIUS:
Retransmit to (10.0.0.3:1234,1234) for id 21645/145
Apr  8 20:03:05.475: RADIUS:
Retransmit to (10.0.0.3:1234,1234) for id 21645/145
Apr  8 20:03:10.473: RADIUS:
Retransmit to (10.0.0.3:1234,1234) for id 21645/145
Apr  8 20:03:15.470: RADIUS:
No response from (10.0.0.3:1234,1234) for id 21645/145
Apr  8 20:03:15.470: RADIUS/DECODE:
parse response no app start; FAIL
Apr  8 20:03:15.470: RADIUS/DECODE:
parse response; FAIL
Apr  8 20:03:15.470: dot11_auth_dot1x_parse_aaa_resp:
Received server response: FAIL
Apr  8 20:03:15.470: dot11_auth_dot1x_parse_aaa_resp:
found eap pak in server response
Apr  8 20:03:15.470: dot11_auth_dot1x_parse_aaa_resp:
detailed aaa_status 1
Apr  8 20:03:15.471: dot11_auth_dot1x_run_rfsm:
Executing Action(SERVER_WAIT,SERVER_FAIL) for 0002.8aa6.304f
Apr  8 20:03:15.471: dot11_auth_dot1x_send_client_fail:
Authentication failed for 0002.8aa6.304f
Apr  8 20:03:15.471: %DOT11-7-AUTH_FAILED: Station 0002.8aa6.304f
Authentication failed

```

- **SERVER_FAIL** This state indicates that the server gave an unsuccessful authentication response

based on the user credentials. The RADIUS debug that precedes this failure shows the user name that was presented to the authentication server. Be sure to check the Failed Attempts log in the authentication server for additional details on why the server denied the client access.

This is an example of a SERVER_FAIL attempt:

```

SERVER_FAIL Example
Apr  8 17:46:13.604: dot11_auth_dot1x_send_response_to_server:
    Sending client 0002.8aa6.304f data to server
Apr  8 17:46:13.604: dot11_auth_dot1x_send_response_to_server:
    Started timer server_timeout 60 seconds
Apr  8 17:46:13.605: RADIUS:  AAA Unsupported      [248] 14
Apr  8 17:46:13.605: RADIUS:  6C 61 62 61 70 31 32 30 30 69 70 31
    [labap1200ip1]
Apr  8 17:46:13.606: RADIUS:  AAA Unsupported      [150] 2
Apr  8 17:46:13.606: RADIUS(0000001D): Using existing nas_port 18
Apr  8 17:46:13.606: RADIUS(0000001D): Config NAS IP: 10.0.0.102
Apr  8 17:46:13.606: RADIUS(0000001D): Config NAS IP: 10.0.0.102
Apr  8 17:46:13.606: RADIUS(0000001D): sending
Apr  8 17:46:13.607: RADIUS(0000001D): Send Access-Request
    to 10.0.0.3:1645 id 21645/97, len 176
Apr  8 17:46:13.607: RADIUS:  authenticator 88 82 8C BB DC 78 67 76
    - 36 88 1D 89 2B DC C9 99
Apr  8 17:46:13.607: RADIUS:  User-Name           [1]  14  "unknown_user"
Apr  8 17:46:13.607: RADIUS:  Framed-MTU         [12]  6  1400
Apr  8 17:46:13.608: RADIUS:  Called-Station-Id  [30] 16  "0005.9a39.0374"
Apr  8 17:46:13.608: RADIUS:  Calling-Station-Id [31] 16  "0002.8aa6.304f"
Apr  8 17:46:13.608: RADIUS:  Service-Type       [6]  6  Login [1]
Apr  8 17:46:13.608: RADIUS:  Message-Authenticato[80] 18  *
Apr  8 17:46:13.608: RADIUS:  EAP-Message       [79] 46
Apr  8 17:46:13.608: RADIUS:  02 44 00 2C 11 01 00 18 02
    69 C3 F1 B5 90 52 F7  [?D?,?????i????R?]
Apr  8 17:46:13.609: RADIUS:
    B2 57 FF F0 74 8A 80 59 31 6D C7 30 D3 D0 AF 65
    [?W??t??Ylm?0???e]
Apr  8 17:46:13.609: RADIUS:  75 6E 6B 6E 6F 77 6E 5F 75 73 65 72
    [unknown_user]
Apr  8 17:46:13.609: RADIUS:  NAS-Port-Type      [61]  6  802.11
    wireless [19]
Apr  8 17:46:13.609: RADIUS:  NAS-Port         [5]  6  18
Apr  8 17:46:13.610: RADIUS:  NAS-IP-Address  [4]  6  10.0.0.102
Apr  8 17:46:13.610: RADIUS:  Nas-Identifier [32] 16
    "labap1200ip102"
Apr  8 17:46:13.622: RADIUS:  Received from id 21645/97
    10.0.0.3:1645, Access-Reject, len 56
Apr  8 17:46:13.622: RADIUS:  authenticator 55 E0 51 EF DA CE F7 78
    - 92 72 3D 97 8F C7 97 C3
Apr  8 17:46:13.622: RADIUS:  EAP-Message       [79]  6
Apr  8 17:46:13.623: RADIUS:  04 44 00 04
    [?D??]
Apr  8 17:46:13.623: RADIUS:  Reply-Message   [18] 12
Apr  8 17:46:13.623: RADIUS:  52 65 6A 65 63 74 65 64 0A 0D [Rejected??]
Apr  8 17:46:13.623: RADIUS:  Message-Authenticato[80] 18  *
Apr  8 17:46:13.624: RADIUS(0000001D): Received from id 21645/97
Apr  8 17:46:13.624: RADIUS/DECODE: EAP-Message fragments, 4, total 4 bytes
Apr  8 17:46:13.624: RADIUS/DECODE: Reply-Message fragments,
    10, total 10 bytes
Apr  8 17:46:13.624: dot11_auth_dot1x_parse_aaa_resp:
    Received server response: FAIL
Apr  8 17:46:13.625: dot11_auth_dot1x_parse_aaa_resp:
    found eap pak in server response
Apr  8 17:46:13.625: dot11_auth_dot1x_run_rfsm:
    xecuting Action(SERVER_WAIT,SERVER_FAIL) for 0002.8aa6.304f
Apr  8 17:46:13.625: dot11_auth_dot1x_send_response_to_client:

```

```

    Forwarding server message to client 0002.8aa6.304f
Apr  8 17:46:13.626: dot11_auth_dot1x_send_response_to_client:
    Started timer client_timeout 20 seconds
Apr  8 17:46:13.626: dot11_auth_dot1x_send_client_fail:
    Authentication failed for 0002.8aa6.304f
Apr  8 17:46:13.626: %DOT11-6-DISASSOC: Interface Dot11Radio0,
    Deauthenticating Station 0002.8aa6.304f
Apr  8 17:46:13.626: %DOT11-7-AUTH_FAILED: Station 0002.8aa6.304f
    Authentication failed

```

- **No Response from Client** In this example, the radius server sends a pass message to the AP which the AP forwards on and then it associates the client. Eventually the client does not respond to the AP. Therefore, the AP deauthenticates it after it reaches the maximum retries.

No Response from the Client	
Sep 22 08:42:04:	dot11_auth_dot1x_run_rfsm: Executing Action(SERVER_WAIT,SERVER_PASS) for 0040.96a0.3758
Sep 22 08:42:04:	dot11_auth_dot1x_send_response_to_client: Forwarding server message to client 0040.96a0.3758
Sep 22 08:42:04:	dot11_auth_dot1x_send_response_to_client: Started timer client_timeout 30 seconds
Sep 22 08:42:04:	%DOT11-6-ASSOC: Interface Dot11Radio0, Station arlitladlhd6j91 0040.96a0.3758 Associated KEY_MGMT[NONE]
Sep 22 10:35:10:	%DOT11-4-MAXRETRIES: Packet to client 0040.96a0.3758 reached max retries , removing the client
Sep 22 10:35:10:	%DOT11-6-DISASSOC: Interface Dot11Radio0, Deauthenticating Station 0040.96a0.3758 Reason: Previous authentication no longer valid

The AP forwards a get challenge response from the radius to the client. The client does not respond and reaches max retries which causes EAP to fail and the AP to deauthenticate the client.

No Response from the Client	
Sep 22 10:43:02:	dot11_auth_dot1x_parse_aaa_resp: Received server response: GET_CHALLENGE_RESPONSE
Sep 22 10:43:02:	dot11_auth_dot1x_parse_aaa_resp: found eap pak in server response
Sep 22 10:43:02:	dot11_auth_dot1x_run_rfsm: Executing Action(SERVER_WAIT,SERVER_REPLY) for 0040.96a0.3758
Sep 22 10:43:02:	dot11_auth_dot1x_send_response_to_client: Forwarding server message to client 0040.96a0.3758
Sep 22 10:43:02:	dot11_auth_dot1x_send_response_to_client: Started timer client_timeout 30 seconds
Sep 22 10:43:05:	%DOT11-4-MAXRETRIES: Packet to client 0040.96a0.3758 reached max retries , removing the client
Sep 22 10:43:05:	Client 0040.96a0.3758 failed: reached maximum retries

Radius sends a pass message to the AP, the AP forwards the pass message to the client, and the client does not respond. The AP deauthenticates it after it reaches the maximum retries. The client then attempts a new Identity request to the AP, but the AP rejects this request because the client has already reached the maximum retries.

No Response from the Client	
Sep 22 10:57:08:	dot11_auth_dot1x_run_rfsm: Executing Action(SERVER_WAIT,SERVER_PASS) for 0040.96a0.3758
Sep 22 10:57:08:	dot11_auth_dot1x_send_response_to_client: Forwarding server message to client 0040.96a0.3758
Sep 22 10:57:08:	dot11_auth_dot1x_send_response_to_client: Started timer client_timeout 30 seconds
Sep 22 10:57:08:	%DOT11-6-ASSOC: Interface Dot11Radio0,

```

Station arlitladlhd6j91 0040.96a0.3758 Reassociated KEY_MGMT[NONE]
Sep 22 10:57:10: %DOT11-4-MAXRETRIES: Packet to client
0040.96a0.3758 reached max retries, removing the client
Sep 22 10:57:10: %DOT11-6-DISASSOC: Interface Dot11Radio0,
Deauthenticating Station0040.96a0.3758 Reason:
Previous authentication no longer valid
Sep 22 10:57:15: AAA/BIND(00001954): Bind i/f
Sep 22 10:57:15: dot11_auth_dot1x_start: in the dot11_auth_dot1x_start
Sep 22 10:57:15: dot11_auth_dot1x_send_id_req_to_client:
Sending identity request to 0040.96a0.3758
Sep 22 10:57:15: dot11_auth_dot1x_send_id_req_to_client:
Client 0040.96a0.3758 timer started for 30 seconds
Sep 22 10:57:15: %DOT11-4-MAXRETRIES: Packet to client
0040.96a0.3758 reached max retries, removing the client
Sep 22 10:57:15: Client 0040.96a0.3758 failed: reached maximum retries

```

The **process** and/or **radius** debugs that immediately *precede* the state machine message show the details of the failure.

For more information on how to configure EAP, refer to EAP Authentication with RADIUS Server.

MAC Authentication

These debugs are the most helpful for MAC authentication:

- **debug radius authentication** When an external authentication server is used, the outputs of this debug start with this word: RADIUS.
- **debug dot11 aaa authenticator mac-authen** The outputs of this debug start with this text: dot11_auth_dot1x_.

These debugs show:

- What is reported during the RADIUS portions of an authentication dialog
- The comparison between the MAC address that is given and the one that is authenticated against

When an external RADIUS server is used with MAC address authentication, the RADIUS debugs apply. The result of this conjunction is a display of the actual conversation between the authentication server and the client.

When a list of MAC addresses is built locally to the device as a user name and password database, only the **mac-authen** debugs show outputs. As the address match or mismatch is determined, these outputs display.

Note: Always enter any alphabetic characters in a MAC address in lowercase.

This examples shows a successful MAC authentication against a local database:

Successful MAC Authentication Example	
Apr 8 19:02:00.109:	dot11_auth_mac_start: method_list: mac_methods
Apr 8 19:02:00.109:	dot11_auth_mac_start: method_index: 0x4500000B, req: 0xA7626C
Apr 8 19:02:00.109:	dot11_auth_mac_start: client->unique_id: 0x28
Apr 8 19:02:00.110:	dot11_mac_process_reply: AAA reply for 0002.8aa6.304f PASSED
Apr 8 19:02:00.145:	%DOT11-6-ASSOC: Interface Dot11Radio0, Station RKIBBE-W2K4 0002.8aa6.304f Associated KEY_MGMT[NONE]

This examples shows a failed MAC authentication against a local database:

Failed MAC Authentication Example

```
Apr  8 19:01:22.336: dot11_auth_mac_start: method_list: mac_methods
Apr  8 19:01:22.336: dot11_auth_mac_start: method_index: 0x4500000B,
req: 0xA7626C
Apr  8 19:01:22.336: dot11_auth_mac_start: client->unique_id: 0x27
Apr  8 19:01:22.337: dot11_mac_process_reply:
AAA reply for 0002.8aa6.304f FAILED
Apr  8 19:01:22.337: %DOT11-7-AUTH_FAILED:
Station 0002.8aa6.304f Authentication failed
```

When a MAC address authentication fails, check for the accuracy of the characters that are entered in the MAC address. Be sure that you have entered any alphabetic characters in a MAC address in lowercase.

For more information on how to configure MAC authentication, refer to [Configuring Authentication Types \(Cisco IOS Software Configuration Guide for Cisco Aironet Access Points, 12.2\(13\)JA\)](#).

WPA

Although Wi-Fi Protected Access (WPA) is not an authentication type, it is a negotiated protocol.

- WPA negotiates between the AP and the client card.
- WPA key management negotiates after a client is successfully authenticated by an authentication server.
- WPA negotiates both a Pairwise Transient Key (PTK) and a Groupwise Transient Key (GTK) in a four-way handshake.

Note: Because WPA requires that the underlying EAP be successful, verify that clients can successfully authenticate with that EAP before you engage WPA.

These debugs are the most helpful for WPA negotiations:

- **debug dot11 aaa authenticator process** The outputs of this debug start with this text:
dot11_auth_dot1x_.
- **debug dot11 aaa authenticator state-machine** The outputs of this debug start with this text:
dot11_auth_dot1x_run_rfsm.

Relative to the other authentications in this document, WPA debugs are simple to read and analyze. A PTK message should be sent and an appropriate reply received. Next, a GTK message should be sent and another appropriate response received.

If the PTK or GTK messages are not sent, the configuration or software level on the AP can be at fault. If the PTK or GTK responses from the client are not received, check the configuration or software level on the WPA supplicant of the client card.

Successful WPA Negotiation Example

```
labap1200ip102#
Apr  7 16:29:57.908: dot11_dot1x_build_ptk_handshake:
building PTK msg 1 for 0030.6527.f74a
Apr  7 16:29:59.190: dot11_dot1x_verify_ptk_handshake:
verifying PTK msg 2 from 0030.6527.f74a
Apr  7 16:29:59.191: dot11_dot1x_verify_eapol_header: Warning:
Invalid key info (exp=0x381, act=0x109)
Apr  7 16:29:59.191: dot11_dot1x_verify_eapol_header: Warning:
Invalid key len (exp=0x20, act=0x0)
Apr  7 16:29:59.192: dot11_dot1x_build_ptk_handshake:
```

```

building PTK msg 3 for 0030.6527.f74a
Apr 7 16:29:59.783: dot11_dot1x_verify_ptk_handshake:
verifying PTK msg 4 from 0030.6527.f74a
Apr 7 16:29:59.783: dot11_dot1x_verify_eapol_header: Warning:
Invalid key info (exp=0x381, act=0x109)
Apr 7 16:29:59.783: dot11_dot1x_verify_eapol_header: Warning:
Invalid key len (exp=0x20, act=0x0)
Apr 7 16:29:59.788: dot11_dot1x_build_gtk_handshake:
building GTK msg 1 for 0030.6527.f74a
Apr 7 16:29:59.788: dot11_dot1x_build_gtk_handshake:
dot11_dot1x_get_multicast_key len 32 index 1
Apr 7 16:29:59.788: dot11_dot1x_hex_dump: GTK:
27 CA 88 7D 03 D9 C4 61 FD 4B BE 71 EC F7 43 B5 82 93 57 83
Apr 7 16:30:01.633: dot11_dot1x_verify_gtk_handshake:
verifying GTK msg 2 from 0030.6527.f74a
Apr 7 16:30:01.633: dot11_dot1x_verify_eapol_header:
Warning: Invalid key info (exp=0x391, act=0x301)
Apr 7 16:30:01.633: dot11_dot1x_verify_eapol_header: Warning:
Invalid key len (exp=0x20, act=0x0)
Apr 7 16:30:01.633: %DOT11-6-ASSOC: Interface Dot11Radio0,
Station 0030.6527.f74a Associated KEY_MGMT[WPA]
labap1200ip102#

```

For more information on how to configure WPA, refer to [WPA Configuration Overview](#).

Administrative/HTTP Authentication

You can restrict administrative access to the device to users who are listed in either a local user name and password database or to an external authentication server. Administrative access is supported with both RADIUS and TACACS+.

These debugs are the most helpful for administrative authentication:

- **debug radius authentication** or **debug tacacs authentication** The outputs of this debug start with one of these words: RADIUS or TACACS.
- **debug aaa authentication** The outputs of this debugs start with this text: AAA/AUTHEN.
- **debug aaa authorization** The outputs of this debugs start with this text: AAA/AUTHOR.

These debugs show:

- What is reported during the RADIUS or TACACS portions of an authentication dialog
- The actual negotiations for authentication and authorization between the device and the authentication server

This example shows a successful administrative authentication when the Service-Type RADIUS attribute is set to Administrative:

Successful Administrative Authentication Example with Service-Type Attribute

```

Apr 13 19:43:08.030: AAA: parse name=tty2 idb type=-1 tty=-1
Apr 13 19:43:08.030: AAA: name=tty2 flags=0x11 type=5 shelf=0 slot=0
adapter=0 port=2 channel=0
Apr 13 19:43:08.031: AAA/MEMORY: create_user (0xA1BB6C) user='NULL' ruser='NULL'
ds0=0 port='tty2' rem_addr='10.0.0.25' authen_type=ASCII service=LOGINN
Apr 13 19:43:08.031: AAA/AUTHEN/START (3200017540): port='tty2'
list='' action=LOGIN service=LOGIN
Apr 13 19:43:08.031: AAA/AUTHEN/START (3200017540): using "default" list
Apr 13 19:43:08.031: AAA/AUTHEN/START (3200017540):
Method=tac_admin (tacacs+)

```

```

Apr 13 19:43:08.032: TAC+: send AUTHEN/START packet ver=192 id=3200017540
Apr 13 19:43:08.032: AAA/AUTHEN(3200017540): Status=ERROR
Apr 13 19:43:08.032: AAA/AUTHEN/START (3200017540):
  Method=rad_admin (radius)
Apr 13 19:43:08.032: AAA/AUTHEN(3200017540): Status=GETUSER
Apr 13 19:43:08.032: AAA/AUTHEN/CONT (3200017540):
  continue_login (user='(undef)')
Apr 13 19:43:08.032: AAA/AUTHEN(3200017540): Status=GETUSER
Apr 13 19:43:08.032: AAA/AUTHEN(3200017540): Method=rad_admin (radius)
Apr 13 19:43:08.032: AAA/AUTHEN(3200017540): Status=GETPASS
Apr 13 19:43:08.033: AAA/AUTHEN/CONT (3200017540):
  continue_login (user='aironet')
Apr 13 19:43:08.033: AAA/AUTHEN(3200017540): Status=GETPASS
Apr 13 19:43:08.033: AAA/AUTHEN(3200017540): Method=rad_admin (radius)
Apr 13 19:43:08.033: RADIUS: Pick NAS IP for u=0xA1BB6C tableid=0
  cfg_addr=10.0.0.102 best_addr=0.0.0.0
Apr 13 19:43:08.033: RADIUS: ustruct sharecount=1
Apr 13 19:43:08.034: Radius: radius_port_info() success=1 radius_nas_port=1
Apr 13 19:43:08.034: RADIUS(00000000): Send Access-Request to 10.0.0.3:1645
  id 21646/48, len 76
Apr 13 19:43:08.034: RADIUS: authenticator 91 A0 98 87 C1 FC F2 E7
  - E7 E4 57 DF 20 D0 82 27
Apr 13 19:43:08.034: RADIUS: NAS-IP-Address      [4]   6  10.0.0.102
Apr 13 19:43:08.034: RADIUS: NAS-Port              [5]   6   2
Apr 13 19:43:08.035: RADIUS: NAS-Port-Type      [61]  6  Virtual          [5]
Apr 13 19:43:08.035: RADIUS: User-Name                [1]   9  "aironet"
Apr 13 19:43:08.035: RADIUS: Calling-Station-Id   [31] 11  "10.0.0.25"
Apr 13 19:43:08.035: RADIUS: User-Password        [2]  18  *
Apr 13 19:43:08.042: RADIUS: Received from id 21646/48 10.0.0.3:1645,
  Access-Accept, len 62
Apr 13 19:43:08.042: RADIUS: authenticator C9 32 E7 8F 97 5F E6 4C
  - 6B 90 71 EE ED 2C 2B 2B
Apr 13 19:43:08.042: RADIUS: Service-Type      [6]   6
Administrative      [6]
Apr 13 19:43:08.042: RADIUS: Framed-IP-Address   [8]   6  255.255.255.255
Apr 13 19:43:08.042: RADIUS: Class                [25]  30
Apr 13 19:43:08.043: RADIUS: 43 49 53 43 4F 41 43 53 3A 30 30 30 30 33 36 36
  [CISCOACS:0000366]
Apr 13 19:43:08.043: RADIUS: 39 2F 30 61 30 30 30 30 36 36 2F 32
  [9/0a000066/2]
Apr 13 19:43:08.044: RADIUS: saved authorization data for user A1BB6C at B0C260
Apr 13 19:43:08.044: AAA/AUTHEN(3200017540): Status=PASS
Apr 13 19:43:08.044: tty2 AAA/AUTHOR/HTTP(1763745147):
  Port='tty2' list='' service=EXEC
Apr 13 19:43:08.044: AAA/AUTHOR/HTTP: tty2(1763745147) user='aironet'
Apr 13 19:43:08.044: tty2 AAA/AUTHOR/HTTP(1763745147): send AV service=shell
Apr 13 19:43:08.044: tty2 AAA/AUTHOR/HTTP(1763745147): send AV cmd*
Apr 13 19:43:08.045: tty2 AAA/AUTHOR/HTTP(1763745147): found list "default"
Apr 13 19:43:08.045: tty2 AAA/AUTHOR/HTTP(1763745147): Method=tac_admin (tacacs+)
Apr 13 19:43:08.045: AAA/AUTHOR/TAC+: (1763745147): user=aironet
Apr 13 19:43:08.045: AAA/AUTHOR/TAC+: (1763745147): send AV service=shell
Apr 13 19:43:08.045: AAA/AUTHOR/TAC+: (1763745147): send AV cmd*
Apr 13 19:43:08.046: AAA/AUTHOR (1763745147): Post authorization status = ERROR
Apr 13 19:43:08.046: tty2 AAA/AUTHOR/HTTP(1763745147):
  Method=rad_admin (radius)
Apr 13 19:43:08.046: AAA/AUTHOR (1763745147):
  Post authorization status = PASS_ADD
Apr 13 19:43:08.443: AAA/MEMORY: free_user (0xA1BB6C) user='aironet'
  ruser='NULL' port='tty2' rem_addr='10.0.0.25' authen_type=ASCII service=LOGIN

```

This example shows a successful administrative authentication when you use vendor-specific attributes in order to send a "priv-level" statement:

Successful Administrative Authentication Example with Vendor-Specific Attribute

```

Apr 13 19:38:04.699: RADIUS: cisco AVPair ""shell:priv-lvl=15""
not applied for shell
Apr 13 19:38:04.699: AAA/AUTHOR (380584213): Post authorization status
= PASS_ADD
Apr 13 19:38:04.802: AAA/MEMORY: free_user (0xAA0E38) user='aironet'
ruser='NULL' port='tty3' rem_addr='10.0.0.25' authen_type=ASCII
service=LOGIN
Apr 13 19:38:04.901: AAA: parse name=tty3 idb type=-1 tty=-1
Apr 13 19:38:04.901: AAA: name=tty3 flags=0x11 type=5 shelf=0 slot=0
adapter=0 port=3 channel=0
Apr 13 19:38:04.902: AAA/MEMORY: create_user (0xAA23BC) user='NULL'
ruser='NULL' ds0=0 port='tty3' rem_addr='10.0.0.25'
authen_type=ASCII service=LOGIN
Apr 13 19:38:04.902: AAA/AUTHEN/START (1346300140): port='tty3' list=''
action=LOGIN service=LOGIN
Apr 13 19:38:04.902: AAA/AUTHEN/START (1346300140): using "default" list
Apr 13 19:38:04.902: AAA/AUTHEN/START (1346300140): Method=tac_admin (tacacs+)
Apr 13 19:38:04.902: TAC+: send AUTHEN/START packet ver=192 id=1346300140
Apr 13 19:38:04.902: AAA/AUTHEN(1346300140): Status=ERROR
Apr 13 19:38:04.902: AAA/AUTHEN/START (1346300140): Method=rad_admin (radius)
Apr 13 19:38:04.902: AAA/AUTHEN(1346300140): Status=GETUSER
Apr 13 19:38:04.903: AAA/AUTHEN/CONT (1346300140): continue_login
(user='(undef)')
Apr 13 19:38:04.903: AAA/AUTHEN(1346300140): Status=GETUSER
Apr 13 19:38:04.903: AAA/AUTHEN(1346300140): Method=rad_admin (radius)
Apr 13 19:38:04.904: AAA/AUTHEN(1346300140): Status=GETPASS
Apr 13 19:38:04.904: AAA/AUTHEN/CONT (1346300140): continue_login
(user='aironet')
Apr 13 19:38:04.904: AAA/AUTHEN(1346300140): Status=GETPASS
Apr 13 19:38:04.904: AAA/AUTHEN(1346300140): Method=rad_admin (radius)
Apr 13 19:38:04.904: RADIUS: Pick NAS IP for u=0xAA23BC tableid=0
cfg_addr=10.0.0.102 best_addr=0.0.0.0
Apr 13 19:38:04.904: RADIUS: ustruct sharecount=1
Apr 13 19:38:04.904: Radius: radius_port_info() success=1 radius_nas_port=1
Apr 13 19:38:04.925: RADIUS(00000000): Send Access-Request to
10.0.0.3:1645 id 21646/3, len 76
Apr 13 19:38:04.926: RADIUS: authenticator 0C DD 2B B7 CA 5E 7C B9
- 46 90 FD 7A FD 56 3F 07
Apr 13 19:38:04.926: RADIUS: NAS-IP-Address [4] 6 10.0.0.102
Apr 13 19:38:04.926: RADIUS: NAS-Port [5] 6 3
Apr 13 19:38:04.926: RADIUS: NAS-Port-Type [61] 6 Virtual [5]
Apr 13 19:38:04.926: RADIUS: User-Name [1] 9 "aironet"
Apr 13 19:38:04.926: RADIUS: Calling-Station-Id [31] 11 "10.0.0.25"
Apr 13 19:38:04.926: RADIUS: User-Password [2] 18 *
Apr 13 19:38:04.932: RADIUS: Received from id 21646/3 10.0.0.3:1645,
Access-Accept, len 89
Apr 13 19:38:04.933: RADIUS: authenticator FA A4 31 49 51 87 9D CA
- 9D F7 B3 9B EF C2 8B 7E
Apr 13 19:38:04.933: RADIUS: Vendor, Cisco [26] 27
Apr 13 19:38:04.933: RADIUS: Cisco AVpair [1] 21 ""shell:priv-lvl=15""
Apr 13 19:38:04.934: RADIUS: Service-Type [6] 6 Login [1]
Apr 13 19:38:04.934: RADIUS: Framed-IP-Address [8] 6 255.255.255.255
Apr 13 19:38:04.934: RADIUS: Class [25] 30
Apr 13 19:38:04.934: RADIUS: 43 49 53 43 4F 41 43 53 3A 30 30 30 33 36 33
[CISCOACS:0000363]
Apr 13 19:38:04.934: RADIUS: 61 2F 30 61 30 30 30 30 36 36 2F 33
[a/0a000066/3]
Apr 13 19:38:05.634: AAA/AUTHOR (3854191802): Post authorization
status = PASS_ADD
Apr 13 19:38:05.917: AAA/MEMORY: free_user (0xA9D054) user='aironet'
ruser='NULL' port='tty2' rem_addr='10.0.0.25' authen_type=ASCII
service=LOGIN priv=0

```

The most common problem with administrative authentication is the failure to configure the authentication server to send the appropriate privilege-level or administrative service-type attributes. This example attempt

failed administrative authentication because no privilege-level attributes or administrative service-type attributes were sent:

```
Without Vendor-Specific or Service-Type Attributes
Apr 13 20:02:59.516: tty3 AAA/AUTHOR/HTTP(2007927065): Port='tty3'
list=' service=EXEC
Apr 13 20:02:59.516: AAA/AUTHOR/HTTP: tty3(2007927065) user='aironet'
Apr 13 20:02:59.516: tty3 AAA/AUTHOR/HTTP(2007927065): send AV service=shell
Apr 13 20:02:59.516: tty3 AAA/AUTHOR/HTTP(2007927065): send AV cmd*
Apr 13 20:02:59.516: tty3 AAA/AUTHOR/HTTP(2007927065): found list "default"
Apr 13 20:02:59.516: tty3 AAA/AUTHOR/HTTP(2007927065): Method=tac_admin (tacacs+)
Apr 13 20:02:59.516: AAA/AUTHOR/TAC+: (2007927065): user=aironet
Apr 13 20:02:59.516: AAA/AUTHOR/TAC+: (2007927065): send AV service=shell
Apr 13 20:02:59.516: AAA/AUTHOR/TAC+: (2007927065): send AV cmd*
Apr 13 20:02:59.516: AAA/AUTHOR(2007927065): Post authorization status = ERROR
Apr 13 20:02:59.517: tty3 AAA/AUTHOR/HTTP(2007927065): Method=rad_admin (radius)
Apr 13 20:02:59.517: AAA/AUTHOR(2007927065): Post authorization status = PASS_ADD
Apr 13 20:02:59.561: AAA/MEMORY: free_user (0xA756E8) user='aironet'
ruser='NULL' port='tty2' rem_addr='10.0.0.25' authen_type=ASCII
service=LOGIN priv=0 vrf= (id=0)
Apr 13 20:02:59.620: AAA/MEMORY: free_user (0x9E5B04) user='aironet'
ruser='NULL' port='tty3' rem_addr='10.0.0.25' authen_type=ASCII
service=LOGIN priv=0 vrf= (id=0)
Apr 13 20:03:04.501: AAA: parse name=tty2 idb type=-1 tty=-1
Apr 13 20:03:04.501: AAA: name=tty2 flags=0x11 type=5 shelf=0 slot=0 adapter=0
port=2 channel=0
Apr 13 20:03:04.502: AAA/MEMORY: create_user (0xA9C7A4) user='NULL'
ruser='NULL' ds0=0 port='tty2' rem_addr='10.0.0.25' authen_type=ASCII
service=LOGIN priv=0
Apr 13 20:03:04.502: AAA/AUTHEN/START (377202642): port='tty2' list='
action=LOGIN service=LOGIN
Apr 13 20:03:04.502: AAA/AUTHEN/START (377202642): using "default" list
Apr 13 20:03:04.503: AAA/AUTHEN/START (377202642): Method=tac_admin (tacacs+)
Apr 13 20:03:04.503: TAC+: send AUTHEN/START packet ver=192 id=377202642
Apr 13 20:03:04.503: AAA/AUTHEN(377202642): Status=ERROR
Apr 13 20:03:04.503: AAA/AUTHEN/START (377202642): Method=rad_admin (radius)
Apr 13 20:03:04.503: AAA/AUTHEN(377202642): Status=GETUSER
Apr 13 20:03:04.503: AAA/AUTHEN/CONT (377202642): continue_login (user='(undef)')
Apr 13 20:03:04.503: AAA/AUTHEN(377202642): Status=GETUSER
Apr 13 20:03:04.503: AAA/AUTHEN(377202642): Method=rad_admin (radius)
Apr 13 20:03:04.503: AAA/AUTHEN(377202642): Status=GETPASS
Apr 13 20:03:04.504: AAA/AUTHEN/CONT (377202642): continue_login (user='aironet')
Apr 13 20:03:04.504: AAA/AUTHEN(377202642): Status=GETPASS
Apr 13 20:03:04.504: AAA/AUTHEN(377202642): Method=rad_admin (radius)
Apr 13 20:03:04.504: RADIUS: Pick NAS IP for u=0xA9C7A4 tableid=0
cfg_addr=10.0.0.102 best_addr=0.0.0.0
Apr 13 20:03:04.505: RADIUS: ustruct sharecount=1
Apr 13 20:03:04.505: Radius: radius_port_info() success=1 radius_nas_port=1
Apr 13 20:03:04.505: RADIUS(00000000): Send Access-Request to 10.0.0.3:1645
id 21646/59, len 76
Apr 13 20:03:04.505: RADIUS: authenticator 0F BD 81 17 8F C5 1C B4
- 84 1C 66 4D CF D4 96 03
Apr 13 20:03:04.505: RADIUS: NAS-IP-Address [4] 6 10.0.0.102
Apr 13 20:03:04.506: RADIUS: NAS-Port [5] 6 2
Apr 13 20:03:04.506: RADIUS: NAS-Port-Type [61] 6 Virtual [5]
Apr 13 20:03:04.506: RADIUS: User-Name [1] 9 "aironet"
Apr 13 20:03:04.506: RADIUS: Calling-Station-Id [31] 11 "10.0.0.25"
Apr 13 20:03:04.507: RADIUS: User-Password [2] 18 *
Apr 13 20:03:04.513: RADIUS: Received from id 21646/59 10.0.0.3:1645,
Access-Accept, len 56
Apr 13 20:03:04.513: RADIUS: authenticator BB F0 18 78 33 D0 DE D3
- 8B E9 E0 EE 2A 33 92 B5
Apr 13 20:03:04.513: RADIUS: Framed-IP-Address [8] 6 255.255.255.255
Apr 13 20:03:04.513: RADIUS: Class [25] 30
```

```
Apr 13 20:03:04.514: RADIUS: 43 49 53 43 4F 41 43 53 3A 30 30 30 30 33 36 38
[CISCOACS:0000368]
Apr 13 20:03:04.514: RADIUS: 33 2F 30 61 30 30 30 30 36 36 2F 32
[3/0a000066/2]
Apr 13 20:03:04.515: RADIUS: saved authorization data for user A9C7A4 at A9C99C
Apr 13 20:03:04.515: AAA/AUTHEN(377202642): Status=PASS
Apr 13 20:03:04.515: tty2 AAA/AUTHOR/HTTP(2202245138): Port='tty2' list=''
service=EXEC
Apr 13 20:03:04.515: AAA/AUTHOR/HTTP: tty2(2202245138) user='aironet'
Apr 13 20:03:04.515: tty2 AAA/AUTHOR/HTTP(2202245138): send AV service=shell
Apr 13 20:03:04.515: tty2 AAA/AUTHOR/HTTP(2202245138): send AV cmd*
Apr 13 20:03:04.515: tty2 AAA/AUTHOR/HTTP(2202245138): found list "default"
Apr 13 20:03:04.516: tty2 AAA/AUTHOR/HTTP(2202245138): Method=tac_admin (tacacs+)
Apr 13 20:03:04.516: AAA/AUTHOR/TAC+: (2202245138): user=aironet
Apr 13 20:03:04.516: AAA/AUTHOR/TAC+: (2202245138): send AV service=shell
Apr 13 20:03:04.516: AAA/AUTHOR/TAC+: (2202245138): send AV cmd*
Apr 13 20:03:04.517: AAA/AUTHOR (2202245138): Post authorization status = ERROR
Apr 13 20:03:04.517: tty2 AAA/AUTHOR/HTTP(2202245138): Method=rad_admin (radius)
Apr 13 20:03:04.517: AAA/AUTHOR (2202245138): Post authorization status
= PASS_ADD
Apr 13 20:03:04.619: AAA/MEMORY: free_user (0xA9C7A4) user='aironet'
ruser='NULL' port='tty2' rem_addr='10.0.0.25' authen_type=ASCII
service=LOGIN priv=0 vrf=
```

For more information on how to configure administrative authentication, refer to [Administering the Access Point \(Cisco IOS Software Configuration Guide for Cisco Aironet Access Points, 12.2\(13\)JA\)](#).

For more information on how to configure administrative privilege to users on the authentication server, refer to [Sample Configuration: Local Authentication for HTTP Server Users](#). Check the section that matches the authentication protocol that you use.

Related Information

- [Cisco IOS Software Configuration Guide for Cisco Aironet Access Points, 12.2\(13\)JA](#)
- [EAP Authentication with RADIUS Server](#)
- [LEAP Authentication with Local RADIUS Server](#)
- [FAQ on Cisco Aironet Wireless Security](#)
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