Common Problems in Debugging RADIUS, PAP and Common Problems in Debugging RADIUS, PAP and CHAP

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Contents

Introduction

This document examines common debugging problems for RADIUS when using Password Authentication Protocol (PAP) or Challenge Handshake Authentication Protocol (CHAP). Common PC settings for Microsoft Windows 95, Windows NT, Windows 98, and Windows 2000 are provided, as well as examples of configurations and examples of good and bad debugs.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

There are no specific prerequisites for this document.

Components Used

The information in this document is based on Cisco IOS® Software Releases 11.2 and later.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Common PC Setting

Windows 95

Follow the instructions provided below:

1. In the Dialup Networking window, select the connection name, then **File > Properties**.
2. On the Server Type tab, see if the **Require Encrypted Password** box beneath Type of Dial−up Server is checked.

   - If this box is checked, it means the PC accepts only CHAP authentication.
   - If this box is not checked, it means the PC accepts PAP or CHAP authentication.

Windows NT

Follow the instructions provided below:

1. In the Dial−Up Networking window, select the connection name, and then select **File > Properties**.
2. Check the settings on the Security tab:

   - If the **Accept any authentication including clear text** box is checked, this means the PC accepts PAP or CHAP.
   - If the **Accept only encrypted authentication** box is checked, the PC accepts only CHAP authentication.

Windows 98

Follow the instructions provided below:

1. In the Dial−Up Networking window, select the connection name, and then select **Properties**.
2. On the Server Types tab, check the settings in the Advanced Options area:

   - If the **Require encrypted password** box is unchecked, this means the PC accepts PAP or CHAP authentication.
   - If the **Require encrypted password** box is checked, this means the PC accepts only CHAP authentication.

Windows 2000

Follow the instructions provided below:

1. In Network and Dial−Up Connections, select the connection name, and then select **Properties**.
2. On the Security tab, check the settings in the **Advanced > Settings > Allow these protocols** area:

   - If the **Unencrypted password (PAP)** box is checked, the PC accepts PAP.
   - If the **Challenge Handshake Authentication Protocol (CHAP)** box is checked, the PC accepts CHAP per RFC 1994.
   - If the **Microsoft CHAP (MS−CHAP)** box is checked, the PC accepts MS−CHAP version 1

and does not accept CHAP per RFC 1994.

Configurations and Debug Examples

RADIUS and PAP

Configuration – RADIUS and PAP

```
Current configuration:
!
version 11.2
service timestamps debug uptime
no service password-encryption
service udp-small-servers
service tcp-small-servers
!
hostname rtpkrb
!
aaa new-model
!

!--- The following four command lines are specific to
!--- Cisco IOS 11.2 and later, up until 11.3.3.T.
!--- See below this configuration for commands
!--- for other Cisco IOS releases.


!
aaa authentication login default radius local
aaa authentication ppp default if-needed radius local
aaa authorization exec radius if-authenticated
aaa authorization network radius if-authenticated
!
enable secret 5 $1$pkX.$JdAySRE1SbdbDe7bj0wyt0
enable password ww
!
username john password 0 doe
username cse password 0 csecse
ip host rtpkrb 10.31.1.5
ip domain-name RTP.CISCO.COM
ip name-server 171.68.118.103
!
interface Loopback0
ip address 1.1.1.1 255.255.255.0
!
interface Ethernet0
ip address 10.31.1.5 255.255.0.0
no mop enabled
!
interface Serial0
no ip address
no ip mroute-cache
shutdown
!
interface Serial1
no ip address
shutdown
!
interface Async1
ip unnumbered Ethernet0
encapsulation ppp
async mode dedicated
peer default ip address pool async
no cdp enable
ppp authentication pap
```

```
!
ip local pool async 15.15.15.15
ip classless
ip route 0.0.0.0 0.0.0.0 10.31.1.1
!
snmp-server community public RW
snmp-server host 171.68.118.100 traps public
radius-server host 171.68.118.101 auth-port 1645 acct-port 1646
radius-server key cisco
!
line con 0
line 1
session-timeout 20
exec-timeout 20 0
password ww
autoselect during-login
autoselect ppp
modem InOut
transport input all
stopbits 1
speed 38400
flowcontrol hardware
line 2
modem InOut
speed 38400
flowcontrol hardware
line 3 16
line aux 0
line vty 0 4
exec-timeout 0 0
password ww
!
end
```

Commands for Other Cisco IOS Releases

Note: To use these commands, remove the highlighted commands from the above configuration and paste these commands in, as dictated by your Cisco IOS release.

Cisco IOS 11.3.3.T until 12.0.5.T

```
aaa authen login default radius local
aaa authen ppp default if-needed radius local
aaa authorization exec default radius if-authenticated
aaa authorization network default radius if-authenticated
```

Cisco IOS 12.0.5.T and Later

```
aaa authen login default group radius local
aaa authen ppp default if-needed group radius local
aaa authorization exec default group radius if-authenticated
aaa authorization network default group radius if-authenticated
```

Sample Debugs – RADIUS and PAP

Note: In the debug output, the bold text highlights problems in the debug. Plain text indicates a good debug.

```
rtpkrb#
rtpkrb#sho deb
General OS:
AAA Authentication debugging is on
AAA Authorization debugging is on
```

```
PPP:
PPP authentication debugging is on
PPP protocol negotiation debugging is on
Radius protocol debugging is on
rtpkrb#
4d02h: As1 LCP: I CONFREQ [Closed] id 0 len 20
4d02h: As1 LCP:    ACCM 0x00000000 (0x020600000000)
4d02h: As1 LCP:    MagicNumber 0x00001F67 (0x050600001F67)
4d02h: As1 LCP:    PFC (0x0702)
4d02h: As1 LCP:    ACFC (0x0802)
4d02h: As1 LCP: Lower layer not up, discarding packet
%LINK-3-UPDOWN: Interface Async1, changed state to up
4d02h: As1 PPP: Treating connection as a dedicated line
4d02h: As1 PPP: Phase is ESTABLISHING, Active Open
4d02h: As1 LCP: O CONFREQ [Closed] id 85 len 24
4d02h: As1 LCP:    ACCM 0x000A0000 (0x0206000A0000)
4d02h: As1 LCP:    AuthProto PAP (0x0304C023)
4d02h: As1 LCP:    MagicNumber 0xF54252D5 (0x0506F54252D5)
4d02h: As1 LCP:    PFC (0x0702)
4d02h: As1 LCP:    ACFC (0x0802)
```

PC insists on doing chap ('accept encrypted authentication only'),
**   but router is set up for pap:**
As1 LCP: I CONFNAK [REQsent] id 98 len 12
As1 LCP: AuthProto 0xC123 (0x0308C12301000001)
As1 LCP: O CONFREQ [REQsent] id 99 len 24
As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
As1 LCP: AuthProto PAP (0x0304C023)
As1 LCP: MagicNumber 0xF54D1AF8 (0x0506F54D1AF8)
As1 LCP: PFC (0x0702)
As1 LCP: ACFC (0x0802)
As1 LCP: I CONFREJ [REQsent] id 99 len 8
As1 LCP: AuthProto PAP (0x0304C023)
As1 PPP: Closing connection because remote won't authenticate

```
4d02h: As1 LCP: I CONFACK [REQsent] id 85 len 24
4d02h: As1 LCP:    ACCM 0x000A0000 (0x0206000A0000)
4d02h: As1 LCP:    AuthProto PAP (0x0304C023)
4d02h: As1 LCP:    MagicNumber 0xF54252D5 (0x0506F54252D5)
4d02h: As1 LCP:    PFC (0x0702)
4d02h: As1 LCP:    ACFC (0x0802)
4d02h: As1 LCP: I CONFREQ [ACKrcvd] id 0 len 20
4d02h: As1 LCP:    ACCM 0x00000000 (0x020600000000)
4d02h: As1 LCP:    MagicNumber 0x00001F67 (0x050600001F67)
4d02h: As1 LCP:    PFC (0x0702)
4d02h: As1 LCP:    ACFC (0x0802)
4d02h: As1 LCP: O CONFACK [ACKrcvd] id 0 len 20
4d02h: As1 LCP:    ACCM 0x00000000 (0x020600000000)
4d02h: As1 LCP:    MagicNumber 0x00001F67 (0x050600001F67)
4d02h: As1 LCP:    PFC (0x0702)
4d02h: As1 LCP:    ACFC (0x0802)
4d02h: As1 LCP: State is Open
4d02h: As1 PPP: Phase is AUTHENTICATING, by this end
4d02h: As1 PAP: I AUTH-REQ id 14 len 19 from "ddunlap"
4d02h: As1 PAP: Authenticating peer ddunlap
4d02h: AAA/AUTHEN: create_user (0x15AD58) user='ddunlap' ruser=''
   port='Async1' rem_addr='async' authen_type=PAP service=PPP priv=1
4d02h: AAA/AUTHEN/START (1953436918): port='Async1' list=''
   action=LOGIN service=PPP
4d02h: AAA/AUTHEN/START (1953436918): using "default" list
4d02h: AAA/AUTHEN (1953436918): status = UNKNOWN
4d02h: AAA/AUTHEN/START (1953436918): Method=RADIUS
4d02h: RADIUS: Initial Transmit id 7 171.68.118.101:1645,
   Access-Request, len 77
4d02h: Attribute 4 6 0A1F0105
```

```
4d02h: Attribute 5 6 00000001
4d02h: Attribute 61 6 00000000
4d02h: Attribute 1 9 6464756E
4d02h: Attribute 2 18 7882E0A5
4d02h: Attribute 6 6 00000002
4d02h: Attribute 7 6 00000001


Radius server is down - produces ERROR - since user is not
    in local database, failover to local FAILs
As1 PAP: I AUTH-REQ id 16 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=16 already in progress
As1 PAP: I AUTH-REQ id 17 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=17 already in progress
RADIUS: Retransmit id 9
As1 PAP: I AUTH-REQ id 18 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=18 already in progress
As1 PAP: I AUTH-REQ id 19 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=19 already in progress
As1 PAP: I AUTH-REQ id 20 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=20 already in progress
RADIUS: Retransmit id 9
As1 PAP: I AUTH-REQ id 21 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=21 already in progress
As1 PAP: I AUTH-REQ id 22 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=22 already in progress
RADIUS: Retransmit id 9
As1 PAP: I AUTH-REQ id 23 len 19 from "ddunlap"
As1 AUTH: Duplicate authentication request id=23 already in progress
As1 LCP: I TERMREQ [Open] id 1 len 8 (0x000002CE)
As1 LCP: O TERMACK [Open] id 1 len 4
As1 PPP: Phase is TERMINATING
RADIUS: No response for id 9
%RADIUS-3-ALLDEADSERVER: No active radius servers found. Id 9.
RADIUS: No response from server
AAA/AUTHEN (3025998849): status = ERROR
AAA/AUTHEN/START (3025998849): Method=LOCAL
AAA/AUTHEN (3025998849): status = FAIL


Key in router does not match that of server:
RADIUS: Received from id 21 171.68.118.101:1645, Access-Reject, len 20
RADIUS: Reply for 21 fails decrypt


NT client sends 'DOMAIN\user' and Radius server expects 'user':
RADIUS: Received from id 11 171.68.118.101:1645, Access-Reject, len 20
AAA/AUTHEN (1406749115): status = FAIL
As1 PAP: O AUTH-NAK id 25 len 32 msg is "Password validation failure"
As1 PPP: Phase is TERMINATING
As1 LCP: O TERMREQ [Open] id 108 len 4
AAA/AUTHEN: free_user (0xDA520) user='CISCO\ddunlap' ruser=''
    port='Async1' rem_addr='async' authen_type=PAP service=PPP priv=1


Radius server refuses user because user user enters bad password,
    or both userid & password are bad:
RADIUS: Received from id 12 171.68.118.101:1645, Access-Reject, len 20
AAA/AUTHEN (733718529): status = FAIL
As1 PAP: O AUTH-NAK id 26 len 32 msg is "Password validation failure"
As1 PPP: Phase is TERMINATING
As1 LCP: O TERMREQ [Open] id 111 len 4
AAA/AUTHEN: free_user (0x15B030) user='ddunlap' ruser=''
    ='Async1' rem_addr='async' authen_type=PAP service=PPP priv=1
```

User passes authentication (i.e. username/password is good)
   but fails authorization (profile not set up for Service-Type=Framed &
   Framed-Protocol=PPP):
RADIUS: Received from id 13 171.68.118.101:1645, Access-Accept, len 20
RADIUS: saved authorization data for user 15AD58 at 15ADF0
AAA/AUTHEN (56862281): status = PASS
AAA/AUTHOR/LCP As1: Authorize LCP
AAA/AUTHOR/LCP: Async1: (959162008): user='cse'
AAA/AUTHOR/LCP: Async1: (959162008): send AV service=ppp
AAA/AUTHOR/LCP: Async1: (959162008): send AV protocol=lcp
AAA/AUTHOR/LCP: Async1: (959162008): Method=RADIUS
RADIUS: no appropriate authorization type for user.
AAA/AUTHOR (959162008): Post authorization status = FAIL
AAA/AUTHOR/LCP As1: Denied
AAA/AUTHEN: free_user (0x15AD58) user='cse' ruser=''
   port='Async1' rem_addr='async' authen_type=PAP service=PPP priv=1
As1 PAP: O AUTH-NAK id 27 len 25 msg is "Authorization failed"

4d02h: RADIUS: Received from id 7 171.68.118.101:1645, Access-Accept, len 32
4d02h: Attribute 6 6 00000002
4d02h: Attribute 7 6 00000001
4d02h: RADIUS: saved authorization data for user 15AD58 at 16C7F4
4d02h: AAA/AUTHEN (1953436918): status = PASS
4d02h: AAA/AUTHOR/LCP As1: Authorize LCP
4d02h: AAA/AUTHOR/LCP: Async1: (2587233868): user='ddunlap'
4d02h: AAA/AUTHOR/LCP: Async1: (2587233868): send AV service=ppp
4d02h: AAA/AUTHOR/LCP: Async1: (2587233868): send AV protocol=lcp
4d02h: AAA/AUTHOR/LCP: Async1: (2587233868): Method=RADIUS
4d02h: AAA/AUTHOR (2587233868): Post authorization status = PASS_REPL
4d02h: AAA/AUTHOR/LCP As1: Processing AV service=ppp
4d02h: As1 PAP: O AUTH-ACK id 14 len 5
4d02h: As1 PPP: Phase is UP
4d02h: AAA/AUTHOR/FSM As1: (0): Can we start IPCP?
4d02h: AAA/AUTHOR/FSM: Async1: (423372862): user='ddunlap'
4d02h: AAA/AUTHOR/FSM: Async1: (423372862): send AV service=ppp
4d02h: AAA/AUTHOR/FSM: Async1: (423372862): send AV protocol=ip
4d02h: AAA/AUTHOR/FSM: Async1: (423372862): Method=RADIUS
4d02h: AAA/AUTHOR (423372862): Post authorization status = PASS_REPL
4d02h: AAA/AUTHOR/FSM As1: We can start IPCP
4d02h: As1 IPCP: O CONFREQ [Closed] id 17 len 10
4d02h: As1 IPCP: Address 10.31.1.5 (0x03060A1F0105)
4d02h: As1 IPCP: I CONFREQ [REQsent] id 1 len 34
4d02h: As1 IPCP: Address 0.0.0.0 (0x030600000000)
4d02h: As1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
4d02h: As1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
4d02h: As1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
4d02h: As1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
4d02h: AAA/AUTHOR/IPCP As1: Start. Her address 0.0.0.0, we want 0.0.0.0
4d02h: AAA/AUTHOR/IPCP As1: Processing AV service=ppp
4d02h: AAA/AUTHOR/IPCP As1: Authorization succeeded
4d02h: AAA/AUTHOR/IPCP As1: Done. Her address 0.0.0.0, we want 0.0.0.0
4d02h: As1 IPCP: Using pool 'async'
4d02h: As1 IPCP: Pool returned 15.15.15.15
4d02h: As1 IPCP: O CONFREJ [REQsent] id 1 len 22
4d02h: As1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
4d02h: As1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
4d02h: As1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
4d02h: As1 IPCP: I CONFACK [REQsent] id 17 len 10
4d02h: As1 IPCP: Address 10.31.1.5 (0x03060A1F0105)
%LINEPROTO-5-UPDOWN: Line protocol on Interface Async1, changed state to up
4d02h: As1 IPCP: I CONFREQ [ACKrcvd] id 2 len 16
4d02h: As1 IPCP: Address 0.0.0.0 (0x030600000000)
4d02h: As1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
4d02h: AAA/AUTHOR/IPCP As1: Start. Her address 0.0.0.0, we want 15.15.15.15
4d02h: AAA/AUTHOR/IPCP As1: Processing AV service=ppp
4d02h: AAA/AUTHOR/IPCP As1: Authorization succeeded

```
4d02h: AAA/AUTHOR/IPCP As1: Done. Her address 0.0.0.0, we want 15.15.15.15
4d02h: As1 IPCP: O CONFNAK [ACKrcvd] id 2 len 16
4d02h: As1 IPCP: Address 15.15.15.15 (0x03060F0F0F0F)
4d02h: As1 IPCP: PrimaryDNS 171.68.118.103 (0x8106AB447667)
4d02h: As1 IPCP: I CONFREQ [ACKrcvd] id 3 len 16
4d02h: As1 IPCP: Address 15.15.15.15 (0x03060F0F0F0F)
4d02h: As1 IPCP: PrimaryDNS 171.68.118.103 (0x8106AB447667)
4d02h: AAA/AUTHOR/IPCP As1: Start. Her address 15.15.15.15, we want 15.15.15.15
4d02h: AAA/AUTHOR/IPCP: Async1: (4204275250): user='ddunlap'
4d02h: AAA/AUTHOR/IPCP: Async1: (4204275250): send AV service=ppp
4d02h: AAA/AUTHOR/IPCP: Async1: (4204275250): send AV protocol=ip
4d02h: AAA/AUTHOR/IPCP: Async1: (4204275250): send AV addr*15.15.15.15
4d02h: AAA/AUTHOR/IPCP: Async1: (4204275250): Method=RADIUS
4d02h: AAA/AUTHOR (4204275250): Post authorization status = PASS_REPL
4d02h: AAA/AUTHOR/IPCP As1: Reject 15.15.15.15, using 15.15.15.15
4d02h: AAA/AUTHOR/IPCP As1: Processing AV service=ppp
4d02h: AAA/AUTHOR/IPCP As1: Processing AV addr*15.15.15.15
4d02h: AAA/AUTHOR/IPCP As1: Authorization succeeded
4d02h: AAA/AUTHOR/IPCP As1: Done. Her address 15.15.15.15, we want 15.15.15.15
4d02h: As1 IPCP: O CONFACK [ACKrcvd] id 3 len 16
4d02h: As1 IPCP: Address 15.15.15.15 (0x03060F0F0F0F)
4d02h: As1 IPCP: PrimaryDNS 171.68.118.103 (0x8106AB447667)
4d02h: As1 IPCP: State is Open
4d02h: As1 IPCP: Install route to 15.15.15.15
rtpkrb#
```

RADIUS and CHAP

<table>
<tr><th colspan="1">Configuration – RADIUS and CHAP</th></tr>
</table>

```
Current configuration:
!
version 11.2
service timestamps debug uptime
no service password-encryption
service udp-small-servers
service tcp-small-servers
!
hostname rtpkrb
!
aaa new-model
!


!--- The following four command lines are specific to
!--- Cisco IOS 11.2 and later, up until 11.3.3.T.
!--- See below this configuration for commands
!--- for other Cisco IOS releases.


!
aaa authentication login default radius local
aaa authentication ppp default if-needed radius local
aaa authorization exec radius if-authenticated
aaa authorization network radius if-authenticated
!
enable secret 5 $1$pkX.$JdAySRE1SbdbDe7bj0wyt0
enable password ww
!
username john password 0 doe
username cse password 0 csecse
ip host rtpkrb 10.31.1.5
ip name-server 171.68.118.103
!
interface Loopback0
ip address 1.1.1.1 255.255.255.0
!
```

```
interface Ethernet0
ip address 10.31.1.5 255.255.0.0
no mop enabled
!
interface Serial0
no ip address
no ip mroute-cache
shutdown
!
interface Serial1
no ip address
shutdown
!
interface Async1
ip unnumbered Ethernet0
encapsulation ppp
async mode dedicated
peer default ip address pool async
no cdp enable
ppp authentication chap
!
ip local pool async 15.15.15.15
ip classless
ip route 0.0.0.0 0.0.0.0 10.31.1.1
!
snmp-server community public RW
snmp-server host 171.68.118.100 traps public
radius-server host 171.68.118.101 auth-port 1645 acct-port 1646
radius-server key cisco
!
line con 0
line 1
session-timeout 20
exec-timeout 20 0
password ww
autoselect during-login
autoselect ppp
modem InOut
transport input all
stopbits 1
speed 38400
flowcontrol hardware
line 2
modem InOut
speed 38400
flowcontrol hardware
line 3 16
line aux 0
line vty 0 4
exec-timeout 0 0
password ww
!
end
```

Commands for Other Cisco IOS Releases

Note: To use these commands, remove the highlighted commands from the above configuration and paste these commands in, as dictated by your Cisco IOS release.

Cisco IOS 11.3.3.T until 12.0.5.T

```
aaa authen login default radius local
aaa authen ppp default if-needed radius local
aaa authorization exec default radius if-authenticated
```

```
        aaa authorization network default radius if-authenticated
```

Cisco IOS 12.0.5.T and Later

```
        aaa authen login default group radius local
        aaa authen ppp default if-needed group radius local
        aaa authorization exec default group radius if-authenticated
        aaa authorization network default group radius if-authenticated
```

Sample Debugs – RADIUS and CHAP

Note: In the debug output, the bold, italicized text highlights problems in the debug. Plain text indicates a good debug.

```
        rtpkrb#show debug
        General OS:
        AAA Authentication debugging is on
        AAA Authorization debugging is on
        PPP:
        PPP authentication debugging is on
        PPP protocol negotiation debugging is on
        Radius protocol debugging is on
        rtpkrb#
        4d02h: As1 LCP: I CONFREQ [Closed] id 0 len 20
        4d02h: As1 LCP: ACCM 0x00000000 (0x020600000000)
        4d02h: As1 LCP: MagicNumber 0x0000405F (0x05060000405F)
        4d02h: As1 LCP: PFC (0x0702)
        4d02h: As1 LCP: ACFC (0x0802)
        4d02h: As1 LCP: Lower layer not up, discarding packet
        %LINK-3-UPDOWN: Interface Async1, changed state to up
        4d02h: As1 PPP: Treating connection as a dedicated line
        4d02h: As1 PPP: Phase is ESTABLISHING, Active Open
        4d02h: As1 LCP: O CONFREQ [Closed] id 87 len 25
        4d02h: As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
        4d02h: As1 LCP: AuthProto CHAP (0x0305C22305)
        4d02h: As1 LCP: MagicNumber 0xF5445B55 (0x0506F5445B55)
        4d02h: As1 LCP: PFC (0x0702)
        4d02h: As1 LCP: ACFC (0x0802)
        4d02h: As1 LCP: I CONFACK [REQsent] id 87 len 25
        4d02h: As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
        4d02h: As1 LCP: AuthProto CHAP (0x0305C22305)
        4d02h: As1 LCP: MagicNumber 0xF5445B55 (0x0506F5445B55)
        4d02h: As1 LCP: PFC (0x0702)
        4d02h: As1 LCP: ACFC (0x0802)
        4d02h: As1 LCP: I CONFREQ [ACKrcvd] id 0 len 20
        4d02h: As1 LCP: ACCM 0x00000000 (0x020600000000)
        4d02h: As1 LCP: MagicNumber 0x0000405F (0x05060000405F)
        4d02h: As1 LCP: PFC (0x0702)
        4d02h: As1 LCP: ACFC (0x0802)
        4d02h: As1 LCP: O CONFACK [ACKrcvd] id 0 len 20
        4d02h: As1 LCP: ACCM 0x00000000 (0x020600000000)
        4d02h: As1 LCP: MagicNumber 0x0000405F (0x05060000405F)
        4d02h: As1 LCP: PFC (0x0702)
        4d02h: As1 LCP: ACFC (0x0802)
        4d02h: As1 LCP: State is Open
        4d02h: As1 PPP: Phase is AUTHENTICATING, by this end
        4d02h: As1 CHAP: O CHALLENGE id 11 len 27 from "rtpkrb"
        4d02h: As1 CHAP: I RESPONSE id 11 len 28 from "chapadd"
        4d02h: AAA/AUTHEN: create_user (0x15AD58) user='chapadd' ruser=''
           port='Async1' rem_addr='async' authen_type=CHAP service=PPP priv=1
        4d02h: AAA/AUTHEN/START (575703226): port='Async1' list=''
           action=LOGIN service=PPP
        4d02h: AAA/AUTHEN/START (575703226): using "default" list
        4d02h: AAA/AUTHEN (575703226): status = UNKNOWN
```

```
4d02h: AAA/AUTHEN/START (575703226): Method=RADIUS
4d02h: RADIUS: Initial Transmit id 8 171.68.118.101:1645,
    Access-Request, len 78
4d02h: Attribute 4 6 0A1F0105
4d02h: Attribute 5 6 00000001
4d02h: Attribute 61 6 00000000
4d02h: Attribute 1 9 63686170
4d02h: Attribute 3 19 0B895D57
4d02h: Attribute 6 6 00000002
4d02h: Attribute 7 6 00000001
```

Radius server is down - produces ERROR - since user is not
in local database, failover to local FAILs:
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
RADIUS: Retransmit id 15
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
RADIUS: Retransmit id 15
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
RADIUS: Retransmit id 15
As1 CHAP: I RESPONSE id 12 len 28 from "chapadd"
As1 AUTH: Duplicate authentication request id=12 already in progress
As1 LCP: I TERMREQ [Open] id 1 len 8 (0x000002CE)
As1 LCP: O TERMACK [Open] id 1 len 4
As1 PPP: Phase is TERMINATING
RADIUS: id 15, requester hung up.
RADIUS: No response for id 15
RADIUS: No response from server
AAA/AUTHEN (1866705040): status = ERROR
AAA/AUTHEN/START (1866705040): Method=LOCAL
AAA/AUTHEN (1866705040): status = FAIL
As1 CHAP: Unable to validate Response. Username chapadd: Authentication failure
As1 CHAP: O FAILURE id 12 len 26 msg is "Authentication failure"
AAA/AUTHEN: free_user (0x1716B8) user='chapadd' ruser=''
**   port='Async1' rem_addr='async' authen_type=CHAP service=PPP priv=1**

Key in router does not match that of server:
RADIUS: Received from id 21 171.68.118.101:1645, Access-Reject, len 20
RADIUS: Reply for 21 fails decrypt

NT client sends 'DOMAIN\user' and Radius server expects 'user':
RADIUS: Received from id 16 171.68.118.101:1645, Access-Reject, len 20
AAA/AUTHEN (2974782384): status = FAIL
As1 CHAP: Unable to validate Response. Username CISCO\chapadd:
**   Authentication failure**
As1 CHAP: O FAILURE id 13 len 26 msg is "Authentication failure"
As1 PPP: Phase is TERMINATING
As1 LCP: O TERMREQ [Open] id 131 len 4
AAA/AUTHEN: free_user (0x171700) user='CISCO\chapadd' ruser=''
**   port='Async1' rem_addr='async' authen_type=CHAP service=PPP priv=1**

Radius server refuses user because user is set up for pap,
**   user enters bad password, or both userid & password are bad:**

```
RADIUS: Received from id 17 171.68.118.101:1645, Access-Reject, len 20
AAA/AUTHEN (3898168391): status = FAIL
As1 CHAP: Unable to validate Response. Username ddunlap: Authentication failure
As1 CHAP: O FAILURE id 14 len 26 msg is "Authentication failure"
As1 PPP: Phase is TERMINATING
As1 LCP: O TERMREQ [Open] id 134 len 4
AAA/AUTHEN: free_user (0x1716B8) user='ddunlap' ruser=''
   port='Async1' rem_addr='async' authen_type=CHAP service=PPP priv=1


User PASSes authentication (i.e. username/password is good)
   but FAILs authorization (profile not set up for Service-Type=Framed &
Framed-Protocol=PPP):
RADIUS: Received from id 19 171.68.118.101:1645, Access-Accept, len 20
AAA/AUTHEN (2006894701): status = PASS
AAA/AUTHOR/LCP As1: Authorize LCP
AAA/AUTHOR/LCP: Async1: (2370106832): user='noauth'
AAA/AUTHOR/LCP: Async1: (2370106832): send AV service=ppp
AAA/AUTHOR/LCP: Async1: (2370106832): send AV protocol=lcp
AAA/AUTHOR/LCP: Async1: (2370106832): Method=RADIUS
RADIUS: no appropriate authorization type for user.
AAA/AUTHOR (2370106832): Post authorization status = FAIL
AAA/AUTHOR/LCP As1: Denied


4d02h: RADIUS: Received from id 8 171.68.118.101:1645, Access-Accept, len 32
4d02h: Attribute 6 6 00000002
4d02h: Attribute 7 6 00000001
4d02h: AAA/AUTHEN (575703226): status = PASS
4d02h: AAA/AUTHOR/LCP As1: Authorize LCP
4d02h: AAA/AUTHOR/LCP: Async1: (4143416222): user='chapadd'
4d02h: AAA/AUTHOR/LCP: Async1: (4143416222): send AV service=ppp
4d02h: AAA/AUTHOR/LCP: Async1: (4143416222): send AV protocol=lcp
4d02h: AAA/AUTHOR/LCP: Async1: (4143416222): Method=RADIUS
4d02h: AAA/AUTHOR (4143416222): Post authorization status = PASS_REPL
4d02h: AAA/AUTHOR/LCP As1: Processing AV service=ppp
4d02h: As1 CHAP: O SUCCESS id 11 len 4
4d02h: As1 PPP: Phase is UP
4d02h: AAA/AUTHOR/FSM As1: (0): Can we start IPCP?
4d02h: AAA/AUTHOR/FSM: Async1: (1916451991): user='chapadd'
4d02h: AAA/AUTHOR/FSM: Async1: (1916451991): send AV service=ppp
4d02h: AAA/AUTHOR/FSM: Async1: (1916451991): send AV protocol=ip
4d02h: AAA/AUTHOR/FSM: Async1: (1916451991): Method=RADIUS
4d02h: AAA/AUTHOR (1916451991): Post authorization status = PASS_REPL
4d02h: AAA/AUTHOR/FSM As1: We can start IPCP
4d02h: As1 IPCP: O CONFREQ [Closed] id 19 len 10
4d02h: As1 IPCP: Address 10.31.1.5 (0x03060A1F0105)
4d02h: As1 IPCP: I CONFREQ [REQsent] id 1 len 34
4d02h: As1 IPCP: Address 0.0.0.0 (0x030600000000)
4d02h: As1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
4d02h: As1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
4d02h: As1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
4d02h: As1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
4d02h: AAA/AUTHOR/IPCP As1: Start. Her address 0.0.0.0, we want 0.0.0.0
4d02h: AAA/AUTHOR/IPCP As1: Processing AV service=ppp
4d02h: AAA/AUTHOR/IPCP As1: Authorization succeeded
4d02h: AAA/AUTHOR/IPCP As1: Done. Her address 0.0.0.0, we want 0.0.0.0
4d02h: As1 IPCP: Using pool 'async'
4d02h: As1 IPCP: Pool returned 15.15.15.15
4d02h: As1 IPCP: O CONFREJ [REQsent] id 1 len 22
4d02h: As1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
4d02h: As1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
4d02h: As1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
4d02h: As1 IPCP: I CONFACK [REQsent] id 19 len 10
4d02h: As1 IPCP: Address 10.31.1.5 (0x03060A1F0105)
4d02h: As1 IPCP: I CONFREQ [ACKrcvd] id 2 len 16
4d02h: As1 IPCP: Address 0.0.0.0 (0x030600000000)
4d02h: As1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
```

```
4d02h: AAA/AUTHOR/IPCP As1: Start. Her address 0.0.0.0, we want 15.15.15.15
4d02h: AAA/AUTHOR/IPCP As1: Processing AV service=ppp
4d02h: AAA/AUTHOR/IPCP As1: Authorization succeeded
4d02h: AAA/AUTHOR/IPCP As1: Done. Her address 0.0.0.0, we want 15.15.15.15
4d02h: As1 IPCP: O CONFNAK [ACKrcvd] id 2 len 16
4d02h: As1 IPCP: Address 15.15.15.15 (0x03060F0F0F0F)
4d02h: As1 IPCP: PrimaryDNS 171.68.118.103 (0x8106AB447667)
4d02h: As1 IPCP: I CONFREQ [ACKrcvd] id 3 len 16
4d02h: As1 IPCP: Address 15.15.15.15 (0x03060F0F0F0F)
4d02h: As1 IPCP: PrimaryDNS 171.68.118.103 (0x8106AB447667)
4d02h: AAA/AUTHOR/IPCP As1: Start. Her address 15.15.15.15, we want 15.15.15.15
4d02h: AAA/AUTHOR/IPCP: Async1: (1096193147): user='chapadd'
4d02h: AAA/AUTHOR/IPCP: Async1: (1096193147): send AV service=ppp
4d02h: AAA/AUTHOR/IPCP: Async1: (1096193147): send AV protocol=ip
4d02h: AAA/AUTHOR/IPCP: Async1: (1096193147): send AV addr*15.15.15.15
4d02h: AAA/AUTHOR/IPCP: Async1: (1096193147): Method=RADIUS
4d02h: AAA/AUTHOR (1096193147): Post authorization status = PASS_REPL
4d02h: AAA/AUTHOR/IPCP As1: Reject 15.15.15.15, using 15.15.15.15
4d02h: AAA/AUTHOR/IPCP As1: Processing AV service=ppp
4d02h: AAA/AUTHOR/IPCP As1: Processing AV addr*15.15.15.15
4d02h: AAA/AUTHOR/IPCP As1: Authorization succeeded
4d02h: AAA/AUTHOR/IPCP As1: Done. Her address 15.15.15.15, we want 15.15.15.15
4d02h: As1 IPCP: O CONFACK [ACKrcvd] id 3 len 16
4d02h: As1 IPCP: Address 15.15.15.15 (0x03060F0F0F0F)
4d02h: As1 IPCP: PrimaryDNS 171.68.118.103 (0x8106AB447667)
4d02h: As1 IPCP: State is Open
%LINEPROTO-5-UPDOWN: Line protocol on Interface Async1, changed state to up
4d02h: As1 IPCP: Install route to 15.15.15.15
rtpkrb#
```

Debug Commands

The following **debug** commands were used to produce the sample debug output in this document.

Note: Before issuing **debug** commands, please see Important Information on Debug Commands.

- **debug aaa authentication** – Display information on AAA authentication.
- **debug aaa authorization** – Display information on AAA authorization.
- **debug radius** – Display detailed debugging information associated with the Remote Authentication Dial–In User Server (RADIUS).
- **debug ppp negotiation** – Displays PPP packets transmitted during PPP startup, where PPP options are negotiated.

Related Information

- **RADIUS Support Page**
- **Technical Support – Cisco Systems**

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