

# Cisco Secure NT: Configuring Large Scale Dialout Using TACACS+

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## Introduction

This document explains how to configure Cisco Secure NT for Large Scale Dialout (LSDO) using the TACACS+ protocol. The configuration in this document assumes that the ISDN connection works prior to attempting LSDO.

In this example, Michigan is a router that acts as the caller, and Ohio is a router that acts as the receiver (or "callee"). Michigan downloads information from Cisco Secure NT on the routes to remote sites (including to Ohio) so that traffic hitting Michigan with an Ohio network destination is properly routed. In addition, Michigan dynamically composes the dialer-map to Ohio and authenticates Ohio through Cisco Secure NT.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

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

- Cisco IOS® Software Release 12.0(3)T or later
- Cisco 2511 router
- Cisco 2524 router
- PC serving as Cisco Secure NT server, TACACS+ server, and AAA server
- Destination registration, admission, and status protocol (RAS) server (for example, a Cisco 2511, AS5200, AS5300, or a Microsoft RAS server)
- Two modems

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

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

## Configure

In this section, you are presented with the information to configure the features described in this document.

**Note:** To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only).

## Cisco Secure NT Setup

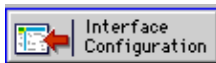
**Note:** In this sample configuration, the Cisco Secure NT server, the Terminal Access Controller Access Control System Plus (TACACS+) server, and the Authentication, Authorization, and Accounting (AAA) server all reside on the PC.

### Create Outbound Service

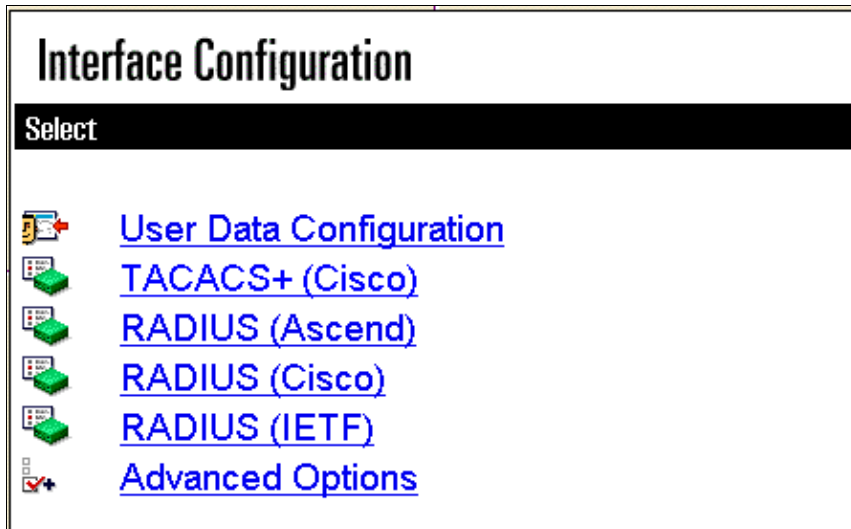
Complete these steps to create new outbound service from the TACACS+ server to the remote networks. For this example, the NAS that dials out is called "michigan," and the remote router is called "ohio."

1. Start your web browser and open Cisco Secure NT.

Select the **Interface Configuration** button.



2. From interface configuration, choose **TACACS+ (Cisco)**.



3. Under New Services, check **Group**, or check both **Group** and **User**.

In the Service box, type **outbound**. In the Protocol box, type **ip**. (Both outbound and ip are typed lower case.) Click **Submit**.

		Service	Protocol
<input type="checkbox"/>	<input checked="" type="checkbox"/>	auth-proxy	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	outbound	ip
<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>		

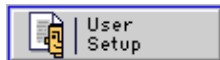
## Create the michigan-1 Profile

Complete these steps:

1. The static routes and the number to dialout are sent from the TACACS+ server to the NAS.

You need three profiles, one for each network connected to the remote router. To download static routes to the NAS (michigan), create a michigan-1 user with the static route information in Cisco Secure.

- ◆ Click the **User Setup** button.



- ◆ Type the username and then click **Add/Edit**.

### User Setup

Select

User:

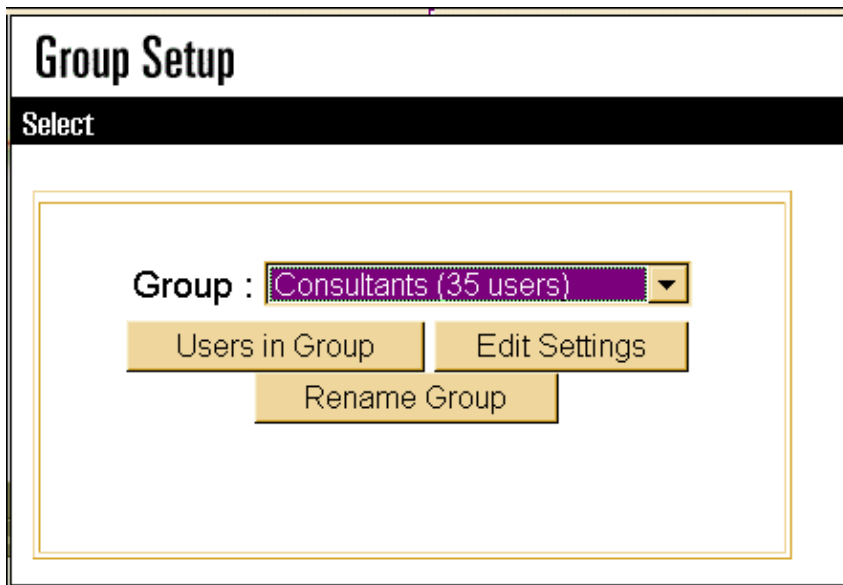
**List users beginning with letter/number:**

<a href="#">A</a>	<a href="#">B</a>	<a href="#">C</a>	<a href="#">D</a>	<a href="#">E</a>	<a href="#">F</a>	<a href="#">G</a>	<a href="#">H</a>	<a href="#">I</a>	<a href="#">J</a>	<a href="#">K</a>	<a href="#">L</a>	<a href="#">M</a>
<a href="#">N</a>	<a href="#">O</a>	<a href="#">P</a>	<a href="#">Q</a>	<a href="#">R</a>	<a href="#">S</a>	<a href="#">T</a>	<a href="#">U</a>	<a href="#">V</a>	<a href="#">W</a>	<a href="#">X</a>	<a href="#">Y</a>	<a href="#">Z</a>
<a href="#">_</a>	<a href="#">0</a>	<a href="#">1</a>	<a href="#">2</a>	<a href="#">3</a>	<a href="#">4</a>	<a href="#">5</a>	<a href="#">6</a>	<a href="#">7</a>	<a href="#">8</a>	<a href="#">9</a>	<a href="#">_</a>	<a href="#">_</a>

2. Networks 20.1.1.0, 30.1.1.0, and 40.1.1.0 are connected to the remote router.

Static routes for these networks are downloaded from the TACACS+ server. From the web admin for Cisco Secure NT, click **Group Setup**, select the group to which the users belong, and then click **Edit**

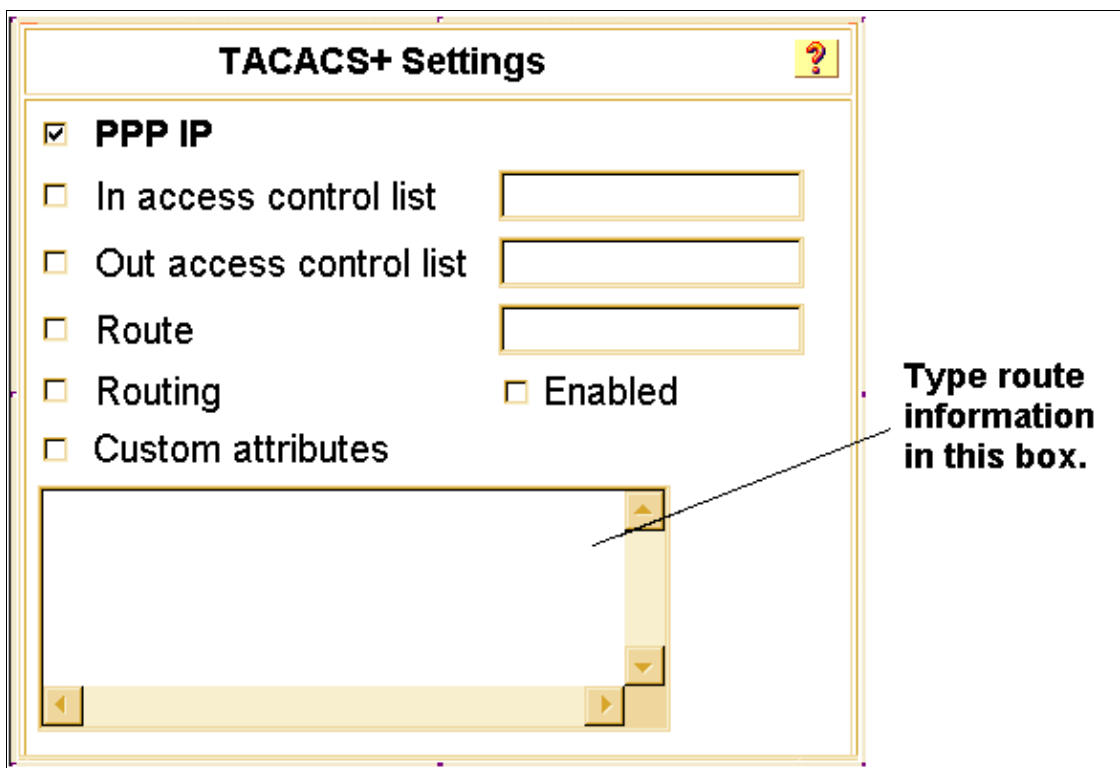
## Settings.



The image shows a 'Group Setup' dialog box with a 'Select' header. It features a dropdown menu for 'Group' currently set to 'Consultants (35 users)'. Below the dropdown are three buttons: 'Users in Group', 'Edit Settings', and 'Rename Group'.

3. Enter this route information in the Custom Attributes window under PPP IP.

**Note:** Make sure **PPP IP** is checked.



The image shows the 'TACACS+ Settings' dialog box. The 'PPP IP' checkbox is checked. There are three empty text input fields for 'In access control list', 'Out access control list', and 'Route'. The 'Routing' checkbox is unchecked, and the 'Enabled' checkbox is also unchecked. The 'Custom attributes' checkbox is unchecked. A large text area with scrollbars is at the bottom, and an arrow points to it with the text 'Type route information in this box.'

The route information is:

```
route#1=60.1.1.1 255.255.255.255 dialer 1 name ohio
route#2=20.1.1.0 255.255.255.0 60.1.1.1
route#3=30.1.1.0 255.255.255.0 60.1.1.1
route#4=40.1.1.0 255.255.255.0 60.1.1
```

## Create the ohio-out Profile

Cisco Secure NT may not have an outbound service in the default interface. If that service does not appear, go to **Interface Configuration > TACACS+** and add a new service called **outbound** for the appropriate level (user or group) and click **Submit**. This causes "service=outbound" to appear in the interface with a Custom Attributes box underneath it. You can use the Custom Attributes box to fill in this information. The destination number is in the ohio-out profile.

```
send-auth=3  
  
send-secret=cisco  
  
dial-number=68858  
  
addr=60.1.1.1
```

The password for this user is **cisco**. Use `send-auth=3` for MS-CHAP, `send-auth=2` for CHAP, and `send-auth=1` for password authentication protocol (PAP). In this case, Microsoft Challenge Handshake Authentication (MS-CHAP) is performed. Include the number to dial and the IP address of the remote peer for PPP negotiations.

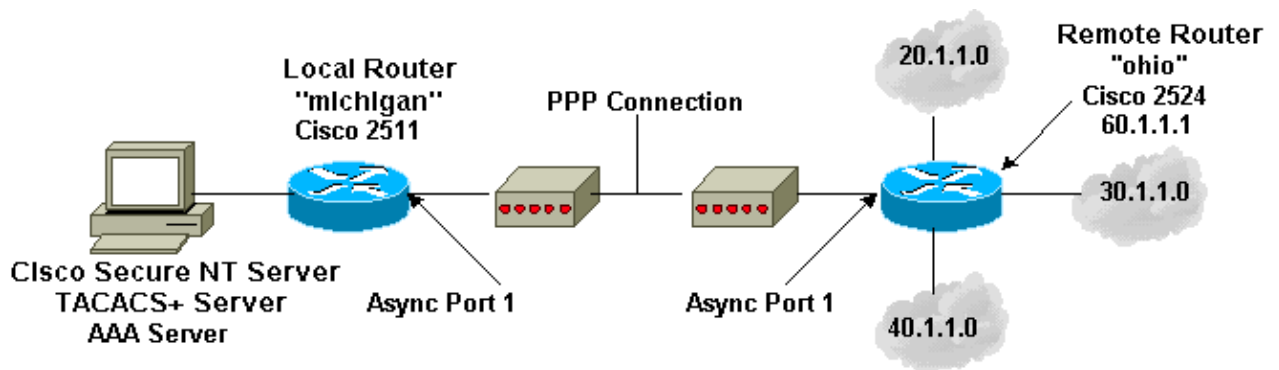
## Create the ohio Profile

Use a normal Point-to-Point Protocol (PPP) profile to create the remote router's profile on the TACACS+ server.

**Note:** Because the router is configured for MS-CHAP, the TACACS+ server must support MS-CHAP. Cisco Secure NT supports MS-CHAP. Make sure that **PPP/IP** and **PPP/LCP** are checked. The password can be in either the NT or the Cisco Secure database.

## Network Diagram

This document uses the network setup shown in this diagram.



## Configurations

### Cisco 2524 Remote Router Configuration

```
ohio#show run  
Building configuration...  
Current configuration:  
!  
version 11.3  
service timestamps debug uptime  
service timestamps log uptime
```

```

no service password-encryption
!
hostname ohio
!
enable password cisco
!

!--- Username and password for MS-CHAP.

username michigan password 0 cisco
!
  interface Loopback0
  ip address 20.1.1.1 255.255.255.0
!interface Loopback1
  ip address 30.1.1.1 255.255.255.0
interface Loopback2
  ip address 40.1.1.1 255.255.255.0
!
interface Ethernet0
  ip address 171.68.201.30 255.255.255.0
  no cdp enable
!
interface Async1
  no ip address
  encapsulation ppp
  dialer rotary-group 1
  async dynamic address
  async mode dedicated
  no cdp enable

!--- Dialer Interface used for traffic to Michigan.

interface Dialer1
  ip address 60.1.1.1 255.255.255.0
  encapsulation ppp
  dialer in-band
  dialer idle-timeout 3600
  dialer-group 1
  no peer default ip address
  no cdp enable
  ppp authentication ms-chap
!
ip classless
ip route 0.0.0.0 0.0.0.0 171.68.201.1
!access-list 199 permit icmp any any
dialer-list 1 protocol ip permit
no cdp run
!
  exec-timeout 0 0
line aux 0
  autoselect ppp
  modem InOut
  modem autoconfigure discovery
  transport input all
  speed 38400
line vty 0 4
  exec-timeout 0 0
  password cisco
  login
!
end

```

## Cisco 2511 Local Router Configuration

!

```
michigan#show run

Building configuration...
Current configuration:
!
version 12.0
service timestamps debug datetime msec
service timestamps log uptime
no service password-encryption
service udp-small-servers
service tcp-small-servers

!
hostname michigan
aaa new-model
aaa authentication login default local group tacacs+
aaa authentication ppp default group tacacs+
aaa authorization network default group tacacs+
aaa authorization configuration default group tacacs+
enable password cisco
username cisco password 7
ip subnet-zero
ip host hoover 171.68.207.179
ip host Rover 172.16.171.9
ip domain-name cisco.com
chat-script callback ABORT ERROR ABORT BUSY "" "ATDT\T" TIMEOUT 30 "CONNECT"
    \c
cns event-service server
!
interface Ethernet0
 ip address 171.68.201.53 255.255.255.0
 no ip directed-broadcast
 no ip route-cache
 no ip mroute-cache
!
interface Serial0
 no ip address
 no ip directed-broadcast
 no ip route-cache
 no ip mroute-cache
 shutdown
 no fair-queue
!
interface Async1
 no ip address
 no ip directed-broadcast
 encapsulation ppp
 no ip route-cache
 no ip mroute-cache
 keepalive 10
 dialer in-band
 dialer rotary-group 1
 async dynamic address
 async mode interactive
 fair-queue 64 16 0
 no cdp enable
!

!--- Dialer.

interface Dialer1
 ip address 50.1.1.1 255.0.0.0
 no ip directed-broadcast
 encapsulation ppp
 no ip route-cache
```

```

no ip mroute-cache
dialer in-band
dialer aaa
dialer idle-timeout 3600
dialer enable-timeout 10
dialer hold-queue 50
dialer-group 1
no cdp enable
ppp authentication ms-chap callin
!
ip local pool default 171.68.201.25
ip classless
ip route 0.0.0.0 0.0.0.0 171.68.201.1
no ip http server
!
dialer-list 1 protocol ip permit
no cdp run
!

/--- Tacacs server host and key.

tacacs-server host 171.68.207.177
tacacs-server key ontop
!
line con 0
  exec-timeout 0 0
  transport input none
line 1 16
  script dialer callback
  modem InOut
  transport input all
  speed 115200
line aux 0
  transport input all
line vty 0 4
  exec-timeout 0 0
  password cisco
!
end

```

## Download Static Routes

Use the **aaa route download [time]** command, entered from the interface config mode on the router (michigan) console, to download static routes from the AAA server:

```

michigan# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
the '100' is the 'route update period in minutes'
michigan(config)#aaa route download 100

*Mar 2 03:58:54.453: AAA/AUTHOR: config command authorization not enabled
*Mar 2 03:58:54.465: AAA: parse name= idb type=-1 tty=-1
*Mar 2 03:58:54.465: AAA/MEMORY: create_user (0x474A18) user=''
  ruser='' port='' rem_addr=''
  authn_type=NONE service=LOGIN priv=0
*Mar 2 03:58:54.473: unknown AAA/AUTHOR/CONFIG (2184933616): Port=''
  list='default' service=unknown
*Mar 2 03:58:54.477: AAA/AUTHOR/CONFIG: unknown (2184933616)
  user='michigan-1'
*Mar 2 03:58:54.477: unknown AAA/AUTHOR/CONFIG (2184933616):
  send AV service=ppp
*Mar 2 03:58:54.481: unknown AAA/AUTHOR/CONFIG (2184933616):
  send AV protocol=ip

```

```

*Mar 2 03:58:54.481: unknown AAA/AUTHOR/CONFIG (2184933616):
  found list "default"
*Mar 2 03:58:54.485: unknown AAA/AUTHOR/CONFIG (2184933616):
  Method=tacacs+ (tacacs+)
*Mar 2 03:58:54.489: AAA/AUTHOR/TAC+: (2184933616): user=michigan-1
*Mar 2 03:58:54.489: AAA/AUTHOR/TAC+: (2184933616): send AV service=ppp
*Mar 2 03:58:54.493: AAA/AUTHOR/TAC+: (2184933616): send AV protocol=ip
*Mar 2 03:58:54.497: TAC+: Using default tacacs server-group "tacacs+" list.
*Mar 2 03:58:54.497: TAC+: Opening TCP/IP to 171.68.207.177/49 timeout=5
*Mar 2 03:58:54.509: TAC+: Opened TCP/IP handle 0x47C6DC to 171.68.207.177/49nd
michigan#
*Mar 2 03:58:54.517: TAC+: 171.68.207.177 (2184933616) AUTHOR/START queued
*Mar 2 03:58:54.993: AAA/AUTHOR: config command authorization not enabled
1d03h: %SYS-5-CONFIG_I: Configured from console by cisco
  on vty1 (171.68.201.34)
*Mar 2 03:58:55.009: TAC+: (2184933616) AUTHOR/START processed
*Mar 2 03:58:55.021: TAC+: (2184933616): received author response
  status = PASS_ADD
*Mar 2 03:58:55.021: TAC+: Closing TCP/IP 0x47C6DC connection
  to 171.68.207.177/49
*Mar 2 03:58:55.029: AAA/AUTHOR (2184933616): Post
  authorization status = PASS_ADD

!--- The IP routes are downloaded from the TACACS+ server.

*Mar 2 03:58:55.037: AAA/AUTHOR/CONFIG: Processing AV service=ppp
*Mar 2 03:58:55.041: AAA/AUTHOR/CONFIG: Processing AV protocol=ip
*Mar 2 03:58:55.041: AAA/AUTHOR/CONFIG: Processing AV route#1=60.1.1.1
  255.255.255.255 dialer 1 name ohio
*Mar 2 03:58:55.045: AAA/AUTHOR/CONFIG: Parse 'ip route 60.1.1.1
  255.255.255.255 dialer 1 name ohio'
*Mar 2 03:58:55.265: AAA/AUTHOR/CONFIG: Parse returned ok (0)
*Mar 2 03:58:55.265: AAA/AUTHOR/CONFIG: Processing AV route#2=20.1.1.0
  255.255.255.0 60.1.1.1
*Mar 2 03:58:55.269: AAA/AUTHOR/CONFIG: Parse 'ip route 20.1.1.0
  255.255.255.0 60.1.1.1'
*Mar 2 03:58:55.321: AAA/AUTHOR/CONFIG: Parse returned ok (0)
*Mar 2 03:58:55.325: AAA/AUTHOR/CONFIG: Processing AV route#3=30.1.1.0
  255.255.255.0 60.1.1.1
*Mar 2 03:58:55.329: AAA/AUTHOR/CONFIG: Parse 'ip route 30.1.1.0
  255.255.255.0 60.1.1.1'
*Mar 2 03:58:55.369: AAA/AUTHOR/CONFIG: Parse returned ok (0)
*Mar 2 03:58:55.369: AAA/AUTHOR/CONFIG: Processing AV route#4=40.1.1.0
  255.255.255.0 60.1.1.1
*Mar 2 03:58:55.373: AAA/AUTHOR/CONFIG: Parse 'ip route 40.1.1.0
  255.255.255.0 60.1.1.1'
*Mar 2 03:58:55.413: AAA/AUTHOR/CONFIG: Parse returned ok (0)
*Mar 2 03:58:55.417: unknown AAA/AUTHOR/CONFIG (2239451311): Port=''
  list='default' service=unknown
*Mar 2 03:58:55.417: AAA/AUTHOR/CONFIG: unknown (2239451311) user='michigan-2'
*Mar 2 03:58:55.421: unknown AAA/AUTHOR/CONFIG (2239451311): send AV service=ppp
*Mar 2 03:58:55.421: unknown AAA/AUTHOR/CONFIG (2239451311): send AV protocol=ip
*Mar 2 03:58:55.425: AAA/AUTHOR/CONFIG: unknown (2239451311)
  Processing AV service=ppp
*Mar 2 03:58:55.429: AAA/AUTHOR/CONFIG: unknown (2239451311)
  Processing AV protocol=ip
*Mar 2 03:58:55.429: AAA/AUTHOR/CONFIG: unknown (2239451311) Processing AV
  route#1=60.1.1.1 255.255.255.255 dialer 1 name ohio
*Mar 2 03:58:55.433: AAA/AUTHOR/CONFIG: unknown (2239451311) Processing AV
  route#2=20.1.1.0 255.255.255.0 60.1.1.1
*Mar 2 03:58:55.437: AAA/AUTHOR/CONFIG: unknown (2239451311) Processing AV
  route#3=30.1.1.0 255.255.255.0 60.1.1.1
*Mar 2 03:58:55.441: AAA/AUTHOR/CONFIG: unknown (2239451311) Processing AV
  route#4=40.1.1.0 255.255.255.0 60.1.1.1
*Mar 2 03:58:55.445: unknown AAA/AUTHOR/CONFIG (2239451311): found list "default"
*Mar 2 03:58:55.445: unknown AAA/AUTHOR/CONFIG (2239451311):

```

```

Method=tacacs+ (tacacs+)
*Mar 2 03:58:55.449: AAA/AUTHOR/TAC+: (2239451311): user=michigan-2
*Mar 2 03:58:55.453: AAA/AUTHOR/TAC+: (2239451311): send AV service=ppp
*Mar 2 03:58:55.453: AAA/AUTHOR/TAC+: (2239451311): send AV protocol=ip
*Mar 2 03:58:55.457: TAC+: using previously set server 171.68.207.177
    from group tacacs+
*Mar 2 03:58:55.461: TAC+: Opening TCP/IP to 171.68.207.177/49 timeout=5
*Mar 2 03:58:55.473: TAC+: Opened TCP/IP handle 0x47CFC8 to 171.68.207.177/49
*Mar 2 03:58:55.473: TAC+: Opened 171.68.207.177 index=1
*Mar 2 03:58:55.481: TAC+: 171.68.207.177 (2239451311) AUTHOR/START queued
*Mar 2 03:58:55.681: TAC+: (2239451311) AUTHOR/START processed
*Mar 2 03:58:55.685: TAC+: (2239451311): received author response status = FAIL
*Mar 2 03:58:55.689: TAC+: Closing TCP/IP 0x47CFC8 connection to 171.68.207.177/49
*Mar 2 03:58:55.693: AAA/AUTHOR (2239451311): Post authorization status = FAIL
*Mar 2 03:58:55.697: AAA/AUTHOR/CONFIG: authorization failed or network error
*Mar 2 03:58:55.701: AAA/AUTHOR/CONFIG: route downloading completed
*Mar 2 03:58:55.701: AAA/MEMORY: free_user (0x474A18) user='michigan-2'
    ruser='' port='' rem_addr='' authen_type=NONE
    service=LOGIN priv=0

```

## Verify

There is currently no verification procedure available for this configuration.

## Troubleshoot

This section provides information you can use to troubleshoot your configuration.

## Debug and Verify the Local Router

Use the `show ip route static download` command to see that the routes are in the route table:

```

michigan#show ip route static download
Connectivity: A - Active, I - Inactive
A 20.1.1.0 255.255.255.0 60.1.1.1
A 30.1.1.0 255.255.255.0 60.1.1.1
A 40.1.1.0 255.255.255.0 60.1.1.1
A 60.1.1.1 255.255.255.255 Dialer1 name ohio

```

Certain `show` commands are supported by the Output Interpreter Tool ( registered customers only ) , which allows you to view an analysis of `show` command output.

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

- **debug aaa authorization** Used to see if the user is authorized by the AAA server.
- **debug tacacs** Used to see if a TACACS login attempt is successful.
- **debug chat-script** Used to see if the chat script calls the client.
- **debug ppp authentication** Used to see if a client passes authentication.
- **debug ppp negotiation** Used to see if a client passes PPP negotiation. This shows which options (callback, MLP, and so on) and what protocols (IP, IPX, and so on) are negotiated.

**ping** the remote networks to verify the connection.

```

michigan#ping 60.1.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 60.1.1.1, timeout is 2 seconds:

```

```
*Mar 2 03:59:34.669: AAA: parse name=Dialer1 idb type=-1 TTY=-1
*Mar 2 03:59:34.673: AAA: name=Dialer1 flags=0x11 type=6 shelf=0
slot=0 adapter=0 port=1 channel=0
*Mar 2 03:59:34.677: AAA: parse name=<no string> idb type=-1 TTY=-1
*Mar 2 03:59:34.677: AAA/MEMORY: create_user (0x47CC34) user=ohio-out
ruser='' port='Dialer1' rem_addr='Dial out' authen_type=NONE
service=LOGIN priv=0
*Mar 2 03:59:34.685: Di1 AAA/AUTHOR/DIALOUT (110659631): Port='Dialer1'
list='default' service=unknown
*Mar 2 03:59:34.689: AAA/AUTHOR/DIALOUT: Di1 (110659631) user=ohio-out
*Mar 2 03:59:34.689: Di1 AAA/AUTHOR/DIALOUT (110659631): send AV service=outbound
*Mar 2 03:59:34.693: Di1 AAA/AUTHOR/DIALOUT (110659631): send AV protocol=ip
*Mar 2 03:59:34.693: Di1 AAA/AUTHOR/DIALOUT (110659631): found list "default"
*Mar 2 03:59:34.697: Di1 AAA/AUTHOR/DIALOUT (110659631): Method=tacacs+ (tacacs+)
*Mar 2 03:59:34.701: AAA/AUTHOR/TAC+: (110659631): user=ohio-out
*Mar 2 03:59:34.701: AAA/AUTHOR/TAC+: (110659631): send AV service=outbound
*Mar 2 03:59:34.705: AAA/AUTHOR/TAC+: (110659631): send AV protocol=ip
*Mar 2 03:59:34.709: TAC+: Using default tacacs server-group "tacacs+" list.
*Mar 2 03:59:34.709: TAC+: Opening TCP/IP to 171.68.207.177/49 timeout=5
*Mar 2 03:59:34.721: TAC+: Opened TCP/IP handle 0x47D40C to 171.68.207.177/49
*Mar 2 03:59:34.729: TAC+: 171.68.207.177 (110659631) AUTHOR/START queued
*Mar 2 03:59:35.129: TAC+: (110659631) AUTHOR/START processed
*Mar 2 03:59:35.137: TAC+: (110659631): received author response
status = PASS_ADD
*Mar 2 03:59:35.137: TAC+: Closing TCP/IP 0x47D40C connection
to 171.68.207.177/49
```

*!--- TACACS+ server provides attributes used for dialout.*

```
*Mar 2 03:59:35.145: Di1 AAA/AUTHOR (110659631): Post authorization
status = PASS_ADD
*Mar 2 03:59:35.153: Di1 AAA/AUTHOR/DIALOUT: Processing AV service=outbound
*Mar 2 03:59:35.157: Di1 AAA/AUTHOR/DIALOUT: Processing AV protocol=ip
*Mar 2 03:59:35.157: Di1 AAA/AUTHOR/DIALOUT: Processing AV send-auth=3
*Mar 2 03:59:35.161: Di1 AAA/AUTHOR/DIALOUT: Processing AV send-secret=cisco
*Mar 2 03:59:35.165: Di1 AAA/AUTHOR/DIALOUT: Processing AV dial-number=68858
*Mar 2 03:59:35.165: Di1 AAA/AUTHOR/DIALOUT: Processing AV addr=60.1.1.1
*Mar 2 03:59:35.169: Di1 AAA/AUTHOR/DIALOUT: Authorization succeeded
*Mar 2 03:59:35.169: Di1 AAA/AUTHOR/DIALOUT: truncating '-out'
suffix, user now is ohio
*Mar 2 03:59:35.173: %LSDialout: temporary debug to verify
the data integrity
*Mar 2 03:59:35.177: dial number = 68858
*Mar 2 03:59:35.177: dialnum_count = 1
*Mar 2 03:59:35.177: force_56 = 0
*Mar 2 03:59:35.181: routing = 0
*Mar 2 03:59:35.181: data_svc = -1
*Mar 2 03:59:35.181: port_type = -1
*Mar 2 03:59:35.185: map_class =
*Mar 2 03:59:35.185: ip_address = 60.1.1.1
*Mar 2 03:59:35.189: send_secret = cisco
*Mar 2 03:59:35.189: send_auth = 3
*Mar 2 03:59:35.197: CHAT1: Attempting async line dialer script
*Mar 2 03:59:35.197: CHAT1: Dialing using Modem script:
callback & System script: none
*Mar 2 03:59:35.205: CHAT1: process started
*Mar 2 03:59:35.209: CHAT1: Asserting DTR
*Mar 2 03:59:35.213: CHAT1: Chat script callback started
*Mar 2 03:59:35.213: CHAT1: Sending string: ATDT\T<68858>.
*Mar 2 03:59:35.217: CHAT1: Expecting string: CONNECT....
Success rate is 0 percent (0/5)
michigan#
*Mar 2 03:59:50.069: CHAT1: Completed match for expect: CONNECT
*Mar 2 03:59:50.073: CHAT1: Sending string: \c
*Mar 2 03:59:50.073: CHAT1: Chat script callback finished, status = Success
*Mar 2 03:59:50.085: Di1 IPCP: Install route to 60.1.1.1
```

```

ld03h: %LINK-3-UPDOWN: Interface Async1, changed state to up
*Mar 2 03:59:52.097: As1 PPP: Treating connection as a callout
*Mar 2 03:59:52.101: As1 PPP: Phase is ESTABLISHING, Active Open
*Mar 2 03:59:52.105: As1 PPP: No remote authentication for call-out
*Mar 2 03:59:52.105: As1 PPP: Overriding authentication config
with AAA authorization
*Mar 2 03:59:52.109: As1 AAA/AUTHOR/FSM: (0): LCP succeeds trivially
*Mar 2 03:59:52.113: As1 LCP: O CONFREQ [Closed] id 59 Len 25
*Mar 2 03:59:52.117: As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 2 03:59:52.121: As1 LCP: AuthProto MS-CHAP (0x0305C22380)
*Mar 2 03:59:52.121: As1 LCP: MagicNumber 0x167D31E6 (0x0506167D31E6)
*Mar 2 03:59:52.125: As1 LCP: PFC (0x0702)
*Mar 2 03:59:52.125: As1 LCP: ACFC (0x0802)
*Mar 2 03:59:52.329: As1 LCP: I CONFREQ [REQsent] id 12 Len 25
*Mar 2 03:59:52.333: As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 2 03:59:52.337: As1 LCP: AuthProto MS-CHAP (0x0305C22380)
*Mar 2 03:59:52.337: As1 LCP: MagicNumber 0x61AFFF85 (0x050661AFFF85)
*Mar 2 03:59:52.341: As1 LCP: PFC (0x0702)
*Mar 2 03:59:52.345: As1 LCP: ACFC (0x0802)
*Mar 2 03:59:52.349: As1 LCP: O CONFACK [REQsent] id 12 Len 25
*Mar 2 03:59:52.349: As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 2 03:59:52.353: As1 LCP: AuthProto MS-CHAP (0x0305C22380)
*Mar 2 03:59:52.357: As1 LCP: MagicNumber 0x61AFFF85 (0x050661AFFF85)
*Mar 2 03:59:52.361: As1 LCP: PFC (0x0702)
*Mar 2 03:59:52.361: As1 LCP: ACFC (0x0802)
*Mar 2 03:59:52.365: As1 LCP: I CONFACK [ACKsent] id 59 Len 25
*Mar 2 03:59:52.369: As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 2 03:59:52.373: As1 LCP: AuthProto MS-CHAP (0x0305C22380)
*Mar 2 03:59:52.373: As1 LCP: MagicNumber 0x167D31E6 (0x0506167D31E6)
*Mar 2 03:59:52.377: As1 LCP: PFC (0x0702)
*Mar 2 03:59:52.377: As1 LCP: ACFC (0x0802)
*Mar 2 03:59:52.381: As1 LCP: State is Open
*Mar 2 03:59:52.385: As1 PPP: Phase is AUTHENTICATING, by both
*Mar 2 03:59:52.385: As1 MS-CHAP: O CHALLENGE id 10 Len 21 from "michigan "
*Mar 2 03:59:52.513: As1 MS-CHAP: I CHALLENGE id 10 Len 21 from "ohio "
*Mar 2 03:59:52.521: AAA: parse name=Async1 idb type=10 TTY=1
*Mar 2 03:59:52.521: AAA: name=Async1 flags=0x11 type=4 shelf=0 slot=0
adapter=0 port=1 channel=0
*Mar 2 03:59:52.525: AAA/MEMORY: create_user (0x47DF08) user=ohio ruser=''
port='Async1' rem_addr='async' authen_type=MSCHAP service=PPP priv=1
*Mar 2 03:59:52.533: TAC+: Look for cached secret first for sendauth
*Mar 2 03:59:53.337: AAA/MEMORY: free_user (0x47DF08) user=ohio ruser=''
port='Async1' rem_addr='async' authen_type=MSCHAP service=PPP priv=1
*Mar 2 03:59:53.345: As1 MS-CHAP: O RESPONSE id 10 Len 60 from "michigan"
*Mar 2 03:59:55.133: As1 MS-CHAP: I SUCCESS id 10 Len 4
*Mar 2 03:59:55.145: As1 MS-CHAP: I RESPONSE id 10 Len 57 from "ohio"
*Mar 2 03:59:55.153: AAA: parse name=Async1 idb type=10 TTY=1
*Mar 2 03:59:55.153: AAA: name=Async1 flags=0x11 type=4 shelf=0 slot=0
adapter=0 port=1 channel=0
*Mar 2 03:59:55.157: AAA/MEMORY: create_user (0x47DF68) user=ohio ruser=''
port='Async1' rem_addr='async' authen_type=MSCHAP service=PPP priv=1
*Mar 2 03:59:55.165: TAC+: send AUTHEN/START packet ver=193 id=3033142512
*Mar 2 03:59:55.165: TAC+: Using default tacacs server-group "tacacs+" list.
*Mar 2 03:59:55.169: TAC+: Opening TCP/IP to 171.68.207.177/49 timeout=5
*Mar 2 03:59:55.181: TAC+: Opened TCP/IP handle 0x47E924 to 171.68.207.177/49
*Mar 2 03:59:55.189: TAC+: 171.68.207.177 (3033142512)
AUTHEN/START/LOGIN/MSCHAP queued
*Mar 2 03:59:55.389: TAC+: (3033142512) AUTHEN/START/LOGIN/MSCHAP processed
*Mar 2 03:59:55.393: TAC+: ver=193 id=3033142512 received AUTHEN status = PASS
*Mar 2 03:59:55.397: TAC+: Closing TCP/IP 0x47E924 connection to 171.68.207.177/49
*Mar 2 03:59:55.405: As1 AAA/AUTHOR/LCP: Authorize LCP
*Mar 2 03:59:55.405: As1 AAA/AUTHOR/LCP (1887155294): Port='Async1'
list='' service=NET
*Mar 2 03:59:55.409: AAA/AUTHOR/LCP: As1 (1887155294) user=ohio
*Mar 2 03:59:55.413: As1 AAA/AUTHOR/LCP (1887155294): send AV service=ppp
*Mar 2 03:59:55.413: As1 AAA/AUTHOR/LCP (1887155294): send AV protocol=lcp

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*Mar 2 03:59:55.417: As1 AAA/AUTHOR/LCP (1887155294): found list "default"
*Mar 2 03:59:55.421: As1 AAA/AUTHOR/LCP (1887155294): Method=tacacs+ (tacacs+)
*Mar 2 03:59:55.421: AAA/AUTHOR/TAC+: (1887155294): user=ohio
*Mar 2 03:59:55.425: AAA/AUTHOR/TAC+: (1887155294): send AV service=ppp
*Mar 2 03:59:55.425: AAA/AUTHOR/TAC+: (1887155294): send AV protocol=lcp
*Mar 2 03:59:55.429: TAC+: using previously set server 171.68.207.177
    from group tacacs+
*Mar 2 03:59:55.433: TAC+: Opening TCP/IP to 171.68.207.177/49 timeout=5
*Mar 2 03:59:55.457: TAC+: Opened TCP/IP handle 0x47ED68 to 171.68.207.177/49
*Mar 2 03:59:55.461: TAC+: Opened 171.68.207.177 index=1
*Mar 2 03:59:55.469: TAC+: 171.68.207.177 (1887155294) AUTHOR/START queued
*Mar 2 03:59:55.665: TAC+: (1887155294) AUTHOR/START processed
*Mar 2 03:59:55.669: TAC+: (1887155294): received author response status = PASS_ADD
*Mar 2 03:59:55.673: TAC+: Closing TCP/IP 0x47ED68 connection to
    171.68.207.177/49
*Mar 2 03:59:55.677: As1 AAA/AUTHOR (1887155294): Post authorization
    status = PASS_ADD
*Mar 2 03:59:55.681: As1 MS-CHAP: O SUCCESS id 10 Len 4
*Mar 2 03:59:55.689: As1 PPP: Phase is UP
*Mar 2 03:59:55.689: As1 AAA/AUTHOR/FSM: (0): Can we start IPCP?
*Mar 2 03:59:55.693: As1 AAA/AUTHOR/FSM (763417858): Port='Async1'
    list='' service=NET
*Mar 2 03:59:55.697: AAA/AUTHOR/FSM: As1 (763417858) user=ohio
*Mar 2 03:59:55.697: As1 AAA/AUTHOR/FSM (763417858): send AV service=ppp
*Mar 2 03:59:55.701: As1 AAA/AUTHOR/FSM (763417858): send AV protocol=ip
*Mar 2 03:59:55.701: As1 AAA/AUTHOR/FSM (763417858): found list "default"
*Mar 2 03:59:55.705: As1 AAA/AUTHOR/FSM (763417858): Method=tacacs+ (tacacs+)
*Mar 2 03:59:55.709: AAA/AUTHOR/TAC+: (763417858): user=ohio
*Mar 2 03:59:55.709: AAA/AUTHOR/TAC+: (763417858): send AV service=ppp
*Mar 2 03:59:55.713: AAA/AUTHOR/TAC+: (763417858): send AV protocol=ip
*Mar 2 03:59:55.713: TAC+: using previously set server 171.68.207.177
    from group tacacs+
*Mar 2 03:59:55.717: TAC+: Opening TCP/IP to 171.68.207.177/49 timeout=5
*Mar 2 03:59:55.733: TAC+: Opened TCP/IP handle 0x47F1AC to 171.68.207.177/49
*Mar 2 03:59:55.737: TAC+: Opened 171.68.207.177 index=1
*Mar 2 03:59:55.745: TAC+: 171.68.207.177 (763417858) AUTHOR/START queued
*Mar 2 03:59:55.813: As1 IPCP: I CONFREQ [Closed] id 17 Len 10
*Mar 2 03:59:55.817: As1 IPCP: Address 60.1.1.1 (0x03063C010101)
*Mar 2 03:59:56.377: TAC+: (763417858) AUTHOR/START processed
*Mar 2 03:59:56.385: TAC+: (763417858): received author response status = PASS_ADD
*Mar 2 03:59:56.389: TAC+: Closing TCP/IP 0x47F1AC connection to 171.68.207.177/49
*Mar 2 03:59:56.393: As1 AAA/AUTHOR (763417858): Post authorization status = PASS_ADD
*Mar 2 03:59:56.397: As1 AAA/AUTHOR/FSM: We can start IPCP
*Mar 2 03:59:56.401: As1 IPCP: O CONFREQ [Closed] id 46 Len 10
*Mar 2 03:59:56.405: As1 IPCP: Address 50.1.1.1 (0x030632010101)
*Mar 2 03:59:56.541: As1 IPCP: I CONFACK [REQsent] id 46 Len 10
*Mar 2 03:59:56.545: As1 IPCP: Address 50.1.1.1 (0x030632010101)
1d03h: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async1, changed state to up
*Mar 2 03:59:58.145: As1 IPCP: I CONFREQ [ACKrcvd] id 18 Len 10
*Mar 2 03:59:58.149: As1 IPCP: Address 60.1.1.1 (0x03063C010101)
*Mar 2 03:59:58.153: As1 AAA/AUTHOR/IPCP: Start. Her address 60.1.1.1,
    we want 60.1.1.1
*Mar 2 03:59:58.157: As1 AAA/AUTHOR/IPCP (3965742514): Port='Async1'
    list='' service=NET
*Mar 2 03:59:58.161: AAA/AUTHOR/IPCP: As1 (3965742514) user=ohio
*Mar 2 03:59:58.165: As1 AAA/AUTHOR/IPCP (3965742514): send AV service=ppp
*Mar 2 03:59:58.165: As1 AAA/AUTHOR/IPCP (3965742514): send AV protocol=ip
*Mar 2 03:59:58.169: As1 AAA/AUTHOR/IPCP (3965742514): send AV addr*60.1.1.1
*Mar 2 03:59:58.169: As1 AAA/AUTHOR/IPCP (3965742514): found list "default"
*Mar 2 03:59:58.173: As1 AAA/AUTHOR/IPCP (3965742514): Method=tacacs+ (tacacs+)
*Mar 2 03:59:58.177: AAA/AUTHOR/TAC+: (3965742514): user=ohio
*Mar 2 03:59:58.177: AAA/AUTHOR/TAC+: (3965742514): send AV service=ppp
*Mar 2 03:59:58.181: AAA/AUTHOR/TAC+: (3965742514): send AV protocol=ip
*Mar 2 03:59:58.185: AAA/AUTHOR/TAC+: (3965742514): send AV addr*60.1.1.1
*Mar 2 03:59:58.185: TAC+: using previously set server 171.68.207.177
    from group tacacs+

```

```

*Mar  2 03:59:58.189: TAC+: Opening TCP/IP to 171.68.207.177/49 timeout=5
*Mar  2 03:59:58.201: TAC+: Opened TCP/IP handle 0x47F5F0 to 171.68.207.177/49
*Mar  2 03:59:58.205: TAC+: Opened 171.68.207.177 index=1
*Mar  2 03:59:58.213: TAC+: 171.68.207.177 (3965742514) AUTHOR/START queued
*Mar  2 03:59:58.413: TAC+: (3965742514) AUTHOR/START processed
*Mar  2 03:59:58.417: TAC+: (3965742514): received author response
      status = PASS_ADD
*Mar  2 03:59:58.421: TAC+: Closing TCP/IP 0x47F5F0 connection
      to 171.68.207.177/49
*Mar  2 03:59:58.425: As1 AAA/AUTHOR (3965742514): Post authorization
      status = PASS_ADD
*Mar  2 03:59:58.433: As1 AAA/AUTHOR/IPCP: Processing AV service=ppp
*Mar  2 03:59:58.433: As1 AAA/AUTHOR/IPCP: Processing AV protocol=ip
*Mar  2 03:59:58.437: As1 AAA/AUTHOR/IPCP: Processing AV addr*60.1.1.1
*Mar  2 03:59:58.437: As1 AAA/AUTHOR/IPCP: Authorization succeeded
*Mar  2 03:59:58.441: As1 AAA/AUTHOR/IPCP: Done.  Her address 60.1.1.1,
      we want 60.1.1.1
*Mar  2 03:59:58.445: As1 IPCP: O CONFACK [ACKrcvd] id 18 Len 10
*Mar  2 03:59:58.449: As1 IPCP:      Address 60.1.1.1 (0x03063C010101)
*Mar  2 03:59:58.449: As1 IPCP: State is Open
michigan#

```

*!--- Ping to Ohio is successful.*

```

michigan#ping 60.1.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 60.1.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 168/172/180 ms

```

*!--- Ping to networks whose routes are downloaded  
!--- from TACACS+ are successful.*

```

michigan#ping 20.1.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 30.1.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 164/168/172 ms

```

*!--- !--- Ping to networks whose routes are  
!--- downloaded from TACACS+ are successful*

```

michigan#ping 30.1.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 40.1.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 160/165/168 ms
michigan#show user

```

Line	User	Host(s)	Idle	Location
0 con 0		idle	00:07:54	
1 TTY 1	<b>ohio</b>	Async interface	00:00:08	PPP: <b>60.1.1.1</b>

Interface	User	Mode	Idle	Peer	Address
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## Related Information

- **Security Product Field Notices (including Cisco Secure ACS for Windows)**
- **Configuring Cisco Secure UNIX for Large Scale Dialout Using RADIUS**
- **Cisco IOS Software Release 12.0 T – Feature Guide**
- **Configuring Large–Scale Dial–Out**
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