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Configuring SGBP with BAP

Document ID: 10323

Introduction

Prerequisites

- Requirements

- Components Used

- Conventions

Background Information

Configure

- Network Diagram

- Configurations

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- Troubleshooting Commands

- Debug Outputs

NetPro Discussion Forums – Featured Conversations

Related Information

Introduction

This document provides a sample configuration for using Bandwidth Allocation Protocol (BAP) in a Stack Group Bidding Protocol (SGBP) scenario.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

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 Cisco Technical Tips Conventions.

Background Information

In this configuration example, the SGBP stack group is composed of three routers. The router acting as the offload server should include the **ppp bap number format digits 4** command in order for BAP to be accepted. In this case, the remote client (the Cisco 800 router) dials-in using one B channel. As soon as the load threshold is reached, a second call is made. However, due to the BAP mechanism, the offload server

needs to send the dial string. The second dial string can be a second member in the SGBP group.

Many installations may fail if the virtual template in the offload server is not configured correctly. Here is an example depicting a correct configuration:

```
interface Virtual-Template1
 ip unnumbered Loopback0
 load-interval 30
 peer default ip address pool default
 ppp authentication chap pap callin
 ppp multilink bap
 ppp timeout multilink link add 1
 ppp timeout bacp 1
 ppp bap call accept acknowledge
 ppp bap timeout pending 20
 ppp bap max req-retries 1
 no ppp bap monitor load
 ppp bap number default 8218
 ppp bap number format digits 4
```

The remote client (the Cisco 800) should include this configuration to request BAP:

```
interface Dialer1
 ip unnumbered Loopback0
 encapsulation ppp
 dialer in-band
 dialer load-threshold 1 outbound
 dialer-group 1
 peer default ip address pool default
 ppp callback accept
 ppp authentication chap pap callin
 ppp multilink bap
 ppp bap call accept acknowledge
 ppp bap timeout pending 20
 !! ppp bap number default 8218
 !! ppp bap number format digits 4
```

The lines with **!!** are optional. However, it is recommended that you include them with some earlier Cisco IOS® versions, such as version 11.3. A few key points to remember for this configuration:

- The **dialer-load threshold 2** command must be configured in the requesting BAP router.
- The **no ppp bap monitor** command must be configured in the accepting or passive BAP router.
- The **ppp bap call accept acknowledge** command must be configured in the accepting BAP router.
- The **ppp multilink bap** command must be configured for the dialers of the network access servers (NASs) for SGBP.

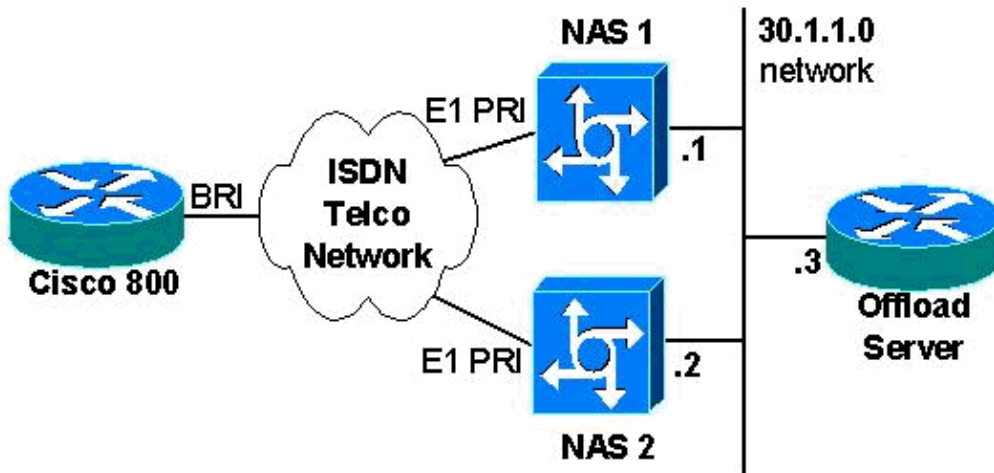
Configure

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) .

Network Diagram

This document uses this network setup:



Configurations

This document uses these configurations:

- Cisco 800 (Remote)
- NAS1 and NAS2
- Offload Server

Note: We have truncated the following configurations to highlight the relevant information.

Cisco 800 (Remote)
<pre>Current configuration: ! version 12.1 service timestamps debug uptime service timestamps log uptime no service password-encryption ! hostname tutu ! ! ! ip subnet-zero ! no ip domain-lookup isdn switch-type basic-net3 ! ! ! interface Loopback0 ip address 8.8.8.8 255.255.255.0 ! interface Loopback1 ip address 7.7.7.7 255.255.255.0 ! interface Loopback3</pre>

```

ip address 6.6.6.6 255.255.255.0
!
interface Ethernet0
no ip address
shutdown
!
interface BRI0
ip address negotiated
encapsulation ppp
dialer idle-timeout 30000
dialer string 8215
dialer string 8218111
dialer string 8218 class 32
dialer load-threshold 2 either
dialer-group 1
isdn switch-type basic-net3
no cdp enable
ppp authentication chap pap callin
ppp chap hostname remote
ppp chap password 7 0822455D0A16
ppp multilink bap
ppp bap call request
ppp bap timeout pending 20
!
router rip
version 2
no validate-update-source
redistribute connected
network 8.0.0.0
network 12.0.0.0
default-metric 2
no auto-summary
!
no ip http server
ip route 0.0.0.0 0.0.0.0 BRI0
!
!
map-class dialer 64
dialer isdn speed 56
!
map-class dialer 32
access-list 1 permit any
dialer-list 1 protocol ip permit
!
line con 0
exec-timeout 0 0
transport input none
stopbits 1
line vty 0 4
password ww
login
!
end

```

NAS1 and NAS2

```

Current configuration:
!
version 12.1
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!

```

```

hostname caramel
!
boot system flash c5300-is-mz.121-3
!
username STACK password 0 stack
username remote password 0 cisco
spe 2/0 2/9
  firmware location system:/ucode/mica_port_firmware
!
!
resource-pool disable
!
!
!
!
!
ip subnet-zero
no ip domain-lookup
ip host rund 172.17.247.195
!
!
sgbp group STACK
sgbp member tnt-buster 30.1.1.2
sgbp member tango 30.1.1.3
sgbp ppp-forward
isdn switch-type primary-net5
isdn voice-call-failure 0
mta receive maximum-recipients 0
!
!
controller E1 0
  clock source line primary
  pri-group timeslots 1-31
!
controller E1 1
  clock source line secondary 1
!
controller E1 2
  clock source line secondary 2
!
controller E1 3
  clock source line secondary 3
!
!
!
!
interface Loopback0
  ip address 10.10.10.10 255.255.255.0
!
interface Ethernet0
  description ip addre 30.1.1.1 255.255.255.0
  ip address 30.1.1.1 255.255.255.0
!
interface Serial0
  no ip address
  no ip mroute-cache
  shutdown
  no fair-queue
  clockrate 2015232
!
interface Serial1
  no ip address
  shutdown
  no fair-queue

```

```

clockrate 2015232
!
interface Serial2
no ip address
shutdown
no fair-queue
clockrate 2015232
!
interface Serial3
no ip address
shutdown
no fair-queue
clockrate 2015232
!
interface Serial0:15
ip unnumbered Loopback0
encapsulation ppp
dialer rotary-group 1
dialer-group 1
isdn switch-type primary-net5
!
interface FastEthernet0
no ip address
shutdown
duplex auto
speed auto
!
interface Dialer1
ip unnumbered Loopback0
encapsulation ppp
dialer in-band
dialer load-threshold 1 outbound
dialer-group 1
peer default ip address pool default
ppp callback accept
ppp authentication chap pap callin
ppp multilink bap
ppp bap call accept acknowledge
ppp bap timeout pending 20
!! ppp bap number default 8218
!! ppp bap number format digits 4
!
router ospf 1
log-adjacency-changes
redistribute connected subnets
redistribute rip subnets
network 30.1.1.0 0.0.0.255 area 0
!
ip local pool default 10.10.10.11 10.10.10.20
ip classless
ip route 0.0.0.0 0.0.0.0 10.200.20.1
no ip http server
!
dialer-list 1 protocol ip permit
!
!
line con 0
exec-timeout 0 0
transport input none
line 1 120
transport output lat pad telnet rlogin udptn v120 lapb-ta
line aux 0
line vty 0 4
login

```

```
!  
end
```

Offload Server

Current configuration:

```
!  
version 12.1  
service timestamps debug uptime  
service timestamps log uptime  
no service password-encryption  
!  
hostname tango  
!  
!  
username STACK password 0 stack  
username remote password 0 cisco  
!  
!  
!  
!  
ip subnet-zero  
no ip domain-lookup  
!  
!  
sgbp group STACK  
sgbp seed-bid offload  
sgbp member caramel 30.1.1.1  
sgbp member tnt-buster 30.1.1.2  
multilink virtual-template 1  
chat-script reset "" "AT&FS0=1" OK  
chat-script dialnum ABORT ERROR ABORT BUSY "" "ATDT\T" TIMEOUT 60 CONNECT  
\c  
!  
!  
!  
interface Loopback0  
 ip address 12.12.12.12 255.255.255.0  
!  
interface Ethernet0  
 ip address 30.1.1.3 255.255.255.0  
!  
interface Virtual-Templat1  
 ip unnumbered Loopback0  
 load-interval 30  
 peer default ip address pool default  
 ppp authentication chap pap callin  
 ppp multilink bap  
 ppp timeout multilink link add 1  
 ppp timeout bacp 1  
 ppp bap call accept acknowledge  
 ppp bap timeout pending 20  
 ppp bap max req-retries 1  
 no ppp bap monitor load  
 ppp bap number default 8218  
 ppp bap number format digits 4  
!  
interface Serial0  
 no ip address  
 shutdown  
!  
interface Serial1  
 no ip address
```

```

shutdown
!
interface Serial2
  no ip address
  shutdown
!
interface Serial3
  no ip address
  shutdown
ip local pool default 12.12.12.13 12.12.12.20
ip classless
ip route 49.1.1.2 255.255.255.255 Async4
no ip http server
!
!
line con 0
  exec-timeout 0 0
  transport input none
line aux 0
  script dialer dialnum
  script reset reset
  modem InOut
  transport input all
line vty 0 4
  login
!
end

```

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

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

Troubleshooting Commands

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, refer to Important Information on Debug Commands.

- **show debugging** displays information about the types of debugging that are enabled for your router.
- **ping** enables you to diagnose basic network connectivity.
- **show users** displays information about the active lines on the router, or information about lawful–intercept users in privileged EXEC mode.

```

LAC#show debug
Dial on demand:
  Dial on demand events debugging is on
VPN:
  L2X protocol events debugging is on
  VPDN events debugging is on
PPP:
  PPP authentication debugging is on
  PPP protocol negotiation debugging is on

```

```

ISDN:
  ISDN events debugging is on

  ISDN events debug DSLs. (On/Off/No DSL:1/0/-)
  DSL 0 --> 1
  1 -

```

```

LNS#show debug
Dial on demand:
  Dial on demand events debugging is on
VPN:
  L2X protocol events debugging is on
  VPDN events debugging is on
PPP:
  PPP authentication debugging is on
  PPP protocol negotiation debugging is on
VTEMPLATE:
  Virtual Template debugging is on

```

Debug Outputs

This section provides the output of various **debug** commands on the remote router, NAS, and the offload server.

Debug Output on the Remote Router (Cisco 800)

```

tutu#ping 10.10.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2 seconds:

1d07h: BR0 DDR: Dialing cause ip (s=8.8.8.8, d=10.10.10.10)
1d07h: BR0 DDR: Attempting to dial 8215
1d07h: ISDN BR0: TX > SETUP pd = 8 callref = 0x62
1d07h:      Bearer Capability i = 0x8890
1d07h:      Channel ID i = 0x83
1d07h:      Called Party Number i = 0x80, '8215',
Plan:Unknown, Type:Unknown
1d07h: ISDN BR0: RX < CALL_PROC pd = 8 callref = 0xE2
1d07h:      Channel ID i = 0x89
1d07h: ISDN BR0: RX < PROGRESS pd = 8 callref = 0xE2
1d07h:      Progress Ind i = 0x8188 - In-band info
or appropriate now available
1d07h: ISDN BR0: RX < CONNECT pd = 8 callref = 0xE2
1d07h: ISDN BR0: TX > CONNECT_ACK pd = 8 callref = 0x62
1d07h: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up
1d07h: BR0:1 PPP: Treating connection as a callout
1d07h: BR0:1 PPP: Phase is ESTABLISHING, Active Open
1d07h: BR0:1 PPP: No remote authentication for call-out
1d07h: BR0:1 CHAP: Using alternate hostname remote
1d07h: BR0:1 LCP: O CONFREQ [Closed] id 70 len 27
1d07h: BR0:1 LCP:      MagicNumber 0x175900B7 (0x0506175900B7)
1d07h: BR0:1 LCP:      MRRU 1524 (0x110405F4)
1d07h: BR0:1 LCP:      EndpointDisc 1 Local (0x13090172656D6F7465)
1d07h: BR0:1 LCP:      LinkDiscriminator 118 (0x17040076)
1d07h: BR0:1 LCP: I CONFREQ [REQsent] id 1 len 31
1d07h: BR0:1 LCP:      AuthProto CHAP (0x0305C22305)
1d07h: BR0:1 LCP:      MagicNumber 0x10DBA9A1 (0x050610DBA9A1)
1d07h: BR0:1 LCP:      MRRU 1524 (0x110405F4)
1d07h: BR0:1 LCP:      EndpointDisc 1 Local (0x130801535441434B)
1d07h: BR0:1 LCP:      LinkDiscriminator 24 (0x17040018)
1d07h: BR0:1 LCP: O CONFACK [REQsent] id 1 len 31

```

```

1d07h: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
1d07h: BR0:1 LCP: MagicNumber 0x10DBA9A1 (0x050610DBA9A1)
1d07h: BR0:1 LCP: MRRU 1524 (0x110405F4)
1d07h: BR0:1 LCP: EndpointDisc 1 Local (0x130801535441434B)
1d07h: BR0:1 LCP: LinkDiscriminator 24 (0x17040018)
1d07h: BR0:1 LCP: I CONFACK [ACKsent] id 70 len 27
1d07h: BR0:1 LCP: MagicNumber 0x175900B7 (0x0506175900B7)
1d07h: BR0:1 LCP: MRRU 1524 (0x110405F4)
1d07h: BR0:1 LCP: EndpointDisc 1 Local (0x13090172656D6F7465)
1d07h: BR0:1 LCP: LinkDiscriminator 118 (0x17040076)
1d07h: BR0:1 LCP: State is Open
1d07h: BR0:1 PPP: Phase is AUTHENTICATING, by the peer
1d07h: BR0:1 CHAP: I CHALLENGE id 1 len 26 from "STACK"
1d07h: BR0:1 CHAP: Using alternate hostname remote
1d07h: BR0:1 CHAP: Username STACK not found
1d07h: BR0:1 CHAP: Using default password
1d07h: BR0:1 CHAP: O RESPONSE id 1 len 27 from "remote"
1d07h: BR0:1 CHAP: I SUCCESS id 1 len 4
1d07h: BR0:1 PPP: Phase is VIRTUALIZED
1d07h: Vi2 PPP: Phase is DOWN, Setup
1d07h: %LINK-3-UPDOWN: Interface Virtual-Access2,
changed state to up
1d07h: Virtual-Access2 DDR: Dialer statechange to up
1d07h: Virtual-Access2 DDR: Dialer call has been placed
1d07h: Vi2 PPP: Treating connection as a callout
1d07h: Vi2 PPP: Phase is ESTABLISHING, Active Open
1d07h: Vi2 PPP: No remote authentication for call-out
1d07h: Vi2 CHAP: Using alternate hostname remote
1d07h: Vi2 LCP: O CONFREQ [Closed] id 1 len 27
1d07h: Vi2 LCP: MagicNumber 0x17590D20 (0x050617590D20)
1d07h: Vi2 LCP: MRRU 1524 (0x110405F4)
1d07h: Vi2 LCP: EndpointDisc 1 Local (0x13090172656D6F7465)
1d07h: Vi2 LCP: LinkDiscriminator 119 (0x17040077)
1d07h: Vi2 PPP: Phase is UP
1d07h: Vi2 BACP: O CONFREQ [Closed] id 1 len 10
1d07h: Vi2 BACP: FavoredPeer 0x17590D2D (0x010617590D2D)
1d07h: Vi2 IPCP: O CONF.REQ [Closed] id 1 len 10
1d07h: Vi2 IPCP: Address 0.0.0.0 (0x030600000000)
1d07h: BR0:1 MLP: STACK, multilink up, first link
1d07h: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to up
1d07h: %LINEPROTO-5-UPDOWN: Line protocol on
Interface Virtual-Access2,
changed state to up
1d07h: Vi2 BACP: TIMEOUT: State REQsent
1d07h: Vi2 BACP: O CONFREQ [REQsent] id 2 len 10
1d07h: Vi2 BACP: FavoredPeer 0x17590D2D (0x010617590D2D)
1d07h: Vi2 IPCP: TIMEOUT: State REQsent
1d07h: Vi2 IPCP: O CONFREQ [REQsent] id 2 len 10
1d07h: Vi2 IPCP: Address 0.0.0.0 (0x030600000000)
1d07h: %ISDN-6-CONNECT: Interface BRI0:1 is now connected
to 8215 STACK.
1d07h: Vi2 BACP: TIMEOUT: State REQsent
1d07h: Vi2 BACP: O CONFREQ [REQsent] id 3 len 10
1d07h: Vi2 BACP: FavoredPeer 0x17590D2D (0x010617590D2D)
1d07h: Vi2 IPCP: TIMEOUT: State REQsent
1d07h: Vi2 IPCP: O CONFREQ [REQsent] id 3 len 10
1d07h: Vi2 IPCP: Address 0.0.0.0 (0x030600000000)
1d07h: Vi2 IPCP: I CONFREQ [REQsent] id 1 len 10
1d07h: Vi2 IPCP: Address 12.12.12.12 (0x03060C0C0C0C)
1d07h: Vi2 IPCP: O CONFACK [REQsent] id 1 len 10
1d07h: Vi2 IPCP: Address 12.12.12.12 (0x03060C0C0C0C)
1d07h: Vi2 PPP: Replace IPCP code 3 id 1 with id 2
1d07h: Vi2 PPP: Replace IPCP code 3 id 2 with id 3

```

```

1d07h: Vi2 BACP: I CONFREQ [REQsent] id 1 len 10
1d07h: Vi2 BACP:   FavoredPeer 0xE0714ACB (0x0106E0714ACB)
1d07h: Vi2 BACP: O CONFACK [REQsent] id 1 len 10
1d07h: Vi2 BACP:   FavoredPeer 0xE0714ACB (0x0106E0714ACB)
1d07h: Vi2 IPCP: I CONFNAK [ACKsent] id 3 len 10
1d07h: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
1d07h: Vi2 IPCP: O CONFREQ [ACKsent] id 4 len 10
1d07h: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
1d07h: Vi2 IPCP: I CONFACK [ACKsent] id 4 len 10
1d07h: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
1d07h: Vi2 IPCP: State is Open
1d07h: BR0 IPCP: Install negotiated
IP interface address 12.12.12.13
1d07h: Vi2 DDR: dialer protocol up
1d07h: BR0 IPCP: Install route to 12.12.12.12.
Success rate is 0 percent (0/5)
tutu#
tutu#
tutu#
tutu#
1d07h: Vi2 BACP: TIMEout: State ACKsent
1d07h: Vi2 BACP: O CONFREQ [ACKsent] id 4 len 10
1d07h: Vi2 BACP:   FavoredPeer 0x17590D2D (0x010617590D2D)
1d07h: Vi2 BACP: I CONFREQ [ACKsent] id 2 len 10
1d07h: Vi2 BACP:   FavoredPeer 0xE0715041 (0x0106E0715041)
1d07h: Vi2 BACP: O CONFACK [ACKsent] id 2 len 10
1d07h: Vi2 BACP:   FavoredPeer 0xE0715041 (0x0106E0715041)
1d07h: Vi2 BACP: I CONFACK [ACKsent] id 4 len 10
1d07h: Vi2 BACP:   FavoredPeer 0x17590D2D (0x010617590D2D)
1d07h: Vi2 BACP: State is Open
1d07h: Vi2 BAP: Group "STACK" (29) (multilink)
with precedence created
1d07h: Vi2 DDR: dialer protocol upping 10.10.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5),
round-trip min/avg/max = 36/37/40 ms

tutu#ping 10.10.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5),
round-trip min/avg/max = 36/39/52 ms
tutu#
1d07h: STACK BAP: Sending CallReq, id 50, len 42 on BR0:1 to remote
1d07h: STACK BAP: O CallReq [Idle] id 50 len 38
1d07h: STACK BAP:   LinkType 64 kbps type isdn (0x0105004001)
1d07h: STACK BAP:   Reason Multilink bundle overloaded
1d07h: STACK BAP:   (0x041D4D756C74696C696E6B2062756E64)
1d07h: STACK BAP:   (0x6C65206F7665726C6F61646564)
1d07h: Vi2 BAP: Received CallRsp, id 50, len 17
1d07h: STACK BAP: I CallRsp [AddWait] id 50 len 21 ACK
1d07h: STACK BAP:   LinkType 64 kbps type isdn (0x0105004001)
1d07h: STACK BAP:   PhoneDelta
1d07h: STACK BAP:   UniqueDigits 4 (0x010304)
1d07h: STACK BAP:   SubscriberNumber 8218
(0x020638323138)ping 10.10.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2 seconds:

```

```

!!!!
Success rate is 100 percent (5/5),
round-trip min/avg/max = 36/43/52 ms
tutu#
1d07h: STACK BAP: I CallRsp, id 50, ACK
1d07h: STACK BAP: Attempt 1 to dial 8218 on BR0
1d07h: --> reason BAP - Multilink bundle overloaded
1d07h: BR0 DDR: Attempting to dial 8218
1d07h: ISDN BR0: TX > SETUP pd = 8 callref = 0x63
1d07h: Bearer Capability i = 0x8890
1d07h: Channel ID i = 0x83
1d07h: Called Party Number i = 0x80, '8218',
Plan:Unknown, Type:Unknown
1d07h: ISDN BR0: RX < CALL_PROC pd = 8 callref = 0xE3
1d07h: Channel ID i = 0x8A
1d07h: ISDN BR0: RX < PROGRESS pd = 8 callref = 0xE3
1d07h: Progress Ind i = 0x8188 - In-band info
or appropriate now available
1d07h: ISDN BR0: RX < CONNECT pd = 8 callref = 0xE3
1d07h: ISDN BR0: TX > CONNECT_ACK pd = 8 callref = 0x63
1d07h: %LINK-3-UPDOWN: Interface BRI0:2, changed state to up
1d07h: BR0:2 PPP: Treating connection as a callout
1d07h: BR0:2 PPP: Phase is ESTABLISHING, Active Open
1d07h: BR0:2 PPP: No remote authentication for call-out
1d07h: BR0:2 CHAP: Using alternate hostname remote
1d07h: BR0:2 LCP: O CONFREQ [Closed] id 67 len 27
1d07h: BR0:2 LCP: MagicNumber 0x17594A2E (0x050617594A2E)
1d07h: BR0:2 LCP: MRRU 1524 (0x110405F4)
1d07h: BR0:2 LCP: EndpointDisc 1 Local (0x13090172656D6F7465)
1d07h: BR0:2 LCP: LinkDiscriminator 120 (0x17040078)
1d07h: BR0:2 LCP: I CONFREQ [REQsent] id 1 len 31
1d07h: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
1d07h: BR0:2 LCP: MagicNumber 0xE70925D1 (0x0506E70925D1)
1d07h: BR0:2 LCP: MRRU 1524 (0x110405F4)
1d07h: BR0:2 LCP: EndpointDisc 1 Local (0x130801535441434B)
1d07h: BR0:2 LCP: LinkDiscriminator 4 (0x17040004)
1d07h: BR0:2 LCP: O CONFACK [REQsent] id 1 len 31
1d07h: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
1d07h: BR0:2 LCP: MagicNumber 0xE70925D1 (0x0506E70925D1)
1d07h: BR0:2 LCP: MRRU 1524 (0x110405F4)
1d07h: BR0:2 LCP: EndpointDisc 1 Local (0x130801535441434B)
1d07h: BR0:2 LCP: LinkDiscriminator 4 (0x17040004)
1d07h: BR0:2 LCP: I CONFACK [ACKsent] id 67 len 27
1d07h: BR0:2 LCP: MagicNumber 0x17594A2E (0x050617594A2E)
1d07h: BR0:2 LCP: MRRU 1524 (0x110405F4)
1d07h: BR0:2 LCP: EndpointDisc 1 Local (0x13090172656D6F7465)
1d07h: BR0:2 LCP: LinkDiscriminator 120 (0x17040078)
1d07h: BR0:2 LCP: State is Open
1d07h: BR0:2 PPP: Phase is AUTHENTICATING, by the peer
1d07h: BR0:2 CHAP: I CHALLENGE id 1 len 26 from "STACK"
1d07h: BR0:2 CHAP: Using alternate hostname remote
1d07h: BR0:2 CHAP: Username STACK not found
1d07h: BR0:2 CHAP: Using default password
1d07h: BR0:2 CHAP: O RESPONSE id 1 len 27 from "remote"
1d08h: BR0:2 CHAP: I SUCCESS id 1 len 4
1d08h: BR0:2 PPP: Phase is VIRTUALIZED
1d08h: BR0:2 MLP: STACK, multilink up
1d08h: STACK BAP: Sending StatusInd, id 50, len 48 on Vi2 to remote
1d08h: STACK BAP: O StatusInd [AddPending] id 50 len 44
1d08h: STACK BAP: CallStatus success, Action no retry (0x06040000)
1d08h: STACK BAP: PhoneDelta
1d08h: STACK BAP: UniqueDigits 4 (0x010304)
1d08h: STACK BAP: SubscriberNumber 8218 (0x020638323138)
1d08h: STACK BAP: Reason Successfully added link

```

```

1d08h: STACK BAP:      (0x04195375636365737366756C6C792061)
1d08h: STACK BAP:      (0x64646564206C696E6B)
1d08h: Vi2 BAP: Received StatusRsp, id 50, len 1
1d08h: STACK BAP: I StatusRsp [AddPending] id 50 len 5 ACK
1d08h: STACK BAP: I StatusRsp, id 50, ACK
1d08h: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:2,
changed state to up
tutu#
tutu#
tutu#
1d08h: %ISDN-6-CONNECT: Interface BRI0:1 is
now connected to 8215 STACKsh user
  Line      User      Host(s)          Idle      Location
*  0 con 0
  Vi2      Virtual PPP (Bundle) 00:00:05 12.12.12.12
  BR0:1    Sync PPP          -      Bundle: Vi2
  BR0:2    Sync PPP          -      Bundle: Vi2

  Interface User      Mode      ;      Idle Peer Address

```

```
tutu#show isdn ac
```

```

-----
                          ISDN ACTIVE CALLS
-----
Call   Calling   Called   Remote   Seconds  Seconds  Seconds  Charges
Type   Number    Number   Name     Used     Left     Idle     Units/Currency
-----
Out    8215      8215     STACK    32       0         1         0
Out    8218      8218     STACK    13       0         1         0
-----

```

Debug Output on the NAS

```

01:44:35: %LINK-3-UPDOWN: Interface Serial0:8,
changed state to up
01:44:35: Se0:8 PPP: Treating connection as a callin
01:44:35: Se0:8 PPP: Phase is ESTABLISHING, Passive Open
01:44:35: Se0:8 LCP: State is Listen
01:44:35: Se0:8 LCP: I CONFREQ [Listen] id 70 len 27
01:44:35: Se0:8 LCP:   MagicNumber 0x175900B7 (0x0506175900B7)
01:44:35: Se0:8 LCP:   MRRU 1524 (0x110405F4)
01:44:35: Se0:8 LCP:   EndpointDisc 1 Local (0x13090172656D6F7465)
01:44:35: Se0:8 LCP:   LinkDiscriminator 118 (0x17040076)
01:44:35: Se0:8 LCP: O CONFREQ [Listen] id 1 len 31
01:44:35: Se0:8 LCP:   AuthProto CHAP (0x0305C22305)
01:44:35: Se0:8 LCP:   MagicNumber 0x10DBA9A1 (0x050610DBA9A1)
01:44:35: Se0:8 LCP:   MRRU 1524 (0x110405F4)
01:44:35: Se0:8 LCP:   EndpointDisc 1 Local (0x130801535441434B)
01:44:35: Se0:8 LCP:   LinkDiscriminator 24 (0x17040018)
01:44:35: Se0:8 LCP: O CONFACK [Listen] id 70 len 27
01:44:35: Se0:8 LCP:   MagicNumber 0x175900B7 (0x0506175900B7)
01:44:35: Se0:8 LCP:   MRRU 1524 (0x110405F4)
01:44:35: Se0:8 LCP:   EndpointDisc 1 Local (0x13090172656D6F7465)
01:44:35: Se0:8 LCP:   LinkDiscriminator 118 (0x17040076)
01:44:35: Se0:8 LCP: I CONFACK [ACKsent] id 1 len 31
01:44:35: Se0:8 LCP:   AuthProto CHAP (0x0305C22305)
01:44:35: Se0:8 LCP:   MagicNumber 0x10DBA9A1 (0x050610DBA9A1)
01:44:35: Se0:8 LCP:   MRRU 1524 (0x110405F4)
01:44:35: Se0:8 LCP:   EndpointDisc 1 Local (0x130801535441434B)
01:44:35: Se0:8 LCP:   LinkDiscriminator 24 (0x17040018)
01:44:35: Se0:8 LCP: State is Open
01:44:35: Se0:8 PPP: Phase is AUTHENTICATING, by this end
01:44:35: Se0:8 CHAP: O CHALLENGE id 1 len 26 from "STACK"

```

```
01:44:35: Se0:8 CHAP: I RESPONSE id 1 len 27 from "remote"
01:44:35: Se0:8 PPP: Phase is FORWARDING
01:44:37: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0:8,
changed state to up
01:44:38: Se0:8 PPP: Phase is FORWARDED
```

Debug Output on the Offload Server

```
01:30:29: %LINK-3-UPDOWN: Interface Virtual-Access3,
changed state to up
01:30:29: Vi3 PPP: Treating connection as a dedicated line
01:30:29: Vi3 PPP: Phase is ESTABLISHING, Active Open
01:30:29: Vi3 LCP: O CONFREQ [Closed] id 1 len 31
01:30:29: Vi3 LCP: AuthProto CHAP (0x0305C22305)
01:30:29: Vi3 LCP: MagicNumber 0xE071382D (0x0506E071382D)
01:30:29: Vi3 LCP: MRRU 1524 (0x110405F4)
01:30:29: Vi3 LCP: EndpointDisc 1 Local (0x130801535441434B)
01:30:29: Vi3 LCP: LinkDiscriminator 23 (0x17040017)
01:30:29: Vi3 PPP: Treating connection as a dedicated line
01:30:29: Vi3 LCP: I FORCED CONFREQ len 27
01:30:29: Vi3 LCP: AuthProto CHAP (0x0305C22305)
01:30:29: Vi3 LCP: MagicNumber 0x10DBA9A1 (0x050610DBA9A1)
01:30:29: Vi3 LCP: MRRU 1524 (0x110405F4)
01:30:29: Vi3 LCP: EndpointDisc 1 Local (0x130801535441434B)
01:30:29: Vi3 LCP: LinkDiscriminator 24 (0x17040018)
01:30:29: Vi3 PPP: Phase is AUTHENTICATING, by this end
01:30:29: Vi3 CHAP: O CHALLENGE id 2 len 26 from "STACK"
01:30:29: Vi3 CHAP: I RESPONSE id 1 len 27 from "remote"
01:30:29: Vi3 CHAP: O SUCCESS id 1 len 4
01:30:29: Vi3 PPP: Phase is VIRTUALIZED
01:30:30: Vi3 BACP: I CONFREQ [Closed] id 1 len 10
01:30:30: Vi3 BACP: FavoredPeer 0x17590D2D (0x010617590D2D)
01:30:30: Vi3 BACP: Lower layer not up, discarding packet
01:30:30: Vi3 IPCP: Packet buffered while building MLP bundle interface
01:30:30: Vi2 PPP: Phase is DOWN, Setup
01:30:30: %LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-Access3,
changed state to up
01:30:32: Vi3 LCP: TIMEout: State Open
01:30:32: Vi3 BACP: I CONFREQ [Closed] id 2 len 10
01:30:32: Vi3 BACP: FavoredPeer 0x17590D2D (0x010617590D2D)
01:30:32: Vi3 BACP: Lower layer not up, discarding packet
01:30:32: Vi3 IPCP: Packet buffered while building MLP
bundle interface
01:30:33: Vi3 BACP: I CONFREQ [Closed] id 3 len 10
01:30:33: Vi3 BACP: FavoredPeer 0x17590D2D (0x010617590D2D)
01:30:34: Vi3 BACP: Lower layer not up, discarding packet
01:30:34: Vi3 IPCP: Packet buffered while building MLP
bundle interface
01:30:34: %LINK-3-UPDOWN: Interface Virtual-Access2,
changed state to up
01:30:34: Vi2 PPP: Treating connection as a dedicated line
01:30:34: Vi2 PPP: Phase is ESTABLISHING, Active Open
01:30:34: Vi2 LCP: O CONFREQ [Closed] id 1 len 31
01:30:34: Vi2 LCP: AuthProto CHAP (0x0305C22305)
01:30:34: Vi2 LCP: MagicNumber 0xE0714AA6 (0x0506E0714AA6)
01:30:34: Vi2 LCP: MRRU 1524 (0x110405F4)
01:30:34: Vi2 LCP: EndpointDisc 1 Local (0x130801535441434B)
01:30:34: Vi2 LCP: LinkDiscriminator 24 (0x17040018)
01:30:34: Vi2 PPP: Phase is UP
01:30:34: Vi2 IPCP: O CONFREQ [Closed] id 1 len 10
01:30:34: Vi2 IPCP: Address 12.12.12.12 (0x03060C0C0C0C)
01:30:34: Vi2 BACP: O CONFREQ [Closed] id 1 len 10
01:30:34: Vi2 BACP: FavoredPeer 0xE0714ACB (0x0106E0714ACB)
01:30:34: Vi3 MLP: remote, multilink up, first link
```

```

01:30:34: Vi2 PPP: Pending ncpQ size is 3
01:30:34: Vi3 IPCP: Redirect packet to Vi2
01:30:34: Vi2 IPCP: I CONFREQ [REQsent] id 1 len 10
01:30:34: Vi2 IPCP:   Address 0.0.0.0 (0x030600000000)
01:30:34: Vi2 IPCP: Pool returned 12.12.12.13
01:30:34: Vi2 IPCP: O CONFNAK [REQsent] id 1 len 10
01:30:34: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
01:30:34: Vi3 IPCP: Redirect packet to Vi2
01:30:34: Vi2 IPCP: I CONFREQ [REQsent] id 2 len 10
01:30:34: Vi2 IPCP:   Address 0.0.0.0 (0x030600000000)
01:30:34: Vi2 IPCP: O CONFNAK [REQsent] id 2 len 10
01:30:34: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
01:30:34: Vi3 IPCP: Redirect packet to Vi2
01:30:34: Vi2 IPCP: I CONFREQ [REQsent] id 3 len 10
01:30:34: Vi2 IPCP:   Address 0.0.0.0 (0x030600000000)
01:30:34: Vi2 IPCP: O CONFNAK [REQsent] id 3 len 10
01:30:34: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
01:30:34: Vi2 IPCP: I CONFACK [REQsent] id 1 len 10
01:30:34: Vi2 IPCP:   Address 12.12.12.12 (0x03060C0C0C0C)
01:30:34: Vi2 BACP: I CONFACK [REQsent] id 1 len 10
01:30:34: Vi2 BACP:   FavoredPeer 0xE0714ACB (0x0106E0714ACB)
01:30:34: Vi2 IPCP: I CONFREQ [ACKrcvd] id 4 len 10
01:30:34: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
01:30:34: Vi2 IPCP: O CONFACK [ACKrcvd] id 4 len 10
01:30:34: Vi2 IPCP:   Address 12.12.12.13 (0x03060C0C0C0D)
01:30:34: Vi2 IPCP: State is Open
01:30:34: Vi2 IPCP: Install route to 12.12.12.13
01:30:35: %LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-Access2,
changed state to up
01:30:35: Vi2 BACP: Negotiation timeout
01:30:35: Vi2 BACP: State is Listen
01:30:35: Vi2 BACP: I CONFREQ [Listen] id 4 len 10
01:30:35: Vi2 BACP:   FavoredPeer 0x17590D2D (0x010617590D2D)
01:30:35: Vi2 BACP: O CONFREQ [Listen] id 2 len 10
01:30:35: Vi2 BACP:   FavoredPeer 0xE0715041 (0x0106E0715041)
01:30:35: Vi2 BACP: O CONFACK [Listen] id 4 len 10
01:30:35: Vi2 BACP:   FavoredPeer 0x17590D2D (0x010617590D2D)
01:30:35: Vi2 BACP: I CONFACK [ACKsent] id 2 len 10
01:30:35: Vi2 BACP:   FavoredPeer 0xE0715041 (0x0106E0715041)
01:30:35: Vi2 BACP: State is Open
01:30:35: Vi2 BAP: Group "remote" (7) (multilink)
without precedence created
01:30:44: Vi2 BAP: Received CallReq, id 50, len 34
01:30:44: remote BAP: I CallReq [Idle] id 50 len 38
01:30:44: remote BAP:   LinkType 64 kbps type isdn (0x0105004001)
01:30:44: remote BAP:   Reason Multilink bundle overloaded
01:30:44: remote BAP:   (0x041D4D756C74696C696E6B2062756E64)
01:30:44: remote BAP:   (0x6C65206F7665726C6F61646564)
01:30:44: remote BAP: I CallReq, id 50
01:30:44: remote BAP: Acknowledge CallReq,
using digits default group number
01:30:44: remote BAP: O ACK for CallReq, id 50
01:30:44: remote BAP: Sending CallRsp, id 50, len 25 on Vi2 to remote
01:30:44: remote BAP: O CallRsp [Idle] id 50 len 21 ACK
01:30:44: remote BAP:   LinkType 64 kbps type isdn (0x0105004001)
01:30:44: remote BAP:   PhoneDelta
01:30:44: remote BAP:   UniqueDigits 4 (0x010304)
01:30:44: remote BAP:   SubscriberNumber 8218 (0x020638323138)
01:30:45: Vi1 PPP: Phase is DOWN, Setup
01:30:48: %LINK-3-UPDOWN: Interface Virtual-Access1,
changed state to up
01:30:48: Vi1 PPP: Treating connection as a dedicated line
01:30:48: Vi1 PPP: Phase is ESTABLISHING, Active Open
01:30:48: Vi1 LCP: O CONFREQ [Closed] id 1 len 31

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01:30:48: Vi1 LCP: AuthProto CHAP (0x0305C22305)
01:30:48: Vi1 LCP: MagicNumber 0xE07181A5 (0x0506E07181A5)
01:30:48: Vi1 LCP: MRRU 1524 (0x110405F4)
01:30:48: Vi1 LCP: EndpointDisc 1 Local (0x130801535441434B)
01:30:48: Vi1 LCP: LinkDiscriminator 25 (0x17040019)
01:30:48: Vi1 PPP: Treating connection as a dedicated line
01:30:48: Vi1 LCP: I FORCED CONFREQ len 27
01:30:48: Vi1 LCP: AuthProto CHAP (0x0305C22305)
01:30:48: Vi1 LCP: MagicNumber 0xE70925D1 (0x0506E70925D1)
01:30:48: Vi1 LCP: MRRU 1524 (0x110405F4)
01:30:48: Vi1 LCP: EndpointDisc 1 Local (0x130801535441434B)
01:30:48: Vi1 LCP: LinkDiscriminator 4 (0x17040004)
01:30:48: Vi1 PPP: Phase is AUTHENTICATING, by this end
01:30:48: Vi1 CHAP: O CHALLENGE id 2 len 26 from "STACK"
01:30:48: Vi1 CHAP: I RESPONSE id 1 len 27 from "remote"
01:30:48: Vi1 CHAP: O SUCCESS id 1 len 4
01:30:48: Vi1 PPP: Phase is VIRTUALIZED
01:30:48: Vi1 MLP: remote, multilink up
01:30:48: Vi2 BAP: Received StatusInd, id 50, len 40
01:30:48: remote BAP: I StatusInd [AddPending] id 50 len 44
01:30:48: remote BAP: CallStatus success,
Action no retry (0x06040000)
01:30:48: remote BAP: PhoneDelta
01:30:48: remote BAP: UniqueDigits 4 (0x010304)
01:30:48: remote BAP: SubscriberNumber 8218 (0x020638323138)
01:30:48: remote BAP: Reason Successfully added link
01:30:48: remote BAP: (0x04195375636365737366756C6C792061)
01:30:48: remote BAP: (0x64646564206C696E6B)
01:30:48: remote BAP: I StatusInd, id 50
01:30:48: remote BAP: O ACK for StatusInd, id 50
01:30:48: remote BAP: Sending StatusRsp, id 50, len 9 on Vi2 to remote
01:30:48: remote BAP: O StatusRsp [Idle] id 50 len 5 ACK
01:30:49: %LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-Access1,
changed state to up
01:30:50: Vi1 LCP: TIMEOUT: State Open
tango(config-if)#
tango(config-if)#
tango(config-if)#^Z
tango#show users

```

Line	User	Host(s)	Idle	Location
* 0	con 0	idle	;	00:00:00
Vi1	remote	Virtual PPP (L2F)	-	0.0.0.0
Vi2	remote	Virtual PPP (Bundle)	00:00:04	12.12.12.13
Vi3	remote	Virtual PPP (L2F)	-	0.0.0.0

Interface	User	Mode	;	Idle Peer Address
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