Configuration Guide

AudioCodes Mediant™ Multi-Service Business Routers Series

Simplifying Network Configuration

Mediant 500Li MSBR

Version 7.2

Caudiocodes

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Related Documentation

Document Name
Mediant MSBR CLI Reference Guide
Mediant 500Li User's Manual
Mediant 500Li Hardware Installation Manual

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1   Introduction

The Mediant 500Li MSBR uses a single IP interface with the capability to link applications such as VoIP to run over the stack. VoIP is now an application that runs on top of the router stack, comprising a Session Border Controller (SBC) and gateway.

Router networking configuration for the Mediant 500Li MSBR is different to that of the MSBRs, but applications configuration is the same. However, for all models, you need to know how to bind the VoIP applications over the networking stack and to link other applications to the stack.

Figure 1-1: Single IP Interface
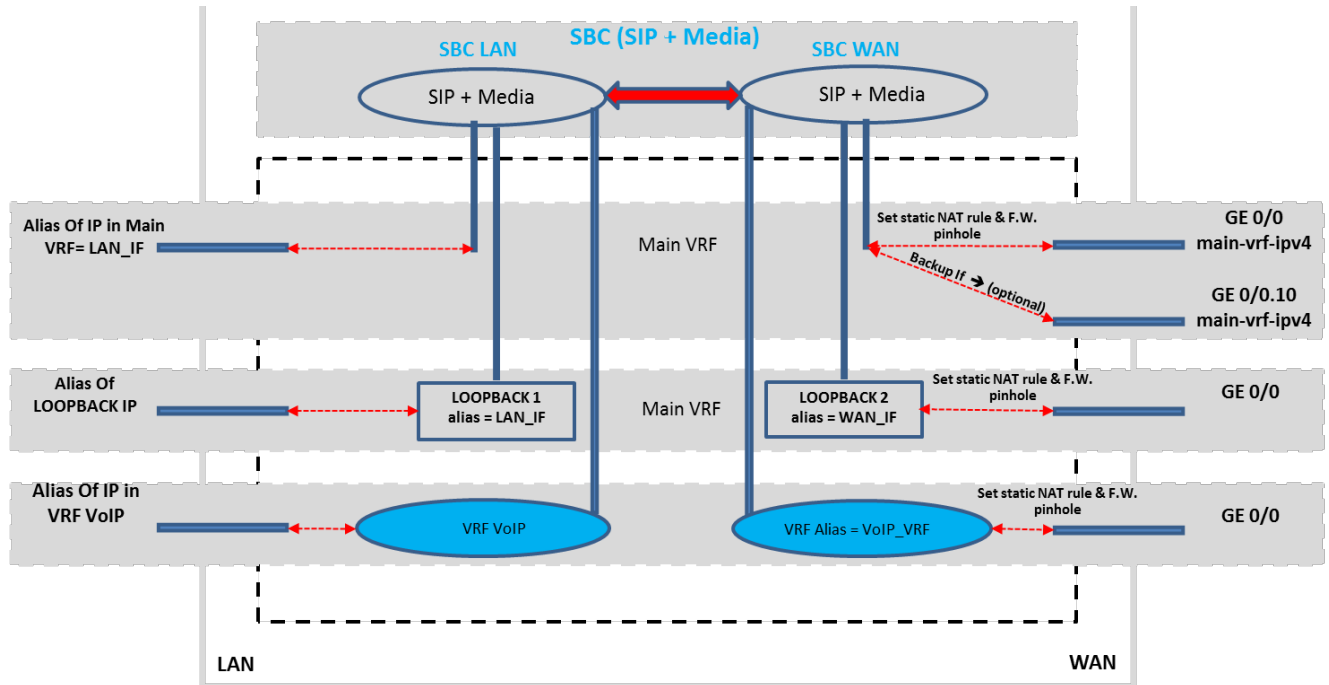
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2   Overview

This chapter provides an overview of the networking concepts that are described in this document.

2.1   VoIP Applications

The following key networking concepts are discussed in this document:

■ **VoIP over WAN:** A group of IP interfaces from which a single interface is dynamically selected through which to send the VoIP traffic.

■ **VoIP over LAN:** An explicit IP interface through which to send the VoIP traffic.

■ **VoIP over VRF:** Configuration of the VoIP application in a VRF mode.

■ **VoIP over Loopback:** An explicit IP interface (LAN or WAN) through which to send VoIP traffic.

2.2   VoIP over WAN

This below configuration example shows the use of the keywords (**bolded**) which represent a pool of WAN interfaces that can be used by the VoIP application. In the example, the VoIP application searches for the proxy IP address through its pool of WAN interfaces, and decides over which WAN interface to run the voice traffic. Using this "**main-vrf-ipv4**" concept, flexibility is maintained to choose from which interface to send the voice traffic, for example, failover from the primary interface to the 4G network interface.

The figure below illustrates an example scenario for VoIP over WAN.

Figure 2-1: VoIP over WAN
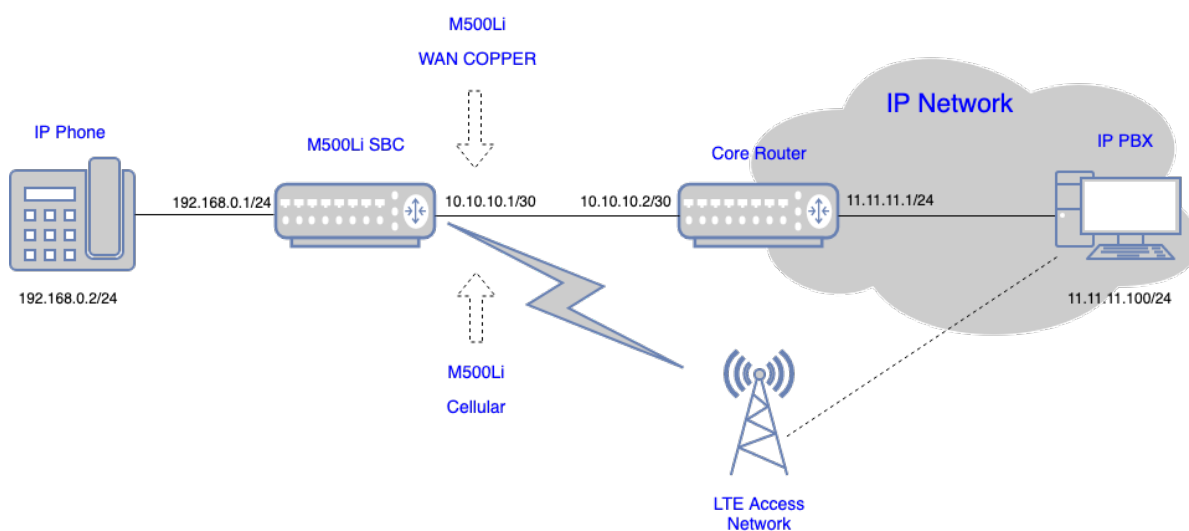
Configuration of the VoIP application to work over a group or pool of interfaces comprising the "**main-vrf-ipv4**" side is done as shown in the following example:

```
realm 1
    name "MR_WAN"
    network-source-ipv4 "main-vrf-ipv4"
    port-range-start 6000
    session-leg 100
```

```
         port-range-end 6990
         activate
       exit
sip-interface 1
       interface-name "SIP_WAN"
       network-source "main-vrf-ipv4"
       application-type sbc
       srd-name WAN_SRD
       media-realm-name "MR_WAN"
       activate
     exit
```

2.3   VoIP over LAN

To configure the VoIP application over a LAN interface, you only need to specify the router's **alias** of the IP address that you wish to attach to the VoIP interface, which can be a specific VLAN (for example, "VLAN 2"), a bridge interface (for example, "BVI 1"), or a loopback interface.

The following example shows configuration of an alias name ("LAN_IF") for VLAN 1 (192.168.0.1) and its attachment to a Media Realm and a SIP Interface:

```
interface VLAN 1
     ip address 192.168.0.1 255.255.255.0 alias "LAN_IF"
     desc "incoming_connection vlan 1"
     no napt
     no firewall enable
     no shutdown
   exit

realm 1
     name "MR_LAN"
     network-source-ipv4 "LAN_IF"
     port-range-start 6000
     session-leg 100
     port-range-end 6990
     activate
   exit

sip-interface 1
     interface-name "SIP_LAN"
     network-source "LAN_IF"
     application-type sbc
     srd-name WAN_SRD
     media-realm-name "MR_LAN"
     activate
   exit
```

2.4   VoIP over VRF

The WAN concept supports all router options, including configuration of the VoIP application in a VRF mode:

```
ip vrf VRF_VoIP ipv4-alias "VoIP"

interface GigabitEthernet 0/0
   ip address 10.10.10.1 255.255.255.0
   ip vrf forwarding VRF_VoIP
   no napt
   no firewall enable
   no shutdown
   exit
interface VLAN 1
   ip address 192.168.0.1 255.255.255.0 alias "LAN_IF"
   desc "incoming_connection vlan 1"
   ip vrf forwarding VRF_VoIP
   no napt
   no shutdown
   exit

realm 1
    name "MR_LAN"
    network-source-ipv4 "LAN_IF"
    port-range-start 6000
    session-leg 100
    activate
   exit
realm 2
    name "MR_WAN"
    network-source-ipv4 "VoIP"
    port-range-start 6000
    session-leg 100
    activate
   exit
sip-interface 1
    interface-name "LAN_IF"
    network-source "LAN_IF"
    application-type sbc
    srd-name "LAN_SRD"
    media-realm-name "MR_LAN"
    activate
   exit
sip-interface 2
    interface-name "WAN_IF"
    network-source "VoIP"
    application-type sbc
    srd-name "WAN_SRD"
    media-realm-name "MR_WAN"
    activate
   exit
```

2.5 Example Scenarios

This document includes the following example scenarios:

- Mediant 500Li Router with Voice Application using Proxy Server and BRI Interfaces
- Mediant 500Li Router with Voice Application using Tel-to-IP Routing Table and BRI Interfaces
- Mediant 500Li with SBC Application
- Mediant 500Li Voice using BRI Interfaces and SBC Application with IPv4 Interface
- Mediant 500Li Voice using BRI Interfaces and SBC Application with WAN as Loopback Interface
- Mediant 500Li Voice using BRI Interfaces and SBC Application with VRF Interface

3 Mediant 500Li Router with Voice Application using Proxy Server and BRI Interfaces

This example scenario describes how to route calls when the Mediant 500Li is configured as a simple voice application using a Proxy server, BRI interfaces, and basic router configuration.

Figure 3-1: Example of Voice using SIP Proxy and BRI Interfaces
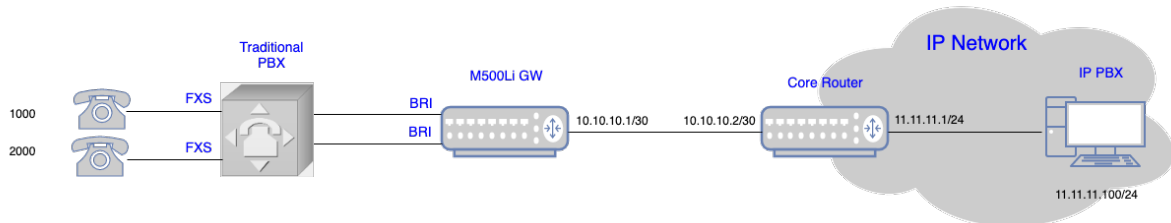
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3.1 Data Configuration

This section describes the data configuration on Mediant 500Li.

3.1.1 Configuring WAN IP Address

```
interface GigabitEthernet 0/0
   ip address 10.10.10.1 255.255.255.0
   mtu auto
   desc "WAN ethernet"
   napt
   firewall enable
   no shutdown
  exit
```

3.1.2 Configuring Static IP Route

```
ip route 0.0.0.0 0.0.0.0 10.10.10.2 GigabitEthernet 0/0 1
```

3.2 Voice Configuration

This section describes the voice configuration on Mediant 500Li.

3.2.1 Configuring Voice Coders

```
coders-and-profiles audio-coders-groups 0
   coders-group-name "AudioCodersGroups_0"
   activate
   audio-coders 0
    name g711-alaw
    p-time 20
    rate 64
    activate
   exit
  exit
```

3.2.2 Configuring WAN Media Realm and Assigning to "main-vrf-ipv4"

```
realm 1
   name "MR_WAN"
   network-source-ipv4 "main-vrf-ipv4"
   port-range-start 6000
   session-leg 50
   activate
  exit
```

3.2.3 Configuring WAN SRD

```
srd 1
   name "SRD_WAN"
   activate
  exit
```

3.2.4 Configuring WAN SIP Interface and Assigning to "main-vrf-ipv4"

```
sip-interface 1
   interface-name "WAN_IF"
   network-source "main-vrf-ipv4"
   srd-name "SRD_WAN"
   media-realm-name "MR_WAN"
   activate
  exit
```

3.2.5   Assigning Proxy Set 1 to WAN SRD and Configuring Proxy Server (IP or Hostname)

```
proxy-set 1
   proxy-name "IPPBX"
   srd-name "SRD_WAN"
   gwipv4-sip-int-name "WAN_IF"
   activate
   proxy-ip 0
    proxy-address "11.11.11.100"
    activate
   exit
  exit
```

3.2.6   Configuring IP Group for WAN Side

```
ip-group 1
   name "WAN_IPG"
   proxy-set-name "IPPBX"
   srd-name "SRD_WAN"
   media-realm-name "MR_WAN"
   activate
  exit
```

3.2.7   Configuring BRI Interfaces

```
interface bri 2/1
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
  interface bri 2/2
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
```

3.2.8   Configuring Trunk Group for BRI Interfaces

```
gateway trunk-group 0
   trunk-group-id 1
   first-trunk-id 1
   first-b-channel 1
   last-b-channel 1
   last-trunk-id 1
   module 2
   activate
 exit
 gateway trunk-group 1
  trunk-group-id 2
  first-trunk-id 1
  first-b-channel 2
  last-b-channel 2
  last-trunk-id 1
  module 2
  activate
 exit
```

3.2.9   Configuring IP-to-Tel Routing

```
gateway routing ip2tel-routing 0
   dst-phone-pattern "1000"
   trunk-group-id 1
   activate
 exit
 gateway routing ip2tel-routing 1
  dst-phone-pattern "2000"
  trunk-group-id 2
  activate
 exit
```

3.2.10   Configuring Trunk Group Settings

```
gateway trunk-group-setting 0
   trunk-group-id 1
   channel-select-mode always-ascending
   registration-mode per-account
   serving-ip-group-name "WAN_IPG"
   activate
 exit
 gateway trunk-group-setting 1
  trunk-group-id 2
  channel-select-mode always-ascending
  registration-mode per-account
  serving-ip-group-name "WAN_IPG"
  activate
 exit
```

3.2.11   Configuring Accounts

```
sip-definition account 0
   served-trunk-group 1
   serving-ip-group-name "WAN_IPG"
   user-name "1000"
   password QHFxcnM= obscured
   host-name "11.11.11.100"
   contact-user "1000"
   register reg
   activate
 exit
 sip-definition account 1
  served-trunk-group 2
  serving-ip-group-name "WAN_IPG"
  user-name "2000"
  password Q3F0dXY= obscured
  host-name "11.11.11.100"
  contact-user "2000"
  register reg
  activate
 exit
```

3.2.12   Viewing Pinhole Rules by show running-config data

```
# Note: The following VoIP Firewall pinholes rules are in effect for system services,
#        conflicting rules should not be created:
#        Application Media Realm: WAN IP 10.10.10.1 protocol udp ports 6000-6499, interface GigabitEthernet 0/0
#        Application SIP: WAN IP 10.10.10.1 protocol udp ports 5060-5060, interface GigabitEthernet 0/0
#        Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5060-5060, interface GigabitEthernet 0/0
#        Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5061-5061, interface GigabitEthernet 0/0
|
```

3.2.13   show network available-app-interfaces Command

The output of the `show network available-app-interfaces` command has two parts. The first part displays the VRF/Interface that is bound to IP addresses. The second part displays application binding information.

In our example, the SIP application is binded to the main VRF, the source IP interface is GigabitEthernet 0/0 (10.10.10.1), and the destination is the destination of the IP-PBX (11.11.11.100).

```
 show network available-app-interfaces

VRF IFs: VRF Alias              Address Family                              Vrf Name            IF Status
         -------------------------------------------------------------------------------------------------
         "main-vrf-ipv4"        IPv4                                        main-vrf            UP
         "main-vrf-ipv6"        IPv6                                        main-vrf            UP
IP  IFs: IP Alias               IP Address            Device IF Name       Vrf Name            IF Status
         -------------------------------------------------------------------------------------------------
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

         App name       VRF Alias         App Dst Address        Source Address        Device IF name
         -------------------------------------------------------------------------------------------------
         SIP            "main-vrf-ipv4"   11.11.11.100           10.10.10.1            GigabitEthernet 0/0
```

If no IP route is configured, the 'Source Address' column displays "**None**":

```
show network available-app-interfaces

VRF IFs: VRF Alias              Address Family                              Vrf Name            IF Status
         -------------------------------------------------------------------------------------------------
         "main-vrf-ipv4"        IPv4                                        main-vrf            UP
         "main-vrf-ipv6"        IPv6                                        main-vrf            UP
IP  IFs: IP Alias               IP Address            Device IF Name       Vrf Name            IF Status
         -------------------------------------------------------------------------------------------------
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

         App name       VRF Alias         App Dst Address        Source Address        Device IF name
         -------------------------------------------------------------------------------------------------
         SIP            "main-vrf-ipv4"   11.11.11.100           None (no route)       None (no route)
```

4 Mediant 500Li Router with Voice Application using Tel-to-IP Routing Table and BRI Interfaces

This example scenario describes how to route calls when Mediant 500Li is configured as a simple voice application using the Tel-to-IP Routing table, BRI interfaces, and basic router configuration.

> **Note:** In this example scenario, the Proxy server is used only for the WAN binding to take effect. The calls will be routed according to the Tel-to-IP Routing table.

Figure 4-1: Example of Voice using Tel-to-IP Routing Table and BRI Interfaces
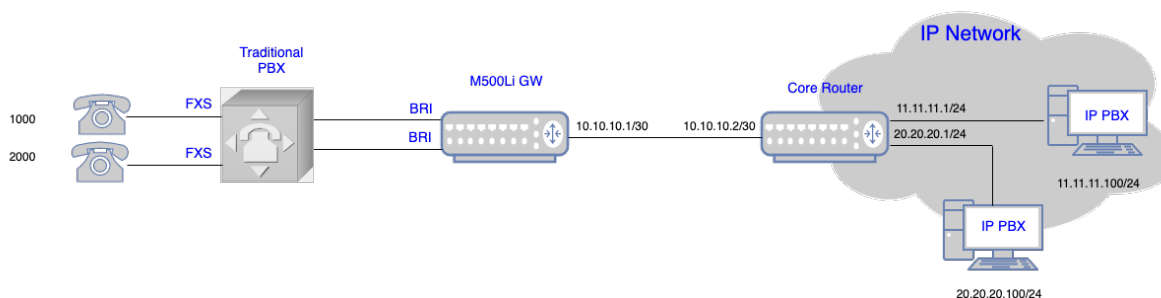
Back to scenarios menu.

4.1 Data Configuration

This section describes the data configuration of Mediant 500Li.

4.1.1 Configuring WAN IP Address

```
interface GigabitEthernet 0/0
   ip address 10.10.10.1 255.255.255.0
   mtu auto
   desc "WAN ethernet"
   napt
   firewall enable
   no shutdown
 exit
```

4.1.2 Configuring Static IP Route

```
ip route 0.0.0.0 0.0.0.0 10.10.10.2 GigabitEthernet 0/0 1
```

4.2 Voice Configuration

This section describes the voice configuration of Mediant 500Li.

4.2.1 Configuring Voice Coders

```
coders-and-profiles audio-coders-groups 0
   coders-group-name "AudioCodersGroups_0"
   activate
   audio-coders 0
    name g711-alaw
    p-time 20
    rate 64
    activate
   exit
  exit
```

4.2.2 Configuring WAN Media Realm and Assigning to "main-vrf-ipv4"

```
realm 1
   name "MR_WAN"
   network-source-ipv4 "main-vrf-ipv4"
   port-range-start 6000
   session-leg 50
   activate
  exit
```

4.2.3 Configuring WAN SRD

```
srd 1
   name "SRD_WAN"
   activate
  exit
```

4.2.4 Configuring WAN SIP Interface and Assigning to "main-vrf-ipv4"

```
sip-interface 1
   interface-name "WAN_IF"
   network-source "main-vrf-ipv4"
   srd-name "SRD_WAN"
   media-realm-name "MR_WAN"
   activate
  exit
```

4.2.5   Assigning Proxy Set 1 to WAN SRD and Configuring Proxy Server (IP or Hostname)

```
proxy-set 1
   proxy-name "IPPBX"
   srd-name "SRD_WAN"
   gwipv4-sip-int-name "WAN_IF"
   activate
   proxy-ip 0
    proxy-address "11.11.11.100"
    activate
   exit
  exit
```

4.2.6   Configuring IP Group for WAN Side

```
ip-group 1
   name "WAN_IPG"
   proxy-set-name "IPPBX"
   srd-name "SRD_WAN"
   media-realm-name "MR_WAN"
   activate
  exit
```

4.2.7   Configuring BRI Interfaces

```
interface bri 2/1
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
  interface bri 2/2
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
```

4.2.8   Configuring Trunk Group for BRI Interfaces

```
gateway trunk-group 0
   trunk-group-id 1
   first-trunk-id 1
   first-b-channel 1
   last-b-channel 1
   last-trunk-id 1
   module 2
   activate
  exit
  gateway trunk-group 1
   trunk-group-id 2
   first-trunk-id 1
   first-b-channel 2
```

```
   last-b-channel 2
   last-trunk-id 1
   module 2
   activate
 exit
```

4.2.9   Configuring Tel-to-IP Routing Rules

```
gateway routing tel2ip-routing 0
   dst-phone-pattern "30"
   dst-ip-address "11.11.11.100"
   dst-port 5060
   dest-sip-interface-name "WAN_IF"
   activate
 exit
 gateway routing tel2ip-routing 1
  dst-phone-pattern "050"
  dst-ip-address "20.20.20.100"
  dst-port 5060
  dest-sip-interface-name "WAN_IF"
  activate
 exit
```

4.2.10   Configuring IP-to-Tel Routing Rules

```
gateway routing ip2tel-routing 0
   dst-phone-pattern "1000"
   trunk-group-id 1
   activate
 exit
 gateway routing ip2tel-routing 1
  dst-phone-pattern "2000"
  trunk-group-id 2
  activate
 exit
```

4.2.11   Configuring Trunk Group Settings

```
gateway trunk-group-setting 0
   trunk-group-id 1
   channel-select-mode always-ascending
   registration-mode per-account
   activate
 exit
 gateway trunk-group-setting 1
  trunk-group-id 2
  channel-select-mode always-ascending
  registration-mode per-account
  activate
 exit
```

4.2.12 Configuring Accounts

```
sip-definition account 0
   served-trunk-group 1
   serving-ip-group-name "WAN_IPG"
   user-name "1000"
   password QHFxcnM= obscured
   host-name "11.11.11.100"
   contact-user "1000"
   register reg
   activate
  exit
  sip-definition account 1
   served-trunk-group 2
   serving-ip-group-name "WAN_IPG"
   user-name "2000"
   password Q3F0dXY= obscured
   host-name "11.11.11.100"
   contact-user "2000"
   register reg
   activate
  exit
```

4.2.13   Viewing Pinhole Rules by show running-config data

```
# Note: The following VoIP Firewall pinholes rules are in effect for system services,
#       conflicting rules should not be created:
#         Application Media Realm: WAN IP 10.10.10.1 protocol udp ports 6000-6499, interface GigabitEthernet 0/0
#         Application SIP: WAN IP 10.10.10.1 protocol udp ports 5060-5060, interface GigabitEthernet 0/0
#         Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5060-5060, interface GigabitEthernet 0/0
#         Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5061-5061, interface GigabitEthernet 0/0
!
```

4.2.14   show network available-app-interfaces Command

The output of the `show network available-app-interfaces` command has two parts. The first part displays the VRF/Interface that is bound to IP addresses. The second part displays application binding information.

In this example, the SIP application is binded to the main VRF, the source IP address is the GigabitEthernet 0/0 (10.10.10.1), and the destination is the destination of the IP-PBX (11.11.11.100).

```
   show network available-app-interfaces

VRF IFs:  VRF Alias            Address Family                                    Vrf Name             IF Status
          ---------------------------------------------------------------------------------------------------------
          "main-vrf-ipv4"      IPv4                                              main-vrf             UP
          "main-vrf-ipv6"      IPv6                                              main-vrf             UP
IP  IFs:  IP Alias             IP Address                  Device IF Name        Vrf Name             IF Status
          ---------------------------------------------------------------------------------------------------------
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

          App name            VRF Alias            App Dst Address             Source Address                 Device IF name
          ---------------------------------------------------------------------------------------------------------
          SIP                 "main-vrf-ipv4"      11.11.11.100                10.10.10.1                     GigabitEthernet 0/0
```

If no IP route is configured, the 'Source Address' displays **"None"**:

```
show network available-app-interfaces

VRF IFs:  VRF Alias            Address Family                                    Vrf Name             IF Status
          ---------------------------------------------------------------------------------------------------------
          "main-vrf-ipv4"      IPv4                                              main-vrf             UP
          "main-vrf-ipv6"      IPv6                                              main-vrf             UP
IP  IFs:  IP Alias             IP Address                  Device IF Name        Vrf Name             IF Status
          ---------------------------------------------------------------------------------------------------------
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

          App name            VRF Alias            App Dst Address             Source Address                 Device IF name
          ---------------------------------------------------------------------------------------------------------
          SIP                 "main-vrf-ipv4"      11.11.11.100                None (no route)                None (no route)
```

5 Mediant 500Li with SBC Application

This example scenario describes how to route calls when Mediant 500Li is configured for the SBC application.

Figure 5-1: Example of IP Phone Connected to SBC
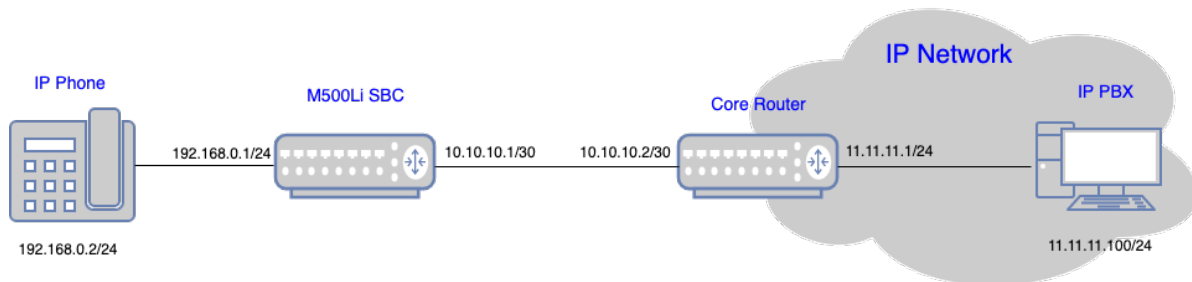
Back to scenarios menu.

5.1 Data Configuration

This section describes the data configuration of median 500Li.

5.1.1 Configuring WAN IP Address

```
interface GigabitEthernet 0/0
   ip address 10.10.10.1 255.255.255.0
   napt
   firewall enable
   no shutdown
  exit
```

5.1.2 Assigning Physical LAN Ethernet 1/1 to VLAN 1

```
interface GigabitEthernet 1/1
   switchport mode trunk
   switchport trunk native vlan 1
   no shutdown
  exit
```

5.1.3 Configuring Logical Interface VLAN 1 and with Alias "LAN_IF"

```
interface VLAN 1
   ip address 192.168.0.1 255.255.255.0 alias "LAN_IF"
   ip dhcp-server network 192.168.0.2 192.168.0.10 255.255.255.0
   service dhcp
   no napt
   no firewall enable
   no shutdown
  exit
```

5.1.4 Configuring IP Route

```
ip route 0.0.0.0 0.0.0.0 10.10.10.2 GigabitEthernet 0/0 1
```

5.2 Voice Configuration

This section describes the voice configuration of Mediant 500Li.

5.2.1 Configuring Voice Coders

```
coders-and-profiles audio-coders-groups 0
   coders-group-name "AudioCodersGroups_0"
   activate
   audio-coders 0
    name g711-alaw
    p-time 20
    rate 64
    activate
   exit
  exit
```

5.2.2 Configuring LAN Media Realm and Assigning to Alias "LAN_IF"

```
realm 1
   name "MR_LAN"
   network-source-ipv4 "LAN_IF"
   port-range-start 6000
   session-leg 100
   activate
  exit
```

5.2.3 Configuring WAN Media Realm and Assigning to "main-vrf-ipv4"

```
realm 2
   name "MR_WAN"
   network-source-ipv4 "main-vrf-ipv4"
   port-range-start 6000
   session-leg 100
   activate
  exit
```

5.2.4 Configuring LAN SRD

```
srd 1
   name "LAN_SRD"
   activate
  exit
```

5.2.5   Configuring WAN SRD

```
srd 2
   name "WAN_SRD"
   activate
 exit
```

5.2.6   Configuring LAN SIP Interface and Assigning to Alias "LAN_IF"

```
sip-interface 1
   interface-name "SIP_LAN"
   network-source "LAN_IF"
   application-type sbc
   srd-name "LAN_SRD"
   media-realm-name "MR_LAN"
   activate
 exit
```

5.2.7   Configuring WAN SIP Interface and Assigning to "main-vrf-ipv4"

```
sip-interface 2
   interface-name "SIP_WAN"
   network-source "main-vrf-ipv4"
   application-type sbc
   srd-name "WAN_SRD"
   media-realm-name "MR_WAN"
   activate
 exit
```

5.2.8   Assigning Proxy Set 2 to WAN SRD and Configuring Proxy Server (IP or Hostname)

```
proxy-set 2
   proxy-name "WAN_Proxy"
   proxy-enable-keep-alive using-options
   srd-name "WAN_SRD"
   sbcipv4-sip-int-name "SIP_WAN"
   activate
   proxy-ip 0
    proxy-address "11.11.11.100"
    activate
   exit
 exit
```

5.2.9   Configuring IP Group for LAN Side

```
ip-group 1
   type user
   name "IP_Phone"
   srd-name "LAN_SRD"
   media-realm-name "MR_LAN"
   classify-by-proxy-set disable
   activate
  exit
```

5.2.10   Configuring IP Group for WAN Side

```
ip-group 2
   name "IPPBX"
   proxy-set-name "WAN_Proxy"
   srd-name "WAN_SRD"
   media-realm-name "MR_WAN"
   activate
  exit
```

5.2.11   Configuring SBC IP-to-IP Routing Rules

```
sbc routing ip2ip-routing 0
   route-name "Options Termination"
   request-type options
   dst-type dst-address
   dst-address "internal"
   activate
  exit
  sbc routing ip2ip-routing 1
   route-name "IPP==>IPPBX"
   src-ip-group-name "IP_Phone"
   dst-ip-group-name "IPPBX"
   activate
  exit
  sbc routing ip2ip-routing 2
   route-name "IPPBX==>IPP"
   src-ip-group-name "IPPBX"
   dst-ip-group-name "IP_Phone"
   activate
  exit
sbc classification 0
   classification-name "IP_Phone"
   srd-name "LAN_SRD"
   src-sip-interface-name "SIP_LAN"
   src-ip-group-name "IP_Phone"
   activate
   exit
```

5.2.12   Viewing Pinhole Rules by show running-config data

```
# Note: The following VoIP Firewall pinholes rules are in effect for system services,
#        conflicting rules should not be created:
#        Application Media Realm: WAN IP 10.10.10.1 protocol udp ports 6000-6999, interface GigabitEthernet 0/0
#        Application SIP: WAN IP 10.10.10.1 protocol udp ports 5060-5060, interface GigabitEthernet 0/0
#        Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5060-5060, interface GigabitEthernet 0/0
#        Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5061-5061, interface GigabitEthernet 0/0
```

5.2.13   show network available-app-interfaces Command

The output of the `show network available-app-interfaces` command has two parts. The first part displays the VRF/Interface that is bound to IP addresses. The second part displays application binding information.

In this example, the SIP application is binded to the main VRF, the source IP address is the GigabitEthernet 0/0 (10.10.10.1), and the destination is the destination of the IP-PBX (11.11.11.100).

```
show network available-app-interfaces

VRF IFs:  VRF Alias             Address Family                             Vrf Name         IF Status
          ----------------------------------------------------------------------------------------------
          "main-vrf-ipv4"       IPv4                                       main-vrf         UP
          "main-vrf-ipv6"       IPv6                                       main-vrf         UP
IP  IFs:  IP Alias              IP Address            Device IF Name       Vrf Name         IF Status
          ----------------------------------------------------------------------------------------------
          "LAN_IF"              192.168.0.1           VLAN 1               main-vrf         UP
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

          App name    VRF Alias         App Dst Address       Source Address          Device IF name
          ----------------------------------------------------------------------------------------------
          SIP         "main-vrf-ipv4"   11.11.11.100          10.10.10.1              GigabitEthernet 0/0
```

If no IP route is configured, the 'Source Address' displays "**0.0.0.0**":

```
show network available-app-interfaces

VRF IFs:  VRF Alias             Address Family                             Vrf Name         IF Status
          ----------------------------------------------------------------------------------------------
          "main-vrf-ipv4"       IPv4                                       main-vrf         UP
          "main-vrf-ipv6"       IPv6                                       main-vrf         UP
IP  IFs:  IP Alias              IP Address            Device IF Name       Vrf Name         IF Status
          ----------------------------------------------------------------------------------------------
          "LAN_IF"              192.168.0.1           VLAN 1               main-vrf         UP
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

          App name    VRF Alias         App Dst Address       Source Address          Device IF name
          ----------------------------------------------------------------------------------------------
          SIP         "main-vrf-ipv4"   11.11.11.100          0.0.0.0                 None (no route)
```

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6 Mediant 500Li Voice using BRI Interfaces and SBC Application with IPv4 Interface

Figure 6-1: Example of Voice using BRI Interfaces and SBC
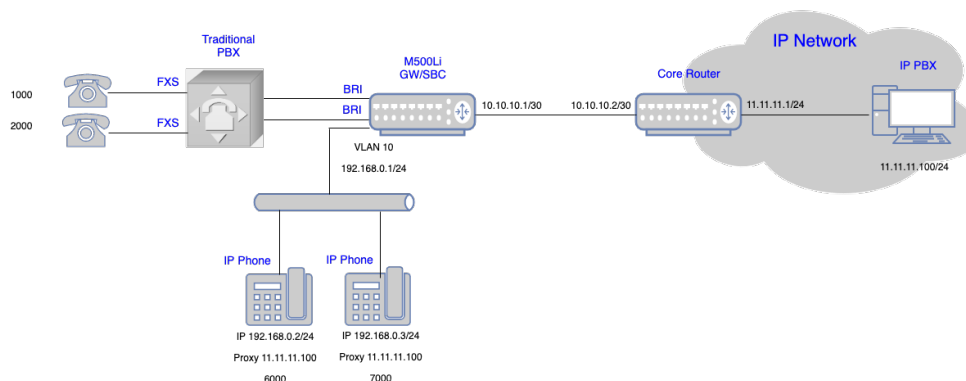
Back to scenarios menu.

6.1 Data Configuration

This section describes the data configuration of median 500Li.

6.1.1 Configuring WAN IP Address

```
interface GigabitEthernet 0/0
   ip address 10.10.10.1 255.255.255.0
   napt
   firewall enable
   no shutdown
  exit
```

6.1.2 Configuring Physical LAN Ethernet 1/1 and Assigning to VLAN 1

```
interface GigabitEthernet 1/1
   switchport mode trunk
   switchport trunk native vlan 1
   no shutdown
  exit
```

6.1.3 Configuring Logical Interface VLAN 1 and with Alias "LAN_IF"

```
interface VLAN 1
   ip address 192.168.0.1 255.255.255.0 alias "LAN_IF"
   ip dhcp-server network 192.168.0.2 192.168.0.10 255.255.255.0
   service dhcp
   no napt
   no firewall enable
   no shutdown
  exit
```

6.1.4 Configuring IP Route

```
ip route 0.0.0.0 0.0.0.0 10.10.10.2 GigabitEthernet 0/0 1
```

6.2 Voice Configuration

This section describes the voice configuration of median 500Li.

6.2.1 Configuring Voice Coders

```
coders-and-profiles audio-coders-groups 0
   coders-group-name "AudioCodersGroups_0"
   activate
   audio-coders 0
    name g711-alaw
    p-time 20
    rate 64
    activate
   exit
  exit
```

6.2.2 Configuring LAN Media Realm and Assigning to Alias "LAN_IF"

```
realm 1
   name "MR_LAN"
   network-source-ipv4 "LAN_IF"
   port-range-start 6000
   session-leg 100
   activate
  exit
```

6.2.3 Configuring WAN Media Realm and Assigning to "main-vrf-ipv4"

```
realm 2
   name "MR_WAN"
   network-source-ipv4 "main-vrf-ipv4"
   port-range-start 6000
   session-leg 100
   activate
  exit
```

6.2.4 Configuring LAN SRD

```
srd 1
   name "LAN_SRD"
   activate
  exit
```

6.2.5 Configuring WAN SRD

```
srd 2
   name "WAN_SRD"
   activate
```

```
    exit
```

6.2.6   Configuring LAN SIP Interface and Assigning to Alias "LAN_IF"

```
sip-interface 1
   interface-name "SIP_LAN"
   network-source "LAN_IF"
   application-type sbc
   srd-name "LAN_SRD"
   media-realm-name "MR_LAN"
   activate
  exit
```

6.2.7   Configuring WAN SIP Interface and Assigning to "main-vrf-ipv4"

```
sip-interface 2
   interface-name "SIP_WAN"
   network-source "main-vrf-ipv4"
   application-type sbc
   srd-name "WAN_SRD"
   media-realm-name "MR_WAN"
   activate
  exit
```

6.2.8   Assigning Proxy Set 2 to WAN SRD and Configuring Proxy Server (IP or Hostname)

```
proxy-set 2
   proxy-name "WAN_Proxy"
   proxy-enable-keep-alive using-options
   srd-name "WAN_SRD"
   sbcipv4-sip-int-name "SIP_WAN"
   activate
   proxy-ip 0
    proxy-address "11.11.11.100"
    activate
   exit
  exit
```

6.2.9   Configuring IP Group for LAN Side

```
ip-group 1
   type user
   name "IP_Phone"
   srd-name "LAN_SRD"
   media-realm-name "MR_LAN"
   classify-by-proxy-set disable
   activate
  exit
```

6.2.10 Configuring IP Group for WAN Side

```
ip-group 2
   name "IPPBX"
   proxy-set-name "WAN_Proxy"
   srd-name "WAN_SRD"
   media-realm-name "MR_WAN"
   activate
 exit
```

6.2.11 Configuring BRI Interfaces

```
interface bri 2/1
   isdn-termination-side network-termination-side
   protocol 50
   activate
 exit
 interface bri 2/2
   isdn-termination-side network-termination-side
   protocol 50
   activate
 exit
```

6.2.12 Configuring Trunk Group for BRI Interfaces

```
gateway trunk-group 0
   trunk-group-id 1
   first-trunk-id 1
   first-b-channel 1
   last-b-channel 1
   last-trunk-id 1
   module 2
   activate
 exit
 gateway trunk-group 1
  trunk-group-id 2
  first-trunk-id 1
  first-b-channel 2
  last-b-channel 2
  last-trunk-id 1
  module 2
  activate
  exit
```

6.2.13 Configuring IP-to-Tel Routing Rules

```
gateway routing ip2tel-routing 0
   dst-phone-pattern "1000"
   trunk-group-id 1
   activate
 exit
 gateway routing ip2tel-routing 1
  dst-phone-pattern "2000"
  trunk-group-id 2
  activate
 exit
```

6.2.14 Configuring Trunk Group Settings

```
gateway trunk-group-setting 0
   trunk-group-id 1
   channel-select-mode always-ascending
   registration-mode per-account
   serving-ip-group-name "IPPBX"
   activate
 exit
 gateway trunk-group-setting 1
  trunk-group-id 2
  channel-select-mode always-ascending
  registration-mode per-account
  serving-ip-group-name "IPPBX"
  activate
 exit
```

6.2.15 Configuring Accounts

```
sip-definition account 0
   served-trunk-group 1
   serving-ip-group-name "IPPBX"
   user-name "1000"
   password QHFxcnM= obscured
   host-name "11.11.11.100"
   contact-user "1000"
   register reg
   activate
 exit
 sip-definition account 1
  served-trunk-group 2
  serving-ip-group-name "IPPBX"
  user-name "2000"
  password Q3F0dXY= obscured
  host-name "11.11.11.100"
  contact-user "2000"
  register reg
  activate
 exit
```

6.2.16 Enabling Keep Original User in REGISTER Messages

```
sbc settings
   keep-contact-user-in-reg unique-param
   activate
  exit
```

6.2.17 Configuring SBC IP-to-IP Routing Rules

```
sbc routing ip2ip-routing 0
   route-name "Options Termination"
   request-type options
   dst-type dst-address
   dst-address "internal"
   activate
  exit
sbc routing ip2ip-routing 1
   route-name "IPP==>IPPBX"
   src-ip-group-name "IP_Phone"
   dst-ip-group-name "IPPBX"
   activate
  exit
sbc routing ip2ip-routing 2
    route-name " IPPBX==>GW"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "1000"
    dst-type gateway
    activate
   exit
sbc routing ip2ip-routing 3
    route-name " IPPBX==>GW"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "2000"
    dst-type gateway
    activate
   exit
sbc routing ip2ip-routing 4
   route-name "IPPBX==>IPP"
   src-ip-group-name "IPPBX"
   dst-user-name-prefix "6000"
   dst-ip-group-name "IP_Phone"
   activate
  exit
sbc routing ip2ip-routing 5
   route-name "IPPBX==>IPP"
   src-ip-group-name "IPPBX"
   dst-user-name-prefix "7000"
   dst-ip-group-name "IP_Phone"
   activate
  exit
sbc classification 0
   classification-name "IP_Phone"
```

```
  srd-name "LAN_SRD"
  src-sip-interface-name "SIP_LAN"
  src-ip-group-name "IP_Phone"
  activate
exit
```

6.2.18 Viewing Pinhole Rules by show running-config data

```
# Note: The following VoIP Firewall pinholes rules are in effect for system services,
    #      conflicting rules should not be created:
    #      Application Media Realm: WAN IP 10.10.10.1 protocol udp ports 6000-6999, interface GigabitEthernet 0/0
    #      Application SIP: WAN IP 10.10.10.1 protocol udp ports 5060-5060, interface GigabitEthernet 0/0
    #      Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5060-5060, interface GigabitEthernet 0/0
    #      Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5061-5061, interface GigabitEthernet 0/0
```

6.2.19 show network available-app-interfaces Command

The output of the `show network available-app-interfaces` command has two parts. The first part displays the VRF/Interface that is bound to IP addresses. The second part displays application binding information.

In this example, the SIP application is binded to the main VRF, the source IP address is the GigabitEthernet 0/0 (10.10.10.1), and the destination is the destination of the IP-PBX (11.11.11.100).

```
show network available-app-interfaces

VRF IFs:  VRF Alias              Address Family                       Vrf Name           IF Status
          ----------------------------------------------------------------------------------------
          "main-vrf-ipv4"        IPv4                                 main-vrf           UP
          "main-vrf-ipv6"        IPv6                                 main-vrf           UP
IP  IFs:  IP Alias               IP Address           Device IF Name  Vrf Name           IF Status
          ----------------------------------------------------------------------------------------
          "LAN_IF"               192.168.0.1                          main-vrf           UP
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

          App name         VRF Alias            App Dst Address       Source Address            Device IF name
          ----------------------------------------------------------------------------------------
          SIP              "main-vrf-ipv4"      11.11.11.100          10.10.10.1                GigabitEthernet 0/0
```

If no IP route is configured, the 'Source Address' displays "**0.0.0.0**":

```
show network available-app-interfaces

VRF IFs:  VRF Alias              Address Family                       Vrf Name           IF Status
          ----------------------------------------------------------------------------------------
          "main-vrf-ipv4"        IPv4                                 main-vrf           UP
          "main-vrf-ipv6"        IPv6                                 main-vrf           UP
IP  IFs:  IP Alias               IP Address           Device IF Name  Vrf Name           IF Status
          ----------------------------------------------------------------------------------------
          "LAN_IF"               192.168.0.1          VLAN 1          main-vrf           UP
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)

          App name         VRF Alias            App Dst Address       Source Address            Device IF name
          ----------------------------------------------------------------------------------------
          SIP              "main-vrf-ipv4"      11.11.11.100          0.0.0.0                   None (no route)
```

7 Mediant 500Li Voice using BRI Interfaces and SBC Application with WAN as Loopback Interface

Figure 7-1: Example of Voice using BRI Interfaces and SBC with WAN Loopback
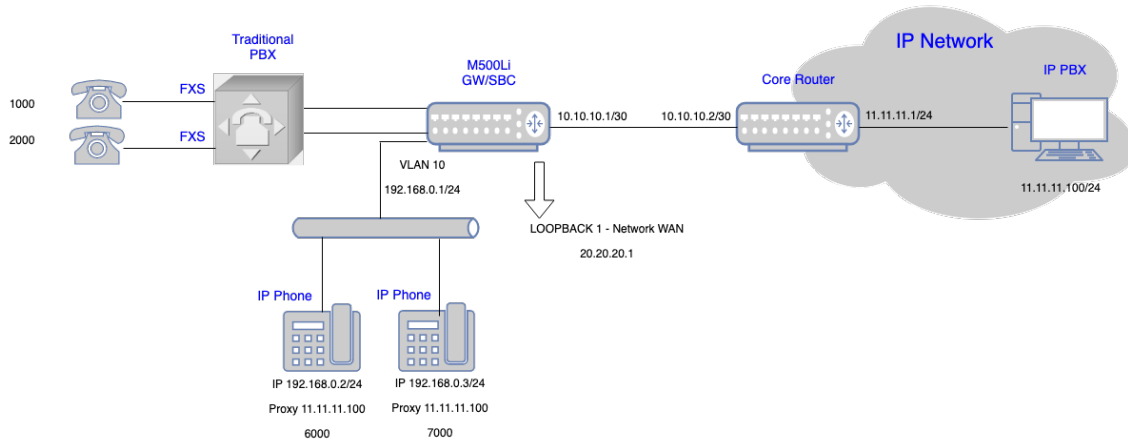
Back to scenarios menu.

7.1 Data Configuration

This section describes the data configuration of Mediant 500Li.

7.1.1 Configuring WAN IP Address

```
interface GigabitEthernet 0/0
   ip address 10.10.10.1 255.255.255.0
   mtu auto
   desc "WAN ethernet"
   napt
   firewall enable
   no shutdown
  exit
```

7.1.2 Configuring Loopback Interface

```
interface Loopback 1
   ip address 20.20.20.1 alias "WAN_LB"
   mtu auto
   desc "LAN Loopback 1"
   no ipv6 enable
   no service dhcp
   network wan
   no napt
   no firewall enable
   no shutdown
  exit
```

7.1.3 Configuring Physical LAN Ethernet 1/1 with VLAN 1

```
interface GigabitEthernet 1/1
   switchport mode trunk
   switchport trunk native vlan 1
   no shutdown
  exit
```

7.1.4 Configuring Logical Interface VLAN 1 and with Alias "LAN_IF"

```
interface VLAN 1
   ip address 192.168.0.1 255.255.255.0 alias "LAN_IF"
   mtu auto
   desc "incoming_connection vlan 1"
   ip dhcp-server network 192.168.0.2 192.168.0.10 255.255.255.0
   service dhcp
   no napt
   no firewall enable
   no shutdown
 exit
```

7.1.5 Configuring IP Route

```
   ip route 0.0.0.0 0.0.0.0 10.10.10.2 GigabitEthernet 0/0 1
```

7.2 Voice Configuration

This section describes the voice configuration of Mediant 500Li.

7.2.1 Configuring Voice Coders

```
coders-and-profiles audio-coders-groups 0
   coders-group-name "AudioCodersGroups_0"
   activate
   audio-coders 0
    name g711-alaw
    p-time 20
    rate 64
    activate
   exit
  exit
```

7.2.2 Configuring LAN Media Realm and Assigning to Alias "LAN_IF"

```
realm 1
   name "MR_LAN"
   network-source-ipv4 "LAN_IF"
   port-range-start 6000
   session-leg 100
   activate
  exit
```

7.2.3 Configuring WAN Media Realm and Assigning to Alias "WAN_LB" (Loopback Interface)

```
realm 2
   name "MR_WAN"
   network-source-ipv4 "WAN_LB"
   port-range-start 6000
   session-leg 100
   activate
 exit
```

7.2.4 Configuring LAN SRD

```
srd 1
   name "LAN_SRD"
   activate
 exit
```

7.2.5 Configuring WAN SRD

```
srd 2
   name "WAN_SRD"
   activate
 exit
```

7.2.6 Configuring LAN SIP Interface and Assigning to Alias "LAN_IF"

```
sip-interface 1
   interface-name "SIP_LAN"
   network-source "LAN_IF"
   application-type sbc
   srd-name "LAN_SRD"
   media-realm-name "MR_LAN"
   activate
 exit
```

7.2.7 Configuring WAN SIP Interface and Assigning to Alias "WAN_LB" (Loopback Interface)

```
sip-interface 2
   interface-name "SIP_WAN"
   network-source "WAN_LB"
   application-type sbc
   srd-name "WAN_SRD"
   media-realm-name "MR_WAN"
   activate
 exit
```

7.2.8 Assigning Proxy Set 2 to WAN SRD and Configuring Proxy Server (IP or Hostname)

```
proxy-set 2
   proxy-name "WAN_Proxy"
   proxy-enable-keep-alive using-options
   srd-name "WAN_SRD"
   sbcipv4-sip-int-name "SIP_WAN"
   activate
   proxy-ip 0
    proxy-address "11.11.11.100"
     activate
   exit
  exit
```

7.2.9 Configuring IP Group for LAN Side

```
ip-group 1
   type user
   name "IP_Phone"
   srd-name "LAN_SRD"
   media-realm-name "MR_LAN"
   classify-by-proxy-set disable
   activate
  exit
```

7.2.10 Configuring IP Group for WAN Side

```
ip-group 2
   name "IPPBX"
   proxy-set-name "WAN_Proxy"
   srd-name "WAN_SRD"
   media-realm-name "MR_WAN"
   activate
  exit
```

7.2.11 Configuring BRI Interfaces

```
interface bri 2/1
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
  interface bri 2/2
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
```

7.2.12 Configuring Trunk Group for BRI Interfaces

```
gateway trunk-group 0
   trunk-group-id 1
   first-trunk-id 1
   first-b-channel 1
   last-b-channel 1
   last-trunk-id 1
   module 2
   activate
 exit
 gateway trunk-group 1
  trunk-group-id 2
  first-trunk-id 1
  first-b-channel 2
  last-b-channel 2
  last-trunk-id 1
  module 2
  activate
 exit
```

7.2.13 Configuring IP-to-Tel Routing Rules

```
gateway routing ip2tel-routing 0
   dst-phone-pattern "1000"
   trunk-group-id 1
   activate
 exit
 gateway routing ip2tel-routing 1
   dst-phone-pattern "2000"
  trunk-group-id 2
  activate
 exit
```

7.2.14 Configuring Trunk Group Settings

```
gateway trunk-group-setting 0
   trunk-group-id 1
   channel-select-mode always-ascending
   registration-mode per-account
   serving-ip-group-name "IPPBX"
   activate
 exit
 gateway trunk-group-setting 1
  trunk-group-id 2
  channel-select-mode always-ascending
  registration-mode per-account
  serving-ip-group-name "IPPBX"
  activate
 exit
```

7.2.15 Configuring Accounts

```
sip-definition account 0
   served-trunk-group 1
   serving-ip-group-name "IPPBX"
   user-name "1000"
   password QHFxcnM= obscured
   host-name "11.11.11.100"
   contact-user "1000"
   register reg
   activate
 exit
 sip-definition account 1
   served-trunk-group 2
   serving-ip-group-name "IPPBX"
   user-name "2000"
   password Q3F0dXY= obscured
   host-name "11.11.11.100"
   contact-user "2000"
   register reg
   activate
 exit
```

7.2.16 Enabling Keep Original User in REGISTER Messages

```
sbc settings
   keep-contact-user-in-reg unique-param
   activate
 exit
```

7.2.17 Configuring SBC IP-to-IP Routing Rules

```
sbc routing ip2ip-routing 0
   route-name "Options Termination"
   request-type options
   dst-type dst-address
   dst-address "internal"
   activate
 exit
sbc routing ip2ip-routing 1
   route-name "IPP==>IPPBX"
   src-ip-group-name "IP_Phone"
   dst-ip-group-name "IPPBX"
   activate
 exit
sbc routing ip2ip-routing 2
    route-name " IPPBX==>GW"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "1000"
    dst-type gateway
    activate
    exit
```

```
sbc routing ip2ip-routing 3
    route-name " IPPBX==>GW"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "2000"
    dst-type gateway
    activate
  exit
sbc routing ip2ip-routing 4
    route-name "IPPBX==>IPP"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "6000"
    dst-ip-group-name "IP_Phone"
    activate
  exit
sbc routing ip2ip-routing 5
    route-name "IPPBX==>IPP"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "7000"
    dst-ip-group-name "IP_Phone"
    activate
  exit
sbc classification 0
    classification-name "IP_Phone"
    srd-name "LAN_SRD"
    src-sip-interface-name "SIP_LAN"
    src-ip-group-name "IP_Phone"
    activate
  exit
```

7.2.18   Viewing Pinhole Rules by show running-config data

```
# Note: The following VoIP Firewall pinholes rules are in effect for system services,
#       conflicting rules should not be created:
#          Application Media Realm: WAN IP 20.20.20.1 protocol udp ports 6000-6999, interface Loopback
#          Application SIP: WAN IP 20.20.20.1 protocol udp ports 5060-5060, interface Loopback 1
#          Application SIP: WAN IP 20.20.20.1 protocol tcp ports 5060-5060, interface Loopback 1
#          Application SIP: WAN IP 20.20.20.1 protocol tcp ports 5061-5061, interface Loopback 1
```

## 7.2.19   show network available-app-interfaces Command

The output of the `show network available-app-interfaces` command has two parts. The first part displays the VRF/Interface that is bound to IP addresses. The second part displays application binding information (current source interface used in the application bounded VRF).

In this example, the SIP application uses two IP aliases -- one for the LAN ("LAN_IF") and one for the WAN ("WAN_LB").

```
show network available-app-interfaces

VRF IFs:  VRF Alias              Address Family                                  Vrf Name         IF Status
          --------------------------------------------------------------------------------------------------
          "main-vrf-ipv4"        IPv4                                            main-vrf         UP
          "main-vrf-ipv6"        IPv6                                            main-vrf         UP

IP  IFs:  IP Alias               IP Address              Device IF Name          Vrf Name         IF Status
          --------------------------------------------------------------------------------------------------
          "WAN_LB"               20.20.20.1              Loopback 1              main-vrf         UP
          "LAN_IF"               192.168.0.1             VLAN 1                  main-vrf         UP

Note - VRF/IP Alias is the name used in order to bind each application to network interface
```

8   Mediant 500Li Voice using BRI Interfaces and SBC Application with VRF Interface

Figure 8-1: Example of Voice using BRI Interfaces and SBC with VRF
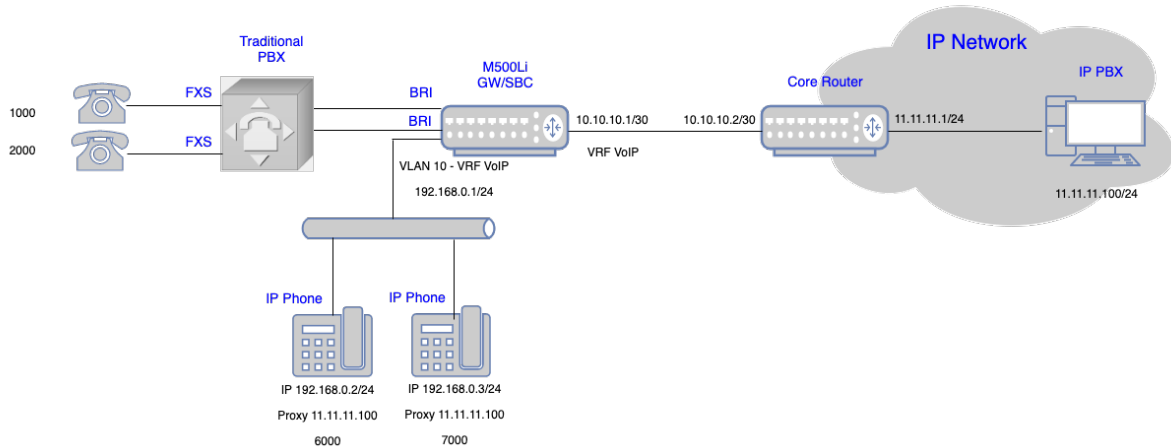
Back to scenarios menu.

8.1   Data Configuration

This section describes the data configuration of Mediant 500Li.

8.1.1   Configuring VRF

```
configure data
   ip vrf VRF_VoIP ipv4-alias "VoIP"
```

8.1.2   Configuring WAN IP Address

```
interface GigabitEthernet 0/0
   ip address 10.10.10.1 255.255.255.0
   desc "WAN ethernet"
   ip vrf forwarding VRF_VoIP
   napt
   firewall enable
   no shutdown
   exit
```

8.1.3   Configuring Physical LAN Ethernet 1/1 and Assigning to VLAN 1

```
interface GigabitEthernet 1/1
   switchport mode trunk
   switchport trunk native vlan 1
   no shutdown
  exit
```

8.1.4 Configuring Logical Interface VLAN 1 and Alias "LAN_IF"

```
interface VLAN 1
    ip address 192.168.0.1 255.255.255.0 alias "LAN_IF"
    desc "incoming_connection vlan 1"
    ip dhcp-server network 192.168.0.2 192.168.0.10 255.255.255.0
    service dhcp
    ip vrf forwarding VRF_VoIP
    no napt
    no shutdown
    exit
```

8.1.5 Configuring IP Route

```
ip route vrf VRF_VoIP 0.0.0.0 0.0.0.0 10.10.10.2 GigabitEthernet 0/0 1
```

8.2 Voice Configuration

This section describes the voice configuration of Mediant 500Li.

8.2.1 Configuring Voice Coders

```
coders-and-profiles audio-coders-groups 0
    coders-group-name "AudioCodersGroups_0"
    activate
    audio-coders 0
     name g711-alaw
     p-time 20
     rate 64
     activate
    exit
  exit
```

8.2.2 Configuring LAN Media Realm and Assigning to Alias "LAN_IF"

```
realm 1
    name "MR_LAN"
    network-source-ipv4 "LAN_IF"
    port-range-start 6000
    session-leg 100
    activate
  exit
```

8.2.3 Configuring WAN Media Realm and Assigning to Alias VRF "VoIP"

```
realm 2
    name "MR_WAN"
    network-source-ipv4 "VoIP"
    port-range-start 6000
    session-leg 100
    activate
  exit
```

8.2.4 Configuring LAN SRD

```
srd 1
    name "LAN_SRD"
    activate
  exit
```

8.2.5 Configuring WAN SRD

```
srd 2
    name "WAN_SRD"
    activate
  exit
```

8.2.6 Configuring LAN SIP Interface and Assigning to Alias "LAN_IF"

```
sip-interface 1
    interface-name "SIP_LAN"
    network-source "LAN_IF"
    application-type sbc
    srd-name "LAN_SRD"
    media-realm-name "MR_LAN"
    activate
  exit
```

8.2.7 Configuring WAN SIP Interface and Assigning to Alias VRF "VoIP"

```
sip-interface 2
    interface-name "SIP_WAN"
    network-source "VoIP"
    application-type sbc
    srd-name "WAN_SRD"
    media-realm-name "MR_WAN"
    activate
  exit
```

8.2.8 Assigning Proxy Set 2 to WAN SRD and Configuring Proxy Server (IP or Hostname)

```
proxy-set 2
   proxy-name "WAN_Proxy"
   proxy-enable-keep-alive using-options
   srd-name "WAN_SRD"
   sbcipv4-sip-int-name "SIP_WAN"
   activate
   proxy-ip 0
    proxy-address "11.11.11.100"
    activate
   exit
  exit
```

8.2.9 Configuring IP Group for LAN Side

```
ip-group 1
   type user
   name "IP_Phone"
   srd-name "LAN_SRD"
   media-realm-name "MR_LAN"
   classify-by-proxy-set disable
   activate
  exit
```

8.2.10 Configuring IP Group for WAN Side

```
ip-group 2
   name "IPPBX"
   proxy-set-name "WAN_Proxy"
   srd-name "WAN_SRD"
   media-realm-name "MR_WAN"
   activate
  exit
```

8.2.11 Configuring BRI Interfaces

```
interface bri 2/1
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
  interface bri 2/2
   isdn-termination-side network-termination-side
   protocol 50
   activate
  exit
```

8.2.12 Configuring Trunk Group for BRI Interfaces

```
gateway trunk-group 0
   trunk-group-id 1
   first-trunk-id 1
   first-b-channel 1
   last-b-channel 1
   last-trunk-id 1
   module 2
   activate
 exit
 gateway trunk-group 1
  trunk-group-id 2
  first-trunk-id 1
  first-b-channel 2
  last-b-channel 2
  last-trunk-id 1
  module 2
  activate
 exit
```

8.2.13 Configuring IP-to-Tel Routing Rules

```
gateway routing ip2tel-routing 0
   dst-phone-pattern "1000"
   trunk-group-id 1
   activate
 exit
 gateway routing ip2tel-routing 1
  dst-phone-pattern "2000"
  trunk-group-id 2
  activate
 exit
```

8.2.14 Configuring Trunk Group Settings

```
gateway trunk-group-setting 0
   trunk-group-id 1
   channel-select-mode always-ascending
   registration-mode per-account
   serving-ip-group-name "IPPBX"
   activate
 exit
 gateway trunk-group-setting 1
  trunk-group-id 2
  channel-select-mode always-ascending
  registration-mode per-account
  serving-ip-group-name "IPPBX"
  activate
 exit
```

8.2.15   Configuring Accounts

```
sip-definition account 0
   served-trunk-group 1
   serving-ip-group-name "IPPBX"
   user-name "1000"
   password QHFxcnM= obscured
   host-name "11.11.11.100"
   contact-user "1000"
   register reg
   activate
 exit
 sip-definition account 1
   served-trunk-group 2
   serving-ip-group-name "IPPBX"
   user-name "2000"
   password Q3F0dXY= obscured
   host-name "11.11.11.100"
   contact-user "2000"
   register reg
   activate
 exit
```

8.2.16   Enabling Keep Original User in REGISTER Message

```
sbc settings
   keep-contact-user-in-reg unique-param
   activate
 exit
```

8.2.17   Configuring SBC IP-to-IP Routing Rules

```
sbc routing ip2ip-routing 0
   route-name "Options Termination"
   request-type options
   dst-type dst-address
   dst-address "internal"
   activate
 exit
sbc routing ip2ip-routing 1
   route-name "IPP==>IPPBX"
   src-ip-group-name "IP_Phone"
   dst-ip-group-name "IPPBX"
   activate
 exit
sbc routing ip2ip-routing 2
    route-name " IPPBX==>GW"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "1000"
    dst-type gateway
    activate
    exit
```

```
sbc routing ip2ip-routing 3
    route-name " IPPBX==>GW"
    src-ip-group-name "IPPBX"
    dst-user-name-prefix "2000"
    dst-type gateway
    activate
  exit
sbc routing ip2ip-routing 4
   route-name "IPPBX==>IPP"
   src-ip-group-name "IPPBX"
   dst-user-name-prefix "6000"
   dst-ip-group-name "IP_Phone"
   activate
 exit
sbc routing ip2ip-routing 5
   route-name "IPPBX==>IPP"
   src-ip-group-name "IPPBX"
   dst-user-name-prefix "7000"
   dst-ip-group-name "IP_Phone"
   activate
 exit
sbc classification 0
   classification-name "IP_Phone"
   srd-name "LAN_SRD"
   src-sip-interface-name "SIP_LAN"
   src-ip-group-name "IP_Phone"
   activate
 exit
```

8.2.18   Viewing Pinhole Rules by show running-config data

```
# Note: The following VoIP Firewall pinholes rules are in effect for system services,
#       conflicting rules should not be created:
#       Application Media Realm: WAN IP 10.10.10.1 protocol udp ports 6000-6999, interface GigabitEthernet 0/0
#       Application SIP: WAN IP 10.10.10.1 protocol udp ports 5060-5060, interface GigabitEthernet 0/0
#       Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5060-5060, interface GigabitEthernet 0/0
#       Application SIP: WAN IP 10.10.10.1 protocol tcp ports 5061-5061, interface GigabitEthernet 0/0
```

8.2.19   show network available-app-interfaces Command

The output of the `show network available-app-interfaces` command has two parts. The first part displays the VRF/Interface that is bound to IP addresses. The second part displays application binding information (current source interface used in the application bounded VRF).

In this example, the SIP application is bInded to VRF VoIP, the source IP is the GigabitEthernet 0/0 interface (10.10.10.1), and the destination is the destination of the IP-PBX (11.11.11.100).

```
show network available-app-interfaces
VRF IFs: VRF Alias            Address Family                            Vrf Name          IF Status
         --------------------------------------------------------------------------------------------
         "main-vrf-ipv4"      IPv4                                      main-vrf          UP
         "main-vrf-ipv6"      IPv6                                      main-vrf          UP
         "VoIP"               IPv4                                      VRF_VoIP          UP
IP  IFs: IP Alias             IP Address           Device IF Name       Vrf Name          IF Status
         --------------------------------------------------------------------------------------------
         "LAN_IF"             192.168.0.1          VLAN 1               VRF_VoIP          UP
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)
         --------------------------------------------------------------------------------------------
         App name       VRF Alias        App Dst Address        Source Address        Device IF name
         --------------------------------------------------------------------------------------------
         SIP            "VoIP"           11.11.11.100           10.10.10.1            GigabitEthernet 0/0
```

If no IP route is configured, the 'Source Address' column displays "**None**":

```
show network available-app-interfaces
VRF IFs: VRF Alias            Address Family                            Vrf Name          IF Status
         --------------------------------------------------------------------------------------------
         "main-vrf-ipv4"      IPv4                                      main-vrf          UP
         "main-vrf-ipv6"      IPv6                                      main-vrf          UP
         "VoIP"               IPv4                                      VRF_VoIP          UP
IP  IFs: IP Alias             IP Address           Device IF Name       Vrf Name          IF Status
         --------------------------------------------------------------------------------------------
         "LAN_IF"             192.168.0.1          VLAN 1               VRF_VoIP          UP
Note - VRF/IP Alias is the name used in order to bind each application to network interface

Applications binding: (Current source interface resolved in the vrf according to app. destination address)
         --------------------------------------------------------------------------------------------
         App name       VRF Alias        App Dst Address        Source Address        Device IF name
         --------------------------------------------------------------------------------------------
         SIP            "VoIP"           11.11.11.100           None (no route)        None (no route)
```

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