

# Mediant MSBR

## Simplifying Network Configuration

Version 6.8



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## Related Documentation

Document Name
CLI Reference Guide
MSBR SIP User's Manual

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31742	Updated logos, links and new formatting.

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# 1 Introduction

Until now, the Mediant MSBR has been configured as two separate networking stacks with separate physical IP interfaces for 'Data' and 'Voice'. The user had to link applications, such as VoIP, Syslog, NTP and management to one of these networking stacks, and then make sure that connectivity had been properly configured. Now the MSBR can be configured as a single networking mode i.e. with a single IP interface with the capability to link applications, such as VoIP to run over this stack. Consequently this configuration (available from 6.80A.335) mode provides a much easier method to link services and applications.

To configure this new mode, reset the device to default, reboot the unit, type the following command and then reboot the unit again:

```
configure system
  config-networking
    single-net-mode enable
```

Once the unit has restarted, you will notice no more networking elements on the VoIP side, i.e. an IP interface is not configured on the VoIP side and instead, VoIP is now an application on top of the router stack comprising an SBC/gateway.

This operation mode is static, which implies that the "write factory" command cannot restore the configuration to dual network mode.

## 1.1 What you Need to Know?

To understand the configuration of the single network mode, the following elements are considered:

- The networking stack
- The applications
- The linking between the above elements

The router networking configuration and applications configuration has not changed. However, you now need to know how to bind the VoIP applications over the networking stack and to link other applications to the stack.

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## 2 Overview

This chapter provides an overview for 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.

### 2.2 VoIP over WAN

Configuring the VoIP application to work over a group or pool of interfaces comprising the 'WAN' side is done as shown in the following example:

```
voip-network realm 1
  name "MR_WAN"
  ipv4if "WAN"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit

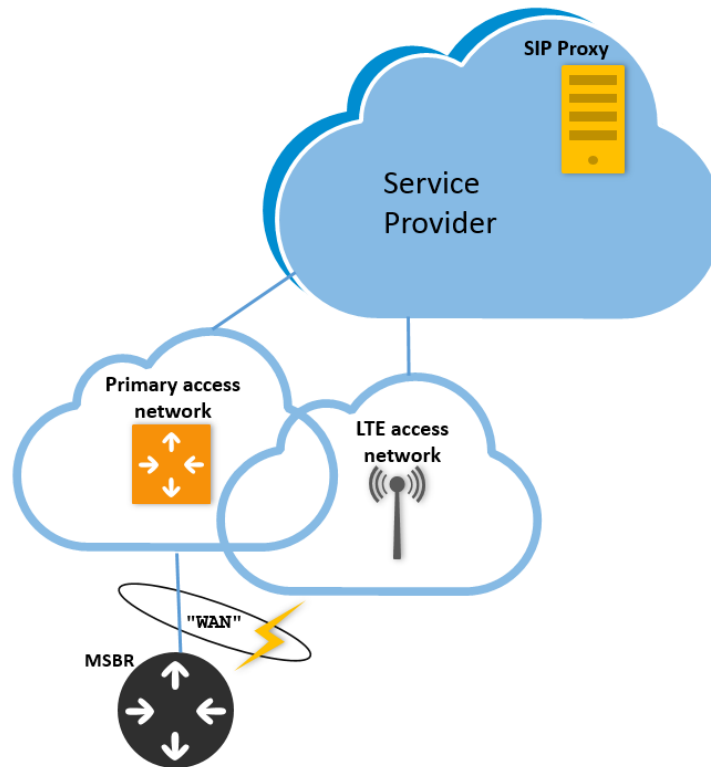
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface "WAN"
  application-type sbc
  srd 1
  activate
exit
```

This above configuration shows the use of the bolded keywords which represent a pool of WAN interfaces that can be used by the VoIP application. Full configuration examples are shown later in this document.

In the above 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 "WAN" 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



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

```
voip-network realm 1
  name "MR_WAN"
  ipv4if "WAN VRF VoiceVRF"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit

voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface "WAN VRF VoiceVRF"
  application-type sbc
  srd 1
  activate
exit
```

## 2.3 VoIP over LAN

Configuring the VoIP application over a LAN interface differs from the WAN interface configuration described in Section 2.2. For VoIP over LAN, you only need to specify the router's LAN interface that you wish to attach the VoIP interface, which can be either a specific VLAN (for example 'vlan 2') or a bridge Interface (for example 'bvi 1'):

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 2"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
exit

voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 2"
  application-type sbc
  activate
exit
```

VLAN 2 is the router's VLAN 2:

```
configure data
  interface vlan 2
    ip address 12.12.12.2 255.255.255.0
    no shutdown
  exit
```

The application in this case searches for the VLAN IP address through which to run the traffic.

```
MSBR# show voip network-source-bindings

VoIP Applications to Network source bindings:
-----

VoIP bind to VLAN 2 with ip address 12.12.12.2

VoIP bind to WAN on VRF main-vrf with destination address
10.9.9.10:
  Current WAN interface is EFM 0/2.2014 with ip address
10.205.0.42

NAT & Port FW rules used by VoIP Applications:
-----

The following WAN ports are in use by VOIP services:
  Ports 6000 - 6990 --> RealmPortPool::MR_WAN
  Ports 5060 - 5060 --> SIPUDP#1
```

```

Ports 5060 - 5060 --> SIPLISTENING#1
Ports 5061 - 5061 --> SIPLISTENING#1
The following NAT rules are in effect for VOIP services:
  RealmPortPool::MR_WAN: LAN ports 6000-6990 to WAN IP
10.205.0.42 ports 6000-6990, interface EFM 0/2.2014
  SIPUDP#1: LAN ports 5060-5060 to WAN IP 10.205.0.42 ports
5060-5060, interface EFM 0/2.2014
  SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 10.205.0.42
ports 5060-5060, interface EFM 0/2.2014
  SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 10.205.0.42
ports 5061-5061, interface EFM 0/2.2014

```

## 2.4 Limitations of VoIP to Network Binding

The following limitations exist for VoIP to network bindings (LAN and WAN):

- Configuration of up to **8** binding interfaces. In case you bind an interface and then you change it, it still remains bound to the VoIP application. You can verify which network interfaces are bound to the VoIP application using the CLI command “show voip network-source-bindings”. (See an example of this scenario in Chapter 7).

There are two ways to delete the interface bind from the VoIP side (in case the interface is no longer in use):

- Delete the interface on the Data side.
- Reset the MSBR.



**Note:** If the interface name includes the ‘WAN’ keyword, then this interface cannot be deleted.

- When setting up more than one IP address for an interface (configuring a secondary IP), network binding works only on the primary IP.
- When setting up more than one VRRP IP for an interface (secondary IP), VRRP works only on the primary IP (when the interface is set with VRRP, the primary VRRP group address is preferred over the local address of the interface).

## 2.5 Example Scenarios

This document includes the following example scenarios:

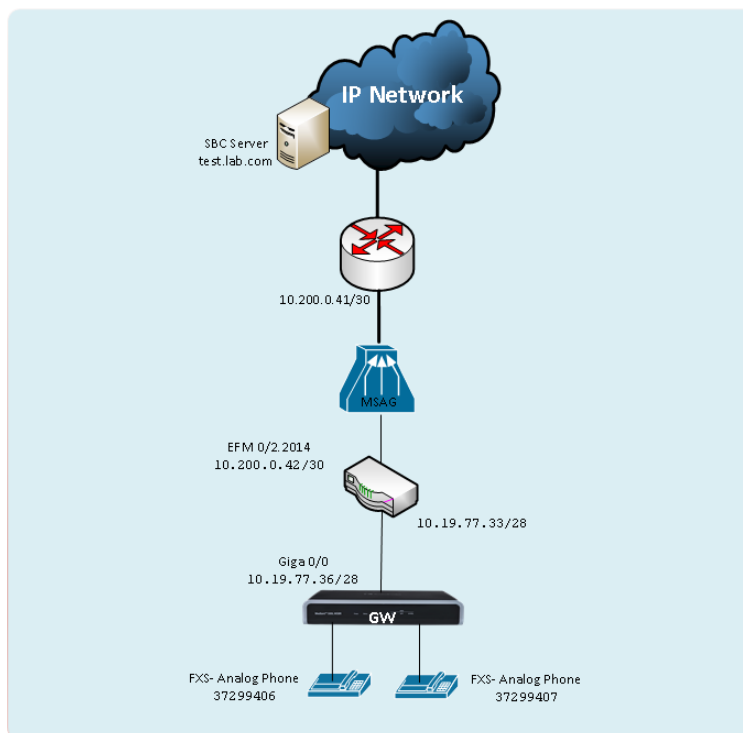
- [MSBR Router with Voice Application \(using Proxy Server\)](#)
- [MSBR Router with Voice Application \(using Tel-to-IP Routing\)](#)
- [MSBR with SBC](#)
- [MSBR with SBC Application \(using LLDP Intercept Feature and IPv4\)](#)
- [MSBR Voice and SBC Applications with IPv6 Interface](#)
- [MSBR Voice and SBC Applications with Loopback Interface](#)
- [MSBR Voice and SBC Applications with VRF Interface](#)
- [Dual MSBRs with Voice and SBC Applications and VRRP](#)



### 3 MSBR Router with Voice Application (using Proxy Server)

This example scenario shows how to route calls when the MSBR is configured as a simple voice application using a Proxy server and basic router configuration.

**Figure 3-1: Gateway (Using Proxy) Scenario**



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#### 3.1 MSBR System Configuration (Entire Configuration)

```
configure system
config-networking
single-net-mode enable
activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 3.2 MSBR Data Configuration (Entire Configuration)

This section describes the data configuration.

### 3.2.1 Setting WAN IP Address

```
interface GigabitEthernet 0/0
  ip address 10.19.77.36 255.255.255.240
  mtu auto
  desc "WAN Copper"
  no ipv6 enable
  speed auto
  duplex auto
  no service dhcp
  ip dns server static
  ip name-server 172.30.9.162 172.30.9.163
  napt
  firewall enable
  no shutdown
exit
```

### 3.2.2 Setting Static IP Route

```
ip route 0.0.0.0 0.0.0.0 10.19.77.33 GigabitEthernet 0/0 1
```

## 3.3 MSBR Voice Configuration (Entire Configuration)

This section describes the voice configuration.

### 3.3.1 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  activate
exit
```

### 3.3.2 Creating WAN Media Realm and Assigning to Reserved Keyword WAN

```
voip-network realm 1
  name "MR_WAN"
  ipv4if "WAN"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit
```

### 3.3.3 Creating WAN SRD and Assigning Media Realm WAN

```
voip-network srd 1
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

### 3.3.4 Creating WAN SIP Interface and Assigning to Reserved Keyword WAN

```
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface "WAN"
  srd 1
  activate
exit
```

### 3.3.5 Assigning Proxy set 2 to SRD 1 (SRD\_WAN)

```
voip-network proxy-set 2
  proxy-enable-keep-alive using-options
  srd-id 1
  activate
exit
```

### 3.3.6 Creating IP Group for WAN Side

```
voip-network ip-group 2
  description "BroadSoft"
  proxy-set-id 2
  srd 1
  media-realm-name "MR_WAN"
  activate
exit
```

### 3.3.7 Setting Proxy Server (IP or Hostname)

```
voip-network proxy-ip 0
  proxy-address "test.lab.com"
  proxy-set-id 2
  activate
exit
```

### 3.3.8 Enabling Registration

```
sip-definition proxy-and-registration
  authentication-mode per-endpoint
  enable-registration on
  activate
exit
```

### 3.3.9 Setting an Extension

```
gw hunt-or-trunk-group trunk-group 0
    trunk-group-id 1
    first-b-channel 1
    last-b-channel 1
    first-phone-number "37299406"
    module 2
    activate
    exit
gw analoggw authentication 0
    user-name "37299406"
    password YlZcQXV5eXQ== obscured
    activate
    exit
```

### 3.3.10 Setting IP-to-Tel Routing

```
gw routing ip2tel-routing 0
    dst-phone-prefix "*"
    trunk-group-id 1
    src-phone-prefix "*"
    src-ip-address "*"
    activate
    exit
```

### 3.3.11 Setting Hunt Group

```
gw hunt-or-trunk-group trunk-group-setting 0
    trunk-group-id 1
    channel-select-mode dst-phone-number
    registration-mode per-endpoint
    serving-ip-group 2
    activate
    exit
```

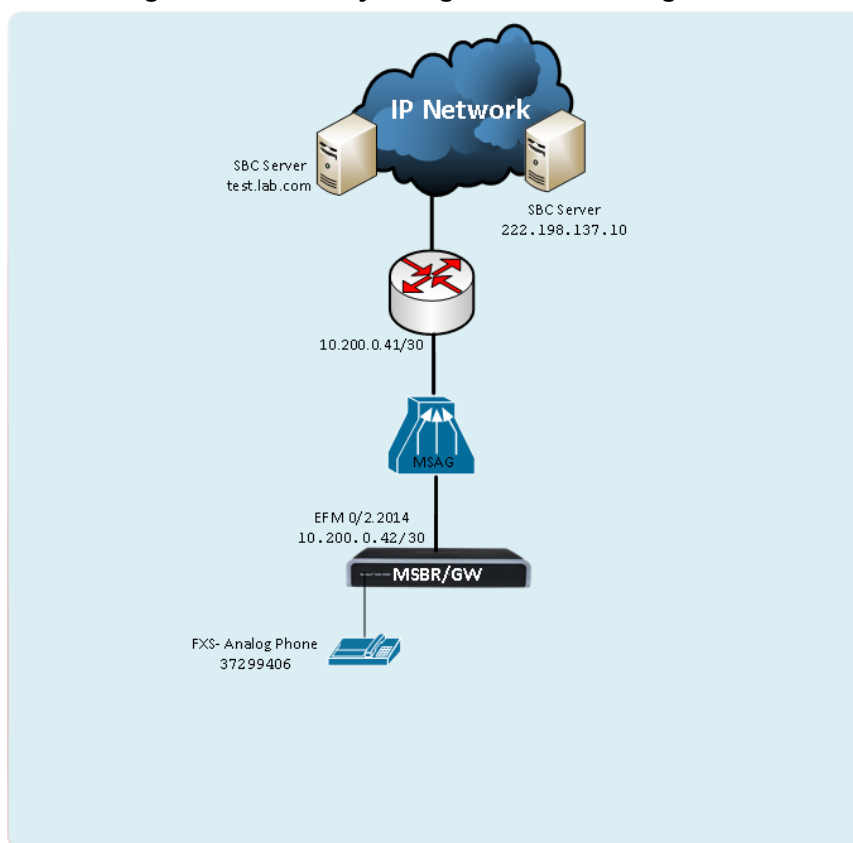
## 4 MSBR Router with Voice Application (using Tel-to-IP Routing table)

This example scenario shows how to route calls when the MSBR is configured as a voice application using the Tel-to-IP table and a basic router configuration.



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

**Figure 4-1: Gateway Using Tel-to-IP Routing Table**



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## 4.1 MSBR System Configuration (Entire Configuration)

```
configure system
  config-networking
    single-net-mode enable
  activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 4.2 MSBR Data Configuration (Entire Configuration)

This section describes the data configuration.

### 4.2.1 Setting WAN IP Address

```
interface dsl 0/2
  #DSL configuration is automatic
  #Termination cpe
  mode VDSL
  auto-switch-attempts vdsl 1 vdsl-v43 0 adsl 2
  no shutdown
exit
interface EFM 0/2.2014
  ip address 10.200.0.42 255.255.255.252
  mtu auto
  ip name-server 172.30.9.162 172.30.9.163
  napt
  firewall enable
  no shutdown
exit
```

### 4.2.2 Setting IP Route

```
ip route 0.0.0.0 0.0.0.0 10.200.0.41 EFM 0/2.2014 1
```

## 4.3 MSBR Voice Configuration (Entire Configuration)

This section describes the voice configuration.

### 4.3.1 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  rate 0
  activate
exit
coders-and-profiles coders-group-0 1
  name "g711Ulaw64k"
  p-time 20
  rate 0
  activate
exit
```

### 4.3.2 Creating WAN Media Realm and Assigning to Reserve Keyword WAN

```
voip-network realm 0
  name "MR_WAN"
  ipv4if "WAN"
  port-range-start 6000
  session-leg 200
  port-range-end 7990
  is-default true
  activate
exit
```

### 4.3.3 Creating WAN SRD and Assigning its Media Realm WAN

```
voip-network srd 0
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

### 4.3.4 Creating WAN SIP Interface and Assigning to Reserved Keyword WAN

```
voip-network sip-interface 0
  interface-name "SIP_WAN"
  network-interface "WAN"
  activate
exit
```

### 4.3.5 Assigning Proxy Set 1 to SRD 0 (SRD\_WAN)

```
voip-network proxy-set 1
  proxy-name ""
  activate
exit
```

### 4.3.6 Creating IP Group for WAN Side

```
voip-network ip-group 1
  description "ProxyforWANB"
  proxy-set-id 1
  activate
exit
```

### 4.3.7 Setting Proxy Server (IP or Hostname)

```
voip-network proxy-ip 1
  proxy-address "test.lab.com"
  proxy-set-id 1
  activate
exit
```

### 4.3.8 Enabling Registration and Setting the Calls to Work with Routing Table

```
sip-definition proxy-and-registration
  dns-query srv
  enable-registration on
prefer-routing-table enable
  activate
exit
```

### 4.3.9 Setting an Extension

```
gw hunt-or-trunk-group trunk-group 0
  trunk-group-id 1
  first-b-channel 1
  last-b-channel 1
  first-phone-number "37299406"
  module 2
  activate
exit
gw analoggw authentication 0
  user-name "37299406"
  password Y1ZcQXV5eXQ== obscured
  activate
exit
```



### 4.3.10 Setting Tel-to-IP Routing Rules

```
gw routing tel2ip-routing 0
  dst-phone-prefix "050"
  dst-ip-address "test.lab.com"
  ip-profile-id 0
  dst-port 5060
  dst-srd 0
  activate
exit
gw routing tel2ip-routing 1
  dst-phone-prefix "03"
  dst-ip-address "222.198.137.10"
  ip-profile-id 0
  dst-port 5060
  dst-srd 0
  activate
exit
```

### 4.3.11 Setting IP-to-Tel Routing

```
gw routing ip2tel-routing 0
  dst-phone-prefix "*"
  trunk-group-id 1
  src-phone-prefix "*"
  src-ip-address "*"
  dst-host-prefix "*"
  src-host-prefix "*"
  activate
exit
```

### 4.3.12 Setting Hunt Group

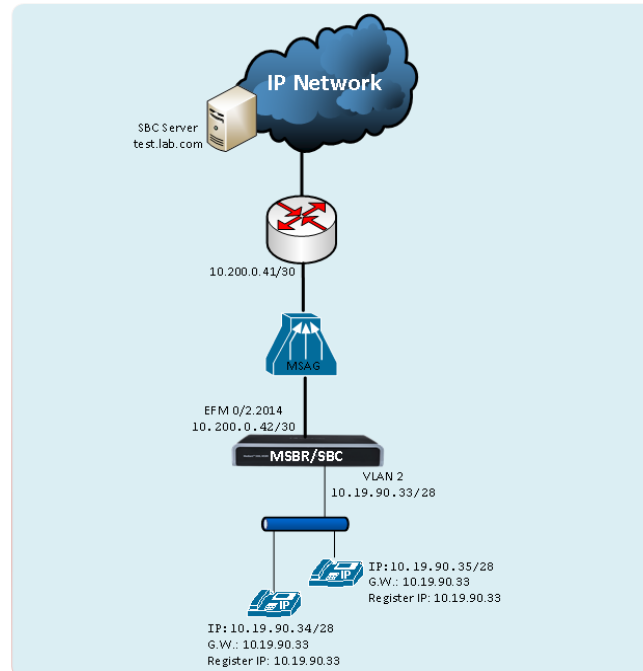
```
gw hunt-or-trunk-group trunk-group-setting 0
  trunk-group-id 1
  channel-select-mode dst-phone-number
  activate
exit
```

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## 5 MSBR with SBC Application

This example scenario shows how to route calls when the MSBR is configured as an SBC application.

### Figure 5-1: IP Phone Connected to SBC



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## 5.1 MSBR System Configuration (Entire Configuration)

```
configure system
  config-networking
    single-net-mode enable
    activate
  exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 5.2 MSBR Data Configuration (Entire Configuration)

This section describes the data configuration.

### 5.2.1 Setting WAN IP Address

```
interface dsl 0/2
    #DSL configuration is automatic
    #Termination cpe
```

```

mode VDSL
auto-switch-attempts vdsl 1 vdsl-v43 0 adsl 2
no shutdown
exit
interface EFM 0/2.2014
ip address 10.200.0.42 255.255.255.252
mtu auto
ip name-server 172.30.9.162 172.30.9.163
napt
firewall enable
no shutdown
exit

```

## 5.2.2 Setting Physical LAN Ethernet 1/1 assign to VLAN2

```

interface FastEthernet 1/1
switchport mode trunk
switchport trunk native vlan 2
no shutdown
exit

```

## 5.2.3 Setting Logical Interface VLAN 2

```

interface VLAN 2
ip address 10.19.90.33 255.255.255.240
desc "LAN switch VLAN 2"
ip dhcp-server network 10.19.90.34 10.19.90.36 255.255.255.240
ip dhcp-server lease 0 1 0
service dhcp
no shutdown
exit

```

## 5.2.4 Setting IP Route

```

ip route 0.0.0.0 0.0.0.0 10.200.0.41 EFM 0/2.2014 1

```

## 5.3 MSBR Voice Configuration (Entire Configuration)

This section describes the voice configuration.

### 5.3.1 Enabling SBC Application

```
configure voip
  appli-enabling
  enable-sbc on
  activate
exit
```

### 5.3.2 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  activate
exit
```

### 5.3.3 Creating LAN Media Realm and Assigning to VLAN2

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 2"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
exit
```

### 5.3.4 Creating WAN Media Realm and Assigning to Reserved Keyword WAN

```
voip-network realm 1
  name "MR_WAN"
  ipv4if "WAN"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit
```

### 5.3.5 Creating LAN SRD and Assigning Media Realm LAN to it

```
voip-network srd 0
  name "SRD_LAN"
  media-realm-name "MR_LAN"
  activate
exit
```

### 5.3.6 Creating WAN SRD and Assigning its Media Realm WAN

```
voip-network srd 1
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

### 5.3.7 Creating LAN SIP Interface

```
voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 2"
  application-type sbc
  activate
exit
```

### 5.3.8 Creating WAN SIP Interface and Assigning to Reserved Keyword WAN

```
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface "WAN"
  application-type sbc
  srd 1
  activate
exit
```

### 5.3.9 Assigning Proxy Set 2 to SRD 1 (SRD\_WAN)

```
voip-network proxy-set 2
  proxy-enable-keep-alive using-options
  srd-id 1
  activate
exit
```

### 5.3.10 Creating IP Group for LAN Side

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

### 5.3.11 Creating IP Group for WAN Side

```
voip-network ip-group 2
  description "BroadSoft"
  proxy-set-id 2
  srd 1
  media-realm-name "MR_WAN"
  activate
exit
```

### 5.3.12 Creating 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==>Broadsoft"
  src-ip-group-id 1
  dst-ip-group-id 2
  activate
exit
sbc routing ip2ip-routing 2
  route-name "Broadsoft==>IPP"
  src-ip-group-id 2
  dst-user-name-prefix "372994"
  dst-ip-group-id 1
  activate
exit
sbc routing classification 0
  classification-name "IP_Phone"
  src-srd-id "0"
  src-ip-group-id "1"
  activate
exit
```

### 5.3.13 Setting Proxy Server (IP or Hostname)

```
voip-network proxy-ip 0
  proxy-address "test.lab.com"
  proxy-set-id 2
  activate
exit
exit
```

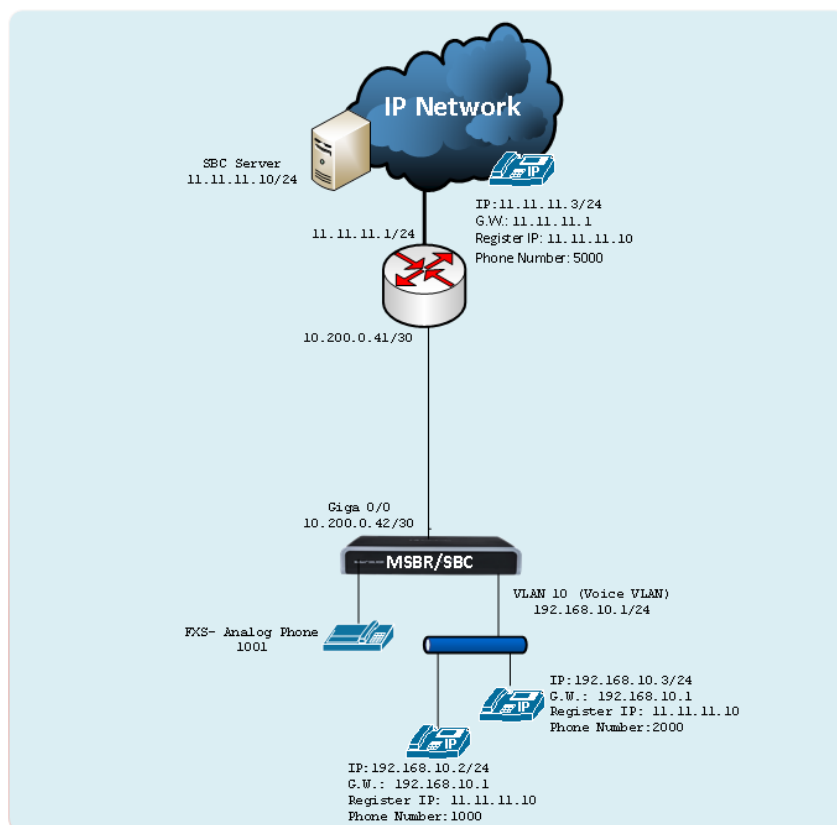
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## 6 MSBR with SBC Application (using LLDP Intercept Feature and IPv4)

This example scenario shows how to route calls when the MSBR is configured as an SBC application using the LLDP Intercept feature and IPv4.

The LLDP protocol is enabled on the MSBR for sending the VLAN voice to the IP Phone. The Intercept feature is enabled for connecting the IP Phone for voice traffic which by default passes directly to the IP-PBX or SIP Server, and then redirecting this traffic to pass via the SBC.



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## 6.1 MSBR System Configuration (Entire Configuration)

```
configure system
  config-networking
    single-net-mode enable
  activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 6.2 MSBR Data Configuration (Entire Configuration)

This section describes the data configuration.

### 6.2.1 Setting WAN IP Address

```
interface GigabitEthernet 0/0
  ip address 10.200.0.42 255.255.255.252
  mtu auto
  desc "WAN Copper"
  no ipv6 enable
  speed auto
  duplex auto
  no service dhcp
  ip dns server static
  napt
  firewall enable
  no shutdown
exit
```

## 6.3 Setting Physical LAN Ethernet assign to VLAN10 configured as VLAN Tagging

```
interface FastEthernet 1/1
  speed auto
  duplex auto
  switchport mode trunk

  switchport trunk allowed vlan add 10
  no shutdown
exit
interface FastEthernet 1/2
  speed auto
  duplex auto
  switchport mode trunk
```

```
switchport trunk allowed vlan add 10
no shutdown
exit
```

## 6.4 Creating ACL for intercepting the traffic to the SBC

This ACL will be used later by the intercept feature (see Section 6.8.8).

```
access-list sbc permit udp any eq 5060 host 11.11.11.10
```

## 6.5 Setting Logical Interface

```
interface VLAN 10
ip address 192.168.10.1 255.255.255.0
mtu auto
desc "LAN switch VLAN 10"
no ipv6 enable
ip dhcp-server network 192.168.10.3 192.168.10.8 255.255.255.0
ip dhcp-server dns-server 0.0.0.0
ip dhcp-server netbios-name-server 0.0.0.0
ip dhcp-server lease 0 1 0
ip dhcp-server provide-host-name
ip dhcp-server time-offset 0
ip dhcp-server netbios-node-type 0
ip dhcp-server ntp-server 0.0.0.0
ip dhcp-server tftp-server 0.0.0.0
ip dhcp-server override-router-address 0.0.0.0
ip dhcp-server next-server 0.0.0.0
service dhcp
ip dns server static
no napt
no firewall enable
no link-state monitor
no shutdown
exit
```



**Note:** Enabling the intercept feature is dependent on the voice configuration (Media Realm and SIP interface). If these entities are not configured, this feature cannot be activated.

## 6.6 Enable LLDP for Sending the VLAN Voice to the IP Phone

```
lldp timer 5
lldp network-policy profile 1
voice vlan 10
cos 7
dscp 46
exit
lldp run
```

## 6.7 Setting IP Route

```
ip route 0.0.0.0 0.0.0.0 10.200.0.41 GigabitEthernet 0/0 1
```

## 6.8 MSBR Voice Configuration (Entire Configuration)

This section describes the voice configuration.

### 6.8.1 Enabling SBC Application

```
configure voip
  appli-enabling
  enable-sbc on
  activate
exit
```

### 6.8.2 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  activate
exit
```

### 6.8.3 Creating LAN Media Realm and Assigning to VLAN10

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 10"
  port-range-start 6000
  session-leg 256
  port-range-end 8550
  activate
exit
```

### 6.8.4 Creating WAN Media Realm and Assigning to Reserved Keyword WAN

```
voip-network realm 1
  name "MR_WAN"
  ipv4if "WAN"
  port-range-start 7000
  session-leg 100
  port-range-end 7990
  activate
exit
```

### 6.8.5 Creating LAN SRD and Assigning Media Realm LAN

```
voip-network srd 0
  name "SRD_LAN"
  media-realm-name "MR_LAN"
  activate
exit
```

### 6.8.6 Creating WAN SRD and Assigning Media Realm WAN

```
Voip-network srd 1
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

### 6.8.7 Creating LAN SIP Interface

```
voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 10"
  application-type sbc
  activate
exit
```

### 6.8.8 Enabling Intercept Feature

This section describes how to enable the intercept feature on the VLAN interface that was created for the voice in Section 6.5.

```
configure data
interface VLAN 10
  intercept ip destination sbc to local-voip
exit
```

### 6.8.9 Creating WAN SIP Interface and Assigning Reserved keyword WAN

```
Configure voip
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface "WAN"
  application-type sbc
  srd 1
  activate
exit
```

### 6.8.10 Assigning Proxy Set 2 to SRD 1 (SRD\_WAN)

```
voip-network proxy-set 2
  proxy-enable-keep-alive using-options
  srd-id 1
  activate
exit
```

### 6.8.11 Creating IP Group for LAN side

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

### 6.8.12 Creating IP Group for WAN Side

```
voip-network ip-group 2
  description "IPPBX"
  proxy-set-id 2
  srd 1
  media-realm-name "MR_WAN"
  activate
exit
```

### 6.8.13 Setting an Extension

```
gw hunt-or-trunk-group trunk-group 0
  trunk-group-id 1
  first-b-channel 1
  last-b-channel 1
  first-phone-number "1001"
  module 2
  activate
exit
gw analoggw authentication 0
  user-name "1001"
  password pass1001
  activate
exit
```

### 6.8.14 Setting IP-to-Tel Routing

```
gw routing ip2tel-routing 0
  dst-phone-prefix "*"
  trunk-group-id 1
  src-phone-prefix "*"
  src-ip-address "*"
  activate
```

```
exit
```

### 6.8.15 Setting Hunt Group

```
gw hunt-or-trunk-group trunk-group-setting 0
  trunk-group-id 1
  channel-select-mode dst-phone-number
  registration-mode per-endpoint
  serving-ip-group 2
  activate
exit
```

### 6.8.16 Creating 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-id 1
  dst-ip-group-id 2
  activate
exit
sbc routing ip2ip-routing 2
  route-name "IPPBX==>GW"
  src-ip-group-id 2
  dst-user-name-prefix "1001"
  dst-type gateway
  activate
exit
sbc routing ip2ip-routing 3
  route-name "IPPBX==>IPP"
  src-ip-group-id 2
  dst-ip-group-id 1
  activate
exit
sbc routing classification 0
  classification-name "IP_Phone"
  src-srd-id "0"
  src-ip-group-id "1"
  activate
exit
```

### 6.8.17 Enabling Registration

```
sip-definition proxy-and-registration
  authentication-mode per-endpoint
  enable-registration on
  activate
exit
```

### 6.8.18 Setting Proxy Server (IP or Hostname)

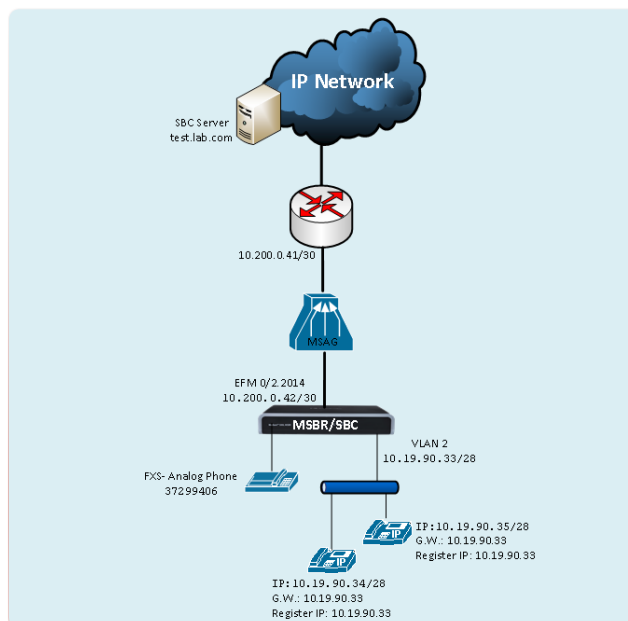
```
voip-network proxy-ip 0
  proxy-address "11.11.11.10"
  proxy-set-id 2
  activate
exit
exit
```



## 7 MSBR Voice and SBC Applications with IPv4 Interface

This example scenario shows how to route calls when the MSBR is configured as both a voice and SBC application with a router configuration.

**Figure 7-1: IP Phone and Gateway Connected to SBC (Using IPv4)**



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### 7.1 MSBR System Configuration (Entire Configuration)

```
configure system
config-networking
single-net-mode enable
activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

### 7.2 MSBR Data Configuration (Entire Configuration)

This section describes the data configuration.

#### 7.2.1 Setting WAN IP Address

```
interface dsl 0/2
#DSL configuration is automatic
#Termination cpe
```

```

mode VDSL
auto-switch-attempts vdsl 1 vdsl-v43 0 adsl 2
no shutdown
exit
interface EFM 0/2.2014
ip address 10.200.0.42 255.255.255.252
mtu auto
ip name-server 172.30.9.162 172.30.9.163
napt
firewall enable
no shutdown
exit

```

## 7.3 Setting Physical LAN Ethernet 1/1 Assign to VLAN2

```

interface FastEthernet 1/1
speed auto
duplex auto
switchport mode trunk
switchport trunk native vlan 2
no shutdown
exit

```

## 7.4 Setting Logical Interface VLAN

```

interface VLAN 2
ip address 10.19.90.33 255.255.255.240
desc "LAN switch VLAN 2"
ip dhcp-server network 10.19.90.34 10.19.90.36 255.255.255.240
ip dhcp-server lease 0 1 0
service dhcp
no shutdown
exit

```

## 7.5 Setting IP Route

```

ip route 0.0.0.0 0.0.0.0 10.200.0.41 EFM 0/2.2014 1

```

## 7.6 MSBR Voice Configuration (Entire Configuration)

### 7.6.1 Enabling SBC Application

```
configure voip
  appli-enabling
  enable-sbc on
  activate
exit
```

### 7.6.2 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  activate
exit
```

### 7.6.3 Creating LAN Media Realm and Assigning to VLAN2

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 2"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
exit
```

### 7.6.4 Creating WAN Media Realm and Assigning to Reserved Keyword WAN

```
voip-network realm 1
  name "MR_WAN"
  ipv4if "WAN"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit
```

### 7.6.5 Creating LAN SRD and Assigning Media Realm LAN

```
voip-network srd 0
  name "SRD_LAN"
  media-realm-name "MR_LAN"
  activate
exit
```

## 7.6.6 Creating WAN SRD and Assigning Media Realm WAN

```
Voip-network srd 1
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

## 7.6.7 Creating LAN SIP Interface

```
voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 2"
  application-type sbc
  activate
exit
```

## 7.6.8 Creating WAN SIP Interface and Assigning Reserved keyword WAN

```
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface "WAN"
  application-type sbc
  srd 1
  activate
exit
```

## 7.6.9 Assigning Proxy Set 2 to SRD 1 (SRD\_WAN)

```
voip-network proxy-set 2
  proxy-enable-keep-alive using-options
  srd-id 1
  activate
exit
```

## 7.6.10 Creating IP Group for LAN side

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

### 7.6.11 Creating IP Group for WAN Side

```
voip-network ip-group 2
  description "BroadSoft"
  proxy-set-id 2
  srd 1
  media-realm-name "MR_WAN"
  activate
exit
```

### 7.6.12 Setting an Extension

```
gw hunt-or-trunk-group trunk-group 0
  trunk-group-id 1
  first-b-channel 1
  last-b-channel 1
  first-phone-number "37299406"
  module 2
  activate
exit
gw analoggw authentication 0
  user-name "37299406"
  password Y1ZcUldQXV5eXQ== obscured
  activate
exit
```

### 7.6.13 Setting IP-to-Tel Routing

```
gw routing ip2tel-routing 0
  dst-phone-prefix "*"
  trunk-group-id 1
  src-phone-prefix "*"
  src-ip-address "*"
  activate
exit
```

### 7.6.14 Setting Hunt Group

```
gw hunt-or-trunk-group trunk-group-setting 0
  trunk-group-id 1
  channel-select-mode dst-phone-number
  registration-mode per-endpoint
  serving-ip-group 2
  activate
exit
```

### 7.6.15 Creating 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==>Broadsoft"
    src-ip-group-id 1
    dst-ip-group-id 2
    activate
  exit
  sbc routing ip2ip-routing 3
    route-name "Broadsoft==>GW"
    src-ip-group-id 2
    dst-user-name-prefix "3729940"
    dst-type gateway
    activate
  exit
  sbc routing ip2ip-routing 4
    route-name "Broadsoft==>IPP"
    src-ip-group-id 2
    dst-user-name-prefix "372994"
    dst-ip-group-id 1
    activate
  exit
  sbc routing classification 0
    classification-name "IP_Phone"
    src-srd-id "0"
    src-ip-group-id "1"
    activate
  exit

```

### 7.6.16 Enabling Registration

```

sip-definition proxy-and-registration
  authentication-mode per-endpoint
  enable-registration on
  activate
exit

```

### 7.6.17 Setting Proxy Server (IP or Hostname)

```

voip-network proxy-ip 0
  proxy-address "test.lab.com"
  proxy-set-id 2
  activate
exit
exit

```

## 7.7 Example of Limitation of Binds Interfaces

As mentioned in Section 2.4, up to 8 binds interfaces (LAN and WAN) can be configured.

In the example below, two new LAN interfaces are added to the current configuration (IP Phone and GW connected to SBC) and bound to the VoIP side (WAN interfaces can also be created).

In the current configuration, we also use two interfaces (VLAN2 and WAN - reserved keyword). To verify which network interfaces are bound to the VoIP application, use the CLI command "show voip network-source-bindings".

```
MSBR# show voip network-source-bindings

VoIP Applications to Network source bindings:
-----

VoIP bind to VLAN 2 with ip address 10.19.90.33

VoIP bind to WAN on VRF main-vrf with destination address 10.9.9.10:
  Current WAN interface is EFM 0/2.2014 with ip address 10.200.0.42

NAT & Port FW rules used by VoIP Applications:
-----

The following WAN ports are in use by VOIP services:
  Ports 6000 - 6990 --> RealmPortPool::MR_WAN
  Ports 5060 - 5060 --> SIPUDP#1
  Ports 5060 - 5060 --> SIPLISTENING#1
  Ports 5061 - 5061 --> SIPLISTENING#1
The following NAT rules are in effect for VOIP services:
  RealmPortPool::MR_WAN: LAN ports 6000-6990 to WAN IP 10.200.0.42
  ports 6000-6990, interface EFM 0/2.2014
  SIPUDP#1: LAN ports 5060-5060 to WAN IP 10.200.0.42 ports 5060-5060,
  interface EFM 0/2.2014
  SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 10.200.0.42 ports 5060-
  5060, interface EFM 0/2.2014
  SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 10.200.0.42 ports 5061-
  5061, interface EFM 0/2.2014
```

### 7.7.1 Creating two LAN Interface (VLAN3 & VLAN4)

```
interface VLAN 3
  ip address 10.18.80.33 255.255.255.240
  desc "LAN switch VLAN 3"
  ip dhcp-server network 10.18.80.34 10.18.80.36 255.255.255.240
  service dhcp
  no shutdown
  exit

interface VLAN 4
  ip address 10.20.80.33 255.255.255.240
  desc "LAN switch VLAN 4"
  ip dhcp-server network 10.20.80.34 10.20.80.36 255.255.255.240
  service dhcp
  no shutdown
  exit
```

## 7.7.2 Binding VLAN3 to VoIP Application

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 3"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
  exit

voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 3"
  application-type sbc
  activate
  exit
```

By using the command “show voip network-source-bindings”, it can be observed that while VLAN3 binds to the VoIP application, VLAN2 still remain as bound to the VoIP application although it is no longer in use.

```
MSBR# show voip network-source-bindings

VoIP Applications to Network source bindings:
-----

VoIP bind to VLAN 2 with ip address 10.19.90.33

VoIP bind to WAN on VRF main-vrf with destination address 10.9.9.10:
  Current WAN interface is EFM 0/2.2014 with ip address 10.200.0.42

VoIP bind to VLAN 3 with ip address 10.18.80.33

NAT & Port FW rules used by VoIP Applications:
-----

The following WAN ports are in use by VOIP services:
  Ports 6000 - 6990 --> RealmPortPool::MR_WAN
  Ports 5060 - 5060 --> SIPUDP#1
  Ports 5060 - 5060 --> SIPLISTENING#1
  Ports 5061 - 5061 --> SIPLISTENING#1
The following NAT rules are in effect for VOIP services:
  RealmPortPool::MR_WAN: LAN ports 6000-6990 to WAN IP 10.200.0.42
  ports 6000-6990, interface EFM 0/2.2014
  SIPUDP#1: LAN ports 5060-5060 to WAN IP 10.200.0.42 ports 5060-5060,
  interface EFM 0/2.2014
  SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 10.200.0.42 ports 5060-
  5060, interface EFM 0/2.2014
  SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 10.200.0.42 ports 5061-
  5061, interface EFM 0/2.2014
```



### 7.7.3 Binding VLAN4 to VoIP Application

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 4"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
  exit

voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 4"
  application-type sbc
  activate
  exit
```

By using the command “show voip network-source-bindings”, it can be observed that while VLAN4 binds to the VoIP application, VLAN2 and VLAN3 still remain as bound to the VoIP application although they are no longer in use.

```
MSBR# show voip network-source-bindings
```

```
VoIP Applications to Network source bindings:
```

```
-----
```

```
VoIP bind to VLAN 2 with ip address 10.19.90.33
```

```
VoIP bind to WAN on VRF main-vrf with destination address 10.9.9.10:
  Current WAN interface is EFM 0/2.2014 with ip address 10.200.0.42
```

```
VoIP bind to VLAN 3 with ip address 10.18.80.33
```

```
VoIP bind to VLAN 4 with ip address 10.20.80.33
```

```
NAT & Port FW rules used by VoIP Applications:
```

```
-----
```

```
The following WAN ports are in use by VOIP services:
```

```
Ports 6000 - 6990 --> RealmPortPool::MR_WAN
```

```
Ports 5060 - 5060 --> SIPUDP#1
```

```
Ports 5060 - 5060 --> SIPLISTENING#1
```

```
Ports 5061 - 5061 --> SIPLISTENING#1
```

```
The following NAT rules are in effect for VOIP services:
```

```
  RealmPortPool::MR_WAN: LAN ports 6000-6990 to WAN IP 10.200.0.42
ports 6000-6990, interface EFM 0/2.2014
```

```
  SIPUDP#1: LAN ports 5060-5060 to WAN IP 10.200.0.42 ports 5060-5060,
interface EFM 0/2.2014
```

```
  SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 10.200.0.42 ports 5060-
5060, interface EFM 0/2.2014
```

```
  SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 10.200.0.42 ports 5061-
5061, interface EFM 0/2.2014
```

There are two ways to delete the interface bind from the VoIP side (in case the interface is no longer in use):

- Delete the interface on the Data side.
- Reset the MSBR.



**Note:** If the interface name includes the 'WAN' reserved keyword, then this interface cannot be deleted.

In the below example, it can be observed that after resetting the unit, only VLAN4 and WAN are bound to the VoIP application, while VLAN2 and VLAN3 have been removed.

```
MSBR# show voip network-source-bindings

VoIP Applications to Network source bindings:
-----

VoIP bind to VLAN 4 with ip address 10.20.80.33

VoIP bind to WAN on VRF main-vrf with destination address
10.9.9.10:
    Current WAN interface is EFM 0/2.2014 with ip address
10.205.0.42

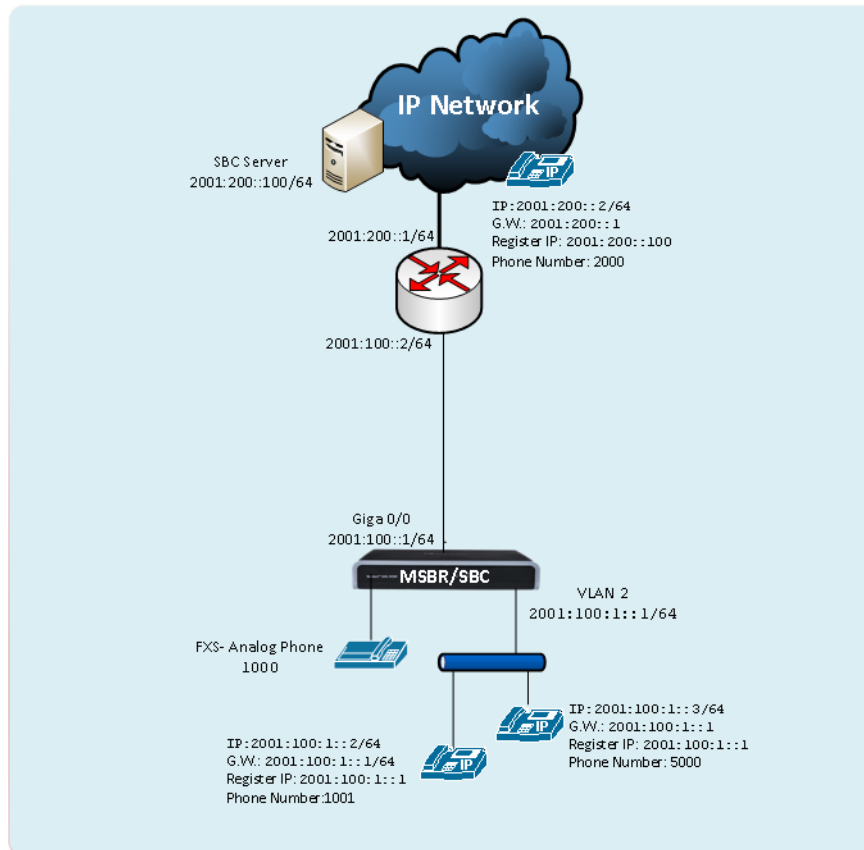
NAT & Port FW rules used by VoIP Applications:
-----

The following WAN ports are in use by VOIP services:
    Ports 6000 - 6990 --> RealmPortPool::MR_WAN
    Ports 5060 - 5060 --> SIPUDP#1
    Ports 5060 - 5060 --> SIPLISTENING#1
    Ports 5061 - 5061 --> SIPLISTENING#1
The following NAT rules are in effect for VOIP services:
    RealmPortPool::MR_WAN: LAN ports 6000-6990 to WAN IP
10.200.0.42 ports 6000-6990, interface EFM 0/2.2014
    SIPUDP#1: LAN ports 5060-5060 to WAN IP 10.200.0.42 ports
5060-5060, interface EFM 0/2.2014
    SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 10.200.0.42
ports 5060-5060, interface EFM 0/2.2014
    SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 10.200.0.42
ports 5061-5061, interface EFM 0/2.2014
```

## 8 MSBR Voice and SBC Applications with IPv6 Interface

This example scenario shows how to route calls when the MSBR is configured as both a voice and SBC application with a router configuration.

**Figure 8-1: IP Phone and Gateway Connected to SBC with a IPv6 Interface**



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### 8.1 MSBR System Configuration (Entire Configuration)

```
configure system
config-networking
single-net-mode enable
activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 8.2 MSBR Data Configuration (Entire Configuration)

```
Setting WAN IP Address
interface GigabitEthernet 0/0
    no ip address
    mtu auto
    desc "WAN Copper"
    ipv6 enable
    ipv6 address 2001:100::1/64
    speed auto
    duplex auto
    no service dhcp
    ip dns server static
    firewall enable
    no shutdown
exit
```

### 8.2.1 Setting Physical LAN Ethernet 1/1 and Assigning to VLAN2

```
interface FastEthernet 1/1
    speed auto
    duplex auto
    switchport mode trunk
    switchport trunk native vlan 2
    no shutdown
exit
```

### 8.2.2 Setting Logical Interface VLAN 2 (Option 1 – without using DHCP Server)

```
interface VLAN 2
    no ip address
    mtu auto
    desc "LAN switch VLAN 2"
    ipv6 enable
    ipv6 address 2001:100:1::1/64
    no service dhcp
    ip dns server auto
    no firewall enable
    no link-state monitor
    no shutdown
exit
```

### 8.2.3 Setting Logical Interface VLAN 2 (Option 2 – By using DHCP Server – Stateful mode)

```
interface VLAN 2
    no ip address
    mtu auto
    desc "LAN switch VLAN 2"
    ipv6 enable
    ipv6 address 2001:100:1::1/64
```

```
ipv6 dhcp-server enable
ipv6 dhcp-server network 2001:100:1::12 2001:100:1::18 0
no service dhcp
ip dns server auto
no firewall enable
no link-state monitor
ipv6 nd managed-config-flag
ipv6 nd other-config-flag
no ipv6 nd ra suppress
no shutdown
exit
```

## 8.2.4 Setting IP Route

```
ipv6 route ::/0 2001:100::2 GigabitEthernet 0/0 1
```

## 8.2.5 MSBR Voice Configuration (Entire Configuration)

This section describes the voice configuration.

## 8.2.6 Enabling SBC Application

```
configure voip
  appli-enabling
  enable-sbc on
  activate
exit
```

## 8.2.7 Creating IP Profile 1

This IP Profile must be created for using IPv6.

```
coders-and-profiles ip-profile 1
  profile-name "IPv6"
  early-media enable
  media-ip-version-preference only-ipv6
  early-answer-timeout 0
  reset-srtp-upon-re-key disable
  generate-srtp-keys only-if-required
  activate
exit
```

## 8.2.8 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  activate
exit
```

## 8.2.9 Creating LAN Media Realm and Assigning to VLAN2

```
voip-network realm 0
  name "MR_LAN"
  ipv6if "VLAN 2 IPv6"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
exit
```

## 8.2.10 Creating WAN Media Realm and Assigning to Reserved Keyword WAN IPv6

```
voip-network realm 1
  name "MR_WAN"
  ipv6if "WAN IPv6"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit
```

## 8.2.11 Creating LAN SRD and Assigning Media Realm LAN

```
voip-network srd 0
  name "SRD_LAN"
  media-realm-name "MR_LAN"
  activate
exit
```

## 8.2.12 Creating WAN SRD and Assigning Media Realm WAN

```
voip-network srd 1
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

## 8.2.13 Creating LAN SIP Interface

```
voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 2 IPv6"
  application-type sbc
  activate
exit
```

### 8.2.14 Creating WAN SIP Interface and Assigning to Reserved Keyword WAN IPv6

```
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface "WAN IPv6"
  application-type sbc
  srd 1
  activate
  exit
```

### 8.2.15 Assigning Proxy Set 2 to SRD 1 (SRD\_WAN)

```
voip-network proxy-set 2
  proxy-enable-keep-alive using-options
  srd-id 1
  activate
  exit
```

### 8.2.16 Creating IP Group for LAN side

```
voip-network ip-group 1
  type user
  description "IP_Phone"
  media-realm-name "MR_LAN"
  classify-by-proxy-set disable
  ip-profile-id 1
  activate
  exit
```

### 8.2.17 Creating IP Group for WAN Side

```
voip-network ip-group 2
  description "SBC Server"
  proxy-set-id 2
  srd 1
  media-realm-name "MR_WAN"
  ip-profile-id 1
  activate
  exit
```

### 8.2.18 Setting an Extension

```
gw hunt-or-trunk-group trunk-group 0
  trunk-group-id 1
  first-b-channel 1
  last-b-channel 1
  first-phone-number "1000"
  module 2
  activate
  exit
gw analoggw authentication 0
```

```

user-name "1000"
password pass1000
activate
exit

```

### 8.2.19 Setting Tel-to-IP Routing

```

gw routing tel2ip-routing 0
dst-phone-prefix "1001"
ip-profile-id 0
dst-ip-group-id 1
src-trunk-group-id 1
activate
exit

```

### 8.2.20 Setting IP-to-Tel Routing

```

gw routing ip2tel-routing 0
dst-phone-prefix "*"
trunk-group-id 1
src-phone-prefix "*"
src-ip-address "*"
activate
exit

```

### 8.2.21 Setting Hunt Group

```

gw hunt-or-trunk-group trunk-group-setting 0
trunk-group-id 1
channel-select-mode dst-phone-number
registration-mode per-endpoint
serving-ip-group 2
activate
exit

```

### 8.2.22 Creating 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==>SBC Server"
src-ip-group-id 1
dst-ip-group-id 2
activate
exit

```



```
sbc routing ip2ip-routing 3
  route-name "SBC Server==>GW"
  src-ip-group-id 2
  dst-user-name-prefix "1000"
  dst-type gateway
  activate
exit
sbc routing ip2ip-routing 4
  route-name "SBC Server==>IPP"
  src-ip-group-id 2
  dst-user-name-prefix "1001"
  dst-ip-group-id 1
  activate
exit
sbc routing ip2ip-routing 5
  route-name "SBC Server==>IPP2"
  src-ip-group-id 2
  dst-user-name-prefix "5000"
  dst-ip-group-id 1
  activate
exit
sbc routing classification 0
  classification-name "IP_Phone"
  src-srd-id "0"
  src-ip-group-id "1"
  activate
exit
```

### 8.2.23 Enabling Registration

```
sip-definition proxy-and-registration
  authentication-mode per-endpoint
  enable-registration on
  activate
exit
```

### 8.2.24 Setting Proxy Server (IP or Hostname)

```
voip-network proxy-ip 0
  proxy-address "2001:200::100"
  proxy-set-id 2
  activate
exit
```

In the current configuration we use two interfaces (VLAN2 and WAN - reserved keyword). To verify which network interfaces are bound to VoIP application you can use the CLI command “show voip network-source-bindings”

```
MSBR # show voip network-source-bindings
```

```
VoIP Applications to Network source bindings:
```

```
-----
```

```
VoIP bind to IPv6 VLAN 2 with ip address 2001:100:1::1
```

```
VoIP bind to IPv6 WAN on VRF main-vrf with destination address
2001:200::100,
  Current WAN interface is GigabitEthernet 0/0 with ip address
2001:100::1
```

NAT & Port FW rules used by VoIP Applications:

-----

The following WAN ports are in use by VOIP services:

Ports 6000 - 6990 --> RealmPortPool::MR\_WAN

Ports 5060 - 5060 --> SIPUDP#1

Ports 5060 - 5060 --> SIPLISTENING#1

Ports 5061 - 5061 --> SIPLISTENING#1

The following NAT rules are in effect for VOIP services:

RealmPortPool::MR\_WAN: LAN ports 6000-6990 to WAN IP 2001:100::1  
ports 6000-6990, interface GigabitEthernet 0/0

SIPUDP#1: LAN ports 5060-5060 to WAN IP 2001:100::1 ports 5060-5060,  
interface GigabitEthernet 0/0

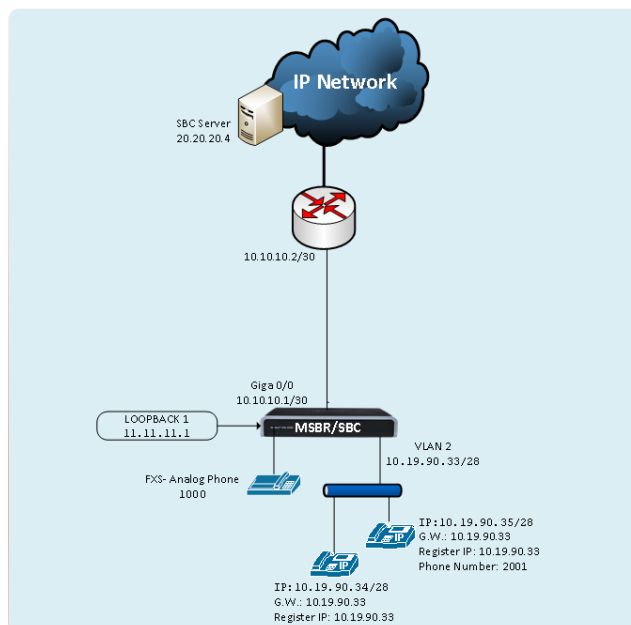
SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 2001:100::1 ports 5060-  
5060, interface GigabitEthernet 0/0

SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 2001:100::1 ports 5061-  
5061, interface GigabitEthernet 0/0

## 9 MSBR Voice and SBC Applications with Loopback Interface

This example scenario shows how to route calls when the MSBR is configured as both a voice and SBC application with a router configuration. In this scenario, the Proxy server uses the IP address of the loopback interface and not the WAN IP. The benefit of using a loopback interface is that it serves as a fixed known address when using two WAN interfaces. For example, WAN Copper and A/DSL or WAN Copper and 4G.

**Figure 9-1: IP Phone and Gateway Connected to SBC (Using Loopback Interface)**



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### 9.1 MSBR System Configuration (Entire Configuration)

```
configure system
config-networking
single-net-mode enable
activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 9.2 MSBR Data Configuration (Entire Configuration)

This section describes the MSBR data configuration.

### 9.2.1 Setting WAN IP Address

```
interface GigabitEthernet 0/0
  ip address 10.10.10.1 255.255.255.252
  napt
  firewall enable
```

### 9.2.2 Setting Loopback Interface

```
interface Loopback 1
  ip address 11.11.11.1
  mtu auto
  desc "LAN Loopback 1"
  no service dhcp
  network wan
  no napt
  no firewall enable
```

### 9.2.3 Setting Physical LAN Ethernet 1/1 to VLAN2

```
interface FastEthernet 1/1
  switchport mode trunk
  switchport trunk native vlan 2
  no shutdown
```

### 9.2.4 Setting Logical Interface VLAN 2

```
interface VLAN 2
  ip address 10.19.90.33 255.255.255.240
  ip dhcp-server network 10.19.90.34 10.19.90.36 255.255.255.240
  service dhcp
  no shutdown
```

### 9.2.5 Setting IP Route

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

## 9.3 MSBR Voice Configuration (Entire Configuration)

This section describes the MSBR voice configuration.

### 9.3.1 Enabling SBC Application

```
configure voip
  appli-enabling
  enable-sbc on
  activate
  exit
```

### 9.3.2 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  activate
exit
```

### 9.3.3 Creating LAN Media Realm and Assigning to VLAN2

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 2"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
exit
```

### 9.3.4 Creating WAN Media Realm and Assigning to Loopback Interface

```
voip-network realm 1
  name "MR_WAN"
  ipv4if " LOOPBACK 1"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit
```

### 9.3.5 Creating LAN SRD and Assigning Media Realm LAN

```
voip-network srd 0
  name "SRD_LAN"
  media-realm-name "MR_LAN"
  activate
exit
```

### 9.3.6 Creating WAN SRD and Assigning Media Realm WAN

```
voip-network srd 1
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

### 9.3.7 Creating LAN SIP Interface

```
voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 2"
  application-type sbc
  activate
exit
```

### 9.3.8 Creating WAN SIP Interface and Assigning to Loopback Interface

```
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface " LOOPBACK 1"
  application-type sbc
  srd 1
  activate
exit
```

### 9.3.9 Assigning Proxy Set 2 to SRD 1 (SRD\_WAN)

```
voip-network proxy-set 2
  proxy-enable-keep-alive using-options
  srd-id 1
  activate
exit
```

### 9.3.10 Creating IP Group for LAN side

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

### 9.3.11 Creating IP Group for WAN Side

```
voip-network ip-group 2
  description "SBC Server"
  proxy-set-id 2
  srd 1
  media-realm-name "MR_WAN"
  activate
exit
```

### 9.3.12 Setting an Extension

```
gw hunt-or-trunk-group trunk-group 0
    trunk-group-id 1
    first-b-channel 1
    last-b-channel 1
    first-phone-number "1000"
    module 2
    activate
exit
gw analoggw authentication 0
    user-name "1000"
    password 1000
    activate
exit
```

### 9.3.13 Setting IP-to-Tel Routing

```
gw routing ip2tel-routing 0
    dst-phone-prefix "*"
    trunk-group-id 1
    src-phone-prefix "*"
    src-ip-address "*"
    activate
exit
```

### 9.3.14 Setting Hunt Group

```
gw hunt-or-trunk-group trunk-group-setting 0
    trunk-group-id 1
    channel-select-mode dst-phone-number
    registration-mode per-endpoint
    serving-ip-group 2
    activate
exit
```

### 9.3.15 Creating 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
sbcrouting ip2ip-routing 1
    route-name "IPP==>SBC Server"
    src-ip-group-id 1
    dst-ip-group-id 2
    activate
exit
sbcrouting ip2ip-routing 3
```

```

route-name "SBC Server==>GW"
src-ip-group-id 2
dst-user-name-prefix "1000"
dst-type gateway
activate
exit
sbc routing ip2ip-routing 4
route-name "SBC Server==>IPP"
src-ip-group-id 2
dst-user-name-prefix "2001"
dst-ip-group-id 1
activate
exit
sbc routing classification 0
classification-name "IP_Phone"
src-srd-id "0"
src-ip-group-id "1"
activate
exit

```

### 9.3.16 Enabling Registration

```

sip-definition proxy-and-registration
authentication-mode per-endpoint
enable-registration on
activate
exit

```

### 9.3.17 Setting Proxy Server (IP or Hostname)

```

voip-network proxy-ip 0
proxy-address "20.20.20.4"
proxy-set-id 2
activate
exit
exit

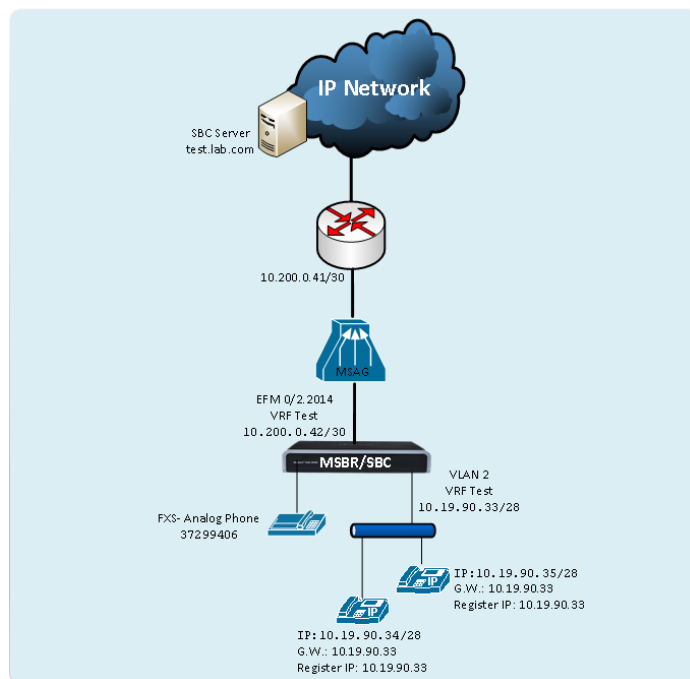
```



## 10 MSBR Voice and SBC Applications with VRF Interface

This example scenario describes how to route calls when the MSBR is configured as both a voice and SBC application with a basic router configuration.

Figure 10-1: IP Phone and Gateway Connected to SBC (Using VRF)



Back to [scenarios](#) menu.

### 10.1 MSBR System Configuration (Entire Configuration)

```
configure system
config-networking
single-net-mode enable
activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 10.2 MSBR Data Configuration (Entire Configuration)

This section describes the data configuration.

### 10.2.1 Creating VRF

```
configure data
ip vrf Test
```

### 10.2.2 Setting WAN IP Address

```
interface dsl 0/2
#DSL configuration is automatic
#Termination cpe
mode VDSL
auto-switch-attempts vdsl 1 vdsl-v43 0 adsl 2
no shutdown
exit
interface EFM 0/2.2014
ip address 10.200.0.42 255.255.255.252
ip name-server 172.30.9.162 172.30.9.163
ip vrf forwarding Test
napt
firewall enable
```

### 10.2.3 Setting Physical LAN Ethernet 1/1 Assigning to VLAN2

```
interface FastEthernet 1/1
switchport mode trunk
switchport trunk native vlan 2
no shutdown
```

### 10.2.4 Setting Logical Interface VLAN 2

```
interface VLAN 2
ip address 10.19.90.33 255.255.255.240
desc "LAN switch VLAN 2"
ip dhcp-server network 10.19.90.34 10.19.90.36 255.255.255.240
service dhcp
ip vrf forwarding Test
exit
```

### 10.2.5 Setting IP Route

```
ip route vrf Test 0.0.0.0 0.0.0.0 10.200.0.41 EFM 0/2.2014 1
```

## 10.3 MSBR Voice Configuration (Entire Configuration)

This section describes the voice configuration.

### 10.3.1 Enabling SBC Application

```
configure voip
  appli-enabling
  enable-sbc on
  activate
exit
```

### 10.3.2 Setting Voice Coders

```
coders-and-profiles coders-group-0 0
  name "g711Alaw64k"
  p-time 20
  activate
exit
```

### 10.3.3 Creating LAN Media Realm and Assigning to VLAN2

```
voip-network realm 0
  name "MR_LAN"
  ipv4if "VLAN 2"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  is-default true
  activate
exit
```

### 10.3.4 Creating WAN Media Realm and Assigning to VRF Test

```
voip-network realm 1
  name "MR_WAN"
  ipv4if " WAN VRF Test"
  port-range-start 6000
  session-leg 100
  port-range-end 6990
  activate
exit
```

### 10.3.5 Creating LAN SRD and Assigning Media Realm LAN

```
voip-network srd 0
  name "SRD_LAN"
  media-realm-name "MR_LAN"
  activate
exit
```

### 10.3.6 Creating WAN SRD and Assigning Media Realm WAN

```
voip-network srd 1
  name "SRD_WAN"
  media-realm-name "MR_WAN"
  activate
exit
```

### 10.3.7 Creating LAN SIP Interface

```
voip-network sip-interface 0
  interface-name "SIP_LAN"
  network-interface "VLAN 2"
  application-type sbc
  activate
exit
```

### 10.3.8 Creating WAN SIP Interface and Assigning to VRF Test

```
voip-network sip-interface 1
  interface-name "SIP_WAN"
  network-interface " WAN VRF Test"
  application-type sbc
  srd 1
  activate
exit
```

### 10.3.9 Assigning Proxy Set 2 to SRD 1 (SRD\_WAN)

```
voip-network proxy-set 2
  proxy-enable-keep-alive using-options
  srd-id 1
  activate
exit
```

### 10.3.10 Creating IP Group for LAN side

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

### 10.3.11 Creating IP Group for WAN Side

```
voip-network ip-group 2
  description "BroadSoft"
  proxy-set-id 2
  srd 1
  media-realm-name "MR_WAN"
  activate
exit
```

### 10.3.12 Setting an Extension

```
gw hunt-or-trunk-group trunk-group 0
  trunk-group-id 1
  first-b-channel 1
  last-b-channel 1
  first-phone-number "37299406"
  module 2
  activate
exit
gw analoggw authentication 0
  user-name "37299406"
  password Y1ZcdQXV5eXQ== obscured
  activate
exit
```

### 10.3.13 Setting IP-to-Tel Routing

```
gw routing ip2tel-routing 0
  dst-phone-prefix "*"
  trunk-group-id 1
  src-phone-prefix "*"
  src-ip-address "*"
  activate
exit
```

### 10.3.14 Setting Hunt Group

```
gw hunt-or-trunk-group trunk-group-setting 0
  trunk-group-id 1
  channel-select-mode dst-phone-number
  registration-mode per-endpoint
  serving-ip-group 2
  activate
exit
```

### 10.3.15 Creating 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==>Broadsoft"
    src-ip-group-id 1
    dst-ip-group-id 2
    activate
  exit
  sbc routing ip2ip-routing 3
    route-name "Broadsoft==>GW"
    src-ip-group-id 2
    dst-user-name-prefix "3729940"
    dst-type gateway
    activate
  exit
  sbc routing ip2ip-routing 4
    route-name "Broadsoft==>IPP"
    src-ip-group-id 2
    dst-user-name-prefix "372994"
    dst-ip-group-id 1
    activate
  exit
  sbc routing classification 0
    classification-name "IP_Phone"
    src-srd-id "0"
    src-ip-group-id "1"
    activate
  exit

```

### 10.3.16 Enabling Registration

```

sip-definition proxy-and-registration
  authentication-mode per-endpoint
  enable-registration on
  activate
exit

```

### 10.3.17 Setting Proxy Server (IP or Hostname)

```

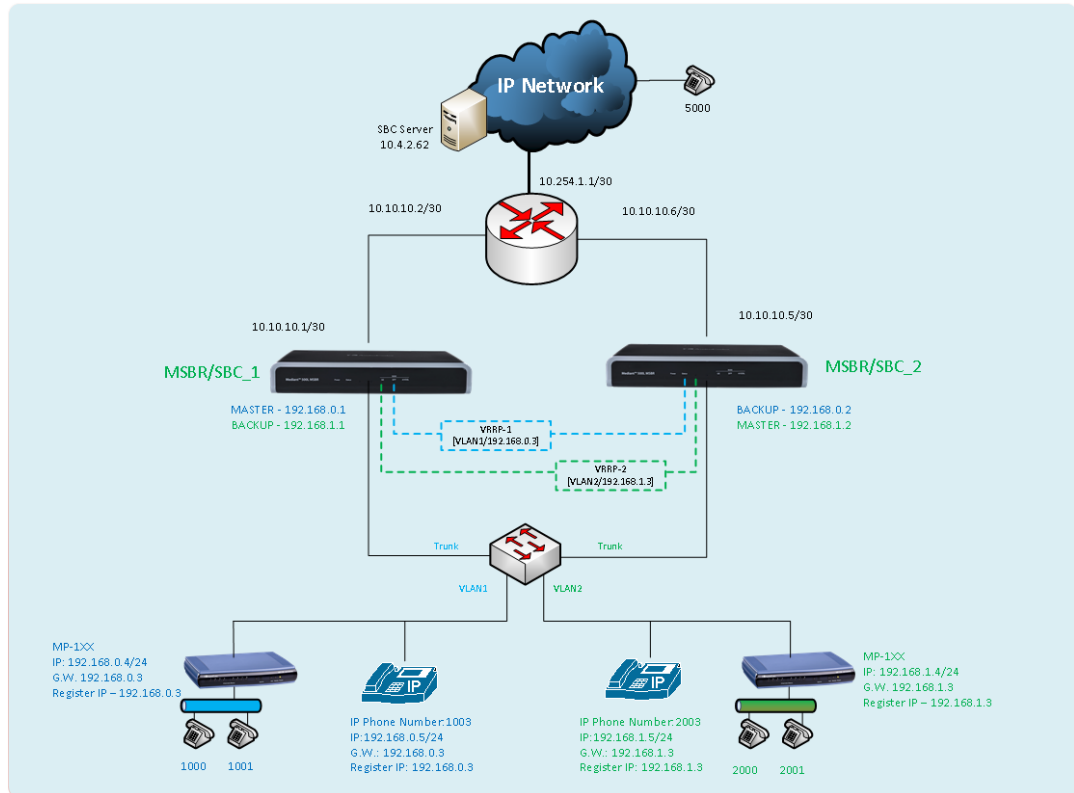
voip-network proxy-ip 0
  proxy-address "test.lab.com"
  proxy-set-id 2
  activate
exit
exit

```

# 11 Dual MSBRs with Voice and SBC Applications and VRRP Interface

The example scenario describes how to route calls using dual MSBR devices as both a voice and SBC application with an advanced router configuration.

**Figure 11-1: IP Phone and Gateway Connected to Two SBC using VRRP**



In this scenario, two MSBRs (configured as both voice and SBC applications) are located at the customer site in a master and slave mode using two separate VRRP - virtual routers.

In this scenario, by using two VRRP instances, the capacity of two ISP connections are utilized, where two MSBRs operate in Active/Active mode.

This implies that some devices on the LAN side connect to VRRP-1 (operating as the 'Master' on MSBR/SBC1) and others connect to VRRP-2 (working as the 'Master' on MSBR/SBC2).

In case of failure on the MSBR/SBC1, all the devices that register to this device will send new registration requests through the Backup MSBR (MSBR/SBC2). The same mechanism applies for the devices that are connected to MSBR/SBC2.

Also, using two MSBR devices allows routing all the connected devices to work with one MSBR and to perform maintenance on the second MSBR.



**Note:** To support this configuration scenario, the 'Registration Time' to the SBC that is configured on the endpoint should be as low as possible. This is necessary to ensure a smooth failover for new voice calls (existing voice calls are dropped).

Back to [scenarios](#) menu.

## 11.1 MSBR System Configuration (Entire Configuration)

```
configure system
config-networking
single-net-mode enable
activate
exit
```



**Note:** To configure this new mode, reset the device to default, reboot the unit, type the above command and then reboot the unit again. This operation mode is static, which implies that the “write factory” command cannot restore the configuration to Dual network mode.

## 11.2 MSBR Data Configuration (Entire Configuration)

This section shows the MSBR configuration for both of the SBC devices.

MSBR/SBC1	MSBR/SBC2
<b>Setting WAN IP Address</b>	
<pre>configure data interface GigabitEthernet 0/0 ip address 10.10.10.1 255.255.255.252 desc "WAN Copper" no ipv6 enable ip dns server static no shutdown exit</pre>	<pre>configure data interface GigabitEthernet 0/0 ip address 10.10.10.5 255.255.255.252 desc "WAN Copper" no ipv6 enable ip dns server static no shutdown exit</pre>
<b>Setting Physical LAN Ethernet 1/1 as trunk and assign VLAN2</b>	
<pre>interface FastEthernet 1/1 switchport mode trunk switchport trunk native vlan 100 switchport trunk allowed vlan add 1 switchport trunk allowed vlan add 2 no shutdown exit</pre>	<pre>interface FastEthernet 1/1 switchport mode trunk switchport trunk native vlan 100 switchport trunk allowed vlan add 1 switchport trunk allowed vlan add 2 no shutdown exit</pre>
<b>Creating VRRP 1 under VLAN 1 (MSBR/SBC1 will be the MASTER)</b>	
<pre>interface VLAN 1 ip address 192.168.0.1 255.255.255.0 vrrp 1 timers advertise 1</pre>	<pre>interface VLAN 1 ip address 192.168.0.2 255.255.255.0 vrrp 1 timers advertise 1</pre>



<pre>vrrp 1 preempt vrrp 1 priority 250 vrrp 1 ip 192.168.0.3 vrrp 1 track 1 decrement 200 no shutdown exit</pre>	<pre>vrrp 1 preempt vrrp 1 priority 100 vrrp 1 ip 192.168.0.3 vrrp 1 track 1 decrement 200 no shutdown exit</pre>
<b>Creating VRRP 2 under VLAN 2 (MSBR/SBC2 will be the MASTER)</b>	
<pre>interface VLAN 2 ip address 192.168.1.1 255.255.255.0 vrrp 2 timers advertise 1 vrrp 2 preempt vrrp 2 priority 100 vrrp 2 ip 192.168.1.3 vrrp 2 track 1 decrement 200 no shutdown exit</pre>	<pre>interface VLAN 2 ip address 192.168.1.2 255.255.255.0 vrrp 2 timers advertise 1 vrrp 2 preempt vrrp 2 priority 250 vrrp 2 ip 192.168.1.3 vrrp 2 track 1 decrement 200 no shutdown exit</pre>
<pre>track 1 IcmpEcho 10.10.10.2 GigabitEthernet 0/0 interval 1 retries 3 ip route 0.0.0.0 0.0.0.0 10.10.10.2 GigabitEthernet 0/0 1 exit</pre>	<pre>track 1 IcmpEcho 10.10.10.6 GigabitEthernet 0/0 interval 1 retries 3 ip route 0.0.0.0 0.0.0.0 10.10.10.6 GigabitEthernet 0/0 1 exit</pre>

## 11.2.1 MSBR Voice Configuration (Entire Configuration)

This section shows the MSBR voice configuration.

MSBR/SBC1	MSBR/SBC2
<b>Enabling SBC Application</b>	
<pre>configure voip   appli-enabling   enable-sbc on   activate exit</pre>	<pre>configure voip   appli-enabling   enable-sbc on   activate exit</pre>
<b>Setting Voice Coders</b>	
<pre>coders-and-profiles coders- group-0 0   name "g711Alaw64k"   p-time 20   activate</pre>	<pre>coders-and-profiles coders- group-0 0   name "g711Alaw64k"   p-time 20   activate</pre>

exit	exit
<b>Creating LAN_1 Media Realm and assign to VLAN1</b>	
<pre> voip-network realm 0   name "MR_LAN_1"   ipv4if "VLAN 1"   port-range-start 6000   session-leg 100   port-range-end 6990   is-default true   activate exit </pre>	<pre> voip-network realm 0   name "MR_LAN"   ipv4if "VLAN 1"   port-range-start 6000   session-leg 100   port-range-end 6990   is-default true   activate exit </pre>
<b>Creating LAN_2 Media Realm and assign to VLAN2</b>	
<pre> voip-network realm 2   name "MR_LAN_2"   ipv4if "VLAN 2"   port-range-start 6000   session-leg 100   port-range-end 6990   activate exit </pre>	<pre> voip-network realm 2   name "MR_LAN_2"   ipv4if "VLAN 2"   port-range-start 6000   session-leg 100   port-range-end 6990   activate exit </pre>
<b>Creating WAN Media Realm and assign to reserved keyword WAN</b>	
<pre> voip-network realm 1   name "MR_WAN"   ipv4if "WAN"   port-range-start 6000   session-leg 100   port-range-end 6990   activate exit </pre>	<pre> voip-network realm 1   name "MR_WAN"   ipv4if "WAN"   port-range-start 6000   session-leg 100   port-range-end 6990   activate exit </pre>
<b>Creating LAN_1 SRD and assign Media Realm LAN_1 to it (MR_LAN_1)</b>	
<pre> voip-network srd 0   name "SRD_LAN_1"   media-realm-name "MR_LAN_1"   activate exit </pre>	<pre> voip-network srd 0   name "SRD_LAN_1"   media-realm-name "MR_LAN_1"   activate exit </pre>
<b>Creating LAN_2 SRD and assign Media Realm LAN_2 to it (MR_LAN_2)</b>	
<pre> voip-network srd 2   name "SRD_LAN_2"   media-realm-name "MR_LAN_2"   activate exit </pre>	<pre> voip-network srd 2   name "SRD_LAN_2"   media-realm-name "MR_LAN_2"   activate exit </pre>

Creating WAN SRD and assign Media Realm WAN to it (MR_WAN)	
<pre> voip-network srd 1   name "SRD_WAN"   media-realm-name "MR_WAN"   activate exit </pre>	<pre> voip-network srd 1   name "SRD_WAN"   media-realm-name "MR_WAN"   activate exit </pre>
Creating LAN_1 SIP Interface	
<pre> voip-network sip-interface 0   interface-name "SIP_LAN_1"   network-interface "VLAN 1"   application-type sbc   activate exit </pre>	<pre> voip-network sip-interface 0   interface-name "SIP_LAN_1"   network-interface "VLAN 1"   application-type sbc   activate exit </pre>
Creating LAN_2 SIP Interface	
<pre> voip-network sip-interface 2   interface-name "SIP_LAN_2"   network-interface "VLAN 2"   application-type sbc   srd 2   activate exit </pre>	<pre> voip-network sip-interface 2   interface-name "SIP_LAN_2"   network-interface "VLAN 2"   application-type sbc   srd 2   activate exit </pre>
Creating WAN SIP Interface	
<pre> voip-network sip-interface 1   interface-name "SIP_WAN"   network-interface "WAN"   application-type sbc   srd 1   activate exit </pre>	<pre> voip-network sip-interface 1   interface-name "SIP_WAN"   network-interface "WAN"   application-type sbc   srd 1   activate exit </pre>
Assigning Proxy Set 2 to SRD 1 (SRD_WAN)	
<pre> voip-network proxy-set 2   srd-id 1   activate exit </pre>	<pre> voip-network proxy-set 2   srd-id 1   activate exit </pre>
Creating IP Group for LAN_1	
<pre> voip-network ip-group 1   type user   description "GW_1"   media-realm-name "MR_LAN_1" </pre>	<pre> voip-network ip-group 1   type user   description "GW_1"   media-realm-name "MR_LAN_1" </pre>

<pre> classify-by-proxy-set disable activate exit </pre>	<pre> classify-by-proxy-set disable activate exit </pre>
<b>Creating IP Group for LAN_2</b>	
<pre> voip-network ip-group 3 type user description "GW_2" srd 2 media-realm-name "MR_LAN_2" classify-by-proxy-set disable activate exit </pre>	<pre> voip-network ip-group 3 type user description "GW_2" srd 2 media-realm-name "MR_LAN_2" classify-by-proxy-set disable activate exit </pre>
<b>Creating IP Group for WAN Side</b>	
<pre> voip-network ip-group 2 description "B.S." proxy-set-id 2 srd 1 media-realm-name "MR_WAN" activate exit </pre>	<pre> voip-network ip-group 2 description "B.S." proxy-set-id 2 srd 1 media-realm-name "MR_WAN" activate exit </pre>
<b>Creating SBC IP-to-IP Routing Rules</b>	
<pre> 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 "GW_1==&gt;B.S." src-ip-group-id 1 dst-ip-group-id 2 activate exit sbc routing ip2ip-routing 2 route-name "B.S.==&gt;GW_1" src-ip-group-id 2 dst-ip-group-id 1 activate </pre>	<pre> 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 "GW_1==&gt;B.S." src-ip-group-id 1 dst-ip-group-id 2 activate exit sbc routing ip2ip-routing 2 route-name "B.S.==&gt;GW_1" src-ip-group-id 2 dst-ip-group-id 1 activate </pre>

<pre> exit sbc routing ip2ip-routing 3   route-name "GW_2==&gt;B.S."   src-ip-group-id 3   dst-ip-group-id 2   activate exit sbc routing classification 0   classification-name "GW_1"   src-srd-id "0"   src-ip-group-id "1"   activate exit sbc routing classification 1   classification-name "GW_2"   src-srd-id "0"   src-ip-group-id "3"   activate </pre>	<pre> exit sbc routing ip2ip-routing 3   route-name "GW_2==&gt;B.S."   src-ip-group-id 3   dst-ip-group-id 2   activate exit sbc routing classification 0   classification-name "GW_1"   src-srd-id "0"   src-ip-group-id "1"   activate exit sbc routing classification 1   classification-name "GW_2"   src-srd-id "0"   src-ip-group-id "3"   activate </pre>
<b>Setting Proxy Server (IP or Hostname) and registration to 30sec</b>	
<pre> sip-definition proxy-and- registration   registration-time 30   activate exit voip-network proxy-ip 0   proxy-address "10.254.1.2"   proxy-set-id 2   activate exit exit </pre>	<pre> sip-definition proxy-and- registration   registration-time 30   activate exit voip-network proxy-ip 0   proxy-address "10.254.1.2"   proxy-set-id 2   activate exit exit </pre>

### 11.3 MSBR System Configuration (Entire Configuration)

MSBR/SBC1	MSBR/SBC2
<pre> configure system   config-networking     <b>single-net-mode enable</b>   activate exit ntp   set secondary-server   "1.asia.pool.ntp.org" </pre>	<pre> configure system   config-networking     <b>single-net-mode enable</b>   activate exit ntp   set secondary-server   "1.asia.pool.ntp.org" </pre>

<pre> set primary-server "0.asia.pool.ntp.org" utc-offset 10800 activate exit hostname SBC_1 exit </pre>	<pre> set primary-server "0.asia.pool.ntp.org" utc-offset 10800 activate exit hostname SBC_2 exit </pre>
--	--

## 11.4 MP-1xx Configuration (Connected to VRRP1)

This section describes the configuration of the MP-1xx. In this example, the MP-1xx is the endpoint device. This endpoint device may also be an IP Phone.

### 11.4.1 Setting the Proxy Registration Time



**Note:** To support this configuration scenario, the value of the 'Registration Time' parameter (configured in the Proxy & Registration table for defining the time interval (in seconds) for registering to a Proxy server) should be as low as possible. This is necessary to ensure a smooth failover for new voice calls (existing voice calls are dropped).

The screenshot shows the AudioCodes configuration web interface. The left sidebar contains a tree view with categories like System, Network, Security, Media, Quality of Experience, Services, Applications Enabling, VoIP Network, SIP Definitions, General Parameters, Advanced Parameters, Account Table, Proxy & Registration, RADIUS Accounting Settings, Mag Policy & Manipulation, Coders and Profiles, GW and IP to IP, Hunt Group, Manipulations, Routing, GTPM and Supplementary, and Analog Gateway. The 'Proxy & Registration' category is selected. The main panel displays the configuration for 'Proxy & Registration' with various parameters and their values:

Parameter	Value
Use Default Proxy	No
Proxy Name	
Redundancy Mode	Parking
Proxy IP List Refresh Time	60
Enable fallback to Routing Table	Disable
Prefer Routing Table	No
Always Use Proxy	Disable
Redundant Routing Mode	Routing Table
SIP ReRouting Mode	Standard Mode
Enable Registration	Enable
Registrar Name	
Registrar IP Address	
Registrar Transport Type	Not Configured
Registration Time	60
Re-registration Timing [%]	50
Registration Retry Time	30
Registration Time Threshold	0
Re-register On INVITE Failure	Disable
ReRegister On Connection Failure	Disable
Gateway Name	
Gateway Registration Name	
DNS Query Type	A-Record
Proxy DNS Query Type	A-Record
Subscription Mode	Per Endpoint
Number of RTT Before WebServer	1

## 11.4.2 Setting IP Address (Default Gateway IP will be the IP of VRRP1 )

**AudioCodes MP-114 FXS**

Configuration Maintenance Status & Diagnostics

Scenarios Search

**Basic** **Full**

- System
  - VoIP
    - Network
      - IP Interfaces Table
      - IP Routing Table
      - Network Settings
      - QoS Settings
    - DNS
    - Security
    - Media
    - Services
    - Applications Enabling
    - Control Network
    - SIP Definitions
    - Coders and Profiles
    - GW and IP to IP

**IP Settings**

Single IP Settings

IP Address	192.168.0.4
Subnet Mask	255.255.255.0
Default Gateway Address	192.168.0.3

VoIP DNS Settings

DNS Primary Server IP	8.8.8.8
DNS Secondary Server IP	

Multiple Interface Settings

Multiple Interface Table	
--------------------------	--

## 11.4.3 Setting Proxy IP Address (will be the IP of VRRP1)

**AudioCodes MP-114 FXS**

Configuration Maintenance Status & Diagnostics

Scenarios Search

**Basic** **Full**

- System
  - VoIP
    - Network
      - IP Interfaces Table
      - IP Routing Table
      - Network Settings
      - QoS Settings
    - DNS
    - Security
    - Media
    - Services
    - Applications Enabling
    - Control Network
    - SIP Definitions
      - General Parameters
      - Advanced Parameters
      - Account Table
      - Proxy & Registration
      - RADIUS Accounting Settings
    - Coders and Profiles
    - GW and IP to IP

**Proxy & Registration**

Use Default Proxy: Yes

Proxy Set Table: [Icon]

Proxy Name: [Text Field]

Redundancy Mode: Parking

Proxy IP List Refresh Time: 60

Enable Failback to Routing Table: Disable

Prefer Routing Table: No

Use Routing Table for Host Names and Profiles: Disable

Always Use Proxy: Enable

Redundant Routing Mode: Disable

SIP ReRouting Mode: Standard Mode

Enable Registration: Enable

Registrar Name: [Text Field]

Registrar IP Address: [Text Field]

Registrar Transport Type: Not Configured

Registration Time: 30

Re-registration Timing [%]: 60

Registration Retry Time: 30

Registration Time Threshold: 0

Re-register On INVITE Failure: Disable

ReRegister On Connection Failure: Disable

Gateway Name: [Text Field]

Gateway Registration Name: [Text Field]

**AudioCodes MP-114 FXS**

Configuration Maintenance Status & Diagnostics

Scenarios Search

**Basic** **Full**

- System
  - VoIP
    - Network
      - IP Interfaces Table
      - IP Routing Table
      - Network Settings
      - QoS Settings
    - DNS
    - Security
    - Media
    - Services
    - Applications Enabling
    - Control Network
    - SIP Definitions
      - General Parameters
      - Advanced Parameters
      - Account Table
      - Proxy & Registration
      - RADIUS Accounting Settings
    - Coders and Profiles
    - GW and IP to IP

**Default Proxy Sets Table**

Proxy Set ID: 0

	Proxy Address	Transport Type
1	192.168.0.3	[Dropdown]
2		[Dropdown]
3		[Dropdown]
4		[Dropdown]
5		[Dropdown]

Enable Proxy Keep Alive: Disable

Proxy Keep Alive Time: 60

Proxy Load Balancing Method: Disable

Is Proxy Hot Swap: No

## 11.4.4 Setting Voice Coders

Codex Name	Packetization Time	Rate	Payload Type	Silence Suppression
G.711A-law	20	64	8	Disabled
G.711U-law	20	64	0	Disabled

## 11.4.5 Setting up an Extension

	Channel(s)	Phone Number	Hunt Group ID	Tel Profile ID
1	1	1000	1	0
2				
3				
4				

## 11.4.6 Setting Hunt Group

	Hunt Group ID	Channel Select Mode	Registration Mode	Serving IP Group ID	Gateway Name	Contact User
1	1	By Dest Phone Number				
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						



## 11.4.7 Setting IP to Hunt Group Routing

AudioCodes MP-114 FXS

Submit Run Device Actions Home Help Log off

Configuration Maintenance Status & Diagnostics

Scenario Search

Basic Full

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IP to Hunt Group Routing Table

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IP To Tel Routing Mode: Route calls before manipulation

	Dest. Host Prefix	Source Host Prefix	Dest. Phone Prefix	Source Phone Prefix	Source IP Address	Hunt Group ID	IP Profile ID	Source IP Group ID
1			*	*		1	0	-1
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

Basic Parameter List

## 11.5 MP-1xx Configuration (Connected to VRRP2)

This section describes the configuration of the MP-1xx. In this example, the MP-1xx is the endpoint device. This endpoint device may also be an IP Phone.

### 11.5.1 Setting the Proxy Registration Time



**Note:** To support this configuration scenario, the value of the 'Registration Time' parameter (configured in the Proxy & Registration table for defining the time interval (in seconds) for registering to a Proxy server) should be as low as possible. This is necessary to ensure a smooth failover for new voice calls (existing voice calls are dropped).

Parameter	Value
Use Default Proxy	No
Proxy Name	
Redundancy Mode	Parking
Proxy IP List Refresh Time	60
Enable Failback to Routing Table	Disable
Prefer Routing Table	No
Always Use Proxy	Disable
Redundant Routing Mode	Routing Table
SIP ReRouting Mode	Standard Mode
Enable Registration	Enable
Registrar Name	
Registrar IP Address	
Registrar Transport Type	Not Configured
Registration Time	60
Re-registration Timing [%]	50
Registration Retry Time	30
Registration Time Threshold	0
Re-register On INVITE Failure	Disable
ReRegister On Connection Failure	Disable
Gateway Name	
Gateway Registration Name	
DNS Query Type	A-Record
Proxy DNS Query Type	A-Record
Subscription Mode	Per Endpoint
Number of RTT Before Next Sum	1

### 11.5.2 Setting IP Address (Default Gateway IP will be the IP of VRRP2)

Section	Parameter	Value
Single IP Settings	IP Address	192.168.1.4
	Subnet Mask	255.255.255.0
	Default Gateway Address	192.168.1.3
VoIP DNS Settings	DNS Primary Server IP	8.8.8.8
	DNS Secondary Server IP	
Multiple Interface Settings	Multiple Interface Table	

### 11.5.3 Setting Proxy IP Address (will be the IP of VRRP2)

The screenshot shows the 'Proxy & Registration' configuration page in the AudioCodes MP-114 FXS web interface. The left sidebar shows the configuration tree with 'Proxy & Registration' selected under 'Control Network'. The main area contains various settings for proxy functionality.

Parameter	Value
Use Default Proxy	Yes
Proxy Set Table	0
Proxy Name	
Redundancy Mode	Parking
Proxy IP List Refresh Time	60
Enable Fallback to Routing Table	Disable
Prefer Routing Table	No
Use Routing Table for Host Names and Profiles	Disable
Always Use Proxy	Enable
Redundant Routing Mode	Disable
SIP ReRouting Mode	Standard Mode
Enable Registration	Enable
Registrar Name	
Registrar IP Address	
Registrar Transport Type	Not Configured
Registration Time	30
Re-registration Timing [%]	80
Registration Retry Time	30
Registration Time Threshold	0
Re-register On INVITE Failure	Disable
ReRegister On Connection Failure	Disable
Gateway Name	
Gateway Registration Name	

The screenshot shows the 'Default Proxy Sets Table' configuration page. The left sidebar shows 'Proxy & Registration' selected. The main area displays a table for proxy sets and their associated addresses and transport types.

Proxy Set ID	Proxy Address	Transport Type
1	192.168.1.3	
2		
3		
4		
5		

Parameter	Value
Enable Proxy Keep Alive	Disable
Proxy Keep Alive Time	60
Proxy Load Balancing Method	Disable
Is Proxy Hot Swap	No

### 11.5.4 Setting Voice Coders

The screenshot shows the 'Coders Table' configuration page. The left sidebar shows 'Coders' selected under 'Control Network'. The main area displays a table for voice coders with columns for Name, Packetization Time, Rate, Payload Type, and Silence Suppression.

Coder Name	Packetization Time	Rate	Payload Type	Silence Suppression
G.711A-law	20	64	8	Disabled
G.711U-law	20	64	0	Disabled

## 11.5.5 Setting up an Extension

The screenshot shows the 'Endpoint Phone Number Table' configuration page. The left sidebar contains a tree view with 'Basic' and 'Full' sections. The 'Full' section is expanded, showing various configuration options. The main area displays a table with 4 rows and 4 columns: Channel(s), Phone Number, Hunt Group ID, and Tel Profile ID.

	Channel(s)	Phone Number	Hunt Group ID	Tel Profile ID
1	1	2000	1	0
2				
3				
4				

## 11.5.6 Setting Hunt Group

The screenshot shows the 'Hunt Group Settings' configuration page. The left sidebar contains a tree view with 'Basic' and 'Full' sections. The 'Full' section is expanded, showing various configuration options. The main area displays a table with 12 rows and 6 columns: Index, Hunt Group ID, Channel Select Mode, Registration Mode, Serving IP Group ID, Gateway Name, and Contact User.

Index	Hunt Group ID	Channel Select Mode	Registration Mode	Serving IP Group ID	Gateway Name	Contact User
1	1	By Dest Phone Number				
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

## 11.5.7 Setting IP to Hunt Group Routing

The screenshot shows the 'IP To Hunt Group Routing Table' configuration page. The left sidebar contains a tree view with 'Basic' and 'Full' sections. The 'Full' section is expanded, showing various configuration options. The main area displays a table with 12 rows and 9 columns: Dest. Host Prefix, Source Host Prefix, Dest. Phone Prefix, Source Phone Prefix, Source IP Address, Hunt Group ID, IP Profile ID, and Source IP Group ID.

	Dest. Host Prefix	Source Host Prefix	Dest. Phone Prefix	Source Phone Prefix	Source IP Address	Hunt Group ID	IP Profile ID	Source IP Group ID
1						1	0	-1
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

## 12 Show Commands

This chapter describes show commands that can be used to show the VRRP and binding statuses.

### 12.1 VRRP Status

```
SBC_1# show data vrrp brief
Interface      Grp Pri Time,msec  Own Pre State  Master
addr          Group addr
VLAN 2         2   100 3609          Y Backup
192.168.1.2    192.168.1.3
VLAN 1         1   250 3023          Y Master
192.168.0.1    192.168.0.3

SBC_2# show data vrrp brief
Interface      Grp Pri Time,msec  Own Pre State  Master
addr          Group addr
VLAN 2         2   250 3023          Y Master
192.168.1.2    192.168.1.3
VLAN 1         1   100 3609          Y Backup
192.168.0.1    192.168.0.3
```

### 12.2 Binding Status

```
SBC_1# show voip network-source-bindings

VoIP Applications to Network source bindings:
-----
VoIP bind to VLAN 1 with ip address 192.168.0.3
VoIP bind to WAN on VRF main-vrf with destination address
10.254.1.2:
    Current WAN interface is GigabitEthernet 0/0 with ip address
10.10.10.1
VoIP bind to VLAN 2 with ip address 192.168.1.3

NAT & Port FW rules used by VoIP Applications:
-----
The following WAN ports are in use by VOIP services:
    Ports 6000 - 6990 --> RealmPortPool::MR_WAN
    Ports 5060 - 5060 --> SIPUDP#1
    Ports 5060 - 5060 --> SIPLISTENING#1
    Ports 5061 - 5061 --> SIPLISTENING#1
The following NAT rules are in effect for VOIP services:
    RealmPortPool::MR_WAN: LAN ports 6000-6990 to WAN IP
10.10.10.1 ports 6000-6990, interface GigabitEthernet 0/0
    SIPUDP#1: LAN ports 5060-5060 to WAN IP 10.10.10.1 ports 5060-
5060, interface GigabitEthernet 0/0
    SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 10.10.10.1 ports
5060-5060, interface GigabitEthernet 0/0
    SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 10.10.10.1 ports
5061-5061, interface GigabitEthernet 0/0
```

```

SBC_2# show voip network-source-bindings

VoIP Applications to Network source bindings:
-----
VoIP bind to VLAN 1 with ip address 192.168.0.3
VoIP bind to WAN on VRF main-vrf with destination address
10.254.1.2:
    Current WAN interface is GigabitEthernet 0/0 with ip address
10.10.10.5
VoIP bind to VLAN 2 with ip address 192.168.1.3

NAT & Port FW rules used by VoIP Applications:
-----
The following WAN ports are in use by VOIP services:
    Ports 6000 - 6990 --> RealmPortPool::MR_WAN
    Ports 5060 - 5060 --> SIPUDP#1
    Ports 5060 - 5060 --> SIPLISTENING#1
    Ports 5061 - 5061 --> SIPLISTENING#1
The following NAT rules are in effect for VOIP services:
    RealmPortPool::MR_WAN: LAN ports 6000-6990 to WAN IP
10.10.10.5 ports 6000-6990, interface GigabitEthernet 0/0
    SIPUDP#1: LAN ports 5060-5060 to WAN IP 10.10.10.5 ports 5060-
5060, interface GigabitEthernet 0/0
    SIPLISTENING#1: LAN ports 5060-5060 to WAN IP 10.10.10.5 ports
5060-5060, interface GigabitEthernet 0/0
    SIPLISTENING#1: LAN ports 5061-5061 to WAN IP 10.10.10.5 ports
5061-5061, interface GigabitEthernet 0/0

```

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