



**Configuring Avaya™ S8300 Media Server and Avaya S8300 Media Server Local Survivable Processor with Enterasys Vertical Horizon VH-2402L3 and VH-2402S – Issue 1.0**

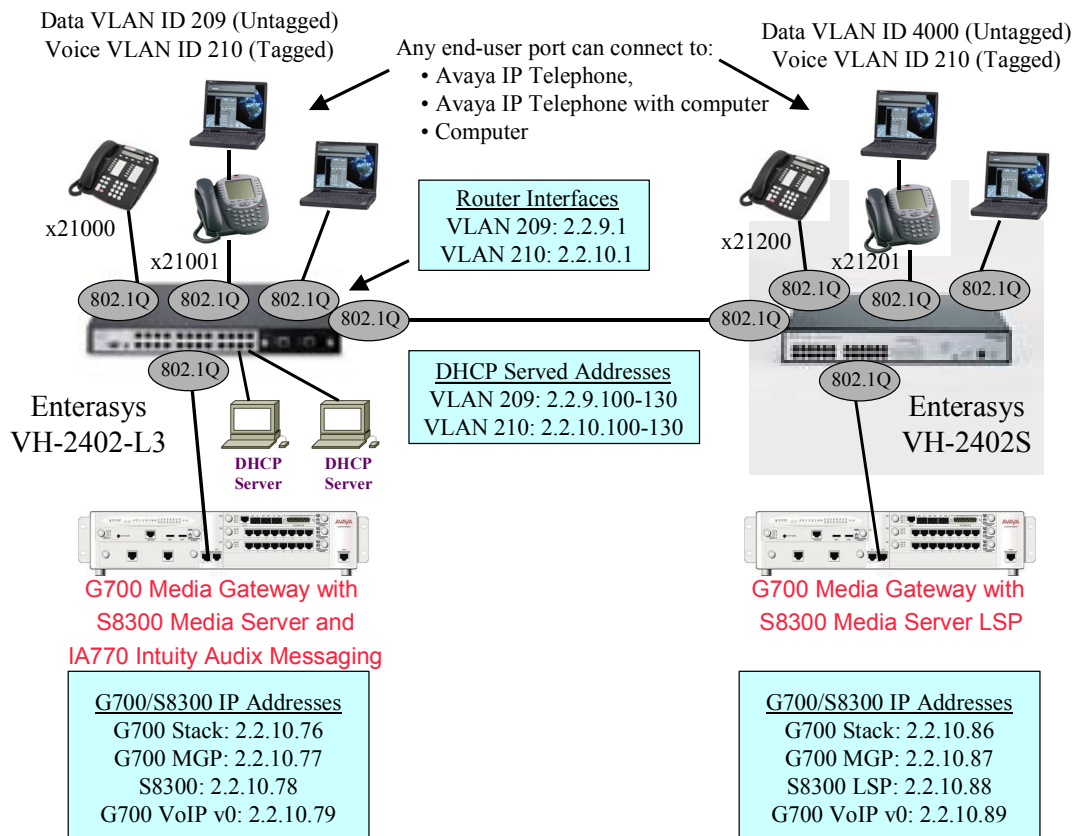
**Abstract**

These Application Notes present a sample configuration for a network comprised of an Avaya™ S8300 Media Server primary controller and an Avaya S8300 Media Server Local Survivable Processor (LSP). The S8300 LSP runs Communication Manager software and can provide service in case of failure of the S8300 primary controller, or a failure of the data network connecting the Avaya G700 Media Gateways. The configuration is networked using the Enterasys Vertical Horizon VH-2402-L3 and VH-2402-S. The LSP configuration described in this document should also work with other data network infrastructures. The Avaya™ G700 Media Gateway configuration, Avaya™ Communication Manager configuration, and the Enterasys configurations are illustrated. The data network configuration enables any Enterasys switch port to connect to an Avaya™ IP Telephone, an Avaya IP Telephone with a computer attached, or a standalone computer, with voice and data on separate VLANs.

# 1. Introduction

These Application Notes present a sample configuration for a network comprised of an Avaya™ S8300 Media Server primary controller and an Avaya S8300 Media Server Local Survivable Processor (LSP). The S8300 LSP runs Communication Manager software and can provide service in case of failure of the S8300 primary controller, or a failure of the data network connecting the Avaya G700 Media Gateways. The configuration is networked using the Enterasys Vertical Horizon VH-2402-L3 and VH-2402-S. The LSP configuration described in this document should also work with other data network infrastructures. The Avaya™ G700 Media Gateway configuration, Avaya™ Communication Manager configuration, and the Enterasys configurations are illustrated. The data network configuration enables any Enterasys switch port to connect to an Avaya™ IP Telephone, an Avaya IP Telephone with a computer attached, or a standalone computer, with voice and data on separate VLANs.

**Figure 1** provides a high-level overview of the network used to verify these Application Notes.



**Figure 1: Network Overview (Avaya™ G700 Media Gateways; Avaya™ 4612 IP Telephone; Avaya™ 4620 IP Telephone; Avaya™ S8300 Media Servers)**

## 2. Equipment and Software Validated

Table 1 shows the equipment and software used for the sample configuration:

Network Component	Version Information
Avaya™ S8300 Media Servers	Load 526.5 (Communication Manager 1.3)
Avaya™ G700 Media Gateway Processor (MGP)	20.13.0
Avaya™ G700 VoIP	FW V11
Avaya™ 4600 Series IP Telephones	1.73
Enterasys VH-2402S	Hardware Version v3.0 Firmware Version V1.11
Enterasys VH-2402-L3	Boot PROM Version: 1.00.00 Firmware Version: V1.0 Hardware Version: 5A1-1A1

Table 1 – Equipment Version Information

## 3. Global Configuration and Conventions

### 3.1. Conventions

Native interfaces have been used to describe the configuration on all products. Wizard interfaces are also available as an alternative. For example, additional information on the Avaya Installation Wizard and other wizards can be found at <http://support.avaya.com/avayaiw/>

In these Application Notes, Avaya Communication Manager administration screens are shown with a gray shaded background. These administration screens are also referred to as “SAT” (System Access Terminal) screens in this document. Avaya™ G700 Media Gateway Command Line Interface (CLI) screens are shown without shading. Enterasys switch screens are shown with a pale blue background. In many instances, the original screens have been edited for brevity in presentation. Commands and fields requiring user input or special attention are highlighted in bold.

It is assumed that the appropriate license files and authentication files have been installed on the Avaya S8300 Media Servers, and that login and password credentials for all products are available to the reader.

### 3.2. End-User Port Configuration Overview

The approach presented in these Application Notes allows the various end-user configurations to be supported. For example, the switch ports used for end-user devices may connect to a computer, an IP telephone, or an IP telephone with attached computer. This is accomplished by

configuring a tagged and untagged VLAN on the switch ports. The tagged VLAN is used for the voice traffic, and the untagged VLAN is for data traffic from computers, either standalone, or attached to an IP Telephone.

### 3.3. DHCP Configuration

DHCP is typically used, but not strictly required. The Avaya IP Telephones can be programmed from the keypad with their VLAN and IP information, including the address for the primary call server (e.g., an S8300). Communication Manager (beginning with release 1.3) can include the S8300 LSP address in the list of alternate gatekeepers provided to the phone during the registration process. The G700 Media Gateway and S8300 Media Server are programmed with their IP identities through management interfaces. These Application Notes were first verified using static addressing, and then verified again with the DHCP configuration summarized in **Table 2** below.

In this configuration, two DHCP servers were connected to the Enterasys VH-2402-L3. One DHCP server was connected to a switch port with PVID=209 (i.e., the data VLAN). Another DHCP server was connected to a switch port with PVID 210 (i.e., the voice VLAN). Alternatively, a single DHCP server with multiple network interfaces could have been used. For a brief discussion of the motivation for this DHCP configuration, refer to the interoperability problem noted in the Conclusion (**Section 6**).

An IP telephone will initially send an untagged DHCP request. For all end-user facing ports, the untagged VLAN on the port is the data VLAN with PVID=209. The DHCP server and scope serving the data VLAN replies with the option 176 string, which instructs the IP telephone to enable 802.1Q tagging with VLAN ID 210. The IP telephone receiving this reply will release the supplied IP address and issue a new DHCP request tagged with VLAN ID 210. This request will be associated with the tagged voice VLAN. The DHCP server and scope serving the voice VLAN replies with an IP address as well as other parameters, and Option 176 will include the string indicated in **Table 2** below.

When a standalone computer or computer attached to an IP Telephone issues a DHCP request, it will also send an untagged DHCP request. This request will be serviced much the same as the initial request from the phone, except that the Option 176 string is irrelevant to the computer.

DHCP Scope	Option 3 Router	Option 176 String Includes these settings	Notes
2.2.10.0	2.2.10.1	MCIPADD=2.2.10.78,2.2.10.88, MCPOR=1719	2.2.10.78 is the S8300 primary controller. 2.2.10.88 is the S8300 LSP. Tagged Voice VLAN
2.2.9.0	2.2.9.1	L2Q=1,L2QVLAN=210	Scope serving untagged Data VLAN. Phones told to tag with VLAN ID 210.

**Table 2 – DHCP Configuration Summary**

### 3.4. QoS and Port Configuration

The Enterasys VH-2402-S has 2 priority queues, with strict priority queuing for each port. The Enterasys VH-2402-L3 has 4 queues. 802.1p values can be observed to classify ingress traffic for mapping to the appropriate egress queue. For more information, consult the product documentation available from <http://www.enterasys.com/support/manuals/v.html>

**Table 3** summarizes an example QoS configuration.

<b>Avaya Equipment</b>	<b>802.1p/Q Configuration</b>	<b>Enterasys Configuration</b>	<b>Notes</b>
IP telephones	IP phone tags with VLAN ID 210. The 802.1p values for voice and voice signaling are obtained from Communication Manager based on the telephone's network region.	By default, switch will examine 802.1p value and map to highest priority egress queue.	Default network region values and default Enterasys switch behavior will result in voice signaling and media in highest priority egress queues.
PC connected to IP Phone	No 802.1p/Q header information will be sent (802.1p/Q does not need to be enabled for the PC NIC).	Untagged VLAN on port (PVID=209)	Untagged data will be classified on ingress as low priority and transmitted out lower priority egress queues.
G700 Media Gateway(s)	G700 will tag with the voice VLAN ID 210. The 802.1p values for voice and voice signaling are obtained from Communication Manager based on the G700's network region.	By default, switch will examine 802.1p value and map to highest priority egress queue.	Default network region values and default Enterasys switch behavior will result in voice signaling and media in highest priority egress queues.

**Table 3 – QoS Configuration Summary**

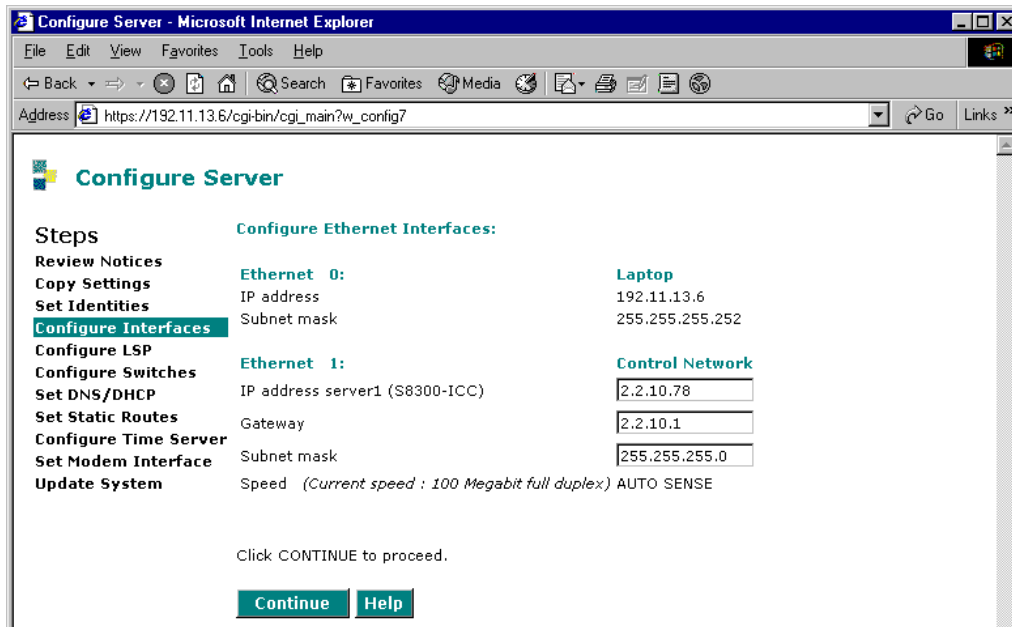
## 4. Detailed Configuration

The following subsections illustrate the relevant configuration steps, organized by product and task.

### 4.1. Configure the S8300 Media Server Primary Controller

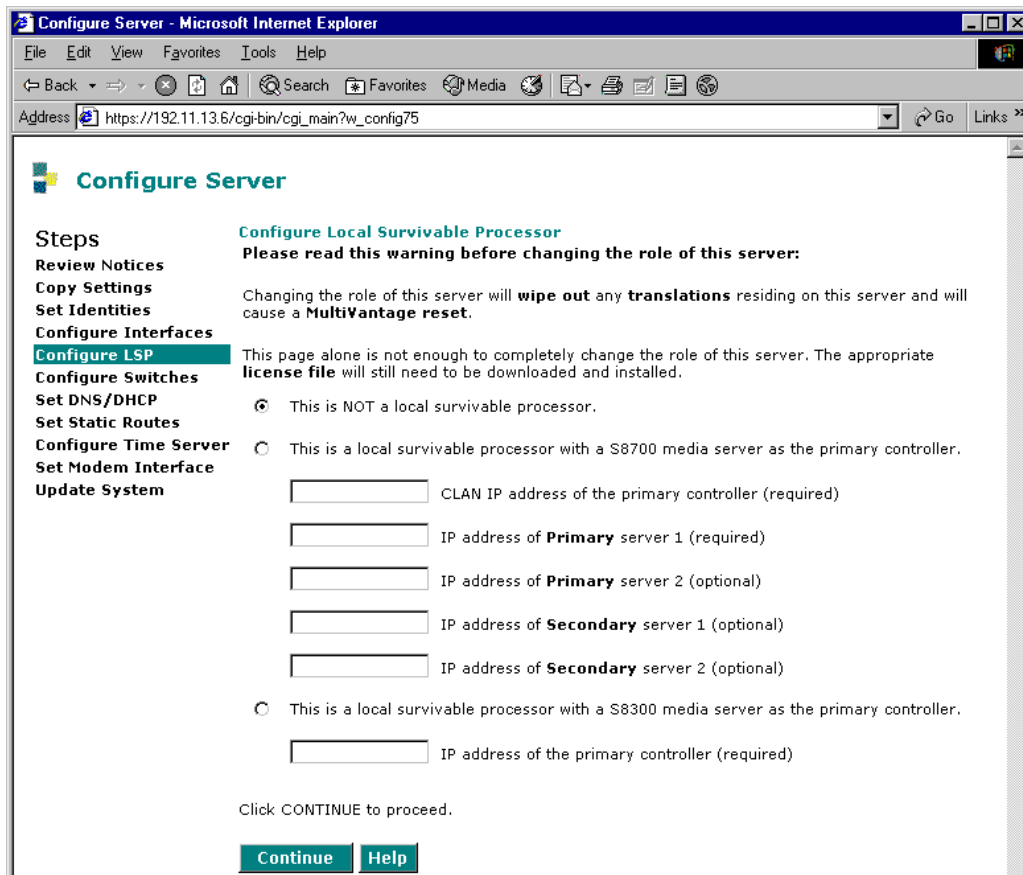
The IP identity of the Avaya™ S8300 Media Server is configured using a web interface. To access the web interface, use a crossover Ethernet cable to connect a computer to the services port of the Avaya S8300 Media Server, located in slot 1 on the left side of the Avaya™ G700 Media Gateway. The services port uses the pre-configured IP address 192.11.13.6 with mask 255.255.255.252. Configure the computer's IP address as 192.11.13.5 with mask 255.255.255.252. Launch a web browser, turn proxies off, and connect to the URL <http://192.11.13.6>. Supply appropriate login and password credentials when prompted to do so. After login, a main menu is presented along the left hand side. Click "Configure Server" from the lower left of this main menu, and follow the self-explanatory on-screen steps.

The following screen sets the IP information for the S8300 Media Server primary controller.



Click "Continue".

The following screen sets the S8300 to be a primary controller (i.e., not an LSP).



Continue until the process is completed with the “Update System” step.

## 4.2. Configure Communication Manager

The next series of steps are performed through the Communication Manager SAT interface. There are various ways to access the SAT login prompt, including, but not limited to:

- Using Avaya Site Administration
- Using “telnet 192.11.13.6 5023” from the computer connected to the services port of the Avaya™ S8300 Media Server. Using 5023 as an argument to telnet brings the user directly to the SAT.
- Using telnet to the IP address assigned to the Avaya S8300 Media Server from the customer’s network (e.g., telnet 2.2.10.78 5023). This approach would not use the direct connection to the services port, but rather could be performed from a computer connected to the data network with access to 2.2.10.78.

The following command can be used to confirm the IP information previously configured through the web interface.

```

display ip-interfaces                                     Page 1 of 19
                                     IP INTERFACES
                                     Net
ON Type Slot Code Sfx Node Name Subnet Mask Gateway Address Rgn VLAN
y PROCR                2 .2 .10 .78 255.255.255.0 2 .2 .10 .1 1

```

The two G700 Media Gateways shown in **Figure 1** can be added using the command “add media-gateway x” where x will be the media gateway number. This is the media gateway number that will appear in the G700 MGP command prompt, once the gateway has registered.

The command “add media-gateway 1” is used below to add the media gateway connected to the Enterasys VH-2402-L3. The Identifier field must be populated with the serial number of the G700 Media Gateway. The serial number can be found on the rear of the G700 Media Gateway, or by using the “show system” command from the G700 MGP CLI as shown in Section 4.3.2. A name can optionally be defined. The IP and MAC Address fields are display only. These fields will contain data after the media gateway has registered with the Avaya S8300 Media Server as its controller.

```

add media-gateway 1                                     Page 1 of 1
                                     MEDIA GATEWAY
Number: 1
Name: G700_Main Identifier: 03DR03076699
IP Address: MAC Address:
Network Region: 1 Location: 1

```

The following command adds the media gateway connected to the Enterasys VH-2402S. (In a production configuration, the media gateways might be assigned to different network regions. The network region considerations are outside the intended scope of these Application Notes.)

```

add media-gateway 2                                     Page 1 of 1
                                     MEDIA GATEWAY
Number: 2
Name: G700_with_LSP Identifier: 02J208742873
IP Address: MAC Address:
Network Region: 1 Location: 1

```

The following screen shows media gateway number 1 once the configuration is complete (i.e., after the G700 Media Gateway with serial number 03DR03076699 has registered). This is shown for information purposes only.

```

display media-gateway 1                               Page 1 of 1
                MEDIA GATEWAY
Number: 1
Name: G700_Main          Identifier: 03DR03076699
IP Address: 2 .2 .10 .77  MAC Address: 00:04:0d:02:0f:4a
Network Region: 1      Location: 1
Site Data:              Registered? y
                        Slot      Module Type
                        V1:       icc
                        V2:       analog
                        V3:       dcp
                        V4:       ds1
                        V8:       messaging-analog

```

The following illustrates a subset of the “change node-names ip” screen that maps logical names to IP addresses. The “default” and “procr” names are automatically added. Enter the S8300-LSP node name and IP address using this form.

```

change node-names ip                               Page 1 of 1
                IP NODE NAMES
Name          IP Address          Name          IP Address
default      0 .0 .0 .0           . . .
procr       2 .2 .10 .78         . . .
S8300-LSP  2 .2 .10 .88         . . .

```

Use the “change lsp” command to enter the S8300-LSP node-name as shown below.

```

change lsp                               Page 1 of 16
                LOCAL SURVIVABLE PROCESSOR
Number  Name          IP Address          Currently  Translations
                Available?  Updated
1      S8300-LSP      . . .              n

```

The following shows an example of this same screen once the configuration is complete and the S8300 LSP has registered. This is shown for information purposes only.

```

change lsp                               Page 1 of 16
                LOCAL SURVIVABLE PROCESSOR
Number  Name          IP Address          Currently  Translations
                Available?  Updated
1      S8300-LSP      2 .2 .10 .88       y          9:52 6/26/2003

```

The following illustrates the configuration for network region 1. A complete description of these fields is outside the scope of these Application Notes.

The fields shown below on page 1 are left at their default values.

```
change ip-network-region 1                               Page 1 of 3
IP NETWORK REGION
Region: 1
Location: 1
Name:
Intra-region IP-IP Direct Audio: yes
Inter-region IP-IP Direct Audio: yes
IP Audio Hairpinning? y
AUDIO PARAMETERS
Codec Set: 1
UDP Port Range
Min: 2048
Max: 3028
RTCP Reporting Enabled? y
RTCP MONITOR SERVER PARAMETERS
Use Default Server Parameters? y
DIFFSERV/TOS PARAMETERS
Call Control PHB Value: 34
Audio PHB Value: 46
AUDIO RESOURCE RESERVATION PARAMETERS
RSVP Enabled? n
802.1P/Q PARAMETERS
Call Control 802.1p Priority: 7
Audio 802.1p Priority: 6
```

Page forward to Page 3, and enter the S8300-LSP node name. This enables Communication Manager to provide the IP address of the S8300 LSP to IP Telephones as an alternate gatekeeper, when the telephones register for service with this region.

```
change ip-network-region 1                               Page 3 of 3
IP NETWORK REGION
LSP NAMES IN PRIORITY ORDER
1  S8300-LSP
2
3
4
5
6
```

The command “save translation” must be entered to save all the administration performed.

```
save translation
SAVE TRANSLATION
Command Completion Status      Error Code
Success                          0
```

Once the S8300 LSP is configured and communicating with the S8300 primary controller (i.e., after all steps in **Section 4** are completed), a “save translation” occurring on the S8300 primary controller will in general cause the automatic transmission of the updated translation file to the S8300 LSP. If the LSP is required to provide service, it will have a replica of the last saved configuration.

### 4.3. Configure the G700 Media Gateway with S8300 Primary Controller

This section illustrates the steps necessary to configure the following components within the Avaya™ G700 Media Gateway.

- Avaya P330 stack processor (resident on the G700 Media Gateway)
- Avaya G700 Media Gateway Processor (MGP)
- VoIP v0 Module resident on the Avaya G700 Media Gateway motherboard

### 4.3.1. Configure the P330 Stack on the G700 Media Gateway

Connect a COM port on a computer to the console port on the lower right corner of the Avaya G700 Media Gateway using a console port cable. Launch a terminal emulation program using appropriate connect parameters (i.e., COM 1, 9600 bps, no parity, 8 data bits, 1 stop bit, no flow control). Press the return key, and the login prompt will appear. Upon login, a welcome banner similar to the following will be seen.

```
Welcome to P330
SW version 3.12.1
```

Help is available by using the keyword “help” at any point in a command. The help system is hierarchical. For example, “help”, “show help”, and “show ip help” are all valid for displaying increasingly narrow help responses.

The format of the prompt is “Hostname-Stack number(mode)”. In the output shown below, the “hostname” is “P330”, and the stack number is 1. Enter configure mode by issuing the command “configure”.

Assign IP parameters to the P330 stack processor using the “set interface” command. The syntax of the command is “set interface inband <vlan> <ip-addr> <netmask>”.

```
P330-1(configure)# set interface inband 210 2.2.10.76 255.255.255.0

Management VLAN number set to 210
Interface inband IP address set.
You must reset the device in order for the change to take effect.
```

As the command response indicates, a reset must be performed for the change to take effect.

```
P330-1(configure)# reset 1

This command will reset module 1 and may disconnect your telnet session.
*** Reset the module *** - do you want to continue (Y/N)? y

Resetting module 1
```

Re-login using the login credentials previously supplied. The IP route for the P330 stack will now be set, using the command syntax “set ip route <destination> <gateway>”. It is not necessary to perform a reset after setting the IP route with the command below.

```

P330-1(configure)# set ip route 0.0.0.0 2.2.10.1
destination = 0.0.0.0 gateway = 2.2.10.1
P330-1(configure)#
ROUTE NET TABLE
destination      gateway          flags  Refcnt  Use      Interface
-----
0.0.0.0          2.2.10.1        3      0       0        se0
2.2.10.0         2.2.10.76       1      1       16       se0
127.1.1.0        127.1.1.1       1      6       796      se1
-----

ROUTE HOST TABLE
destination      gateway          flags  Refcnt  Use      Interface
-----
127.0.0.1        127.0.0.1       5      2       7        lo0
-----

```

The output of the prior command includes IP addresses that begin with 127. These addresses are used internally within the Avaya™ G700 Media Gateway.

The following commands put the two Ethernet ports on the front center of the G700 Media Gateway in VLAN 210, the voice VLAN. Only one of the ports is used in this configuration.

```

P330-1(configure)# set port vlan 210 1/1
VLAN 210 modified.
VLAN Mod/Ports
-----
 210 1/1
P330-1(configure)# set port vlan 210 1/2
VLAN 210 modified.
VLAN Mod/Ports
-----
 210 1/1-2

```

The following commands set 802.1Q on the two Ethernet ports on the front of the G700 Media Gateway. Egress traffic on these ports will tag with VLAN ID 210, and the 802.1p value for voice media and signaling traffic will be set to the values configured within Communication Manager for this G700's network region (i.e., region 1 in this simple configuration).

```

P330-1(configure)# set trunk 1/1 dot1q
Dot1Q VLAN tagging set on port 1/1.
P330-1(configure)# set trunk 1/2 dot1q
Dot1Q VLAN tagging set on port 1/2.

```

The following commands are optional. The port name is set, and a show port command is issued to illustrate the actual connectivity.

```
P330-1(configure)# set port name 1/1 To-VH-2402-L3
Port 1/1 name set.
P330-1(configure)# show port
```

Port	Name	Status	Vlan	Level	Neg	Dup.	Spd.	Type
1/1	To-VH-2402-L3	connected	210	0	enable	full	100M	10/100Base-Tx
1/2	NO NAME	no link	210	0	enable	full	100M	10/100Base-Tx

### 4.3.2. Configure the G700 Media Gateway Processor (MGP)

The next step is to interact with the command line interface (CLI) of the Avaya G700 Media Gateway Processor (MGP) to assign IP parameters. The MGP CLI can be accessed via the “session mgp” command; no new authentication is necessary. The MGP can also be accessed directly from the IP network once IP settings have been assigned to the MGP.

```
P330-1(configure)# session mgp
```

Enter configuration mode using the “configure” command.

```

Welcome to Media Gateway Processor
FW version 20.13.0
MG-???-1(super)# configure
```

The format of the prompt is “Hostname-Media Gateway number-Stack Number (mode)#”. In the examples shown, the hostname is MG. The hostname can be changed, if desired, using “set hostname name”. The Media Gateway number will be shown as question marks until the gateway has registered with its controller. Once registered, the prompt will show the media gateway number assigned by Communication Manager. The stack number is shown as 1 because this is a single (i.e., not stacked) Avaya G700 Media Gateway.

Help is available by using the keyword help at any point in a command. For example, “help”, “show help”, and “show interface help” are all valid for displaying increasingly narrow help responses.

The command “set interface mgp <vlan> <ip> <netmask>” is used to set the IP parameters for the Avaya G700 Media Gateway Processor as follows:

```
MG-???-1(configure)# set interface mgp 210 2.2.10.77 255.255.255.0
```

The change will take effect after reboot.

As indicated, the user must issue a reset for the ip address assignment to take effect:

```
MG-???-1(configure)# reset mgp
```

```
This command will perform a hard reset.
Do you want to continue (Y/N)? y
```

Wait a short time (e.g., one minute) to allow the MGP reset to proceed. Use the “session mgp” command to reconnect to the MGP CLI. Use the “configure” command to return to configure mode. Optionally, verify the MGP configuration using the command “show interface mgp”.

```
MG-???-1(configure)# show interface mgp
OPERATIONAL STATE: -- Currently in use --

INTERFACE  SRC  VLAN  IP ADDRESS          NETMASK             MAC ADDRESS
-----
mgp        S   210   2.2.10.77          255.255.255.0      00-04-0D-02-0F-4A
```

The following command assigns a default IP route for the MGP. The command syntax is “set ip route <destination> <netmask> <gateway>”. The “0.0.0.0” addresses in the command imply a default gateway.

```
MG-???-1(configure)# set ip route 0.0.0.0 0.0.0.0 2.2.10.1
```

The “show system” command can be used to discover or confirm the serial number (shown in bold). This serial number is used as an identifier in the Communication Manager configuration (see “add media gateway x” in Section 4.2).

```
MG-???-1(configure)# show system
(Output abridged)
Serial No      : 03DR03076699
```

### 4.3.3. Configure the VoIP Module on the G700 Media Gateway

The next steps assign and verify an IP address for the integral Voice over IP (VoIP) component resident on the Avaya G700 Media Gateway motherboard. This VoIP component is identified as “voip v0” to differentiate it from any (functionally equivalent) MM760 VoIP Media Modules installed in the media module bays (v1-v4). The following command assigns an IP address to “voip v0”. The VoIP v0 will use the VLAN and NETMASK already set for the MGP.

```
MG-???-1(configure)# set interface voip v0 2.2.10.79
MG-???-1(configure)# show interface voip v0
OPERATIONAL STATE: -- Currently in use --

INTERFACE  SRC  VLAN  IP ADDRESS          NETMASK             MAC ADDRESS
-----
voip-v0    S   210   0.0.0.0            255.255.255.0      00-00-00-00-00-00

OPERATIONAL STATE: -- Pending reboot --

INTERFACE  SRC  VLAN  IP ADDRESS          NETMASK             MAC ADDRESS
-----
voip-v0    S   210   2.2.10.79          255.255.255.0      00-00-00-00-00-00
```

Next, a reset is performed.

```
MG-???-1(configure)# reset voip v0
This command will perform a hard reset.
Do you want to continue (Y/N)? y
```

After the reset, the VoIP v0 configuration can be confirmed as follows.

```
MG-???-1(configure)# show interface voip v0
OPERATIONAL STATE: -- Currently in use --
INTERFACE SRC VLAN IP ADDRESS NETMASK MAC ADDRESS
-----
voip-v0 S 210 2.2.10.79 255.255.255.0 00-04-0D-02-29-4A
```

### 4.3.3.1 Configure the G700 Media Gateway Controller List and Recovery

The G700 Media Gateway maintains a list of controller IP addresses. This list will be configured with the address of the Avaya S8300 Media Server primary controller followed by the address of the Avaya S8300 Media Server LSP. The command “set mgc list” is used as follows:

```
MG-???-1(configure)# set mgc list 2.2.10.78,2.2.10.88
```

The procedures shown above assume the controller list was empty at the start. The “clear mgc list” command can be used to remove any unwanted entries from the list.

Once the G700 Media Gateway has registered with its controller, the prompt will show the media gateway number assigned by the active controller. The command “show mgc” displays the status of the H.248 link to the controller, as well as the contents of the controller list. The prompt in the screen shown below, taken after the gateway had registered, includes the media gateway number assigned by Communication Manager.

```
MG-001-1(configure)# show mgc
CALL CONTROLLER STATUS
-----
Registered          : YES
Active Controller    : 2.2.10.78
H248 Link Status     : UP
H248 Link Error Code: 0x0
MGC List Management : Static

CONFIGURED MGC HOST          DHCP SPECIFIED MGC HOST
-----
2.2.10.78                    -- Not Available --
2.2.10.88                    -- Not Available --
-- Not Available --         -- Not Available --
-- Not Available --         -- Not Available --
```

The Avaya G700 Media Gateway can be programmed with information relevant to the H.248 link recovery process. The “set mgp reset-times help” command is illustrated below to show the commands, which will be summarized briefly below.

```
MG-001-1(configure)# set mgp reset-times help

set mgp reset-times commands:
-----
set mgp reset-times primary-search          Sets the MGP primary search timer
set mgp reset-times total-search           Sets the MGP total search timer
set mgp reset-times transition-point        Sets the MGP entry point
```

The media gateway controller list has been configured with the address of the S8300 primary controller, followed by the address of the S8300 LSP. The following command instructs the G700 Media Gateway that the “transition point” from primary controllers to survivable processors in the media gateway controller list is after the first member of the list.

```
MG-001-1(configure)# set mgp reset-times transition-point 1
```

The primary search time is the time (in minutes) that the MGP will attempt to connect with those addresses in the controller list up to and including the transition point, before moving on to try to connect to controllers beyond this transition point.

```
MG-001-1(configure)# set mgp reset-times primary-search 1
```

The total search time is the time (in minutes) that the MGP will attempt to connect with all addresses in the controller list, before the MGP will perform a hard reset. In the sample configuration, the set command was not used to change the total search interval. The default value, 30 minutes, was retained. The output of the corresponding help is shown below.

```
MG-001-1(configure)# set mgp reset-times total-search help

set mgp reset-times total-search command:
-----
Usage: set mgp reset-times total-search <minutes>

<minutes> - Number of minutes for the total search timer.
Values allowed are from 1 to 60.

Example: set mgp reset-times total-search 30
```

The following command summarizes the recovery parameters.

```
MG-001-1(configure)# show mgp recovery

MGP RECOVERY TIMES
-----
Primary Search   : 1
Total Search     : 30
Transition Point : 1
```

## 4.4. Configure the Enterasys VH-2402-L3

The following subsections illustrate the configuration of the Enterasys VH-2402-L3.

### 4.4.1. Change the Operating Mode

Select “Switch Settings” from the main menu shown below.

```
VH-2402-L3 Local Management                Layer 2 Switch
-----
Main Menu
-----
Basic Setup:                               Advanced Setup:
  Switch Information                       Spanning Tree
  IP Setup                                 Forwarding
  Remote Management Setup                 Filtering
  Switch Settings                       Priority
  Configure Ports                         Mirroring
  Setup User Accounts                     Multicasting
  Serial Port Settings                    VLANs
  Utilities                                Port Trunking
  Network Monitoring
  Save Changes
  Reboot
  Logout
```

Select “Switch Operation Mode”.

```
Switch Settings                            Layer 2 Switch
-----
Switch Operation Mode
Layer 2 Switch Settings
```

The following screen is displayed.

```
Switch Operation Mode                      Layer 2 Switch
-----
The current mode of operation is Layer 2 Only, Support IEEE802.1Q VLANs
Choose a mode then select APPLY to make the mode active.
The switch automatically saves the changes and reboots.

Select switch operation mode:<Layer 2 Only, Support IEEE802.1Q VLANs >
```

Use the space bar to toggle the switch operation mode to support IP Routing and apply.

```
Switch Operation Mode                      Layer 2 Switch
-----
The current mode of operation is Layer 2 Only, Support IEEE802.1Q VLANs
Choose a mode then select APPLY to make the mode active.
The switch automatically saves the changes and reboots.

Select switch operation mode:<IP Routing, Support IEEE 802.1Q VLANs >

APPLY
```

Enter “y” to allow a reboot to occur to change the operating mode.

```
The switch automatically saves the changes and reboots.
Are you sure that you want to change operation mode?y

Save all settings to NV-RAM... done.
Please wait, the switch is rebooting...
```

#### 4.4.2. Configure VLANs and Ports

In this configuration, ports 1-20 are used to connect to end-user devices. Port 21 is used for the interface to the DHCP Server on the Voice VLAN. Port 22 is used for the interface to the DHCP Server on the Data VLAN. Port 23 is used for the interface to the G700 Media Gateway with S8300 primary controller installed. Port 24 is used to connect to the Enterasys VH-2402S. (Of course, in production environments, a higher speed inter-switch link could be used.)

The following screens establish a VLAN “Voice\_Main” that will be used for voice devices. This VLAN will be configured as a tagged VLAN on those ports that connect to voice devices. Select “VLANs” from the main menu.

```
VH-2402-L3 Local Management                               Layer 3 Switch
-----
Main Menu

Basic Setup:
Switch Information
IP Setup
Remote Management Setup
Switch Settings
Configure Ports
Setup User Accounts
Serial Port Settings
Utilities
Network Monitoring
Save Changes
Reboot
Logout

Advanced Setup:
Spanning Tree
Forwarding
Filtering
Priority
Mirroring
Multicasting
VLANs
Port Trunking
Layer 3 IP Networking
```

Select “Edit 802.1Q VLANs” from the VLAN Menu.

```
VLAN Menu                                               Layer 3 Switch
-----
Edit 802.1Q VLANs

Configure 802.1Q Port Settings
```

Use the space bar to enter an “E” in the Membership row for the appropriate switch ports. All ports should show an “E” with the exception of port 22, which connects to the DHCP server on the data VLAN. Enter a “T” in the Tagging row for all ports except port 21, which is connected to the DHCP server on the voice VLAN. Enter an appropriate name in the VLAN Name field.

```

Edit 802.1Q VLANs                                     Layer 3 Switch
-----
Action: <Add/Modify> VID: [210 ]   VLAN Name: [Voice_Main ] Total Entries:7
      Port  1 to 8  9 to 16 17 to 24 25  26
Membership (E/F/-): [EEEEEEEE] [EEEEEEEE] [EEEE-EE] [-] [-]
Tagging (U/T)      : [TTTTTTTT] [TTTTTTTT] [TTTUTTT] [T] [T]
-----
APPLY

```

Using these same menus, a VLAN “Data\_Main” is established next. This VLAN will be used for the computers and workstations. The space bar is used to enter an “E” in the Membership row for the appropriate switch ports. All ports are shown as members of the data VLAN except port 21, which connects to the DHCP server on the voice VLAN, and port 23, which connects to the G700 Media Gateway. Enter a “U” in the Tagging row for all member ports since the data VLAN will be untagged. Enter an appropriate name in the VLAN Name field. Apply.

```

Edit 802.1Q VLANs                                     Layer 3 Switch
-----
Action: <Add/Modify> VID: [209 ]   VLAN Name: [Data_Main ] Total Entries:7
      Port  1 to 8  9 to 16 17 to 24 25  26
Membership (E/F/-): [EEEEEEEE] [EEEEEEEE] [EEEE-E-E] [-] [-]
Tagging (U/T)      : [UUUUUUUU] [UUUUUUUU] [UUUTUTU] [T] [T]
-----
APPLY

```

The next screens configure the default VLAN ID for untagged traffic received on a port. From the VLAN menu, choose “Configure 802.1Q Port Settings”.

```

VLAN Menu                                             Layer 3 Switch
-----
Edit 802.1Q VLANs
Configure 802.1Q Port Settings

```

Configure PVID 209, the data VLAN for all ports that may connect to computers, whether standalone or connected via an Avaya IP Telephone. Ports 1 to 20 are end-user ports. Apply.

```

Configure 802.1Q Port Settings                       Layer 3 Switch
-----
Configure Port from [1 ] to [20]
PVID [209 ] Ingress Filter<Disabled> GVRP<Disabled> GMRP Disabled APPLY
-----

```

In this configuration, port 24 is used to connect to the VH-2402S. Data traffic received from the VH-2402S will be untagged, and therefore use PVID 209. As will be seen in **Section 4.7**, the VH-2402S requires that the PVID be set to 4000 when 802.1Q is used. However, the number 4000 used by the VH-2402S is not relevant to the VH-2402-L3 configuration. Configure PVID 209 for port 24. Apply.

```

Configure 802.1Q Port Settings                       Layer 3 Switch
-----
Configure Port from [24 ] to [24]
PVID [209 ] Ingress Filter<Disabled> GVRP<Disabled> GMRP Disabled APPLY
-----

```

Port 22 connects to the DHCP server serving the data VLAN. Configure PVID 209. Apply.

```
Configure 802.1Q Port Settings                               Layer 3 Switch
-----
Configure Port from [22 ] to [22]
PVID [209 ] Ingress Filter<Disabled>  GVRP<Disabled>  GMRP Disabled  APPLY
-----
```

Port 23 connects to the G700 Media Gateway. Configure PVID 210. Apply.

```
Configure 802.1Q Port Settings                               Layer 3 Switch
-----
Configure Port from [23 ] to [23]
PVID [210 ] Ingress Filter<Disabled>  GVRP<Disabled>  GMRP Disabled  APPLY
-----
```

Port 21 connects to the DHCP server serving the voice VLAN. Configure PVID 210. Apply.

```
Configure 802.1Q Port Settings                               Layer 3 Switch
-----
Configure Port from [21 ] to [21]
PVID [210 ] Ingress Filter<Disabled>  GVRP<Disabled>  GMRP Disabled  APPLY
-----
```

### 4.4.3. Configure Router Interfaces

Select “Layer 3 IP Networking” from the Main Menu.

```
VH-2402-L3 Local Management                               Layer 3 Switch
-----
Main Menu

Basic Setup:
Switch Information
IP Setup
Remote Management Setup
Switch Settings
Configure Ports
Setup User Accounts
Serial Port Settings
Utilities
Network Monitoring
Save Changes
Reboot
Logout

Advanced Setup:
Spanning Tree
Forwarding
Filtering
Priority
Mirroring
Multicasting
VLANs
Port Trunking
Layer 3 IP Networking
```

Select “Setup IP Interface”.

```
Setup Layer 3 - IP Networking                               Layer 3 Switch
-----
IP Interface:
Setup IP Interface

Routing Protocols:
Setup RIP Configuration
```

Establish IP Address 2.2.10.1 as the router interface for VLAN 210, the voice VLAN. The interface name for the IP interface is configured to match the VLAN name. Apply.

```

Setup IP Interface                                     Layer 3 Switch
-----
Action:<Add/Modify>
Interface Name:[Voice_Main ]           VID:[210 ]
IP Address :[2.2.10.1 ]               Active:<Yes>
Subnet Mask :[255.255.255.0 ]

Total IP Interface: 1      APPLY
  
```

Using the same menu, set the router interface for VLAN 209, the data VLAN. Apply.

```

Setup IP Interface                                     Layer 3 Switch
-----
Action:<Add/Modify>
Interface Name:[Data_Main ]           VID:[209 ]
IP Address :[2.2.9.1 ]               Active:<Yes>
Subnet Mask :[255.255.255.0 ]

Total IP Interface: 2      APPLY
  
```

The following screen summarizes the IP Routing interfaces for informational purposes only. Select “Network Monitoring” from the Main Menu. Select “Routing Table” from the Network Monitoring Menu as shown below.

```

Network Monitoring Menu                               Layer 3 Switch
-----
Statistics:
  Port Utilization
  Port Error Packets
  Port Packet Analysis

Address Table:
  Browse MAC Address Table
  Browse IP Address
  Routing Table
  ARP Table

Applications:
  GVRP
  Browse Router Port
  IGMP Snooping
  IP Multicast Forwarding Table
  IGMP Group Table
  DVMRP Routing Table
  Switch History
  
```

The following screen appears showing the router interfaces established in this section.

```

Browse Routing Table                                 Layer 3 Switch
-----
Jump to Destination Address:[0.0.0.0 ]   Mask:[0.0.0.0 ]
Gateway:[0.0.0.0 ]   GO   CLEAR TABLE   Total Entries:2

-----
IP Address      Netmask      Gateway      Interface Name  Hops Protocol
-----
2.2.9.0         255.255.255.0  2.2.9.1     Data_Main       1   Local
2.2.10.0        255.255.255.0  2.2.10.1    Voice_Main      1   Local
  
```

#### 4.4.4. Save the Configuration

From the Main Menu, choose “Save Changes” to save the configuration to non-volatile memory.

Save all settings to NV-RAM... done.

Press any key to continue...

## 4.5. Configure the S8300 Media Server LSP

This section presents configuration steps for the Avaya S8300 Media Server LSP. The web configuration is similar to Section 4.1, so the supporting text describing access will not be repeated here. The following screen establishes the IP configuration.

**Configure Server**

**Steps**

- Review Notices
- Copy Settings
- Set Identities
- Configure Interfaces**
- Configure LSP
- Configure Switches
- Set DNS/DHCP
- Set Static Routes
- Configure Time Server
- Set Modem Interface
- Update System

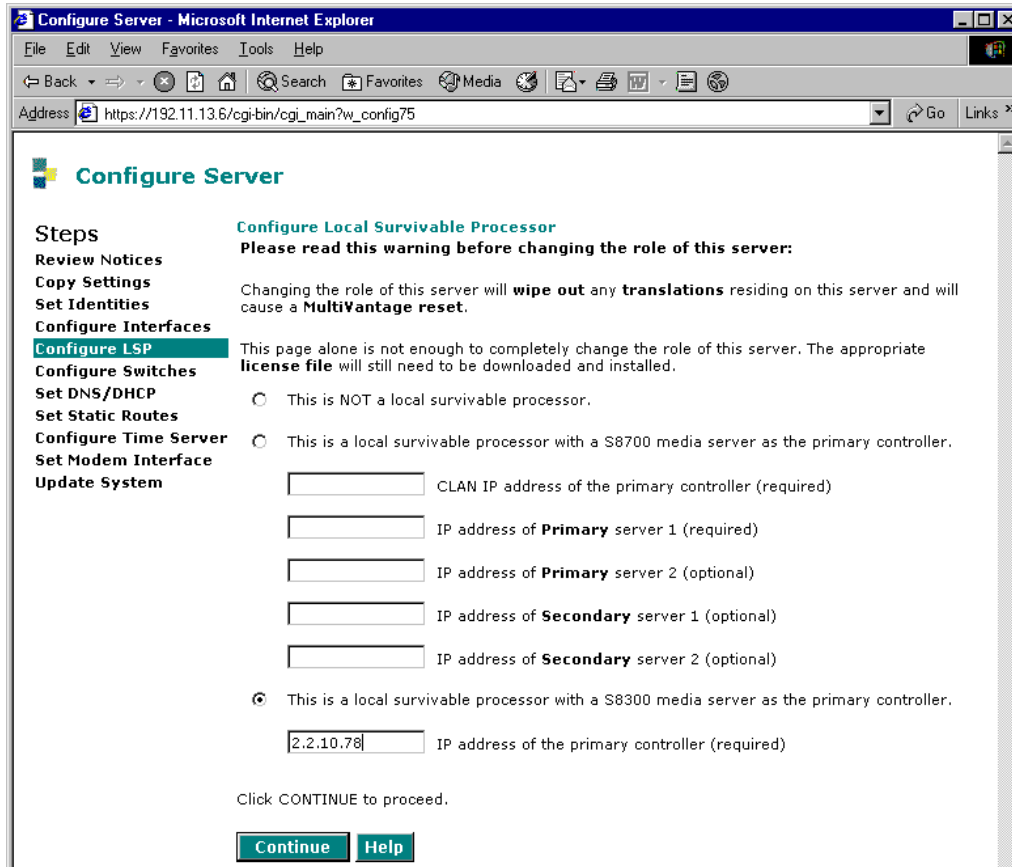
**Configure Ethernet Interfaces:**

<b>Ethernet 0:</b>	<b>Laptop</b>
IP address	192.11.13.6
Subnet mask	255.255.255.252
<b>Ethernet 1:</b>	<b>Control Network</b>
IP address server1 (S8300-LSP)	<input type="text" value="2.2.10.88"/>
Gateway	<input type="text" value="2.2.10.1"/>
Subnet mask	<input type="text" value="255.255.255.0"/>
Speed (Current speed : 100 Megabit full duplex)	AUTO SENSE

Click CONTINUE to proceed.

Click "Continue".

In the following screen, this server is set to an LSP, and the IP address of the primary controller is set to 2.2.10.78.



Notice that there is no need for a section describing the Communication Manager configuration of the LSP. The S8300 LSP receives its Communication Manager configuration automatically when translations are saved at the S8300 primary controller.

## 4.6. Configure the G700 Media Gateway with S8300 LSP installed

This section is very similar to Section 4.2. Therefore, some informational text has been omitted while retaining the configuration commands.

### 4.6.1. Configure the P330 Stack on the G700 Media Gateway

Connect to the console port as described in Section 4.3.1.

```
Welcome to P330
SW version 3.12.1
```

Enter configure mode by issuing the command “configure”. Assign IP parameters to the P330 stack processor using the “set interface” command.

```
P330-1(configure)# set interface inband 210 2.2.10.86 255.255.255.0
```

```
Management VLAN number set to 210  
Interface inband IP address set.  
You must reset the device in order for the change to take effect.
```

As the command response indicates, a reset must be performed for the change to take effect.

```
P330-1(configure)# reset 1
```

```
This command will reset module 1 and may disconnect your telnet session.  
*** Reset the module *** - do you want to continue (Y/N)? y
```

```
Resetting module 1
```

Re-login using the login credentials previously supplied. The IP route for the P330 stack will now be set, using the command syntax “set ip route <destination> <gateway>”.

```
P330-1(configure)# set ip route 0.0.0.0 2.2.10.1
```

```
destination = 0.0.0.0 gateway = 2.2.10.1
```

```
P330-1(configure)#
```

```
ROUTE NET TABLE
```

destination	gateway	flags	Refcnt	Use	Interface
0.0.0.0	2.2.10.1	3	0	0	se0
2.2.10.0	2.2.10.86	1	1	4	se0
127.1.1.0	127.1.1.1	1	7	621	se1

```
ROUTE HOST TABLE
```

destination	gateway	flags	Refcnt	Use	Interface
127.0.0.1	127.0.0.1	5	1	7	lo0

The following commands put the two Ethernet ports on the front of the G700 Media Gateway in VLAN 210, the voice VLAN.

```
P330-1(configure)# set port vlan 210 1/1
```

```
VLAN 210 modified.
```

```
VLAN Mod/Ports
```

```
-----  
210 1/1
```

```
P330-1(configure)# set port vlan 210 1/2
```

```
VLAN 210 modified.
```

```
VLAN Mod/Ports
```

```
-----  
210 1/1-2
```

The following commands set 802.1Q on the two Ethernet ports on the front of the G700 Media Gateway. Egress traffic on these ports will tag with VLAN ID 210, and the 802.1p value for

voice media and voice signaling will be set to the values configured within Communication Manager for this G700 Media Gateway's network region.

```
P330-1(configure)# set trunk 1/1 dot1q
Dot1Q VLAN tagging set on port 1/1.
P330-1(configure)# set trunk 1/2 dot1q
Dot1Q VLAN tagging set on port 1/2.
```

#### 4.6.2. Configure the G700 Media Gateway Processor (MGP)

Access the MGP CLI via the “session mgp” command; no new authentication is necessary.

```
P330-1(configure)# session mgp
```

Enter configuration mode using the “configure” command. (In the examples shown, the hostname has been set previously using “set hostname G700-with-LSP”).

```

Welcome to Media Gateway Processor
FW version 20.13.0
G700-with-LSP-???-1(super)# configure
G700-with-LSP-???-1(configure)#
```

The command “set interface mgp <vlan> <ip> <netmask>” can be used to set the IP parameters for the Avaya G700 Media Gateway Processor as follows:

```
G700-with-LSP-???-1(configure)# set interface mgp 210 2.2.10.87 255.255.255.0
The change will take effect after reboot.
```

As indicated, the user must issue a reset for the ip address assignment to take effect.

```
G700-with-LSP-???-1(configure)# reset mgp
This command will perform a hard reset.
Do you want to continue (Y/N)? y
```

After the MGP reset is complete, use “session mgp” command to reconnect. Use the “configure” command to return to configure mode. Verify the MGP configuration using the command “show interface mgp”.

```
G700-with-LSP-???-1(super)# configure
G700-with-LSP-???-1(configure)# show interface mgp
OPERATIONAL STATE: -- Currently in use --
INTERFACE  SRC  VLAN  IP ADDRESS          NETMASK             MAC ADDRESS
-----
mgp        S   210   2.2.10.87          255.255.255.0      00-04-0D-02-0C-9E
```

The following commands assign and show the default IP route for the MGP.

```
G700-with-LSP-???-1(configure)# set ip route 0.0.0.0 0.0.0.0 2.2.10.1
G700-with-LSP-???-1(configure)# show ip route mgp
```

DESTINATION	MASK	GATEWAY	INTERFACE	(F/C/U)
0.0.0.0	0.0.0.0	2.2.10.1	motfec0	(3/0/0)
2.2.10.0	255.255.255.0	2.2.10.87	motfec0	(101/0/0)

### 4.6.3. Configure the VoIP Module on the G700 Media Gateway

The next steps assign and verify an IP address for the integral Voice over IP (VoIP) component resident on the Avaya G700 Media Gateway motherboard.

```
G700-with-LSP-???-1(configure)# set interface voip v0 2.2.10.89
G700-with-LSP-???-1(configure)# reset voip v0
```

This command will perform a hard reset.  
Do you want to continue (Y/N)? **y**

```
G700-with-LSP-???-1(configure)# show interface voip v0
OPERATIONAL STATE: -- Currently in use --
```

INTERFACE	SRC	VLAN	IP ADDRESS	NETMASK	MAC ADDRESS
voip-v0	S	210	2.2.10.89	255.255.255.0	00-04-0D-02-26-9E

The “show system” command can be used to discover or confirm the serial number (shown in bold). This serial number is used as an identifier in the Communication Manager configuration as described in **Section 4.2**.

```
MG-???-1(configure)# show system
(Output abridged)
Serial No : 02J208742873
```

#### 4.6.3.1 Configure the G700 Media Gateway Controller List and Recovery

The G700 Media Gateway maintains a list of controller IP addresses. This list will be configured with the address of the Avaya S8300 Media Server primary controller, followed by the address of the Avaya S8300 Media Server LSP. The command “set mgc list” is used as follows:

```
G700-with-LSP-???-1 (configure)# set mgc list 2.2.10.78,2.2.10.88
G700-with-LSP-???-1 (configure)# show mgc list
CONFIGURED MGC HOST                DHCP SPECIFIED MGC HOST
-----
2.2.10.78                          -- Not Available --
2.2.10.88                          -- Not Available --
-- Not Available --                -- Not Available --
-- Not Available --                -- Not Available --
```

The procedures shown above assume the controller list was empty at the start. The “clear mgc list” command can be used to remove any unwanted entries from the list.

Once the G700 Media Gateway has registered with its controller, the prompt will show the media gateway number assigned by the active controller. The command “show mgc” displays the status of the H.248 link to the controller, as well as the contents of the controller list. The prompt in the screen shown below, taken after the gateway had registered, includes the media gateway number assigned by Communication Manager.

```
G700-with-LSP-002-1 (configure)# show mgc
CALL CONTROLLER STATUS
-----
Registered          : YES
Active Controller   : 2.2.10.78
H248 Link Status    : UP
H248 Link Error Code: 0x0
MGC List Management : Static

CONFIGURED MGC HOST                DHCP SPECIFIED MGC HOST
-----
2.2.10.78                          -- Not Available --
2.2.10.88                          -- Not Available --
-- Not Available --                -- Not Available --
-- Not Available --                -- Not Available --
```

The H.248 link recovery parameters discussion provided in Section 4.3.3.1 also applies to this G700 Media Gateway. The following command illustrates the recovery parameters in use.

```
G700-with-LSP-???-1 (configure)# show mgp recovery

MGP RECOVERY TIMES
-----
Primary Search      : 1
Total Search        : 30
Transition Point    : 1
```

## 4.7. Configure the Enterasys VH-2402S

The following sub-sections present the configuration of the Enterasys VH-2402S.

### 4.7.1. Configure VLANs and Ports

The following screens establish a VLAN “Voice” that will be used for voice devices. Select “Device Control Menu” from the main menu.

```
Vertical Horizon Stack Local Management
                          Main Menu

                          System Information Menu...
                          Management Setup Menu...
                          Device Control Menu...
                          Network Monitor Menu...
                          System Restart Menu...
                          Exit
```

Select “Global VLAN Configuration” from the Device Control Menu.

```
Vertical Horizon Stack Local Management
                          Device Control Menu

Port Configuration ...      Global VLAN Configuration ...
Port Information ...       Port Assignment VLAN Configuration ...
Port Security Configuration ... Egress Ports VLAN Config ...
Port Trunking Configuration ... VLAN Forbidden Ports Config ...
Port GARP Configuration ... 802.1Q VLAN Base Information ...
Port GMRP Configuration ... 802.1Q VLAN Current Table Information ...
Extended Bridge Configuration ... 802.1Q VLAN Static Table Configuration ...
Spanning Tree Configuration ... 802.1P Configuration ...
Spanning Tree Information ... IGMP Configuration ...
Mirror Port Configuration ... IGMP Member Port Configuration ...
BStorm Control Configuration ... Multicast Router Port Configuration ...
```

Press the space bar key in the Status field until "create" is displayed. Use "apply" to create the VLAN ID 210 with name “Voice”. The Status changes to Disable.

```
Vertical Horizon Stack Local Management
                          Global VLAN Configuration
(output abridged)
      VLAN ID           : 210
      VLAN Name         : Voice
      Status            : Create
```

Enable VLAN 210, by toggling the Status to “Enabled” using the space bar key. Apply.

```
Vertical Horizon Stack Local Management
                          Global VLAN Configuration
(output abridged)
      VLAN ID           : 210
      VLAN Name         : Voice
      Status            : Enabled
```

Each port, from 1-24, will be set up as an 802.1Q trunk. End-user ports are set up as a trunk to allow an IP Telephone, computer, or IP Telephone with computer attached to connect to any end-user port. A trunk port has also been used for the port connecting to the G700 Media Gateway. The port connecting to the Enterasys VH-2402-L3 will also be an 802.1Q trunk.

Select “Port Assignment VLAN Configuration” from the Device Control Menu.

```

Vertical Horizon Stack Local Management
      Device Control Menu

Port Configuration ...      Global VLAN Configuration ...
Port Information ...        Port Assignment VLAN Configuration ...
Port Security Configuration ... Egress Ports VLAN Config ...
Port Trunking Configuration ... VLAN Forbidden Ports Config ...
Port GARP Configuration ...  802.1Q VLAN Base Information ...
Port GMRP Configuration ...  802.1Q VLAN Current Table Information ...
Extended Bridge Configuration ... 802.1Q VLAN Static Table Configuration ...
Spanning Tree Configuration ...  802.1P Configuration ...
Spanning Tree Information ...    IGMP Configuration ...
Mirror Port Configuration ...    IGMP Member Port Configuration ...
BStorm Control Configuration ... Multicast Router Port Configuration ...
  
```

The VH-2402S version under test requires the PVID for the untagged VLAN on a tagged port to be set to 4000. In the “Port Assignment VLAN Configuration” screen below, when the 802.1Q Trunk parameter for a port is set to YES, the PVID is automatically set to PVID 4000. The screen shows the first 10 ports; the remaining ports are configured identically.

```

Vertical Horizon Stack Local Management
      Port Assignment VLAN Configuration
      Unit  Port PVID  802.1Q Trunk  Ingress Filter
      -----
          1      1  4000      YES          FALSE
          1      2  4000      YES          FALSE
          1      3  4000      YES          FALSE
          1      4  4000      YES          FALSE
          1      5  4000      YES          FALSE
          1      6  4000      YES          FALSE
          1      7  4000      YES          FALSE
          1      8  4000      YES          FALSE
          1      9  4000      YES          FALSE
          1     10  4000      YES          FALSE
Unit ID   : 1                               [Show]
  
```

The following procedures are shown for information purposes only. Configuration is not required. Select “Egress Ports VLAN Config...” from the Device Control Menu.

```

Vertical Horizon Stack Local Management
      Device Control Menu

Port Configuration ...      Global VLAN Configuration ...
Port Information ...        Port Assignment VLAN Configuration ...
Port Security Configuration ... Egress Ports VLAN Config ...
Port Trunking Configuration ... VLAN Forbidden Ports Config ...
Port GARP Configuration ...  802.1Q VLAN Base Information ...
Port GMRP Configuration ...  802.1Q VLAN Current Table Information ...
Extended Bridge Configuration ... 802.1Q VLAN Static Table Configuration ...
Spanning Tree Configuration ...  802.1P Configuration ...
Spanning Tree Information ...    IGMP Configuration ...
Mirror Port Configuration ...    IGMP Member Port Configuration ...
BStorm Control Configuration ... Multicast Router Port Configuration ...
  
```

Enter VLAN ID 4000 and “Show”. Observe VLAN ID 4000, the data VLAN.

```

Vertical Horizon Stack Local Management
                Egress Ports VLAN Configuration
Unit  Permanent      Dynamic      Permanent      Dynamic
     Egress Ports    Egress Ports  Untagged Ports  Untagged Ports
-----
  1   1-24
  2
  3
  4
  5
  6
  7
     Indexed by   : VID
     VLAN ID     : 4000
     VLAN Name   :
                [Show]
                [More]
    
```

Enter VLAN ID 210 and “Show”. Observe VLAN ID 210, the voice VLAN.

```

Vertical Horizon Stack Local Management
                Egress Ports VLAN Configuration
Unit  Permanent      Dynamic      Permanent      Dynamic
     Egress Ports    Egress Ports  Untagged Ports  Untagged Ports
-----
  1   1-24
  2
  3
  4
  5
  6
  7
     Indexed by   : VID
     VLAN ID     : 210
     VLAN Name   : Voice
                [Show]
                [More]
    
```

### 4.7.2. QoS Configuration

The following screens are shown for information purposes only. No changes are required to achieve a simple 802.1p based priority for voice.

Select 802.1P Configuration from the Main Menu.

```

Vertical Horizon Stack Local Management
                802.1P Configuration
                802.1P Port Priority Configuration ...
                802.1P Port Traffic Class Information ...
    
```

Select 802.1P Port Priority Configuration. The default ingress user priority is 0 for all ports. The screen shows the first 12 ports, and the next pages (not shown) are similar.

```

Vertical Horizon Stack Local Management
802.1P Port Priority Configuration : Unit 1 Port 1-12
Port      Default Ingress      Number of Egress
          User Priority      Traffic Class
-----
1         0         2
2         0         2
3         0         2
4         0         2
5         0         2
6         0         2
7         0         2
8         0         2
9         0         2
10        0         2
11        0         2
12        0         2
<APPLY> <OK> <CANCEL> <PREV UNIT> <NEXT UNIT> <PREV PAGE> <NEXT PAGE>

```

Return to the 802.1P Configuration menu, and select "802.1P Port Traffic Class Information".

```

Vertical Horizon Stack Local Management
802.1P Configuration

802.1P Port Priority Configuration ...
802.1P Port Traffic Class Information ...

```

The following information is displayed. Using this default configuration, ingress traffic with priority values 0-3 (e.g., data) will be transmitted by the low priority queue, and ingress traffic with priority values 4-7 (e.g., tagged voice media and voice signaling) will be transmitted by the high priority queue. The first 12 ports are shown; the remaining ports are similarly defaulted.

```

Vertical Horizon Stack Local Management
802.1P Port Traffic Class Information : Unit 1 Port 1-12
Port      User Priority
          0      1      2      3      4      5      6      7
-----
1  0  0  0  0  1  1  1  1
2  0  0  0  0  1  1  1  1
3  0  0  0  0  1  1  1  1
4  0  0  0  0  1  1  1  1
5  0  0  0  0  1  1  1  1
6  0  0  0  0  1  1  1  1
7  0  0  0  0  1  1  1  1
8  0  0  0  0  1  1  1  1
9  0  0  0  0  1  1  1  1
10 0  0  0  0  1  1  1  1
11 0  0  0  0  1  1  1  1
12 0  0  0  0  1  1  1  1

```

## 5. Verification Steps

The configuration described herein has been verified. This verification included, but was not limited to:

- Ensuring that computers using DHCP receive service when connected directly to the Enterasys VH-2402-L3 or the VH-2402S
- Ensuring that computers using DHCP receive service when connected to an Avaya IP Telephone that is connected to the Enterasys VH-2402-L3 or the VH-2402S
- Verifying calls among Avaya IP telephones that are all connected to the VH-2402-L3.
- Verifying calls among Avaya IP telephones that are all connected to the VH-2402S.
- Verifying calls between Avaya IP telephones that are connected to the VH-2402-L3 and Avaya IP telephones that are connected to the VH-2402S.
- Verifying calls to Avaya IP telephones that are voice mail subscribers on the IA770 Voice Messaging application. Calls cover to voice mail, and voice messages can be left.
- Retrieval of voice mail from Avaya IP Telephones.
- Forced failure of the link connecting the VH-2402-L3 with the VH-2402S to trigger the automatic fail-over of the G700 Media Gateway and IP Telephones connected to the VH-2402S to the S8300 LSP. Stable voice calls among IP telephones connected to the VH-2402S that are “ip-direct” and have a voice path prior to the forced failure of the inter-switch link continue to have a voice path after failure of the data link. When the users hang up, the IP telephones automatically register for service with the S8300 LSP.
- Fail-back of the G700 Media Gateway and IP Telephones connected to the VH-2402S to the S8300 primary controller, as directed by manual intervention on the S8300 Media Server LSP once the inter-switch data link is restored.
- Forced failure of the S8300 primary controller (e.g., shutdown via the web interface), to trigger the automatic fail-over of the G700 Media Gateways and all IP Telephones to the S8300 LSP. Note that stable voice calls among IP telephones that are “ip-direct” and have a voice path prior to the forced failure continue to have a voice path after the forced failure. When the users hang up the active calls, the IP telephones automatically register for service with the S8300 LSP. The S8300 LSP handles subsequent call processing. Service from the LSP is not limited to basic telephony, but also includes access to the full set of Communication Manager features such as meet-me conferencing, bridging, EC500, etc.
- Fail-back of the G700 Media Gateways and IP Telephones to the S8300 primary controller, as directed by manual intervention on the S8300 Media Server LSP, once the S8300 primary controller is restored to service.

The following snapshots of status screens are presented to reinforce concepts presented earlier.

## **5.1. Call Between Avaya IP Telephones Registered to S8300 Primary**

The following screen shows details for a call involving the IP Telephone with IP address 2.2.10.101 and the IP Telephone with IP address 2.2.10.102. Both Avaya IP telephones are registered with the S8300 Media Server primary controller, whose address is 2.2.10.78. Observe that the final audio path is “ip-direct” between the two telephones.

```

status station 21200                                     Page 3 of 4
                CALL CONTROL SIGNALING
                Switch          IP          IP
                Port          Switch-end IP Addr:Port  Set-end IP Addr:Port
IP Signaling: PROCR          2. 2. 10. 78  :1720      2. 2. 10.101:3264
  H.245:
  Node Name:
Network Region:          1                               1
                AUDIO CHANNEL
                Switch          IP          IP
                Port          Other-end IP Addr :Port  Set-end IP Addr:Port
G.711MU   Audio:          2. 2. 10.102  :2972      2. 2. 10.101:2900
  Node Name:
Network Region:          1                               1
  Audio Connection Type: ip-direct
  Product ID: IP_Phone
H.245 Tunneled in Q.931? does not apply
  Registration Status: registered-authenticated
  MAC Address: 00:04:0d:00:44:8c

```

## 5.2. IP Telephone Retrieving Voice Mail from IA770

This screen shows an example of the connectivity when an IP Telephone is retrieving voice mail. The IP Telephone has called the hunt group extension containing the messaging ports. The IP media path is between the IP Telephone and the VoIP media processor (2.2.10.79) in the G700 Media Gateway containing the S8300 with IA770.

```

status station 21200                                     Page 3 of 4
                CALL CONTROL SIGNALING
                Switch          IP          IP
                Port          Switch-end IP Addr:Port  Set-end IP Addr:Port
IP Signaling: PROCR          2. 2. 10. 78  :1720      2. 2. 10.101:6014
  H.245:
  Node Name:
Network Region:          1                               1
                AUDIO CHANNEL
                Switch          IP          IP
                Port          Other-end IP Addr :Port  Set-end IP Addr:Port
G.711MU   Audio:          2. 2. 10. 79  :2132      2. 2. 10.101:2838
  Node Name:
Network Region:          1                               1
  Audio Connection Type: ip-tdm
  Product ID: IP_Phone
H.245 Tunneled in Q.931? does not apply
  Registration Status: registered-authenticated
  MAC Address: 00:04:0d:00:44:8c

```

The following page shows that the call is terminating on one of the messaging ports (1v808)

```

status station 21200                                     Page 4 of 4
                CONNECTED PORTS
src port: S00003          MP      HP          src port: S00003          MP      HP
ip-start: 2. 2. 10.101:2838
ip-end: 2. 2. 10. 79:2132 001V101
audio: G.711MU          ss:off  pkt:20ms
(Output abridged)
dst port: 001V808          dst port:

```

### 5.3. Both G700 Media Gateways Registered with S8300 Primary

The following Communication Manager screen illustrates the registration status of both G700 Media Gateways.

```

list media-gateway
                MEDIA-GATEWAY REPORT
Number      Name          Identifier      IP Address      Registered?
1          G700_Main      03DR03076699  2 .2 .10 .77    Y
2          G700_with_LSP  02J208742873  2 .2 .10 .87    y

```

### 5.4. Example of Call Processed by the S8300 LSP

This call was established after a forced failure (e.g., S8300 primary controller shutdown) had caused the IP Telephones and G700 Media Gateways to register with the S8300 LSP for service. Note that the IP Telephone with IP Address 2.2.10.101 is now registered with the LSP, whose IP address is 2.2.10.88. A call is in progress with the IP Telephone with IP address 2.2.10.102.

```

status station 21200                                     Page 3 of 4
                CALL CONTROL SIGNALING
                Switch      IP      IP
                Port      Switch-end IP Addr:Port  Set-end IP Addr:Port
IP Signaling: PROCR      2. 2. 10. 88  :1720  2. 2. 10.101:4489
H.245:
Node Name:
Network Region: 1          1
                AUDIO CHANNEL
                Switch      IP      IP
                Port      Other-end IP Addr :Port  Set-end IP Addr:Port
G.711MU Audio: 2. 2. 10.102 :2856  2. 2. 10.101:3026
Node Name:
Network Region: 1          1
Audio Connection Type: ip-direct
Product ID: IP_Phone
H.245 Tunneled in Q.931? does not apply
Registration Status: registered-authenticated
MAC Address: 00:04:0d:00:44:8c

```

## 5.5. G700 Media Gateway Status while Registered with S8300 LSP

This G700 Media Gateway status command was issued after a forced failure (e.g., S8300 primary controller shutdown) had caused the IP Telephones and G700 Media Gateways to register with the S8300 LSP for service. Observe that 2.2.10.88, the IP Address of the LSP, is the Active Controller.

```
G700-with-LSP-002-1(configure)# show mgc

CALL CONTROLLER STATUS
-----
Registered          : YES
Active Controller   : 2.2.10.88
H248 Link Status    : UP
H248 Link Error Code: 0x0
MGC List Management : Static

CONFIGURED MGC HOST          DHCP SPECIFIED MGC HOST
-----
2.2.10.78                    -- Not Available --
2.2.10.88                    -- Not Available --
-- Not Available --         -- Not Available --
-- Not Available --         -- Not Available --
```

## 6. Conclusion

As illustrated in these Application Notes, the Avaya S8300 Media Server LSP can provide service in case of data networking or other failure conditions rendering the Avaya S8300 Media Server primary controller inaccessible. The Application Notes illustrate that the Avaya™ S8300 Media Server, Avaya™ G700 Media Gateway, and Avaya™ IP Telephones can interoperate with the Enterasys Vertical Horizon VH-2402-L3 and VH-2402S products. The LSP configuration described in this document should also work with other data network infrastructures. Enterasys switch ports can be configured to enable any end-user port to connect to a standalone computer, an Avaya IP Telephone, or an Avaya IP Telephone with computer attached. Separate VLANs can be used for voice and for data.

In **Section 3.3**, it was noted that the illustrated DHCP configuration was motivated in part by an interoperability problem discovered during the testing. To elaborate, Avaya has observed that with the Enterasys switch versions noted in **Table 1**, Avaya IP Telephones are unable to complete the proper DHCP sequence if DHCP Relay services are required of the Enterasys VH-2402-L3. When DHCP relay services are configured, the Avaya IP Telephone's DHCP Discover message and the DHCP Server's DHCP Offer are relayed properly. However, the Enterasys VH-2402-L3 does not forward the subsequent DHCP Request message received from an Avaya IP Telephone to the DHCP Server. As a workaround, this Application Note presents a configuration where a DHCP server is accessible on the same VLAN used for the Avaya IP Telephones (i.e., so that DHCP relay service is not required). Separate VLANs for voice and data, and IP Telephones with computers attached can still be achieved, as described herein.

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