Avaya Solution & Interoperability Test Lab

Application Notes for Enterasys Networks Matrix N5, Enterasys Networks SecureStack C2 and Enterasys Networks SecureStack B2 with Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe the procedure for Enterasys Networks Matrix N5, Enterasys Networks SecureStack C2, and Enterasys Networks SecureStack B2 switches to interoperate with Avaya Communication Manager using Avaya S8300 Media Server and Avaya G700 Media Gateway in a converged network infrastructure. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe a compliance-tested configuration utilizing Avaya S8300 Media Server, Avaya G700 Media Gateway, and Avaya 4600-series IP Telephones with Enterasys Networks Matrix N5, Enterasys Networks SecureStack C2 and Enterasys Networks SecureStack B2 switches.

The Enterasys Networks Matrix N5 is a modular five-slot chassis with an integrated Power over Ethernet (PoE) shelf. The Matrix N5 leverages Enterasys' distributed architecture whereby the switching and control functions are embedded on each module. It supports Enterasys' next-generation modules called Distributed Forwarding Engines (DFEs). The DFEs couple wire-speed throughput with advanced intelligence to recognize and prioritize traffic flows automatically.

The SecureStack C2 supports IEEE standards for switching and provides QoS support for VoIP and real-time broadcast/multicast video. The Enterasys Networks SecureStack C2 switch (model C2H124-48P) used for compliance testing features 48 ports of non-blocking 10/100 Base-TX with PoE capability, four uplink ports supporting Small Form-factor Pluggable (SFP) GBICs and two integrated stacking ports.

The SecureStack B2 supports IEEE standards for switching, provides QoS support for VoIP and video, and supports Layer 2/3/4 packet classification and marking based on a number of factors. The Enterasys Networks SecureStack B2 switch (model B2H124-48P) used for compliance testing features 48 ports of 10/100 Base TX with PoE capability, four uplink ports supporting Small Form-factor Pluggable (SFP) GBICs and two integrated stacking ports.

The configuration in **Figure 1** shows a network consisting of an Avaya S8300 Media Server with G700 Media Gateway, Avaya 4600-series IP Telephones, Infoblox DNSone and PCs connected to the Enterasys Networks Matrix N5, SecureStack C2 and SecureStack B2 switches. The Matrix N5 was used to provide Layer 3 routing. 802.1Q tagged trunks were used to uplink Layer 2 Virtual LAN (VLAN) traffic from the SecureStack C2 and SecureStack B2 switches to the Matrix N5's routing interfaces. See **Table 1** for detailed port configurations.

The tested configuration is shown in **Figure 1**.

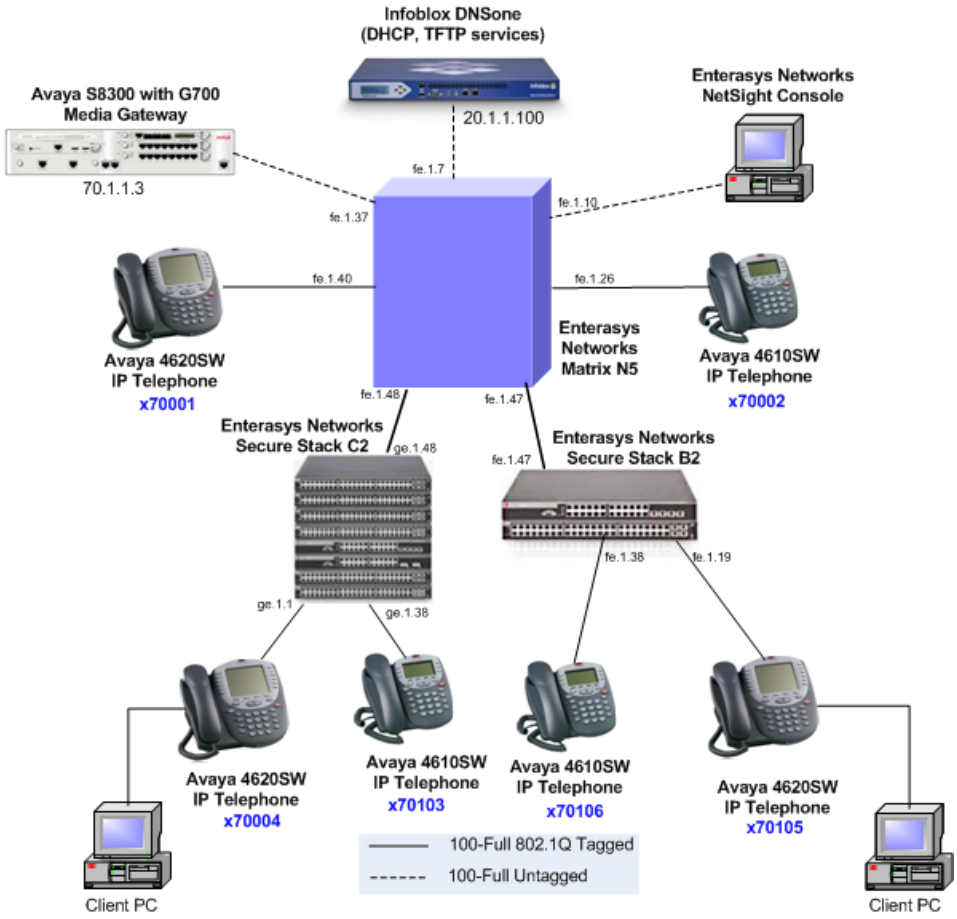


Figure 1 – Sample Network Configuration

Device	Port	PVID	Port Priority	Static VLANs	IP Interface
Avaya S8300 Media Server with G700 Media Gateway	1/1	1			Processor – 70.1.1.3/24 Voip v0 – 70.1.1.4/24 Media Gateway Processor – 70.1.1.2/24 Stack – 70.1.1.1/24
Enterasys Networks NetSight Console	NIC				20.1.1.36/24
Infoblox DNSone	NIC				20.1.1.100/24
Enterasys Networks Matrix N5	fe.1.7	2			vlan2 – 20.1.1.254/24
Enterasys Networks Matrix N5	fe.1.10	2			vlan2 – 20.1.1.254/24
Enterasys Networks Matrix N5	fe.1.26			5 tag	vlan5 – 50.1.1.254/24

Device	Port	PVID	Port Priority	Static VLANs	IP Interface
Enterasys Networks Matrix N5	fe.1.37	7	6		vlan7 – 70.1.1.254/24
Enterasys Networks Matrix N5	fe.1.40			7 tag	vlan7 – 70.1.1.254/24
Enterasys Networks Matrix N5	fe.1.47			1 tag 2 tag 3 tag 4 tag 5 tag 6 tag 7 tag	vlan1 – 10.1.1.254/24 vlan2 – 20.1.1.254/24 vlan3 – 30.1.1.254/24 vlan4 – 40.1.1.254/24 vlan5 – 50.1.1.254/24 vlan6 – 60.1.1.254/24 vlan7 – 70.1.1.254/24
Enterasys Networks Matrix N5	fe.1.48			1 tag 2 tag 3 tag 4 tag 5 tag 6 tag 7 tag	vlan1 – 10.1.1.254/24 vlan2 – 20.1.1.254/24 vlan3 – 30.1.1.254/24 vlan4 – 40.1.1.254/24 vlan5 – 50.1.1.254/24 vlan6 – 60.1.1.254/24 vlan7 – 70.1.1.254/24
Enterasys Networks SecureStack C2	ge.1.1	1		6 tag	vlan1 – 10.1.1.254/24 vlan6 – 60.1.1.254/24
Enterasys Networks SecureStack C2	ge.1.38	3		4 tag	vlan3 – 30.1.1.254/24 vlan4 – 40.1.1.254/24
Enterasys Networks SecureStack C2	ge.1.48			1 tag 2 tag 3 tag 4 tag 5 tag 6 tag 7 tag	vlan1 – 10.1.1.254/24 vlan2 – 20.1.1.254/24 vlan3 – 30.1.1.254/24 vlan4 – 40.1.1.254/24 vlan5 – 50.1.1.254/24 vlan6 – 60.1.1.254/24 vlan7 – 70.1.1.254/24
Enterasys Networks SecureStack B2	fe.1.19	3		4 tag	vlan3 – 30.1.1.254/24 vlan4 – 40.1.1.254/24
Enterasys Networks SecureStack B2	fe.1.38	7			vlan7 – 70.1.1.254/24
Enterasys Networks SecureStack B2	ge.1.47			1 tag 2 tag 3 tag 4 tag 5 tag 6 tag 7 tag	vlan1 – 10.1.1.254/24 vlan2 – 20.1.1.254/24 vlan3 – 30.1.1.254/24 vlan4 – 40.1.1.254/24 vlan5 – 50.1.1.254/24 vlan6 – 60.1.1.254/24 vlan7 – 70.1.1.254/24

Table 1 – Connectivity Matrix

Table 2 shows the DHCP Option 176 string settings the Infoblox DNSone DHCP server must provide for the Avaya 4600-series IP Telephones to register with Avaya Communication Manager.

VLAN	Scope	Option 3 Router	Option 176 String (do not insert blanks in string)
VLAN1	10.1.1.0/24	10.1.1.254	L2Q=1,L2QVLAN=6
VLAN2	20.1.1.0/24	20.1.1.254	
VLAN3	30.1.1.0/24	30.1.1.254	L2Q=1,L2QVLAN=4
VLAN4	40.1.1.0/24	40.1.1.254	MCIPADD=70.1.1.3,MCPORT=1719,TFTPSRVR=20.1.1.100
VLAN5	50.1.1.0/24	50.1.1.254	MCIPADD=70.1.1.3,MCPORT=1719,TFTPSRVR=20.1.1.100
VLAN6	60.1.1.0/24	60.1.1.254	MCIPADD=70.1.1.3,MCPORT=1719,TFTPSRVR=20.1.1.100
VLAN7	70.1.1.0/24	70.1.1.254	MCIPADD=70.1.1.3,MCPORT=1719,TFTPSRVR=20.1.1.100

Table 2 – DHCP Option 176 by VLAN Information

2. Equipment and Software Validated

The following equipment and software/firmware were used for the sample configuration provided:

Equipment	Software/Firmware
Avaya S8300 Media Server with G700 Media Gateway	Avaya Communication Manager 3.01 (R013x.00.1.346.0)
Avaya 4600 Series IP Telephones	2.3 (H.323)
Enterasys Networks Matrix N5	05.14.04
Enterasys Networks SecureStack C2	03.01.52
Enterasys Networks SecureStack B2	01.01.41
Enterasys Networks NetSight Console	2.1
Infoblox DNSone	3.2r1-1

Table 3 – Equipment and Software / Firmware Versions Validated

3. Configure Enterasys Networks Matrix N5 Switch

The Enterasys Networks Matrix N5 switch provides a web interface, a Command Line Interface (CLI) as well as the Enterasys Networks NetSight Console for administration. These Application Notes present administration via the CLI for configuring the Enterasys Networks Matrix N5 for this solution.

For all other provisioning information, please refer to Enterasys Networks product documentation in references [2], [3], and [4].

Step	Description
	The configuration in this section was captured after the compliance test.
1.	Create and assign tag values to applicable Virtual LANs (VLANs), assign IP interfaces to the VLANs and administer the target DHCP server for the DHCP relayed requests. **Note**: The ip helper IP address is the DHCP server. `Matrix>Router1#config t`

Step	Description
	Matrix>Router1(config-if)#**interface vlan 1** Matrix>Router1(config-if(vlan1))#**ip address 10.1.1.254 255.255.255.0** Matrix>Router1(config-if(vlan1))#**ip helper-address 20.1.1.100** Matrix>Router1(config-if(vlan1))#**no shutdown** Matrix>Router1(config-if(vlan1))#**exit** Matrix>Router1(config-if)#**interface vlan 2** Matrix>Router1(config-if(vlan2))#**ip address 20.1.1.254 255.255.255.0** Matrix>Router1(config-if(vlan2))#**ip helper-address 20.1.1.100** Matrix>Router1(config-if(vlan2))#**no shutdown** Matrix>Router1(config-if(vlan2))#**exit** Matrix>Router1(config-if)#**interface vlan 3** Matrix>Router1(config-if(vlan3))#**ip address 30.1.1.254 255.255.255.0** Matrix>Router1(config-if(vlan3))#**ip helper-address 20.1.1.100** Matrix>Router1(config-if(vlan3))#**no shutdown** Matrix>Router1(config-if(vlan3))#**exit** Matrix>Router1(config-if)#**interface vlan 4** Matrix>Router1(config-if(vlan4))#**ip address 40.1.1.254 255.255.255.0** Matrix>Router1(config-if(vlan4))#**ip helper-address 20.1.1.100** Matrix>Router1(config-if(vlan4))#**no shutdown** Matrix>Router1(config-if(vlan4))#**exit** Matrix>Router1(config-if)#**interface vlan 5** Matrix>Router1(config-if(vlan5))#**ip address 50.1.1.254 255.255.255.0** Matrix>Router1(config-if(vlan5))#**ip helper-address 20.1.1.100** Matrix>Router1(config-if(vlan5))#**no shutdown** Matrix>Router1(config-if(vlan5))#**exit** Matrix>Router1(config-if)#**interface vlan 6** Matrix>Router1(config-if(vlan6))#**ip address 60.1.1.254 255.255.255.0** Matrix>Router1(config-if(vlan6))#**ip helper-address 20.1.1.100** Matrix>Router1(config-if(vlan6))#**no shutdown** Matrix>Router1(config-if(vlan6))#**exit** Matrix>Router1(config-if)#**interface vlan 7** Matrix>Router1(config-if(vlan7))#**ip address 70.1.1.254 255.255.255.0** Matrix>Router1(config-if(vlan7))#**ip helper-address 20.1.1.100** Matrix>Router1(config-if(vlan7))#**no shutdown** Matrix>Router1(config-if(vlan7))#**exit** Matrix>Router1(config-if)#**exit**
2.	Configure interface information for the switch. Matrix>Router1#**set ip address 20.1.1.1 mask 255.255.255.0** Matrix>Router1#**set ip route default 20.1.1.254**
3.	Assign VLANs to ports for Infoblox DNSone, Enterasys Networks Netsight Console PC, and Avaya S8300 with G700 Media Gateway as listed in **Table 1**. Matrix>Router1#**clear vlan egress 1 fe.1.7;fe.1.10;fe.1.26;fe.1.37; fe.1.40** Matrix>Router1#**set port vlan fe.1.7 2** Matrix>Router1#**set port vlan fe.1.10 2** Matrix>Router1#**set port vlan fe.1.37 7** Matrix>Router1#**set vlan egress 2 fe.1.7;fe.1.10 untagged** Matrix>Router1#**set vlan egress 7 fe.1.37 untagged** Matrix>Router1#**set vlan dynamic egress 1 enable**

Step	Description

4.	Statically assign the VLANs to ports connected to Avaya 4600-series IP Telephones as listed in **Table 1**.
	`Matrix>Router1#set port vlan fe.1.26 5`
	`Matrix>Router1#set port vlan fe.1.40 7`
	`Matrix>Router1#set vlan egress 5 fe.1.26 tagged`
	`Matrix>Router1#set vlan egress 7 fe.1.40 tagged`

5.	Statically assign VLANs to neighboring Secure Stack C2 port as listed in **Table 1**.
	`Matrix>Router1#set vlan egress 1 fe.1.48 tagged`
	`Matrix>Router1#set vlan egress 2 fe.1.48 tagged`
	`Matrix>Router1#set vlan egress 3 fe.1.48 tagged`
	`Matrix>Router1#set vlan egress 4 fe.1.48 tagged`
	`Matrix>Router1#set vlan egress 5 fe.1.48 tagged`
	`Matrix>Router1#set vlan egress 6 fe.1.48 tagged`
	`Matrix>Router1#set vlan egress 7 fe.1.48 tagged`

6.	Statically assign VLANs to neighboring Secure Stack B2 port as listed in **Table 1**.
	`Matrix>Router1#set vlan egress 1 fe.1.47 tagged`
	`Matrix>Router1#set vlan egress 2 fe.1.47 tagged`
	`Matrix>Router1#set vlan egress 3 fe.1.47 tagged`
	`Matrix>Router1#set vlan egress 4 fe.1.47 tagged`
	`Matrix>Router1#set vlan egress 5 fe.1.47 tagged`
	`Matrix>Router1#set vlan egress 6 fe.1.47 tagged`
	`Matrix>Router1#set vlan egress 7 fe.1.47 tagged`

7.	Configure the Avaya Communication Manager port with priority 6 (high). `Matrix>Router1#set port priority fe.1.37 6`
8.	Save the configuration. This completes configuration of the Matrix N5. `Matrix>Router1#show config outfile slot1/n5config`

4. Configure Enterasys Networks SecureStack C2 Switch

The SecureStack C2 switch provides a web interface, a Command Line Interface (CLI) as well as the Enterasys Networks NetSight Console for administration. These Application Notes present administration via the CLI for configuring the SecureStack C2 for this solution.

For all other provisioning information, please refer to Enterasys Networks product documentation in references [2], [3], and [4].

Step	Description
	The configuration in this section was captured after the compliance test.

1.	Create applicable Virtual LANs.
	`C2 (su)->set vlan create 2`
	`C2 (su)->set vlan create 3`
	`C2 (su)->set vlan create 4`
	`C2 (su)->set vlan create 5`
	`C2 (su)->set vlan create 6`
	`C2 (su)->set vlan create 7`

2.	Configure interface information for the switch. `C2 (su)->set ip address 20.1.1.3 mask 255.255.255.0 gateway 20.1.1.254`

3.	Statically assign the VLANs to ports connected to Avaya 4600-series IP Telephones as listed in **Table 1**.
	`C2 (su)->clear vlan egress 1 ge.1.38`
	`C2 (su)->set port vlan ge.1.38 3`
	`C2 (su)->set vlan egress 6 ge.1.1 tagged`
	`C2 (su)->set vlan egress 4 ge.1.38 tagged`

4.	Statically assign VLANs to neighboring Matrix N5 port as listed in **Table 1**.
	`C2 (su)->set vlan egress 1 ge.1.48 tagged`
	`C2 (su)->set vlan egress 2 ge.1.48 tagged`
	`C2 (su)->set vlan egress 3 ge.1.48 tagged`
	`C2 (su)->set vlan egress 4 ge.1.48 tagged`
	`C2 (su)->set vlan egress 5 ge.1.48 tagged`
	`C2 (su)->set vlan egress 6 ge.1.48 tagged`
	`C2 (su)->set vlan egress 7 ge.1.48 tagged`

5.	Save the configuration. This completes configuration of the SecureStack C2. `C2 (su)->show config outfile configs/c2config`

5. Configure Enterasys Networks SecureStack B2 Switch

The SecureStack B2 switch provides a web interface, a Command Line Interface (CLI) as well as the Enterasys Networks NetSight Console for administration. These Application Notes present administration via the CLI for configuring the SecureStack B2 for this solution.

For all other provisioning information, please refer to Enterasys Networks product documentation in references [2], [3], and [4].

Step	Description
	The configuration in this section was captured after the compliance test.

1.	Create applicable Virtual LANs.
	`B2 (su)->set vlan create 2`
	`B2 (su)->set vlan create 3`
	`B2 (su)->set vlan create 4`
	`B2 (su)->set vlan create 5`
	`B2 (su)->set vlan create 6`
	`B2 (su)->set vlan create 7`

2.	Configure interface information for the switch. `B2 (su)->set ip address 20.1.1.2 mask 255.255.255.0 gateway 20.1.1.254`

3.	Statically assign the VLANs to ports connected to Avaya 4600-series IP Telephones as listed in **Table 1**.
	`B2 (su)->clear vlan egress 1 fe.1.19;fe.1.38`
	`B2 (su)->set port vlan fe.1.19 3`
	`B2 (su)->set port vlan fe.1.38 7`
	`B2 (su)->set vlan egress 4 fe.1.19 tagged`
	`B2 (su)->set vlan egress 7 fe.1.38 untagged`

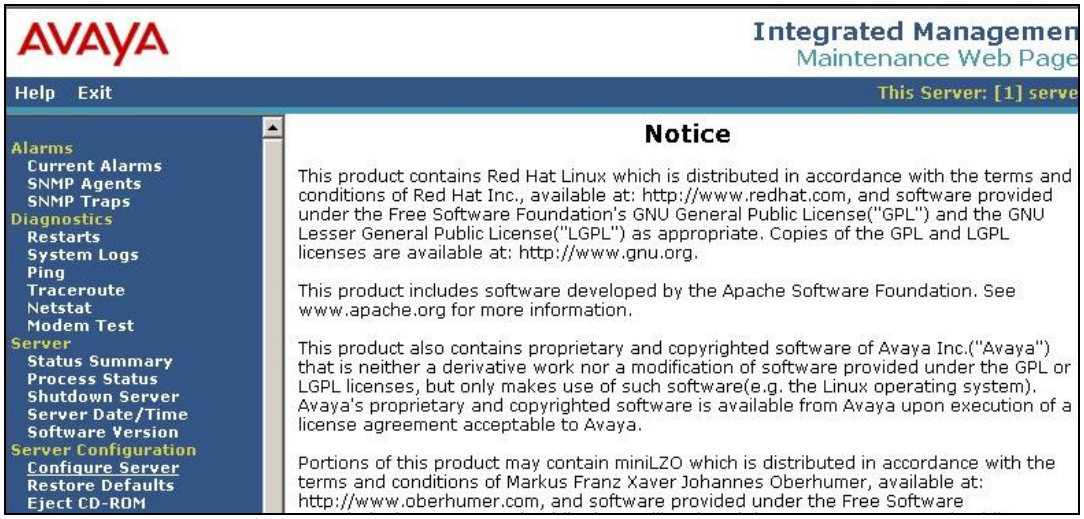
4.	Enable GVRP (GARP[1] VLAN Registration Protocol) to neighboring Matrix N5 switch. GVRP prunes trunk links so that only active VLANs will be sent across the trunk connection. `B2 (su)->set gvrp enable fe.1.47`
5.	Save the configuration. This completes configuration of the SecureStack B2. `B2 (su)->show config outfile configs/b2config`

6. Configure Avaya S8300 Media Server

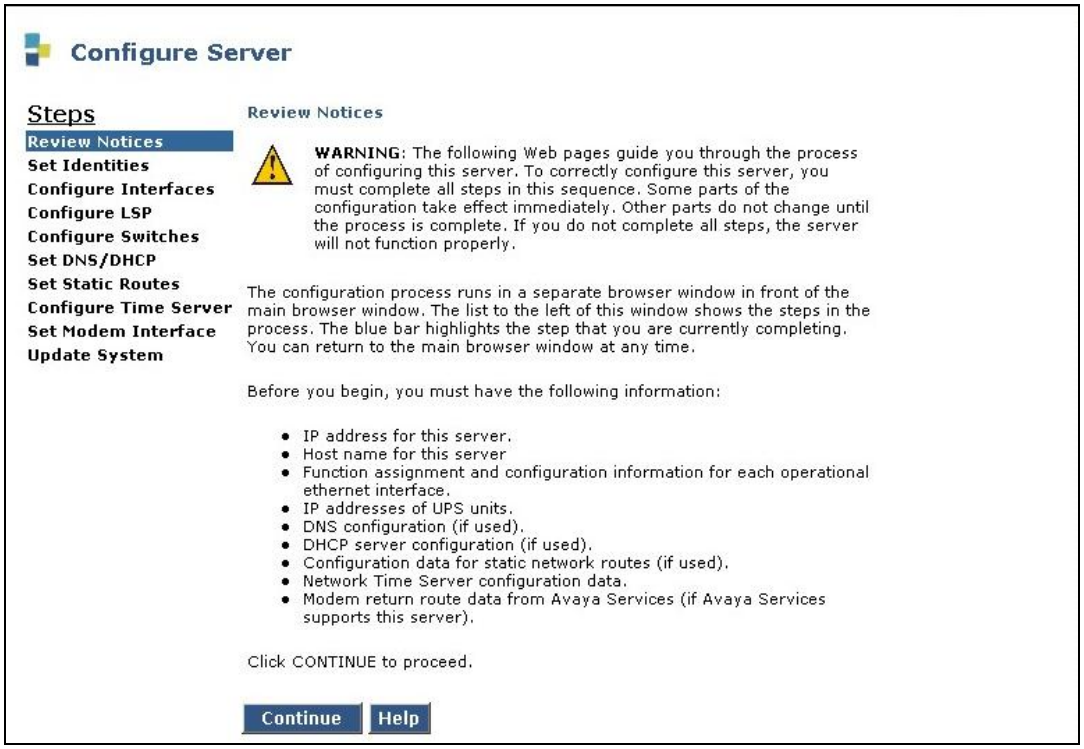
The information provided in this section describes the steps required for setting up the Avaya S8300 Media Server via the web interface for the configuration described in these Application Notes.

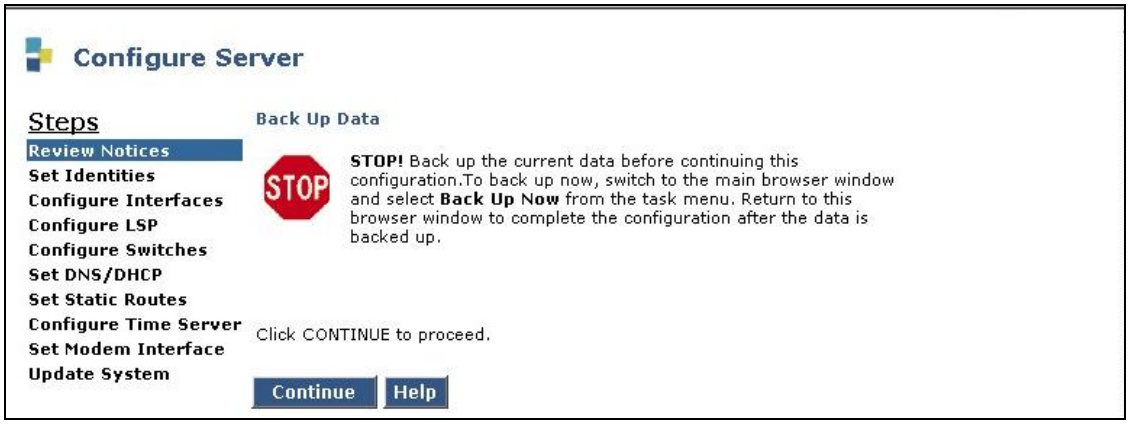
Step	Description
1.	Establish a web browser to the service port of the Avaya S8300 Media Server (e.g., http://192. 11.13.6).
2.	Enter a valid Logon ID with administrative privileges.

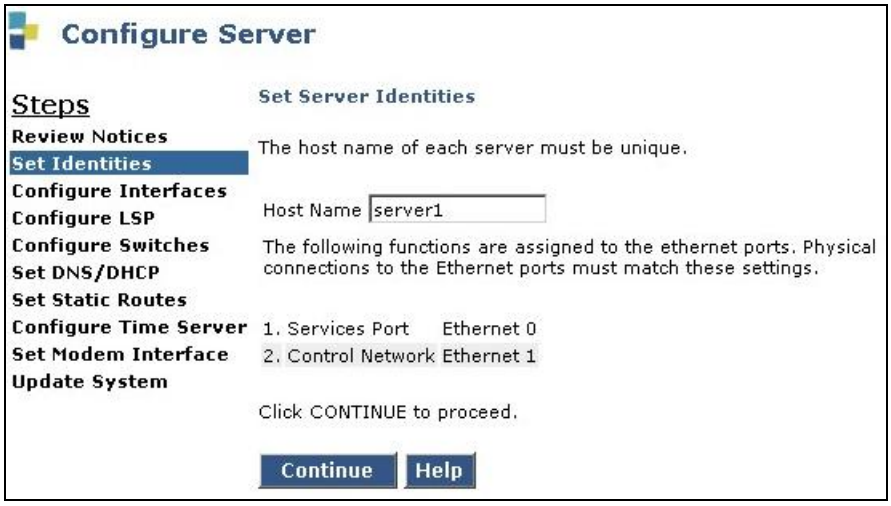
[1] Generic Attribute Registration Protocol

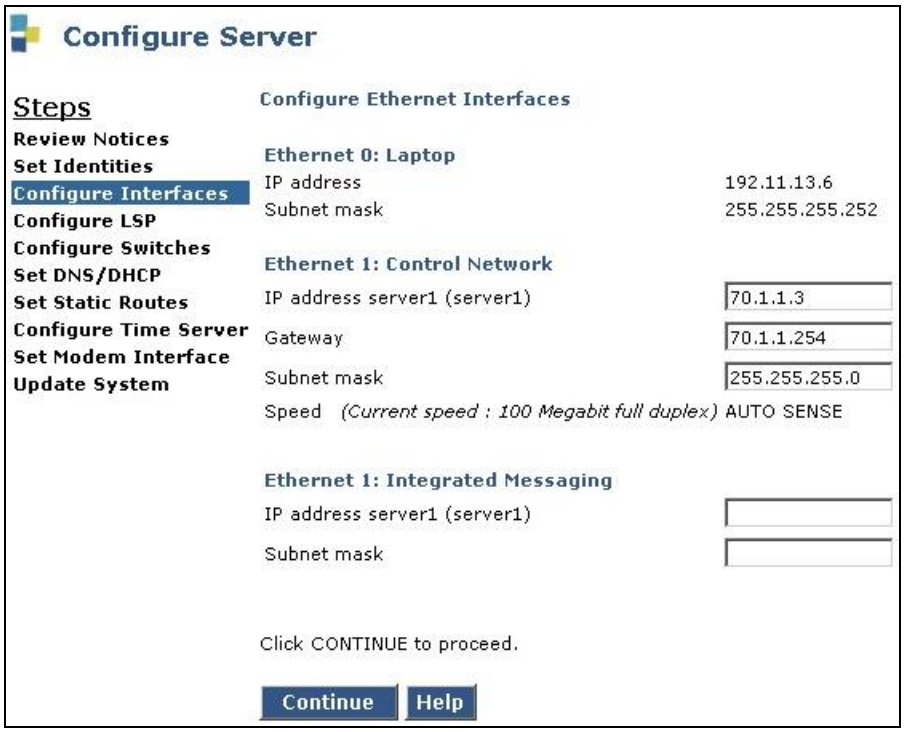
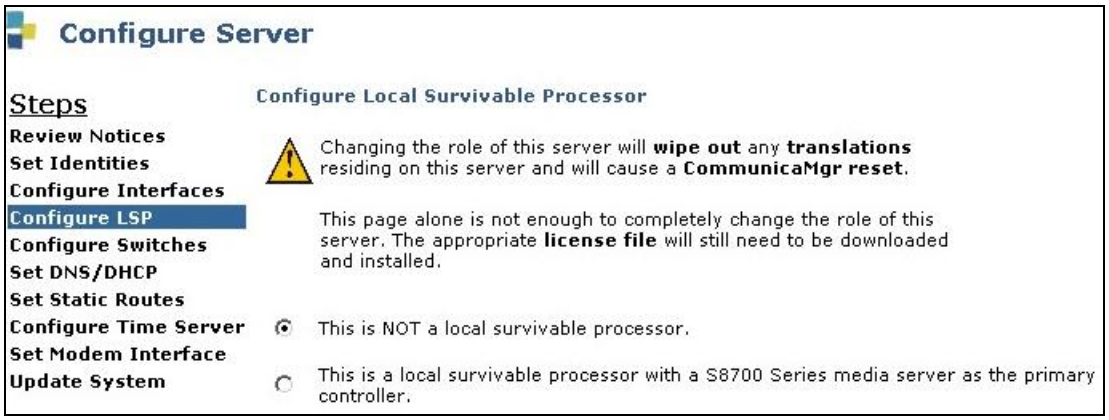
Step	Description
3.	In the web page that appears, click **Launch Maintenance Web Interface**. 
4.	In the web page that appears, click **Configure Server** from the left navigation pane. 

Step	Description
5.	In the Configure Server page that appears, observe the "Review Notices" and click **Continue**.
6.	In the next page that appears, observe "Back Up Data" and click **Continue**.





Step	Description
7.	In the next page that appears, select **Configure all services using the wizard** and click **Continue**. 
8.	In the next page that appears, enter a hostname for the server and click **Continue**. 

Step	Description
9.	In the next page that appears, set **IP address server1 (server1)** to ***70.1.1.3***, **Gateway** to ***70.1.1.254***, **Subnet mask** to ***255.255.255.0*** and click **Continue**. 
10.	In the next page that appears, select **This is NOT a local survivable processor** and click **Continue** (not shown). 

Step	Description
11.	Select system defaults for the remaining configuration options until the page with "Update System" appears, click **Continue** to complete server administration. 

7. Configure Avaya G700 Media Gateway

The following commands were executed using the Command Line Interface on Avaya G700 Media Gateway through the console port. The configuration described below was used for these Application Notes.

Step	Description

1.	Configure the stack processor inband management IP address and default route.
	`P330-1(super)# set interface inband 1 70.1.1.1 255.255.255.0`
	`P330-1(super)# set ip route 0.0.0.0 70.1.1.254`

2.	Use the "session mgp" command to log into the Media Gateway Processor. Enter the "config" command to enter configuration mode. Use the "show system" command to observe the serial number, which will be provisioned in Avaya Communication Manager in a subsequent step.
	`MG-001-1(super)# show system`
	
	`Uptime(d,h:m:s): 26, 21:08:37`
	
	`System Name : -- Empty --`
	`System Location: -- Empty --`
	`System Contact : -- Empty --`
	`MAC Address : 00-04-0D-02-08-75`
	`Serial No : 02DR06751838`
	`Model No : G700`
	`HW Vintage : 00`
	`HW Suffix : A`
	`FW Vintage : 22.16.0`
	
	`Media Gateway Power Supplies`
	`VOLTAGE(V) ACTUAL(V) STATUS`
	`---------- ---------- ----------`
	`DSP Complex 3.4 3.390 OK`
	`MGP 5.1 5.090 OK`
	`Media Modules -48.0 -49.000 OK`
	`VoIP DSP 1.6 1.590 OK`
	`VoIP CPU 2.5 2.500 OK`

3.	Configure the MGP and VoIP v0 IP interfaces.
	`MG-001-1(super)# set interface mgp 1 70.1.1.2 255.255.255.0`
	`MG-001-1(super)# set interface voip v0 70.1.1.4`

4.	Configure the MGP to use the Enterasys Networks Matrix N5 as the default static route. `MG-001-1(super)# set ip route mgp 0.0.0.0 0.0.0.0 70.1.1.254`
5.	Configure the Media Gateway Controller (MGC) list with the Avaya S8300 Media Server IP address. `MG-001-1(super)# set mgc list 70.1.1.3`

8. Configure Avaya Communication Manager

The following commands were performed using the System Access Terminal (SAT). It is assumed that all necessary licensed features have been enabled.

Step	Description
1.	Add the Avaya G700 Media Gateway. From the SAT prompt, enter **add media-gateway 1**. In the form that appears, set **Type** to ***g700***, **Name** to ***G700GW***, and **Serial No** to the serial number of the Media Gateway obtained in Section 7, Step 2. **add media-gateway 1** MEDIA GATEWAY Number: **1** IP Address: Type: **g700** FW Version/HW Vintage: Name: **G700GW** MAC Address: Serial No: **02DR06751838** Encrypt Link? n Network Region: 1 Location: 1 Registered? n Controller IP Address: Recovery Rule: none Site Data: Slot Module Type Name V1:
2.	Configure IP Codec Set 1 to utilize G.711MU codec. From the SAT prompt, enter **change ip-codec-set 1**. In the form that appears, verify **Audio Codec** is set to ***G.711MU***. **change ip-codec-set 1** Page 1 of 2 IP Codec Set Codec Set: 1 Audio Codec / Silence Suppression / Frames Per Pkt / Packet Size(ms) 1: G.711MU n 2 20 2: 3: 4: 5: 6: 7:

Step	Description
3.	Configure IP Network Region 1 to use Codec Set 1 and allow all IP-IP Direct connections. From the SAT prompt, enter change **ip-network-region 1**. In the form that appears, set **Codec Set** to ***1***, **Intra-region IP-IP Direct Audio** to ***yes*** and **Inter-region IP-IP Direct Audio** to ***yes***. **change ip-network-region 1** Page 1 of 19 IP NETWORK REGION Region: 1 Location: Authoritative Domain: Name: MEDIA PARAMETERS Intra-region IP-IP Direct Audio: **yes** Codec Set: **1** Inter-region IP-IP Direct Audio: **yes** UDP Port Min: 2048 IP Audio Hairpinning? y UDP Port Max: 3028 DIFFSERV/TOS PARAMETERS RTCP Reporting Enabled? y Call Control PHB Value: 34 RTCP MONITOR SERVER PARAMETERS Audio PHB Value: 46 Use Default Server Parameters? y Video PHB Value: 26 802.1P/Q PARAMETERS Call Control 802.1p Priority: 6 Audio 802.1p Priority: 6 Video 802.1p Priority: 5 AUDIO RESOURCE RESERVATION PARAMETERS H.323 IP ENDPOINTS RSVP Enabled? n H.323 Link Bounce Recovery? y Idle Traffic Interval (sec): 20 Keep-Alive Interval (sec): 5 Keep-Alive Count: 5
4.	Add the necessary 4600 Series IP Telephone stations for testing purposes. Add a security code, and select unique names to identify callers during verification. Station 70001 shown below is an example where **Extension** is set to ***70001***, **Type** is set to ***4620***, **Port** is set to ***IP***, **Name** is set to ***John G*** and **Security Code** is set to ***1234*** after entering **add station 70001** from the SAT prompt. **add station 70001** Page 1 of 4 STATION Extension: **70001** Lock Messages? n BCC: 0 Type: **4620** Security Code: **1234** TN: 1 Port: **IP** Coverage Path 1: COR: 1 Name: **John G** Coverage Path 2: COS: 1 Hunt-to Station: STATION OPTIONS Loss Group: 19 Personalized Ringing Pattern: 1 Message Lamp Ext: 70001 Speakerphone: 2-way Mute Button Enabled? y Display Language: english Expansion Module? n Survivable GK Node Name: Survivable COR: internal Media Complex Ext: Survivable Trunk Dest? y IP SoftPhone? n

Step	Description
5.	Save Avaya Communication Manager translations. From the SAT prompt, enter **save translation**. **save translation** SAVE TRANSLATION Command Completion Status Error Code Success 0

9. Configure Infoblox DNSone (DHCP/TFTP Server)

The requirements for the DHCP server used in this configuration are to provide scopes to support voice and data hosts on different VLANs simultaneously as listed in **Table 2**. For information on how to configure the Infoblox DNSone (20.1.1.100/24) to provide DHCP and TFTP services for this configuration, please refer to the Application Notes in reference [1]. A summary of the information required for the configuration in these Application Notes follows below.

The "DataEdge" scope includes the appropriate default gateway option 003 and custom option 176, which informs Avaya 4600-series IP Telephones attempting to boot on native PVID 1 that the Avaya 4600-series IP Telephones must tag on VLAN 6 and rediscover an appropriate IP address on the newly assigned voice VLAN.

```
Scope [10.1.1.0] DataEdge
      Address Pool
            Start Address = 10.1.1.120
            End Address = 10.1.1.130
      Option 003 Router = 10.1.1.254
      Option 176 IP Telephone = L2Q=1,L2QVLAN=6
```

The "VoiceEdge" scope includes the appropriate default gateway option 003 and custom option 176, which informs Avaya 4600-series IP Telephones of the Avaya Communication Manager, registration port and TFTP server IP address.

```
Scope [60.1.1.0] VoiceEdge
      Address Pool
            Start Address = 60.1.1.120
            End Address = 60.1.1.130
      Option 003 Router = 60.1.1.254
      Option 176 IP Telephone =
          MCIPADD=70.1.1.3,MCPORT=1719,TFTPSRVR=20.1.1.100
```

A similar arrangement was used for data VLAN 3 with voice VLAN 4. VLAN 5 and VLAN 7 are configured as VoiceEdge VLANs.

10. Interoperability Compliance Testing

The Interoperability Compliance Test included feature functionality and performance testing. Feature functionality testing examined the Enterasys Networks Matrix N5, SecureStack C2 and SecureStack B2 switches ability to forward Voice over IP (VoIP) signaling, audio and data co-existing without any impact on voice quality. Performance tests verified that the configuration remained stable under load.

10.1. General Test Approach

Feature functionality testing was performed manually. Calls were made between stations that were registered to Avaya Communication Manager. A protocol analyzer was used to monitor call signaling and audio flows to ensure that proper QoS markers at Layer 2 and Layer 3 were being relayed for the configuration. Performance testing was done using a data traffic generator to stress the QoS functionality of the devices over a one-hour period.

10.2. Test Results

All feature functionality and performance test cases passed successfully. A one-hour test was conducted with UDP traffic saturating the 100 Mbps LAN link between the Matrix N5 switch and connected SecureStack C2 and B2 switches. Various calls were placed between phones without any call loss or voice quality degradation.

11. Verification Steps

From the SecureStack C2 and SecureStack B2

- Verify connectivity from the SecureStack C2 and SecureStack B2 to the Matrix N5 using ping command.

```
C2 (su)->ping 20.1.1.254
Send count=3, Received count=3, from 20.1.1.254
```

From the Avaya Communication Manager

- From the SAT, confirm Media Gateway registration.

```
display media-gateway 1
                               MEDIA GATEWAY
        Number: 1                                IP Address: 70 .1  .1  .2
          Type: g700               FW Version/HW Vintage: 22 .16 .0  /0
          Name: G700GW                        MAC Address: 00:04:0d:02:08:75
     Serial No: 02DR06751838                 Encrypt Link? n
 Network Region: 1                             Location: 1
    Registered? y                 Controller IP Address: 70 .1  .1  .3
  Recovery Rule: none                          Site Data:
      Slot   Module Type              Name
       V1:   S8300                    ICC MM
       V2:   MM712                    DCP MM
       V3:   MM710                    DS1 MM
       V4:   MM711                    ANA MM

       V8:
       V9:   gateway-announcements    ANN VMM
```

- From the MGP command prompt, verify that the MGP has registered with the MGC.

```
MG-001-1(configure)# show mgc

CALL CONTROLLER STATUS
--------------------------------------
Registered          : YES
Active Controller   : 70.1.1.3
H248 Link Status    : UP
H248 Link Error Code: 0x0

CONFIGURED MGC HOST
---------------------
70.1.1.3
-- Not Available --
-- Not Available --
-- Not Available --
```

- Verify that the default MGP route is configured.

```
MG-001-1(super)# show ip route mgp

DESTINATION      MASK             GATEWAY          INTERFACE   (F/C/U)
---------------  ---------------  ---------------  ----------  -----------
0.0.0.0          0.0.0.0          70.1.1.254       motfec0     (3/0/41)
70.1.1.0         255.255.255.0    70.1.1.2         motfec0     (101/0/0)
```

- Check that the VoIP static route is also configured properly.

```
MG-001-1(super)# show ip route voip v0

DESTINATION      MASK             GATEWAY
---------------  ---------------  ---------------
0.0.0.0          0.0.0.0          70.1.1.254
70.1.1.0         255.255.255.0    70.1.1.4
```

- Confirm that the MGP and VoIP v0 interfaces are properly configured.

```
MG-001-1(super)# show interface

OPERATIONAL STATE: -- Currently in use --

INTERFACE  SRC  VLAN  IP ADDRESS       NETMASK          MAC ADDRESS
---------  ---  ----  ---------------  ---------------  -----------------
mgp        S    1     70.1.1.2         255.255.255.0    00-04-0D-02-08-75
voip-v0    S    1     70.1.1.4         255.255.255.0    00-04-0D-02-22-75
```

- Verify inband management interface.

```
P330-1(super)# show interface inband
   Interface Name     VLAN    IP address         Netmask
--------------------  ----  ---------------  ---------------
inband                1     70.1.1.1         255.255.255.0
```

- Verify default gateway for management purposes.

```
P330-1(super)# show ip route
Destination        Gateway
-------------      -------------
0.0.0.0            70.1.1.254
```

- Verify that port speed and duplex negotiated properly with the Matrix N5 switch.

```
P330-1(super)# show port 1/1
Port   Name            Status    Vlan Level  Neg     Dup. Spd. Type
------ --------------- --------- ---- ------ ------- ---- ---- ----------------
 1/1   NO NAME         connected 1    0      enable  full 100M 10/100Base-Tx
```

- Verify that the IP Telephones on the tagged voice ports power up, obtain initial DHCP address from the data VLAN, tag on the voice VLAN based on option 176 values and successfully complete the registration process.
- Verify that the IP Telephones on the untagged voice ports power up, obtain initial DHCP address from the voice VLAN based on option 176 values and successfully complete the registration process.
- Place IP-to-IP calls and verify audio quality.

12. Support

For technical support on the Enterasys Networks Matrix N5, Enterasys Networks SecureStack C2 and Enterasys Networks SecureStack B2 Switches, contact the Enterasys Networks Tech Support at 800-872-8440. Technical support email can be sent to support@enterasys.com.

13. Conclusion

These Application Notes describe administration steps, which allowed the Enterasys Networks Matrix N5, Enterasys Networks SecuresStack C2, and Enterasys Networks SecureStack B2 switches to interoperate with Avaya S8300 Media Server with G700 Media Gateway for the purposes of providing basic network connectivity and Layer 2 Quality of Service (QoS) via 802.1p prioritization. Features and functionality were successfully validated.

14. Additional References

Available from Avaya:

[1] Application Notes for Infoblox DNSone in an Avaya Communication Manager IP Telephony Infrastructure – Issue 1.0, March 2006

Available from Enterasys Networks:

[2] Enterasys Networks Matrix N Standalone (NSA) Platinum Series Configuration Guide, Firmware Version 5.14.xx

[3] Enterasys Networks SecureStack C2 Configuration Guide, Firmware Version 3.01.xx

[4] Enterasys Networks SecureStack B2 Configuration Guide, Firmware Version 1.01.xx

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya Developer*Connection* Program at devconnect@avaya.com.