



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring the Motorola Solutions PTP 600 Point-to-Point Wireless Ethernet Solution with an Avaya Aura® Telephony Infrastructure in a Wireless Multi-Site Converged VoIP and Data Network - Issue 1.1

Abstract

These Application Notes describe how to configure the Motorola Solutions PTP 600 Point-to-Point wireless Ethernet solution with Avaya Aura® Communication Manager, Avaya Aura® Session Manager and Avaya IP Telephones in a Multi-Site wireless Converged VoIP and Data Network.

The Motorola Solutions PTP 600 Point-to-Point wireless Ethernet radio solution is designed to satisfy the demand for reliable, high-throughput last-mile access using the Internet Protocol in challenging environments.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe a sample configuration of a Multi-Site Voice over IP (VoIP) solution using a Motorola Solutions PTP 600 with Avaya Aura® Communication Manager, Avaya Aura® Session Manager and Avaya IP Telephones in a Converged VoIP and Data Network.

The Motorola Solutions PTP 600 was compliance-tested with Avaya™ Communication Manager, Avaya Aura® Session Manager and Avaya IP Telephones with emphasis placed on verifying voice quality in a multi-site converged VoIP and Data network scenario. QoS (Quality of Service) based on 802.1p (Layer 2 Priority) was implemented across the network to prioritize voice traffic over the LAN. The Avaya H.323 IP Telephones get QoS priority settings from Communication Manager; the Avaya SIP IP Telephones get QoS priority settings from the 46xxsettings phone configuration file. The QoS settings are enforced in the network by the Motorola Solutions PTP 600. Tests were performed by oversubscribing the interfaces with low priority data traffic and verifying that good voice quality was achieved when calls were routed over all LAN interfaces. Compliance testing included QoS, throughput, Open, Direct Media and the G.711 and G.729 codecs.

With aggregate throughput, the Motorola Solutions PTP 600 delivers up to 300 Mbps. PTP 600 solutions are available in several models to address local regulatory guidelines and specific application requirements.

1.1. Interoperability Compliance Testing

Interoperability compliance testing covered feature functionality, serviceability, and performance testing. Compliance testing emphasis was placed on verifying voice quality in a wireless multi-site converged VoIP and data network scenario. Specifically, compliance testing verified that when the Motorola Solutions PTP 600 interfaces are oversubscribed with low priority data traffic, the higher priority VoIP media and signaling traffic still gets through with good voice quality.

Note: The compliance test did not include radio or distances testing. Testing tools were used to interconnect the radios during testing at the Avaya Lab.

Feature functionality tested:

- Layer 2 Quality of Service (QoS)
- VLANs

The telephony features verified to operate correctly:

- Attended/Unattended transfer
- Conference call add/drop/participation
- Multiple call appearances
- Caller ID operation
- Call forwarding
- Call Park/Call Pick-up
- Bridged call appearances
- Voicemail using Avaya Aura® Communication Manager Messaging and Avaya Modular Messaging
- Message Waiting Indicator (MWI)
- Hold/Return from hold
- Direct IP Media (Shuffling)
- G.711 and G.729 codecs

Serviceability testing:

- Serviceability testing was conducted to verify the ability of the Avaya/ Motorola Solutions solution to recover from adverse conditions by power-cycling devices and disconnecting/reconnecting cables between the LAN interfaces. In all cases, the ability to recover to normal working state was verified after the adverse conditions were removed/addressed.

1.2. Support

24/7 Technical support for Motorola Solutions can be obtained through the following:

- Phone: + 1-866-961-9288
- Web support at [www.Motorola Solutions.com/ptp/support](http://www.MotorolaSolutions.com/ptp/support)

2. Reference Configuration

The network diagram shown in **Figure 1** illustrates the network environment used for the compliance test. The Motorola Solutions PTP 600 Point-to-Point wireless Ethernet solution provides network connectivity for the voice and data traffic between the Corporate and Remote Sites.

The Avaya and Motorola Solutions components used to create the corporate site included:

- Avaya S8300D Server running Communication Manager
- Avaya G450 Media Gateway
- Avaya 9600-Series IP Telephone (H.323)
- Avaya 9600-Series IP Telephone (SIP)
- Avaya 1600-Series IP Telephone (H.323)
- Avaya 2410 Digital Telephone
- Motorola Solutions PTP 600
- LAN router/switch
- DHCP/HTTP/TFTP Server

The Avaya and Motorola Solutions components used to create the remote site included:

- Avaya 9600-Series IP Telephone (H.323)
- Avaya 9600-Series IP Telephone (SIP)
- Motorola Solutions PTP 600
- LAN router/switch

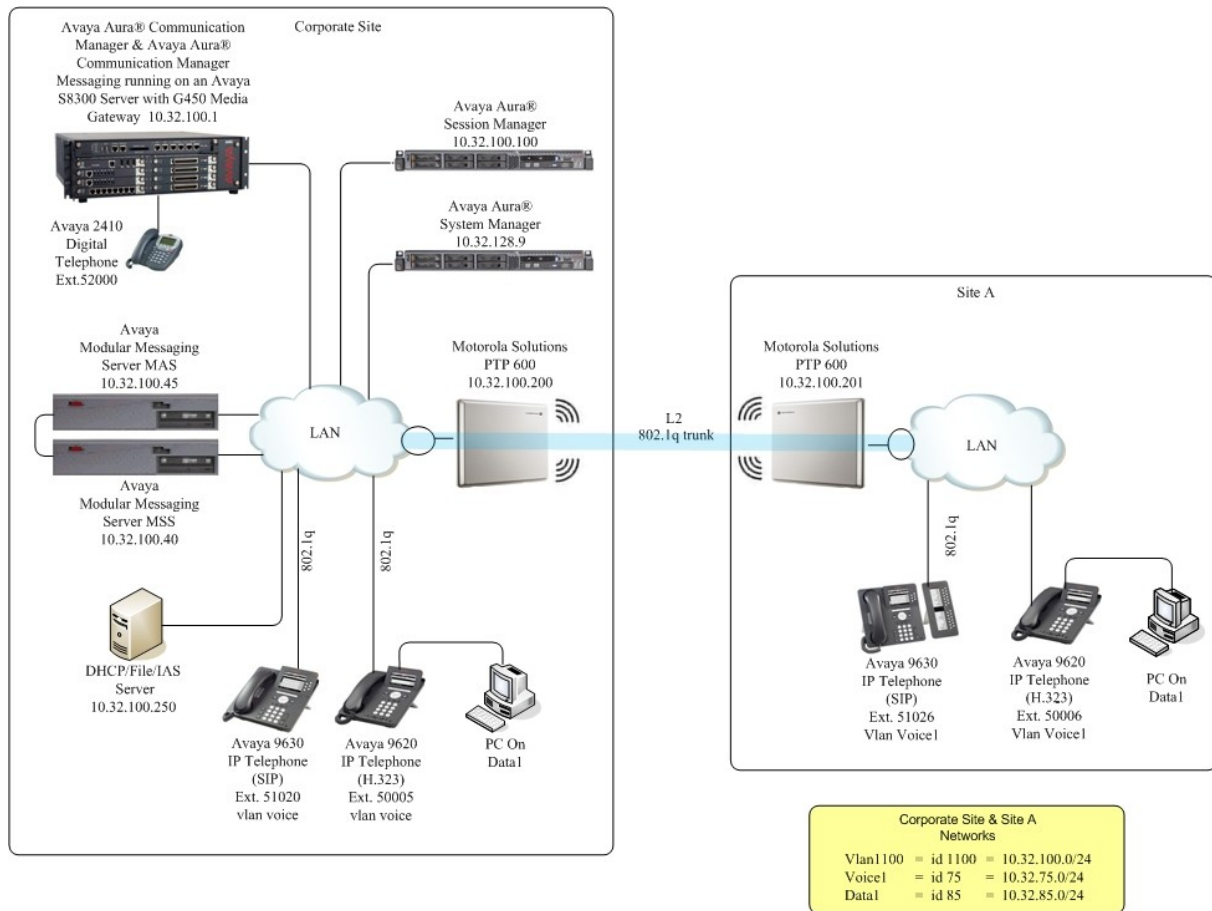


Figure 1: Avaya IP Telephony Network Traversing Motorola Solutions PTP 600 Wireless Ethernet Solution

3. Equipment and Software Validated

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

Equipment	Software/Firmware
<i>Avaya PBX Products</i>	
Avaya S8300 Server running Avaya Aura® Communication Manager	Avaya Aura® Communication Manager 6.0
Avaya G450 Media Gateway (Corporate Site) MGP MM712 DCP Media Module	30 .13 .2 HW9
<i>Avaya Aura® Session Manager</i>	
Avaya Aura® Session Manager	6.0
Avaya Aura® System Manager	6.0
<i>Avaya Messaging (Voice Mail) Products</i>	
Avaya Modular Messaging - Messaging Application Server (MAS)	5.2
Avaya Modular Messaging - Message Storage Server (MSS)	5.2
Avaya Aura® Communication Manager Messaging (CMM)	6.0
<i>Avaya Telephony Sets</i>	
Avaya 9600 Series IP Telephones	(H.323 3.1.1) and (SIP 2.6.4)
Avaya 2410 Digital Telephone	5.0
<i>Motorola Solutions Products</i>	
Motorola Solutions PTP 600 Series	(09-01)
<i>Server PC</i>	
Dell Server running DHCP/HTTP/TFTP	Microsoft Windows 2003 Server

Table 1: Equipment and Software Tested

The specific equipment above was used for the compliance testing. Note that this solution will be compatible with other Avaya Server and Media Gateway platforms running similar versions of Avaya Aura® Communication Manager.

4. Configure Avaya Aura® Communication Manager

There is no Motorola Solutions PTP 600 specific configuration required on Avaya Aura® Communication Manager and Avaya Aura® Session Manager to support this solution. It is assumed that all Aura® Telephony components, appropriate licenses and authentication files have been configured already, e.g., trunks, dial plans, etc. These standard configurations will not be covered in this document. For detailed information on the installation, maintenance, and configuration of Communication Manager and Session Manager, please refer to [1] through [4] in Section 10. Sections 4.1 and 4.2 are supplied for reference; no special configuration is required.

4.1. Verify OPS

Using the SAT, verify that the Off-PBX Telephones (OPS) is enabled on the **Optional Features** form. The license file installed on the system controls these options. If a required feature is not enabled, contact an authorized Avaya sales representative. On **Page 1**, verify that the number of OPS stations allowed in the system is sufficient for the number of SIP endpoints that will be deployed.

display system-parameters customer-options		Page 1 of 11
OPTIONAL FEATURES		
G3 Version: V16	Software Package: Enterprise	
Location: 2	System ID (SID): 1	
Platform: 28	Module ID (MID): 1	
		USED
Platform Maximum Ports: 6400		143
Maximum Stations: 2400		44
Maximum XMOBILE Stations: 2400		0
Maximum Off-PBX Telephones - EC500: 9600		5
Maximum Off-PBX Telephones - OPS: 9600		35
Maximum Off-PBX Telephones - PBFMC: 9600		0
Maximum Off-PBX Telephones - PVFMC: 9600		0
Maximum Off-PBX Telephones - SCCAN: 0		0
Maximum Survivable Processors: 313		0
(NOTE: You must logoff & login to effect the permission changes.)		

4.2. Verify QoS

This section describes the steps required for Communication Manager to support the configuration shown in **Figure 1**. The following pages provide instructions on how to administer the required configuration parameters. The assumption is that the appropriate license and authentication files have been installed on the servers and that login and password credentials are available. It is assumed that the reader has a basic understanding of the administration of Communication Manager and has access to the System Administration Terminal (SAT) screen. For detailed information on the installation, maintenance, and configuration of Communication Manager, please consult references [1] through [4] in **Section 10**.

IP networks were originally designed to carry data on a best-effort delivery basis, which meant that all traffic had equal priority and an equal chance of being delivered in a timely manner. As a result, all traffic had an equal chance of being dropped when congestion occurred. QoS is now utilized to prioritize VoIP traffic and should be implemented throughout the entire network.

In order to achieve prioritization of VoIP traffic, the VoIP traffic must be classified. The Avaya Aura® telephony infrastructure supports both IEEE 802.1p and DiffServ.

The DiffServ and 802.1p/Q values configured here will be downloaded to the Avaya H.323 IP wired and wireless Telephones via Communication Manager. Avaya SIP IP Telephones will get QoS settings by downloading the 46xxsettings file from the HTTP server (not shown in this document). For more information on QoS settings please refer to [1] through [4] in **Section 10**.

On **Page 1** of the **change ip-network-region** form, verify the Differentiated Services Code Point for **Call Control PHB Value** and **Audio PHB Value** are set to **46** and the **Call Control 802.1p Priority** and **Audio 802.1p Priority** are set to **6**.

change ip-network-region 1		Page 1 of 20
IP NETWORK REGION		
Region: 1		
Location:		Authoritative Domain: dev4.com
Name: Main		
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? n
UDP Port Max: 3329		
DIFFSERV/TOS PARAMETERS		
Call Control PHB Value: 46		
Audio PHB Value: 46		
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		

5. Configure Corporate Motorola Solutions PTP 600

It is assumed that all Motorola Solutions PTP 600 Powered indoor unit (PIDU) and Outdoor unit (ODU) components and all appropriate licenses are installed. For PIDU and ODU instructions, please refer to [10] in **Section 10**.

If the PTP 600 was purchased as a pair, one unit will be factory configured as a Master unit with an IP address of 169.254.1.2. The other unit will be factory configured as a Slave unit with an IP address of 169.254.1.1.

5.1. Connecting the PTP 600 to a PC

By default, the IP interface of the PTP 600 is configured for in-band local management with an IP address of 169.254.1.2 (Master) or 169.254.1.1 (Slave), subnet mask of 255.255.0.0 and default gateway of 169.254.0.0

Configure the PTP 600 using the built-in web-based **Management Tool**. Access this tool by establishing a web browser connection to the PTP 600. For more information on configuring PTP 600, please refer to [10] in **Section 10**.

Configure a PC with the following IP Address information:

- IP address - 169.254.0.20
- Subnet Mask - 255.255.0.0.
- The default gateway can be left blank

Connect the LAN port of the computer being used to the LAN port on the PTP 600. Start the web browser and enter **https://169.254.1.2**. The **System Administrator Login** page is displayed. Log into the PTP 600 using default credentials which can be obtained from the Motorola Solutions PTP 600 documentation (refer to [10] in **Section 10**).



The screenshot shows the Motorola Point-to-Point Wireless Solutions web interface. On the left is a dark blue sidebar with a menu: Home, Status, System (highlighted with a blue bar), Installation, Management, Change Password, and Logout. The main content area has a blue header with the Motorola logo and the text 'MOTOROLA POINT-TO-POINT WIRELESS SOLUTIONS'. Below the header is a white box with the same Motorola logo and text, followed by the instruction 'Please login to gain access to the PTP wireless unit'. There is a 'Password:' label, a text input field, and a 'Login' button.

5.2. Interface Configuration

This section describes the IP address and wireless configuration. The radio licenses and wireless settings will vary from installation to installation and are beyond the scope of the compliance testing and will not be covered in this document. For more information on configuring the PTP 600, please refer to the PTP 600 product documentation in **Section 10**.

From the left hand menu, select **System Administration → Installation**. The **Step 1: Interface Configuration** page appears. Update the IP interface attributes with the IP information shown in **Figure 1** for the corporate site. Select **Submit Interface Configuration**. Select **Next** to continue.

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Step 1: Interface Configuration

Please complete the wizard in order to arm the unit.

A valid IP address and subnet mask is required before the PTP unit can be used on a network. Please see your network administrator if you are unsure of the correct values to enter here.


Interface configuration data entry

Attributes	Value	Units
IP Address	10 . 32 . 100 . 200	
Subnet Mask	255 . 255 . 255 . 0	
Gateway IP Address	10 . 32 . 100 . 254	
Use VLAN For Management Interfaces	No VLAN Tagging	
Telecoms Interface	<input checked="" type="radio"/> None <input type="radio"/> E1 <input type="radio"/> T1	

Next ➡➡

The **Step 2: Wireless Configuration** page appears.

Select the **TDM Traffic** radio button for **Link Mode Optimization**. The rest of the parameters, like **Tx Max Power**, **Ranging Mode**, etc., are part of the wireless configuration and are not covered in this document. Refer to the PTP 600 Series User Guide and PTP 600 Deployment Guide in **Section 10**. Select **Next** to continue.

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Step 2: Wireless Configuration



Please enter the following wireless configuration parameters

WARNING: please refer to the "TDM Link Mode Optimization" section in the user manual for more information on how link configuration can trade off performance for stability.

Wireless data entry

Attributes	Value	Units
Access Method	<input checked="" type="radio"/> Link Access <input type="radio"/> Link Name Access <input type="radio"/> Group Access	
Target MAC Address	00:04:56: XXXXXXXXXX	
Dual Payload	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled	
Master Slave Mode	<input checked="" type="radio"/> Master <input type="radio"/> Slave	
Link Mode Optimization	<input type="radio"/> IP Traffic <input checked="" type="radio"/> TDM Traffic	
TDD Synchronization Mode	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled	
Tx Max Power	<input type="text" value="-7"/>	dBm
Ranging Mode	<input checked="" type="radio"/> Auto 0 to 40 km <input type="radio"/> Auto 0 to 100 km <input type="radio"/> Auto 0 to 200 km <input type="radio"/> Target Range	
Target Range	<input type="text" value="0.0"/>	km
Platform Variant	<input type="radio"/> Integrated Antenna <input checked="" type="radio"/> Connectorized	
Antenna Gain	<input type="text" value="0.0"/>	dBi
Cable Loss	<input type="text" value="0.0"/>	dB
Channel Bandwidth	<input checked="" type="radio"/> 30 MHz <input type="radio"/> 15 MHz <input type="radio"/> 10 MHz <input type="radio"/> 5 MHz	
Link Symmetry	<input type="radio"/> 2 to 1 <input checked="" type="radio"/> 1 to 1 <input type="radio"/> 1 to 2	
Spectrum Management Control	<input checked="" type="radio"/> DFS <input type="radio"/> Fixed Frequency	
Lower Center Frequency	<input type="text" value="5742"/>	MHz
Tx Color Code	<input type="text" value="A"/>	
Rx Color Code	<input type="text" value="A"/>	
Installation Tones	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled	

The **Step 3: Confirm Installation Configuration** page appears. Select **Confirm Configuration, Arm Agent and Reboot**. The reboot confirmation popup is displayed (not shown), Select **OK** to reboot.


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Step 3: Confirm Installation Configuration

Please review your entered configuration. If any of the configuration items are incorrect please use the back button to apply the corrections.

Once you're happy with the configuration press the 'Confirm Configuration, Arm Installation Agent and Reboot' button, this will commit the parameters to non-volatile memory and reboot this wireless unit.

Installation configuration

Attributes	Value	Units
IP Address	10.32.100.200	
Subnet Mask	255.255.255.0	
Gateway IP Address	10.32.100.254	
Use VLAN For Management Interfaces	No VLAN Tagging	
Telecoms Interface	None	
Lowest Telecoms Modulation Mode	BPSK 0.63	
Access Method	Link Access	
Target MAC Address	00:04:58:00:10:10	
Dual Payload	Enabled	
Master Slave Mode	Master	
Link Mode Optimization	TDM Traffic	
TDD Synchronization Mode	Disabled	
Tx Max Power	-7	dBm
Ranging Mode	Auto 0 to 40 km	
Platform Variant	Connectorized	
Antenna Gain	0.0	dBi
Cable Loss	0.0	dB
EIRP	-7.0	dBm
Channel Bandwidth	30 MHz	
Link Symmetry	1 to 1	
Spectrum Management Control	i_DFS	
Lower Center Frequency	5742	MHz
Tx Color Code	A	
Rx Color Code	A	
Installation Tones	Disabled	

Confirm Configuration, Arm Installation Agent and Reboot

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5.3. Configuring Quality of Service

Perform this task to configure the classification of Layer 2 Control Protocol frames and priority encoded Ethernet frames into up to eight traffic classes. To configure quality of service, proceed as follows:

From the left hand menu, select **System → Configuration → QoS Configuration**. The **QoS Configuration** page is displayed. Select **Set Default 802.1Q Priority Mappings**. Select **Reboot** to continue.


QoS Configuration

This page controls the classification of tagged Ethernet frames into priority queues. Q7 is the highest priority queue.

VLAN Priority	P0	P1	P2	P3	P4	P5	P6	P7	Untagged
Priority Queue Mapping	Q1	Q0	Q2	Q3	Q4	Q5	Q6	Q7	Q1

5.4. Check System Status

Once the System is back up, check the status of the PTP 600. From the left hand menu, select **Status**. Verify that **Data Port Status** and **Wireless Link Status** are up.

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System Status - Master

Equipment

Attributes	Value	Units
Link Name	Master	
Site Name		
Software Version	58600-09-01	
Hardware Version	D04-R02-C-FPS	
Region Code	Region Code 1	
Elapsed Time Indicator	00:01:47	

Ethernet / Internet

Data Port Status	Copper Link Up	
Data Port Speed And Duplex	1000 Mbps Full Duplex	
MAC Address	00:04:00:00:00:00	
Remote MAC Address	00:04:00:00:00:00	
Remote IP Address	10.32.100.201	

Telecoms

Channel A	Disabled	
Channel B	Disabled	

TDD Synchronization

TDD Synchronization Inactive	TDD Sync Disabled	
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Status Page Refresh Period	3600	Seconds
----------------------------	------	---------

Wireless

Attributes	Value	Units
Wireless Link Status	Up	
Maximum Transmit Power	-7	dBm
Remote Maximum Transmit Power	-7	dBm
Transmit Power	-7.0, -7.0, -7.0, -7.0	dBm
Receive Power	-48.5, -48.5, -48.7, -48.5	dBm
Vector Error	-28.7, -29.6, -30.5, -29.6	dB
Link Loss	41.5, 41.5, 41.5, 41.5	dB
Transmit Data Rate	140.86, 140.86, 140.86, 140.86	Mbps
Receive Data Rate	140.86, 140.86, 140.86, 140.86	Mbps
Link Capacity	281.74	Mbps
Transmit Modulation Mode	256QAM 0.81 (Dual) (30 MHz)	
Receive Modulation Mode	256QAM 0.81 (Dual) (30 MHz)	
Link Symmetry	1 to 1	
Receive Modulation Mode Detail	Running At Maximum Receive Mode	
Range	0.1	km

Update Page Refresh Period

Reset form

6. Configure Site A Motorola Solutions Solutions PTP 600 (Slave Unit)

6.1. Connecting the PTP 600 to a PC

Configure the PTP 600 using the built-in web-based **Management Tool**. Access this tool by establishing a web browser connection to the PTP 600. For more information on configuring PTP 600, please refer to [10] in **Section 10**.

Configure a PC with the following IP Address information:

- IP address - 169.254.0.20
- Subnet Mask - 255.255.0.0.
- The default gateway can be left blank.

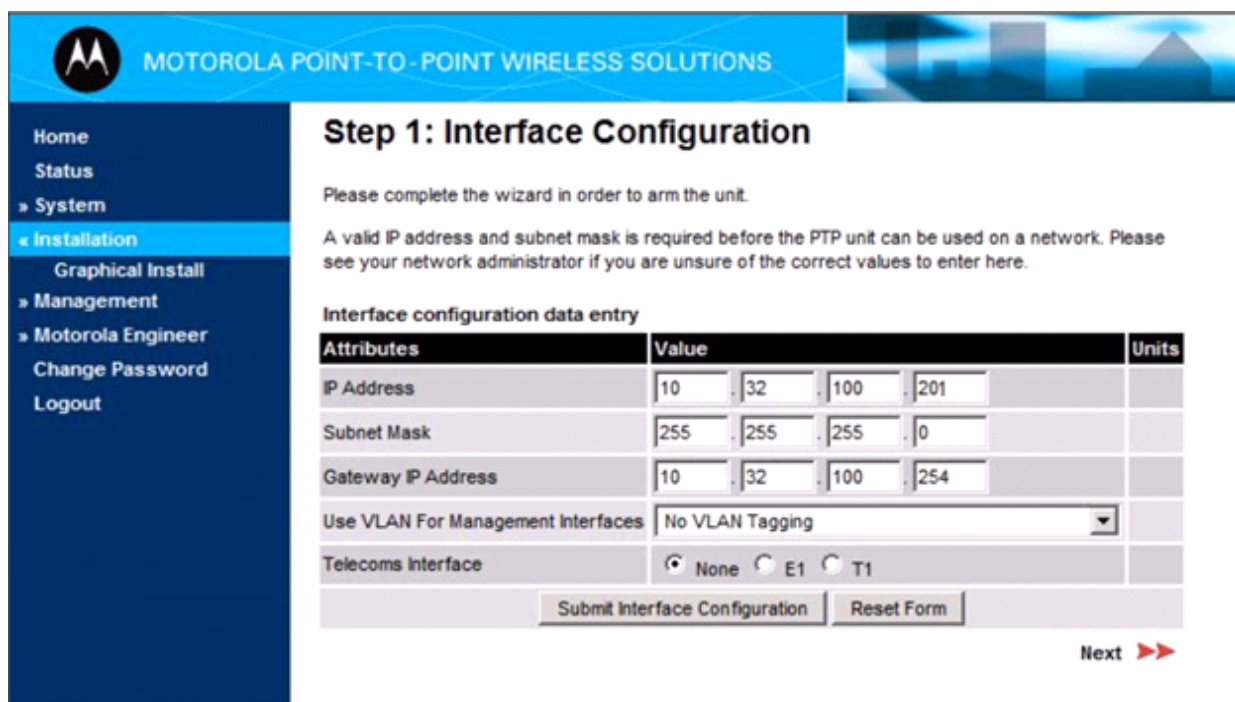
Connect the LAN port of the computer being used to the LAN port on the PTP 600. Start the web browser and enter **https://169.254.1.1**. The **System Administrator Login** page is displayed. Log into the PTP 600 using default credentials which can be obtained from the Motorola Solutions PTP 600 documentation (refer to [10] in **Section 10**).



6.2. Interface Configuration

This section describes the IP address and wireless configuration. The Radio Licenses and wireless setting will vary from installation to installation and are beyond the scope of the compliance testing, and therefore will not be covered in this document (**Step 2** below is shown for illustration purposes only). For more information on configuring PTP 600, please refer to [10] in **Section 10**.

From the left hand menu, select **System Administration** → **Installation**. The **Step 1: Interface Configuration** page appears. Update the IP interface attributes with the IP information shown in **Figure1** for the remote site. Select **Submit Interface Configuration**. Select **Next** to continue.



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Step 1: Interface Configuration

Please complete the wizard in order to arm the unit.

A valid IP address and subnet mask is required before the PTP unit can be used on a network. Please see your network administrator if you are unsure of the correct values to enter here.


Interface configuration data entry

Attributes	Value	Units
IP Address	10 . 32 . 100 . 201	
Subnet Mask	255 . 255 . 255 . 0	
Gateway IP Address	10 . 32 . 100 . 254	
Use VLAN For Management Interfaces	No VLAN Tagging	
Telecoms Interface	<input checked="" type="radio"/> None <input type="radio"/> E1 <input type="radio"/> T1	

Next ➤

The **Step 2: Wireless Configuration** page appears.

Select the **TDM Traffic** radio button for **Link Mode Optimization**. The rest of the parameters, like **Tx Max Power**, **Ranging Mode**, etc., are part of the wireless configuration and are not covered in this document. Refer to the PTP 600 Series User Guide and PTP 600 Deployment Guide in **Section 10**. Select **Next** to continue.

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Step 2: Wireless Configuration



Please enter the following wireless configuration parameters

WARNING: please refer to the "TDM Link Mode Optimization" section in the user manual for more information on how link configuration can trade off performance for stability.

Wireless data entry

Attributes	Value	Units
Access Method	<input checked="" type="radio"/> Link Access <input type="radio"/> Link Name Access <input type="radio"/> Group Access	
Target MAC Address	00:04:56: XXXXXXXX	
Dual Payload	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled	
Master Slave Mode	<input checked="" type="radio"/> Master <input type="radio"/> Slave	
Link Mode Optimization	<input type="radio"/> IP Traffic <input checked="" type="radio"/> TDM Traffic	
TDD Synchronization Mode	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled	
Tx Max Power	<input type="text" value="-7"/>	dBm
Ranging Mode	<input checked="" type="radio"/> Auto 0 to 40 km <input type="radio"/> Auto 0 to 100 km <input type="radio"/> Auto 0 to 200 km <input type="radio"/> Target Range	
Target Range	<input type="text" value="0.0"/>	km
Platform Variant	<input type="radio"/> Integrated Antenna <input checked="" type="radio"/> Connectorized	
Antenna Gain	<input type="text" value="0.0"/>	dBi
Cable Loss	<input type="text" value="0.0"/>	dB
Channel Bandwidth	<input checked="" type="radio"/> 30 MHz <input type="radio"/> 15 MHz <input type="radio"/> 10 MHz <input type="radio"/> 5 MHz	
Link Symmetry	<input type="radio"/> 2 to 1 <input checked="" type="radio"/> 1 to 1 <input type="radio"/> 1 to 2	
Spectrum Management Control	<input checked="" type="radio"/> DFS <input type="radio"/> Fixed Frequency	
Lower Center Frequency	<input type="text" value="5742"/>	MHz
Tx Color Code	<input type="text" value="A"/>	
Rx Color Code	<input type="text" value="A"/>	
Installation Tones	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled	

The **Step 3: Confirm Installation Configuration** page appears. Select **Confirm Configuration, Arm Agent and Reboot**. The reboot confirmation popup is displayed (not shown), Select **OK** to reboot.


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Step 3: Confirm Installation Configuration

Please review your entered configuration. If any of the configuration items are incorrect please use the back button to apply the corrections.

Once you're happy with the configuration press the 'Confirm Configuration, Arm Installation Agent and Reboot' button, this will commit the parameters to non-volatile memory and reboot this wireless unit.

Installation configuration

Attributes	Value	Units
IP Address	10.32.100.201	
Subnet Mask	255.255.255.0	
Gateway IP Address	10.32.100.254	
Use VLAN For Management Interfaces	No VLAN Tagging	
Telecoms Interface	None	
Lowest Telecoms Modulation Mode	BPSK 0.63	
Access Method	Link Access	
Target MAC Address	00:04:58:00:10:10	
Dual Payload	Enabled	
Master Slave Mode	Master	
Link Mode Optimization	TDM Traffic	
TDD Synchronization Mode	Disabled	
Tx Max Power	-7	dBm
Ranging Mode	Auto 0 to 40 km	
Platform Variant	Connectorized	
Antenna Gain	0.0	dBi
Cable Loss	0.0	dB
EIRP	-7.0	dBm
Channel Bandwidth	30 MHz	
Link Symmetry	1 to 1	
Spectrum Management Control	i_DFS	
Lower Center Frequency	5742	MHz
Tx Color Code	A	
Rx Color Code	A	
Installation Tones	Disabled	

Confirm Configuration, Arm Installation Agent and Reboot

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6.3. Configuring Quality of Service

Perform this task to configure the classification of Layer 2 Control Protocol frames and priority encoded Ethernet frames into up to eight traffic classes. To configure quality of service, proceed as follows:

From the left hand menu, select **System → Configuration → QoS Configuration**. The **QoS Configuration** page is displayed. Select **Set Default 802.1Q Priority Mappings**. Select **Reboot** to continue.

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QoS Configuration

This page controls the classification of tagged Ethernet frames into priority queues. Q7 is the highest priority queue.

VLAN Priority	P0	P1	P2	P3	P4	P5	P6	P7	Untagged
Priority Queue Mapping	Q1	Q0	Q2	Q3	Q4	Q5	Q6	Q7	Q1

6.4. Check System Status

Once the System is back up, check the status of the PTP 600. From the left hand menu, select **Status**. Verify that **Data Port Status** and **Wireless Link Status** are up.

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System Status - Master

Equipment

Attributes	Value	Units
Link Name	Master	
Site Name		
Software Version	58600-09-01	
Hardware Version	D04-R02-C-FPS	
Region Code	Region Code 1	
Elapsed Time Indicator	00:01:47	

Ethernet / Internet

Data Port Status	Copper Link Up	
Data Port Speed And Duplex	1000 Mbps Full Duplex	
MAC Address	00:04:00:00:00:00	
Remote MAC Address	00:04:00:00:00:00	
Remote IP Address	10.32.100.200	

Telecoms

Channel A	Disabled	
Channel B	Disabled	

TDD Synchronization

TDD Synchronization Inactive	TDD Sync Disabled	
Status Page Refresh Period	3600	Seconds

Wireless

Attributes	Value	Units
Wireless Link Status	Up	
Maximum Transmit Power	-7	dBm
Remote Maximum Transmit Power	-7	dBm
Transmit Power	-7.0, -7.0, -7.0, -7.0	dBm
Receive Power	-48.5, -48.5, -48.7, -48.5	dBm
Vector Error	-28.7, -29.6, -30.5, -29.6	dB
Link Loss	41.5, 41.5, 41.5, 41.5	dB
Transmit Data Rate	140.86, 140.86, 140.86, 140.86	Mbps
Receive Data Rate	140.86, 140.86, 140.86, 140.86	Mbps
Link Capacity	281.74	Mbps
Transmit Modulation Mode	256QAM 0.81 (Dual) (30 MHz)	
Receive Modulation Mode	256QAM 0.81 (Dual) (30 MHz)	
Link Symmetry	1 to 1	
Receive Modulation Mode Detail	Running At Maximum Receive Mode	
Range	0.1	km

Update Page Refresh Period Reset form

7. General Test Approach and Test Results

The general test approach was to configure a wireless Multi-Site Voice over IP (VoIP) Solution using the Motorola Solutions PTP 600 Point-to-Point Wireless Ethernet Solution with Avaya Aura® Communication Manager, Avaya Aura® Session Manager and Avaya IP Telephones with emphasis placed on voice quality. The configuration, (shown in **Figure 1**) was used to exercise the features and functionality listed in **Section 1.1**

The Motorola Solutions PTP 600 Point-to-Point Wireless Ethernet Solution with Aura® Communication Manager, Avaya Aura® Session Manager and Avaya IP Telephones passed compliance testing.

During the load testing while over-subscribing the links by 40%, the call remained up but intermittently a one second loss of voice was observed. Motorola Solutions was not able to reproduce the problem in their test lab.

8. Verification Steps

This section provides the steps for verifying end-to-end network connectivity and QoS. In general, the verification steps include:

- Place calls between the Corporate and Remote Site Avaya IP Telephones.
- Place calls between the Avaya 2410 Digital Telephone and Avaya IP Telephones at the Remote Site.
- Verify DHCP relay is functioning by confirming that the Avaya IP Telephones at the Remote Site received their IP addresses from the DHCP server connected to the corporate network.
- From the Communication Manager SAT, use the **status signaling-group** command to verify that the SIP signaling group is in-service.
- From the Communication Manager SAT, use the **status trunk-group** command to verify that the SIP trunk group is in-service.
- From the Avaya Aura® System Manager web administration interface, verify that SIP endpoints at both the Corporate and Remote Sites are registered with Avaya Aura® Session Manager. To view the registration status, navigate to Elements → Session Manager → System Status → User Registrations.
- Verify that the Avaya H.323 IP endpoints at both the Corporate and Remote Sites have successfully registered with Avaya Communication Manager by typing the **list registered-ip-stations** command on the SAT.

9. Conclusion

These Application Notes describe the configuration necessary for integrating the Motorola Solutions PTP 600 Point-to-Point Wireless Ethernet Solution into an Aura® Telephony Infrastructure including Avaya Aura® Communication Manager, Avaya Aura® Session Manager and Avaya IP Telephones in a Wireless Multi-Site Converged VoIP and Data Network.

For the configuration described in these Application Notes, the Motorola Solutions PTP 600 Point-to-Point Wireless Ethernet Solution was responsible for network connectivity for the voice and data traffic between the Corporate and Remote Sites and enforcing QoS. Good voice quality was successfully achieved in the Avaya/Motorola Solutions configuration described herein.

10. References

This section references the documentation relevant to these Application Notes. Additional Avaya product documentation is available at <http://support.avaya.com>.

- [1] *Installing and Configuring Avaya Aura® System Platform*, Release 6, June 2010.
- [2] *Administering Avaya Aura® System Platform*, Release 6, June 2010.
- [3] *Administering Avaya Aura® Communication Manager*, May 2009, Document Number 03-300509.
- [4] *Avaya Aura® Communication Manager Feature Description and Implementation*, May 2009, Document Number 555-245-205.
- [5] *Avaya one-X Deskphone Edition for 9600 Series IP Telephones Administrator Guide*, November 2009, Document Number 16-300698.
- [6] *Administering Avaya Aura® Session Manager, Release 6.0*, June 2010, Document Number 03-603324.
- [7] *Avaya one-X Deskphone SIP for 9600 Series IP Telephones Administrator Guide, Release 2.0*, Document Number 16-601944.
- [8] *Modular Messaging, Release 5.0 with the Avaya MSS Messaging Application Server (MAS) Administration Guide*, January 2009.
- [9] *Avaya Aura® Communication Manager Messaging Installation and Initial Configuration*.

The following product documentation is provided by Motorola Solutions Solutions. For additional product and company information, visit: www.motorola.com/ptp/software.

- [10] *Motorola Solutions PTP 600 Series User Guide*
- [11] *Motorola Solutions PTP 600 Deployment Guide*

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