



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for LayerX Technologies Arbitrator with Avaya Aura® Communication Manager and Avaya H.323 IP Telephones – Issue 1.0**

### **Abstract**

These Application Notes describe the configuration procedures required to allow LayerX Technologies Arbitrator to collect call quality data from Avaya Aura® Communication Manager and Avaya H.323 IP Telephones utilizing Avaya Real Time Control Protocol (RTCP).

The LayerX Arbitrator collects, stores, and processes call records to provide usage analysis, latency, and packet drop. During the compliance test, the LayerX Arbitrator solution was shown to successfully collect and process call quality data for all call scenarios tested, including outbound trunk calls, inbound trunk calls, intra-switch calls and inter-switch calls.

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**

The LayerX Arbitrator collects, stores, and processes call records to provide usage analysis, latency, and packet drop. During the compliance test, the LayerX Arbitrator solution was shown to successfully collect and process call quality data for all call scenarios tested, including outbound trunk calls, inbound trunk calls, intra-switch calls and inter-switch calls.

## **2. General Test Approach and Test Results**

The general test approach was to manually place intra-switch and inter-switch calls, inbound trunk and outbound trunk calls to and from telephones registered to the Communication Manager, and verify that the LayerX Arbitrator solution collects and reports the attributes of the call. For serviceability testing, physical and logical links were disabled/re-enabled, media servers were reset and LayerX was restarted.

### **2.1. Interoperability Compliance Testing**

The compliance test included feature, serviceability, and performance test. The feature testing evaluated the ability of LayerX to collect the call quality data from various call scenarios. The serviceability testing introduced failure scenarios to see if LayerX can resume quality data collection after failure recovery.

### **2.2. Test Results**

All executed test cases passed. The LayerX successfully collected call quality data from Communication Manager and Avaya H.323 IP Telephones via a TCP/IP connection for all call types generated including intra-switch calls, inbound/outbound PSTN trunk calls, inbound/outbound private IP trunk calls, transferred calls, and conference calls. For serviceability testing, LayerX was able to resume collecting statistics after failure recovery.

### **2.3. Support**

For LayerX Arbitrator technical support:

Phone: 866-277-9850

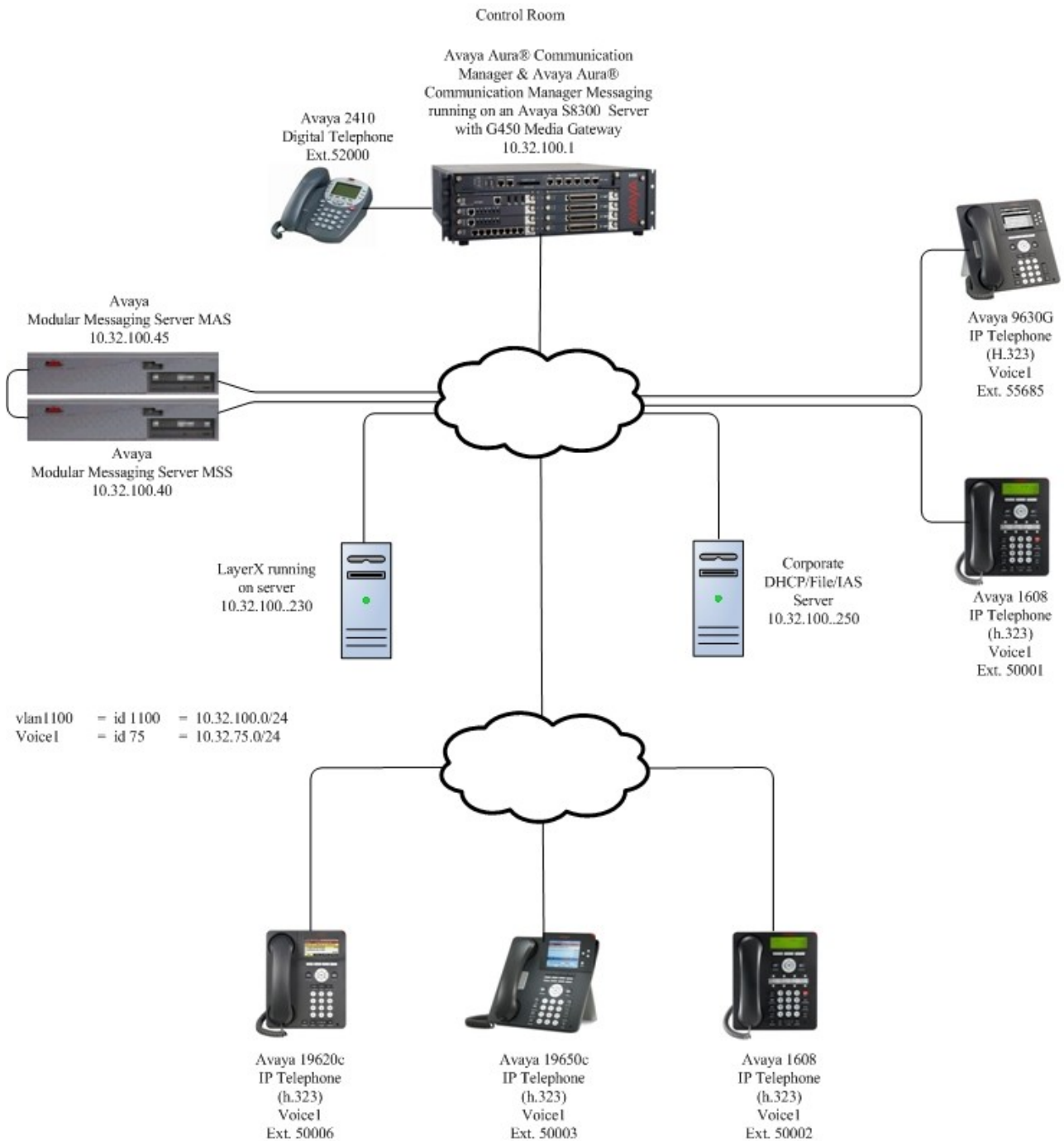
WEB: <http://www.layerxtech.com/pages/support>

### 3. Reference Configuration

**Figure 1** provides the test configuration used for the compliance test.

**The Avaya and Extreme components used to create the Control Room included:**

- Avaya S8300D Server running Avaya Aura® Communication Manager & Avaya Aura® Communication Manager Messaging
- Avaya G450 Media Gateway
- Avaya Modular Messaging Server (MAS and MSS)
- Avaya 9600-Series IP telephone (H.323)
- Avaya 1600-Series IP telephone (H.323)
- Avaya 2410 digital telephone
- DHCP/HTTP/TFTP Server



**Figure 1: LaxerX/Avaya Network**

## 4. Equipment and Software Validated

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

Equipment	Software/Firmware
<b><i>Avaya PBX Products</i></b>	
Avaya S8300 Server running Avaya Aura® Communication Manager	Avaya Aura® Communication Manager 6.0.1 with patch 00.1.510.1-18621
Avaya G450 Media Gateway (Corporate Site) MGP MM712 DCP Media Module	30.13.2 HW9
<b><i>Avaya Messaging (Voice Mail) Products</i></b>	
Avaya Modular Messaging - Messaging Application Server (MAS)	5.2
Avaya Modular Messaging - Message Storage Server (MSS)	5.2
Avaya Aura® Communication Manager Messaging (CMM)	6.0.1
<b><i>Avaya Telephony Sets</i></b>	
Avaya 9600 Series IP Telephones	(H.323 3.1.1)
Avaya 1600 Series IP Telephones	(H.323 1.3)
Avaya 2410 Digital Telephone	5.0
<b><i>LayerX Products</i></b>	
LayerX Technologies Arbitrator	4.0001-10p
<b><i>Microsoft products</i></b>	
DHCP/HTTP/TFTP Server	Microsoft Windows 2003 Server

## 5. Configure Avaya Aura® Communication Manager

This section describes the steps required for Communication Manager to support the configuration in **Figure 1**. The following pages provide step-by-step instructions on how to administer parameters specific to the LayerX solution only. The assumption is that the appropriate license and authentication files have been installed on the servers, that login and password credentials are available, and that the reader has a basic understanding of the administration of Communication Manager. It is assumed that all other connections, e.g., to PSTN and LAN, are configured and will not be covered in this document. The reader will need access to the System Administration Terminal screen (SAT). For detailed information on the installation, maintenance, and configuration of Communication Manager, please see **Section 9** and refer to [1].

### 5.1. Configure RTCP Monitor Server

This section provides the procedures for configuring RTCP Monitor Server. Since LayerX utilizes RTCP packets to calculate and report the quality of the call stream, a RTCP Monitor Server needs to be created in Communication Manager. The following screen describes the setting of the RTCP Monitor Server. Enter the **change system-parameters ip-options** command to configure the RTCP Monitor Server. Provide the following information:

- **Server IPV4 Address:** - IP address of the LayerX server
- **IPV4 Server Port:** – **5005** [This port number must match the LayerX RTCP Listening Port. The default value for the Default Server Port field is 5005.]
- **RTCP Report Period (secs):** – **5** [The report period indicates how often Communication Manager forwards RTCP packet to the RTCP Monitor Server, which is the LayerX server. The default value for the Default RTCP Report Period (secs) field is 5.]

```
change system-parameters ip-options                               Page 1 of 4
                        IP-OPTIONS SYSTEM PARAMETERS

IP MEDIA PACKET PERFORMANCE THRESHOLDS
  Roundtrip Propagation Delay (ms)      High: 800      Low: 400
                                Packet Loss (%)      High: 40      Low: 15
                                Ping Test Interval (sec): 20
  Number of Pings Per Measurement Interval: 10
                                Enable Voice/Network Stats? n

RTCP MONITOR SERVER
  Server IPV4 Address: 10.32.100.123    RTCP Report Period(secs): 5
                                IPV4 Server Port: 5005
  Server IPV6 Address:
                                IPV6 Server Port: 5005

AUTOMATIC TRACE ROUTE ON
  Link Failure? y

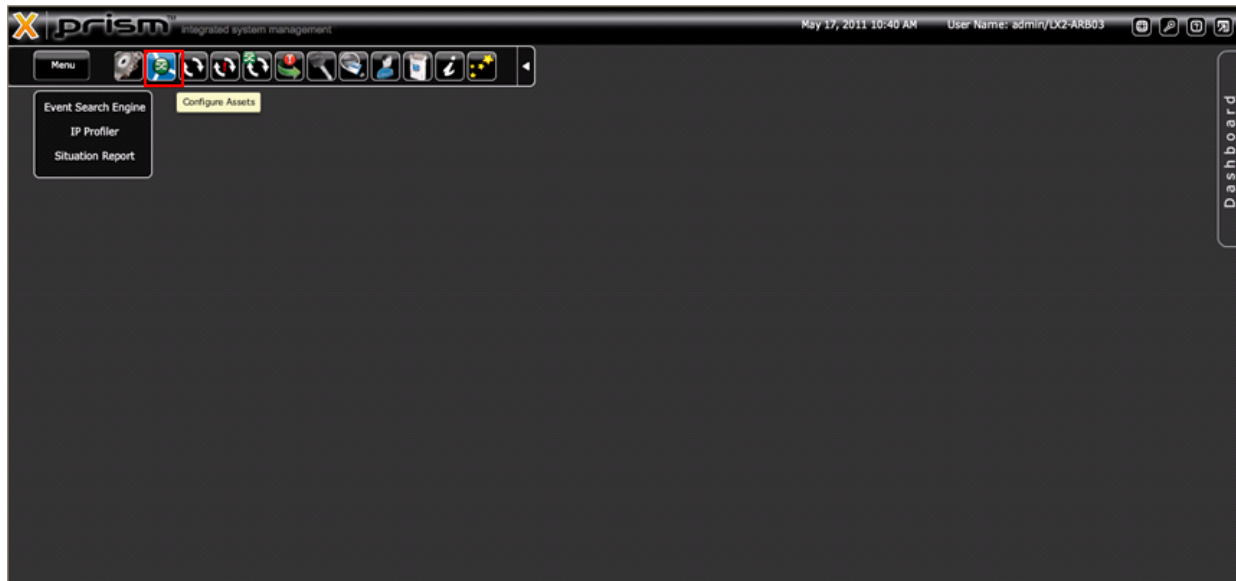
                                H.323 IP ENDPOINT
H.248 MEDIA GATEWAY                                Link Loss Delay Timer (min): 5
  Link Loss Delay Timer (min): 5                    Primary Search Time (sec): 75
                                Periodic Registration Timer (min): 20
                                Short/Prefixed Registration Allowed? n
```

## 6. Configure LayerX Technologies Arbitrator

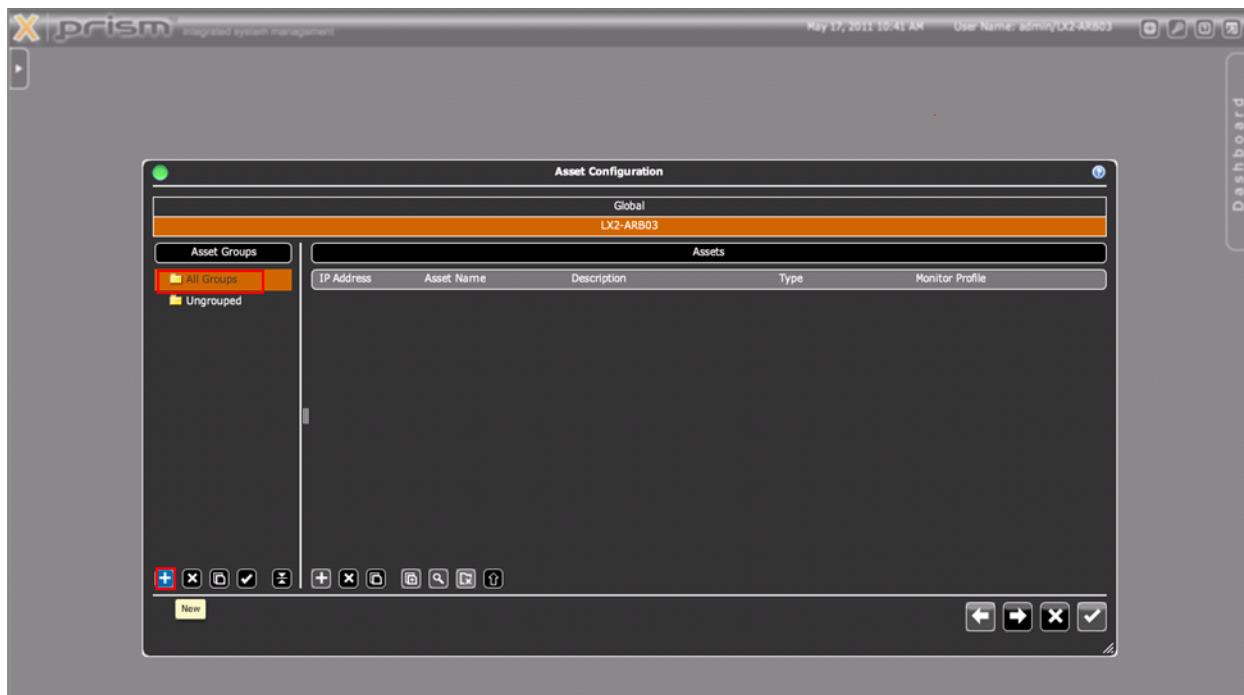
The configuration of the LayerX Arbitrator is performed by LayerX professional services. This section is supplied for reference only. For configuration procedures, please refer to [3] and [4].

The image shows a login interface for LayerX. At the top, the word "layerX" is displayed in a large, stylized, lowercase font. Below the logo, there are three input fields: "USERNAME", "PASSWORD", and "REALM". Each field has a corresponding label to its left. To the right of the "REALM" field, there is a small link that says "SHOW REALMS". At the bottom of the interface, there are two buttons: "Proxy Settings" on the left and "LOGIN" on the right.

Configure the Avaya PBX to monitor. From the configuration menu, select the **Configure Assets** icon.

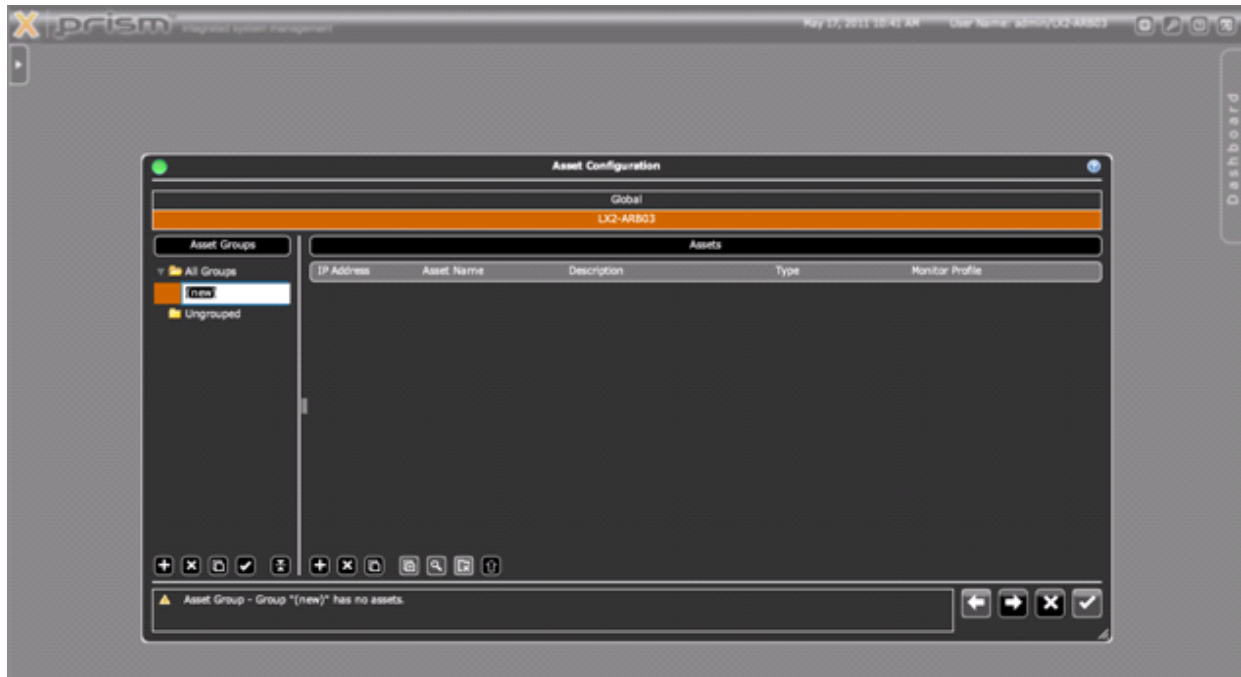


The **Asset Configuration** window appears. Create a new group, from the left pane, select **All Groups** then click the ‘+’ button from the bottom of the left pane.





Enter the name of the new group and hit the '**Enter**' key. For the purpose of the test, the group was called '**Avaya**'.



Click the ‘+’ button in ‘**Assets**’ pane to add a new asset to the group.

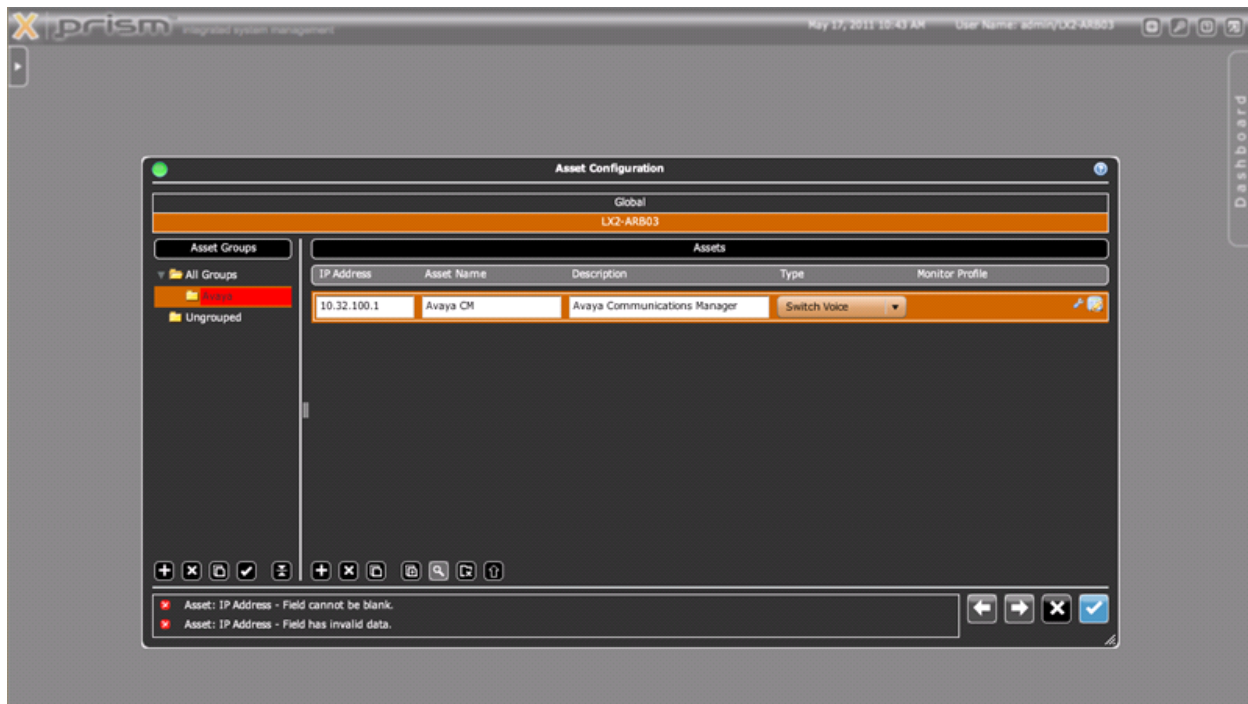
Enter following information:

IP address = IP Address of the Communication Manager

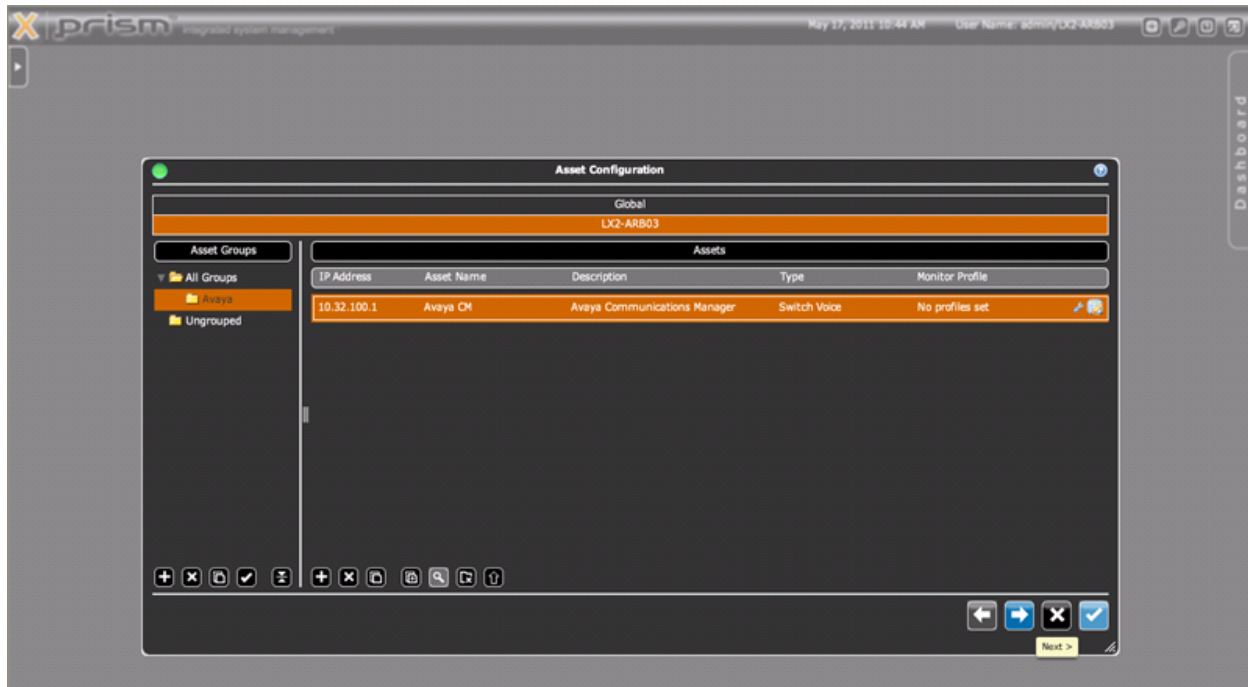
Asset Name = Use a unique name for the Asset Name

Description = Use a unique name for the Description

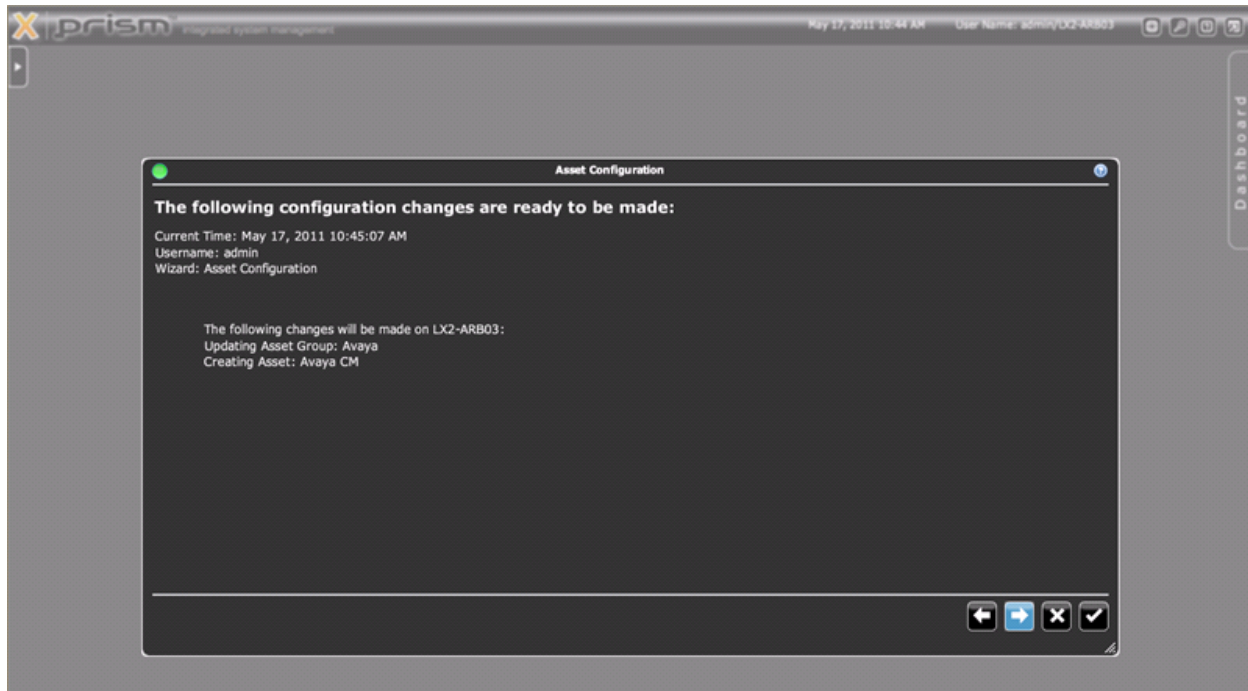
Hit the ‘**Enter**’ button to continue.



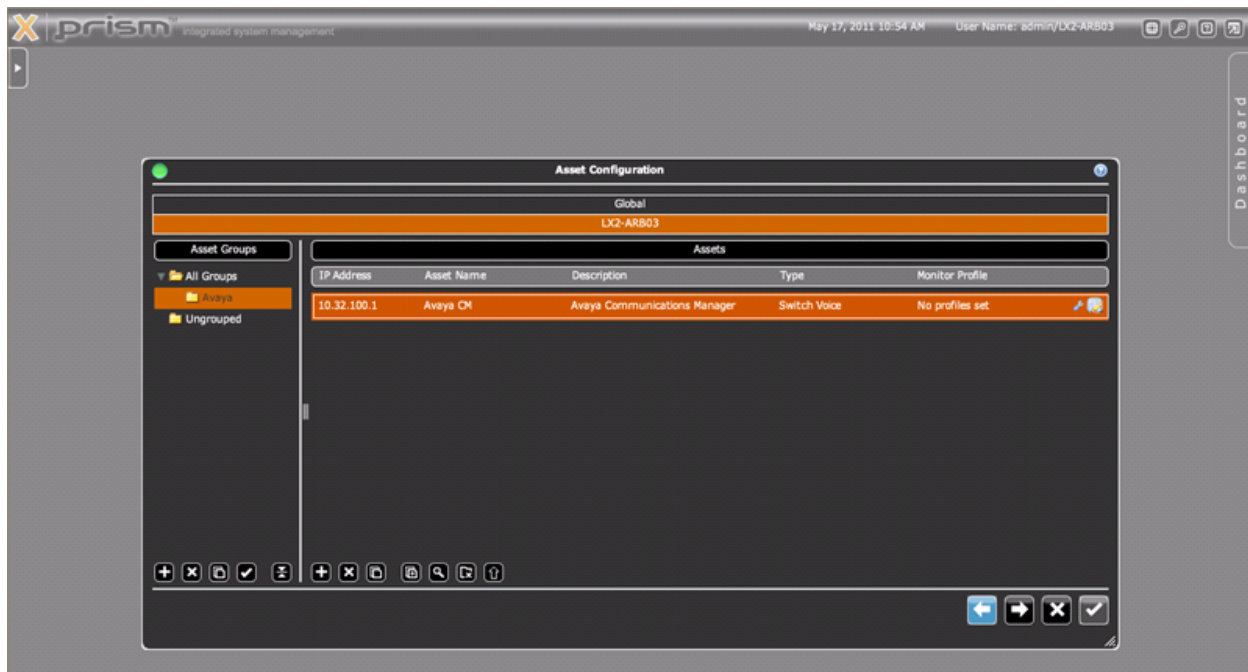
Select the **right arrow** button in the bottom right of the pane to push the configuration change.



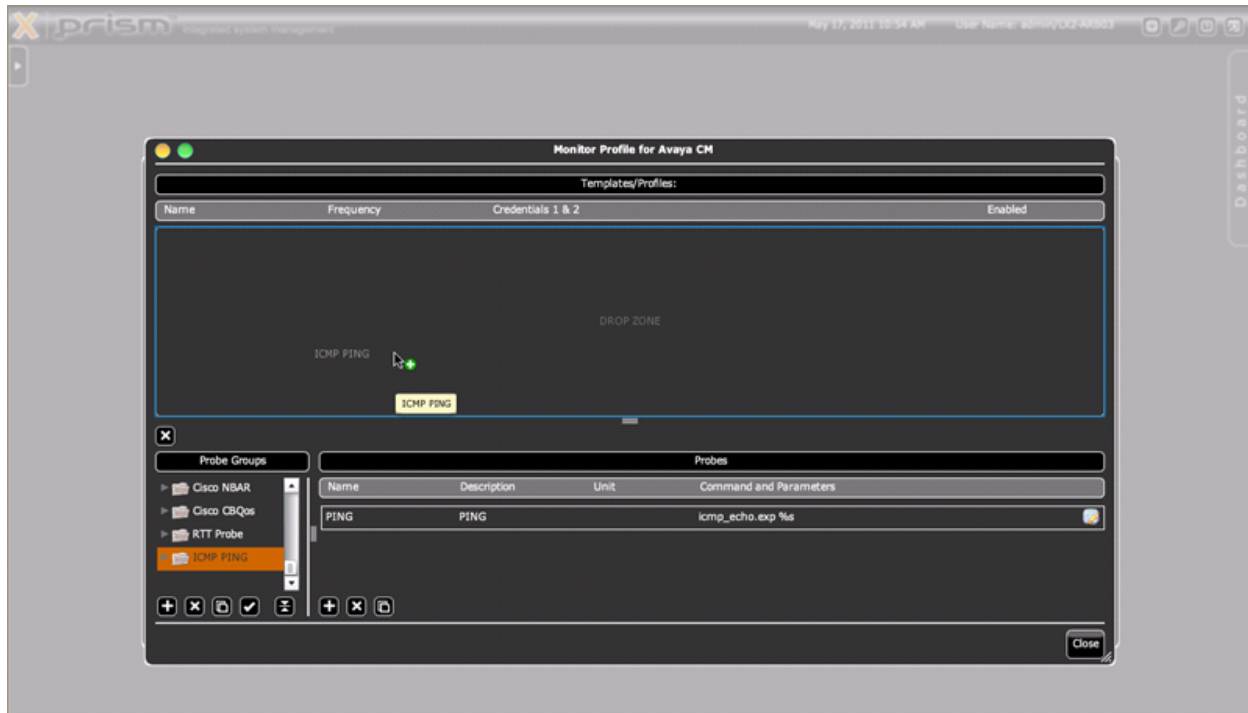
The configuration change validation screen will be displayed. Click the **‘check’** button in the bottom right to confirm the configuration change and save it.



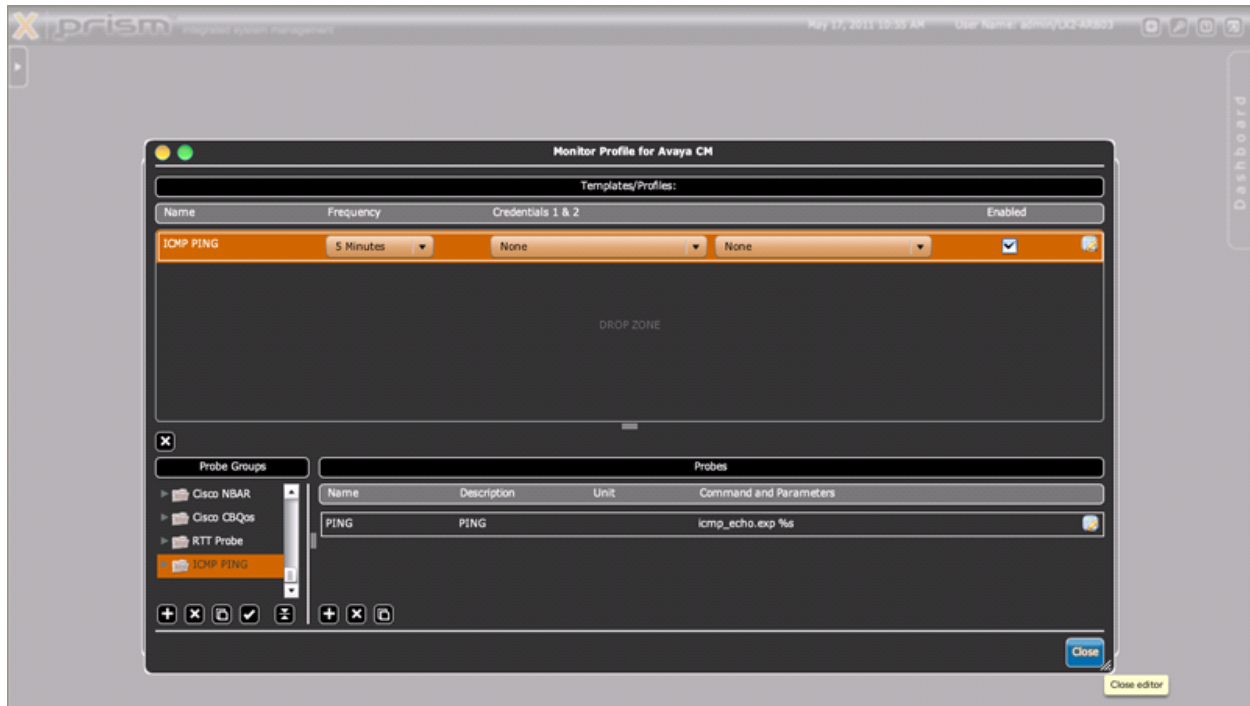
Configure an ICMP PING probe for the asset by clicking the small ‘wrench’ icon on the right-side of the asset entry line.



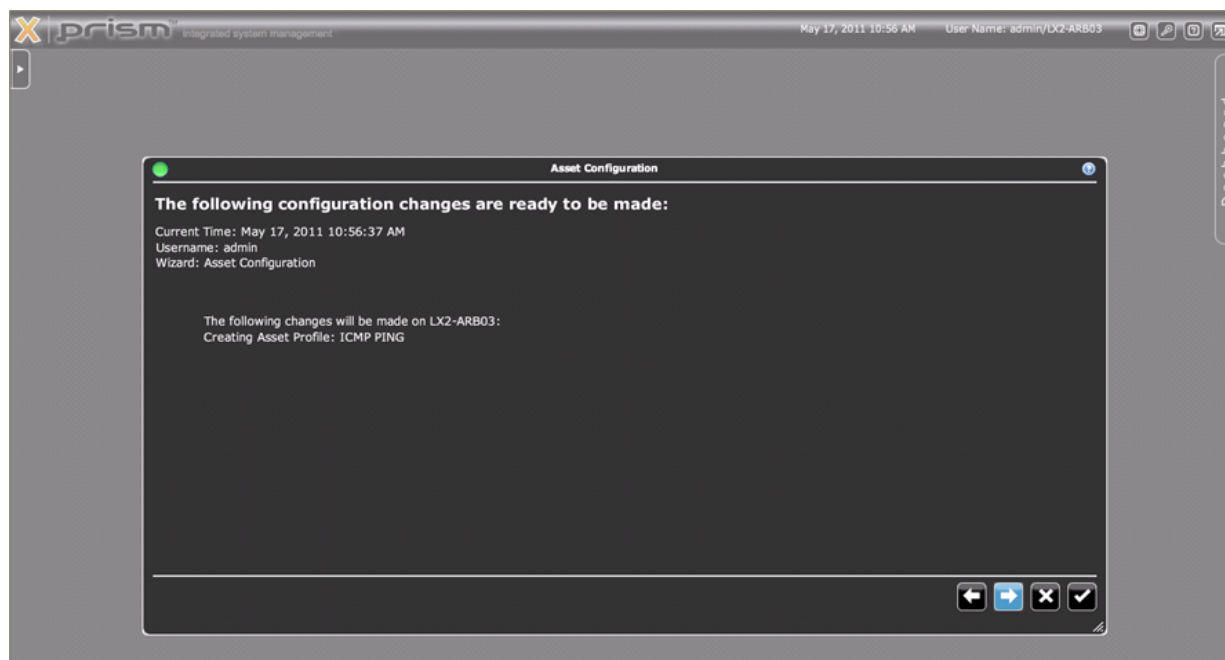
Click on the 'ICMP PING' from the Probe Groups list in the bottom left pane. Drag and drop the probe to the top '**Templates/Profiles**' pane to assign that probe to that asset. Set the polling frequency using the drop-down menu, (not shown).



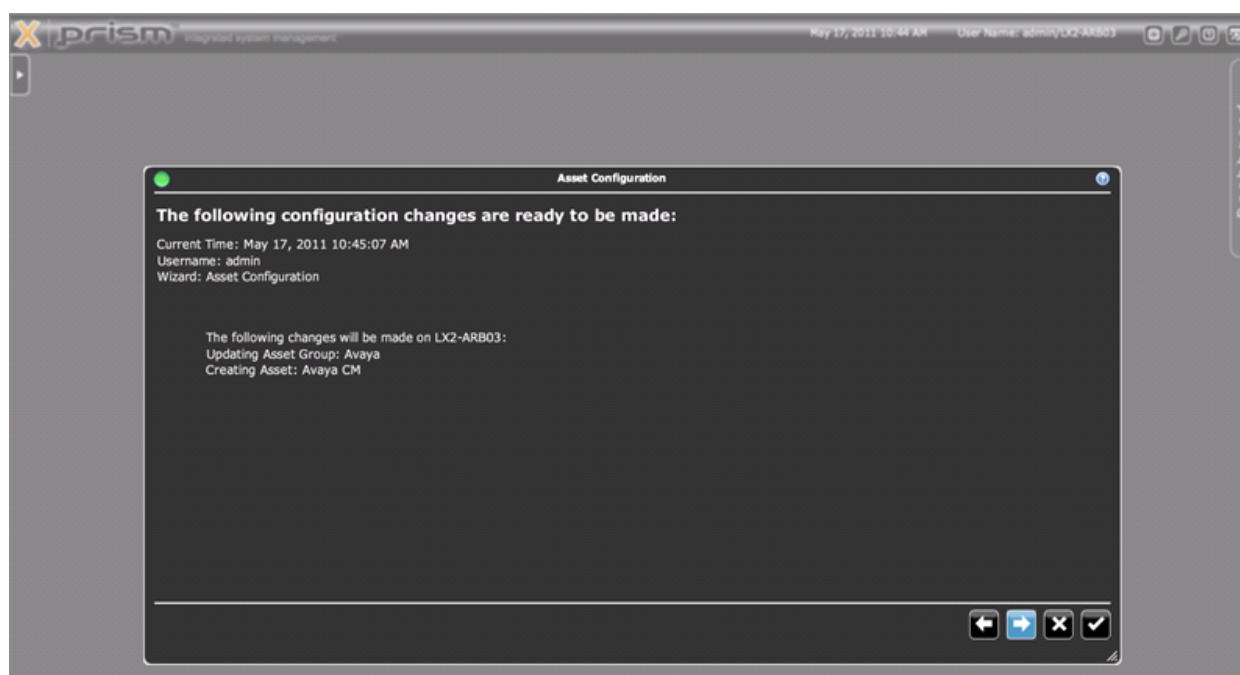
Click the ‘Close’ button in the bottom right corner of the window to complete the asset assignment.



Select the **‘right arrow’** key in the bottom right of the pane to push the config change.

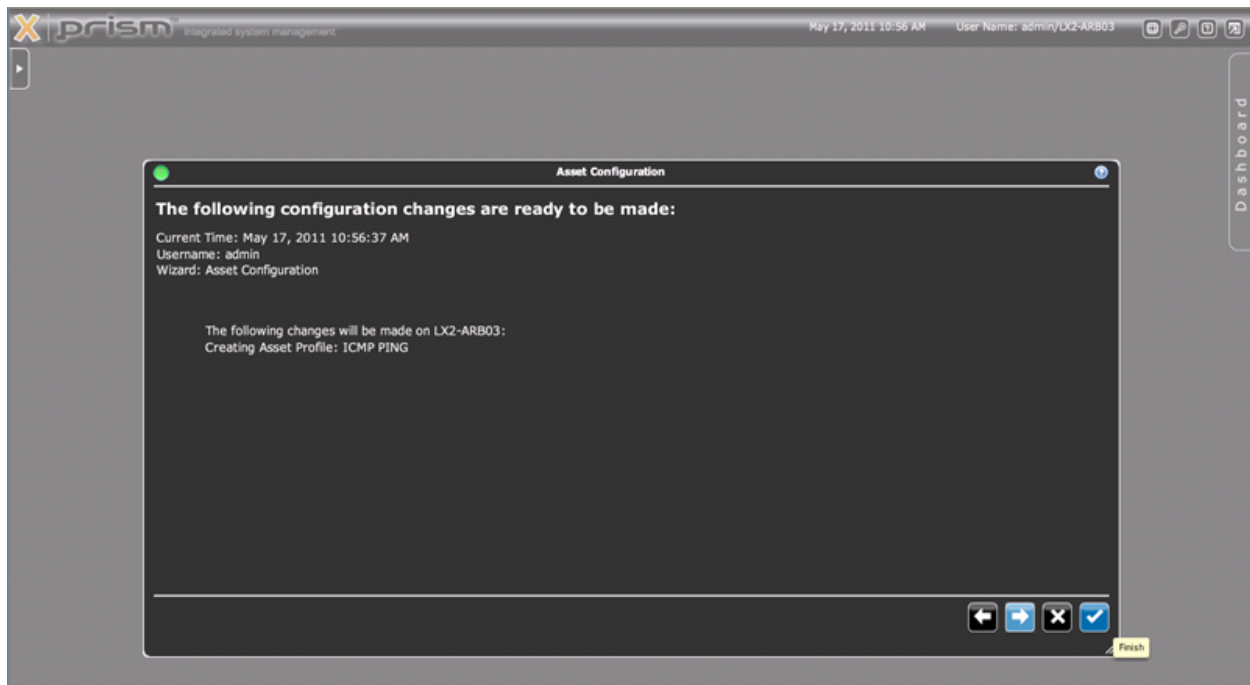


Select the **‘right arrow’** key in the bottom right of the pane to push the configuration change.





The configuration change validation screen will be displayed. Click the **‘check’** button in the bottom right to confirm the configuration change and save it.



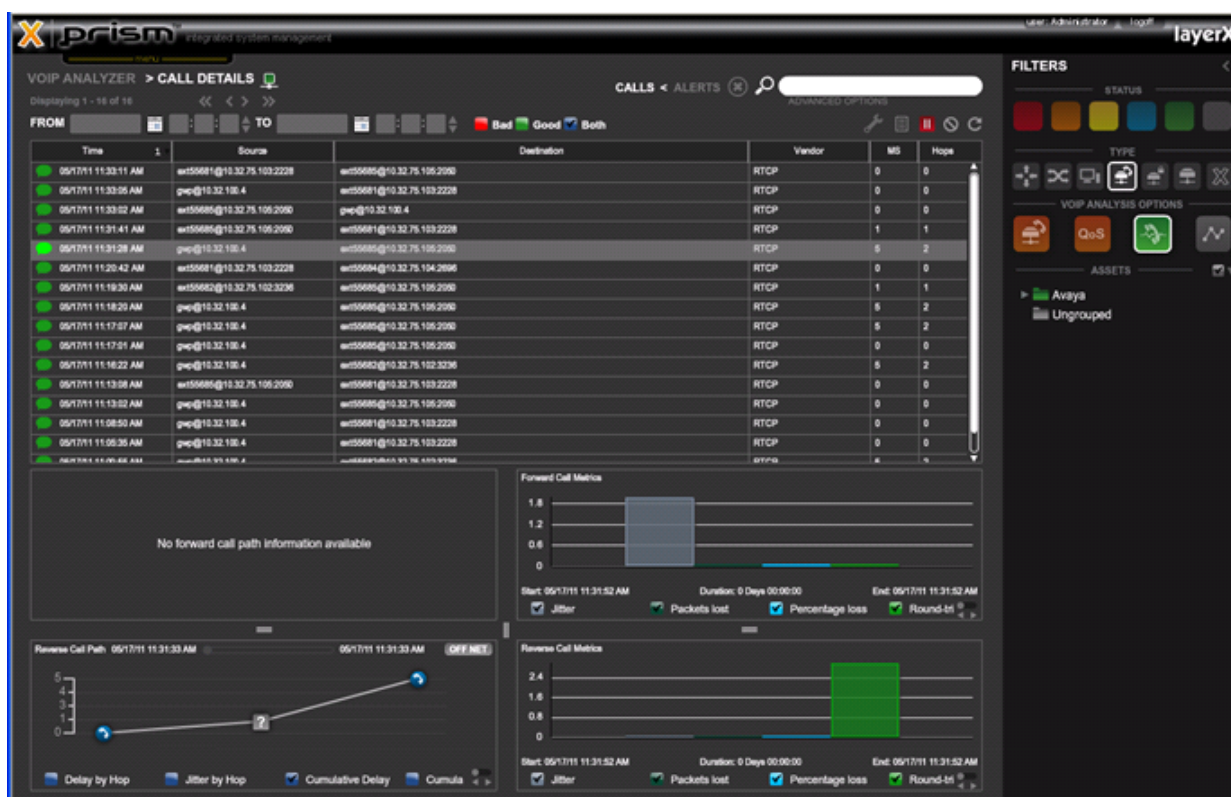
## 7. Verification Steps

The following steps may be used to verify the configuration:

Once the Avaya PBX configuration is complete, use the browser to navigate to <https://<ip-address>/Prism/index.html> to view Call Details, where <ip-address> is the ....

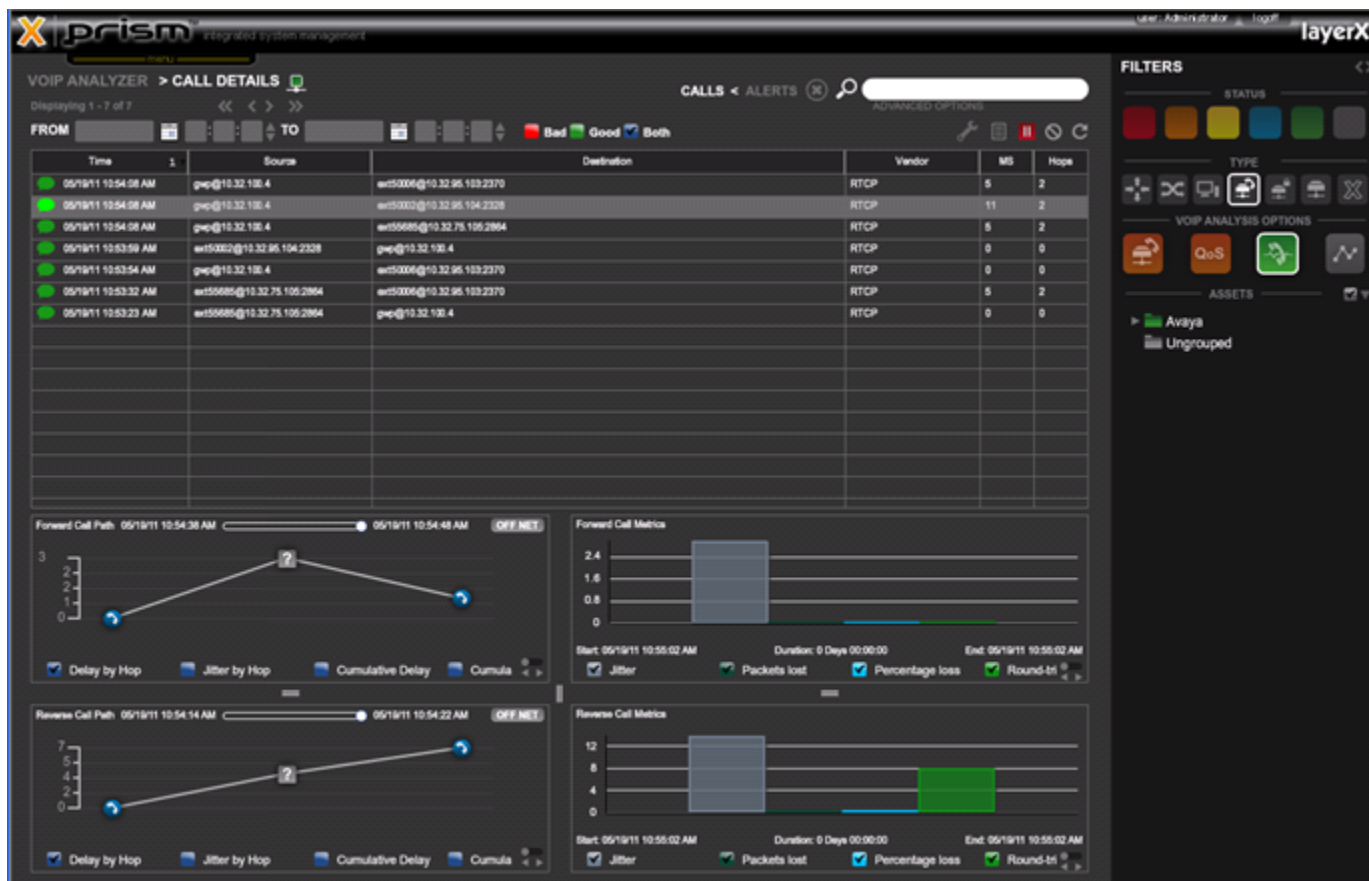
Log into the LayerX Technologies Arbitrator PRISM user interface Click on the 'X' graphic in the upper left corner → Select the VOIP Analyzer interface → Select the green 'phone' icon from the 'VOIP Analysis Options' section.

The Call Details screen will display the VQM metrics, call sender/receiver information, and call route information as it traversed the IP network.

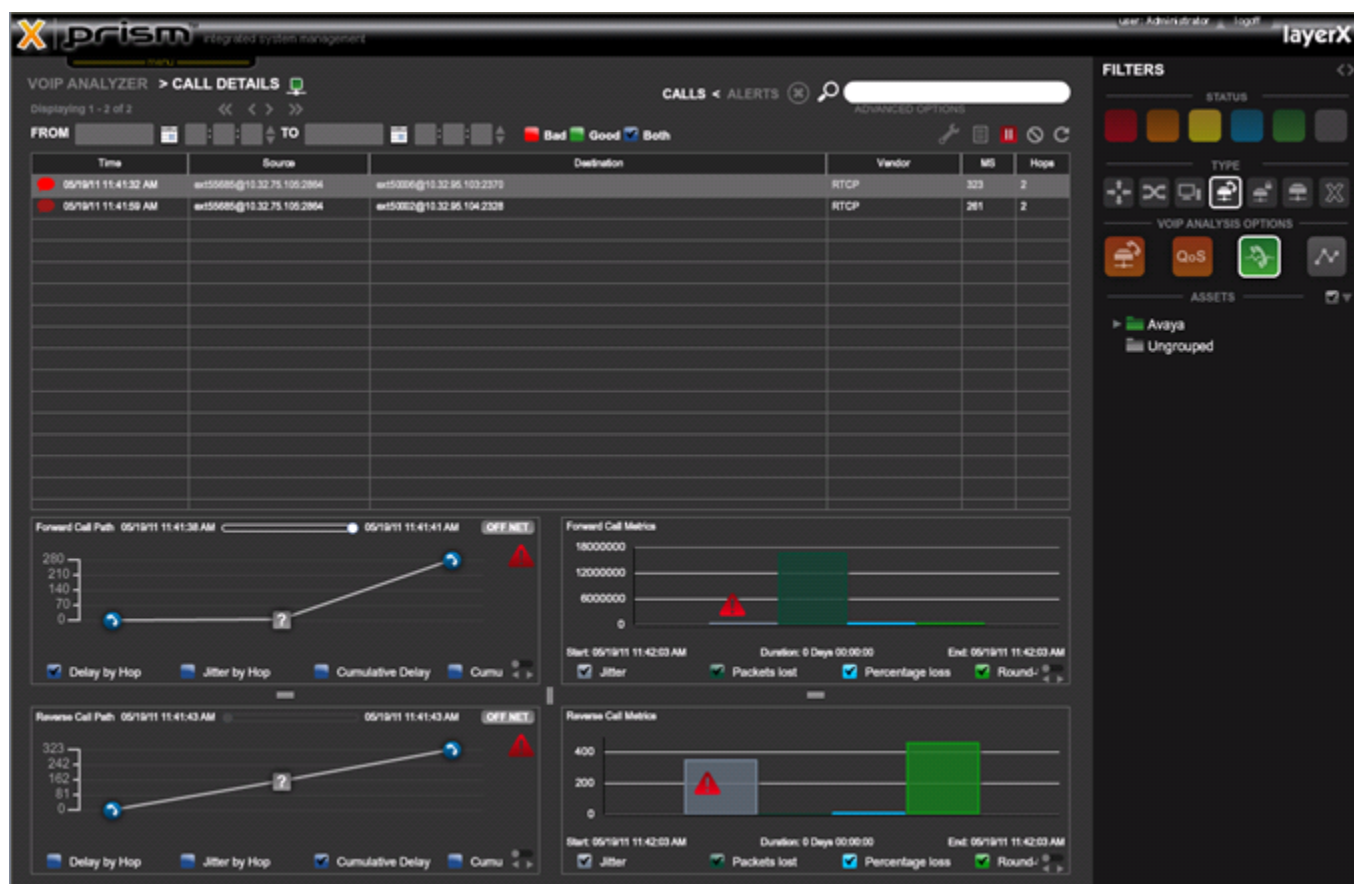


The following screens show examples of good and bad calls. Bad calls are a metric threshold that has been exceeded and are displayed with a red icon and an 'exclamation' icon to point out the metric that was exceeded specifically.

All call on the following screen were completed and did not exceed call threshold values.



All calls on the following screen were incomplete or had bad voice quality and exceed call threshold and are displayed with a red icon.



## 8. Conclusion

These Application Notes describe the procedures for configuring LayerX Technologies Arbitrator to collect call quality data from Avaya Aura® Communication Manager and Avaya H.323 IP Telephones utilizing Avaya Real Time Control Protocol (RTCP). LayerX Technologies Arbitrator successfully passed all compliance testing.

## 9. Additional References

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

[1] *Installing and Configuring Avaya Aura® Communication Manager*, Doc ID 03-603558, Release 6.0 June, 2010.

[2] *Administering Avaya Aura® Communication Manager*, Doc ID 03-300509, Issue 6.0 June 2010.

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