



Avaya Solution & Interoperability Test Lab

Application Notes for WildPackets OmniPeek Enterprise in an Avaya IP Telephony Environment – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for WildPackets OmniPeek Enterprise to interoperate in an Avaya IP Telephony environment, consisting of Avaya Communication Manager, Avaya 4610SW IP Telephones, and Avaya one-X™ Deskphone Edition. 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

WildPackets OmniPeek Enterprise is a network analysis application. The interoperability is in an Avaya IP Telephony environment, consisting of Avaya Communication Manager, Avaya 4610SW IP Telephones, and Avaya one-X™ Deskphone Edition. OmniPeek Enterprise monitors the RTP streams from the Avaya IP telephones, and analyzes the media packets to help identify any voice quality problems.

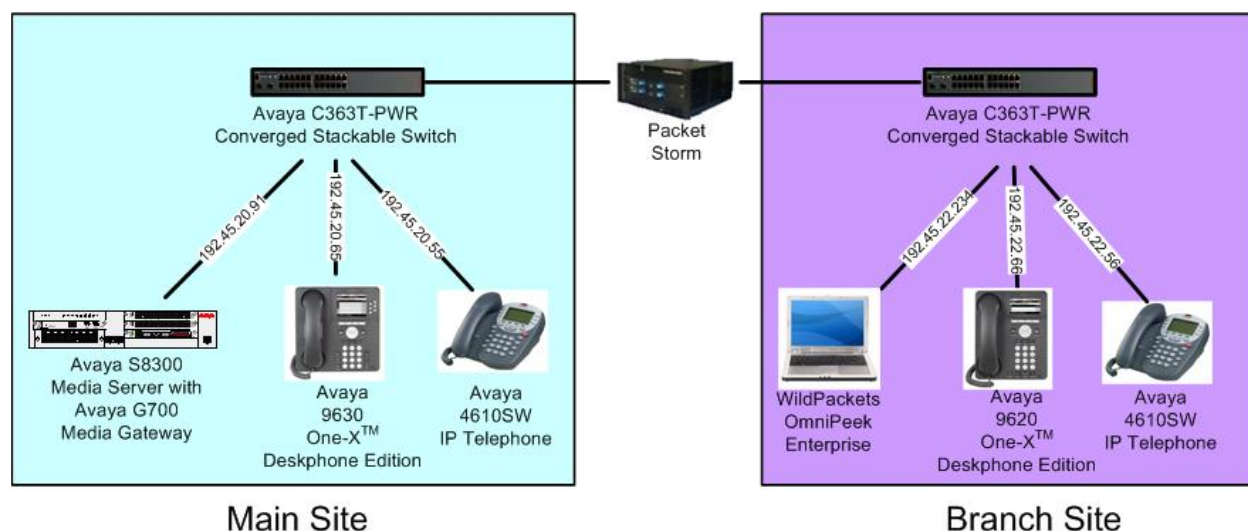


Figure 1: WildPackets Enterprise OmniPeek in an Avaya IP Telephony Environment

In the test configuration shown in **Figure 1**, OmniPeek Enterprise monitored the Avaya 4610SW IP and Avaya 9620 one-X™ Deskphone Edition telephones at the Branch site. The RTP stream for the two telephones at the Branch site were mirrored on the Avaya C363T-PWR Converged Stackable Switch, and sent over to OmniPeek Enterprise. The Packet Storm was used as a tool to inject VoIP impairments, such as jitter and loss, into the network for calls between the Branch site and the Main site.

For the compliance testing, the Enhanced Voice Option from OmniPeek Enterprise was used for analysis of voice quality. The Enhanced Voice Option enabled the VoIP impairments and the overall speech quality assessment scores to be reported. Even though OmniPeek Enterprise supports local data capture from remote OmniEngines, the remote OmniEngines were not included in the compliance testing.

The Avaya IP Telephony infrastructure is not the focus of these Application Notes and will not be described. Furthermore, the port mirroring on the Avaya C363T-PWR Converged Stackable Switch and the VoIP impairment injection on the Packet Storm will also not be described. Note that other network tapping methods, besides port mirroring, may be used for the purpose of RTP stream captures.

2. Equipment and Software Validated

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

Equipment	Software
Avaya S8300 Media Server with G700 Media Gateway	Avaya Communication Manager 3.1.2, load 632.1
Avaya C363T-PWR Converged Stackable Switches	4.3.12
Avaya 4610SW IP Telephones (H.323)	2.30
Avaya 9620 one-X™ Deskphone Edition (H.323)	1.0
Avaya 9630 one-X™ Deskphone Edition (H.323)	1.0
Packet Storm	10.5v1
WildPackets OmniPeek Enterprise running on Dell Latitude D600	4.0.1 Windows XP SP2

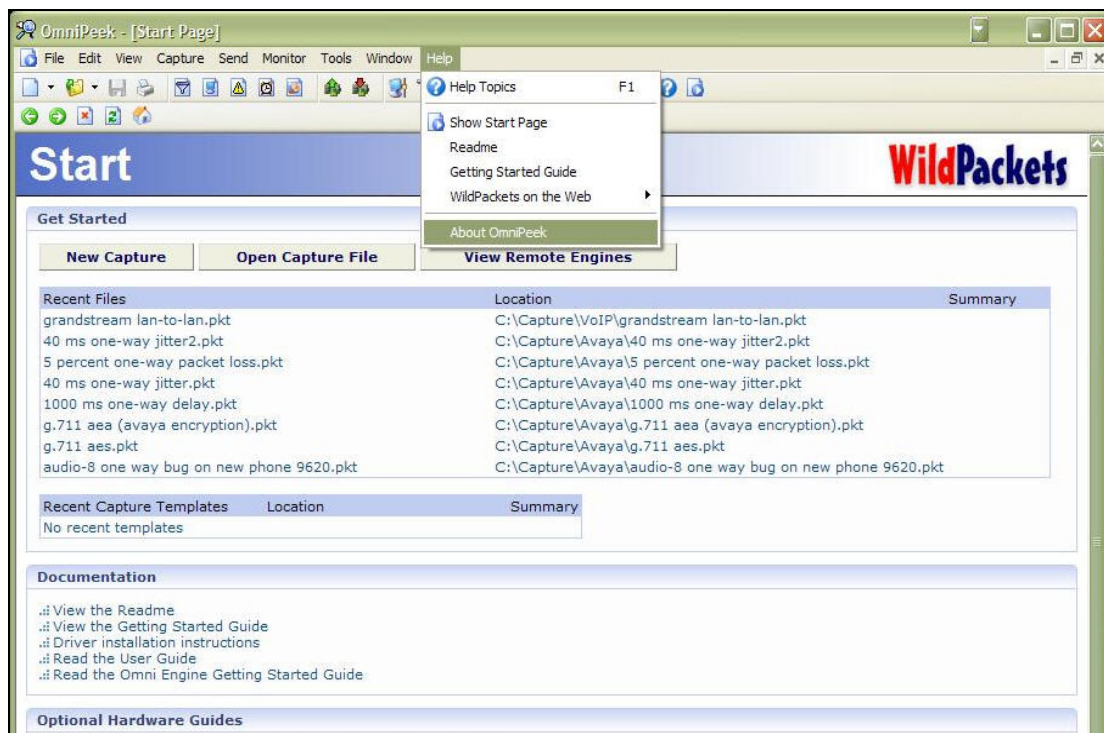
3. Configure WildPackets OmniPeek Enterprise

This section provides the procedures for configuring WildPackets OmniPeek Enterprise. The procedures fall into the following areas:

- Verify Enhanced Voice Option
- Administer new capture

3.1. Verify Enhanced Voice Option

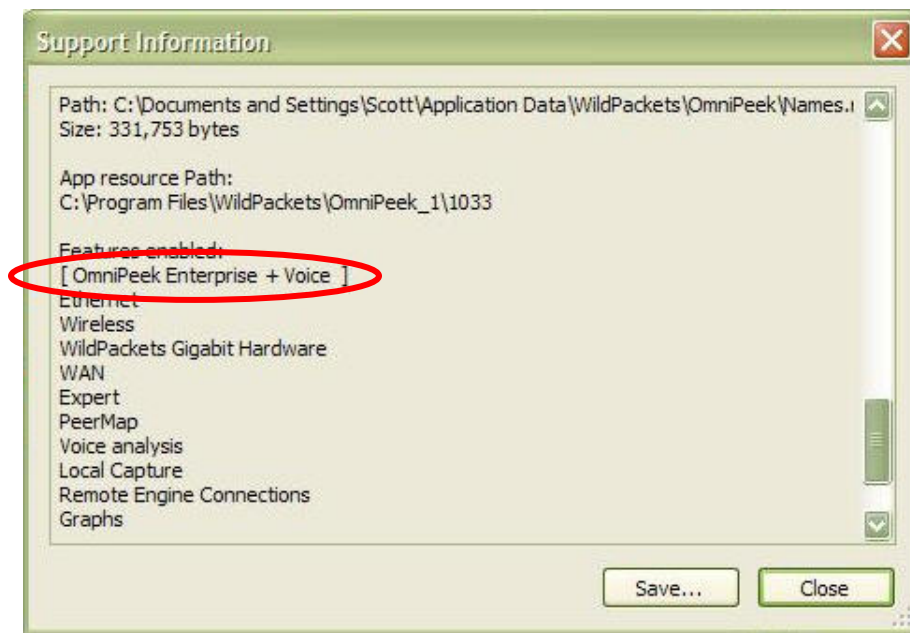
From the OmniPeek Enterprise server, select **Start > All Programs > WildPackets OmniPeek**. The **Start** screen is displayed. Select **Help > About OmniPeek**, as shown below.



The **About OmniPeek** dialog box is displayed. Click on **Support**.

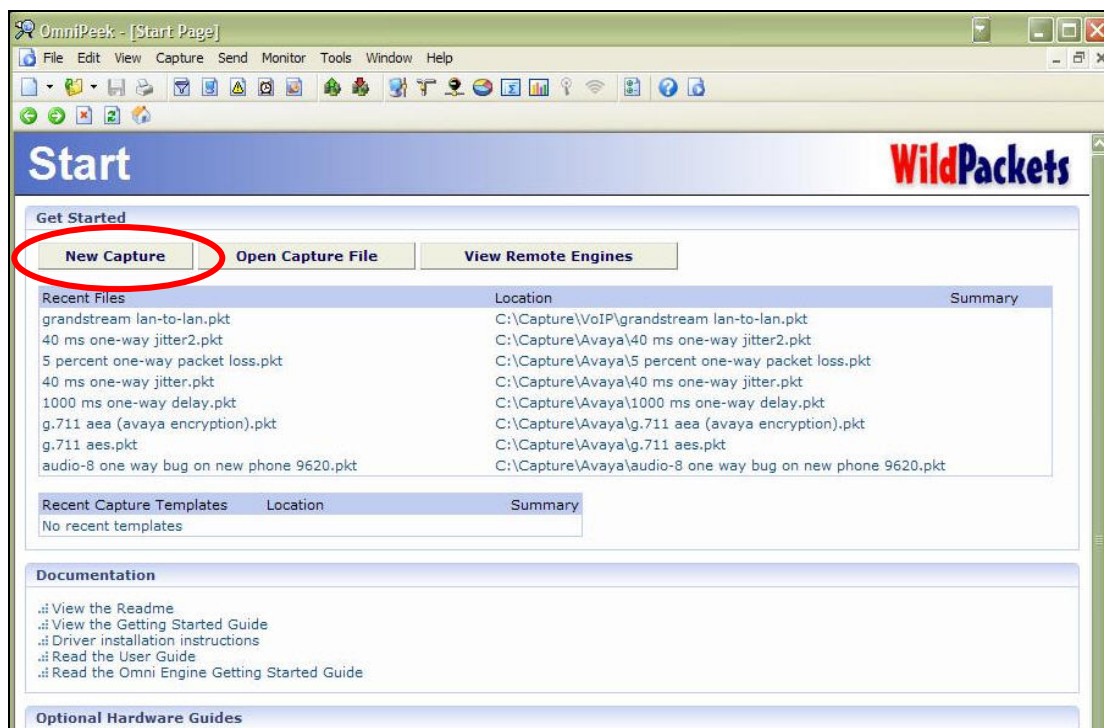


The **Support Information** dialog box is displayed next. Scroll down the window and verify that the Enhanced Voice Option is enabled, as indicated by the [**OmniPeek Enterprise + Voice**] feature shown below. Click on **Close** after the verification.

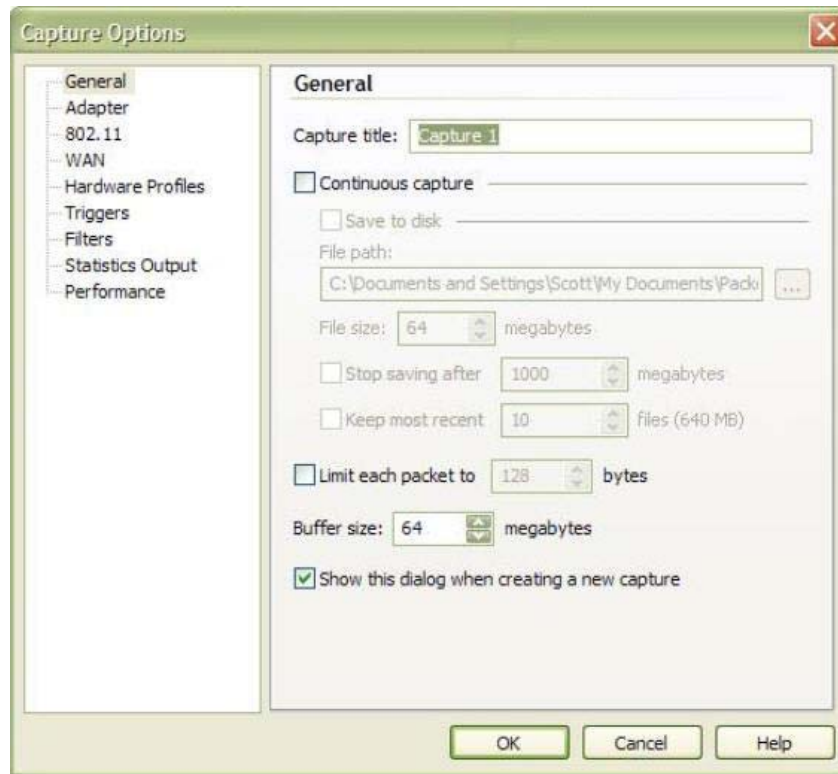


3.2. Administer New Capture

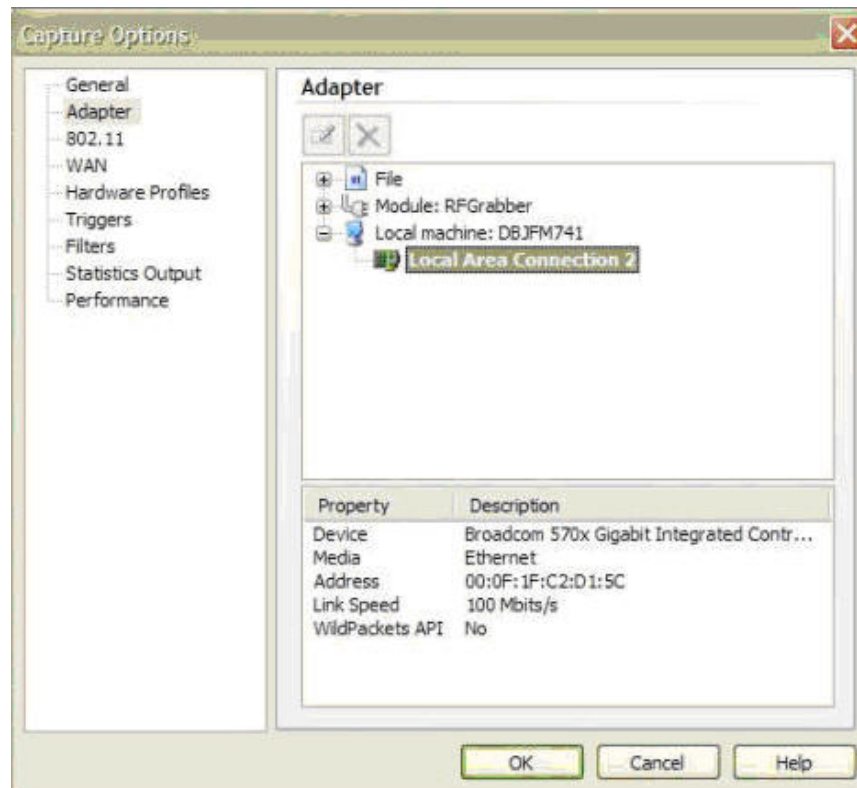
The **Start** screen is displayed again. Select **New Capture** to start a new capture.



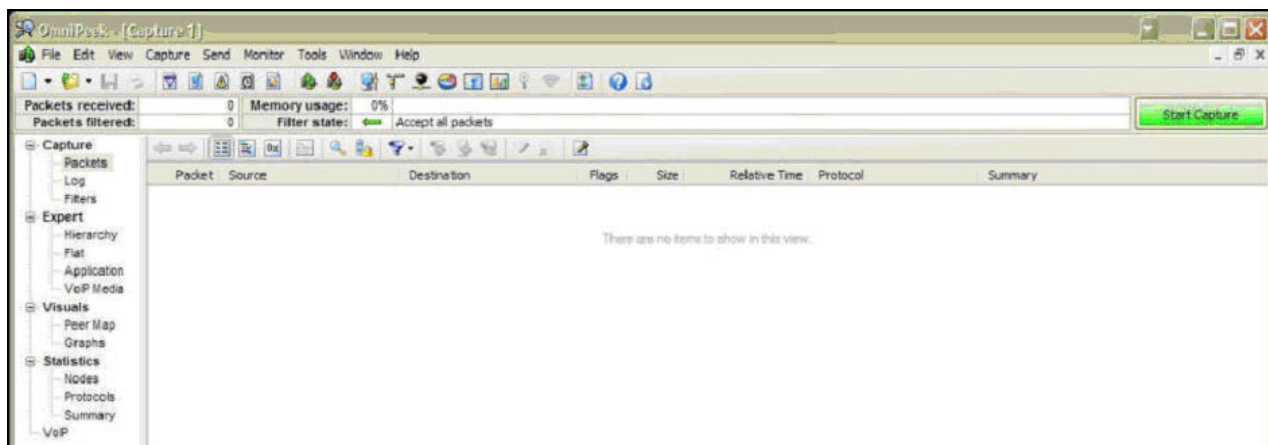
The **Capture Options** screen is displayed. Select **General** from the left pane. In the **Capture title** field, enter a descriptive name for the capture. The remaining fields may be modified as needed. For the compliance testing, all default values were retained, which allows the capture to continue until the buffer is filled with 64 megabytes of data.



Select **Adapter** from the left pane. Expand **Local machine:DBJFM741** in the right pane, and select an appropriate network adapter to use for the testing. Note that the local machine and adapter names may vary. For the compliance testing, the **Local Area Connection 2** Ethernet adapter was used. For network configurations involving WAN or wireless, a different type of adapter will need to be installed and selected. Click on **OK**.



The **OmniPeek – [Capture 1]** screen is displayed next, as shown below. Click on the green **Start Capture** button on the right to start the data capture.



4. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on verifying WildPackets OmniPeek Enterprise's capture and display of RTP streams, and analysis of voice quality from the Avaya 4610SW IP and Avaya 9620 one-X™ Deskphone Edition telephones. The call scenarios included registration, audio codecs with and without IP media shuffling, encryption, and VoIP impairment.

The serviceability testing focused on verifying the ability of WildPackets OmniPeek Enterprise to recover from adverse conditions, such as disconnecting the Ethernet cables to OmniPeek Enterprise.

4.1. General Test Approach

All tests were performed manually. The Packet Storm was used to inject VoIP impairments, such as jitter and loss, into the network for calls between the two sites.

The serviceability test cases were performed manually by disconnecting and reconnecting the LAN cable to WildPacket OmniPeek Enterprise.

The verification of all tests included checking of proper display of captured data at the OmniPeek Enterprise server, and of comparing the reported VoIP impairments from OmniPeek Enterprise with the network audio quality data reported on the Avaya 4610SW IP and Avaya 9620 one-X™ Deskphone Edition telephones.

4.2. Test Results

All test cases were executed and passed.

There were two observations from the compliance testing. First, when encryption was used for the calls, the OmniPeek Enterprise displayed "RTP Dynamic" to denote media packets that cannot be decoded.

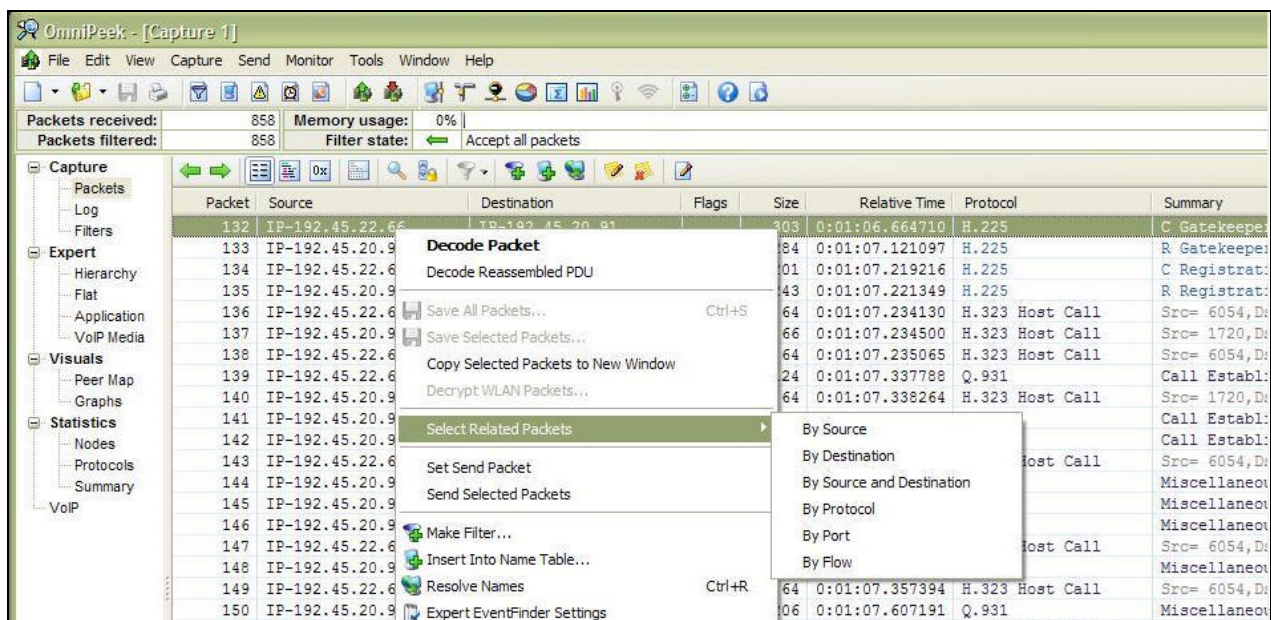
Second, the packet jitter value displayed by OmniPeek Enterprise is the jitter buffer value, which showed a nominal delay for normal traffic, and increased accordingly as additional jitter was injected by Packet Storm.

5. Verification Steps

This section provides the tests that can be performed to verify proper configuration of WildPackets OmniPeek Enterprise. Prior to verification, connect the two telephones monitored by OmniPeek Enterprise and make a few calls to enable registration and media packets to be captured.

5.1. Verify WildPackets OmniPeek Enterprise

In the **OmniPeek – [Capture 1]** screen continued from **Section 3.2**, verify that the packets are captured and automatically populated, as shown below. Right-click on an entry with the value “H.225” in the **Protocol** column, and select **Select Related Packets > By Protocol** from the drop down list. This will enable all registration packets to be selected.



The **Selection Results** dialog box is displayed. Click on **Copy**, to enable the selected packets to be copied to a new window.



The new **OmniPeek – [Capture 1 – Selection]** screen is created, and displays the captured registration packets as shown below. Verify that the IP telephones are successfully registered, as indicated by entries with “IP-192.45.22.66” and “IP-192.45.22.56” in the **Destination** column, and “R Registration Confirm (RCF)” in the corresponding **Summary** column. Note that these two IP addresses correspond to the two Avaya IP telephones monitored by OmiPeek Enterprise. Select **File > Close** from the menu bar, to close this screen after verification.

Packet	Source	Destination	Size	Relative Time	Protocol	Summary
1	IP-192.45.22.66	IP-192.45.20.91	303	0.000000	H.225	C Gatekeeper Request (GRQ)
2	IP-192.45.20.91	IP-192.45.22.66	284	0.456387	H.225	R Gatekeeper Confirm (GCF)
3	IP-192.45.22.66	IP-192.45.20.91	201	0.554506	H.225	C Registration Request (RRQ)
4	IP-192.45.20.91	IP-192.45.22.66	243	0.556639	H.225	R Registration Confirm (RCF)
5	IP-192.45.22.56	IP-192.45.20.91	111	36.475103	H.225	C Gatekeeper Request (GRQ)
6	IP-192.45.20.91	IP-192.45.22.56	118	36.476486	H.225	R Gatekeeper Confirm (GCF)
7	IP-192.45.22.56	IP-192.45.20.91	197	36.505435	H.225	C Registration Request (RRQ)
8	IP-192.45.20.91	IP-192.45.22.56	173	36.507717	H.225	R Registration Confirm (RCF)

The **OmniPeek – [Capture 1]** screen is displayed again. Select **Expert > VoIP Media** from the left pane, and verify that the voice quality and impairments are reported in the **Jitter**, **Packet Loss %**, **MOS-CQ**, and **R Factor Conversational** columns. The selection of which columns to display is accomplished by right-clicking on an existing column heading, and checking the desired fields, as shown below.

Flow ID	Source Addr	Dest Addr	Duration	Jitter	Packet Loss %	Codec	MOS-CQ	R Factor Conversational
6	192.45.20.93	192.45.22.56	0.047	0.047	5	G.729A	2.61	53
8	192.45.22.56	192.45.20.93	0.034	0.034	0	G.729A	3.91	82
9	192.45.22.66	192.45.20.93	0.034	0.034	0	G.729A	3.91	82
9	192.45.20.93	192.45.22.66	0.053	0.053	5	G.729A	2.66	54
23	192.45.20.93	192.45.22.56	0.042	0.042	0	G.711 µ-law	4.19	93
23	192.45.22.56	192.45.20.93	0.040	0.040	0	G.711 µ-law	4.19	93
24	192.45.22.56	192.45.20.55	0.034	0.034	0	G.711 µ-law	4.19	93
24	192.45.20.55	192.45.22.56	0.059	0.059	4	G.711 µ-law	2.81	57
25	192.45.22.66	192.45.20.93	0.040	0.040	0	G.711 µ-law	4.19	93
25	192.45.20.93	192.45.22.66	0.044	0.044	5	G.711 µ-law	1.83	37
27	192.45.22.66	192.45.20.65	0.034	0.034	0	G.711 µ-law	4.19	93
27	192.45.20.65	192.45.22.66	0.050	0.050	4	G.711 µ-law	2.76	56

6. Support

Technical support on WildPackets OmniPeek Enterprise can be requested at www.wildpackets.com/support/contact.

7. Conclusion

These Application Notes describe the configuration steps required for WildPackets OmniPeek Enterprise 4.0.1 to interoperate in an Avaya IP Telephony environment, consisting of Avaya Communication Manager 3.1.2, Avaya 4610SW IP Telephones, and Avaya one-X™ Deskphone Edition. All feature and serviceability test cases were completed successfully.

8. Additional References

This section references the product documentation relevant to these Application Notes.

- *Administrator Guide for Avaya Communication Manager*, Document 03-300509, Issue 2.1, May 2006, available at <http://support.avaya.com>
- *WildPackets OmniPeek Getting Started Guide*, available on OmniPeek Enterprise installation CD.
- *WildPackets OmniPeek User Guide*, available on OmniPeek Enterprise installation CD.

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