



Clarinet VoIP Applications

PESQ Measurement Using H.323

Introduction

PDS have provided an example profile to control two Clarinet LAN units for automatic generation of an RTP (real time protocol) flow. After the profile has finished the user may run a protocol filter on the recorded event file, which is designed to extract QOS (quality of service) parameters including perceptual evaluation of speech quality (PESQ) measurement.

- In order to run these profiles you will need to connect the optional Clarinet PESQ security key (dongle) to your PC parallel port. One Clarinet LAN unit should be set to an ID of 1 (one) and the other should be set to an ID of 2 (two).
- Connect both of these units to a Hub together with your notebook PC if this is what you are intending to use as a Gatekeeper. In the 'Gatekeeper' folder you will find a Readme.txt document describing how to install the PDS configuration of OpenH323 Gatekeeper. OpenH323 Gatekeeper from OpenH323.org was used on our Clarinet PC host to complete the configuration of this example application. It is very convenient for demonstration or evaluation because one notebook PC can be used to control two Clarinet LAN units both running H.323 simulation while the same PC host is acting as the H.323 Gatekeeper to supervise and control the communication.
- Copy the 'H.323 example profile' folder in to your C:\Clarinet\Cladata folder. Run the Clarinet loader and open the Manager, use your mouse pointer to select 'Directory' and choose the working route directory to be 'H.323 example profile'.
- With your PC set up to act as a Gatekeeper connect this together with your two Clarinet LAN units to the same Ethernet Hub. Now click on the horse and run the profile 'Lan_H.323_PESQ_TxRx.acp'.
- The profile will be launched using the filter 'Lan_auto_rtp_analog.acf' which will provide a decode of all events captured by Clarinet 1 including the full ASN.1 content of all User-User messages.
- To verify that Clarinet 2 is present you will notice that Clarinet 1 will launch an ARP request (the same as PING) that will be replied to by Clarinet 2 via the Gatekeeper on the IP address 192.168.2.200.
- To see how the profile was created select the folder 'P IP' in the Clarinet Manager and open the IP profile 'H.323_PESQ_Gen.aip' and look at the configuration for the H.323 call that will be generated by Clarinet 1 when running this profile. With the 'H.323_PESQ_Gen.aip' profile open, click on 'Generator' and then 'Edit' to look at 'H.323 Destination 1'. There is a five second starting delay which is how long the Clarinet will wait before launching this call. The destination IP address is 192.168.2.242 which is Clarinet 2.





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- The 'Active source' is PESQ using the 'Tx file' 'tx1_or137_8kx16.wav'. This WAV file will be sent once for a duration of 10 seconds (send 1 time and clear after 10 sec). Close this IP profile without saving any changes and open the IP profile 'H.323_PESQ_Res.aip'. This is the IP profile for Clarinet 2 and is set up to respond to the call received from Clarinet 1. With the 'H.323_PESQ_Res.aip' profile open, select 'Responder' to view the configured behaviour. Clarinet 2 will connect to the incoming call after a 1 second delay and also has an 'Active source' of PESQ transmitting the same WAV file (tx1_or137_8kx16.wav) in the opposite direction. It is necessary to measure in both directions to be sure that you have assessed the quality of the entire communication path.

TIP

If your PC has a sound card and you would like to hear the audio that has been exchanged by Clarinet 1 and Clarinet 2, then use Explorer to locate the file 'tx1_or137_8Kx16.wav' and double click on this file to hear the content.

- When you run the main Clarinet profile 'Lan_H.323_PESQ_TxRx.acp' it will automatically load and run the two IP profiles that you were examining.
- If your Gatekeeper is correctly configured and everything is connected, the Clarinet event trace will provide the following indications:
 - a) Own address indication 192.168.2.241 for Clarinet 1.
 - b) An ARP request and an ARP reply prove that Clarinet 2 is accessible.
 - c) A Gatekeeper request message is sent from both Clarinet units.
 - d) Gatekeeper Confirm messages are sent to both Clarinet units.
 - e) Registration Requests are now sent from both Clarinet units.
 - f) The Gatekeeper sends a Registration Confirm to both.
 - g) Clarinet 1 wishes to generate a call so it sends an Admission Request.
 - h) The Gatekeeper replies with an Admission Confirm to allow the call.
 - i) A call SETUP message is sent from Clarinet 1 to Clarinet 2.
 - j) A Call Proceeding message is sent from Clarinet 2 to Clarinet 1.
 - k) Clarinet 2 asks to participate in this call by sending an Admission Request.
 - l) The Gatekeeper responds with an Admission Confirm.
 - m) Clarinet 2 now sends an Alerting message and waits one second.
 - n) 1 second later Clarinet 2 sends the Connect message.
 - o) Now you will see the RTP flow initially in a stable state (d5 d5 d5...).
 - p) After a short delay the RTP becomes unstable (91 99 84 99 e1 95...) which is due to the speech contained in the WAV files transmitted by the Clarinet units.
 - q) The end of the call is clear from the Release Complete message sent by Clarinet 1 and just prior to this, you will see an RTCP (real time control protocol) message closing the session and indicating that it was used for 'Quality traffic'.





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- After the calls have successfully completed you will need to plug in your optional Clarinet PESQ security key (dongle) and click 'Filter' at the top of the Clarinet Manager window to select 'Run Protocol'. In the 'Clarinet – Protocol Filter Exec' window that opens, choose your source file 'Lan_H.323_PESQ_TxRx.ace' and select to run this past a new filter called 'Lan_PESQ_extract.acf'. Type any name that you would like to use for the result file and then click 'Apply'. The filter execution will take a few seconds and then you can go to the Clarinet event editor (Open protocol event file), select your newly named result file and use the filter 'Lan_PESQ_extract.acf' to view the results.
- With the file open click on the binoculars, type 'PESQ' in upper case then click 'Find'. The first match will be the name of your Clarinet profile in the event window, click '>' to see that the next match follows the 'Call Proceeding' message where the Clarinet indicates an intention to measure PESQ and to transmit a file. Click '>' again and see the PESQ result indication which also includes Jitter and Loss measurements.
- If you do not have access to the optional Clarinet PESQ security key you can still see the results by using the Clarinet event editor (Open protocol event file) to view the file called 'H.323_PESQ_RESULT_SAMPLE.ace' using the filter 'Lan_PESQ_extract.acf'. This will show a PESQ result of 4.37 in both directions and this was obtained by using exactly the Clarinet configuration described in this document.

Thank you for your interest in using the powerful Clarinet system for H.323 applications.

