

Agilent PXT Wireless Communications Test Set (E6621A)



N6061A LTE Protocol Logging and Analysis User's Guide



Agilent Technologies

Notices

© Agilent Technologies, Inc. 2010-2013

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc. as governed by United States and international copyright laws.

Trademark Notices

Windows®, MS Windows XP®, and MS Windows 7® are either registered trademarks of Microsoft Corporation in the United States and/or other countries.

Warranty

The material contained in this document is provided “as is,” and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Statement of Compliance

This product has been designed and tested in accordance with accepted industry standards, and has been supplied in a safe condition. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Manual Part Number

E6621-90004

Edition

September 2013
Version 6.5

Agilent Technologies, Inc.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as “Commercial computer software” as defined in DFAR 252.227-7014 (June 1995), or as a “commercial item” as defined in FAR 2.101(a) or as “Restricted computer software” as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies’ standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

Safety Notices

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies Inc. assumes no liability for the customer’s failure to comply with these requirements.

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Where to Find the Latest Information

Agilent will periodically update product documentation. For the latest information about this wireless test set, including software upgrades, operating and application information, and product and accessory information, see the following URL: <http://www.agilent.com/find/pxt>

Is your product software up-to-date?

Agilent will periodically release software updates to fix known defects and incorporate product enhancements. To search for software updates for your product, go to the Agilent software manager website at

<http://www.agilent.com/find/softwaremanager>

IMPORTANT

An active N6050AS software and technical support contract (STSC) is required to access the software manager website (displayed above), together with the login credentials registered by you or your company for activation. See the section on licensing in the ***Agilent PXT Wireless Communications Test Set Getting Started Guide*** for instructions to activate your STSC.

This page is intentionally left blank.

Table of Contents

1	Introduction	1
	Latest Documentation	1
	Latest Software Application Releases.....	1
2	System Architecture	2
3	Installation and Setup	3
	Personal Computer Requirements.....	3
	Downloading the Latest Version of N6061A Protocol Logging and Analysis Software.....	3
4	Using the N6061A Logging and Analysis Application.....	4
	Configuring UE Attributes on the N6061A.....	4
	Capturing a log.....	5
	Viewer Setup.....	7
	Logging.....	8
	Replaying previously recorded logs.....	8
	Exporting Logs to HTML Format.....	9
	Exporting Logs to pcap Format	10
	Wireshark Instructions	11
5	Using the API to control the N6061A remotely	19
	Downloading and installing the API.....	19
	API Commands	19
	API Error Codes.....	21
6	Service and Support	23
	Calling Agilent Technologies.....	23
	Locations for Agilent Technologies.....	24
	Software and Technical Support Contracts	25
	STSCs for the Agilent E6621A PXT.....	25
	Web-based support.....	25
	E-mail support	26
	Phone support.....	26

This page is intentionally left blank.

1 Introduction

Welcome to the ***N6061A LTE Protocol Logging and Analysis User's Guide*** for the Agilent E6621A PXT Wireless Communications Test Set (PXT). The purpose of this guide is to provide you with installation instructions and user information for your logging and analysis software.

Latest Documentation

For the latest version of all documentation, please go to www.agilent.com/find/pxt.

Latest Software Application Releases

For the latest release of all PXT related software, please go to <http://www.agilent.com/find/softwaremanager>.

IMPORTANT	An active N6050AS Software and Technical Support Contract (STSC) is required to access the software manager website (displayed above), together with the login credentials registered by you or your company for activation. See the section on licensing in the <i>Agilent PXT Wireless Communications Test Set Getting Started Guide</i> for instructions to activate your STSC.
------------------	---

2 System Architecture

The N6061A application software runs on PCs using the Microsoft (MS) Windows XP/ Windows 7 operating systems. It displays and stores protocol and event logs of the PXT. The stored log files can be replayed and analyzed using this software and other advanced post-processing tools. The log files can also be exported as HTML or pcap file types. The export to pcap and subsequent import into Wireshark allows examination of signaling above the IP layer. The N6061A Protocol Logging and Analysis Application is connected to the PXT via a private Ethernet interface to capture MAC and PHY message exchange. Figure 2-1 shows an example N6061A log.

No	Time	RFN	TTI	DIR	Protocol	RNTI	Layer	Channels	Length	PDU Message	Note
6856	2010/06/03 01:42:47.169	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6857	2010/06/03 01:42:47.186	22	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6858	2010/06/03 01:42:47.186	22	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6859	2010/06/03 01:42:47.186	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6860	2010/06/03 01:42:47.229	24	0	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6861	2010/06/03 01:42:47.229	24	0	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6862	2010/06/03 01:42:47.229	-	-	DL	LTE	0xFFFF	RRC	BCCH	34	SystemInformationBlockType	
6863	2010/06/03 01:42:47.231	24	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6864	2010/06/03 01:42:47.231	24	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6865	2010/06/03 01:42:47.232	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6866	2010/06/03 01:42:47.241	26	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6867	2010/06/03 01:42:47.241	26	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6868	2010/06/03 01:42:47.241	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6869	2010/06/03 01:42:47.251	28	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6870	2010/06/03 01:42:47.251	28	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6871	2010/06/03 01:42:47.251	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6872	2010/06/03 01:42:47.279	30	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6873	2010/06/03 01:42:47.279	30	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6874	2010/06/03 01:42:47.280	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6875	2010/06/03 01:42:47.287	32	0	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6876	2010/06/03 01:42:47.287	32	0	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6877	2010/06/03 01:42:47.287	-	-	DL	LTE	0xFFFF	RRC	BCCH	34	SystemInformationBlockType	
6878	2010/06/03 01:42:47.289	32	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6879	2010/06/03 01:42:47.289	32	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6880	2010/06/03 01:42:47.290	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6881	2010/06/03 01:42:47.306	34	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6882	2010/06/03 01:42:47.306	34	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6883	2010/06/03 01:42:47.307	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	
6884	2010/06/03 01:42:47.352	36	5	DL	LTE	0xFFFF	MAC	DCI	7	DCI Format 1a	
6885	2010/06/03 01:42:47.352	36	5	DL	LTE	0xFFFF	PHY	PDCCH	7	PHY_DATA	
6886	2010/06/03 01:42:47.352	-	-	DL	LTE	0xFFFF	RRC	BCCH	15	SystemInformationBlockType	

Figure 2-1: Example N6061A log

3 Installation and Setup

Personal Computer Requirements

Processing large amounts of time critical data is an inherent requirement of the logging function. A high performance desk- top style computer with expansion capacity for additional Network Interface Cards (NIC) or adaptors is recommended.

Minimum System Requirements	
Operating System	Computer running Windows XP or Windows 7
Communication with Test Set(s)	Ethernet
RAM (Memory)	4 GB RAM (Minimum)
Processor	>2.5 GHz Intel Pentium® Quad core or equivalent
.NET Framework	Version 2.0 or later

NOTES:

1. Consideration for storage space should be given for storing logs and supporting documentation.
2. A clean installation of the Operating System is required to ensure freedom from Ad-ware, Spy-ware, updaters, and other processor resource consuming applications. For expected performance, Antivirus software should not be running.
3. Connecting the PXT and logging PC to a network is not recommended.

Downloading the Latest Version of N6061A Protocol Logging and Analysis Software

To ensure you have the latest version, the N6061A software is downloaded from the Agilent software manager web site. To access the download site, you will first need to register and activate your N6050AS Software and Technical Support Contract (STSC) for the E6621A PXT.

If you have not already done so, follow the instructions on your N6050AS Entitlement Certificate to activate your Contract. For more information on activating licenses, see the section on licensing in the **Agilent PXT Wireless Communications Test Set Getting Started Guide**.

On the www.agilent.com/find/softwaremanager download site, locate the N6061A Protocol Logging and Analysis Software, and save it to a location on your PC.

Locate the file on your PC and double-click the setup file to install the software. Follow the on-screen instructions to complete the installation.

Before running the software, plug your N6061A USB license key into your PC.

NOTE	Always check the release notes for the latest information about any known issues and other important information about your product. Release notes are available for download from www.agilent.com/find/softwaremanager
-------------	---

4 Using the N6061A Logging and Analysis Application

Connect the PC to the E6621A PXT using an Ethernet cable, either directly or via a private Ethernet hub. Configure the IP addresses and subnet-mask as shown in the table below.

Item	Agilent E6621A PXT	Agilent N6061A Protocol Logging and Analysis PC
IP address	192.168.1.60	192.168.1.135
Subnet Mask	255.255.255.0	255.255.255.0
Gateway	not required	not required

Start the N6061A Protocol Logging and Analysis application from the Windows Start menu by selecting Start, All Programs, Agilent PXT, N6061A Protocol Logging and Analysis, N6061A, or by double-clicking on



the desktop icon. N6061A

Configuring UE Attributes on the N6061A

On the N6061A, the Configuration option on the menu bar allows you to specify attributes of the UE under test.

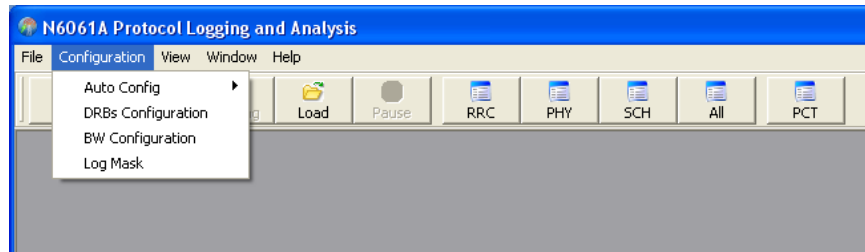


Figure 4-1: Set the Logging Attributes.

The "Auto Config" option enables you to configure the N6061A Dedicated Radio Bearers (DRBs) and BW configuration automatically from information sent by the PXT and stored within an LDM log file, rather than manually from the Configuration menu. LDM log files created prior to version 6.3 of the N6061A will not contain this information and will require manual configuration of the DRBs and BW.

The Configuration menu also displays the “Log Mask” submenu. Configure which channels you want to log by ensuring there is a checkmark next to each selected channel.

NOTE	For SCH PDUs, the log mask has two modes: short and long. When set to short, PDUs are truncated to save bandwidth on the connection between N6061A and E6621A. This mode is useful for seeing short messages, or to see that a PDU was present if you do not care about the specific content. When set to long, the entire PDU is transferred to the N6061A for completeness.
-------------	---

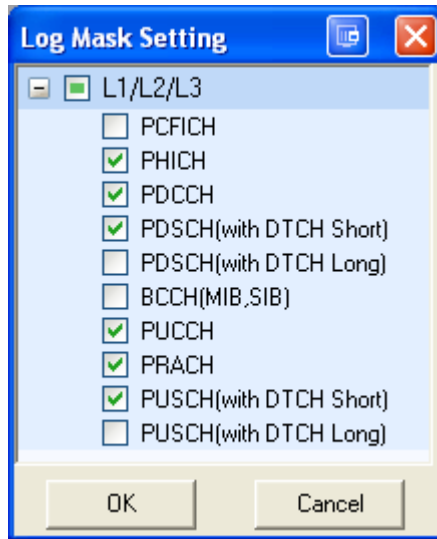


Figure 4-2: Select Logging Channels on the Log Mask

Capturing a log

Click the **Connect** button (or select **File, Connect**) and enter the IP address of the PXT to which you wish to connect in the pop-up window. If the connection is successful, you will see a green light and Online status message at the lower left corner of the application window, the “**Connect**” button will change to “**Disconnect**” and the “**Logging**” button will become active.

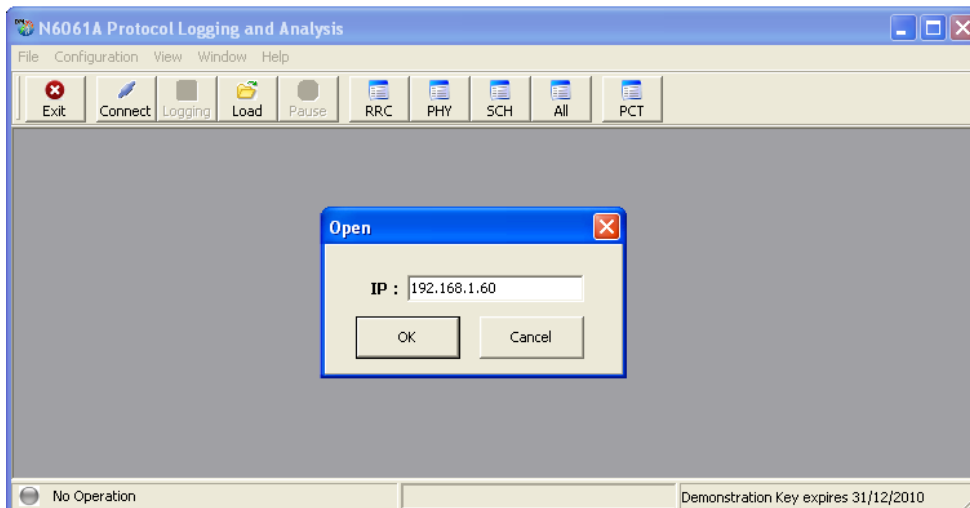


Figure 4-3: Connection Setup Window

Choose the information views you want to record and analyze. The example below shows the RRC logging view. You can select any number of the individual views. These can be arranged in a variety of ways on your display using the Window options in the menu bar.

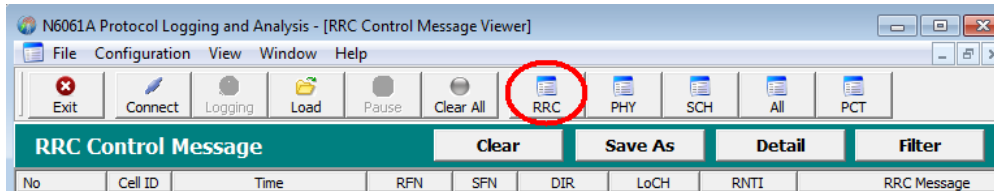


Figure 4-4: Setting Up the RRC Logging View

Viewer Setup

In each of the view windows, you have the choice of how you want to see the information. Each window has the same options:

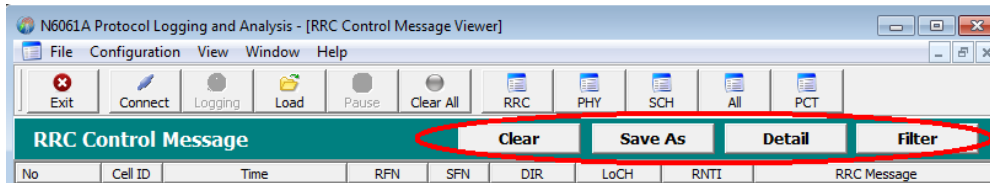


Figure 4-5: Changing the Information Display

NOTE	There is now a Clear All option on the left-hand side of the RRC view selection shown in Figure 4-5, above. Selecting this button enables you to clear all views at the same time.
-------------	--

Menu Option	Task Performed
Clear	Clears the Message Viewer
Save As	Saves a range of messages in the current view to an .ldm file. Select the 1 st and last message using the "No." column as the index. Select Apply then select the filename to save the selected messages to a log file (.ldm)
Detail	Displays the detailed decode and the raw received hex of a selected message.
Filter	Filters the displayed messages. You can choose to enable or disable logged messages either by logical channel or by individual message types. In software version ≥ 6.4 , there are two additional filter options for DCI Format 1A: DCI Format 1a (SI) enables you to exclude all DCI Format 1A System Information messages (these occur very frequently and can make it hard to see other messaging). DCI Format 1a (Other) enables you to exclude these DCI Format 1A messages: RA-RNTI, P-RNTI, and C-RNTI.

Logging

Once the connection is established, you can start logging the over-the-air messages between the PXT and UE to a file. By simply clicking on **Logging** from the **File** menu or the **Logging** button, you can save the logging data from the enabled views.

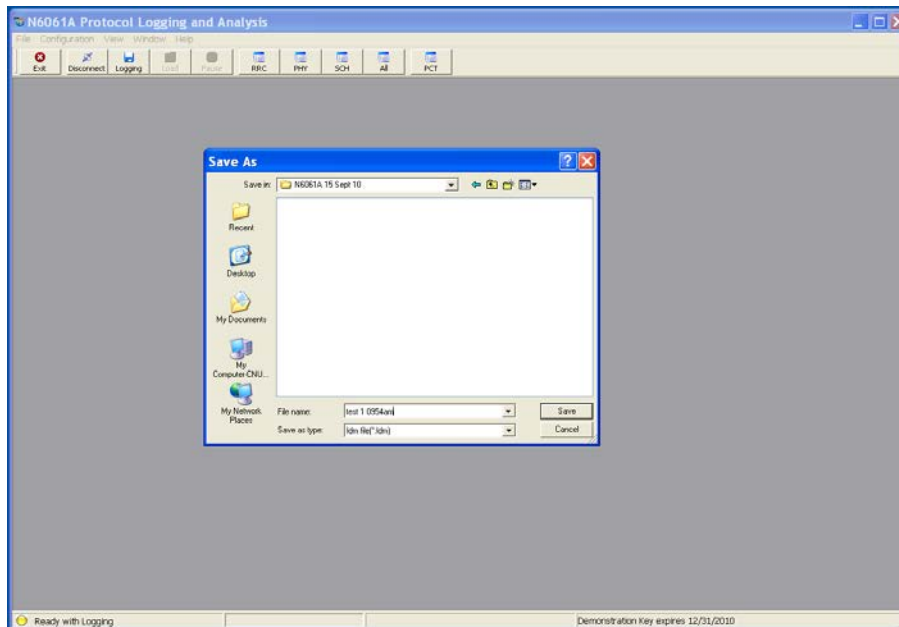


Figure 4-6: Set the Logging File Details

NOTE

Only the messages displayed in the views currently open are stored in the .ldm file when the “Logging” feature is in use.

NOTE

In software version ≥ 6.4 , you can change the maximum file size you wish to save by selecting **File > Max Log File Size**. The default value is 50 Mbytes, but you can modify the maximum size to fit your requirements. When the maximum file size is reached, a new log file will be created – this prevents log files reaching unmanageably large sizes.

Replaying previously recorded logs

With the N6061A, you can load and replay saved .ldm files. If the N6061A is connected to an E6621A PXT you must first select the **Disconnect** key in order to load previously-recorded message logs. When no active connection with an E6621A exists, the **Load** button (and the **File, Load** option) is enabled and you can load previously-recorded log files (.ldm).

NOTE

When replaying a previously-recorded message log, only the views that were open when the log was recorded are displayed.

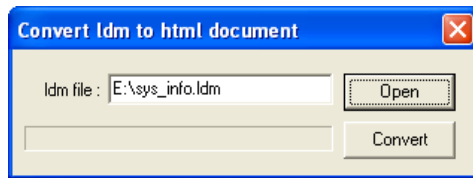
Exporting Logs to HTML Format

To enable simple viewing of logs without the need to use the N6061A, it is possible to convert logs to HTML format for viewing with a web browser.

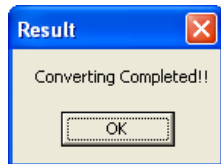
To convert an .ldm file to HTML, follow these steps:

NOTE	The log to be converted must already exist as an .ldm file.
-------------	---

1. On the **File** menu, select **Export to HTML**.
2. In the popup window, select **Open** and browse to find the .ldm file to be converted.



3. Select **Convert**.
4. When complete, the following pop-up is shown.



The converted log will be stored at the same location as the original .ldm file in a folder named "converted_<original_ldm_file>index.html".

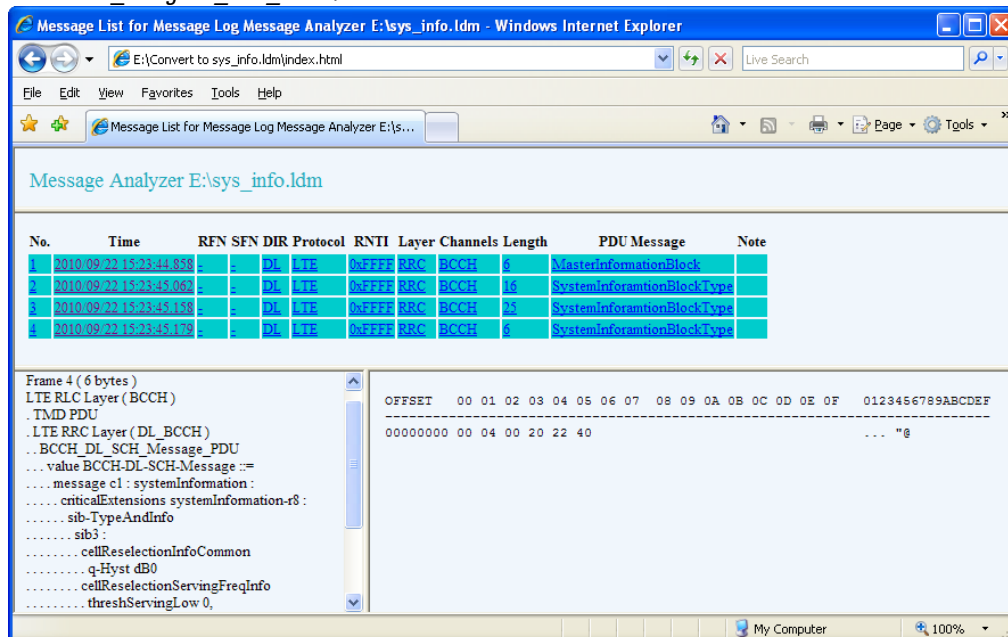


Figure 4-7: Converted HTML Log File

Clicking on any value for each message in the message summary frame will show the detailed decode and hex data for that message in the lower frames.

Exporting Logs to pcap Format

To enable simple viewing of logs without the need to use the N6061A, it is possible to convert logs into the pcap format for viewing with *Wireshark* which is a network protocol analyzer tool.

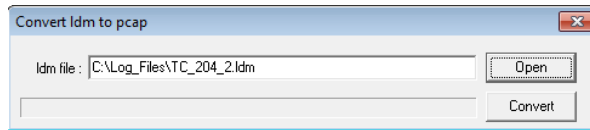
pcap is the file format used by the *Wireshark* logging tool. Together with a custom plug-in dissector dll, these pcap files can be read by the *Wireshark* tool enabling access to the feature set.

To convert an .ldm file to PCAP, follow these steps:

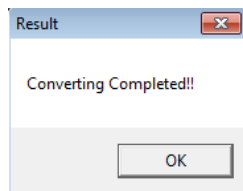
NOTE

The log to be converted must already exist as an .ldm file.

1. On the **File** menu, select **Export to PCAP**.
2. In the popup window, select **Open** and browse to find the .ldm file to be converted.



3. Select **Convert**.
4. When complete, the following pop-up is shown.



The converted log is stored at the same location as the original .ldm file. The file is named "<original_ldm_file>.pcap".

5. Now you can open the file using *Wireshark* as shown in the figure below.

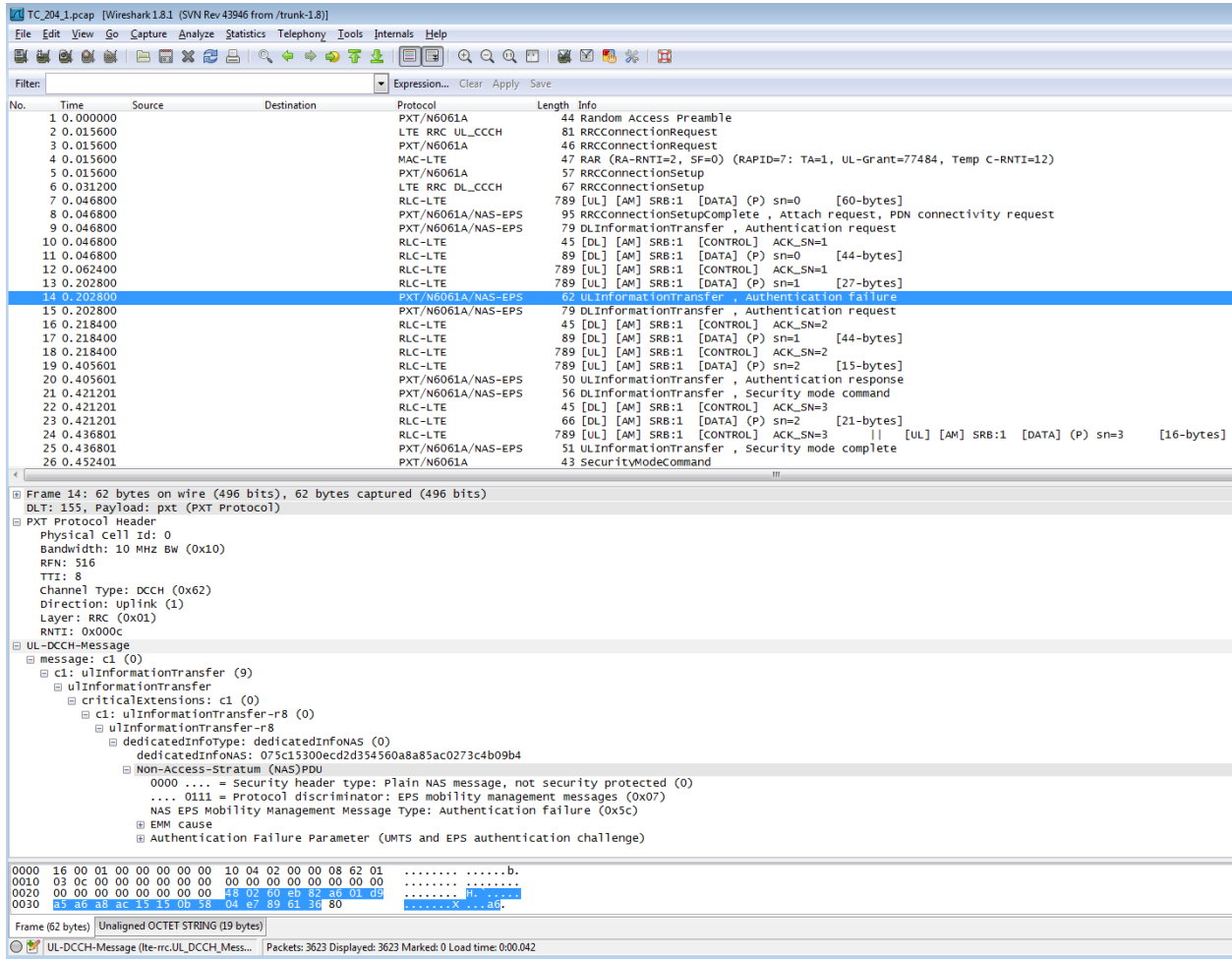


Figure 4-8: Converted PCAP Log File viewed using *Wireshark*

Clicking on any value for each message in the message summary frame shows the detailed decode and hex data for that message in the lower frames.

Wireshark Instructions

The following information explains how to install, set preferences, and use filters to view log files in Wireshark.

Installation

1. Install *Wireshark* onto your PC - either a 32 bit or 64 bit version of the tool. *Wireshark* versions 1.6.x and 1.8.x versions are supported with version 1.0.0 of the DLL. *Wireshark* versions 1.10.x are supported with versions 1.0.10 of the DLL. Earlier (or later) versions may not be compatible with the custom plug-in dissector DLLs. (Obtain this dissector DLL here:

www.agilent.com/find/N6061A-wireshark-dissector.)

To find out the version required for windows 7, click on start, right-click on computer, and select properties. In the system section you should see the system type, either 32 or 64 bit.

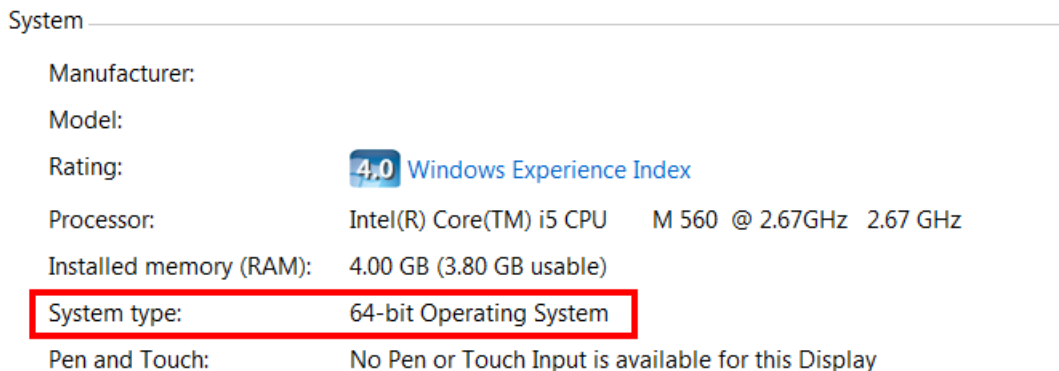


Figure 4-9: PC Operating System

To determine the version of the DLL, hover over the file icon of the file or right-click on the file, select Properties, and then Details.

2. Place the appropriate supplied DLL into the following directory.

C:\Program Files\Wireshark\plugins\<Wireshark version number>\

This assumes *Wireshark* has been installed into the default location - if not, find the install location and locate the sub-directory named "plugins\<Wireshark version number>"

There are two versions of the DLL named either:

- pxt_win32.dll or
- pxt_win64.dll

Win32 *Wireshark* on win32 should use the win32 DLL and Win64 *Wireshark* on win64 should use the win64 DLL.

Choose the version of the DLL based on the version of *Wireshark* that you are using (see [step 1](#), above).

3. The *Wireshark* shortcut contains a link to *Wireshark* with a "-o" option as shown below.

```
C:\Program Files\Wireshark\wireshark.exe -o "uat:user_dlts:\User 8  
(DLT=155)\",\"pxt\", \"0\", \"\", \"0\", \"\""
```

NOTE	The path to the <i>Wireshark</i> executable may need to be altered, depending on your original installation location. If you installed <i>Wireshark</i> in the default location, the supplied shortcut is correct.
-------------	--

4. You can now load pcap files generated by the N6061A tool into *Wireshark*.

Setting Wireshark User Preferences

A few user preferences must be set inside *Wireshark* to enable recursive decodes (for example: SIP packets contained in IPv6 packets, PDCP packets, RLC packets, and MAC transport blocks can be decoded in one step).

1. On *Wireshark*, select **Edit, Preferences**. A pop-up box is displayed.

2. Select the + sign next to **Protocols** on the left-hand side menu and select **MAC-LTE**. Then click on the **LCID ->DRB Mappings Table** as shown below.

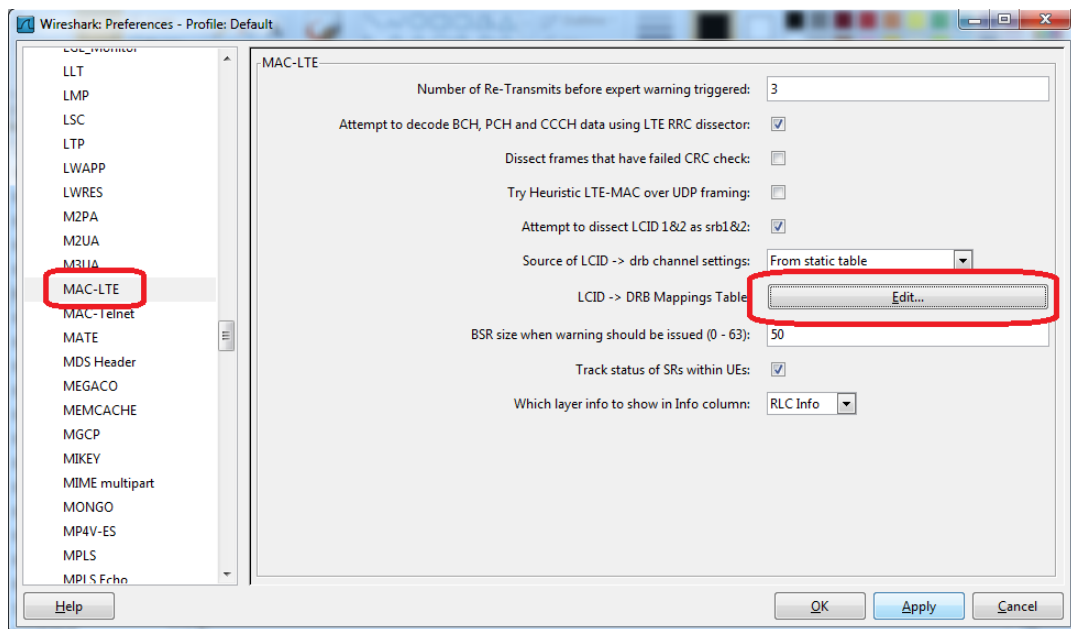


Figure 4-10: LCID -> DRB Mappings Table

The **LCID -> DRB Mappings Table** must be edited to match the radio bearer configuration inside your scenario file. The tool needs the mapping of logical channel identity (LCID) onto RLC mode of operation (AM, UM with sequence length 10 or UM with sequence length 5). For many scenario files, including the default ones you received in software version 6.4, the settings below should suffice for **MAC-LTE**.

NOTE

Changing scenario files may require that you change these preference settings because they are retained when you close and re-open *Wireshark*.

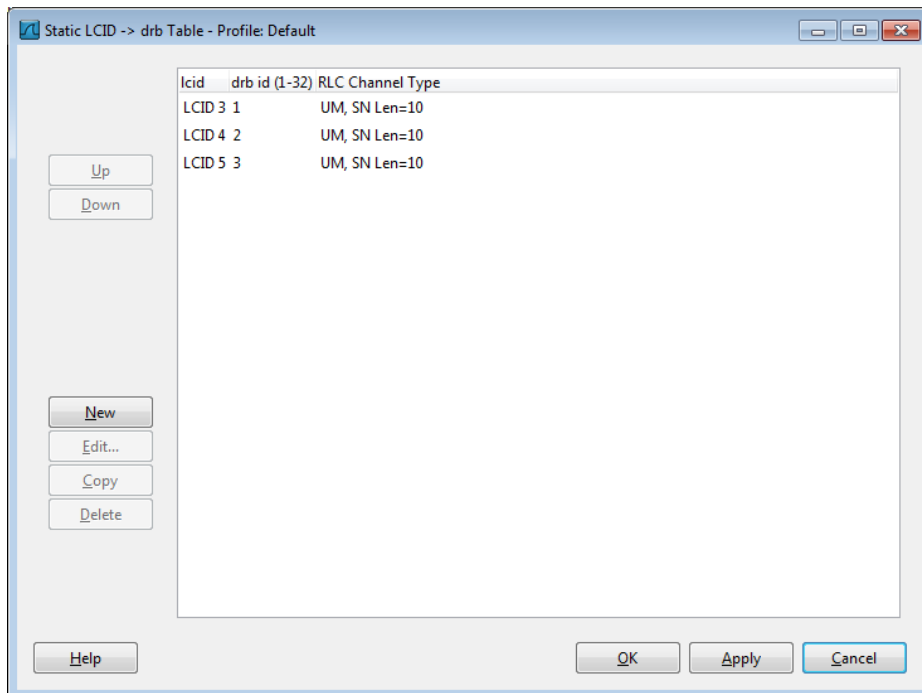


Figure 4-11: Static LCID -> drb Table – Profile Default

3. Inside the preferences for **RLC-LTE**, set the **Call PDCP Dissector for DRB PDUs** to '12 bit SN' (the most commonly used option – if your scenario file uses smaller SN length for PDCP, select this). This passes the contents of RLC PDUs to the PDCP layer for analysis.

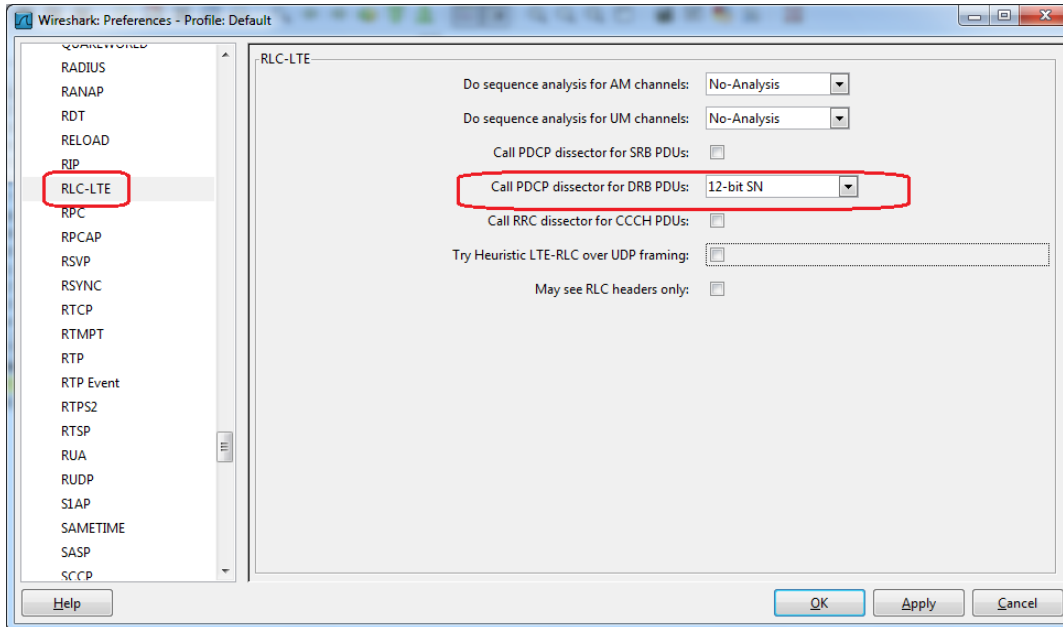


Figure 4-12: Wireshark Preferences – RLC-LTE

4. Inside the preferences for **PDCP-LTE**, select the checkbox labeled **Show Uncompressed User-Plane data as IP**. This sends the contents of PDCP PDUs to the IP layer for decode.

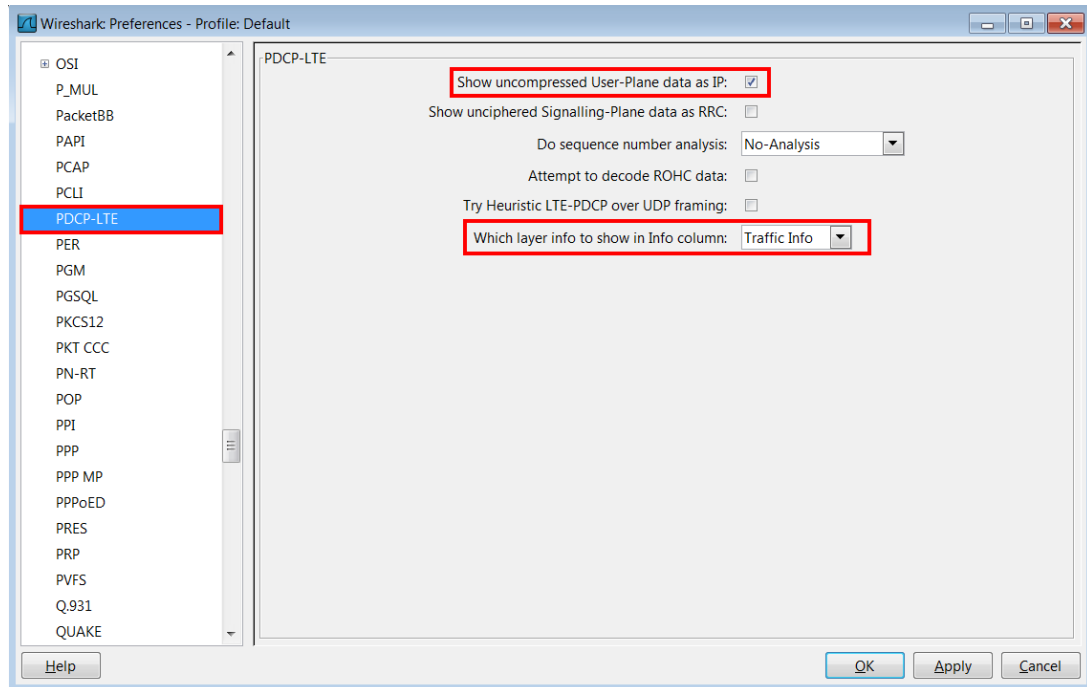


Figure 4-13: Wireshark Preferences – PDCP-LTE

If you are using *Wireshark* 1.8.x or later, inside the preferences for **PDCP-LTE**, set the drop-down box that selects **Which Layer Info to Show in Info Column** to 'Traffic Info'.

Verifying Wireshark Preferences

1. To test if the DLL is being used by *Wireshark* and if the user preferences are taking effect, load an example log file. (You can use the "pinglog.pcap" file that is available when you obtained the other N6061A .dlls.) The decode should look a little like that shown below. Note that the **Filter** box at the top left of the main page has been configured to ignore 'PHY' messages by entering the following term: `!(pxt.header.layer == "PHY")`.

Agilent LTE N6061A Protocol Logging and Analysis User's Guide

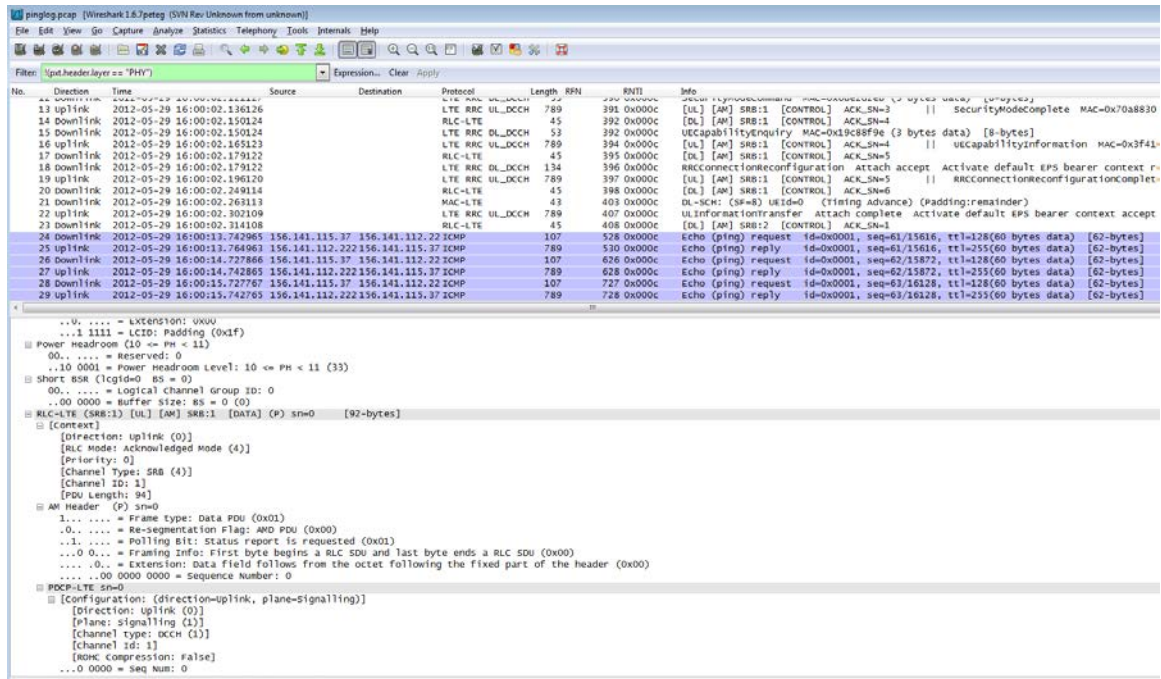


Figure 4-14: Wireshark Filter – View: Ignoring PHY Messages

2. *Wireshark* offers a rich variety of options for filtering and presentation. For example, enter 'icmp' into the **Filter** box on the main page to view only the ICMP entries (see below). These entries are decoded from MAC transport blocks, containing RLC PDUs, containing PDCP PDUs – and all of the additional header information.

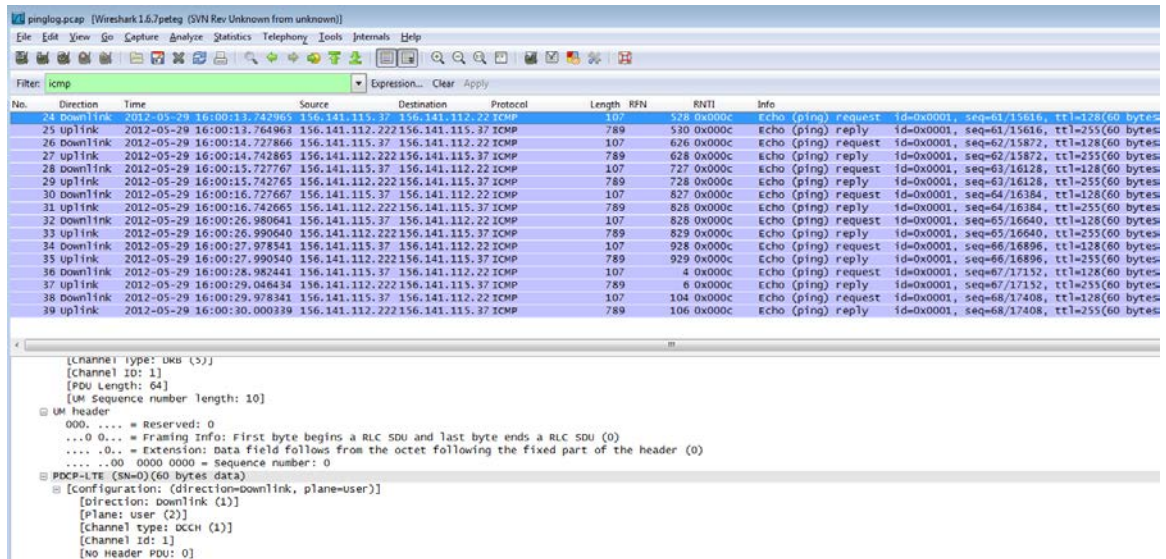


Figure 4-15: Wireshark Filter - View: ICMP Entries Only

3. Go to the lower pane of the *Wireshark* log and select the + sign next to the MAC-LTE DL-SCH header. The RLC-LTE data is revealed. Select the + sign next to the RLC-LTE header and the PDCP data is revealed. Select the + sign next to the PDCP-LTE header to reveal the PDCP content.

Notes

1. If RLC PDUs are segmented, it is possible for *Wireshark* to re-assemble and then decode the PDCP PDUs (and therefore the IP packets inside) in version 1.10 and later. Make sure you enable sequence analysis as 'Only-MAC-frames' in the RLC-LTE configuration, as shown below.

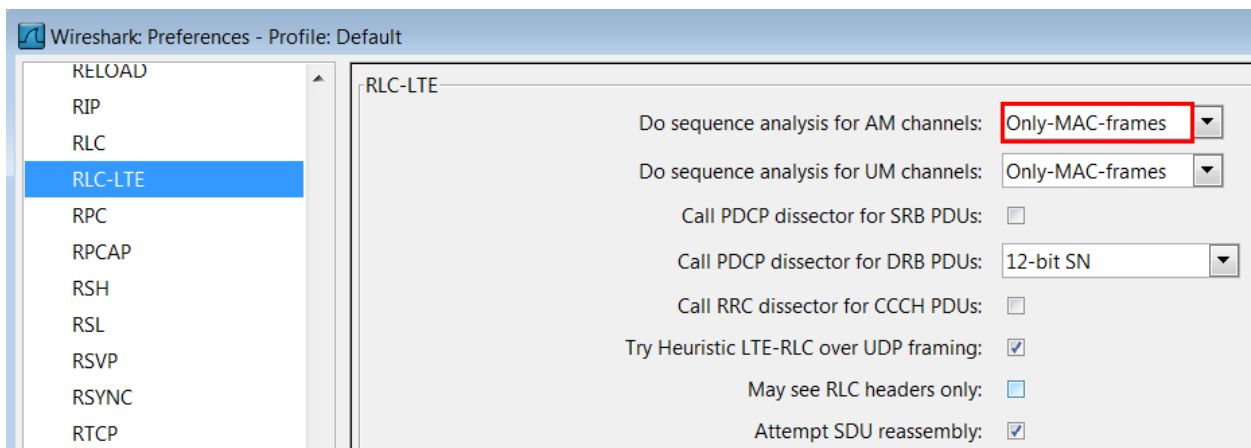


Figure 4-16: Wireshark Preferences – RLC-LTE

Agilent LTE N6061A Protocol Logging and Analysis User's Guide

2. In PDCP-LTE, it may be useful to check the box named "Show Unciphered Signaling Plane Data as RRC" if you have converted from an SCH only N6061A file.

Tips

- Ensure that you have the correct plug-in: 32 or 64 bit. See Installation, [step 1](#), above.
- Verify that you have the correct version of DLL for the version of Wireshark you are using (see the [Installation instructions](#) above).
- Verify that you located the plug-in in the correct location.
There may be several different versions of *Wireshark* on your PC. If several versions of *Wireshark* are installed, verify that you have copied the dll to the correct directory in use. A new installation of *Wireshark* may require you to copy the dll to the new version folder.
- Verify that there are not duplicate copies of the plug-in. Using different names, does not prevent problems with start-up. *Wireshark* crashes halfway through the start up process, if you have multiple copies of the dll on your PC even though they have different names.
- Verify that the shortcut points to the *Wireshark* .exe location.

5 Using the API to control the N6061A remotely

A remote control API is provided that enables you to control the N6061A Protocol Logging and Analysis application from any programs you write. You can control the N6061A from the same PC on which the N6061A Protocol Logging Application is running or from a separate PC.

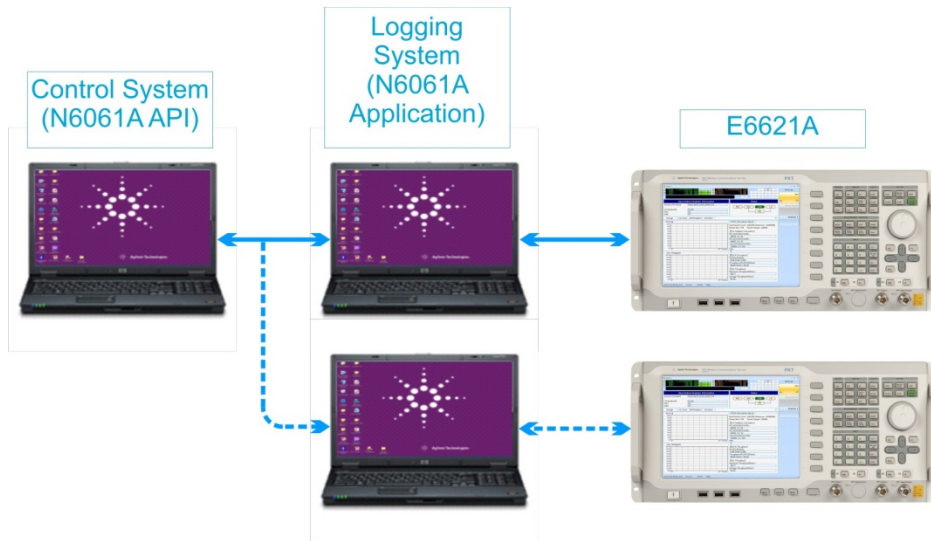


Figure 5-1: Typical API Controller Configuration

NOTE	You can control multiple “Logging Systems” from a single Control System. Each Logging System connects to a single PXT. In this configuration, the Control System and the “Logging Systems” must be on separate PC.
-------------	--

Downloading and installing the API

The application programming interface for the N6061A is provided via a Windows DLL designed for PCs running a Windows XP or Windows 7 operating system. It can be downloaded from www.agilent.com/find/softwaremanager by users with a current Software and Technical Support Contract (STSC). The API download package contains the DLL and header file. Please read the N6061A software release notes for the latest product information.

API Commands

The version of the N6061A Remote Control API DLL can be obtained by:

- `int N6061A_QueryDllVersion(char* version)`
output parameter: string with API library version information
return value: Error code. See “API Error Codes” for a list of possible error codes.

The N6061A Remote API is initialized by calling:

- `int N6061A_Initialize(int Port)`
input parameter: User-defined UDP port opened by the API and used for communication to the N6061A.
return value: Error code. See “API Error Codes” for a list of possible error codes.

The connection between N6061A Remote Control API and N6061A application is established by:

■ **int N6061A_ConnectLoggingSystem(char* ip_addr, int port)**

input parameters: IP address(string) of the system running the N6061A and the UDP port that the N6061A listens to for remote control commands (the port number is a fixed value and must be 10003).
return value: (positive value) Logging System ID, or (negative value) Error code. See "API Error Codes" for a list of possible error codes.

NOTE: The N6061A must be running on the Logging System PC prior to calling this function.

The connection between N6061A Remote Control API and N6061A application is closed by:

■ **int N6061A_DisconnectLoggingSystem(int ID)**

input parameter: Logging System ID returned from N6061A_ConnectLoggingSystem()

return value: Error code. See "API Error Codes" for a list of possible error codes.

The version of the N6061A application can be obtained by:

■ **int N6061A_QueryLoggingSystemVersion(int ID, char* version)**

input parameter: Logging System ID returned from N6061A_ConnectLoggingSystem()

output parameter: string with API library version information

return value: Error code. See "API Error Codes" for a list of possible error codes.

The connection between The N6061A application and PXT is established by:

■ **int N6061A_ConnectInstrument(int ID, char* ip_addr, int port)**

input parameters: Logging System ID, IP address(string) of the PXT to connect to, and the UDP port to use for communication between the PXT and the N6061A (the port number is a fixed value and must be 4736).

return value: Error code. See "API Error Codes" for a list of possible error codes.

The connection between the N6061A application and PXT is closed by:

■ **int N6061A_DisconnectInstrument(int ID)**

input parameter: Logging System ID

return value: Error code. See "API Error Codes" for a list of possible error codes.

Logging to an .LDM file will be started by:

■ **int N6061A_StartLogging(int ID, char* filename);**

input parameters: Logging System ID and full path to the logging file to be created. Note: If the file already exists, it will be silently overwritten.

return value: Error code. See "API Error Codes" for a list of possible error codes.

Logging will be stopped by:

■ **int N6061A_StopLogging(int ID);**

input parameter: Logging System ID

return value: Error code. See "API Error Codes" for a list of possible error codes.

The captures LDM file can be converted to HTML by calling:

■ **int N6061A_ConvertLogLdmToHtml(int ID, char* filename);**

input parameters: Logging System ID and the full path to the logging file to be converted.

return value: Error code. See "API Error Codes" for a list of possible error codes.

To finish using the API and close all ports, call:

■ **int N6061A_Finalize(void)**

return value: Error code. See "API Error Codes" for a list of possible error codes.

API Error Codes

The table below describes the possible error codes returned by the N6061A API.

Error Code	Description
Positive value	Connection ID. Applicable to N6061A_ConnectLoggingSystem() only.
0	No error
-1	API not initialized. Ensure N6061A_Initialize() is called.
-2	Invalid license. Check the USB license key for the N6061A.
-3	Reserved for future use
-4	Connection failure. An attempt to connect to or control a Logging System or PXT failed. Check that IP address and ports are correct; that the Logging System or PXT has not been disconnected and that the ID is correct.
-5	Not connected. Attempting to use an ID that has not been opened.
-6	File access error. The specified file does not exist.
-7	Logging buffer is empty
-8	Logging stopped unexpectedly. N6061A_StopLogging() was called but logging was not in progress.
-9	Port error. The specified port number is already in use.
-10	No response
-11	Permission denied
-12	File conversion failed. There was a problem converting the LDM file to HTML.

Example program

The follow pseudo-code shows an example remote capture logging session including conversion of the captured log to HTML. For simplicity, no error trapping is used.

In the example, the N6061A is running on a PC with IP address 192.168.1.135 and the PXT has the IP address 192.168.1.60. The user has chosen UDP port 12345 as the port the DLL will use to communicate with the N6061A.

```
int LoggingSystemID;
N6061A_Initialize(12345);
LoggingSystemID = N6061A_ConnectLoggingSystem("192.168.1.135", 10003);
N6061A_ConnectInstrument(LoggingSystemID, "192.168.1.60", 4736);
N6061A_StartLogging(LoggingSystemID, "C:\\temp\\mylogfile.ldm");
// capture logging information until the user stops logging
N6061A_StopLogging(LoggingSystemID);
```

Agilent LTE N6061A Protocol Logging and Analysis User's Guide

```
N6061A_DisconnectInstrument(LoggingSystemID);  
N6061A_ConvertLogLdmToHtml(LoggingSystemID, "C:\temp\mylogfile.ldm");  
N6061A_DisconnectLoggingSystem(LoggingSystemID);  
N6061A_Finalize();
```

6 Service and Support

Calling Agilent Technologies

Agilent Technologies has offices around the world to provide you with complete support for your products. For help, to obtain servicing information or to order replacement parts, contact the nearest Agilent Technologies office listed below. In any correspondence or telephone conversations, you will need the product number, full serial number, software revision and Software and Technical Support Contract (STSC) details.

Press the **INFO** front panel key to view the product number (E6621A), serial number, and software revision information and STSC expiry date.

Locations for Agilent Technologies

Online assistance: <http://www.agilent.com/find/assist>

If you do not have access to the Internet, one of these centers can direct you to your nearest representative:

If you have a current STSC for the E6621A, you can contact Agilent at the email addresses listed in "Software and Technical Support Contracts" on page 25.

Should the Declaration of Conformity be required, please contact an Agilent Sales Representative, or the closest Agilent Sales Office. Alternately, contact Agilent at: www.agilent.com.

Americas

Brazil
(11) 4197 3600

Canada
(877) 894 4414

Mexico
01800 5064 800

United States
(800) 829 4444

Asia Pacific

Australia
1 800 629 485

India
1 800 112 929

Malaysia
1 800 888 848

China
800 810 0189

Japan
0120 (421) 345

Singapore
1 800 375 8100

Hong Kong
800 938 693

Korea
080 769 0800

Taiwan
0800 047 866

Other Asian Countries:

www.agilent.com/find/contactus

Europe & Middle East

Belgium
32 (0) 2 404 93 40

Ireland
1890 924 204

Spain
34 (91) 631 3300

Denmark
45 45 80 12 15

Israel
972-3-9288-504/544

Sweden
0200-88 22 55

Finland
358 (0) 10 855 2100

Italy
39 02 92 60 8484

Switzerland
0800 80 53 53

France
0825 010 700*
*0.125 €/minute

Netherlands
31 (0) 20 547 2111

United Kingdom
44 (0) 118 927 6201

Germany
49 (0) 7031 464 6333

Other Unlisted Countries:

www.agilent.com/find/contactus

Software and Technical Support Contracts

Software and Technical Support Contracts (STSC) entitle you to software updates and feature enhancements, as well as direct access to a technical expert for technical support for a fixed period, usually one year.

The STSC gives you direct access to technical product experts to increase your productivity and minimize the software difficulties you encounter. These technical support engineers are experts on the E6621A PXT test set and its complementary software products. They have instant access to instruments and software to enable them to resolve your issues as quickly as possible. Agilent will investigate all software defects and operational problems reported through the technical support channel. Upon completion of the investigation, we will advise you on possible solutions and functional alternatives. Where possible, Agilent will provide software releases to address problems caused by defects in the firmware or software.

STSCs for the Agilent E6621A PXT

The N6050AS STSC covers the N6050A, N6051A, and N6052A software applications running on the E6621A PXT wireless communications test set, plus the associated N6061A and N6062A PC software applications.

If you have a Software and Technical Support Contract, there are three methods of accessing your technical support:

- [Web-based support](#): My Support Center
- [E-mail support](#)
- [Phone support](#)

For fastest response times, we recommend using the web-based or email access methods as these provide the most direct route to your technical support expert. All support cases may be viewed and tracked through the online support center (My Support Center), regardless of how you initially contacted technical support.

Web-based support

You can directly enter and manage your support requests online via www.agilent.com/find/mysupportcenter.

The first time you use My Support Center you will be asked to create a profile and provide proof of entitlement. Once your profile is created, you can use the online support center to enter your support request.

Each support request will be given a unique case number which you can use to track the progress of your support case. A technical expert will contact you via phone or email (whichever you have stated as your preferred option) to resolve your issue.

English, Japanese, Korean, and Mandarin local language support is available.

E-mail support

You can also contact our technical support at the following e-mail addresses:

- wireless_test_support_americas@agilent.com
- wireless_test_support_japan@agilent.com
- wireless_test_support_europe@agilent.com
- wireless_test_support_asia@agilent.com
- wireless_test_support_korea@agilent.com

Your support request will be routed to a technical expert who will contact you via e-mail or phone (whichever you have stated as your preferred option) to help resolve your issue.

English, Japanese, Korean, and Mandarin local language support is available.

Phone support

If you prefer to speak to someone directly, you can call the Agilent customer contact centers at the numbers given in the "[Locations for Agilent Technologies](#)" section of this document.

The customer contact center will route your request to a technical support expert, who will contact you about your support request via phone or email. Local language support is available in many countries.

This page is intentionally left blank.

