

SIPv6 Analyzer User Guide v 1.0

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I. Getting Start

The SIPv6 Analyzer is a packet analysis tool for IPv6 SIP-based VoIP applications. SIPv6 Analyzer, which developed by *National Chiao Tung University* (NCTU) VoIP Laboratory, contains Packet Viewer, SIP Viewer, RTP Spy and Statistics functions. The software and hardware requirements of the SIPv6 Analyzer are listed as follows:

- Network Interface Card(s): 10/100Mbps Ethernet or 802.11a/b/g WLAN card
- Processor: Intel Pentium 750MHz or faster x86-compatible CPU
- Disk Space: 50MB in hard disk
- Memory: 256MB or more RAM
- Operating System: Windows 2000/XP/2003

To download SIPv6 Analyzer, the user opens the web browser (e.g. IE or Netscape), inputs the URL http://www.csie.nctu.edu.tw/~yhsung/sipv6_analyzer (Figure 1 (1)) and click the hyper-link named **SIPv6 Analyzer 0.1.5 RELEASE** in Figure 1 (2). Then the user can see a pop-up window that prompts the user to save the setup file (setup.exe) of the SIPv6 Analyzer to the local hard disk. The user can click the **OK** button on this window to save the setup file.

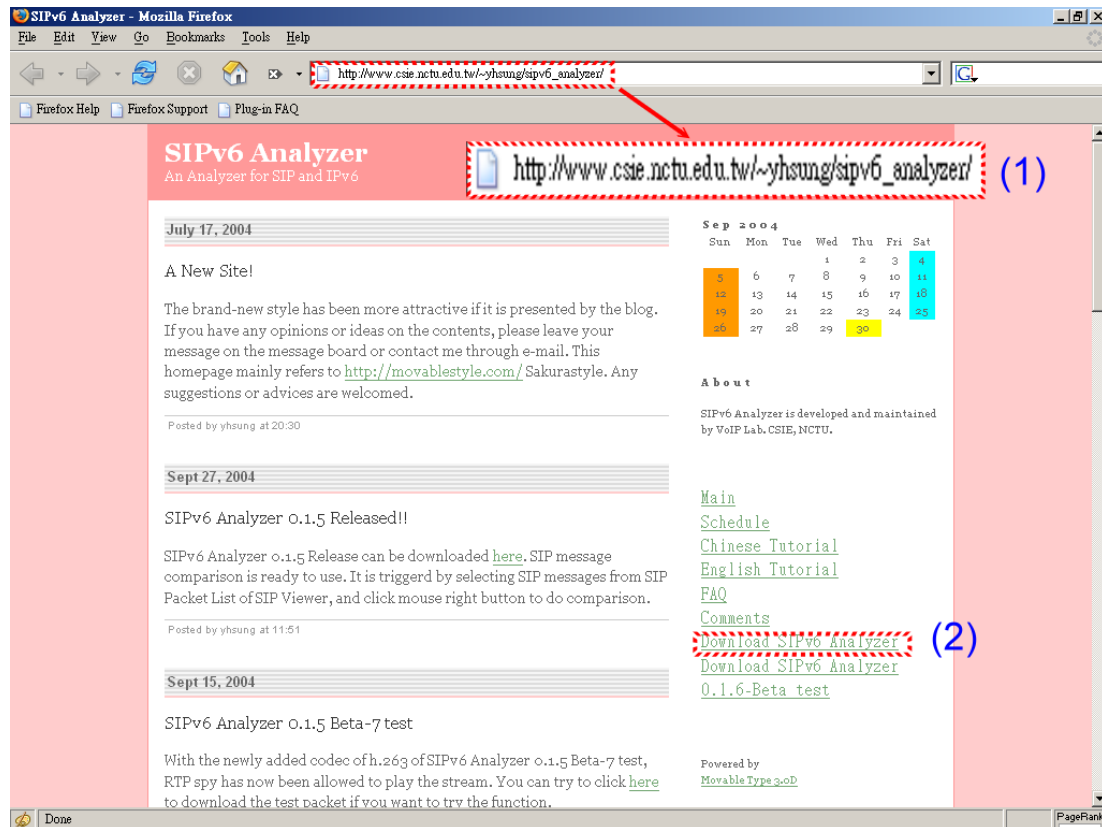


Figure 1. Download SIPv6 Analyzer

II. Installation

After downloading the setup file (setup.exe), the user can double-click the file to start the installation procedure. The detailed steps are illustrated in Figure 2. First, the user can see the **Setup Wizard** and click the **Next** button to continue installation. Then the user can see the **License Agreement** page of the SIPv6 Analyzer. This agreement based on GPL (GNU General Public License). If the user accepts this agreement, he/she can choose **I accept the agreement** item. In Figure 2 (4) and (5), the user selects a folder on the computer to install the SIPv6 Analyzer. In Figure 2 (6) and (7), the user can select the components of the SIPv6 Analyzer. The SIPv6 Analyzer components include the main program of the SIPv6 Analyzer, the binary executables of Ethereal and installation program for WinPcap. The user can disable WinPcap selection if he/she already installed it in the computer. Figure 2 (8) and (9) are the steps to create the program's shortcuts in the **Start Menu** folder. Figure 2 (10) shows a list of selected components and the configurations for the user who attempts to review or change any settings.

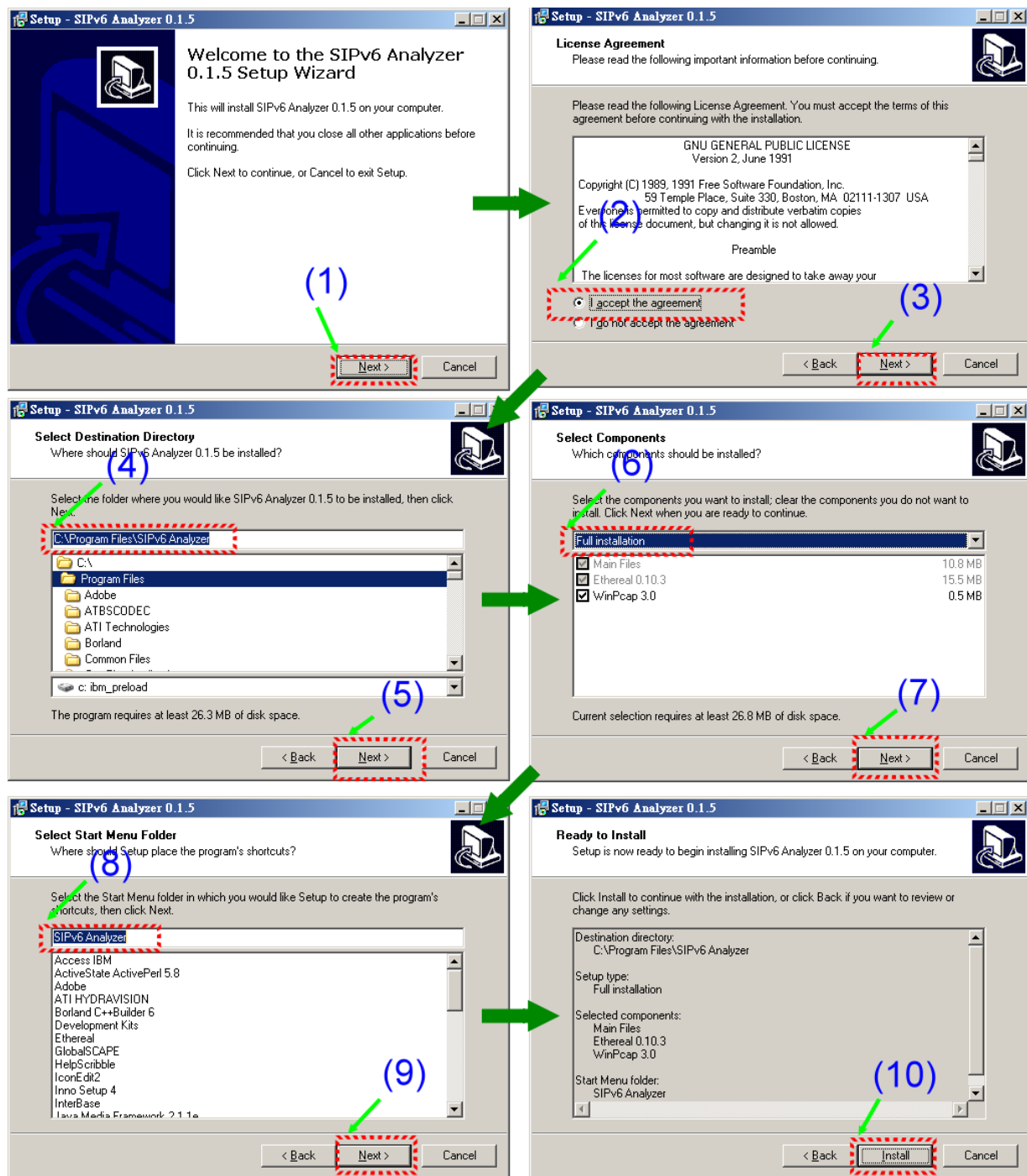


Figure 2. SIPv6 Analyzer installation process

Figure 3 is the installation procedure for WinPcap. If the user would like to install WinPcap, he/she can click **Next** button. Then the user can see the license agreement. If the user accepts this agreement, he/she can choose **Yes, I agree with all the terms of the license agreement**. Then the user can see WinPcap installation progress. In Figure 3 (4), the user can read the **Readme** information, and he/she can click **Next** button to the final step for WinPcap installation. The user can click **OK** button to finish the installation as show in Figure 3 (5).

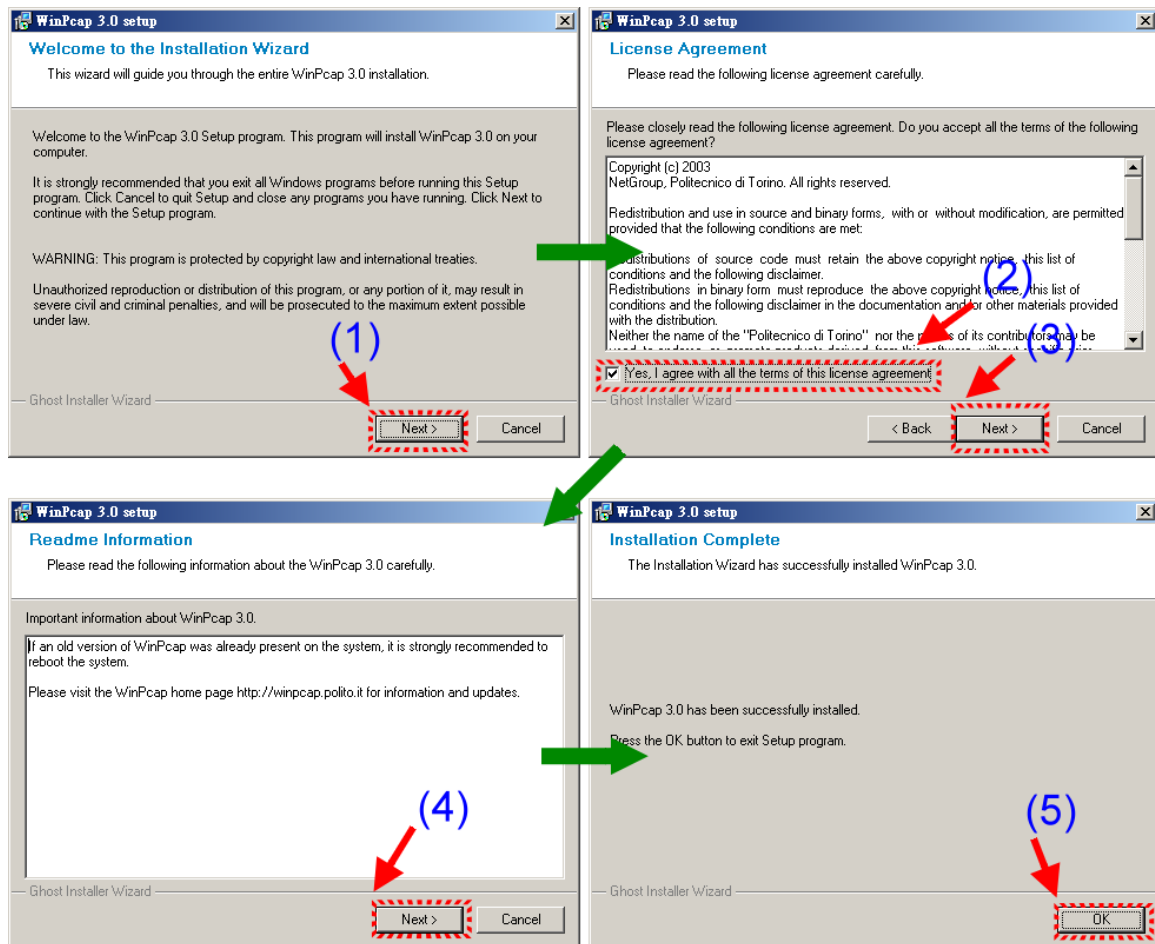


Figure 3. WinPcap installation process

After click **Finish** button as shown in Figure 4, the installation process of the SIPv6 Analyzer is finished and the user is ready to use the SIPv6 Analyzer without rebooting the operation system.

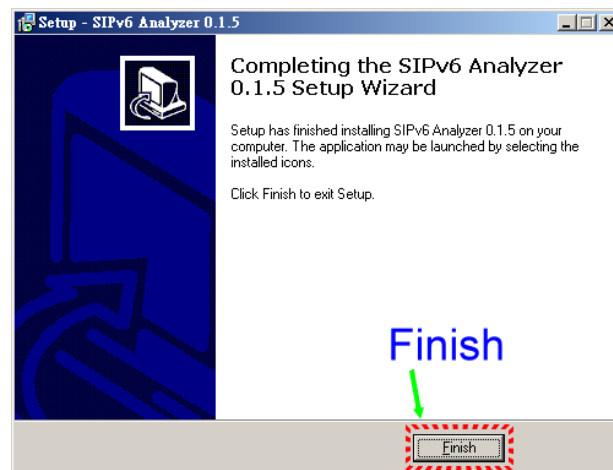


Figure 4. Finish SIPv6 Analyzer installation

III. User interface :

The main screen of the SIPv6 Analyzer shown in Figure 5 includes a menu bar and a tool bar.

The menu bar contains the **File**, **Window** and **Help** options. **File** option contains **Remote Capture(a)**, **Local Capture(b)**, **Open Offline Packet(c)**, **Close Form(d)**, **Quit(e)** items. **Window** option contains **Next Window(f)**, **Cascade(g)**, **Tile Horizontally(h)** and **Tile Vertically(i)** items. The **Help** option contains **Help(j)**, **About(k)**, and **Check New Version(l)** items.

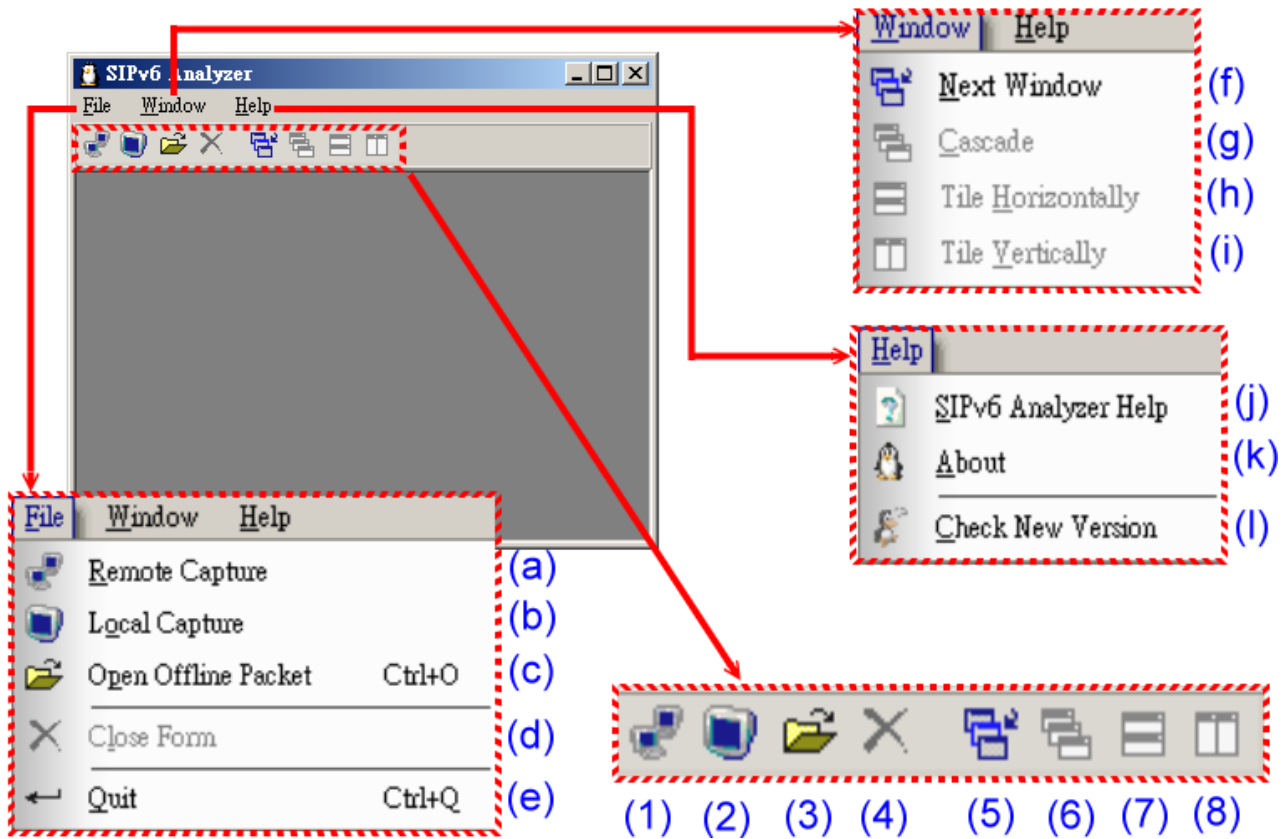


Figure 5. User Interface – main screen

Remote Capture allows the local host to interact with a remote host and capture packets that are transmitted or received on the remote host. **Local Capture** is used to capture the packets that are transmitted or received on the local host. The SIPv6 Analyzer can simultaneously listen on multiple network interfaces, and the operations of network interface selection would be elaborated in the demo scenario (demo.doc). **Open Offline Packet** is employed to restore the captured packets (in libPCAP-format) from the hard-disk. **Close Form** and **Quit** are used to close an active project (the project in use) and the SIPv6 Analyzer program, respectively. The user can select **Help** option and click **About** to get current system status, the Copyright information and click **SIPv6 Analyzer Help** to view user guide for SIPv6 Analyzer. If the user clicks the Check New Version item, the

SIPv6 Analyzer will pop-up a window to check the version of the SIPv6 Analyzer. If there is a latest version, the window will prompt the user to download the new installer for the SIPv6 Analyzer.

Figure5(1) to (8) shows a tool bar, which includes the functions of capturing packet, opening files, closing projects and adjusting windows. The functions of Buttons (1) to (4) are the same as them of menu items (a) to (d) that are mentioned above. Button (5) switches the current active project to next project window. Buttons (6) to (8) are utilized to re-arrange windows. Button (6) cascades all project windows in the main screen. Button (7) tiles all windows in the main screen horizontally. Button (8) tiles all windows in the main screen vertically. Figure5(f) to (i) has the same functionality as the Button (6) to (8).

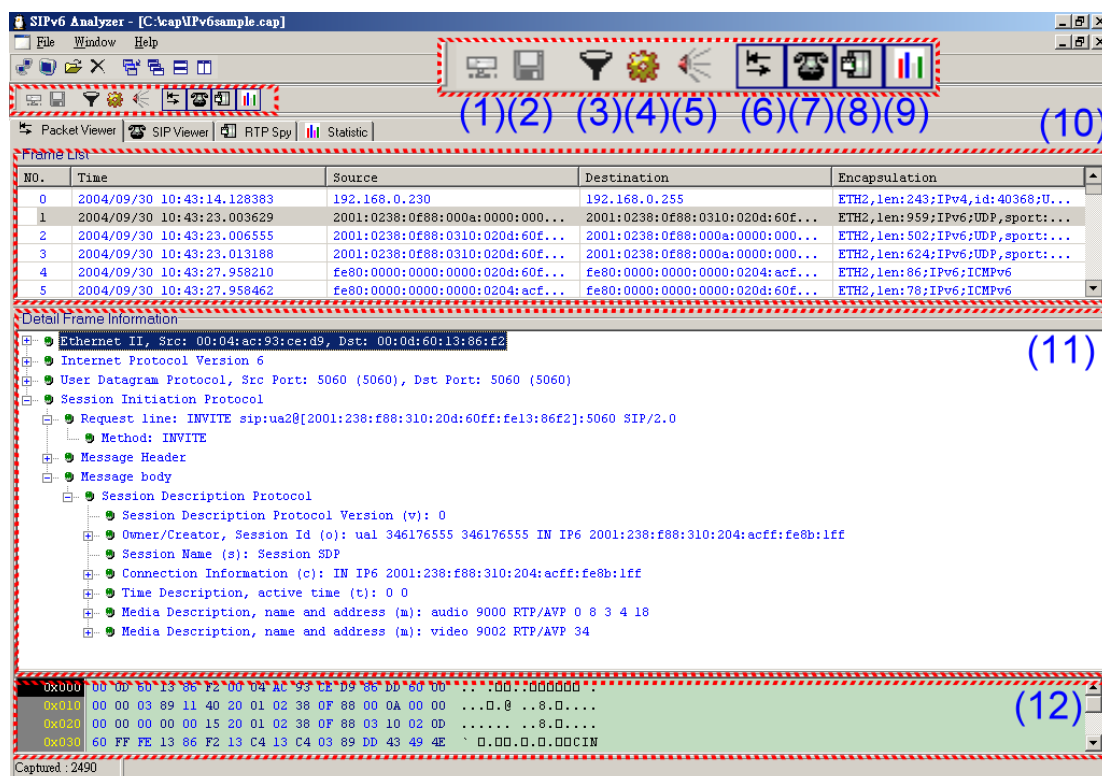


Figure 6. User Interface of a Project

Figure 6 shows the user interface of a project which contains a tool bar and four tabs (i.e., Packet Viewer, SIP Viewer, RTP Spy, and Statistics). The functions of these components are described as follows.

Button (1) is to start or stop capturing packets. Button (2) is to save the captured packets as a WinPcap format file. Button (3) is to enable or disable **Display filter**. Button (4) is to set **Capture**

filter and **Display filter**. Button (5) is used to **configure jitter buffer** length. Buttons (6) to (9) are to open or close **Packet Viewer**, **SIP Viewer**, **RTP Spy** and **Statistics** tabs, respectively. **Frame List** (see Figure 6(10)) displays the captured packets and shows the sequence number, captured time, source address, destination address and its encapsulation. **Detail Frame Information** (see Figure 6(11)) shows detailed information of the selected packet. **Hex Information** (see Figure 6(12)) shows packet information in hex format.

The SIP Viewer (see Figure 7) is one of the most important functions of the SIPv6 Analyzer. General purpose analyzer such as Ethereal only lists the captured packet and displays their protocol headers. The SIP Viewer collects the SIP packets through the SIP dialog including SIP Call-Id, From and To header fields. In Figure 7 (1), **Dialog (Call-leg) List** shows the SIP message grouped by SIP dialog. The **Call-ID** field is the Call-ID header in the SIP message. The **Caller** field which represents for originator is the **From** header field in the SIP message. The **Callee** field which represents for terminator is the **To** header field in the SIP message. In Figure 7 (2), the **SIP Packet List** shows all SIP messages belonging to the selected SIP dialog.

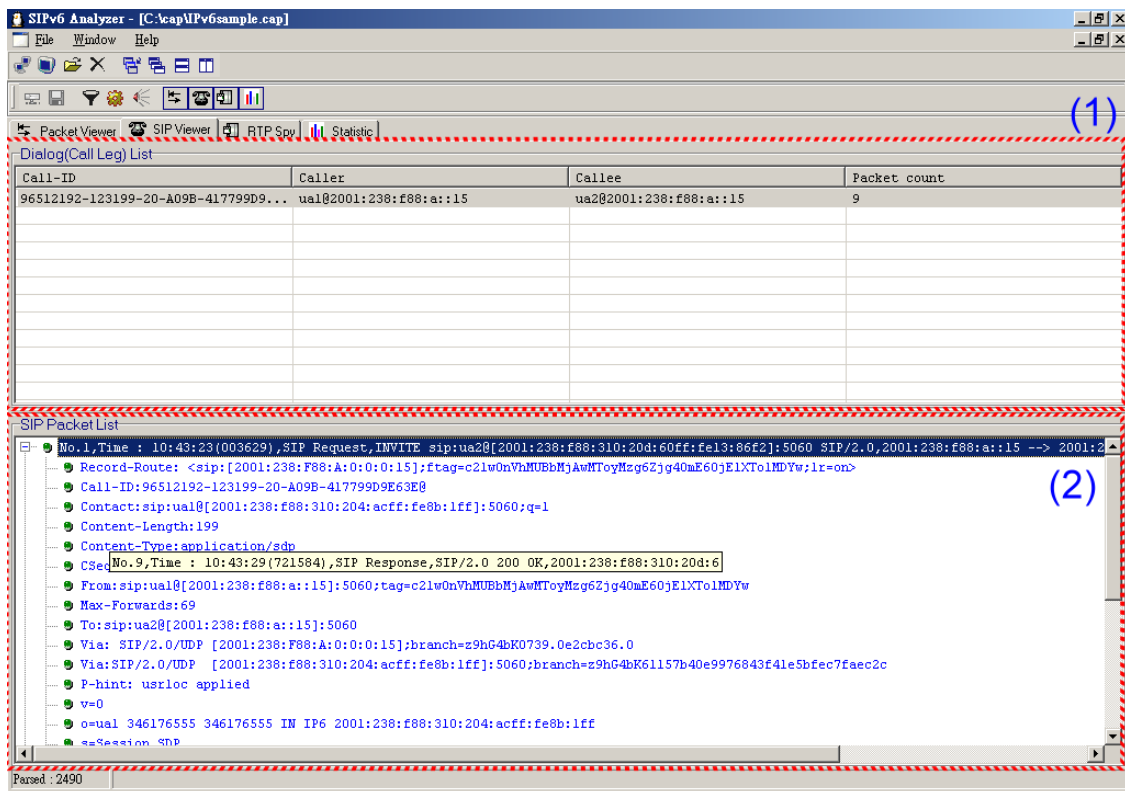


Figure 7. User Interface of SIP Viewer

The RTP Spy (Figure 8) collects RTP packets and playback. In Figure 8 (1), **Session List** collects RTP packets according to the media description in the SDP fields and groups them into the RTP sessions according to the SSRC field of the RTP header. In **Session List**, **Session** field contains the destination IP address and port of a RTP session. **SSRC** field lists the SSRC (Synchronization Source) fields in RTP headers. The **Media Type** field is the audio/video codec that set in RTP packet header. The **Packet Count** field presents the packet count that belongs to a RTP session. By double-clicking the entry in **Session List**, a RTP session is selected and listed in **Media Instance** (Figure 8 (2)). Users can play back the video/voice by selecting an entry in **Media Instance** and clicking the play button in Figure 8(3). In **Media Instance** list, **Media Description** field presents the destination address, port and RTP payload type of this RTP stream. The **Status** field contains three states (i.e., Ready, Playing or Complete) for one media instance. The **Packet Count** field is the packet count of the selected RTP stream and **Length** field is the duration of this RTP stream. In Figure 8 (3), The **Play Control Panel** is contains three buttons to play, stop or pause the RTP stream.

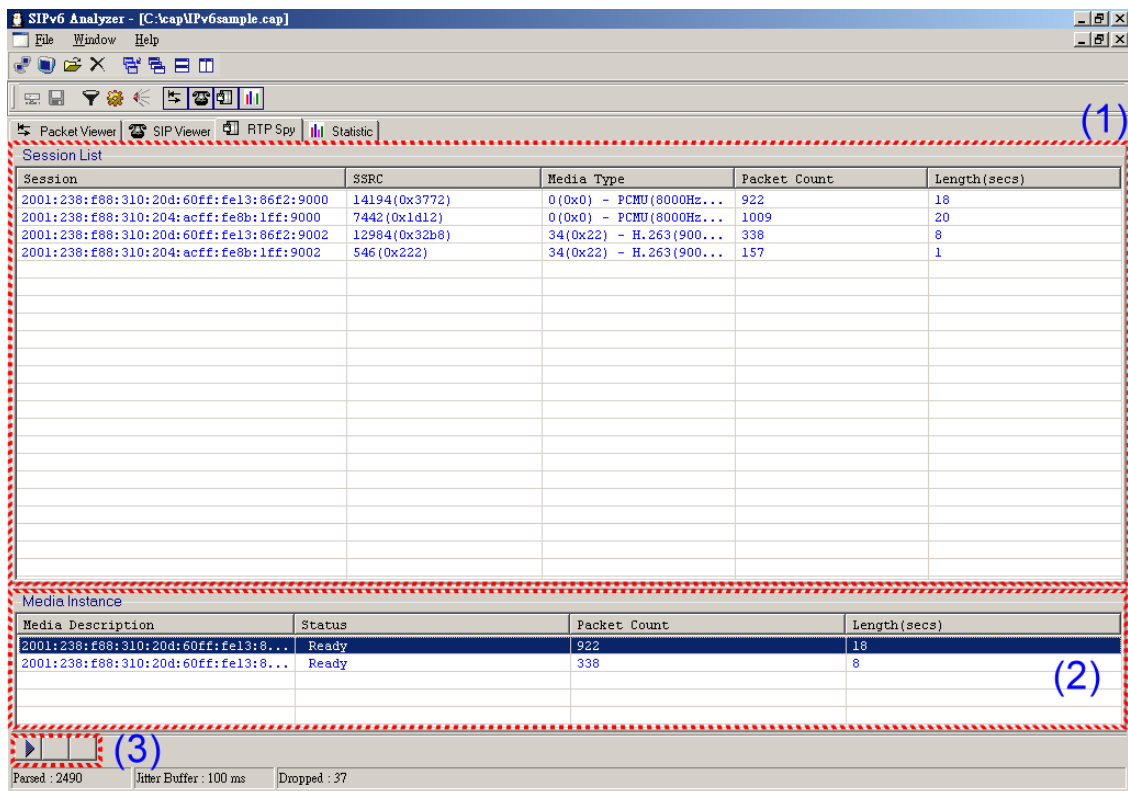


Figure 8. User Interface of RTP Spy

The **Statistics** (Figure 9) shows the **Host Traffic**, **Packet Distribution** and **Network Throughput** of the local host. In Figure 9 (1), the **Host Traffic** shows the packet count and byte count of each flow (a pair of source and destination IP addresses). In Figure 9 (2), **Packet Distribution** shows the packet distribution of different protocols in **Network layer**, **Transport layer** and **Application layer**. The **Network layer** tab contains three protocols (i.e., **IPv4**, **IPv6** and **Others**). The **Transport layer** page contains the **TCP**, **UDP** and **Other** protocols. The **Application layer** page contains **SIP**, **RTP**, **HTTP** and **Other** protocols. In Figure 9 (3), the **Flow Statistics** shows current network throughput of the local host.

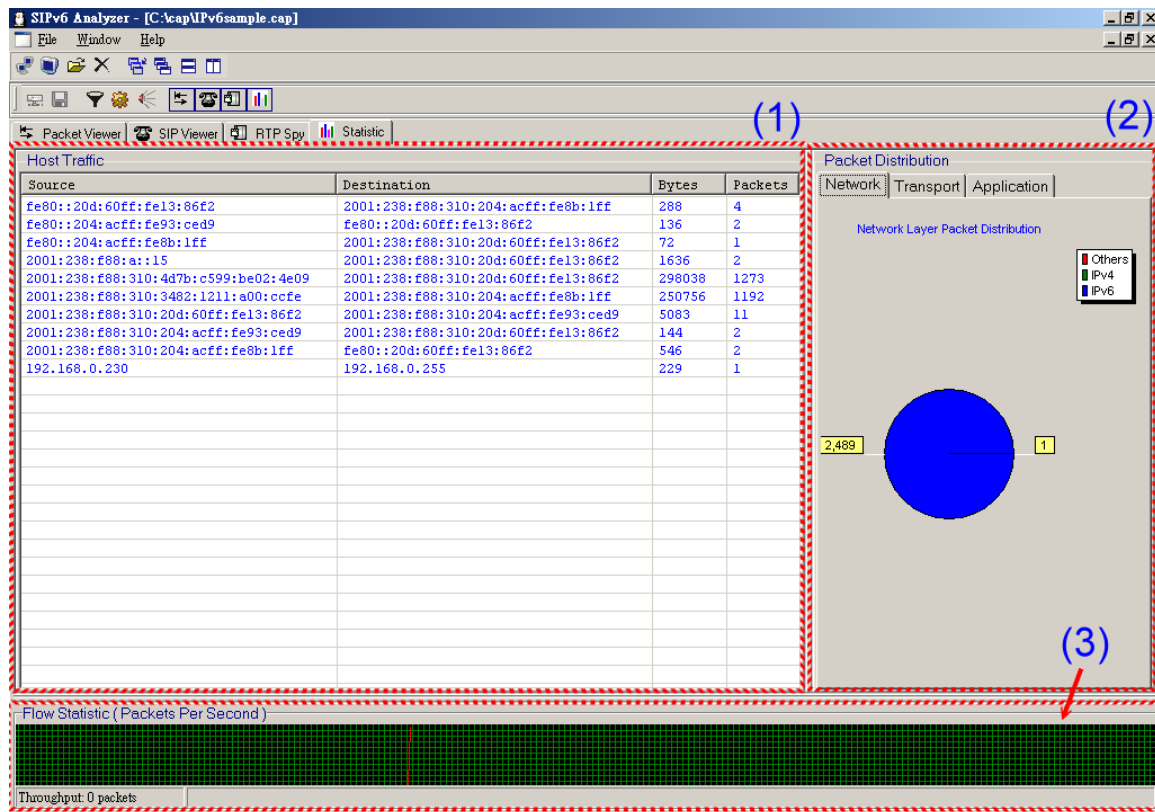


Figure 9. User Interface of Statistics

IV. Conclusion

In the existing stage, the SIP-based multimedia applications (e.g., Video phone) are important drivers to promote IPv6. To assist the development and deployment, we design and implement the SIPv6 Analyzer. The SIPv6 Analyzer provides convenient user interfaces for IPv6 SIP and RTP packets. This document presents the installation steps and describes the function of each component (i.e., the button on the tool-bar or the item of the menu). Users can exercise the operation of the

SIPv6 Analyzer through the captured file (i.e. IPv6sample.cap). The detail operation of the demo scenario can be found in the document (i.e. demo.doc). The up-to-date program and the related documents (e.g., the captured file and the user guide) can be downloaded from the web site (i.e. http://www.csie.nctu.edu.tw/~yhsung/sipv6_analyzer).

Related Links:

1. SIPv6 Analyzer: http://www.csie.nctu.edu.tw/~yhsung/sipv6_analyzer
2. Demo Scenario: http://www.csie.nctu.edu.tw/~yhsung/sipv6_analyzer/demo.pdf
3. User Guide: http://www.csie.nctu.edu.tw/~yhsung/sipv6_analyzer/user-guide.pdf
4. IPv6 Sample File: http://www.csie.nctu.edu.tw/~yhsung/sipv6_analyzer/IPv6sample.cap
5. Demo Video: http://www.csie.nctu.edu.tw/~yhsung/sipv6_analyzer/video.ppt