Capture and Analysis of SIP Packets

Computer Network Technologies and Services (CNTS)
Tecnologie e Servizi di Rete (TSR)

Preliminary Note

The aim of this exercise is to study basic aspects of the SIP. Before executing the exercise you should familiarize with the SIP specification. The exercise requires:

- Two PCs running MS Windows
- The X-Lite software or any other SIP softphone installed on PCs (in the following detailed instructions are provided for X-Lite, but they can be transposed to any other softphone supporting SIP). You can download the software from:
  
  http://www.counterpath.com/x-lite.html

- Two SIP accounts, which can be obtained at iptel.org.
- A network analyzer installed on the PCs.

The X-Lite software is already installed on LABINF and LADISPE PCs.

1 SIP User Agent Configuration (for X-Lite)

1. Install the X-lite SIP User Agent

2. Create a SIP account using the iptel service

  http://serweb.iptel.org/user/reg/

At the end of the creation procedure, a web page will appear showing your SIP URI in the form sip:<username>@iptel.org. You will receive a notification email to the email account you indicated during the registration procedure. This email contains all data concerning your new SIP account.

3. Run your X-lite software. Right-click on the X-lite window and select SIP Account Settings. It can be found under the Softphone item of the menu. The SIP Accounts window will open. In the selected Account tab:

(a) Insert the name you want to associate to the account in the display name box (any name)
(b) Insert your username SIP in the username box. For example, if the URI you have received is sip:torrero@iptel.org, only insert torrero (sip: and @iptel.org are not required)

(c) Insert your password in the password box

(d) Leave blank the Authorization user name box

(e) Insert iptel.org in the domain box

(f) Be sure that Register with domain and receive incoming calls is selected (it should be by default)

(g) Select domain in the Send Outbound via: box

(h) Disable check for voice mail in the Voice mail tab

(i) Click Ok to close the window. At this point the registration procedure to the iptel.org domain.

(j) To make a call, it is sufficient to provide the complete URI of the user you would like to call (in the form sip:<nome_utente>@iptel.org) through the X-lite interface.

2 Analysis of SIP Protocol

1. Start the network analyzer. Select the proper network interface and start the capture.

2. Run the SIP user agent (which has been configured earlier): you should see packets related to the registration procedure in the network analyzer.

3. If your registration capture is correct, save the capture and be ready to start the capture of the SIP call. To do this, you need a second SIP account. Clearly, you also need a second PC. The suggestion is coordinate with other students and setup a SIP call with them.

4. When you are ready, start the capture and make the phone call to the other user.

5. Once you have the two captures, you can start answering the following questions.
Answer the Following Questions

Note. You don’t need to hand in your responses will not get any evaluation for them. The aim of the proposed questions is to allow you to autonomously verify your understanding of the given topics.

Registration procedure analysis

1. Write the most important data of the connection (URI of the user is registering, IP address of the UA is registering, SIP domain, and SIP Proxy IP address)

   _______________________________________________
   _______________________________________________
   _______________________________________________
   _______________________________________________
   _______________________________________________
   _______________________________________________
   _______________________________________________

2. Write the SIP messages sent during the registration phase (requests and replies, excluding possible SIP packets that are not strictly necessary for the registration)
3. Briefly discuss each message. Describe their meaning, the role of the most significant fields of their SIP headers in the context of the registration.
Phone call analysis

4. Write the most important data of the connection (URI of the involved users, SIP domain of each users, IP addresses of the involved PCs)

5. Write the list of all SIP messages exchanged during the voice session setup (it is preferable to use the SIP trapezoid, including all requests and replies)
6. Briefly describe the meaning of the most important SIP messages in the context of a voice call, also highlighting the role of their most significant fields.