S-38.115 Signaling Protocol, Exercise 4 (SIP LAB EXERCISE]

Zhou Yi: Networking laboratory 2003

Deadline: Wed 16.4.2003 at 8:25 before the beginning of the exercise lecture

All late answers will be disregarded. Please, adhere to the deadline.

The answers are to be returned either to the exercise assistant (in person or via email to zhouyi@netlab.hut.fi) or, preferably, to a box underneath the lab's notice board on G-wing 2nd floor. Please write your *name, student number and exercise number* clearly in each answer page.

Attention:

1) Each student should submit his or her own copy of individual exercise answers

2) For those who will return the exercises via email, please use the "Exercise x" as the *subject* in your email, where x is the series number of the exercise. And also write your *name, student number and exercise number* clearly in each answer page.

Preparation:

1. Download the SIP User Agent

   Download the SDK or JRE for the running environment
   Download the SIP centre User Agent
   http://www.sipcenter.com/testarea/testdownloads.html

2. Install the SIP User Agent
   http://www.sipcenter.com/files/Ubiquity_SIP_UA_install_guide.pdf

3. Run the SIP User Agent
   http://www.sipcenter.com/files/Ubiquity_SIP_UA_UserGuide.pdf

4. Network Server Registration
   http://www.sipcenter.com/testarea/testregisterproxy.html

5. User Agent Configuration
   http://www.sipcenter.com/files/sipcenterconfig1.pdf

6. FAQ:
   http://www.sipcenter.com/testarea/testfaqs.html

7. Other references:
   Lecture slides: VoIP: SIP 1, SIP 2, SIP 3
    http://www.netlab.hut.fi/opetus/s38115/eindex.shtml

1. Test User Agent Functionality

Make a call between the two User Agents on a LAN.

Check and analysis the CallLog file , fill in the following table and give the Signalling Flow Chart according to the logged SIP signalling messages for each call.

1) CALL----ANSWER-----HANG UP

No.	Message Content	Message Type
1		
2		
3		
4		
5		
6		
7		

2) CALL----REJECT

No.	Message Content	Message Type
1		
2		
3		
4		
5		

3) REGISTER DENIED ----- REGISTER ACCEPTED

No.	Message Content	Message Type
1		
2		
3		
4		
5		
6		

2.   Using the SIP Center Network Server to Test Proxy Functionality

http://www.sipcenter.com/testarea/testproxytest.html#top

Make a call between the two User Agents on a LAN via SIP proxy center

1)   Check and analysis the CallLog files from both local site and remote site , fill in the following table and draw the signalling flow chart according to the logged SIP signalling messages .

2)   How could you distinguish whether the message is between UA & Proxy Or the message is between UA& UA

1) CALL----ANSWER-----HANG UP (SIP proxy center)   [**LOCAL SITE:**]

No.	Message Content	Message Type
1		
2		
3		
4		
5		
6		
7		

2) CALL----ANSWER-----HANG UP (SIP proxy center) **[REMOTE SITE:]**

No.	Message Content	Message Type
1		
2		
3		
4		
5		
6		
7		

REFERENCE

FORMAT OF SIP MESSAGES

1.   SIP Request Format

A SIP Request Line has three elements: Method + Request-URL + Protocol Version.

Method indicates the type of requests

Request-URL indicates the next hop, which is where the request has to be routed

Protocol-version indicates the version of the SIP protocol used.

E.g.   **INVITE** sip:Bob@130.233.22.176 SIP/2.0

2.   SIP Response Format

A SIP Response consists of a status line, several headers, an empty line and a message body (optional).

Status Line: Protocol version + status code + a reason phrase.

E.g. SIP/2.0 100 Trying

SIP Headers provide information about the request (or response) and about the body it contains.

E.g.

> To: sip:Bob@130.233.22.176
>
> From: Alice<sip:Alice@130.233.28.113>;tag=415718855
>
> CSeq: 1 INVITE
>
> **Call-ID: 1045564702437890952@130.233.28.113**
>
> Via: SIP/2.0/UDP 130.233.28.113:5060
>
> Content-Length: 0

To: The To header always contains the recipient of the request.

From : The From header contains the initiator of the request and a SIP URL.

Call-ID: Represents a SIP signalling relationship shared among two or more users. It identifies a particular invitation and all of the subsequent transactions related to that invitation in a format that looks like the following:

Cseq (Command Sequence): An integer + a method name

The numerical part of the Cseq is used to order different requests within the same session (defined by a particular Call-ID). It is also used to match requests against responses.

Via: Via headers store all the proxies that handle the request. Hence , they contain the path taken by the request. This information is used for detecting routing loops.

3. SIP Bodies

SIP Bodies are only meaningful to the UA, messages bodies can be encrypted end to end without losing any functionality.

The following is an example of an **SDP** session description in a SIP body:

E.g.

```
v=0
o=- 1036096179036 1036096179036 IN IP4 130.233.28.113
s=-
c=IN IP4 130.233.28.113
t=0 0
m=audio 5004 RTP/AVP 8 3 0
```

SDP Syntax:

Type = value

1) v=0

The *v* line indicates that the protocol version is zero(SDP version 0)

2) o=1036096179036 1036096179036 IN IP4 130.233.28.113

The *o* line indicates the creator of the session and the IP address of its site.

3) s=-

The *s* line contains the name of the session

4) c=IN IP4 130.233.28.113

The *c* line indicates the multicast address where the session can be received

5) t=0 0

The *t* line indicates when the session is active

6) m=audio 5004 RTP/AVP 8 3 0

An *m* line begins with the media type:

m=<media type><port number><transport protocol><media formats>

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4. Sample Message

No.	Message Content	Message Type
1	22:29:39 : Outgoing Message Connection Key: 80.248.33.37:5060 2 2 TTL: 1 **INVITE** sip:Bob@130.233.22.176 SIP/2.0 CSeq: 1 INVITE To: sip:Bob@130.233.22.176 From: Alice<sip:Alice@130.233.28.113>;tag=415718855 **Call-ID: 1045564702437890952@130.233.28.113** Via: SIP/2.0/UDP 130.233.28.113:5060 User-Agent: UbiquityUserAgent/4 Accept: text/plain Accept: application/sdp Accept-Encoding: identity Contact: <sip:Alice@130.233.28.113> Subject: no subject Content-Type: application/sdp Content-Length: 125 v=0 o=- 1036096179036 1036096179036 IN IP4 130.233.28.113 s=- c=IN IP4 130.233.28.113 t=0 0 m=audio 5004 RTP/AVP 8 3 0	INVITE
2		
3		