

KSU / CCIS / CS DEPARTMENT

CSC-493, FALL 2010

HOMEWORK 1

Implement the SCSIP protocol specified below using the programs seen in tutorial 2. The application will have four threads, two for Caller (client and server) and two for Callee (client and server). Consider the following requirements:

- When Callee receives a session request, you enter the answer to send back to Caller using a scanner.
- Caller and Callee log their operation on text files. The following is an example of the Caller's log format (see the SCSIP specification for more details):

```
Caller starting on 192.168.0.9:5060 Tue, 23 Oct 2010 16:40:758
Request received Tue, 23 Oct 2010 16:47:548
INVITE
From: 192.168.0.9:5070
Session-Id: 8587532638744223

Response sent Tue, 23 Oct 2010 16:49:158
OK
To: 192.168.0.9:5071
Session-Id: 8587532638744223
```

SCSIP: Simple Communication Session Initiation Protocol

1. Purpose

SCSIP is a simple protocol that permits to Caller to try to establish a communication session with Callee. The communication content and means are not described by this protocol. Once the session is established, Caller and Callee can exchange voice, text, or multimedia message.

2. Transport

SCSIP uses UDP. SCSIP devices send from one port and receive on that port plus 1. For example, if a device sends from port 5048, it will listen on port 5049.

3. SCSIP architecture

Caller and Callee are two communication devices that "speak" SCSIP. They exchange SCSIP messages.

4. SCSIP Messages

SCSIP messages are requests and responses.

4.1 Requests

SCSIP has two request messages: INVITE and ACK.

4.2 Responses

SCSIP has four response messages: OK, DECLINE, and UNAVAILABLE

5. SCSIP message sequence

5.1 Successful session setting

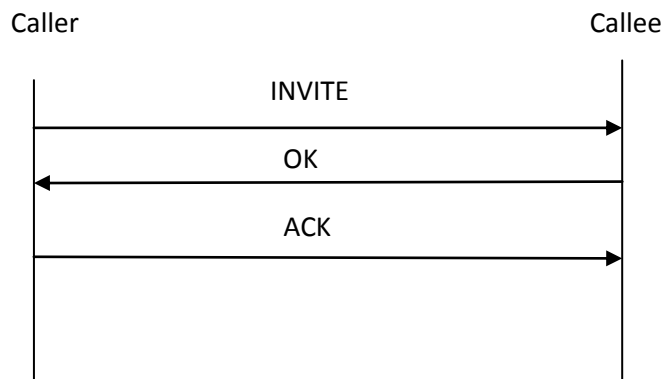


Fig.1

5.2 Declined session request

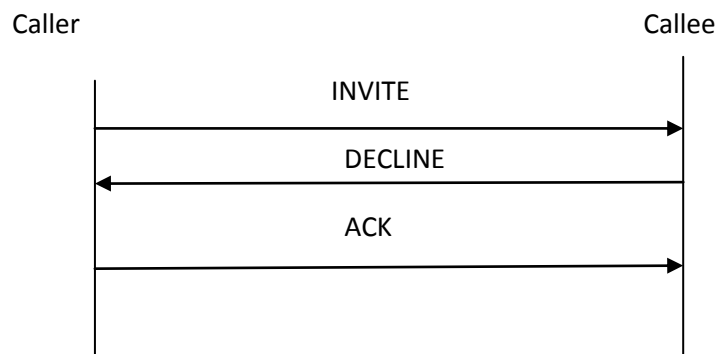


Fig.2

5.3 Failed session request

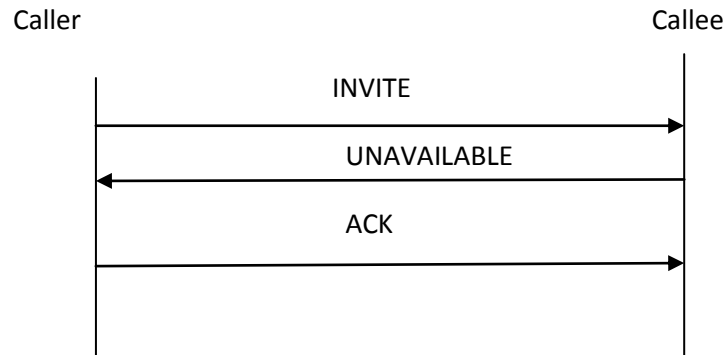


Fig.3

6. Message structure

A SCSIP message starts with a method followed by a set of headers. Methods are INVITE, ACK, DECLINE, and UNAVAILABLE.

6.1 INVITE request example

```
INVITE
From: Ahmed
IP: 192.168.0.10
Port: 5060
To: Ali
IP: 192.168.2.140
Port: 5071
Session-Id: 984857037837
```

Session-Id is a randomly generated number that exhaustively identifies the session. It remains the same during all the session establishment process.

6.2 OK response example

```
OK
From: Ali
IP: 192.168.2.140
Port: 5070
To: Ahmed
IP: 192.168.0.10
```

Port: 5061
Session-Id: 984857037837

6.3 DECLINE response example

DECLINE
From: Ali
IP: 192.168.2.140
Port: 5070
To: Ahmed
IP: 192.168.0.10
Port: 5061
Session-Id: 984857037837

6.4 UNAVAILABLE response example

UNAVAILABLE
From: Ali
IP: 192.168.2.140
Port: 5070
To: Ahmed
IP: 192.168.0.10
Port: 5061
Session-Id: 984857037837

6.5 ACK message example

ACK
From: Ahmed
IP: 192.168.0.10
Port: 5060
To: Ali
IP: 192.168.2.140
Port: 5071
Session-Id: 984857037837