S-38.3152 Networked Multimedia Protocols and Services Jörg Ott

Exam 31 August 2010

Please write readably and answer in English.

There are three classes of questions: (a) expecting (relatively) short answers, (b) expecting more elaborate answers, and (c) a small design task. The questions are marked accordingly.

Questions:

1. [6p, a] a) Which (two) purposes does the CNAME attribute of the RTCP SDES packet serve?
   b) Describe one further function that the SDES packet may accomplish?
2. [6p, b] a) How is end-to-end message authentication achieved in SIP?
   b) How does end-to-end encryption work? Why can SIP messages still be routed to the right target?
3. [6p, a] a) What is the purpose of an RTSP DESCRIBE message?
   b) Describe a case when the RTSP client need not send a DESCRIBE (still using RTSP). Why does your case work and how does the client proceed to obtain the media stream?
4. [6p, b] [6p, b] The SIP entity at the node `bar.example.com` receives the following SIP message:

```
SIP/2.0 200 OK
Via: ...
To: <sip:bob@example.com>;tag=234567890
From: <sip:bob@example.com>;tag=123456789
Call-Id: 234343798wgyd73@foo.example.com
CSeq: 3361875 REGISTER
Contact: <sip:bob@bar.example.com:50060>;q=0.5;expires=3600
Contact: <sip:bob@monster.example.com:3001>;q=0.7;expires=60
Content-Length: 0
```

   a) What are the semantics of this message? Discuss all the headers shown with a value.
   b) Which action(s) would this SIP entity have to perform next? When?
5. [6p, a] Briefly sketch two broadcasting schemes (no return channel) that allow users better access to media streams than traditional TV. What are their pros and cons with respect to each other?
6. [6p, a] Explain the (three) different types of SIP URIs and when/where they are used.
7. [6p, b] Contrast a SIP redirect server, SIP proxy, and SIP B2BUA.
8. [12p, c] Assume user A is watching an IP-based based television program using an RTSP-capable interactive TV set and finds an interesting piece of documentation A wants to point B to. A wants to call B (using SIP) and inform B about the program and discuss its contents while watching each in their home. Sketch the protocol interactions for one possible solution (there are many!) and describe how its works and why you have chosen your approach. (*Note: there are many possible solutions*).