Lab Assignments for Chapter 28

We have created two lab assignments for this chapter: Lab8-1 and Lab8-2. We have also included two lab-report sheets, which means that each lab should be reported in a separate sheet. It is assumed that you have done the lab assignment for Chapter 1, which told you how to install the Wireshark software and how to use it.

In the first lab, we are only interested in the encoding of the multimedia packets. In the second lab, we need to find which transport-layer protocol is used for multimedia.

28.1   LAB28-1: ENCODING (PAYLOAD TYPE)

To transmit multimedia over the Internet, the information needs to be encoded (compressed). In this lab assignment, we want to find the encoding method of the captured data (Table 28.7 in the textbook).

Part I: Internet Radio

Browse the Internet for a live radio station. Start capturing the packets as you are listening to the radio. Save the captured file.

Questions

Using the captured information, answer the following question in your lab-report sheet.

1. Checking the HTTP Get messages, what character set(s) is/are accepted by the receiver?
2. Explain the type of the character set (you may need to do Internet search)?
3. Checking the HTTP Get messages, what encoding algorithm(s) is/are accepted by the receiver?
4. Explain the type of encoding (you may need to do Internet search)?
5. Checking the HTTP OK messages, what character set is used by the sender?
6. Checking the HTTP OK messages, what encoding method is used by the sender?

Part II: Voice over IP

To complete this portion of the LAB, you need to have the Internet Telephony Service to capture the packets during a telephone exchange. Alternatively, you may download a captured VOIP session from one of the many websites such as

http://wiki.wireshark.org/SampleCaptures

Questions

Using the captured information, answer the following question in your lab-report sheet.
   1. Examining RTP packets, what is the payload type?
   2. Explain the payload type.

28.1.1   Documents to Turn in

   1. A copy of the Lab28-1 report sheet that contains answered questions.
   2. A printout of the supporting captured information.

28.2   LAB28-2: TRANSPORT-LAYER PROTOCOL

Multimedia today use either TCP or UDP as the transport-layer protocol. Although some Internet radio and TV use TCP, the interactive multimedia mostly use UDP. In the second case, however, UDP needs to be combined with RTP and RTCP. In addition, interactive multimedia communication needs a kind of signaling system, which mostly is provided by the SIP as discussed in the textbook.

Part I: Internet Radio

Open the captured file you saved from the live radio.

Questions

Using the captured information, answer the following question in your lab-report sheet.
   1. Is the service a streaming stored audio, streaming live audio, or interactive audio?
   2. What transport-layer protocol is used to transmit the audio in the radio station?
   3. Do you experience any jitter? What is the reason?

Part II: Live Internet TV

Browse the Internet for a live TV station, such as **Al Jazeera Live TV (English version)** at

http://wwitv.com/tv_channels/b3554.htm

Capture packets while you are watching.

Questions

Using the captured information, answer the following question in your lab-report sheet.

1. Is the service a streaming stored audio/video, streaming live audio/video, or interactive audio/video?
2. Al Jazeera TV station uses **Real Time Messaging Protocol** (RTMP). Do an Internet search and describe this protocol.
3. Does RTMP use the service of UDP or TCP?
4. Do you experience jitter? What is the reason?

Part III: RTP from Voice over IP

Using the VOIP captured information file you saved earlier and consulting Figure 28.35 of the textbook, examine one of the RTP packets.

Questions

Using the captured information, answer the following question in your lab-report sheet.

1. Does RTP use the service of UDP or TCP? Is it expected?
2. What is the port number used by RTP? Is it a well-known port? Explain
3. What is the version number? Is there padding? How many contributing source (CSRC) identifier is in the packet? What is the payload type?
4. What is the sequence number?
5. What is the value of the timestamp?
6. What is the synchronization source (SSRC) identifier?

Part IV: RTCP from Voice over IP

Using the VOIP captured information file you saved earlier and consulting Figure 28.36 in the textbook, examine one of the RTCP packets.

Questions

Using the captured information, answer the following question in your lab-report sheet.

1. Does RTCP use the service of UDP or TCP? Is it expected?
2. What is the port number? Is it a well-known port? Explain.
3. How many RTCP packets are packed in a single transport-layer packet? Explain your answer.
4. What types of RTCP packet are in the trace? What are their code numbers? What is the purpose of each packet?

Part V: SIP from Voice over IP

Using the VOIP captured information file you saved earlier, examine SIP packets.

Questions

Answer the following questions in your lab-report sheet.

1. Which entities do the SIP addresses in the request packets define? Which entities do the SIP addresses in the response packets define?
2. Do SIP packets use the service of UDP or TCP? Can they use either one?
3. Which type of the request SIP messages can you identify?
4. Which type of the response SIP messages can you identify? What are their codes?
5. Is there a SIP/SDP packet? Which SIP message type encapsulates the SDP packet? Examining a SDP packet, can you explain its function?

28.2.2 Documents to Turn in

1. A copy of the Lab28-2 report sheet that contains answered questions.
2. A printout of the supporting captured information.