Computer Networks, Spring 2026

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Lab 8: Streaming audio/video files over UDP

1 Objective

In this lab, you will explore the mechanisms of sending multimedia content over the connectionless UDP protocol. Unlike TCP, UDP does not provide reliability or flow control. You will evaluate the trade-offs between data rate, packet loss, and playback smoothness. *This lab is to be done individually or in a team of two.*

2 Core Requirements

1. Server Implementation: The server should read a multimedia file (e.g., `streamable.mp4`) and send it in blocks to a client upon receiving a `GET` command.
2. Client Implementation: The client should receive these blocks and either store them in a file or pipe them directly to a media player (e.g., `vlc -`).
3. Pacing: Implement a mechanism to regulate the data rate (e.g., using `nanosleep()`).

3 Multimedia Preparation

Use `ffmpeg` to convert your video into a stream-friendly format like MPEG-TS:
`ffmpeg -i input.mp4 -f mpegts output.ts`

4 Performance Evaluation

1. Compare the size of the sent vs. received files at different data rates.
2. Identify the "sweet spot" data rate where the video plays smoothly without excessive buffering or artifacts.
3. Discuss: What happens to the playback if you omit the `nanosleep()` delays entirely?

5 Evaluation

☐ Server can stream a video file over UDP. TA: _____

☐ Client can receive and play back the stream. TA: _____

☐ Provided a report on data rate vs. playback quality. TA: _____