

CS490-004: Lecture Note (Lecture #3, September 1, 2026)

1. Distribute:

- Attendance card
- Exercise handout (9/1/2026)

2. Announcements:

- Quiz #1 is scheduled today (1:30-1:45)
 - A timekeeper wanted

3. Introduction to “Network Programming” (continued from our previous lecture)

(a) Concepts of “the client-server” and “peer-to-peer” application models?

- D: Examples of the network applications based on “the client-server” model?
- D: Examples of the network applications based on “peer-to-peer” model?
- The API structure for network applications based on “the client-server” model
- The API structure for network applications based on “peer-to-peer” model

(b) Concepts of “network address” and “port”

- What are they?
- What are they for?

(c) Concepts of “unicast” and “multicast” transmission modes

- Visualizing unicast transmissions
- Visualizing multicast transmissions
- D: Examples of the network applications based on unicast transmissions
- D: Examples of the network applications based on multicast transmissions
- D: What are their (primary) advantages and disadvantages?

(d) Tunneling (can be implemented either by hardware (e.g., VPN) or by software (e.g., IPsec tunnel-mode)).

- What is “tunneling”?

- (a) Tunneling by software
- (b) Tunneling by hardware

- Case Study #1: Soft-LAN (an example of “Layer-1 tunneling)
- Case Study #2: IPsec Tunnel-Mode (an example of “Layer-3 tunneling)
- Case Study #3: M-Bone (an example of “Layer-3 tunneling)
- Motivations for tunneling

4. Quiz #1 (1:30-1:45)