COMP 4981
Computer Systems Technology, Data Communications and Internetworking Option
Jan 2024

This is an individual assignment.

Objective

- To create a C-based client-server application where clients can move a character on the screen using arrow keys.
- The application will use the ncurses library for display and UDP for network communication, with an emphasis on handling UDP's inherent unreliability.

Learning Outcomes

- Apply UDP socket programming in C for networked communication.
- Utilize the ncurses library for graphical display and input handling in a terminal.
- Develop strategies for dealing with UDP's unreliability, such as lost or delayed packets.
- Enhance understanding of client-server architecture and real-time state synchronization across clients.

Details

Client Application

- Captures user input from arrow keys to send movement commands to the server.

Server Application

- This application receives movement commands from clients, updates the character's position, and broadcasts this updated position to all connected clients.

Movement Synchronization

- Ensures all clients display the same character position on their screens, despite potential packet loss or delay.

Constraints

- Follow the guidelines.
- Use the C programming language with strict adherence to the provided style guidelines.

- Implement the networking aspect using UDP.
- Employ the ncurses library for character display and movement.
- Develop a mechanism to handle the unreliability of UDP, ensuring that character movement is synchronized across clients.

Resources

- C programming language documentation.
- ncurses library documentation for terminal handling.
- UDP socket programming tutorials and documentation.
- Sample code or tutorials on client-server architecture using UDP.

Submission

- Follow the assignment submission requirements.
- Be sure you are aware of the late submission policy.

***Note:** Please strictly adhere to the submission requirements to ensure you don't lose any marks.*

Evaluation

Topic	Value
Cient	30
Server	20
Handling of UDP unreliability	10
Testing & Design	40
Total	**100**

Hints

- Establish an essential UDP communication between the client and server before integrating ncurses.
- When dealing with UDP unreliability, consider implementing a simple protocol atop UDP that acknowledges received messages or resends lost ones.

- For synchronizing character movement, have the server maintain the authoritative state of the character's position and ensure clients update their displays based on server broadcasts.
- Explore ncurses functions for non-blocking input handling to capture arrow key presses.