

6.111 Final Project Checkoff List: LASERNET

COMMITMENT:

Basic input and output (Amanda)

- Keyboard input via Nexys4 USB PS/2 emulator
- Display text strings on VGA monitor
- Verify proper encoding/decoding with integrated logic analyzer
- Working laser output and photodiode input to/from FPGA logic

Basic state machine and one-way message transmission (Allan)

- Demonstrate successful three-way handshake establishing TCP link
- Demonstrate successful four-way handshake terminating TCP link
- Demonstrate successful one-way transmission of a text message
 - Keyboard input of text message into node A
 - Flip a switch to “transmit”
 - Receive error-free message on node B, display on VGA monitor
 - Receive proper ACK/NACK messages on node A

GOAL:

Full-duplex (two-way) message transmission (Allan)

- Keyboard input text message on both nodes
- Flip switches to “transmit”
- Receive and display error-free messages on both nodes on VGA monitors

Robustness to transmission errors (Amanda)

- Block laser to forcibly drop packets, demonstrate that message is still fully transmitted
- Insert “error module” to “randomly” insert bit errors, demonstrate that message is still correctly transmitted

Image transmission (Amanda and Allan)

- Use camera to capture an image on node A
- Transmit captured image to node B and display with VGA monitor

STRETCH:

Streaming video and audio (Amanda and Allan)

- Implement UDP protocol for streaming
- Stream video from node A to node B
- Stream audio from node A to node B

Fun interactive things (Amanda and Allan)

- Implement two-player pong over laser link
- Implement two-way audio streaming (“VoIP phone call”)
- Implement two-way video streaming (“video call”)