CS 118: Project 2

Go-Back-N Protocol over UDP

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CS 118 Project 2 Report

# Implementation Description

## Header Format

Type: Stores the type of message. 0 means request, 1 means ACK, 2 means data, and 3 means teardown.

Sequence Number: Sequence number denotes the current packet’s sequence number.

Length: The length stores the length of the data in bytes.

Data: The data carries the request or actual data. This is empty if the type is an ACK.

## Client

The client is run with:

$ ./client <hostname> <port number> <filename>

If the file requested is found on the server, the server will send the file to the client. Otherwise, it will cause an error. The first packet received by the client from the server will contain data for the requested file. If the packet received has the correct sequence number, the client will send the server an ACK. If the packet that was received is not supposed to be the next one, the client will respond with an ACK of the last sequence number from the client. This process will continue until the client receives a packet with a sequence number that represents the end of the file transmission.

## Server

The server is run with:

$ ./server <port number>

The server stays running as soon as it is started. It accepts a packet from the client which will request a file. If the file is found, it will be sent over to the client, otherwise it sends an error. To ensure reliable data transfer, the server uses the Go-Back-N protocol. The server keeps a list of unpacked packets. Once the server receives an ACK from the client, it will send the packet with the sequence number from the ACK. After a certain time, if an ACK for the packet that was sent is not received, any unACKed packets in the window will be retransmitted.

## Messages

The most common messages used by this client-server pair are ACKs.

## Timeouts

Timeouts are used by the server to determine whether a packet has been lost. If lost, it will retransmit certain packets based on the last one that was ACKed. The client uses timeouts to determine if the server has stopped or is done sending data.

## Go-Back-N

Go-Back-N is the Window-Based Protocol that we used for this project. The receiver will only accept the packet that has the next sequence number. If a packet is lost, the lost packet will be retransmitted before any further packets can be sent.

# Difficulties

Filenames were reading incorrectly, with one or two random characters being added onto the end of the filename. This was fixed by changing from memcpy to strcpy for the filename, in addition to adding 1 onto the requested packet length.