Lab08 Robust UDP Challenge

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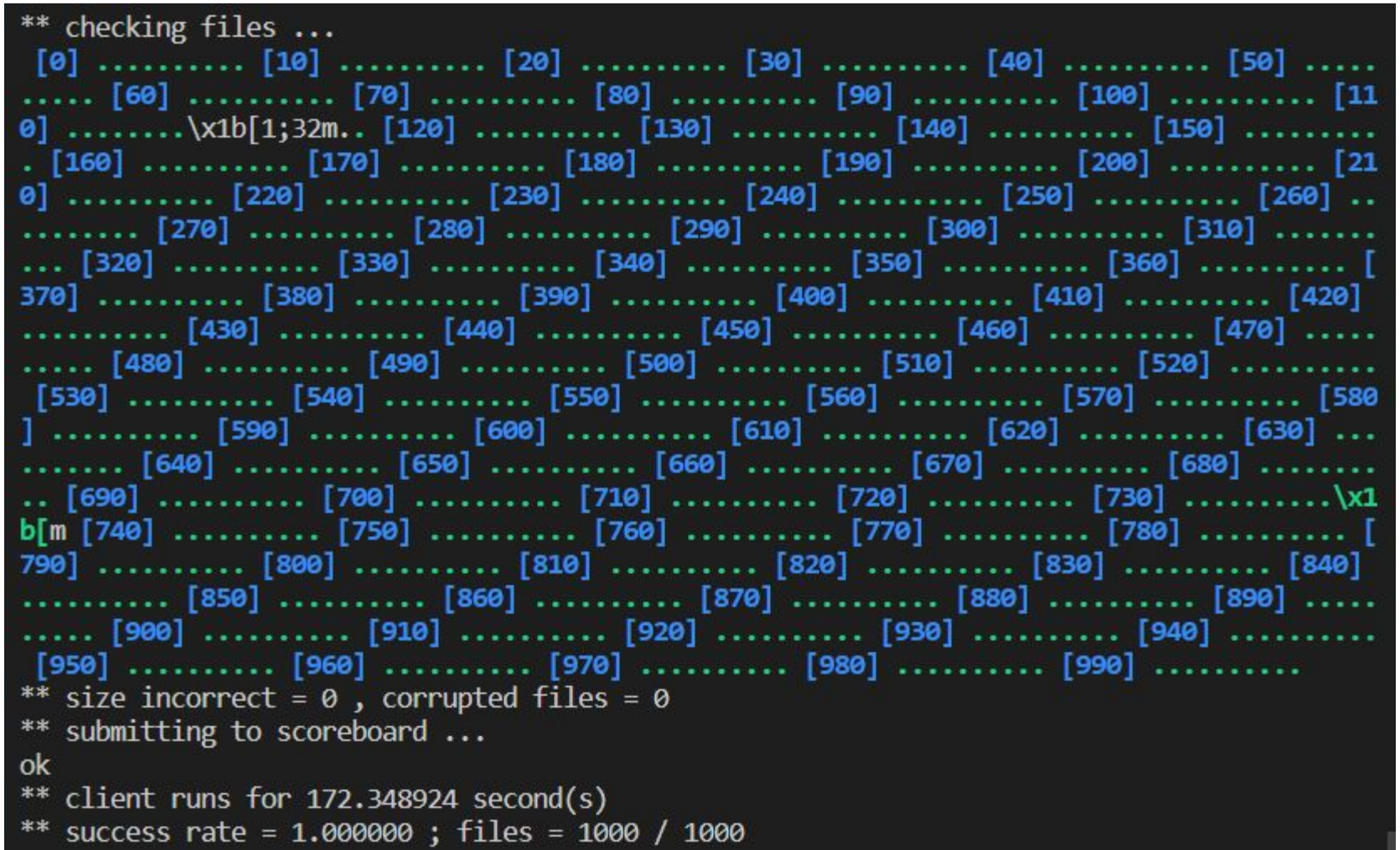
Result

- latest result, now in rank 27



Parameters & Data Structures

```c
#define MAXLINE 512
#define SEND_TIME 24
#define CHECK_ACK_TIME 256
#define MAX(a, b) (a>b?a:b)

typedef struct {
    int     file_no;
    int     seq_no;
    int     eof;
    char    data[MAXLINE];
} pkt_t;

typedef struct {
    int file_no;
    int seq_no;
} ack_t;
```

The idea about send and receive

- For client
  - Suppose no packets are lost during transmission
  - Only resend after receiving ack
- For server
  - Only receive in-order packets
  - Send ack every certain period of time

Client

- for all file, read the content into packets (size : 1024 bytes)
- for each packet, send it to server for at most 32 times. After sending to server, client wait for a while for ACK response.
- If received ACK, move on to next packet.

- After all packets are sent, send an EOF to server

Client (cont.)

- main loop look like this

```
while (read(fr, pkt.data, sizeof(pkt.data)) > 0) {
    for (int i = 0; i < SEND_TIME; i++) {
        if(sendto(s, (void*) &pkt, sizeof(pkt), 0, (struct sockaddr*) &sin, sizeof(sin)) < 0)
            perror("sendto");
        // recv ack
        usleep(50);
        int rlen;
        if((rlen = recvfrom(s, (void*) &ack, sizeof(ack), MSG_DONTWAIT, NULL, NULL)) > 0){
            //printf("RECV: ");
            //printack(&ack);
            if(ack.file_no == pkt.file_no && ack.seq_no == pkt.seq_no+1){
                break;
            }
        }
        usleep(100);
    }

    pkt.seq_no++;
    seq_no++;

    memset(&pkt.data, 0, sizeof(pkt.data));
}
```

Server

- After receiving packets and EOF, send ACK indicating the next packet that client should send
- only write to file if receive the valid packet

Server (cont.)

- main idea of server

```
/* Deal with packets */
pkt_t pkt;
for ( ; ; ) {

    /* Receive packet */
    if((rlen = recvfrom(s, (void*) &pkt, sizeof(pkt), 0, (struct sockaddr*) &csin, &csinlen)) <= 0) {
    //usleep(1);
    /* Store */
    // write to different file?
    if (file_no == pkt.file_no && seq_no == pkt.seq_no)
    {
        if (pkt.eof == 1) {
            file_no++;
            seq_no = 0;
            break;
        }

        if (write(fw, pkt.data, strlen(pkt.data)) < 0)
            perror("write");

        seq_no++;
    }
    ack_t ack = {.file_no = file_no, .seq_no = seq_no};
    sendto(s, (void*) &ack, sizeof(ack), 0, (struct sockaddr*) &csin, sizeof(csin));
```