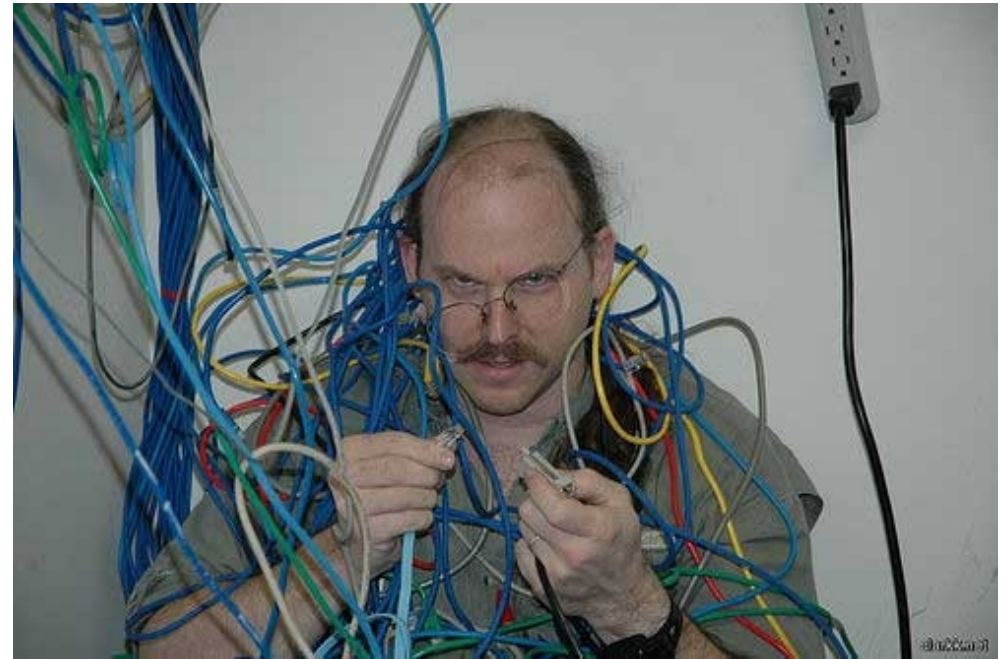


## Some Miscellaneous Stuff (... Part I??)

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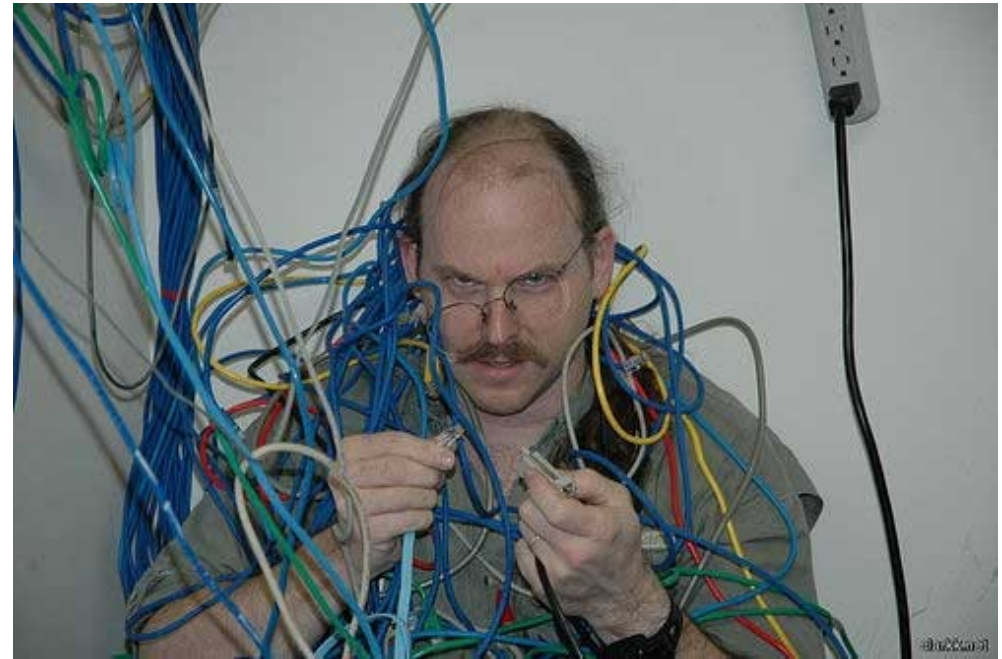
# Assignment 5

- You don't need to parse the instruction *at all!*
  - Trying to do this has tripped some people up.
  - Use `dataLen` parameter and payload length.
- Be sure you're always reading the payload sent by the server.
  - If you ignore the payload, you will get out of sync!



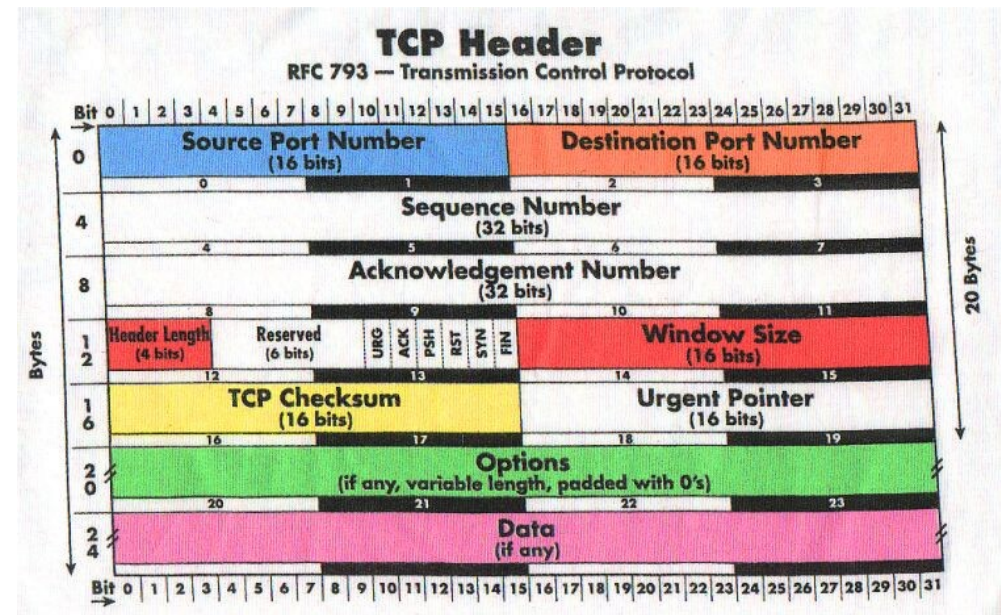
# Assignment 5

- To debug, use GDB on the client
  - Set a breakpoint or conditional breakpoint
  - You need to be running the server too!
  - The verify script will run *both* the client and the server for you
- Remember to **check your return values** from I/O functions and the server!



# Structured data I/O

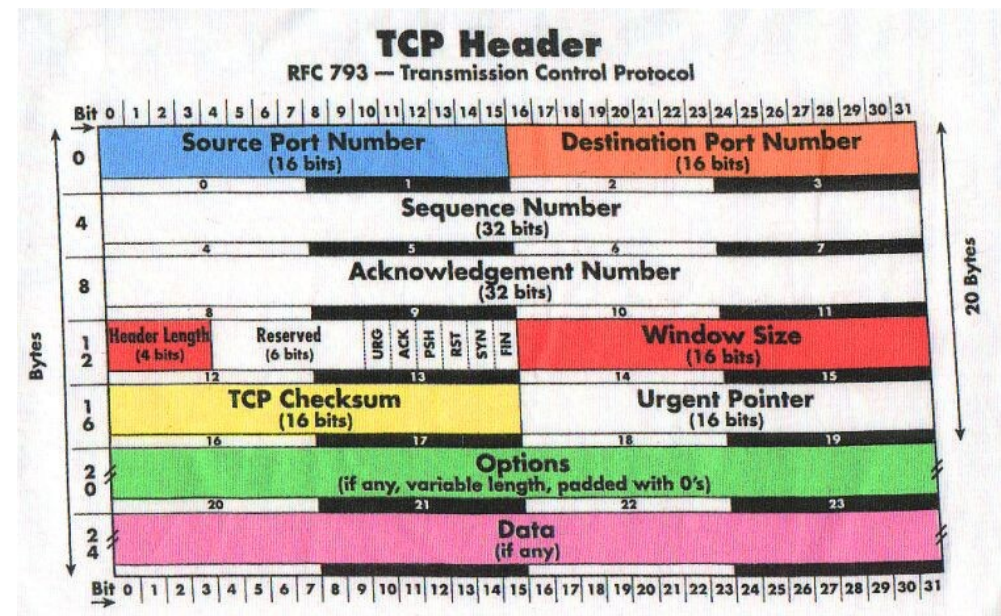
- Remember read/write take a `void *`, so you can pass a pointer to any data type.
- Is there some type that might be a natural fit for structured data?





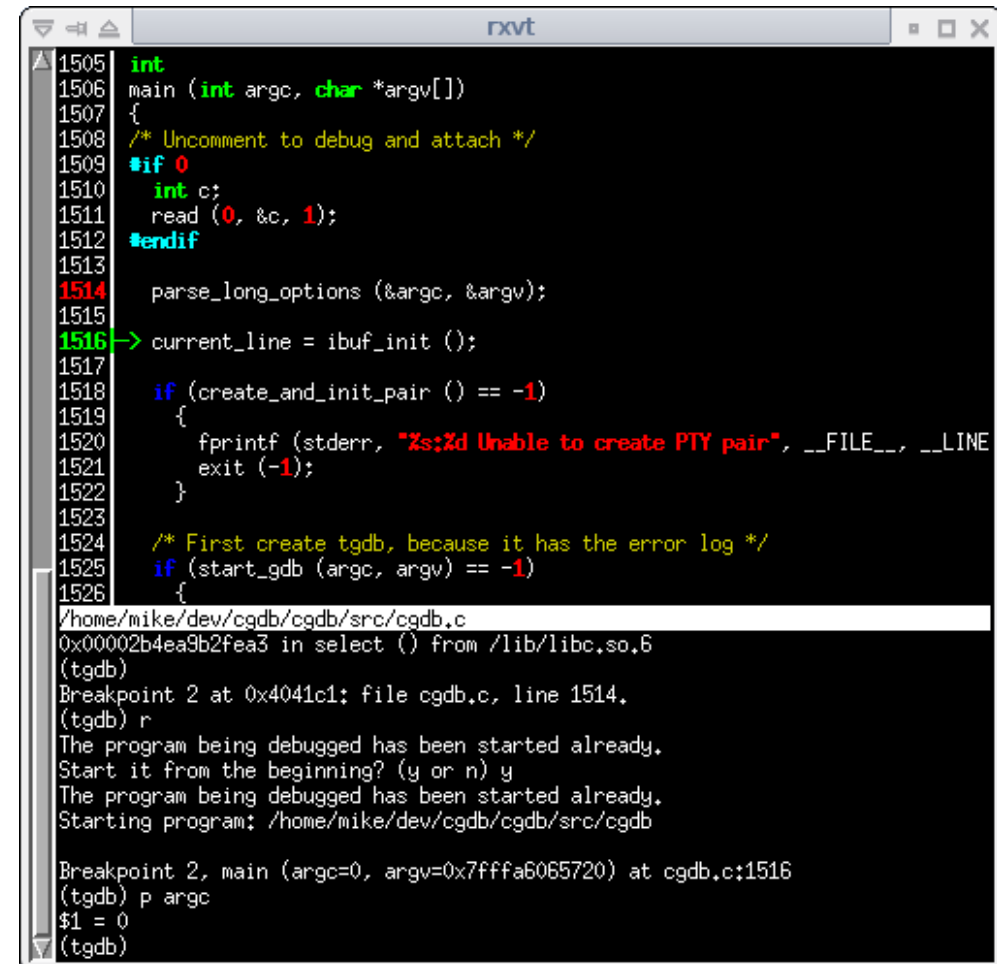
# Structured data I/O

- Remember read/write take a `void *`, so you can pass a pointer to any data type.
- Is there some type that might be a natural fit for structured data?
  - Caveat: watch out for padding bytes!
  - The assignments are safe; I designed around this.



- I just discovered this last week!
- Still in development, so don't rely completely on it if something seems off.
  - You can always get code listings in GDB with the `list` command.
- Run `cgdb` command just like you would `gdb`.
- To install:

`sudo apt-get install cgdb`



```
1505 int
1506 main (int argc, char *argv[])
1507 {
1508     /* Uncomment to debug and attach */
1509     #if 0
1510     int c;
1511     read (0, &c, 1);
1512     #endif
1513
1514     parse_long_options (&argc, &argv);
1515
1516     current_line = ibuf_init ();
1517
1518     if (create_and_init_pair () == -1)
1519     {
1520         fprintf (stderr, "%s:%d Unable to create PTY pair", __FILE__, __LINE);
1521         exit (-1);
1522     }
1523
1524     /* First create tgdb, because it has the error log */
1525     if (start_gdb (argc, argv) == -1)
1526     {
/home/mike/dev/cgdb/cgdb/src/cgdb.c
0x00002b4ea9b2fea3 in select () from /lib/libc.so.6
(tgdb)
Breakpoint 2 at 0x4041c1: file cgdb.c, line 1514.
(tgdb) r
The program being debugged has been started already.
Start it from the beginning? (y or n) y
The program being debugged has been started already.
Starting program: /home/mike/dev/cgdb/cgdb/src/cgdb

Breakpoint 2, main (argc=0, argv=0x7fffa6065720) at cgdb.c:1516
(tgdb) p argc
$1 = 0
(tgdb)
```



- For those who don't know this already...
  - Open until the end of class
  - Anonymous
  - Instructor can't see any replies until after grades are in
  - I really value your feedback, whether positive or critical

# And for my next trick...

- Let's speed-code a Web server!

