NFS

(ft. last year OSN TA's slides inspiration :P)

What's included in this project?

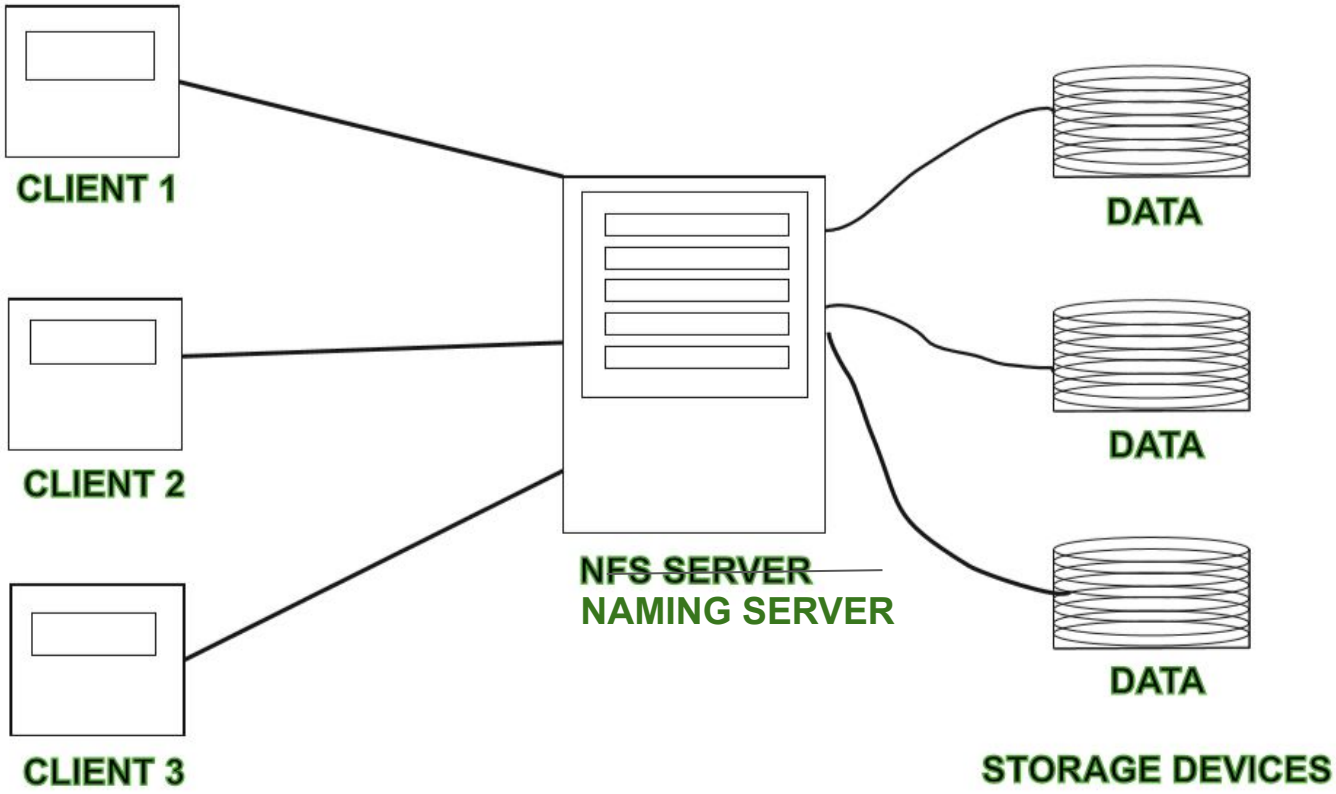
~~Distributed Systems?~~

1. Socket programming
2. Threading
3. Concurrency
4. Persistence

- OS Concepts
- Data Structures and Algorithms (no OJ)
- API Calls?

- Teamwork!

NFS


CLIENT 1
CLIENT 2
CLIENT 3
NFS SERVER
NAMING SERVER
DATA
DATA
DATA
STORAGE DEVICES

The storage servers

BIG DAWGS

- Store the data (duh)
- Expose the accessible paths to the NM
- Give relevant information such as ports, IP addresses, etc. to the NM on connection

Client

- Wants to read, write, modify files in the filesystem.
- Goes to NS
- Where there is NS, there is way.
- Multiple clients co-exist.

Multiple clients

- File reading
- File Writing

Two clients request writing into a file at once…what does NM do?

Essentially your NM's *mantra* (Concurrent Client Access)

Naming Server

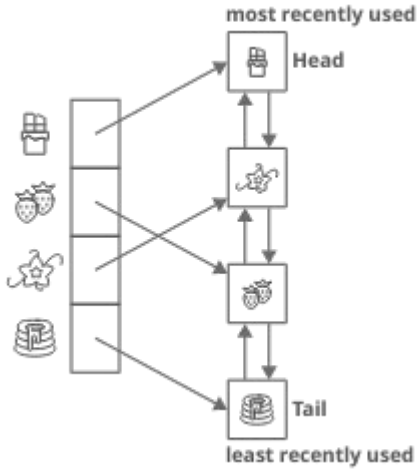
- I expect the previous parts to be relatively straightforward
- They account for ~50% of the assignment
- Let’s take a look at the other specifications

Naming Server

- Can add new storage servers at any point in the execution (try to create a thread for adding new SS)
- Requests made to NM
  - Handled by SS
    - Reading files
    - Writing files
    - Access information
    - Music streaming
  - Handled by NM
    - Creating files and directories
    - Deleting files and directories
    - Copying files and directories
  - **A few places require ACK; a few requirements are asynchronous.**

Search

- Linear search?
  - 🤮
- No, do something better than *O(n)*
  - *Tries and hashmaps* (You can copy code from online this ain't sem-2).
- Caching (LRU)

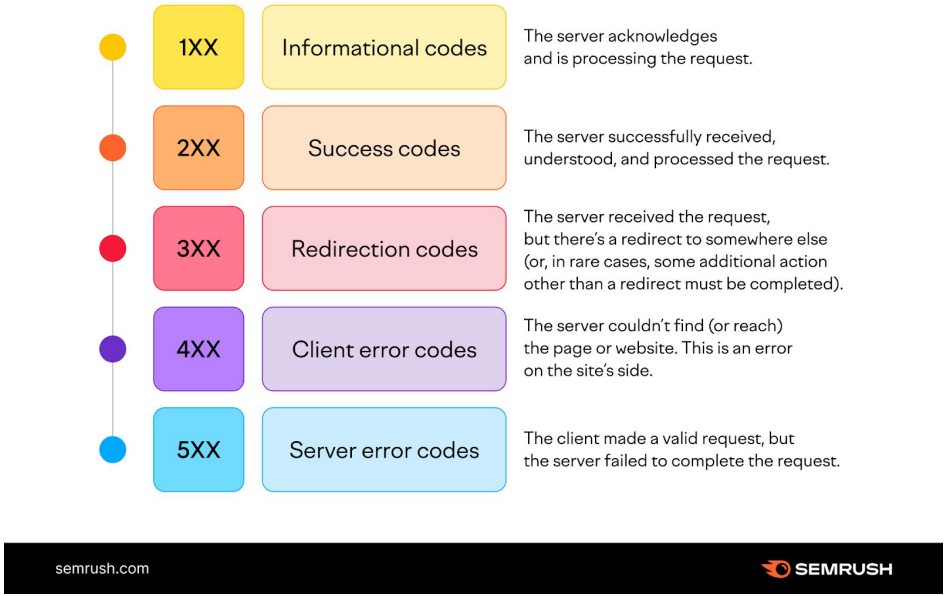


Backup And Redundancy

- Easily the *most challenging* part of your assignment
- Failure detection. SS down!
- Data redundancy and replication
  - Async
- Async duplication of write commands
- SS Recovery (Bonusssssssssssssssssssssssss)(Be Happy its Bonus).

Other stuff

- Error codes
  - Will make your own life easier.
- Bookkeeping
  - Essentially debug statements
  - Very organised.



Motivation

- NFS is cool
- You get to build a proper *large* system (unlike C-shell)
- Learn a bunch of stuff. Seriously.
- If none of this worked
  - Think about what it can do for your resume :)
  - Corporate wants to know your location.(GS)

- Grades chahiye. (Projects 60%)

I asked Google for “Tech is cool” images

Some pointers

- Only POSIX Libraries
- If you’re picking up something from - cite the resource
- Prompts given to LLMs should be included in the code
- Modular code
- Divide work efficiently; plan
- Should have started yesterday :/ (Jk Lmao)

Thanks for coming

(Go have lunch)