STORAGE SERVER FOR APARTMENT BUILDINGS

TEAM 37

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OVERVIEW

- Data management at apartment buildings
- Need efficient means of storage and methods for maintaining this data
- Usage of hash tables and C string libraries to implement system
- Performance of aforementioned approaches
- Importance of organizing data

RESIDENTIAL DATA MANAGEMENT

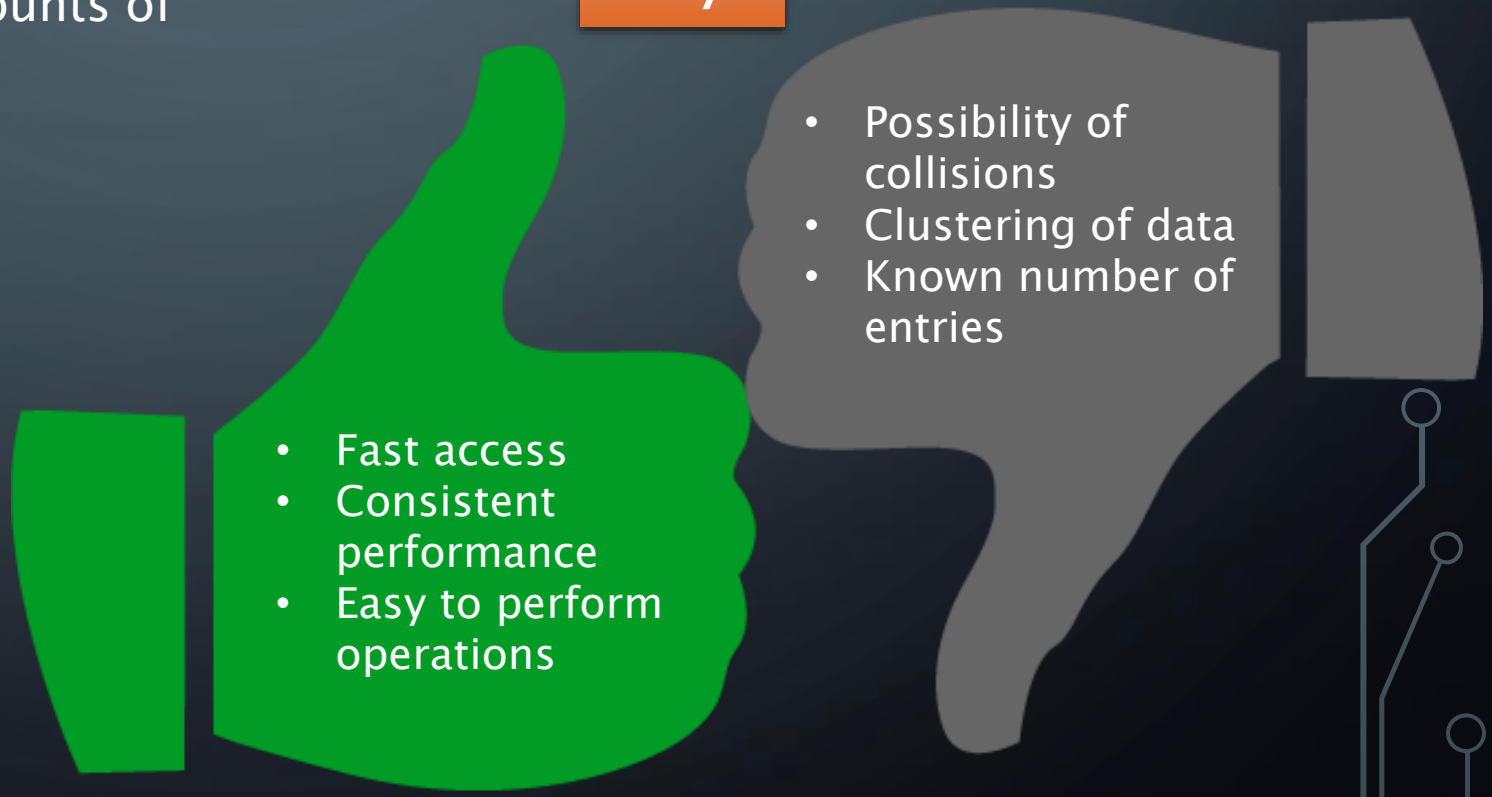
- *Client*: management, superintendent, security
- *Problem*
  - Current system is fully paper based and unorganized
  - Access is slow and inaccurate
- *Solution*
  - Data to be stored in hash tables and centralized at one location
  - Chosen data structure is built for quick access and consistent performance

WHAT DATA STRUCTURE ARE WE USING?

- **Requirements**:
  - Direct access of a tenant record
  - Capable of storing large amounts of data
  - Easy to maintain
- **Alternatives**: array, linked list, binary search tree, hash table

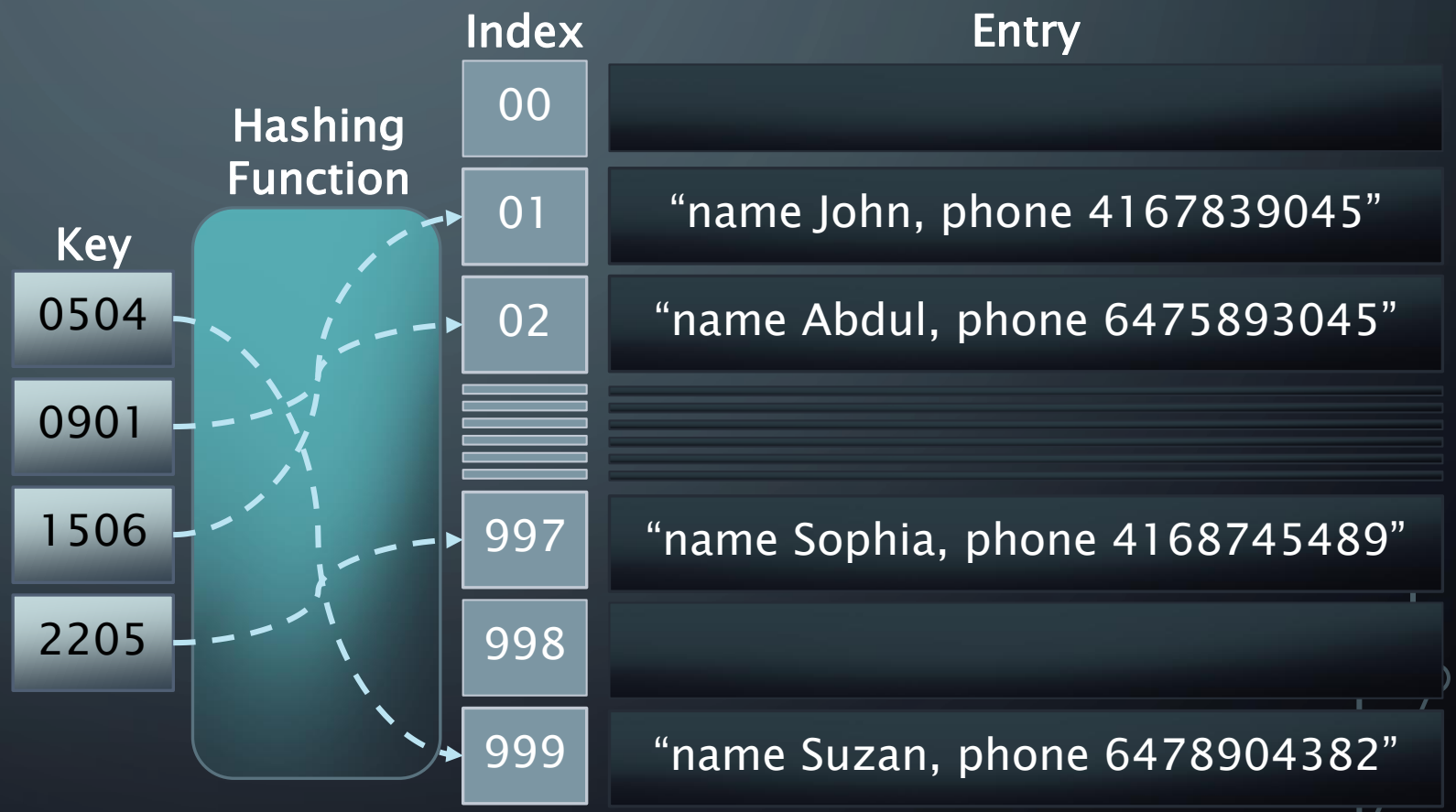
Our pick: Hash Table

Why?



THE IMPLEMENTATION OF OUR STRUCTURE

- **Key**: Apartment number
- **Hashing function**: Function to convert keys to addressable indices in array
- **Index**: Position of data in array
- **Entry**: Data to be recorded

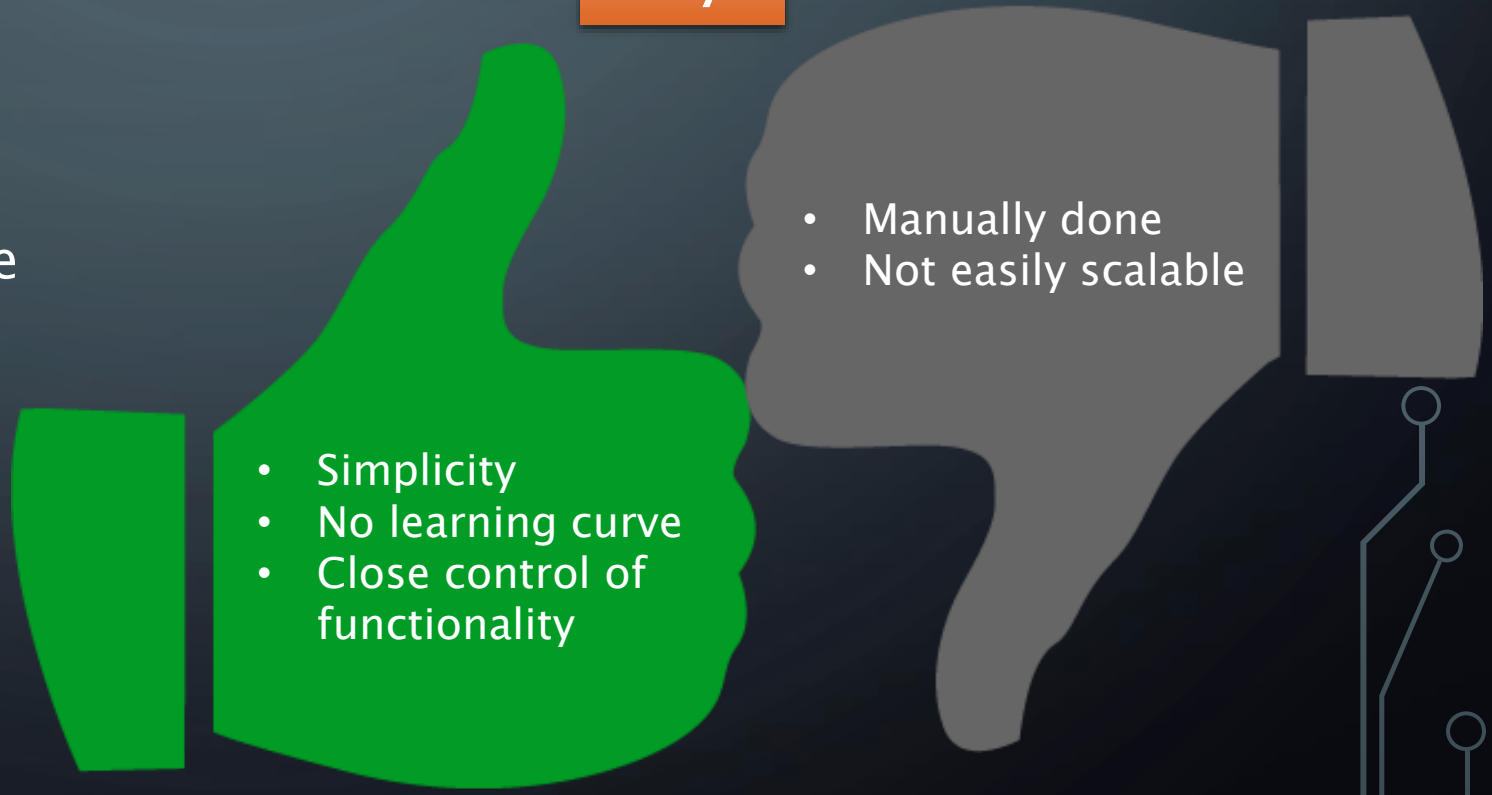


HOW ARE WE READING DATA?

- **Requirements**:
  - Robustness
  - Handling different characters
  - Identifying errors
- **Types**: User commands, storage data, configuration
- **Alternatives**: string manipulation, Lex/Yacc (or similar tools)

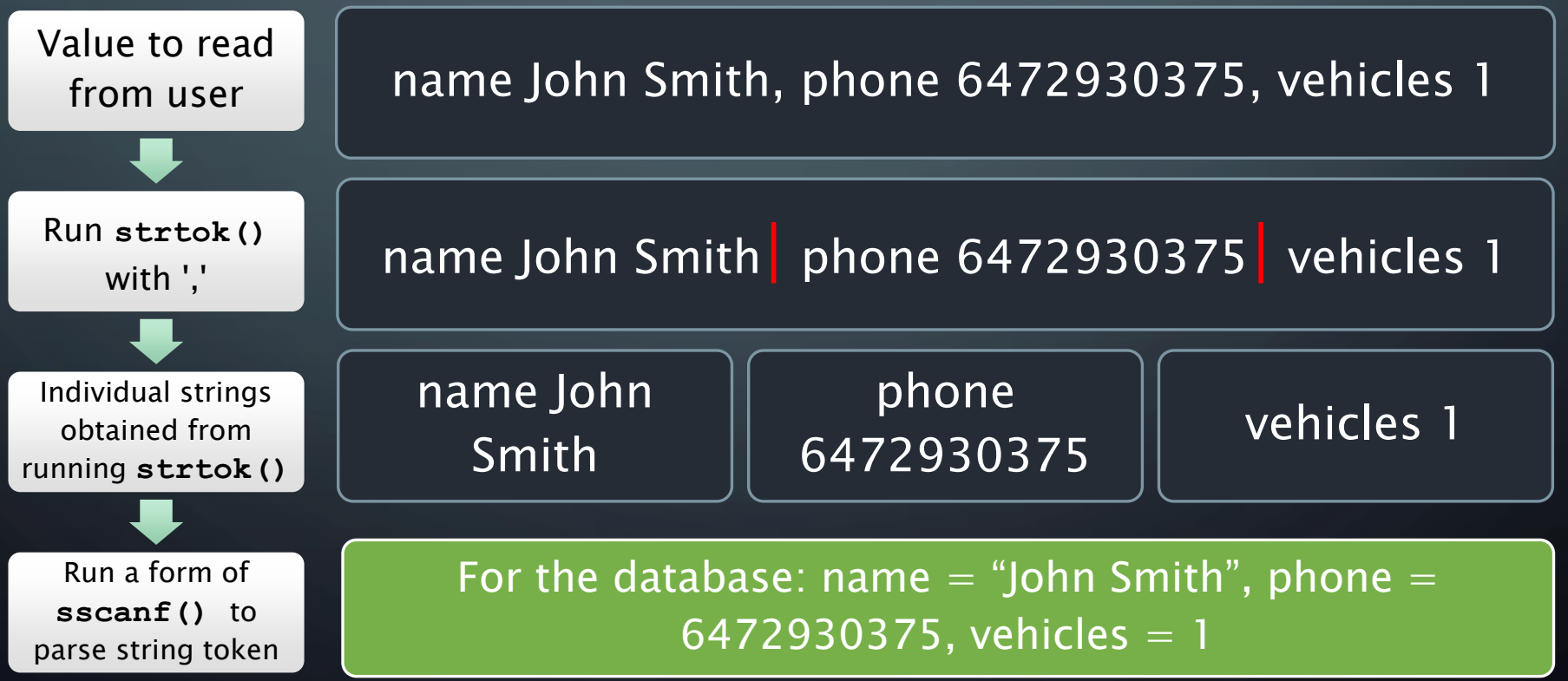
Our pick: String Manipulation

Why?

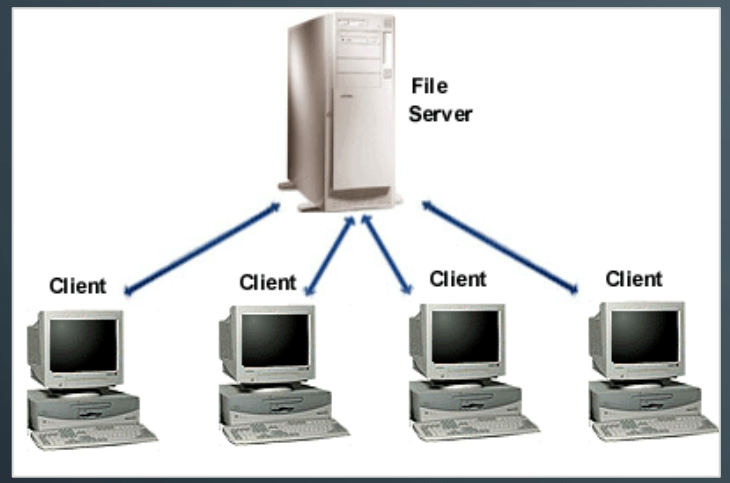


THE IMPLEMENTATION OF PARSING

- **`strtok()`** and **`sscanf()`** are C string library functions
- Each string token is parsed using variations of **`sscanf()`**



ADDITIONAL SERVER FEATURES

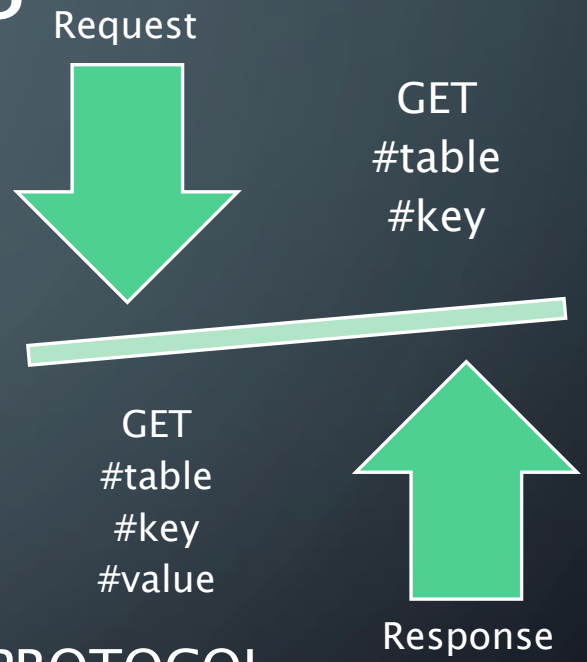


CONCURRENCY

Server capable of handling up to 10 clients simultaneously

LOGGING

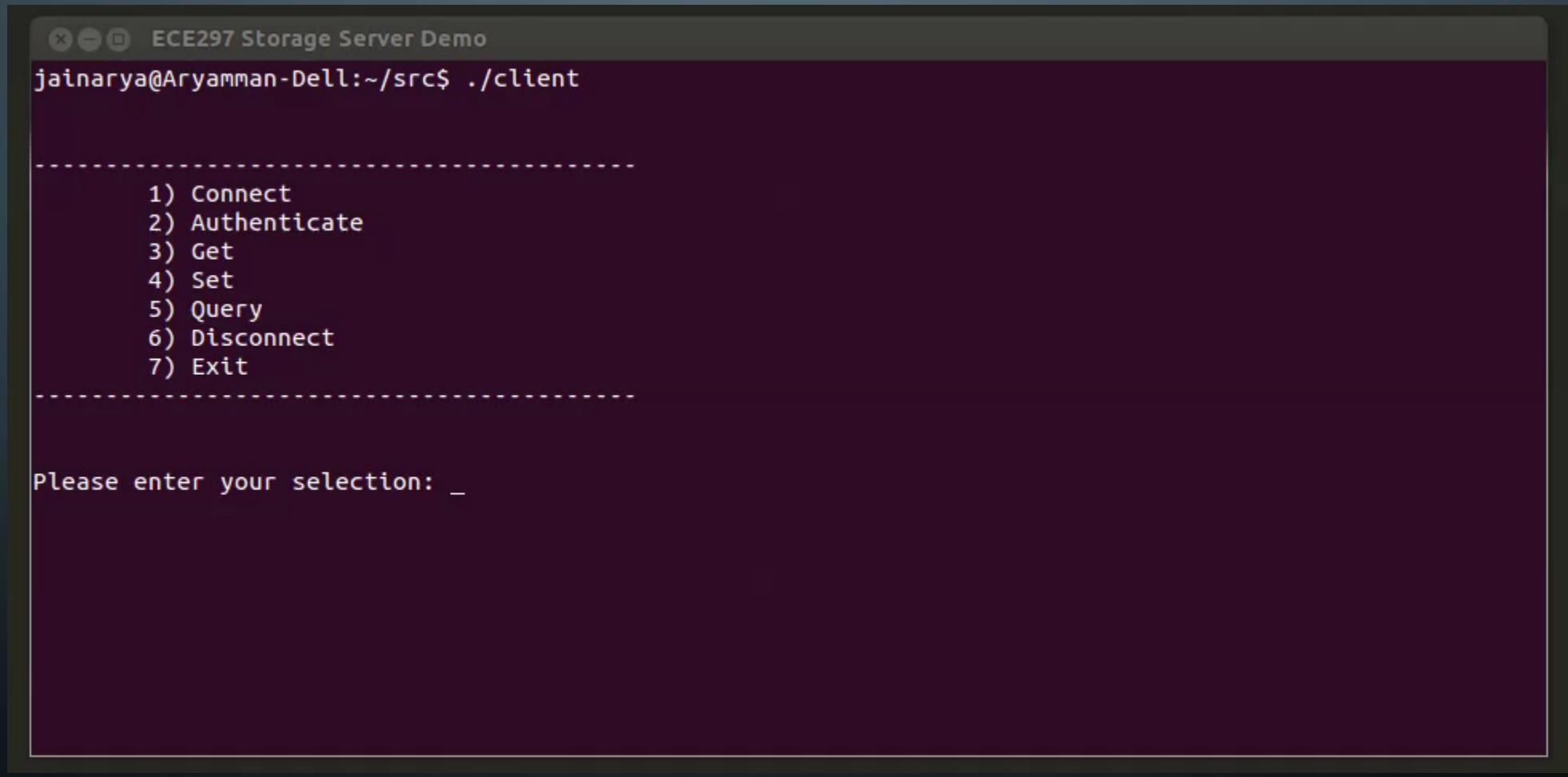
Thread-safe log files created on user's computer



PROTOCOL

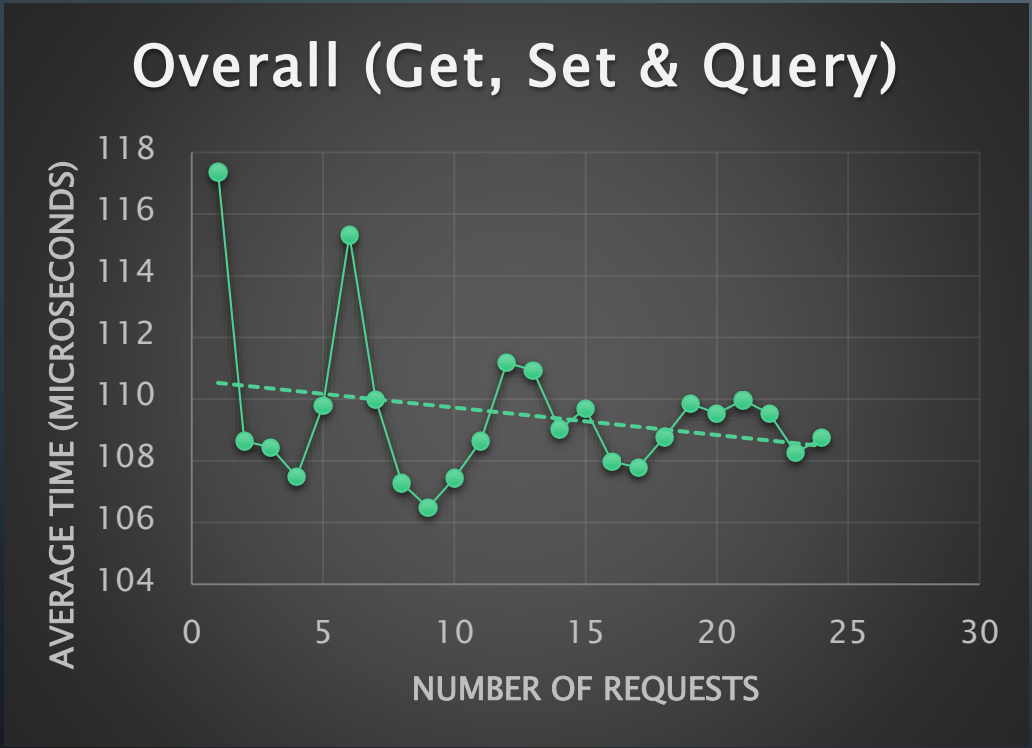
Minimize data needed to be transmitted between client library and server

USE CASE SCENARIO: MANAGEMENT OFFICE UPDATING A TENANT RECORD

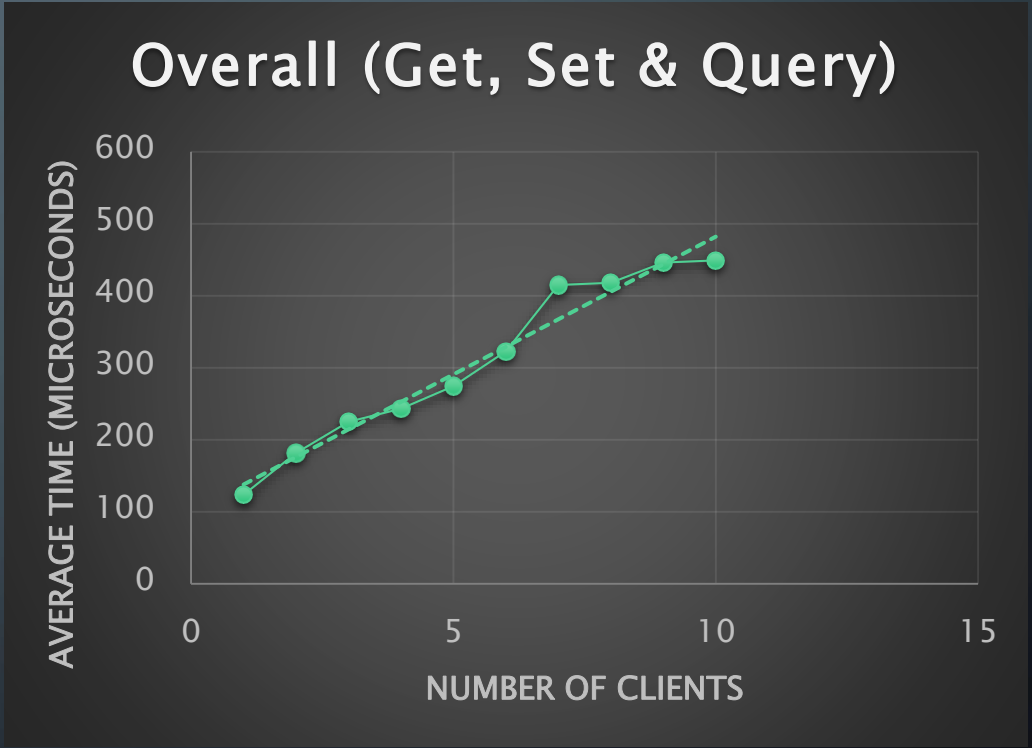


END-TO-END EVALUATION RESULTS

Single Client



Multiple Clients



“CHAOS WAS THE LAW OF NATURE; ORDER WAS THE DREAM OF MAN”

Henry Adams

OTHER PERFORMANCE RESULTS

Transaction: A pair of Get and Set requests to update a record

Test Cases

- Constructed using check framework
- Tested Get, Set and Query individually