CMP636 Distributed Systems Key/Value Server Lab

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Requirement

Implement a key/value server using Python

1. Server maintains an in-memory map of key/value pairs
2. Clients sends read/write/append to the server
3. Client communicate with server through gRPC

Python Implementation

Server

1. Initialize empty K/V map
2. Create 1 RPC server stub
3. Wait for client requests
4. Perform client's request and print the operation input/result

Client

1. Create 5 client threads
2. Each thread
   1. Select a random request out of:
      - **Get** value of K1
      - **Put** value ClientNum in K1
      - **Append** value ClientNum to K1
   2. Send a request to Server
   3. Wait for response

Python Implementation

gRPC proto

- Service1: **Get**
- Message: **key**
- Behavior:
  return map[key]
- Response: **value**

- Service2: **Put**
- Message: **key, value**
- Behavior:
  map[key] = value
- Response: **success**

- Service3: **Append**
- Message: **key, args**
- Behavior:
  old_value = map[key]
  map[key] += args
- Response: **old_value**

Python Implementation

What happens when we increase the number of server threads?

Thank you