



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

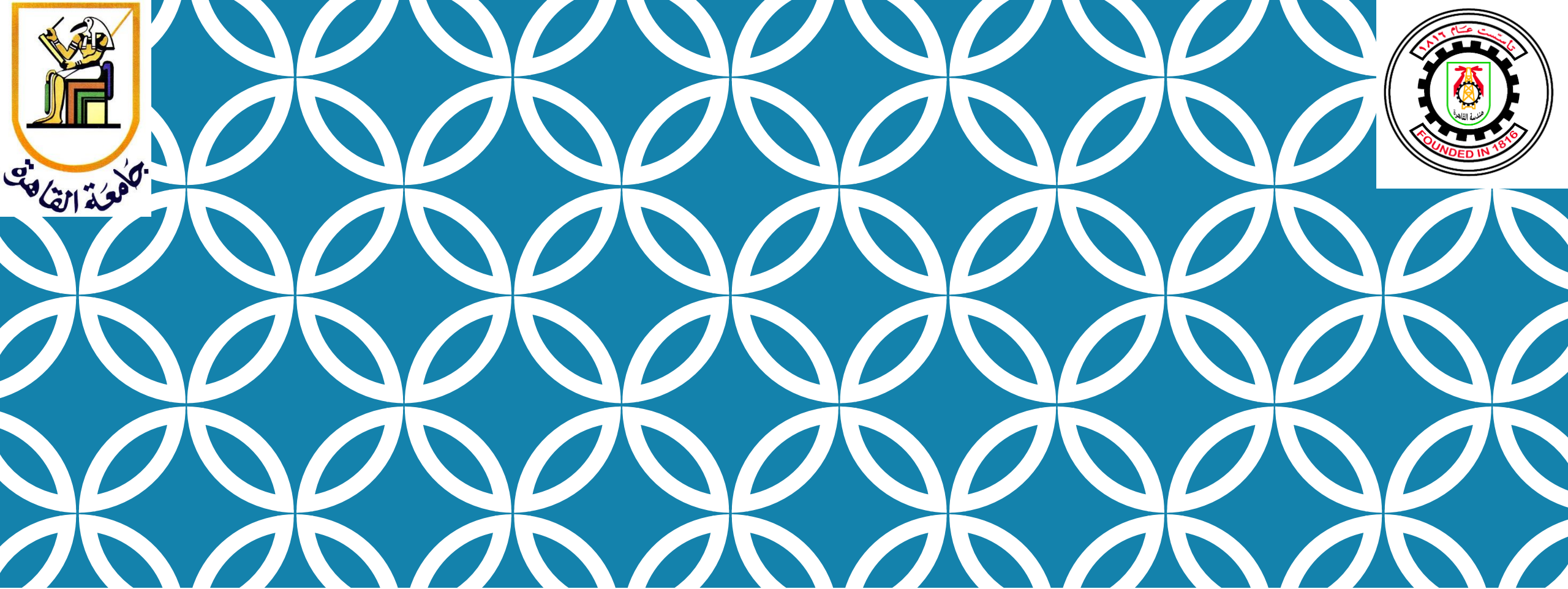
gRPC proto

- 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