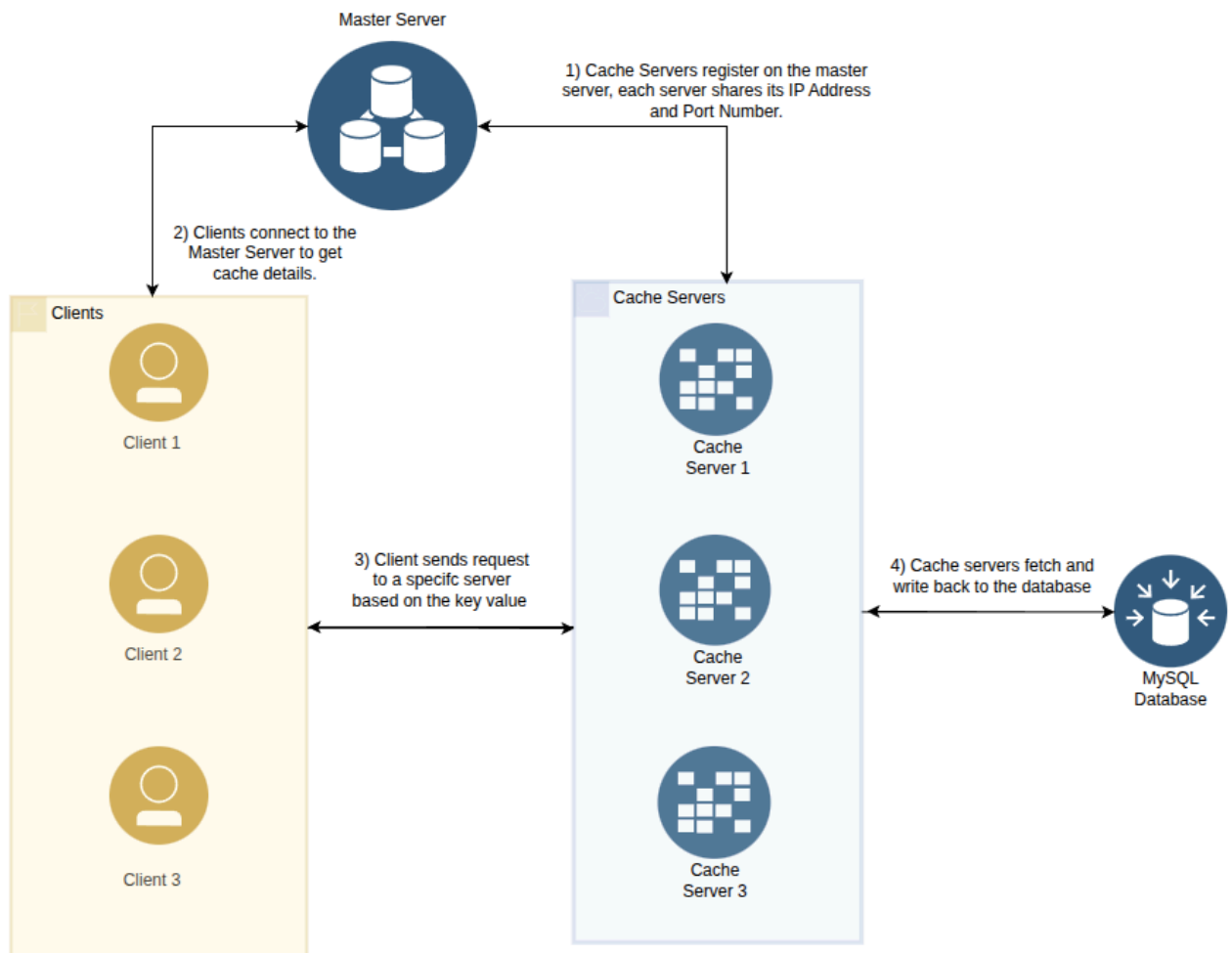


SigmaCache - Report

Bharat Chandra Mukkavalli - 25M0829

Below is the network architecture of the SigmaCache system:



There are three tiers to the system: Master Server, Cache Servers and the Database. The servers are HTTP servers and communicate via the REST API.

The system flow is as follows:

- The master server boots up first, followed by the cache servers. Each server registers itself to the master server by sending its IP address and the port number. The master server assigns key ranges to each cache server.
- When a client joins the network, the client first initiates its connection with the master server. The master server sends the details of all cache servers to the client.
- When the client sends a new request, it first establishes a new connection with the cache server corresponding to the key value. The cache servers are sharded based on the key ranges, this is done at the master server. The cache servers do not know which ranges they belong to.
- Each cache server is again internally sharded based on the number of partitions. The number of partitions are fixed ahead. The synchronization in the cache server is at the granularity of shards. Each shard again acts as a cache.
- LRU Replacement policy has been implemented along with the write-back policy, for each shard.

The code can be found here: [SigmaCache](#)