URL Shortner

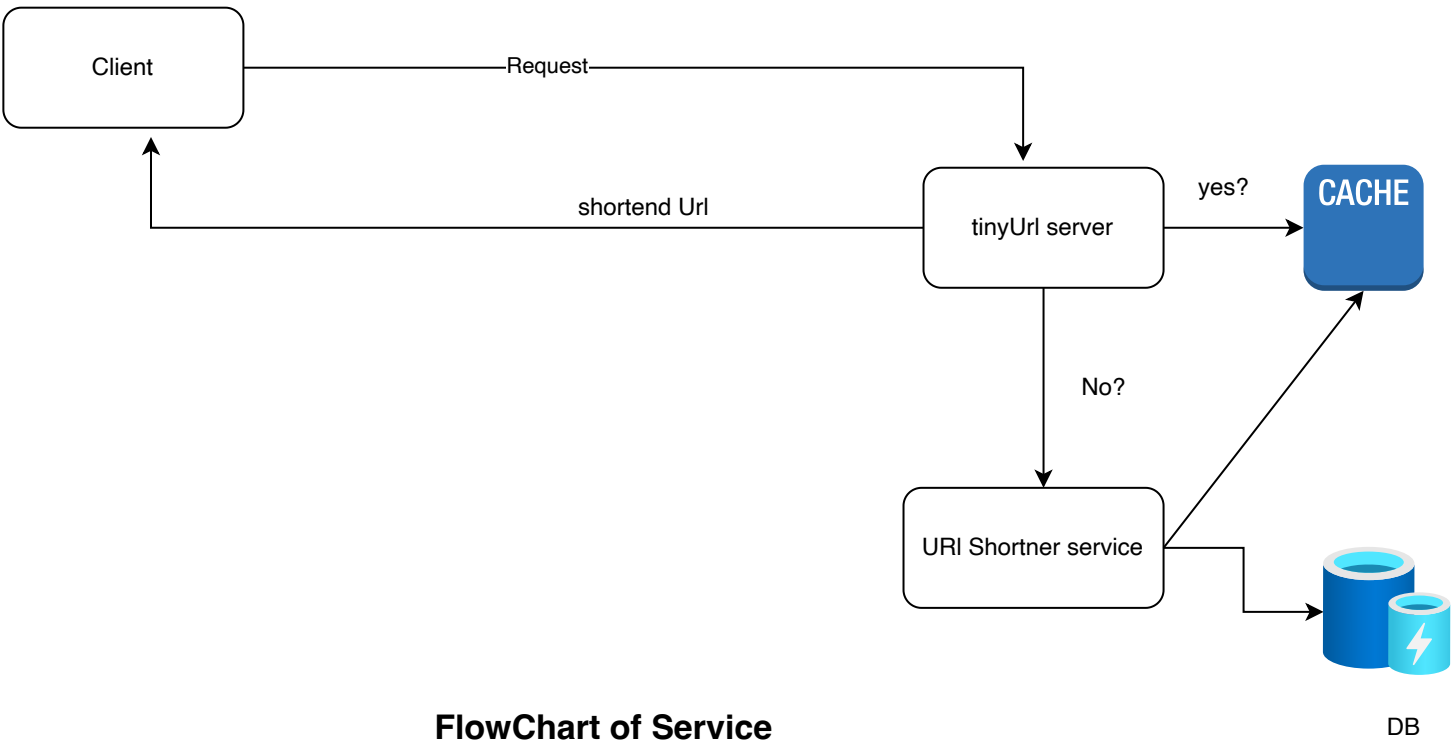## Requirement

-Size of shortend URL-as short as possible.

-chars in shortend url-0-9, a-z, A-Z

-Same short url for same long URL

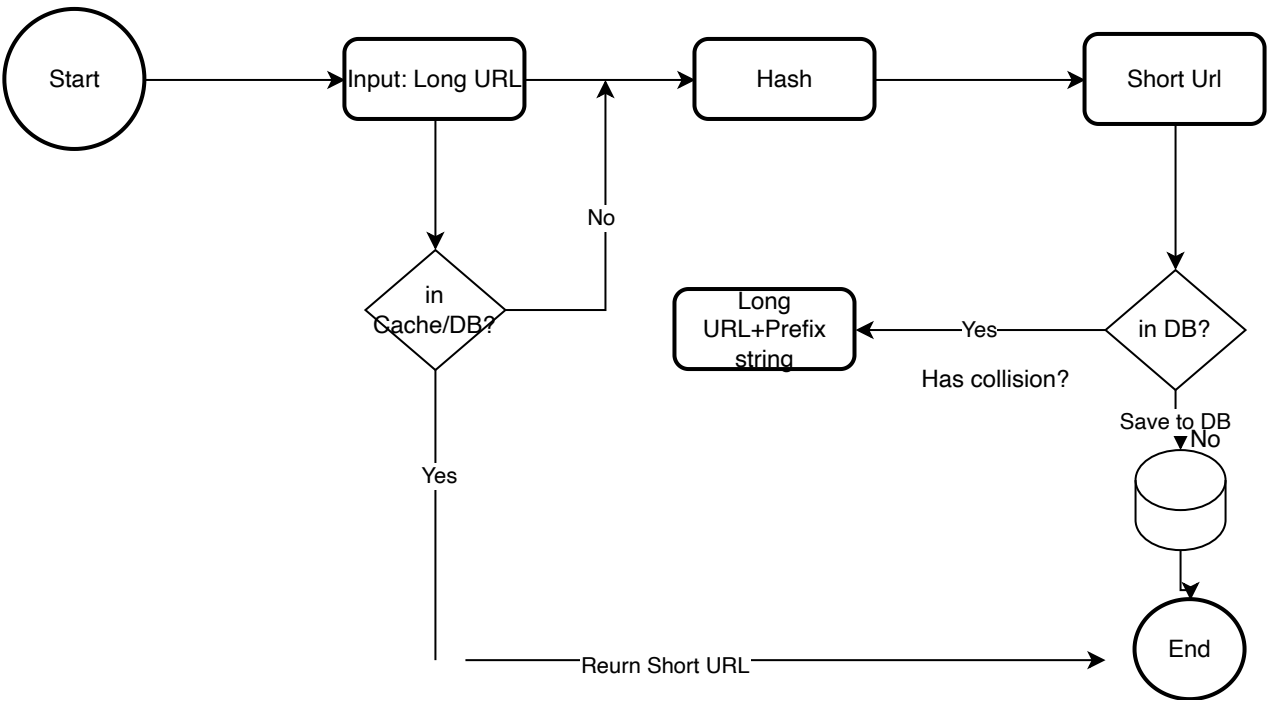-DAU- 100M urls/day

-Can't be deleted/updated.

Back of envelope estimation(BEE)

-**Write op**: 10^8 URL/ day = 1160/sec(QPS)

-**Read op:** 10:1 (R : W)- 11600 QPS.

-Assume service works for 10 years-
10^8*365*10 = 365 billion record save.

-Avg url size= 100 bytes

-Total DB Storage needed:
100*365billion=365TB of memory storage.

HLD-1

Client —Request—

shortend Url

tinyUrl server

yes?

CACHE

No?

URI Shortner service

DB

FlowChart of Service

Start → Input: Long URL → Hash → Short Url

in Cache/DB?

No

Yes

Long URL+Prefix string

Yes

in DB?

Has collision?

Save to DB

No

Reurn Short URL

End

```
┌─────────────┐        ╱╲                              ┌─────────────┐
│             │       ╱  ╲        Yes, return          │             │
│  Long URL   │──────▶│ In DB? │───────────────────────▶│  Short url  │
│             │       ╲  ╱                              │             │
└─────────────┘        ╲╱                              └─────────────┘
                        │                                      ▲
                        │                                      │
                        ▼                                      │
               ┌─────────────────┐                            │
               │                 │                            │
               │ Generate UniqueID│                           │
               │                 │                            │
               └─────────────────┘                            │
                        │                                      │
                        ▼                                      │
               ┌─────────────────┐                            │
               │                 │────────────────────────────┘
               │ Convert to base 62│
               │                 │
               └─────────────────┘
                        │
                        ▼
                    ┌───────┐
                    │ Save to│
                    │  DB    │
                    └───────┘
```
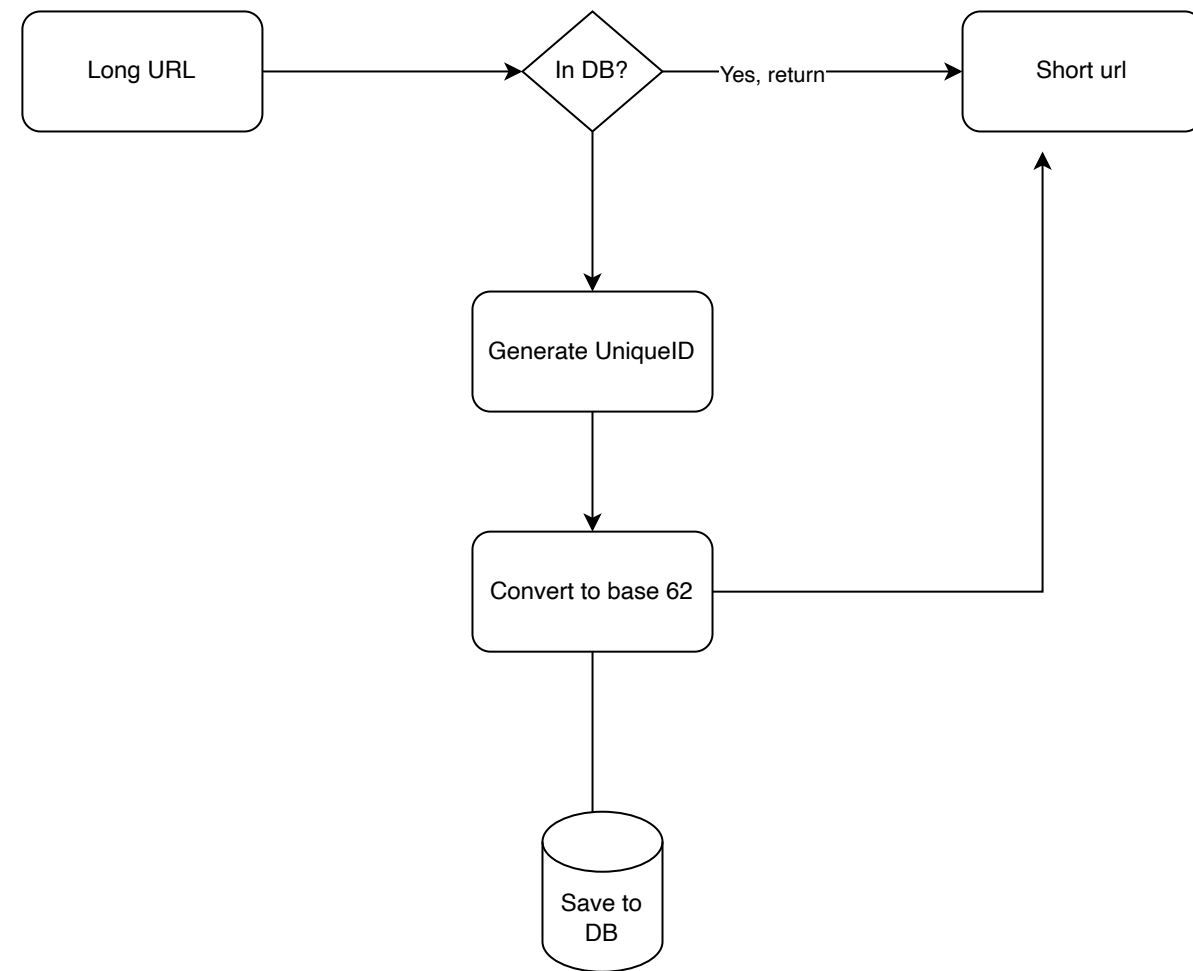
Data Model

Table
PK(Auto increment)
Long_url
Short_url