Design a service like TinyUrl

1. Functional requirements:
1) Get Short URL
2) Redirect to long URL

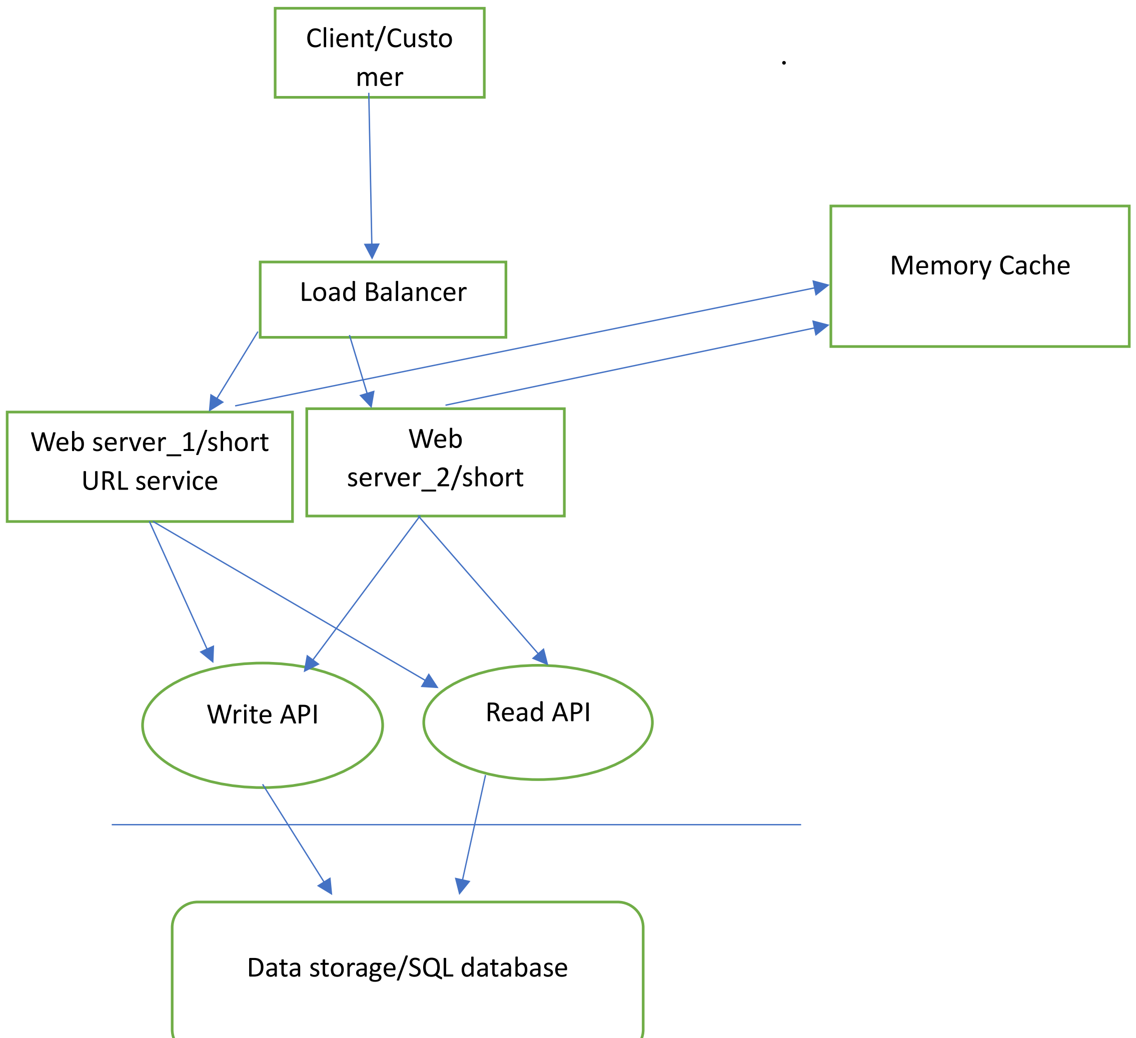
2. Non-Functional requirements:
1) Very low latency
2) Very high availability

3. What should be length of short URL:
Traffic: Number of requests:
Ex: For example there would x requests/sec
X*60*60*24*365*10 (No. of request in 10 years)

What are chars to be included in URL:
Ex: A-Z(26) + a-z(26) + 0-9(10) = 62 characters

If url length is = 7 then total url: 62^7 (2.5 trillion)

There are three layers: API, API layer, Persistence layer



APIs required:

1) createTinyURL(long url)-> returns tiny url
2) getLongURL(tiny url) -> returns long url

Basically client is communicating to server/service using REST API or other methods, which will be received by load balancer. Load balancer is the front end for server/service and load balancer will redirect the request to web servers. Web servers will call write/read API to communicate with Data storage at persistence layer.

How to generate tiny URL:

1) Total possible characters: A-Z(26) + a-z(26) + 0-9(10) = total 62
2) If we have to use only 7 characters then it will 62^7 characters in tiny url
3) How many requests will be sent per second?? For ex: 1000 requests/sec

Load Balancer:

1) Load balancers improve application performance by increasing response time
2) Reducing network latency.
   They perform several critical tasks such as the following: Distribute the load evenly between servers to improve application performance. Redirect client requests to a geographically closer server to reduce latency.