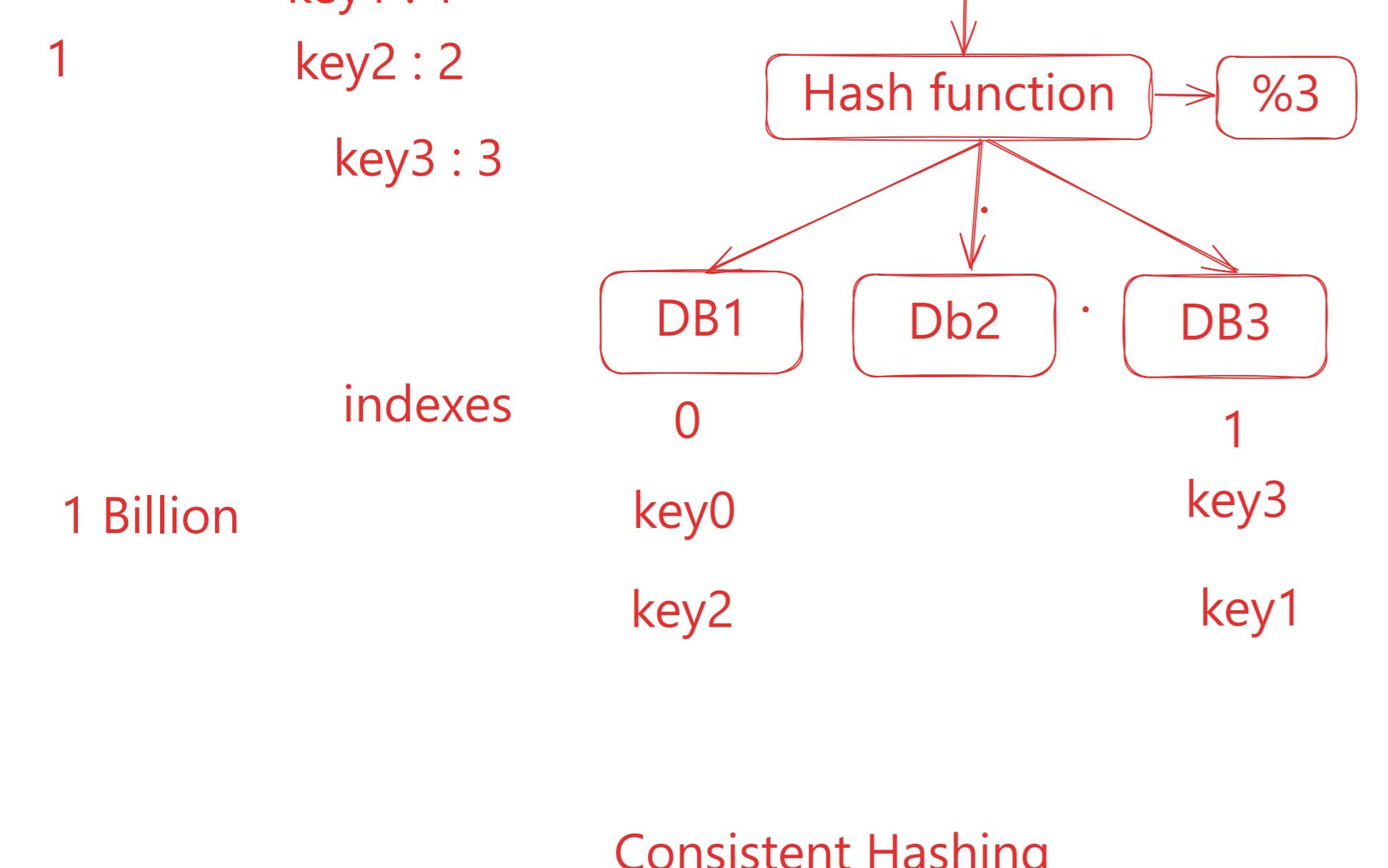
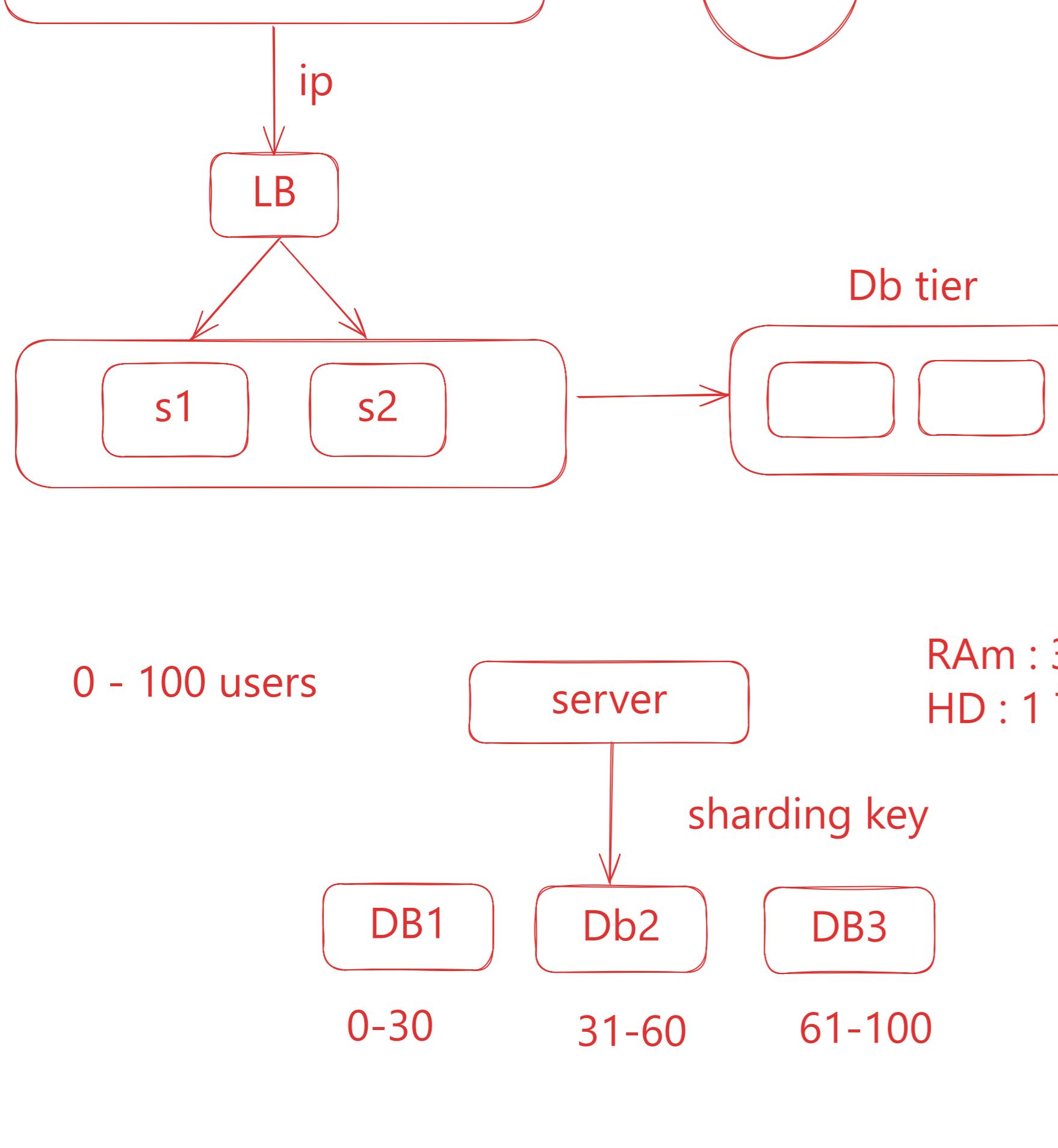
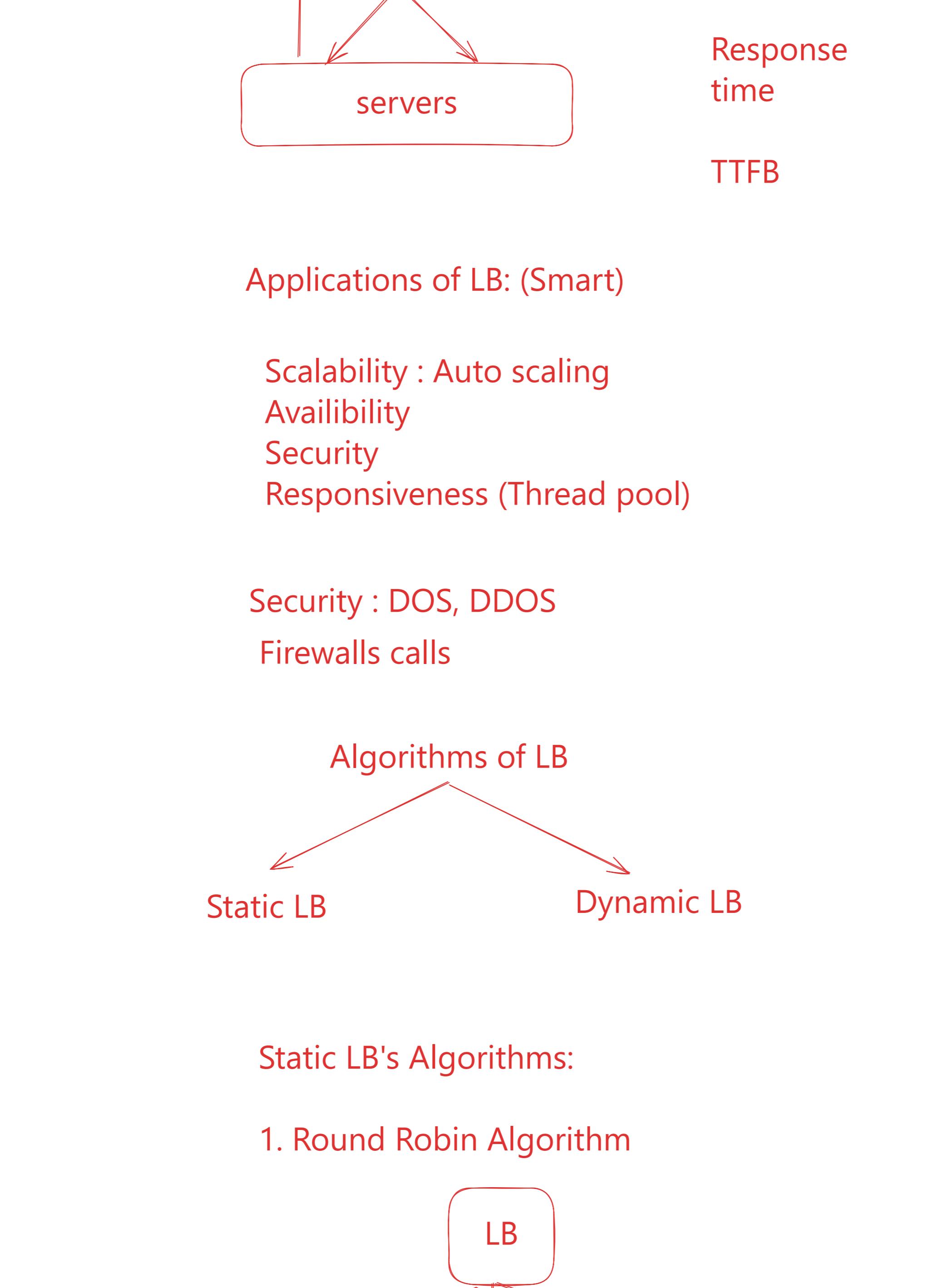
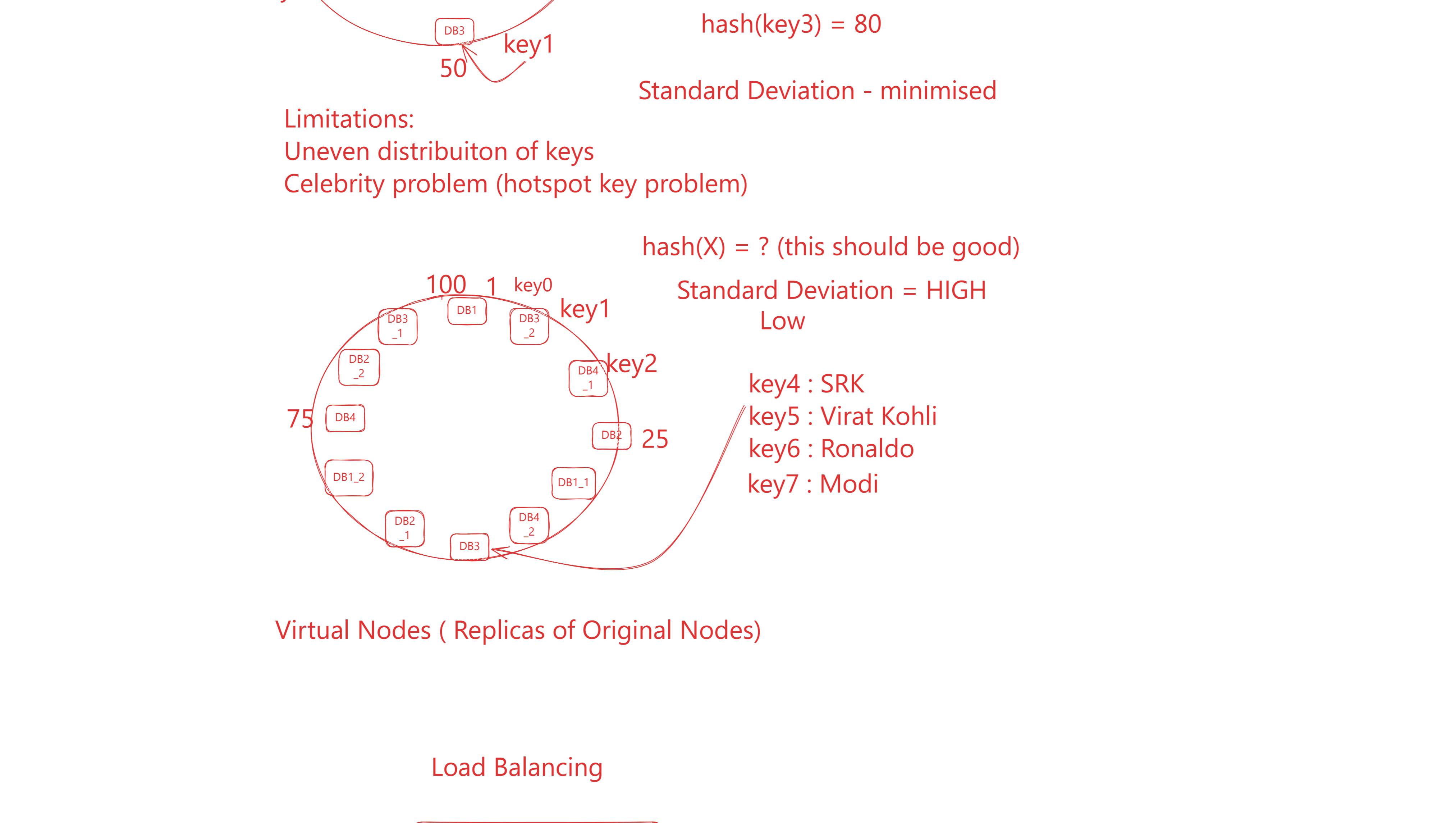


DB Sharding -- Consistent Hashing

Load balancers

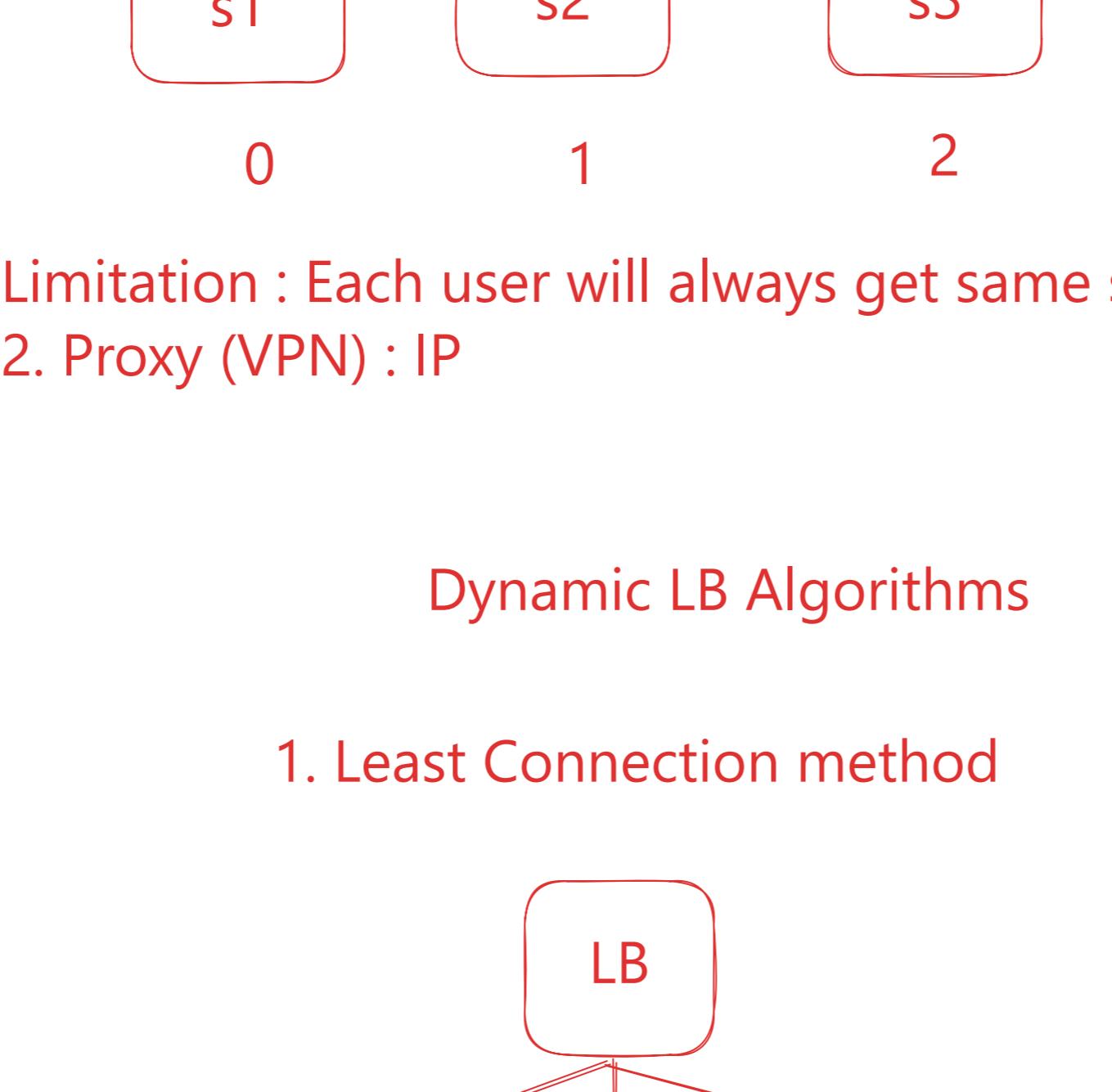


Hash methods. --> Modulo Operator



Virtual Nodes (Replicas of Original Nodes)

Load Balancing



Applications of LB: (Smart)

Scalability : Auto scaling
Availability
Security
Responsiveness (Thread pool)

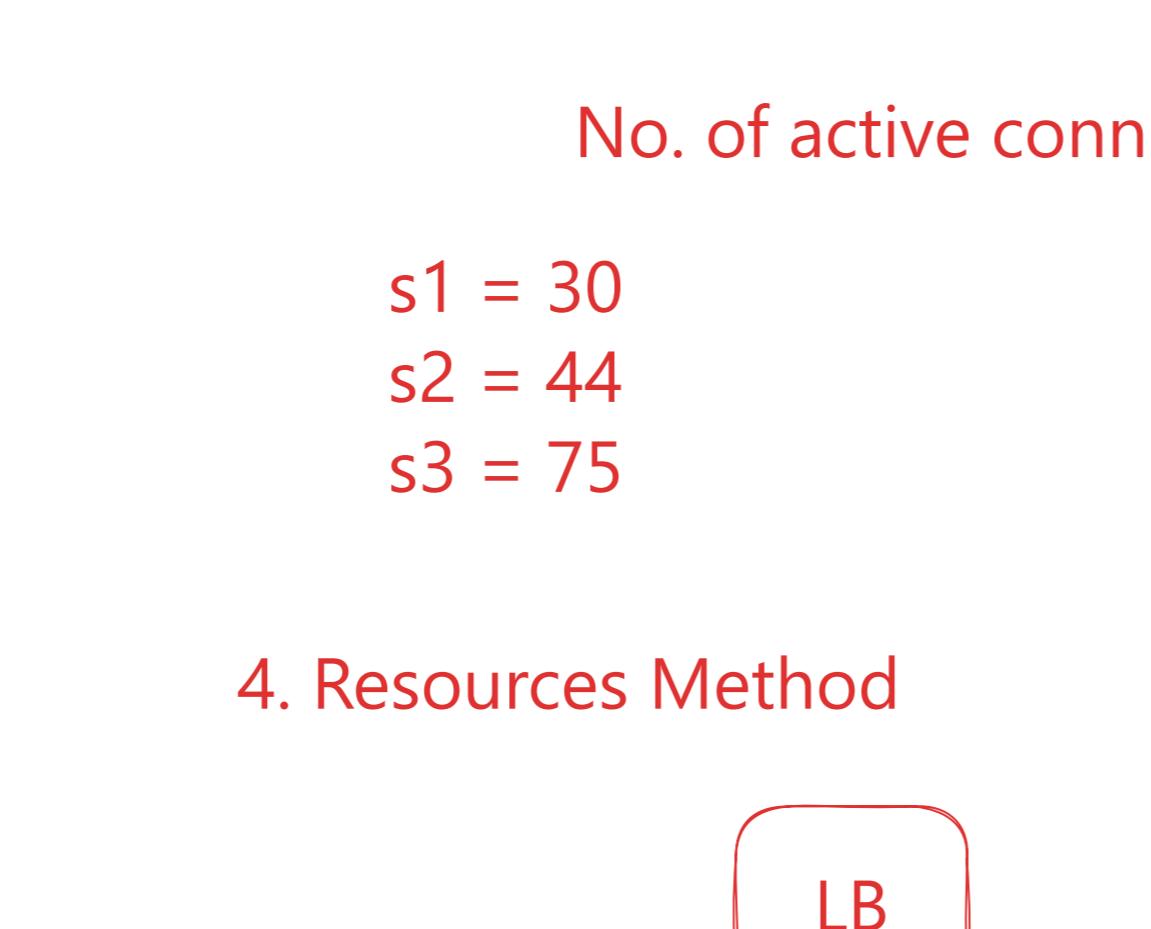
Security : DOS, DDOS
Firewalls calls

Algorithms of LB

Static LB Dynamic LB

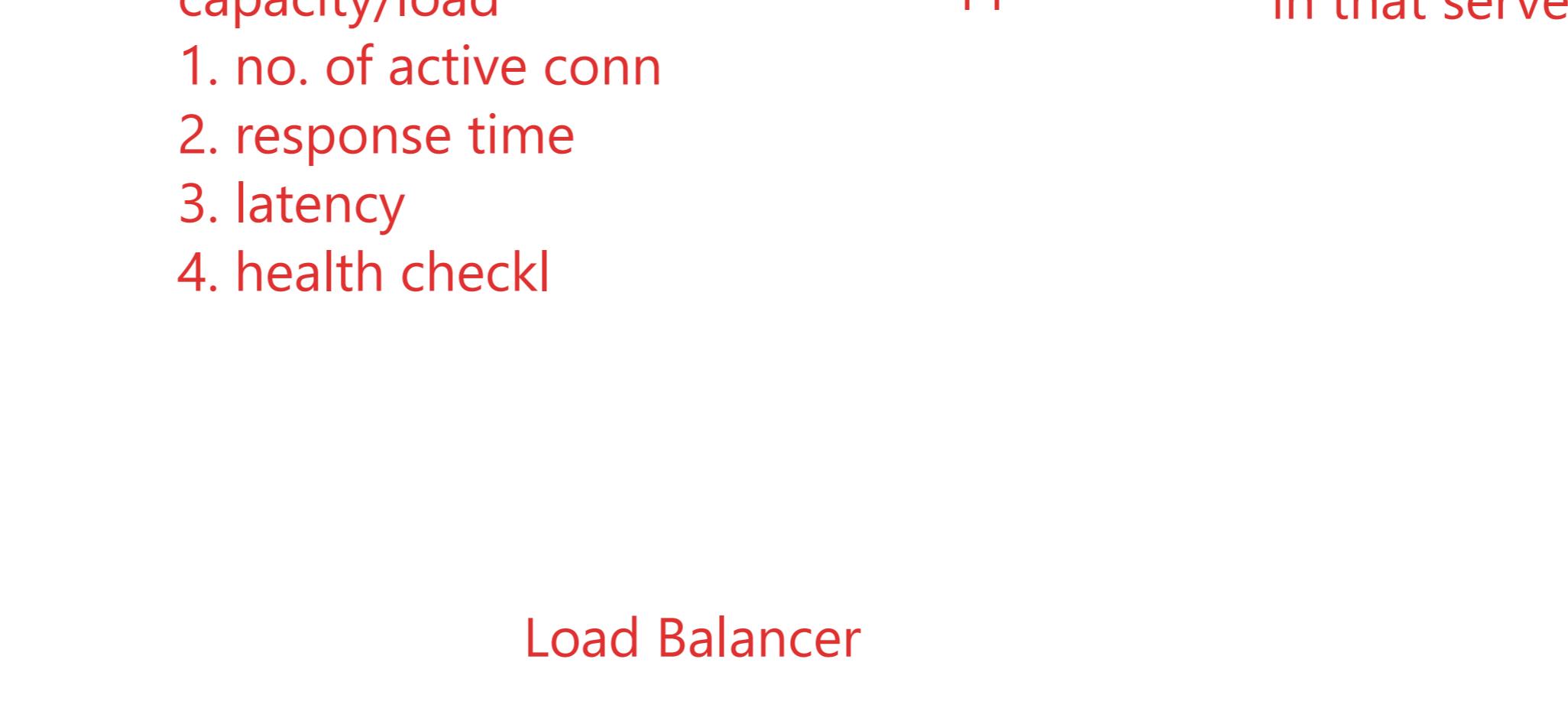
Static LB's Algorithms:

1. Round Robin Algorithm



Limitations:
Do not consider load on any server

2. Weighted Round Robin Algorithm



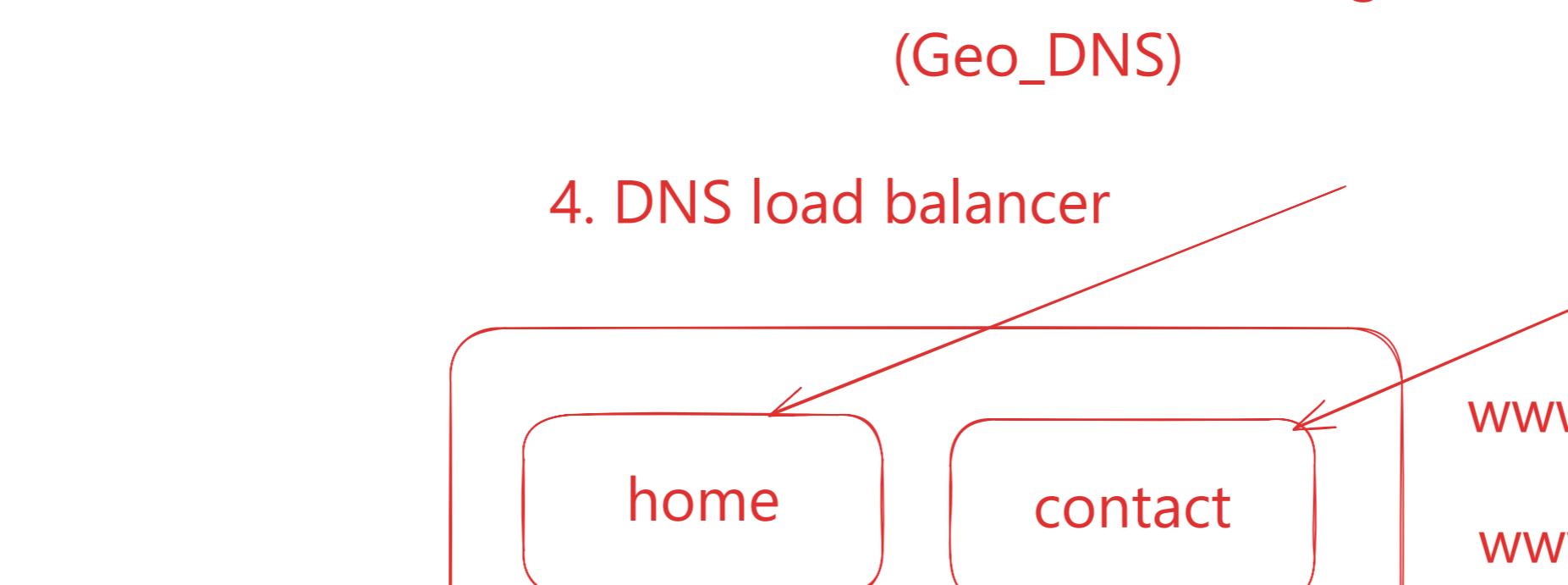
wt : RAM, CPU

wt : 32 GB

Limitation

Does not manage load on server

3. IP Hashing



r1 : IP : hash(X) = ? (MOD)

r2 L IP : hash(X) = ?

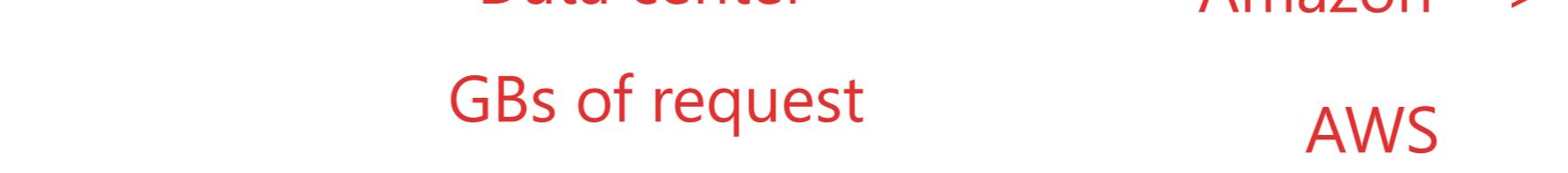
Tightly coupled (stateful Architecture)

Limitation : Each user will always get same server

2. Proxy (VPN) : IP

Dynamic LB Algorithms

1. Least Connection method



connection

HTTP : Stateless

u1 --> s1

r1

r2

r3

2. Weighted Least connection method

server:

No. of connections weight

no. of conn / weight

3. Least Response time method

Response Time

s1 = 30
s2 = 44
s3 = 75

4. Resources Method

HTTP (empty)

/health/check

Health Check

200 (ok)

agents:

1. To check if server is up

2. At a particular moment what is the capacity or load in that server

Types of LB

Load Balancer

1. Application level LB (HTTP/HTTPS)

2. Network layer LB (Ip addresses)

3. Global server Load balancing (data centers) (Geo_DNS)

4. DNS load balancer

www.example.com/contact --> 123.23.23.35

www.example.com/email --> 123.23.23.36

AWS

serverless Arch

Data center

GBs of request

Amazon --> Elastic LB

AWS

IP

Port

Protocol

SSL/TLS

HTTP/2

HTTP/3

HTTP/1.1

HTTP/1.0

HTTP/0.9

HTTP/0.8

HTTP/0.7

HTTP/0.6

HTTP/0.5

HTTP/0.4

HTTP/0.3

HTTP/0.2

HTTP/0.1

HTTP/0.0

HTTP/-1

HTTP/-2

HTTP/-3

HTTP/-4

HTTP/-5

HTTP/-6

HTTP/-7

HTTP/-8

HTTP/-9

HTTP/-10

HTTP/-11

HTTP/-12

HTTP/-13

HTTP/-14

HTTP/-15

HTTP/-16

HTTP/-17

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