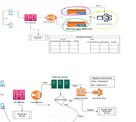
Start at 11:14

## # Step 1 :- Clarify

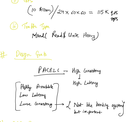
- Make Faster Application
- Allow (Read + write)
- Show Files

## # Step 2 :- Design of A Message



## # Step 3 :- Protocol & API

1) HTTP (Pull)
2) Socket Connection ( Strong, Not, Real time web)
3) Server Push (Comet)
4) HTTP Stream
5) Long



## # Step 4 :- Storage

## # Step 5 :- Scale Calculation

### # Step 1 :- Calculation

1) 1 Billion msg /day.
2) 250 Bytes / msg
3) Text Message
4) Ability Index ( Typing)

Hourly
Daily
Monthly

### # Step 2 :- Requirements

1) Low Latency
2) Low Bandwidth consumption
3) Chat History (Recent)
4) Group chat
5) Ability Index ( Typing)

Hourly
Daily
Monthly

### # Step 3 :- Scale Calculation

1) Storage

1 Billion msg /day

$\Rightarrow$ 250 Bytes / msg

$\Rightarrow$ 250 * 1 Billion
$\Rightarrow$ 250 GB

$\Rightarrow$ 250 GB * 365 days
$\Rightarrow$ 90 TB

Chat History
Group Chat
Messages

1 Year
10 Years

2) BW

(1 Billion) / 24 * 3600 = 11.574 K/s

$\Rightarrow$ 250 * 11.574 K/s
$\Rightarrow$ 2.89 MB/s

3) Traffic Spike

Model Peak Traffic Hourly

### # Step 4 :- Design Goals

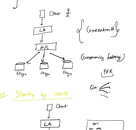
PACELC :- $\Rightarrow$ High Availability
$\Rightarrow$ High Latency

Availability Consistency
Latency Consistency

$\Rightarrow$ Not the Banking system
$\Rightarrow$ Low Latency

### # Step 5 :- Design

1) Send message (message, text, Image, emojis)



Send Message

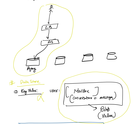
2) get messages (user id, conversation id, limit, offset)

limit = new 5 msg
offset = start

3) get conversation (user id, limit, offset)

### # Step 6 :- Implementation

Client Side Caching



### # Step 7 :- Scaling by users

### # Step 8 :- Scaling

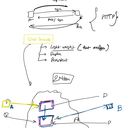
### # Step 9 :- Scaling

### # Step 10 :- Scaling

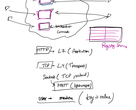
### # Step 11 :- Scaling

### # Step 12 :- Scaling

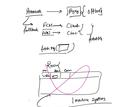
### # Step 13 :- Scaling



### # Step 14 :- Scaling

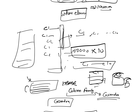


### # Step 15 :- Scaling

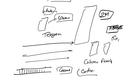


### # Step 16 :- Scaling

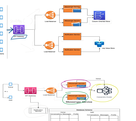
### # Step 17 :- Scaling



### # Step 18 :- Scaling



### # Step 19 :- Scaling



### # Step 20 :- Scaling

### # Step 21 :- Scaling



### # Step 22 :- Scaling



### # Step 23 :- Scaling

### # Step 24 :- Scaling



### # Step 25 :- Scaling



### # Step 26 :- Scaling

### # Step 27 :- Scaling



### # Step 28 :- Scaling

### # Step 29 :- Scaling



### # Step 30 :- Scaling



### # Step 31 :- Scaling



### # Step 32 :- Scaling



### # Step 33 :- Scaling



### # Step 34 :- Scaling



### # Step 35 :- Scaling



### # Step 36 :- Scaling



### # Step 37 :- Scaling



### # Step 38 :- Scaling



### # Step 39 :- Scaling



### # Step 40 :- Scaling



### # Step 41 :- Scaling



### # Step 42 :- Scaling





### # Step 43 :- Scaling



### # Step 44 :- Scaling



### # Step 45 :- Scaling



### # Step 46 :- Scaling



### # Step 47 :- Scaling



### # Step 48 :- Scaling



### # Step 49 :- Scaling



### # Step 50 :- Scaling



### # Step 51 :- Scaling



### # Step 52 :- Scaling



### # Step 53 :- Scaling



### # Step 54 :- Scaling



### # Step 55 :- Scaling



### # Step 56 :- Scaling



### # Step 57 :- Scaling



### # Step 58 :- Scaling



### # Step 59 :- Scaling



### # Step 60 :- Scaling



### # Step 61 :- Scaling



### # Step 62 :- Scaling



### # Step 63 :- Scaling



### # Step 64 :- Scaling



### # Step 65 :- Scaling



### # Step 66 :- Scaling





### # Step 67 :- Scaling



### # Step 68 :- Scaling



### # Step 69 :- Scaling



### # Step 70 :- Scaling



### # Step 71 :- Scaling



### # Step 72 :- Scaling



### # Step 73 :- Scaling



### # Step 74 :- Scaling



### # Step 75 :- Scaling



### # Step 76 :- Scaling



### # Step 77 :- Scaling



### # Step 78 :- Scaling



### # Step 79 :- Scaling



### # Step 80 :- Scaling



### # Step 81 :- Scaling



### # Step 82 :- Scaling



### # Step 83 :- Scaling



### # Step 84 :- Scaling



### # Step 85 :- Scaling



### # Step 86 :- Scaling



### # Step 87 :- Scaling



### # Step 88 :- Scaling



### # Step 89 :- Scaling



### # Step 90 :- Scaling





### # Step 91 :- Scaling



### # Step 92 :- Scaling



### # Step 93 :- Scaling



### # Step 94 :- Scaling



### # Step 95 :- Scaling



### # Step 96 :- Scaling



### # Step 97 :- Scaling



### # Step 98 :- Scaling



### # Step 99 :- Scaling



### # Step 100 :- Scaling



### # Step 101 :- Scaling



### # Step 102 :- Scaling



### # Step 103 :- Scaling



### # Step 104 :- Scaling



### # Step 105 :- Scaling



### # Step 106 :- Scaling



### # Step 107 :- Scaling



### # Step 108 :- Scaling



### # Step 109 :- Scaling



### # Step 110 :- Scaling



### # Step 111 :- Scaling



### # Step 112 :- Scaling



### # Step 113 :- Scaling



### # Step 114 :- Scaling