



Big Tech Interview Bootcamp

Cheat Sheet

Performance Indicators

These are the three central figures that need to be calculated as part of the capacity estimation section in the system design interview.

Throughput

Daily active users x Number of requests / 10^5

Bandwidth

Total Request per second x Request size

Storage

Write requests per second x
Request size x
Replication factor

Shorthands

These shorthands help you to calculate the most common conversions with ease and without the risk of making small but impactful mistakes.

Next Higher Unit

$1000 \text{ kb} / 1000 = 10^{(3-3)} = 1 \text{ MB}$

Requests per Second

$100\text{k RPS} / 100\text{k sec} = 10^5 / 10^5 = 10^{(5-5)} = 1$

Second-next Higher Unit

$1000 \text{ kb} / 10000 = 10^{(3-6)} = 0,1 \text{ GB}$

Storage in 5 years

Per Second

storage per second x 24h x 3600 x 2000 =
storage per second x $\sim 2 \times 10^8$

Per Day

storage per day x 30 days x 12 month x 5 years =
storage per day x ~ 2000



Bandwidth Requirements

Bandwidth	Application
80 Kbps	VoIP calling
150 Kbps	Screen Sharing
0.5 Mbps	Live streaming Webinars
3 Mbps	720p video / zoom meetings
5 Mbps	HD 1080p video streaming (youtube/netflix)
25 Mbps	4k Ultra HD video

Datastore Latency

The latency to fetch for 1 MB of data requires the fixed cost of seeking where the data is and sequentially reading the data.

Storage	Latency
Disk	3ms
SSD	0.2ms (15x faster)
Memory	0.01ms (300x faster)



File Sizes for Estimations

Use these numbers on file sizes for capacity estimation.

Images

Quality	Size	Example
Low	10 KB	Thumbnail, small website images
Medium	100 KB	Website photos
High	2 MB	Phone camera photo
Very High	20 MB	RAW photographer image

Video

Quality	Size	Example
Low	2 MB/min	480p video
Medium	20 MB/min	1080p video
High	80 MB/min	4k video

Audio

Quality	Size	Example
Low	700 KB	Low quality Mp3
High	3 MB	High quality Mp3