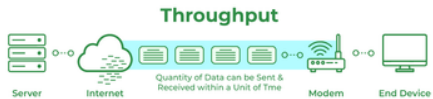
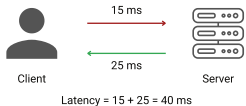
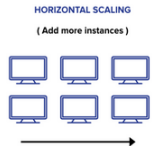
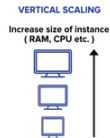


$$\text{Availability} = \frac{\text{Uptime}}{(\text{Uptime} + \text{downtime})}$$

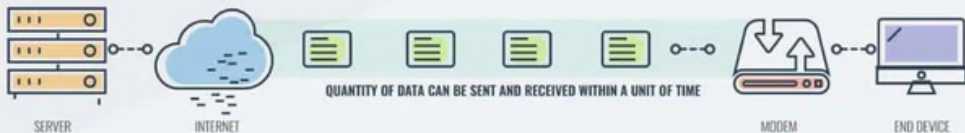


Latency, Throughput, Bandwidth, Availability, Scalability
Database Sharding, Reliability, Redundancy and Capacity Estimation

LATENCY



THROUGHPUT



Bandwidth vs. throughput

Bandwidth



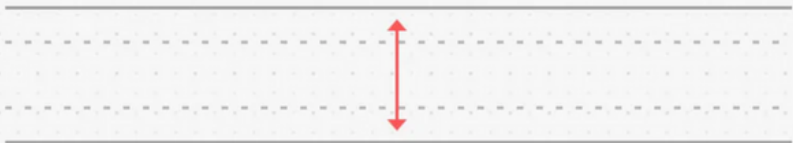
Throughput



Latency



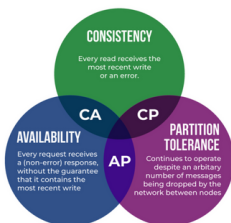
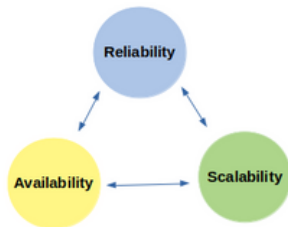
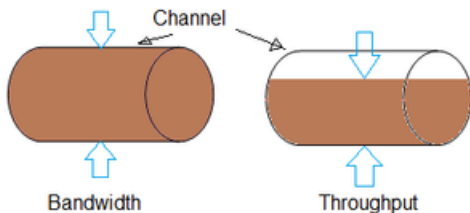
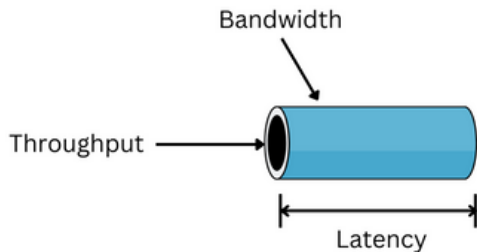
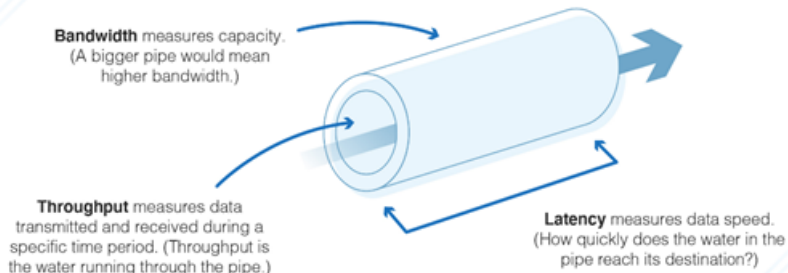
Bandwidth



Throughput



Network Latency vs. Throughput vs. Bandwidth



CAPACITY ESTIMATION



YouTube Bandwidth

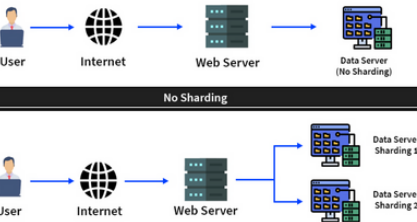
Metric **A**ssumptions **C**alculation

↳ Data transferred/second - viewing videos

- 4200 req/sec
- 10 second
- 1 MB

4200 MB/sec

→ Assumptions



Causes of Network Latency

