



Redis , CDN

Redis কী?

 **Redis (Remote Dictionary Server) হলো in-memory, key-value data store**
→ Ultra-low latency (\approx microseconds)

Redis সাধারণত হয়:

- Cache
- Session store
- Real-time data engine

 DB না — Database-এর সামনে বসে speed বাড়ায়

Redis Architecture (simple)

App Server

↓

Redis (RAM)

↓ (only if miss)

Database (Disk))

◆ Why RAM?

- RAM \approx 100x faster than disk
- Network + memory access = super fast

✖ Redis কী কী store করতে পারে?

- String
- Hash
- List
- Set
- Sorted Set

✖ Redis Data Structures

◆ String

user:123:name → "Arman"

Use: counters, tokens

◆ Hash

user:123 → { name: "Arman", age: 25 }

Use: user profile

◆ List

notifications → [n1, n2, n3]

Use: queue, chat

◆ Set

online_users → {u1, u2, u3}

Use: unique items

◆ Sorted Set (🔥 FAANG favorite)

leaderboard → (score, userId)

Use: ranking, feeds

✅ Redis Pros

- Super fast
- Rich data structures
- TTL support
- Widely used at FAANG

❌ Redis Cons

- Memory expensive
- Not primary DB
- Data loss possible (if not configured)

👉 Redis Cache Patterns

● Cache-Aside (Most Used)

Read → Check cache

Miss → DB → Store in cache

✅ Simple

❌ Stale data possible

● Write-Through

Write → Cache → DB

✓ Strong consistency

✗ Slower writes

● Write-Back

Write → Cache → DB later

✓ Fast writes

✗ Data loss risk

5 Redis TTL & Eviction

🕒 TTL (Time To Live)

SET key value EX 60

→ Auto expire after 60s

📌 FAANG line:

“Redis is used for low-latency access to frequently accessed data.”

🌐 CDN (Content Delivery Network)

👉 **CDN = geographically distributed servers**

Delivers **static content** from nearest location.

👉 **CDN = globally distributed cache servers (Edge nodes)**

→ User-এর কাছাকাছি content serve করে

What CDN serves?

- Images
- CSS / JS
- Videos
- Static HTML

CDN Flow

User

↓

Nearest Edge CDN

↓ (only on miss)

Origin Server

Why CDN?

- Lower latency
- Faster page load
- Reduce server load
- Better global availability

CDN Cache Flow

First Request (MISS)

User → CDN → Origin → CDN cache → User

Next Request (HIT)

User → CDN → User

Redis vs CDN (IMPORTANT)

Feature	Redis	CDN
Data type	Dynamic	Static
Location	Server-side	Edge (global)
Speed	Microseconds	Milliseconds
Use	App logic	Asset delivery
Example	Session	Images

 Interview line:

“Redis caches dynamic data, while CDN caches static assets globally.”

FAANG Interview Killer Lines

- “Redis is used for low-latency dynamic caching.”
- “CDN caches static assets closer to users globally.”
- “Database remains the source of truth.”



Ultimate Summary

Redis accelerates backend logic

CDN accelerates frontend delivery