

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)

4 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

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

4 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