# Caching

### 🧠 Caching কী?

👉 **Caching মানে frequently used data অস্থায়ীভাবে fast storage-এ রাখা** যাতে বারবার database-এ যেতে না হয়।

📌 Cache সাধারণত থাকে:

- Memory (Redis, Memcached)
- CDN (static content)

### ⚡ Cache কেন দরকার?

**Without Cache**

Client → Server → Database (slow)

❌ High latency
❌ DB overload

**With Cache**

Client → Server → Cache → Database (only if needed)

✅ Fast response
✅ DB load কম
✅ Scales better

### 🔁 Cache Flow (Read Example)

1. Client request
2. Server cache check করে

3. Cache hit → data return
4. Cache miss → DB → cache store → client

### ⚖️ Cache vs Database (VERY IMPORTANT)

| **Topic** | **Cache** | **Database** |
|---|---|---|
| Speed | ⚡ Very fast | 🐢 Slower |
| Storage | In-memory | Disk-based |
| Persistence | Temporary | Permanent |
| Cost | Expensive | Cheaper |
| Use case | Fast access | Source of truth |
| Data loss | Possible | No |

📌 FAANG line:

"Cache improves performance, but database remains the source of truth."

### 🎯 When to Use Cache?

✅ Read-heavy system

✅ Repeated data access

✅ Low latency critical

Examples:

- Instagram feed
- Product listing
- User profile

### ❌ Cache Problems (Trade-offs)

- Stale data
- Cache invalidation complexity
- Memory limit

📌 Famous quote:

“There are only two hard things in Computer Science: cache invalidation and naming things.”

### 🧠 Cache Strategies (High-Level)

(Detail পরে আসবে)

- Read-through
- Write-through
- Write-back
- Cache-aside (most common)

### 🏆 FAANG Interview Cheat Sentences

- “Caching reduces latency and database load.”
- “We cache read-heavy data with acceptable staleness.”
- “Database is the source of truth.”

### 🔚 One-Line Summary

**Cache = speed**
**Database = truth**