# CBT Diary: MongoDB □□ □□□□ □□ □□□

□□□: 2025□ 6□ 21□
□□□: CBT Diary □□□
□□ □□: MariaDB + MongoDB □□□□□ □□□□ □□

---

## □ □□

```
mindmap
  root((CBT Diary
MongoDB □□))
    □□ □□
      □□ □□ □□
      MongoDB □□ □□
    □□□ □□
      □□□ □□ □□
      □□ □□
      □□□ □□
    □□□□ □□
      Polyglot Persistence
      □□□ □□ □□
      API □□□□
    □□ □□
      □□□ □□□□□□□
      □□□ □□
      □□□ □□
    □□ □□
      □□ □□
      □□ □□□
      □□□ □□
```

---

## 1. □ □□ □□

□ □□□ □□ MariaDB(□□□ □□□□□□) □□□□ □□□ CBT-Diary □□□□□ **MongoDB(□□□□ □□□□□□□)**□ □□□□, □ □ □□□ □□□ □□ □□□ □□□□□□□ □□□□ **□□□□□ □□□□□□ □□□□(Polyglot Persistence)**□ □□□□ □□□ □□□□□.

### □ □□ □□□ vs □□ □□□

```
graph LR
    subgraph "□□ (MariaDB Only)"
        A[React Native] --> B[Spring Boot]
        B --> C[(MariaDB)]
        B --> D[(Redis)]
        E[Python AI] --> B
    end
```

```
    subgraph "□□ (Hybrid Architecture)"
        F[React Native] --> G[Spring Boot]
        G --> H[(MariaDB
□□□□ □□□)]
        G --> I[(MongoDB
□□□□□ □□□)]
        G --> J[(Redis
□□)]
        K[Python AI] --> G
    end

    style H fill:#e1f5fe
    style I fill:#fff3e0
    style J fill:#f3e5f5
```

□□□ □□ □□□ □□□□ □□□, □□□, □□□ □□ □□□ □□□□□ □□□□ □□□ □□□□ □ □□ □□□ □□ □□□ □□□.

---## 2. □ □ MongoDB□ □□□□ □□□?

□□ □□□□ □□□□ □□□□ □□□ □ □□□ □□ MariaDB□ □□□□ □□□□□□□. □□□ CBT-Diary □□□□ □□□ □□□ □ □□□ MongoDB□ □□ NoSQL □□□□□□□□ □ □□□ □□□ □□□□.

## □ □□□ □□ □□ □ □□

```
graph TB
    subgraph "□ MongoDB □□ □□"
        A[□ □□ □□
□□□□ + □□□]
        B[□ AI □□□□
□□□□ + □□□]
        C[□ □□ □□
□□□□ + □□□]
    end

    subgraph "⚡ MongoDB □□ □□"
        D[□ □□ □□
□□□□ + □□□]
    end

    subgraph "□ MariaDB □□ □□"
        E[□ □□□ □□
□□□ + □□□]
        F[□ □□ □□
□□□ + □□□]
    end

    A --> MongoDB[(MongoDB
Document DB)]
    B --> MongoDB
    C --> MongoDB
```

```
    D --> MongoDB

    E --> MariaDB[(MariaDB
Relational DB)]
    F --> MariaDB

    style A fill:#ff9800
    style B fill:#ff9800
    style C fill:#ff9800
    style D fill:#ffc107
    style E fill:#2196f3
    style F fill:#2196f3
    style MongoDB fill:#4caf50
    style MariaDB fill:#00bcd4
```

## □ □□ □□ □□

| □ □□□ □□ | □ □□ **(MariaDB)** | □ □□□ □ □□ | □ **MongoDB** □□ □ □□ |
|---|---|---|---|
| □ □□ □ □ **AI** □□ □□ | diary, report □□□□ □□□ □□ □□ □□ | □□□ □□□: □□ □□□ □□□ □□□□ □ □□□□ □, AI □□ □□(□□, □□□ □)□ □□□□ □□□ □ □<br>□□□ □□: AI □□ □□□□ □□ □□□ □□/□□□ □□□ report □□□□ □□□ □□(ALTER TABLE)□ □□ | □□□ □□□: JSON□ □□□ BSON □□□ □ □□□, □□ □□□ □□□ AI □□ □□□ □□ □□□ □□<br>□□: □□□ □□□□ □□□ □□□□□ □□□□ JOIN □□ □ □□ □□□ □□□ □□ |
| □ □□□ □□ □□ | (□□ □□□) | □□ □□□ □□ □, □□□ □□(Write) □□□□ □ □ □□ □□ □□□ | □□ □□ □□: □□□ □□ □□□□ □□□ □□ □□□ □□ □□: □□□ □□□ □□□□ □□□ □ □ □□ □□ |
| □ □□□ □□ □□□ | sse_emitter □□□ □ □□ □□ □□ | □□□ □□ □□ □, □□□ □□□ □□ □ □□ □□ □ □ □□□ □□□ | **Capped Collection**: □□□ □□□ □□ □□□ □□ □□ □□ □□□ □□ **Change Streams**: □□□□□□ □□ □□ □□□ □□□□ |

## □ □□ □□ □□

```
gantt
    title □□ □□ □□ □□ (□□ + AI □□ □□ □□)
    dateFormat X
    axisFormat %s ms

    section MariaDB (JOIN)
    □□□ □□    :0, 50
    □□ □□      :50, 150
    AI □□ □□   :150, 300
    Total         :0, 300

    section MongoDB (Single Query)
```

```
    □□ □□□□ □□ :0, 80
    Total             :0, 80
```

---

## 3. □ MongoDB □□ □□ □□□ □□

MongoDB□ □□□ □□□□□ □□, □□ □□□□□ MongoDB□ □□□□□ □□ □□□□ □□ □□□□□.

### □ □□ □□□□ □□□□

```
graph TB
    subgraph "□ □□□ □□"
        A[□ □□ □ AI □□ □□□
• □□ □□□□ □□□
• □□□ □□□ □□
• □□ □□ □□]
    end

    subgraph "⚡ □□ □□"
        B[□ □□□ □□ □□
• □□ □□□ □□
• □□ □□ □□
• □□ □□□]
        C[□ □□□ AI □□
• □□□ □□□
• □□□□ □□
• □□□ □□]
        D[□ □□□ □□
• □□ □□□
• □□ □□
• □□□□ □□]
    end

    A --> B
    A --> C
    B --> D
    C --> D

    style A fill:#ffcdd2
    style B fill:#f8bbd9
    style C fill:#e1bee7
    style D fill:#d1c4e9
```

### □ [□□□ □□] □□ □ AI □□ □□□

□□: □□□□ □□□ □□ □□ AI □□ □□□ □ □□□□ □□ □□□□ □□□□□□. □ □□ □□□□□ □□ □□□ □□□□ □□□□, □□□ **"Diary Document"**□ □□ □□□□ □□ □□ □□□□□□.

**□ MongoDB □□□ □□ □□ (diaries □□□)**

```
erDiagram
    DiaryDocument {
        ObjectId _id
        Number userId
        String title
        String content
        String weather
        Date createdAt
        Date updatedAt
        Object report
    }

    ReportSubDocument {
        String status
        Date analysisDate
        Array emotions
        Array cognitiveDistortions
        Array solutions
        Object metadata
    }

    EmotionObject {
        String name
        Number score
        String intensity
    }

    DiaryDocument ||--|| ReportSubDocument : contains
    ReportSubDocument ||--o{ EmotionObject : has
```

```
{
  "_id": "6492a48f5e3b2e1f8a7b3d9c", // MongoDB□ ObjectId
  "userId": 123, // MariaDB□ User ID (FK □□)
  "title": "□□□ □□",
  "content": "□□□ □□□ □□ □□□ □□□ □□□□...",
  "weather": "□□",
  "createdAt": "2025-06-21T10:00:00Z",
  "updatedAt": "2025-06-21T10:00:00Z",
  "report": {
    // AI □□ □□□ □□(embedded) □□□□□ □□
    "status": "COMPLETED",
    "analysisDate": "2025-06-21T10:01:00Z",
    "emotions": [
      { "name": "□□", "score": 0.8, "intensity": "□□" },
      { "name": "□□", "score": 0.6, "intensity": "□□" }
    ],
    "cognitiveDistortions": [
      // AI □□□ □□□□□ □□□ □□□ □□□ □□□ □□ □□□
      {
        "type": "□□ □□",
```

```
        "originalSentence": "□□□ □□□ □□□ □□□□",
        "alternativeThought": "□□□ □□□□ □□ □□□ □□□ □ □□.",
        "confidence": 0.7
      }
    ],
    "solutions": ["□□ □□ □□□□ □□□ □□□ □□□□□."],
    "metadata": {
      "modelVersion": "GPT-4-turbo",
      "processingTime": 1250,
      "tokensUsed": 245
    }
  }
}
```

### □ [□□ □□] □□□ □□ □□

□□: API □□ □□, □□ □□ □□ □□ □□ □□□□ □□□ □□ □ □□□ □□□ □□□□□.

□ □□ □□ □□□ □□□

```
sequenceDiagram
    participant U as User
    participant A as Auth Server
    participant M as MongoDB
    participant D as Dashboard

    U->>A: API □□
    A->>A: □□□□ □□ □□
    A->>M: □□ □□ □□ (□□□)
    A->>U: □□ □□

    Note over M: □□ □□ □□
    M->>D: □□ □□□ □□
```

#### □ MongoDB □□□ □□ □□ (activity_logs □□□)

```
{
  "_id": "...",
  "userId": 123,
  "action": "LOGIN_SUCCESS", // □□ "CREATE_DIARY", "DELETE_DIARY" □
  "ipAddress": "127.0.0.1",
  "timestamp": "2025-06-21T09:00:00Z",
  "details": {
    "device": "Android",
    "osVersion": "13.0",
    "appVersion": "1.2.3",
    "sessionId": "sess_abc123",
    "responseTime": 245,
```

```
    "statusCode": 200
  },
  "metadata": {
    "userAgent": "CBT-Diary/1.2.3 (Android 13.0)",
    "referer": "/dashboard",
    "geolocation": {
      "country": "KR",
      "city": "Seoul"
    }
  }
}
```

## □ [□□ □□] □□□ AI □□ □□

□□: □□□□ AI □□ □□ □□ □□□ □□□□□. □ □□ □□□ □□□ □□□□□ □□□□ □□□□□ □□□□ □□□□□.

□ □□ □□ □□

```
graph TD
    A[Chat Session] --> B[Messages Array]
    B --> C[User Message]
    B --> D[Assistant Message]
    B --> E[System Message]

    C --> F[Content]
    C --> G[Timestamp]
    C --> H[Metadata]

    D --> I[Content]
    D --> J[Timestamp]
    D --> K[AI Model Info]

    style A fill:#e3f2fd
    style B fill:#f3e5f5
    style C fill:#fff3e0
    style D fill:#e8f5e8
    style E fill:#fce4ec
```

### □ MongoDB □□□ □□ □□ (chat_sessions □□□)

```
{
  "_id": "...",
  "userId": 123,
  "createdAt": "2025-06-21T11:00:00Z",
  "lastActivity": "2025-06-21T11:15:00Z",
  "status": "active", // active, closed, archived
  "summary": "□□□□ □□ □□ □□",
  "messages": [
```

```
      {
        "role": "user",
        "content": "□□ □□ □□□□.",
        "timestamp": "2025-06-21T11:00:00Z",
        "metadata": {
          "sentiment": "negative",
          "urgency": "medium"
        }
      },
      {
        "role": "assistant",
        "content": "□□ □□ □□□□□? □□ □ □□□ □□□□□□ □ □□□?",
        "timestamp": "2025-06-21T11:00:30Z",
        "metadata": {
          "model": "GPT-4",
          "temperature": 0.7,
          "responseTime": 1200
        }
      }
    ],
    "analytics": {
      "totalMessages": 8,
      "averageResponseTime": 1150,
      "userSentiment": "improving",
      "sessionDuration": 900 // seconds
    }
  }
```

---

## 4. □ □□ □□□□: Polyglot Persistence

MariaDB□ MongoDB□ □□ □□□□ □□□□□ □□□□□□□. **Auth-server**□ □ □□□□□□□ □□ □□□□, □□□□ □□□ □□ □□ □ □□□□ □□□□□.

### □ □□ □□□ □□□□

```
graph TB
    subgraph "Client Layer"
        Client["□ CBT-front
(React-Native)"]
    end

    subgraph "API Gateway Layer"
        Gateway["□ API Gateway
(Optional)"]
    end

    subgraph "Application Layer"
        AuthServer["□ Auth-server
(Spring Boot)"]
        AiServer["□ ai-server
```

```
(Python/FastAPI)"]
    end

    subgraph "Database Layer"
        subgraph "Structured Data"
            RDBMS["□ MariaDB
• □□□ □□
• □□ □□□
• □□□ □□□"]
        end

        subgraph "Semi-Structured Data"
            NoSQL["□ MongoDB
• □□ □□
• AI □□ □□
• □□ □□
• □□ □□"]
        end

        subgraph "Cache Layer"
            Cache["⚡ Redis
• □□ □□
• Refresh Token
• □□ □□□"]
        end
    end

    subgraph "External Services"
        OpenAI["□ OpenAI API
(GPT Models)"]
    end

    Client --> Gateway
    Gateway --> AuthServer
    AuthServer --> AiServer
    AiServer --> OpenAI

    AuthServer -.->|"□□□, □□"| RDBMS
    AuthServer -.->|"□□, □□, □□"| NoSQL
    AuthServer -.->|"□□, □□"| Cache

    style RDBMS fill:#e1f5fe
    style NoSQL fill:#fff3e0
    style Cache fill:#f3e5f5
    style AuthServer fill:#e8f5e8
    style AiServer fill:#fce4ec
```

## □ □□□ □□ □□

```
pie title □□□ □□ □□ (□□)
    "MariaDB (□□□□ □□□)" : 25
```

```
    "MongoDB (□□□□□□ □□□)" : 60
    "Redis (□□ □□□)" : 15
```

## □ □□□ □□□ □□

```
sequenceDiagram
    participant C as Client
    participant A as Auth Server
    participant M as MariaDB
    participant Mo as MongoDB
    participant R as Redis

    Note over A: □□□ □□
    C->>A: □□□ □□
    A->>M: □□□ □□ □□
    M-->>A: □□□ □□□
    A->>R: □□ □□
    A-->>C: □□ □□

    Note over A: □□ □□
    C->>A: □□ □□ □□
    A->>Mo: □□ □□□□ □□
    Mo-->>A: □□ □□
    A->>Mo: □□ □□ □□ (□□□)
    A-->>C: □□ □□ □□
```

## □ □□□□□□□ □□ □□

| □ **MariaDB (RDBMS)** | □ **MongoDB (NoSQL)** | ⚡ **Redis (Cache)** |
|---|---|---|
| □ □□□ □□ □□ | □ □□ □□ □ AI □□ | □ JWT Refresh Token |
| □ □□ □ □□ □□ | □ □□□ □□ □□ | □ □□ □□ |
| □ □□□ □□ | □ □□□ AI □□ □□ | □ □□ □□ □□□ |
| □ □□□ □□ | □ □□□ □□ □□□ | □ API □□ □□ |

## □ □□□□□□□ □□ □□

```
graph LR
    subgraph "Synchronous Communication"
        A[Auth API] -->|HTTP/REST| B[User Service]
        A -->|HTTP/REST| C[Diary Service]
    end

    subgraph "Asynchronous Communication"
        D[Event Publisher] -->|Message Queue| E[Log Service]
        D -->|Message Queue| F[Analytics Service]
```

```
        D -->|Message Queue| G[Notification Service]
    end

    subgraph "Data Access Pattern"
        H[Repository Layer] --> I[(MariaDB)]
        H --> J[(MongoDB)]
        H --> K[(Redis)]
    end

    style A fill:#e3f2fd
    style D fill:#fff3e0
    style H fill:#f3e5f5
```

---

## 5. □ □□□ □□ □□

### □ □□ □□□

```
gantt
    title MongoDB □□ □□□□ □□
    dateFormat  YYYY-MM-DD
    section Phase 1: □□□ □□
    Docker □□ □□     :p1-1, 2025-06-22, 3d
    MongoDB □□ □ □□  :p1-2, after p1-1, 2d
    □□□□ □□        :p1-3, after p1-2, 2d

    section Phase 2: □□□ □□
    □□□ □□          :p2-1, after p1-3, 1d
    Repository □□ □□ :p2-2, after p2-1, 5d
    Service □□ □□    :p2-3, after p2-2, 4d
    API □□□□□ □□   :p2-4, after p2-3, 3d

    section Phase 3: □□□ □□□□□□
    □□□□□□ □□□□ □□ :p3-1, after p2-4, 4d
    □□□ □□□ □□□□□□ :p3-2, after p3-1, 2d
    □□ □□□ □□□□□□   :p3-3, after p3-2, 3d

    section Phase 4: □□□ □ □□
    □□ □□□          :p4-1, after p3-3, 3d
    □□ □□□          :p4-2, after p4-1, 4d
    □□ □□□          :p4-3, after p4-2, 3d
    □□ □□           :p4-4, after p4-3, 2d
```

### □ 1. □□□ □□ (docker-compose.yml)

docker-compose.yml □□□ MongoDB □□□□ □□□□, Auth-server□ □□□ □ □□□ □□□□□ □□□□□.

```
# docker-compose.yml □□ □□
version: "3.8"
```

```
services:
  # ... □□ □□□□ ...

  mongodb:
    image: mongo:7.0
    container_name: cbt-mongodb
    restart: unless-stopped
    environment:
      MONGO_INITDB_ROOT_USERNAME: admin
      MONGO_INITDB_ROOT_PASSWORD: secure_password
      MONGO_INITDB_DATABASE: cbt_diary
    ports:
      - "27017:27017"
    volumes:
      - mongodb_data:/data/db
      - ./mongo-init:/docker-entrypoint-initdb.d
    networks:
      - cbt-network

  mongo-express:
    image: mongo-express:1.0.0
    container_name: cbt-mongo-express
    restart: unless-stopped
    ports:
      - "8081:8081"
    environment:
      ME_CONFIG_MONGODB_ADMINUSERNAME: admin
      ME_CONFIG_MONGODB_ADMINPASSWORD: secure_password
      ME_CONFIG_MONGODB_URL:
mongodb://admin:secure_password@mongodb:27017/
    depends_on:
      - mongodb
    networks:
      - cbt-network

volumes:
  mongodb_data:

networks:
  cbt-network:
    driver: bridge
```

## ⚙ 2. □□□ □□□ □ □□ (Auth-server)

### □ **build.gradle □□□ □□**

```
dependencies {
    // ... □□ □□□□ ...

    // MongoDB □□ □□□
```

```
    implementation 'org.springframework.boot:spring-boot-starter-data-
mongodb'
    implementation 'org.springframework.data:spring-data-mongodb'

    // JSON □□ □□
    implementation 'com.fasterxml.jackson.core:jackson-databind'
    implementation 'com.fasterxml.jackson.datatype:jackson-datatype-
jsr310'

    // □□□□ □□ MongoDB
    testImplementation 'de.flapdoodle.embed:de.flapdoodle.embed.mongo'
}
```

**□ application.properties □□**

```
# MongoDB □□
spring.data.mongodb.uri=mongodb://admin:secure_password@localhost:27017/cb
t_diary?authSource=admin
spring.data.mongodb.auto-index-creation=true

# JPA□ MongoDB □□ □□
spring.jpa.hibernate.ddl-auto=validate
spring.jpa.show-sql=false

# □□ □□
logging.level.org.springframework.data.mongodb=DEBUG
logging.level.org.mongodb.driver=INFO
```

## □ 3. □□□ □ □□□□□ □□□

**□ DiaryDocument □□□**

```
@Document(collection = "diaries")
@Data
@Builder
@NoArgsConstructor
@AllArgsConstructor
public class DiaryDocument {

    @Id
    private String id;

    @Indexed
    private Long userId; // MariaDB User□ □□

    private String title;
    private String content;
    private String weather;
```

```
    @CreatedDate
    private LocalDateTime createdAt;

    @LastModifiedDate
    private LocalDateTime updatedAt;

    private ReportSubDocument report;

    // □□□ □□□ □□ □□□□ □□□
    @CompoundIndex(name = "user_date_idx",
                   def = "{'userId': 1, 'createdAt': -1}")
    public static class Indexes {}
}

@Data
@Builder
@NoArgsConstructor
@AllArgsConstructor
public class ReportSubDocument {
    private String status;
    private LocalDateTime analysisDate;
    private List<EmotionData> emotions;
    private List<CognitiveDistortion> cognitiveDistortions;
    private List<String> solutions;
    private AnalysisMetadata metadata;
}
```

**□ Repository □□□□□**

```
@Repository
public interface DiaryMongoRepository extends
MongoRepository<DiaryDocument, String> {

    // □□□□ □□ □□ (□□□)
    Page<DiaryDocument> findByUserIdOrderByCreatedAtDesc(
        Long userId, Pageable pageable);

    // □□ □□ □□□ □□ □□
    List<DiaryDocument> findByUserIdAndCreatedAtBetween(
        Long userId, LocalDateTime start, LocalDateTime end);

    // AI □□ □□□ □□□ □□
    List<DiaryDocument> findByUserIdAndReport_Status(
        Long userId, String status);

    // □□ □□ (MongoDB Atlas Search □□)
    @Query("{ '$text': { '$search': ?0 } }")
    List<DiaryDocument> findByContentText(String searchText);

    // □□□ □□ □□
```

```
    @Query("{ 'userId': ?0, 'report.emotions.name': ?1 }")
    List<DiaryDocument> findByUserIdAndEmotion(Long userId, String
emotion);
}
```

## □ 4. □□□ □□ □□□

### ⚖ AS-IS vs TO-BE □□

```
graph TB
    subgraph "AS-IS (JPA □□)"
        A1[DiaryService] --> A2[DiaryRepository]
        A1 --> A3[ReportRepository]
        A2 --> A4[(MariaDB)]
        A3 --> A4
        A5[AI □□ □] --> A6[□□ Report □□]
        A6 --> A7[Diary-Report □□]
    end

    subgraph "TO-BE (MongoDB □□)"
        B1[DiaryService] --> B2[DiaryMongoRepository]
        B2 --> B3[(MongoDB)]
        B4[AI □□ □] --> B5[Diary Document □□□□]
        B5 --> B6[□□□ □□□□□ □□]
    end

    style A4 fill:#ffcdd2
    style B3 fill:#c8e6c9
```

### □ □□□ □□ □□ □□

```
@Service
@Transactional
public class DiaryService {

    private final DiaryMongoRepository diaryMongoRepository;
    private final UserRepository userRepository; // MariaDB
    private final AiAnalysisService aiAnalysisService;

    public DiaryDocument createDiary(Long userId, CreateDiaryRequest
request) {
        // 1. □□□ □□ □□ (MariaDB)
        User user = userRepository.findById(userId)
            .orElseThrow(() -> new UserNotFoundException("User not
found"));

        // 2. □□ □□□□ □□ □ □□ (MongoDB)
        DiaryDocument diary = DiaryDocument.builder()
```

```
                .userId(userId)
                .title(request.getTitle())
                .content(request.getContent())
                .weather(request.getWeather())
                .build();

        DiaryDocument savedDiary = diaryMongoRepository.save(diary);

        // 3. AI □□ □□ (□□□)
        CompletableFuture.runAsync(() -> {
            try {
                ReportSubDocument report =
aiAnalysisService.analyzeContent(
                    savedDiary.getContent());
                savedDiary.setReport(report);
                diaryMongoRepository.save(savedDiary);
            } catch (Exception e) {
                log.error("AI □□ □□: diaryId={}", savedDiary.getId(), e);
            }
        });

        return savedDiary;
    }

    public Page<DiaryDocument> getDiariesByDate(Long userId, LocalDate
date,
                                                Pageable pageable) {
        LocalDateTime startOfDay = date.atStartOfDay();
        LocalDateTime endOfDay = date.atTime(23, 59, 59);

        return diaryMongoRepository.findByUserIdAndCreatedAtBetween(
            userId, startOfDay, endOfDay, pageable);
    }
}
```

## □ 5. □□□ □□□□□□□ □□

```
flowchart TD
    A[□□ MariaDB □□□□] --> B{□□□□□□□ □□□□□}
    B --> C[□□□□ □□]
    C --> D{□□ □□?}
    D -->|YES| E[MongoDB □□]
    D -->|NO| F[□□ □□ □□]
    F --> G[□□ □□]
    G --> C
    E --> H[MongoDB □□]
    H --> I[□□□□ □□]
    I --> J{□□□□ □□?}
    J -->|YES| K[□□□□□□□ □□]
    J -->|NO| L[□□ □□]
```

```
    style A fill:#ffcdd2
    style K fill:#c8e6c9
    style L fill:#ffcdd2
```

---

## 6. □ □□ □□ □ □□ □□

### □ □□ □□ □□

```
graph TD
    A[MongoDB □□] --> B[□□ □□□ □□]
    A --> C[□□ □□]
    A --> D[□□□ □□]
    A --> E[□□□□ □□□□]

    B --> B1[□□□ □□ □□□]
    B --> B2[□□ □□ □□]
    B --> B3[AI □□ □□ □□]

    C --> C1[JOIN □□ □□]
    C --> C2[□□ □□ □□]
    C --> C3[□□ □□ □□]

    D --> D1[□□□ □□]
    D --> D2[□□□ □□□ □□]
    D --> D3[□□ □□]

    E --> E1[□□□ □□□ □□□]
    E --> E2[□□□ □□□]
    E --> E3[□□□ □□]

    style A fill:#e3f2fd
    style B fill:#fff3e0
    style C fill:#e8f5e8
    style D fill:#f3e5f5
    style E fill:#fce4ec
```

### □ □□ □□ □□ □□

```
graph LR
    subgraph "□□ □□ □□"
        A[□□ □□ □□
300ms → 80ms
73% □□]
        B[□□ □□ □□
450ms → 120ms
73% □□]
        C[AI □□ □□ □□
200ms → 50ms
```

```
  75% □□]
      end

      subgraph "□□□ □□"
          D[□□ □□□
  100 → 500
  5□ □□]
          E[□□ □□ TPS
  50 → 200
  4□ □□]
          F[□□□ □□ □□
  1000/s → 5000/s
  5□ □□]
      end

      style A fill:#c8e6c9
      style B fill:#c8e6c9
      style C fill:#c8e6c9
      style D fill:#bbdefb
      style E fill:#bbdefb
      style F fill:#bbdefb
```

## □ □□ □□□ □□

| □ □□ | □ □□ **(MariaDB Only)** | □ □□ □ **(Hybrid)** | □ □□ □□ |
|---|---|---|---|
| □□ □□□ | □□ DB □□ □□□ □□ | □□□ □□□□ □□□ □□ | **30%** □□ □□ |
| □□ □□ | □□□ □□ □ □□□□ □□ | □□□ □□□ □□ | **50%** □□ □□ |
| □□□□ | □□□ JOIN □□ □□□ | □□□ □□□□ □□ | **40%** □□□ □□ |
| □□ □□ | □□ □□ (Scale-up) | □□ □□ (Scale-out) | **60%** □□ □□ |

## □ □□ □□ □□

□ □□□ □□

- □□ □□: □□ □□ □□ 70% □□ □□
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- □□□: □ 1TB □□ □□□ □□ □□ □□

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- □□□: □□□ □□□ 4.5/5.0 □□
- □□□: □ □□□ 20% □□ □□
- □□ □□: □□ □□ □□□ 30% □□
- □□ □□□: AI □□ □□ □□□ 60% □□

□ □□□□ □□

- □□ □□: □ □□ □□ □□ 50% □□
- □□ □□: □□□ □□ □□ 30% □□
- □□ □□: □ □□ 20% □□ □□
- □□ □□□: CBT □ □□□□ □□ □□ □□

### ⚠ □□□ □□ □ □□ □□

```
graph TD
    A[□□□ □□] --> B{□□□ □□}

    B --> C[□□□ □□□]
    B --> D[□□□ □□□]
    B --> E[□□□□ □□□]

    C --> C1[□□□ □□□□□□ □□]
    C --> C2[□□ □□]
    C --> C3[□□□ □□]

    D --> D1[□ □□ □□]
    D --> D2[□□ □□□ □□]
    D --> D3[□□□□ □□□]

    E --> E1[□□ □□ □□]
    E --> E2[□□ □□ □□]
    E --> E3[□□□ □□□ □□]

    C1 --> F1[□□□ □□□□□□
□□ □□ □□]
    C2 --> F2[□□ □□□ □□
□□□□ □□ □□]
    C3 --> F3[□□□ □□□□ □□
□□□ □□□]

    D1 --> G1[MongoDB □□ □□□□
□□ □□□ □□]
    D2 --> G2[□□ □□□ □□
□□□ □□ □□]
    D3 --> G3[□□ □□□□ □□□□
□□ □□□ □□]

    E1 --> H1[□□ □□ □□
□□□□ □□]
    E2 --> H2[□□ □□ □□
□□ □□□□]
    E3 --> H3[□□□ □□ □□
□□ □□ □□]

    style A fill:#ffcdd2
    style F1 fill:#c8e6c9
    style F2 fill:#c8e6c9
    style F3 fill:#c8e6c9
    style G1 fill:#bbdefb
```

```
    style G2 fill:#bbdefb
    style G3 fill:#bbdefb
    style H1 fill:#fff3e0
    style H2 fill:#fff3e0
    style H3 fill:#fff3e0
```

---

# □ □□ □ □□

## □ □□ □□□

CBT Diary □□□□□□ MongoDB□ □□□□□ □□ □□□ □□ □□ □□□ □□, □□ □□□□□ □□□□□ □□□□□□. □□ □□ □□□ □□ □□□ □□ □ □□ □ □□□□:

```
mindmap
  root((□□□ □□))
    □□□ □□
      □□□ □□
      □□ □□□
      □□ □□□ □□
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      □□ □□□
      □□□□ □□□
      □□□ □□
```

□ □□□ *CBT Diary* □□□□□□ □□□ □□□ □□□ □□ □□□ □□ □□□□□□□□.

□ □□ □□

- □□: v1.0
- □□□: 2025□ 6□ 21□
- □□□: □□□
- □□□: CTO
- □□ □□: 2025□ 6□ 28□