Firebase Firestore Cheat Sheet

Databases · Quick Reference

OVERVIEW & SETUP

Firebase Firestore powerful database solution

```
# Install (Docker):
docker run -d --name mydb \
-e DB_PASSWORD=secret \
-p 5432:5432 firebase firestore:latest
```

Connect: host, port, user, password, database name

INSTALLATION & CONFIG

```
# Package manager install
brew install firebase firestore
# Or download from official site
```

Config file: firebase firestore.conf or similar

Set max connections, memory, storage paths

```
# Start service
systemctl start firebase firestore
```

DATA MODELING

Define schemas, tables/collections, data types

```
-- Create table (SQL example):
CREATE TABLE users (
id SERIAL PRIMARY KEY,
name VARCHAR(100) NOT NULL,
email VARCHAR(200) UNIQUE NOT NULL
);
```

Normalize for consistency; denormalize for performance

CRUD OPERATIONS

```
-- INSERT
INSERT INTO users (name, email) VALUES
('Alice', 'a@b.com');
-- SELECT
SELECT * FROM users WHERE active = true;
-- UPDATE
UPDATE users SET name = 'Bob' WHERE id =
1;
-- DELETE
DELETE FROM users WHERE id = 1;
```

QUERYING

```
SELECT u.*, o.total
FROM users u
JOIN orders o ON o.user_id = u.id
WHERE o.status = 'paid'
ORDER BY o.created_at DESC
LIMIT 10 OFFSET 20;
```

Use EXPLAIN/EXPLAIN ANALYZE to inspect query plans

INDEXING

```
CREATE INDEX idx_users_email ON
users(email);
CREATE UNIQUE INDEX
idx_users_email_unique ON users(email);
-- Composite index:
CREATE INDEX idx_orders ON
orders(user_id, status, created_at);
```

Index columns used in WHERE, JOIN, ORDER BY clauses

Too many indexes slow writes profile before adding

TRANSACTIONS

```
BEGIN;
UPDATE accounts SET balance = balance -
100 WHERE id = 1;
UPDATE accounts SET balance = balance +
100 WHERE id = 2;
COMMIT;
-- On error:
ROLLBACK;
```

ACID: Atomicity, Consistency, Isolation, Durability

REPLICATION & HA

Primary-replica replication for read scaling

```
# Primary: enable binary logging / WAL
# Replica: point to primary host
```

Automatic failover with Patroni/Sentinel/etc

Read from replicas; write to primary only

Monitor replication lag alert if > threshold

SECURITY

Create least-privilege database users

```
CREATE USER appuser WITH PASSWORD
'secret';
GRANT SELECT, INSERT, UPDATE ON users TO
appuser;
```

Enable SSL/TLS for connections in transit

Encrypt sensitive columns at application layer

Regular security updates and patches

MONITORING & PERF

Monitor query performance, connections, disk I/O

```
-- Slow query log
SET log_min_duration_statement = 1000;
-- 1s
```

EXPLAIN ANALYZE for individual query tuning

Connection pooling: PgBouncer, ProxySQL, HikariCP

Vacuum/ANALYZE (PostgreSQL) or OPTIMIZE (MySQL)

CLI / TOOLS

```
psql -h host -U user -d database
\l   list databases  \dt  list tables
\d users  describe table structure
-- Backup:
pg_dump dbname > backup.sql
-- Restore:
psql dbname < backup.sql
```

COMMON GOTCHAS

Never store plaintext passwords use bcrypt/Argon2

Use connection pooling raw connections are expensive

Always parameterize queries prevent SQL injection

Regular backups with point-in-time recovery

Test failover procedures before production incidents