

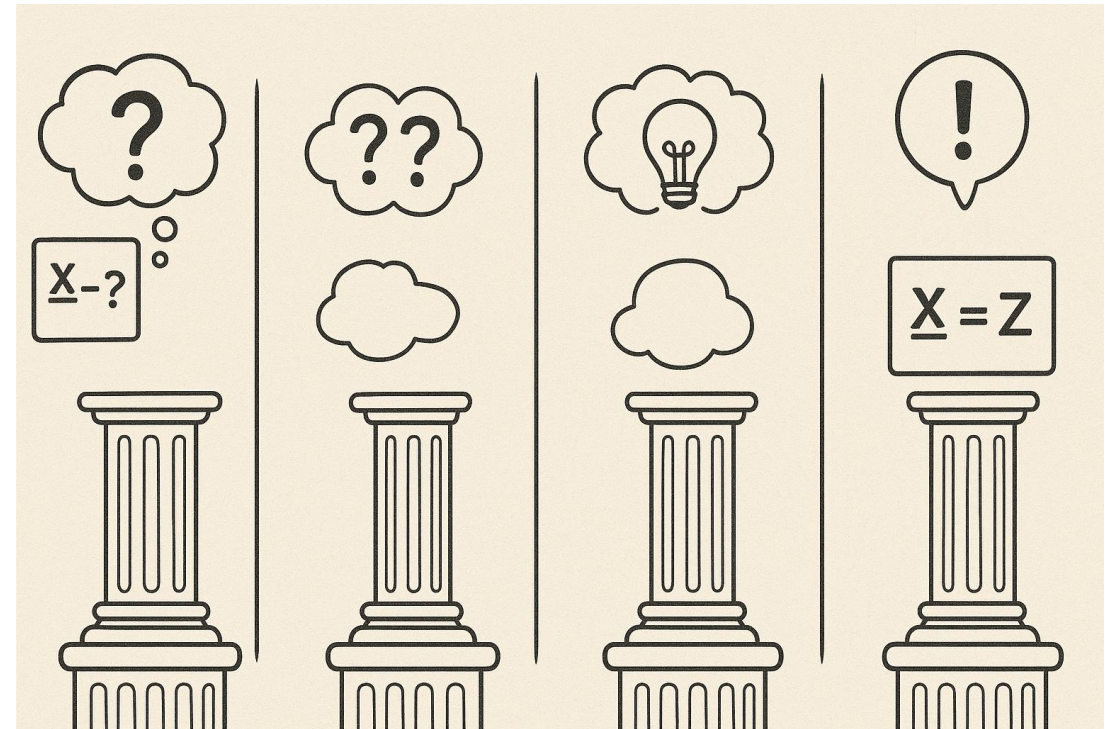
ILP / 10

Reaching out to others and Redis

Michael Glienecke, PhD

Thank you for the excellent questions

- Why do we do this assignment / lecture or what do we want to achieve?



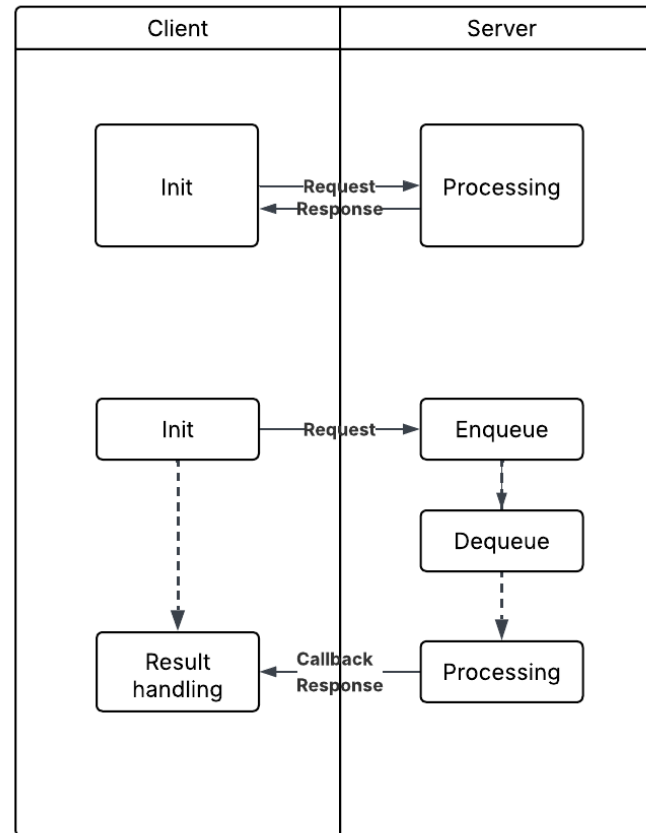
About the project (CW2)

- Drone Id is String, the other IDs Integer
 - Do you know the difference between **integer** and **Integer**?
- What is there to do really...
- What to consider?
- What to be careful of?
- What should not be forgotten?
- Check your assumptions
- Can I use a different URL for the REST-service?

The main problem

- Service Points have
 - Drones which have
 - features (moves, size, cooling, heating)
 - availability (Mo – 12:00 – 16:00, ...)
- Find the right drone(s) to fulfil the requests (or none if there is option)
- Fly the deliveries avoiding the no-fly-zones and staying with the move-size and possible directions and not exceeding the max moves

Async processing

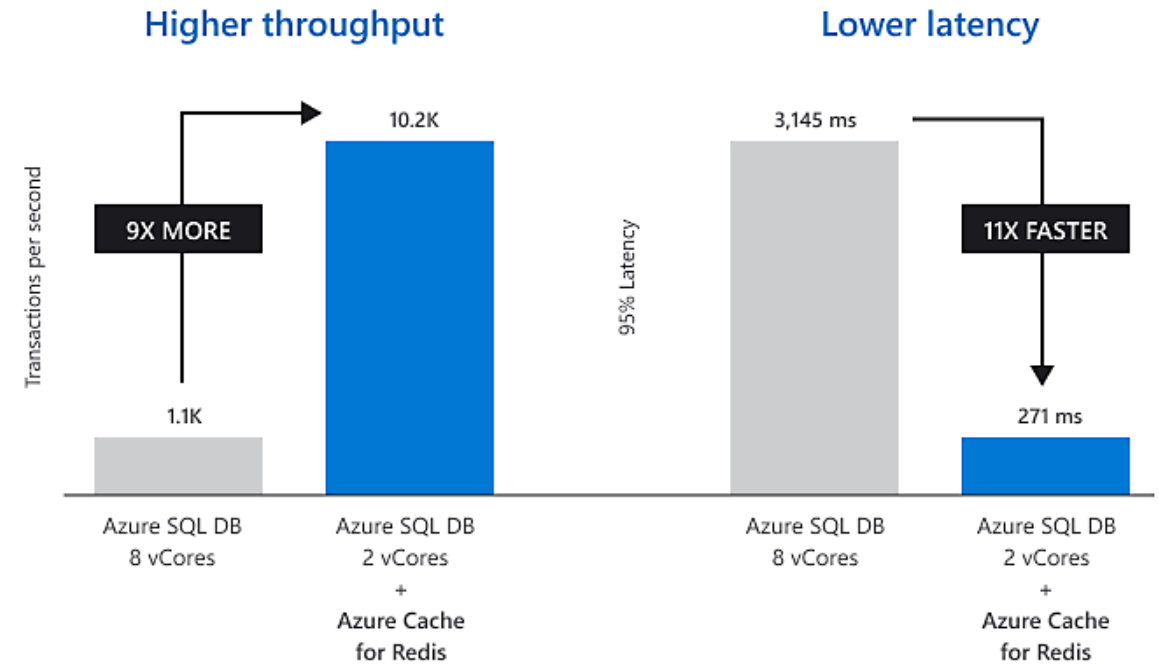


Developing in the cloud locally

- Localstack (<https://www.localstack.cloud/>) is a big boost when working with aws and services

Redis

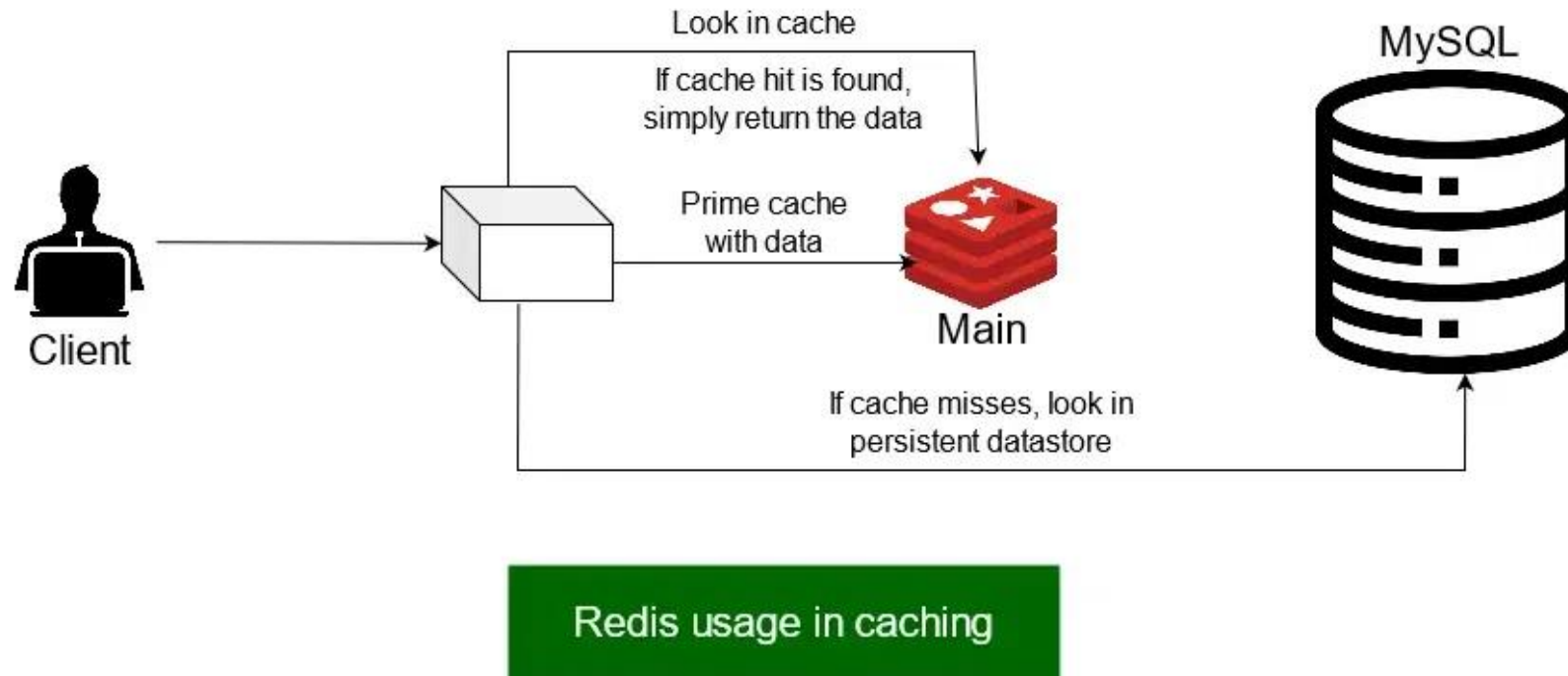
- The problem... efficient caching...
- Distributed (say cluster)



So, what is Redis

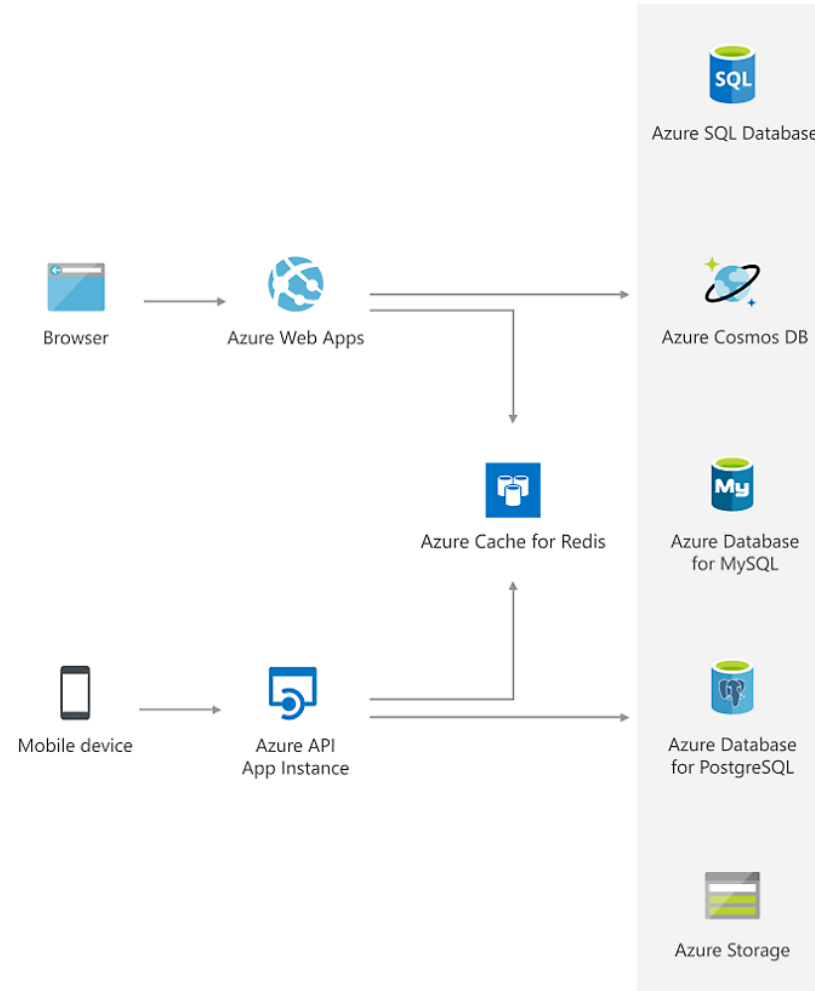
- Very fast non-relational database
<https://redis.io/docs/management/optimization/benchmarks/>
- Mappings of keys to types
- Supports in-memory persistent storage to disc
- Replication to scale read-performance
- Clustering (failover)
- Index, Query, Full-Text-Search support

Redis usage

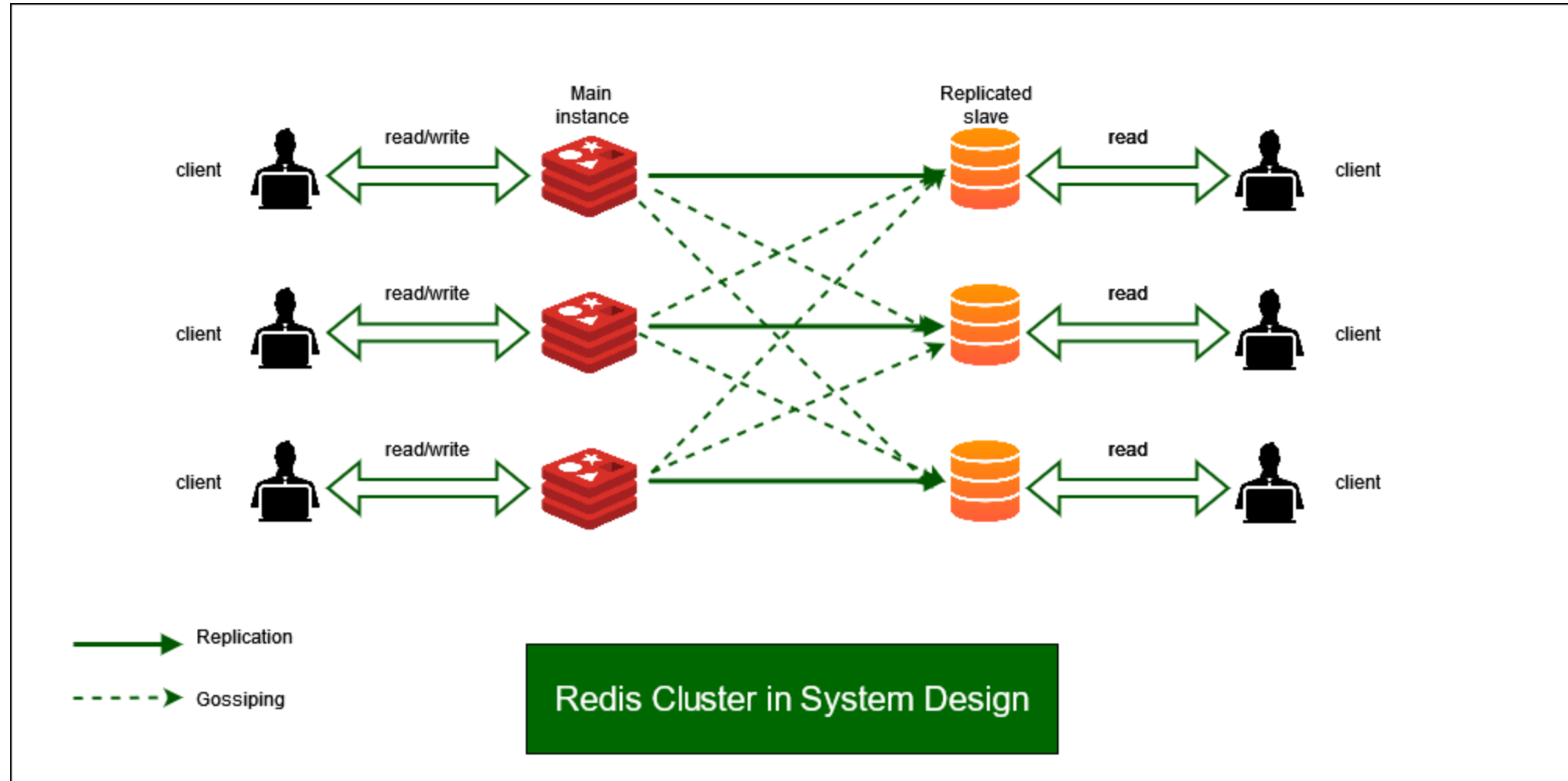


<https://www.geeksforgeeks.org/redis-and-its-role-in-system-design/>

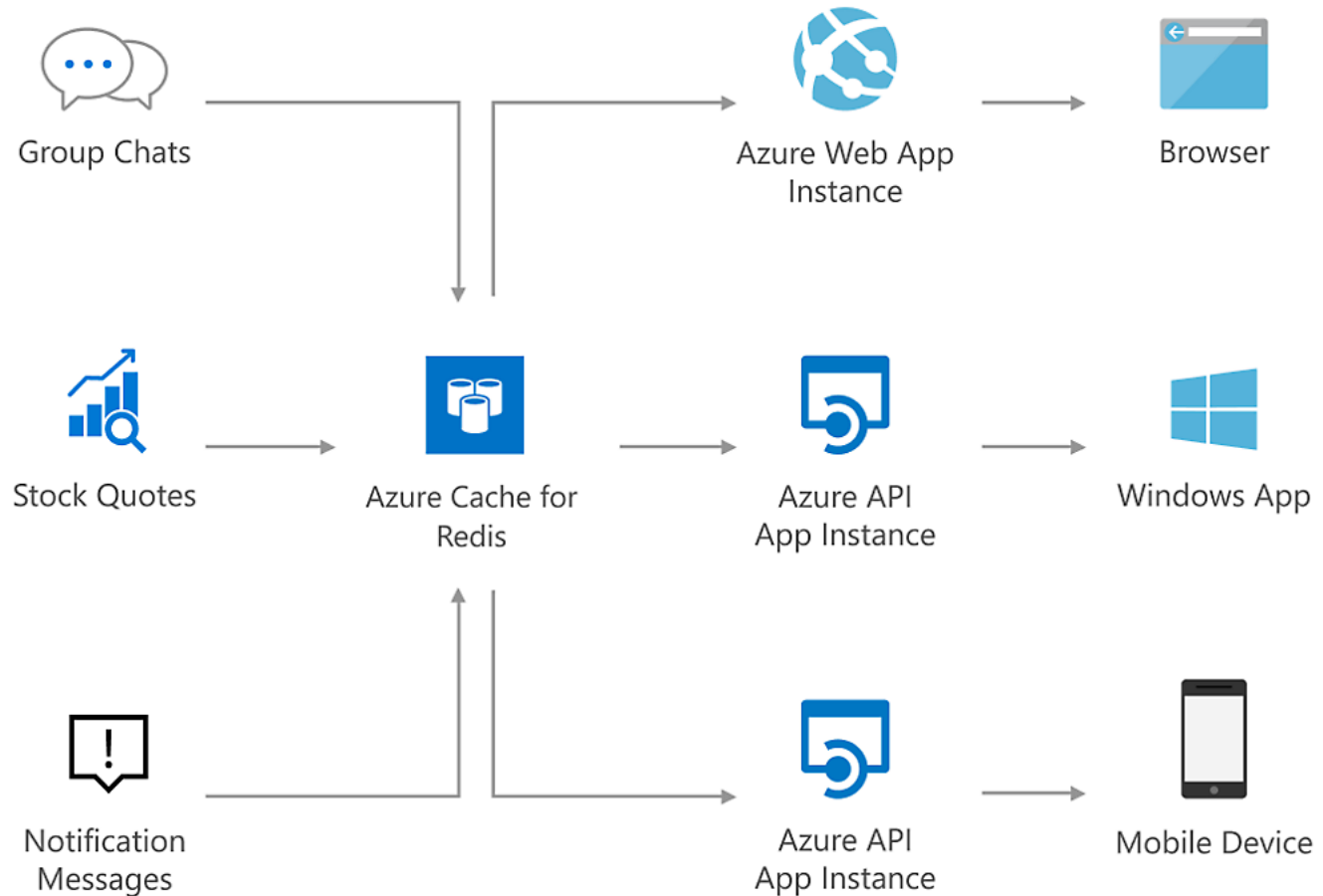
Speeding up applications



Redis cluster



Use as a message broker (unconventional...)



Redis data types

- Strings – text or binary data up to 512MB in size
- Lists – a collection of Strings in the order they were added
- Sets – an unordered collection of strings with the ability to intersect, union, and diff other Set types
- Sorted Sets – Sets ordered by a value
- Hashes – a data structure for storing a list of fields and values
- Bitmaps – a data type that offers bit level operations
- HyperLogLogs – a probabilistic data structure to estimate the unique items in a data set
- Streams - a log data structure Message queue
- Geospatial - a longitude-/latitude-based entries Maps, "nearby"
- JSON - a nested, semi-structured object of named values supporting numbers, strings, Booleans, arrays, and other objects

Redis data types

redis cache	String
01101010100010010	Bitmap
{24445}{6634730}{987}	Bitfield
{x: "redis", b: "cache"}	Hash
[x>y>c>c]	List
{x<y<z}	Set
{x1,y2,z3}	Sorted Set
{x (60.2,0,7)}	Geospatial
00110001 10010110 11001100	Hyperlog
{id1=time1.seq((x:"foo", y:"bar"))}	Stream

Different data-types for Redis data storage

Redis patterns

- <https://redis.io/docs/manual/patterns/>
- Bulk loading
- Distributed locks
- Secondary indexing

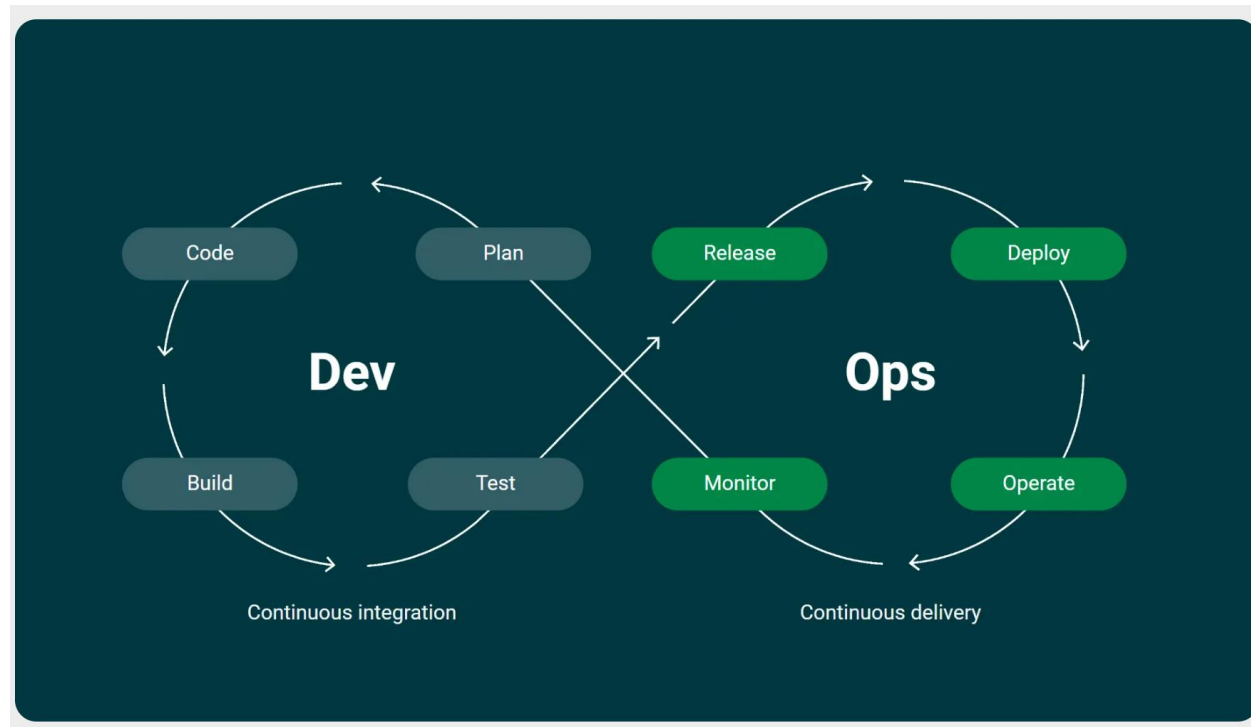
How to access

- <https://learn.microsoft.com/en-us/azure/azure-cache-for-redis/cache-java-get-started?tabs=cmd>
- <https://www.baeldung.com/jedis-java-redis-client-library>
- <https://developer.redis.com/develop/java/getting-started/>
- <https://docs.spring.io/spring-data/redis/reference/index.html>
- <https://github.com/spring-projects/spring-data-examples/tree/main/redis>

CI/CD



The DevOps Cycle



<https://circleci.com/ci-cd/>