ThoughtWorks

Microservice Architecture Proposal

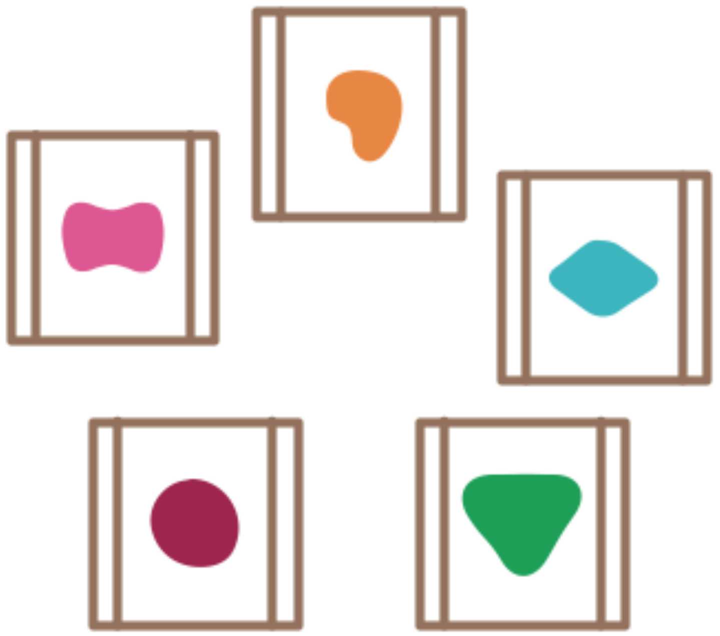
CONTENT

- Microservice
- Key points of design
- Architecture Proposal
- Evolution Suggestions

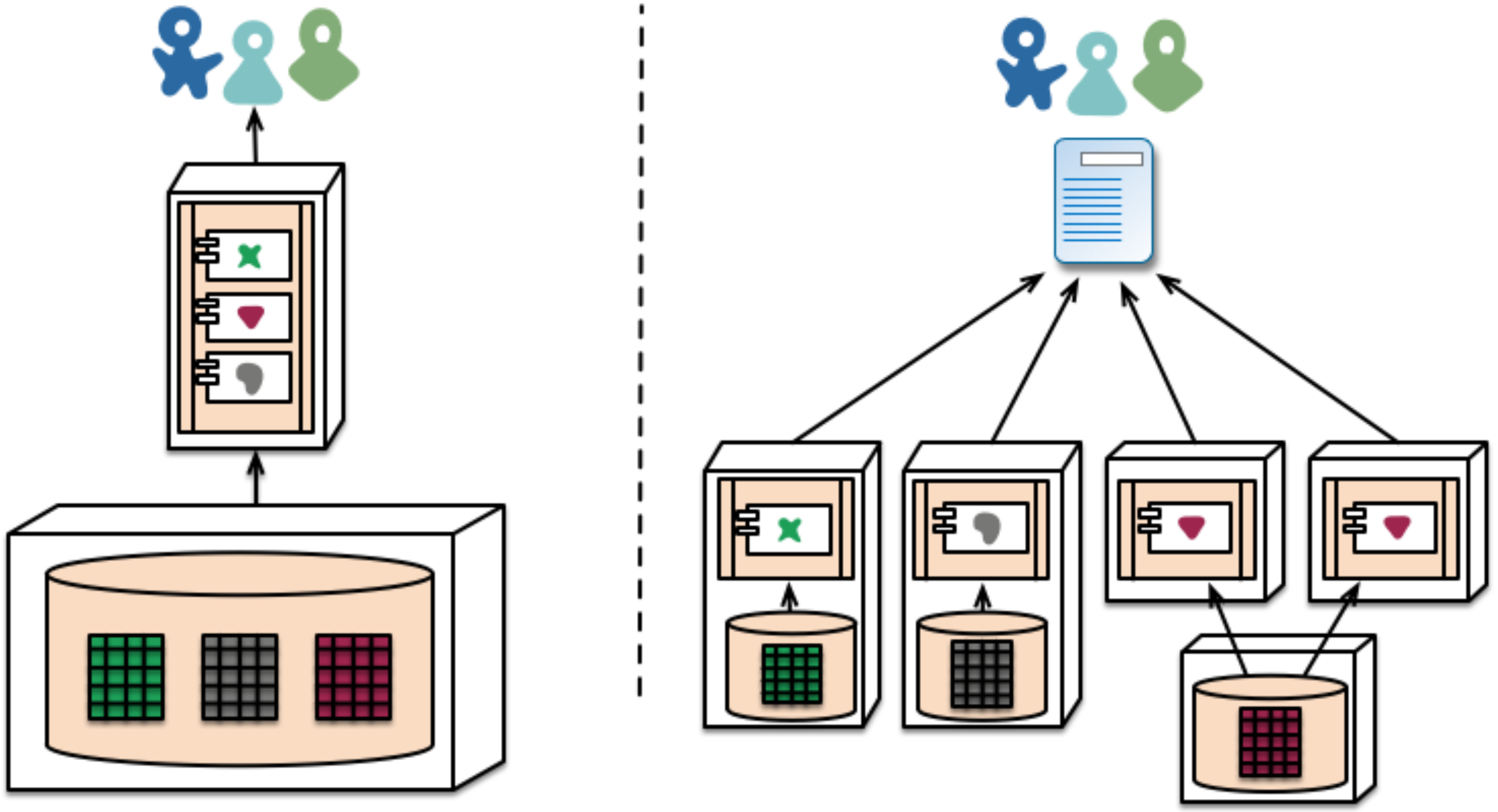
Microservices

common characteristics of this architectural style

by James Lewis and Martin Fowler



MICROSERVICE


monolith - single database

microservices - application databases

ADVANTAGES

- Advantages
  - deploy, release, and operation independently
  - refine resource usage
  - reduce interference between features
  - freedom for technology options
  - improve agility of organization
  - tackles the problem of complexity, faster to develop, easier to understand and maintain

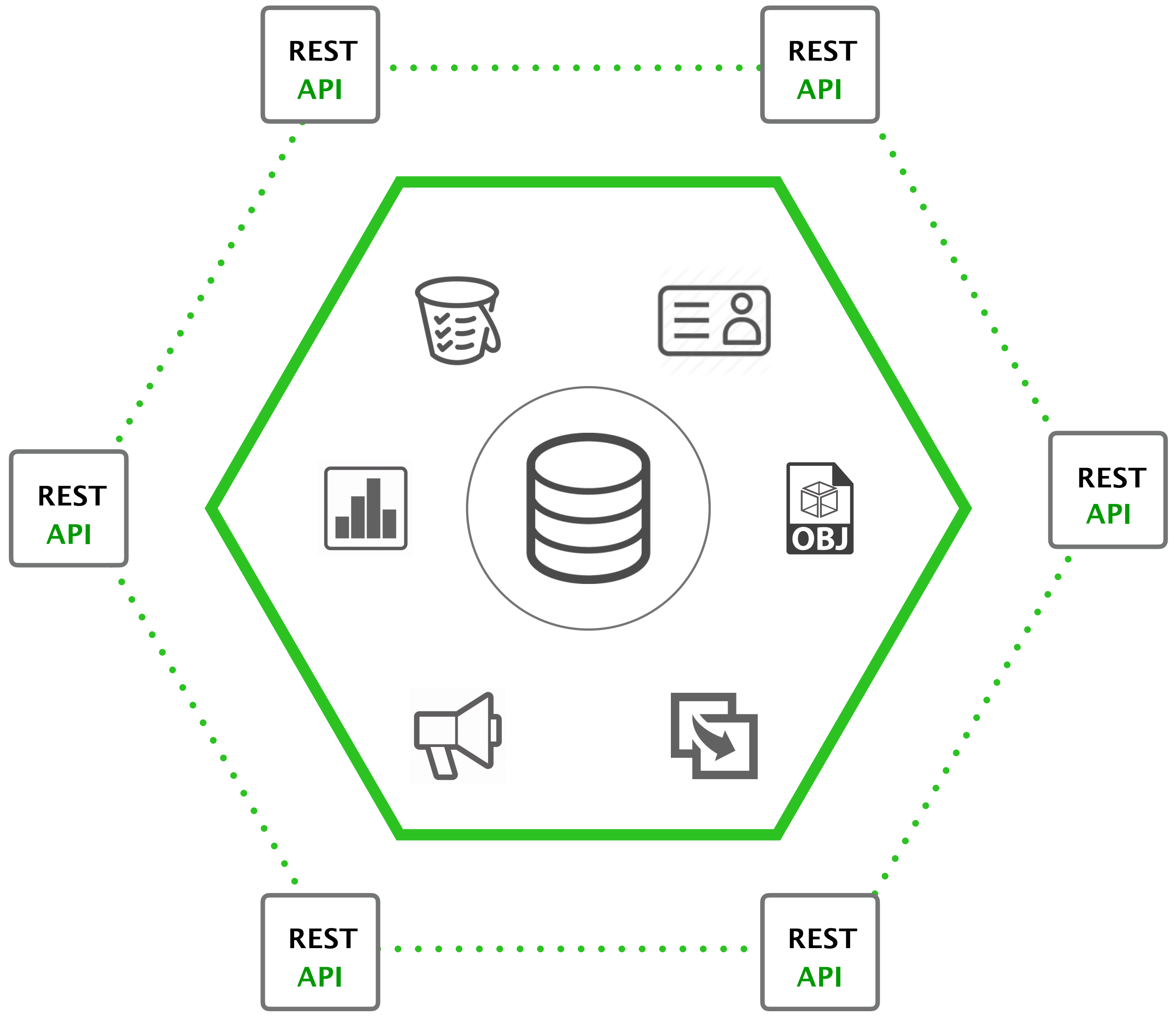
➤ *Differences with modules?*

DISADVANTAGES

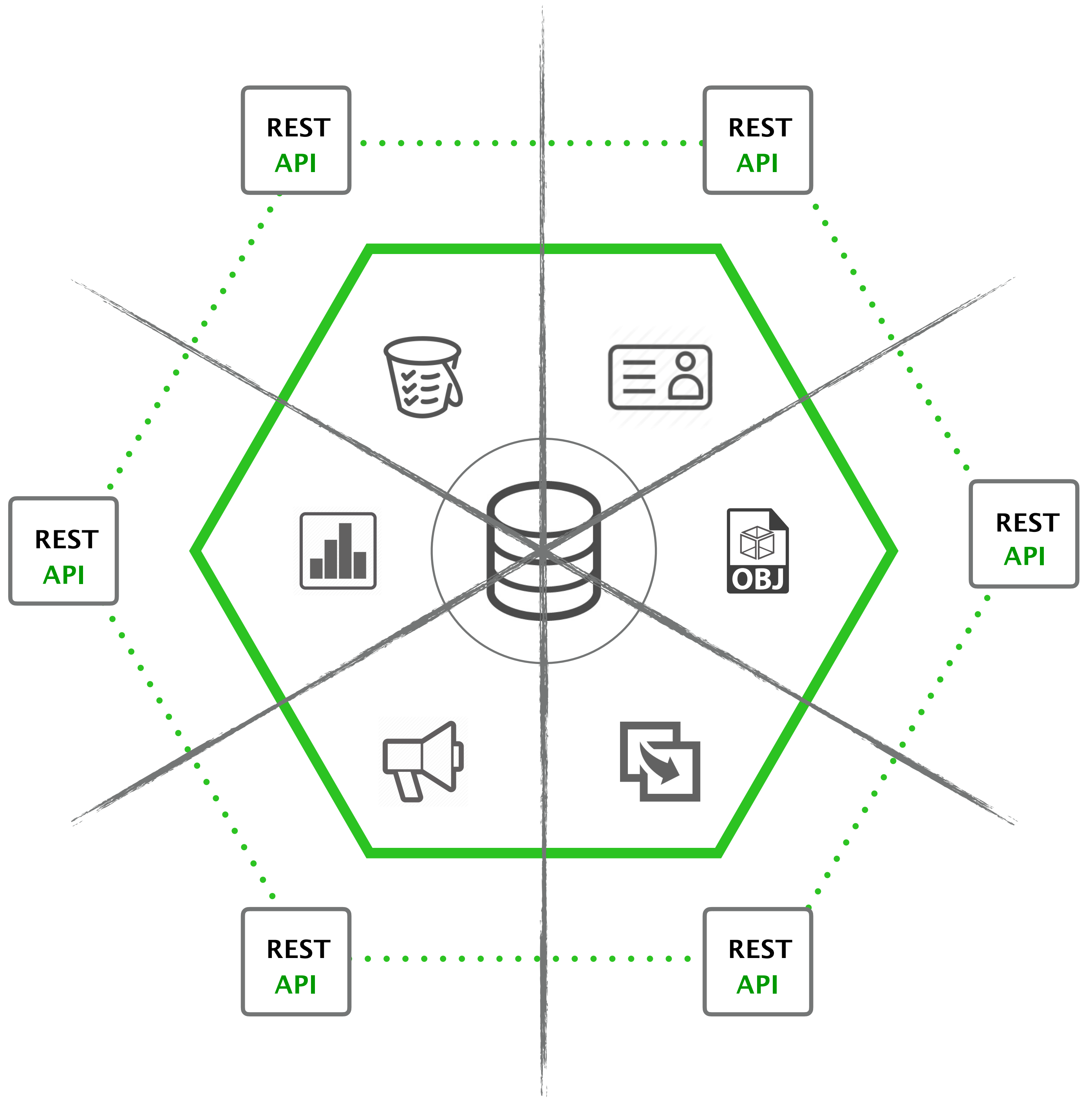
- Disadvantages
  - complexity of distributed system
  - demands for infrastructure and DevOps
  - demands for adaptive organization structure

Key points of design

MONOLITHS



SERVICE PARTITION



Prefer Vertical Partitioning

- *DB splitting is critical*

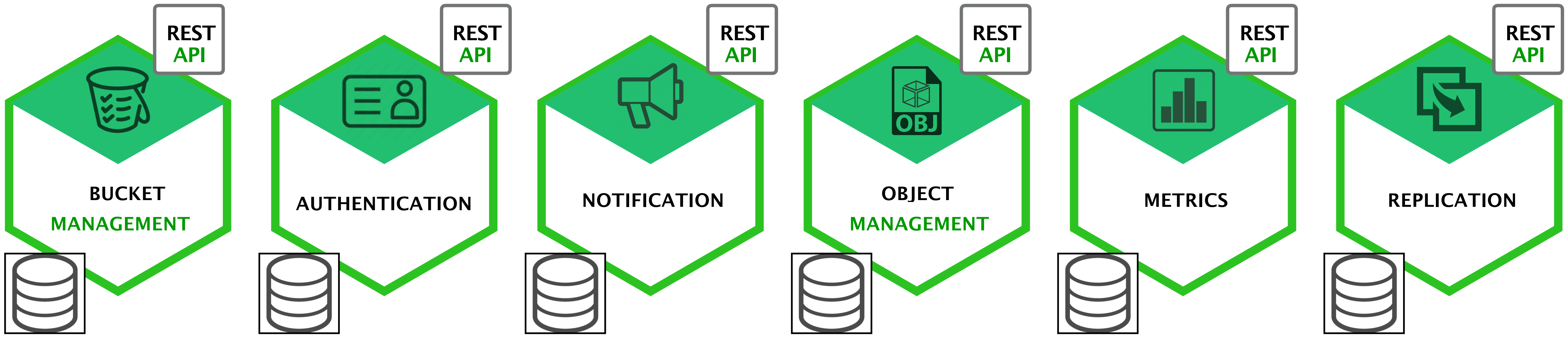
Core Principle

- *high cohesion*
- *low coupling*

Operable Principle

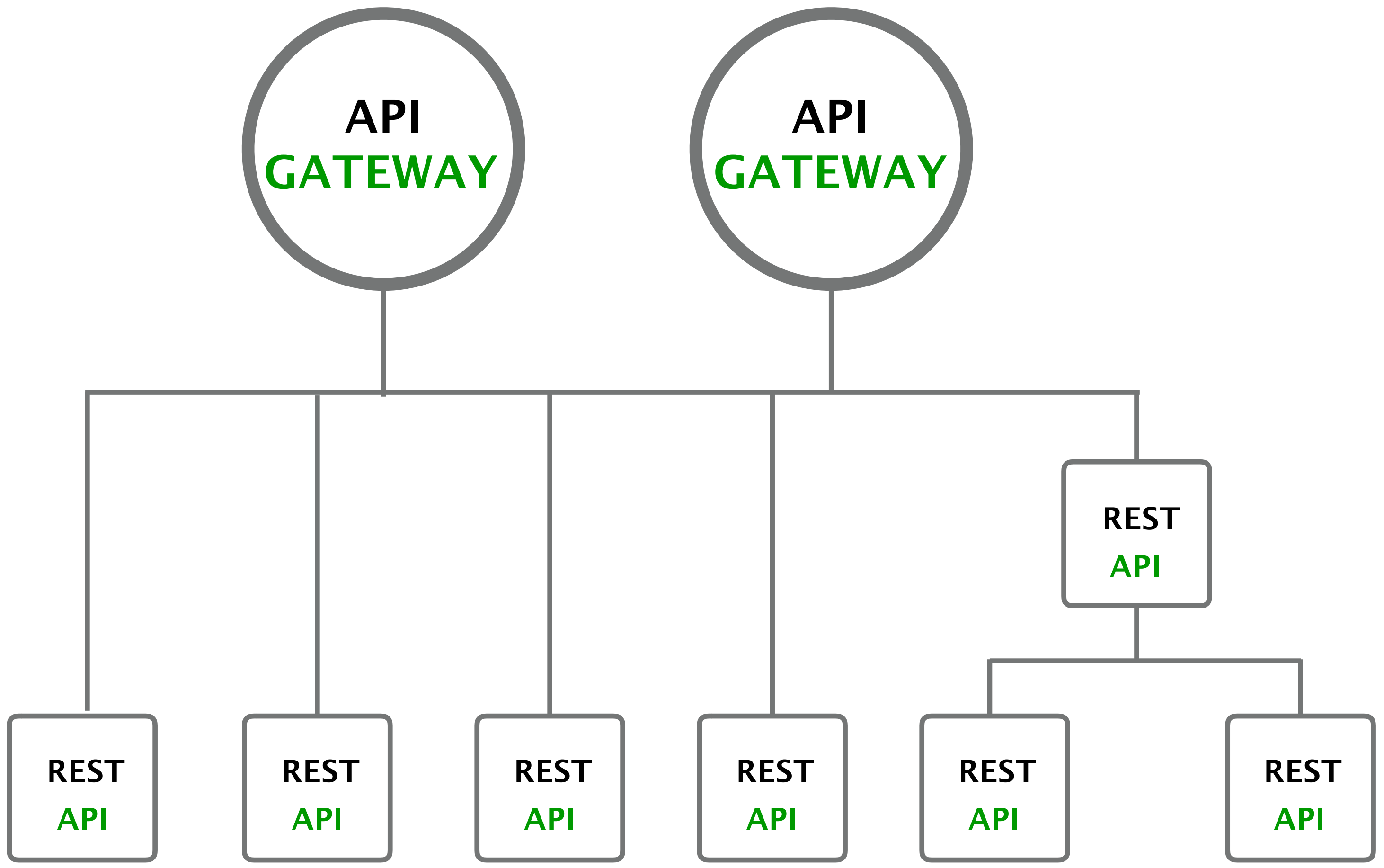
- *Orthogonal design*

SERVICE CHARACTERS



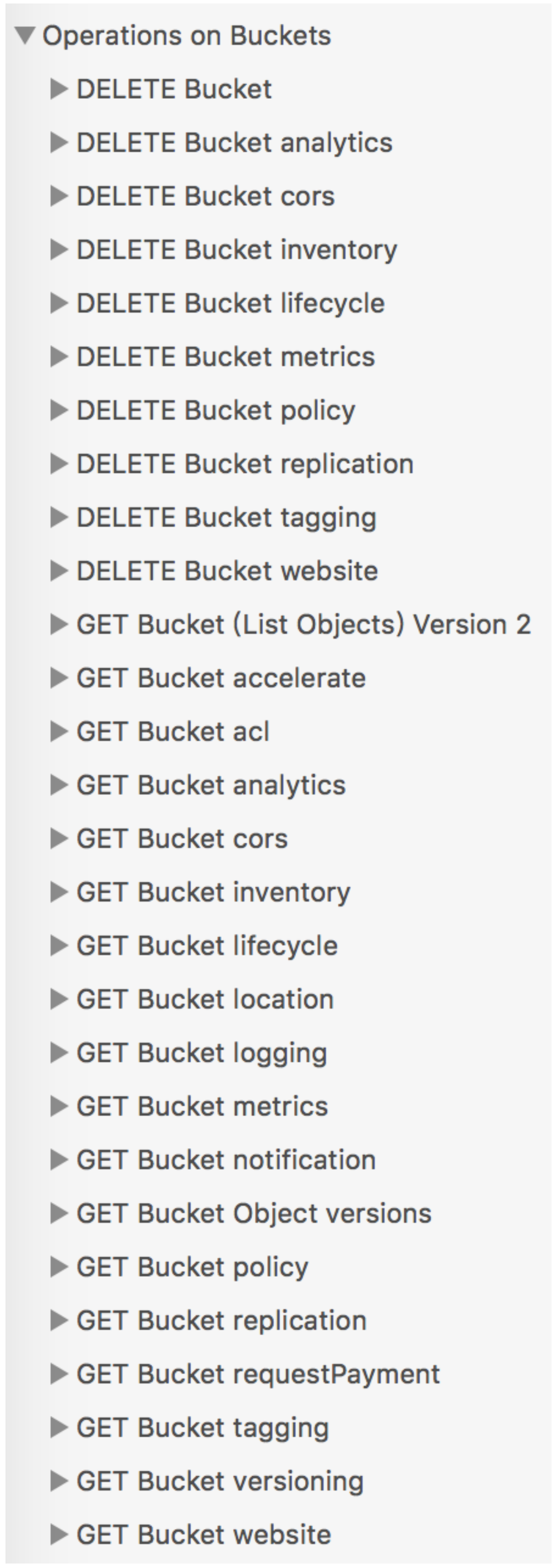
- *Present customer value preferentially*
- *Cohesive for independence*
- *Reduce interaction*
- *Concern consistency requirements*
- *Treat performance issues reasonably*

API DESIGN

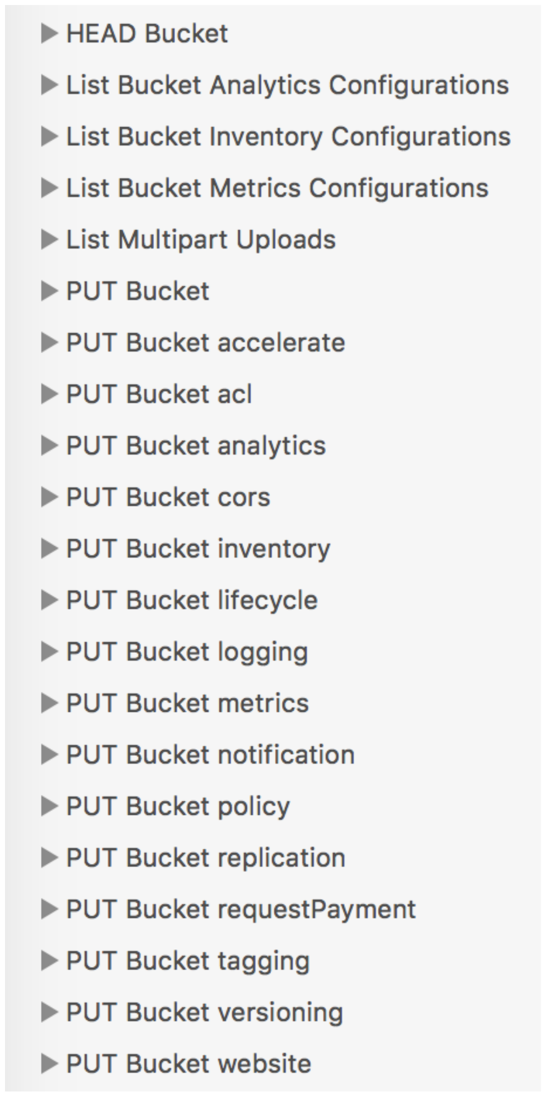


- *One size does not fit all*
- *Interface isolate principle*
- *Use facade pattern to convenient different users*
- *SYNC vs ASYNC*
- *P2P vs PUB/SUB*
- *REST is not the only choice*
- *Postel principle*
- *Idempotent design*
- *Semantic version*
- *…*

AWS S3 API



▼ Operations on Buckets
- ▶ DELETE Bucket
- ▶ DELETE Bucket analytics
- ▶ DELETE Bucket cors
- ▶ DELETE Bucket inventory
- ▶ DELETE Bucket lifecycle
- ▶ DELETE Bucket metrics
- ▶ DELETE Bucket policy
- ▶ DELETE Bucket replication
- ▶ DELETE Bucket tagging
- ▶ DELETE Bucket website
- ▶ GET Bucket (List Objects) Version 2
- ▶ GET Bucket accelerate
- ▶ GET Bucket acl
- ▶ GET Bucket analytics
- ▶ GET Bucket cors
- ▶ GET Bucket inventory
- ▶ GET Bucket lifecycle
- ▶ GET Bucket location
- ▶ GET Bucket logging
- ▶ GET Bucket metrics
- ▶ GET Bucket notification
- ▶ GET Bucket Object versions
- ▶ GET Bucket policy
- ▶ GET Bucket replication
- ▶ GET Bucket requestPayment
- ▶ GET Bucket tagging
- ▶ GET Bucket versioning
- ▶ GET Bucket website



- ▶ HEAD Bucket
- ▶ List Bucket Analytics Configurations
- ▶ List Bucket Inventory Configurations
- ▶ List Bucket Metrics Configurations
- ▶ List Multipart Uploads
- ▶ PUT Bucket
- ▶ PUT Bucket accelerate
- ▶ PUT Bucket acl
- ▶ PUT Bucket analytics
- ▶ PUT Bucket cors
- ▶ PUT Bucket inventory
- ▶ PUT Bucket lifecycle
- ▶ PUT Bucket logging
- ▶ PUT Bucket metrics
- ▶ PUT Bucket notification
- ▶ PUT Bucket policy
- ▶ PUT Bucket replication
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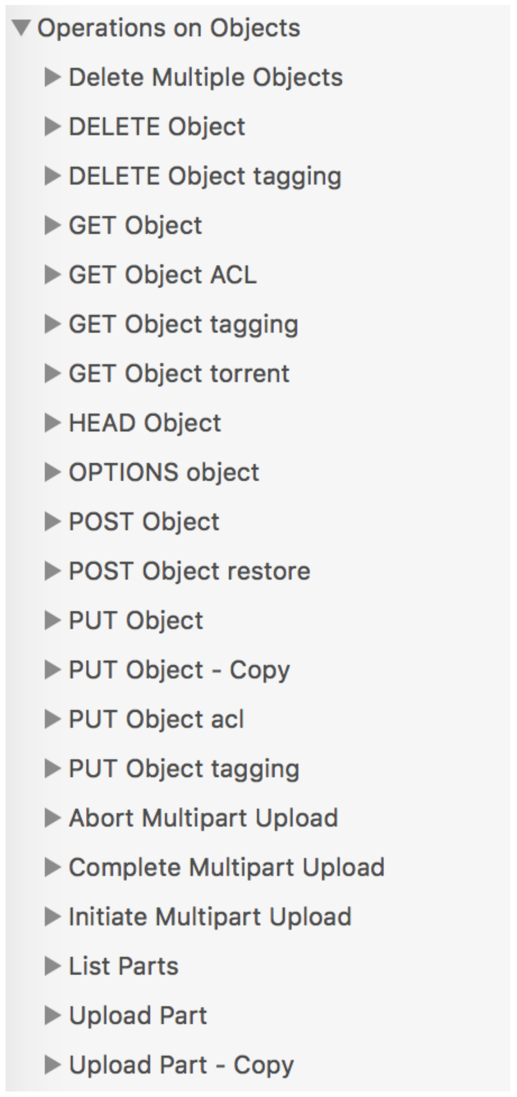
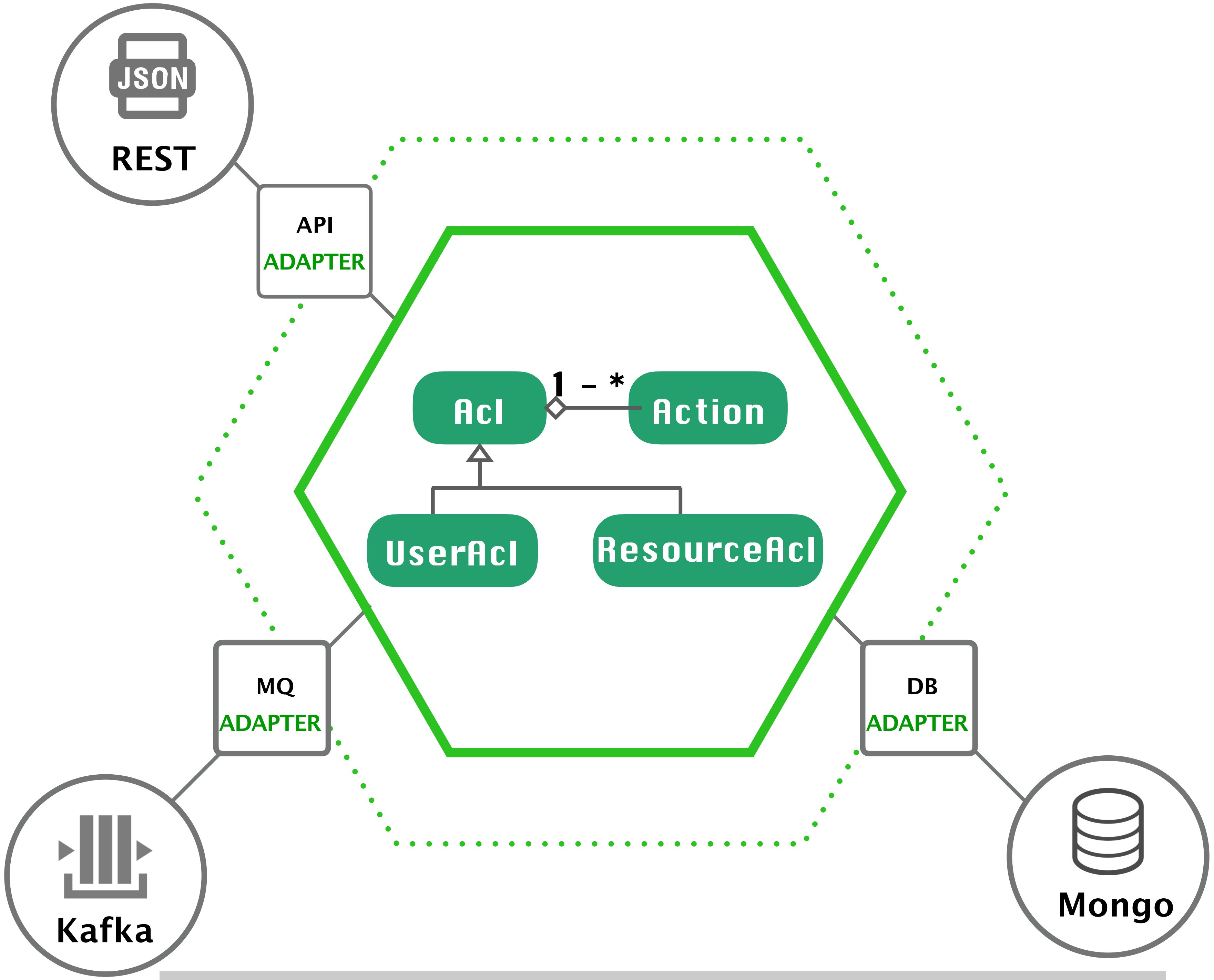
- ▶ PUT Bucket tagging
- ▶ PUT Bucket versioning
- ▶ PUT Bucket website



▼ Operations on Objects
- ▶ Delete Multiple Objects
- ▶ DELETE Object
- ▶ DELETE Object tagging
- ▶ GET Object
- ▶ GET Object ACL
- ▶ GET Object tagging
- ▶ GET Object torrent
- ▶ HEAD Object
- ▶ OPTIONS object
- ▶ POST Object
- ▶ POST Object restore
- ▶ PUT Object
- ▶ PUT Object - Copy
- ▶ PUT Object acl
- ▶ PUT Object tagging
- ▶ Abort Multipart Upload
- ▶ Complete Multipart Upload
- ▶ Initiate Multipart Upload
- ▶ List Parts
- ▶ Upload Part
- ▶ Upload Part - Copy

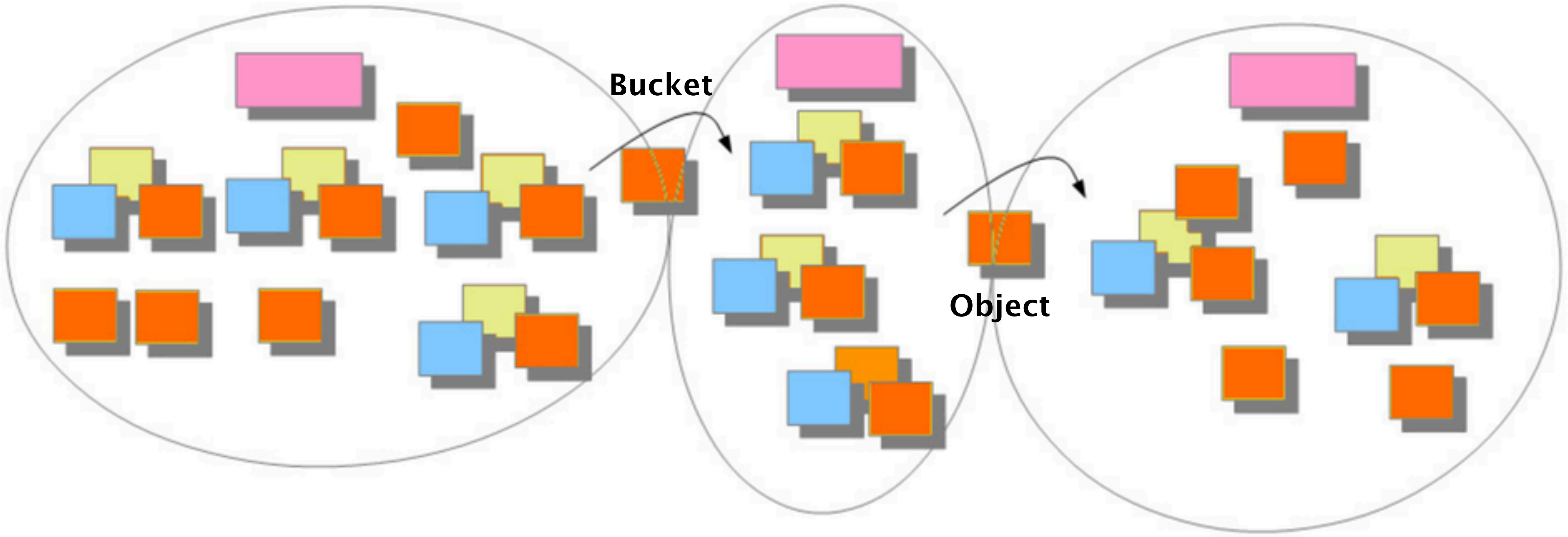
SDK

DOMAIN MODEL IS CRITICAL



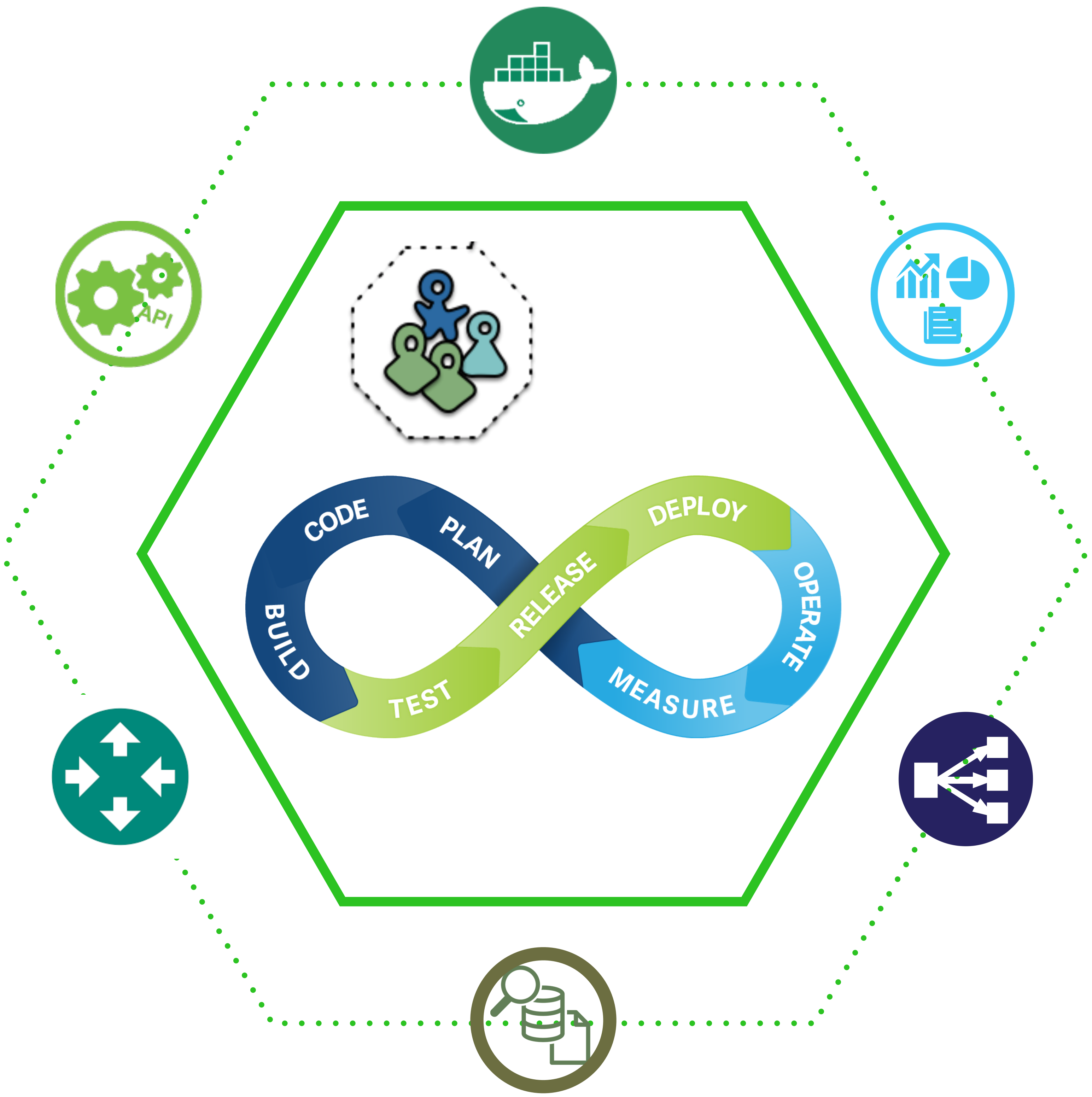
- *decouple with DB, API, SDK…*
- *prevent from anemia model （TDA)*
- *reuse between microservices carefully （RoR)*

USE DOMAIN EVENT TO SHARE MODEL



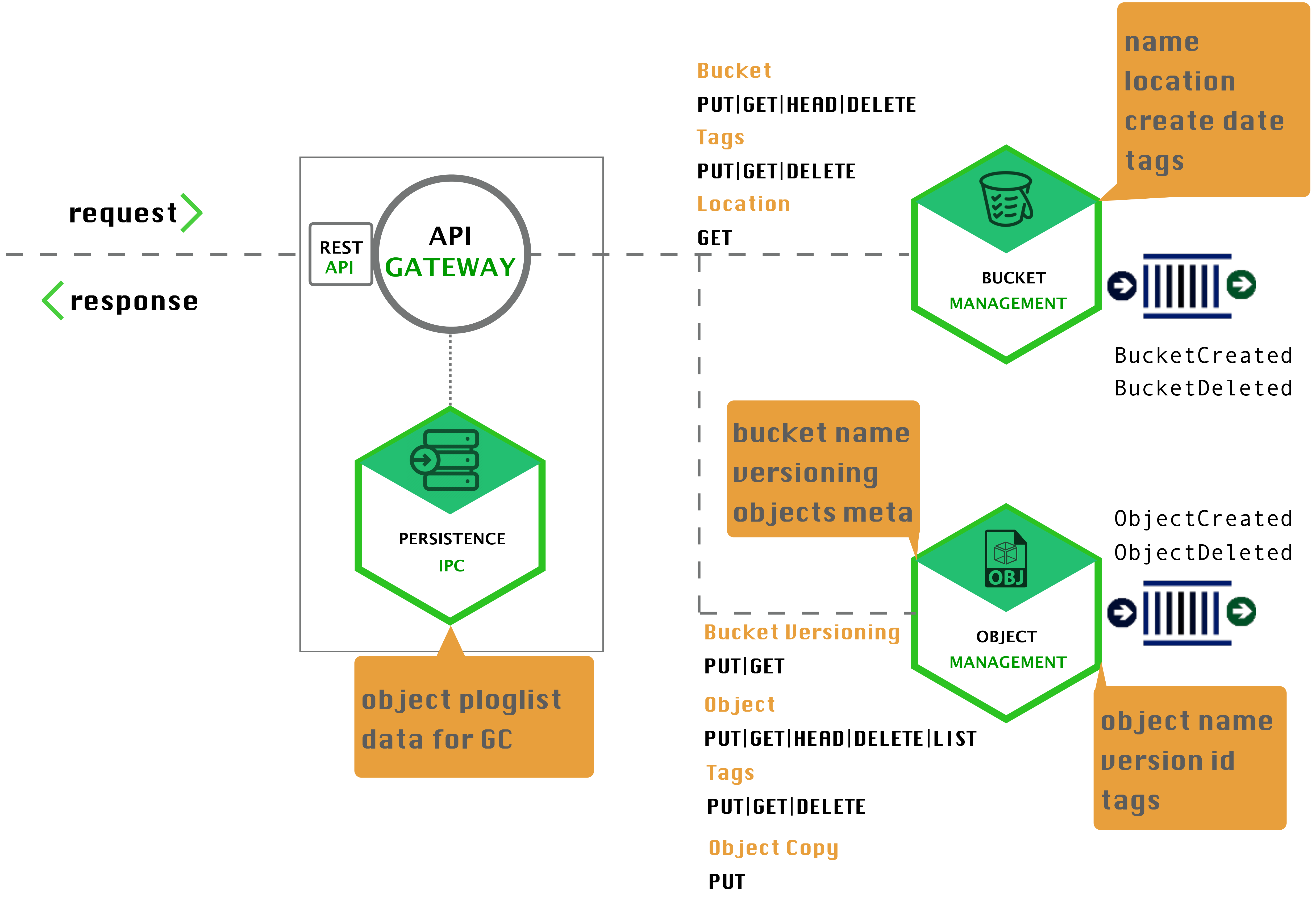
- *communicating by domain events*
- *separate command and query*

INFRASTRUCTURE SUPPORT

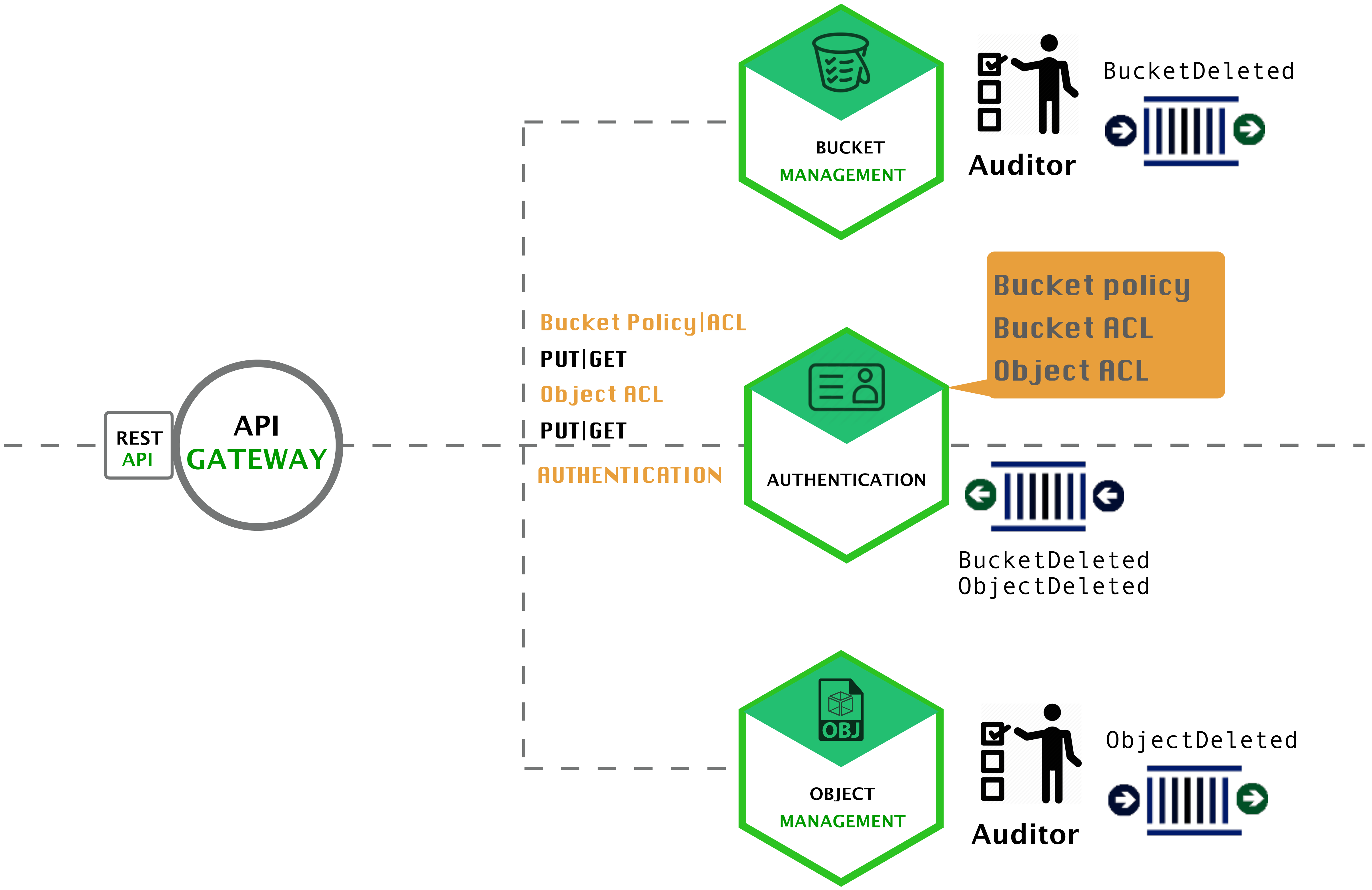


Architecture Proposal

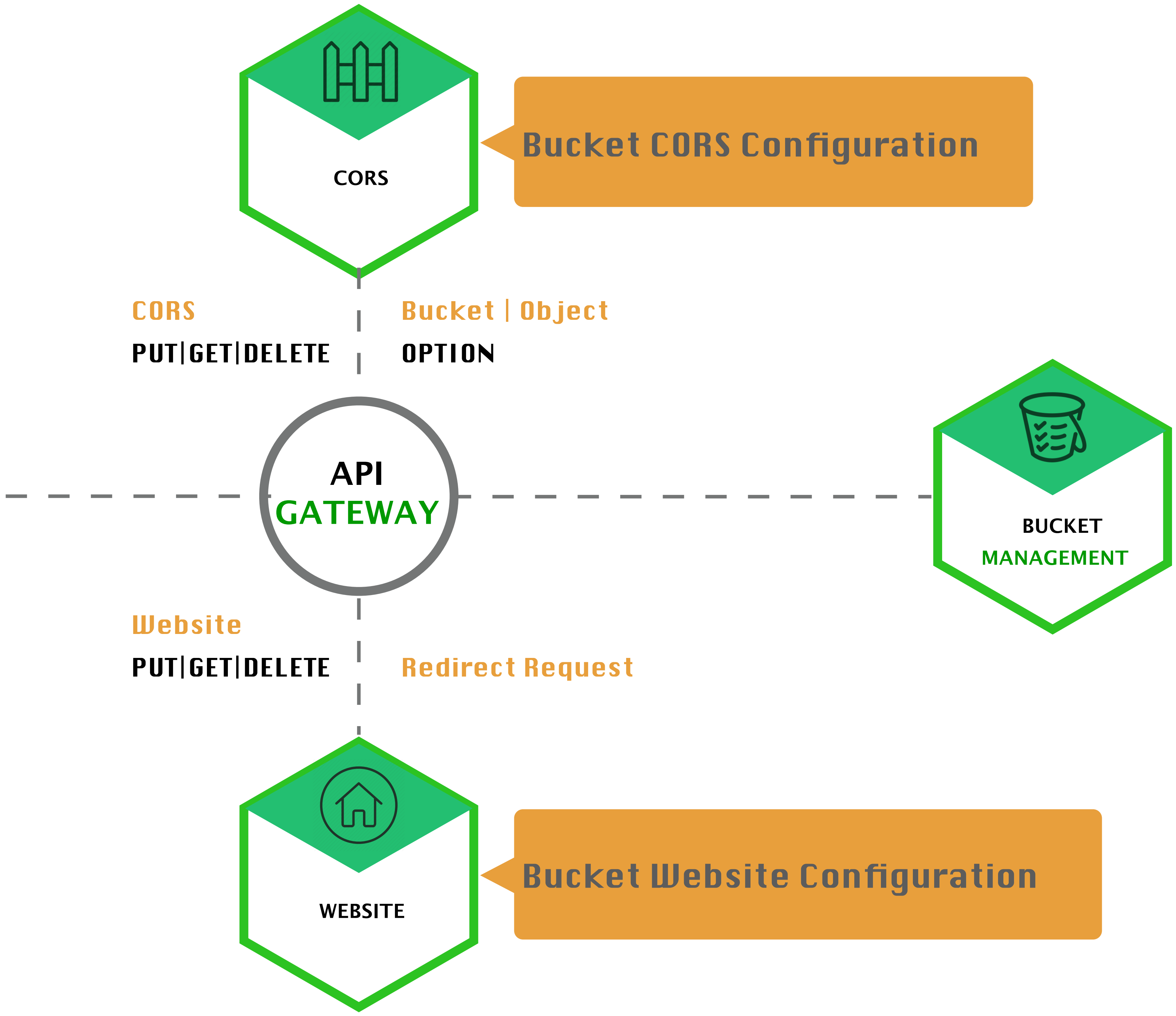
BASE SKETCH


request
response
REST API
API GATEWAY
PERSISTENCE IPC
object ploglist data for GC
Bucket
PUT|GET|HEAD|DELETE
Tags
PUT|GET|DELETE
Location
GET
BUCKET MANAGEMENT
name
location
create date
tags
BucketCreated
BucketDeleted
bucket name
versioning
objects meta
OBJ
OBJECT MANAGEMENT
ObjectCreated
ObjectDeleted
Bucket Versioning
PUT|GET
Object
PUT|GET|HEAD|DELETE|LIST
Tags
PUT|GET|DELETE
Object Copy
PUT
object name
version id
tags

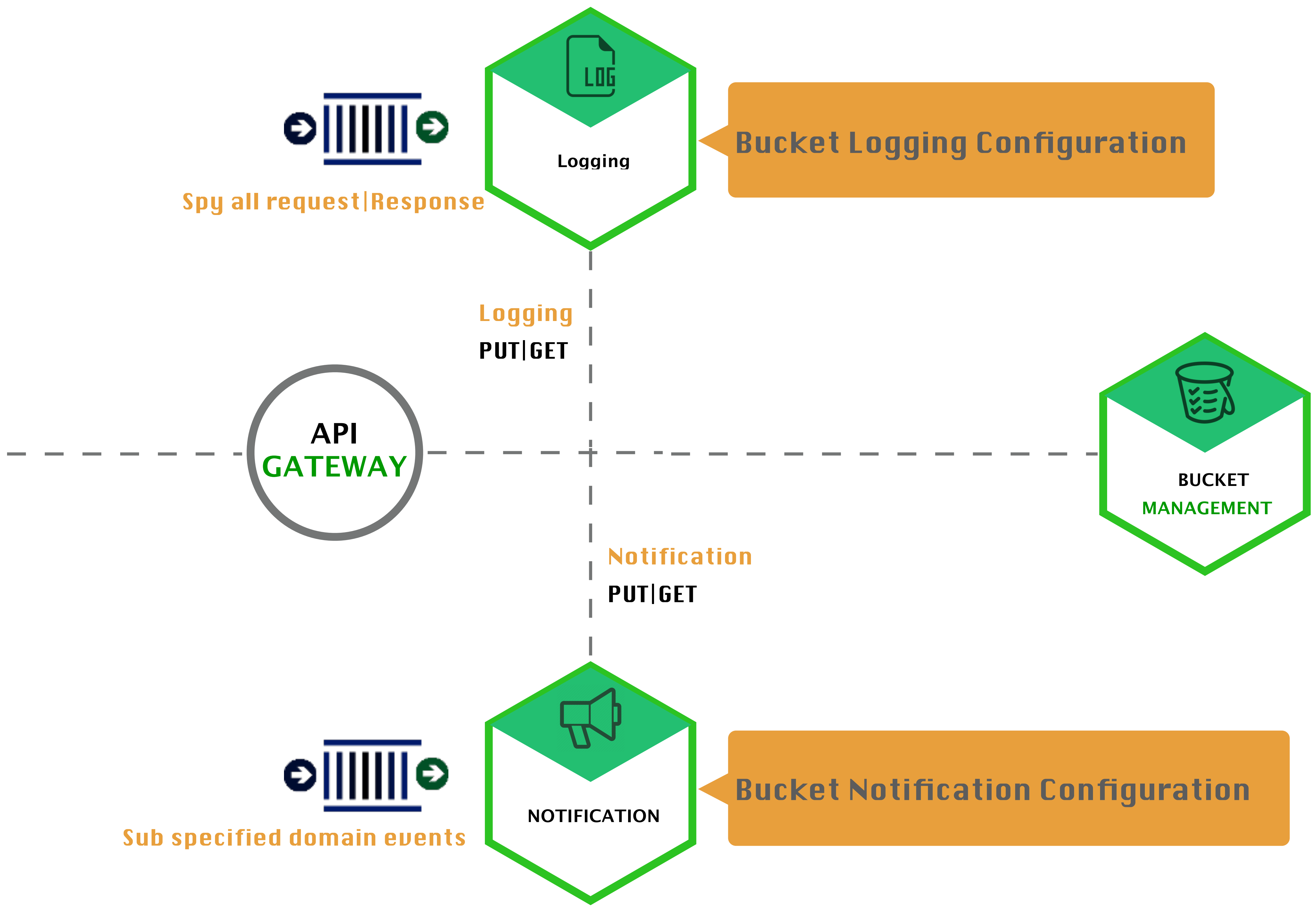
AUTHENTICATION



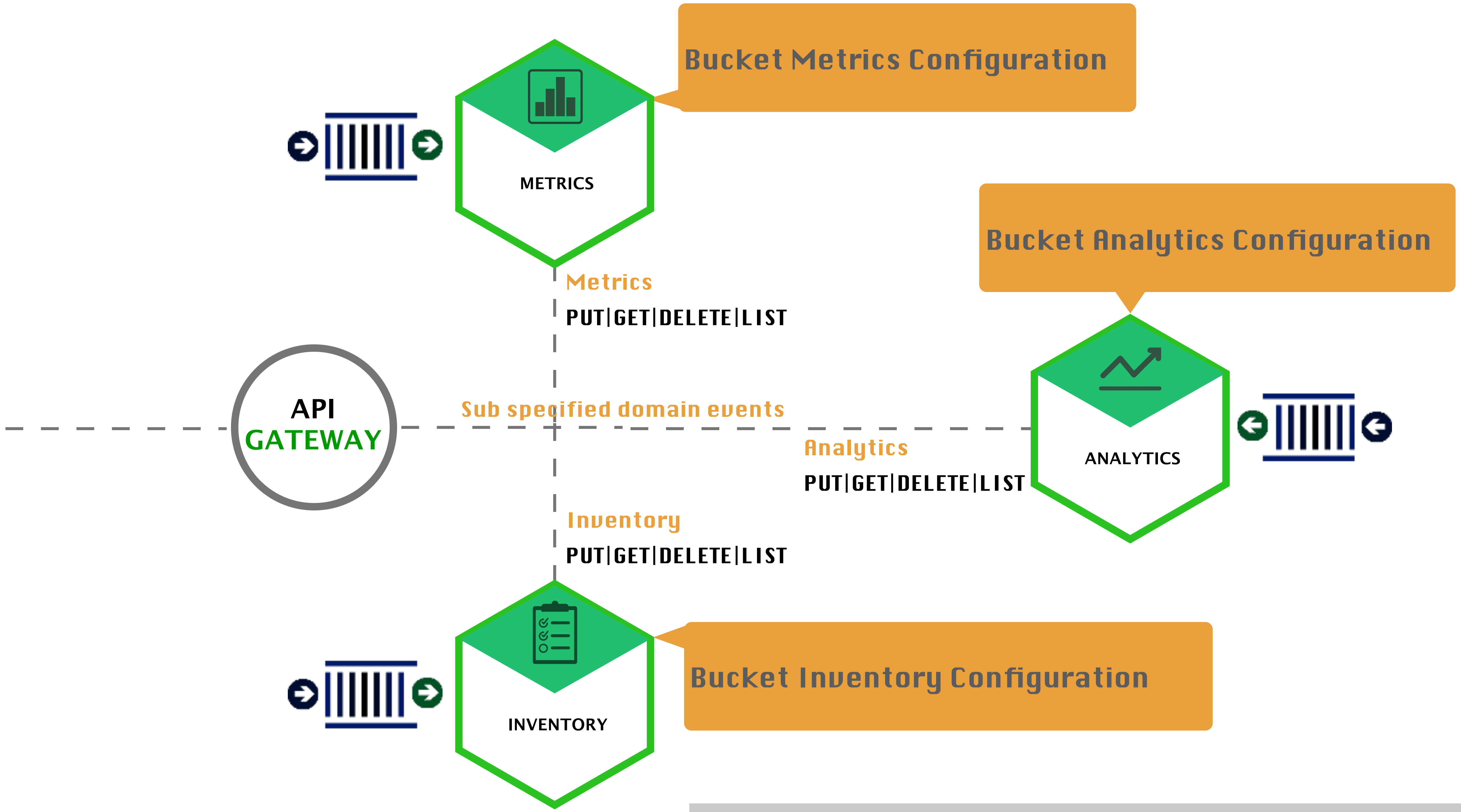
WEBSITE AND CORS



LOGGING AND NOTIFICATION

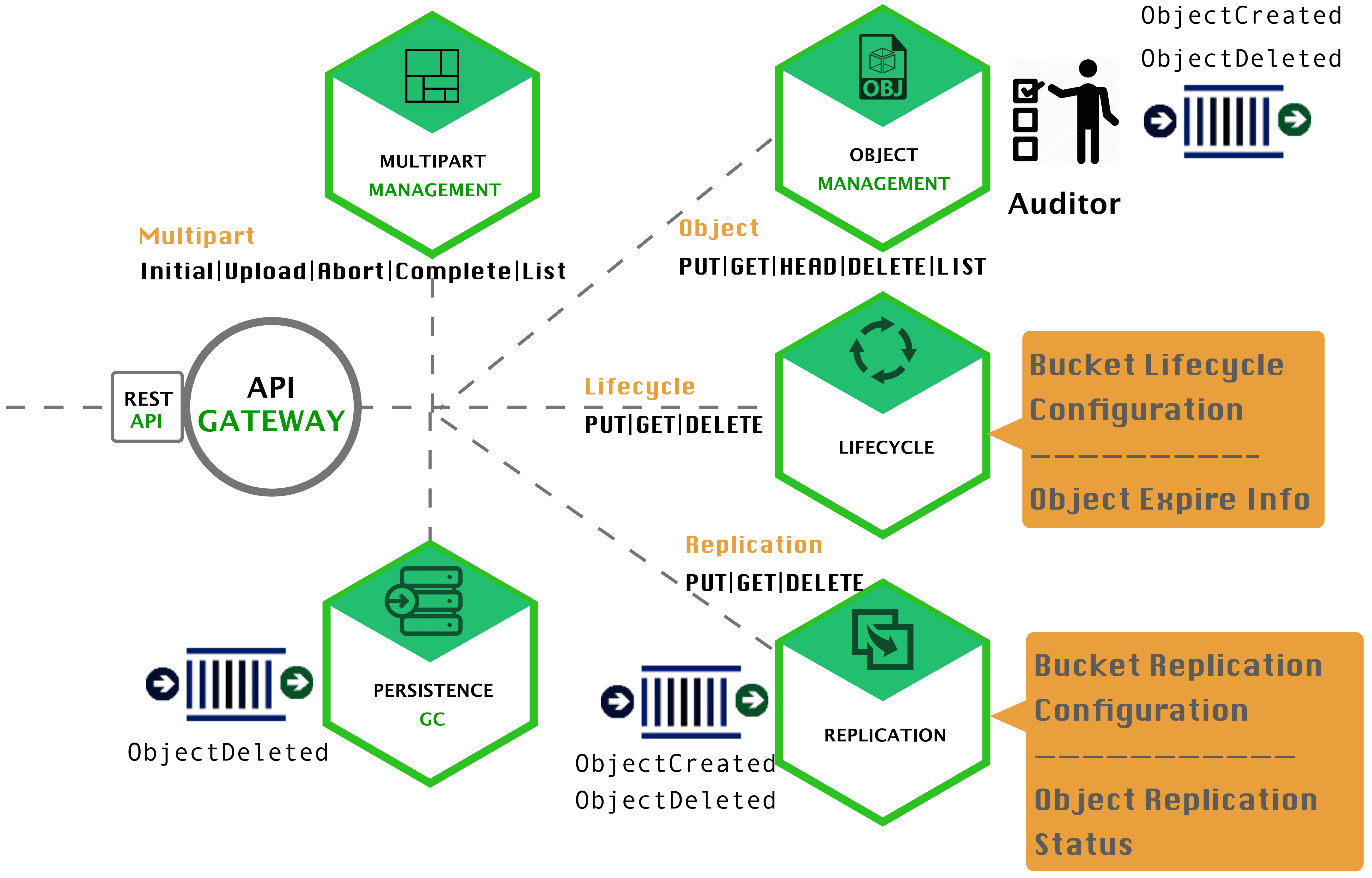


STATISTICS AND ANALYTICS



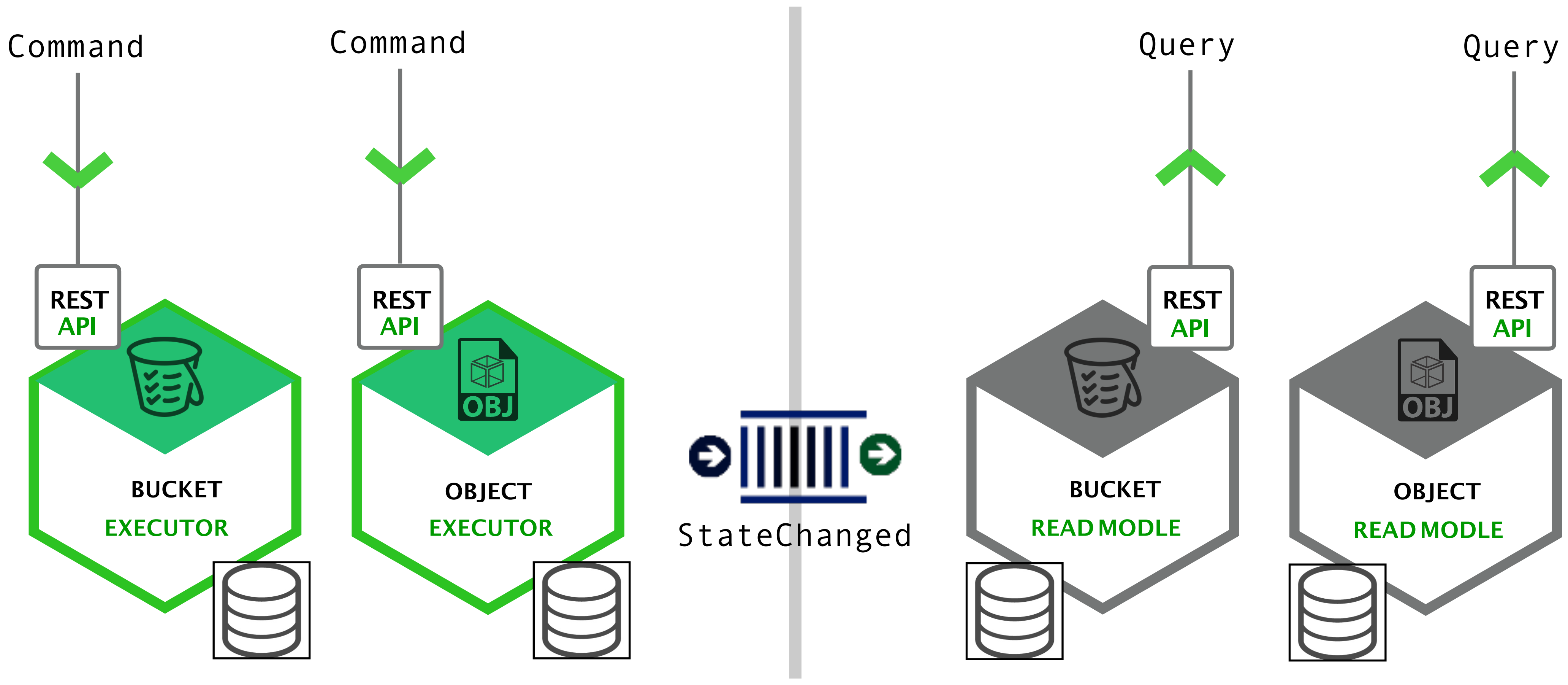
➤ *Maybe time series database is more suitable*

OBJECT

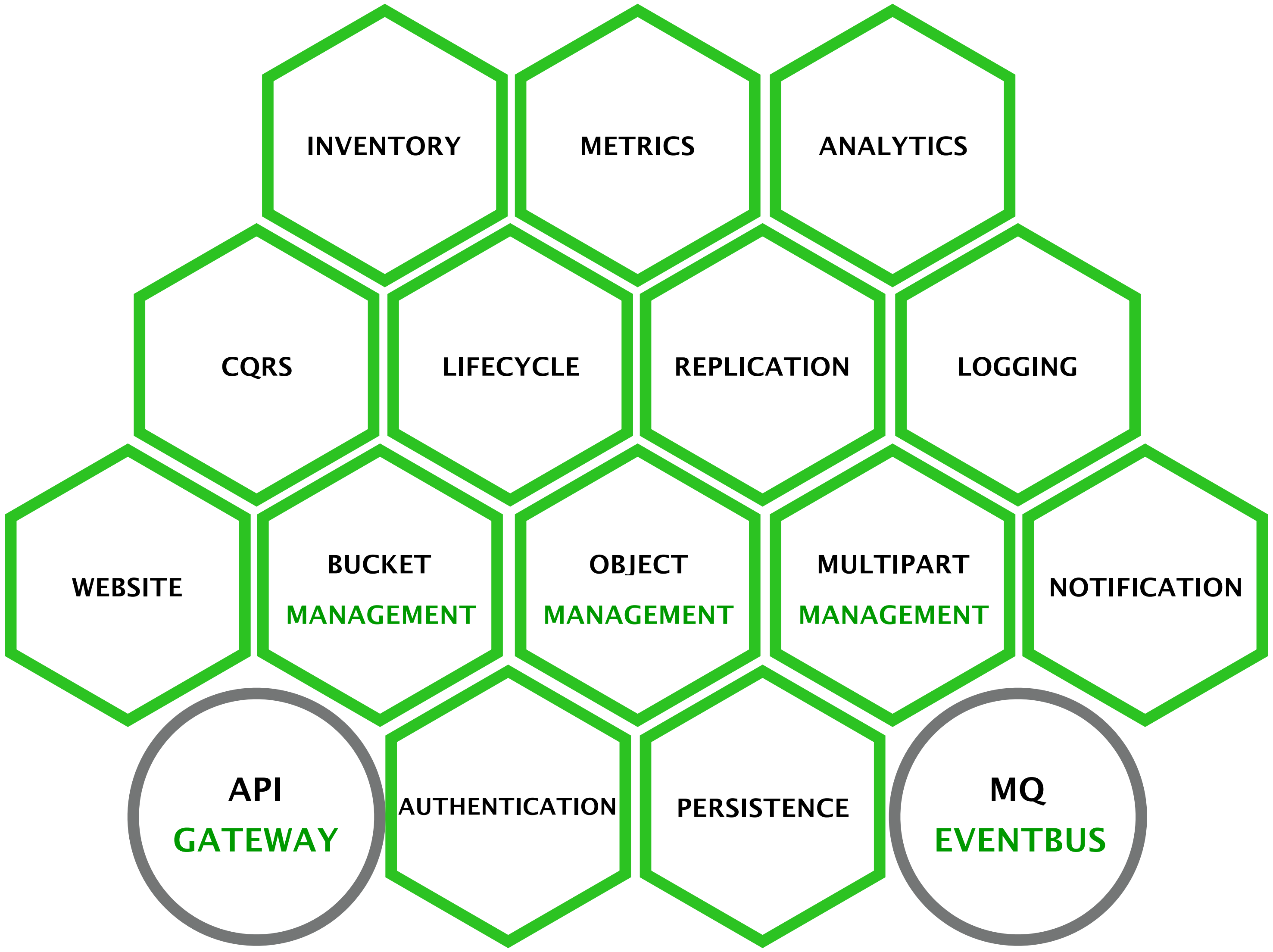


➤ *Composite design： service level reuse*

CQRS IS AN OPTION



CONCLUSION

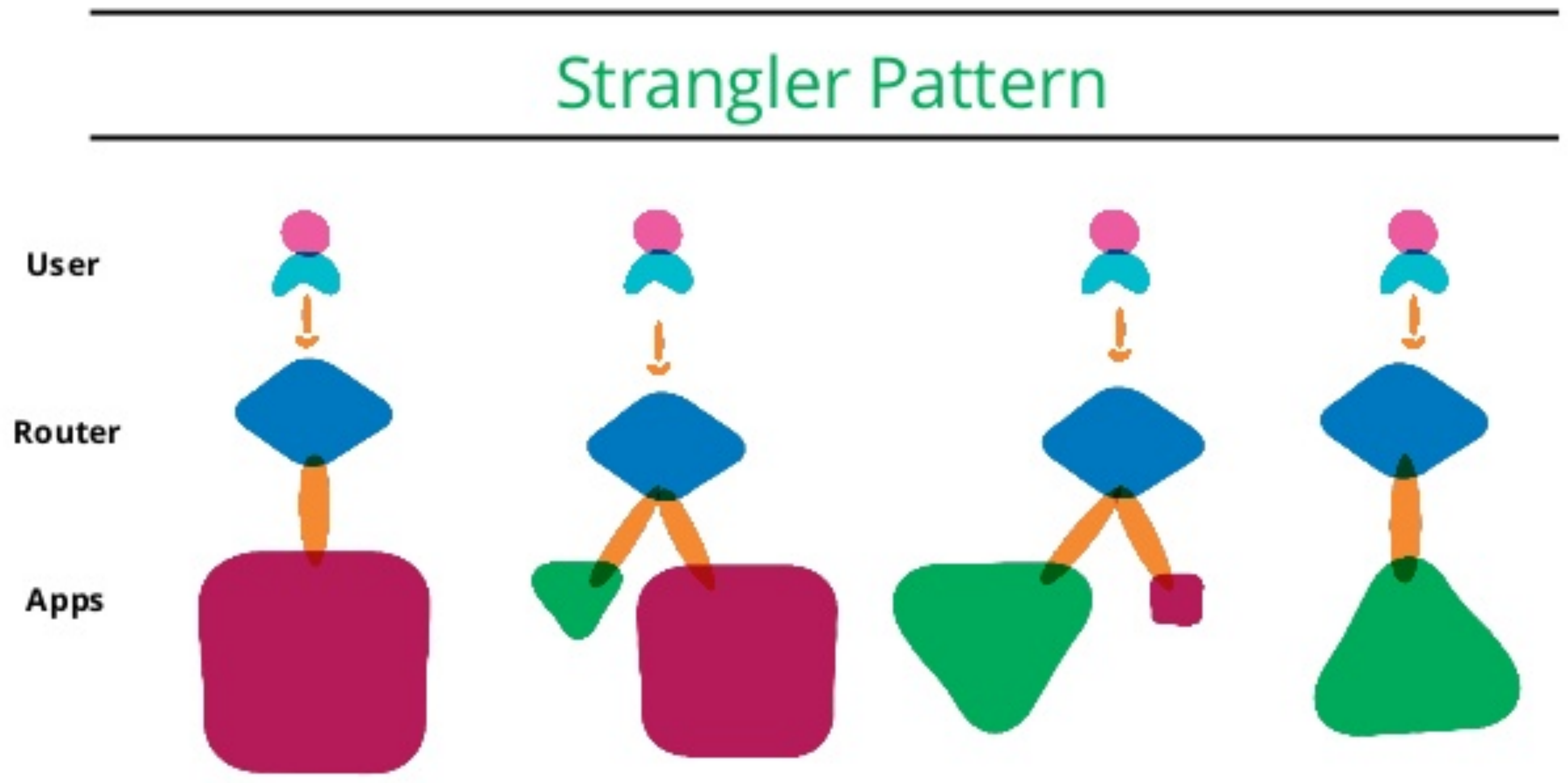


- *vertical partitioning*
- *service level reuse*

- *separate different concerns*
- *narrow dependencies*
- *depend on stable directions*

Evolution Suggestions

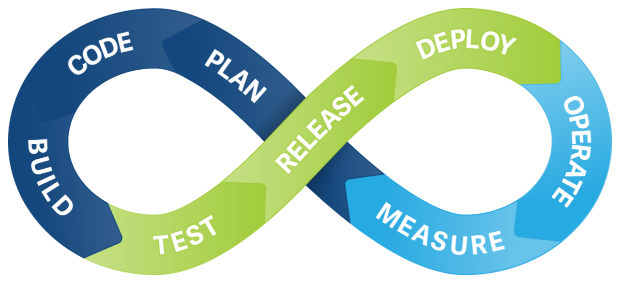
EVOLUTION WAYS



➤ *Visualize the whole process, statistics can tell you more!*

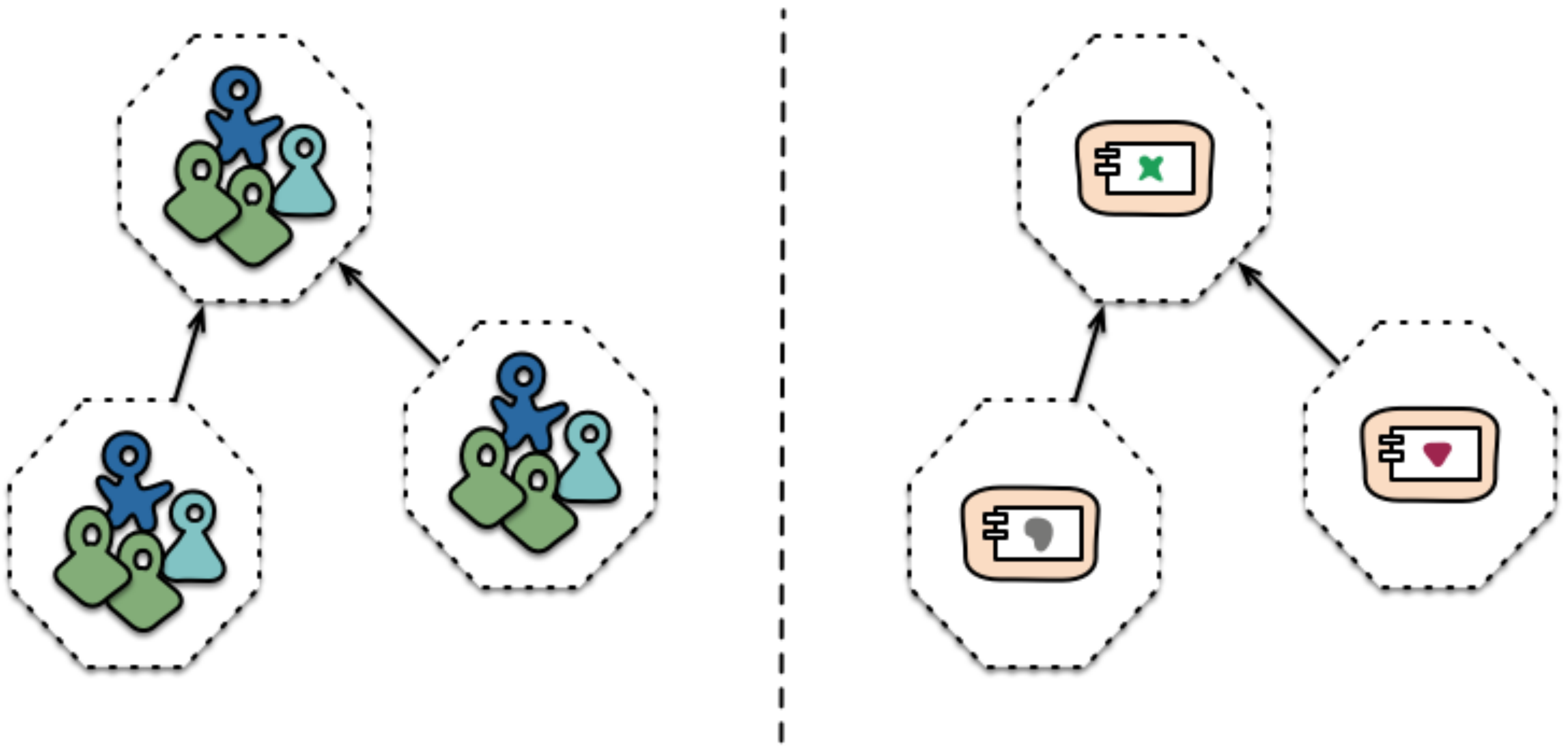
IMPROVEMENTS

- Skills of design, coding and test
  - Domain Driven Design
  - Orthogonal design
  - TDD, Refactoring ...



- Process on continuous delivery pipeline
  - Consumer driven contract test
  - integrating speed

ADAPTIVE ORGANIZATION STRUCTURE



Cross-functional teams...

... organised around capabilities
Because Conway's Law

Questions?

ThoughtWorks

THANKS

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