Top Level Performance

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Agenda

1. Use-case analysis
2. Infrastructure
3. Optimization examples
4. Testing
5. Repository walk-through

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Know your use-case

- Decide on the core measurements to optimize for

Read vs. Write

- Focus on high frequency updates
- Many parallel (retrieval) requests
- Mixture of both

Update size and parallelity

- Single entity/attribute updates
- Batch updates (of varying sizes)
- Few high-frequency clients
- Many parallel clients

Know your use-case

- Decide on the features required for the use-case

Subscriptions

- Multiple Subscribers
- Single/few subscribers
- Complex subscription queries
- Full data updates

Temporal representation of entities

- Full History for every entity
- History for subset only
- Reduced density enough?
- History retention/down-sampling

Take a look at Orion Performance Tuning for further details.

Be aware of your infrastructure

- Flexibility for up and downscaling
- Rolling updates
- Automated(versioned) configuration and deployment
  - https://github.com/FIWARE/helm-charts/tree/main/charts/orion

Images: https://commons.wikimedia.org, https://github.com/cncf/artwork

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Be aware of your infrastructure

- Operational tooling
  - Logging
  - Monitoring
  - Alerting
- Ingress
  - Scale with the broker
  - Support operational aspects
- Persistence
  - HDD vs. SDD

Images: https://commons.wikimedia.org, https://github.com/cncf/artwork

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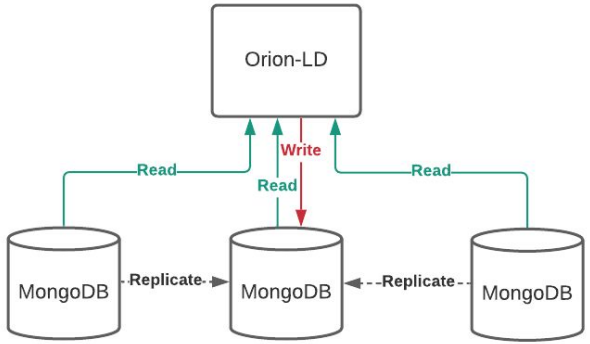
Improve write performance

- Set “db.entities.createIndex({"_id.id”: 1})” on MongoDB
- Use SSD-Disks on MongoDB(if self-managed)
- Prefer scaling MongoDB vertical over horizontal
- Batch-Operations: Increase Memory assigned to Orion

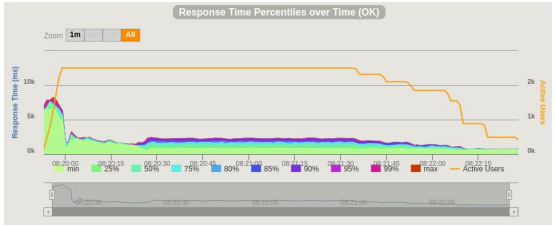
Improve read performance

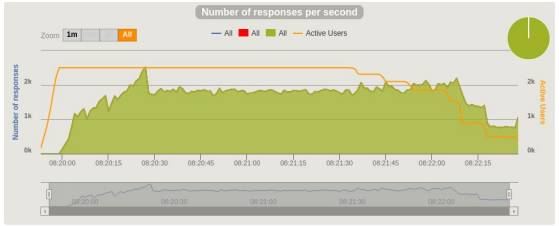
- Indexes fitting the common queries
- Use read replicas
- If available, InMemory-engine for MongoDB

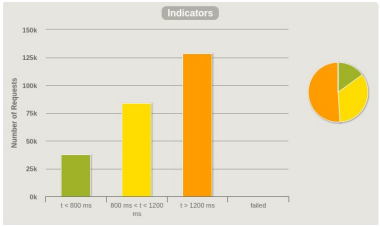


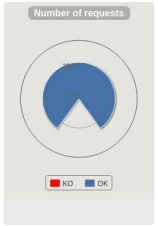
Test the assumptions

- Load-tests for running against the NGSI-LD/V2 context broker
  - https://github.com/FIWARE/orion-loadtest
  - Gatling framework, multiple scenarios implemented
  - Reports for multiple sizes available, including all configurations
- Execute tests from local (mvn, gatling reporter)
- Execute distributed in the cluster (via kubernetes jobs)
- Can be used to evaluate different configurations for specific use-cases









Repository walk-through

Helm-Charts: https://github.com/FIWARE/helm-charts

Repository walk-through

Test-framework: https://github.com/FIWARE/orion-loadtest

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