Health Monitoring

using ActiveMQ Artemis and Quarkus on OpenShift

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About me

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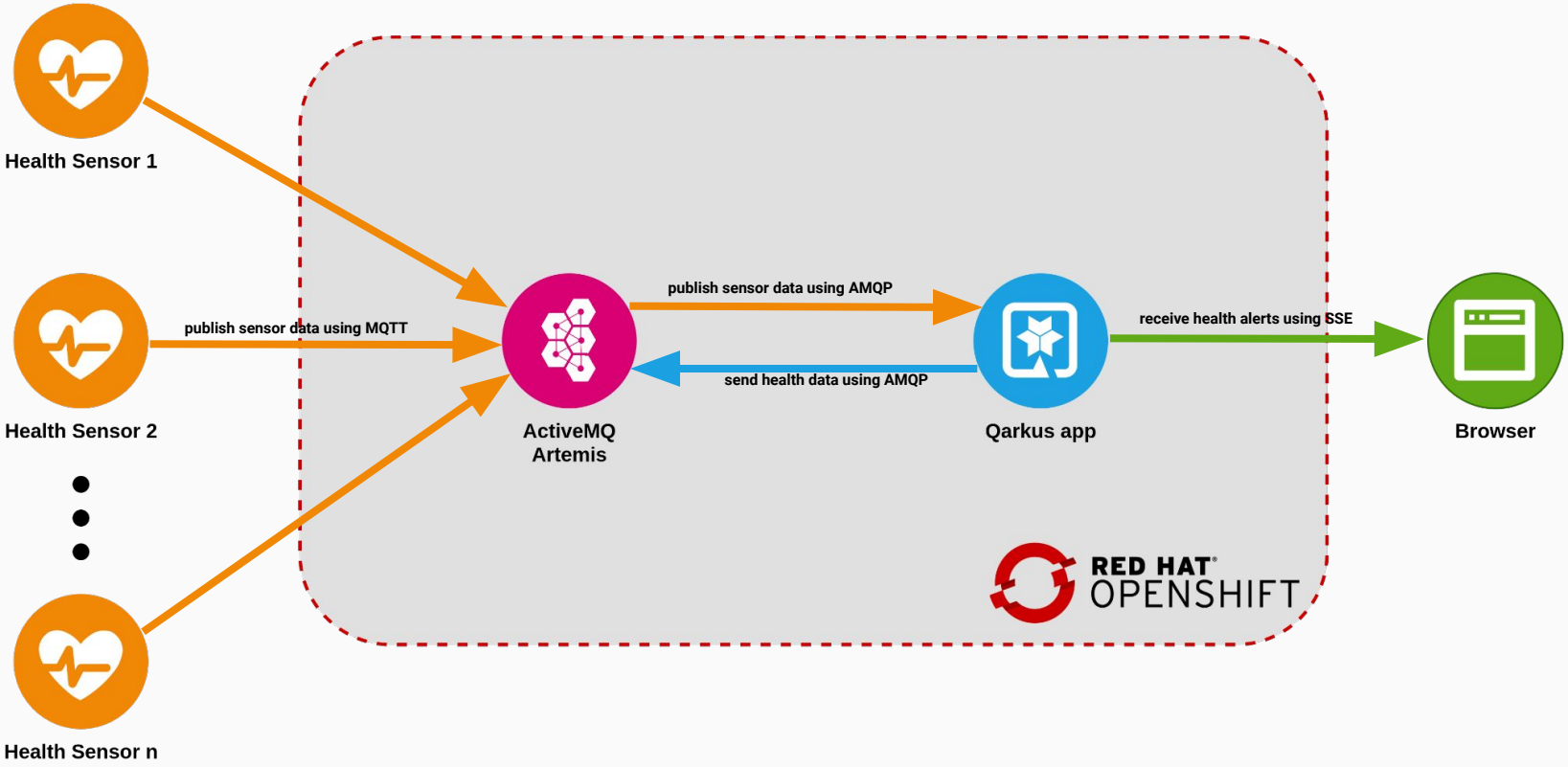
Agenda

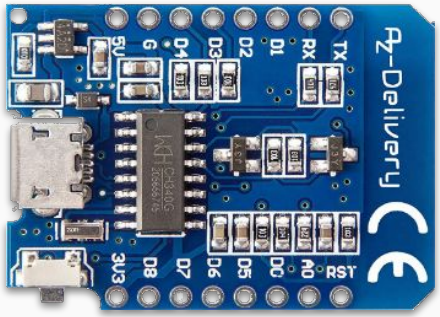
- Overview
- Health sensor
- ActiveMQ Artemis
- ArtemisCloud
- Quarkus
- Addresses
- Demo
- Questions and answers

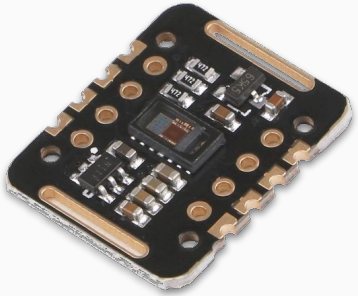
Overview


Health Sensor 1
Health Sensor 2
Health Sensor n
publish sensor data using MQTT
ActiveMQ
Artemis
publish sensor data using AMQP
send health data using AMQP
Qarkus app
receive health alerts using SSE
Browser
RED HAT
OPENSHIFT

Health sensor

- What hardware?
  - ESP8266
  - MAX30102
- What data?
  - SpO2
  - Heartrate
  - Temperature
- Why MQTT?
  - lightweight
  - flexibility





ActiveMQ Artemis

- Standards based (JMS 1.x/2.x/3.x)
- Multi protocol (AMQP, MQTT, STOMP, OpenWire)
- Powerful and flexible address model
- Transaction support
- Embedding support
- Cluster ready and highly available

ArtemisCloud

- Open source project sponsored by RedHat
- Deploys ActiveMQ Artemis on Kubernetes
- An operator based solution
- Provides custom resource definitions
  - Broker
  - Address
  - Scaledown

```yaml
apiVersion: broker.amq.io/v2alpha4
kind: ActiveMQArtemis
metadata:
  name: ex-aao
spec:
  deploymentPlan:
    size: 1
    image: placeholder
```

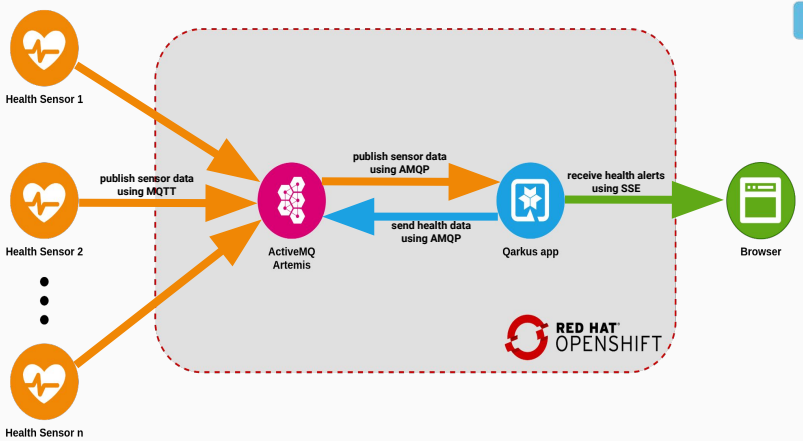
Quarkus

- Toolkit and framework for java
- Supersonic Subatomic Java
- Native Image Support
- Serverless e Container-Friendly
- Best of breed libraries and standards
- Unifies imperative and reactive

```
@Inject
@Channel("health-alert")
Publisher<JsonObject> healthAlert;

@GET
@Path("users/alerts")
@Produces(MediaType.SERVER_SENT_EVENTS)
public Publisher<JsonObject> userHealthAlerts() {
    return healthAlert;
}
```

Addresses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alert
data
health
event
data
sensor
user 2
data
event
sensor
data
alert
health
data
event
sensor
alert
data
health
users
user 1
user n

Demo

Conclusions

- This is a proof of concept.
- To do …
- Questions?

Resources

Cloud Health Monitoring

https://github.com/brusdev/health-monitoring

- ActiveMQ Artemis: https://activemq.apache.org/components/artemis/
- ArtemisCloud: https://artemiscloud.io/
- Quarkus: https://quarkus.io/
- Node-RED: https://nodered.org/
- Arduino on ESP8266: https://github.com/esp8266/Arduino