Building containerized IoT solutions on OpenShift

Featuring Red Hat Enterprise Linux, JBoss A-MQ, Fuse Integration Service, BRMS, OpenShift Container Platform

Andrew Block, Ishu Verma
Red Hat

May 2, 2017
Enterprise IoT

Help with finding a parking space

30 percent of drivers in cities are looking for a parking space. Intelligent machine-to-machine (M2M) solutions make life easier in the city.

1. Sensors "detect" whether a parking space is occupied or vacant and...
2. ...transmit data to the central server
3. Smartphone app "requests" a parking space and guides drivers to the free space
4. Parking fee is paid directly through the app
5. Special permit Administration of...
6. Legitimation Access control to restricted traffic areas such as loading zones, residential parking

Intelligent Street Lighting

Turns on/off (increases the light intensity) when the street is actually used

Smart pumps can further improve safety by standardizing the dosing units and calculating the rate in these dosing units, as well as ml./hr, eliminating the risk of calculation error.
Enterprises are Embracing Digital Transformation

- **STREAMLINED AND AUTOMATED**
- **ELASTIC AND SCALABLE**
- **AGILE AND RESPONSIVE**
- **UTILITY-LIKE**

- **PROVISIONING, CONFIGURATION MANAGEMENT**
- **HYBRID CLOUD AND CLOUD BURSTING**
- **RAPID APPLICATION DEPLOYMENT**
- **MANAGED, POLICY DRIVEN, AND ALWAYS ON**
Containers Help Achieve Digital Transformation

- **Packaging**
  - Atomic
  - Built for Continuous Integration and Continuous Delivery

- **Collaboration**
  - Containers consist of infrastructure and application components
  - Multiple teams participate in container creation

- **Runtime**
  - Lightweight
  - Distributable
  - Portable
Lab Overview
IoT Use Case

The packages monitored by sensors; intelligent gateway routes data; business rules create alerts for driver, operations

Asset tracking
- Security
- Temperature control
- Vibration control
- Humidity control
- Location monitoring

Real-time alerts and business rules
- Dispatch control
- Customer notification
- Rerouting
Core Components

Intelligent IoT Gateway

Apache Zeppelin

PostgreSQL

Sensor

RED HAT OPENSHIFT
Container Platform
Lab Resources

- Red Hat Container Development Kit
- Lab Repository (/home/student/iot-ocp)
  - Templates
    - Broker
    - Database & Database Seeding
    - Integration Service
    - Software Sensor
    - Visualization
  - Zeppelin Configuration
  - Software Sensor Configuration File (ConfigMap)
  - Source Code for each Deployed Container
Lab Workflow

- **Lab 1**: Create Project, Add Templates
- **Lab 2**: Add Resources to Project
- **Lab 3**: Configure Zeppelin
- **Lab 4**: Dynamic Capabilities
- **Lab 5**: Extending Functionality
Resources
Project Directory Structure

- **iot-ocp-routing-service**
  - Consumption, transformation and routing of messages
- **iot-ocp-software-sensor**
  - Simulated software sensor
- **rhel-zeppelin**
  - Visualization tool
- **summit2017-lab**
  - Tooling to support the 2017 Red Hat Summit lab
- **support**
  - Tooling to support the standalone project
Lab Directory Structure (cont.)

Located within the summit2017-lab directory within the project

- image-build
  - Tooling to build the lab environment
- runtime
  - Assets for attendees to utilize during the lab session
- scripts
  - Executables to build the lab environment
Additional Resources

- Red Hat Container Development Kit
  - https://developers.redhat.com/products/cdk/overview/
- OpenShift Container Platform
  - https://www.openshift.com/container-platform/
- Red Hat JBoss Fuse Integration Services (FIS)
- Red Hat A-MQ
- Red Hat JBoss BRMS
- Apache Zeppelin
  - Project Page: https://zeppelin.apache.org/
IoT on OpenShift Example Project

- Build containerized IoT Solution on OpenShift
  - Code: https://github.com/sabre1041/iot-ocp
Don’t forget to submit the survey!
THANK YOU

plus.google.com/+RedHat
linkedin.com/company/red-hat
youtube.com/user/RedHatVideos
facebook.com/redhatinc
twitter.com/RedHatNews

#redhat #rhsummit