Jean-Frederic Clere
Tomcat: from a cluster to the Cloud
• Who I am
• A cluster:
  - Session replication and application.
• The cloud:
  - Nope it doesn’t work from scratch.
  - External session replication
    • Via Infinispan and KubePing
  - Modify the tomcat cluster (still not finished)
    • AKA dynamic list of nodes
    • Only TCP (8888 port exported via deployment.yml)
  - Demos
• What next? Questions / Suggestions
Who am I?

- Jean-Frederic Clere
- Red Hat
- Years writing JAVA code and server software
- Tomcat committer since 2001
- Doing OpenSource since 1999
- Cyclist/Runner etc
- Lived 15 years in Spain (Barcelona)
- Now in Neuchâtel (CH)
A cluster

INTERNET

Router/Proxy

INTRANET
How to replicate sessions

- In cluster:
  - `<distributable/>` in web.xml
  - `<Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster"/>
  - Port upd 45564
  - Ports tcp range 4000:4100
Demo

- Number guess clusterized.
OPENSHIFT

- A Red Hat project / product
- See OpenShift
  https://www.openshift.com/
- Docker 1.4
- Kubernetes 1.12
Tomcat in OpenShift

**Master**
- API/Authentication
- Data Store
- Scheduler
- Management/Replication

**Routing Layer**
- Node
  - POD
  - RHEL

**Service Layer**
- Physical
- Virtual
- Private
- Public

**Persistent Storage**
- Database

**Developer**
- SCM (Git/Svn)
- CI/CD

**Operations**
- Existing Automation Toolsets
Developing Tomcat App in OpenShift

When a developer creates a new application OpenShift start a new pod.

RHEL Master
Node
Node
Node

AWS / CloudForms / OpenStack (IaaS) / RHEV (Virt) / Bare Metal
Getting started

- minishift:
  - Allow to demo on single box.
  - Easy to setup
  - Small demo

- Bare metal / VM:
  - Use ansible to install
  - 3 nodes + master minimal

- Tomcat webapp with sessions
  - Counter demo.
Session replication in a cluster

- **HTTP/1.1**
  - No transaction
  - No persistent connection

- **Web App:**
  - Using cookies to carry session ID
  - Store information in the session:
    - Shopping cart etc.

- **Multi nodes and dynamic**
  - Route request to right node
  - Replicate information
From a cluster to the Cloud

Load balancer

Tomcat node

Tomcat node

Tomcat node

HTTPD

RHEL

Broker

Node

RHEL

Node

RHEL

Node
Problems for a cluster to cloud...

• Many ways to solve:
  – Embed tomcat with SpringBoot
  – Create a docker image
  – Extend an existing docker image
  – Fabric8 (selected)

• Tomcat session replication:
  – No multicast in the cloud.
  – Need a “ping” to find the other nodes (KubePing)
  – Add view to the system account of the project.
Goals

● **Have something:**
  - Minimal modification of the *tomcat configuration (server.xml)*
  - Reuse existing code

● **Some code still missing:**
  - Some in Tomcat
  - Documentation / tests.

● **Some more stuff:**
  - We use ansible for the install.
  - Some maven builds and shells.
What is next?

- **Main sites:**
  - [https://docs.openshift.com](https://docs.openshift.com)
- **Questions?**
- **Suggestions?**