Red Hat OpenShift Overview

Sudharshan Govindan

sudharshan.govindan@in.ibm.com

@sudhargovindan

Projects vs Products

Production-Grade Open Source Project
quarterly minor releases, no long-term Support
community support
platform certification: (AKS, EKS, GKE, IKS)
core framework / limited security
platform or user responsible to integrate beyond core

Production-Grade Open Source based Product
quarterly releases, support for major release 3+ years
enterprise support
ecosystem certification: platform and app containers
k8s core plus abstractions / dashboard / security
opinions and integration of common features

OpenShift is trusted enterprise Kubernetes
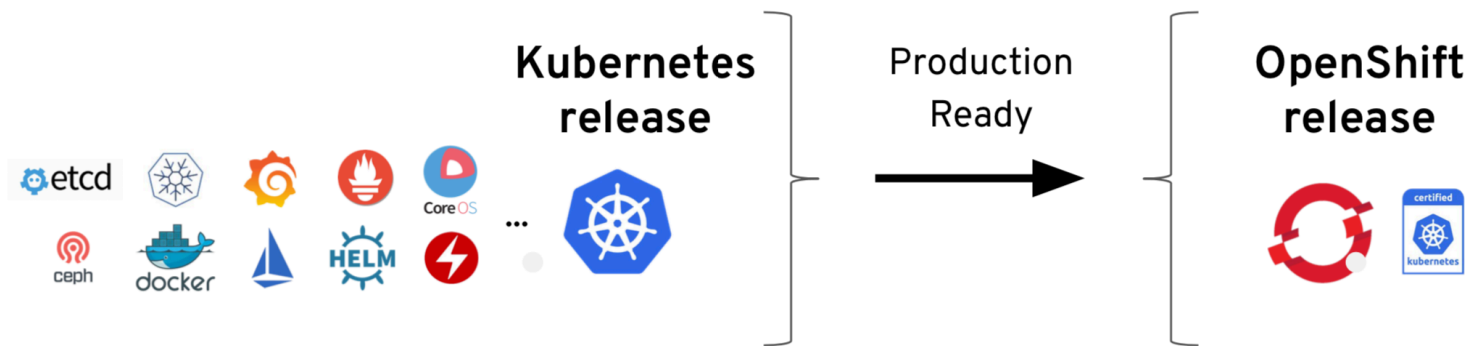
- Hundreds of defect and performance fixes
- 200+ validated integrations
- Certified container ecosystem
- 9-year enterprise life-cycle management
- Red Hat is a leading Kubernetes contributor since day 1

OpenShift Personas

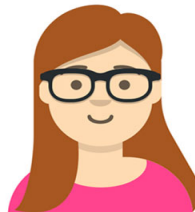| Summary of the kinds of challenges and pain points experienced by multiple personas				
Solution Architect	Operations Admin	Enterprise Developer	Line of business owner	Compliance/Audit
• Aligned to corporate requirements • Scalable and efficient • Available where needed cloud architectures	• Integrates with our environment • Manages containerized apps • Day 2 operations • Enable developer productivity / ownership • Features we need	• Supports languages and frameworks we use • Agility in projects with integrated DevOps • Less time with plumbing, more time with coding	• Increase velocity of application delivery • Modernizing applications • Reducing costs • KPI visibility	• Security built-in • Public cloud compliance • Private cloud options

A successful solution appeals to a broad range of roles, not just those classically associated with applications and code
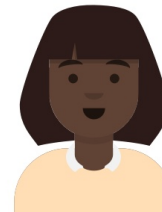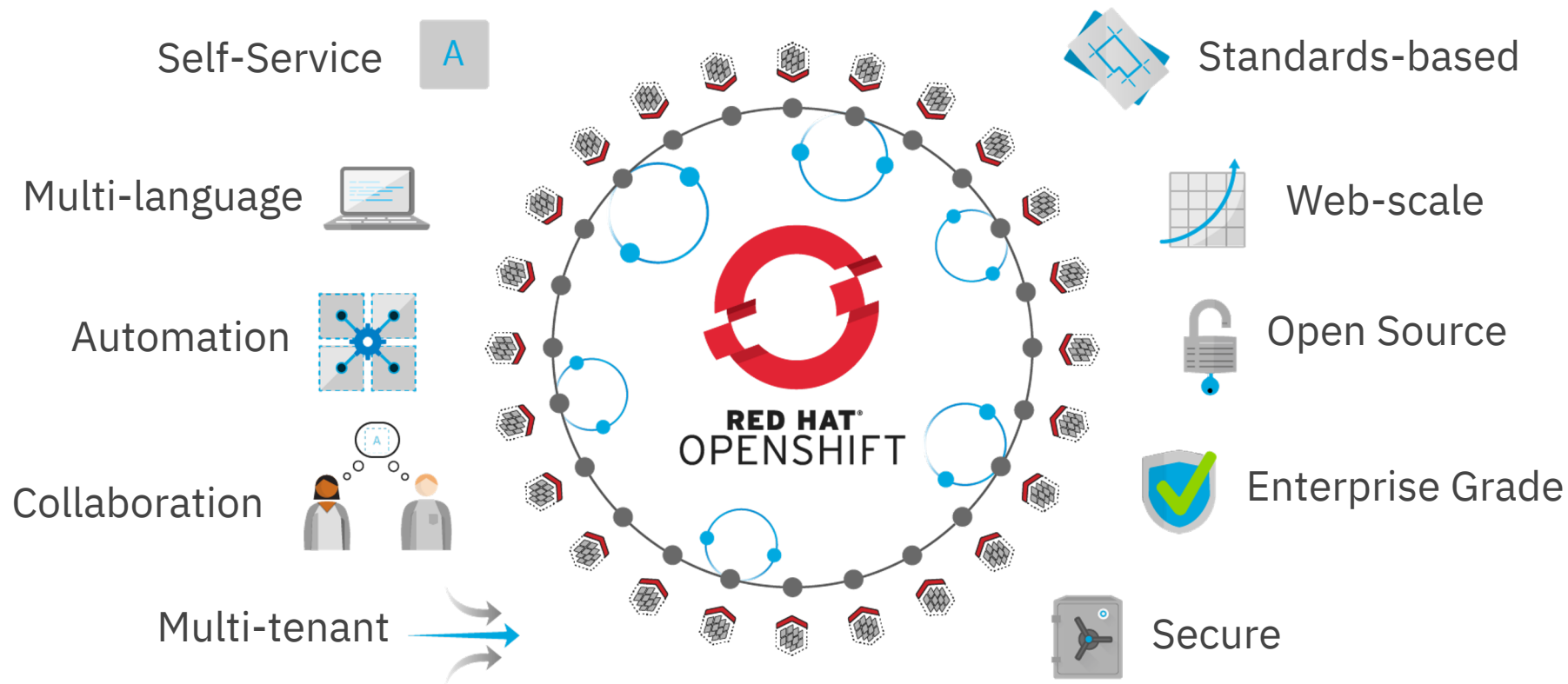
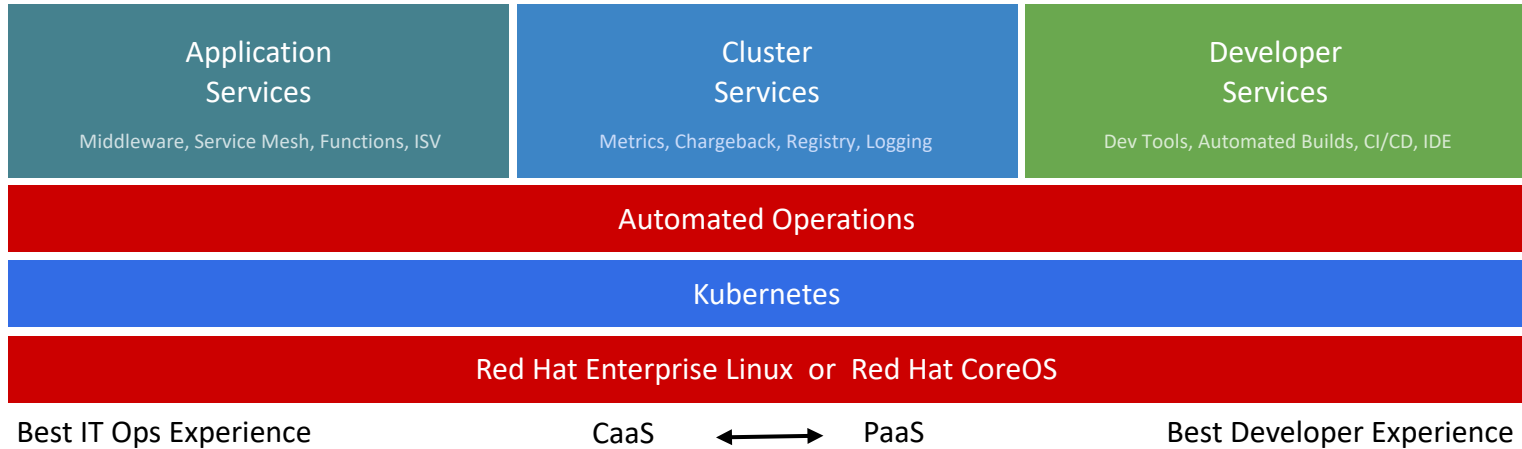**Champ**: Solution Architect **Todd**: Operations Admin **Jane**: Lead Enterprise Developer **Shani**: Line of business owner **Zora**: Compliance/Audit

IBM **Developer**

Self-Service

Multi-language

Automation

Collaboration

Multi-tenant

Standards-based

Web-scale

Open Source

Enterprise Grade

Secure

OpenShift Container Platform

Application Services	Cluster Services	Developer Services
Middleware, Service Mesh, Functions, ISV	Metrics, Chargeback, Registry, Logging	Dev Tools, Automated Builds, CI/CD, IDE

Automated Operations

Kubernetes

Red Hat Enterprise Linux or Red Hat CoreOS

Best IT Ops Experience   CaaS ⟷ PaaS   Best Developer Experience

OpenShift Architecture
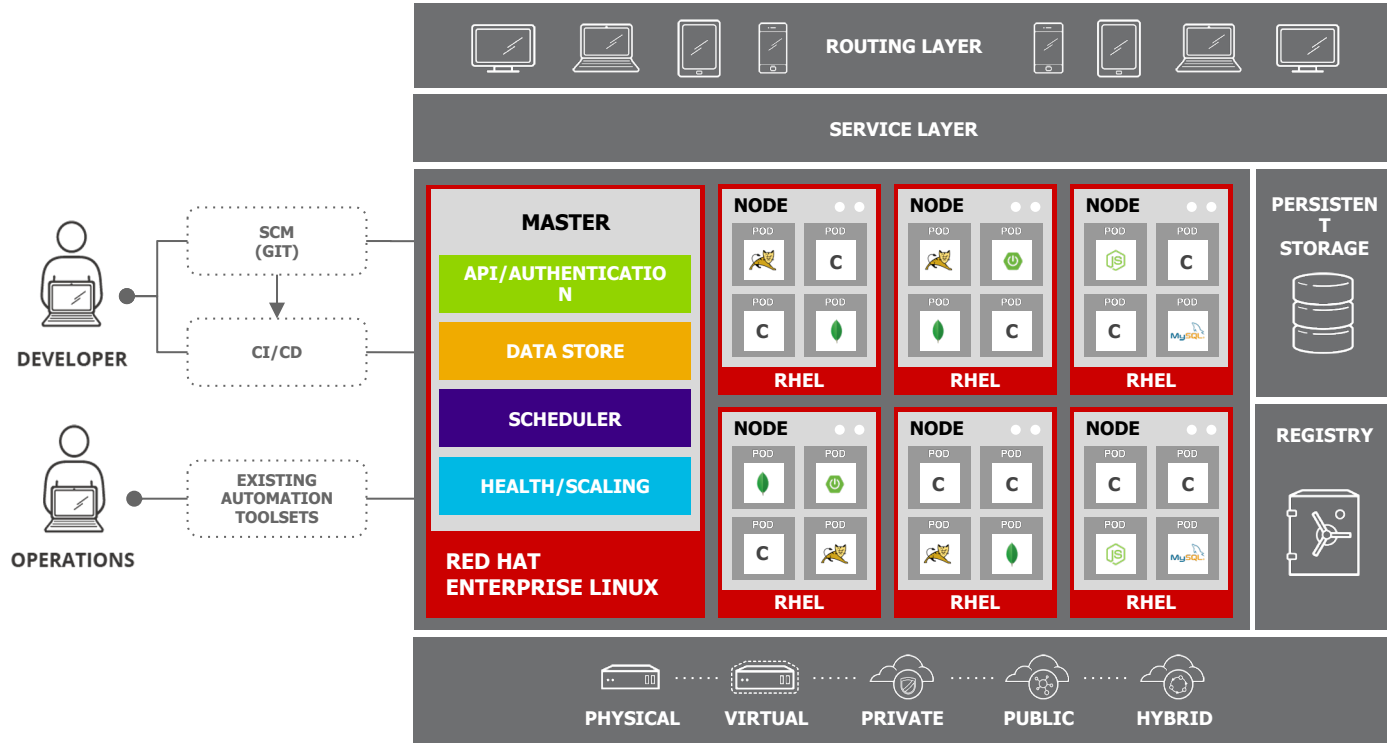
Container runtime

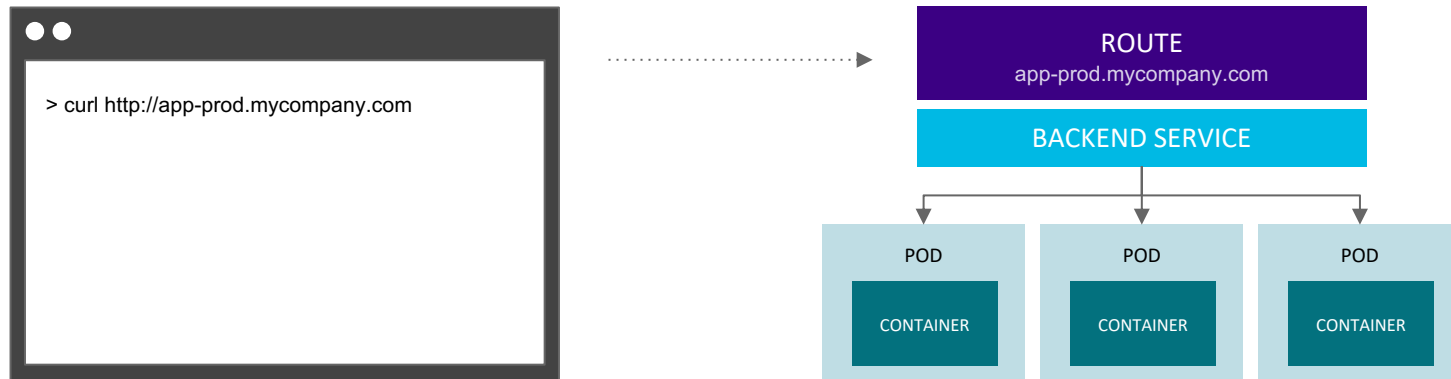

A lightweight, OCI-compliant container runtime

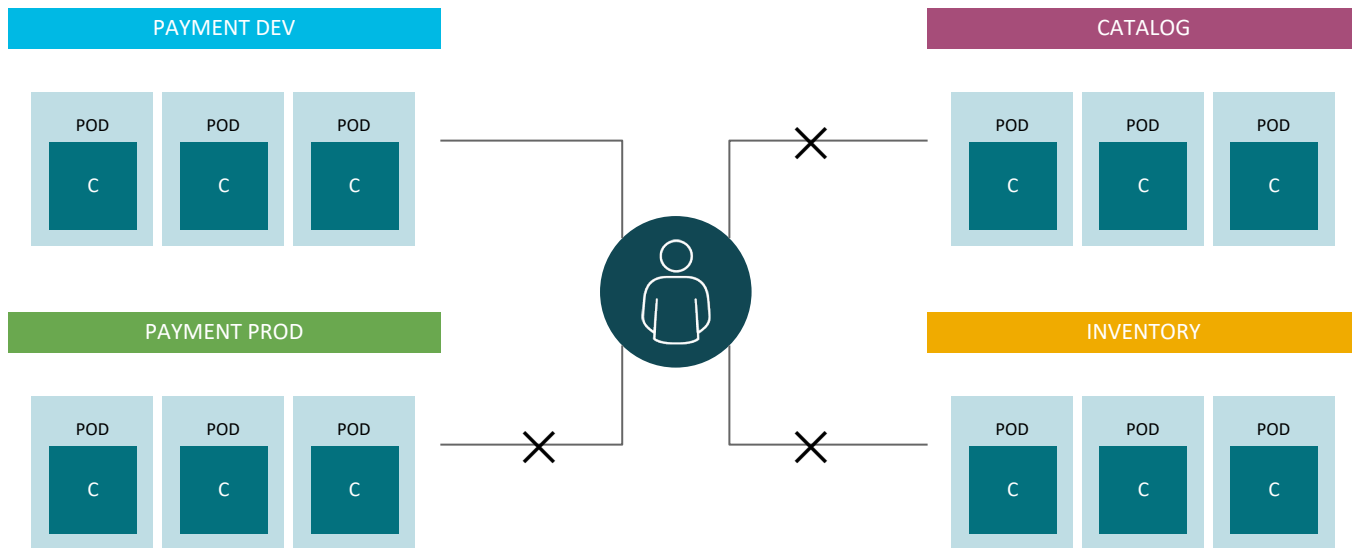| Minimal and Secure Architecture | Optimized for Kubernetes | Runs any OCI-compliant image (including docker) |

Routes

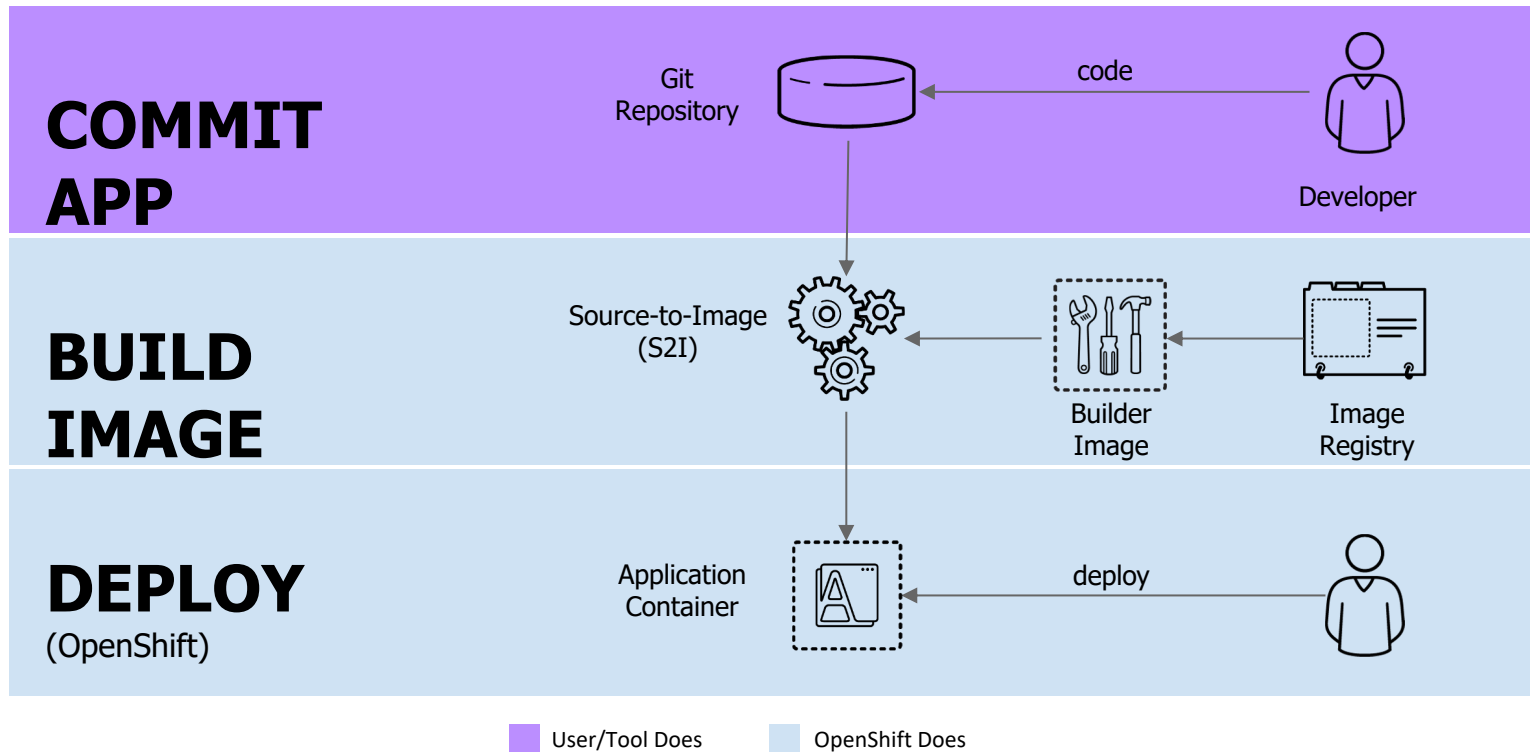routes add services to the external load-balancer and provide readable urls for the app

> curl http://app-prod.mycompany.com

ROUTE
app-prod.mycompany.com

BACKEND SERVICE

POD

CONTAINER

POD

CONTAINER

POD

CONTAINER

Projects – extends k8s namespaces

projects isolate apps across environments, teams, groups and departments

PAYMENT DEV		
POD	POD	POD
C	C	C

CATALOG		
POD	POD	POD
C	C	C

PAYMENT PROD		
POD	POD	POD
C	C	C

INVENTORY		
POD	POD	POD
C	C	C

Source-to-Image

COMMIT APP

BUILD IMAGE

DEPLOY
(OpenShift)

Git Repository

code

Developer

Source-to-Image (S2I)

Builder Image

Image Registry

Application Container

deploy

User/Tool Does   OpenShift Does

Jenkins-as-a-Service

- Certified Jenkins images with pre-configured plugins
  - Provided out-of-the-box
  - Follows Jenkins 1.x and 2.x LTS versions

- Jenkins S2I Builder for customizing the image
  - Install Plugins
  - Configure Jenkins
  - Configure Build Jobs

- OpenShift plugins to integrate authentication with OpenShift and also CI/CD pipelines

- Dynamically deploys Jenkins slave containers

Plugins
Jobs
Configuration

Jenkins
(S2I)

Jenkins
Image

Custom
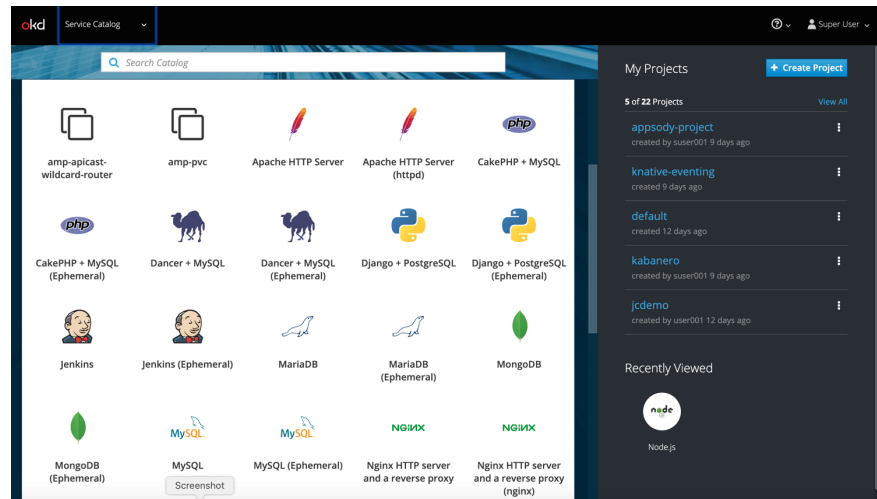Jenkins
Image
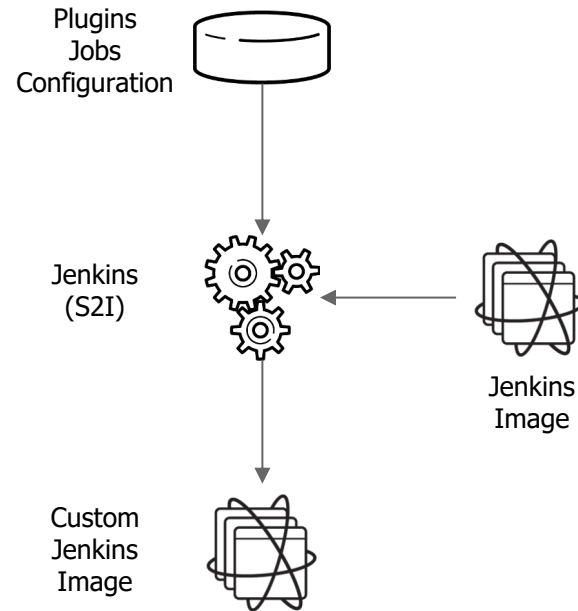
Log management with EFK

- EFK stack to aggregate logs for hosts and applications
  - **Elasticsearch:** a search and analytics engine
  - **Fluentd:** gathers logs and sends to Elasticsearch
  - **Kibana:** A web UI for Elasticsearch

- Access control
  - Cluster administrators can view all logs
  - Users can only view logs for their projects

- Ability to send logs elsewhere
  - External Elasticsearch, Splunk, etc
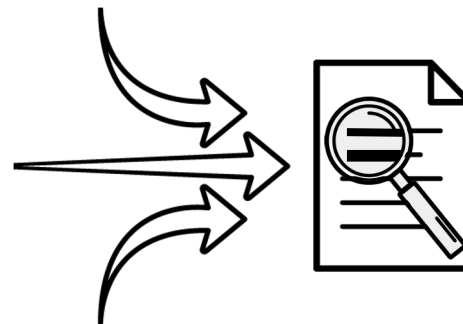
Web Console
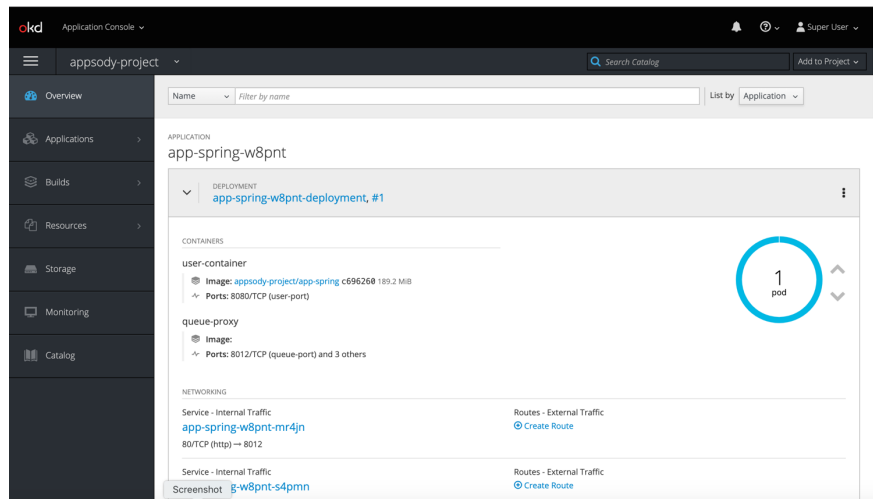
Application dashboard

Service Catalog