

Red Hat
Summit

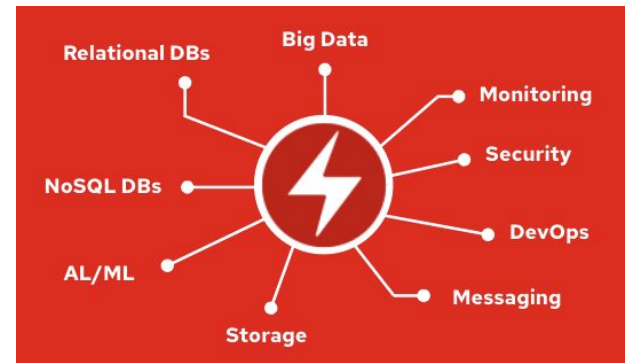
XaaS: Kontejnerová platforma

Everything as a Services

Patrik Plachý
Solution Architect



- XaaS model
- OpenShift : Zkušenosti s ClouDEM
- OpenShift : 8 vrstev XaaS
- Ukázka architektury portfolia





XAAS JE JIŽ SOUČÁSTÍ NAŠEHO ŽIVOTA

zipcar.    citiz

NETFLIX

prime video

 Spotify

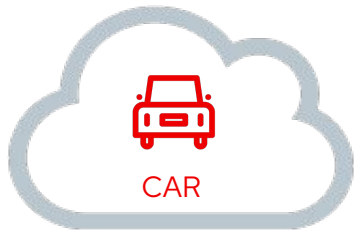
 Office 365

 salesforce

 Adobe



SOFTWARE



CAR



ENTERTAINMENT



INDUSTRY



MOBILITY



COMPUTING



FOOD



Uber  kapten_

Uber Eats  deliveroo
 foodora



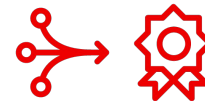
XAAS VÝHODY MODELU



Scale Out / Scale In



Cost and Time



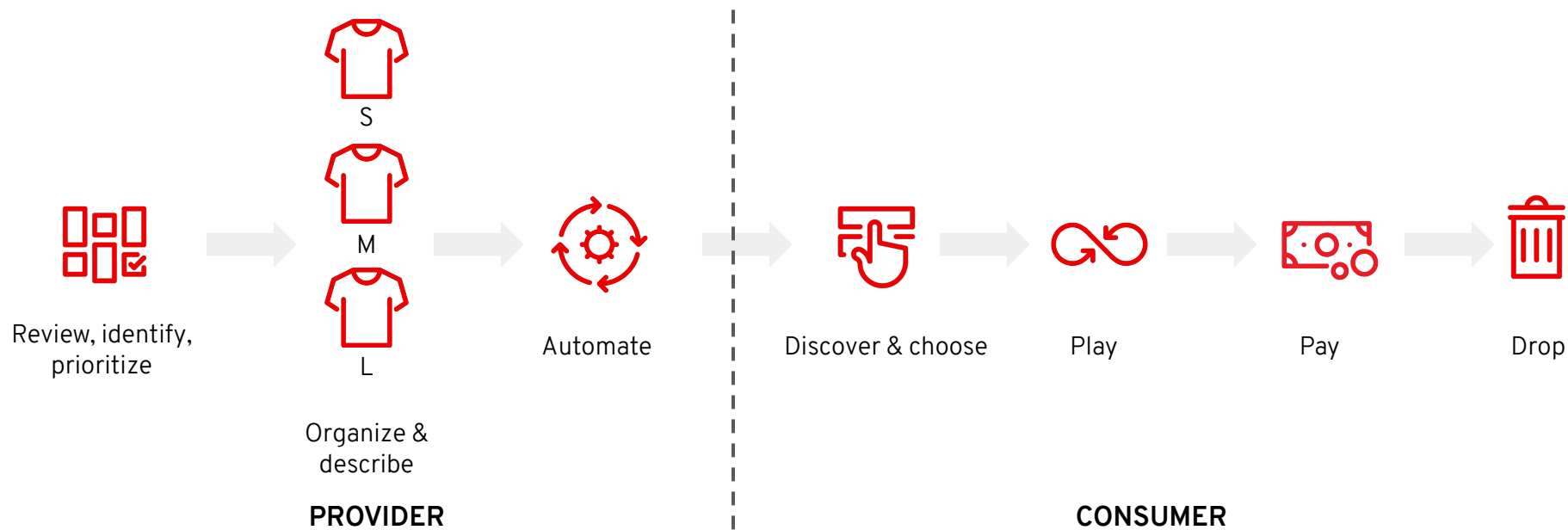
Simplicity and QoS



Experience and
Satisfaction



"EVERYTHING AS A SERVICE" V PRAXI



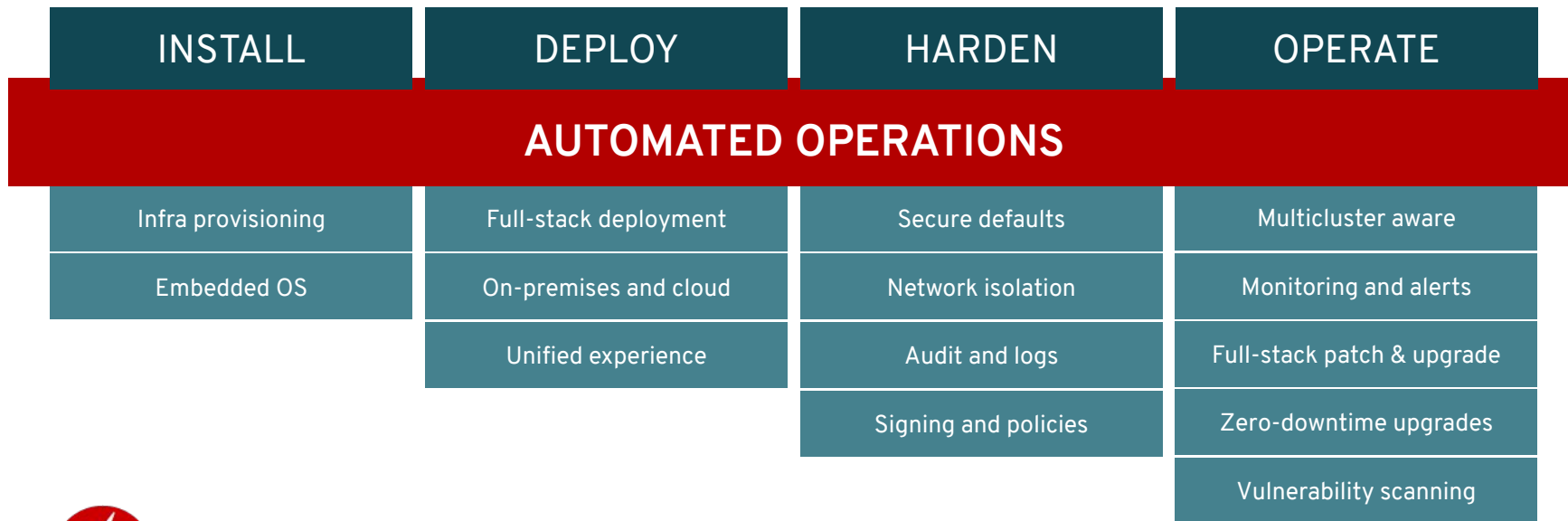


OpenShift : Zážitek jako v cloudu → VŠUDE



Vše, co potřebujete k vytvoření XaaS!

OpenShift : Plně automatizovaný Day-1 & Day-2



Znalosti uložené do boxu a v klastru !

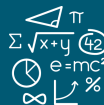


Operátoři K8S – „Kubernetes-Native“ – představují znalost operací a procesů, automatizují celý životní cyklus platformy A kontejnerových aplikací v Kubernetes.

Nový provozní model



Flexibilní
architektura aplikací



Žádné nové objevování
základních konceptů



Jednotné nasazení
a ladění



Skutečně hybridní

Operátoři poskytují základ pro nový standardní provozní model, plně přenosný a hybridní. Představuje skutečnou alternativu k provozním znalostem poskytovatelů cloudu.

OperatorHub.io : "DockerHub"operatru K8S

OperatorHub.io is a new home for the Kubernetes community to share Operators. Find an existing Operator or list your own today.

Search OperatorHub...

Contribute ▾

CATEGORIES

OPERATORS

VIEW ▢ ▾ SORT A-Z ▾

AI/Machine Learning
Application Runtime
Big Data
Cloud Provider
Database
Developer Tools
Integration & Delivery
Logging & Tracing
Monitoring
Networking
OpenShift Optional
Security
Storage
Streaming & Messaging

PROVIDER

- ☐ Alibaba Cloud (1)
- ☐ Altinity (1)
- ☐ Anchore (1)
- ☐ Apicurio (1)
- ☐ AppDynamics (1)

[Show 115 more](#)

CAPABILITY LEVEL

- ☐ Basic Install (82)
- ☒ Seamless Upgrades (41)
- ☐ Full Lifecycle (27)
- ☒ Deep Insights (19)



Akka Cluster Operator
provided by Lightbend, Inc.

Run Akka Cluster applications
on Kubernetes.



Apache Spark Operator
provided by radanalytics.io

An operator for managing the
Apache Spark clusters and
intelligent applications that



**API Operator for
Kubernetes**
provided by WSO2

API Operator provides a fully
automated experience for



Appratrix CPS Operator
provided by Appratrix, Inc

The Appratrix CPS operator
enables you to back up and
restore your



Appsody Operator
provided by Appsody

Deploys Appsody based
applications



AtlasMap Operator
provided by AtlasMap

AtlasMap is a data mapping
solution with an interactive
web based user interface, f



Azure Service Operator
provided by Microsoft

The Azure Service Operator
helps you provision Azure
resources and connect your



**Banzai Cloud Kafka
Operator**
provided by Banzai Cloud

Installs and maintains Kafka



Community Jaeger Operator
provided by CNCF

Provides tracing, monitoring
and troubleshooting for
microservices-based



credstash-operator
provided by Ouzi

An operator that creates and
manages Kubernetes secrets
from Credstash secrets



Dell CSI Operator
provided by Dell EMC

An operator for installing and
managing CSI Drivers provided
by Dell EMC



Dynatrace OneAgent
provided by Dynatrace LLC

Install full-stack monitoring of
Kubernetes clusters with the
Dynatrace OneAgent.



Dynatrace Operator
provided by Dynatrace LLC



Eclipse Che
provided by Eclipse
Foundation

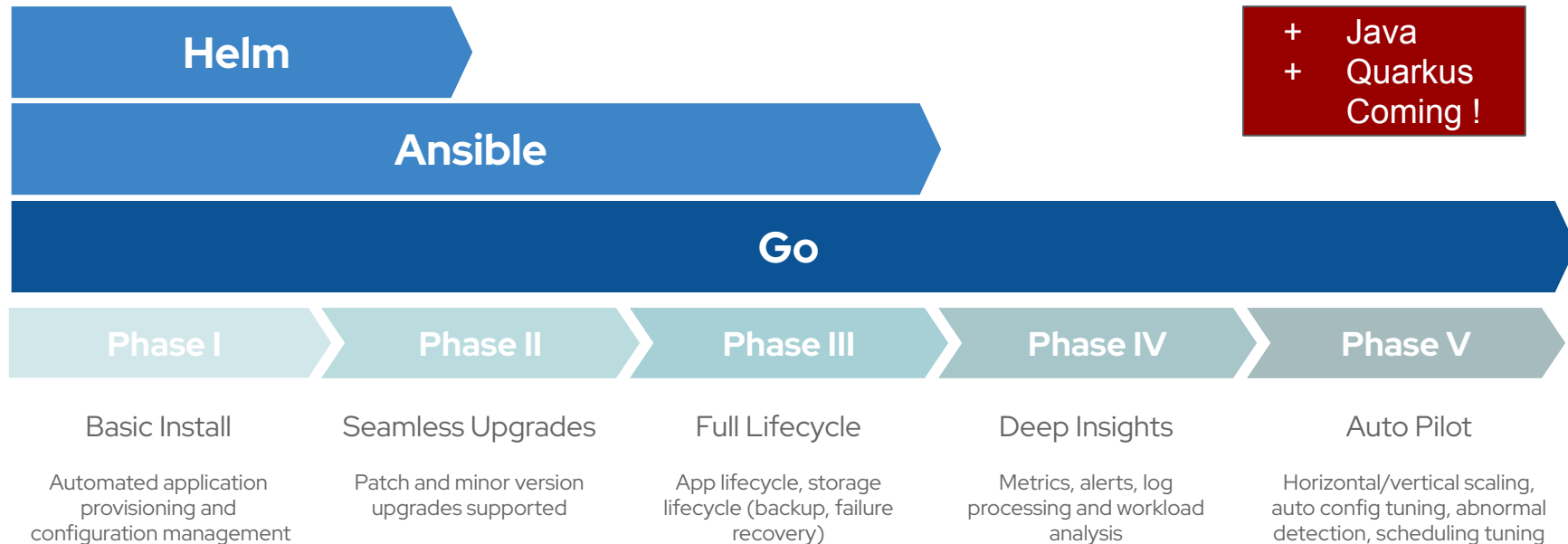
A Kube-native development
solution that delivers port



Eclipse Ditto
provided by Jens Reimann

Eclipse Ditto provides a Digital
Twin platform. A digital twin is
a virtual, cloud based,

Operator SDK : Helm, Ansible, Go





OPERATORs : Maturity Model

DBaaS example

Capability Level

- ✓ Basic Install
- ✓ Seamless Upgrades
- ✓ Full Lifecycle
- ✓ Deep Insights
- ✓ Auto Pilot



Crunchy PostgreSQL for OpenShift

4.5.0 provided by Crunchy Data



Install

Latest Version

4.5.0

Capability Level

- ✓ Basic Install
- ✓ Seamless Upgrades
- ✓ Full Lifecycle
- ✓ Deep Insights
- ✓ Auto Pilot

Provider Type

Certified

Provider

Crunchy Data

Repository

<https://github.com/CrunchyData/postgres-operator>

Container Image

registry.connect.redhat.com/crunchydata/postgres-operator@sha256:d7319ae77c83dccc0589b28e00f93b4a46135d6eacb08685f05d7f67b40e2186

Created At

Dec 31, 2019 8:40 pm

Support

crunchydata.com

Crunchy PostgreSQL for OpenShift lets you run your own production-grade PostgreSQL-as-a-Service on OpenShift!

Powered by the Crunchy [PostgreSQL Operator](#), Crunchy PostgreSQL for OpenShift automates and simplifies deploying and managing open source PostgreSQL clusters on OpenShift by providing the essential features you need to keep your PostgreSQL clusters up and running, including:

- **PostgreSQL Cluster Provisioning:** [Create, Scale, & Delete PostgreSQL clusters with ease](#), while fully customizing your Pods and PostgreSQL configuration!
- **High-Availability:** Safe, automated failover backed by a [distributed consensus based high-availability solution](#). Uses [Pod Anti-Affinity](#) to help resiliency; you can configure how aggressive this can be! Failed primaries automatically heal, allowing for faster recovery time. You can even create regularly scheduled backups as well and set your backup retention policy
- **Disaster Recovery:** Backups and restores leverage the open source [pgBackRest](#) utility and [includes support for full, incremental, and differential backups as well as efficient delta restores](#). Set how long you want your backups retained for. Works great with very large databases!
- **Monitoring:** Track the health of your PostgreSQL clusters using the open source [pgMonitor](#) library.
- **Clone:** Create new clusters from your existing clusters or backups with a single [pgo create cluster --restore-from](#) command.
- **Full Customizability:** Crunchy PostgreSQL for OpenShift makes it easy to get your own PostgreSQL-as-a-Service up and running on and lets make further enhancements to customize your deployments, including:
 - Selecting different storage classes for your primary, replica, and backup storage
 - Select your own container resources class for each PostgreSQL cluster deployment; differentiate between resources applied for primary and replica clusters!
 - Use your own container image repository, including support [imagePullSecrets](#) and private repositories
 - Bring your own trusted certificate authority (CA) for use with the Operator API server
 - Override your PostgreSQL configuration for each cluster

and much more!

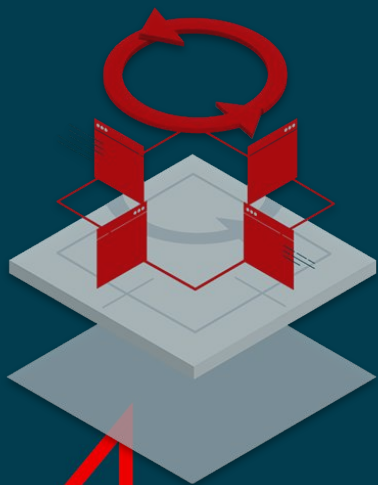
Before You Begin

There are a few manual steps that the cluster administrator must perform prior to installing the PostgreSQL Operator. At the very least, it must be provided with an initial configuration.

First, select a namespace in which to install the PostgreSQL Operator. PostgreSQL clusters will also be

OpenShift

8 vrstev XaaS



PaaS	Vaše App aaS
IDE aaS	Pipelines aaS
Storage aaS	Function aaS
Cluster aaS	Machine aaS

Log in to your account

Username *

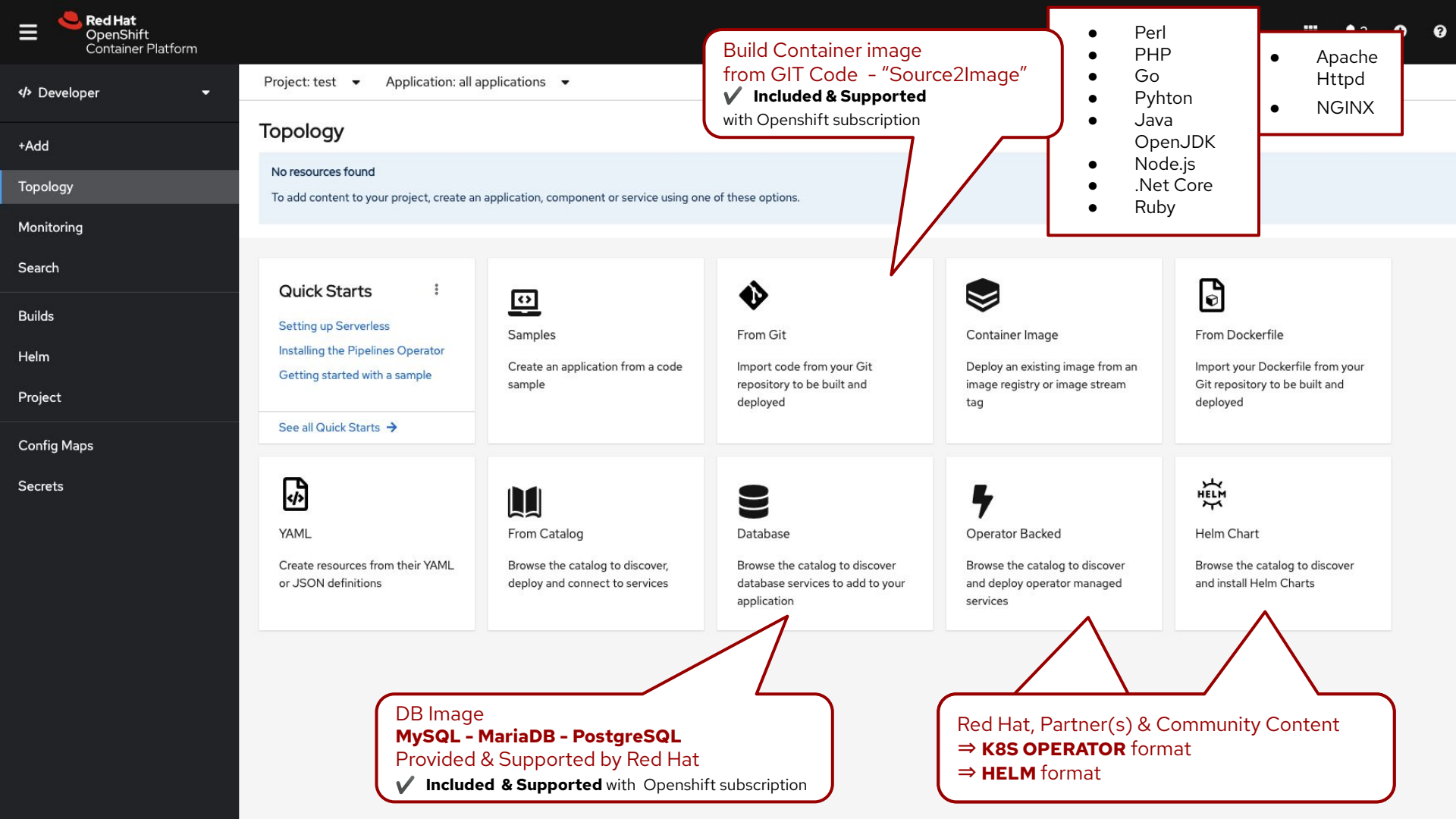
Password *

Log in



Red Hat
OpenShift Container Platform

Welcome to Red Hat OpenShift Container Platform.



Build Container image
from GIT Code - "Source2Image"
✓ **Included & Supported**
with Openshift subscription

- Perl
- PHP
- Go
- Python
- Java
- OpenJDK
- Node.js
- .Net Core
- Ruby

- Apache Httpd
- NGINX

DB Image
MySQL - MariaDB - PostgreSQL
Provided & Supported by Red Hat
✓ **Included & Supported** with Openshift subscription

Red Hat, Partner(s) & Community Content
⇒ **K8S OPERATOR** format
⇒ **HELM** format

OpenShift OperatorHub

Community, Certified and Marketplace

- Administrator
- Home
 - Overview
 - Projects
 - Search
 - Explore
 - Events
- Operators
 - OperatorHub**
 - Installed Operators
- Workloads
- Networking
- Storage
- Builds
- Monitoring
- Compute
- User Management
- Administration

Project: test

All Items

Database

Filter by keyword...

AI/Machine Learning

Application Runtime

Big Data

Cloud Provider

Database

Developer Tools

Integration & Delivery

Logging & Tracing

Monitoring

Networking

OpenShift Optional

Security

Storage

Streaming & Messaging

Install State

☐ Installed (0)

☐ Not Installed (55)

Provider Type

☐ Red Hat (2)

☒ Certified (22)

☐ Community (15)

☒ Marketplace (16)

Provider

☐ Red Hat (3)

☐ Alcidre (0)



Anzo Unstructured Operator
provided by Cambridge Semantics

Kubernetes Operator for Anzo
Unstructured



Marketplace

Anzo Unstructured Operator
provided by Cambridge Semantics

Kubernetes Operator for Anzo
Unstructured

an zodgraph db

AnzoGraph Operator
provided by Cambridge Semantics

kubernetes operator for
AnzoGraph DB

an zodgraph db

Marketplace

AnzoGraph Operator
provided by Cambridge Semantics

kubernetes operator for
AnzoGraph DB



ArangoDB
provided by ArangoDB GmbH

ArangoDB Kubernetes Operator



Cloud Native PostgreSQL
provided by EnterpriseDB
Corporation

Operator to manage Postgres
high availability clusters with a
primary/standby architecture.



CockroachDB
provided by Cockroach Labs

CockroachDB Operator



Marketplace

CockroachDB
provided by Cockroach Labs

CockroachDB Operator



Marketplace

Couchbase Operator
provided by Couchbase



Couchbase Operator
provided by Couchbase



Marketplace

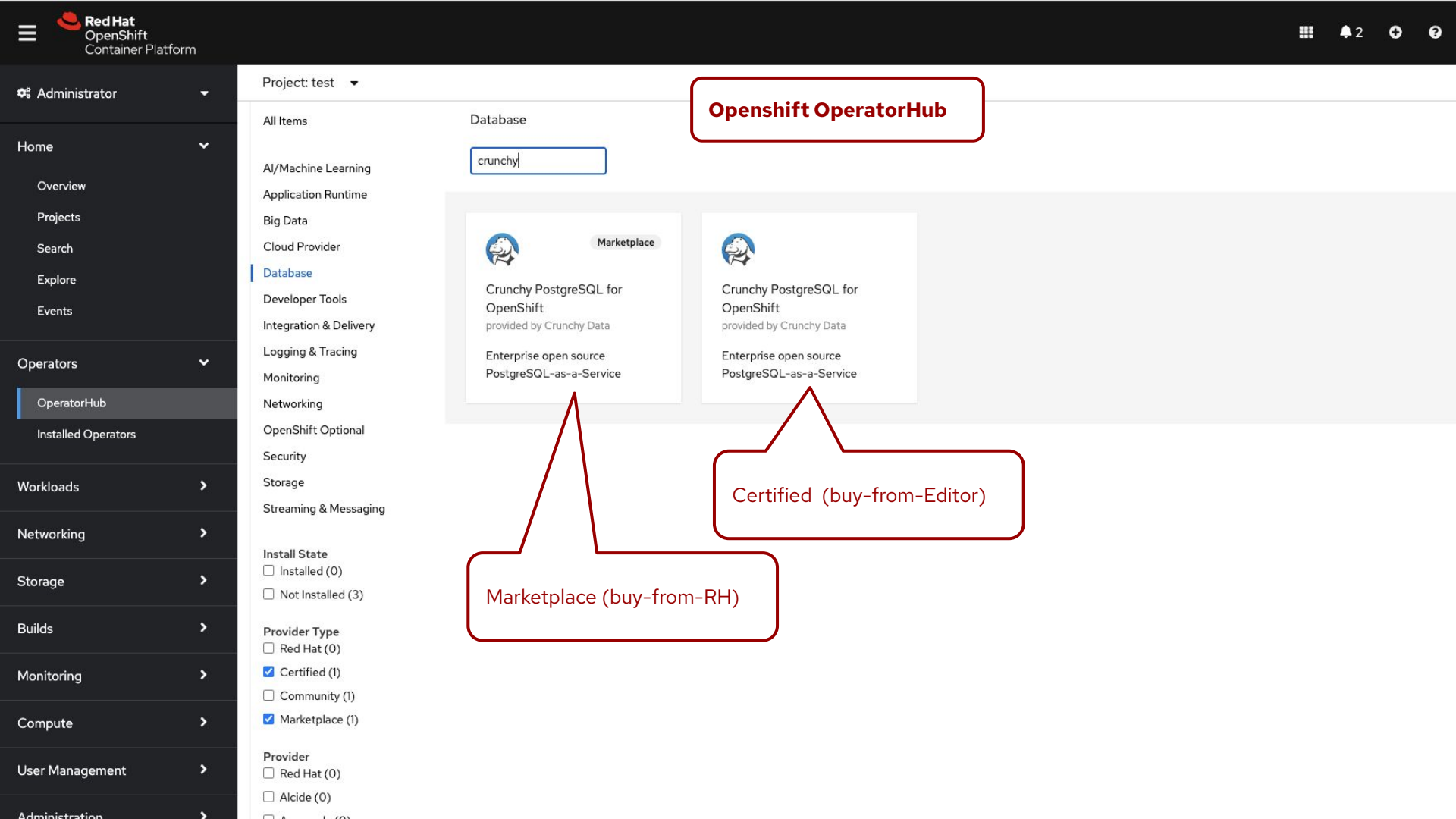
Crunchy PostgreSQL for
OpenShift
provided by Crunchy Data

Enterprise open source
PostgreSQL-as-a-Service



Crunchy PostgreSQL for
OpenShift
provided by Crunchy Data

Enterprise open source
PostgreSQL-as-a-Service



Openshift OperatorHub

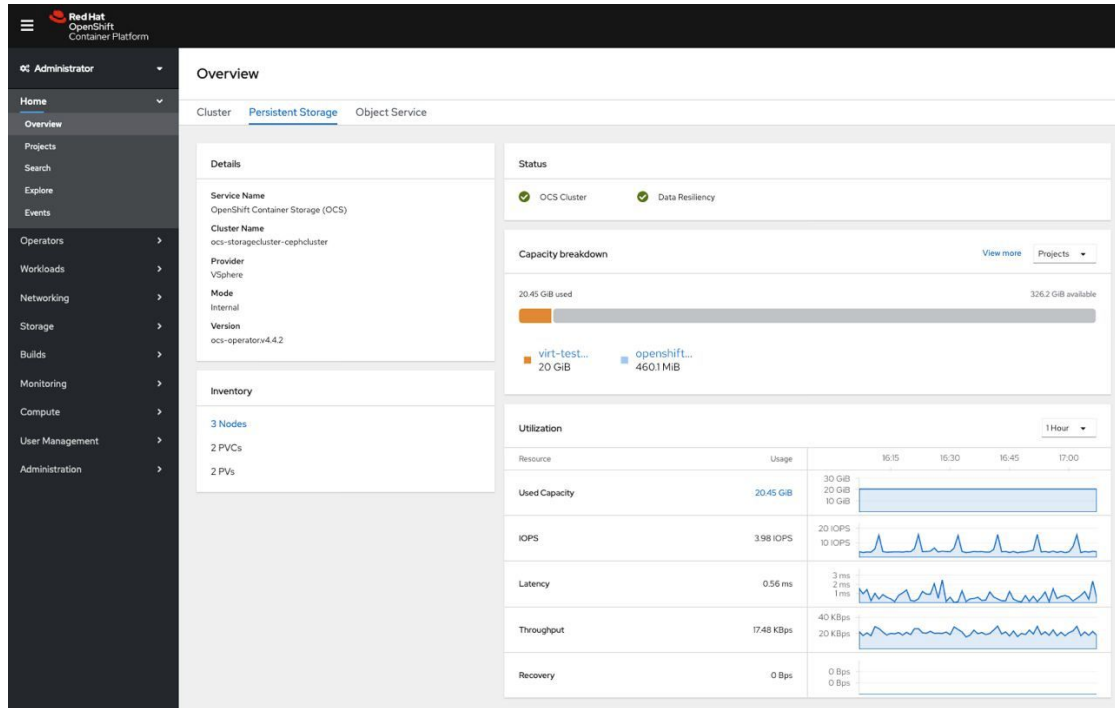
Marketplace (buy-from-RH)

Certified (buy-from-Editor)



STORAGE AS A SERVICE - OpenShift Container Storage

- **Create** storage clusters from OpenShift console, dedicating or reusing nodes to hold containerized Ceph controllers
- **Manage** different **storage classes** corresponding to your app needs: block, file and object storage
- **Scale** or **Autoscale** machines from MachineSets, OpenShift take care of provisioning and attaching them to the cluster





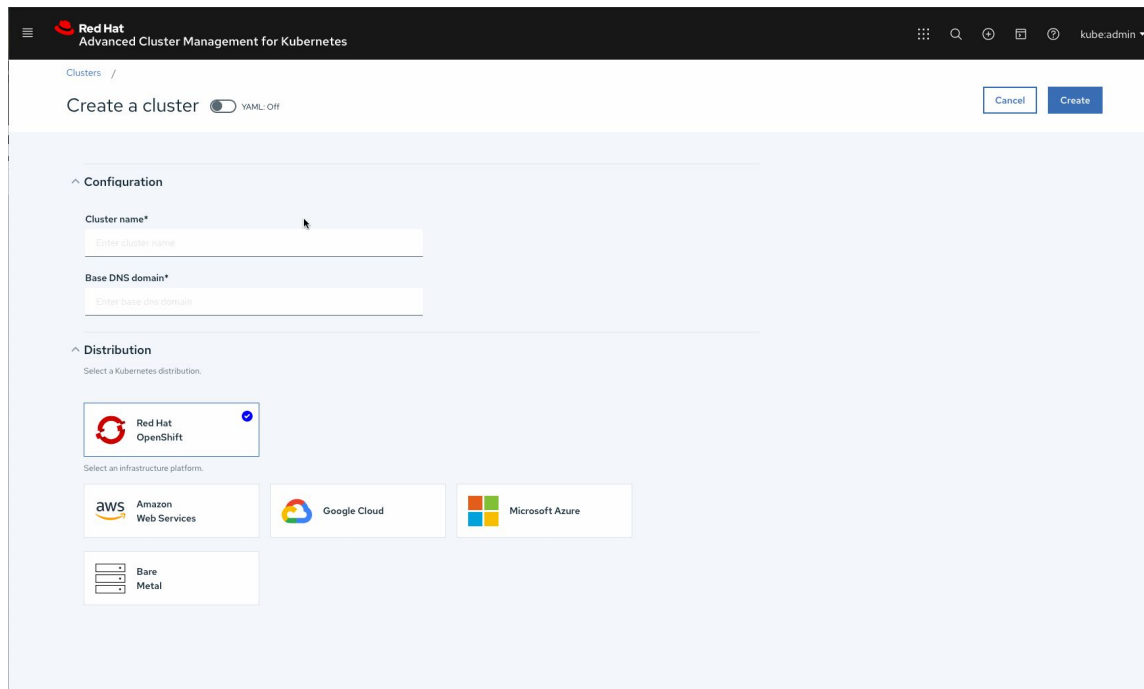
STORAGE AS A SERVICE - OpenShift Container Storage “OCS”

	Infrastructure supported	Provisioning modes		Persistence		File RWX	Block RWO	Object S3
		Dynamic	Static	Zone	Multi-zone			
OCS 4	Any	✓	✓	✓	✓	✓	✓	✓
NFS	Any	✗	✓	✗	✗	✓	✗	✓
EBS	AWS only	✓	✓	✓	✗	✓	✓	✓
vSphere Volume	VMware only	✓	✓	✗	✗	✗ Coming soon	✓	✗



CLUSTER AS A SERVICE - Advanced Cluster Management

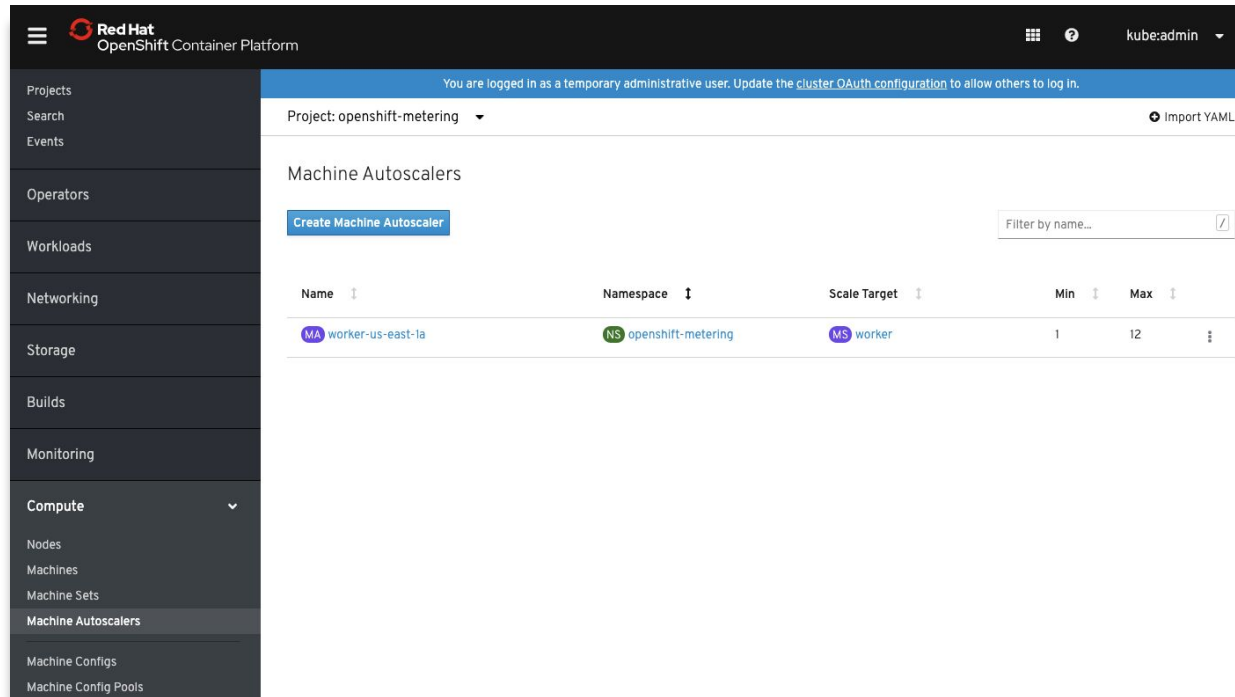
- **Create, Upgrade and Destroy** OCP clusters.
- Wizard or YAML based create cluster flow
- **Multi-Hybrid Cluster management** with Red Hat ACM
 - Provisioning
 - Application Lifecycle / GitOps
 - Governance / Compliance
 - Observability





MACHINE AS A SERVICE - Machine Sets

- **Manage** your compute node configuration as Kubernetes resources
- **Organize** them into **MachineSets** with deployment rules regarding provider topology
- **Scale** or **Autoscale** machines from MachineSets, OpenShift take care of provisioning and attaching them to the cluster

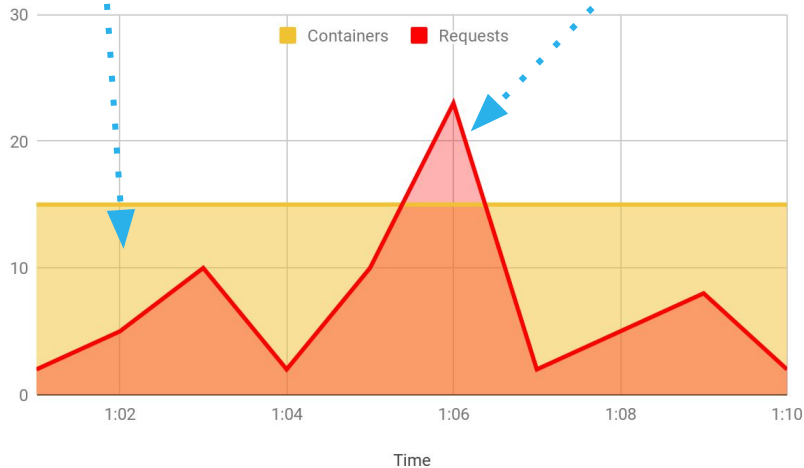




FUNCTION AS A SERVICE - OpenShift Serverless & Mesh

Over provisioning

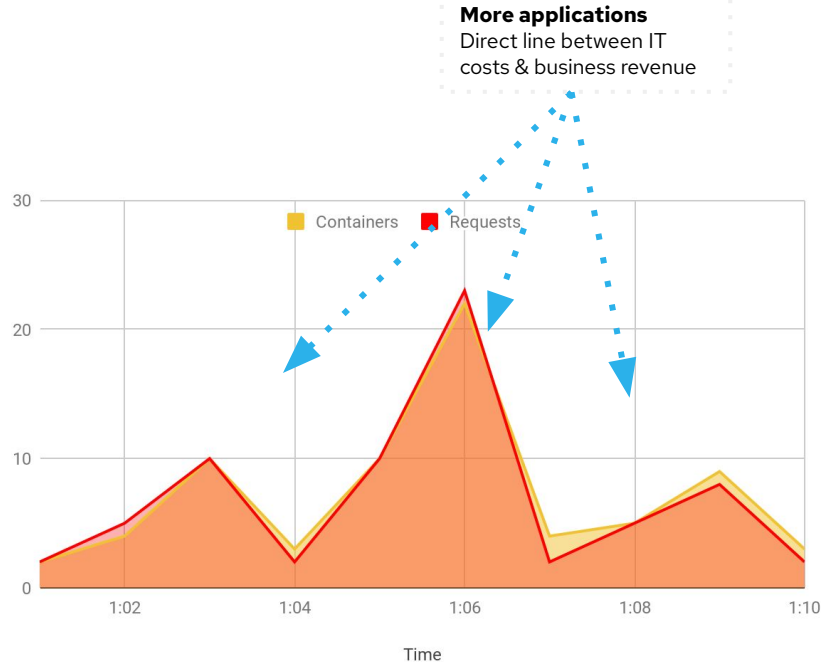
Time in capacity planning
IT cost of idle resources



NOT Serverless

Under provisioning

Lost business revenue
Poor quality of service



with Serverless

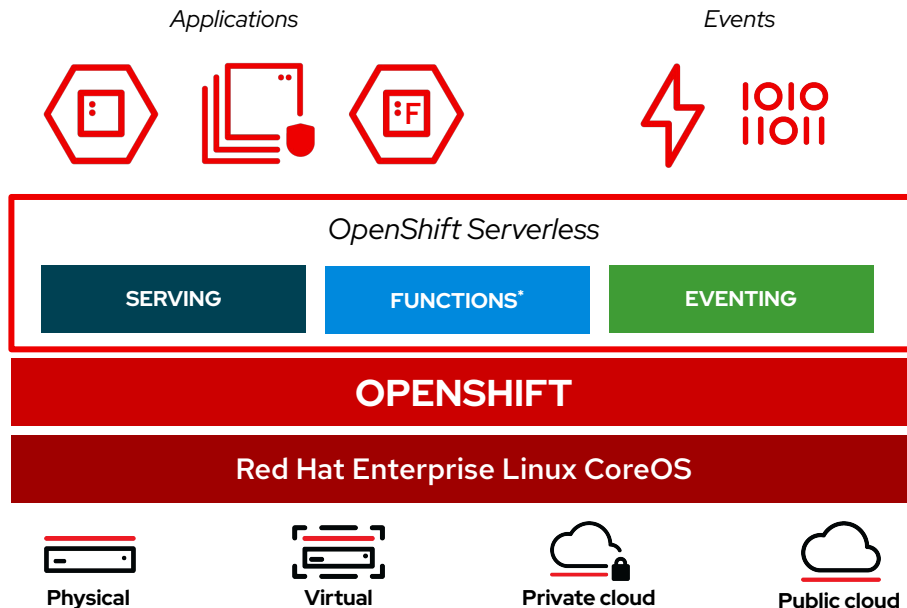
More applications

Direct line between IT costs & business revenue



FUNCTION AS A SERVICE - OpenShift Serverless & Mesh

- Deploy and run **serverless containers**
- Use any programming language or runtime
- Modernize existing applications to run serverless
- Powered by a rich ecosystem of event sources
- Manage serverless apps natively in Kubernetes
- Based on open source project **Knative**
- Run anywhere OpenShift runs





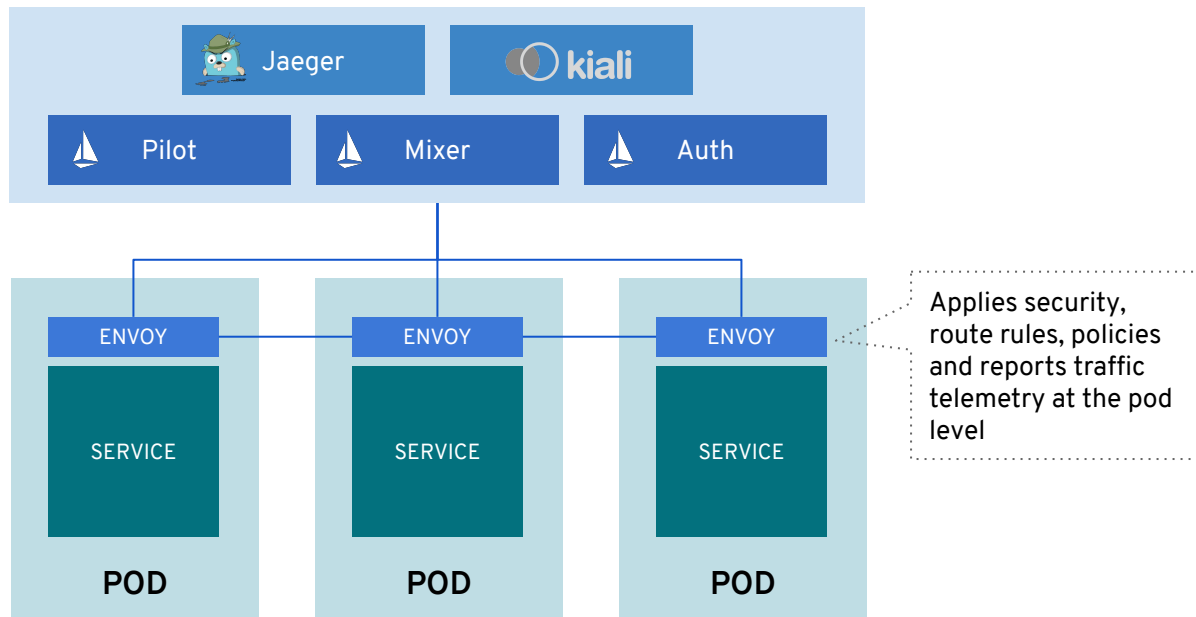
FUNCTION AS A SERVICE - OpenShift Service Mesh

TRAFFIC MANAGEMENT

OBSERVABILITY

SERVICE IDENTITY
& SECURITY

POLICY ENFORCEMENT





IDE AS A SERVICE - Code Ready Workspaces

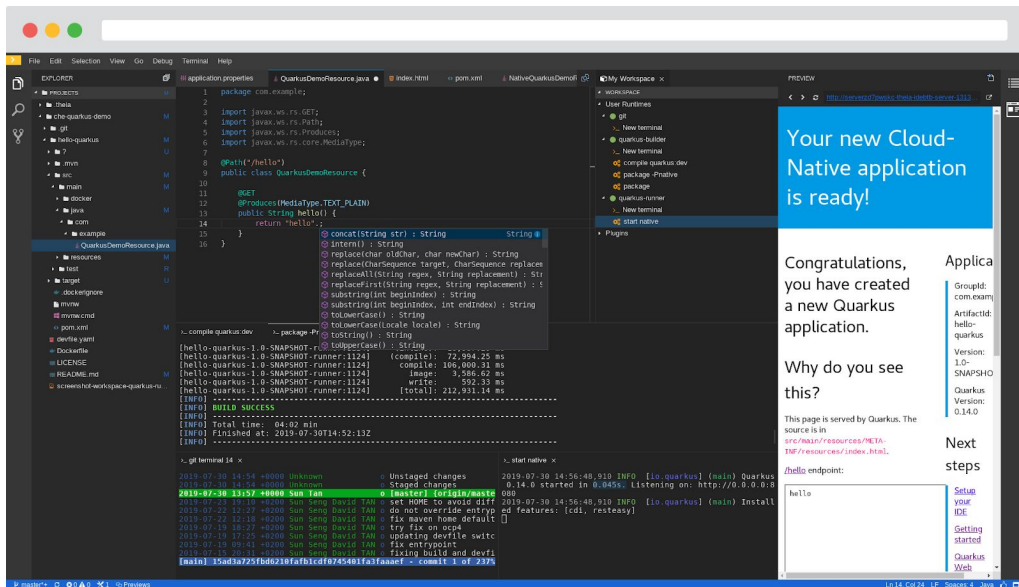


39% MORE TIME FOR CODING.*



IDE AS A SERVICE - Code Ready Workspaces

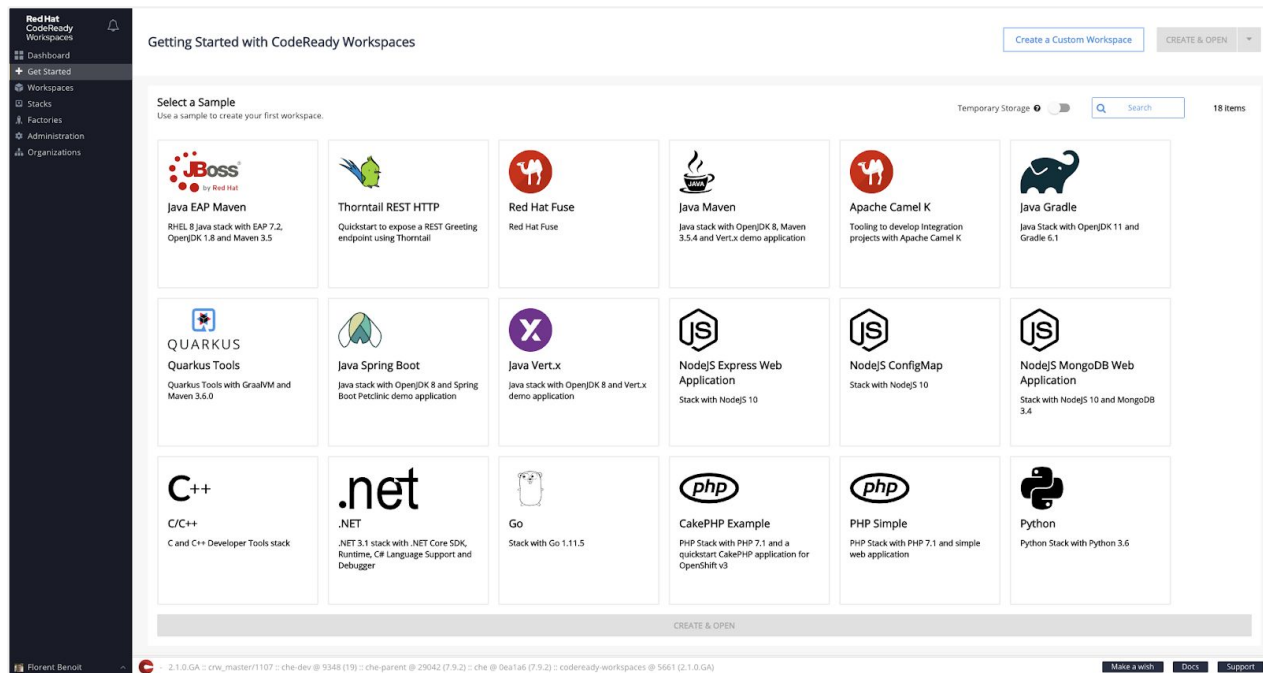
- Get your Development **workspace in minutes !**
- Developer-**environment configuration as code** into a DevFile
- Top-of-the-art desktop like experience in the browser
- **VSCode extension compatibility**: benefits from huge ecosystems
- Auto-connected with OpenShift cluster
- Monitor with Prometheus and Grafana
- Based on **Eclipse Che**





IDE AS A SERVICE - Code Ready Workspaces

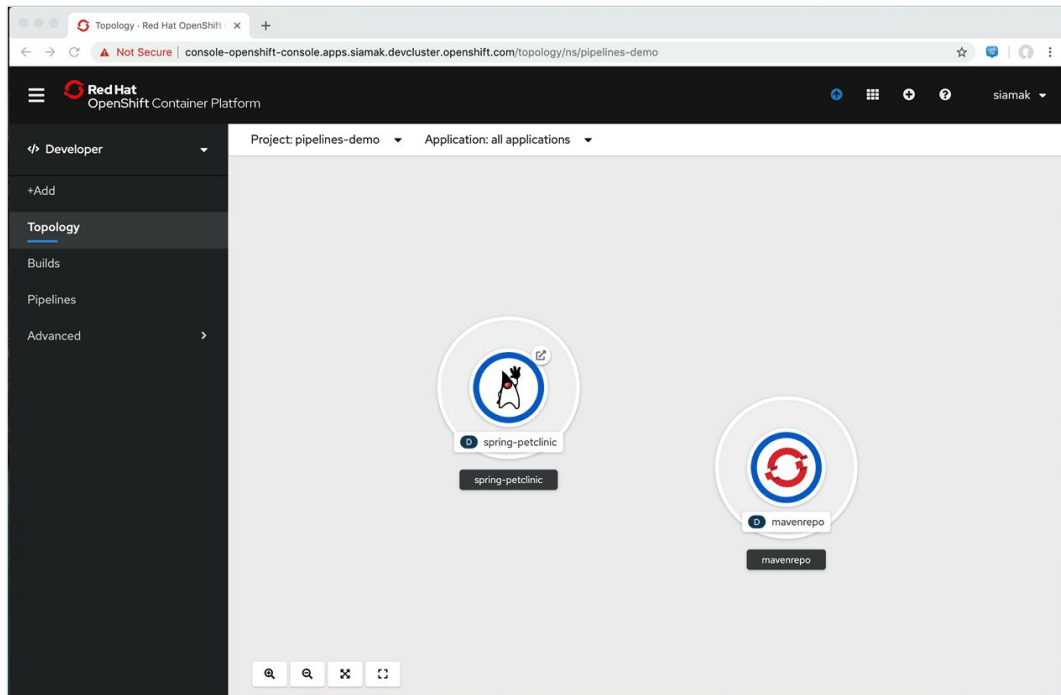
- Use **any programming language** or runtime





PIPELINE AS A SERVICE - OpenShift Pipelines

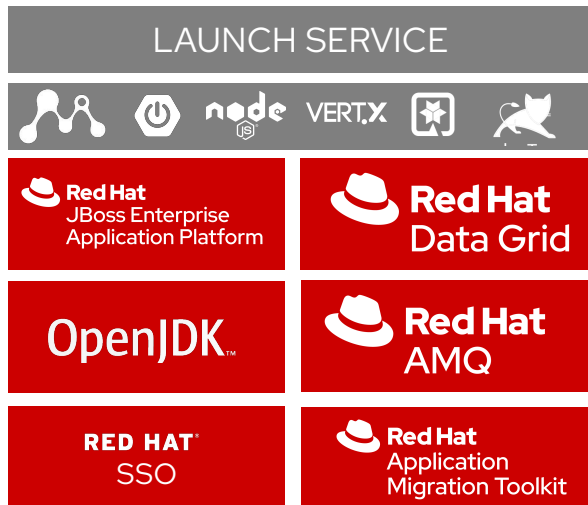
- Deploy and run **stateless pipelines**, runs serverless (no CI engine !)
- Containers as building blocks
- Powered by a rich ecosystem of on-the-shelf tasks
- Build images with Kube tools (s2i, buildah, kaniko, jib, buildpack, etc ...)
- Based on open source project **Tekton**
- Run anywhere Kubernetes runs





PAAS - Red Hat Runtimes

Curated set of runtimes and application services for highly-distributed **cloud native** applications. Also supported JBoss EAP JEE and OpenJDK runtimes for smooth transition from monoliths.



- Best-of-breed runtimes, frameworks and languages
 - Quarkus, Spring-Boot, Microprofile, Vert.x, Node.js, Serverless *
- OpenShift & Kubernetes Services native integration
- Modernization and optimization initiatives
- Established middleware technologies (EAP)
- In-memory data grid
- Standards-based enterprise messaging
- SSO authentication



DATABASE AS A SERVICE - Red Hat

Developer Catalog

Add shared apps, services, or source-to-image builders to your project from the Developer Catalog. Cluster admins can install additional apps which will show up here automatically.

Databases

Filter by keyword... Group By: None

DB Image
MySQL - MariaDB - PostgreSQL
Provided & Supported by Red Hat
✓ **Included & Supported** with Openshift subscription

Left Sidebar:

- All Items
- Languages
- Databases
 - MySQL
 - Postgres
 - MariaDB
- Middleware
- CI/CD
- Other

Type





















- ☐ Operator Backed (0)
- ☐ Helm Charts (0)
- ☐ Builder Image (0)
- ☐ Template (8)
- ☐ Service Class (0)


Grid of Templates:


- MariaDB** (provided by Red Hat, Inc.)
MariaDB database service, with persistent storage. For more information about using this...
- MariaDB (Ephemeral)** (provided by Red Hat, Inc.)
MariaDB database service, without persistent storage. For more information about using this...
- MySQL** (provided by Red Hat, Inc.)
MySQL database service, with persistent storage. For more information about using this...
- MySQL (Ephemeral)** (provided by Red Hat, Inc.)
MySQL database service, without persistent storage. For more information about using this...
- PostgreSQL** (provided by Red Hat, Inc.)
PostgreSQL database service, with persistent storage. For more information about using this...
- PostgreSQL (Ephemeral)** (provided by Red Hat, Inc.)
PostgreSQL database service, without persistent storage. For more information about using this...
- Red Hat Process Automation Manager 7.8 managed KIE Server with a MySQL database** (provided by Red Hat, Inc.)
Application template for a managed KIE Server with a MySQL database, for Red Hat...
- Red Hat Process Automation Manager 7.8 managed KIE Server with a PostgreSQL database** (provided by Red Hat, Inc.)
Application template for a managed KIE Server with a PostgreSQL database, for Red Hat...



DATABASE AS A SERVICE - Red Hat ISV

 <p>Altinity ClickHouse Operator provided by Altinity</p> <p>ClickHouse Operator manages full lifecycle of ClickHouse</p>	 <p>Cassandra provided by Instaclustr</p> <p>Manage the full lifecycle of the Cassandra clusters.</p>	 <p>CockroachDB provided by Helm Community</p> <p>CockroachDB Operator based on the CockroachDB helm chart</p>	 <p>Couchbase Operator provided by Couchbase</p> <p>The Couchbase Autonomous Operator allows users to easily deploy, manage, and maintain</p>	 <p>Crunchy PostgreSQL for Kubernetes provided by Crunchy Data</p> <p>Enterprise open source PostgreSQL-as-a-Service</p>
 <p>Elastic Cloud on Kubernetes provided by Elastic</p> <p>Run Elasticsearch, Kibana and the APM Server on Kubernetes and OpenShift</p>	 <p>etcd provided by CNCF</p> <p>Create and maintain highly-available etcd clusters on Kubernetes</p>	 <p>Ext Postgres Operator provided by movetokube.com</p> <p>Manage databases and roles in external PostgreSQL server or cluster</p>	 <p>Hazelcast Operator provided by Hazelcast, Inc.</p> <p>Install Hazelcast Enterprise cluster.</p>	 <p>Infinispan provided by Infinispan</p> <p>Create and manage Infinispan clusters.</p>
 <p>MongoDB provided by MongoDB, Inc.</p> <p>The MongoDB Enterprise Kubernetes Operator enables easy deploys of MongoDB</p>	 <p>NuoDB Operator provided by NuoDB, Inc.</p> <p>This Operator will deploy the Community Edition of NuoDB</p>	 <p>Operator for Apache CouchDB provided by IBM</p> <p>Apache CouchDB is a highly available NOSQL database</p>	 <p>Percona Server MongoDB Operator provided by Percona</p> <p>Percona Server for MongoDB Operator manages the</p>	 <p>Percona XtraDB Cluster Operator provided by Percona</p> <p>Percona XtraDB Cluster Operator manages the</p>
 <p>PlanetScale Operator for Vitess provided by PlanetScale</p> <p>PlanetScale's operator for Vitess deploys and manages</p>	 <p>Postgres-Operator provided by Zalando SE</p> <p>Postgres operator creates and manages PostgreSQL clusters running in Kubernetes.</p>	 <p>Postgresql Operator provided by Openlabs</p> <p>Deploys postgresql based applications</p>	 <p>PostgreSQL Operator by Dev4Devs.com provided by Dev4Devs.com</p> <p>Operator in Go developed using the Operator Framework</p>	 <p>Redis Enterprise provided by Redis Labs, Inc.</p> <p>An operator to run Redis Enterprise Clusters</p>

 Relational database Operator with commercial support

 NoSQL database Operator with commercial support

Openshift OperatorHub



Marketplace

Crunchy PostgreSQL for
OpenShift
provided by Crunchy Data

Enterprise open source
PostgreSQL-as-a-Service



Crunchy PostgreSQL for OpenShift

4.5.0 provided by Crunchy Data

Purchase [↗](#)

Install

Latest Version

4.5.0

Capability Level

- Basic Install
- Seamless Upgrades
- Full Lifecycle
- Deep Insights
- Auto Pilot

Provider Type

Marketplace

Provider

Crunchy Data

Repository

<https://github.com/CrunchyData/postgres-operator>

Container Image

registry.marketplace.redhat.com/rhm/crunchydata/postgres-operator@sha256:d7319ae77c83dccc0589b28e00f93b4a46135d6eacb08685f05d7f67b40e2186

Marketplace Operator

This Operator is purchased through Red Hat Marketplace. After completing the purchase process, you can install the Operator on this or other OpenShift clusters. Visit Red Hat Marketplace for more details and to track your usage of this application.

[Learn more about the Red Hat Marketplace ↗](#)

Crunchy PostgreSQL for OpenShift lets you run your own production-grade PostgreSQL-as-a-Service on OpenShift!

Powered by the Crunchy [PostgreSQL Operator](#), Crunchy PostgreSQL for OpenShift automates and simplifies deploying and managing open source PostgreSQL clusters on OpenShift by providing the essential features you need to keep your PostgreSQL clusters up and running, including:

- PostgreSQL Cluster Provisioning:** [Create, Scale, & Delete PostgreSQL clusters with ease](#), while fully customizing your Pods and PostgreSQL configuration!
- High-Availability:** Safe, automated failover backed by a [distributed consensus based high-availability solution](#). Uses [Pod Anti-Affinity](#) to help resiliency; you can configure how aggressive this can be! Failed primaries automatically heal, allowing for faster recovery time. You can even create regularly scheduled backups as well and set your backup retention policy
- Disaster Recovery:** Backups and restores leverage the open source [pgBackRest](#) utility and [includes support for full, incremental, and differential backups as well as efficient delta restores](#). Set how long you want your backups retained for. Works great with very large databases!
- Monitoring:** Track the health of your PostgreSQL clusters using the open source [pgMonitor](#) library.
- Clone:** Create new clusters from your existing clusters or backups with a single [pgo create cluster --restore-from](#) command.
- Full Customizability:** Crunchy PostgreSQL for OpenShift makes it easy to get your own PostgreSQL-as-a-Service up and running on and lets make further enhancements to customize your deployments, including:
 - Selecting different storage classes for your primary, replica, and backup storage





A simpler way to buy and deploy
container-based software across clouds

 Find certified software for Red Hat OpenShift

<https://marketplace.redhat.com/en-us>



Certified enterprise ready

[About certification](#)

Certification standards

- ✓ Runs on OpenShift
- ✓ Certified operators
- ✓ Fully containerized
- ✓ T1-T3 support
- ✓ Vulnerability scans

Capabilities level

- ✓ Basic install
- ✓ Seamless upgrades
- ✓ Full lifecycle
- ✓ Deep insights
- ✓ Auto pilot

Last updated

15/12/2020, 00:30

Category

Crunchy PostgreSQL for Kubernetes

By Crunchy Data

Deploy trusted open source PostgreSQL at scale. Crunchy PostgreSQL for OpenShift Container Platform (OCP) includes Crunchy PostgreSQL Operator and Crunchy PostgreSQL Container Suite supporting hybrid cloud, open source PostgreSQL-as-a-Service.

Software version
4.5

Delivery method
Operator

Rating
★★★★★ 3 reviews 

[Overview](#)

[Documentation](#)

[Pricing](#)

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Free trial

Crunchy PostgreSQL for OCP Trial

No charge

Free

for 30 days

This is a trial version of the
Crunchy PostgreSQL for
OpenShift Container Platform.

[Begin free trial](#)

Annual

Crunchy PostgreSQL for OCP

Starting at

\$1,500

per virtual processor core

Production ready and
commercially supported. This
edition is priced based on the
number of vCPUs used by any
deployed PostgreSQL clusters.

[Configure](#)

Monthly

Crunchy PostgreSQL for OCP Cluster

Starting at

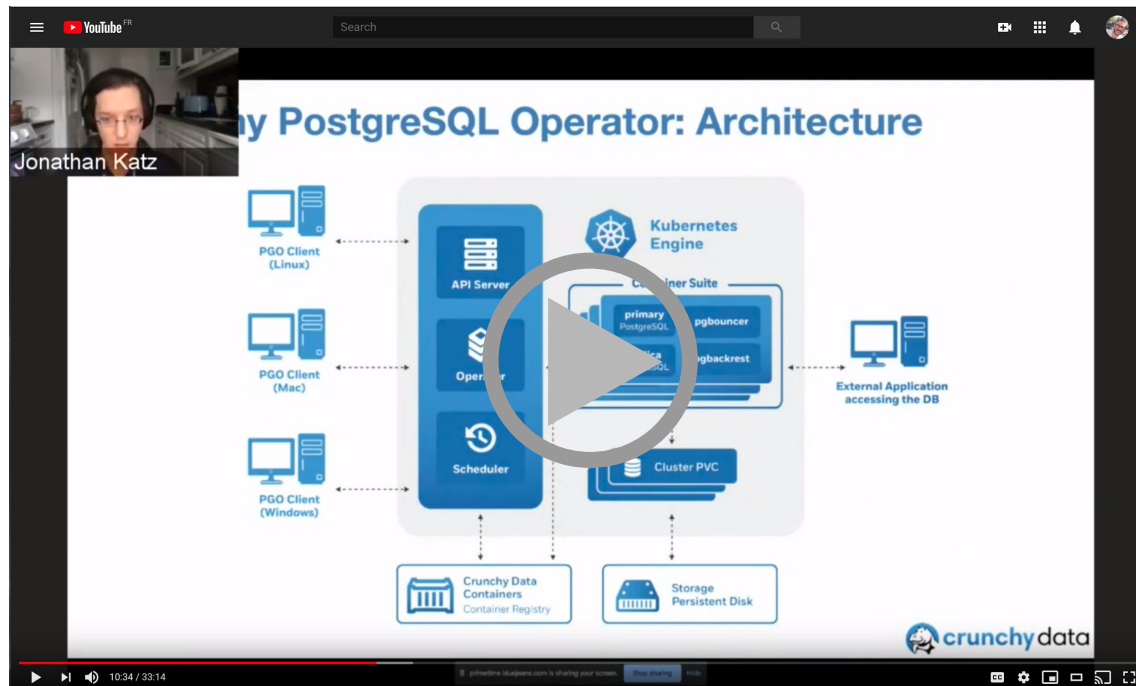
\$1,990

per cluster

Production ready and
commercially supported. This
edition is priced based on the
number of PostgreSQL clusters
deployed.

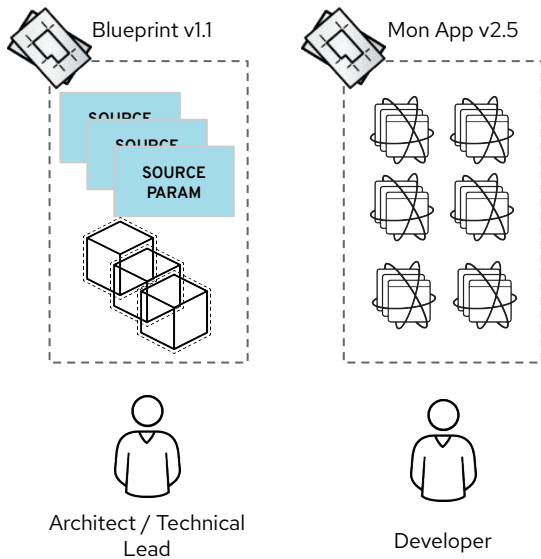
[Configure](#)

Ukázka pomocí Crunchydata PostgreSQL Operator





Your App as a Service - Zkuste to sami!



TEMPLATES

OPERATORS

	Templates / Helm	Operator
Packaging	✓	✓
App Installation	✓	✓
App Update (kubernetes manifests)	✓	✓
App Upgrade (data migration, adaption, etc)	-	✓
Backup & Recovery	-	✓
Workload & Log Analysis	-	✓
Intelligent Scaling	-	✓
Auto tuning	-	✓

Portfolio Architektury

Obecný pohled na architekturu

Hybrid Multi-cloud management with GitOps

Business Drivers



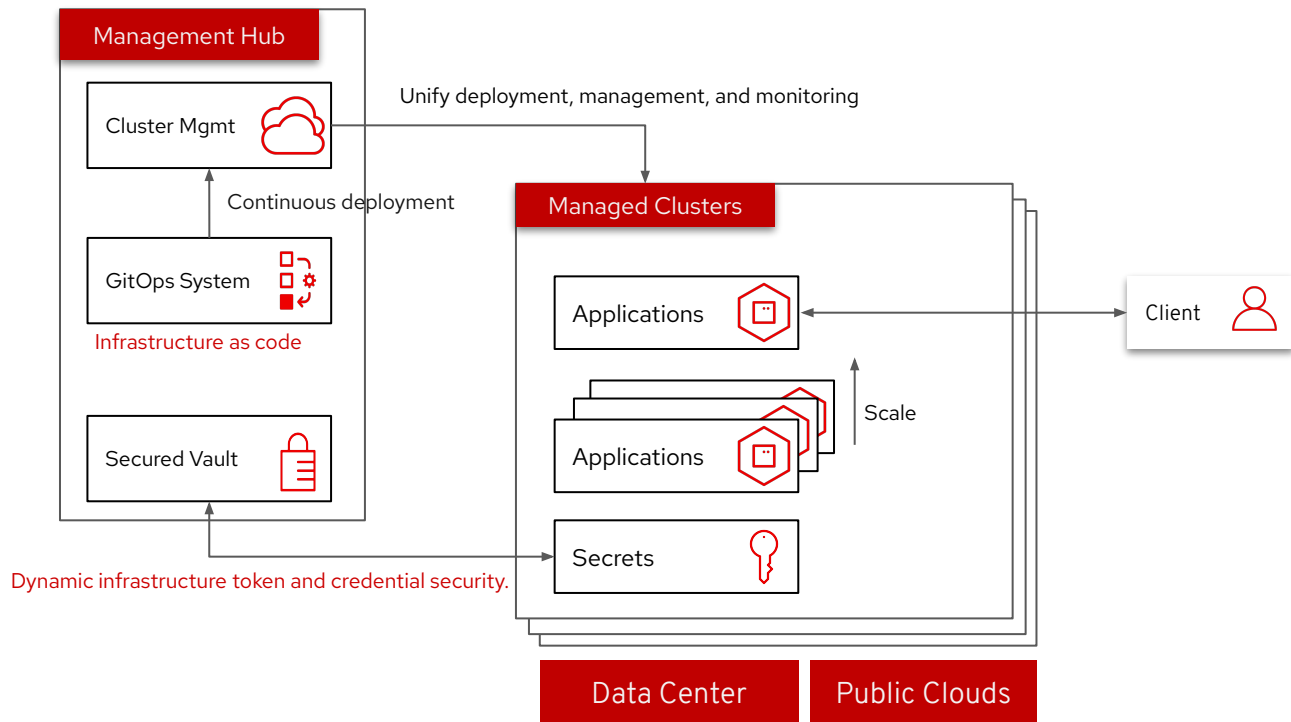
Unify management across cloud environments.



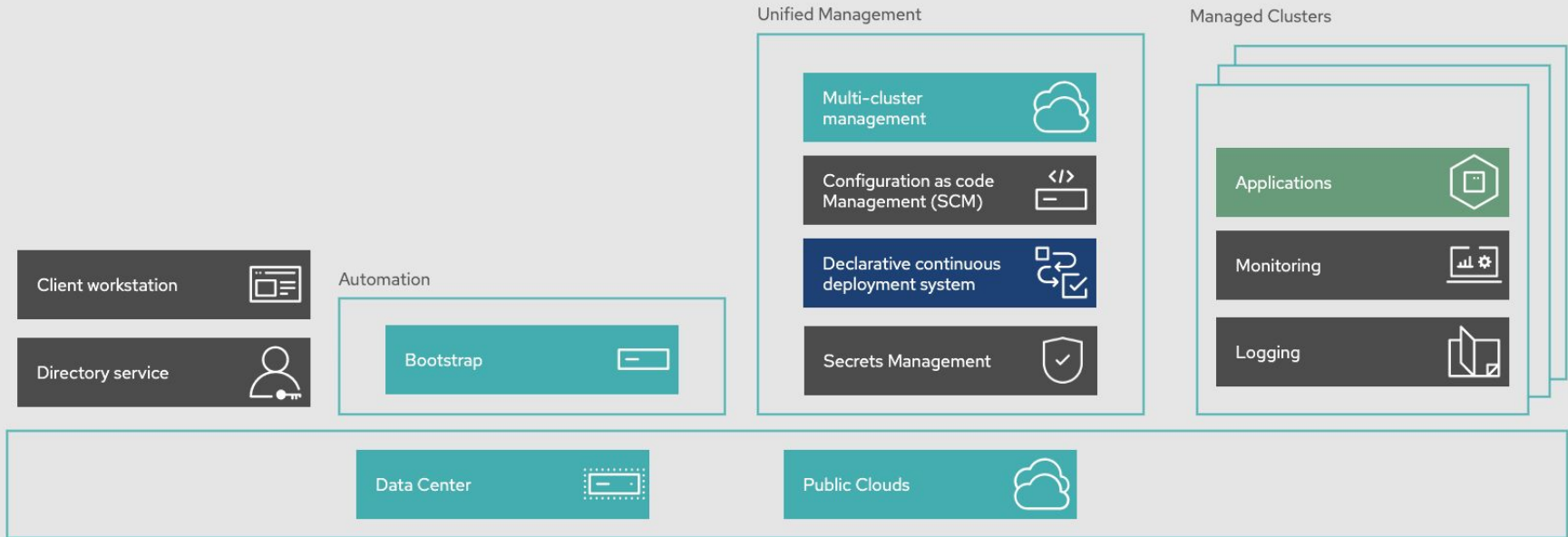
Dynamic infrastructure security.



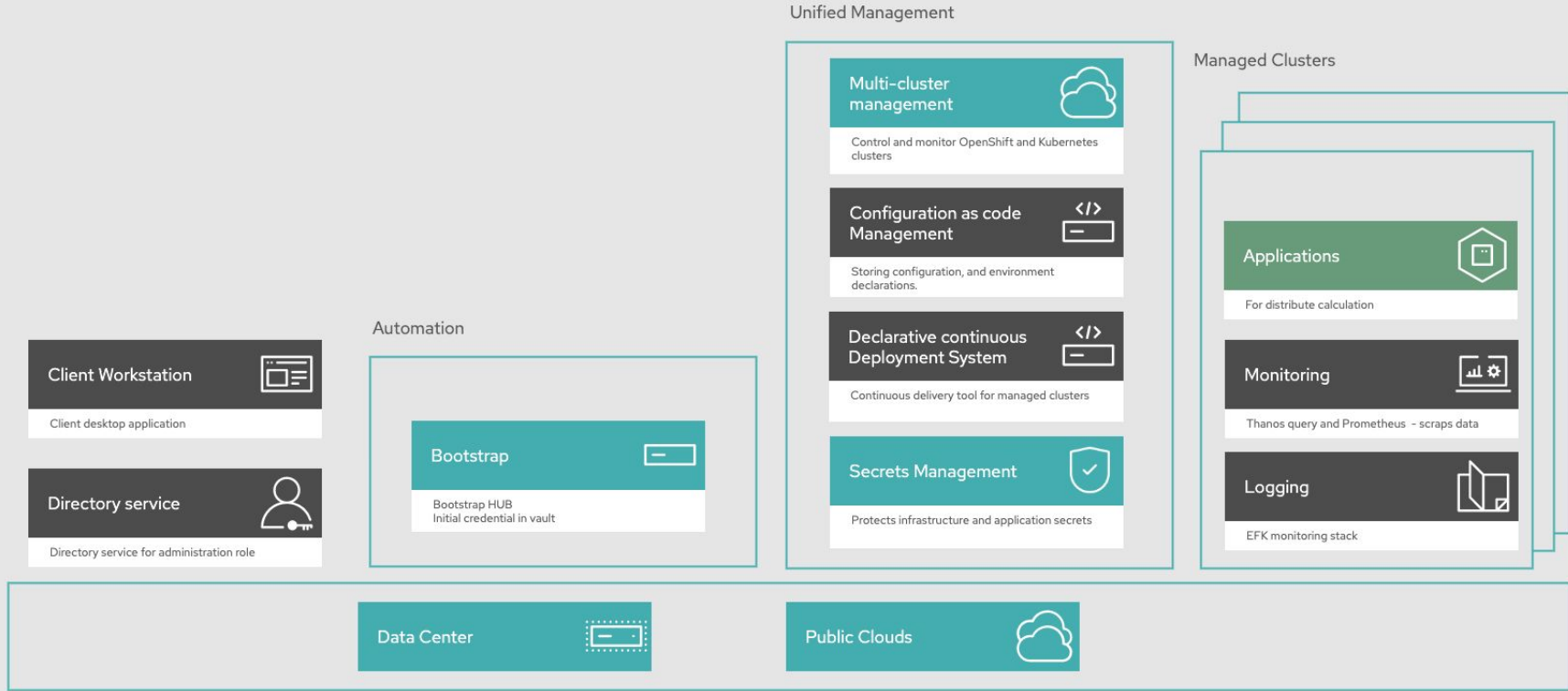
Infrastructural continuous delivery best practices.



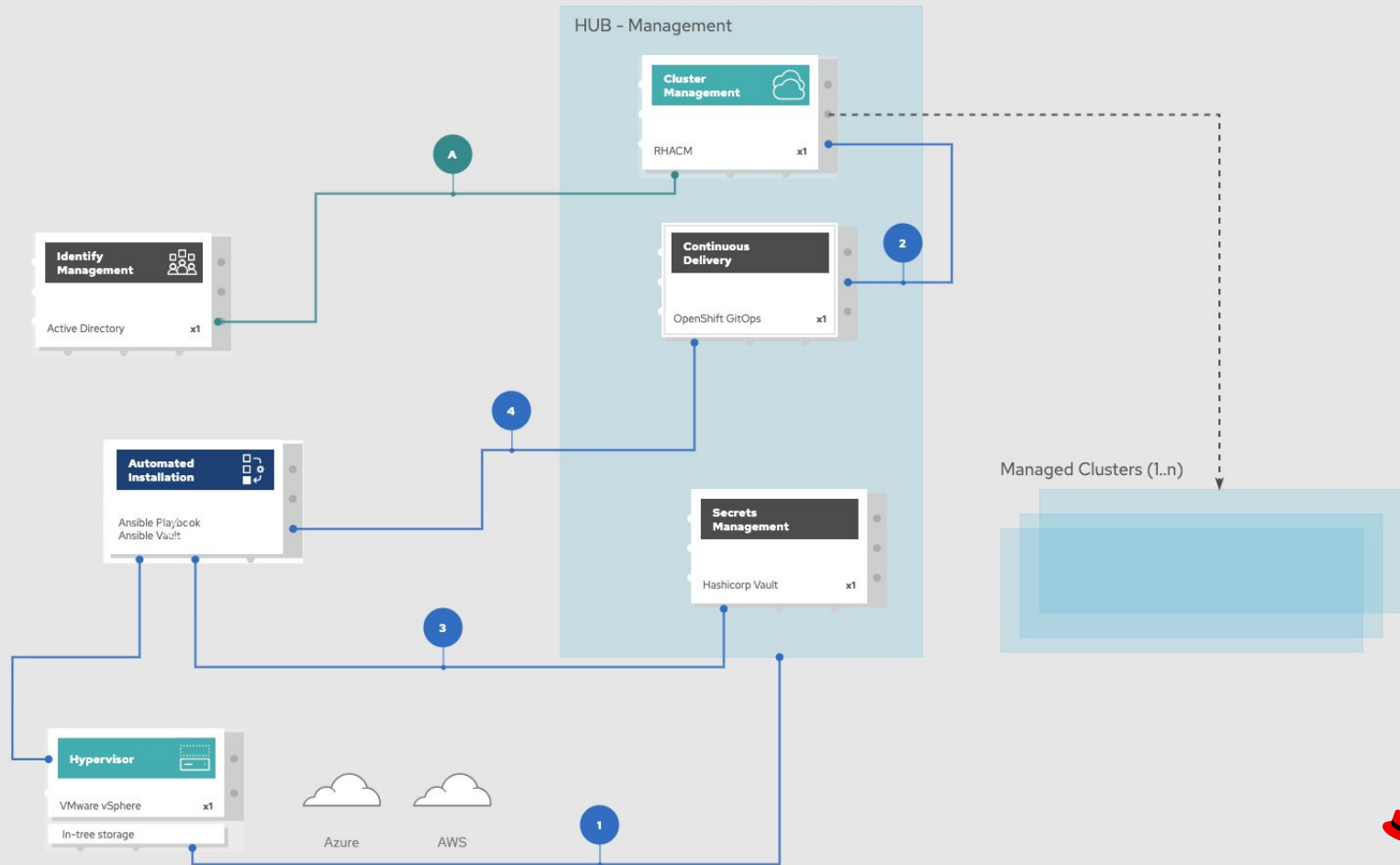
Logical - Hybrid Multi-cloud management with GitOps



Logical - Hybrid Multi-cloud management with GitOps



Schematic diagram -Hybrid Multi-cloud management with GitOps (Setup)



Red Hat
Summit

THANK
YOU



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