State of the Union, OpenShift Roadmap and Vision

Reza Shafii
Vice President - Cloud Platform Services
October 16th 2018
Does IT Matter? - Circa 2003

In 1968, a young Intel engineer named Ted Hoff found a way to put the circuits necessary for computer processing onto a tiny piece of silicon. His invention of the microprocessor spurred a series of technological breakthroughs—desktop computers, local and wide area networks, enterprise software, and the Internet—that have transformed the business world. Today, no one would dispute that information technology has become the backbone of commerce. It underpins the operations of individual companies, ties together far-flung supply chains, and, increasingly, links businesses to the customers they serve. Hardly a dollar or a euro changes hands anymore without the aid of computer systems.

As IT's power and presence have expanded, companies have come to view it as a resource ever more critical to their success, a fact clearly reflected in their spending habits. In 1965, according to a study by the U.S. Department of Commerce's Bureau of Economic Analysis, less than 5% of the capital expenditures of
Computing Applications

- On way to “boring necessity to operations”
- Forever a source of differentiation

Computing Services

- No sign yet of commoditization

Computing Infrastructure

- E
- Consul
- Drupal
- Apache

- Infrastructure
- Infrastructure
- WMI
- CMS
Computing Infrastructure

Computing Application Services

Reached “boring necessity to operations”

Electrical Infrastructure

Electrical Services

Forever a source of differentiation

Still innovating

Reached “boring necessity to operations”
A true hybrid cloud experience

- Manage multiple Kubernetes clusters across on-prem and multiple clouds
- **Automated operations** - Simplicity of the cloud anywhere
- **True hybrid services**
- Optionally choose fully managed (Dedicated)
Compute Services and Infrastructure Neutrality

- GKE
- AKS
- EKS
- PKS
- Red Hat OpenShift

Contributions to K8s
THE FACTORY OF THE FUTURE WILL HAVE ONLY TWO EMPLOYEES, A MAN AND A DOG.

THE MAN WILL BE THERE TO FEED THE DOG.

THE DOG WILL BE THERE TO KEEP THE MAN FROM TOUCHING THE EQUIPMENT.

- Warren G. Bennis
CoreOS TECHNOLOGY STACK

Three key elements

**CoreOS Container Linux**
- Fully immutable, container optimized, automatically updated Linux host foundation for OpenShift

**CoreOS Tectonic**
- ETCD
- Prometheus
- Metering/Chargeback
- Adds automated operations and day 2 management (install, upgrades, monitoring, metering & chargeback)
- Best-in-class support for CaaS/KaaS/PaaS use cases

**CoreOS Quay Registry**
- Enterprise container registry; self managed & as-a-service
- Premium offering usable standalone or with OpenShift
- Geo-replication, vulnerability scanning, build automation
OVER-THE-AIR UPDATES

- OpenShift retrieves list of available updates
- Admin selects the target version
- OpenShift full stack is updated over the air
- Auto-update support
DELIVERING IMMUTABLE INFRASTRUCTURE WITH RED HAT COREOS

- Minimal Linux distribution
- Optimized for running containers
- Decreased attack surface
- Over-the-air automated updates
- Immutable foundation for OpenShift clusters
- Ignition-based Metal and Cloud host configuration
DAY 2 MANAGEMENT: NEW OPENSSHIFT ADMIN CONSOLE

DEVELOPER CONSOLE
Existed within OpenShift 3.0

OPERATOR CONSOLE
New with the Tectonic integration

- Developer centric console that exposes the service catalogue
- Multi-tenant aware project management
- Admin centric console that leverages the Tectonic console
- The Operator Lifecycle Management and Metering capabilities of Tectonic will be exposed in this new console
Out of the box infrastructure monitoring

- Cluster management for OpenShift Admins
- Cluster health, control plane status, and capacity planning
- Prometheus alerting with pre-configured alerts
Operator metering - In OpenShift Admin console

- CPU, Memory, networking, and storage tracking + reports
- Actual and reserved usage
- By namespace, pod, label, cloud service, and app type
- Correlated to underlying IaaS cost
INTRODUCING THE OPERATOR FRAMEWORK

Operator Framework is an open source toolkit to manage application instances on Kubernetes in an effective, automated and scalable way.
THE INDUSTRY IS ALIGNING BEHIND THE CONTAINER OPERATOR FRAMEWORK

60+ Certified ISV Operators in Red Hat Early Access Program
- Containerized
- Cloud storage ready
- Replicated
- Backup
- Automated updates
- Containerized
- Container storage ready
- Replicated
- Backup
- Automated updates
- Enhanced observability
- Customization
- Local development
- Fully Open Source
- Any Kubernetes
- Certified on OpenShift
OpenShift 4.0 Converged Stack

Multi-cluster Unified Hybrid Cloud

Infra Monitoring
- Service Catalog / Operators
e.g., etcd, Prometheus, Red Hat Middleware, ISVs
- Automated Operations
  - Lifecycle Mgmt
  - Ops & Dev Consoles
- App Monitoring
  - Install / Upgrade
  - Security / Auth
  - Network / CNI
  - Storage / CSI

Automated Operations
- Cluster Services
  - Metering/Chargeback
  - Registry, Logging, Metrics
- Developer Productivity
  - Build Automation, Image Streams, CI/CD

Kubernetes
- CaaS ↔ PaaS

Red Hat Enterprise Linux or Red Hat CoreOS

Best Operator Experience

Best Developer Experience
A true hybrid cloud experience

- Manage multiple Kubernetes clusters across on-prem and multiple clouds
- Automated operations - Simplicity of the cloud anywhere
- True hybrid services
- Optionally choose fully managed (Dedicated)
OPENSHIFT IS GAINING MOMENTUM

CUSTOMER GROWTH IS ACCELERATING
Thank you
“Many organizations struggle with the burden of managing security across hundreds of VMs. As container-centric architectures become the norm and these organizations are responsible for thousands or tens of thousands of containers, their security practices should emphasize automation and efficiency to keep up.”

Source: NIST Special Publication 800-190 - Application Container Security Guide
Unified Hybrid Cloud
cloud.redhat.com

- manage clusters across all infrastructures
- browse and deploy true hybrid services from operator marketplace to clusters

**Quay Geo-Replication**
- centralized content ingress & federation
- Quay Geo-Replication to serve applications from localized storage across regions
- Quay Repo Mirroring to automatically distribute content to local registries

**Quay Repo Mirroring**
- single source of truth for depl. artefacts
- centralized metadata repository (signatures, vulnerabilities, labels)
- event triggers / notifications

- provenance data across the lifecycle
- attestations stored in centralized registry

**Embedded Operator Marketplace**
- Policy Management & Enforcement
- Vulnerability Dashboards
- Notifications / Alerting

**RED HAT**
- Code
- Build
- Scan
- Test
- Deploy
- Run

**end2end content management overview**
Red Hat OpenShift and Serverless

Developer experience
APIs, CLI, service binding

Building blocks for serverless
Source-centric and container-based

The leading enterprise Kubernetes platform
Automated Operations
Build and run anywhere (Hybrid Cloud)

---

Function as a Service

- Knative engine
- Riff
- OpenFaaS
- Kubeless

Red Hat OpenShift

Automated Operations

- RH MW Services (Operator backed)
- ISV Services (Operator backed)

Operator Framework

- Istio
- Hybrid Install / Ops
- Install / Upgrade
- Network / CNI
- Ops & Dev Consoles
- Security / Auth
- Storage / CSI

Kubernetes

- Red Hat Enterprise Linux or Red Hat CoreOS