RED HAT CLOUD SUITE ROADMAP
Building a New Digital Future

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Joe Fernandes - OpenShift
Xavier Lecauchois - Management

Jesse Wu - Integrated Solutions
Rob Young - Virtualization
WHO IS RED HAT?
DEFINITION OF AN OPERATING SYSTEM - 70’s

“The software that supports a computer's basic functions, such as scheduling tasks, executing applications, and controlling peripherals.”

“A system software that manages computer hardware and software resources and provides common services for computer programs”

“A collection of software that directs a computer's operations, controlling and scheduling the execution of other programs, and managing storage, input/output, and communication resources”
DEFINITION OF AN OPERATING SYSTEM - 2017

“The software that supports a computer’s data center’s basic functions, such as scheduling tasks, executing applications, and controlling peripherals.”

“A system software that manages computer hardware and software data center resources and provides common services for computer programs (n.k.a - applications)”

“A collection of software that directs a computer’s data center’s operations, controlling and scheduling the execution of other programs (n.k.a - applications), and managing storage, input/output, and communication resources”
DEFINITION OF AN OS - SIMPLIFIED

“OS ABSTRACTS APPLICATIONS FROM HARDWARE”
CHALLENGES ALSO REMAIN THE SAME

STABILITY  MANAGEABILITY  RELIABILITY  SCALABILITY  ADAPTABILITY
STABILITY CHALLENGE
FROM SINGLE SERVER TO HYBRID CLOUD PLATFORM
RELIABILITY CHALLENGE
FROM SINGLE LIFECYCLE TO ECOSYSTEM INTEROPERABILITY
SCALABILITY CHALLENGE
FROM DISCRETE TO INTEGRATED
ADAPTABILITY CHALLENGE
FROM MONOLITH TO SYMBIONT
IT STARTS WITH APPLICATIONS

APPLICATION
APPLICATIONS NEEDS CAPACITY

APPLICATION

HARDWARE
AND AN OS TO PUT THEM TOGETHER

APPLICATION

OPERATING SYSTEM

HARDWARE
CLOUD AS OPERATING SYSTEM

**APPLICATION**
- APPLICATION CODE
- DEPENDENCIES
- RESOURCES

**OPERATING SYSTEM**
- RESOURCE MANAGEMENT
- RUNTIMES
- SERVICE MANAGEMENT

**HARDWARE**
- PRIVATE IAAS
- PUBLIC CLOUD
- VIRTUALIZATION / PHYSICAL
PERSPECTIVES MATTER

APPLICATION

OPERATING SYSTEM

DEVELOPERS

OPERATIONS

HARDWARE
CONTAINERS TO THE RESCUE

APPLICATION

OPERATING SYSTEM

HARDWARE
INFRASTRUCTURE SPECIALIZATION

DEV

APPLICATION

APP OPS

OPERATING SYSTEM

SYS OPS

HARDWARE

Application Runtime
Application Services
Application Workflow
Container Scheduling
Container Orchestration
Container Engine
IaaS
Operating System
Virtual / Physical Infrastructure
RED HAT CLOUD SUITE
CONTAINERS AND ABSTRACTIONS
What Are Containers?

It Depends on Who You Ask

Sys-Admins / Ops

- Sandboxed application processes on a shared Linux OS kernel
- Simpler, lighter, and denser than virtual machines
- Portable across different environments

Developers

- Package my application and all of its dependencies
- Deploy to any environment in seconds and enable CI/CD
- Easily access and share containerized components
CONTAINERS IN ACTION
Critical features for both Dev and Ops

- Self-Service
- Multi-language
- Automation
- Collaboration
- Seamless

Standards-based
Web-scale
Open Source
Enterprise Grade
Secure
Application Architecture

- Shift from monolithic applications to microservices
- Independently deployable and updatable, limited dependencies
- Optimized for agility & accelerated time to market
Platform Infrastructure

- Shift from virtualization to scale-out cloud infrastructure
- Rapid growth in public cloud usage for enterprises
- Hybrid cloud deployments span private & multiple public clouds
Development Process

- Shift to more agile development and deployment processes
- Increased collaboration between Development & Operations
- Move from Continuous Integration to Continuous Deployment
CONTAINER DEPLOYMENT FOOTPRINTS
DevOps With Containers Across the Hybrid Cloud?
MODERNIZING WORKLOADS
THE DATA CENTER IS MOVING FORWARD
PRESSURES FROM CUSTOMERS & COMPETITORS TO MODERNIZE

NEXT-GENERATION ARCHITECTURE
New ways of developing, delivering, and integrating applications

CLOUD-NATIVE PLATFORMS
Modernize existing and build new cloud-based infrastructure

DEVOPS & CULTURAL CHANGES
More agile process across both IT and the business
### Balancing Innovation and Optimization

Most customers can’t go all one way or the other.

#### Virtualization
- **Big stateful VM**
- **1 Application -> 1-3 VMs**
- **VM lifecycle in years**
- **Increased demand -> Scale up**
- **High availability (HA) at the infrastructure layer**

#### Cloud
- **Small stateless instance**
- **1 Application -> many instances**
- **Instance lifecycle in hours to months**
- **Increased demand -> Scale out**
- **High availability (HA) at the application layer**

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**Mode 1**

**Mode 2**
BALANCING INNOVATION AND OPTIMIZATION
RED HAT VIRTUALIZATION FOCUS ON OPTIMIZATION & INTEGRATION

- Optimize the IT you have
- Integrate apps, data, and processes
- Add and manage cloud infrastructure
- Build more modern applications

Leverage and integrate existing investments in order to enable future technology
INTEGRATE APPS, DATA, & PROCESSES

Red Hat Enterprise Linux 7.3
- Hot CPU unplug support
- Virt-sparsify

Software Defined Networking (SDN) capabilities by offering native support for Open Virtual Network (OVN) for Open vSwitch.

TECH PREVIEW IN RHV 4.1
INTEGRATION & AUTOMATION

Ansible
by Red Hat®

Red Hat Virtualization and Ansible 2.3 are integrated in order to provide streamlined configuration for:

- Virtual machines
- Virtual networks
- Virtual storage
- Configuration
- Updates
Red Hat Virtualization is a first class infrastructure provider for CloudForms. The RHV provider now includes support for features such as:

- VM live migrate
- VM reconfiguration (hot add CPU & RAM, hot remove of previously added CPUs)
- VM Live Snapshot
Red Hat Virtualization continues to integrate with Red Hat OpenStack Platform to enable “Cloud Transition” use cases. This includes continued and planned integration with:

- Compute
- Networking
- Storage
- Security
- High Availability
- TripleO
PRIVATE OPTIONS
RUNNING WORKLOADS PRIVATELY

THE DO-IT-YOURSELF APPROACH VS THE MANAGED APPROACH
RUNNING WORKLOADS PRIVATELY

THE SELF MANAGED APPROACH

- Can be on or off-premises
- Red Hat simplifies experience:
  - in place automated upgrades
  - ops tools enablement
  - handle configuration as code
- But still require investment:
  - steep learning curve for ops
  - organization adaptation

THE MANAGED APPROACH

- Can be on or off-premises
- Still benefits from Red Hat’s
  - Tooling
  - QA & Support
  - Life cycle
  - Ecosystem
- API is used freely and cost to maintain is fully bundled

RED HAT OPENSTACK PLATFORM
Bridges the gap between your physical choices and your cloud deployments
STABILITY IN RAPID RELEASE CYCLES
OPENSTACK PRODUCT STRATEGY
Stable, production-ready release co-engineered with RHEL

Enterprise Ready  NFV Ready  Optimized Portfolio  Certified Partner Ecosystem
TRENDS: CONSUMPTION
Emerging consumption patterns

Some want long life versions
- Reluctant to change what’s in production
- Upgrades are a disruption
- Cannot handle downtime involved
- Do not need new features
- Manually validating environment
- Constrained by complex regulations

Others want the latest features
- Want new features ASAP
- Often working on fast apps themselves
- Understand continuous delivery concepts
- Automated validation procedures
- Continuously scale infrastructure with newer hardware
RED HAT OPENSTACK PLATFORM
LIFE-CYCLE

<table>
<thead>
<tr>
<th>RHOSP 8 Liberty</th>
<th>RHOSP 9 Mitaka</th>
<th>RHOSP 10 Newton</th>
<th>RHOSP 11 Ocata</th>
<th>RHOSP 12 Pike</th>
<th>RHOSP 13 Queens</th>
<th>RHOSP 14 R....</th>
<th>RHOSP 15 S....</th>
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<tbody>
<tr>
<td>3 years</td>
<td>3 years</td>
<td>3 years (+2 years)</td>
<td>1 year</td>
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- Every **6 month** release of RHOSP is supported for 1 year
  - No feature backports (Production Phase 2 from the start)
  - In-place/online upgrades supported during this timeframe from n to n+1

- Every **18 months**, we elect an extended life support version (Long Life releases)
  - Selected Backports available to Long Life releases
  - In-place upgrades from N → N+1 from this release supported if done within year 1 (with a 6 month buffer window)
  - Upgrades from Long Life → Long Life will be done via automated* migration to latest RHOSP available with tooling provided.
  - Extension from 3 to 5 years at additional cost (ELS add-on)

* with potential impact on service continuity, see next slide
Red Hat OpenStack Platform - 10k Foot View

RHOSP 11
(Spring 2017)
- Composable HA Architecture
- Composable Upgrades
- Ceph RBD Cinder Volume Replication driver for DR (Tech-preview)
- Opstools performance (collectd client)
- EC2 API deployment support
- Octavia LBaaS (tech preview)

RHOSP 12
(Winter 2017)
- Containerized OpenStack Deployment (docker-cmd)
- Instance HA director integration
- Storage Encryption (manual keys)
- Octavia LBaaS full support
- Additional TLS service coverage

13+
(Spring 2018 and beyond)
- Containerized OpenStack Deployment on OpenShift (kubernetes)
- Barbican availability
- Multi-site w/shared Keystone, and Replicated Storage
- Stretched Clusters
- Distributed Compute Nodes
- Introducing tooling for Parallel Cloud Migration

Private IaaS
- Support for VLAN Aware VMs
- Metadata exposure of SRIOV physical function VLAN tags to guests
- OpenDaylight automated deployment using director (tech preview)
- Hyper-Converged Infra

NFV - Telco
- OpenDaylight full support
- Emulator thread policies
- Flexible scheduling for SR-IOV

NFV - Telco
- RT-KVM full support
- NFV Service Assurance (CloudForm Enhanced Integration)
- NFV Director UI
Containerized RHOSP deployment & management

“Thai Flute” High Level View

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<th>GA: Major upgrades of containers via Heat &amp; Ansible</th>
<th>GA: Deployment of containerized OpenStack via Kubernetes as an underlying technology</th>
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<td>GA: Minor updates of containers via Kubernetes</td>
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<td>GA: Major upgrades to Kubernetes based deployments</td>
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Epic maturity legend:
- early
- partial
- good
- strong
MANAGING A COMPLEX ENVIRONMENT
Everyone is talking about automation.
AUTOMATION IN ENTERPRISE IT TODAY

- Servers
- Cloud
- Network
- Containers
- Apps
AUTOMATED SILOS ARE STILL SILOS
Ansible solves these problems where no other technology has been able to do so.

SIMPLE  AGENTLESS  EXTENSIBLE
ANSIBLE AUTOMATION

is at the core of our management strategy
RED HAT MANAGEMENT AND AUTOMATION FOR IT OPERATIONS

**Ansible Tower by Red Hat**
- Centralize automation governance

**Red Hat CloudForms**
- Deliver services across your hybrid cloud

**Red Hat Insights**
- Prevent critical issues before they occur

**Red Hat Satellite**
- Build a trusted & secure Red Hat environment

**Ansible**
- Automate your I.T. processes & deployments
ANSIBLE AND CLOUD SUITE
RED HAT MANAGEMENT AND AUTOMATION FOR IT OPERATIONS

RED HAT® CLOUDFORMS
DELIVER SERVICES ACROSS YOUR HYBRID CLOUD

RED HAT® INSIGHTS
PREVENT CRITICAL ISSUES BEFORE THEY OCCUR

RED HAT® SATELLITE
BUILD A TRUSTED & SECURE RED HAT ENVIRONMENT

ANSIBLE
AUTOMATE YOUR I.T. PROCESSES & DEPLOYMENTS
- Single Management Platform across Openstack, RHEV and Openshift
- Ansible is becoming the default automation language of CloudForms
- No more sysadmins writing and maintaining Ruby
- Ansible removes the biggest barrier to entry for new CloudForms deployments
Insights now creates Ansible Playbooks to fix issues it identifies.

Insights generates tailored Playbooks customized to the user’s specific environment.

Integrate Insights remediations into stand-alone or CloudForms based workflows.
● The best way to manage your entire Red Hat infrastructure

● Ansible already work with Satellite - inventory sharing, Satellite as a content provider, Tower as a post-deployment call-out

● Future versions of Satellite will default to Ansible automation provider while continuing to support existing Puppet deployments

● Not just Ansible - tighter integrations with Insights & CloudForms
MANAGEMENT EMBEDDED IN THE RED HAT PORTFOLIO

Today

- RED HAT OPENSHIFT
- openstack
- RED HAT CLOUD INFRASTRUCTURE
- RED HAT STORAGE
- RED HAT CERTIFIED ARCHITECT

Coming

- RED HAT JBOSS MIDDLEWARE
- RED HAT ENTERPRISE LINUX
- RED HAT CLOUDFORMS
- RED HAT INSIGHTS

???
# Comprehensive Cloud Suite

## Management
- **Red Hat CloudForms**
- **Red Hat Insights**

## Containers
- **Red Hat OpenShift**
- **Kubernetes**

## Virtualization
- **Red Hat Virtualization**
  - VMware
  - Microsoft Hyper-V

## Private Cloud
- **Red Hat OpenStack Platform**

## Public Cloud
- Amazon Web Services
- Microsoft Azure

## Platform
- **Red Hat Enterprise Linux**

## Storage
- **Red Hat Ceph Storage**