SUSE OpenStack Cloud Roadmap

Session FUT1430

April 2019

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Agenda

- Lifecycle
- Major Focus Areas
- Cloud 9
- Containerization Tech Preview
- Cloud 9 Updates
- Cloud 10
- Questions

Information is forward looking and subject to change at any time.
SUSE: Underpinning Digital Transformation

Physical Infrastructure:
- Multi-platform Servers, Switches, Storage

Container Management
- SUSE CaaS Platform

Business-critical Applications

Machine Learning

Internet of Things

Business Analytics

High Performance Computing

Traditional IT & Applications

Application Delivery

Compute
- Virtual Machine & Container

Storage
- SUSE Enterprise Storage

Networking
- SDN and NFV

Multimodal Operating System
- SUSE Linux Enterprise Server

Private Cloud / IaaS
- SUSE OpenStack Cloud

Software-defined Infrastructure

Public Cloud
- SUSE Cloud Service Provider Program

Services
- SUSE Global Services
- Consulting Services
- Select Services
- Premium Support Services

Open, Secure, Proven
SUSE OpenStack Cloud Lifecycles

**SUSE OpenStack Cloud 7 (Newton)**
GA 3/2017 - EOS 12/2019

**SUSE OpenStack Cloud 8 (Pike)**
GA 05/2018 - EOS 05/2021

HPE Helion OpenStack 8 (Pike)
GA 08/2018 - EOS 08/2021

**SUSE OpenStack Cloud 9 (Rocky)**
GA 04/2019 - EOS 04/2022

**SUSE OpenStack Cloud 10 (Train)**
GA 1H/2020 - EOS 1H/2023

**No HPE Helion Release Will Provide Upgrade to Cloud 9**
SUSE OpenStack Cloud + Enterprise Storage Lifecycle

- **SUSE OpenStack Cloud 7 (Newton)**
  - GA 3/2017 - EOS 4/2019
  - Works with SES 3,4
  - Works with SLES12SP2

- **SUSE OpenStack Cloud 8 (Pike)**
  - GA 05/2018 - EOS 05/2021
  - Works with SES 4,5,6
  - Works with SLES12SP3

- **SUSE OpenStack Cloud 9 (Rocky)**
  - GA 03/2019 - EOS 03/2022
  - Works with SES 5,6,7
  - Works with SLES12SP4

- **SUSE OpenStack Cloud 10 (T)**
  - GA 1H/2020 - EOS 1H/2023
  - Works with SES 5,6,7
  - Works with SLES15SP1

- **SUSE Enterprise Storage 4**
  - GA 12/2016 – EOS 09/2019
  - SLES12SP2

- **SUSE Enterprise Storage 5**
  - GA 10/2017 – EOS 09/2020
  - SLES12SP3

- **SUSE Enterprise Storage 6**
  - GA 05/2019 – EOS 09/2021
  - SLES15

- **SUSE Enterprise Storage 7**
  - GA Q2 2020 – EOS Q3 2023
  - SLES15SP1

OpenStack Releases Qualified with Storage Versions during Lifecycle
Futures - Themes for SUSE OpenStack Cloud

• Simplify Day 2 Operations
• Add more Networking Capabilities
• Containerized Components
• Standardized Monitoring Capabilities
• Support for Emerging Technologies
What’s new in SUSE OpenStack Cloud 9?

• Based on OpenStack Rocky
  • Multi-attached storage
  • Ironic Improvements
  • Includes Queens functionality
• SUSE Linux Enterprise Server 12 SP4
• Day two UI – CLM Admin Console
• IPV6 Support**
• Watcher Optimization – Tech Preview**
• GA Release planned for April 2019
• Dual lifecycle options
  • Crowbar
  • Cloud Lifecycle Manager (CLM)

**Delivered in Cloud 9 Updates
## Cloud 9 - OpenStack Project Status

<table>
<thead>
<tr>
<th>Project</th>
<th>Crowbar</th>
<th>CLM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbican</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cinder</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Designate</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Freezer</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Glance</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Heat</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Horizon</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Ironic</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Keystone</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Magnum</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manila</td>
<td>✓</td>
<td>✓</td>
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</table>

<table>
<thead>
<tr>
<th>Project</th>
<th>Crowbar</th>
<th>CLM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monasca</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Monasca-Ceilometer</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Neutron</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Neutron(LBaaSv2)</td>
<td></td>
<td>Octavia</td>
</tr>
<tr>
<td>Neutron(VPNaaS)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Neutron(Fwaas)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nova</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Octavia</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sahara</td>
<td>✓; Tech</td>
<td>✓; Tech</td>
</tr>
<tr>
<td></td>
<td>Preview</td>
<td>Preview</td>
</tr>
<tr>
<td>Swift</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Watcher</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Note:** Freezer is deprecated.
Day 2 UI SUSE OpenStack Cloud 9

CLM Admin Console

Service Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Status</th>
<th>Endpoints</th>
<th>Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardana</td>
<td>Ardana Service</td>
<td>-</td>
<td>Admin <a href="https://192.168.245.6:9085">https://192.168.245.6:9085</a></td>
<td>region1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Internal <a href="https://192.168.245.6:9085">https://192.168.245.6:9085</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Public <a href="https://myardana.test:9085">https://myardana.test:9085</a></td>
<td></td>
</tr>
<tr>
<td>Barbican</td>
<td>Barbican as a Key Manager Service (created via barbican deploy)</td>
<td>-</td>
<td>Admin <a href="https://192.168.245.6:9311">https://192.168.245.6:9311</a></td>
<td>region1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Internal <a href="https://192.168.245.6:9311">https://192.168.245.6:9311</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Public <a href="https://myardana.test:9311">https://myardana.test:9311</a></td>
<td></td>
</tr>
<tr>
<td>Ceilometer</td>
<td>Ceilometer Service</td>
<td>-</td>
<td>Admin <a href="https://192.168.245.6:8777/">https://192.168.245.6:8777/</a></td>
<td>region1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Internal <a href="https://192.168.245.6:8777/">https://192.168.245.6:8777/</a></td>
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<td>Public <a href="https://myardana.test:8777/">https://myardana.test:8777/</a></td>
<td></td>
</tr>
<tr>
<td>Cinder</td>
<td>Cinder Volume Service</td>
<td>-</td>
<td>Admin <a href="https://192.168.245.6:8776/v1/tenant_ids">https://192.168.245.6:8776/v1/tenant_ids</a></td>
<td>region1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Internal <a href="https://192.168.245.6:8776/v1/tenant_ids">https://192.168.245.6:8776/v1/tenant_ids</a></td>
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</table>
What is it?
• OpenStack services (e.g. Nova, Keystone, Neutron) packaged to run in containers as opposed to running as processes on bare metal
• Kubernetes installed onto bare metal, with OpenStack deployed within containers using Helm Charts
• Airship open source project foundation for lifecycle management

Why are we introducing it?
• Containers are more lightweight than VMs, easier to start up and terminate
  • OpenStack environment faster to start up and scale
• Easier to separate individual OpenStack projects
  • Easier to scale individual components up and down
  • Upgrades of individual components become easier
• Leverage Kubernetes’ built-in HA
  • Designing a self-healing environment becomes simpler
• Securing individual services and components becomes easier due to container isolation
Cloud 9 Containerized OpenStack

Tech Preview
- Separately delivered – In Parallel with Cloud 9 Delivery
- Milestone for Cloud 10 Roadmap
- Unification of Lifecycle Management
- Based on upstream Airship Project

- SUSE Manager Integration Investigation – SUSE Manager Team

- Target for Delivery April 2019
- Details Linked from the Cloud 9 Beta Page
  https://www.suse.com/betaprogram/cloud-beta/

We need your Feedback!!!
Cloud Lifecycle Management Airship
Containerized Deployment

Full Details Attend SUSEcon Session TUT1273
Containerized OpenStack Preview
Thursday April 4 at 2:00 PM

SUSE Manager UI

SUSE Linux

YAML Configuration
SUSE Simplified Overrides

Airship Components

Deployer

Shipyard
Deckhand
Pegleg
Armada

Deployer delivers components

CaaSP – Kubernetes Cluster

CaaSP – Kubernetes Cluster

Node 1
Node 2
Node 3
Node 4
Node 5
Node 6

Control
Control
Control
Compute
Compute
Compute

kvm
kvm
kvm

Airship runs as containers in the cluster
Lifecycle Upgrade Paths / Unification Plan

- SUSE OpenStack Cloud 10 Containerized Control Plane Requires Life Cycle Manager Conversion
- Provide Migration Path in Cloud 9 for both Flavors
- Allows single customer conversion to CCP in Cloud 10
- Lifecycle Manager is more aligned with Upstream
Cloud 9 Updates
IPV6 Support Details

- Cloud 8 Supports IPV6 Tenant Networks
- IPV6 Support for both Tenant and Control Plane Networks in Cloud 9
- Single Stack Support for IPV6
- No Conversion Allowed – Requires New Deployment
- Full Delivery in Early Cloud 9 Update Cycle
SUSE OpenStack Cloud GPU Support

- **Primary Requested Use Case #1**
  - PCI Passthru NVIDIA GPUs to Guest VMs
  - This use case will be qualified in the Cloud 9 Updates

- **Second Most Requested Use Case #2**
  - NVIDIA GPUs shared using vGPU Driver
  - Once the NVIDIA vGPU driver is supported by NVIDIA we will consider this for the Cloud 9 Updates

- **Other Requested Configurations**
  - FPGAs
  - Other GPU Vendor Types
  - Discovery of GPUs and Provisioning within Ironic
SUSE Cloud/Storage Integration

Installation / Configuration Improvements to Connect the Cloud to SUSE Enterprise Storage

Delivery Phases
1. Cloud 8 CLM Manual Additions Input Model
2. Cloud 8 CLM Updates Export / Import
   Cloud 9 Crowbar Export/Import in Maintenance Update
OpenStack Watcher Cloud 9 Tech Preview

- Monitors ("Watches") Infrastructure

- Watcher provides **Dynamic Resource Optimization**
  - Complete optimization loop using policies

- Primary Use Case Supported in Cloud 9
  - Compute Server is Overloaded High CPU Utilization
  - Redistribute VMs via Live VM Migration other Servers
  - Less Operator Intervention

- Delivered in a Cloud 9 Update
Scalability Improvements

Clouds are Getting Bigger

• Start Qualification Testing of Large Clouds in the 1,000 – 2,000 Node range – 2nd Half of 2019

• Key Areas of Focus to Enable This Growth
  • Adding Region Support to Lifecycle Managers
  • Working on Multi-Site Use cases
  • Federation
SDN Integration

Current SDN Support
- VMware v6.3 NSX-V - Cloud 8*

Planned Support
- VMware v2.4 NSX-T – Cloud 9 Updates **
- Juniper v5 – Cloud 9 Updates **

Planning
- Cisco ACI ***

* ESX supported only
** kvm & ESX supported
*** kvm only

Networking at SUSE FUT1442
Mark Darnell Tues, Wed at 10:00 am
Monitoring Updates

Monasca Improvements
Lifecycle Events Monitoring
Correlation of Events
Better out of the box defaults

Introduction of Prometheus – Cloud 10
Common View Across Products with Grafana Dashboards
Cloud 10 Themes

• Containerization of OpenStack – Full Production Support
• New Options for Monitoring
• Leveraging Kubernetes for HA
• Common Installer for Cloud Infrastructure
• New Single Lifecycle Manager Based on Airship
• Exploit new Acceleration Technology
Questions??
SUSE OpenStack Cloud

**Built On**
- OpenStack Pike Release
- SUSE Linux Enterprise Server 12 SP3

**New or Expanded Services**
- SUSE CAP Integration
- Physical Server as a Service (Ironic)
- SDN Support for NSX-V
- Dual lifecycle manager options

**Operational Enhancements**
- Non-disruptive Upgrade to Cloud 8
- Planning and Pre-install Validation
- Simple Deployment UI
- Scale Testing 200 nodes
- Monitor Capacity and Performance
- 3-year support

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**Built On**
- OpenStack Rocky Release
- SUSE Linux Enterprise Server 12 SP4

**New or Expanded Services**
- CLM Manila Support

**Operational Enhancements**
- Lifecycle Tools Improvements
- mkcloud support
- SES Integration

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**Built On**
- OpenStack Train Release
- SUSE Linux Enterprise Server 15

**New or Expanded Services**
- Containerized Deployment
- Accelerator Engine Support

**Operational Enhancements**
- Prometheus Monitoring
- Multiple Site Enhancements
- DR Enhancements
- Root Cause Detection/Analysis/Repair
- Kubernetes Networking Configurations
- Workflow Automation

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**Built On**
- OpenStack Rocky Release
- SUSE Linux Enterprise Server 12 SP4

**New or Expanded Services**
- GPU Support
- SDN Support for Juniper
- SDN Support for NSX-T

**Operational Enhancements**
- IPV6 Support
- Policy-based Optimization**
- Scalability Improvements
  - Region Support
  - Federation
  - Multi-Data Center Support
- Cloud Monitoring
  - Lifecycle Events Monitoring
  - Advanced Log Analysis
  - Monitoring Analytics
- Integration with SUSE Single Sign-on

**Notes**
- Items are tech preview
- Information is forward looking and subject to change at any time.
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