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Project overview and update

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Overview

- Community-Generated Roadmap background
- ➡ Top features/enhancements in the Pike cycle
- Development themes per cycle (Pike, Queens, Rocky)
- → Big picture view of development (P, Q, R combined)
- ⇒ Development per project



Roadmap background & orientation

Roadmap background

- Produced by the Product Work Group
- Based on input from 24 Project
 Team Leaders and core contributors
- Surveyed in mid- to late-April 2017
- Provides a preview of what project teams are planning—but might change in the future





34 projects invited to contribute.24 contributed, including all projects with >25% adoption









What does the Roadmap show us?

- Key features coming in Pike
- Development themes per release
- Major development themes overall (P, Q, and R releases)
- Overall development projection



Pike cycle features & enhancements

Top 8 features coming down the Pike



- ➡ EXTEND VOLUME WHILE ATTACHED
- ➡ ARCHIVING OLD DOCUMENTATION ON DOCS.OPENSTACK.ORG.



➡ IRONIC & NEUTRON INTEGRATION



➡ UNIFIED LIMIT SUPPORT FOR BETTER QUOTA USABILITY ACROSS OTHER OPENSTACK SERVICES



LIVE VM MIGRATION BETWEEN HETEROGENOUS NETWORKING BACKENDS FOR BETTER MIXED HARDWARE ENVIRONMENT SUPPORT



➡ SUPPORT MULTIPLE CELLS V2 CELLS IN THE API



- SWIFT OBJECT CONTAINER SHARDING
- ➡ KURYR-KUBERNETES & KURYR-LIBNETWORK



Development themes per project: Major contributors in Pike



How projects indicated development themes

















Analysis of individual themes

- Although you might see a smaller proportion of projects focused on security, that does not mean projects neglect security. The "major focus" designation highlights work related to delivering security-related functionality, such as access control and auditability.
- All of the projects adhere to OpenStack Security Team's security patching requirements.



Development themes per cycle: Pike, Queens and Rocky



Pike Cycle Development Themes





Queens Cycle Development Themes

Minor focus Not a focus
No information/not appicable Major focus



Rocky Cycle Development Themes

Key takeaways for development over time:

- User experience will continue to be the #1 focus area overall
- Manageability, resiliency, and scalability are the other top concerns
- ➡Queens outlook is available for 83% of projects
- Rocky outlook is available for 70% of projects

Analysis of overall themes

- It's interesting to note that manageability and user experience are consistently among the top themes across all releases. User Experience is meant to capture API enhancements and capabilities that end users can leverage, while Manageability captures enhancements to the operator experience, such as simplified management of the service itself.
- This roadmap reflects developers focusing on the overall user experience for both users and operators.



Development overview: Pike, Queens and Rocky combined



Major Focus Areas Per Release

Pike Queens R Release



Overall Development Outlook



Individual project overview & coming Pike features

Barbican: Secret and key management

USABILITY

- List filters
- ID field
- Deprecate certificate orders

SECURITY

- Hashicorp Vault plugin
- IPA Vault plugin
- Adopt new python cryptography library

➡ INTEROPERABILITY

- New Projects Adopting Barbican (Swift, Tacker)
- Oslo adoption of Castellan library interface

Contributors: 52 User Survey - Adoption: 11% User Survey - Considering: 27%

Stats

➡ POTENTIAL QUEENS FEATURE(S)

• No Info



Blazar: Reservation service

➡ INSTANCE RESERVATION

- Reserve instance capacity (e.g. 4 instances with 1 vCPU/1GB RAM) for VNFs
- https://blueprints.launchpad.net/blazar/+spec/new-instance-reservation

➡ GUI

- Horizon UI integration to show reservation schedule from Blazar
- https://blueprints.launchpad.net/blazar/+spec/climate-dashboard

➡ IMPROVE CONVENIENCE OF API

- Improvements in API user experience/usability
- https://launchpad.net/blazar/+milestone/0.3.0

Stats

Contributors: 10 User Survey - Adoption: N/A User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

• Operator-friendly API and features improvements

Cinder: Block storage service

EXTEND VOLUME WHILE ATTACHED

- Enable resizing a volume that is currently attached to an instance without requiring a detach, which avoids taking a volume offline.
- <u>https://specs.openstack.org/openstack/cinder-specs/specs/pike/extend-attached-volume.html</u>

REPLICATION GROUP SUPPORT

- Group replication. Enhancement to allow enabling replication on a group of volumes. Current replication is system-wide and only visible to the cloud admin. Group replication will allow cloud users to control which volumes have an application association and control the replication of those groups of volumes for increased data protection.
- <u>https://specs.openstack.org/openstack/cinder-specs/specs/pike/replication-group.html</u>

CINDER VOLUME REVERT TO SNAPSHOT

- Simplifies reversion to most recent snapshot of a volume. This minimizes volume downtime needed to recover from errors.
- <u>https://specs.openstack.org/openstack/cinder-specs/specs/pike/cinder-volume-revert-by-snapshot.html</u>

Stats

Contributors: 215 User Survey - Adoption: 89% User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

 Push for backend driver support for new features such as multi-attach, group replication, and consistent snapshots.

Documentation: OpenStack manuals

ARCHIVING OLD DOCUMENTATION ON DOCS.OPENSTACK.ORG.

- This addresses the requirement to archive old content, and make it available to users on older versions of OpenStack.
- https://blueprints.launchpad.net/openstack-manuals/+spec/archiving and https://review.openstack.org/#/c/426047/10/specs/pike/archiving.rst

➡ MOVE ADMINISTRATOR GUIDE TO PROJECT REPOS

- This proposes allowing project teams to manage their administrator guide content similar to how the api-ref and installation guides are being managed.
- https://review.openstack.org/#/c/439122/

➡ CONTINUE REVISION OF THE ARCHITECTURE DESIGN GUIDE FOR PIKE.

- Revising the content structure to refine use cases to the most common OpenStack deployments, and create an abstraction between cloud architecture concepts and various OpenStack projects. This will make it easier to maintain the guide.
- https://blueprints.launchpad.net/openstack-manuals/+spec/arch-design-pike and https://review.openstack.org/#/c/436747/4/specs/pike/arch-guide-restructure.rst



Stats

Contributors: 163 User Survey Insight: 61% use docs daily or weekly

POTENTIAL QUEENS FEATURE(S)

- Finalizing the transition to the projectspecific Administration Guide(s)
- Working alongside the security team to look at maintaining the Security Guide

Dragonflow: Distributed SDN-based Neutron Implementation

VLAN-AWARE-VMS

- Allows VMs/Containers to leverage trunk ports by using VLAN tagging
- <u>https://blueprints.launchpad.net/dragonflow/+spec/vlan-trunk</u>

➡ SERVICE FUNCTION CHAINING

- Service function chains can be implemented using Neutron ports. This makes it possible to create a traffic steering model for service chaining that uses only Neutron ports.
- https://blueprints.launchpad.net/dragonflow/+spec/service-function-chaining

➡ IPV6 SUPPORT

• <u>https://blueprints.launchpad.net/dragonflow/+spec/ipv6</u>

➡ POTENTIAL QUEENS FEATURE(S)

• LBaaS, FWaaS, and integration with other projects (e.g. Kuryr)

Contributors: 6 User Survey - Adoption: N/A User Survey - Considering: N/A



Stats

Glance: Image service

IMAGE IMPORT REFACTOR

- MVP redesign of the "import" API for Glance that will enable operators and end users upload and activate custom images in their respective cloud deployments seamlessly and securely
- https://specs.openstack.org/openstack/glance-specs/specs/mitaka/approved/imageimport/image-import-refactor.html
- SUPPORT FOR PYTHON 3.5 COMPATIBILITY IN GLANCE SERVER, CLIENT AND THE STORE CODEBASES
- Adds Python 3.5 compatibility for Glance components to meet Pike Community Goal
- <u>http://specs.openstack.org/openstack/glance-specs/specs/pike/approved/glance/lite-specs.html#community-goal-support-python-3-5</u>
- <u>http://specs.openstack.org/openstack/glance-specs/specs/pike/approved/python-glanceclient/lite-specs.html#community-goal-support-python-3-5</u>
- <u>http://specs.openstack.org/openstack/glance-specs/specs/pike/approved/glance_store/lite-specs.html#community-goal-support-python-3-5</u>

CONTROL PLANE API ENDPOINTS DEPLOYMENT VIA WSGI

- DevStack plugin to run Images V2 API supplied by Glance in mod_wsgi to meet Pike Community Goal
- <u>http://specs.openstack.org/openstack/glance-specs/specs/pike/approved/glance/lite-specs.html#community-goal-control-plane-api-endpoints-deployment-via-wsgi</u>
- https://governance.openstack.org/tc/goals/pike/deploy-api-in-wsgi.html



Stats

Contributors: 55 User Survey - Adoption: 97% User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

- Further improvements to the Image Import Refactor spec
- Enhancements to the Rolling upgrades

Heat: Orchestration service

➡ PERFORMANCE AND MEMORY IMPROVEMENT

➡ AUTOMATIC IMPROVEMENT

- Examples: improvements to desired automatic functionality such as autohealing, auto-scaling
- [Any relevant link for docs]

➡ IMPROVE THE USABILITY FOR OTHER PROJECTS/USERS/OPS

- Improve usability for Heat especially when building large stacks
- [Any relevant link for docs]



Stats

Contributors: 102 User Survey - Adoption: 69% User Survey - Considering: N/A

➡ POTENTIAL QUEENS FEATURE(S)

• Convergence enhancements (aka convergence 2.0)

Ironic: Bare metal service

DYNAMIC DRIVERS

- Reduces the number of drivers for Ironic by defining a single driver per vendor with configurable options.
- https://specs.openstack.org/openstack/ironic-specs/specs/notimplemented/driver-composition-reform.html

➡ IRONIC NEUTRON INTEGRATION

- This enables network isolation between tenants and the use of physical servers and VMs on the same tenant network.
- https://specs.openstack.org/openstack/ironic-specs/specs/notimplemented/ironic-ml2-integration.html

NEW INTERFACE

• New interface to support the addition, list, and removal of virtual interfaces for Neutron networking.



Stats

Contributors: 183 User Survey - Adoption: 23% User Survey - Considering: 29%

➡ POTENTIAL QUEENS FEATURE(S)

• No info

Keystone: Authorization, authentication, and identity management service

BETTER USABILITY AND MANAGEMENT OF POLICY

 Remove the need to maintain a policy file (if using defaults) <u>http://specs.openstack.org/openstack/keystone-</u> <u>specs/specs/keystone/pike/policy-in-code.html</u>

BETTER DOCUMENTATION OF POLICY OPERATIONS

- Better documentation of policy operations to prevent the need to read code to understand what a specific policy rule actually does.
- <u>http://specs.openstack.org/openstack/keystone-specs/specs/keystone/pike/policy-docs.html</u>

UNIFIED LIMIT SUPPORT FOR BETTER QUOTA USABILITY ACROSS OTHER OPENSTACK SERVICES

- Make keystone an authoritative source on limits data rather than storing it at the service level (e.g. in nova in the API database) which will provide a more consistent limits UX in the future
- <u>http://specs.openstack.org/openstack/keystone-specs/specs/keystone/ongoing/unified-limits.html</u>



Contributors: 10-15 User Survey - Adoption: 98% User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

- Continue improving policy by driving cross project efforts to deliver Role Based Access Control (RBAC) in OpenStack
- Drive consistent adoption of quotas in other services by leveraging a unified limits implementation in Keystone



Kolla: OpenStack deployment with Docker containers

➡ KOLLA-KUBERNETES PRODUCTION READY

- Enable deployment of OpenStack services on a Kubernetes cluster
- <u>https://launchpad.net/kolla-kubernetes</u>
- ➡ FULL RELEASE UPGRADE GATES
- ➡ AUTOMATED DOCKERHUB PUBLISHER





Stats

Contributors: 170 User Survey - Adoption: 13% User Survey - Considering: 28%

Kuryr: Map OpenStack networking and storage APIs to container APIs

KURYR-KUBERNETES

- First release with basic Kubernetes networking support, Neutron ports per Pod and Neutron Load Balancing for services
- <u>https://docs.openstack.org/developer/kuryr-kubernetes/devref/service_support.html</u>

KURYR-LIBNETWORK

- Docker Swarm mode support with IPv4 and IPv6 networking. You can optionally run the libnetwork plugin with TLS support
- https://github.com/openstack/kuryr-libnetwork#running-kuryr

⇒ FUXI

- Manila shares support. Allows mounting manila shares on bare-metal Docker containers
- <u>https://github.com/openstack/fuxi/blob/master/doc/source/devref/manila_provider.rst</u>



Stats

Contributors: 45 User Survey - Adoption: N/A User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

- Octavia support for Kubernetes
- Network policy and Ingress controller support for Kubernetes
- Cinder and Manila volume support for baremetal Kubernetes

Magnum: Container infrastructure service

CLUSTER UPGRADES

- New API endpoint to handle cluster upgrades (and to specify which attributes can be upgraded)
- https://blueprints.launchpad.net/magnum/+spec/cluster-upgrades

➡ NODEGROUPS

- Add concept of Node Groups to enable heterogeneous clusters
- https://blueprints.launchpad.net/magnum/+spec/nodegroups

CLUSTER NODE REPLACEMENT

- Add ability to update cluster information after node replacement
- https://blueprints.launchpad.net/magnum/+spec/cluster-nodereplacement

Stats

User Survey - Adoption: 12% User Survey - Considering: 37%

POTENTIAL QUEENS FEATURE(S) No info

Contributors: 28



Neutron: Networking service

ROLLING UPGRADES ALLOW SERVER TO BE UPDATED WITHOUT API DOWNTIME

- Minimal/non-disruptive upgrades for Neutron API service
- https://blueprints.launchpad.net/neutron/+spec/online-upgrades

LIVE VM MIGRATION BETWEEN HETEROGENOUS NETWORKING BACKENDS FOR BETTER MIXED HARDWARE ENVIRONMENT SUPPORT

- Allows a second inactive port binding for hosts to provide the required portbinding information to Nova for live migration operations
- <u>https://blueprints.launchpad.net/neutron/+spec/live-migration-portbinding</u>
- QUALITY OF SERVICE API ENHANCEMENTS FOR BI-DIRECTIONAL NETWORK BANDWIDTH LIMITS
- Add support for ingress bandwith limiting to compliment the existing egress bandwidth limiting rules
- <u>https://blueprints.launchpad.net/neutron/+spec/instance-ingress-bw-limit</u>



Stats

Contributors: 142 User Survey - Adoption: 95% User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

• No info

Nova: Compute service

➡ IMPROVEMENTS TO SCHEDULING AND PLACEMENT FOR GENERIC RESOURCE MODELING, RELIABILITY AND EFFICIENCY

https://specs.openstack.org/openstack/nova-specs/specs/pike/index.html

➡ SUPPORT MULTIPLE CELLS V2 CELLS IN THE API

- Increase the number of allowed Cells V2 cells (Ocata supports a single Cells V2 cell)
- https://blueprints.launchpad.net/nova/+spec/cells-aware-api

➡ USE THE NEW CINDER VOLUME ATTACHMENT APIS TO SET THE STAGE FOR SUPPORTING THE VOLUME MULTI-ATTACH FEATURE

- Leverage new Cinder attach/detach APIs that provide a clean interface to pave the way for additional capabilities such as multi-attach in the future
- <u>https://specs.openstack.org/openstack/nova-specs/specs/pike/approved/cinder-new-attach-apis.html</u>



Stats

Contributors: 233 User Survey - Adoption: 98% User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

- VGPU support
- Full shared storage/network reporting and affinity support in the placement service
- Volume multi-attach
- Cinder as ephemeral backend
- Integration of limits in Keystone
- Cells v2 hardening

Octavia: Network load balancing

- MERGING THE NEUTRON-LBAAS LBAAS V2 API INTO A STANDALONE OCTAVIA V2 API ENDPOINT
- ➡ OPENSTACK CLIENT (OSC) SUPPORT FOR THE OCTAVIA V2 API
- Add support for Octavia V2 API in OpenStack Client
- https://launchpad.net/octavia/+milestone/pike-1

➡ ADDED SUPPORT FOR OCTAVIA DEPLOYMENT USING OPENSTACK ANSIBLE

 https://specs.openstack.org/openstack/openstack-ansiblespecs/specs/mitaka/lbaasv2.html

Stats

Contributors: 65 User Survey - Adoption: N/A User Survey - Considering: N/A

➡ POTENTIAL QUEENS FEATURE(S)

- Provide Active/Active load balancers
- Support for vendor drivers under the new Octavia v2 API
- Load Balancer flavors
- Horizon dashboard enhancements



OpenStack Ansible: Production deployments of OpenStack using Ansible

Stats

Contributors: 106 User Survey - Adoption: N/A User Survey - Considering: N/A

➡ SUPPORT FOR CENTOS 7

STANDARDIZING THE OPENSTACK API SERVICES TO UTILIZE NGINX/UWSGI

- Deploy nginx and uWSGI for each OpenStack API service to meet Pike Community Goal of deploying APIs in WSGI
- https://review.openstack.org/#/c/458595/

➡ ADDING AN OPERATIONS GUIDE FOR OPENSTACK-ANSIBLE

- Create an operations guide to enhance documentation for OSA
- https://docs.openstack.org/developer/openstack-ansible/draft-operationsguide/index.html

POTENTIAL QUEENS FEATURE(S)

• Utilizing Artifacts to work towards rolling Upgrades

Sahara: Data processing service

➡ ABILITY TO CREATE AND VALIDATE IMAGES FROM SAHARA

- Sahara Plugin Images (SPI) will help plugin authors with creation and validation of images with different versions of the Sahara service
- https://specs.openstack.org/openstack/saharaspecs/specs/mitaka/validate-image-spi.html

➡ FACILITATED THE ADDITION OF NEW DATA SOURCES AND JOB TYPES

- Create a Data Source and Job Binary interface to make adding new data sources easier
- https://specs.openstack.org/openstack/sahara-specs/specs/ocata/datasource-plugin.html



Stats

Contributors: 55 User Survey - Adoption: 11% User Survey - Considering: 25%

➡ POTENTIAL QUEENS FEATURE(S)

- Release APIv2
- Considering moving our plugins code out of Sahara

Swift: object storage

SUPPORT FOR ERASURE CODES IN GLOBAL CLUSTERS

 https://specs.openstack.org/openstack/swiftspecs/specs/in_progress/global_ec_cluster.html

CONTAINER SHARDING

- Create additional containers when containers get too large (e.g. 1M objects)
- https://specs.openstack.org/openstack/swiftspecs/specs/in_progress/container_sharding.html

➡ IMPROVEMENTS TO EFFICIENCY WHEN ADDING CAPACITY TO A CLUSTER

• <u>https://etherpad.openstack.org/p/swift-rebalance</u>



Stats

Contributors: 120 User Survey - Adoption: 51% User Survey - Considering: N/A

POTENTIAL QUEENS FEATURE(S)

• Continuing work on rebalance efficiency

Telemetry: Metering services

TELEMETRY Described Community Project

Stats

Contributors: 50 User Survey - Adoption: 40% User Survey - Considering: N/A

- ➡ THE COLLECTOR PROCESS HAS BEEN DEPRECATED AND WILL BE REMOVED. THIS SIMPLIFY THE CEILOMETER STANDARD ARCHITECTURE A LOT AND REDUCES THE LOAD ON MESSAGING.
- ➡ ADD A NEW ZAQAR PUBLISHER. CEILOMETER WILL BE ABLE TO PUSH DIRECTLY OPENSTACK NOTIFICATIONS TO A ZAQAR QUEUE.
- Allows leveraging a Zaqar queue for publishing Telemetry notifications

POTENTIAL QUEENS FEATURE(S) No info

TripleO: Deployment service

- ➡ ADDING FULL SUPPORT FOR CONTAINERIZED OVERCLOUD DEPLOYMENTS
- ➡ UPGRADE SUPPORT FROM BAREMETAL TO CONTAINER DEPLOYMENT
- ➡ REVISED MINOR UPDATE IMPLEMENTATION TO SUPPORT COMPOSABLE ROLES AND CONTAINERS

TRIPLEO a Open Stack Community Project

Stats

Contributors: 189 User Survey - Adoption: N/A User Survey - Considering: N/A

➡ POTENTIAL QUEENS FEATURE(S)

- Consolidate new container architecture
- Move vendor plugins to containers

Trove: Database as a Service

COMMUNITY GOAL: ENABLE TROVE API BEHIND MOD-WSGI

- Pike Community Goal of deploying APIs in WSGI for better deployment flexibility
- ➡ COMMUNITY GOAL: ENABLE PYTHON 3 SUPPORT
- Add Python 3.5 compatibility to meet Pike Community Goal
- ➡ ADD SUPPORT FOR XENIAL AS THE GUEST AND CONTROLLER OPERATING SYSTEM



Stats

Contributors: 25-30 User Survey - Adoption: 13% User Survey - Considering: 33%



Vitrage: Root cause analysis service

PERSISTENT GRAPH DATABASE

- Ability to store entity graph in a persistent Graph Database vs in-memory
- [Any relevant link for docs]

➡ INTEGRATIONS WITH OTHER PROJECTS

- Integrate with Mistral to execute Mistral workflow based on Vitrage deduced alarms/states
- ➡ MACHINE LEARNING POC



Stats

Contributors: 10 User Survey - Adoption: N/A User Survey - Considering: N/A

➡ POTENTIAL QUEENS FEATURE(S)

- Alarm integration
- Alarm history
- RCA history

Zaqar: Messaging service

➡ SUPPORT SWIFT AS THE MESSAGE STORE

- Store messages in a Swift container
- https://specs.openstack.org/openstack/zaqar-specs/specs/ocata/swiftstorage.html

➡ SUPPORT SQLALCHEMY MIGRATION

- Add support for DB migration for SQLAlchemy
- https://blueprints.launchpad.net/zaqar/+spec/sqlalchemy-migration

SUPPORT OSPROFILER

- Integrate OSProfiler with Zaqar to improve troubleshooting experience
- https://specs.openstack.org/openstack/zaqarspecs/specs/ocata/osprofiler.html



Stats

Contributors: 38 User Survey - Adoption: 4% User Survey - Considering: 21%

➡ POTENTIAL QUEENS FEATURE(S)

• No info