Nova
Project Update, OpenStack Summit Sydney

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What is Nova?

• Compute service

• Nova provides the compute controller fabric for the base OpenStack IaaS deployment
Project background

- Founded during the Austin release of OpenStack
- 237 contributors for latest release (Pike)

Latest user survey adoption numbers:

- Deployed: 98% of clouds in production indicate they are using this project
OpenStack Pike Features

https://docs.openstack.org/releasenotes/nova/pike.html

- **Multi-cell support for Cells v2**
  - The control plane services (API, conductor, scheduler) are now multi-cell aware
  - Compute hosts can be manually or automatically registered with a cell
  - Quota usage is now counted during resource creation rather than relying on reservations
  - There are some limitations with a segregated message queue multi-cell deployment
  - Cells v1 is deprecated
OpenStack Pike Features

- Scheduling and placement improvements
  - The FilterScheduler now performs simple resource claims during scheduling
  - This improves the chances of the scheduler picking the correct host the first time, rather than relying on an expensive reschedule loop during server create and resize
  - Placement should be upgraded before nova-scheduler
  - Ironic instance flavors are automatically migrated to custom resource classes
  - Operators will need to adjust their baremetal flavors
  - Exact ram/core/disk filters are deprecated
  - Added the PCIWeigher
  - Make sure to get the latest 16.0.x release for fixes
OpenStack Pike Features

- Other improvements

<table>
<thead>
<tr>
<th>Microversion</th>
<th>Description</th>
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<tbody>
<tr>
<td>2.47</td>
<td>Displays the embedded instance flavor in server details</td>
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<tr>
<td>2.48</td>
<td>Provides a standardized instance diagnostics response</td>
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<tr>
<td>2.49</td>
<td>Allows attaching network interfaces and volumes with a custom device tag which gets exposed to the guest via the metadata API service</td>
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<tr>
<td>2.52</td>
<td>Allows creating a server with custom tags</td>
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OpenStack Pike Features

- Other improvements
  - The Cinder v3 API is used by default
  - The quota and flavor access APIs will now attempt to validate project parameters with Keystone
  - Certain types of volumes and compute drivers now support extending the size of an attached volume
OpenStack Pike Features

- Other improvements
  - Running nova-api using a WSGI server is now supported and tested in CI jobs
    - Update your api-paste.ini to use the request_log middleware
  - Troublesome computes will be auto-disabled after a configurable number of build failures
  - It is now possible to configure a service user token for long-running interactions with the image service to avoid user token timeout, e.g. during a large disk snapshot operation
  - Policy rules are now documented
OpenStack Queens

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

➡ Cells

• Efficient multi-cell instance listing and merge sort including build requests and cell0 instances
• Support alternate hosts for reschedules during server create and resize

➡ Scheduling and placement

• Improve internal resource allocation tracking during migrate
• Support nested resource providers for limited SR-IOV PF/VF relationships
• Add the ability to filter resource providers during scheduling via qualitative traits
• Implement Placement API support in OpenStackClient
OpenStack Queens

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

Other improvements

- Support volume multi-attach
- Use the Neutron port binding API to minimize network downtime during live migration and also support migrating across different network backends without a reboot of the instance
- Improve baremetal scheduling capabilities using traits with Placement
- Basic vGPU support
- Update the documentation that was migrated from openstack-manuals in Pike
- More privsep integration
OpenStack Queens

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

- Other improvements
  - Deprecate personality files and allow passing user_data to rebuild
  - Allow keypair reset during instance rebuild
  - Add more instance action record tracking to the API
  - Allow setting (and updating) a description field on flavors
  - Specify a target host during cold migration / resize
  - Native QEMU volume encryption support (e.g. encrypted RBD volumes with libvirt)
  - More versioned notifications
Cross-Project Work

- Cinder
  - Support volume multi-attach
- Neutron
  - Reduce network downtime during live migration
  - Improve performance of filtering instances with an IP
- Ironic
  - Baremetal instance scheduling with traits
  - Driver feature parity: rebuild, rescue, boot from volume enhancements
- Keystone
  - Simplify inter-service configuration using keystonauth adapter
Beyond Queens

- Bandwidth-based scheduling
- NUMA resource tracking and scheduling with Placement
- Resource affinity modeling in Placement
- Cells v1 and nova-network removal (OMG YES OH PLEASE)
- VIF negotiation with Neutron for robust live migration and upgrade
- Cinder ephemeral storage backend and/or simplified boot from volume workflow
- Modeling shared storage in Placement
How to give feedback

- Report bugs

- Start a conversation in the #openstack-dev and/or #openstack-operators mailing lists
  - Tell us how you or your users are using the compute service
  - What is missing?
  - What are your barriers to entry?
  - What deployment tooling do you need, i.e. nova-manage?
How to give feedback

● Attend Forum sessions
  ○ Cinder/Nova Cross Project Session on Multi-Attach
  ○ Documentation and relnotes, what do you miss?
  ○ OpenStackClient and Nova API microversions
  ○ Bare metal as a service: Ironic vs Mogan vs Nova
  ○ Placement update and direction
  ○ Cells v2 update and direction
  ○ Nova: Queens roadmap and checkpoint
How to contribute

https://docs.openstack.org/nova/pike/contributor/index.html

- Subscribe to the openstack-dev mailing list and filter on [nova]
- Chat with us at #openstack-nova in freenode irc
- Attend some weekly meetings: http://eavesdrop.openstack.org/
- Help with bug triage
  - Presentation: Upstream bug triage: the hidden gem?
- Attend the Nova project on-boarding session
How to contribute

- Help with [code reviews](#)
- Help cleanup the docs; if something does not make sense or is missing, tell us - or better yet push a patch to fix it
- Try to break things and report bugs
- Perform scale testing and identify bottlenecks - [and report them](#)
- Propose bug fix backports to the [stable branches](#)
Q&A

Thank you!