



Migrate from Neutron LBaaS to Octavia LoadBalancing

OpenStack Summit Berlin

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German Eichberger

- Senior Software Engineer with Rackspace
- Core Reviewer OpenStack Octavia, OpenStack Ansible Octavia, Neutron Firewall-as-a-Service
- Currently working on Rackspace's Managed Kubernetes offering which leverages Tectonic, Terraform, OpenStack, etc.



Carlos Goncalves

- Senior Software Engineer at Red Hat
- OpenStack Octavia & Neutron LBaaS core reviewer, and contributor to TripleO
- Prior to Red Hat: Software Specialist at NEC, OPNFV Doctor core reviewer and OPNFV Ambassador



What is Octavia?

Network Load Balancing as a Service for OpenStack.

- Octavia provides scalable, on demand, and self-service access to network load balancer services, in a technology agnostic manner, for OpenStack.
- The reference load balancing driver provides a highly available load balancer that scales with your compute environment.
- Founded during the Juno release of OpenStack.
- 90 contributors from 30 companies for latest release
- Moved from a Neutron sub-project to a top level OpenStack project during the Ocata series.
- #1 Neutron feature “actively using, interested in using, or looking forward to using” for the past two April OpenStack user surveys.



Neutron-LBaaS Deprecation Update

- Neutron-lbaas was declared deprecated during the Queens release cycle
 - No new features will be merged, but bug fixes will continue
- Plan to retire neutron-lbaas and neutron-lbaas-dashboard in September 2019 or the “U” OpenStack release cycle, whichever comes first
- A deprecation FAQ is available on the wiki
 - <https://wiki.openstack.org/wiki/Neutron/LBaaS/Deprecation>

Migration Tools

1. Octavia provider driver
2. Pass-through proxy plugin for neutron-lbaas that forwards requests made via the Neutron endpoint to the new Octavia endpoint
3. You can also use L7 policies to redirect LBaaS requests from the Neutron API to the new Octavia v2 API
4. Additional testing has been done validating that the Octavia v2 API is a compatible superset of the neutron-lbaas LBaaS v2 implementation
5. Database migration tool for going from Neutron LBaaS -> Octavia
 - only works for loadbalancers created through Neutron LBaaS
 - works for a provider driver supporting migration
 - VMware has successfully used the migration tool

1. Octavia provider driver

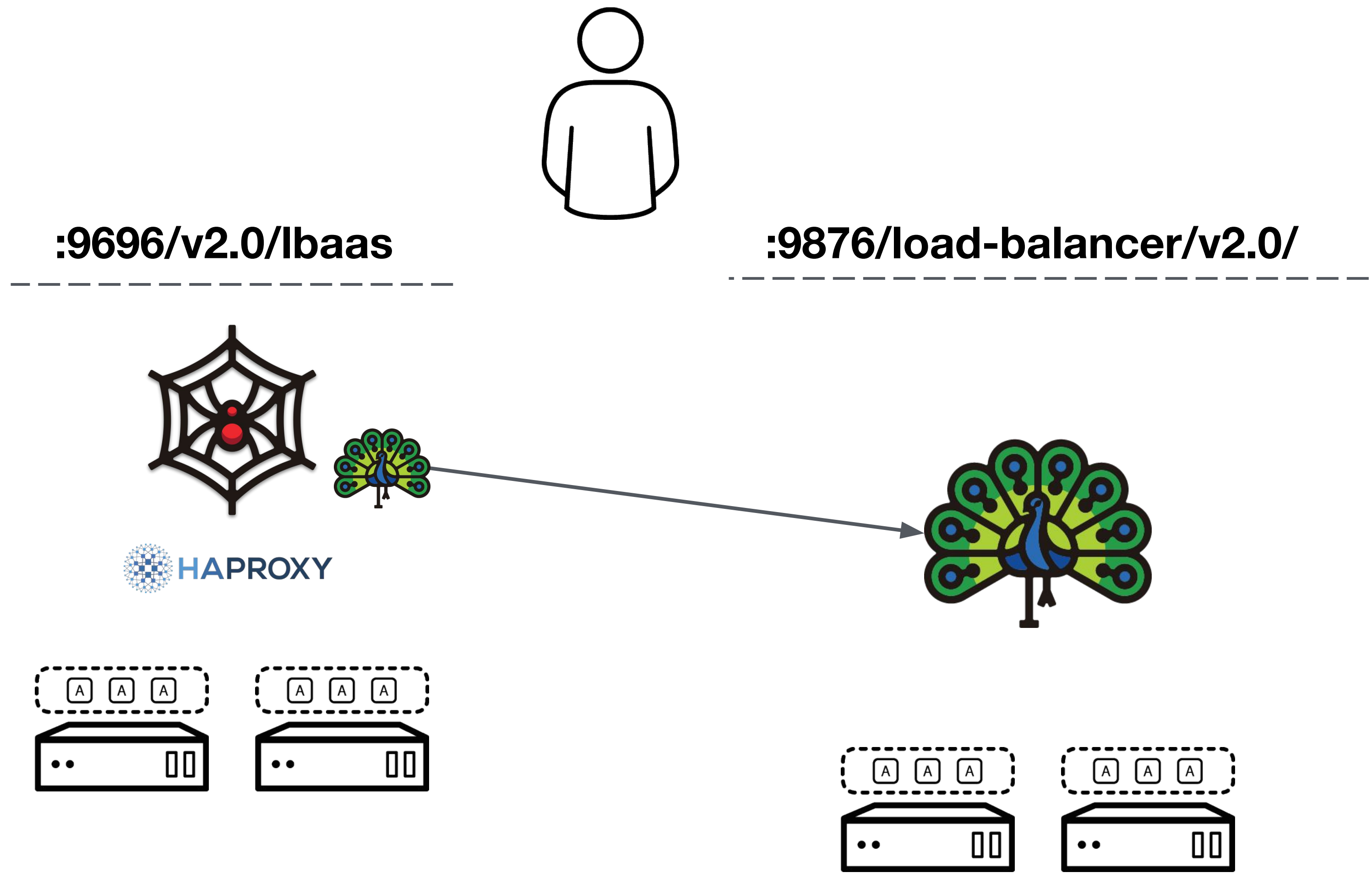
- Neutron-lbaas Octavia provider driver
- In Neutron configuration file, set

```
[service_providers]/service_provider =  
LOADBALANCERV2:Octavia:neutron_lbaas.drivers.octavia.driver.OctaviaDriver:default
```

- **Devstack:** `NEUTRON_LBAAS_SERVICE_PROVIDERV2= \`
`LOADBALANCERV2:Octavia:neutron_lbaas.drivers.octavia.driver.OctaviaDriver:default`
- All applications using the Neutron API endpoint will continue to run like nothing changed.

Zuul check (5 rechecks)	Oct 27 7:42 AM
openstack-tox-cover	SUCCESS in 7m 33s
openstack-tox-lower-constraints	SUCCESS in 7m 35s
openstack-tox-pep8	SUCCESS in 8m 10s
openstack-tox-py27	SUCCESS in 8m 14s
openstack-tox-py35	SUCCESS in 6m 14s
openstack-tox-py36	SUCCESS in 8m 27s
openstack-tox-docs	SUCCESS in 21m 06s
neutron-lbaasv2-dsvm-api	SUCCESS in 1h 11m 28s
neutron-lbaasv2-dsvm-py3x-api	SUCCESS in 1h 12m 14s
neutron-lbaasv2-dsvm-scenario	SUCCESS in 1h 13m 01s (non-voting)
neutron-lbaasv2-dsvm-py3x-scenario	SUCCESS in 1h 22m 14s (non-voting)

1. Octavia provider driver

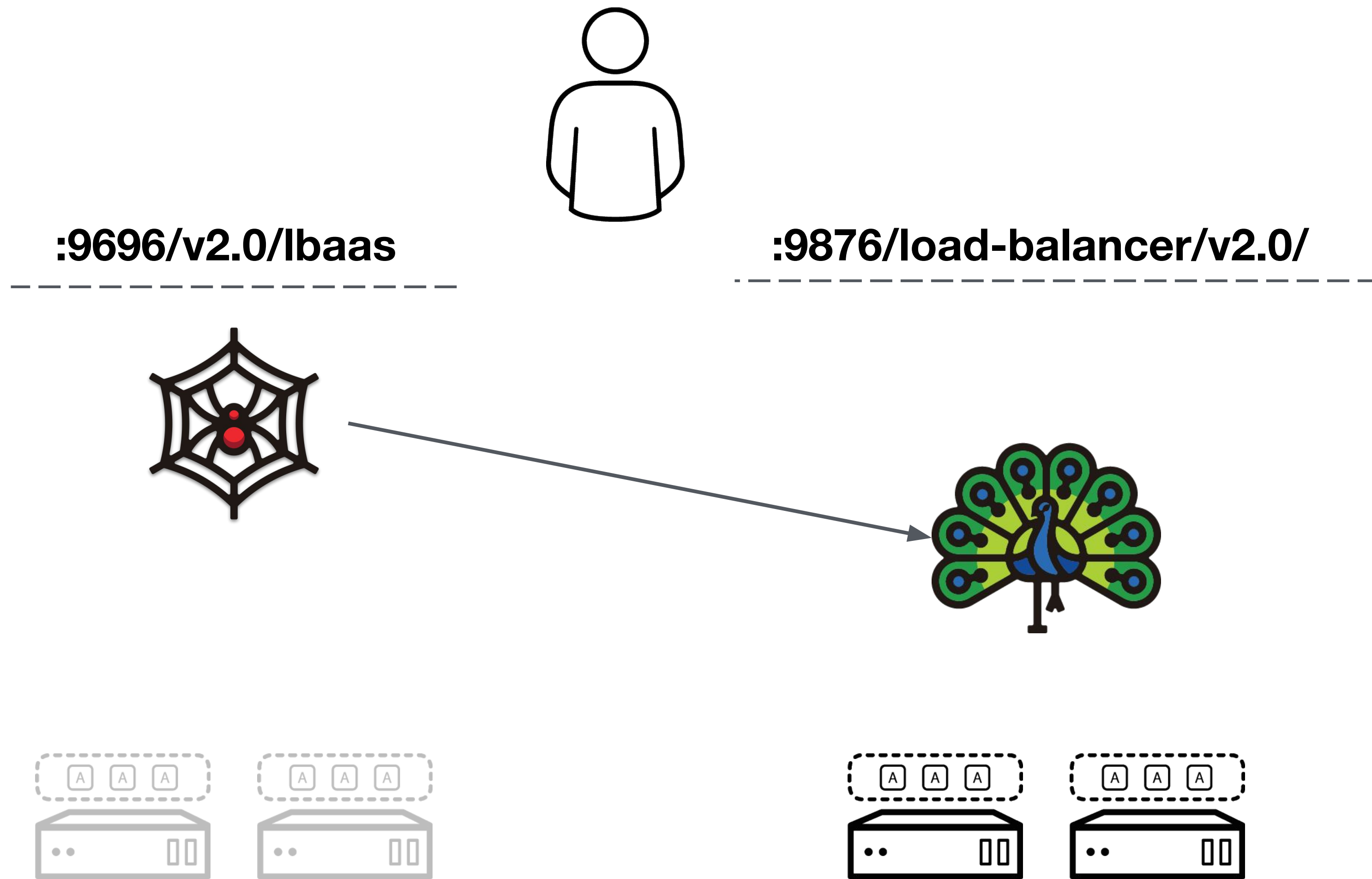


2. Neutron Proxy

- Neutron plugin `lbaasv2-proxy` which will proxy lbaas calls from neutron to Octavia
- Simply replace `lbaasv2` in `/etc/neutron.conf` with `lbaasv2-proxy`
 - Devstack: `LBAASV2_PLUGIN=lbaasv2-proxy`
- All applications using the Neutron API endpoint will continue to run like nothing changed.

Zuul check	Sep 27 2:04 AM
openstack-tox-pep8	SUCCESS in 6m 32s
openstack-tox-py27	SUCCESS in 13m 36s
openstack-tox-py35	SUCCESS in 11m 46s
build-openstack-releasenotes	SUCCESS in 5m 30s
lbaas-tox-lower-constraints	SUCCESS in 13m 15s
neutron-lbaasv2-dsvm-api	SUCCESS in 1h 20m 25s
neutron-lbaasv2-dsvm-api-proxy	SUCCESS in 54m 31s
neutron-lbaasv2-dsvm-py3x-api	SUCCESS in 1h 19m 26s
neutron-lbaasv2-dsvm-api-namespace	SUCCESS in 50m 05s
neutron-lbaasv2-dsvm-py3x-api-namespace	SUCCESS in 58m 03s
neutron-lbaasv2-dsvm-scenario	SUCCESS in 1h 27m 35s
neutron-lbaasv2-dsvm-py3x-scenario	SUCCESS in 1h 15m 43s
neutron-lbaasv2-dsvm-scenario-namespace	SUCCESS in 42m 13s
neutron-lbaasv2-dsvm-py3x-scenario-namespace	SUCCESS in 47m 29s
neutron-lbaasv2-dsvm-api-l7octavia	SUCCESS in 57m 56s (non-voting)

2. Neutron Proxy

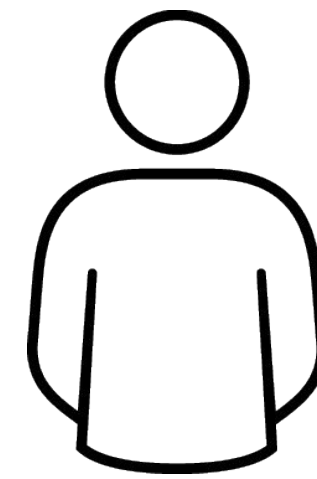


3. Direct L7

- Redirect Neutron API calls Octavia API
 - non-LBaaS calls continue being sent to Neutron API
- Put an user-facing proxy server (e.g. HAProxy) redirecting `/v2.0/lbaas` to Octavia API `/load-balancer/v2.0/lbaas` & update Neutron endpoint to proxy server
 - Devstack: `PROXY_OCTAVIA=True`
- All applications using the Neutron API endpoint will continue to run like nothing changed.

Zuul check	Sep 27 2:04 AM
openstack-tox-pep8	SUCCESS in 6m 32s
openstack-tox-py27	SUCCESS in 13m 36s
openstack-tox-py35	SUCCESS in 11m 46s
build-openstack-releasenotes	SUCCESS in 5m 30s
lbaas-tox-lower-constraints	SUCCESS in 13m 15s
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neutron-lbaasv2-dsvm-py3x-scenario-namespace	SUCCESS in 47m 29s
neutron-lbaasv2-dsvm-api-l7octavia	SUCCESS in 57m 56s (non-voting)

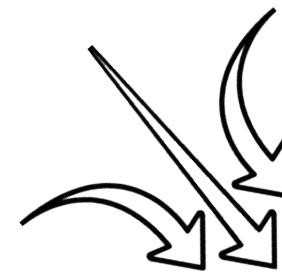
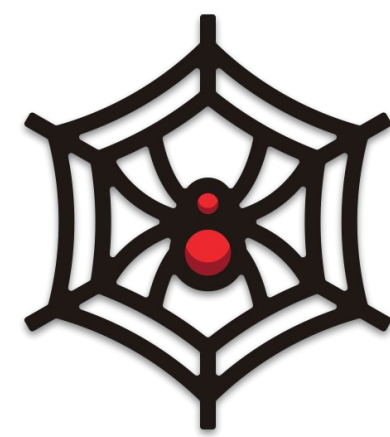
3. Direct L7



:9695/v2.0/

HAProxy (frontend :9695)

:9695/v2.0/lbaas? -> :9876/load-balancer/v2.0/

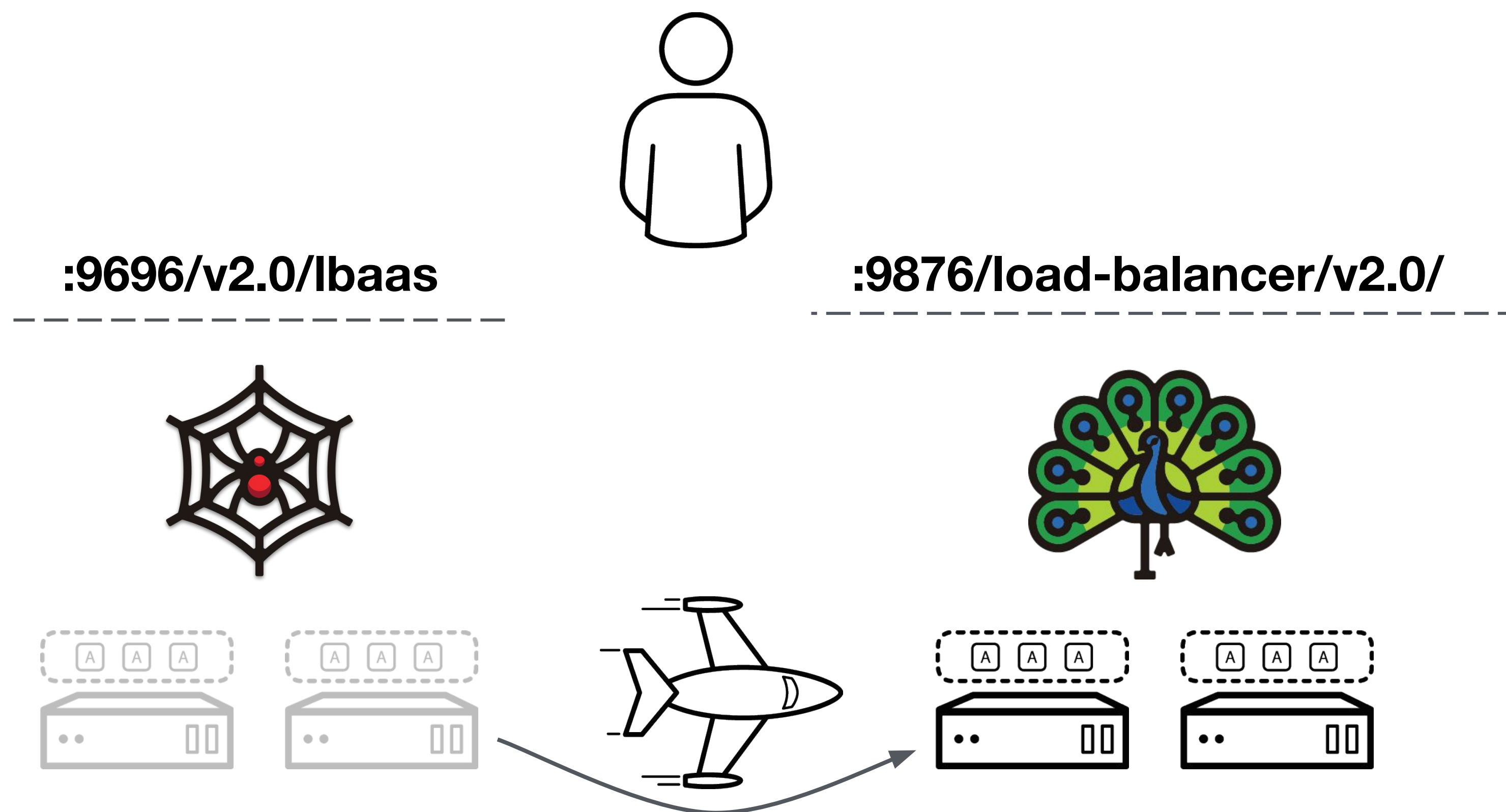


4. Superset API

- Octavia v2 API is a compatible superset of the neutron-lbaas LBaaS v2 implementation
- All applications using the Neutron API endpoint will continue to run like nothing changed.

openstack-tox-functional	SUCCESS in 6m 15s
openstack-tox-functional-py35	SUCCESS in 6m 37s
octavia-v1-dsvm-scenario	SUCCESS in 51m 30s
octavia-v1-dsvm-py3x-scenario	SUCCESS in 43m 01s

5. (Live) Migration



Job	Project	Branch	Pipeline	Change	Duration	Start time	Result
neutron-lbaas-to-octavia-migration	openstack/neutron-lbaas	master	periodic	master	3587	2018-11-08T06:02:52	FAILURE
neutron-lbaas-to-octavia-migration	openstack/neutron-lbaas	stable/rocky	periodic	stable/rocky	3310	2018-11-08T06:03:18	SUCCESS

5. Database migration

```
usage: nlbaas2octavia [-h] [--all] [--config-dir DIR] [--config-file PATH]
                    [--debug] [--lb_id LB_ID] [--log-config-append PATH]
                    [--log-date-format DATE_FORMAT] [--log-dir LOG_DIR]
                    [--log-file PATH] [--noall] [--nodebug]
                    [--nouse-journal] [--nouse-json] [--nouse-syslog]
                    [--nowatch-log-file] [--project_id PROJECT_ID]
                    [--syslog-log-facility SYSLOG_LOG_FACILITY]
                    [--use-journal] [--use-json] [--use-syslog] [--version]
                    [--watch-log-file]
```

5. Common command line settings

- `--all` Migrate all load balancers
- `--config-file PATH` Path to a config file to use. Multiple config files can be specified, with values in later files taking precedence. Defaults to None.
- `--lb_id LB_ID` Load balancer ID to migrate
- `--project_id PROJECT_ID` Migrate all load balancers owned by this project

5. Configuration file

```
[DEFAULT]
```

```
# debug = False
```

```
[migration]
```

```
# Run without making changes
```

```
# trial_run=False
```

```
# Delete the load balancer records from neutron-lbaas after migration
```

```
# delete_after_migration=True
```

```
# Octavia service account ID
```

```
octavia_account_id = $USER_UUID
```

```
# Connection string for the neutron database
```

```
neutron_db_connection = mysql+pymysql://root:secretdatabase@127.0.0.1/neutron
```

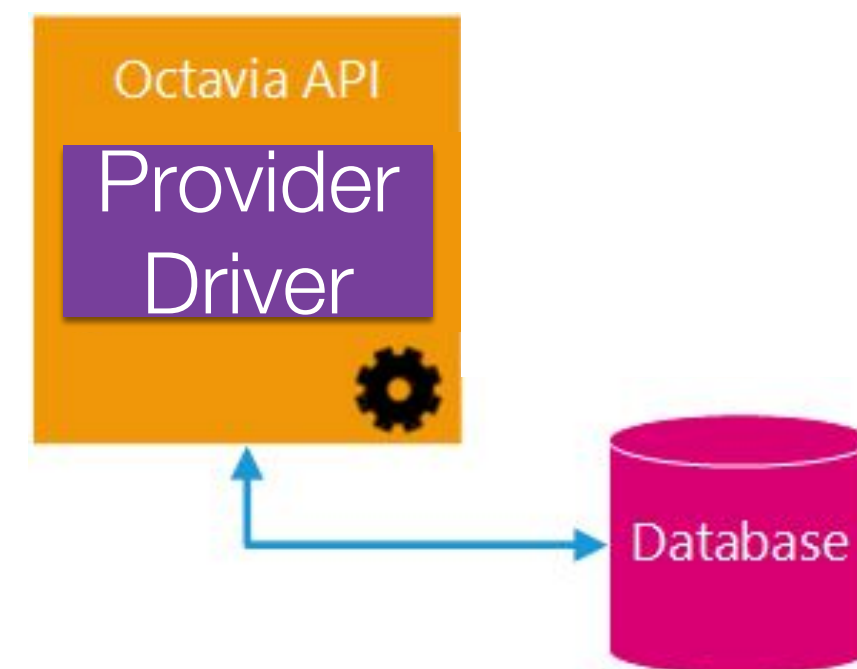
```
# Connection string for the octavia database
```

```
octavia_db_connection = mysql+pymysql://root:secretdatabase@127.0.0.1:3306/octavia
```

DEMO

Provider support

- Provider framework in Rocky+ (<https://docs.openstack.org/octavia/latest/contributor/specs/version1.1/enable-provider-driver.html>)



Provider support

- Open-source provider drivers
 - Amphora
 - Reference implementation
 - Feature-rich (e.g. TCP, UDP, L7, TLS-terminated listeners)
 - Extensively tested and used in production environments
 - OVN
 - L4 load balacing (TCP, UDP)
 - Lightweight: no VMs, fast to provision
 - Very useful when used with Kuryr Kubernetes
 - No L7 nor member health check
- Vendor provider drivers
 - VMWare: NSX-V & NSX-T (<https://review.openstack.org/#/c/570925/>)

Provider support

Amphora	OVN	VMWare
<pre>[[local localrc]] enable_plugin octavia \$GIT_BASE/openstack/octavia enable_service octavia enable_service o-cw enable_service o-hm enable_service o-hk enable_service o-api # Default amphora base OS is Ubuntu, for CentOS: OCTAVIA_AMP_BASE_OS=centos OCTAVIA_AMP_DISTRIBUTION_RELEASE_ID=7 OCTAVIA_AMP_IMAGE_SIZE=3</pre>	<pre>[[local localrc]] enable_plugin networking-ovn \ \$GIT_BASE/openstack/networking-ovn enable_service ovn-northd enable_service ovn-controller enable_service networking-ovn-metadata-agent enable_service q-svc # Disable Neutron agents not used with OVN disable_service q-agt disable_service q-l3 disable_service q-dhcp disable_service q-meta DISABLE_AMP_IMAGE_BUILD=True enable_plugin octavia \$GIT_BASE/openstack/octavia enable_service o-api enable_service o-hk enable_service ovn-octavia disable_service o-cw disable_service o-hm</pre>	<pre>[[local localrc]] OCTAVIA_NODE=api DISABLE_AMP_IMAGE_BUILD=True enable_plugin octavia \$GIT_BASE/openstack/octavia enable_service octavia enable_service o-api [[post-config \$OCTAVIA_CONF]] [DEFAULT] verbose = True debug = True [api_settings] default_provider_driver=vmwareedge enabled_provider_drivers=vmwareedge:NSX [oslo_messaging] topic=vmwarensxv_edge_lb</pre>

Summary

- Octavia is more robust, resilient to failures and performant than neutron-lbaas
- Octavia API is a superset of the neutron-lbaas LBaaS v2
- Plan to retire neutron-lbaas and neutron-lbaas-dashboard in September 2019 or the “U” OpenStack release cycle, whichever comes first
 - Migrate soon, migrate today, migrate NOW! :-)
- Further third-party vendors developing provider drivers
 - Refer to your LB vendor for details
- Octavia supported by various OpenStack installers (Devstack, OSA, TripleO, Kolla, ...)

How to contribute

- We are looking for developers and code reviewers!
- We have work available:
 - Bug fixing
 - OpenFlow development
 - API feature enhancements
 - Tempest tests
- If you are a load balancing vendor, work on creating an Octavia provider driver. There is a driver library (octavia-lib), driver developer guide and support from the team available.

Come to our project update session tomorrow at 2:35 pm in CityCube Berlin - Level 3 - M3

Q&A

Thank you!



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