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February 1-2, 2024 Brussels

OpenStack RDO deployment on Community Distribution of Kubernetes (OKD)



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RDO

Who we are



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What is RDO ?

RPM Distribution of OpenStack



- Community-supported
- Supports CentOS Stream 9
- Released every 6-month, following OpenStack release cycle
- Provides two different set of repos for different purposes: RDO Trunk and CloudSIG



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RDO and deployment tools: how did we end up here?

- An OpenStack deployment is composed of many processes which interact via API or async messaging
- Code is organized in separated functional projects and repos
- Deployment flexibility, agility and contributions model...
- ...but hard to manage and orchestrate



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RDO and deployment tools: how did we end up here? (II)

packstack

theforeman/
staypuft

Openstack Foreman Installer



Fuel for OpenStack



OPENSTACK-HELM

an OpenStack Community Project



OPENSTACK-ANSIBLE

an OpenStack Community Project



TRIPLEO

an OpenStack Community Project



KOLLA

an OpenStack Community Project



OPENSTACK CHARMS

an OpenStack Community Project

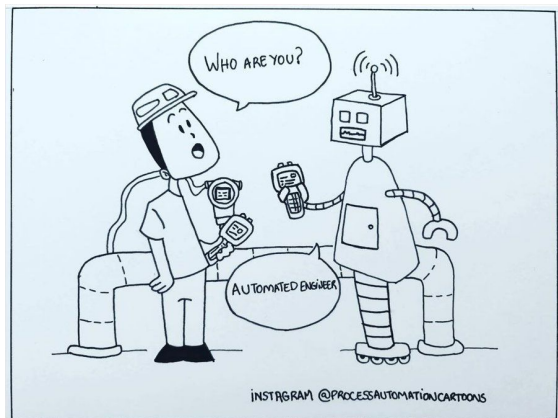
- A myriad of deployment projects created.
- In the EL / Red Hat focus moved through packstack, staypuft and finally TripleO.
- OpenStack control services ~ [cloud-native](#) deployment model.
- Kubernetes has become the standard platform for cloud-native apps.
- TripleO was replaced by a next generation deployment model with k8s as platform orchestrator.



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Kubernetes Operators



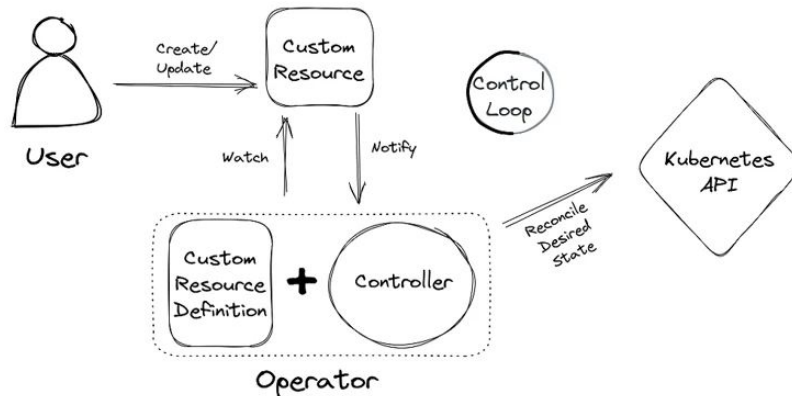
- The [Operators](#) pattern provides a way of automating the management of applications running on kubernetes.
- are considered a best practice to automate complex applications on kubernetes [by Red Hat](#).



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Kubernetes operators (II)



- Composed of:
 - Application elements descriptions in kubernetes API.
 - Software code that performs the tasks to achieve the desired status of the application.

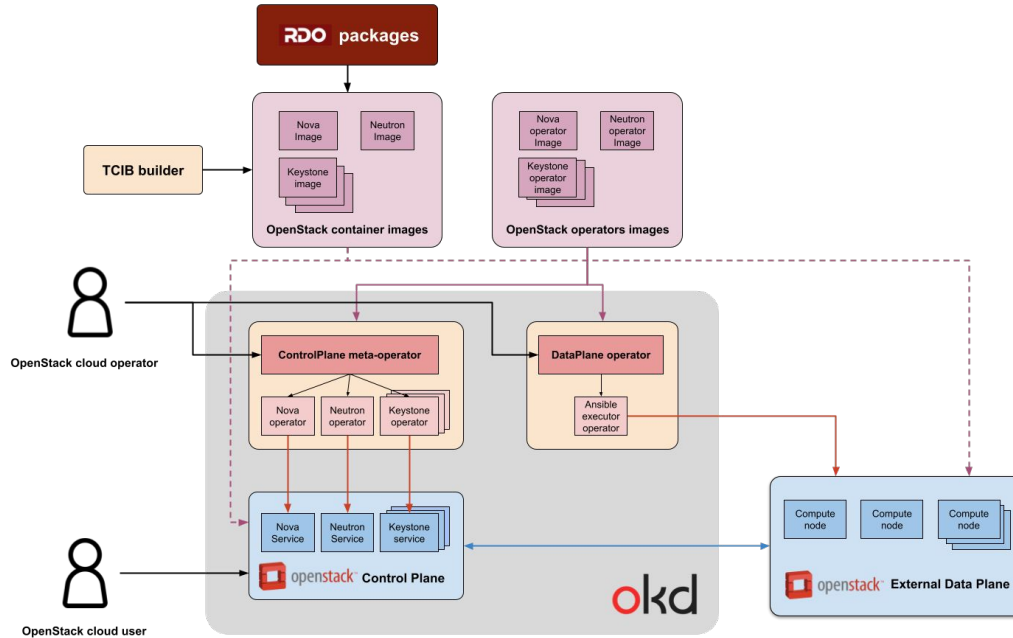


Introduction to OpenStack Kubernetes operators

- Project sponsored by Red Hat intended to be the base for [the next generation of Red Hat OpenStack platform](#)
- Hosted at <http://github.com/openstack-k8s-operators> org
- <https://openstack-k8s-operators.github.io/data-plane-adoption/>
- Developed in the go programming language
- Validated in OpenShift using its usual machinery and CI with additional specific tooling



High level architecture



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RDO's goals

1. Provide deployment tool for community
2. Use the deployment to test RDO
3. Test openstack-k8s-operators with cases which are not covered



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What is OKD



[OKD](#) is the community distribution of kubernetes that powers Red Hat OpenShift:

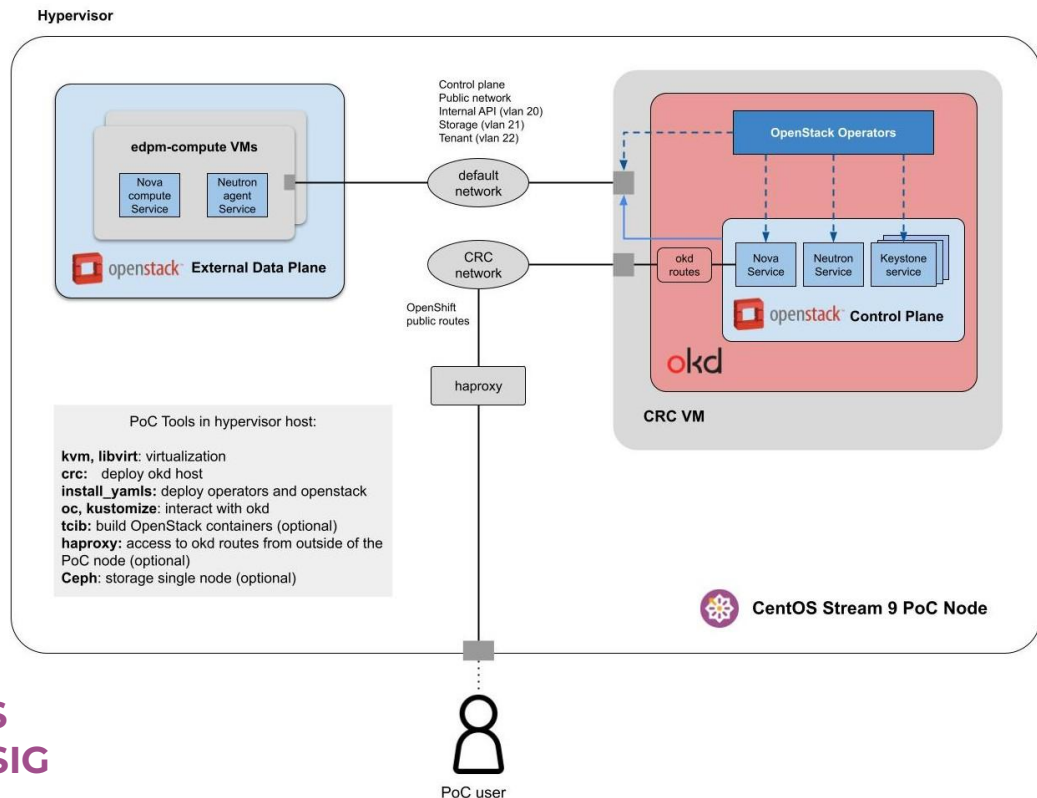
- **Distribution of Kubernetes** optimized for continuous application development and multi-tenant deployment
- It embeds Kubernetes and extends it with security and other integrated concepts
- **Sibling** Kubernetes distribution to **Red Hat OpenShift**
- Runs CentOS Stream CoreOS (SCOS) or Fedora CoreOS as [base OS](#)



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Architecture of PoC deployment



Development purposes only, not intended for a production!



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Deployment workflow

Hypervisor VM / bare metal

Install PoC tooling

Deploy CRC

Build custom containers (optional)

Deploy the OpenStack operators

Deploy the OpenStack control plane

Deploy a compute node VM

Deploy the dataplane with Custom Resources

Validate installation



CentOS Stream 9 PoC Node

Development purposes only, not intended for a production.



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Define Custom Resource

```
[cloud-user@centos controlplane]$ oc kustomize .
```

```
apiVersion: core.openstack.org/v1beta1
```

```
kind: OpenStackControlPlane
```

```
metadata:
```

```
  name: openstack-galera-network-isolation
```

```
  namespace: openstack
```

```
spec:
```

```
  cinder:
```

```
    apiOverride:
```

```
    route: {}
```

```
    template:
```

```
    containerImage: default-route-openshift-image-registry.apps-crc.testing/openstack/openstack-horizon:cloudsig-bobcat
```

```
    replicas: 1
```

```
    secret: osp-secret
```

```
    customServiceConfig: |
```

```
      [DEFAULT]
```

```
      enabled_backends = ceph
```



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So far, so good - early enthusiasts are welcome to test

Until this moment we:

- Create documentation:
https://sigs.centos.org/cloud/rdo_on_okd/introduction/
- Deploy and improve PoC deployment on Antelope on OKD
- Introduce deployment with Bobcat custom containers (untested upstream!) -
https://pagure.io/centos-sig-cloud/rdo_artifacts/blob/main/f/bobcat-cloudsig-cr



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So far, so good - early enthusiasts are welcome to test

(...)

- Create custom CRC bundle based on SCOS image
- Create jobs to build tcib containers on some RDO events
- Enable additional services, like Horizon
- Experiment with OpenStack services



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What we are working on

- Hands-on documentation about handy usage
- Add support for OKD in CI-framework (cifmw)
- Create jobs that create new containers and deploy full OpenStack with edpm
- Run OpenStack operators on custom CRC bundles



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Questions?

contact us!

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