RDO openstack on OKD kubernetes:

The perfect combination for modern enterprise datacenter

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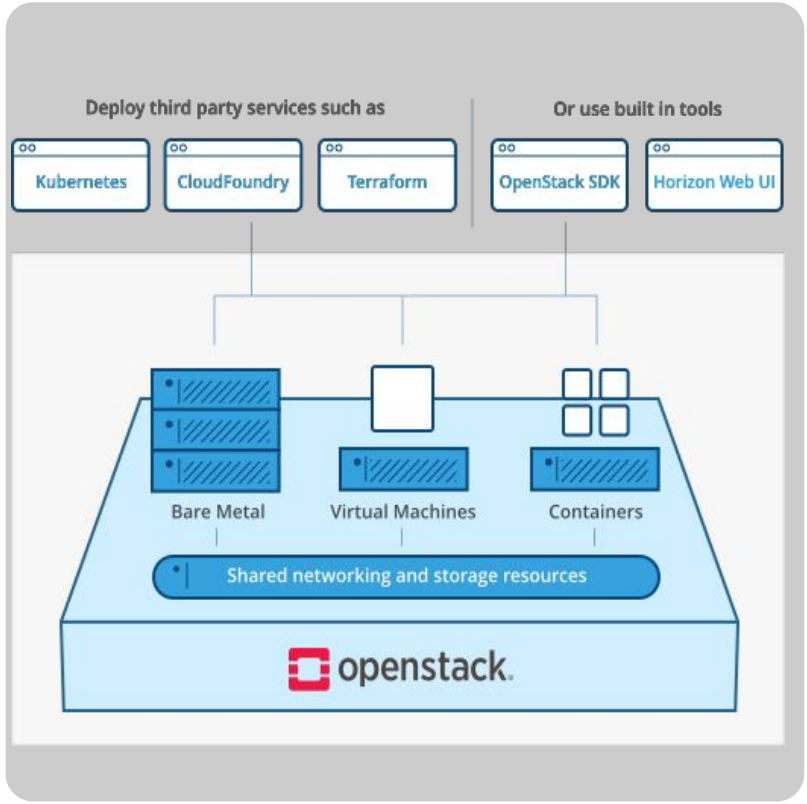
What we'll discuss today

- OpenStack
- RDO
- OKD
  - SCOS (CentOS 9 Stream)
  - FCOS (Fedora)
- OpenStack Kubernetes Operators
- RDO on OKD

OpenStack

Open source IaaS



OpenStack is a Infrastructure as a Service that utilizes a common API and authentication to control large pools of Compute, Storage and Networking resources in one or more Data Centers.

- Virtual Machines
- Bare Metal
- Containers

Source:
https://www.openstack.org/

RDO

RPM Distribution of OpenStack

What's RDO?

Open source community project that builds OpenStack packages for CentOS Stream 9.

Why RDO?

Enable community to run and test free and open source OpenStack clouds.

How?

Release cycle follows OpenStack (every 6 months).

Source:
https://www.rdoproject.org/

OKD

OpenShift Kubernetes Engine

What's OKD?

OKD is the upstream distribution (community maintained) of Red Hat OpenShift Container Platform (kubernetes).

Why OKD?

OKD presents a free and open source approach to running kubernetes.

How?

Runs on a immutable Operating System (FCOS and SCOS), Includes web console, authentication, image registry/tooling, monitoring, node config/upgrades, networking and operator management out of the box.

Source:
https://okd.io/

FCOS to SCOS

Immutable OS for OKD

FCOS (Fedora CoreOS)

- Build from Fedora Linux
- OKD community stopped using FCOS in release 4.15
- Upgrade path to from OKD 4.15 FCOS to SCOS is via version 4.16 - 4.17

SCOS (CentOS Stream CoreOS)

- Build from CentOS Stream 9
- Default Operating System for OKD starting from version 4.17
- All new builds of OKD use CentOS Stream CoreOS

Source:
https://okd.io/blog/2024/06/01/okd-future-statement

OpenStack Kubernetes Operators

Modern approach to running OpenStack

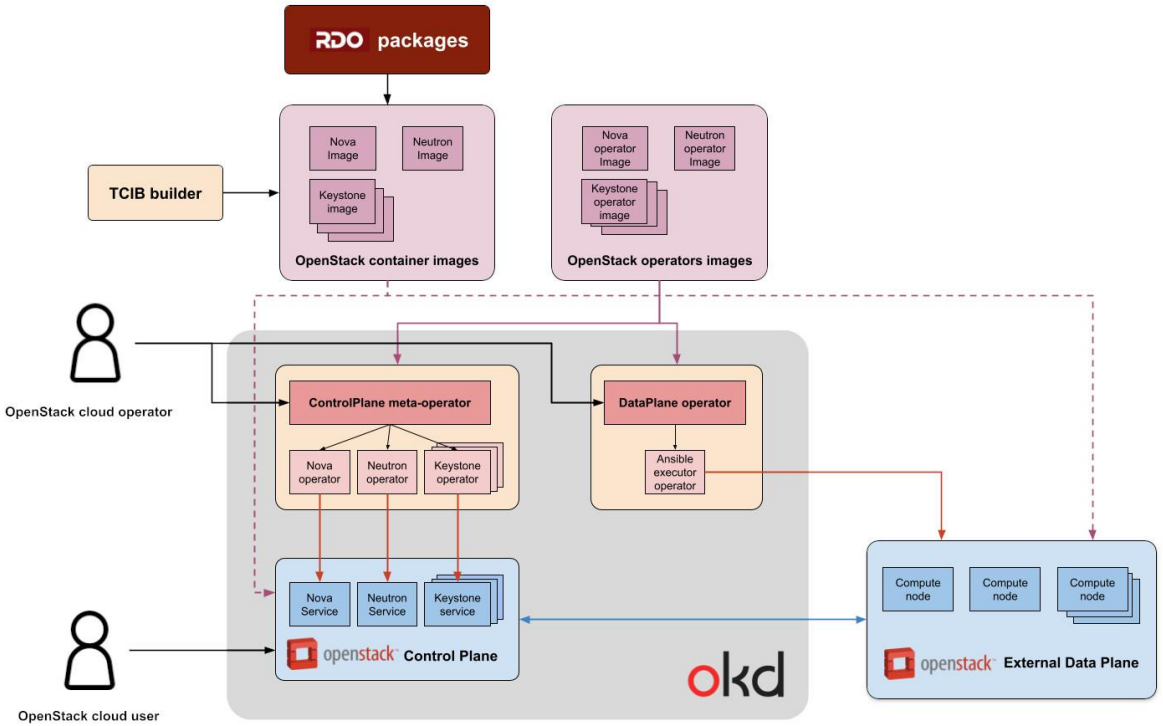
OpenStack deployment automated using native kubernetes API.

- Adheres to kubernetes operator pattern (endorsed by Red Hat)
- Defines a set of kubernetes CRDs (Custom Resource Definitions) dedicated to maintaining the lifecycle of OpenStack Control and Dataplane services
- Deprecates and completely replaces tripleO based OpenStack deployments

Source:
https://github.com/openstack-k8s-operators/

RDO on OKD

Putting it all together



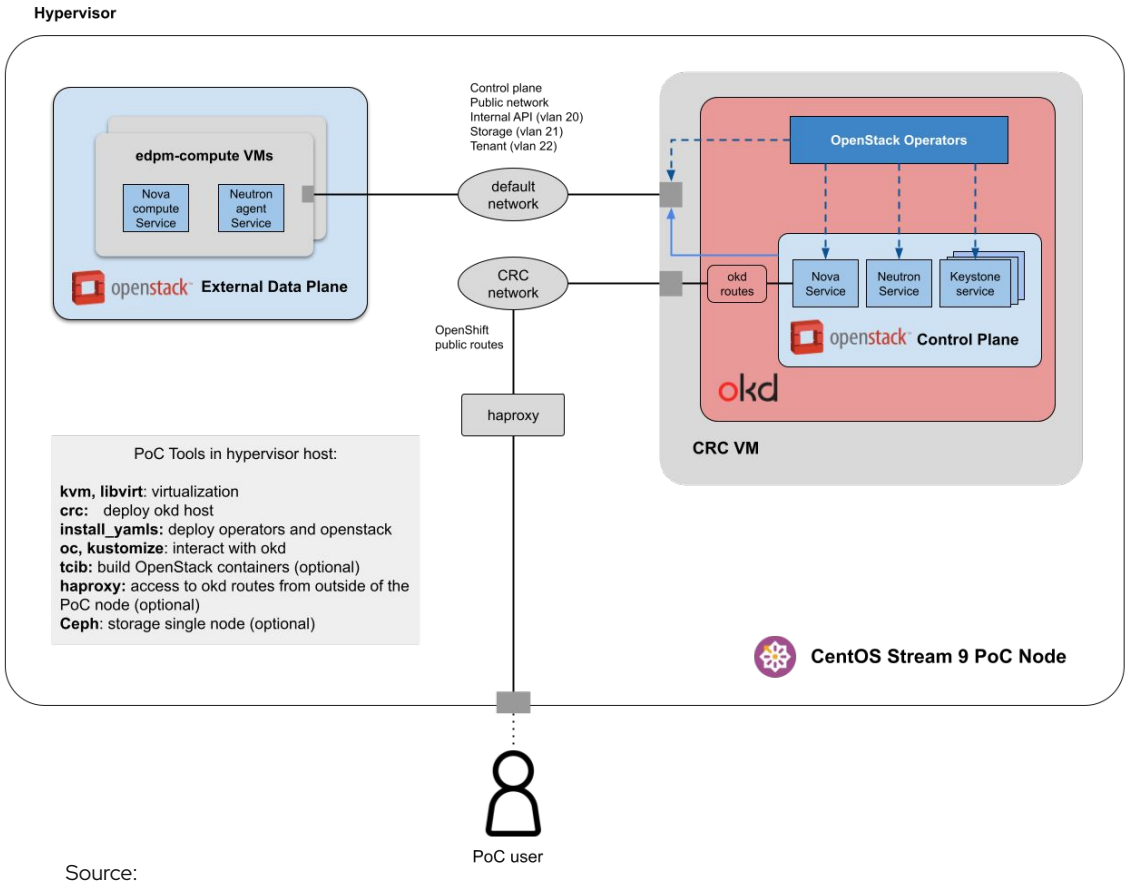
High level architecture deployment of RDO on OKD consists of:

- RDO packages (pre-built based on Antelope release or custom built using supplied TCIB framework)
- OpenStack Kubernetes Operators
  - ControlPlane
  - DataPlane
- OKD running on SCOS

Source:
https://sigs.centos.org/cloud/rdo_on_okd/introduction/

Try it yourself!

PoC deployment of RDO on OKD (not for production)



Source:
https://sigs.centos.org/cloud/rdo_on_okd/CRC_PoC/

Deploy RDO running on OKD using OpenStack Kubernetes Operators on a single host capable of running VMs (baremetal or VM with nested virt).

- CRC (Code Ready Containers) deploys OKD
- Install_yamls deploys operators
- HAProxy to external access to the environment

Existing workloads

Red Hat OpenStack Services on OpenShift

Infrastructure-as-a-Service

Cloud-native workloads

Easier installation

Container-native installation reduces risk

Faster deployment

Not just easier, but faster - reducing time to market

Unified management

New management for today's applications

Source:
https://www.redhat.com/en/technologies/cloud-computing/openstack-services-on-openshift

References

- https://www.openstack.org/
- https://www.rdoproject.org/
- https://okd.io/
- https://github.com/openstack-k8s-operators/
- https://sigs.centos.org/cloud/
- https://www.redhat.com/en/technologies/cloud-computing/openstack-services-on-openshift

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