

OpenStack, Containers and Supporting Technologies

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OpenStack Kolla-Ansible

Containers for deploying/operating OpenStack clouds

<https://wiki.openstack.org/wiki/Kolla>

- Kolla-Ansible provides Docker containers + Ansible playbooks to deploy OpenStack services and infrastructure components in Docker containers on baremetal or VM

```
allinone@oska:~$ docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED
STATUS	PORTS NAMES		
80712c44e063 single-c"	kolla/centos-binary-horizon:queens	"dumb-init --	horizon
bc4da43738c1 single-c"	kolla/centos-binary-heat-engine:queens	"dumb-init --	heat_engine
9e18eb2c7dd9 single-c"	kolla/centos-binary-heat-api-cfn:queens	"dumb-init --	heat_api_cfn
fcacf74fc697 single-c"	kolla/centos-binary-heat-api:queens	"dumb-init --	heat_api
c535293e7eb2 single-c"	kolla/centos-binary-neutron-metadata-agent:queens	"dumb-init --	neutron_metadata_agent
088f00a0ca48 single-c"	kolla/centos-binary-neutron-l3-agent:queens	"dumb-init --	neutron_l3_agent
3626e51e4608 single-c"	kolla/centos-binary-neutron-dhcp-agent:queens	"dumb-init --	neutron_dhcp_agent
44e32416f91b single-c"	kolla/centos-binary-neutron-openvswitch-agent:queens	"dumb-init --	neutron_openvswitch_agent
e62fcf00417f single-c"	kolla/centos-binary-neutron-server:queens	"dumb-init --	neutron_server
[...]			



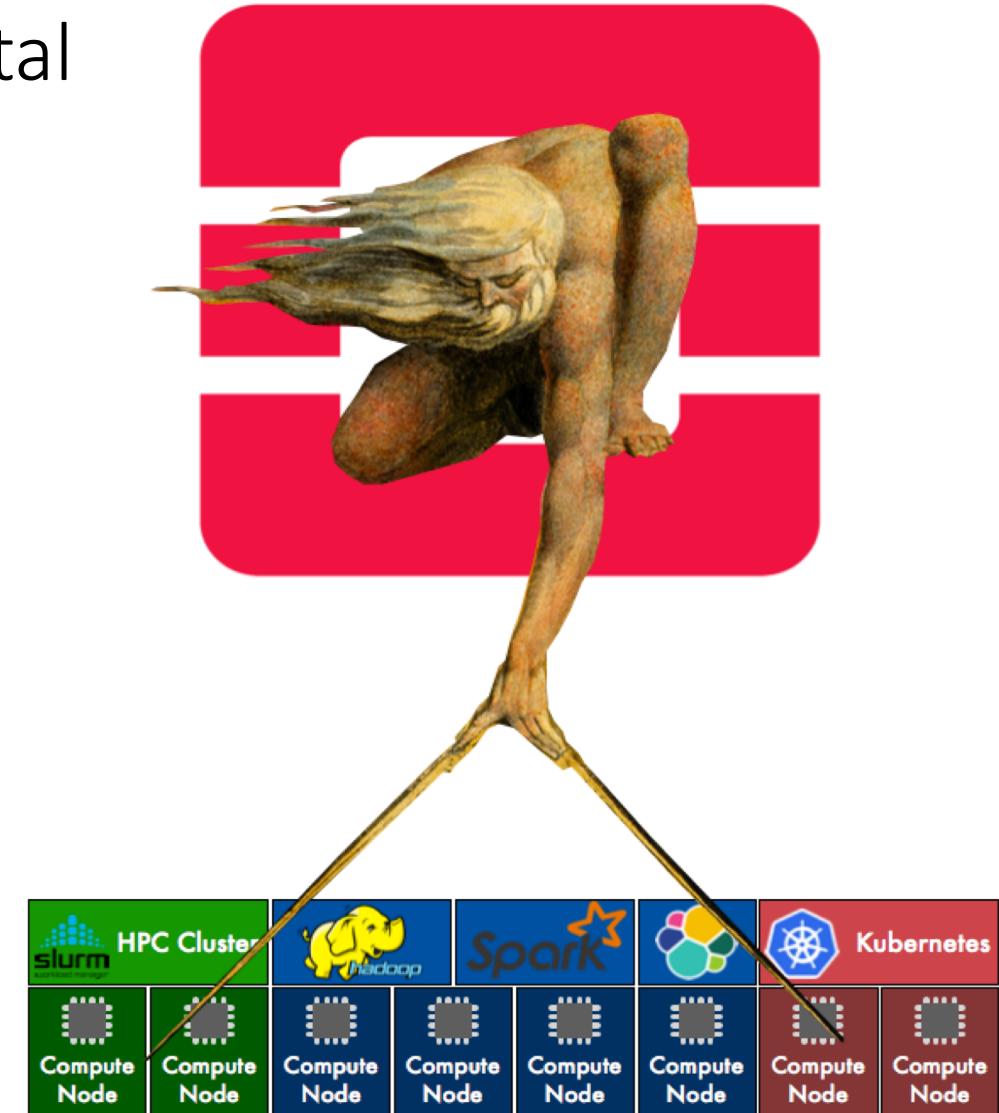
<https://www.openstack.org/videos/denver-2019/kolla-project-update-3>

OpenStack Kayobe

Containerized OpenStack on bare metal

<https://kayobe.readthedocs.io/en/latest/>

- Extends Kolla-Ansible
 - Bifrost (deploy base image onto a set of known hardware using ironic) discovers and provisions the cloud
 - Kolla builds container images for OpenStack services
 - Kolla-Ansible delivers painless deployment and upgrade of containerized OpenStack services
 - + Configuration of cloud host OS & flexible networking
 - + Management of physical network devices
- Bare metal deployment of control plane
- Bare metal compute node management
- Configuration of control plane host OS
- Infrastructure-as-Code



<https://www.stackhpc.com/kayobe-5.html>

<https://github.com/openstack/kayobe>

Magnum

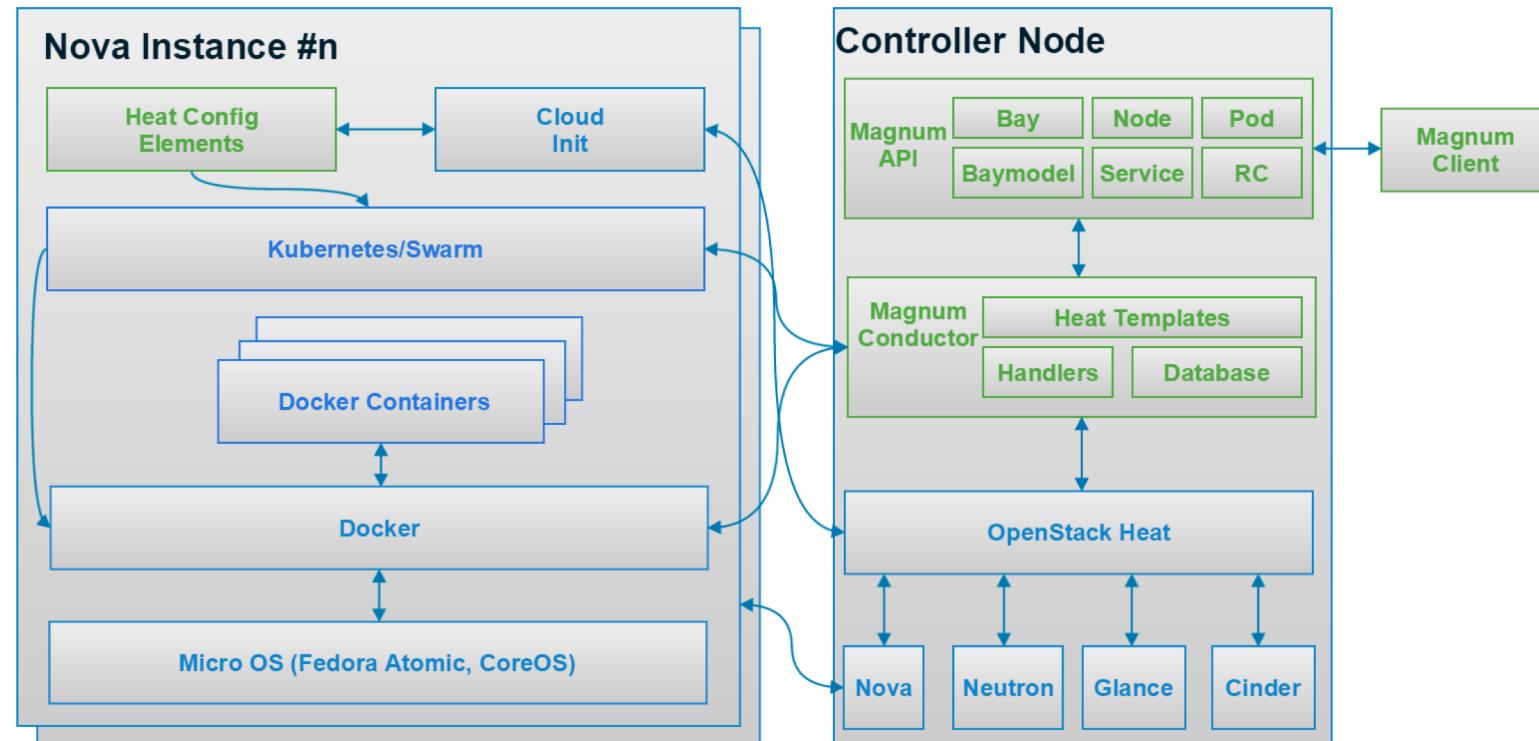
Container Service for OpenStack

<https://wiki.openstack.org/wiki/Magnum>



MAGNUM
an OpenStack Community Project

- Uses Heat to orchestrate an OpenStack image with Docker and Container Orchestration Engine (COE)
 - Docker Swarm, Kubernetes, Apache Mesos
- Runs image in VM or bare metal in a cluster configuration



<https://www.openstack.org/videos/denver-2019/magnum-project-update-2>

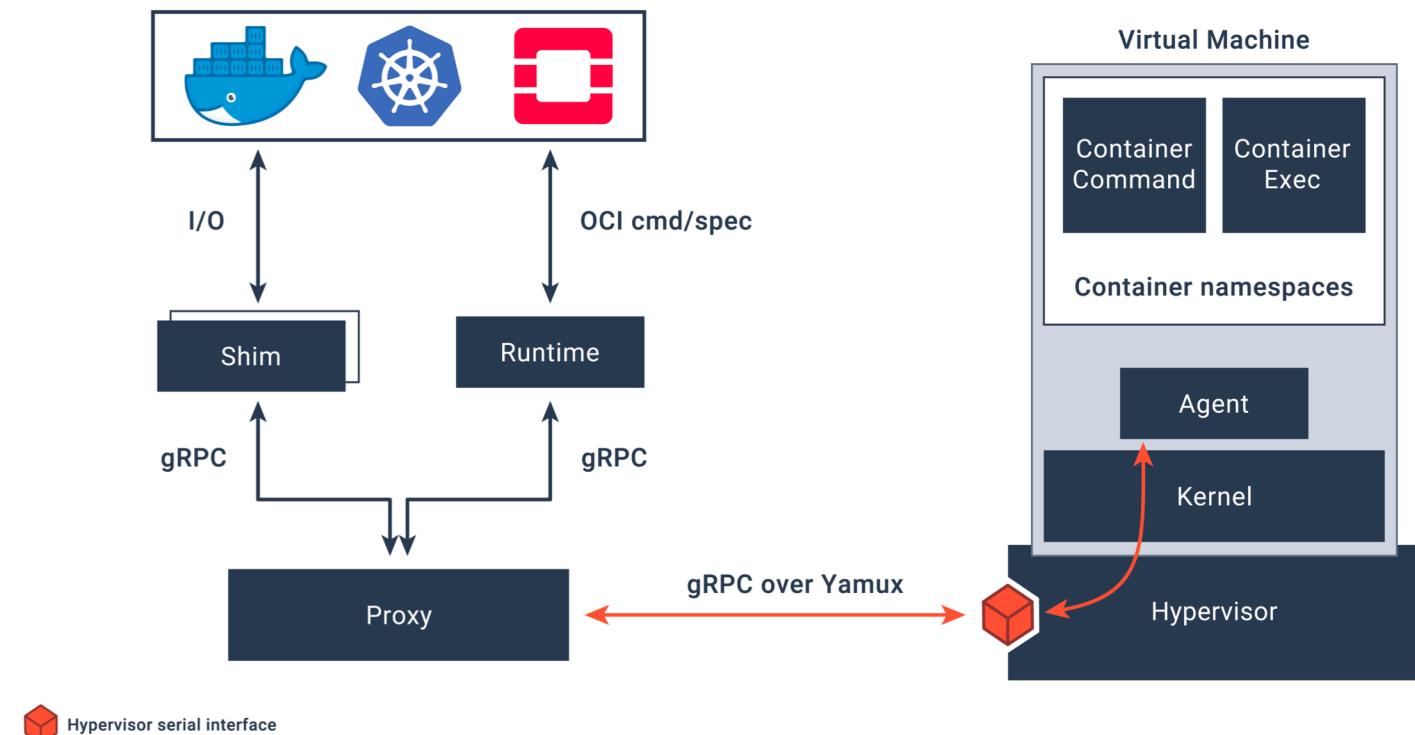


Kata Containers

Container runtime building lightweight VM

<https://katacontainers.io/>

- secure container runtime with lightweight virtual machines that feel and perform like containers, but provide stronger workload isolation using hardware virtualization technology
 - Open Container Initiative (OCI) compliant
- 1.5.0 introduces support for the Firecracker hypervisor
<https://firecracker-microvm.github.io/>



<https://www.openstack.org/videos/denver-2019/kata-containers-project-updates>

AirShip

Framework for defining/managing open infrastructure

<https://www.airshipit.org/>

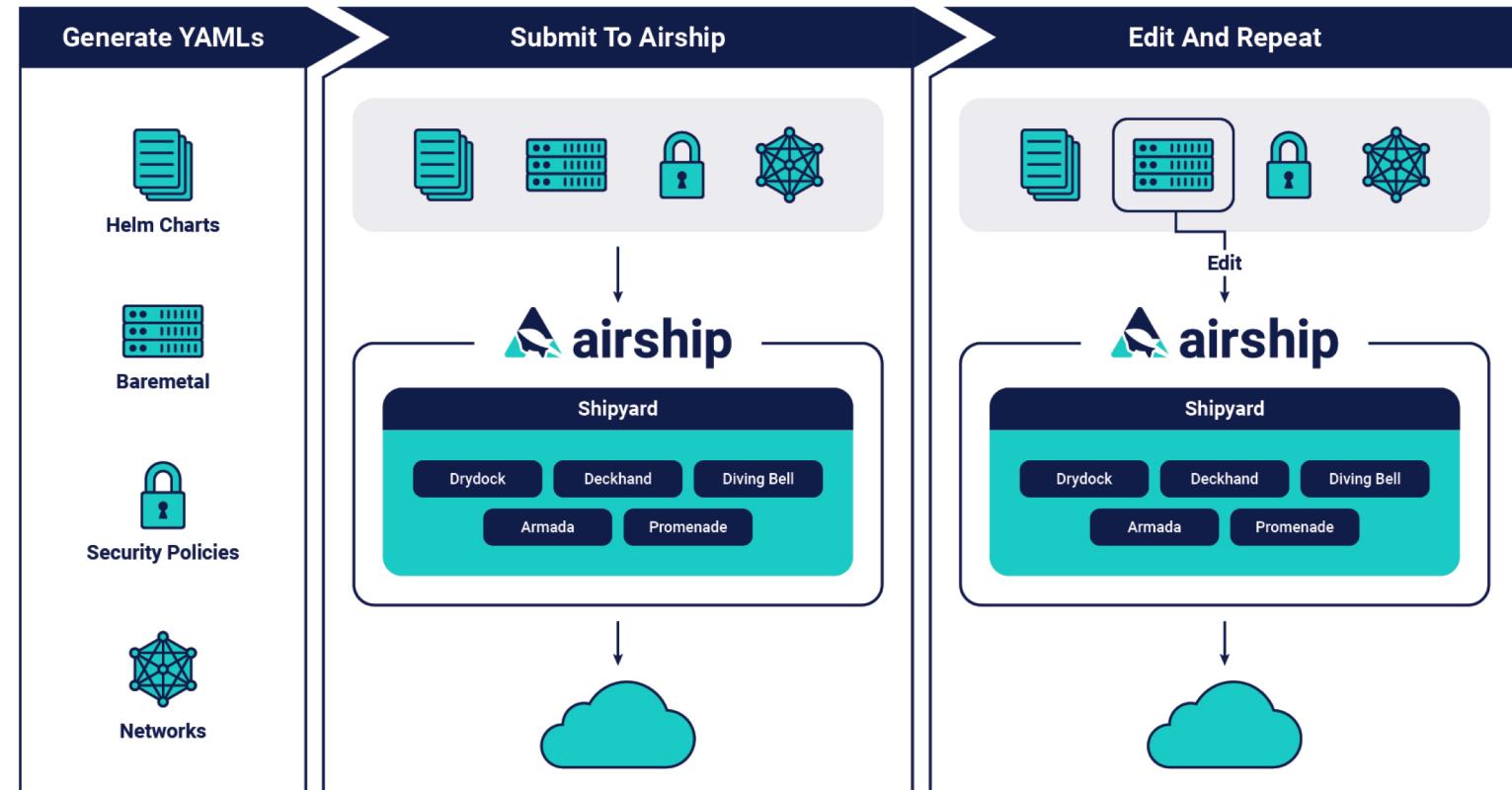


- Loosely-coupled interoperable open source tools to automate cloud provisioning

- Tools: OpenStack (VM), Kubernetes (container orchestration), MaaS (bare metal)

- Containers as an unit of infrastructure delivery at scale

- deliver a production-grade Kubernetes cluster with Helm deployed artifacts, including OpenStack-Helm



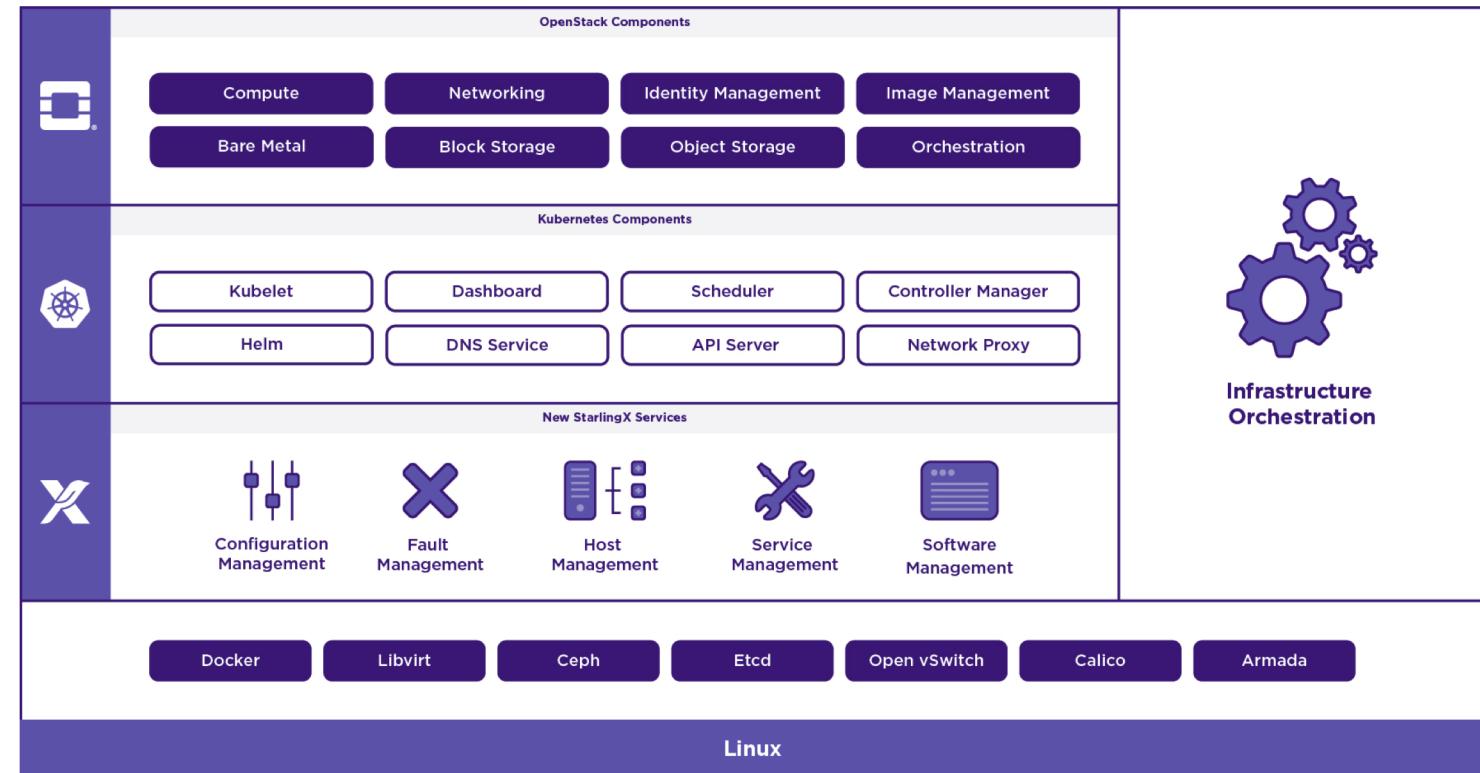
<https://www.openstack.org/videos/denver-2019/airship-project-update-1>

StarlingX

Cloud for the distributed edge

<https://www.starlingx.io/>

- Cloud infrastructure software stack for the edge
 - Deploys a K8s to run an OS at the edge
 - Integrates a number of upstream projects: CentOS, OvS-DPDK, Ceph, Kubernetes, OpenStack
- Edge-tuned/optimized
- Management of Host, Service, Software, Fault



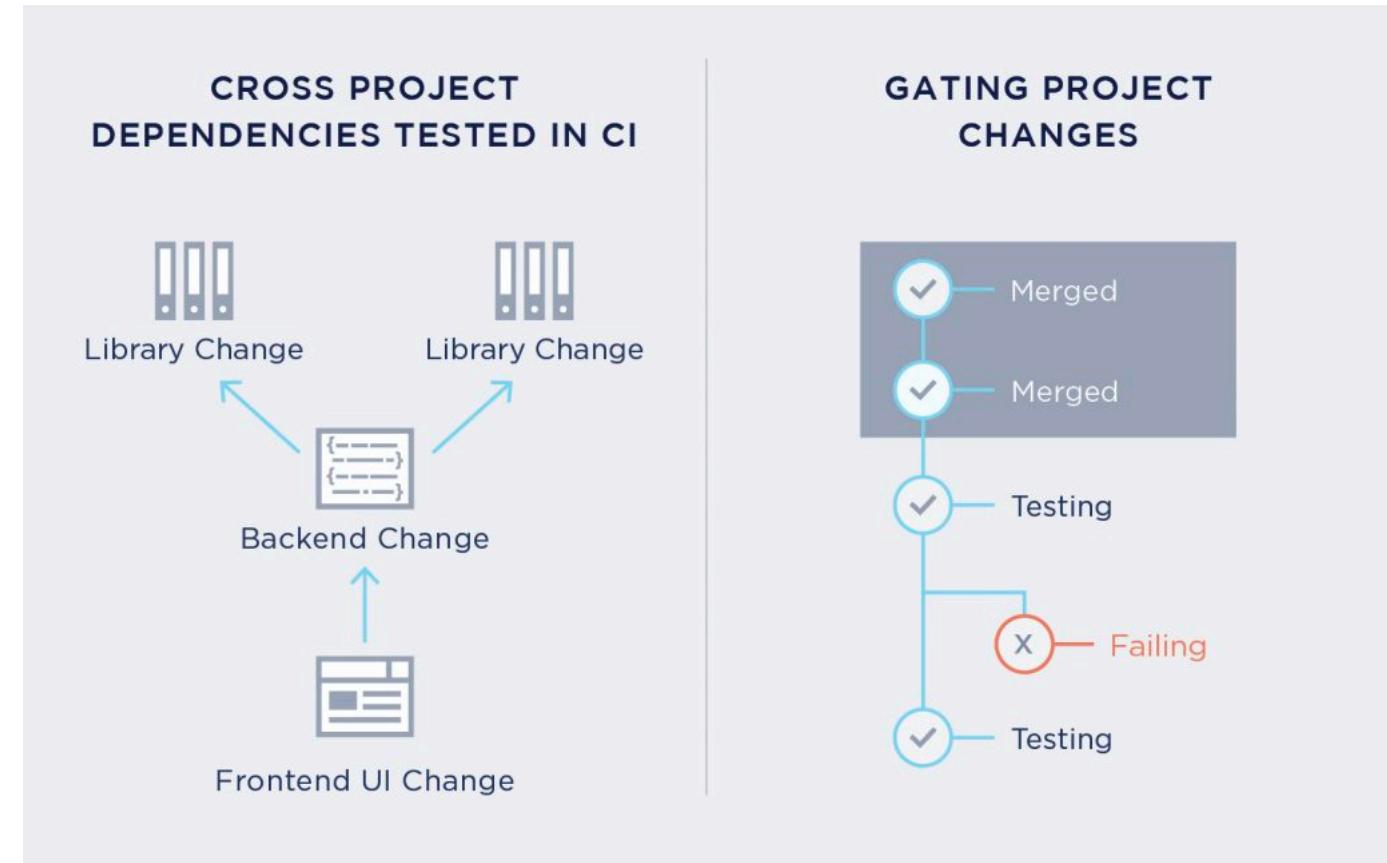
<https://www.openstack.org/videos/denver-2019/starlingx-project-update>

Zuul

Project Gating System

<https://zuul-ci.org/docs/zuul/>

- continuous integration, delivery, and deployment systems
 - focus on project gating and interrelated projects.
- Facilitates running tests and automated tasks in response to Code Review events
 - Tests cross-project changes in parallel so users can easily validate changes to multiple systems together before landing a single patch.



<https://www.openstack.org/videos/denver-2019/zuul-project-update-1>

Container Safe

Container Security Scanner

<https://www.containersafe.io/>

- Quickly Scan the layers within the container, performing analysis of:
 - Malware
 - Common Vulnerabilities and Exposures (CVE)
- Currently in limited access testing phase

Container URL:
Image Url *

nginx Scan

Created	2019-02-06T08:11:09.870Z
Size	104.14 MB
Labels	"maintainer":"NGINX Docker Maintainers <docker-maint@nginx.com>"
Analysis status	Completed
Analysis result	Pass with warning

of vulnerable packages: ▲ 3

vulnerabilities:

▼ 0:

▼ CVE-2017-5932:

```
cveid: "CVE-2017-5932"
cvss_access_complexity: "Low"
cvss_access_vector: "Local access"
cvss_authentication: "None required"
cvss_availability_impact: "Partial"
cvss_base: 4.6
cvss_confidentiality_impact: "Partial"
cvss_exploit: 3.9
cvss_impact: 6.4
cvss_integrity_impact: "Partial"
```

▼ cvss_vector:

```
0: "AV:L"
1: "AC:L"
2: "Au:N"
3: "C:P"
4: "I:P"
5: "A:P"
cweid: "CWE-20"
mod_date: "31-03-2017"
pub_date: "27-03-2017"
summary: "The path completion feature in Bash 4.4 allows local users to gain privileges via a crafted filename starting with a " (double quote) character and a command substitution metacharacter."
```



datamachines.io

Contact containersafe@datamachines.io for access