



Kolla를 이용한 OpenStack Container 생성 및 CI (Continuous Integraton) 파이프라인

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NIC R&D Center Open System Lab

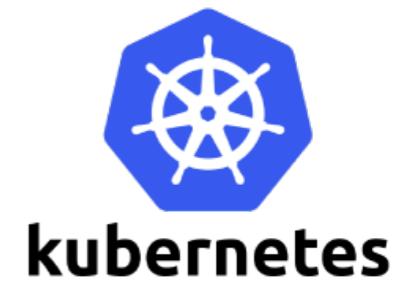
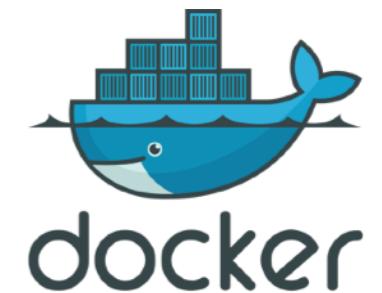
추자원

What is Kolla



KOLLA

an OpenStack Community Project



Kolla

- What is Kolla
- Mission
- Directory
- Dockerfile
- Images and Layers
- Install/**Build**/Deploy

CI 적용 사례

- Concept
- Repositories
- kolla-build.conf
- Build workflow
- Test and Tagging
- Daily Build

Background

- Deploying OpenStack is difficult
 - CentOS, Ubuntu, RHEL, Debian, OracleLinux & Versions
 - git source, binary(rpm, apt), rdo, rhos
- Operating OpenStack is even more difficult
 - upstream sync, upgrade
 - dependency hell
- Too many services

Kolla - Mission

Kolla provides production-ready containers and deployment tools for operating OpenStack clouds.

- kolla : Docker containers
- kolla-ansible : Deploy OpenStack on BM/VM
- kolla-kubernetes : Deploy OpenStack on k8s

Kolla - Directory

40 OpenStack Services

Infrastructure components

```
root@kolla-k8s:/usr/local/share/kolla/docker#  
root@kolla-k8s:/usr/local/share/kolla/docker# ls  
aodh dind horizon kuryr octavia telegraf  
barbican dnsmasq influxdb macros.j2 openstack-base tempest  
base elasticsearch ironic magnum openvswitch tgtd  
bifrost etcd iscsid manila panko trove  
ceilometer fluentd kafka mariadb rabbitmq vitrage  
ceph freezer karbor mistral rally vmtp  
chrony glance keepalived monasca redis watcher  
cinder gnocchi keystone mongodb sahara zaqar  
cloudkitty grafana kibana multipathd searchlight zookeeper  
collectd haproxy kolla-toolbox murano senlin zun  
congress heat kube neutron solum  
cron heka kubernetes-entrypoint nova swift  
designate helm-repository kubetoolbox tacker  
root@kolla-k8s:/usr/local/share/kolla/docker#
```

Kolla containers - Directory

```
|-- freezer
|   |-- freezer-api
|   |   |-- Dockerfile.j2
|   |   |-- extend_start.sh
|   |-- freezer-base
|       |-- Dockerfile.j2
|       |-- extend_start.sh
|       |-- freezer_sudoers
|-- glance
|   |-- glance-api
|   |   |-- Dockerfile.j2
|   |   |-- extend_start.sh
|   |-- glance-base
|       |-- Dockerfile.j2
|       |-- extend_start.sh
|   |-- glance-registry
|       |-- Dockerfile.j2
|-- gnocchi
|   |-- gnocchi-api
|   |   |-- Dockerfile.j2
|   |   |-- extend_start.sh
|   |-- gnocchi-base
|       |-- Dockerfile.j2
|       |-- extend_start.sh
|       |-- gnocchi_sudoers
|   |-- gnocchi-metricd
|       |-- Dockerfile.j2
```

Kolla - Dockerfiles

~/glance/glance-api/Dockerfile.j2

```
1 FROM {{ namespace }}/{{ image_prefix }}glance-base:{{ tag }}
2 MAINTAINER {{ maintainer }}
3
4 {% block glance_api_header %}{% endblock %}
5
6 {% import "macros.j2" as macros with context %}
7
8 {% if base_distro in ['centos', 'oraclelinux', 'rhel'] %}
9     {% set glance_api_packages = ['qemu-img'] %}
10 {% elif base_distro in ['ubuntu'] %}
11     {% set glance_api_packages = ['qemu-utils'] %}
12 {% endif %}
13
14 {{ macros.install_packages(glance_api_packages | customizable("packages")) }}
15
16 COPY extend_start.sh /usr/local/bin/kolla_glance_extend_start
17 RUN chmod 755 /usr/local/bin/kolla_glance_extend_start
18
19 {% block glance_api_footer %}{% endblock %}
20 {% block footer %}{% endblock %}
21
22 USER glance
```

Kolla - Images and Layers

nova-api



nova-base



openstack-base



ubuntu-base



ubuntu:16.04



ubuntu-binary-nova-api:4.0.3 (based on ubuntu-binary-nova-base:4.0.3)

0443655c58f0	0 B
544b82f8f8db	802 B
8062b09761d6	802 B
3375c6afaab2	1 B
63cc9949208e	12.1 MB

82c24e91145d	0 B
84d418f82714	802 B
48493635057f	802 B
e9dfa902360a	1 B
84bd8777f530	12.1 MB

d1e2498888ae
ubuntu-binary-openstack-base:4.0.3

90b612cc6ed6
ubuntu-binary-base:4.0.3

nova-api/Dockerfile.j2

```
USER nova

RUN chmod 755 /usr/local/bin/kolla_nova_extend_start

COPY extend_start.sh /usr/local/bin/kolla_nova_extend_start

RUN echo > /etc/apache2/ports.conf

apt-get install httpd mod_ssl mod_wsgi openstack-nova-api
```

ubuntu-binary-nova-base:4.0.3
(based on ubuntu-binary-openstack-base:4.0.3)

ubuntu-binary-openstack-base:4.0.3
(based on ubuntu-binary-base:4.0.3)

...

Container ubuntu-binary-base:4.0.3
(based on ubuntu-16.04)

Kolla - Install

[kolla]

```
git clone https://git.openstack.org/openstack/kolla -b stable/ocata
```

```
pip install ./kolla
```

[kolla-ansible]

```
git clone https://git.openstack.org/openstack/kolla-ansible -b stable/ocata
```

```
pip install ./kolla-ansible
```

```
cp -r ./kolla-ansible/etc/kolla /etc/
```

Kolla - Build



ubuntu



CentOS



debian



git



tarballs



redhat



ORACLE
LINUX



DEBIAN / UBUNTU
PACKAGE MANAGEMENT



kolla/ubuntu-binary-keystone-api	:4.0.3
kolla/centos-source-glance-register	:4.0.3
kolla/debian-binary-openstack-base	:3.0.0

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Kolla - Build

```
jawon@kolla-k8s:~$ sudo kolla-build --base ubuntu --type binary neutron-server
INFO:kolla.image.build:Found the docker image folder at /usr/local/share/kolla/docker
INFO:kolla.image.build:Added image base to queue
INFO:kolla.image.build:Attempting to run task BuildTask(base) for the first time
INFO:kolla.image.build.base:Building
INFO:kolla.image.build.base:Step 1/27 : FROM ubuntu:16.04
INFO:kolla.image.build.base: ---> d355ed3537e9
INFO:kolla.image.build.base:Step 2/27 : MAINTAINER Kolla Project (https://launchpad.net/kolla)
```

--base

The distro type of the base image.

centos, rhel, ubuntu, oraclelinux, debian

--type

The method of the OpenStack install.

binary, source, rdo, rhos

--base-image

Customizing builds

"get your own base images!"

```
FROM ubuntu:16.04

MAINTAINER Open System Lab.

COPY repos/sources.list /etc/apt/sources.list

# setup pipy utils
RUN mkdir ~/.pip && \
    echo '[global]' > ~/.pip/pip.conf && \
    echo 'extra-index-url = http://skt-deploy01/pypi/simple/' >> ~/.pip/pip.conf && \
    echo 'trusted-host = skt-deploy01' >> ~/.pip/pip.conf && \
    apt-get install net-tools vim netcat iputils-ping -y && \
    . . .

# setup label
LABEL org.label-schema.name="SKT Ubuntu Base Image" \
      org.label-schema.description="This service does awesome things with other things" \
      org.label-schema.vendor="SKT" \
      org.label-schema.version="phase2" \
      org.label-schema.schema-version="0.1" \
      . . .
```

Customizing builds

"use template-override files!!"

```
# kolla-build --template-override horizon/template-override.j2 horizon  
=====  
{% extends parent_template %}  
  
{% block horizon_header %}  
LABEL org.label-schema.name="SKT horizon Image"  
{% endblock %}  
  
{% block horizon_footer %}  
COPY glance_policy.json /etc/openstack-dashboard/glance_policy.json  
{% endblock %}
```

Customizing builds

"use tag and namespace!!!"

```
jawon@kolla-k8s:~$ # sudo kolla-build --namespace skt-taco01:5000 --tag develop nova-api
jawon@kolla-k8s:~$ 
jawon@kolla-k8s:~$ sudo docker images | grep nova-api
skt-taco01:5000/centos-binary-nova-api          1.0.0
skt-taco01:5000/centos-binary-nova-api          17.07.10
skt-taco01:5000/centos-binary-nova-api          develop
skt-taco01:5000/centos-binary-nova-api          test
kolla/ubuntu-source-nova-api                    4.0.0
kolla/debian-source-nova-api                   3.0.0
```

Customizing builds

"namespace 확장"

```
jawon@upgrade:~$ sudo docker images | grep skt-taco01:5000/
skt-taco01:5000/newton/ubuntu-source-nova-api      1.0.0
skt-taco01:5000/newton/ubuntu-source-nova-api      17.07.07
skt-taco01:5000/newton/ubuntu-source-nova-api      develop
skt-taco01:5000/newton/ubuntu-source-nova-api      test
skt-taco01:5000/ocata/ubuntu-source-nova-api      17.07.07
skt-taco01:5000/ocata/ubuntu-source-nova-api      develop
skt-taco01:5000/ocata/ubuntu-source-nova-api      test
.
```

Kolla - Deploy

```
jawon@kolla-k8s:~$ cat /etc/kolla/globals.yml | egrep -v '(^#|^$|:$|\-\-\-\-)'  
kolla_base_distro: "ubuntu"  
kolla_install_type: "source"  
openstack_release: "4.0.0"  
kolla_internal_vip_address: "10.77.1.210"  
network_interface: "ens34"  
neutron_external_interface: "ens33"  
neutron_plugin_agent: "linuxbridge"  
openstack_logging_debug: "True"  
nova_console: "novnc"  
enable_heat: "no"  
designate_backend: "bind9"  
designate_ns_record: "sample.openstack.org"  
jawon@kolla-k8s:~$  
jawon@kolla-k8s:~$ sudo kolla-ansible deploy
```

Kolla - Deploy

Screenshot of the OpenStack Hypervisors dashboard showing resource usage and host details.

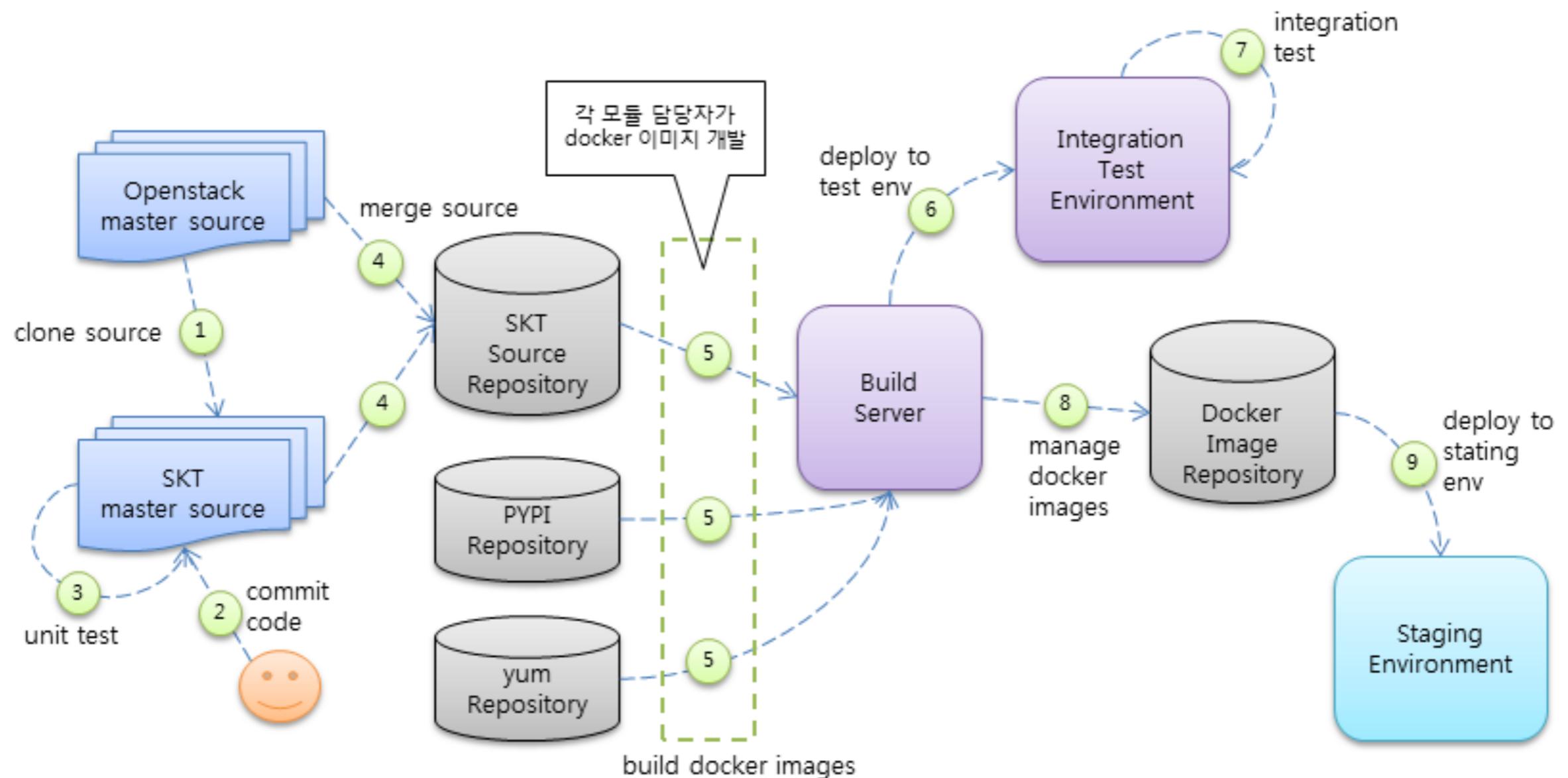
Hypervisor Summary

Resource	Value
VCPUs Usage	Used 0 of 4
Memory Usage	Used 5.1GB of 7.7GB
Local Disk Usage	Used 5GB of 29GB

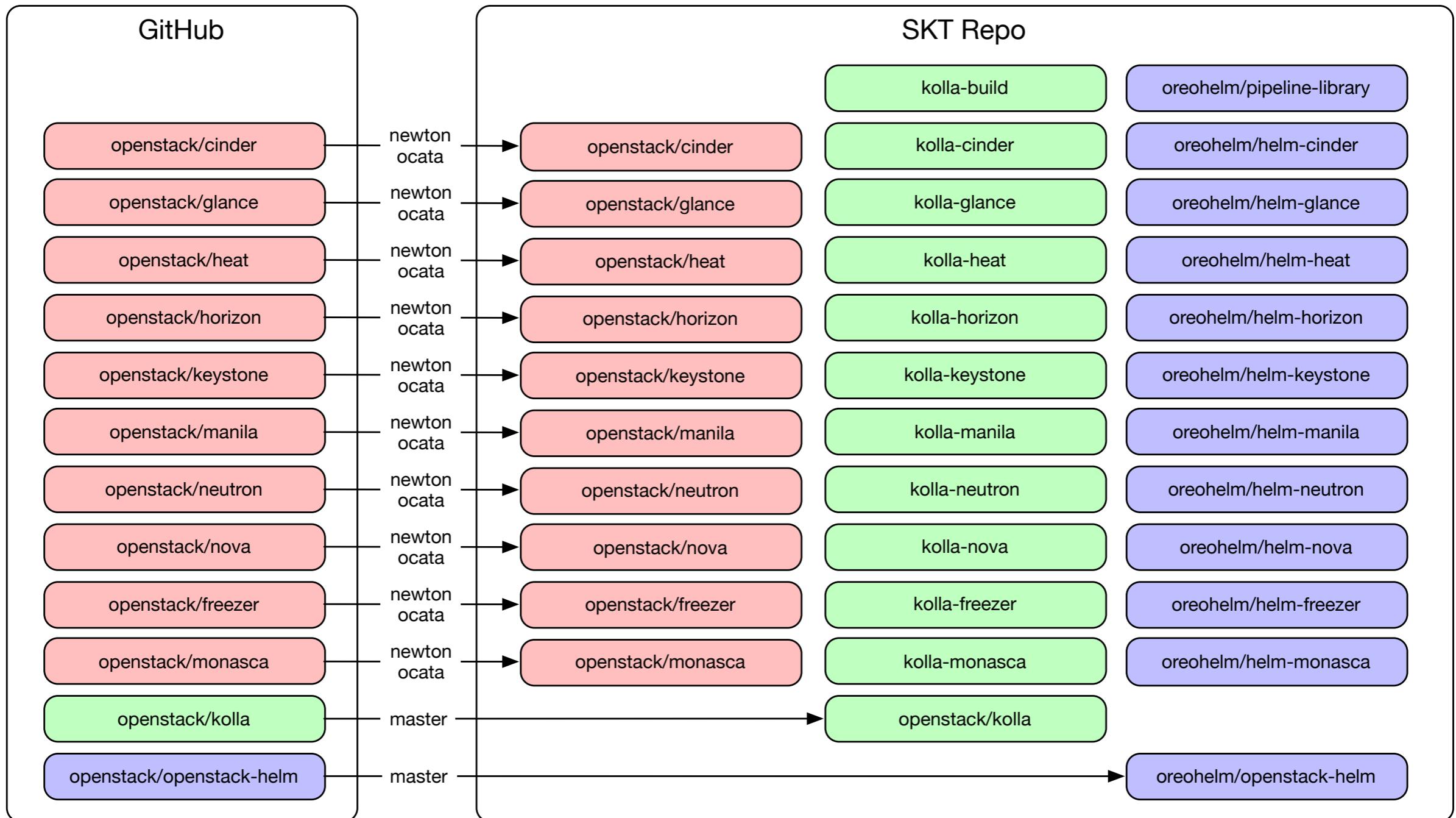
Host Details

Hostname	Type	VCPUs (used)	VCPUs (total)	RAM (used)	RAM (total)	Local Storage (used)	Local Storage (total)	Instances
kolla-k8s	QEMU	0	4	5.1GB	7.7GB	5GB	29GB	0

CI - Concept



CI - Repositories



CI - kolla-build.conf

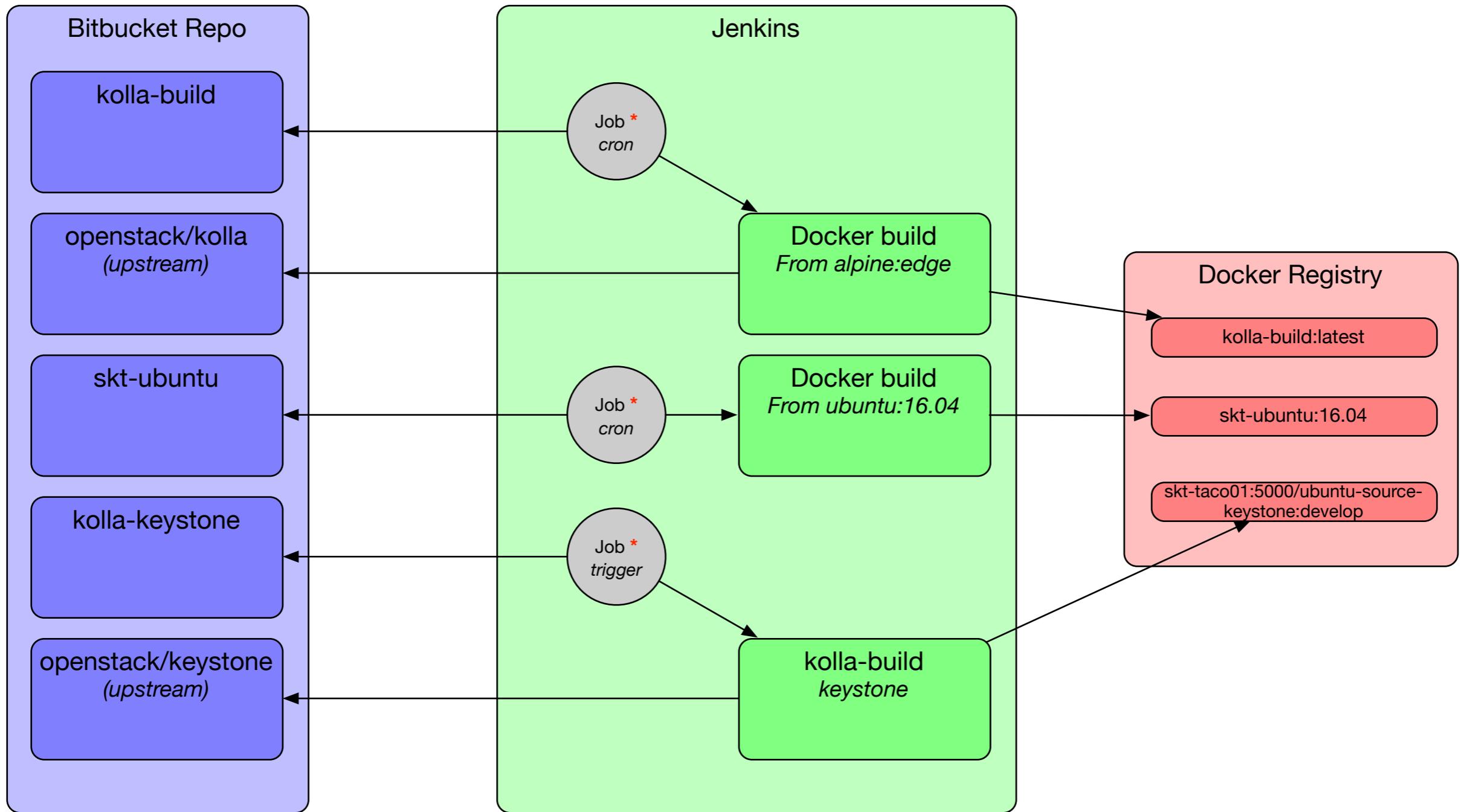
```
[keystone-base]

#
# From kolla
#
# Source location type (string value)
# Allowed values: local, git, url
type = git

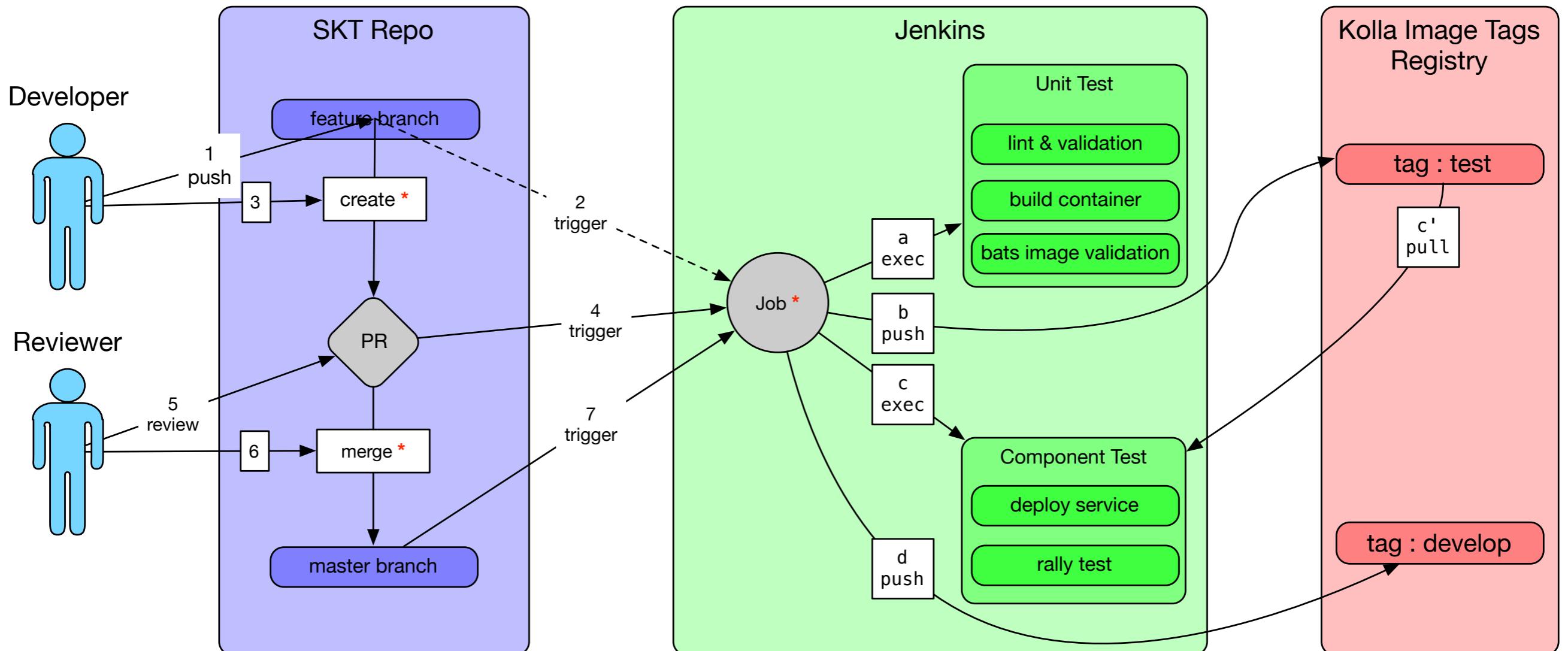
# The location for source install (string value)
location = https://tde.sktelecom.com/stash/scm/openstack/keystone.git

# Git reference to pull, commit sha, tag or branch name (string value)
reference = stable/@BRANCH
```

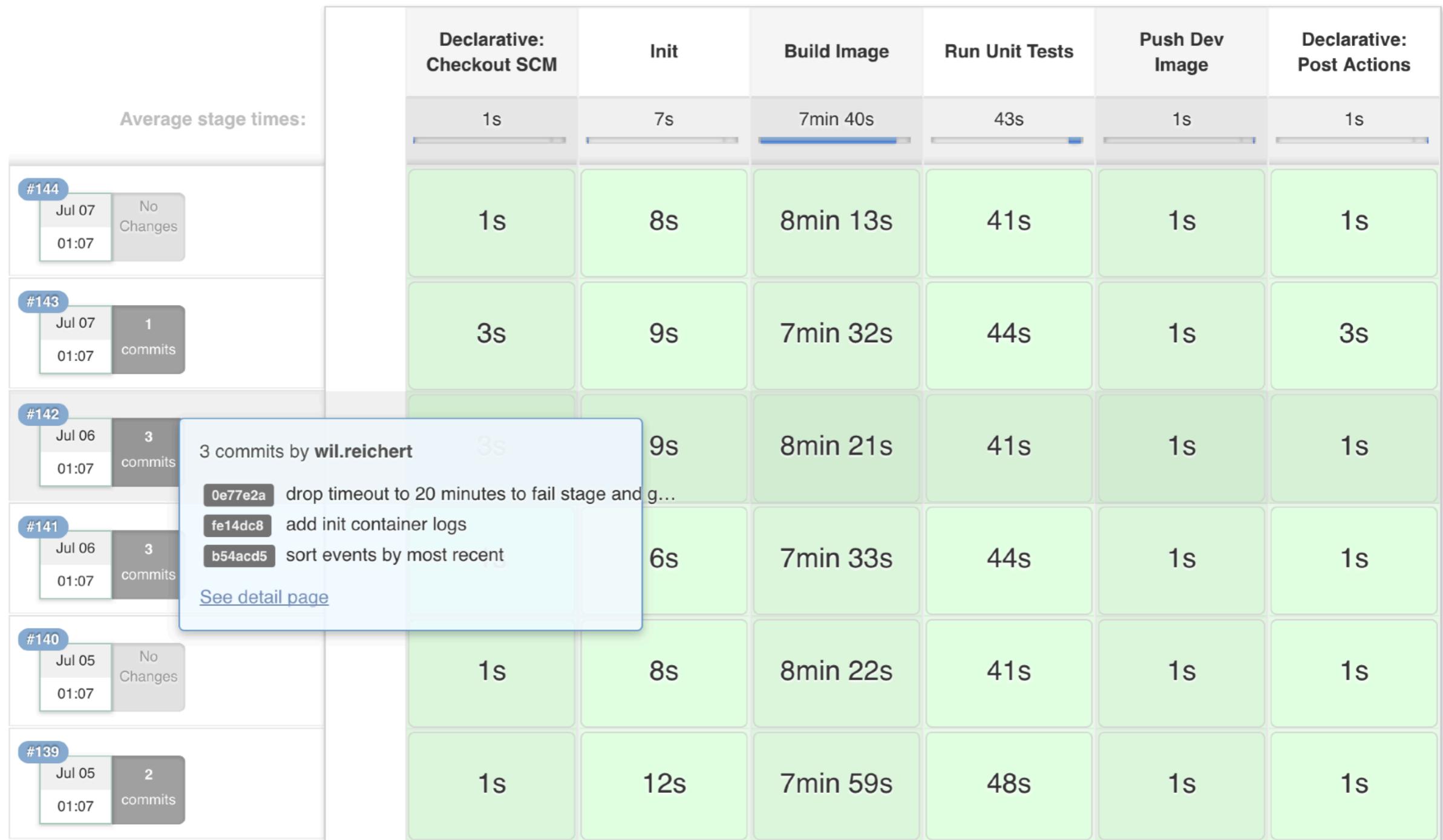
CI - Build Workflow



CI - Test and Tagging



Daily - Daily Build



CI - Jenkins Job

All	Helm	Helm Master	Kolla	Kolla Master	Random	SONA	Tools	+	
S	W	Name ↓			Last Success	Last Failure	Last Duration	Fav	
		OREO Kolla » OREOKOLLA/kolla-cinder » master			17 hr - #165	11 days - #138	12 min		
		OREO Kolla » OREOKOLLA/kolla-glance » master			17 hr - #144	5 days 17 hr - #133	9 min 15 sec		
		OREO Kolla » OREOKOLLA/kolla-heat » master			17 hr - #79	11 days - #52	10 min		
		OREO Kolla » OREOKOLLA/kolla-horizon » master			17 hr - #139	4 days 2 hr - #130	20 min		
		OREO Kolla » OREOKOLLA/kolla-keystone » master			17 hr - #139	11 days - #111	9 min 53 sec		
		OREO Kolla » OREOKOLLA/kolla-kubernetes-entrypoint » master			17 hr - #69	4 days 2 hr - #64	2 min 56 sec		
		OREO Kolla » OREOKOLLA/kolla-manila » master			17 hr - #79	11 days - #52	10 min		
		OREO Kolla » OREOKOLLA/kolla-monasca » master			17 hr - #46	4 days 2 hr - #41	9 min 59 sec		
		OREO Kolla » OREOKOLLA/kolla-neutron » master			17 hr - #130	5 days 17 hr - #119	13 min		
		OREO Kolla » OREOKOLLA/kolla-neutron-onos » master			17 hr - #62	11 days - #49	12 min		
		OREO Kolla » OREOKOLLA/kolla-nova » master			17 hr - #131	11 days - #104	14 min		
		OREO Kolla » OREOKOLLA/kolla-openstack » master			4 days 2 hr - #63	N/A	4 min 59 sec		
		OREO Kolla » OREOKOLLA/kolla-openvswitch » master			17 hr - #126	5 days 17 hr - #115	10 min		
		OREO Kolla » OREOKOLLA/kolla-rally » master			17 hr - #78	11 days - #51	10 min		
		OREO Kolla » OREOKOLLA/kolla-tempest » master			17 hr - #125	11 days - #98	8 min 39 sec		
		OREO Kolla » OREOKOLLA/kolla-toolbox » master			17 hr - #128	11 days - #101	6 min 38 sec		

감사합니다

OpenStack Kolla Project
<https://docs.openstack.org/kolla/latest/>

hub docker Kolla
<https://hub.docker.com/u/kolla/>

Facebook OpenStack Korea Group
<https://www.facebook.com/groups/openstack.kr/>