
OpenWhisk for RHEL7 Documentation

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OpenWhisk components are delivered as a Kubernetes pod by deploying Docker containers. The base images are pulled from [OpenWhisk repository on Docker Hub](#) to build clusters and some tips and issues that we experienced are provided in this guide to help other users.

CHAPTER 1

Docker 1.12, not 17.09 ce

Kubernetes needs a container engine, e.g. Docker but the latest one may not work as expected. We find two reasons why Docker 1.12 is chosen, because 1) [Kubernetes recommends v1.12](#) (also [here](#)) and 2) **Docker CE 17.09 does not support RHEL7** <https://docs.docker.com/engine/installation/linux/docker-ee/rhel/> > ‘_

Note: Docker package is also available in a RHEL extras repository which is recommended to receive support by Red Hat.

1.1 Manual Installation

This section provides a list of commands to install Docker manually, instead of using package managers i.e. yum to use an exact version of Docker.

Download Docker *rpm* package:

```
wget https://packages.docker.com/1.12/yum/repo/main/centos/7/Packages/docker-engine-1.12.6.cs8-1.el7.centos.x86_64.rpm
```

Note: If this link is broken, please look up substitute the repository.

The following command to install:

```
sudo yum -y install docker-engine-1.12.6.cs8-1.el7.centos.x86_64.rpm
```

Note: `--installroot=/opt/docker` may be used to separate installed location, set variable by `export DOCKER_ROOT=/opt/docker`

Service file from the Moby Project:

```
wget https://raw.githubusercontent.com/moby/moby/master/contrib/init/systemd/docker.  
↪service -P $DOCKER_ROOT/etc/systemd/system  
wget https://raw.githubusercontent.com/moby/moby/master/contrib/init/systemd/docker.  
↪socket -p $DOCKER_ROOT/etc/systemd/system
```

(Optional) for /opt/docker:

```
export DOCKER_ROOT_ESCAPED=`echo $DOCKER_ROOT|sed -e 's/\\/\\\\\\\\/g'`  
sed -ie "s/ExecStart=/Environment=\"LD_LIBRARY_PATH=$DOCKER_ROOT_ESCAPED/usr/lib64\  
↪\"Environment=\"PATH=$PATH:$DOCKER_ROOT_ESCAPED/bin:$DOCKER_ROOT_ESCAPED/sbin:\  
↪sbin\"/nExecStart=$DOCKER_ROOT_ESCAPED/" $DOCKER_ROOT/etc/systemd/system/docker.  
↪service  
sudo mkdir /var/lib/docker  
sudo mkdir /etc/docker  
sudo ln -s /opt/docker/etc/systemd/system/docker.s* /etc/systemd/system
```

Devicemapper as storage driver

```
cat << EOF > /etc/docker/daemon.json  
{  
  "storage-driver": "devicemapper"  
}  
EOF
```

Service reload/restart:

```
sudo systemctl daemon-reload  
sudo systemctl start docker
```

CHAPTER 2

Kubernetes (WIP)

```
cat <<EOF > /etc/yum.repos.d/kubernetes.repo
[kubernetes]
name=Kubernetes
baseurl=https://packages.cloud.google.com/yum/repos/kubernetes-el7-x86_64
enabled=1
gpgcheck=1
repo_gpgcheck=1
gpgkey=https://packages.cloud.google.com/yum/doc/yum-key.gpg https://packages.cloud.
↪google.com/yum/doc/rpm-package-key.gpg
EOF

setenforce 0
yum install -y kubelet kubeadm kubectl

sudo sed -i "s/ExecStart=/usr/bin/ExecStart=$DOCKER_ROOT_ESCAPED/bin/usr/bin/"
↪$DOCKER_ROOT/etc/systemd/system/kubelet.service
sudo sed -i "s/ExecStart=/usr/bin/ExecStart=$DOCKER_ROOT_ESCAPED/bin/usr/bin/"
↪$DOCKER_ROOT/etc/systemd/system/kubelet.service.d/10-kubeadm.conf
sudo sed -i "s/cgroup-driver=systemd/cgroup-driver=cgroupfs/" $DOCKER_ROOT/etc/
↪systemd/system/kubelet.service.d/10-kubeadm.conf
sudo sed -i "s/KUBELET_EXTRA_ARGS/KUBELET_EXTRA_ARGS --fail-swap-on=false/" $DOCKER_
↪ROOT/etc/systemd/system/kubelet.service.d/10-kubeadm.conf

# Weave net CNI addon
export kubever=$(kubectl version | base64 | tr -d '\n')
kubectl apply -f "https://cloud.weave.works/k8s/net?k8s-version=$kubever"

export K8S_ROOT=/opt/kubernetes

# Master to check token
sudo $K8S_ROOT/bin/kubeadm token list

# Node to join
sudo $K8S_ROOT/bin/kubeadm join --token <TOKEN> <MASTER_IP>:<MASTER_PORT i.e. 6443> --
↪skip-preflight-checks --discovery-token-unsafe-skip-ca-verification
```

```
# Label for nodes
$K8S_ROOT/bin/kubectl label node <NODE_HOSTNAME> node-role.kubernetes.io/node=
```