RED HAT CONSULTING

Engagement Journal

PREPARED FOR - MitziCom

Sebastian Hetze

Version 0.2

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1. History and Revisions

Version	Date	Authors	Changes
0.2		Sebastian Hetze < shetze@redhat.com>	Initial version of the document

2. Preface

2.1. Confidentiality, Copyright, and Disclaimer

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2.2. About This Document

This document contains details of the four day engagement with Red Hat and MitziCom that took place in January 2017. It contains the relavent configuration details from this engagement

2.3. Audience

The audience of the document is MitziCom’s Linux Administrators

2.4. Additional Background and Related Documents

This document does not contain step by step details of installation or other tasks, as they are covered in the relavent documentation on access.redhat.com. Instead, links to this documents will be made when appropriate

2.5. Terminology

Provide a glossary for terminology that may not be common knowledge with the intended audience. Define terms and expand then define acronyms. If the terminology table exceeds a full page in length, it should probably be moved to an Appendix with a reference to the appendix in this section in place of the table.

Table 1. Terminology Table

Term	Definition
Pod	Pods are the smallest deployable units of computing that can be created and managed in OpenShift.

3. OpenShift Advanced Deployment PoC Engagement

MitziCom provides hosting and cloud services to a variety of clients, from medium size companies to enterprise giants.

The purpose of the POC is to determine the feasibility of using Red Hat OpenShift Container Platform as a target for internal and client workloads.

The PoC requirements and outcomes are listed and documented below.

4. PoC Requirements and Outcomes

4.1. Automation

- Create a public github repository with all your work which can be cloned onto a homework bastion host and executed to execute all the steps below:

```
git clone https://github.com/shetze/OpenShift.git
```

- Create an ansible inventory file which deploys the desired OpenShift and its components

The script is generated by the deployment script:

```
cd OpenShift/MitziCom-OpenShift-PoC
sh Deploy-OpenShift.sh
```

- Create a script or process that completes the following:
    - Customizses the ansible inventory file for different hostnames

```
read -p "
This script will perform a completely automated OpenShift deployment into the OpenShift HA Deployment lab environment.
In order to get things going you need to provide some details about your current lab environment.

What is the GUID of your lab? " GUID
```

4.2. Basic and HA Requirements

- PoC Use Case: Set up storage, networking, and other environment configurations

```
ansible nfs -m shell -a for i in {001..050}; do mkdir /srv/nfs/pv$i; chown nfsnobody:nfsnobody /srv/nfs/pv$i; chmod 777 /srv/nfs/pv$i;
done

support1.0be7.internal | SUCCESS | rc=0 >>
```

- PoC Use Case: Provide instructions for the MitziCom administrator to deploy all the above in a single command

```
ansible-playbook -i ./hosts -f 20 //usr/share/ansible/openshift-ansible/playbooks/prerequisites.yml

 [WARNING]: Could not match supplied host pattern, ignoring: oo_hosts_containerized_managed_true

TASK [container_runtime : Remove CRI-O default configuration files]
******************************************************************************************************************************************
****************************************************************************************************************

TASK [container_runtime : Create the CRI-O configuration]
******************************************************************************************************************************************
**************************************************************************************************************************

TASK [container_runtime : Ensure CNI configuration directory exists]
******************************************************************************************************************************************
***************************************************************************************************************

TASK [container_runtime : Add iptables allow rules]
******************************************************************************************************************************************
```

```
********************************************************************************************************************************

TASK [container_runtime : Remove iptables rules]
******************************************************************************************************************************************
***********************************************************************************************************************************

TASK [container_runtime : Add firewalld allow rules]
******************************************************************************************************************************************
*******************************************************************************************************************************

TASK [container_runtime : Remove firewalld allow rules]
******************************************************************************************************************************************
****************************************************************************************************************************

TASK [container_runtime : Configure the CNI network]
******************************************************************************************************************************************
*******************************************************************************************************************************

TASK [container_runtime : Create /etc/sysconfig/crio-network]
******************************************************************************************************************************************
**********************************************************************************************************************

TASK [container_runtime : Start the CRI-O service]
******************************************************************************************************************************************
*********************************************************************************************************************************

TASK [container_runtime : include_tasks]
******************************************************************************************************************************************
******************************************************************************************************************************************
*

PLAY RECAP
******************************************************************************************************************************************
******************************************************************************************************************************************
*******************************
infranode1.0be7.internal   : ok=58   changed=8    unreachable=0    failed=0
infranode2.0be7.internal   : ok=58   changed=8    unreachable=0    failed=0
loadbalancer1.0be7.internal : ok=35   changed=4    unreachable=0    failed=0
localhost                  : ok=13   changed=0    unreachable=0    failed=0
master1.0be7.internal      : ok=67   changed=8    unreachable=0    failed=0
master2.0be7.internal      : ok=62   changed=8    unreachable=0    failed=0
master3.0be7.internal      : ok=62   changed=8    unreachable=0    failed=0
node1.0be7.internal        : ok=58   changed=8    unreachable=0    failed=0
node2.0be7.internal        : ok=58   changed=8    unreachable=0    failed=0
node3.0be7.internal        : ok=58   changed=8    unreachable=0    failed=0
support1.0be7.internal     : ok=33   changed=2    unreachable=0    failed=0


INSTALLER STATUS
******************************************************************************************************************************************
******************************************************************************************************************************************
*************************
Initialization             : Complete (0:00:22)
```

```
ansible-playbook -i ./hosts -f 20 /usr/share/ansible/openshift-ansible/playbooks/deploy_cluster.yml

 [WARNING]: Consider using yum, dnf or zypper module rather than running rpm
 [WARNING]: Consider using file module with mode rather than running chmod
 [WARNING]: Consider using unarchive module rather than running tar
 [WARNING]: Consider using get_url or uri module rather than running curl
 [WARNING]: Could not match supplied host pattern, ignoring: oo_containerized_master_nodes
 [WARNING]: Could not match supplied host pattern, ignoring: oo_nodes_use_flannel
 [WARNING]: Could not match supplied host pattern, ignoring: oo_nodes_use_calico
 [WARNING]: Could not match supplied host pattern, ignoring: oo_nodes_use_contiv
 [WARNING]: Could not match supplied host pattern, ignoring: oo_nodes_use_kuryr
 [WARNING]: Could not match supplied host pattern, ignoring: oo_nodes_use_nuage
 [WARNING]: Could not match supplied host pattern, ignoring: glusterfs
 [WARNING]: Could not match supplied host pattern, ignoring: glusterfs_registry
TASK [openshift_management : Note the correct podified db template name]
```

```
********************************************************************************************************************************************
************************************************************************************************************

TASK [openshift_management : Ensure the Management App is created]
********************************************************************************************************************************************
******************************************************************************************************************

TASK [openshift_management : Wait for the app to come up. May take several minutes, 30s check intervals, 30 retries]
********************************************************************************************************************************************
****************************************************************

PLAY [Management Install Checkpoint End]
********************************************************************************************************************************************
********************************************************************************************************************************************
*

TASK [Set Management install 'Complete']
********************************************************************************************************************************************
********************************************************************************************************************************************
*

PLAY RECAP
********************************************************************************************************************************************
********************************************************************************************************************************************
*******************************
infranode1.0be7.internal   : ok=129  changed=34   unreachable=0    failed=0
infranode2.0be7.internal   : ok=129  changed=34   unreachable=0    failed=0
loadbalancer1.0be7.internal : ok=61   changed=6    unreachable=0    failed=0
localhost                  : ok=14   changed=0    unreachable=0    failed=0
master1.0be7.internal      : ok=1055 changed=393  unreachable=0    failed=0
master2.0be7.internal      : ok=333  changed=117  unreachable=0    failed=0
master3.0be7.internal      : ok=333  changed=117  unreachable=0    failed=0
node1.0be7.internal        : ok=129  changed=34   unreachable=0    failed=0
node2.0be7.internal        : ok=129  changed=34   unreachable=0    failed=0
node3.0be7.internal        : ok=129  changed=34   unreachable=0    failed=0
support1.0be7.internal     : ok=29   changed=2    unreachable=0    failed=0


INSTALLER STATUS
********************************************************************************************************************************************
********************************************************************************************************************************************
*************************
Initialization             : Complete (0:00:27)
Health Check               : Complete (0:00:47)
etcd Install               : Complete (0:01:10)
NFS Install                : Complete (0:00:13)
Load balancer Install      : Complete (0:00:18)
Master Install             : Complete (0:13:54)
Master Additional Install  : Complete (0:01:02)
Node Install               : Complete (0:03:15)
Hosted Install             : Complete (0:01:53)
Web Console Install        : Complete (0:00:45)
Metrics Install            : Complete (0:02:02)
Logging Install            : Complete (0:03:14)
Prometheus Install         : Complete (0:00:54)
Service Catalog Install    : Complete (0:01:39)
```

```
ansible masters[0] -b -m fetch -a "src=/root/.kube/config dest=/root/.kube/config flat=yes"

master1.0be7.internal | SUCCESS => {
    "changed": true,
    "checksum": "dfe8922932d320407a8604c2f207467326d1703e",
    "dest": "/root/.kube/config",
    "failed": false,
    "md5sum": "9466d1066a5e8c7e0f22a7119242c858",
    "remote_checksum": "dfe8922932d320407a8604c2f207467326d1703e",
    "remote_md5sum": null
}
```

- PoC Use Case: Ability to authenticate at the master console

```
oc adm policy add-cluster-role-to-user cluster-admin admin

cluster role "cluster-admin" added: "admin"


oc adm policy add-cluster-role-to-user cluster-admin Karla

cluster role "cluster-admin" added: "Karla"
```

```
oc adm groups sync --sync-config=/root/OpenShift/MitziCom-OpenShift-PoC/Workdir/groupsync.yaml --whitelist=/root/OpenShift/MitziCom
-OpenShift-PoC/Workdir/whitelist.yaml --confirm
group/portalapp
group/paymentapp
group/ocp-platform
group/ocp-production
oc adm policy add-cluster-role-to-group cluster-admin ocp-platform

cluster role "cluster-admin" added: "ocp-platform"
```

- PoC Use Case: Registry has storage attached and working

```
oc describe pod docker-registry-1-gh5rk
docker-registry-1-mn229 -n default

Name:           docker-registry-1-gh5rk
Namespace:      default
Node:           infranode1.0be7.internal/192.199.0.33
Start Time:     Mon, 25 Jun 2018 21:08:49 +0000
Labels:         deployment=docker-registry-1
                deploymentconfig=docker-registry
                docker-registry=default
Annotations:    openshift.io/deployment-config.latest-version=1
                openshift.io/deployment-config.name=docker-registry
                openshift.io/deployment.name=docker-registry-1
                openshift.io/scc=restricted
Status:         Running
IP:             10.128.0.3
Controlled By:  ReplicationController/docker-registry-1
Containers:
  registry:
    Container ID:   docker://c6c942874cf6dc2898d3ebbf028a9a2051917c2f9f251945180c8d5dd79bcf7b
    Image:          openshift3/ose-docker-registry:v3.9.27
    Image ID:       docker-pullable://registry.access.redhat.com/openshift3/ose-docker-
registry@sha256:6c36a22e5f5120657964f7c3b0acf0a397a52428961bec497fb61dbf8c7c36b7
    Port:           5000/TCP
    State:          Running
      Started:      Mon, 25 Jun 2018 21:09:07 +0000
    Ready:          True
    Restart Count:  0
    Requests:
      cpu:      100m
      memory:   256Mi
    Liveness:   http-get https://:5000/healthz delay=10s timeout=5s period=10s #success=1 #failure=3
    Readiness:  http-get https://:5000/healthz delay=0s timeout=5s period=10s #success=1 #failure=3
    Environment:
      REGISTRY_HTTP_ADDR:                                     :5000
      REGISTRY_HTTP_NET:                                      tcp
      REGISTRY_HTTP_SECRET:                                   ZizmBYU3sU3viPxZet9DnroVO3S9FE2wuom9TQsBOqo=
      REGISTRY_MIDDLEWARE_REPOSITORY_OPENSHIFT_ENFORCEQUOTA:  false
      REGISTRY_OPENSHIFT_SERVER_ADDR:                         docker-registry.default.svc:5000
      REGISTRY_HTTP_TLS_CERTIFICATE:                          /etc/secrets/registry.crt
      REGISTRY_HTTP_TLS_KEY:                                  /etc/secrets/registry.key
    Mounts:
      /etc/secrets from registry-certificates (rw)
      /registry from registry-storage (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from registry-token-mmmrp (ro)
Conditions:
  Type           Status
  Initialized    True
  Ready          True
  PodScheduled   True
Volumes:
  registry-storage:
    Type:       PersistentVolumeClaim (a reference to a PersistentVolumeClaim in the same namespace)
    ClaimName:  registry-claim
    ReadOnly:   false
  registry-certificates:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  registry-certificates
    Optional:    false
  registry-token-mmmrp:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  registry-token-mmmrp
    Optional:    false
QoS Class:       Burstable
Node-Selectors:  env=infra
Tolerations:     node.kubernetes.io/memory-pressure:NoSchedule
Events:
  Type    Reason                 Age   From                               Message
  ----    ------                 ----  ----                               -------
  Normal  Scheduled              9m    default-scheduler                  Successfully assigned docker-registry-1-gh5rk to
infranode1.0be7.internal
  Normal  SuccessfulMountVolume  9m    kubelet, infranode1.0be7.internal  MountVolume.SetUp succeeded for volume "registry-certificates"
  Normal  SuccessfulMountVolume  9m    kubelet, infranode1.0be7.internal  MountVolume.SetUp succeeded for volume "registry-token-mmmrp"
  Normal  SuccessfulMountVolume  9m    kubelet, infranode1.0be7.internal  MountVolume.SetUp succeeded for volume "registry-volume"
  Normal  Pulling                9m    kubelet, infranode1.0be7.internal  pulling image "openshift3/ose-docker-registry:v3.9.27"
  Normal  Pulled                 9m    kubelet, infranode1.0be7.internal  Successfully pulled image "openshift3/ose-docker-
registry:v3.9.27"
  Normal  Created                9m    kubelet, infranode1.0be7.internal  Created container
  Normal  Started                9m    kubelet, infranode1.0be7.internal  Started container


Name:           docker-registry-1-mn229
Namespace:      default
Node:           infranode2.0be7.internal/192.199.0.216
Start Time:     Mon, 25 Jun 2018 21:08:49 +0000
Labels:         deployment=docker-registry-1
                deploymentconfig=docker-registry
                docker-registry=default
Annotations:    openshift.io/deployment-config.latest-version=1
                openshift.io/deployment-config.name=docker-registry
                openshift.io/deployment.name=docker-registry-1
                openshift.io/scc=restricted
Status:         Running
IP:             10.128.2.3
Controlled By:  ReplicationController/docker-registry-1
Containers:
  registry:
    Container ID:   docker://a11267a1f5e8c44bfd4f6f82e040fb6e65c10decfa9fe724dafae90b14063632
    Image:          openshift3/ose-docker-registry:v3.9.27
    Image ID:       docker-pullable://registry.access.redhat.com/openshift3/ose-docker-
registry@sha256:6c36a22e5f5120657964f7c3b0acf0a397a52428961bec497fb61dbf8c7c36b7
    Port:           5000/TCP
    State:          Running
      Started:      Mon, 25 Jun 2018 21:08:59 +0000
    Ready:          True
    Restart Count:  0
    Requests:
      cpu:      100m
      memory:   256Mi
    Liveness:   http-get https://:5000/healthz delay=10s timeout=5s period=10s #success=1 #failure=3
    Readiness:  http-get https://:5000/healthz delay=0s timeout=5s period=10s #success=1 #failure=3
    Environment:
      REGISTRY_HTTP_ADDR:                                     :5000
      REGISTRY_HTTP_NET:                                      tcp
      REGISTRY_HTTP_SECRET:                                   ZizmBYU3sU3viPxZet9DnroVO3S9FE2wuom9TQsBOqo=
      REGISTRY_MIDDLEWARE_REPOSITORY_OPENSHIFT_ENFORCEQUOTA:  false
      REGISTRY_OPENSHIFT_SERVER_ADDR:                         docker-registry.default.svc:5000
      REGISTRY_HTTP_TLS_CERTIFICATE:                          /etc/secrets/registry.crt
      REGISTRY_HTTP_TLS_KEY:                                  /etc/secrets/registry.key
    Mounts:
      /etc/secrets from registry-certificates (rw)
      /registry from registry-storage (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from registry-token-mmmrp (ro)
Conditions:
  Type           Status
  Initialized    True
  Ready          True
  PodScheduled   True
Volumes:
  registry-storage:
    Type:       PersistentVolumeClaim (a reference to a PersistentVolumeClaim in the same namespace)
    ClaimName:  registry-claim
    ReadOnly:   false
  registry-certificates:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  registry-certificates
    Optional:    false
  registry-token-mmmrp:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  registry-token-mmmrp
    Optional:    false
QoS Class:       Burstable
Node-Selectors:  env=infra
Tolerations:     node.kubernetes.io/memory-pressure:NoSchedule
Events:
  Type    Reason                 Age   From                               Message
  ----    ------                 ----  ----                               -------
  Normal  Scheduled              9m    default-scheduler                  Successfully assigned docker-registry-1-mn229 to
infranode2.0be7.internal
  Normal  SuccessfulMountVolume  9m    kubelet, infranode2.0be7.internal  MountVolume.SetUp succeeded for volume "registry-token-mmmrp"
  Normal  SuccessfulMountVolume  9m    kubelet, infranode2.0be7.internal  MountVolume.SetUp succeeded for volume "registry-certificates"
  Normal  SuccessfulMountVolume  9m    kubelet, infranode2.0be7.internal  MountVolume.SetUp succeeded for volume "registry-volume"
  Normal  Pulling                9m    kubelet, infranode2.0be7.internal  pulling image "openshift3/ose-docker-registry:v3.9.27"
  Normal  Pulled                 9m    kubelet, infranode2.0be7.internal  Successfully pulled image "openshift3/ose-docker-
registry:v3.9.27"
  Normal  Created                9m    kubelet, infranode2.0be7.internal  Created container
  Normal  Started                9m    kubelet, infranode2.0be7.internal  Started container
```

- PoC Use Case: Router is configured on each infranode

```
oc get pods -o wide -n default |grep router

router-1-74b44             1/1       Running   0          10m       192.199.0.33    infranode1.0be7.internal
router-1-w6lw8             1/1       Running   0          10m       192.199.0.216   infranode2.0be7.internal
```

- PoC Use Case: PVs of different types are available for users to consume

```
persistentvolume "pv001" created
persistentvolume "pv002" created
persistentvolume "pv003" created
persistentvolume "pv004" created
persistentvolume "pv005" created
persistentvolume "pv006" created
persistentvolume "pv007" created
persistentvolume "pv008" created
persistentvolume "pv009" created
persistentvolume "pv010" created
persistentvolume "pv011" created
persistentvolume "pv012" created
persistentvolume "pv013" created
persistentvolume "pv014" created
persistentvolume "pv015" created
persistentvolume "pv016" created
persistentvolume "pv017" created
persistentvolume "pv018" created
persistentvolume "pv019" created
persistentvolume "pv020" created
persistentvolume "pv021" created
persistentvolume "pv022" created
persistentvolume "pv023" created
persistentvolume "pv024" created
persistentvolume "pv025" created
persistentvolume "pv026" created
persistentvolume "pv027" created
persistentvolume "pv028" created
persistentvolume "pv029" created
persistentvolume "pv030" created
persistentvolume "pv031" created
persistentvolume "pv032" created
persistentvolume "pv033" created
persistentvolume "pv034" created
persistentvolume "pv035" created
persistentvolume "pv036" created
persistentvolume "pv037" created
persistentvolume "pv038" created
persistentvolume "pv039" created
persistentvolume "pv040" created
persistentvolume "pv041" created
persistentvolume "pv042" created
persistentvolume "pv043" created
persistentvolume "pv044" created
persistentvolume "pv045" created
persistentvolume "pv046" created
persistentvolume "pv047" created
persistentvolume "pv048" created
persistentvolume "pv049" created
persistentvolume "pv050" created
oc get pv|grep Available

pv001                            5Gi        RWO            Recycle          Available
10s
pv002                            5Gi        RWO            Recycle          Available
10s
pv003                            5Gi        RWO            Recycle          Available
10s
pv004                            5Gi        RWO            Recycle          Available
10s
pv005                            5Gi        RWO            Recycle          Available
9s
pv006                            5Gi        RWO            Recycle          Available
9s
pv007                            5Gi        RWO            Recycle          Available
9s
pv008                            5Gi        RWO            Recycle          Available
9s
pv009                            5Gi        RWO            Recycle          Available
9s
pv010                            5Gi        RWO            Recycle          Available
9s
pv011                            10Gi       RWO            Recycle          Available
8s
pv012                            10Gi       RWO            Recycle          Available
8s
pv013                            10Gi       RWO            Recycle          Available
8s
pv014                            10Gi       RWO            Recycle          Available
8s
```

```
pv015                            10Gi       RWO            Recycle          Available
8s
pv016                            10Gi       RWO            Recycle          Available
7s
pv017                            10Gi       RWO            Recycle          Available
7s
pv018                            10Gi       RWO            Recycle          Available
7s
pv019                            10Gi       RWO            Recycle          Available
7s
pv020                            10Gi       RWO            Recycle          Available
7s
pv021                            10Gi       RWO            Recycle          Available
6s
pv022                            10Gi       RWO            Recycle          Available
6s
pv023                            10Gi       RWO            Recycle          Available
6s
pv024                            10Gi       RWO            Recycle          Available
6s
pv025                            10Gi       RWO            Recycle          Available
6s
pv026                            10Gi       RWX            Recycle          Available
5s
pv027                            10Gi       RWX            Recycle          Available
5s
pv028                            10Gi       RWX            Recycle          Available
5s
pv029                            10Gi       RWX            Recycle          Available
5s
pv030                            10Gi       RWX            Recycle          Available
5s
pv031                            10Gi       RWX            Recycle          Available
4s
pv032                            10Gi       RWX            Recycle          Available
4s
pv033                            10Gi       RWX            Recycle          Available
4s
pv034                            10Gi       RWX            Recycle          Available
4s
pv035                            10Gi       RWX            Recycle          Available
4s
pv036                            10Gi       RWX            Recycle          Available
3s
pv037                            10Gi       RWX            Recycle          Available
3s
pv038                            10Gi       RWX            Recycle          Available
3s
pv039                            10Gi       RWX            Recycle          Available
3s
pv040                            10Gi       RWX            Recycle          Available
3s
pv041                            10Gi       RWX            Retain           Available
3s
pv042                            10Gi       RWX            Retain           Available
2s
pv043                            10Gi       RWX            Retain           Available
2s
pv044                            10Gi       RWX            Retain           Available
2s
pv045                            10Gi       RWX            Retain           Available
2s
pv046                            10Gi       RWX            Retain           Available
2s
pv047                            10Gi       RWX            Retain           Available
1s
pv048                            10Gi       RWX            Retain           Available
1s
pv049                            10Gi       RWX            Retain           Available
1s
```

```
pv050                           10Gi       RWX            Retain           Available
1s
```

- PoC Use Case: Ability to deploy a simple app (nodejs-mongo-persistent)

```
Now using project "smoke-test" on server "https://loadbalancer1.0be7.internal:8443".

You can add applications to this project with the 'new-app' command. For example, try:

    oc new-app centos/ruby-22-centos7~https://github.com/openshift/ruby-ex.git

to build a new example application in Ruby.
--> Deploying template "openshift/nodejs-mongo-persistent" to project smoke-test

     Node.js + MongoDB
     ---------
     An example Node.js application with a MongoDB database. For more information about using this template, including OpenShift
considerations, see https://github.com/openshift/nodejs-ex/blob/master/README.md.

     The following service(s) have been created in your project: nodejs-mongo-persistent, mongodb.

     For more information about using this template, including OpenShift considerations, see https://github.com/openshift/nodejs-
ex/blob/master/README.md.

     * With parameters:
        * Name=nodejs-mongo-persistent
        * Namespace=openshift
        * Memory Limit=512Mi
        * Memory Limit (MongoDB)=512Mi
        * Volume Capacity=1Gi
        * Git Repository URL=https://github.com/openshift/nodejs-ex.git
        * Git Reference=
        * Context Directory=
        * Application Hostname=
        * GitHub Webhook Secret=a1c8ayM7tpJ7m5nGNJCUDajrkcqakbF1qPEJELww # generated
        * Generic Webhook Secret=osLxA1RxvFGjAr1oO8yTiAC66Rs3PKExH1sJ3nxv # generated
        * Database Service Name=mongodb
        * MongoDB Username=userITA # generated
        * MongoDB Password=OEStTDCOthmmql12 # generated
        * Database Name=sampledb
        * Database Administrator Password=FvsWBbCtggC1Ftnk # generated
        * Custom NPM Mirror URL=

--> Creating resources ...
    secret "nodejs-mongo-persistent" created
    service "nodejs-mongo-persistent" created
    route "nodejs-mongo-persistent" created
    imagestream "nodejs-mongo-persistent" created
    buildconfig "nodejs-mongo-persistent" created
    deploymentconfig "nodejs-mongo-persistent" created
    persistentvolumeclaim "mongodb" created
    service "mongodb" created
    deploymentconfig "mongodb" created
--> Success
    Access your application via route 'nodejs-mongo-persistent-smoke-test.apps.0be7.example.opentlc.com'
    Build scheduled, use 'oc logs -f bc/nodejs-mongo-persistent' to track its progress.
    Run 'oc status' to view your app.
NAME                              READY     STATUS     RESTARTS   AGE
nodejs-mongo-persistent-1-build   0/1       Init:0/2   0          1s
NAME                      HOST/PORT                                                          PATH      SERVICES                  PORT
TERMINATION   WILDCARD
nodejs-mongo-persistent   nodejs-mongo-persistent-smoke-test.apps.0be7.example.opentlc.com             nodejs-mongo-persistent   <all>
None
```

- PoC Use Case: There are three masters working oc get nodes|grep master

```
master1.0be7.internal      Ready     master    12m       v1.9.1+a0ce1bc657
master2.0be7.internal      Ready     master    12m       v1.9.1+a0ce1bc657
master3.0be7.internal      Ready     master    12m       v1.9.1+a0ce1bc657
```

- PoC Use Case: There are three etcd instances working

```
ansible masters[0] -m shell -a '/usr/bin/etcdctl --cert-file /etc/etcd/peer.crt --key-file /etc/etcd/peer.key --ca-file /etc/etcd/ca.crt
-C https://bastion.0be7.example.opentlc.com:2379 cluster-health'

master1.0be7.internal | SUCCESS | rc=0 >>
member 2f0e21c293cf69b5 is healthy: got healthy result from https://192.199.0.38:2379
member 506d56f93ac87e3a is healthy: got healthy result from https://192.199.0.24:2379
member f0672186882e4526 is healthy: got healthy result from https://192.199.0.63:2379
cluster is healthy
```

- PoC Use Case: There is a load balancer to access the masters called loadbalancer.0be7.example.opentlc.com

```
curl http://loadbalancer.0be7.example.opentlc.com:9000/

  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0100 17480    0 17480    0     0   134k      0 --:--:-- --:
--:-- --:--:--  135k
</tr><tr class="active4"><td class=ac><a name="atomic-openshift-api/master0"></a><a class=lfsb href="#atomic-openshift-
api/master0">master0</a></td><td>0</td><td>0</td><td>-</td><td>0</td><td>10</td><td></td><td>2</td><td>5</td><td>-</td><td><u>739<div
class=tips><table class=det><tr><th>Cum. sessions:</th><td>739</td></tr><tr><th colspan=3>Avg over last 1024 success.
conn.</th></tr><tr><th>- Queue time:</th><td>0</td><td>ms</td></tr><tr><th>- Connect time:</th><td>0</td><td>ms</td></tr><tr><th>- Total
time:</th><td>99</td><td>ms</td></tr></table></div></u></td><td>739</td><td>2s</td><td><span class="rls">3</span>49<span
class="rls">7</span>560</td><td>1<span class="rls">2</span>20<span
class="rls">7</span>181</td><td></td><td>0</td><td></td><td>0</td><td><u>0<div class=tips>Connection resets during transfers: 0 client, 0
server</div></u></td><td>0</td><td>0</td><td class=ac>26m14s UP</td><td class=ac><u> L4OK in 0ms<div class=tips>Layer4 check
passed</div></u></td><td class=ac>1</td><td class=ac>Y</td><td class=ac>-</td><td><u>1<div class=tips>Failed Health
Checks</div></u></td><td>1</td><td>3m24s</td><td class=ac>-</td></tr>
<tr class="active4"><td class=ac><a name="atomic-openshift-api/master1"></a><a class=lfsb href="#atomic-openshift-
api/master1">master1</a></td><td>0</td><td>0</td><td>-</td><td>0</td><td>5</td><td></td><td>5</td><td>5</td><td>-</td><td><u>9<div
class=tips><table class=det><tr><th>Cum. sessions:</th><td>9</td></tr><tr><th colspan=3>Avg over last 1024 success.
conn.</th></tr><tr><th>- Queue time:</th><td>0</td><td>ms</td></tr><tr><th>- Connect time:</th><td>0</td><td>ms</td></tr><tr><th>- Total
time:</th><td>1</td><td>ms</td></tr></table></div></u></td><td>9</td><td>12m7s</td><td><span class="rls">1</span>808</td><td>1<span
class="rls">0</span>460</td><td></td><td>0</td><td></td><td>0</td><td><u>0<div class=tips>Connection resets during transfers: 0 client, 0
server</div></u></td><td>0</td><td>0</td><td class=ac>26m13s UP</td><td class=ac><u> L4OK in 0ms<div class=tips>Layer4 check
passed</div></u></td><td class=ac>1</td><td class=ac>Y</td><td class=ac>-</td><td><u>2<div class=tips>Failed Health
Checks</div></u></td><td>1</td><td>3m24s</td><td class=ac>-</td></tr>
<tr class="active4"><td class=ac><a name="atomic-openshift-api/master2"></a><a class=lfsb href="#atomic-openshift-
api/master2">master2</a></td><td>0</td><td>0</td><td>-</td><td>0</td><td>1</td><td></td><td>1</td><td>1</td><td>-</td><td><u>1<div
class=tips><table class=det><tr><th>Cum. sessions:</th><td>1</td></tr><tr><th colspan=3>Avg over last 1024 success.
conn.</th></tr><tr><th>- Queue time:</th><td>0</td><td>ms</td></tr><tr><th>- Connect time:</th><td>0</td><td>ms</td></tr><tr><th>- Total
time:</th><td>0</td><td>ms</td></tr></table></div></u></td><td>1</td><td>12m7s</td><td>0</td><td>0</td><td></td><td>0</td><td></td><td>0</
td><td><u>0<div class=tips>Connection resets during transfers: 0 client, 0 server</div></u></td><td>0</td><td>0</td><td class=ac>26m14s
UP</td><td class=ac><u> L4OK in 0ms<div class=tips>Layer4 check passed</div></u></td><td class=ac>1</td><td class=ac>Y</td><td class=ac>-
</td><td><u>1<div class=tips>Failed Health Checks</div></u></td><td>1</td><td>3m22s</td><td class=ac>-</td></tr>
```

- PoC Use Case: There is a load balancer/DNS for both infranodes called *.apps.0be7.example.opentlc.com

```
host *.apps.0be7.example.opentlc.com

*.apps.0be7.example.opentlc.com has address 18.184.183.152
*.apps.0be7.example.opentlc.com has address 18.185.6.77
```

- PoC Use Case: There are at least two infranodes, labeled env=infra

```
oc get nodes -l env=infra

NAME                       STATUS    ROLES     AGE       VERSION
infranode1.0be7.internal   Ready     <none>    12m       v1.9.1+a0ce1bc657
infranode2.0be7.internal   Ready     <none>    12m       v1.9.1+a0ce1bc657
```

4.3. Environment Configuration

- PoC Use Case: NetworkPolicy is configured and working with projects isolated by default (simulate Multitenancy)

```
oc label namespace default name=default
namespace "default" labeled
oc create -n default -f project-request-template.yaml

template "project-request" created

ansible masters -i hosts -m lineinfile -a "path=/etc/origin/master/master-config.yaml regexp='^(.*)projectRequestTemplate:(.*)' line='
projectRequestTemplate: \'default/project-request\''"
master1.0be7.internal | SUCCESS => {
    "backup": "",
    "changed": true,
    "failed": false,
    "msg": "line replaced"
}
master2.0be7.internal | SUCCESS => {
    "backup": "",
    "changed": true,
    "failed": false,
    "msg": "line replaced"
}
master3.0be7.internal | SUCCESS => {
    "backup": "",
    "changed": true,
    "failed": false,
    "msg": "line replaced"
}
```

- PoC Use Case: Aggregated logging is configured and working

```
oc get pods -n logging

NAME                                      READY     STATUS    RESTARTS   AGE
logging-curator-1-pgfmf                   1/1       Running   0          7m
logging-es-data-master-3j31mv2l-1-t82mp   2/2       Running   0          6m
logging-fluentd-2g4sd                     1/1       Running   0          7m
logging-fluentd-bkjnv                     1/1       Running   0          7m
logging-fluentd-dlc7h                     1/1       Running   0          7m
logging-fluentd-dt68h                     1/1       Running   0          7m
logging-fluentd-fzrvs                     1/1       Running   0          6m
logging-fluentd-m52vg                     1/1       Running   0          6m
logging-fluentd-ptxf5                     1/1       Running   0          6m
logging-fluentd-vjms7                     1/1       Running   0          7m
logging-kibana-1-lxmk2                    2/2       Running   0          7m
```

- PoC Use Case: Metrics collection is configured and working

```
oc get pods -n openshift-infra

NAME                         READY     STATUS    RESTARTS   AGE
hawkular-cassandra-1-9qrvp   1/1       Running   0          10m
hawkular-metrics-5wsm5       1/1       Running   0          10m
heapster-kl9mr               1/1       Running   0          10m
NAME                             READY     STATUS    RESTARTS   AGE
prometheus-0                     6/6       Running   0          6m
prometheus-node-exporter-8d9nt   1/1       Running   0          5m
prometheus-node-exporter-8mzvk   1/1       Running   0          5m
prometheus-node-exporter-8zzr2   1/1       Running   0          5m
prometheus-node-exporter-bnnpk   1/1       Running   0          5m
prometheus-node-exporter-dfpgc   1/1       Running   0          5m
prometheus-node-exporter-gtvg8   1/1       Running   0          5m
prometheus-node-exporter-mpg7k   1/1       Running   0          5m
prometheus-node-exporter-srcg9   1/1       Running   0          5m
```

- PoC Use Case: Router and Registry Pods run on Infranodes

```
oc get pods -n default -o wide

NAME                       READY     STATUS    RESTARTS   AGE       IP              NODE
docker-registry-1-gh5rk    1/1       Running   0          13m       10.128.0.3      infranode1.0be7.internal
docker-registry-1-mn229    1/1       Running   0          13m       10.128.2.3      infranode2.0be7.internal
registry-console-1-kt4gg   1/1       Running   0          12m       10.131.2.22     node2.0be7.internal
router-1-74b44             1/1       Running   0          13m       192.199.0.33    infranode1.0be7.internal
router-1-w6lw8             1/1       Running   0          13m       192.199.0.216   infranode2.0be7.internal
```

- PoC Use Case: Metrics and Logging components run on Infranodes

```
oc get pods -n logging -o wide

NAME                                      READY     STATUS    RESTARTS   AGE       IP            NODE
logging-curator-1-pgfmf                   1/1       Running   0          7m        10.128.2.8    infranode2.0be7.internal
logging-es-data-master-3j31mv2l-1-t82mp   2/2       Running   0          6m        10.128.2.10   infranode2.0be7.internal
logging-fluentd-2g4sd                     1/1       Running   0          7m        10.130.0.4    master1.0be7.internal
logging-fluentd-bkjnv                     1/1       Running   0          7m        10.129.0.7    master2.0be7.internal
logging-fluentd-dlc7h                     1/1       Running   0          7m        10.131.0.7    master3.0be7.internal
logging-fluentd-dt68h                     1/1       Running   0          7m        10.128.0.8    infranode1.0be7.internal
logging-fluentd-fzrvs                     1/1       Running   0          6m        10.129.2.2    node1.0be7.internal
logging-fluentd-m52vg                     1/1       Running   0          6m        10.130.2.5    node3.0be7.internal
logging-fluentd-ptxf5                     1/1       Running   0          6m        10.131.2.23   node2.0be7.internal
logging-fluentd-vjms7                     1/1       Running   0          7m        10.128.2.9    infranode2.0be7.internal
logging-kibana-1-lxmk2                    2/2       Running   0          7m        10.128.2.6    infranode2.0be7.internal
NAME                         READY     STATUS    RESTARTS   AGE       IP           NODE
hawkular-cassandra-1-9qrvp   1/1       Running   0          10m       10.128.0.5   infranode1.0be7.internal
hawkular-metrics-5wsm5       1/1       Running   0          10m       10.128.0.6   infranode1.0be7.internal
heapster-kl9mr               1/1       Running   0          10m       10.128.2.5   infranode2.0be7.internal
NAME                             READY     STATUS    RESTARTS   AGE       IP              NODE
prometheus-0                     6/6       Running   0          6m        10.128.0.10     infranode1.0be7.internal
prometheus-node-exporter-8d9nt   1/1       Running   0          6m        192.199.0.16    node1.0be7.internal
prometheus-node-exporter-8mzvk   1/1       Running   0          6m        192.199.0.33    infranode1.0be7.internal
prometheus-node-exporter-8zzr2   1/1       Running   0          6m        192.199.0.63    master2.0be7.internal
prometheus-node-exporter-bnnpk   1/1       Running   0          6m        192.199.0.18    node3.0be7.internal
prometheus-node-exporter-dfpgc   1/1       Running   0          6m        192.199.0.216   infranode2.0be7.internal
prometheus-node-exporter-gtvg8   1/1       Running   0          6m        192.199.0.41    node2.0be7.internal
prometheus-node-exporter-mpg7k   1/1       Running   0          6m        192.199.0.38    master1.0be7.internal
prometheus-node-exporter-srcg9   1/1       Running   0          6m        192.199.0.24    master3.0be7.internal
```

- PoC Use Case: Service Catalog, Template Service Broker, and Ansible Service Broker are all work

```
oc get pods --all-namespaces|grep 'broker\|catalog'

kube-service-catalog                apiserver-8mmbv                          1/1       Running     0          5m
kube-service-catalog                apiserver-d7bmh                          1/1       Running     0          5m
kube-service-catalog                apiserver-l6m6v                          1/1       Running     0          5m
kube-service-catalog                controller-manager-hdkxl                 1/1       Running     0          5m
kube-service-catalog                controller-manager-hf46t                 1/1       Running     0          5m
kube-service-catalog                controller-manager-xpj8s                 1/1       Running     0          5m
openshift-ansible-service-broker    asb-1-462gm                              1/1       Running     2          4m
openshift-ansible-service-broker    asb-etcd-1-29vwp                         1/1       Running     0          4m
openshift-template-service-broker   apiserver-7cbj2                          1/1       Running     0          4m
openshift-template-service-broker   apiserver-htqp8                          1/1       Running     0          4m
```

4.4. CICD Workflow

- PoC Use Case: Jenkins pod is running with a persistent volume

```
oc new-project tasks --display-name=OpenShift Tasks
oc new-app jenkins-persistent

Now using project "tasks" on server "https://loadbalancer1.0be7.internal:8443".

You can add applications to this project with the 'new-app' command. For example, try:

    oc new-app centos/ruby-22-centos7~https://github.com/openshift/ruby-ex.git

to build a new example application in Ruby.
--> Deploying template "openshift/jenkins-persistent" to project tasks

     Jenkins
     ---------
     Jenkins service, with persistent storage.

     NOTE: You must have persistent volumes available in your cluster to use this template.

     A Jenkins service has been created in your project.  Log into Jenkins with your OpenShift account.  The tutorial at
https://github.com/openshift/origin/blob/master/examples/jenkins/README.md contains more information about using this template.

     * With parameters:
        * Jenkins Service Name=jenkins
        * Jenkins JNLP Service Name=jenkins-jnlp
        * Enable OAuth in Jenkins=true
        * Memory Limit=512Mi
        * Volume Capacity=1Gi
        * Jenkins ImageStream Namespace=openshift
        * Jenkins ImageStreamTag=jenkins:2

--> Creating resources ...
    route "jenkins" created
    persistentvolumeclaim "jenkins" created
    deploymentconfig "jenkins" created
    serviceaccount "jenkins" created
    rolebinding "jenkins_edit" created
    service "jenkins-jnlp" created
    service "jenkins" created
--> Success
    Access your application via route 'jenkins-tasks.apps.0be7.example.opentlc.com'
    Run 'oc status' to view your app.
deploymentconfig "jenkins" resource requirements updated
Wait for jenkinst to be deployed
--> Deploying template "openshift/eap70-basic-s2i" to project tasks

     JBoss EAP 7.0 (no https)
     ---------
     An example EAP 7 application. For more information about using this template, see https://github.com/jboss-openshift/application-
templates.
```

```
     A new EAP 7 based application has been created in your project.

     * With parameters:
        * Application Name=tasks
        * Custom http Route Hostname=
        * Git Repository URL=https://github.com/OpenShiftDemos/openshift-tasks.git
        * Git Reference=master
        * Context Directory=
        * Queues=
        * Topics=
        * A-MQ cluster password=YSQd6P8s # generated
        * Github Webhook Secret=YiJtQDUN # generated
        * Generic Webhook Secret=8Vb3iTAC # generated
        * ImageStream Namespace=openshift
        * JGroups Cluster Password=JYI83rRD # generated
        * Deploy Exploded Archives=false
        * Maven mirror URL=
        * ARTIFACT_DIR=
        * MEMORY_LIMIT=1Gi

--> Creating resources ...
    service "tasks" created
    service "tasks-ping" created
    route "tasks" created
    imagestream "tasks" created
    buildconfig "tasks" created
    deploymentconfig "tasks" created
--> Success
    Access your application via route 'tasks-tasks.apps.0be7.example.opentlc.com'
    Build scheduled, use 'oc logs -f bc/tasks' to track its progress.
    Run 'oc status' to view your app.
Wait for JBoss to be deployed
```

- PoC Use Case: Jenkins OpenShift plugin is used to create a CICD workflow

```
buildconfig "openshift-tasks-pipeline" created
NAME                       TYPE              FROM      LATEST
openshift-tasks-pipeline   JenkinsPipeline             0
```

- PoC Use Case: Jenkins deploys openshift-tasks app

```
oc start-build openshift-tasks-pipeline

build "openshift-tasks-pipeline-1" started
Wait pipeline to build
```

- PoC Use Case: HPA is configured and working on production deployment of openshift-tasks

```
oc autoscale tasks/tasks --min 1 --max 5 --cpu-percent=80

the server doesn't have a resource type "tasks"
```

4.5. Multitenancy

- PoC Use Case: Multiple Clients (customers) created

```
system:admin
Login successful.

You don't have any projects. You can try to create a new project, by running

    oc new-project <projectname>

Login successful.

You don't have any projects. You can try to create a new project, by running

    oc new-project <projectname>

Login successful.

You don't have any projects. You can try to create a new project, by running

    oc new-project <projectname>

Login successful.

You don't have any projects. You can try to create a new project, by running

    oc new-project <projectname>

Login successful.

You have access to the following projects and can switch between them with 'oc project <projectname>':

  * default
    kube-public
    kube-service-catalog
    kube-system
    logging
    management-infra
    openshift
    openshift-ansible-service-broker
    openshift-infra
    openshift-metrics
    openshift-node
    openshift-template-service-broker
    openshift-web-console
    smoke-test
    tasks

Using project "default".
NAME      UID                                    FULL NAME   IDENTITIES
Amy       ed7dd7fc-78bf-11e8-b93f-06e4b3ef5fb0               htpasswd_auth:Amy
Andrew    eda63b9a-78bf-11e8-b93f-06e4b3ef5fb0               htpasswd_auth:Andrew
Betty     edf92872-78bf-11e8-b93f-06e4b3ef5fb0               htpasswd_auth:Betty
Brian     edcf6bbf-78bf-11e8-b93f-06e4b3ef5fb0               htpasswd_auth:Brian
admin     f0fc01d9-78bd-11e8-af49-061ba0b7b0b0               htpasswd_auth:admin
```

- PoC Use Case: Clients will be named Alpha Corp and Beta Corp (client=alpha, client=beta), and a client=common for unspecified customers.

```
```

- PoC Use Case: Alpha Corp will have two users, Amy and Andrew

```
user "admin" labeled
user "Amy" labeled
user "Andrew" labeled
```

- PoC Use Case: Beta Corp will have two users, Brian and Betty

```
user "Brian" labeled
user "Betty" labeled
```

- PoC Use Case: Dedicated node for each Client

```
node "node1.0be7.internal" labeled
node "node2.0be7.internal" labeled
node "node3.0be7.internal" labeled
The Project "Alpha Corp" is invalid: metadata.name: Invalid value: "Alpha Corp": a DNS-1123 label must consist of lower case alphanumeric
characters or '-', and must start and end with an alphanumeric character (e.g. 'my-name',  or '123-abc', regex used for validation is '[a-
z0-9]([-a-z0-9]*[a-z0-9])?')
The Project "Beta Corp" is invalid: metadata.name: Invalid value: "Beta Corp": a DNS-1123 label must consist of lower case alphanumeric
characters or '-', and must start and end with an alphanumeric character (e.g. 'my-name',  or '123-abc', regex used for validation is '[a-
z0-9]([-a-z0-9]*[a-z0-9])?')
```

- PoC Use Case: admissionControl plugin sets specific limits per label (client/customer)

```
error: unable to decode "STDIN": Object 'Kind' is missing in
'{"admissionConfig":{"pluginConfig":{"ProjectRequestLimit":{"configuration":{"apiVersion":"v1","kind":"ProjectRequestLimitConfig","limits"
:[{"selector":{"client":"admin"}},{"maxProjects":10,"selector":{"client":"alpha"}},{"maxProjects":5,"selector":{"client":"beta"}},{"maxPro
jects":2}]}}}}}'
```

- PoC Use Case: The new project template is modified so that it includes a LimitRange

```
Name:       project-request
Namespace:  default
Created:    18 minutes ago
Labels:     <none>
Annotations:    <none>

Parameters:
    Name:   PROJECT_NAME
    Required:   false
    Value:  <none>

    Name:   PROJECT_DISPLAYNAME
    Required:   false
    Value:  <none>

    Name:   PROJECT_DESCRIPTION
    Required:   false
    Value:  <none>

    Name:   PROJECT_ADMIN_USER
    Required:   false
    Value:  <none>

    Name:   PROJECT_REQUESTING_USER
    Required:   false
    Value:  <none>


Object Labels:  <none>

Message:    <none>

Objects:
    Project.project.openshift.io       ${PROJECT_NAME}
    RoleBinding.rbac.authorization.k8s.io   system:image-pullers
    RoleBinding.rbac.authorization.k8s.io   system:image-builders
    RoleBinding.rbac.authorization.k8s.io   system:deployers
    RoleBinding.rbac.authorization.k8s.io   admin
    NetworkPolicy.networking.k8s.io     allow-from-same-namespace
    NetworkPolicy.networking.k8s.io     allow-from-default-namespace
    LimitRange                  core-resource-limits
```

- PoC Use Case: The new user template is used to create a user object with the specific label value

```
NOP
```

- PoC Use Case: On-boarding new client documentation explains how to create a new client/customer

```
NOP
```

- PoC Use Case:

```
```

- PoC Use Case:

```
```

5. Issues & Resolutions

This section details any issues encountered and what the resolution was

5.1. Issue 1

- Build pipeline fails build "tasks-#" did not complete successfully within the configured timeout of "900000" ms

Resoution

No resolution.

5.2. Issue 2

- Autoscaling fails with 'the server doesn’t have a resource type "tasks"'

Resoution

This issue will be resolved after the build pipleline succeeds to built the tasks application.

6. Additional Information

The template for this AsciiDoctor engagement report has been prepared by Adrian Bradshaw <adrian@redhat.com> and is available on CEE Gitlab:

- git@gitlab.cee.redhat.com:abradsha/asciidoctor-ej.git