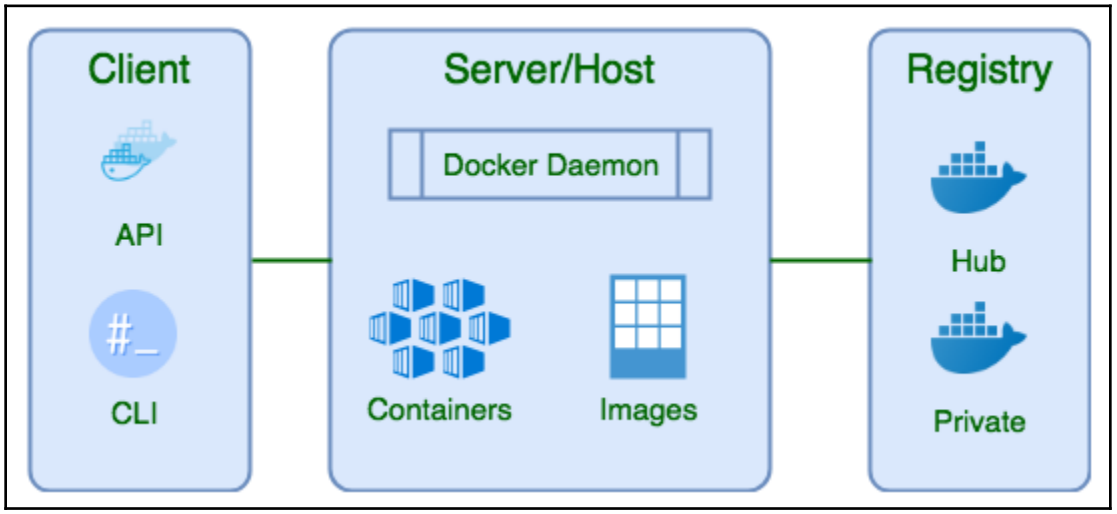
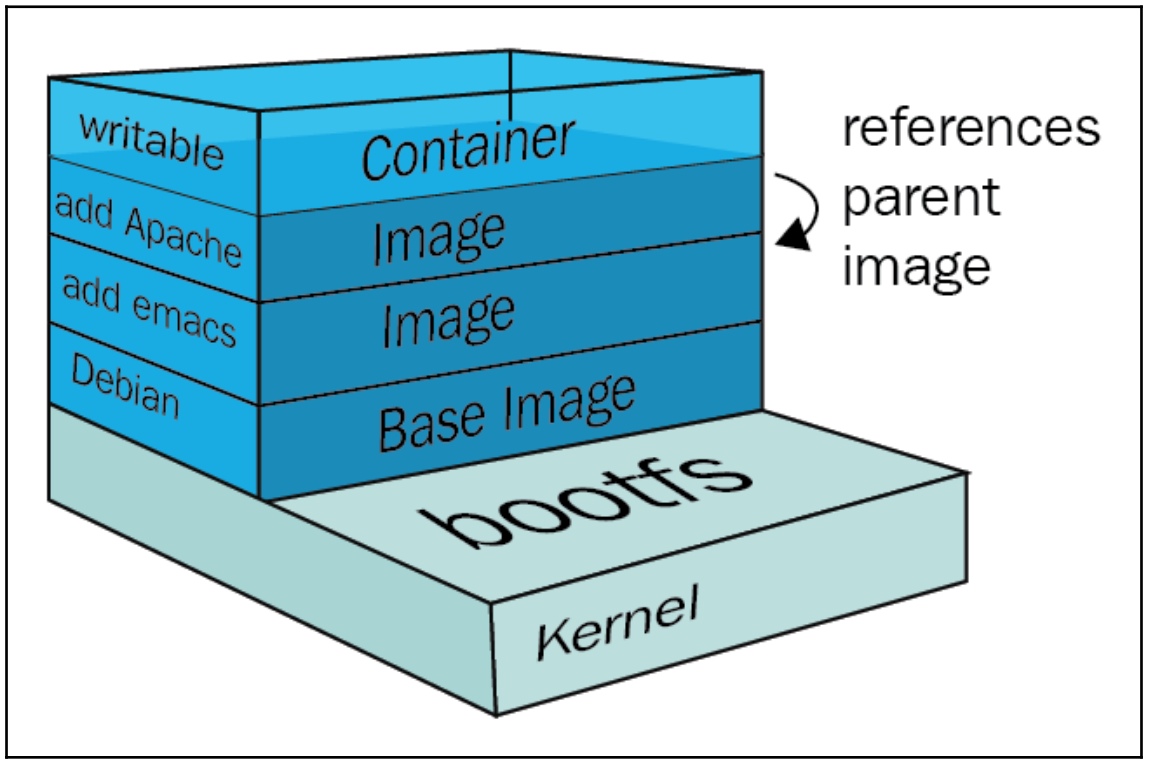
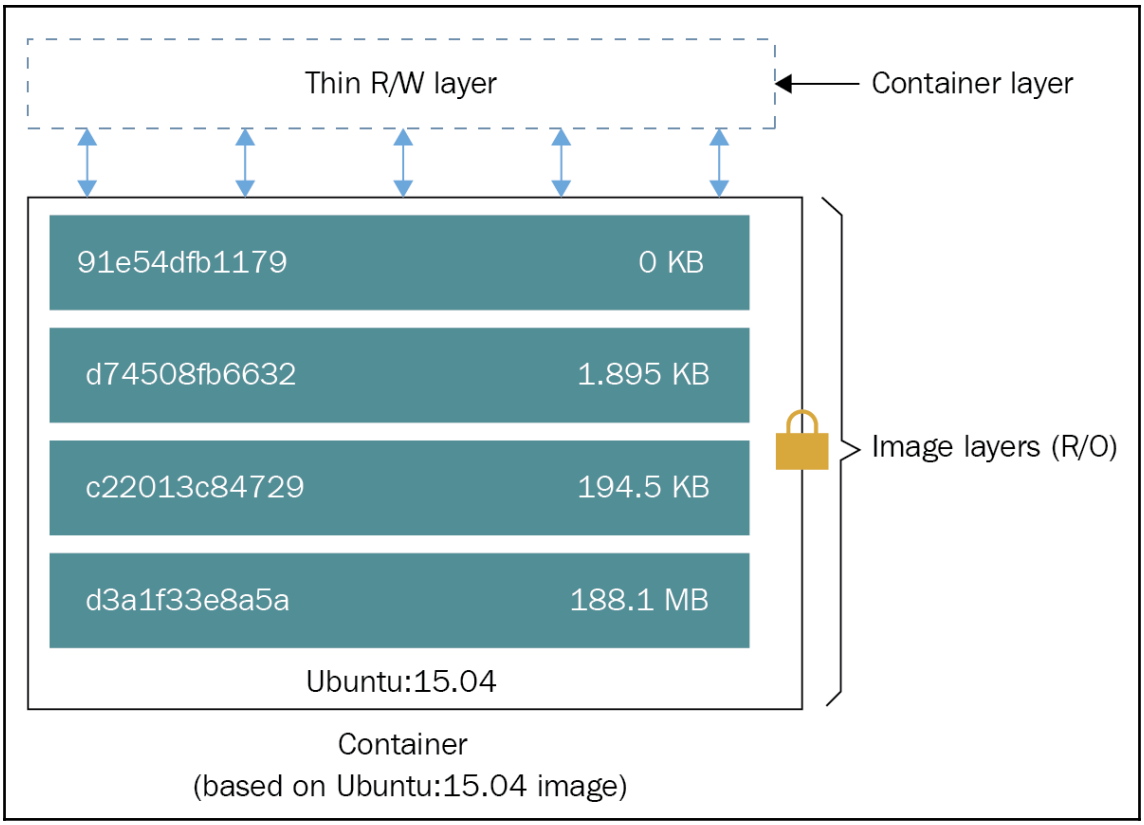
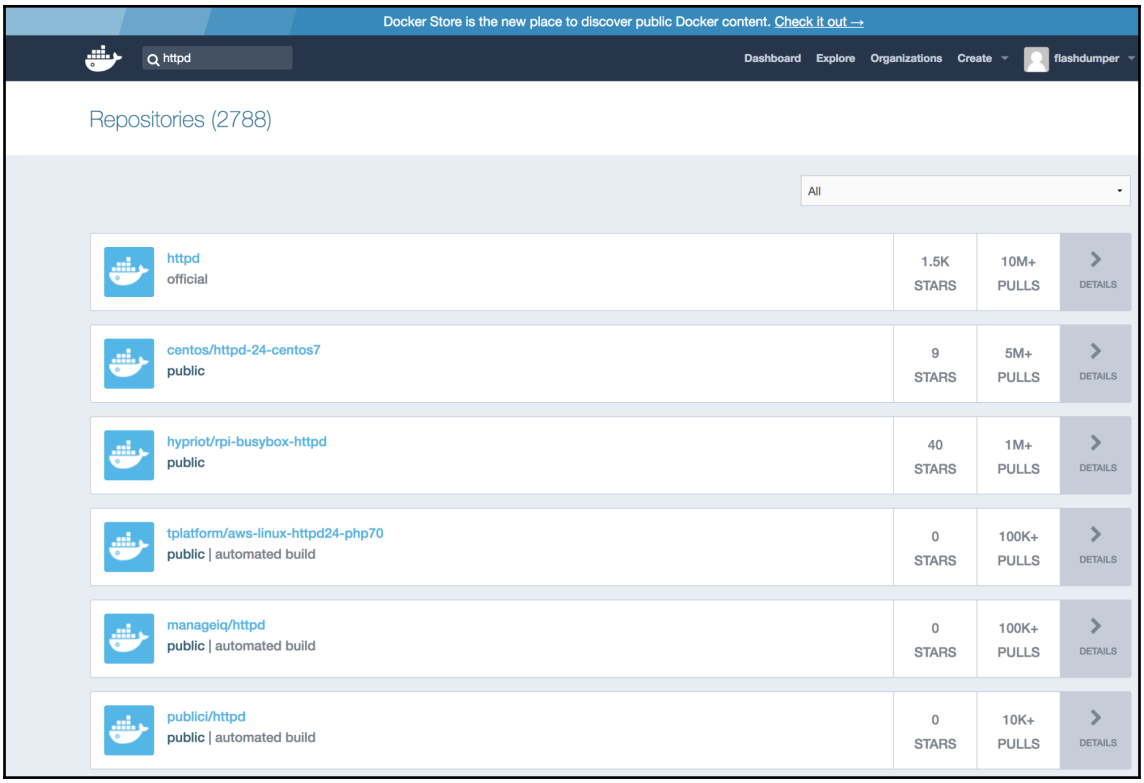
Chapter 1: Containers and Docker Overview

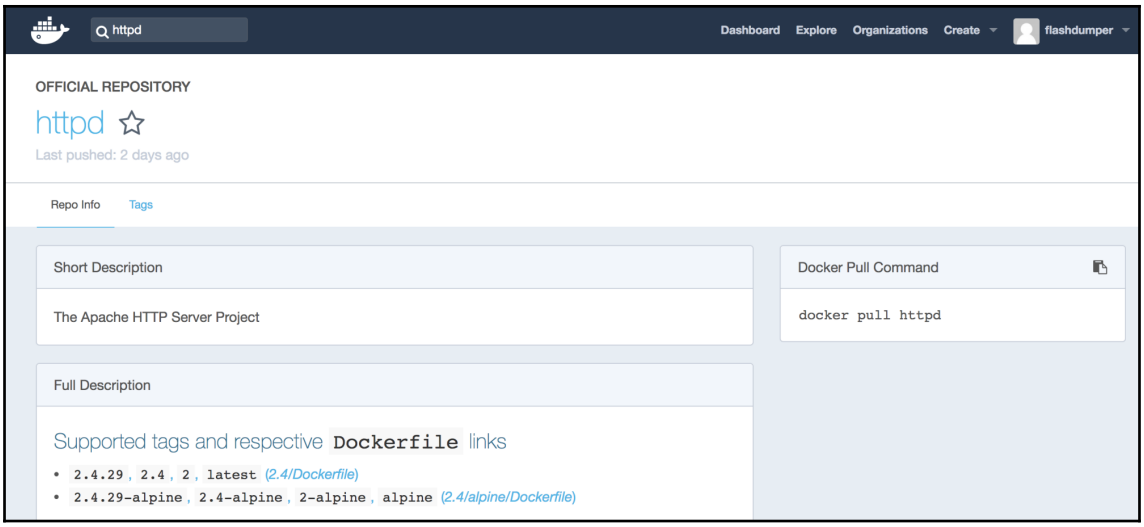





Thin R/W layer
Container layer
91e54dfb1179
0 KB
d74508fb6632
1.895 KB
c22013c84729
194.5 KB
d3a1f33e8a5a
188.1 MB
Ubuntu:15.04
Image layers (R/O)
Container
(based on Ubuntu:15.04 image)




```
Using default tag: latest
latest: Pulling from library/httpd
4176fe04cefe: Pull complete
d6c01cf91b98: Pull complete
b7066921647a: Pull complete
643378aaba88: Pull complete
3c51f6dc6a3b: Pull complete
4f25e420c4cc: Pull complete
ccdbe37da15c: Pull complete
Digest: sha256:6e61d60e4142ea44e8e69b22f1e739d89e1dc8a2764182d7eecc83a5bb31181e
Status: Downloaded newer image for httpd:latest
```




```
2.2.29: Pulling from library/httpd
4d2e9ae40c41: Pull complete
a3ed95caeb02: Pull complete
71da54557245: Pull complete
721128148697: Pull complete
bb02db57acca: Pull complete
973e8b763f43: Pull complete
9792a80ebd27: Pull complete
Digest: sha256:0a39699d267aaee04382c6b1b4fe2fc30737450fe8d4fabd88eee1a3e0016144
Status: Downloaded newer image for httpd:2.2.29
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
httpd	latest	01154c38b473	13 days ago	177MB
httpd	2.2.29	78ef8a7db81a	2 years ago	153MB

```
Untagged: httpd:2.2.29
Untagged: httpd@sha256:0a39699d267aaee04382c6b1b4fe2fc30737450fe8d4fabd88eee1a3e0016144
Deleted: sha256:78ef8a7db81acde885e627ceafbc7f2d76a052b44d679b9c274a18bce85d5ccc
Deleted: sha256:5d5325c9e14025425b154bcd4b4c4092fddc0cf28095dec4fda01da336a03aa6
Deleted: sha256:c04125bb67950cffe237d960070d48c9b29a00b27fcb12513406ecf0ab80d32d
Deleted: sha256:5f9dca6732ab55daa3c354a6de5c0e651a7032ad3700a8c5f5f2b4daefb3b8ef
Deleted: sha256:7a9b5807179ca1a30644ad5f8d0ff89c9970f6e30ed8957e7758321eff7036e4
Deleted: sha256:55efd6082c88416ed5089a9f9347d3493264931c11934299da4a0d0fe4aa22fb
Deleted: sha256:41324ac66556b527c8824ad9144cd2639e9753e4e387efde49fd2838082864ca
Deleted: sha256:c2b6854195202c32627a0918233531678a7f53ba89cb10c8ede6acc9c5139ab3
Deleted: sha256:5f7c1bd0a29de2d99977a1476cdc8eb357080a4831e91342738a2587e54bd095
Deleted: sha256:386ab9d75eab80ae1eedf219c639be1f398997e1b0773ccb05d4d0bbb7ca86d2
Deleted: sha256:080cf2d8b7f3c25eea37c4393b6696f30eb0411290ebaedc6dda57f17b375ec2
Deleted: sha256:64f09aa49f80203adc402b131fc8736961031f2b4478b1c5245bcaec404fd354
Deleted: sha256:a5dd5b712a2ae1a4868cedf54e44b8a63c8fd35c9a75edf74d64c099a9278331
Deleted: sha256:e10e5ea91f007db418b284f4adc5f0b98f374d79ae52b9687b0d6d33865ffbcf
Deleted: sha256:c69ae1aa46985cbaf186b6354c61a1d2e0d6af47133db47bf04f0c6eb9c858e9
```

```
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
httpd               latest              01154c38b473        13 days ago         177MB
```

```
-rw-------  1 dzuev  staff  186355712 Feb 28 17:55 httpd.tar
```

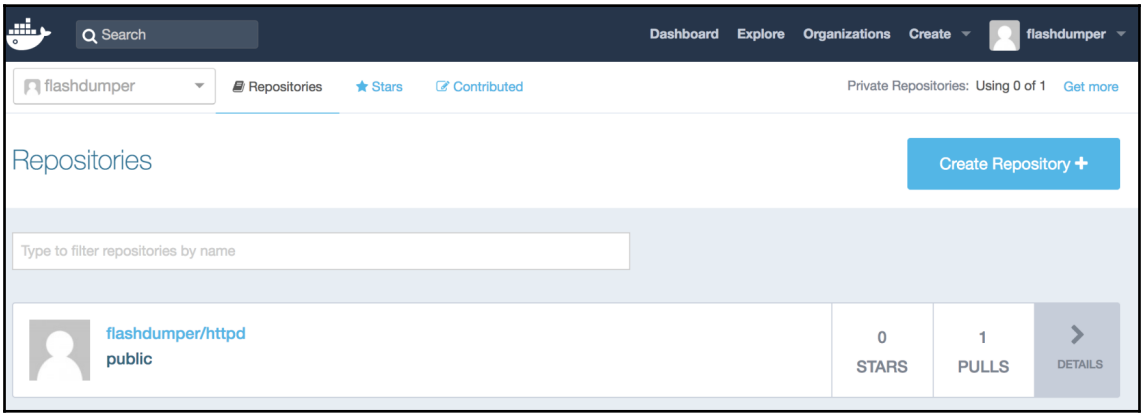
```
Using default tag: latest
latest: Pulling from library/httpd
4176fe04cefe: Pull complete
d6c01cf91b98: Pull complete
b7066921647a: Pull complete
643378aaba88: Pull complete
3c51f6dc6a3b: Pull complete
4f25e420c4cc: Pull complete
ccdbe37da15c: Pull complete
Digest: sha256:6e61d60e4142ea44e8e69b22f1e739d89e1dc8a2764182d7eecc83a5bb31181e
Status: Downloaded newer image for httpd:latest
```

```
dzuev-mac15:~ dzuev$ docker load -i httpd.tar
ffc4c11463ee: Loading layer [==================================>]  129.3MB/129.3MB
a9681abc377f: Loading layer [==================================>]  3.584kB/3.584kB
53cbc0080070: Loading layer [==================================>]  2.56kB/2.56kB
400eca481024: Loading layer [==================================>]  5.12kB/5.12kB
ca92f217a68e: Loading layer [==================================>]  46.6MB/46.6MB
6702ee5815dd: Loading layer [==================================>]  10.44MB/10.44MB
11d3a23fba24: Loading layer [==================================>]  3.584kB/3.584kB
Loaded image: httpd:latest
```

```
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
httpd               latest              01154c38b473        13 days ago         177MB
```

```
The push refers to repository [docker.io/flashdumper/httpd]
11d3a23fba24: Mounted from library/httpd
6702ee5815dd: Mounted from library/httpd
ca92f217a68e: Mounted from library/httpd
400eca481024: Mounted from library/httpd
53cbc0080070: Mounted from library/httpd
a9681abc377f: Mounted from library/httpd
ffc4c11463ee: Mounted from library/httpd
latest: digest: sha256:6a457fe47eaa405ea173ca61d29c4367a593e8b092ed2e6c0fda0c77d801c485 size: 1780
```

```
NAME                DESCRIPTION         STARS               OFFICIAL            AUTOMATED
flashdumper/httpd                       0
```

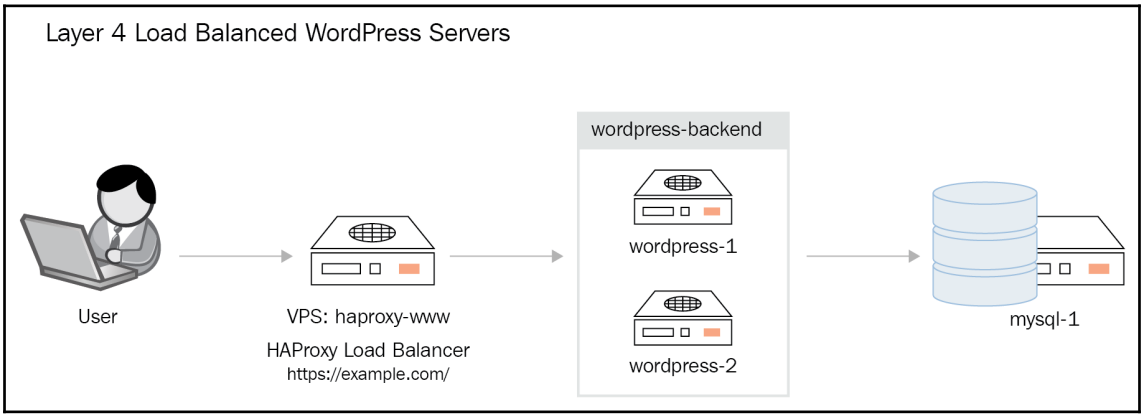


```
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive glob
ally to suppress this message
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive glob
ally to suppress this message
[Thu Mar 01 02:49:53.773723 2018] [mpm_event:notice] [pid 1:tid 139825906345856] AH00489: Apache/2.4.29 (Unix) configured -- resuming normal
 operations
[Thu Mar 01 02:49:53.773841 2018] [core:notice] [pid 1:tid 139825906345856] AH00094: Command line: 'httpd -D FOREGROUND'
```

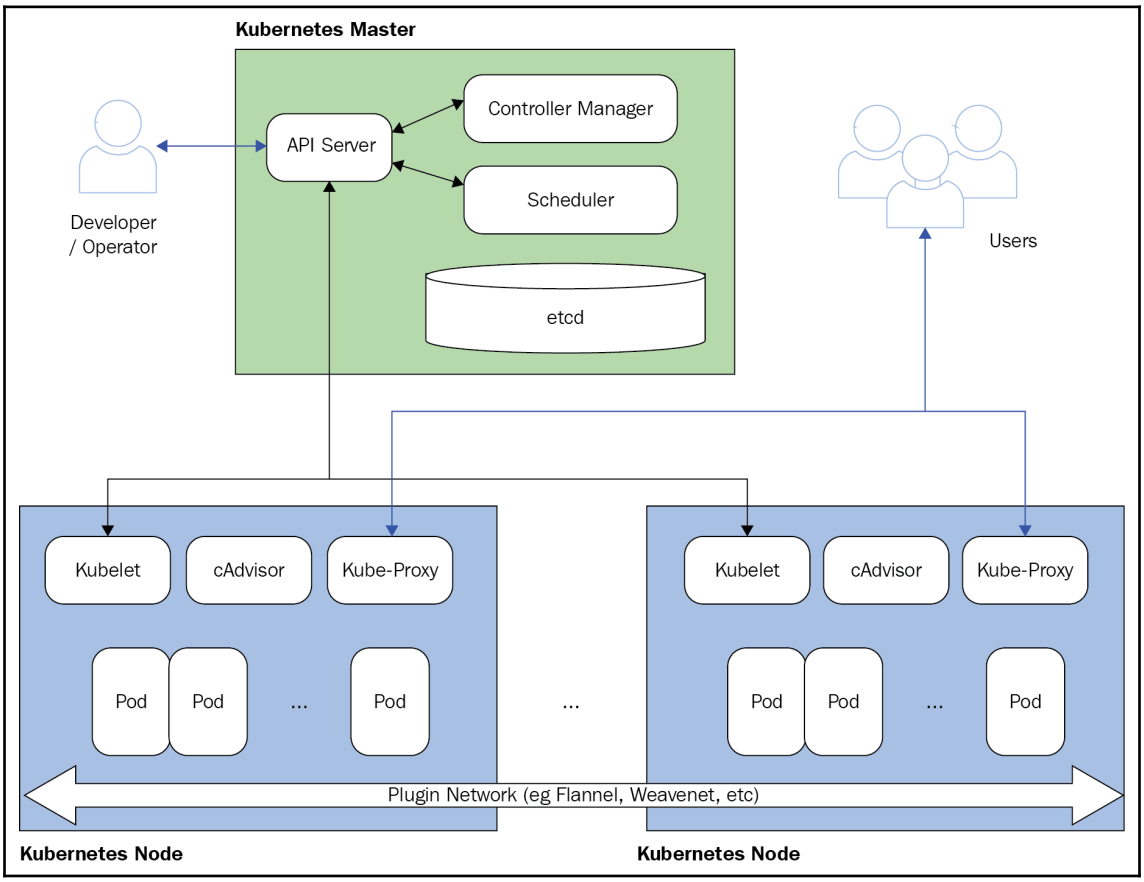
```
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS                      PORTS               NAMES
5e3820a43ffc        httpd               "httpd-foreground"  About a minute ago  Exited (0) About a minute ago                   vigorous_fermat
```

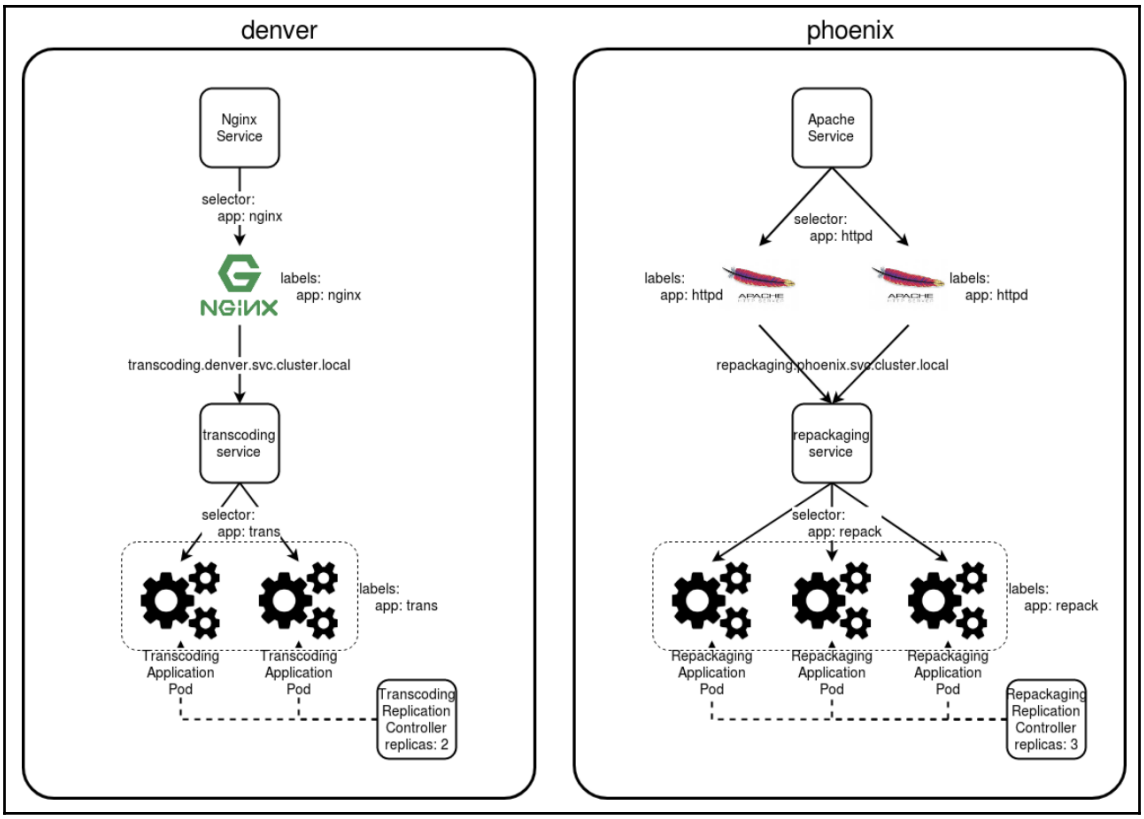
```
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress this message
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress this message
[Thu Mar 01 02:51:58.612492 2018] [mpm_event:notice] [pid 1:tid 139874373552000] AH00489: Apache/2.4.29 (Unix) configured -- resuming normal operations
[Thu Mar 01 02:51:58.612605 2018] [core:notice] [pid 1:tid 139874373552000] AH00094: Command line: 'httpd -D FOREGROUND'
[Thu Mar 01 02:52:26.822026 2018] [mpm_event:notice] [pid 1:tid 139874373552000] AH00491: caught SIGTERM, shutting down
```

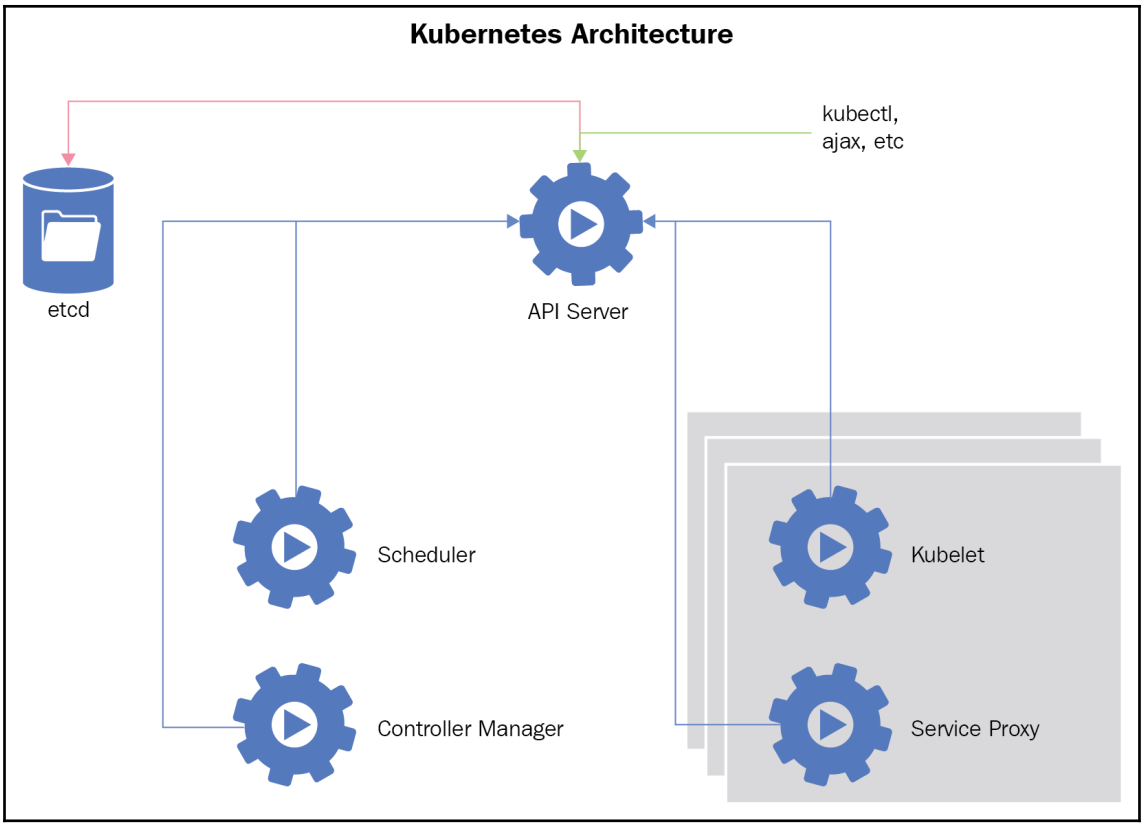
```
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
00f343906df3        httpd               "httpd-foreground"  19 seconds ago      Up 21 seconds       80/tcp              epic_ramanujan
```

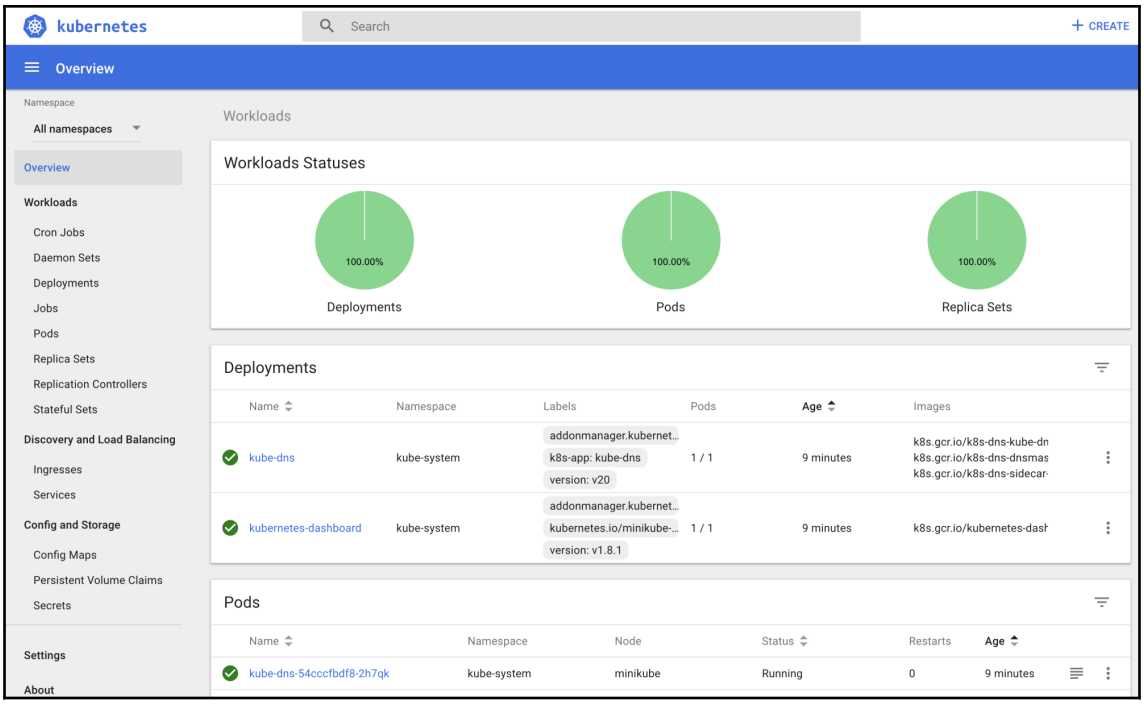


Chapter 2: Kubernetes Overview

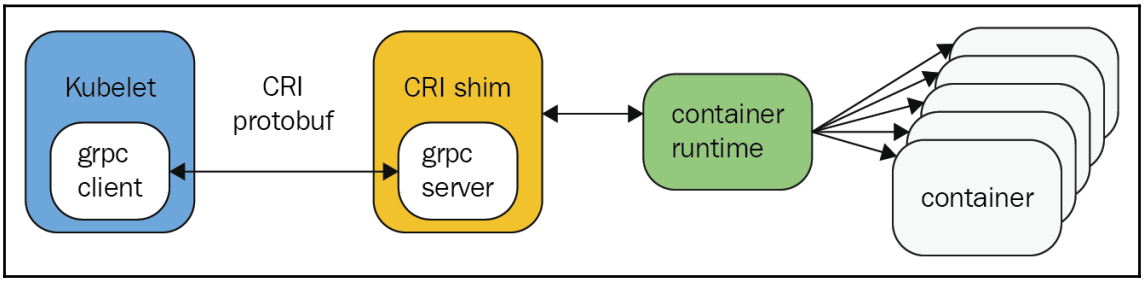


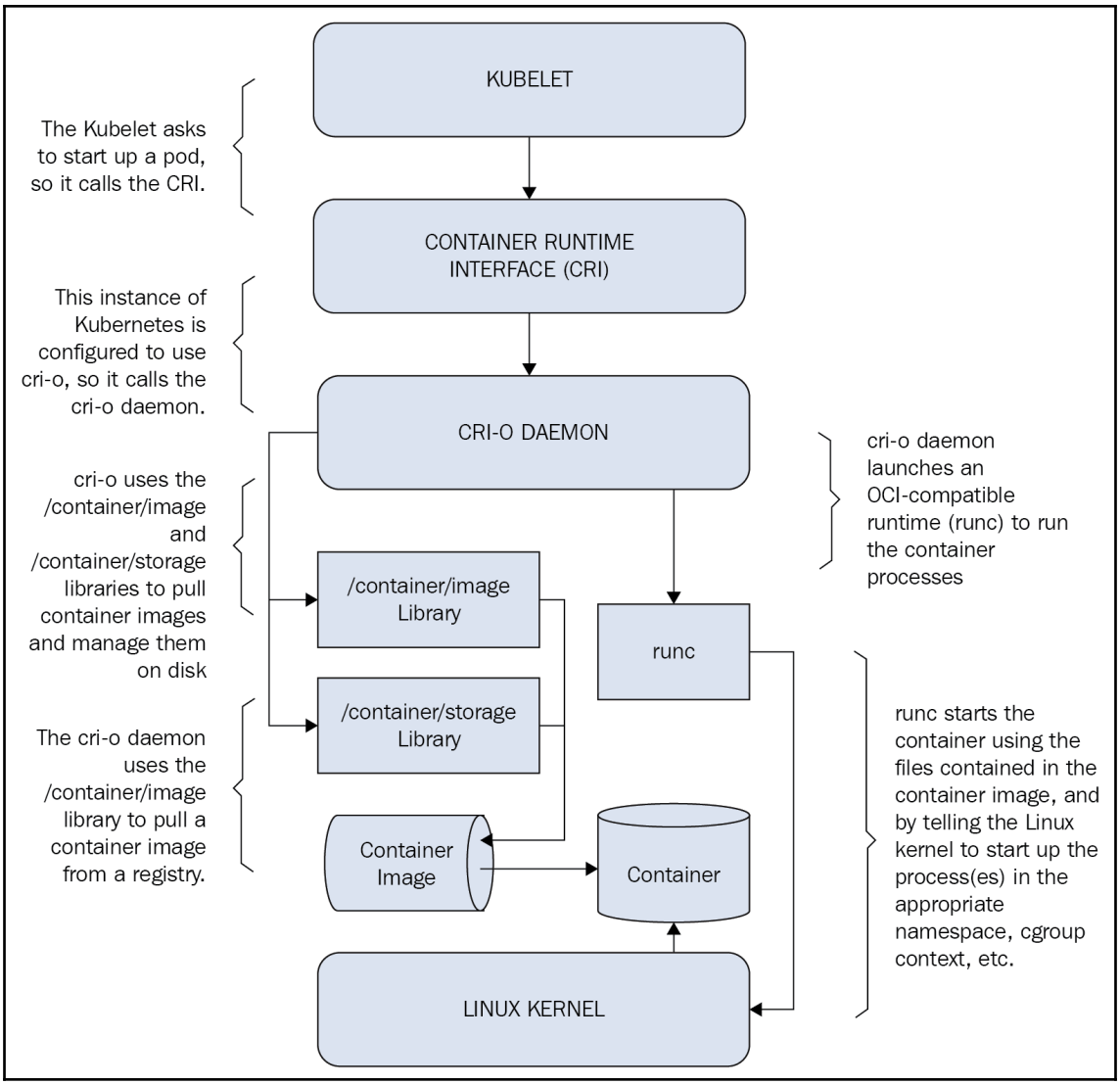

denver
Nginx Service
selector: app: nginx
labels: app: nginx
transcoding.denver.svc.cluster.local
transcoding service
selector: app: trans
labels: app: trans
Transcoding Application Pod
Transcoding Application Pod
Transcoding Replication Controller replicas: 2
phoenix
Apache Service
selector: app: httpd
labels: app: httpd
labels: app: httpd
repackaging.phoenix.svc.cluster.local
repackaging service
selector: app: repack
labels: app: repack
Repackaging Application Pod
Repackaging Application Pod
Repackaging Application Pod
Repackaging Replication Controller replicas: 3


Kubernetes Architecture
kubectl,
ajax, etc
etcd
API Server
Scheduler
Controller Manager
Kubelet
Service Proxy

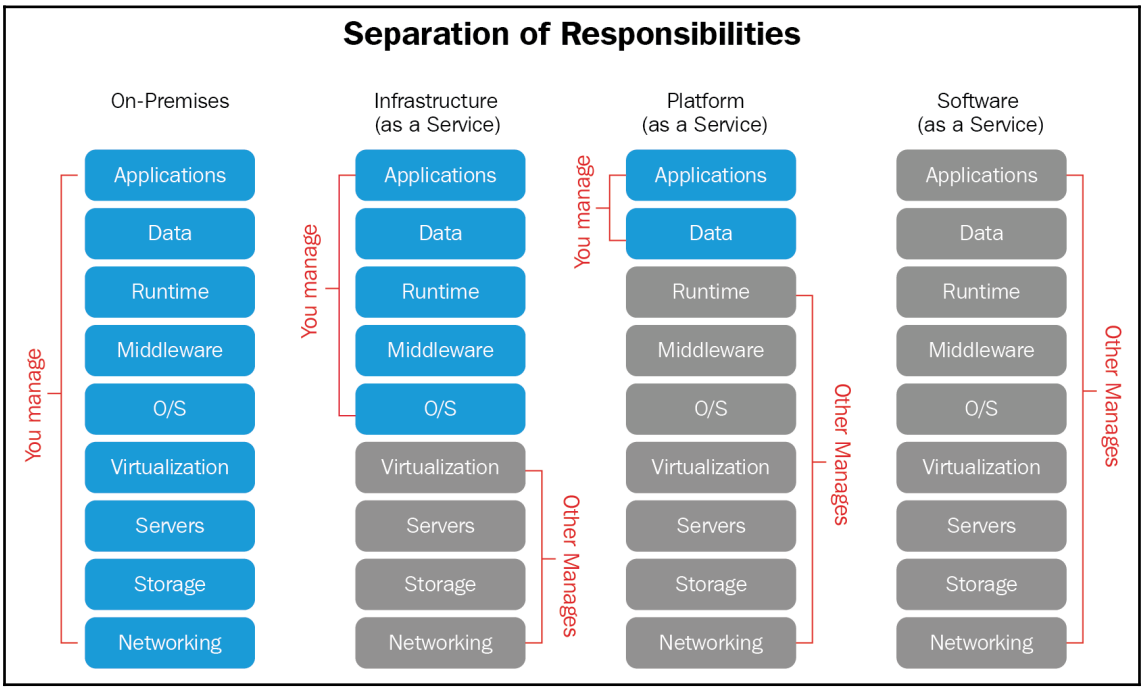

kubernetes
Search
+ CREATE
Overview
Namespace
All namespaces
Overview
Workloads
Cron Jobs
Daemon Sets
Deployments
Jobs
Pods
Replica Sets
Replication Controllers
Stateful Sets
Discovery and Load Balancing
Ingresses
Services
Config and Storage
Config Maps
Persistent Volume Claims
Secrets
Settings
About
Workloads
Workloads Statuses
100.00%
Deployments
100.00%
Pods
100.00%
Replica Sets
Deployments
Name
Namespace
Labels
Pods
Age
Images
kube-dns
kube-system
addonmanager.kubernet...
k8s-app: kube-dns
version: v20
1 / 1
9 minutes
k8s.gcr.io/k8s-dns-kube-dn
k8s.gcr.io/k8s-dns-dnsmas
k8s.gcr.io/k8s-dns-sidecar-
kubernetes-dashboard
kube-system
addonmanager.kubernet...
kubernetes.io/minikube-...
version: v1.8.1
1 / 1
9 minutes
k8s.gcr.io/kubernetes-dash
Pods
Name
Namespace
Node
Status
Restarts
Age
kube-dns-54cccfbdf8-2h7qk
kube-system
minikube
Running
0
9 minutes

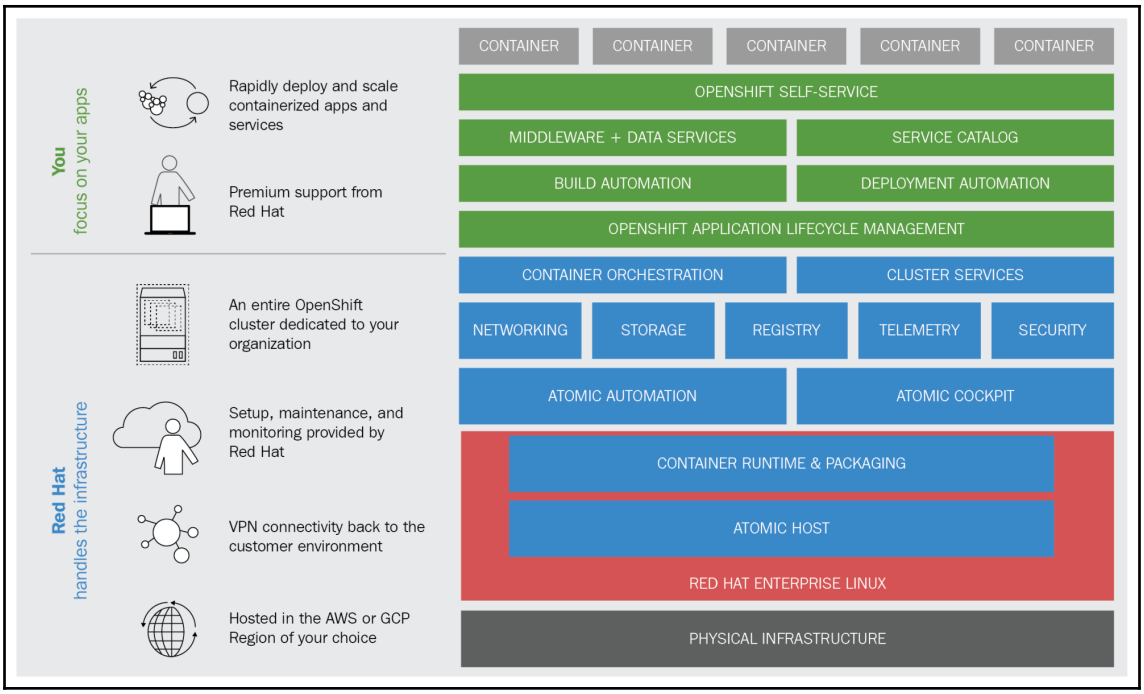
Chapter 3: CRI-O Overview



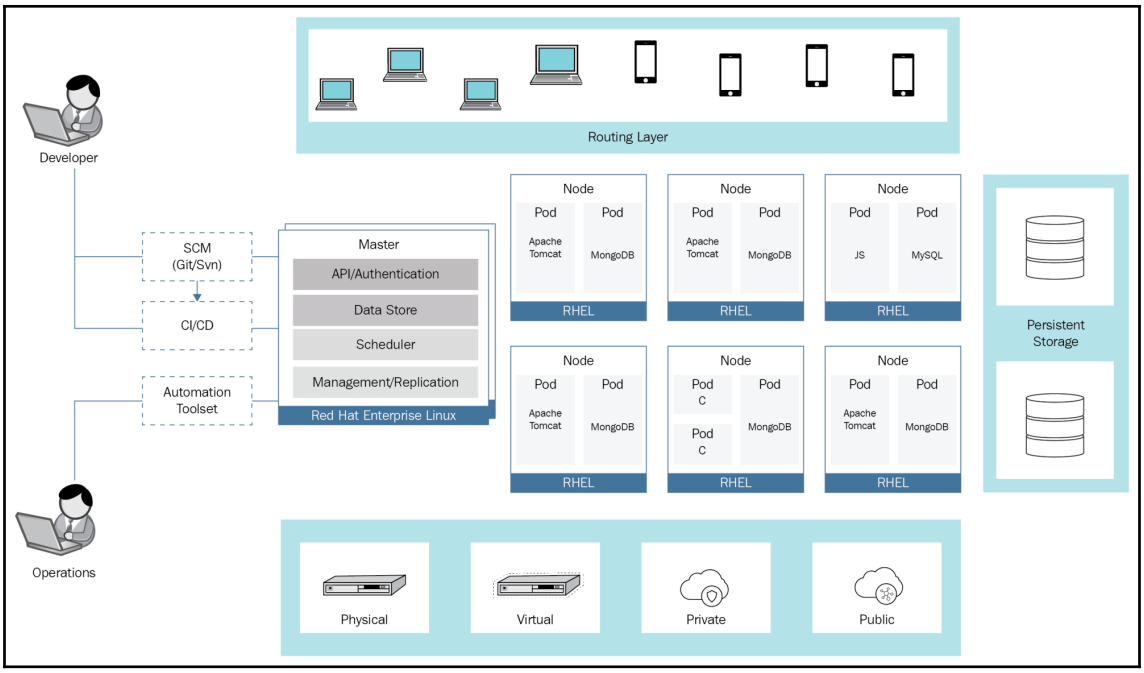

KUBELET
The Kubelet asks to start up a pod, so it calls the CRI.
CONTAINER RUNTIME INTERFACE (CRI)
This instance of Kubernetes is configured to use cri-o, so it calls the cri-o daemon.
CRI-O DAEMON
cri-o daemon launches an OCI-compatible runtime (runc) to run the container processes
cri-o uses the /container/image and /container/storage libraries to pull container images and manage them on disk
/container/image Library
runc
/container/storage Library
The cri-o daemon uses the /container/image library to pull a container image from a registry.
Container Image
Container
runc starts the container using the files contained in the container image, and by telling the Linux kernel to start up the process(es) in the appropriate namespace, cgroup context, etc.
LINUX KERNEL

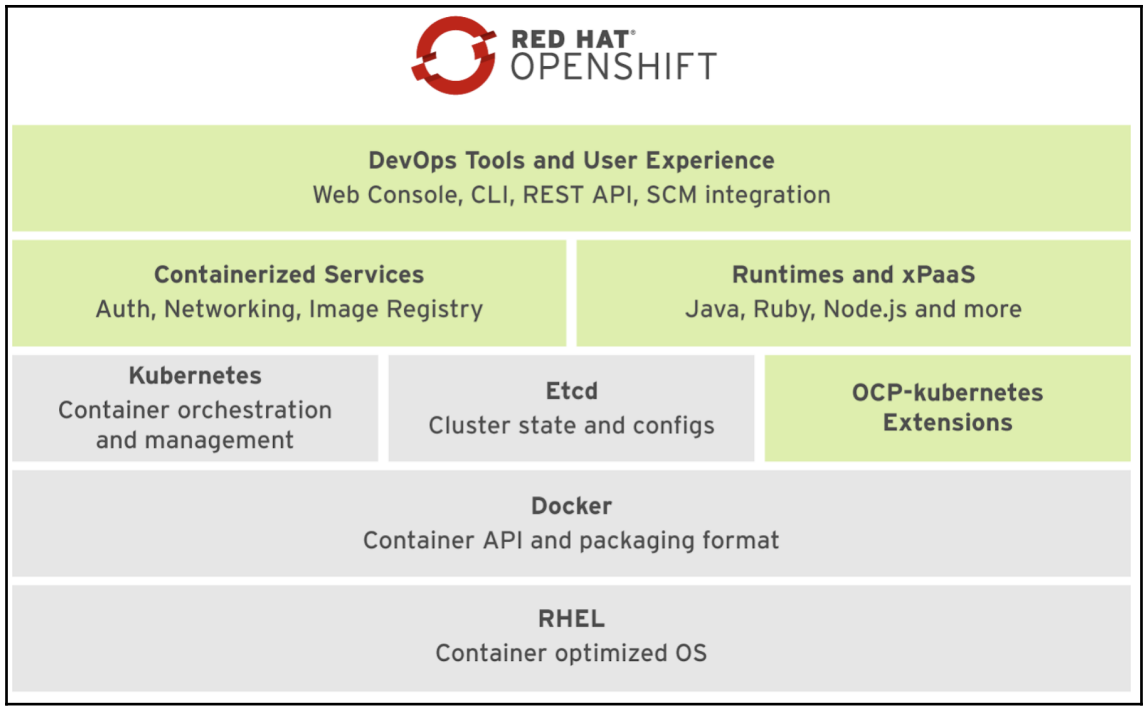
Chapter 4: OpenShift Overview



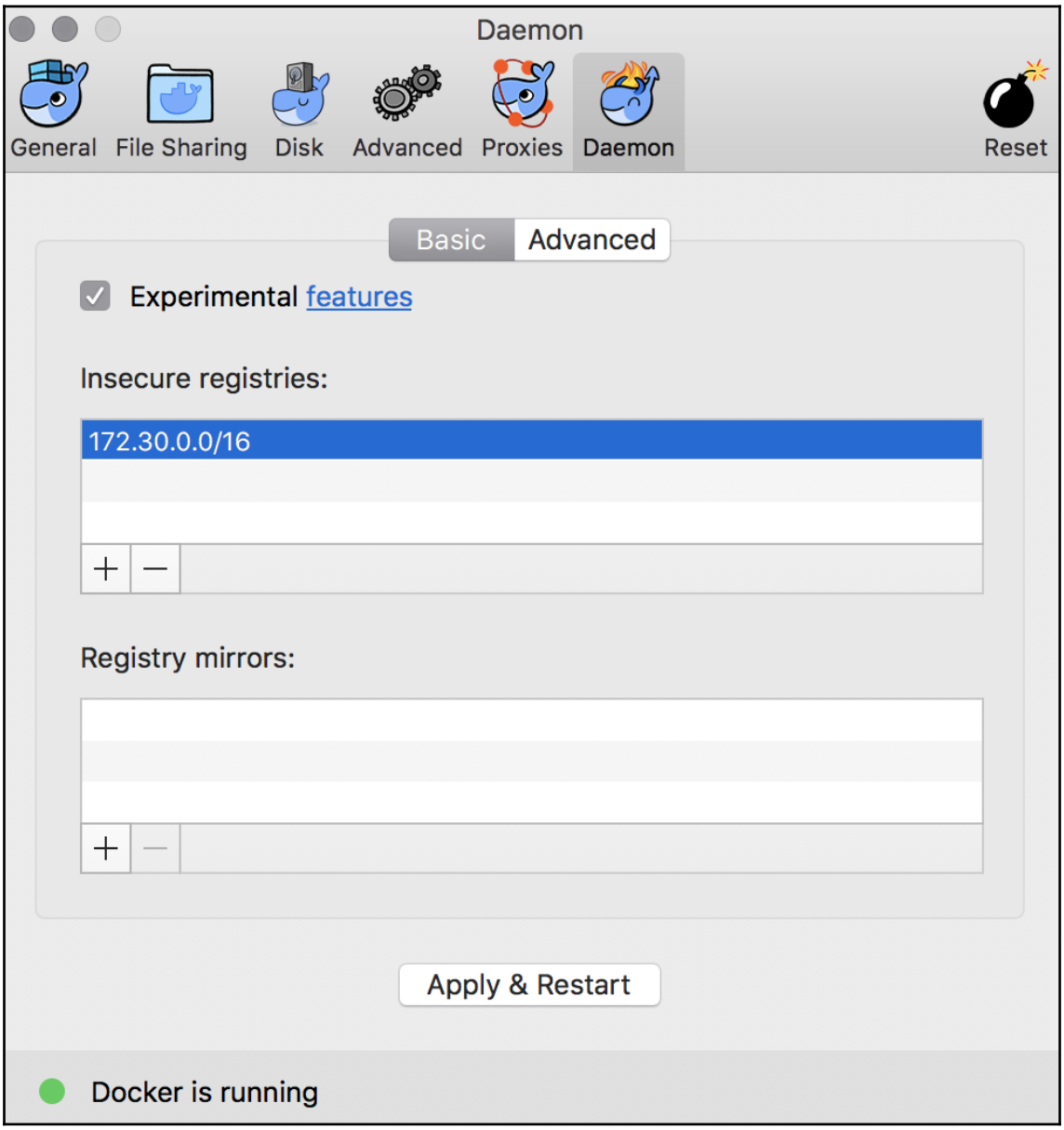

You
focus on your apps
Rapidly deploy and scale containerized apps and services
Premium support from Red Hat
Red Hat
handles the infrastructure
An entire OpenShift cluster dedicated to your organization
Setup, maintenance, and monitoring provided by Red Hat
VPN connectivity back to the customer environment
Hosted in the AWS or GCP Region of your choice
CONTAINER
CONTAINER
CONTAINER
CONTAINER
CONTAINER
OPENSHIFT SELF-SERVICE
MIDDLEWARE + DATA SERVICES
SERVICE CATALOG
BUILD AUTOMATION
DEPLOYMENT AUTOMATION
OPENSHIFT APPLICATION LIFECYCLE MANAGEMENT
CONTAINER ORCHESTRATION
CLUSTER SERVICES
NETWORKING
STORAGE
REGISTRY
TELEMETRY
SECURITY
ATOMIC AUTOMATION
ATOMIC COCKPIT
CONTAINER RUNTIME & PACKAGING
ATOMIC HOST
RED HAT ENTERPRISE LINUX
PHYSICAL INFRASTRUCTURE

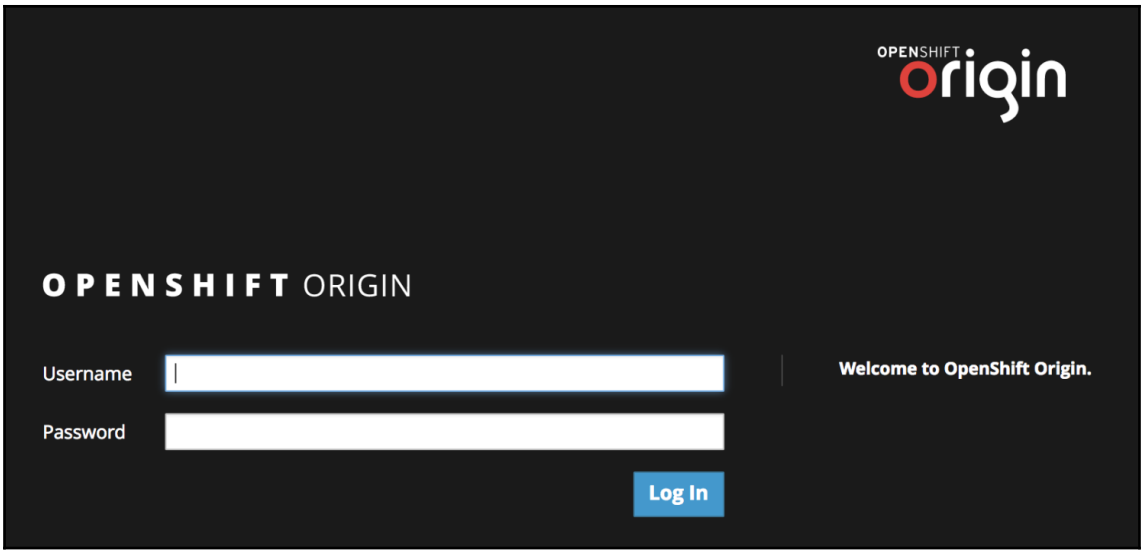
Containers Transform
Monolith
N-Tier
Microservices
Applications
Datacenter
Hosted
Hybrid
Infrastructures
Waterfall
Agile
DevOps
Processes

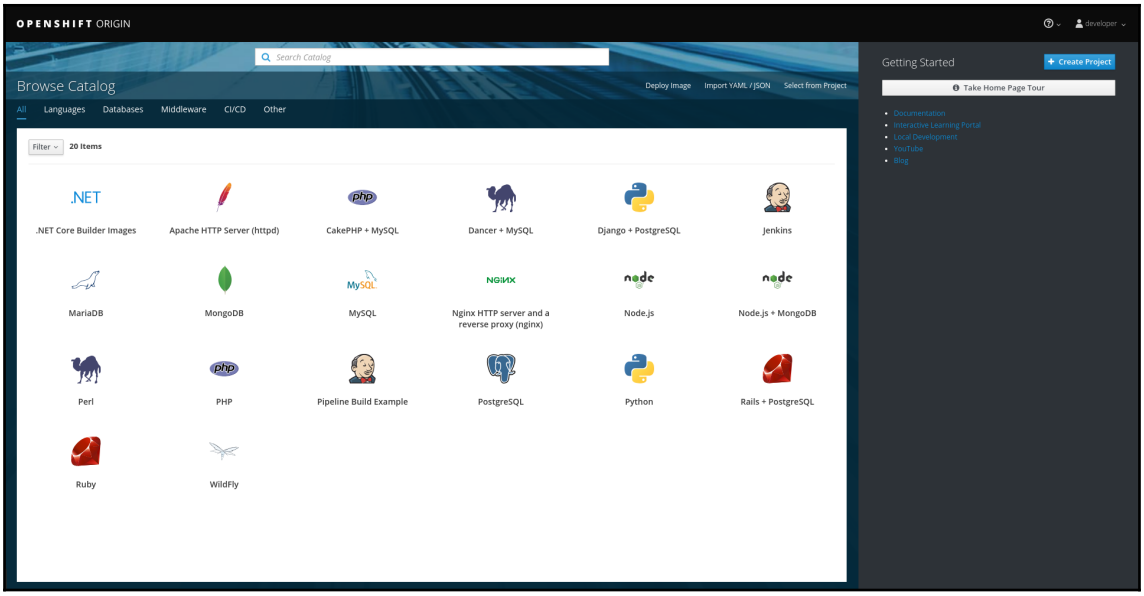

Routing Layer
Developer
SCM
(Git/Svn)
CI/CD
Automation
Toolset
Master
API/Authentication
Data Store
Scheduler
Management/Replication
Red Hat Enterprise Linux
Node
Pod
Apache
Tomcat
MongoDB
RHEL
JS
MySQL
Pod
C
Persistent
Storage
Operations
Physical
Virtual
Private
Public

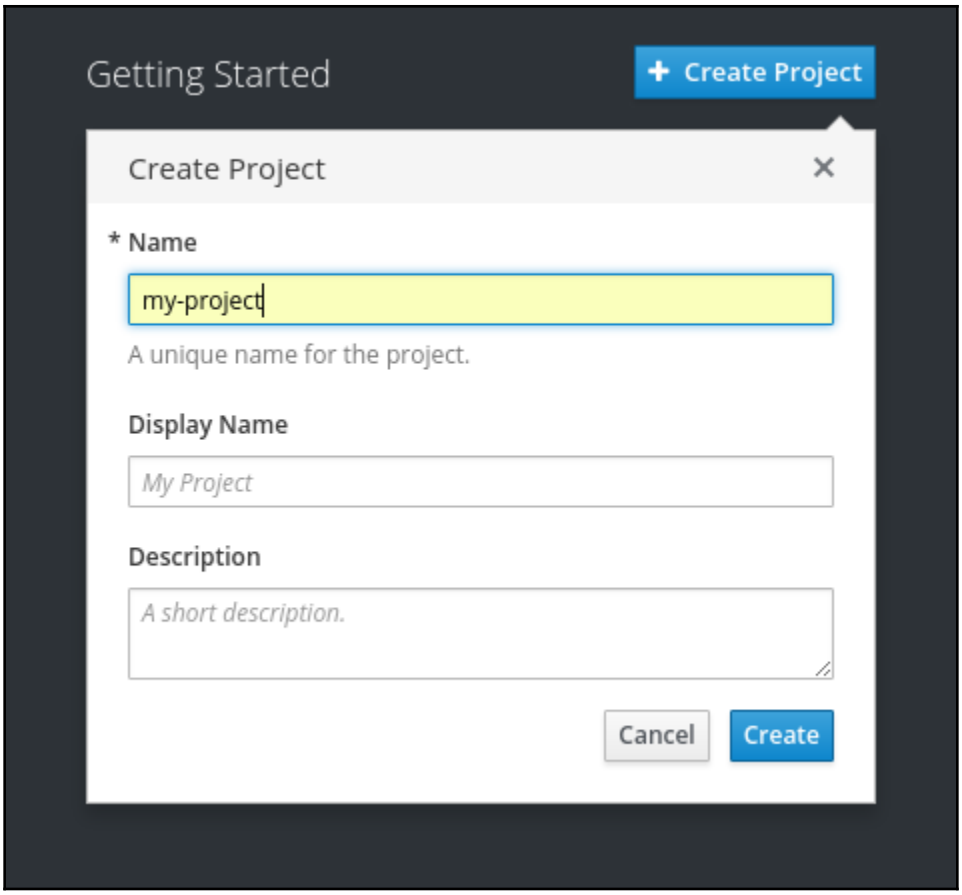

RED HAT
OPENSHIFT
DevOps Tools and User Experience
Web Console, CLI, REST API, SCM integration
Containerized Services
Auth, Networking, Image Registry
Runtimes and xPaaS
Java, Ruby, Node.js and more
Kubernetes
Container orchestration and management
Etcd
Cluster state and configs
OCP-kubernetes Extensions
Docker
Container API and packaging format
RHEL
Container optimized OS

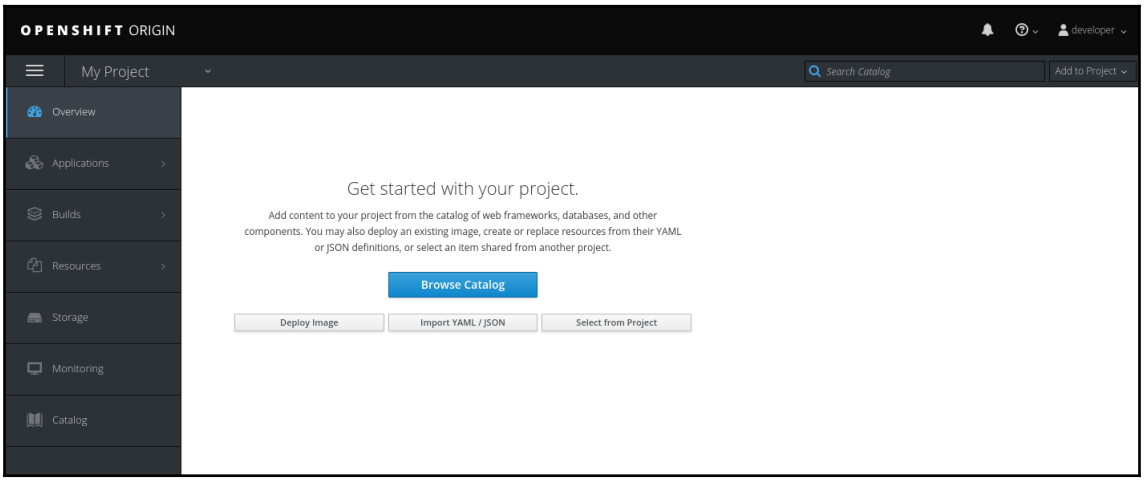
Chapter 5: Building an OpenShift Lab

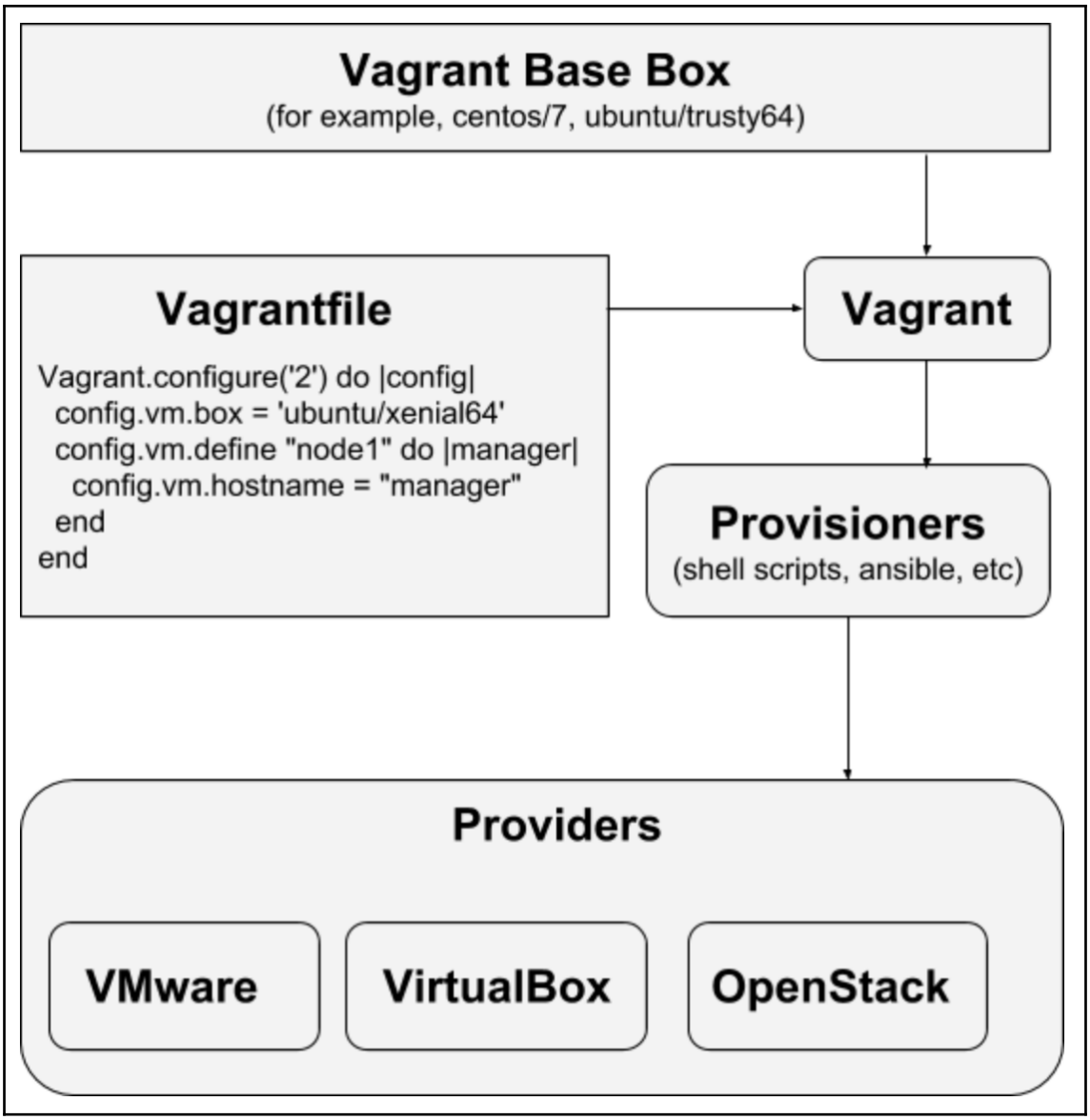



OPENSHIFT origin
OPENSHIFT ORIGIN
Username
Password
Log In
Welcome to OpenShift Origin.

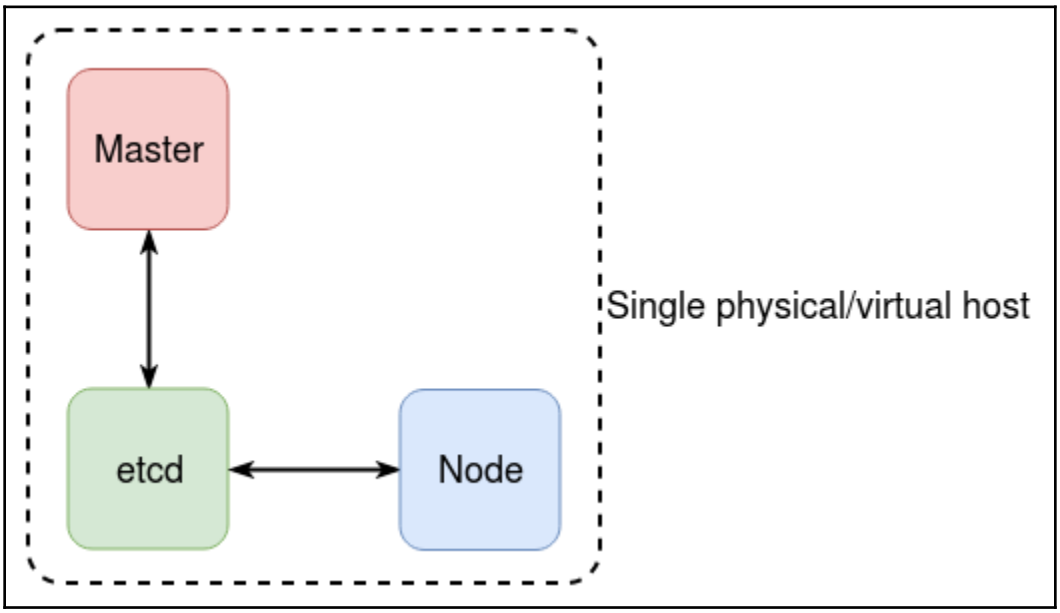

OPENSHIFT ORIGIN
developer
Search Catalog
Browse Catalog
Deploy Image
Import YAML / JSON
Select from Project
All
Languages
Databases
Middleware
CI/CD
Other
Filter
20 Items
.NET Core Builder Images
Apache HTTP Server (httpd)
CakePHP + MySQL
Dancer + MySQL
Django + PostgreSQL
Jenkins
MariaDB
MongoDB
MySQL
Nginx HTTP server and a reverse proxy (nginx)
Node.js
Node.js + MongoDB
Perl
PHP
Pipeline Build Example
PostgreSQL
Python
Rails + PostgreSQL
Ruby
WildFly
Getting Started
Create Project
Take Home Page Tour
Documentation
Interactive Learning Portal
Local Development
YouTube
Blog

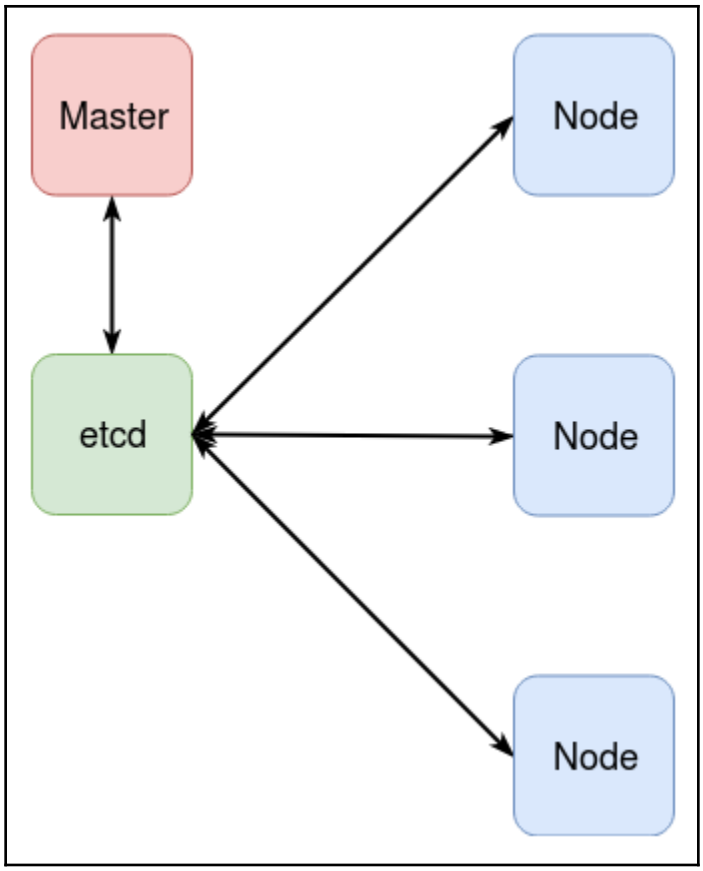

Getting Started
+ Create Project
Create Project
* Name
my-project
A unique name for the project.
Display Name
My Project
Description
A short description.
Cancel
Create

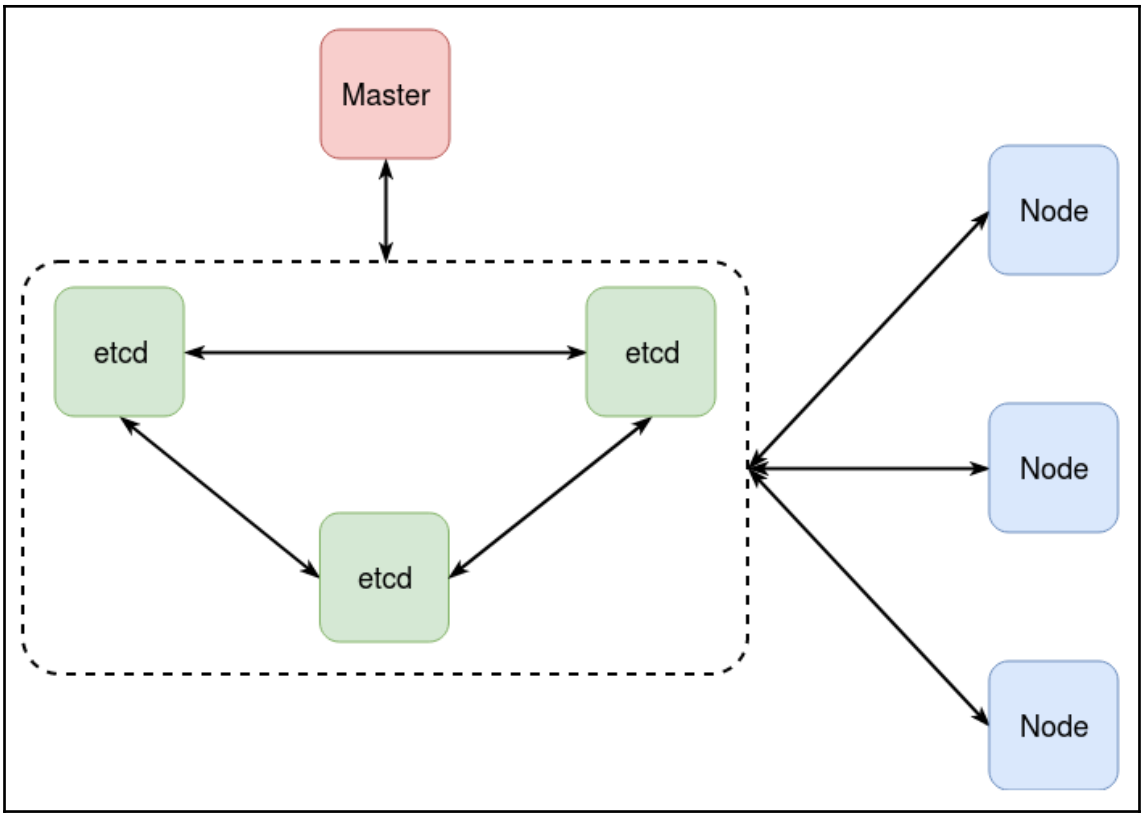

OPENSHIFT ORIGIN
developer
My Project
Search Catalog
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Catalog
Get started with your project.
Add content to your project from the catalog of web frameworks, databases, and other components. You may also deploy an existing image, create or replace resources from their YAML or JSON definitions, or select an item shared from another project.
Browse Catalog
Deploy Image
Import YAML / JSON
Select from Project

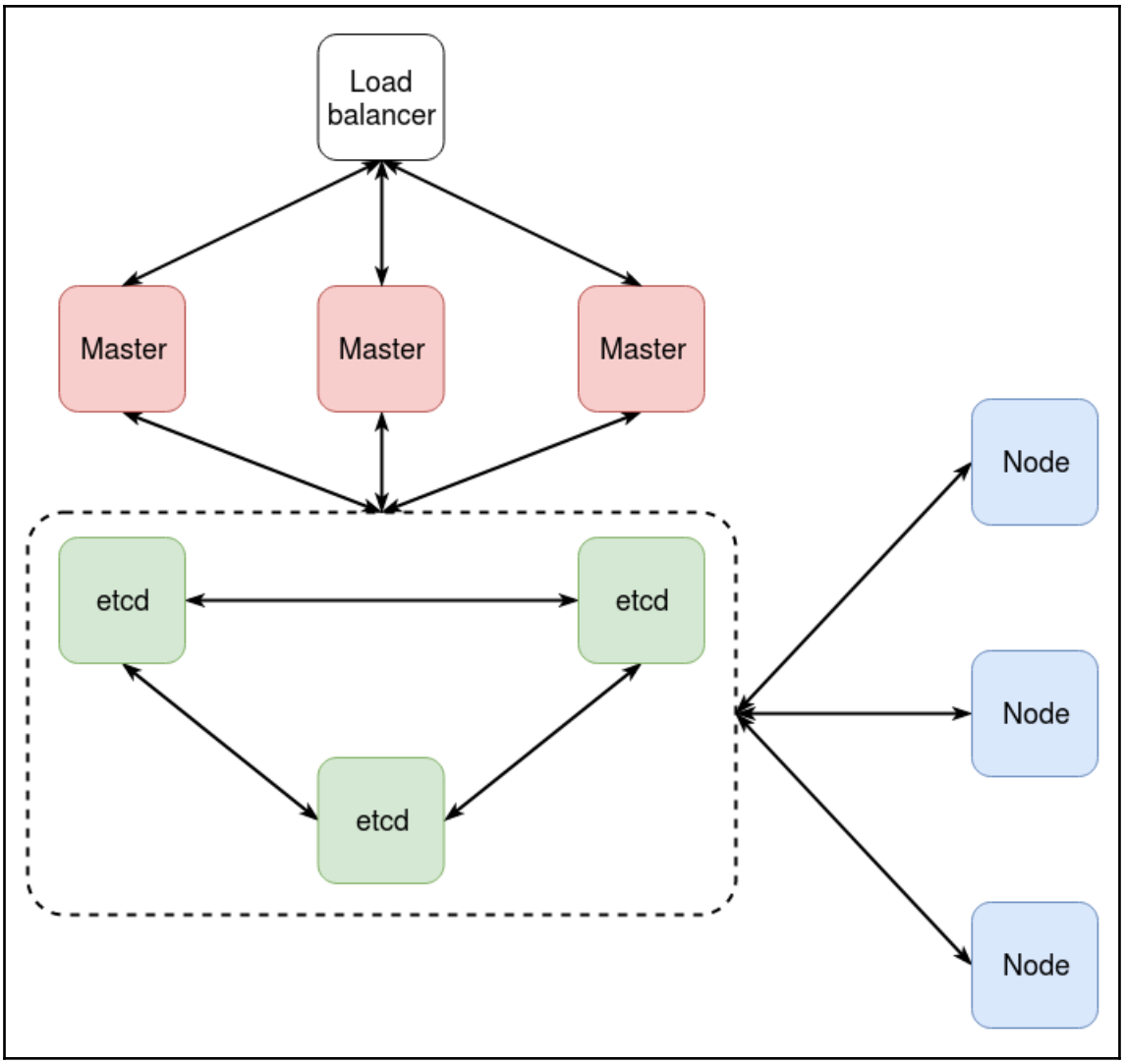

Vagrant Base Box
(for example, centos/7, ubuntu/trusty64)
Vagrantfile
Vagrant.configure('2') do |config|
config.vm.box = 'ubuntu/xenial64'
config.vm.define "node1" do |manager|
config.vm.hostname = "manager"
end
end
Vagrant
Provisioners
(shell scripts, ansible, etc)
Providers
VMware
VirtualBox
OpenStack

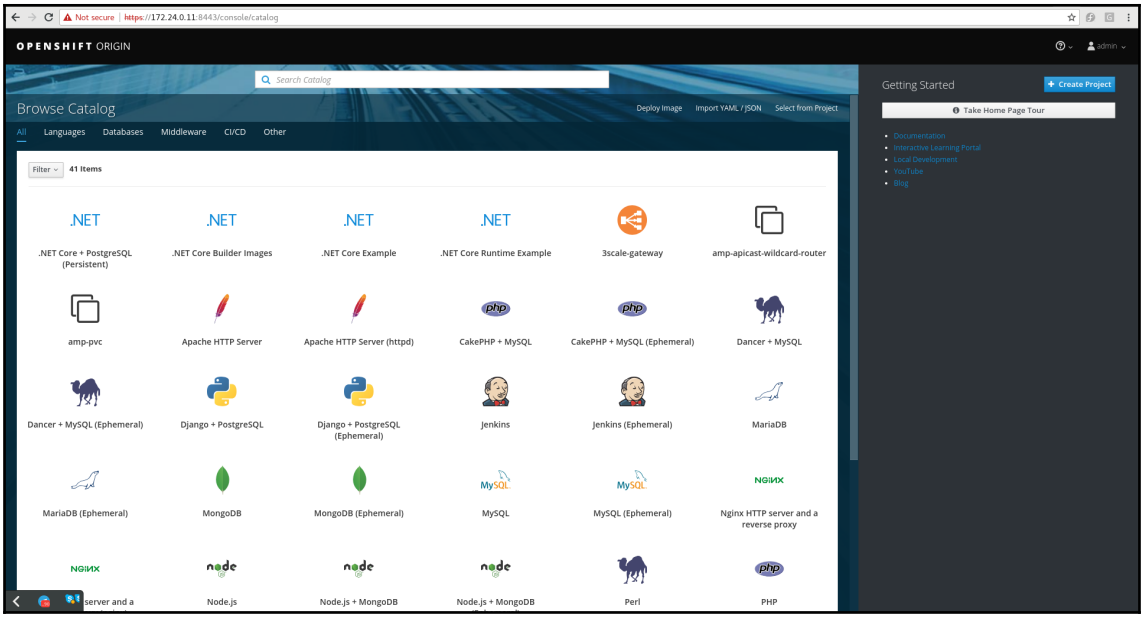
Chapter 6: OpenShift Installation



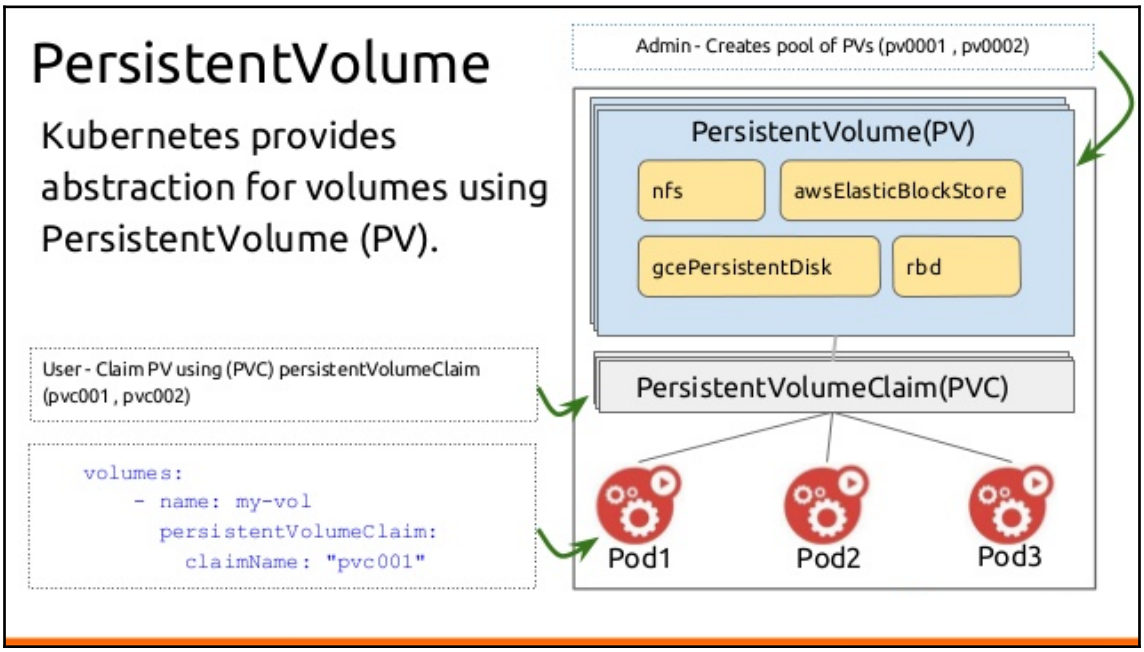

Master
Node
etcd
Node
Node

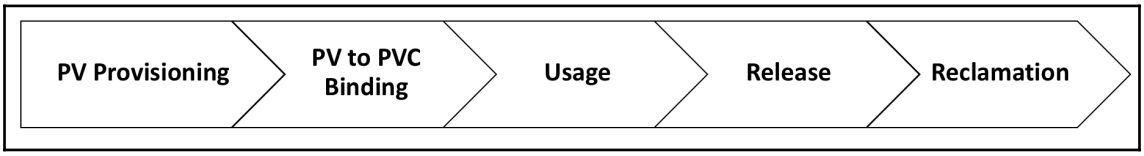

Master
etcd
etcd
etcd
Node
Node
Node


Load balancer
Master
Master
Master
etcd
etcd
etcd
Node
Node
Node

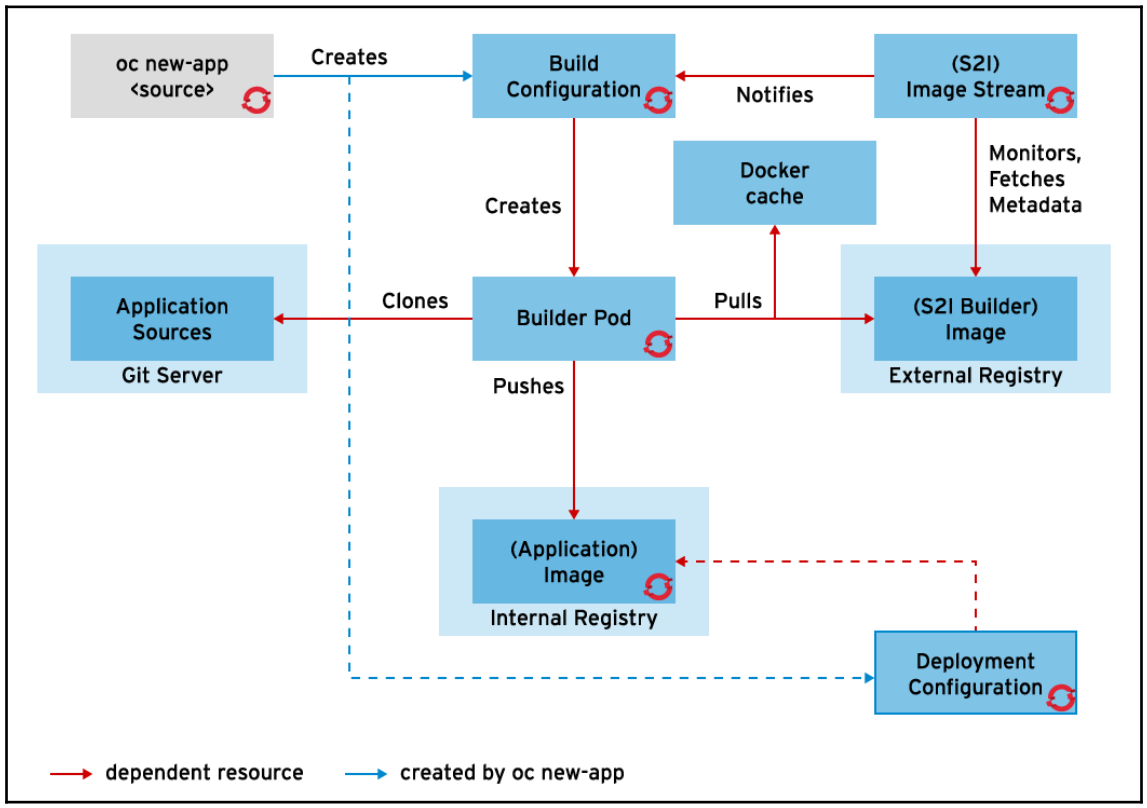

Not secure | https://172.24.0.11:8443/console/catalog
OPENSHIFT ORIGIN
admin
Search Catalog
Browse Catalog
Deploy Image
Import YAML / JSON
Select from Project
All
Languages
Databases
Middleware
CI/CD
Other
Filter
41 Items
.NET Core + PostgreSQL (Persistent)
.NET Core Builder Images
.NET Core Example
.NET Core Runtime Example
3scale-gateway
amp-apicast-wildcard-router
amp-pvc
Apache HTTP Server
Apache HTTP Server (httpd)
CakePHP + MySQL
CakePHP + MySQL (Ephemeral)
Dancer + MySQL
Dancer + MySQL (Ephemeral)
Django + PostgreSQL
Django + PostgreSQL (Ephemeral)
Jenkins
Jenkins (Ephemeral)
MariaDB
MariaDB (Ephemeral)
MongoDB
MongoDB (Ephemeral)
MySQL
MySQL (Ephemeral)
Nginx HTTP server and a reverse proxy
Node.js
Node.js + MongoDB
Node.js + MongoDB
Perl
PHP
Getting Started
Create Project
Take Home Page Tour
Documentation
Interactive Learning Portal
Local Development
YouTube
Blog

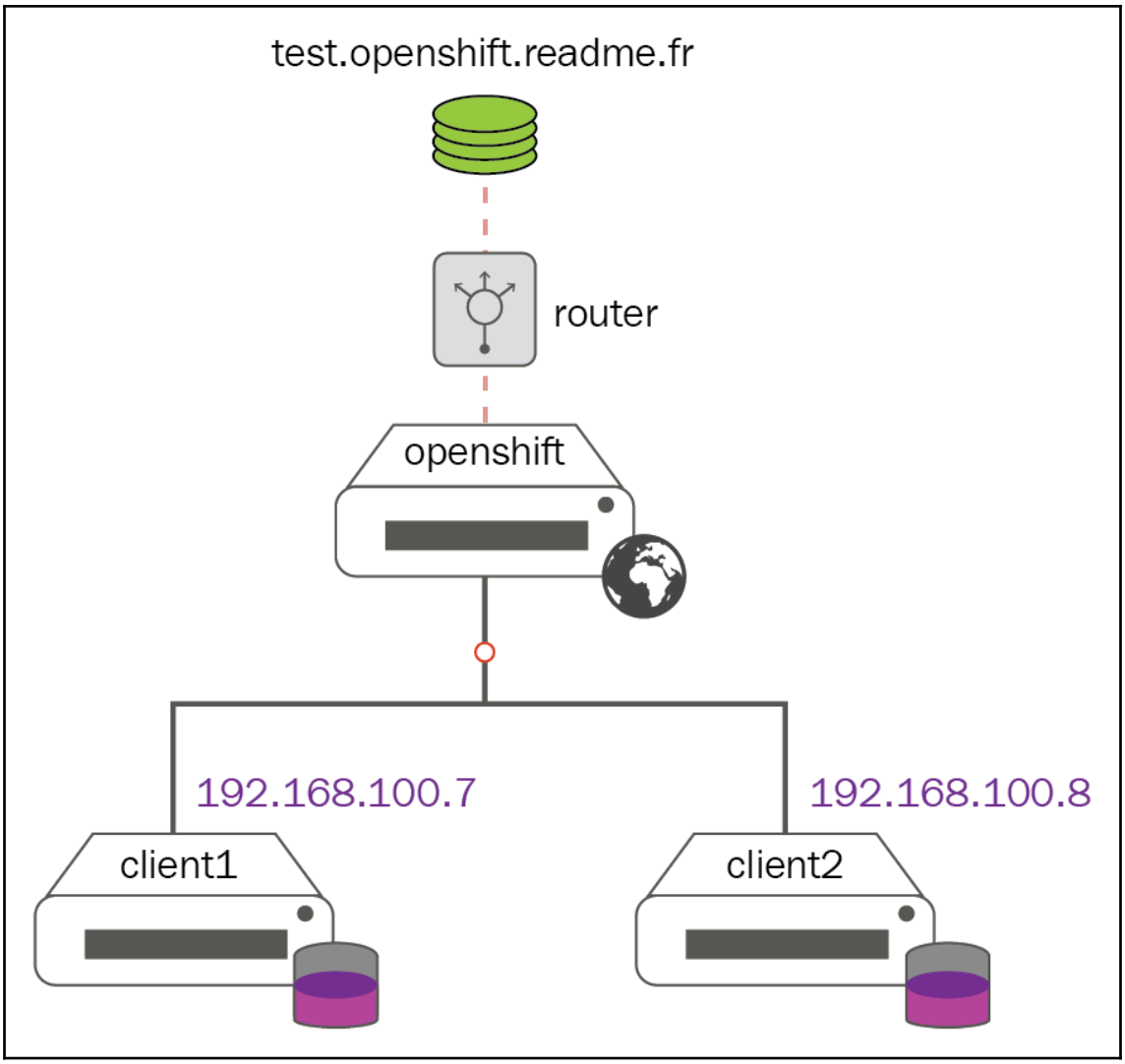
Chapter 7: Managing Persistent Storage





Chapter 8: Core OpenShift Concepts




test.openshift.readme.fr
router
openshift
192.168.100.7
192.168.100.8
client1
client2

Welcome to your Ruby application on OpenShift

Deploying code changes

The source code for this application is available to be forked from the OpenShift GitHub repository. You can configure a webhook in your repository to make OpenShift automatically start a build whenever you push your code:

1. From the Web Console homepage, navigate to your project
2. Click on Browse > Builds
3. From the view for your Build click on the button to copy your GitHub webhook
4. Navigate to your repository on GitHub and click on repository settings > webhooks
5. Paste your webhook URL provided by OpenShift — that's it!

After you save your webhook, if you refresh your settings page you can see the status of the ping that Github sent to OpenShift to verify it can reach the server.

Note: adding a webhook requires your OpenShift server to be reachable from GitHub.

Working in your local Git repository

If you forked the application from the OpenShift GitHub example, you'll need to manually clone the repository to your local system. Copy the application's source code Git URL and then run:

```
$ git clone <git_url> <directory_to_create>

# Within your project directory
# Commit your changes and push to OpenShift

$ git commit -a -m 'Some commit message'
$ git push
```

After pushing changes, you'll need to manually trigger a build if you did not setup a webhook as described above.

Managing your application

Documentation on how to manage your application from the Web Console or Command Line is available at the Developer Guide.

Web Console

You can use the Web Console to view the state of your application components and launch new builds.

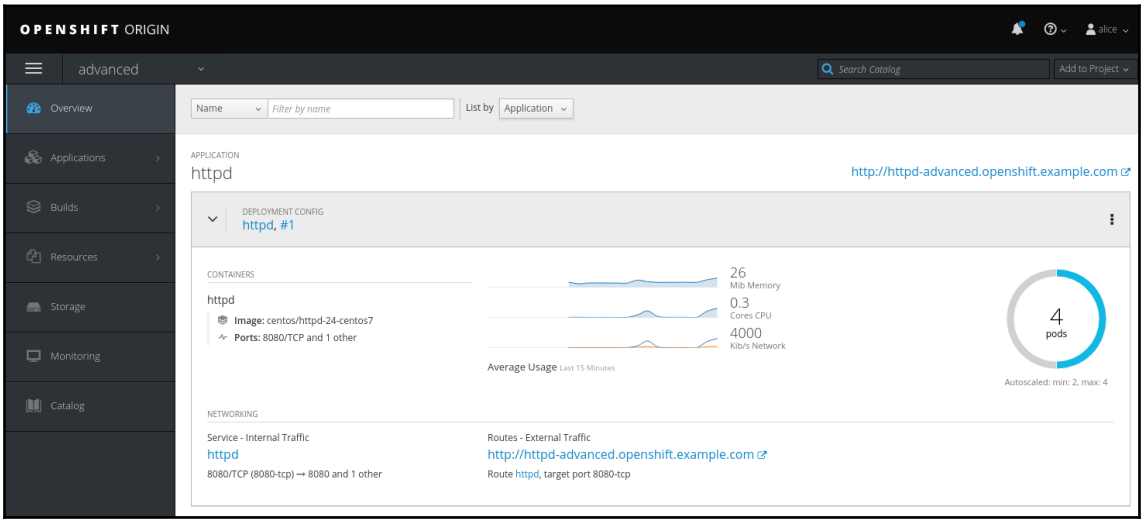
Command Line

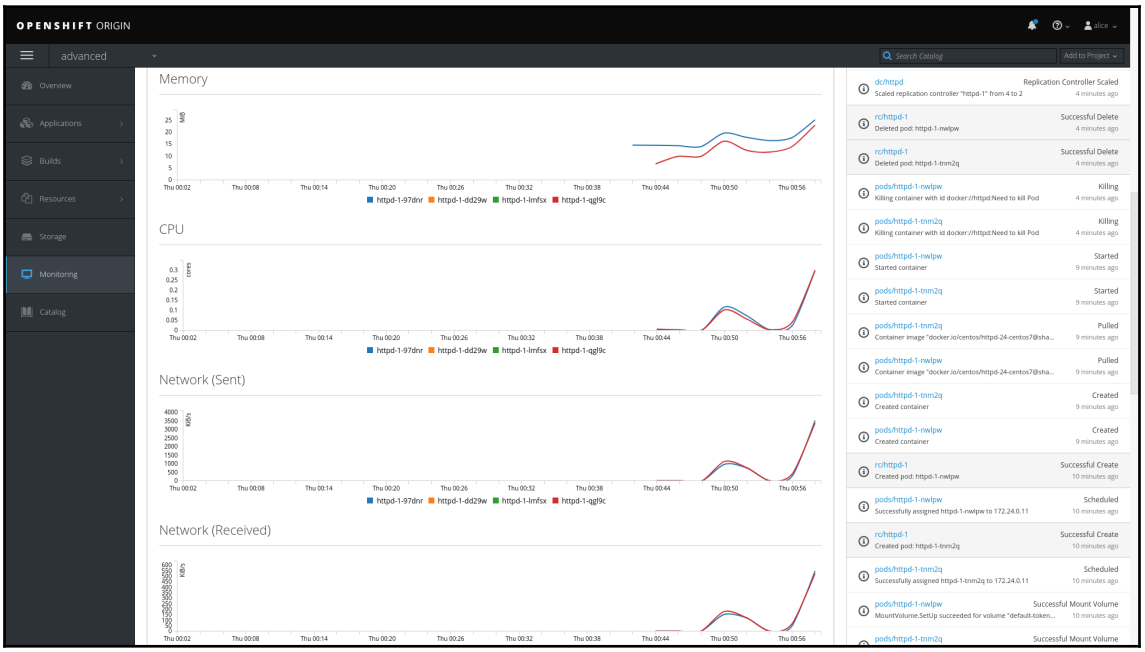
With the OpenShift command line interface (CLI), you can create applications and manage projects from a terminal.

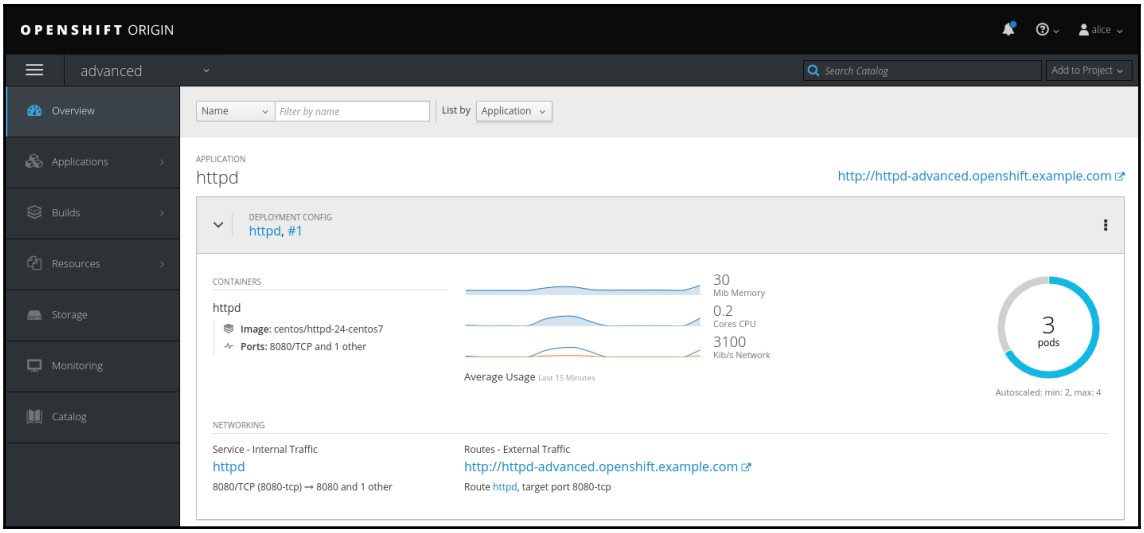
Development Resources

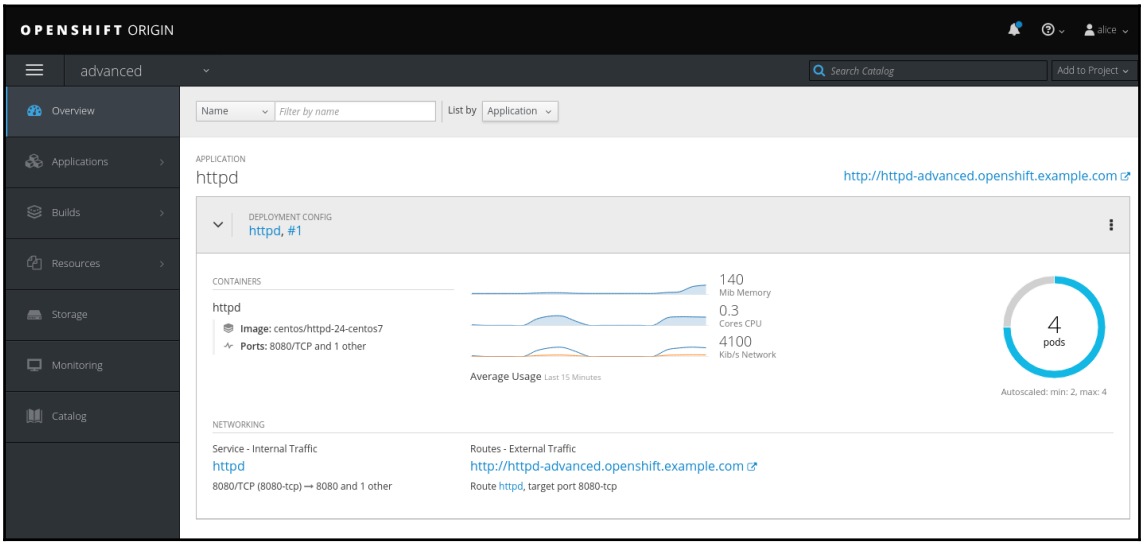
- OpenShift Documentation
- Openshift Origin GitHub
- Source To Image GitHub
- Getting Started with Ruby on OpenShift
- Stack Overflow questions for OpenShift
- Git documentation

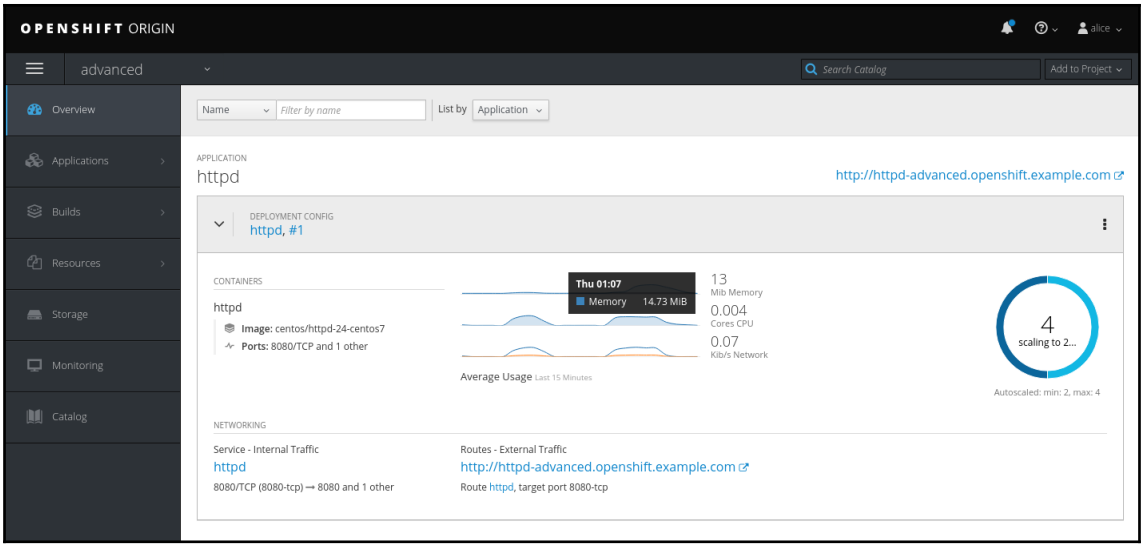
Chapter 9: Advanced OpenShift Concepts



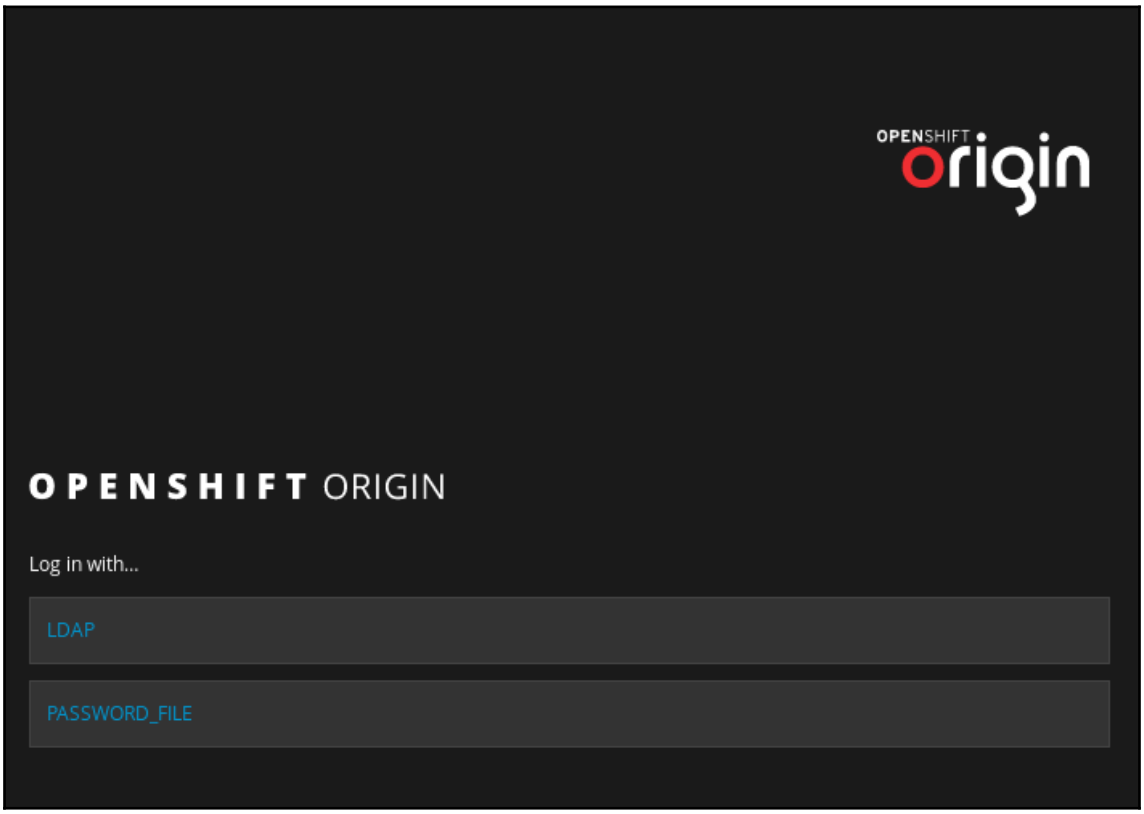


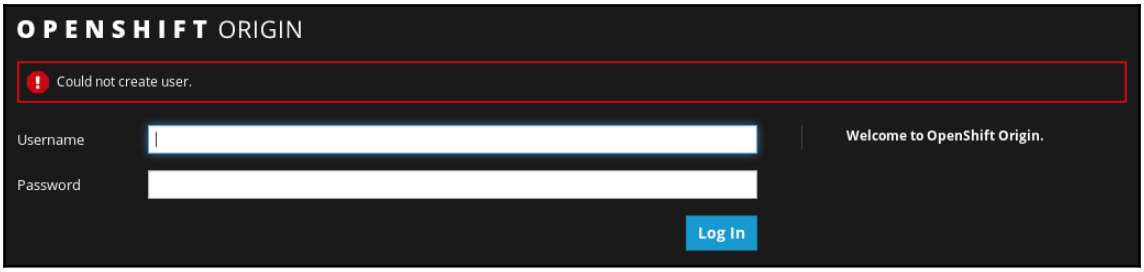

OPENSHIFT ORIGIN
alice
advanced
Search Catalog
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Catalog
Name
Filter by name
List by
Application
APPLICATION
httpd
http://httpd-advanced.openshift.example.com
DEPLOYMENT CONFIG
httpd, #1
CONTAINERS
httpd
Image: centos/httpd-24-centos7
Ports: 8080/TCP and 1 other
30
Mib Memory
0.2
Cores CPU
3100
Kib/s Network
Average Usage Last 15 Minutes
3
pods
Autoscaled: min: 2, max: 4
NETWORKING
Service - Internal Traffic
httpd
8080/TCP (8080-tcp) → 8080 and 1 other
Routes - External Traffic
http://httpd-advanced.openshift.example.com
Route httpd, target port 8080-tcp

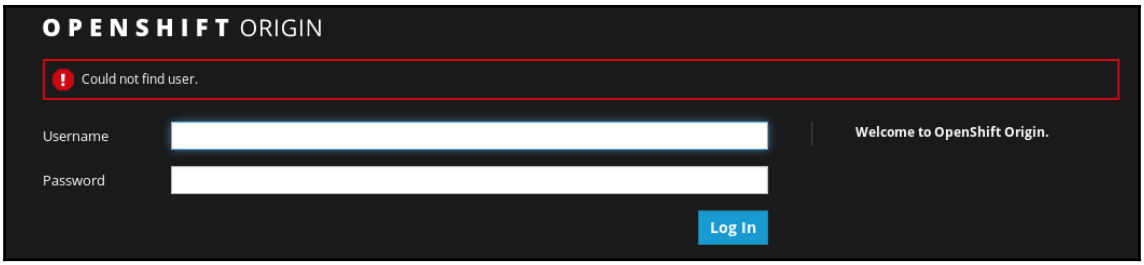

OPENSHIFT ORIGIN
alice
advanced
Search Catalog
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Catalog
Name
Filter by name
List by
Application
APPLICATION
httpd
http://httpd-advanced.openshift.example.com
DEPLOYMENT CONFIG
httpd, #1
CONTAINERS
httpd
Image: centos/httpd-24-centos7
Ports: 8080/TCP and 1 other
140
Mib Memory
0.3
Cores CPU
4100
Kib/s Network
Average Usage Last 15 Minutes
4
pods
Autoscaled: min: 2, max: 4
NETWORKING
Service - Internal Traffic
httpd
8080/TCP (8080-tcp) → 8080 and 1 other
Routes - External Traffic
http://httpd-advanced.openshift.example.com
Route httpd, target port 8080-tcp

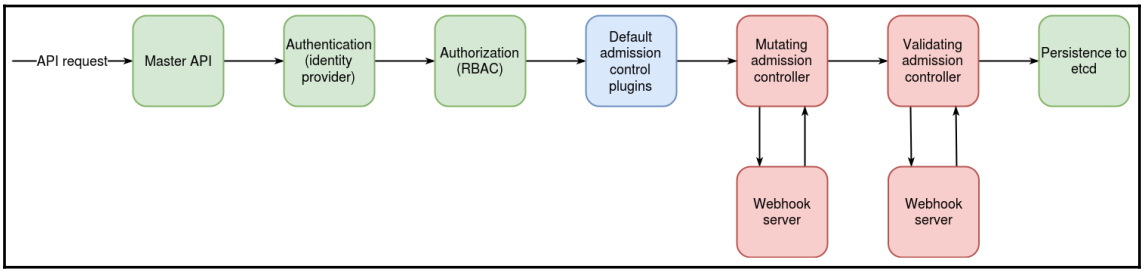

OPENSHIFT ORIGIN
alice
advanced
Search Catalog
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Catalog
Name
Filter by name
List by
Application
APPLICATION
httpd
http://httpd-advanced.openshift.example.com
DEPLOYMENT CONFIG
httpd, #1
CONTAINERS
httpd
Image: centos/httpd-24-centos7
Ports: 8080/TCP and 1 other
Thu 01:07
Memory 14.73 MiB
13
Mib Memory
0.004
Cores CPU
0.07
Kib/s Network
Average Usage
Last 15 Minutes
4
scaling to 2...
Autoscaled: min: 2, max: 4
NETWORKING
Service - Internal Traffic
httpd
8080/TCP (8080-tcp) → 8080 and 1 other
Routes - External Traffic
http://httpd-advanced.openshift.example.com
Route httpd, target port 8080-tcp

Chapter 10: Security in OpenShift



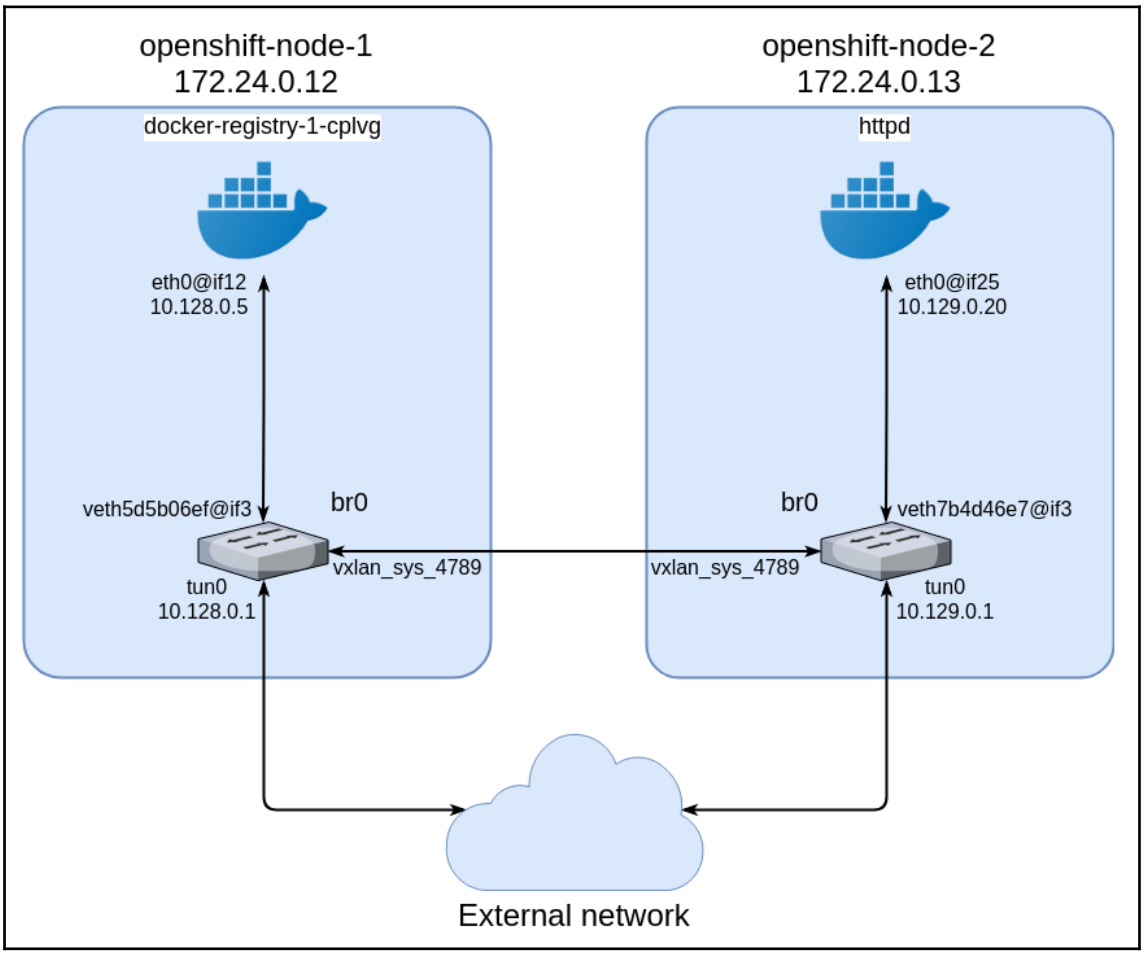


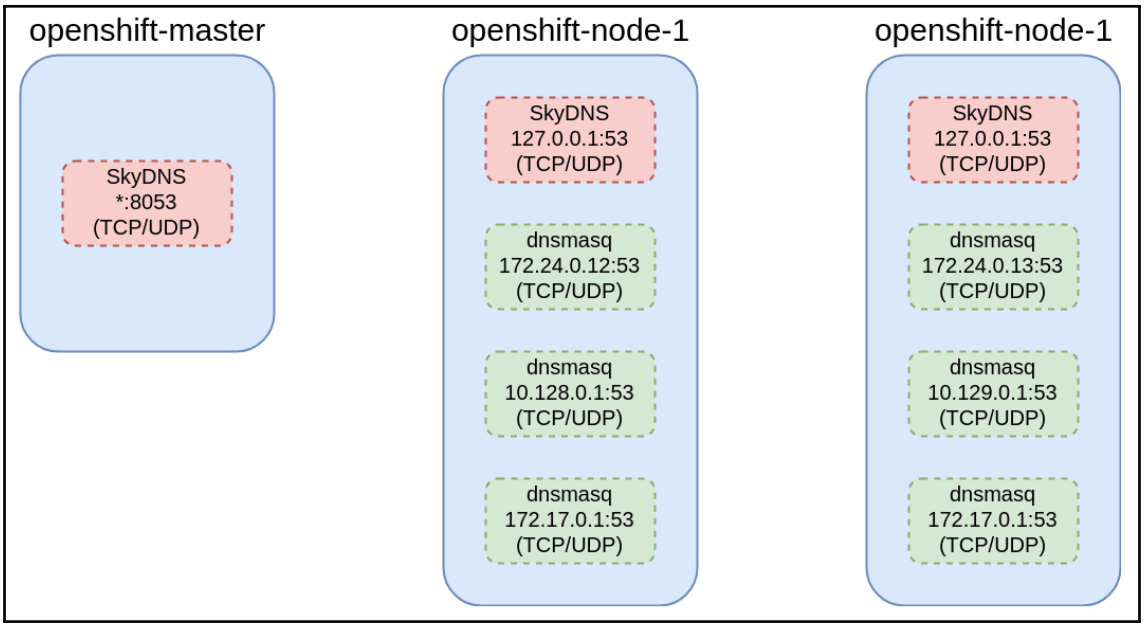

OPENSHIFT ORIGIN
Could not find user.
Username
Password
Log In
Welcome to OpenShift Origin.

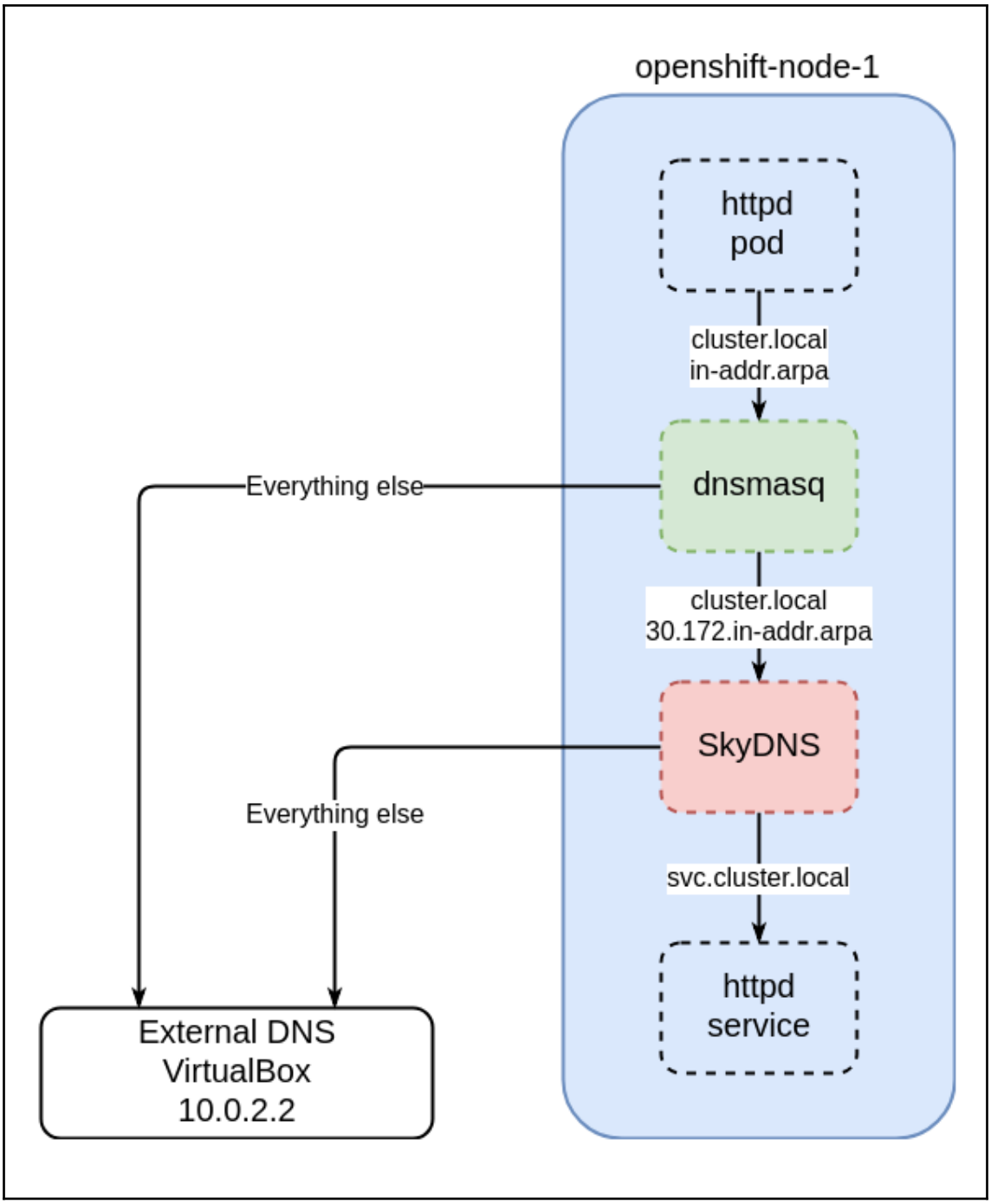

API request
Master API
Authentication (identity provider)
Authorization (RBAC)
Default admission control plugins
Mutating admission controller
Validating admission controller
Persistence to etcd
Webhook server
Webhook server

https://nginx-myproject.192.168.42.43.nip.io
Search
Welcome to nginx!
If you see this page, the nginx web server is successfully installed and working.
Further configuration is required.
For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.
Thank you for using nginx.

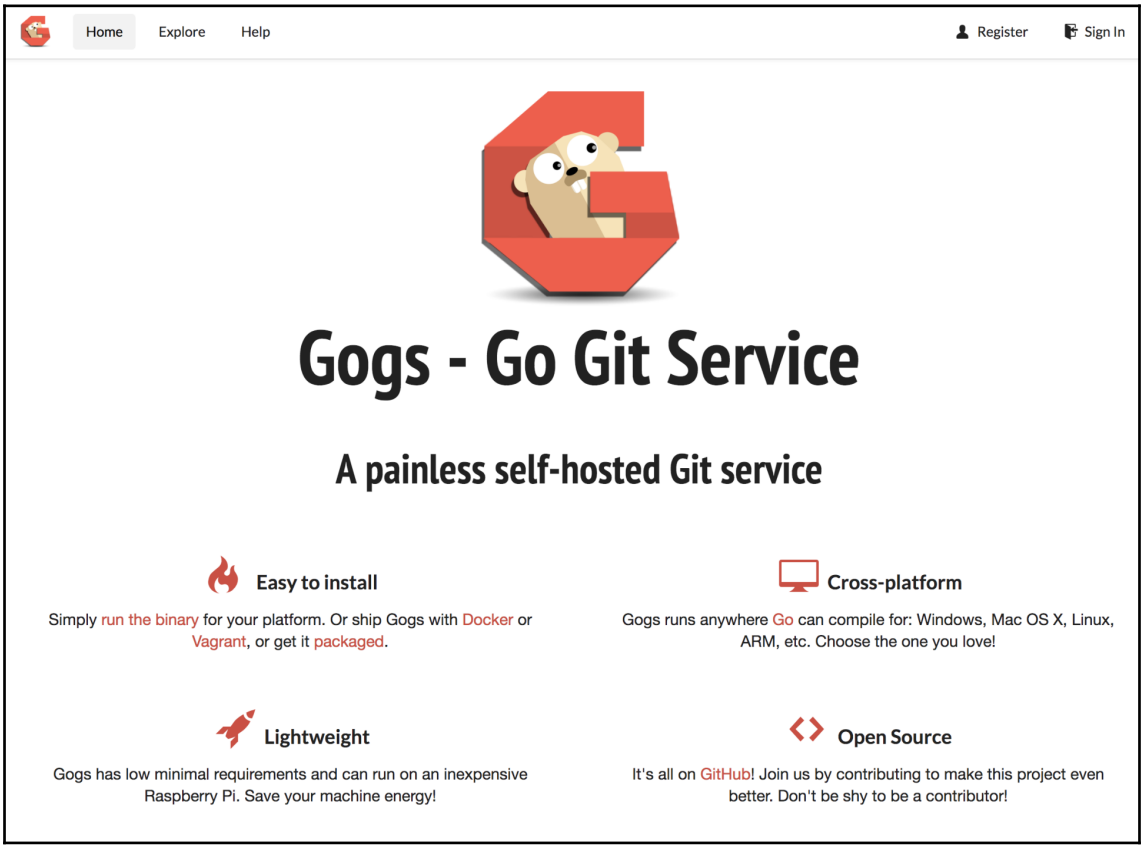
Chapter 11: Managing OpenShift Networking



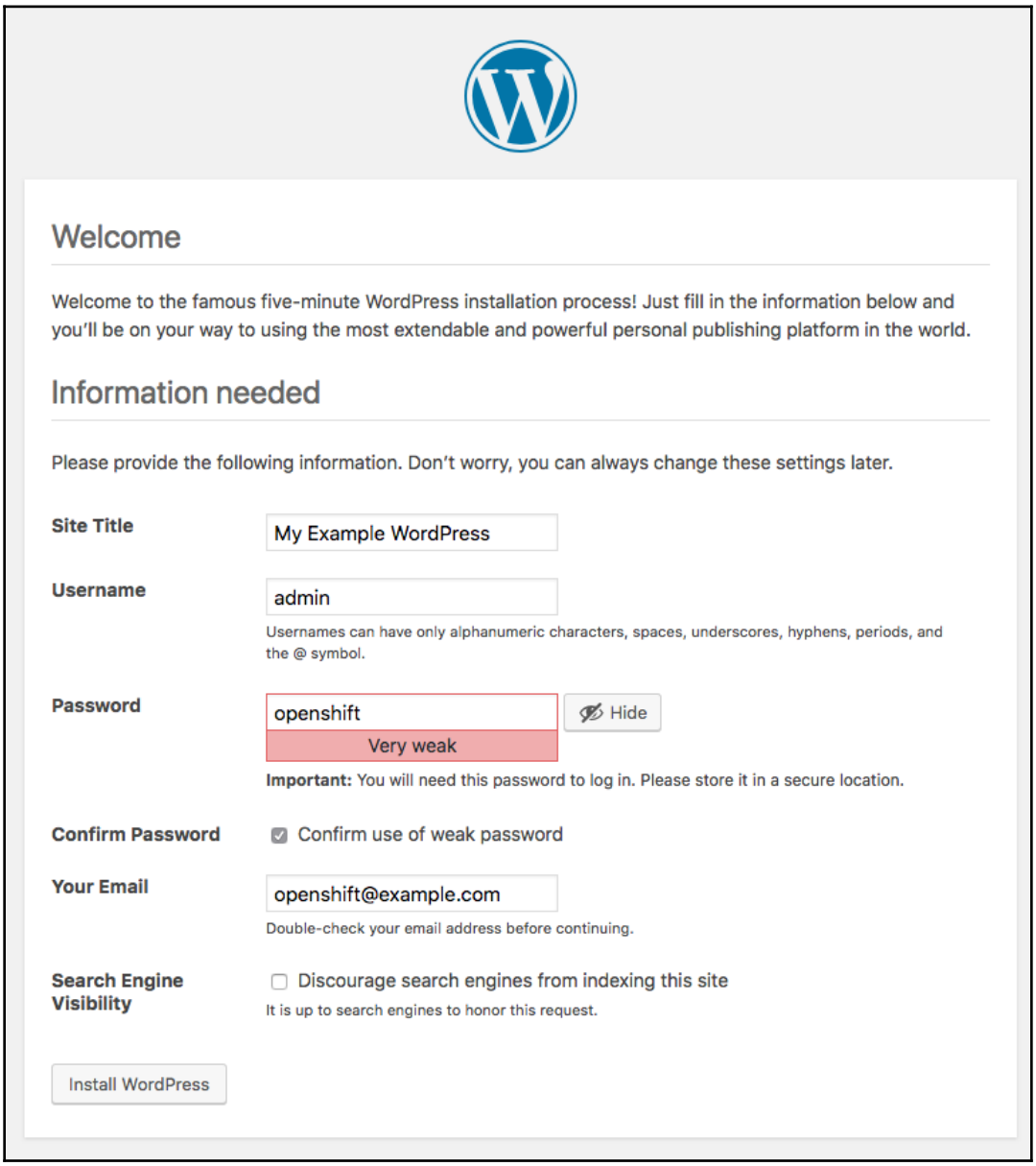

openshift-master
SkyDNS
*:8053
(TCP/UDP)
openshift-node-1
SkyDNS
127.0.0.1:53
(TCP/UDP)
dnsmasq
172.24.0.12:53
(TCP/UDP)
dnsmasq
10.128.0.1:53
(TCP/UDP)
dnsmasq
172.17.0.1:53
(TCP/UDP)
openshift-node-1
SkyDNS
127.0.0.1:53
(TCP/UDP)
dnsmasq
172.24.0.13:53
(TCP/UDP)
dnsmasq
10.129.0.1:53
(TCP/UDP)
dnsmasq
172.17.0.1:53
(TCP/UDP)

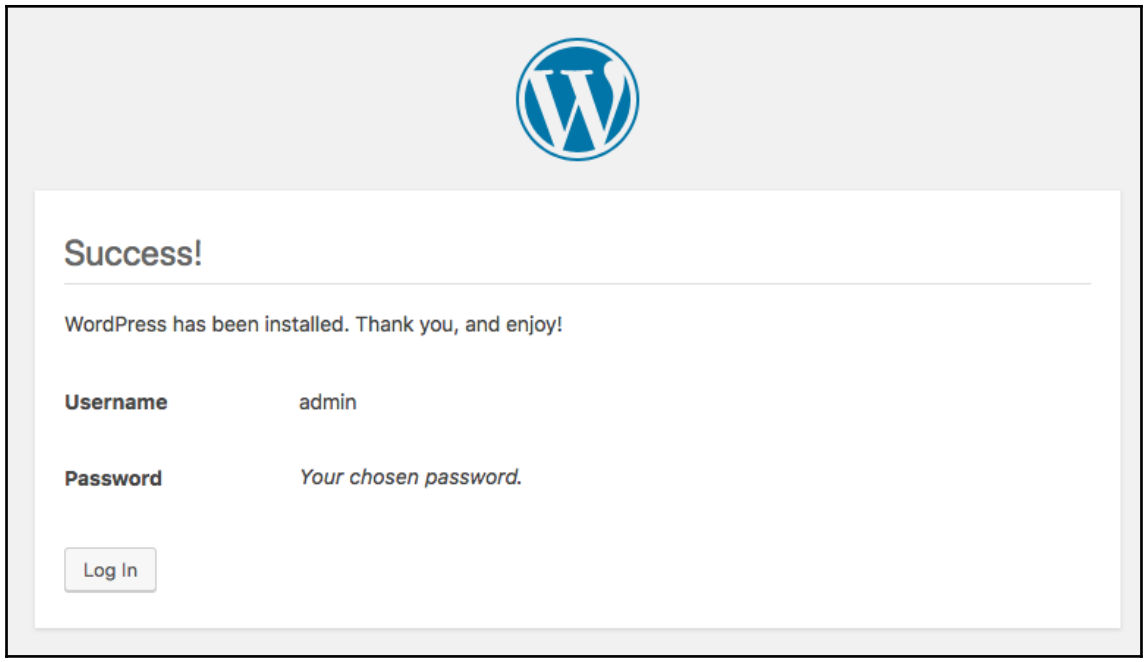

openshift-node-1
httpd
pod
cluster.local
in-addr.arpa
dnsmasq
Everything else
cluster.local
30.172.in-addr.arpa
SkyDNS
Everything else
svc.cluster.local
httpd
service
External DNS
VirtualBox
10.0.2.2

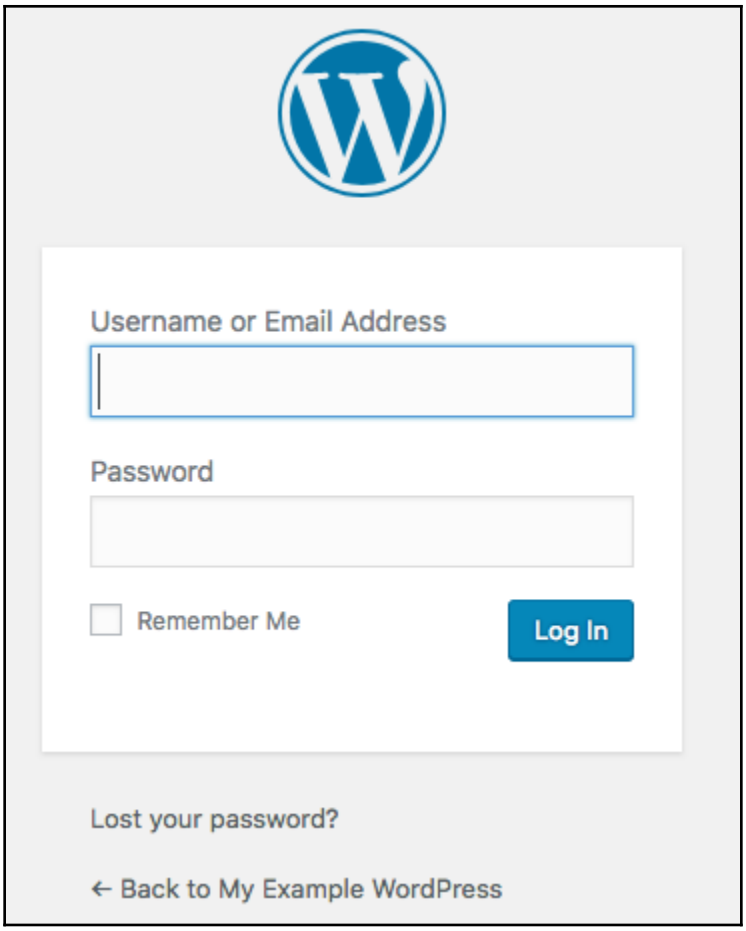
Chapter 13: Deploying Multi-Tier Applications Using Templates

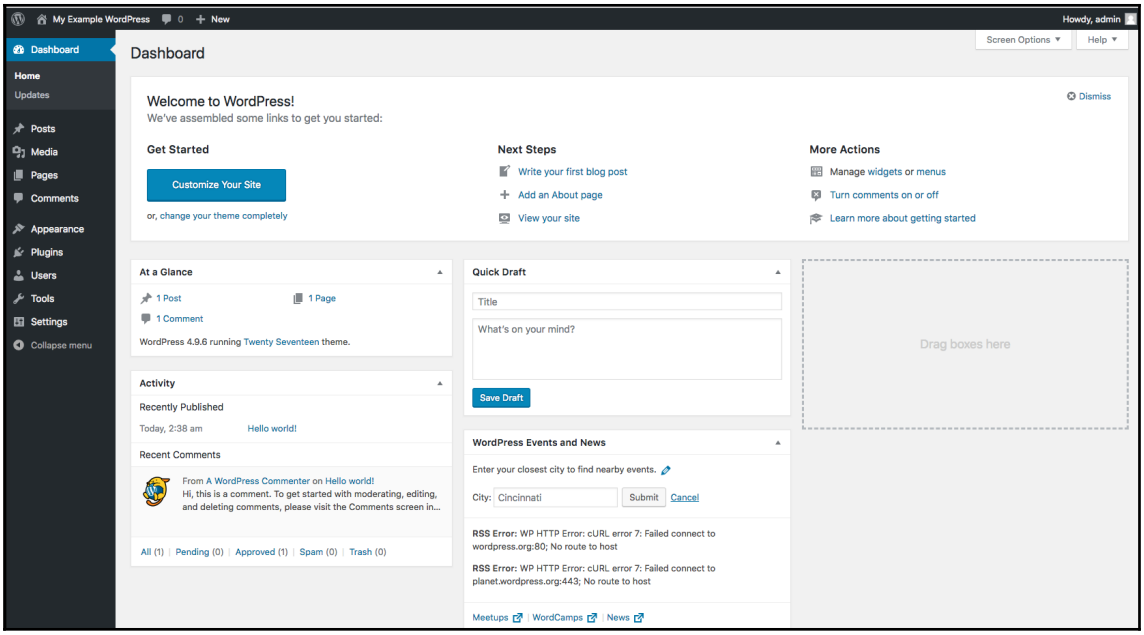


Chapter 16: Building a Multi-Tier Application from Source Code

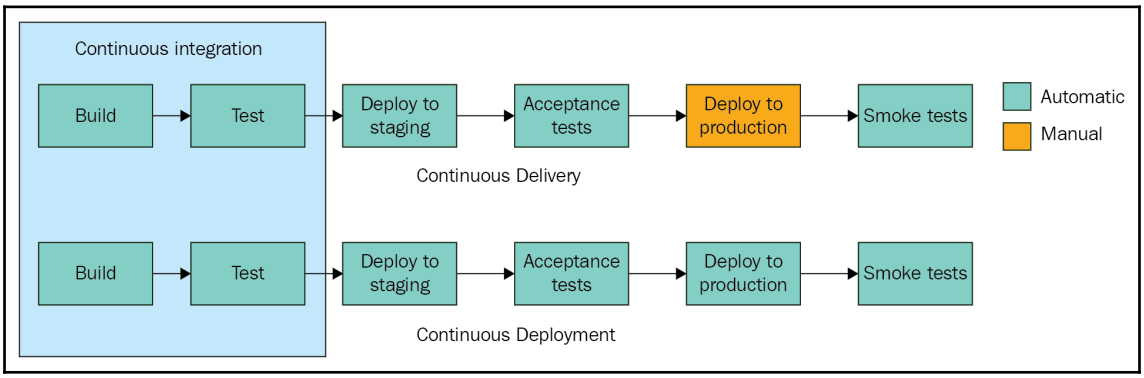


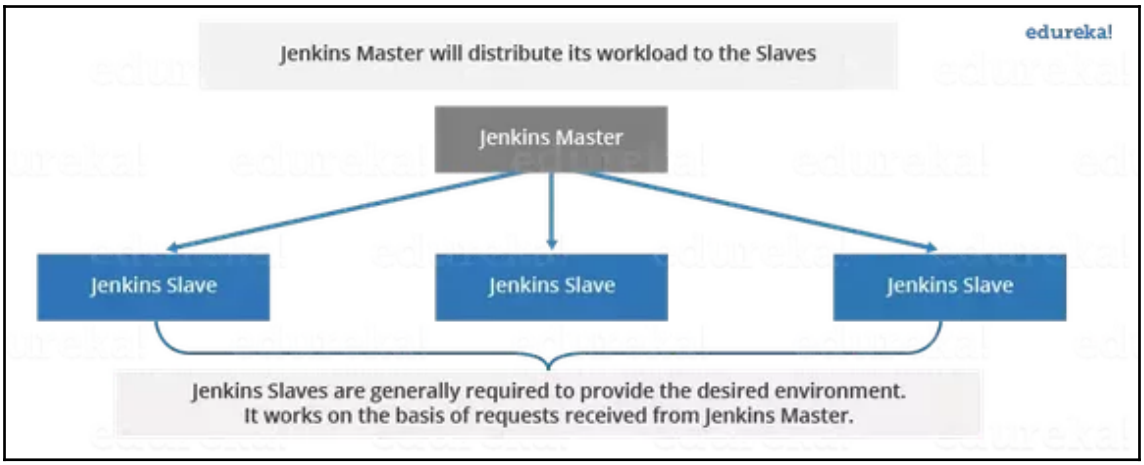

Success!
WordPress has been installed. Thank you, and enjoy!
Username
admin
Password
Your chosen password.
Log In

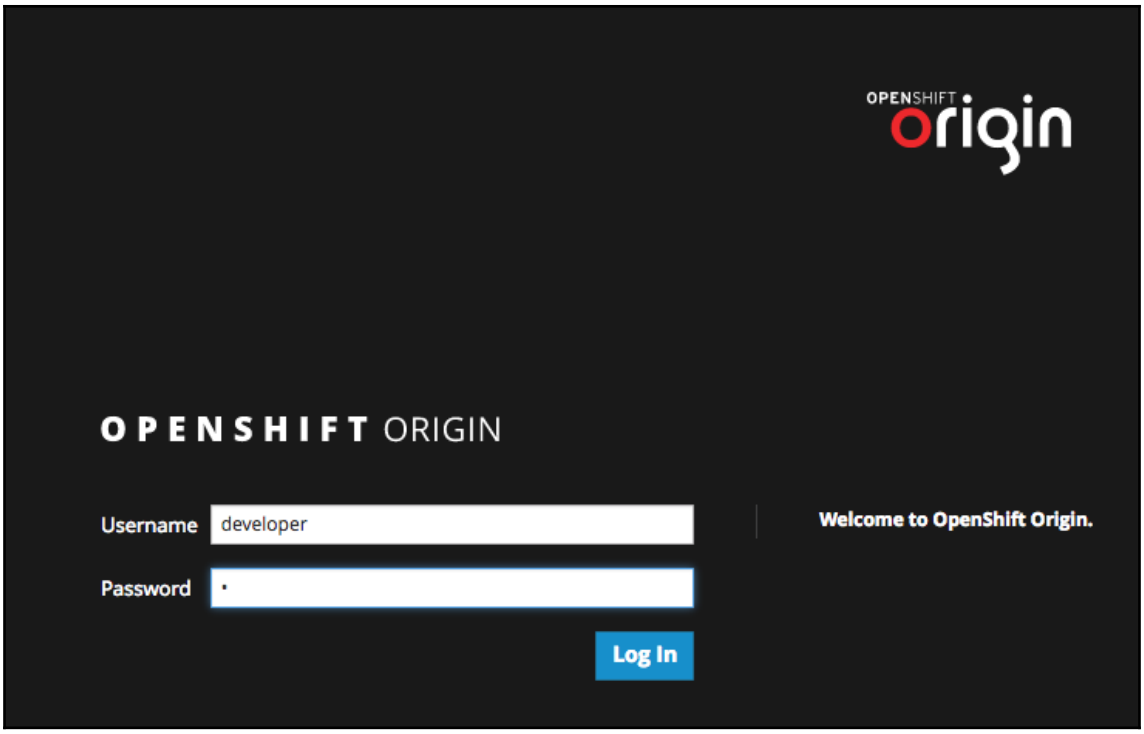

Username or Email Address
Password
Remember Me
Log In
Lost your password?
← Back to My Example WordPress

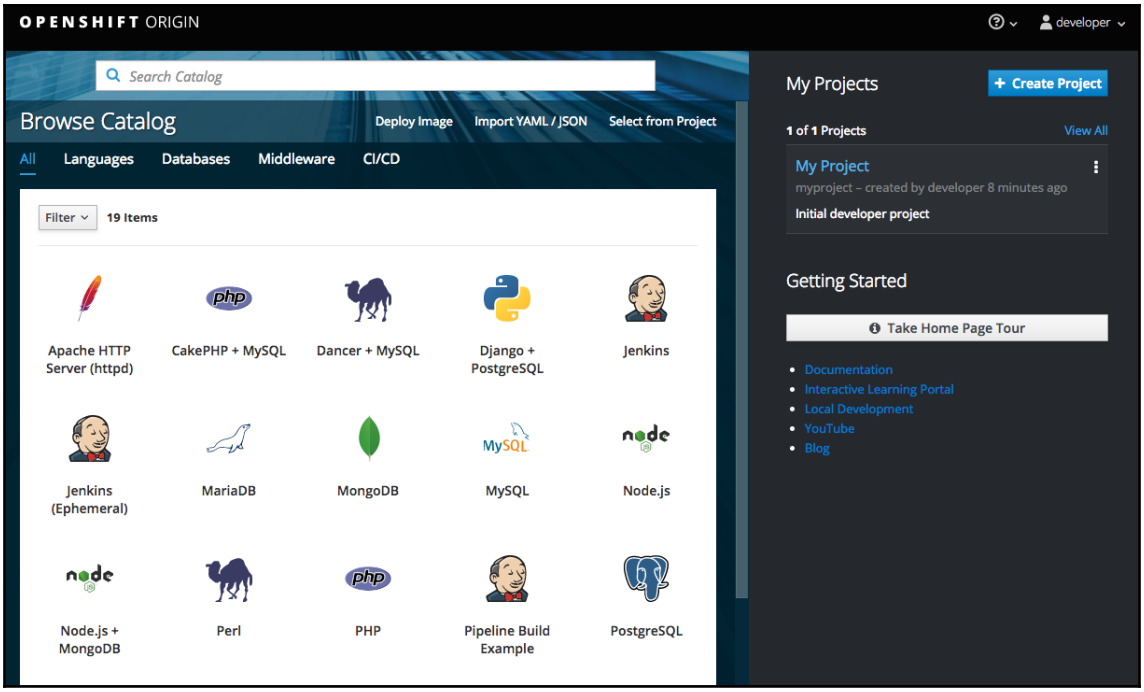

My Example WordPress
0
New
Howdy, admin
Screen Options
Help
Dashboard
Home
Updates
Posts
Media
Pages
Comments
Appearance
Plugins
Users
Tools
Settings
Collapse menu
Dashboard
Welcome to WordPress!
We've assembled some links to get you started:
Dismiss
Get Started
Customize Your Site
or, change your theme completely
Next Steps
Write your first blog post
Add an About page
View your site
More Actions
Manage widgets or menus
Turn comments on or off
Learn more about getting started
At a Glance
1 Post
1 Page
1 Comment
WordPress 4.9.6 running Twenty Seventeen theme.
Activity
Recently Published
Today, 2:38 am
Hello world!
Recent Comments
From A WordPress Commenter on Hello world!
Hi, this is a comment. To get started with moderating, editing, and deleting comments, please visit the Comments screen in...
All (1) | Pending (0) | Approved (1) | Spam (0) | Trash (0)
Quick Draft
Title
What's on your mind?
Save Draft
WordPress Events and News
Enter your closest city to find nearby events.
City: Cincinnati
Submit
Cancel
RSS Error: WP HTTP Error: cURL error 7: Failed connect to wordpress.org:80; No route to host
RSS Error: WP HTTP Error: cURL error 7: Failed connect to planet.wordpress.org:443; No route to host
Meetups | WordCamps | News
Drag boxes here

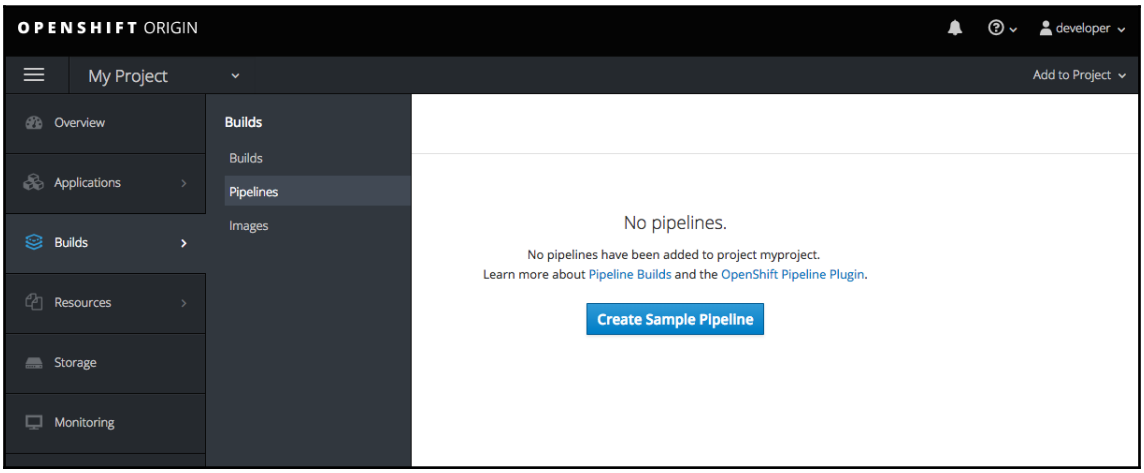
Chapter 17: CI/CD Pipelines in OpenShift

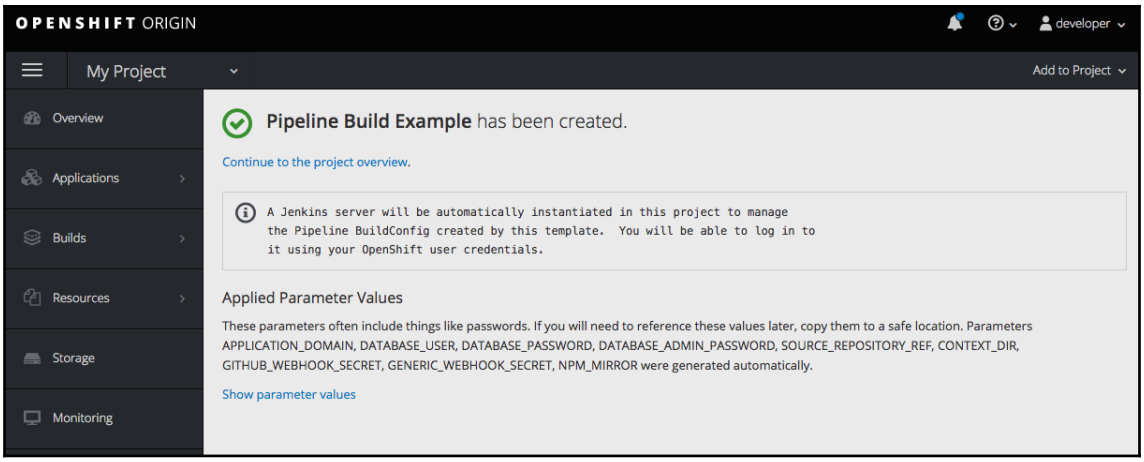


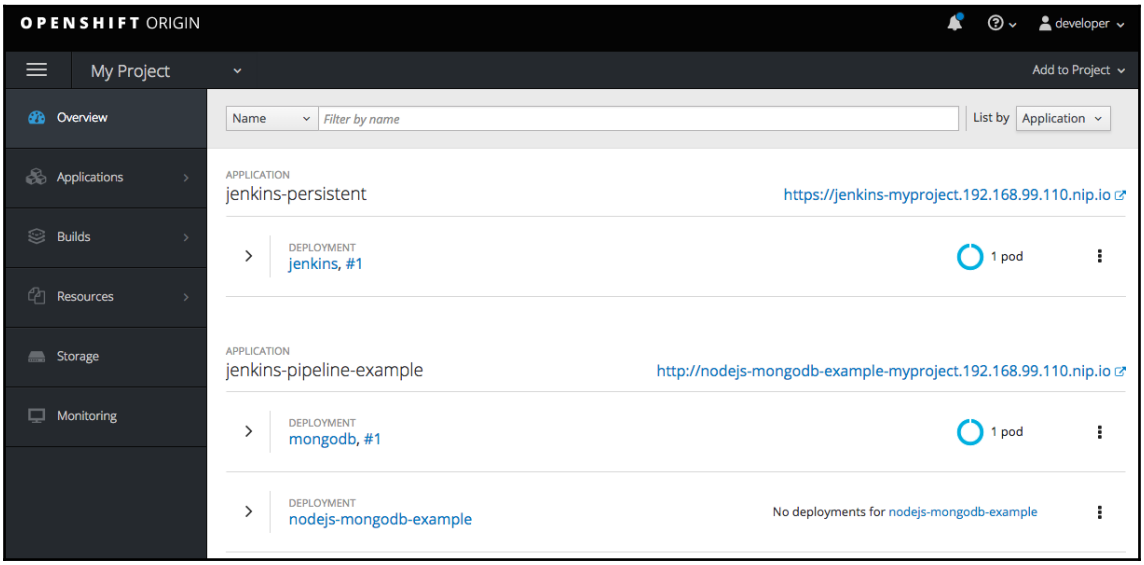


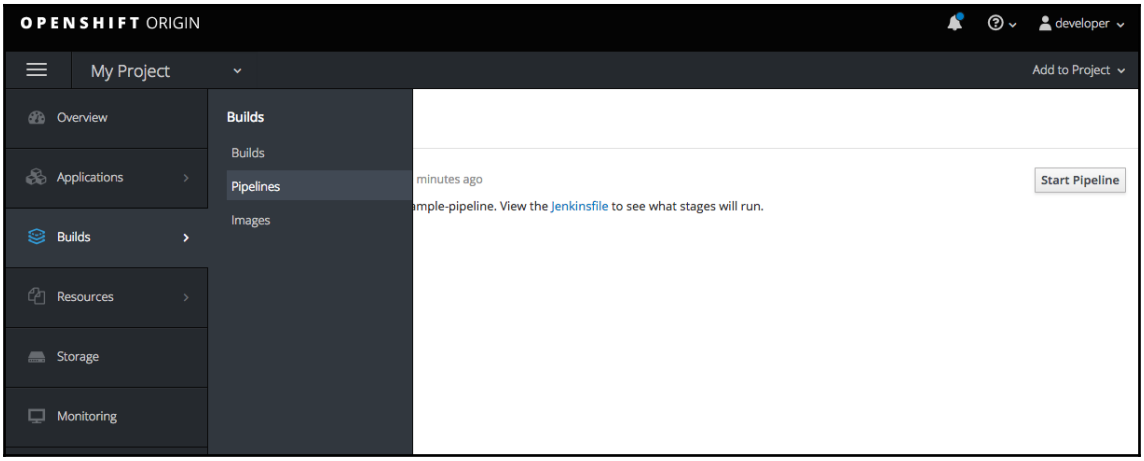

OPENSHIFT origin
OPENSHIFT ORIGIN
Username
developer
Password
Log In
Welcome to OpenShift Origin.

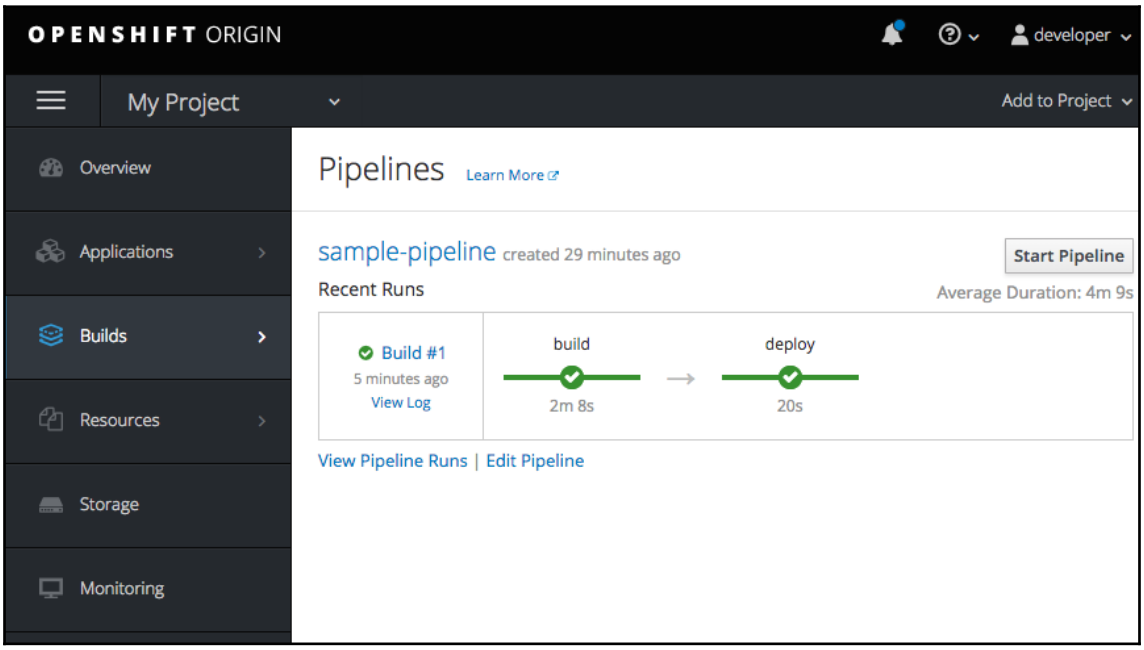

OPENSHIFT ORIGIN
developer
Search Catalog
Browse Catalog
Deploy Image
Import YAML / JSON
Select from Project
All
Languages
Databases
Middleware
CI/CD
Filter
19 Items
Apache HTTP Server (httpd)
CakePHP + MySQL
Dancer + MySQL
Django + PostgreSQL
Jenkins
Jenkins (Ephemeral)
MariaDB
MongoDB
MySQL
Node.js
Node.js + MongoDB
Perl
PHP
Pipeline Build Example
PostgreSQL
My Projects
+ Create Project
1 of 1 Projects
View All
My Project
myproject – created by developer 8 minutes ago
Initial developer project
Getting Started
Take Home Page Tour
Documentation
Interactive Learning Portal
Local Development
YouTube
Blog

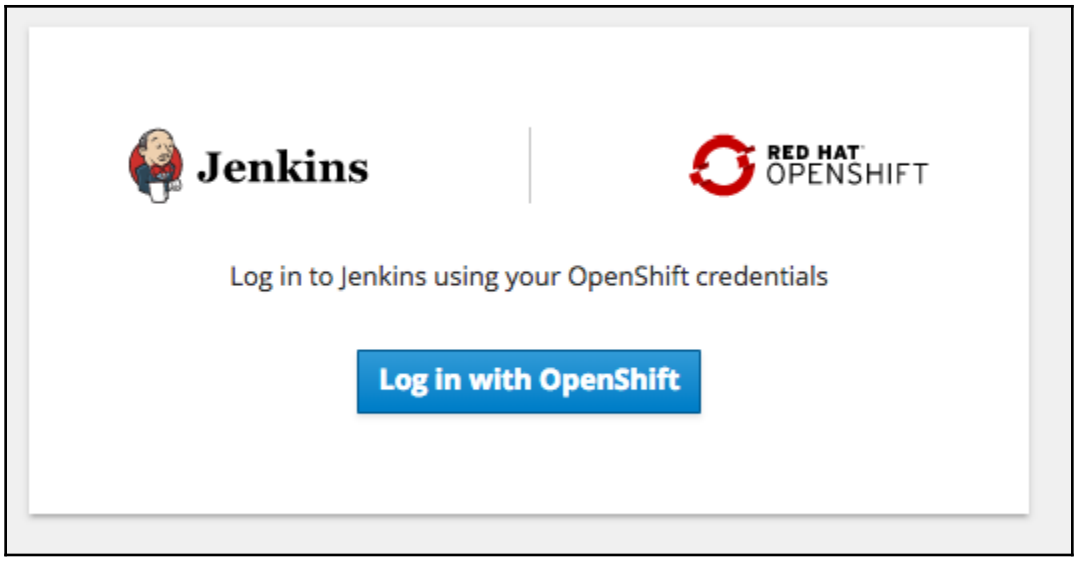

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Builds
Builds
Pipelines
Images
No pipelines.
No pipelines have been added to project myproject.
Learn more about Pipeline Builds and the OpenShift Pipeline Plugin.
Create Sample Pipeline

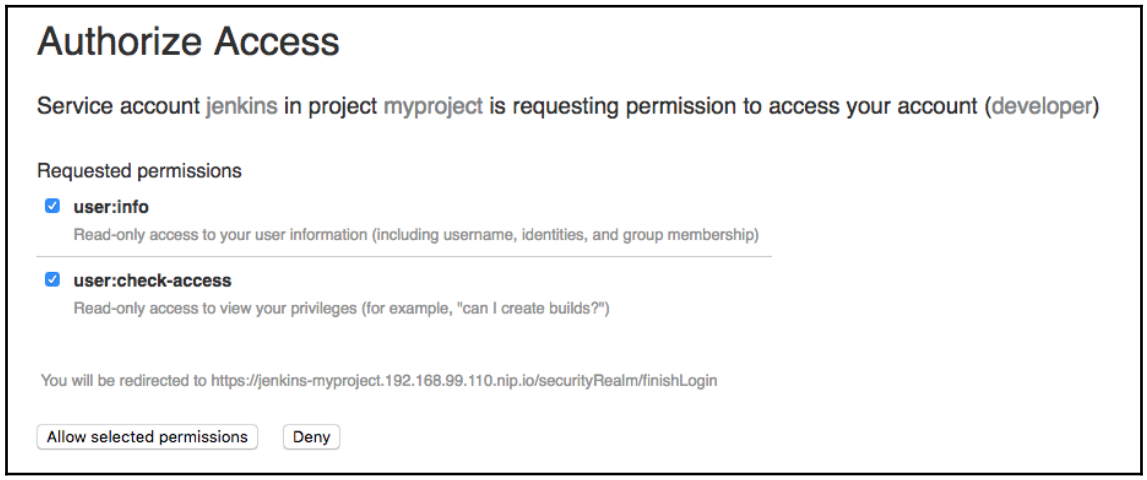

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Pipeline Build Example has been created.
Continue to the project overview.
A Jenkins server will be automatically instantiated in this project to manage
the Pipeline BuildConfig created by this template. You will be able to log in to
it using your OpenShift user credentials.
Applied Parameter Values
These parameters often include things like passwords. If you will need to reference these values later, copy them to a safe location. Parameters APPLICATION_DOMAIN, DATABASE_USER, DATABASE_PASSWORD, DATABASE_ADMIN_PASSWORD, SOURCE_REPOSITORY_REF, CONTEXT_DIR, GITHUB_WEBHOOK_SECRET, GENERIC_WEBHOOK_SECRET, NPM_MIRROR were generated automatically.
Show parameter values

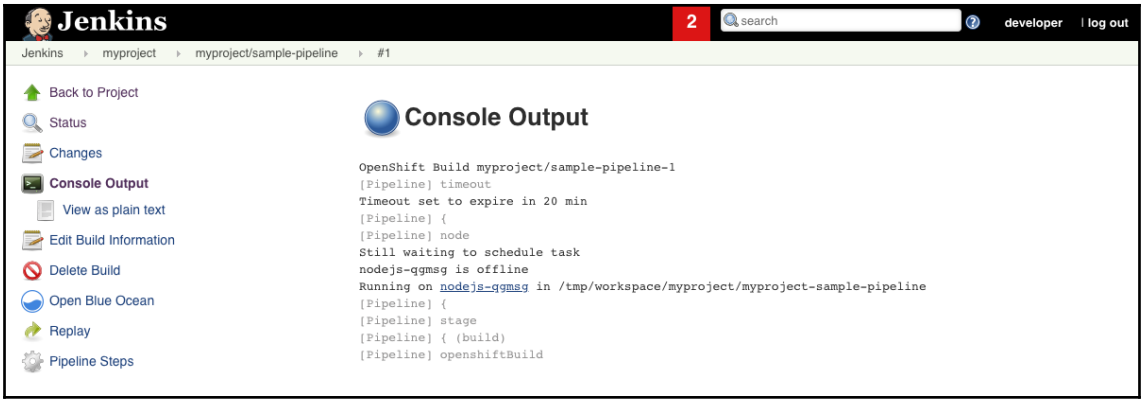

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Name
Filter by name
List by
Application
APPLICATION
jenkins-persistent
https://jenkins-myproject.192.168.99.110.nip.io
DEPLOYMENT
jenkins, #1
1 pod
APPLICATION
jenkins-pipeline-example
http://nodejs-mongodb-example-myproject.192.168.99.110.nip.io
DEPLOYMENT
mongodb, #1
1 pod
DEPLOYMENT
nodejs-mongodb-example
No deployments for nodejs-mongodb-example

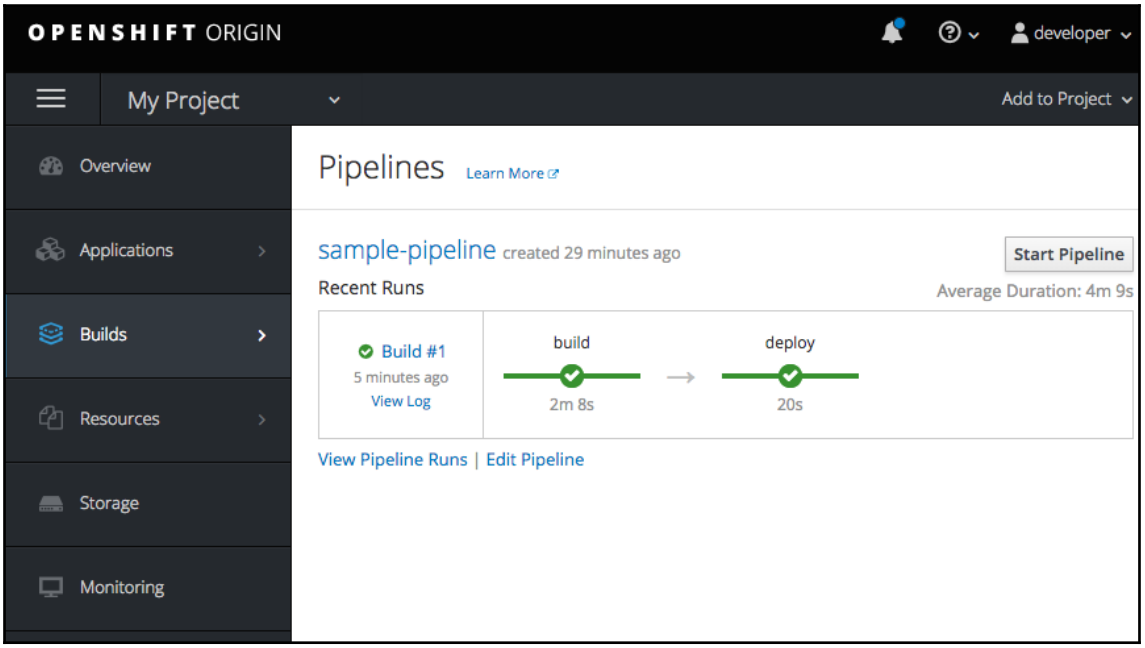

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Builds
Builds
Pipelines
Images
minutes ago
ample-pipeline. View the Jenkinsfile to see what stages will run.
Start Pipeline

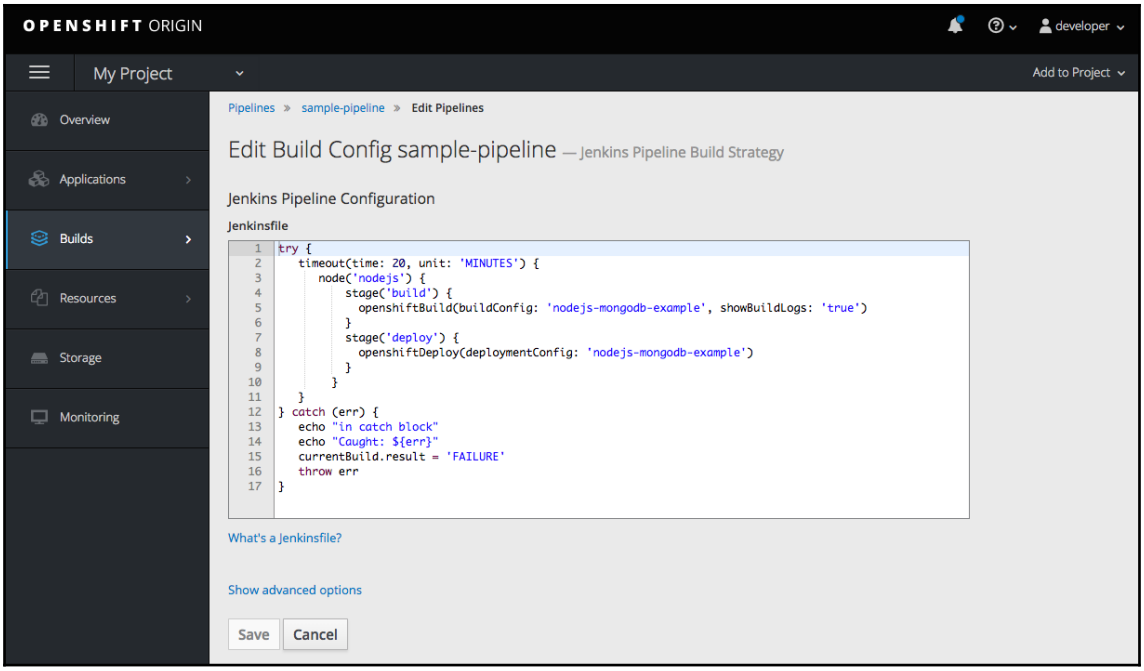

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Pipelines
Learn More
sample-pipeline created 29 minutes ago
Start Pipeline
Recent Runs
Average Duration: 4m 9s
Build #1
5 minutes ago
View Log
build
2m 8s
deploy
20s
View Pipeline Runs | Edit Pipeline

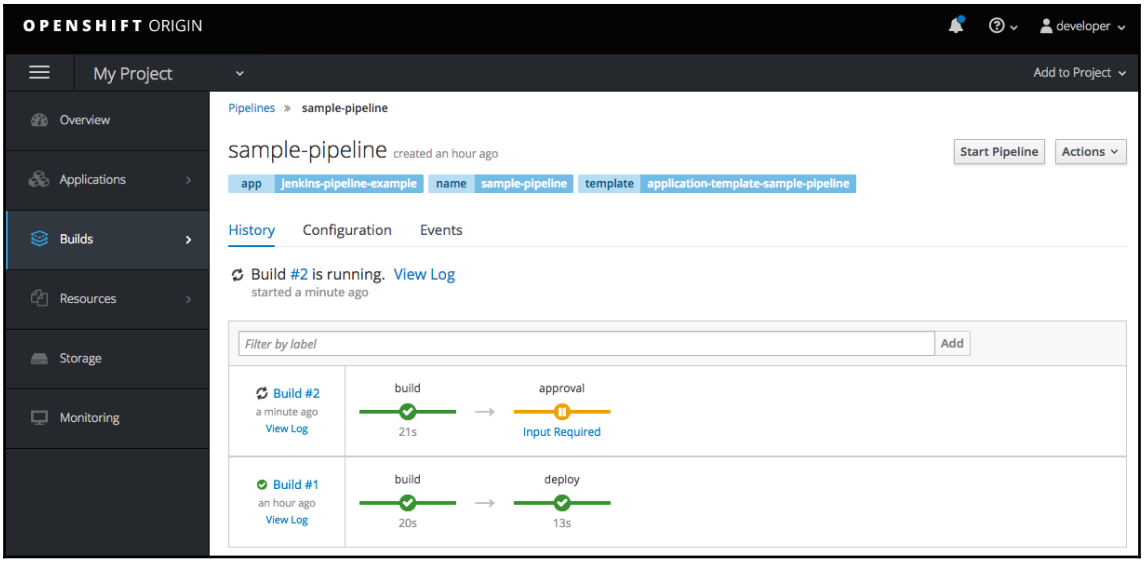

Jenkins
RED HAT OPENSHIFT
Log in to Jenkins using your OpenShift credentials
Log in with OpenShift

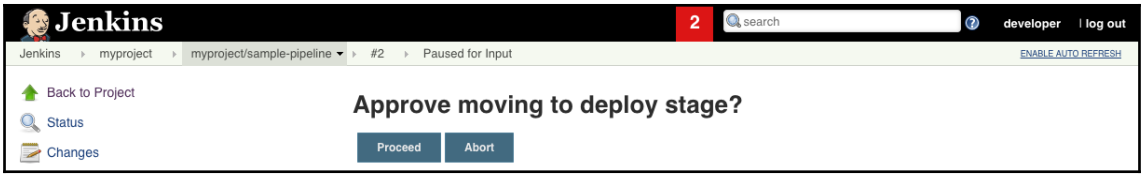

Authorize Access
Service account jenkins in project myproject is requesting permission to access your account (developer)
Requested permissions
user:info
Read-only access to your user information (including username, identities, and group membership)
user:check-access
Read-only access to view your privileges (for example, "can I create builds?")
You will be redirected to https://jenkins-myproject.192.168.99.110.nip.io/securityRealm/finishLogin
Allow selected permissions
Deny

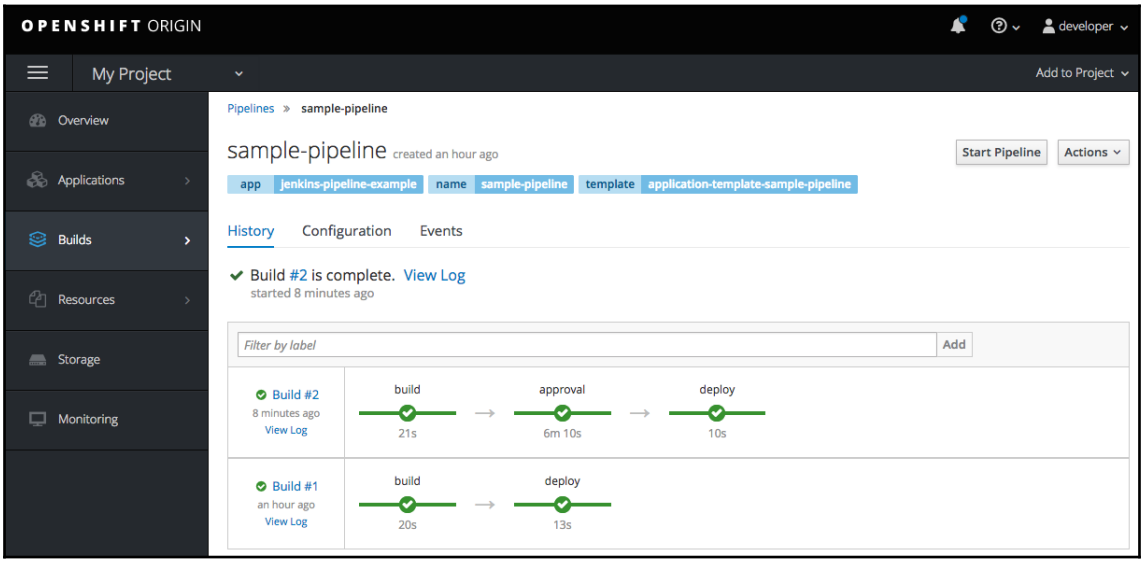

Jenkins
2
search
developer
log out
Jenkins
myproject
myproject/sample-pipeline
#1
Back to Project
Status
Changes
Console Output
View as plain text
Edit Build Information
Delete Build
Open Blue Ocean
Replay
Pipeline Steps
Console Output
OpenShift Build myproject/sample-pipeline-1
[Pipeline] timeout
Timeout set to expire in 20 min
[Pipeline] {
[Pipeline] node
Still waiting to schedule task
nodejs-qgmsg is offline
Running on nodejs-qgmsg in /tmp/workspace/myproject/myproject-sample-pipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (build)
[Pipeline] openshiftBuild

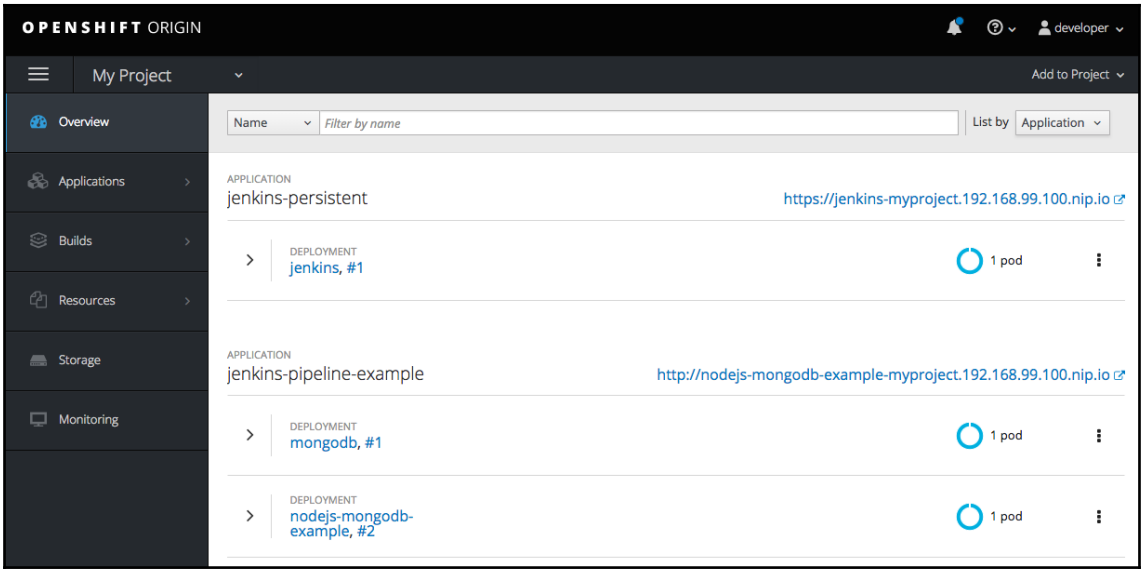

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Pipelines
Learn More
sample-pipeline created 29 minutes ago
Start Pipeline
Recent Runs
Average Duration: 4m 9s
Build #1
5 minutes ago
View Log
build
2m 8s
deploy
20s
View Pipeline Runs | Edit Pipeline


OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Pipelines » sample-pipeline » Edit Pipelines
Edit Build Config sample-pipeline — Jenkins Pipeline Build Strategy
Jenkins Pipeline Configuration
Jenkinsfile
try {
timeout(time: 20, unit: 'MINUTES') {
node('nodejs') {
stage('build') {
openshiftBuild(buildConfig: 'nodejs-mongodb-example', showBuildLogs: 'true')
}
stage('deploy') {
openshiftDeploy(deploymentConfig: 'nodejs-mongodb-example')
}
}
}
} catch (err) {
echo "in catch block"
echo "Caught: ${err}"
currentBuild.result = 'FAILURE'
throw err
}
What's a Jenkinsfile?
Show advanced options
Save
Cancel

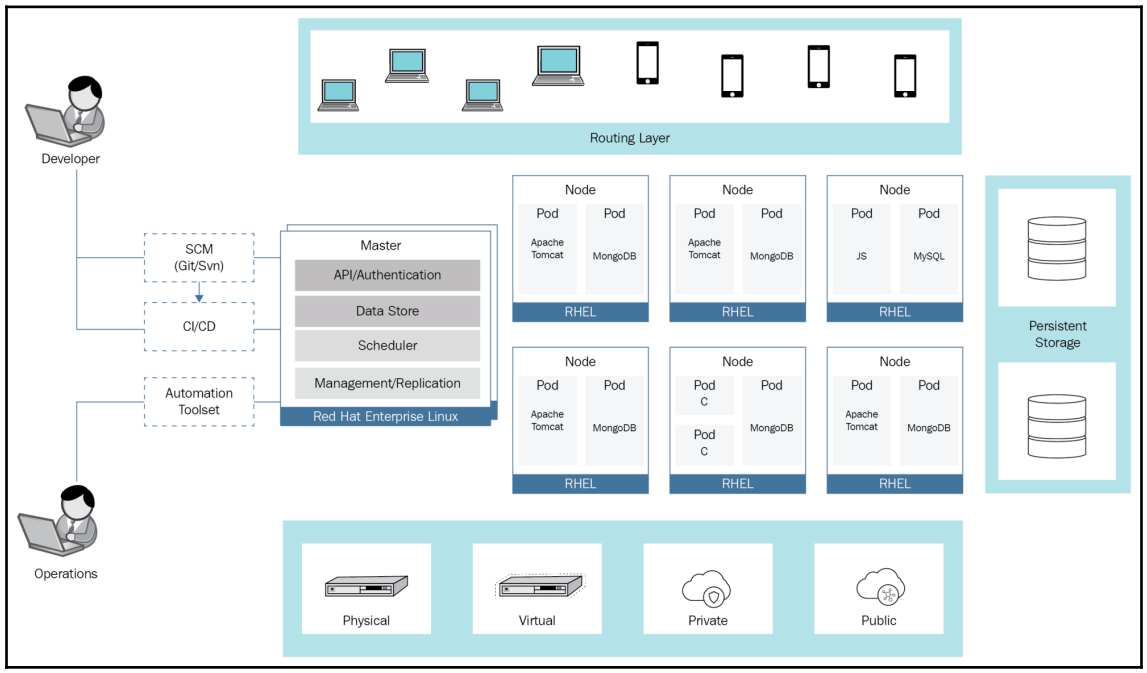

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Pipelines » sample-pipeline
sample-pipeline created an hour ago
Start Pipeline
Actions
app jenkins-pipeline-example
name sample-pipeline
template application-template-sample-pipeline
History
Configuration
Events
Build #2 is running. View Log
started a minute ago
Filter by label
Add
Build #2
a minute ago
View Log
build
21s
approval
Input Required
Build #1
an hour ago
View Log
build
20s
deploy
13s

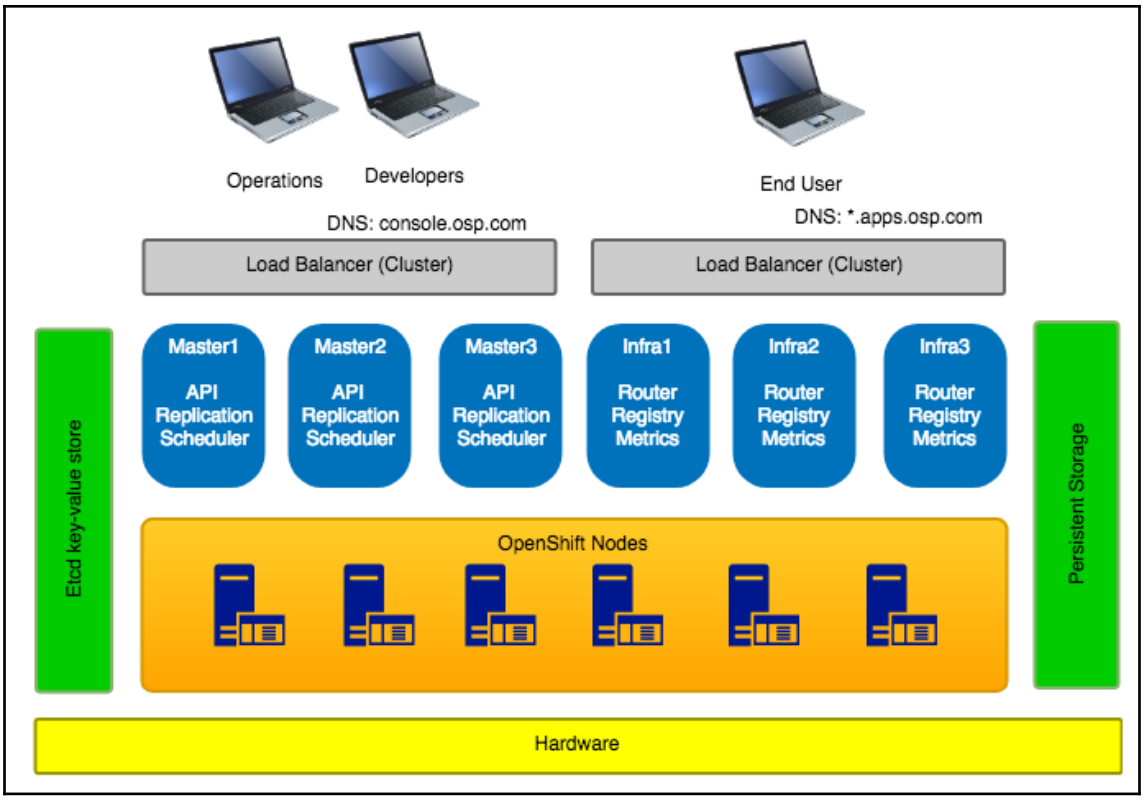

Jenkins
2
search
developer
log out
Jenkins
myproject
myproject/sample-pipeline
#2
Paused for Input
ENABLE AUTO REFRESH
Back to Project
Status
Changes
Approve moving to deploy stage?
Proceed
Abort

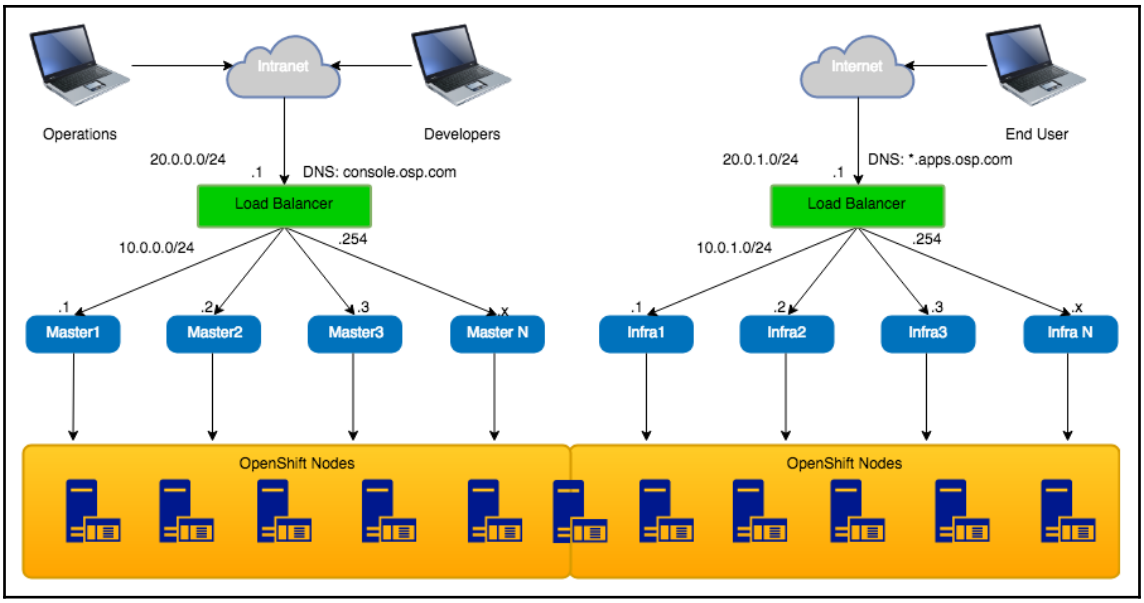

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Pipelines » sample-pipeline
sample-pipeline created an hour ago
Start Pipeline
Actions
app
jenkins-pipeline-example
name
sample-pipeline
template
application-template-sample-pipeline
History
Configuration
Events
Build #2 is complete. View Log
started 8 minutes ago
Filter by label
Add
Build #2
8 minutes ago
View Log
build
21s
approval
6m 10s
deploy
10s
Build #1
an hour ago
View Log
build
20s
deploy
13s

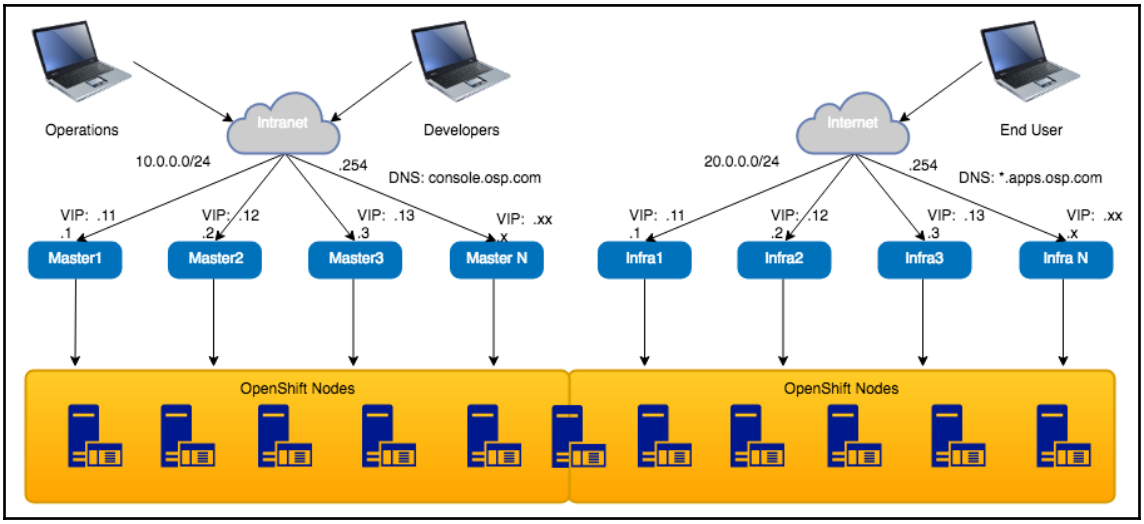

OPENSHIFT ORIGIN
developer
My Project
Add to Project
Overview
Applications
Builds
Resources
Storage
Monitoring
Name
Filter by name
List by
Application
APPLICATION
jenkins-persistent
https://jenkins-myproject.192.168.99.100.nip.io
DEPLOYMENT
jenkins, #1
1 pod
APPLICATION
jenkins-pipeline-example
http://nodejs-mongodb-example-myproject.192.168.99.100.nip.io
DEPLOYMENT
mongodb, #1
1 pod
DEPLOYMENT
nodejs-mongodb-example, #2
1 pod

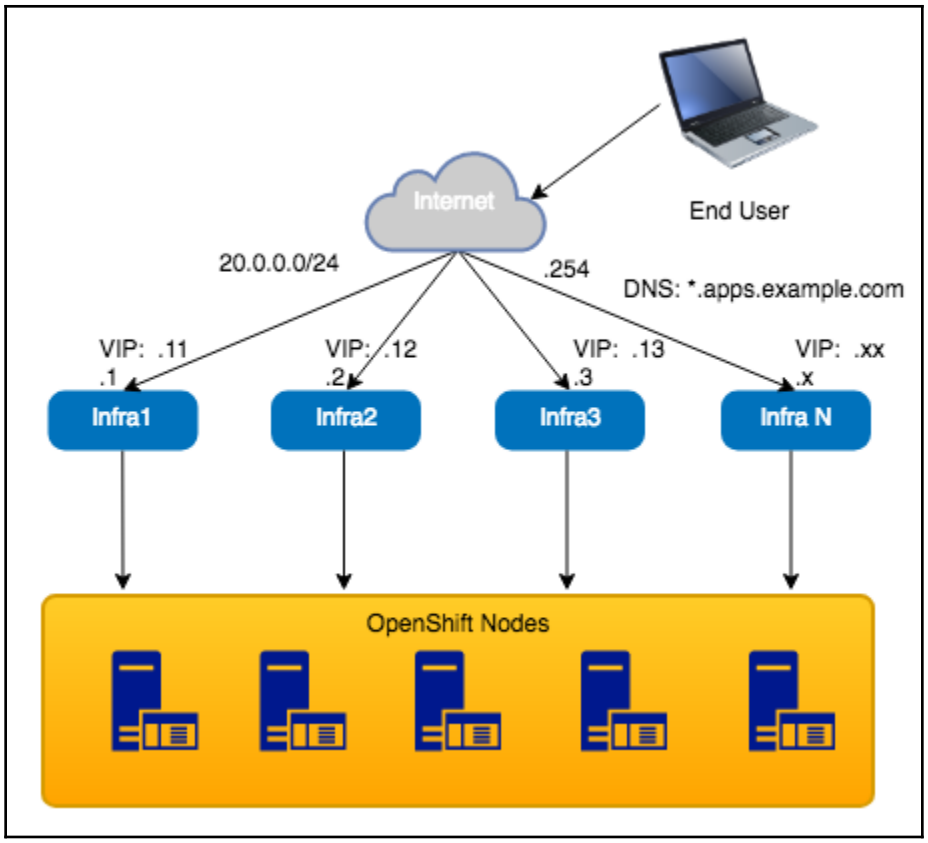
Chapter 18: OpenShift HA Architecture Overview



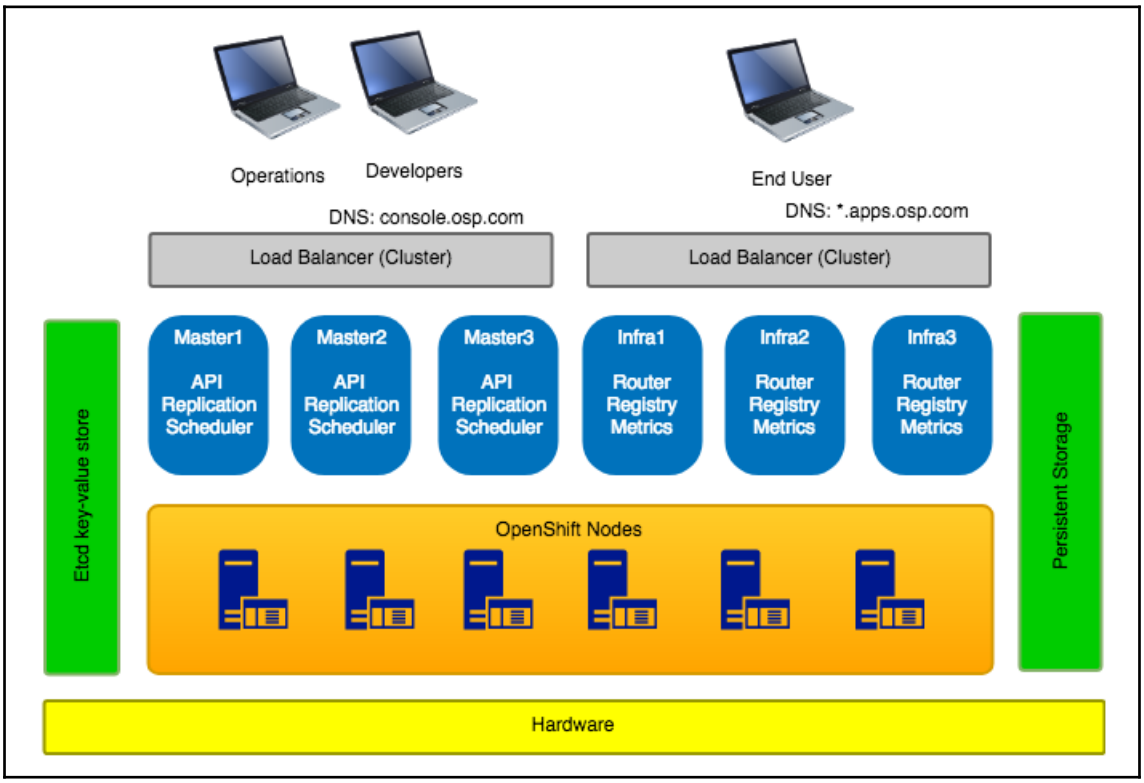

Operations
Developers
End User
DNS: console.osp.com
DNS: *.apps.osp.com
Load Balancer (Cluster)
Load Balancer (Cluster)
Etcd key-value store
Master1
API
Replication
Scheduler
Master2
API
Replication
Scheduler
Master3
API
Replication
Scheduler
Infra1
Router
Registry
Metrics
Infra2
Router
Registry
Metrics
Infra3
Router
Registry
Metrics
Persistent Storage
OpenShift Nodes
Hardware

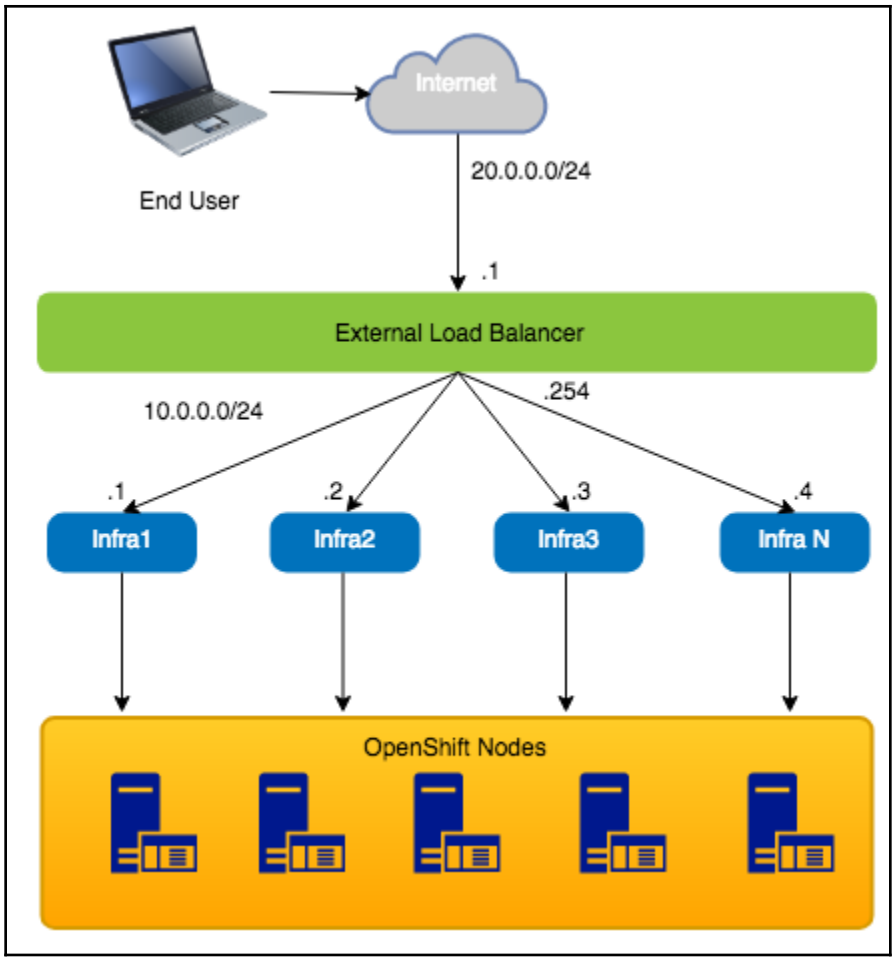

Intranet
Operations
Developers
20.0.0.0/24
.1
DNS: console.osp.com
Load Balancer
10.0.0.0/24
.254
.1
.2
.3
.x
Master1
Master2
Master3
Master N
OpenShift Nodes
Internet
End User
20.0.1.0/24
.1
DNS: *.apps.osp.com
Load Balancer
10.0.1.0/24
.254
.1
.2
.3
.x
Infra1
Infra2
Infra3
Infra N
OpenShift Nodes

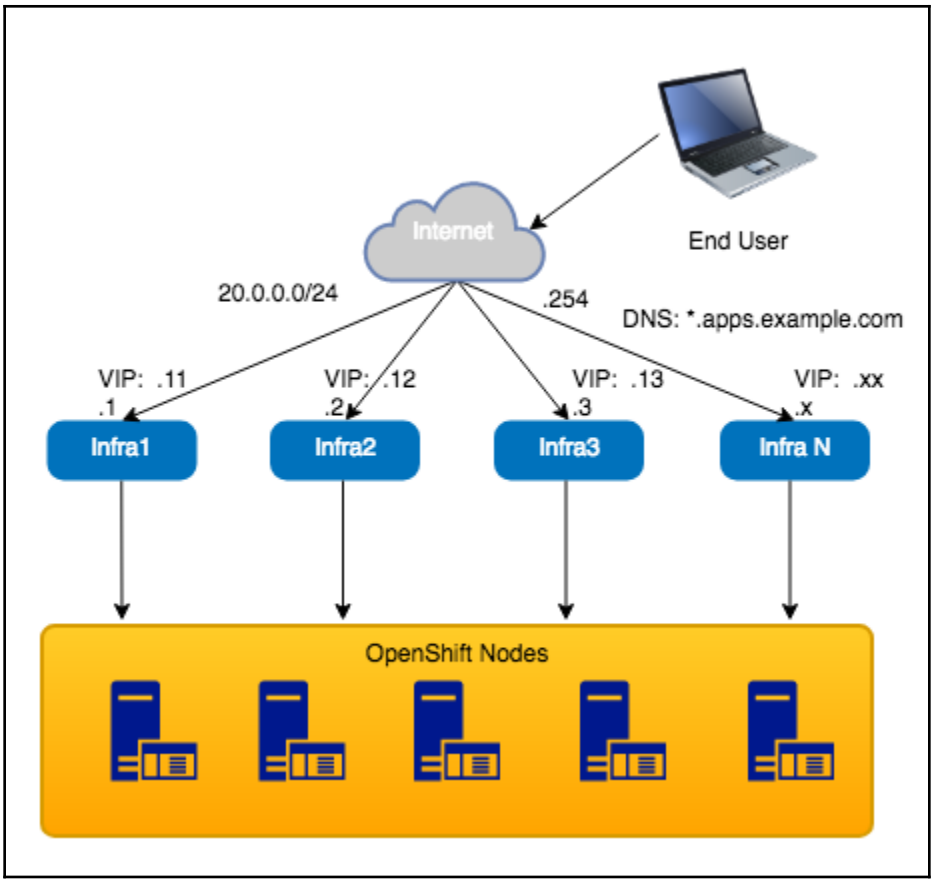

Intranet
Operations
Developers
10.0.0.0/24
.254
DNS: console.osp.com
VIP: .11
.1
VIP: .12
.2
VIP: .13
.3
VIP: .xx
.x
Master1
Master2
Master3
Master N
OpenShift Nodes
Internet
End User
20.0.0.0/24
.254
DNS: *.apps.osp.com
VIP: .11
.1
VIP: .12
.2
VIP: .13
.3
VIP: .xx
.x
Infra1
Infra2
Infra3
Infra N
OpenShift Nodes

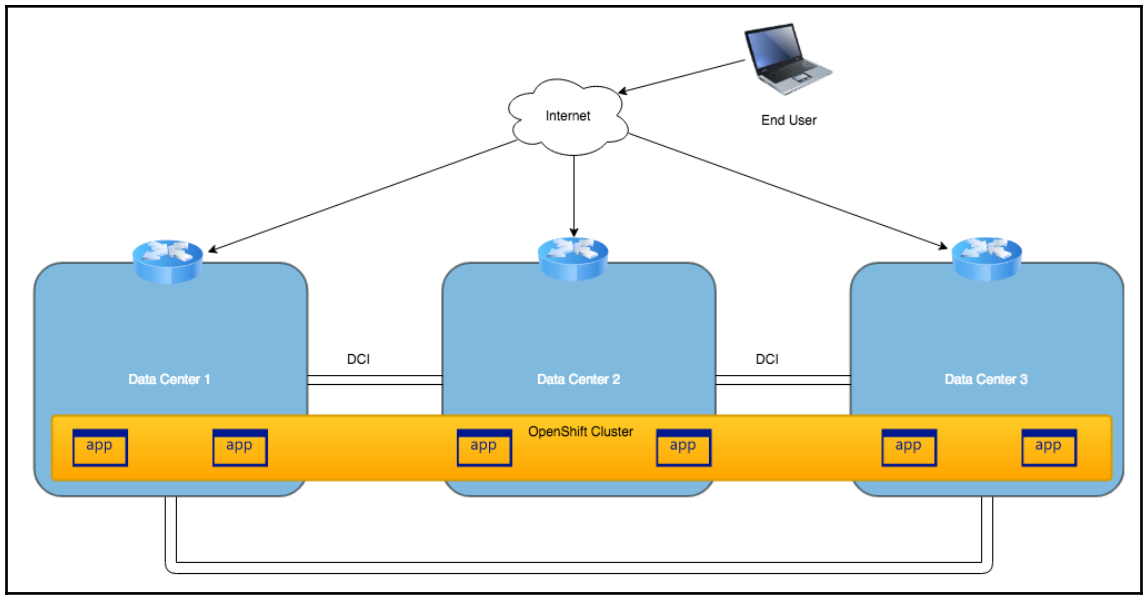

Internet
End User
20.0.0.0/24
.254
DNS: *.apps.example.com
VIP: .11
.1
VIP: .12
.2
VIP: .13
.3
VIP: .xx
.x
Infra1
Infra2
Infra3
Infra N
OpenShift Nodes

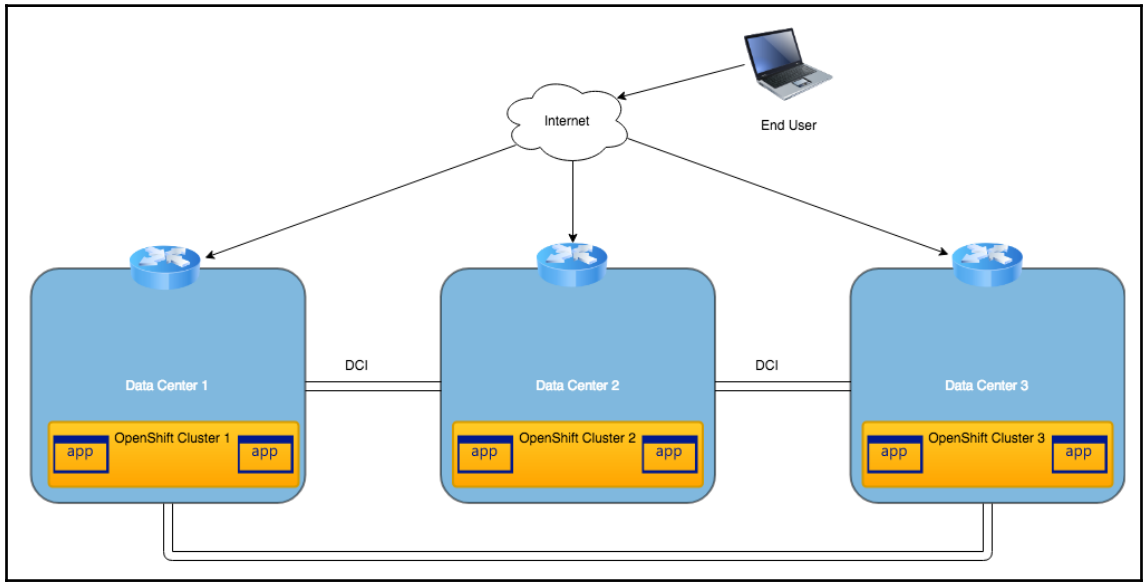
Chapter 19: OpenShift HA Design for Single and Multiple DCs

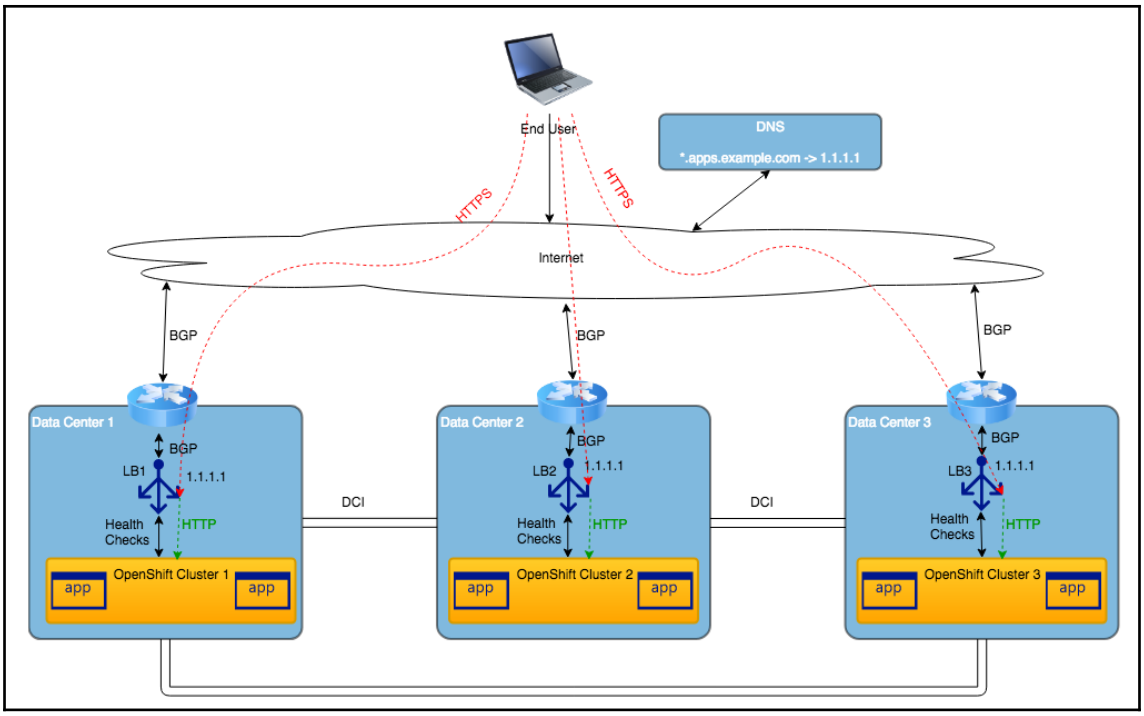


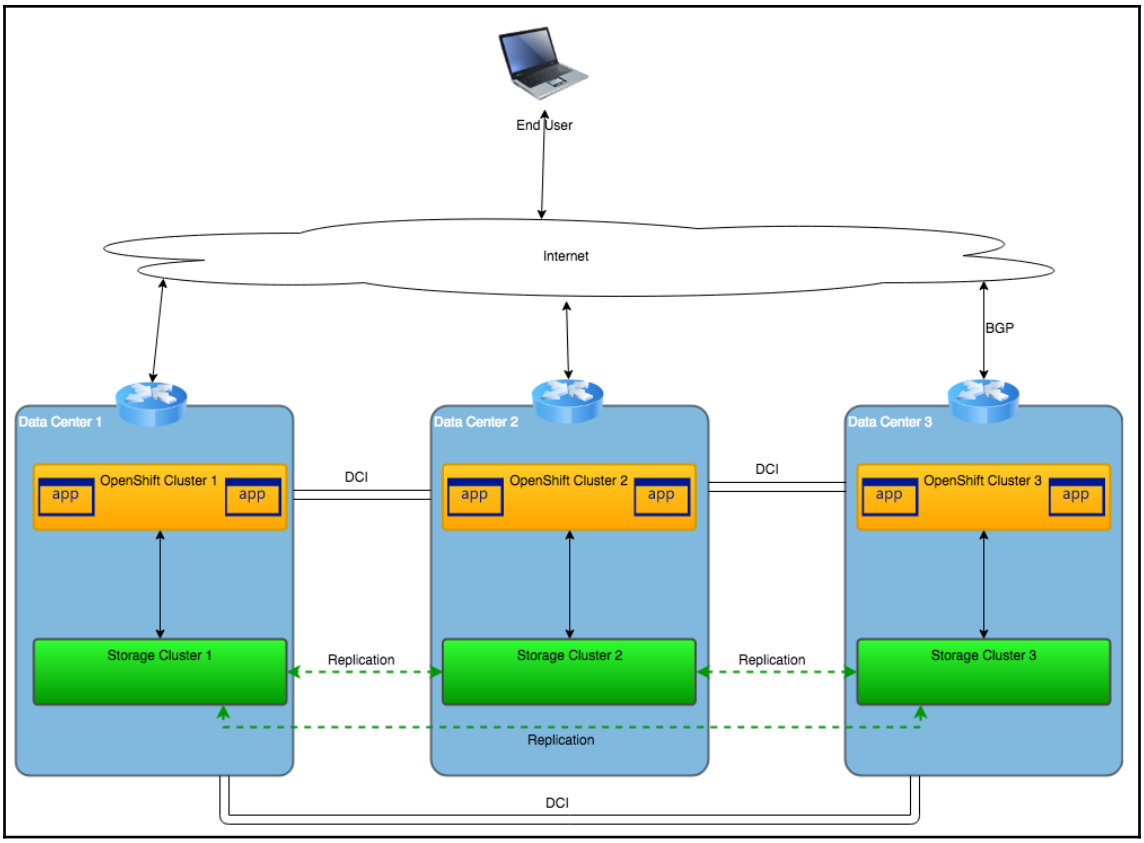

Internet
End User
20.0.0.0/24
.1
External Load Balancer
10.0.0.0/24
.254
.1
.2
.3
.4
Infra1
Infra2
Infra3
Infra N
OpenShift Nodes

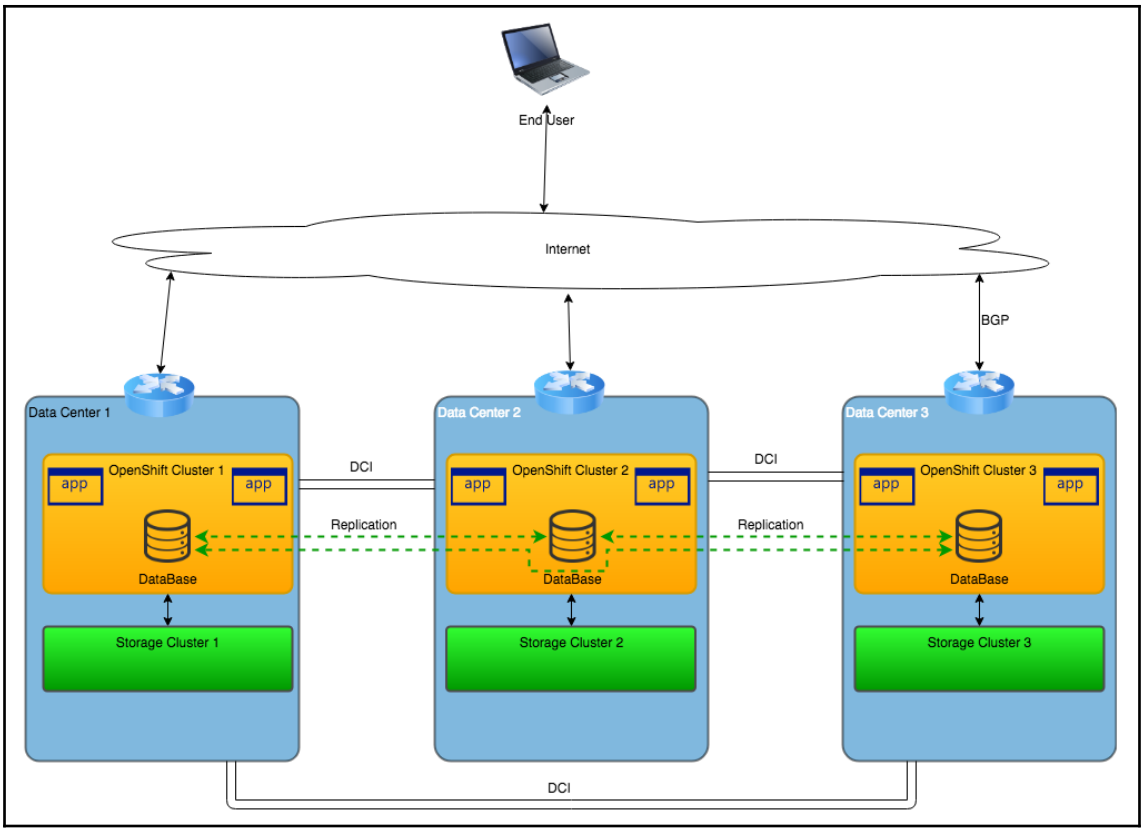

Internet
End User
20.0.0.0/24
.254
DNS: *.apps.example.com
VIP: .11
.1
VIP: .12
.2
VIP: .13
.3
VIP: .xx
.x
Infra1
Infra2
Infra3
Infra N
OpenShift Nodes

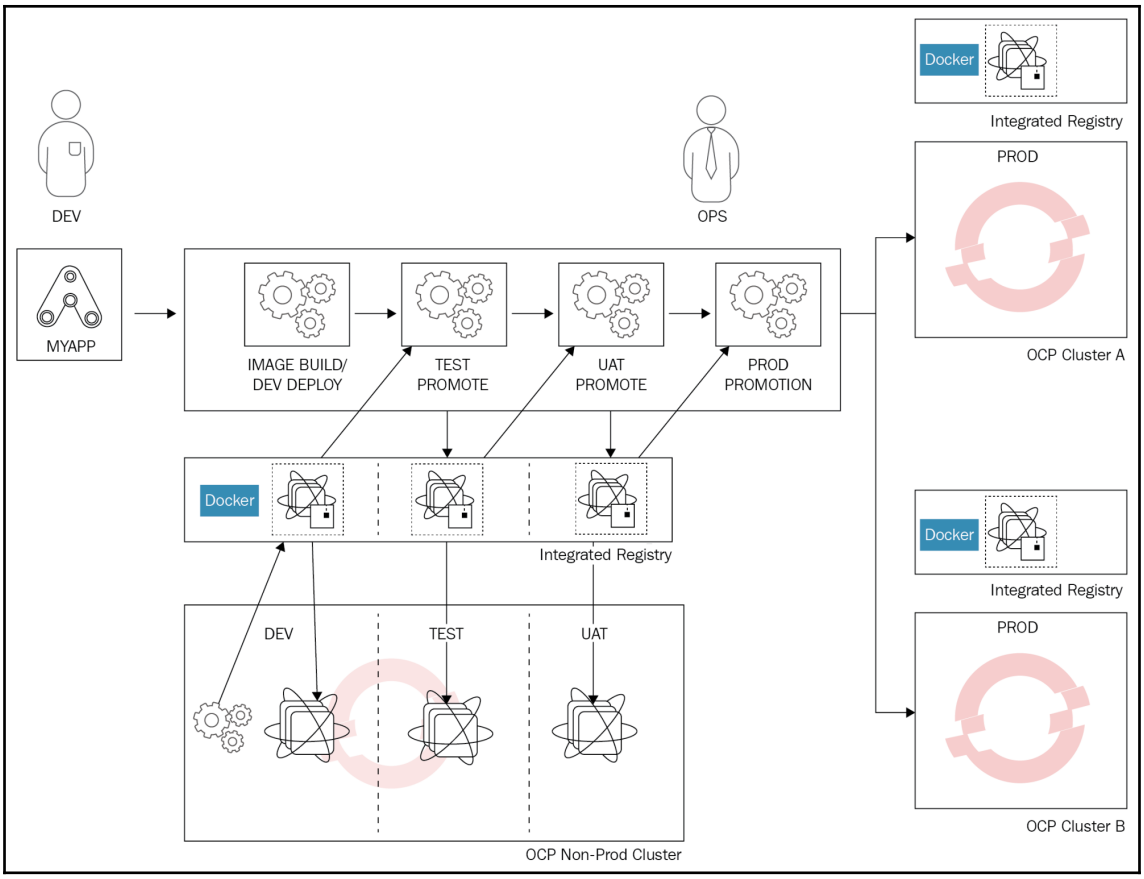

Internet
End User
Data Center 1
DCI
Data Center 2
DCI
Data Center 3
app
app
app
OpenShift Cluster
app
app
app


Internet
End User
Data Center 1
DCI
Data Center 2
DCI
Data Center 3
app
OpenShift Cluster 1
app
app
OpenShift Cluster 2
app
app
OpenShift Cluster 3
app

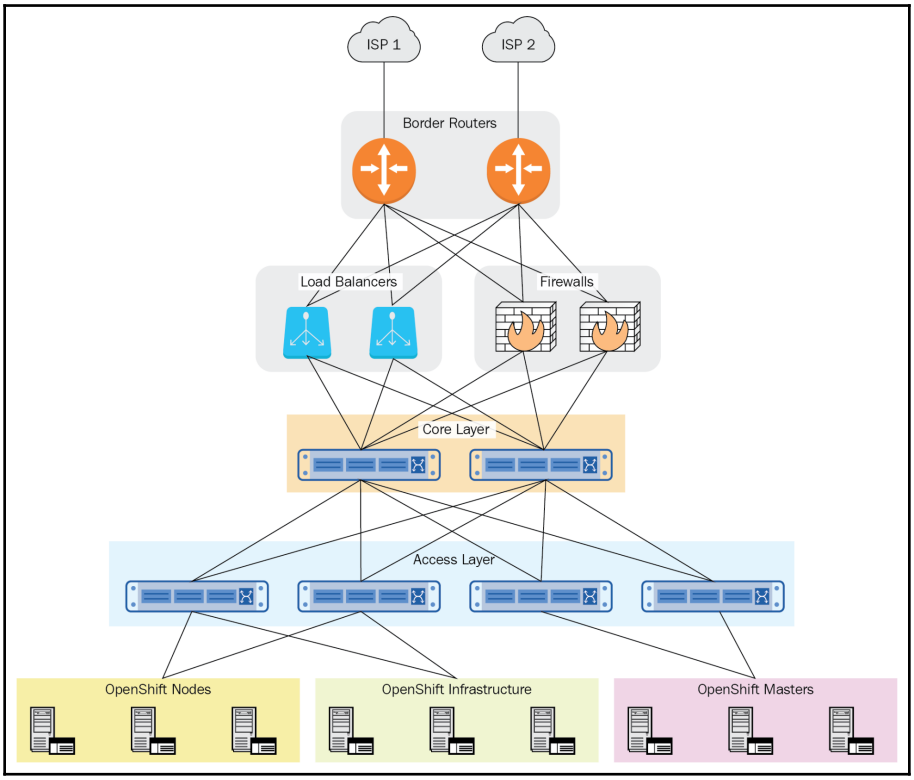

End User
DNS
*.apps.example.com -> 1.1.1.1
HTTPS
HTTPS
Internet
BGP
BGP
BGP
Data Center 1
BGP
LB1
1.1.1.1
Health Checks
HTTP
app
OpenShift Cluster 1
app
DCI
Data Center 2
BGP
LB2
1.1.1.1
Health Checks
HTTP
app
OpenShift Cluster 2
app
DCI
Data Center 3
BGP
LB3
1.1.1.1
Health Checks
HTTP
app
OpenShift Cluster 3
app

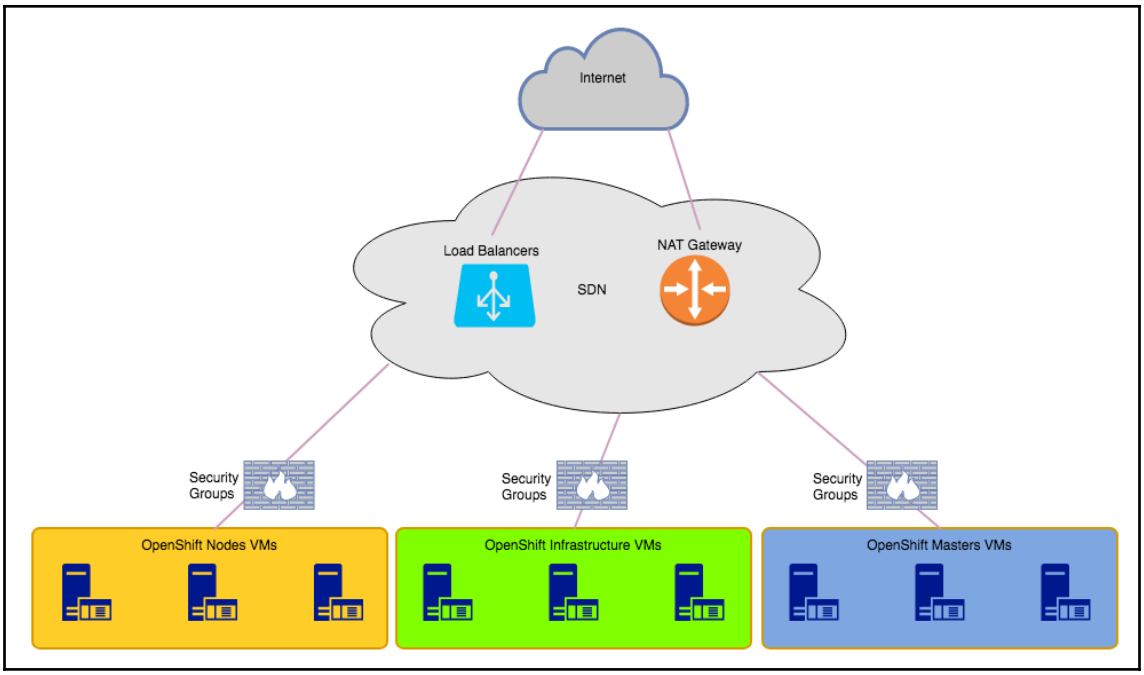

End User
Internet
BGP
Data Center 1
OpenShift Cluster 1
app
app
DCI
Storage Cluster 1
Replication
Data Center 2
OpenShift Cluster 2
app
app
DCI
Storage Cluster 2
Replication
Data Center 3
OpenShift Cluster 3
app
app
Storage Cluster 3
Replication
DCI


End User
Internet
BGP
Data Center 1
Data Center 2
Data Center 3
OpenShift Cluster 1
OpenShift Cluster 2
OpenShift Cluster 3
app
app
app
app
app
app
DCI
DCI
Replication
Replication
DataBase
DataBase
DataBase
Storage Cluster 1
Storage Cluster 2
Storage Cluster 3
DCI


Docker
Integrated Registry
DEV
OPS
PROD
MYAPP
IMAGE BUILD/
DEV DEPLOY
TEST
PROMOTE
UAT
PROMOTE
PROD
PROMOTION
OCP Cluster A
Docker
Integrated Registry
Docker
Integrated Registry
DEV
TEST
UAT
PROD
OCP Non-Prod Cluster
OCP Cluster B

Chapter 20: Network Design for OpenShift HA




Internet
Load Balancers
SDN
NAT Gateway
Security Groups
Security Groups
Security Groups
OpenShift Nodes VMs
OpenShift Infrastructure VMs
OpenShift Masters VMs