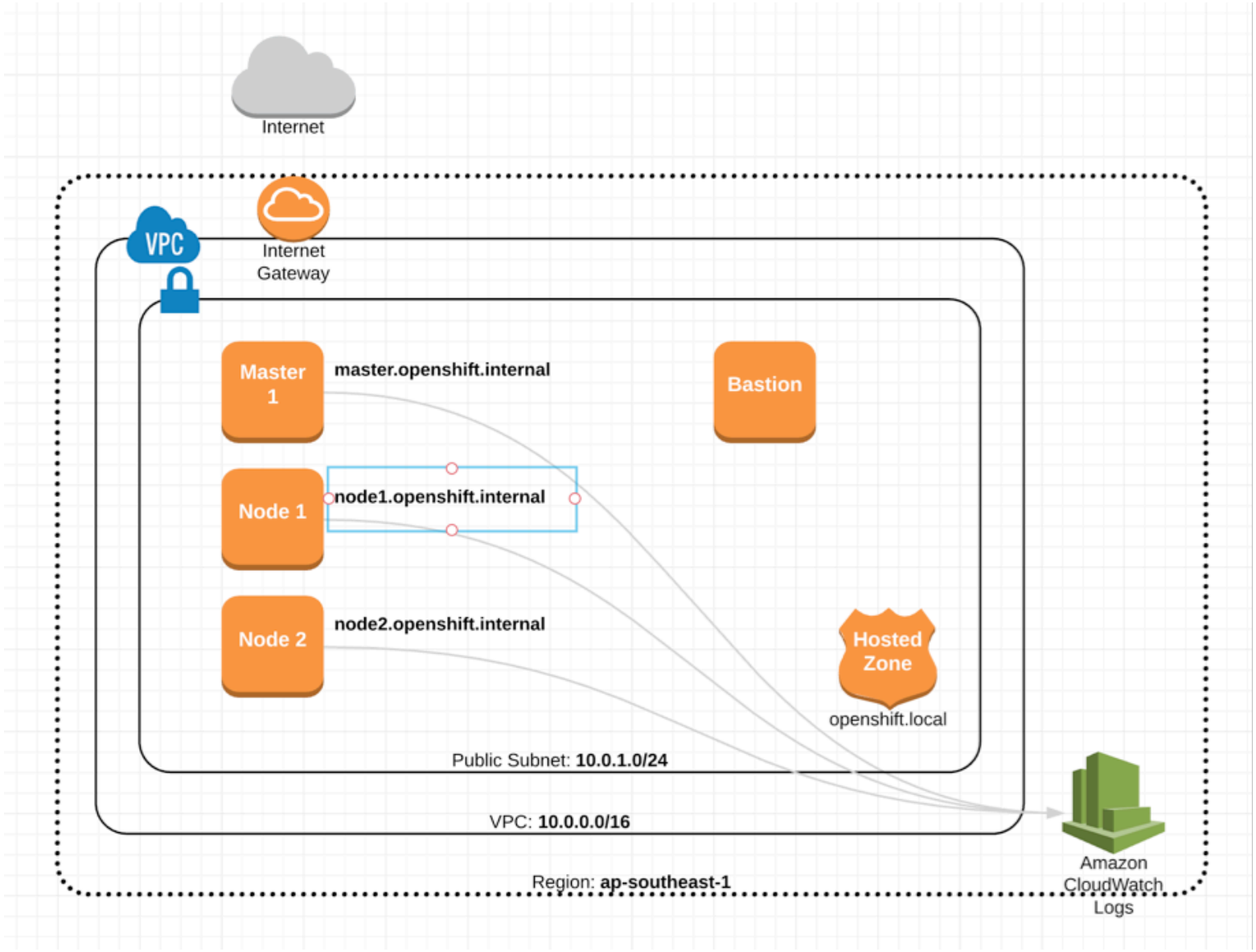
# OpenShift on AWS using Terraform

This project shows you how to set up OpenShift Origin on AWS using Terraform. This the companion project to my article [Creating a Resilient Consul Cluster for Docker Microservice Discovery with Terraform and AWS].

## Overview

Terraform is used to create infrastructure as shown:



Once the infrastructure is set up an inventory of the system is dynamically created, which is used to install the OpenShift Origin platform on the hosts.

## Prerequisites

You need:

1. Terraform - brew update && brew install terraform
2. An AWS account, configured with the cli locally - brew install awscli && aws configure

## Creating the Cluster

Create the infrastructure first:

```
# Get the modules, create the infrastructure.
terraform get && terraform apply
```

You will be asked for a region to deploy in, use us-east-1 or your preferred region. You can configure the nuances of how the cluster is created in the main.tf file. Once created, you will see a message like:

```
$ terraform apply
var.region
  Region to deploy the cluster into

  Enter a value: ap-southeast-1

...

Apply complete! Resources: 20 added, 0 changed, 0 destroyed.
```

That's it! The infrastructure is ready and you can install OpenShift. Leave about five minutes for everything to start up fully.

## Installing OpenShift

Make sure you have your local identity added:

```
$ ssh-add ~/.ssh/id_rsa
```

Then create the inventory, copy it to the bastion and run the install script:

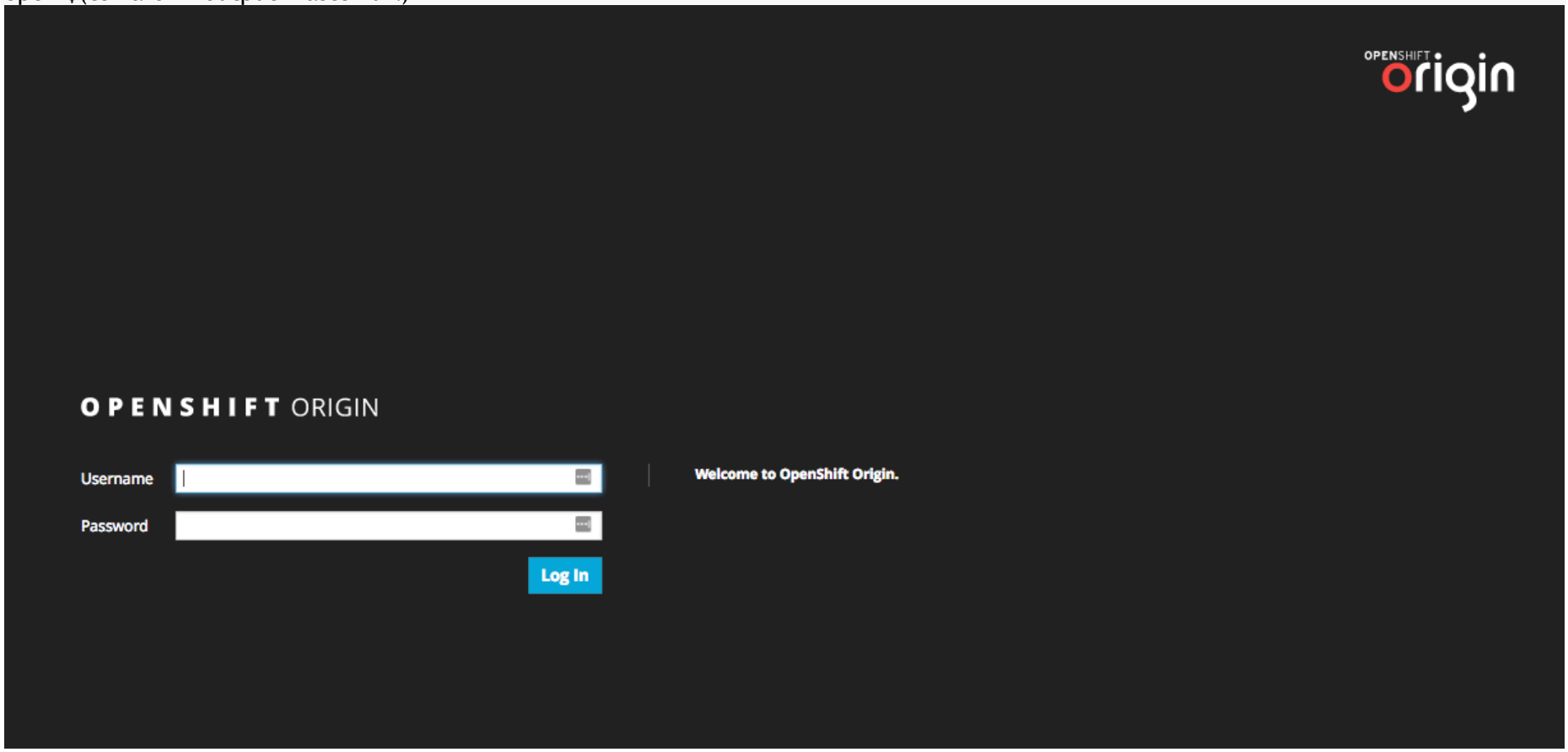
```
# Create our inventory from the template and terraform output.
sed "s/\${aws_instance.master.public_ip}/$(terraform output master-public_ip)/" inventory.template.cfg > inventory.cfg
```

```
# Copy the inventory to the bastion.
scp ./inventory.cfg ec2-user@$(terraform output bastion-public_dns):~

# Run the installer on the bastion.
cat install-from-bastion.sh | ssh -A ec2-user@$(terraform output bastion-public_dns)
```

If the last line fails with an ansible not found error, just run it again. It will take about 10-15 minutes.
Open it by hitting port 8443 of the master node. Any username and password will work:

```
open $(terraform output master-url)
```




## Additional Configuration

The easiest way to configure is to change the settings in the ./inventory.template.cfg file, based on settings in the OpenShift Origin - Advanced Installation guide.

Access the master or nodes to update configuration and add feature as needed:

```
$ oc login $(terraform output master-url)

$ oc get nodes
NAME                 STATUS    AGE
master.openshift.local   Ready     1h
node1.openshift.local    Ready     1h
node2.openshift.local    Ready     1h
```

If you don't want to install the OpenShift client locally, you can access the hosts directly via the bastion:

```
$ ssh -A ec2-user@$(terraform output bastion-public_dns)

$ ssh master.openshift.local

$ sudo su && oc get nodes
NAME                 STATUS    AGE
master.openshift.local   Ready     1h
node1.openshift.local    Ready     1h
node2.openshift.local    Ready     1h
```

## Destroying the Cluster

Bring everything down with:

```
terraform destroy
```

## Pricing

You'll be paying for:

- 3 x t2.large instances

## Troubleshooting

Image pull back off, Failed to pull image, unsupported schema version 2

Ugh, stupid OpenShift docker version vs registry version issue. There's a workaround. First, ssh onto the master:

```
$ ssh -A ec2-user@$(terraform output bastion-public_dns)

$ ssh master.openshift.local
```

Now elevate priviledges, enable v2 of of the registry schema and restart:

```
sudo su
oc set env dc/docker-registry -n default REGISTRY_MIDDLEWARE_REPOSITORY_OPENSHIFT_ACCEPTSCHEMA2=true
systemctl restart origin-master.service
```

## References

- https://www.udemy.com/openshift-enterprise-installation-and-configuration - The basic structure of the network is based on this course.
- https://blog.openshift.com/openshift-container-platform-reference-architecture-implementation-guides/ - Detailed guide on high available solutions, including production grade AWS setup.
- https://access.redhat.com/sites/default/files/attachments/ocp-on-gce-3.pdf - Some useful info on using the bastion for installation.
- http://dustymabe.com/2016/12/07/installing-an-openshift-origin-cluster-on-fedora-25-atomic-host-part-1/ - Great guide on cluster setup.