Lab 2: Creating Lease and launching BareMetal instance and SSH Login

Version: 1.0 **Date: November 20,2020**

READ ME

As one of the newest employees at **BitBeat** you've been asked to provision a webserver for your company to deploy the newest version of its product **BitBanger** which is set to take the record industry and the world by storm.

The product team is currently building the **BitBanger** application and has asked you for some help. At this point, they need to be able to deploy some of their applications to a bare metal machine so they can test out if everything works and have better performance. Because resources are not being shared, no hypervisor layer is needed, allowing more of the server's processing power to be allocated to the application.

BitBeat has hired you to setup their infrastructure, you've already gathered their requirements and are ready to get started.

BEFORE GETTING STARTED

Here's some important information to know before starting this hands-on activity.

Activity time: 120 min

Requirements: You must have to be a part of a n active project in Chameleon cloud account. You can find the link for Chameleon Cloud portal here link.

Getting help: If you experience any issues as you complete this activity, please ask your instructor

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DID YOU KNOW

CHI stands for Chameleon Infrastructure and refers to the technology powering bare-metal clouds: a combination of software components from OpenStack, Grid'5000, and their own developments.

Task overview:

In this hands-on activity, you are going to reserve a lease and build a cloud-based webserver using a CentOS machine image on a Chameleon BareMetal instance.

Task objectives:

- Create a Lease
- Create Security Group
- Launch and configure a Bare metal instance
- Create Floating IP for public access
- Create Key-Pair
- Login with SSH to instance

Learning outcomes:

Once you've completed this activity you should be able to:

- Creating Lease
- Creating Security group
- Build a Chameleon BareMetal server
- Create a key pair
- SSH login to instance

Let's Get Started!

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DID YOU KNOW

The Chameleon Bare Metal clouds require users to reserve resources before allowing them to launch instances. Once a reservation (Lease) has been accepted, users are guaranteed that resources will be available at the time they chose (except in extraordinary circumstances such as hardware or platform failures), which helps to plan large scale experiments.

Follow tasks to complete this activity-

1. Creating Lease

Our first requirement is to reserve a lease on one of the sites.

i. In chameleoncloud.org portal find and select **Dashboard**
ii. Select and click on **active project**
iii. Choose one of the sites (CHI@TACC or CHI@UC) from **Experiment** dropdown.
iv. Click on **Reservations** under project
v. Click on **Leases**
vi. Click on "**Create Lease**" button 

vii. Give the Lease name "**BitBeatLease**" and write **4** in **Lease Length and** click on **create** button.

Wait for your Lease State to display as **Active**

Important Info

- By default, the Lease will be created for one day and it will be deleted after that so you can specify days how long do you want the lease.
- If you have not selected a time zone earlier, the default time zone is **UTC**. Therefore, the date must be entered in **UTC**! You can get the UTC time by running date -u in your terminal.
- You may only request one type of node in each individual lease. If you wish to request multiple node types, you must create separate Leases for each node type.

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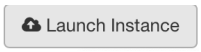
2. Creating Security Group

i. Select Security Group from Network.
ii. Click on **+create Security Group**, provide **name** and click on **create security group**.
iii. Click on **Add Rule**, select **All ICMP** rule, click on **Add**. Similarly, create one more rule for **SSH**.

3. Launching instance

i. Click on **Compute** from **Project** dropdown
ii. Select and click on **Instances**
iii. Click on **Launch Instance** button 

then configure
iv. Give instance name **BitBeatServer** and choose above created reservation **BitBeatLease** and click **Next**.
v. Select **CC-CentOS7** image by clicking on respective up arrow button  and click on Next.
vi. Select **baremetal** from **Flavor** and click **Next**.
vii. Select **sharednet1** from **Networks** and click **Next**.
viii. Click on **Next**.
ix. Select above created **security group** and click on **Next**.
x. you can use already created key pair. Or Click on **Create Key Pair**, give the key name as **BitBeatkey** and choose **SSH key** as key type. Click on **Create Keypair** at bottom and copy Private key to Clipboard, select **done** and then click on **Next**. Save the copied Private key in a text file **BitBeatkey.pem** in your laptop.
xi. Copy the following code in **customization script** under **configuration** and click **Next**.
    a. This is #bash

```
#!/bin/bash
yum -y install httpd
systemctl enable httpd
systemctl start httpd
echo '<html><h1>Hello Earthling, Take me to your
leader! </h1></html>' > /var/www/html/index.html
```

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Here's what this bash script does, see if you can identify which actions each line of script executes:

a. Installs, enables, and starts the Apache HTTP Server.
b. Creates an index.html page with a message.

xii. Click Next, Next, Next then click on **Launch Instance** button.

Wait for your Instance Task to display as **Running**. It will take few minutes.

4. Create Floating IP

1. Click on **Floating IPs** under Project dropdown.
2. Click on **Allocate IP** To Project button 

.
3. Add **IP for BitBeatServer** in **description** and click on **Allocate IP**.
4. Click on **Associate** under Actions.
5. Select a port (**BitBeatServer: IP**) from dropdown and click on **Associate.**

Test

Copy the public IP of **BitBeatServer** and paste in browser tab.

You should see the message ***Hello Earthling! Take me to your leader!***

SSH into Chameleon bare metal instance (Mac/Linux machine)

1. Navigate instances and click on **BitBeatServer** instance.
2. Copy the public IP of this instance.
3. Go to the directory where you placed your **BitBeatkey.pem** key.

You will need to open an SSH client on your computer. Mac computers have a Terminal app that can is used for SSH. Open the Terminal app to complete the steps to connect to you web server.

Before you can connect to your webserver, you will need to set the permissions of your private key file so that only you can read it. Do not skip this step, otherwise you will not be able to login to your instance.

4. Use the following command in the Terminal command prompt:
   chmod 400 Desktop/BitBeatkey.pem
5. Now, you are ready to connect to your instance. In the terminal window, enter the following command in the Terminal command prompt:
   ssh -i Desktop/BitBeatkey.pem cc@xxx.xxx.xxx.xxx (Public IP of instance)

SSH into Chameleon bare metal instance (Windows users)

Windows users follow the SSH login steps provided in **Secure Shell (SSH) into Amazon EC2 (PC**) Activity.

Great job!

Bonus Activity – Clean Up Your Environment

You are requested to get rid of the testing machine you created.

Steps-

1. Find and select your **BitBeatServer**
2. Click on **Delete instance**.
3. Click on Security group and delete the above security group created by you.
4. Find your Floating IP and click on **Release Floating IPs** button.

Important info

If you get an error stating that No valid host was found, it might be caused by a lack of resources in the cloud. The Chameleon staff continuously monitors the utilization of the testbed, but there might be times when no more resources are available.

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Test your knowledge

1. What does CHI stands for ?
2. What can be the reason for the error “No valid host was found” ?
3. How does Lease help users in terms of resources?
4. What is the default time zone for reserving lease in Chameleon?
5. How many type of node can be selected for each individual lease?

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