EECE 7290 – Software Defined Networking (Spring 2017), University of Massachusetts, Lowell

Project - SDN for Secure Video Streaming: CORD Based Secure Video Streaming

Document – Setting up CORD in the CloudLab.

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This paper walks through instructions for setting up XOS on OpenStack profile on CloudLab and provides technical overview of implementation of a simple HelloWorld service on the XOS platform. [1]

Steps:

1. Login to CloudLab - https://www.cloudlab.us/login.php

2. Go to Experiments → Start Experiment

3. Follow Select Profile → Change Profile

Select this profile **OnePC-Ubuntu14.04.4**
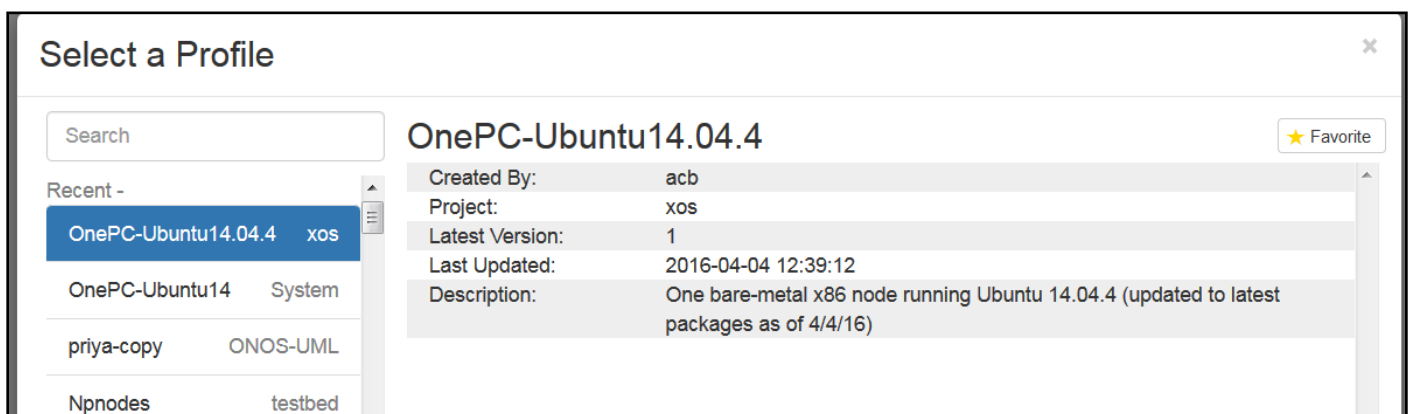
Scroll down and click 'Select Profile'

Skip the Parameterize tab.

Make following selections on Finalize Tab. And then click Finish.

Current Usage: 590.81 Node Hours, Prev Week: 336, Prev Month: 837 (30 day rank: 104 of 398 users) ❓

| 1. Select a Profile | 2. Parameterize | 3. Finalize |

Profile: OnePC-Ubuntu14.04.4   **Version:** 1   Source

Please review the selections below and then click Finish.

Name: SDN_Project

Cluster: Cloudlab Wisconsi⬤ ▾

➕ Advanced Options

Check Cluster Status

node

Previous   Finish

This will take some time (typically 5-10 minutes) to get the experiment ready. See the progress.

Note: Do not proceed to next step until 'State' becomes "ready". It will give error in later step if the 'State' is "booted (startup services are still running)".

Please wait while we get your experiment ready ❯

Name:	SDNProject
State:	provisioning
Profile:	OnePC-Ubuntu14.04.4
Created:	May 3, 2017 11:57 PM
Expires:	May 4, 2017 3:57 PM (in 16 hours)

Copy Extend Terminate

Please wait while we get your experiment ready ❯

Name:	SDNProject
State:	booting
Profile:	OnePC-Ubuntu14.04.4
Created:	May 3, 2017 11:57 PM
Expires:	May 4, 2017 3:57 PM (in 16 hours)

Sliver   Clone Copy Extend Terminate

Your experiment is ready! ❯

Name:	SDNProject
State:	ready
Profile:	OnePC-Ubuntu14.04.4
Created:	May 3, 2017 11:57 PM
Expires:	May 4, 2017 3:57 PM (in 16 hours)

Sliver   Clone Copy Extend Terminate

Once the experiment is ready, Click on Extend button to click the experiment to prevent is from expiring.

Scroll Down and see the IP address of the compute node allocated by using following command.

```
Topology View   List View   Manifest   Graphs   node
Welcome to Ubuntu 14.04.4 LTS (GNU/Linux 3.13.0-83-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

aman_uml@node:~$ hostname -i
128.104.222.127
aman_uml@node:~$
```

SSH into the node using terminal. (I am using Linux OS Ubuntu 14.04)

Before doing ssh make sure you have set up valid public-private key pair.
Follow the steps given on link below for generating a new SSH key and adding it to the ssh-agent
https://help.github.com/articles/generating-a-new-ssh-key-and-adding-it-to-the-ssh-agent/

Files are generated in .ssh folder. we have to copy them from **.ssh to home/ubuntu/** so that we can upload them to the cloudLab portal. Copy the files using following instructions.
cp .ssh/id_rsa.pub ./
cp .ssh/id_rsa ./

Once, above steps are successful we have to ssh into the compute node.
  ➢ ssh username@ip_address
     ex- ssh aman_uml@128.104.222.127

Follow the steps mentioned on https://github.com/opencord/cord/blob/master/docs/quickstart.md to setup the XOS and CORD environment.
Steps typically includes,
  1) Installing the system requirements first
  ➢ sudo apt-get update
  ➢ sudo apt-get install screen

- ➢ sudo apt-get install curl
- ➢ curl -o ~/cord-in-a-box.sh https://raw.githubusercontent.com/opencord/cord/cord-2.0/scripts/cord-in-a-box.sh

Execute the screen command as the next process takes approximately 4 hours to complete. We want to detach the screen while the process is being executed.

- ➢ screen

  (Press space bar 2-3 times)

- ➢ bash ~/cord-in-a-box.sh -t | tee ~/install.out

  Now press ctrl+A+D to detach the screen.
- ➢ Exit

  Wait for 4 hours at least. To attach the screen again, we can use following command.
- ➢ Screen –r

  Check the logs if installation is successful by running following command.
- ➢ Cat install –out

  Installation should be successful.

```
maas-test-client-install : Stop container ----------------------------- 49.09s
maas-test-client-install : Create testclient container --------------- 23.13s
platform-check : Ensure br-int exists on all compute nodes (check VTN) --- 9.17s
setup ---------------------------------------------------------------- 9.09s
setup ---------------------------------------------------------------- 8.83s
setup ---------------------------------------------------------------- 8.79s
setup ---------------------------------------------------------------- 8.76s
test-vsg : Make sure testclient has default route to vSG ------------- 5.29s
test-vsg : Test external connectivity in test client ---------------- 5.14s
test-vsg : start container ------------------------------------------ 4.15s
test-exampleservice : Get public IP of VM --------------------------- 4.12s
test-exampleservice : Get mgmt IP of VM ----------------------------- 3.94s
test-vsg : Get mgmt IP of VM ---------------------------------------- 3.86s
test-vsg : Get name of compute node --------------------------------- 3.76s
test-vsg : Get ID of VM --------------------------------------------- 3.73s
test-vsg : Wait for vSG VM to come up ------------------------------- 3.73s

BUILD SUCCESSFUL

Total time: 14 mins 29.446 secs
aman_uml@node:~$
```

Now ssh into prod environment to see the list of services

➢ ssh prod

```
Total time: 14 mins 29.446 secs
aman_uml@node:~$ ssh prod
Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 3.13.0-117-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

  System information as of Thu May  4 07:42:07 UTC 2017

  System load:                    2.26
  Usage of /:                     38.3% of 39.34GB
  Memory usage:                   48%
  Swap usage:                     0%
  Processes:                      749
  Users logged in:                0
  IP address for eth0:            192.168.121.23
  IP address for eth1:            10.100.198.201
  IP address for eth3:            10.6.1.201
  IP address for mgmtbr:          10.1.0.1
  IP address for docker0:         172.17.0.1
  IP address for br-656b67836a01: 172.18.0.1
  IP address for virbr0:          192.168.122.1
```

Verify the folders created

```
Last login: Thu May  4 07:42:08 2017 from 10.100.198.200
vagrant@prod:~$ ls
admin-openrc.sh               onos-cord        xos
keystone_juju_ca_cert.crt     onos-fabric      xos_libraries
node_key                      service-profile  xos_services
vagrant@prod:~$
```

If everything goes well at this point, we are good to start the making changes in the hello world service. Refer to the document 'Running HelloWorld service and creating new tenant service' [1] in the github repository to run example service.

References –

[1] CORD-in-a-Box Quick Start Guide

https://github.com/opencord/cord/blob/cord-2.0/docs/quickstart.md

[2] Project Documentation

https://github.com/amanmaldar/EECE7290_Project