

Introduction to Computer Network Project 1-1

OpenNet & OpenADM Installation

Date: 2016/09/12

Deadline: 2016/09/26 (Mon.) 23:59



Outline

- 實驗目的
- OpenNet & OpenADM
- 實驗環境
- 安裝OpenNet
- 安裝OpenADM
- 作業要求
- 本課程作業遲交扣分方式
- Q&A



實驗目的

- 練習手動安裝OpenNet和OpenADM
 - OpenNet: Network Emulator
 - 可在實驗室設定網路環境
 - 進行實際程式的擬真驗證
 - OpenADM: Diagnosis, Analytic and Management Framework
 - 可在實驗室設定開發環境
 - 研發網路診斷、分析與管理或應用的軟體
 - OpenNet和OpenADM為開源軟體
 - 以Linux開源作業系統為基礎
 - 提前熟悉Linux
 - 對往後其他課程有很大的幫助



OpenNet & OpenADM

- OpenNet

- Network Emulator
- Physical + Virtual
- Support Wireless Network
- <https://github.com/dlinknctu/OpenNet>

- OpenADM

- Diagnosis, Analytic and Management Framework
- Web GUI
- <https://github.com/dlinknctu/OpenADM>



實驗環境

- Ubuntu **14.04** LTS
 - Physical Machine / VMware Player / VirtualBox
 - 安裝虛擬主機(Virtual Machine)與Ubuntu
 - 請參考附件: Installing Ubuntu on VM
- Hardware Requirement
 - 2+ Cores(2+ CPUs)
 - 2G RAM



安裝 OpenNet (1/2)


● Build OpenNet

- `sudo su`
- `apt-get install git ssh`
- `git clone https://github.com/dlinknctu/OpenNet.git`
- `cd OpenNet`
- `./configure.sh`
- `./install.sh master`



安裝 OpenNet (2/2)

- NS3編譯比較花時間(大約8分鐘)，不是當機
- 安裝Script跑完後，注意**failed = 0**才是安裝成功



```
PLAY RECAP *****
master                : ok=71   changed=51   unreachable=0   failed=0

=====
OpenNet installation has completed.
With an SDN controller, the example script should work fine.
=====
$ sudo su -
# cd /home/icn/OpenNet
# git clone https://github.com/noxrepo/pox.git
# cd /home/icn/OpenNet/pox
# ./pox.py forwarding.l2_learning &
# cd /home/icn/OpenNet/mininet/examples/opennet
# python wifiroaming.py

root@icn-VirtualBox:/home/icn/OpenNet#
```



安裝OpenADM (1/2)

● Install dependencies

```
■ sudo su
■ echo oracle-java7-installer shared/accepted-oracle-license-v1-1 select true
  | debconf-set-selections && \
apt-get update && \
apt-get install -y software-properties-common && \
add-apt-repository -y ppa:webupd8team/java && \
apt-get update && \
apt-get install -y git-core wget unzip python-minimal python-pip python-dev
oracle-java7-installer ant && \
rm -rf /var/lib/apt/lists/* && \
rm -rf /var/cache/oracle-jdk7-installer && \
wget -qO- https://deb.nodesource.com/setup_5.x | bash - && \
apt-get install -y nodejs
```




安裝OpenADM (2/2)

- Install OpenADM bundle

- exit
- `git clone https://github.com/dlinknctu/openadm.git`
 `~/openadm`
- `cd openadm`
- `./run.sh install`
- `sudo pip install --upgrade six`



使用OpenNet & OpenADM (1/9)

- 開啟4個Terminal，分別執行以下指令 (**一定要照順序**)
 - `sudo ~/floodlight/floodlight.sh`
 - `~/local/bin/omniui`
 - `cd ~/openadm/ui && npm run dev`
 - `sudo mn --topo=tree,2 --controller=remote`



使用OpenNet & OpenADM (2/9)

- floodlight.sh

```
Starting floodlight server ...
Java HotSpot(TM) 64-Bit Server VM warning: ignoring option PreBlockSpin=8; support was removed in 7.0_40
2016-08-31 15:08:16.494 INFO [n.f.c.m.FloodlightModuleLoader] Loading default modules
2016-08-31 15:08:16.753 INFO [n.f.c.i.Controller] Controller role set to MASTER
2016-08-31 15:08:16.756 INFO [n.f.c.i.Controller] Flush switches on reconnect - Disabled
2016-08-31 15:08:19.93 INFO [n.f.l.i.LinkDiscoveryManager] Setting autoportfast feature to OFF
2016-08-31 15:08:19.212 INFO [o.s.s.i.c.FallbackCCProvider] Cluster not yet configured; using fallback local configuration
2016-08-31 15:08:19.213 INFO [o.s.s.i.SyncManager] [32767] Updating sync configuration ClusterConfig [allNodes={32767=Node [hostname=localhost, port=6642, nodeId=32767, domainId=32767]}, authScheme=CHALLENGE_RESPONSE, keyStorePath=/etc/floodlight/auth_credentials.jceks, keyStorePassword is unset]
2016-08-31 15:08:19.260 INFO [o.s.s.i.r.RPCService] Listening for internal floodlight RPC on localhost/127.0.0.1:6642
2016-08-31 15:08:19.367 INFO [n.f.c.i.Controller] Listening for switch connections on 0.0.0.0/0.0.0.0:6633
2016-08-31 15:08:25.601 INFO [n.f.j.JythonServer] Starting DebugServer on :6655
```



使用OpenNet & OpenADM (3/9)

- Omniui

```
loading NWInfo.....
loading BusyLink_Detect.....
loading Simulate.....
loading Flow_mod.....
No BusyLink
No BusyLink
```

- npm run dev

```
> nctucs@0.0.1 dev /home/alex/openadm/ui
> NODE_ENV=development node devServer.js

Listening at http://0.0.0.0:8000
webpack built 8475abea069c3dd3bf7a in 8375ms
```



使用OpenNet & OpenADM (4/9)

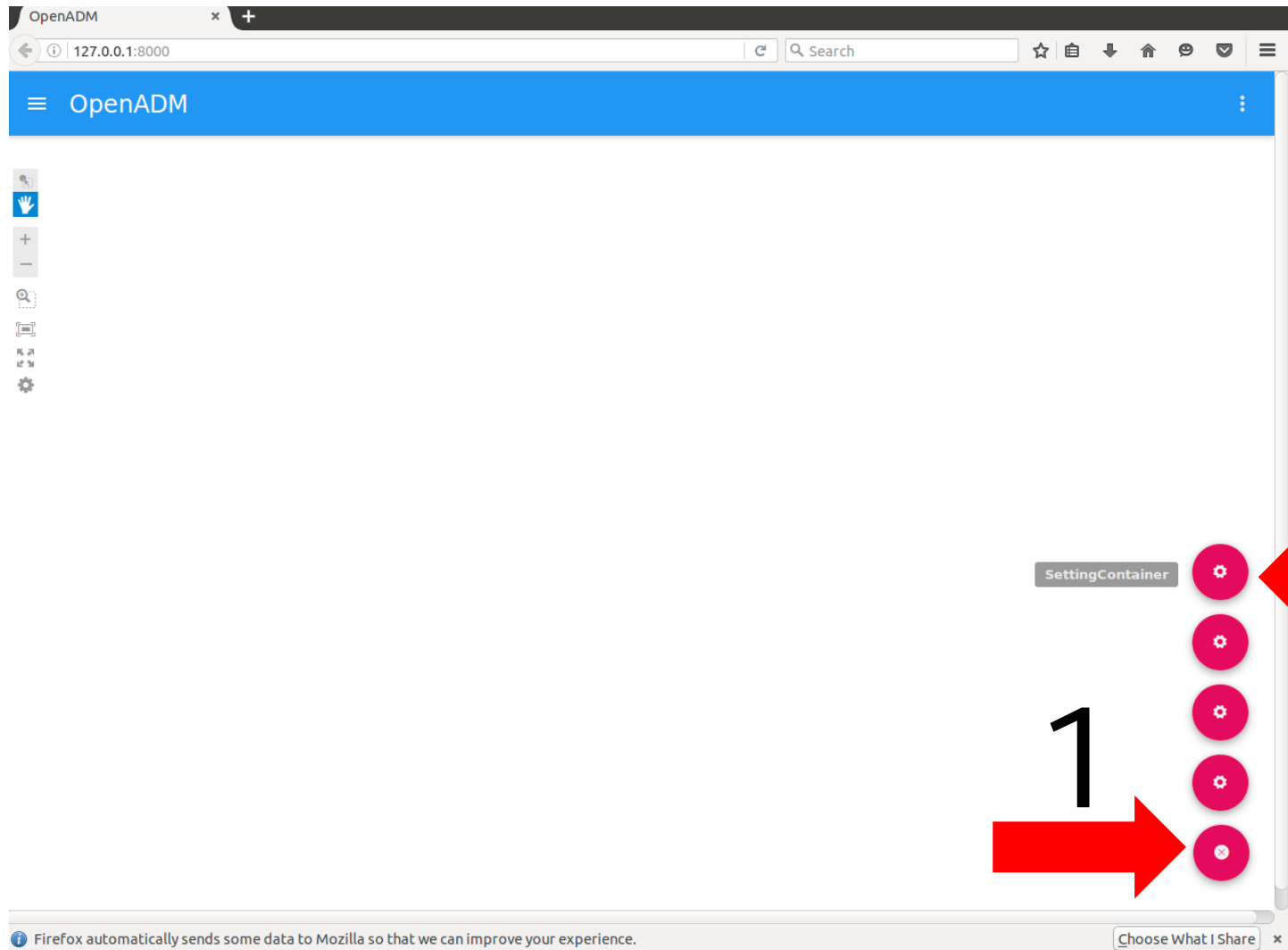
● OpenNet

```
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4
*** Adding switches:
s1 s2 s3
*** Adding links:
(s1, s2) (s1, s3) (s2, h1) (s2, h2) (s3, h3) (s3, h4)
*** Configuring hosts
h1 h2 h3 h4
*** Starting controller
c0
*** Starting 3 switches
s1 s2 s3 ...
*** Starting CLI:
opennet> 
```



使用OpenNet & OpenADM (5/9)

- 開啟瀏覽器，進入127.0.0.1:8000





使用OpenNet & OpenADM (6/9)

● Setting Controller

- Core URL: `http://127.0.0.1:5567`
- Adapter URL: `http://127.0.0.1:8080`
- 一定要輸入 **http://**

A screenshot of a software window titled "Controller Setting". It has a blue header bar with window control icons. The window contains three input fields: "Core URL" with a gear icon and the value "http://127.0.0.1:5567", "Controller Adapter URL" with a circular refresh icon and the value "http://127.0.0.1:8080", and "Custom Controller Name" with a person icon and the value "ICN". At the bottom right is a blue button labeled "SETTING". A large red arrow points from the right towards this button.

Controller Setting

Core URL
⚙️ `http://127.0.0.1:5567`

Controller Adapter URL
🔄 `http://127.0.0.1:8080`

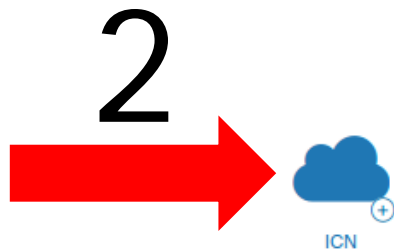
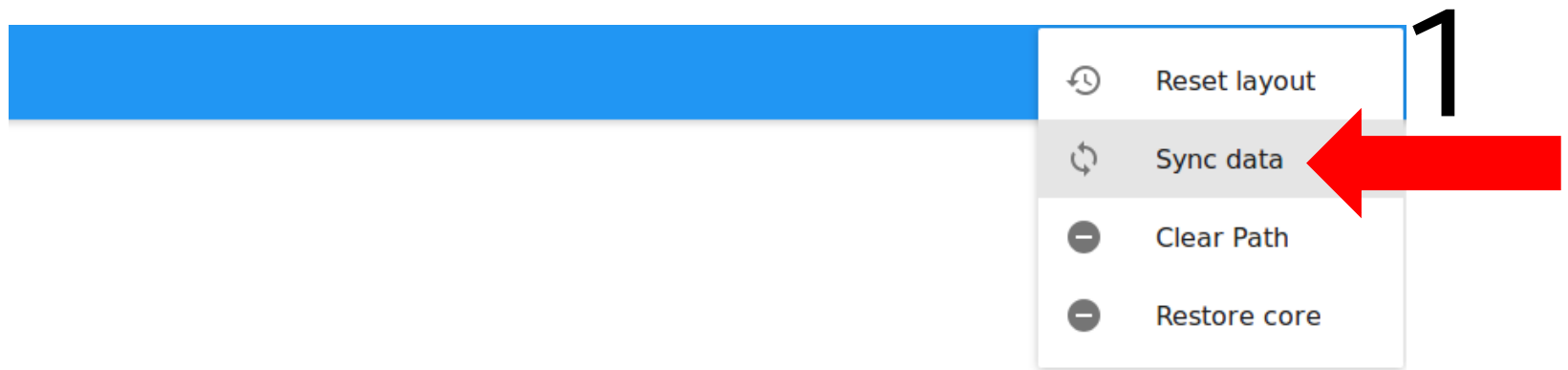
Custom Controller Name
👤 ICN

SETTING



使用OpenNet & OpenADM (7/9)

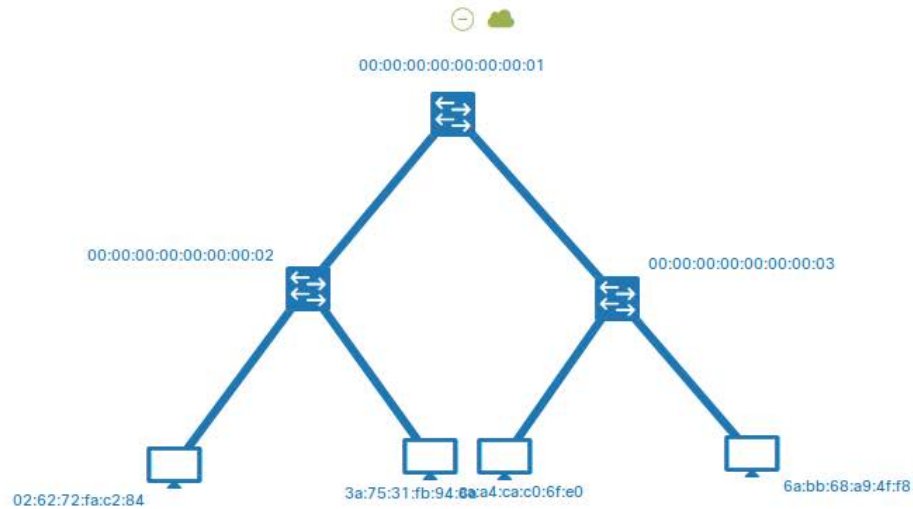
- 右上角的設定 → Sync data
- 點選那朵雲





使用OpenNet & OpenADM (8/9)

OpenADM





使用OpenNet & OpenADM (9/9)

- 如果看不到雲
 - 重開瀏覽器，重設Controller後再Sync data
- 若在雲中看不到拓譜可能是比例跑掉
 - 點選Fit Stage



- 如果還是看不到拓譜
 - 重開OpenNet並Sync data即可



作業要求 (1/2)

- 需繳交報告一份
 - 實驗過程 (附上截圖)
 - 安裝OpenNet成功截圖
 - 成功在OpenADM GUI中看到拓譜截圖
 - 心得 (或是過程中遇到的困難及解法)



作業要求 (2/2)

- 繳交方式

- 請上傳到e3，檔名格式為：**project1-1_學號.pdf**
- Deadline: **2016/09/26 (Mon.) 23:59**



本課程作業遲交扣分方式

- 遲交7日，Project 分數以原始分數九成計
- 遲交14日，Project 分數以原始分數七成計
- 超過14日，**不再接受繳交，Project 以零分計**



Q&A

- 如果對Project有任何問題
 - 請來信 icnta@win.cs.nctu.edu.tw
 - 計網概助教關心您