

LAB1

ECE444/544



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YIFAN ZHU University of Idaho

Introduction

In ECE444/544 lab 1, it used 3 controllers with 6 switches and 6 hosts.

Here is the layout.

Relay Physical Placement & Static IP addresses



IED: Intelligent Electronic Device

In mininet, we can't put all the 3 controllers, because it didn't catch all the hosts. So, we only make one controller.

Procedure

1. Open the miniedit and ryu as shown in lab0.

Make the schematic.



2. Set the data on these 5 elements.

In switch, the IP address and Port are set randomly by me, which means

you can set these two on your own.

Set the preference as same as we did in lab0.

😣 🗉 Controller Details				
Name: c0				
Controller Port: 663	33			
Controller Type: Re	emote Controller 🛁			
Protocol: TC	P			
Remote/In-Band Controller				
IP Address: 127.0.0.1				
	_			
ОК	Cancel			

	Edit	
Hostname:	s1	External Interface: Add
DPID:	00000000001	External Interfaces
Enable NetFlow:		
Enable sFlow:		
Switch Type:	Open vSwitch Kernel Mode	-
IP Address:	192.168.1.1	
DPCTL port:	6233	
Start Command:		
Stop Command:		
OK	Cancel	
😣 🗖 🗊 Mini	Edit	
Hostname:	Edit	External Interface: Add
Hostname: DPID:	Edit s2 00000000000000000000000000000000000	External Interface: Add
😸 😑 🔲 Mini Hostname: DPID: Enable NetFlow:	Edit s2 0000000000000000000000000000000000	External Interface: Add
😸 😑 🔲 Mini Hostname: DPID: Enable NetFlow: Enable sFlow:	Edit s2 00000000000000000000000000000000000	External Interface: Add
Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type:	Edit s2 0000000000000000000000000000000000	External Interface: Add
Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address:	Edit s2 00000000000000000000000000000000000	External Interface: Add
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 0000000000000000000000000000000000	External Interface: Add
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 0000000000000000000000000000000000	External Interface: Add
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 0000000000000000000000000000000000	External Interface: Add External Interfaces
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 0000000000000000000000000000000000	External Interface: Add External Interfaces
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 0000000000000000000000000000000000	External Interface: Add
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 0000000000000000000000000000000000	External Interface: Add External Interfaces
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 00000000000000000000000000000000	External Interface: Add
Nini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port:	Edit s2 0000000000000000000000000000000000	External Interface: Add
 Mini Hostname: DPID: Enable NetFlow: Enable sFlow: Switch Type: IP Address: DPCTL port: 	Edit s2 0000000000000000000000000000000000	External Interface: Add
Key Command: Start Command: Stop Command:	Edit S2 0000000000000 Open vSwitch Kernel Mode 192.168.1.2 6234	External Interface: Add

	MiniE	dit			
Properties	VLAN	Interfaces	External Int	terfaces	Private Directories
Hostn	ame: h	າ1			
IP Add	Iress: 1	10.0.0.1			
Default R	oute:				
Amount	CPU:			host	-
с	ores:			_	
Start Comm	nand:			_	
Stop Comm	nand:				
ОК		Cancel			
]]				
		19			
	MINIE	dit			
Properties		dit Interfaces	External Int	erfaces	Private Directories
Properties Hostna	VLAN ame: h	dit Interfaces	External Int	erfaces	Private Directories
Properties Hostna IP Add	VLAN ame: h	dic Interfaces	External Int	erfaces	Private Directories
Properties Hostna IP Add Default Ro	VLAN ame: h lress: 1 oute:	Interfaces	External Int	erfaces	Private Directories
Properties Hostna IP Add Default Ro Amount	MINIE VLAN ame: h ress: 1 oute: CPU:	Interfaces	External Int	erfaces	Private Directories
Properties Hostna IP Add Default Ro Amount	MINIE VLAN ame: h lress: 1 oute: CPU:	Interfaces	External Int	erfaces host	Private Directories
Properties Hostna IP Add Default Ro Amount C	MINIE VLAN ame: h lress: 1 oute: CPU: ores:	oic Interfaces 12 10.0.0.2	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm	MINIE VLAN ame: h ress: 1 oute: CPU: cores: and:	aic Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	MINIE VLAN ame: h Iress: 1 oute: CPU: cores: nand: nand:	aic Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	MINIE VLAN ame: h Iress: 1 oute: CPU: CPU: cores: hand: hand:	olc Interfaces 12 10.0.0.2	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	VLAN ame: h ress: 1 oute: CPU: cores: nand: nand:	aic Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	VLAN ame: I Iress: 1 oute: CPU: cores: hand: hand:	aic Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	VLAN ame: h Iress: 1 oute: CPU: cores: hand: hand:	alt Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	VLAN ame: I Iress: 1 oute: CPU: cores: hand: hand:	alt Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	VLAN ame: I Iress: 1 oute: CPU: cores: hand: hand:	alc Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	VLAN ame: h Iress: 1 oute: CPU: cores: hand: hand:	aic Interfaces	External Int	host	Private Directories
Properties Hostna IP Add Default Ro Amount C Start Comm Stop Comm	VLAN ame: h Iress: 1 oute: CPU: cores: hand: hand:	alc Interfaces	External Int	host	Private Directories

3. Run it and use the same commands as provided in lab 0.

Alternatively, if you save the mn file and export it as level 2. Remember the path, use 'cd' open that directory, type 'ls' to check the files. If you find them, type 'python XXX(you file name).py' So you can directly run it without opening the miniedit.

Termin	erminal				
	😣 🔿 🕕 root@ubuntu: /home/ubuntu/mininet	🛇 🖨 🕕 ubuntu@ubuntu: ~/ryu/ryu/app			
0	*** Add hosts	packet in 1 2a:a3:3a:3c:9e:87 33:33:00:00:00:fb 1			
	*** Add links	packet in 2 2a:1a:cd:8b:e7:ae 33:33:00:00:00:02 1			
	*** Starting network	packet in 1 2a:a3:3a:3c:9e:87 33:33:00:00:00:02 1			
	*** Configuring hosts	packet in 2 a2:2f:51:63:f5:46 33:33:00:00:00:02 65534			
	h2 h1	packet in 1 a2:2f:51:63:f5:46 33:33:00:00:00:02 1			
	*** Starting controllers	packet in 2 7a:a7:6d:78:2e:d2 33:33:00:00:00:02 2			
9	*** Starting switches	packet in 1 7a:a7:6d:78:2e:d2 33:33:00:00:00:02 1			
	*** Post configure switches and hosts	packet in 2 Za:1a:cd:8b:e7:ae ff:ff:ff:ff:ff 1			
	*** Starting CLI:	packet in 1 Za:a3:3a:3c:9e:87 ff:ff:ff:ff:ff 1			
= 53	mininet> pingall	packet in 2 Za:1a:cd:8b:e7:ae 33:33:00:00:fb 1			
	*** Ping: testing ping reachability	packet in 1 2a:a3:3a:3c:9e:87 33:33:00:00:60 1			
	h2 -> h1	packet in 1 ba:c9:3d:f2:fd:26 33:33:00:00:00:02 2			
	h1 -> h2	packet in 2 ba:c9:3d:f2:fd:26 33:33:00:00:00:02 1			
	*** Results: 0% dropped (2/2 received)	packet in 1 82:93:c1:42:79:42 33:33:00:00:00:02 65534			
_	mininet> nodes	packet in 2 82:93:c1:42:79:42 33:33:00:00:00:02 1			
	available nodes are:	packet in 2 2a:1a:cd:8b:e7:ae 33:33:00:00:00:02 1			
	c0 h1 h2 s1 s2	packet in 1 2a:a3:3a:3c:9e:87 33:33:00:00:00:02 1			
	mininet> net	packet in 2 a2:2f:51:63:f5:46 33:33:00:00:00:02 65534			
-8-	h2 h2-eth0:s2-eth2	packet in 1 a2:2f:51:63:f5:46 33:33:00:00:00:02 1			
Δ	h1 h1-eth0:s1-eth2	packet in 2 7a:a7:6d:78:2e:d2 33:33:00:00:00:02 2			
	s2 lo: s2-eth1:s1-eth1 s2-eth2:h2-eth0	packet in 1 7a:a7:6d:78:2e:d2 33:33:00:00:00:02 1			
	s1 Lo: s1-eth1:s2-eth1 s1-eth2:h1-eth0	packet in 1 2a:a3:3a:3c:9e:87 ff:ff:ff:ff:ff:ff 1			
a	C0	packet in 2 Za:la:cd:8b:e7:ae ff:ff:ff:ff:ff 1			
\sim	mininet>				
-					
122					

4. Open a new terminal, type 'sudo wireshark' to capture the packages.

In wiresahrk, select 'any', then you will see this. Wireshark can capture your laptop's IP address and the VMware's, so in order not to get mixed. You can search the 'openflow_v1' in the green bar.

-							
8	🔎 *any						
File	Edit View Go	<u>Capture</u> <u>A</u> naly:	ze <u>S</u> tatistics Teleph	on <u>y W</u> ireless <u>T</u> ools	<u>H</u> elp		
		- 🖾 🔽 🛛		🛛 🛪 🚛 🖃 🕯			
 0	penflow_v1					Expression	n +
No.	Time	Source	Destination	Protocol	Length Info		A
	193 16.953403050	192.168.183.	128 192.168.18	3.2 DNS	90 Standard query Oxt	b79d A daisy.ubuntu.com.local	1
	194 16.953688480	192.168.183. fe801429.9	128 192.168.18 fff.fe2 ff0216	3.2 DNS TCMPv6	90 Standard query 0x0 92 Multicast Listener	d95 AAAA daisy.ubuntu.com.lo r Report Message v2	J
	196 17.234748565	fe80::1429:9	fff:fe2 ff02::2	ICMPv6	72 Router Solicitatio	on from 16:29:9f:26:16:03	
	197 17.242523861	fe80::1429:9	fff:fe2 ff02::16	ICMPv6	92 Multicast Listener	r Report Message v2	
	198 17.3365/3842	fe80::1429:9	fff:fe2 ff02::fb	MDNS	109 Standard query 0x0	JUUU PIR _1ppstcp.1oca1, "(sponse 0x0000 PTR_workstati(2
	200 17.347020911	fe80::1429:9	fff:fe2 ff02::fb	MDNS	323 Standard query 0x0	0000 ANY ubuntu [16:29:9f:26	
	201 17.478700286	fe80::863:2d	ff:fe01 ff02::16	ICMPv6	92 Multicast Listener	r Report Message v2	
	202 17.478704955 203 17 478764710	Te80::863:20	ff:fe01 ff02::10	ICMPV6 ICMPv6	72 Router Solicitatio	r Report Message V2 on from 0a:63:2d:01:65:5f	
	204 17.478765668	fe80::863:2d	ff:fe01 ff02::2	ICMPv6	72 Router Solicitatio	on from 0a:63:2d:01:65:5f	
	205 17.479115745	fe80::863:2d	ff:fe01 ff02::2	OpenF1	156 Type: OFPT_PACKET_	_IN	
► Ei	ame 1: 344 bytes	on wire (2752	bits), 344 bytes c	aptured (2752 bits) on interface 0		
	inux cooked captur	e	.06 (00.00.00.11.00	.06) Date 45.40.0	4.40.00.00 (45.40.01.40.0	20.00	
► Da	ata (314 bytes)	rayconn_11:39	:a0 (00:00:80:TT:38	:90), DSL: 45:10:0	1:48:00:00 (45:10:01:48:0	10:00)	
	Data: 0000ffffff	ff004400430134	42d2301010600191826	670021			
	[Length: 314]						
0010	45 10 01 48 00	00 00 00 80 1	1 39 96 00 00 00 00	E · · H · · · · · · 9 · · · •			
0020	ff ff ff ff 00 ·	44 00 43 01 3	4 2d 23 01 01 06 00	·····D·C ·4-#···			
0030	19 18 26 67 00 1	21 00 00 00 0	0 00 00 00 00 00 00 00 3 2d 01 65 5f 00 00	···&g·!·· ·····			
0050	00 00 00 00 00 00	00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
0060	00 00 00 00 00 00	00 00 00 00 00	0 00 00 00 00 00 00	• • • • • • • • • • • • • • • • • • • •			
0070	00 00 00 00 00 00		0 00 00 00 00 00 00 00	• • • • • • • • • • • • • • • • • • • •			
0090		30 00 00 00 00 0	0 00 00 00 00 00 00 00				
00a0	00 00 00 00 00 00	00 00 00 00 00	0 00 00 00 00 00 00				
00b0			0 00 00 00 00 00 00 00 00				
00d0		30 00 00 00 00 0 30 00 00 00 0	0 00 00 00 00 00 00 00 0 00 00 00 00 00				
00e0	00 00 00 00 00	0 00 00 00 00	0 00 00 00 00 00 00				
00f0	00 00 00 00 00 00	00 00 00 00 00 00	0 00 00 00 00 00 00	•••••			
0100							-
	Z Data (data.data), 314 bytes			Packets: 709 · Disp	played: 709 (100.0%) Profile: D	efault