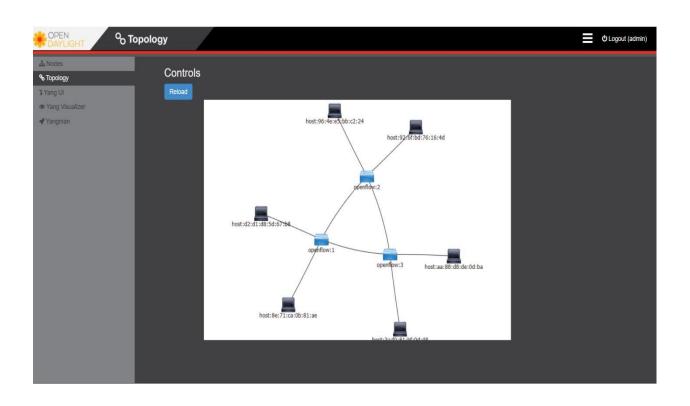
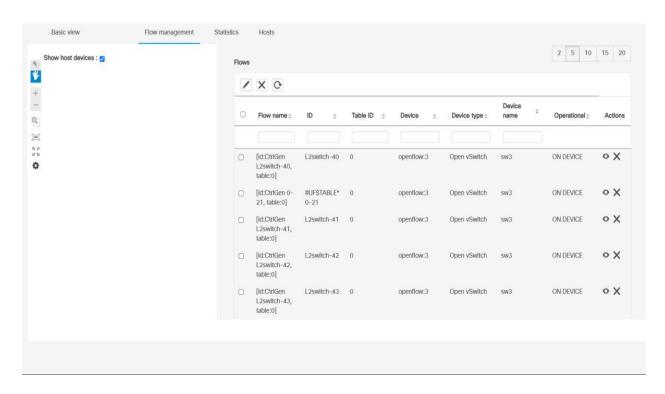
## Kết quả:

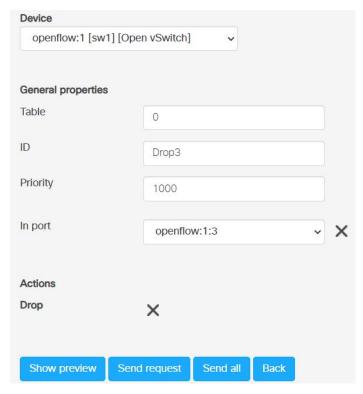
```
mininet@mininet-vm:~$ sudo mn --custom triangle.py --topo custom --controller=none
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4 h5 h6
*** Adding switches:
sw1 sw2 sw3
*** Adding links:
(sw1, h1) (sw1, h2) (sw1, sw2) (sw1, sw3) (sw2, h3) (sw2, h4) (sw2, sw3) (sw3, h5) (sw3, h6)
*** Configuring hosts
h1 h2 h3 h4 h5 h6
*** Starting controller
*** Starting 3 switches
sw1 sw2 sw3 ..
*** Starting CLI:
mininet> sh sudo ovs-ofctl dump-flows sw1
NXST_FLOW reply (xid=0x4):
mininet> sh sudo ovs-ofctl dump-flows sw2
NXST_FLOW reply (xid=0x4):
mininet> sh sudo ovs-ofctl dump-flows sw3
NXST_FLOW reply (xid=0x4):
mininet> pingall
*** Ping: testing ping reachability h1 -> X X X X X
h2 -> X X X X X
h3 -> X X X X X
h4 -> X X X X X
h5 -> X X X X X
h6 -> X X X X X
*** Results: 100% dropped (0/30 received)
mininet>
```

No.	Time	Source	Destination	Protocol	Length	Info	
6	15.704	192.168	192.168.2.22	OpenFlow	74	Type:	OFPT HELLO
6	15.710	192.168	192.168.2.20	OpenFlow	90	Type:	OFPT FEATURES REQUEST
6	15.710	192.168	192.168.2.22	OpenFlow	98	Type:	OFPT FEATURES REPLY
6	15.711	192.168	192.168.2.20	OpenFlow	74	Type:	OFPT_BARRIER_REQUEST
6			192.168.2.22	OpenFlow	74	Type:	OFPT_BARRIER_REPLY
6	15.718	192.168	192.168.2.20	OpenFlow	82	Type:	OFPT_MULTIPART_REQUEST, OFPMP_DE
6	15.718	192.168	192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_DESC
7	15.728	192.168	192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_PO
7			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_METE
7			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_GROU
7			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_PORT
7			192.168.2.20	OpenFlow			OFPT_ROLE_REQUEST
7			192.168.2.22	OpenFlow			OFPT_ROLE_REPLY
7			192.168.2.20	OpenFlow			OFPT_ROLE_REQUEST
7			192.168.2.22	OpenFlow			OFPT_ROLE_REPLY
7			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_TA
7.20			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_TABLE
7			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_GR
7			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_GROU
7			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_GR
7			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_GROUP
7			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_FL
7			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_FLOW
7			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_PO
7			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_PORT
7			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_QU
			192.168.2.22	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_QUEUE
			192.168.2.20	OpenFlow			OFPT_FLOW_MOD
7			192.168.2.20	OpenFlow OpenFlow			OFPT_PACKET_OUT
7			192.168.2.20	OpenFlow			OFPT_BARRIER_REQUEST OFPT_BARRIER_REPLY
7			192.168.2.22 192.168.2.20	OpenFlow			OFPT_BARKIER_REPLY OFPT_FLOW_MOD
7			192.168.2.20	OpenFlow		2 1	OFPT_FLOW_MOD
7			192.168.2.20	OpenFlow			OFPT_PACKET_OUT
7			192.168.2.20	OpenFlow			OFPT PACKET OUT
7			192.168.2.20	OpenFlow			OFPT BARRIER REQUEST
7			192.168.2.22	OpenFlow			OFPT BARRIER REPLY
8			192.168.2.20	OpenFlow			OFPT MULTIPART REQUEST, OFPMP TA
0	10.//0	192.100	192.108.2.20	openFlow	82	Type:	OFFI_MOLITPART_REQUEST, OFFMF_TA



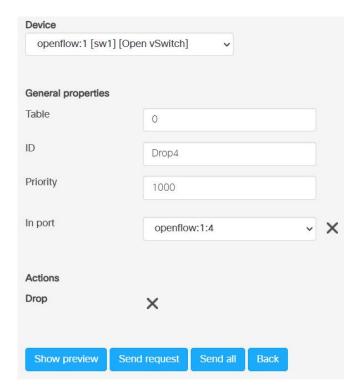


## Chỉnh sửa đường mạng:



No.	Time	Source	Destination	Protocol	Length	Info	
4	5.1271	192.168	192.168.2.21	OpenFlow	642	Type:	OFPT MULTIPART REPLY, OFPMP PORT
4			192.168.2.20	OpenFlow			OFPT MULTIPART REQUEST, OFPMP QU
4	5.1277	192.168	192.168.2.21	OpenFlow			OFPT MULTIPART REPLY, OFPMP QUEUE
4			192.168.2.20	OpenFlow			OFPT PACKET OUT
4			192.168.2.20	OpenFlow			OFPT PACKET OUT
4	5.3221	192.168	192.168.2.20	OpenFlow	316	Type:	OFPT PACKET OUT
4	5.3222	192.168	192.168.2.20	OpenFlow	316	Type:	OFPT PACKET OUT
4	5.3222	192.168	192.168.2.20	OpenFlow	191	Type:	OFPT PACKET OUT
4	5.3226	192.168	192.168.2.21	OpenFlow	193	Type:	OFPT PACKET IN
4	5.3227	192.168	192.168.2.21	OpenFlow	193	Type:	OFPT PACKET IN
4	5.3229	192.168	192.168.2.21	OpenFlow	193	Type:	OFPT PACKET IN
4	5.3232	192.168	192.168.2.20	OpenFlow	191	Type:	OFPT PACKET OUT
4	5.3233	192.168	192.168.2.20	OpenFlow	316	Type:	OFPT PACKET OUT
4	5.3234	192.168	192.168.2.21	OpenFlow	193	Type:	OFPT_PACKET_IN
4	5.3235	192.168	192.168.2.21	OpenFlow	193	Type:	OFPT_PACKET_IN
4	5.3239	192.168	192.168.2.20	OpenFlow	316	Type:	OFPT_PACKET_OUT
4	5.3240	192.168	192.168.2.21	OpenFlow	193	Type:	OFPT_PACKET_IN
4			192.168.2.20	OpenFlow			OFPT_BARRIER_REQUEST
4			192.168.2.21	OpenFlow			OFPT_BARRIER_REPLY
4			192.168.2.20	OpenFlow			OFPT_BARRIER_REQUEST
4			192.168.2.21	OpenFlow			OFPT_BARRIER_REPLY
4			192.168.2.20	OpenFlow			OFPT_BARRIER_REQUEST
4			192.168.2.21	OpenFlow			OFPT_BARRIER_REPLY
5			192.168.2.20	OpenFlow			OFPT_FLOW_MOD
5			192.168.2.20	OpenFlow			OFPT_BARRIER_REQUEST
5			192.168.2.21	OpenFlow			OFPT_BARRIER_REPLY
5			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_TA
5			192.168.2.21	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_TABLE
5			192.168.2.20	OpenFlow			OFFT_MULTIPART_REQUEST, OFFMP_GR
5			192.168.2.21	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_GROU
5			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_GR
5			192.168.2.21	OpenFlow			OFPT_MULTIPART_REPLY, OFPMP_GROUP
5			192.168.2.20	OpenFlow			OFPT_MULTIPART_REQUEST, OFPMP_FL
J	7.8798	192.108	192.168.2.21	OpenFlow	/38	Type:	OFPT_MULTIPART_REPLY, OFPMP_FLOW

```
▶ Frame 5383: 130 bytes on wire (1040 bits), 130 bytes captured (1040 bits) on
  Ethernet II, Src: Vmware 5a:ea:d7 (00:0c:29:5a:ea:d7), Dst: Vmware 70:59:2a
 Internet Protocol Version 4, Src: 192.168.2.21, Dst: 192.168.2.20
  Transmission Control Protocol, Src Port: 6653, Dst Port: 60234, Seq: 1345, A
▼ OpenFlow 1.3
     Version: 1.3 (0x04)
     Type: OFPT_FLOW_MOD (14)
     Length: 64
     Transaction ID: 7948
     Cookie: 0x00000000000000000
     Cookie mask: 0x0000000000000000
     Table ID: 0
     Idle timeout: 0
     Hard timeout: 0
     Priority: 1000
     Buffer ID: OFP_NO_BUFFER (4294967295)
     Out port: OFPP_ANY (4294967295)
     Out group: OFPG_ANY (4294967295)
    Flags: 0x0000
Pad: 0000
    Match
   ▶ Instruction
```



```
mininet> pingall

*** Ping: testing ping reachability
h1 -> h2 X X X X
h2 -> h1 X X X X
h3 -> X X h4 h5 h6
h4 -> X X h3 h5 h6
h5 -> X X h3 h4 h6
h6 -> X X h3 h4 h5

*** Results: 53% dropped (14/30 received)
```

## Trường hợp sự cố mạng:

```
▶ Frame 4238: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits) on
Ethernet II, Src: Vmware 5a:ea:d7 (00:0c:29:5a:ea:d7), Dst: Vmware 70:59:2a
▶ Internet Protocol Version 4, Src: 192.168.2.21, Dst: 192.168.2.20
Transmission Control Protocol, Src Port: 6653, Dst Port: 60234, Seq: 685, Acl
OpenFlow 1.3
     Version: 1.3 (0x04)
     Type: OFPT FLOW MOD (14)
     Length: 72
     Transaction ID: 13734
     Cookie: 0x00000000000000000
     Cookie mask: 0x0000000000000000
     Table ID: 0
     Command: OFPFC DELETE STRICT (4)
     Idle timeout: 0
     Hard timeout: 0
     Priority: 1000
     Buffer ID: OFP NO BUFFER (4294967295)
     Out port: OFPP ANY (4294967295)
     Out group: OFPG ANY (4294967295)
  ▶ Flags: 0x0000
     Pad: 0000
   ▶ Match
  ▶ Instruction
```

```
muninet> pungall

*** Ping: testing ping reachability
h1 -> h2 h3 h4 h5 h6
h2 -> h1 h3 h4 h5 h6
h3 -> h1 h2 h4 h5 h6
h4 -> h1 h2 h3 h5 h6
h5 -> h1 h2 h3 h4 h6
h6 -> h1 h2 h3 h4 h5

*** Results: 0% dropped (30/30 received)
```