PROJECT 2: Floodlight Firewall App

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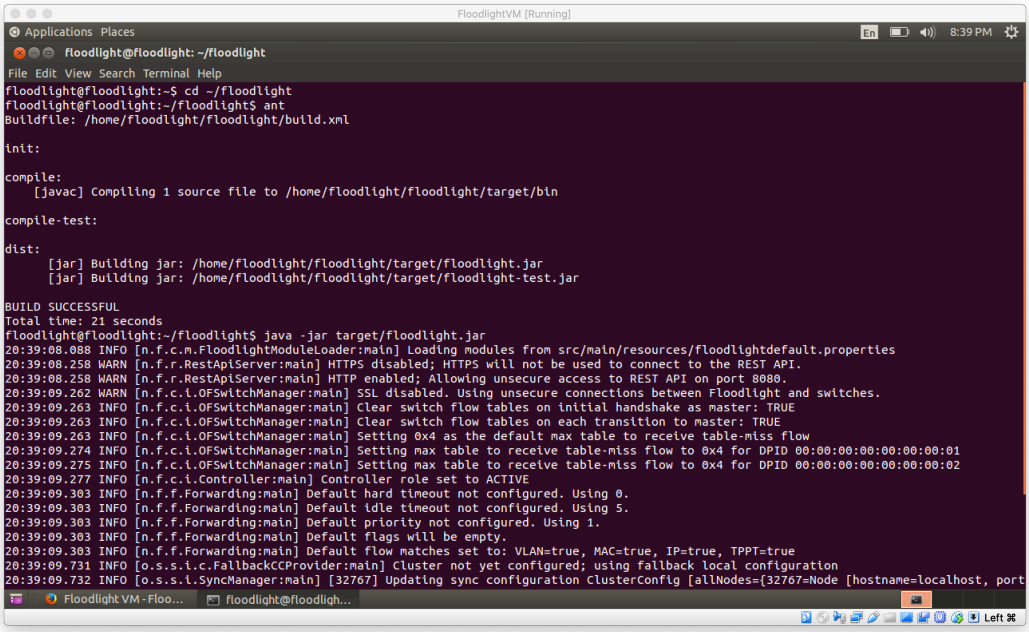
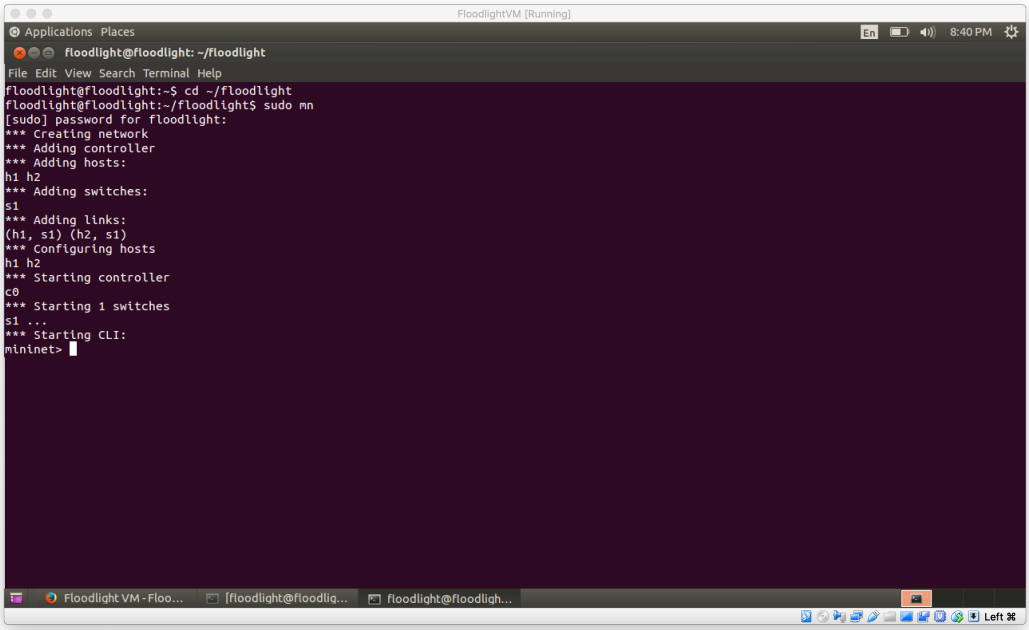
Inorder to setup the SDN environment, we first download the Floodlight VM and run it on the virtual box. After setting up the Virtual machine we do the following steps:

1. On the terminal, we cd into the floodlight directory and run the `ant` command which is a java library to build the java files in the directory. After this we run `java -jar target/floodlight.jar` to run floodlight and get our localhost setup in the VM.
   Screenshot:



2. Next a virtual network is setup using mininet . Thus the floodlight is attached to the OpenFlow network.



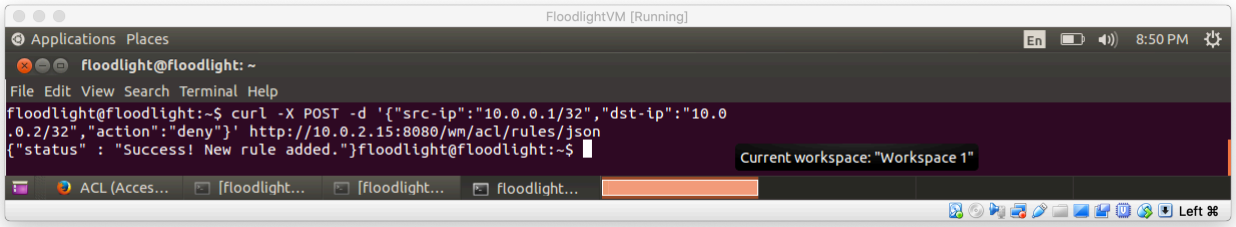
ACL REST API

1. Add an ACL rule:

command:

```
curl -X POST -d '{"src-ip":"10.0.0.1/32","dst-ip":"10.0.0.2/32","action":"deny"}' http://10.0.2.15:8080/wm/acl/rules/json
```

Screenshot:

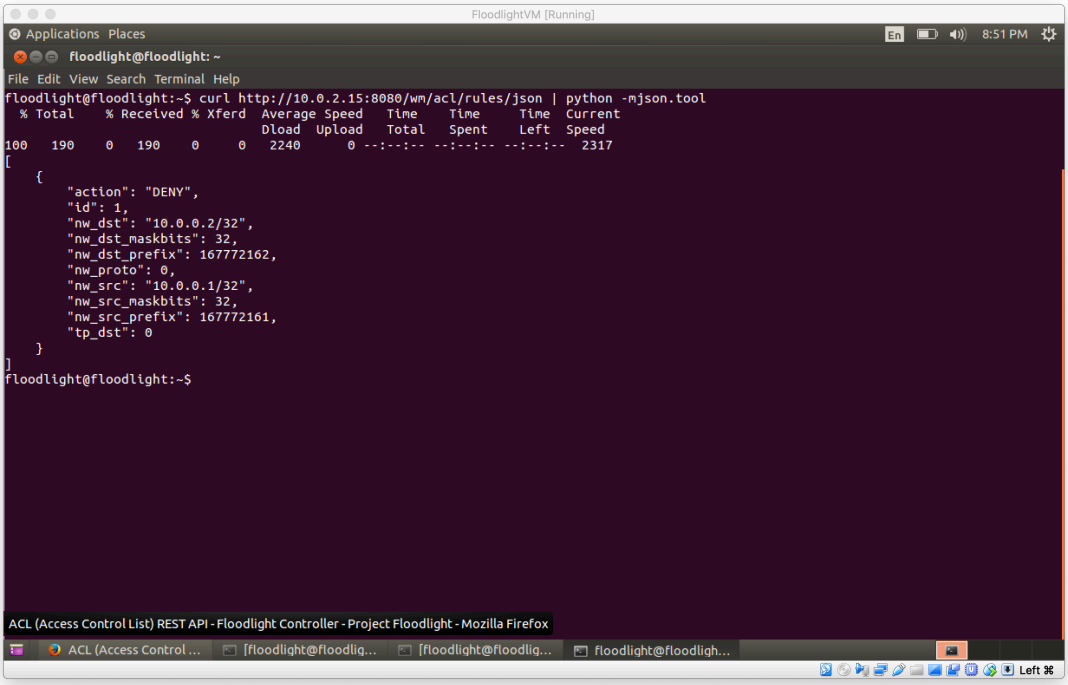


2. Listing all ACL rules

Command:

```
curl http://10.0.2.15:8080/wm/acl/rules/json | python -mjson.tool
```

Screenshot:

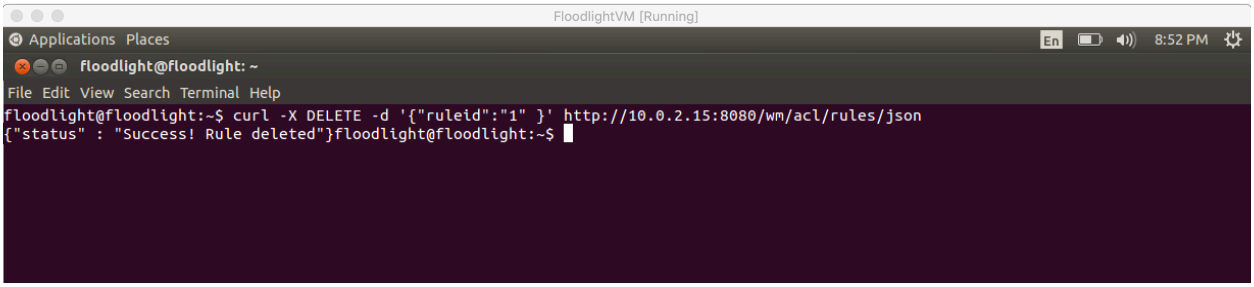


3. Remove an ACL rule:

Command:

```
curl -X DELETE -d '{"ruleid":"1" }' http://10.0.2.15:8080/wm/acl/rules/json
```

Screenshot:

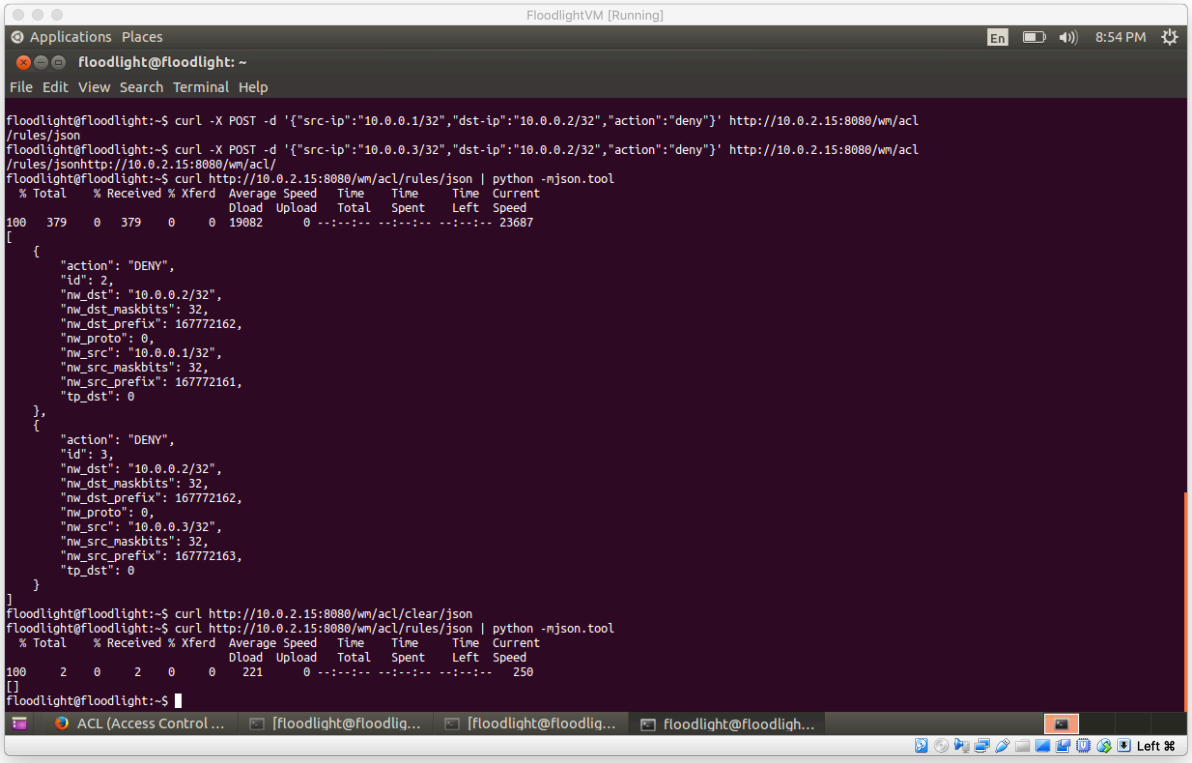


4. Remove all ACL rules:

Command:

```
curl http://10.0.2.15:8080/wm/acl/clear/json
```

Screenshot:



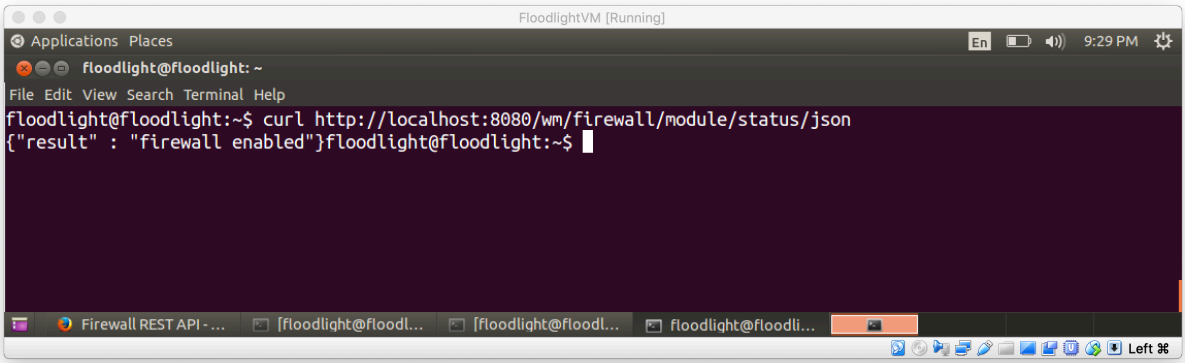
Firewall REST API

1. Check status of firewall (enabled/disabled).

Command:

```
curl http://localhost:8080/wm/firewall/module/status/json
```

Screenshot:

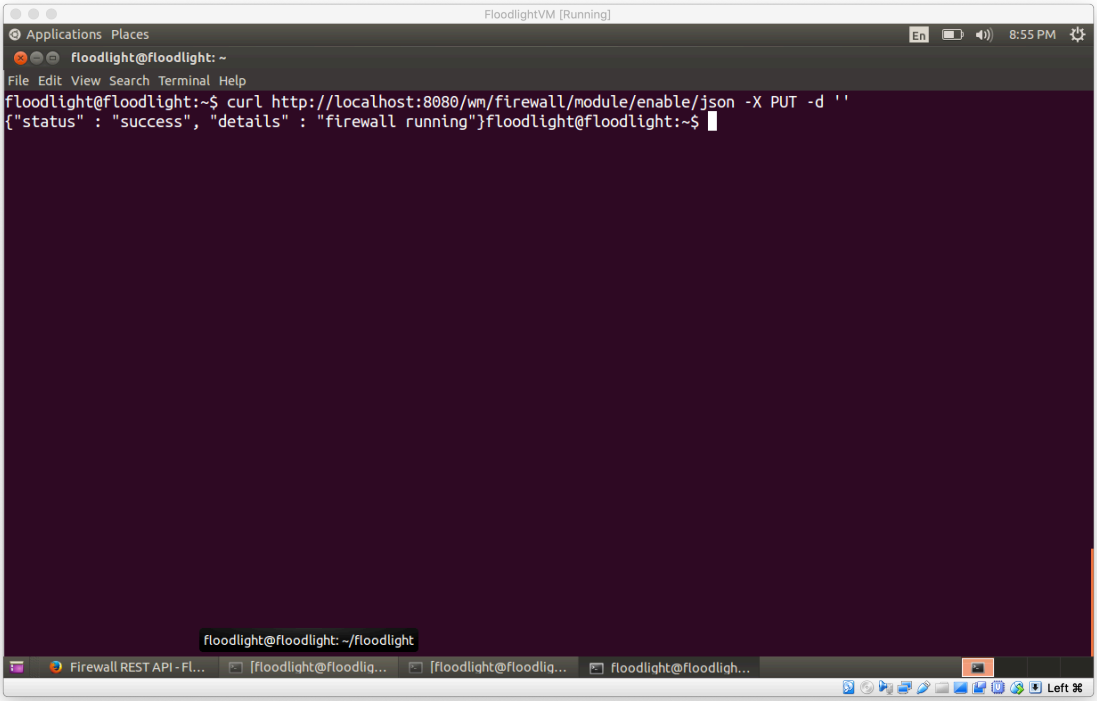


2. Enable the firewall.

Command:

```
curl http://localhost:8080/wm/firewall/module/enable/json -X PUT -d ''
```

Screenshot:

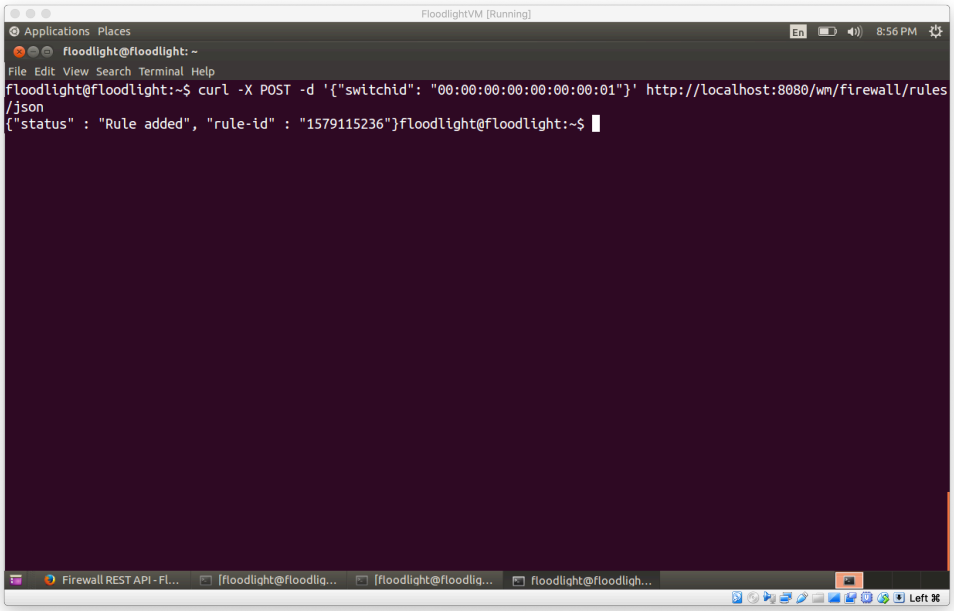


3. Adding an ALLOW rule for all flows to pass through switch 00:00:00:00:00:00:00:01.

Command:

```
curl -X POST -d '{"switchid": "00:00:00:00:00:00:00:01"}' http://localhost:8080/wm/firewall/rules/json
```

Screenshot:

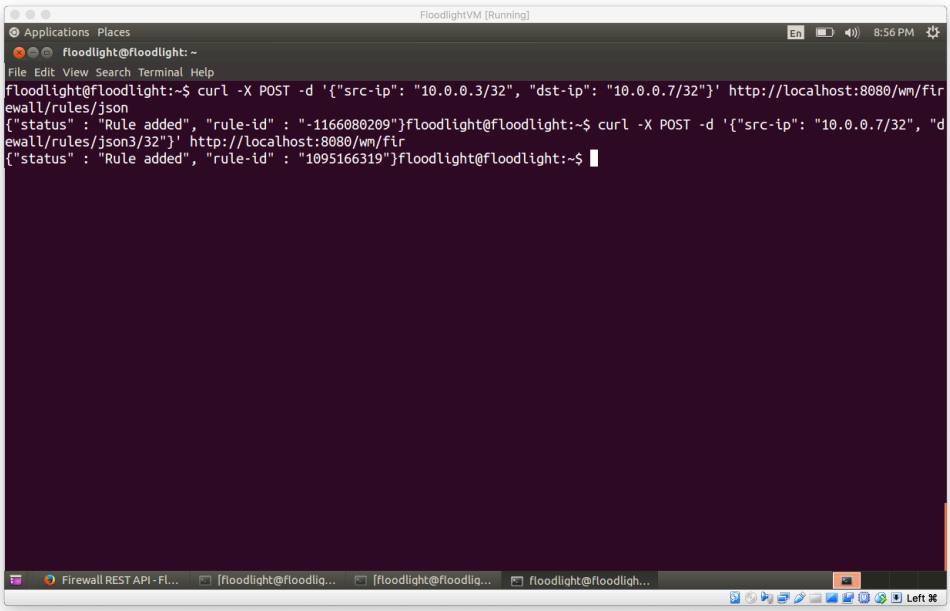


4. Adding an ALLOW rule for all flows between IP host 10.0.0.3 and host 10.0.1.5.

Command:

```
 curl -X POST -d '{"src-ip": "10.0.0.3/32", "dst-ip": "10.0.0.7/32"}' http://localhost:8080/wm/firewall/rules/json
curl -X POST -d '{"src-ip": "10.0.0.7/32", "dst-ip": "10.0.0.3/32"}' http://localhost:8080/wm/firewall/rules/json
```

Screenshot:

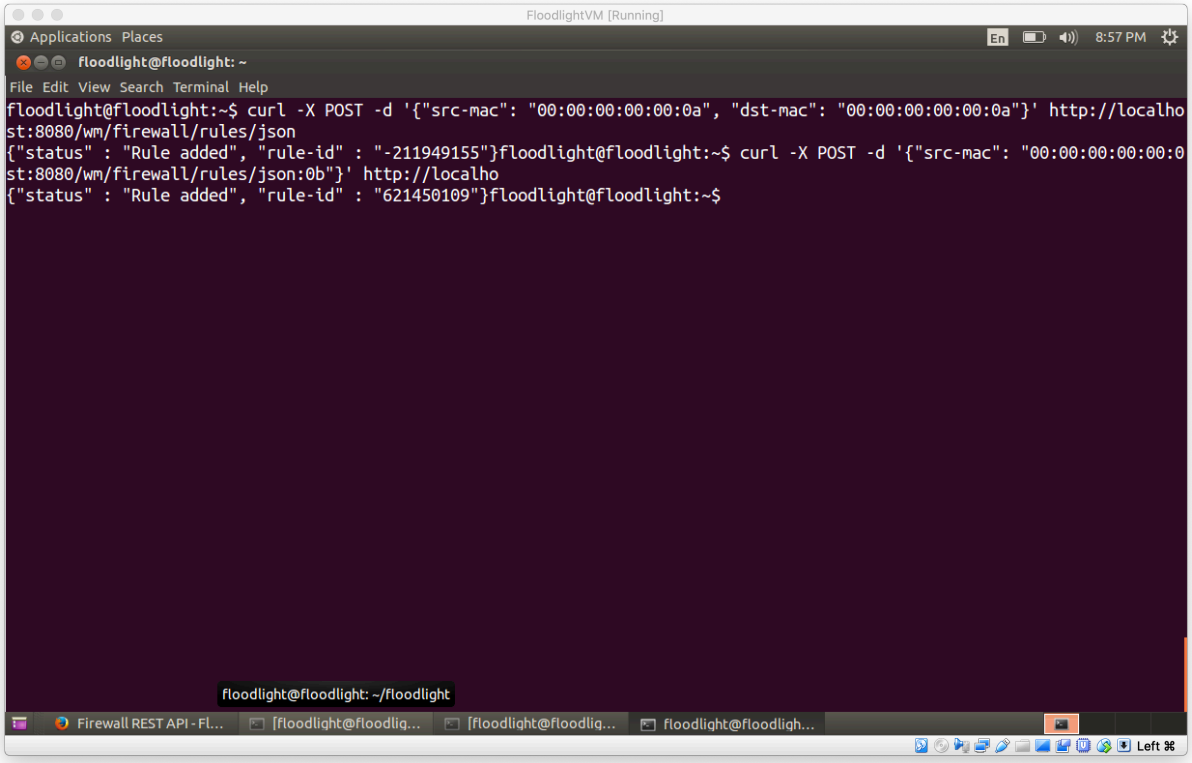


5. Adding an ALLOW rule for all flows between host mac 00:00:00:00:00:0a and host 00:00:00:00:00:0b.

Command:

```
curl -X POST -d '{"src-mac": "00:00:00:00:00:0a", "dst-mac":
"00:00:00:00:00:0a"}' http://localhost:8080/wm/firewall/rules/json
curl -X POST -d '{"src-mac": "00:00:00:00:00:0b", "dst-mac":
"00:00:00:00:00:0b"}' http://localhost:8080/wm/firewall/rules/json
```

Screenshot:



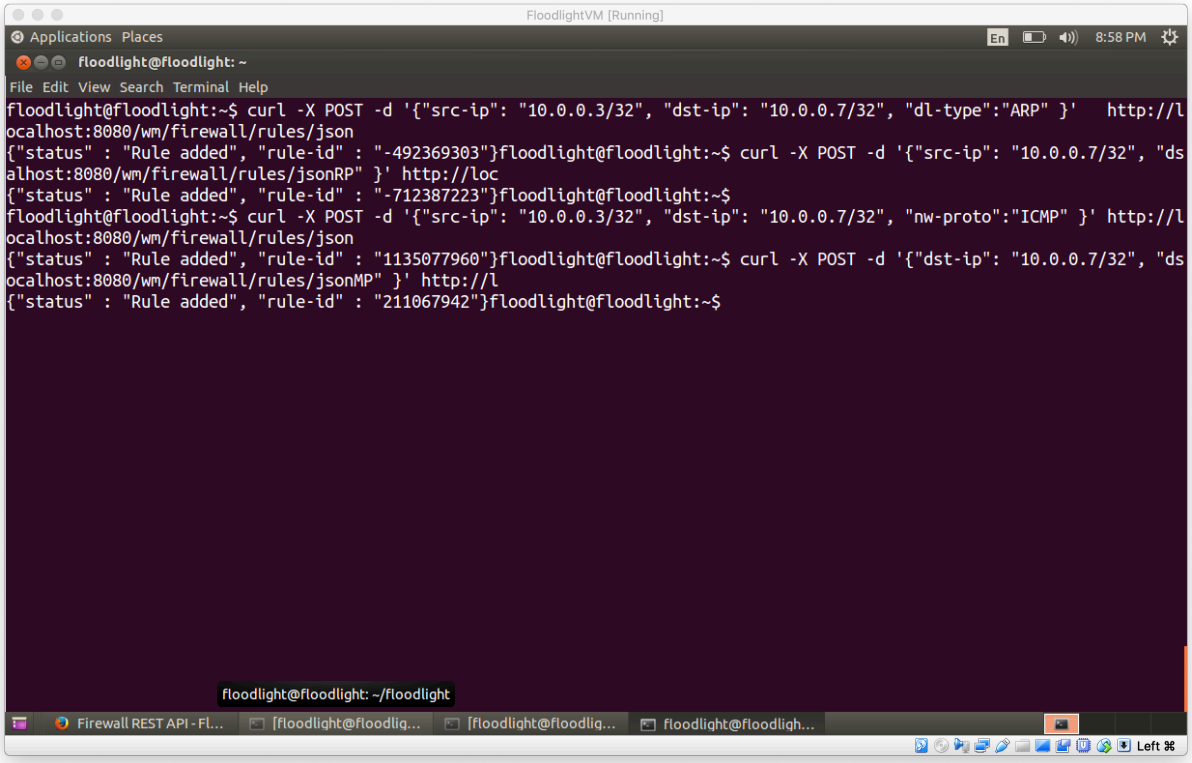
6. Adding an ALLOW rule for ping to work between IP hosts 10.0.0.3 and 10.0.0.7.

Command:

```
curl -X POST -d '{"src-ip": "10.0.0.3/32", "dst-ip": "10.0.0.7/32",
"dl-type":"ARP" }'   http://localhost:8080/wm/firewall/rules/json
curl -X POST -d '{"src-ip": "10.0.0.7/32", "dst-ip": "10.0.0.3/32",
"dl-type":"ARP" }' http://localhost:8080/wm/firewall/rules/json

curl -X POST -d '{"src-ip": "10.0.0.3/32", "dst-ip": "10.0.0.7/32",
"nw-proto":"ICMP" }' http://localhost:8080/wm/firewall/rules/json
curl -X POST -d '{"dst-ip": "10.0.0.7/32", "dst-ip": "10.0.0.3/32",
"nw-proto":"ICMP" }' http://localhost:8080/wm/firewall/rules/json
```

Screenshot:



7. Adding an ALLOW rule for UDP to work between IP hosts 10.0.0.4 and 10.0.0.10, and then blocking port 5010.

Command:

```
curl -X POST -d '{"src-ip": "10.0.0.4/32", "dst-ip": "10.0.0.10/32",
"dl-type":"ARP" }' http://localhost:8080/wm/firewall/rules/json
curl -X POST -d '{"dst-ip": "10.0.0.10/32", "dst-ip": "10.0.0.4/32",
"dl-type":"ARP" }' http://localhost:8080/wm/firewall/rules/json

curl -X POST -d '{"src-ip": "10.0.0.4/32", "dst-ip": "10.0.0.10/32",
"nw-proto":"UDP" }' http://localhost:8080/wm/firewall/rules/json
curl -X POST -d '{"src-ip": "10.0.0.10/32", "dst-ip": "10.0.0.4/32",
"nw-proto":"UDP" }' http://localhost:8080/wm/firewall/rules/json

curl -X POST -d '{"src-ip": "10.0.0.4/32", "dst-ip": "10.0.0.10/32",
"nw-proto":"UDP", "tp-src":"5010", "action":"DENY" }' http://
localhost:8080/wm/firewall/rules/json
curl -X POST -d '{"src-ip": "10.0.0.10/32", "dst-ip": "10.0.0.4/32",
"nw-proto":"UDP", "tp-src":"5010", "action":"DENY" }' http://
localhost:8080/wm/firewall/rules/json
```

Screenshot: