SDN DEMO PREP

Iteration 3

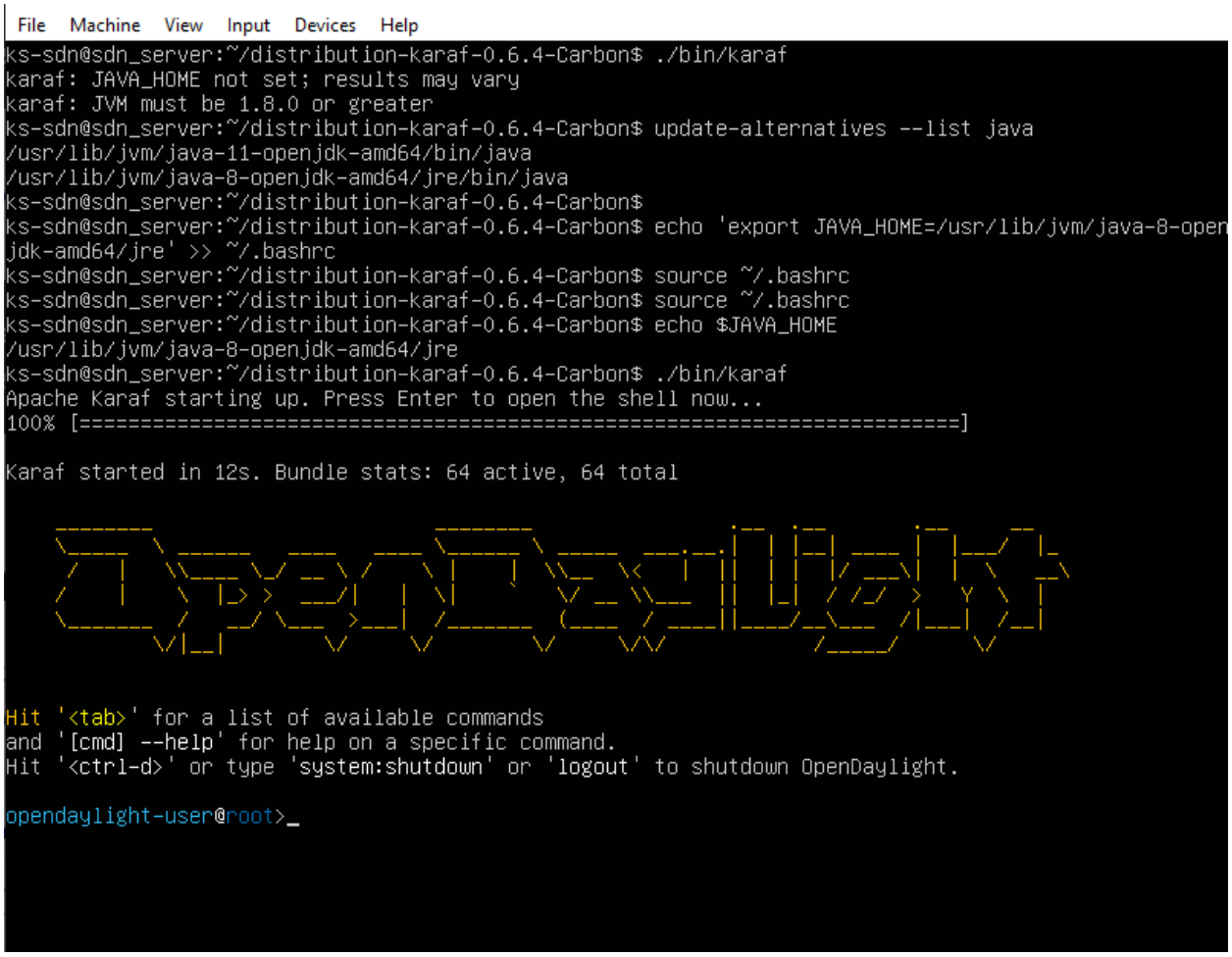
By

Kabiru Sanusi

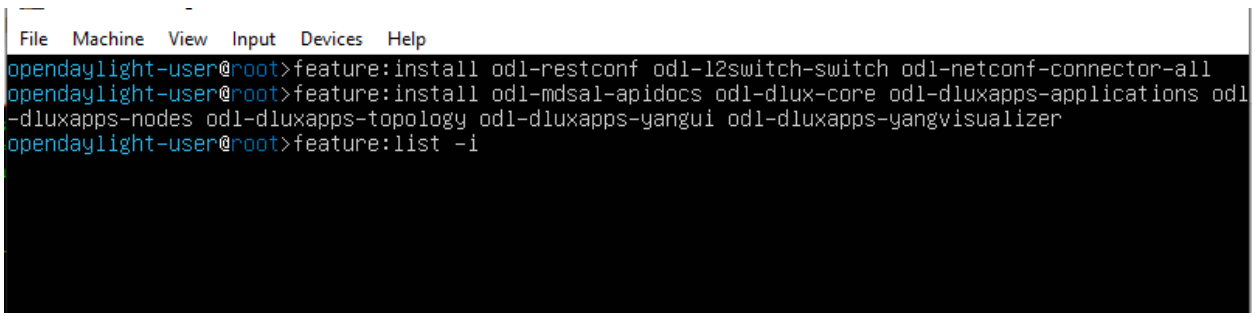
Mininet/Opendaylight walkthrough

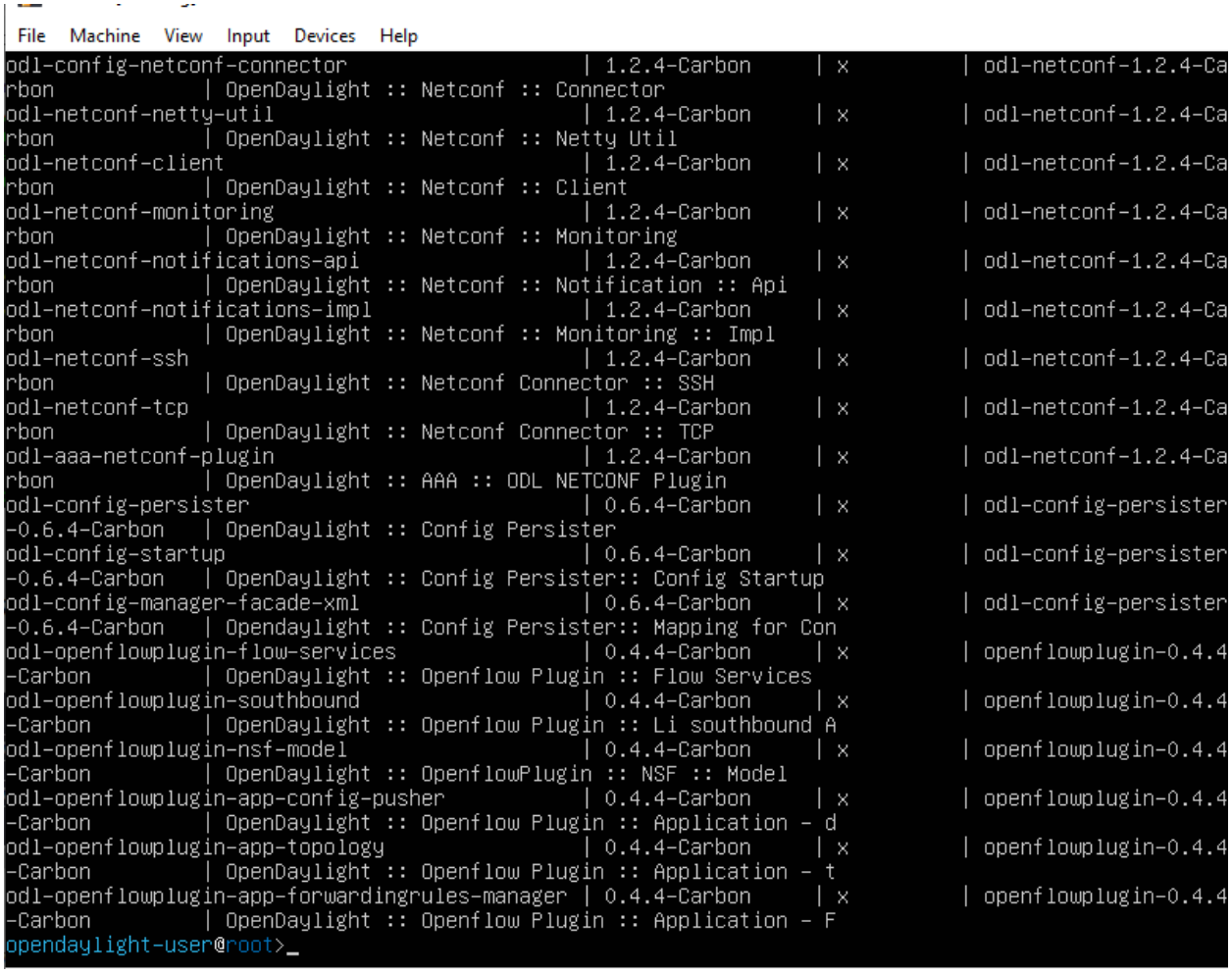
Result:

- **Start the OpenDayLight (ODL) Controller and Mininet**

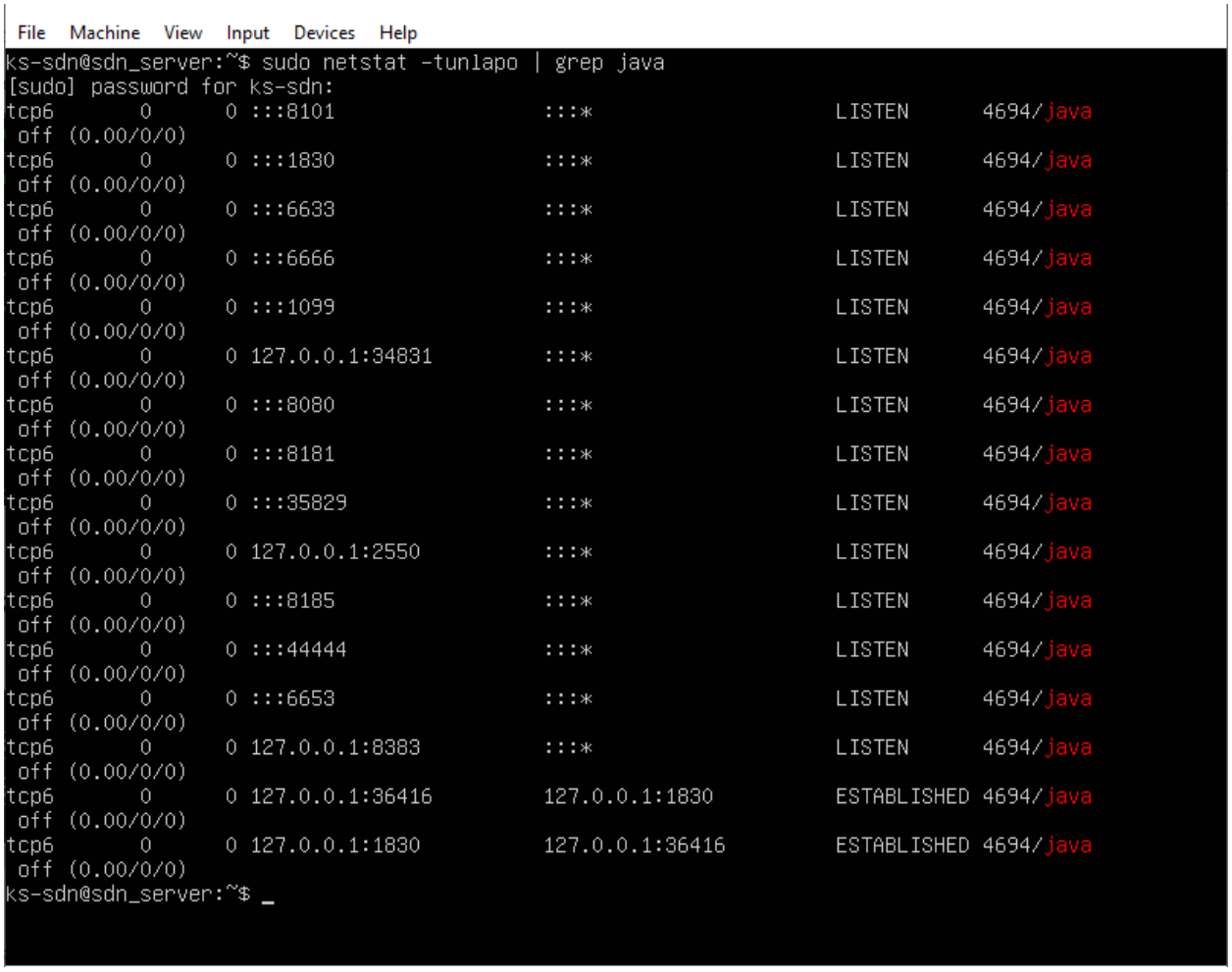


- **Install additional features & check installed features**

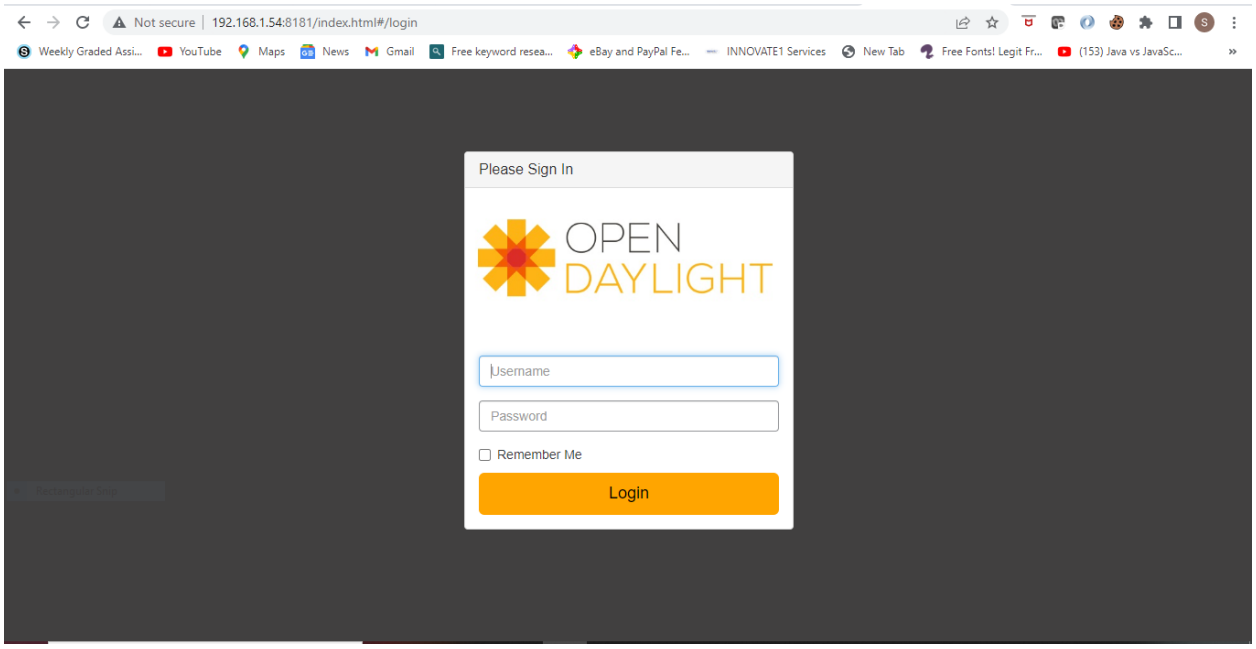


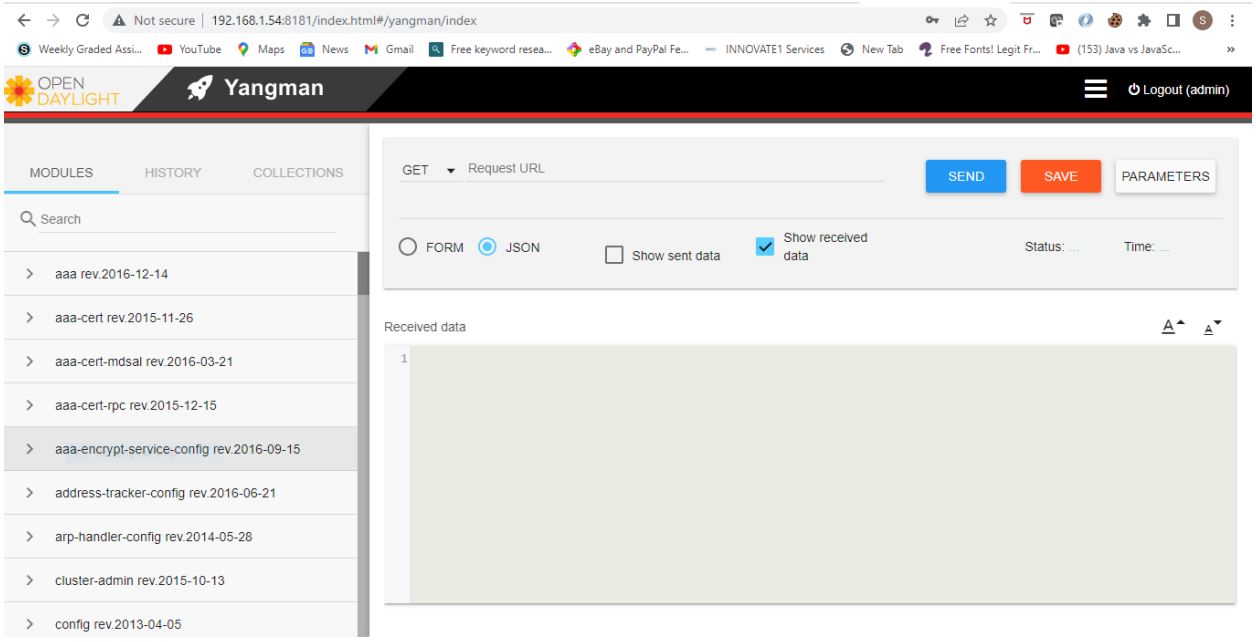


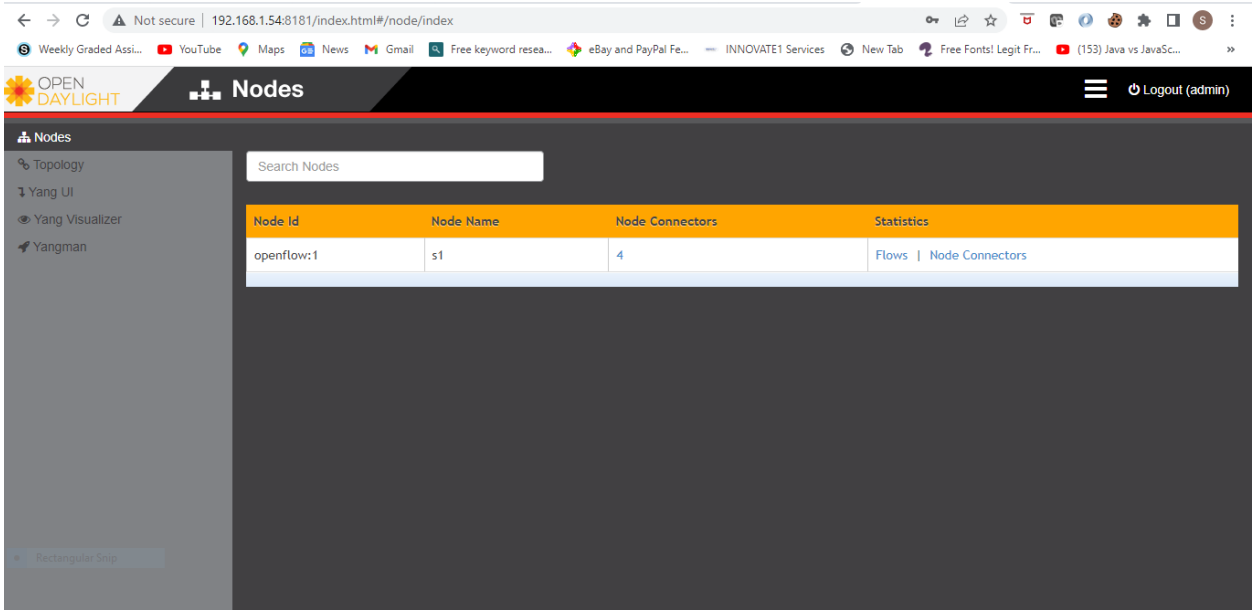
- **Check open ports**



- **Using a browser window, connect the VM to open the ODL**
- **By typing the following url in the address bar:**
  - **http://192.168.1.54:8181/index.html#/login**
  - **Note that the ip address will differ in another VM**
  - **username= admin**
  - **password= admin**


Not secure | 192.168.1.54:8181/index.html#/login
Please Sign In
OPEN DAYLIGHT
Username
Password
Remember Me
Login

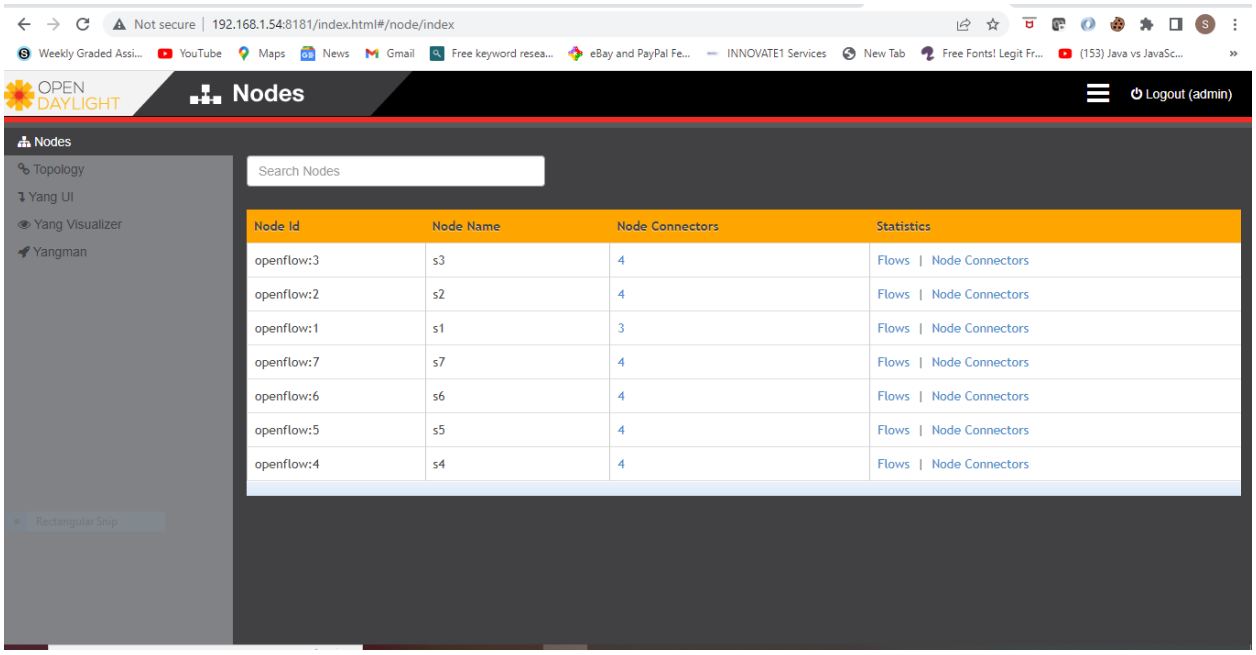

Not secure | 192.168.1.54:8181/index.html#/yangman/index
OPEN DAYLIGHT
Yangman
Logout (admin)
MODULES
HISTORY
COLLECTIONS
Search
aaa rev.2016-12-14
aaa-cert rev.2015-11-26
aaa-cert-mdsal rev.2016-03-21
aaa-cert-rpc rev.2015-12-15
aaa-encrypt-service-config rev.2016-09-15
address-tracker-config rev.2016-06-21
arp-handler-config rev.2014-05-28
cluster-admin rev.2015-10-13
config rev.2013-04-05
GET
Request URL
SEND
SAVE
PARAMETERS
FORM
JSON
Show sent data
Show received data
Status: ...
Time: ...
Received data



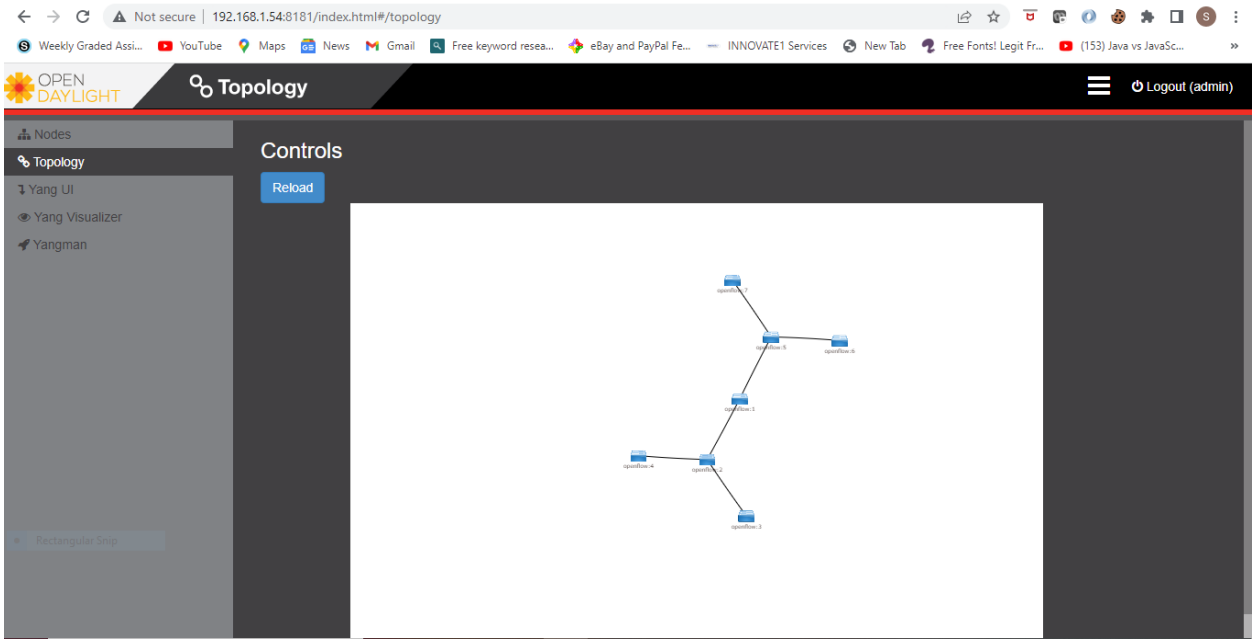
- **Start Mininet**

```
ks-sdn@sdn_server:~$ sudo mn --topo tree,3 --mac --controller 'remote,ip=192.168.1.54,port=6653' --s
witch ovsk,protocols=OpenFlow13
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4 h5 h6 h7 h8
*** Adding switches:
s1 s2 s3 s4 s5 s6 s7
*** Adding links:
(s1, s2) (s1, s5) (s2, s3) (s2, s4) (s3, h1) (s3, h2) (s4, h3) (s4, h4) (s5, s6) (s5, s7) (s6, h5) (
s6, h6) (s7, h7) (s7, h8)
*** Configuring hosts
h1 h2 h3 h4 h5 h6 h7 h8
*** Starting controller
c0
*** Starting 7 switches
s1 s2 s3 s4 s5 s6 s7 ...
*** Starting CLI:
mininet>
```

- **Mininet Network appear in Nodes Menu**



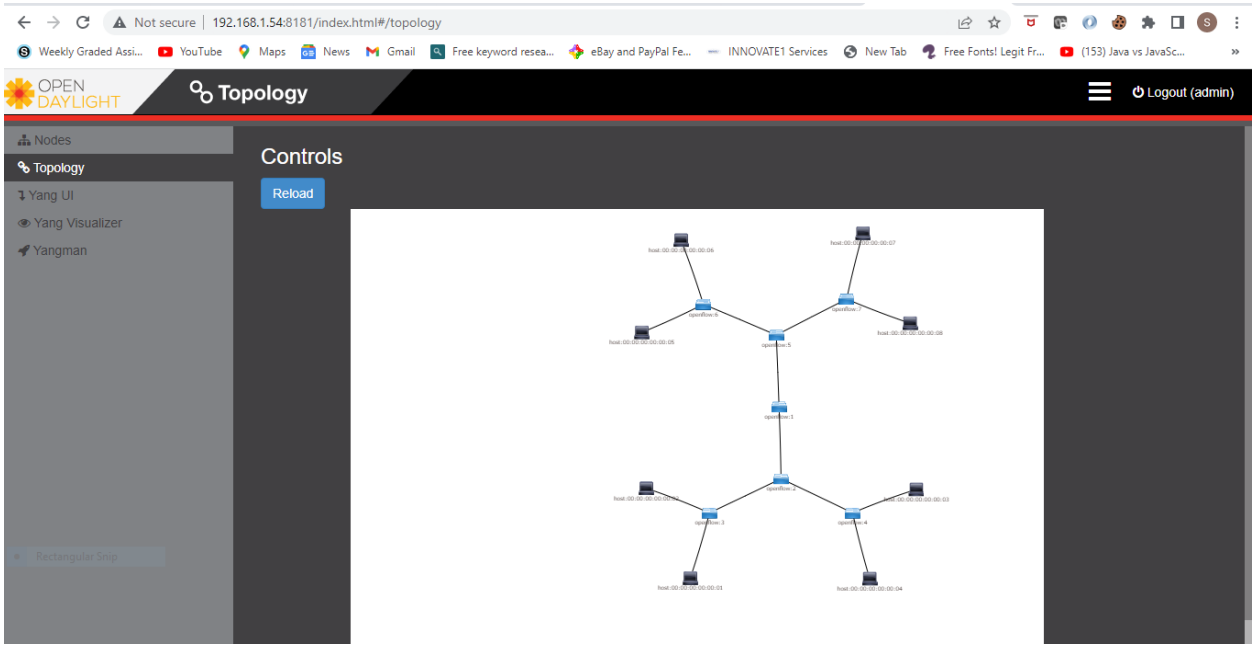
- **Network Topology before pingall command**



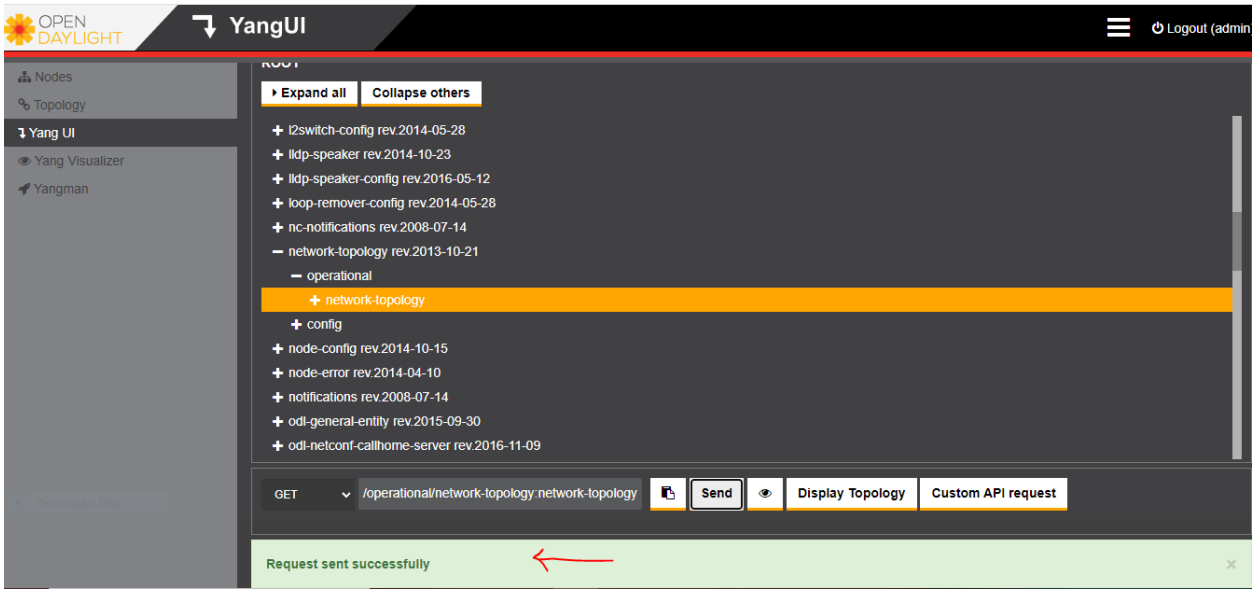
- **Pingall command used to ping all nodes**

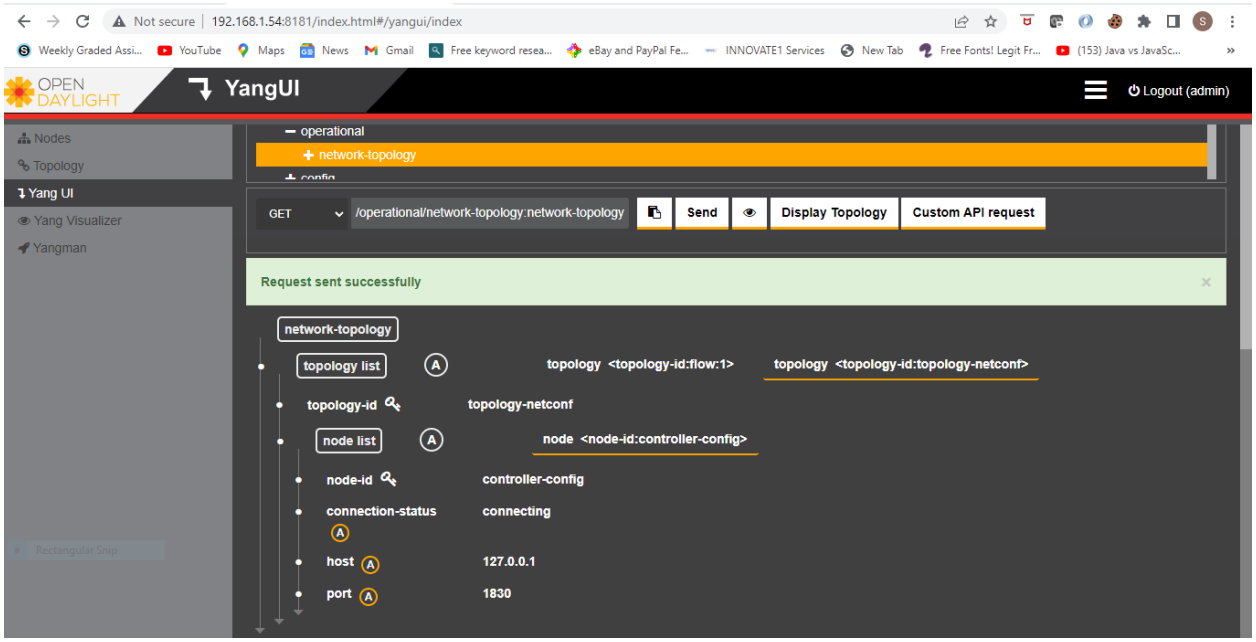
```
ks-sdn@sdn_server:~$ sudo mn --topo tree,3 --mac --controller 'remote,ip=192.168.1.54,port=6653' --s
witch ovsk,protocols=OpenFlow13
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4 h5 h6 h7 h8
*** Adding switches:
s1 s2 s3 s4 s5 s6 s7
*** Adding links:
(s1, s2) (s1, s5) (s2, s3) (s2, s4) (s3, h1) (s3, h2) (s4, h3) (s4, h4) (s5, s6) (s5, s7) (s6, h5) (
s6, h6) (s7, h7) (s7, h8)
*** Configuring hosts
h1 h2 h3 h4 h5 h6 h7 h8
*** Starting controller
c0
*** Starting 7 switches
s1 s2 s3 s4 s5 s6 s7 ...
*** Starting CLI:
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 h4 h5 h6 h7 h8
h2 -> h1 h3 h4 h5 h6 h7 h8
h3 -> h1 h2 h4 h5 h6 h7 h8
h4 -> h1 h2 h3 h5 h6 h7 h8
h5 -> h1 h2 h3 h4 h6 h7 h8
h6 -> h1 h2 h3 h4 h5 h7 h8
h7 -> h1 h2 h3 h4 h5 h6 h8
h8 -> h1 h2 h3 h4 h5 h6 h7
*** Results: 0% dropped (56/56 received)
mininet>
```

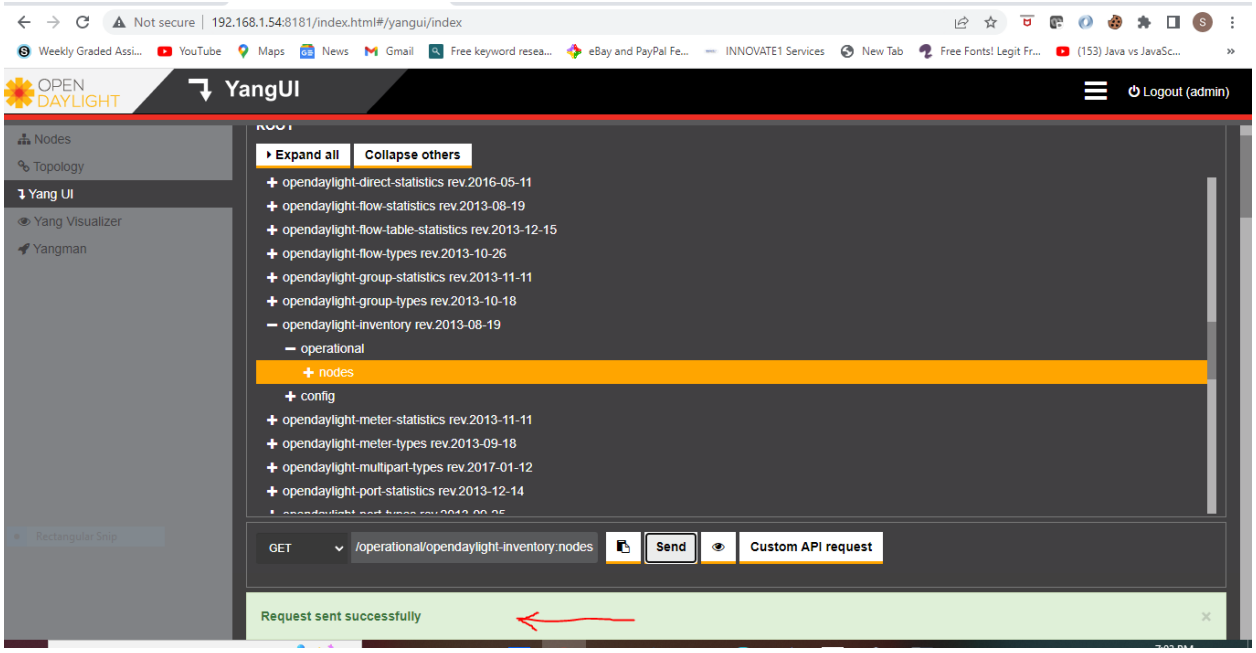
- **Network topology after pingall command**

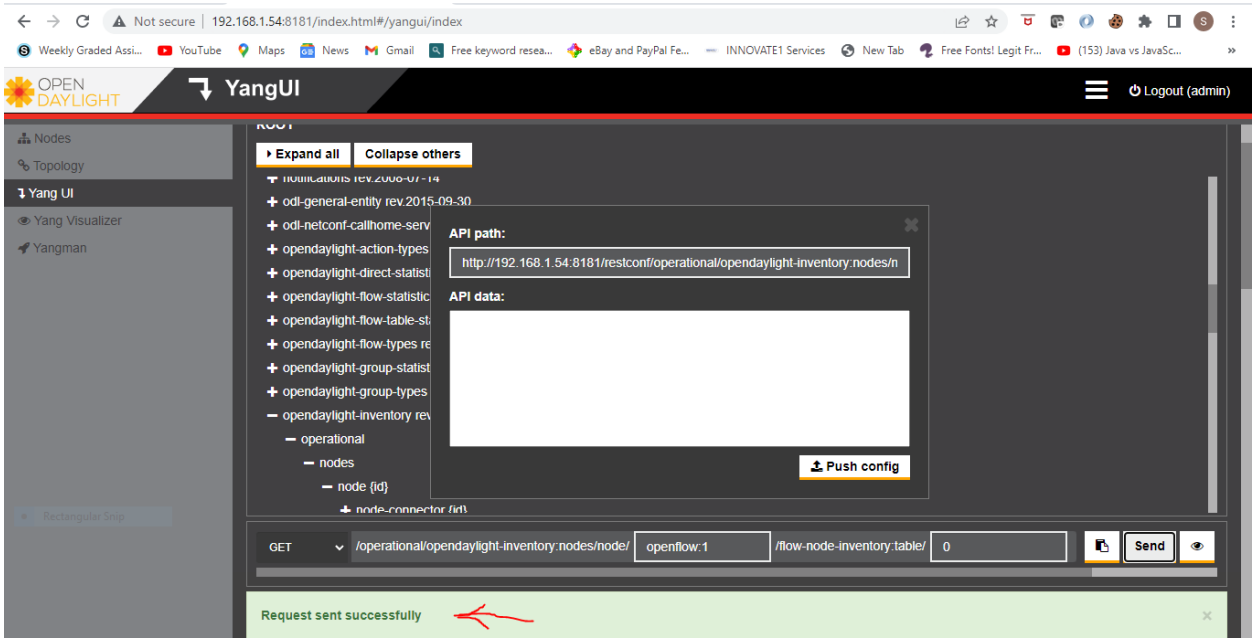


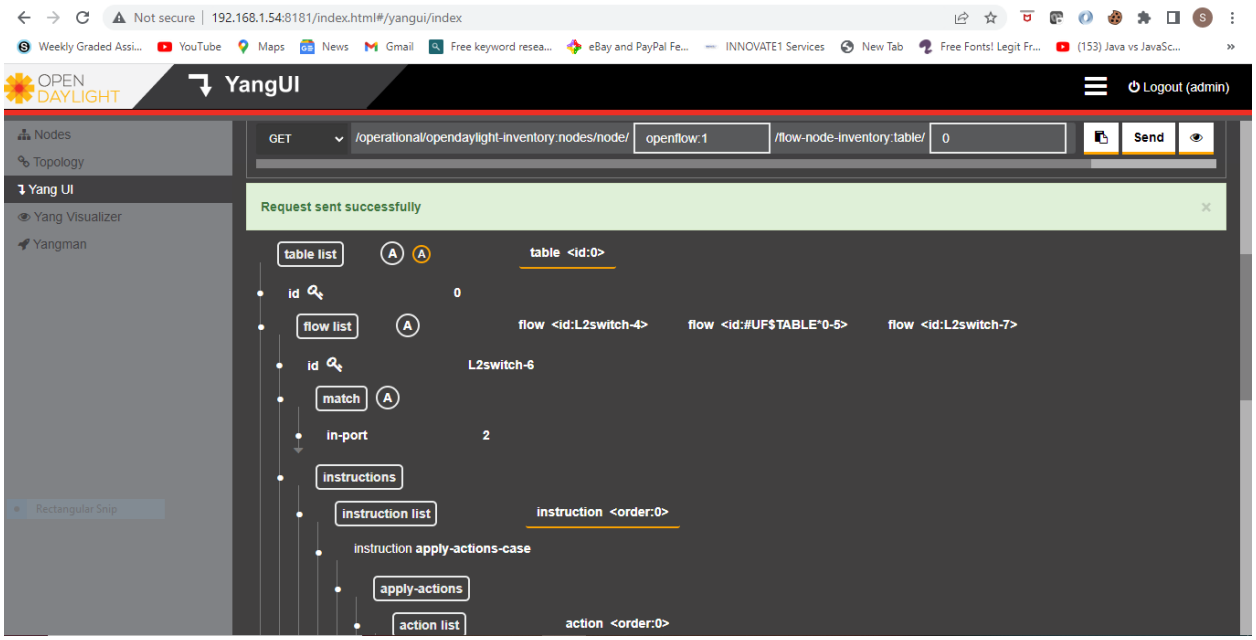
- **Using Yang GUI to display topology**

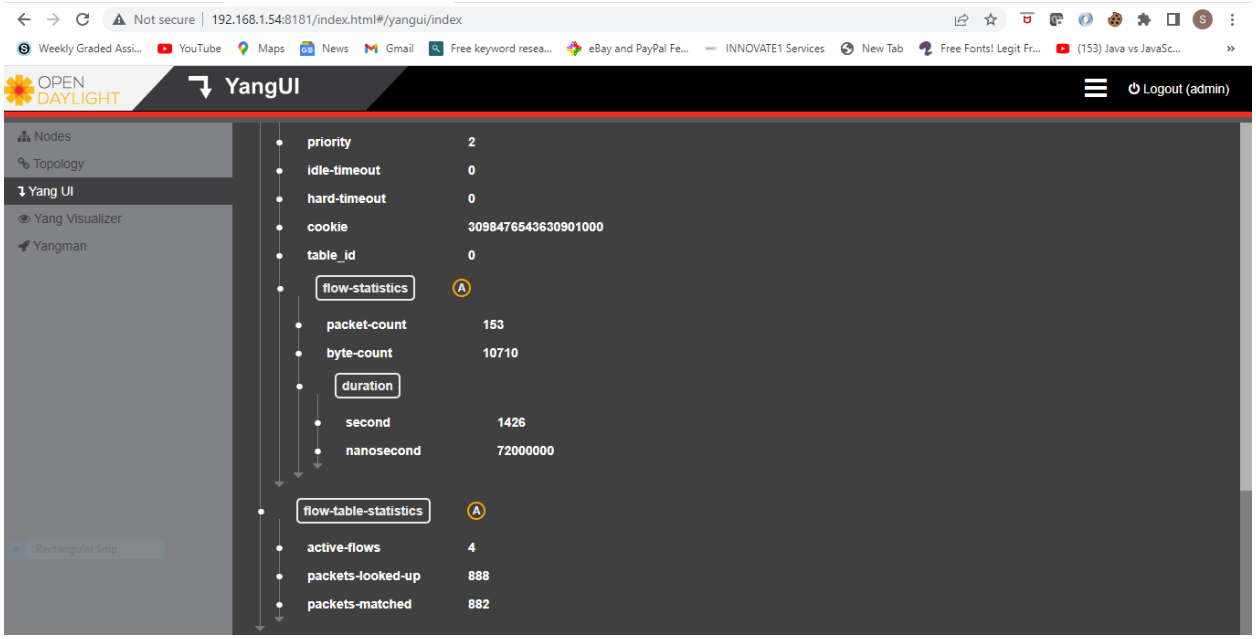

OPEN DAYLIGHT
YangUI
Logout (admin)
Nodes
Topology
Yang UI
Yang Visualizer
Yangman
Expand all
Collapse others
l2switch-config rev.2014-05-28
lldp-speaker rev.2014-10-23
lldp-speaker-config rev.2016-05-12
loop-remover-config rev.2014-05-28
nc-notifications rev.2008-07-14
network-topology rev.2013-10-21
operational
network-topology
config
node-config rev.2014-10-15
node-error rev.2014-04-10
notifications rev.2008-07-14
odl-general-entity rev.2015-09-30
odl-netconf-callhome-server rev.2016-11-09
GET
/operational/network-topology:network-topology
Send
Display Topology
Custom API request
Request sent successfully


Not secure | 192.168.1.54:8181/index.html#/yangui/index
OPEN DAYLIGHT
YangUI
Logout (admin)
Nodes
Topology
Yang UI
Yang Visualizer
Yangman
operational
network-topology
GET
/operational/network-topology:network-topology
Send
Display Topology
Custom API request
Request sent successfully
network-topology
topology list
topology <topology-id:flow:1>
topology <topology-id:topology-netconf>
topology-id
topology-netconf
node list
node <node-id:controller-config>
node-id
controller-config
connection-status
connecting
host
127.0.0.1
port
1830


Not secure | 192.168.1.54:8181/index.html#/yangui/index
OPEN DAYLIGHT
YangUI
Logout (admin)
Nodes
Topology
Yang UI
Yang Visualizer
Yangman
Expand all
Collapse others
opendaylight-direct-statistics rev.2016-05-11
opendaylight-flow-statistics rev.2013-08-19
opendaylight-flow-table-statistics rev.2013-12-15
opendaylight-flow-types rev.2013-10-26
opendaylight-group-statistics rev.2013-11-11
opendaylight-group-types rev.2013-10-18
opendaylight-inventory rev.2013-08-19
operational
nodes
config
opendaylight-meter-statistics rev.2013-11-11
opendaylight-meter-types rev.2013-09-18
opendaylight-multipart-types rev.2017-01-12
opendaylight-port-statistics rev.2013-12-14
GET
/operational/opendaylight-inventory:nodes
Send
Custom API request
Request sent successfully

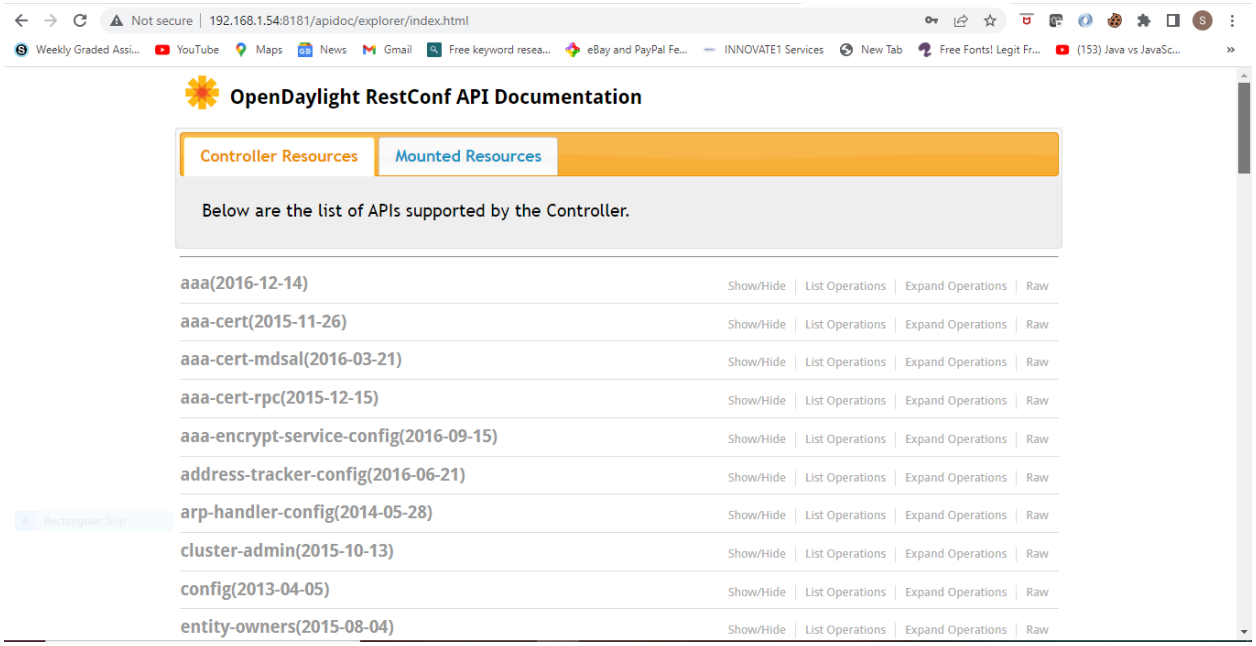

Not secure | 192.168.1.54:8181/index.html#/yangui/index
OPEN DAYLIGHT
YangUI
Logout (admin)
Nodes
Topology
Yang UI
Yang Visualizer
Yangman
Expand all
Collapse others
odl-general-entity rev.2015-09-30
API path:
http://192.168.1.54:8181/restconf/operational/opendaylight-inventory:nodes/n
API data:
Push config
operational
nodes
node {id}
GET
/operational/opendaylight-inventory:nodes/node/
openflow:1
/flow-node-inventory:table/
0
Send
Request sent successfully



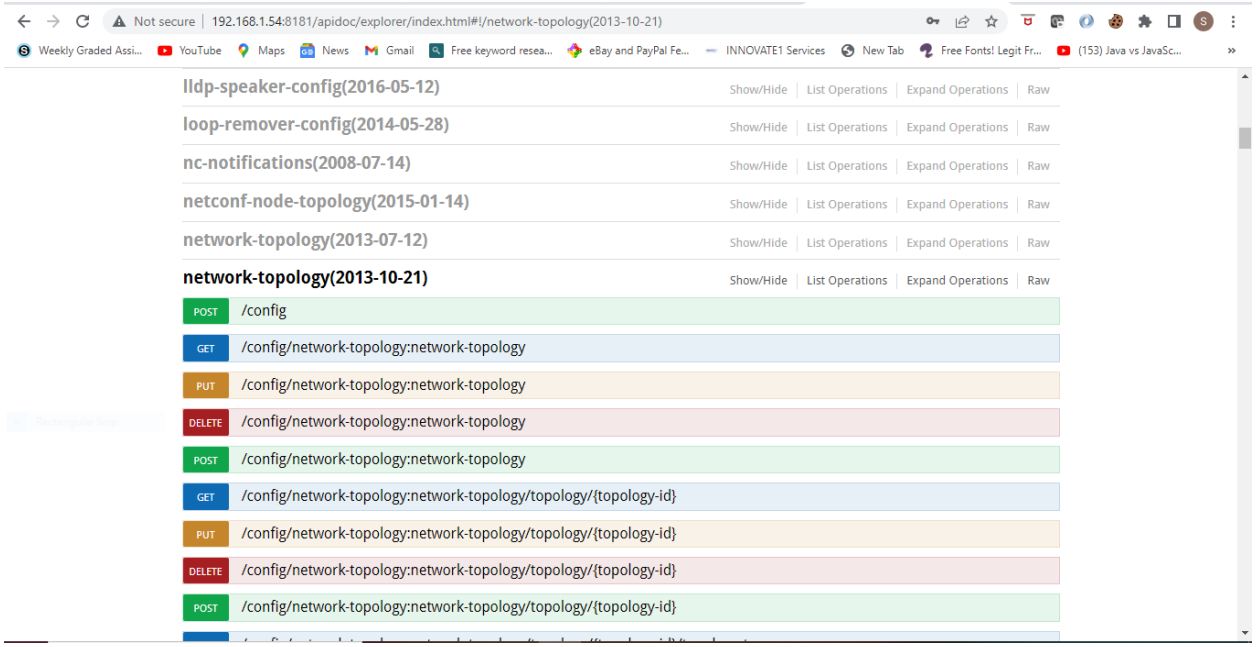


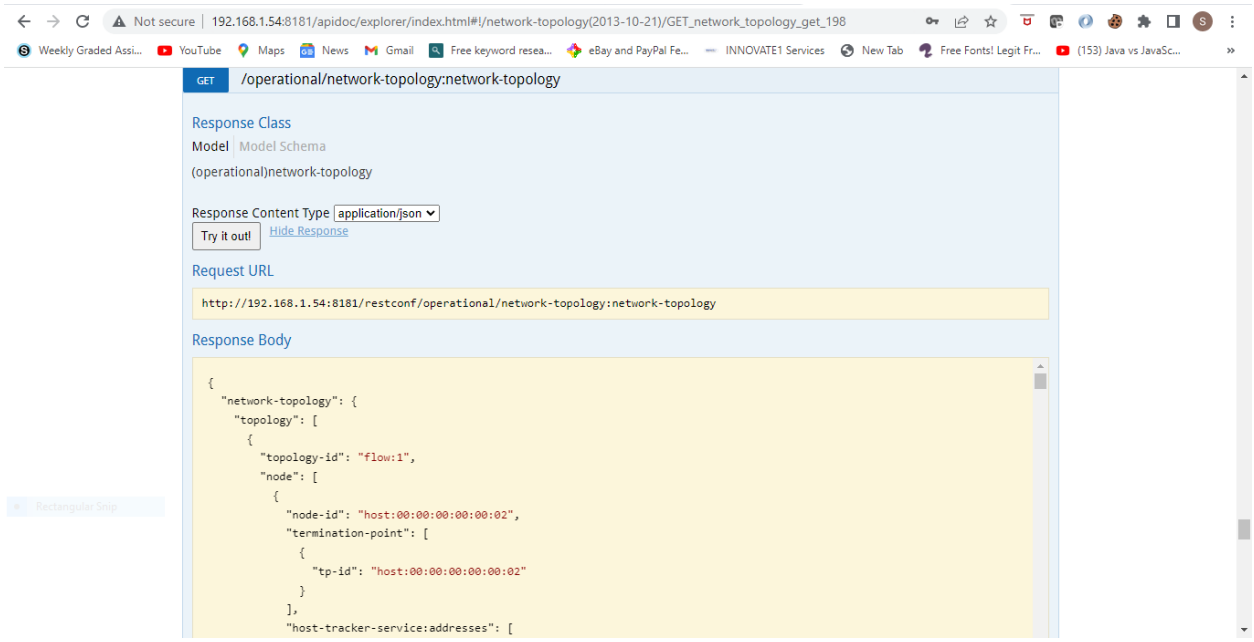
ODL API Documentation (Swagger)

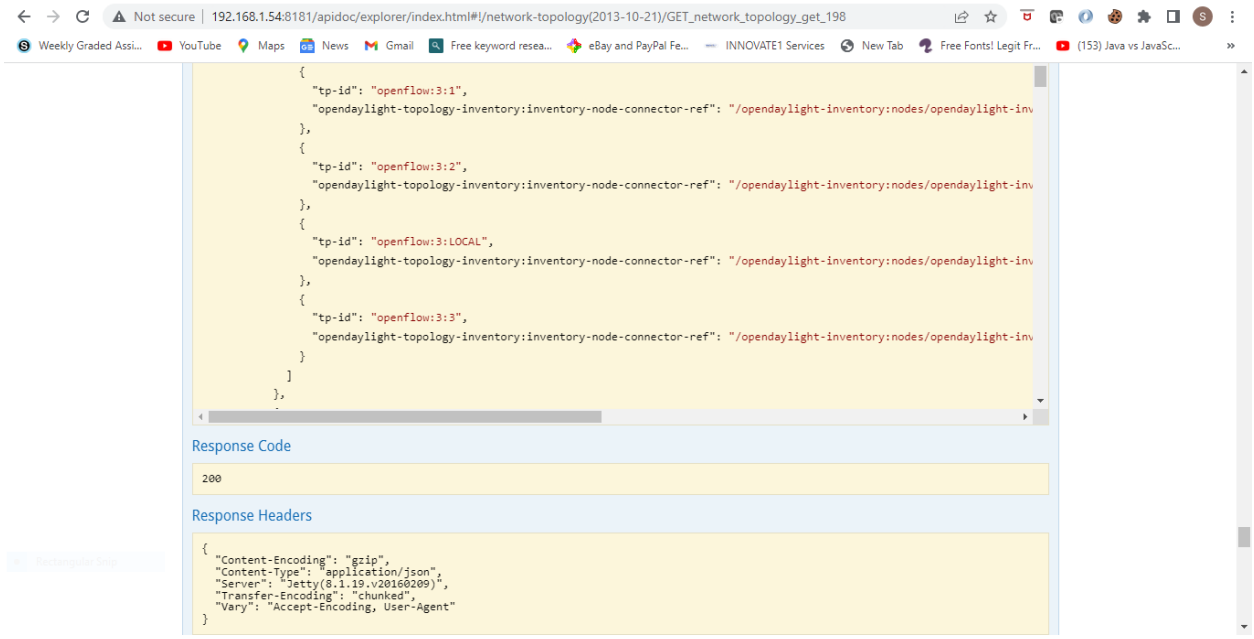
- Open the API Doc url at the web browser:
  - http://192.168.1.54:8181/apidoc/explorer/index.html
  - username= admin
  - password= admin



- Click **network-topology(2013-10-21)**
- Scroll down **/operational/network-topology:network-topology/**
- Click on **Try it out!** Button to get the result shown below
    - Response Code: **200**
    - Response Body: topology in **JSON format**

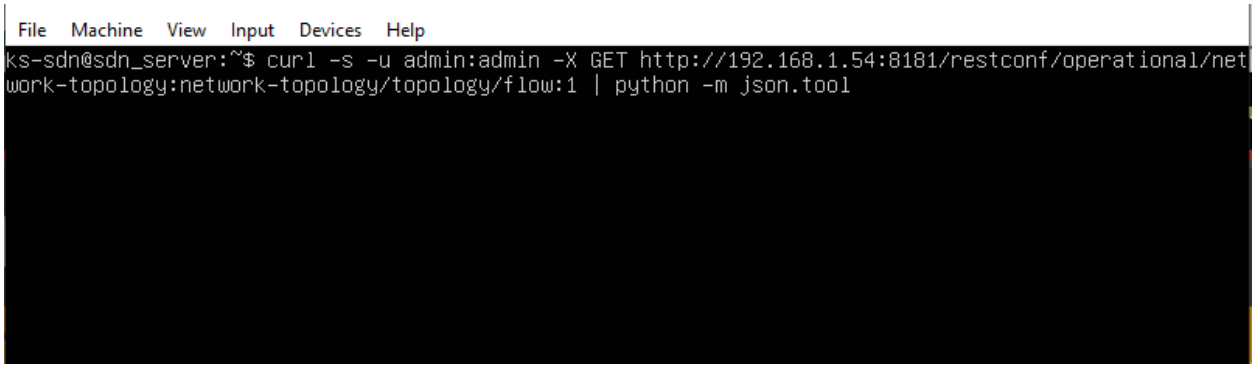


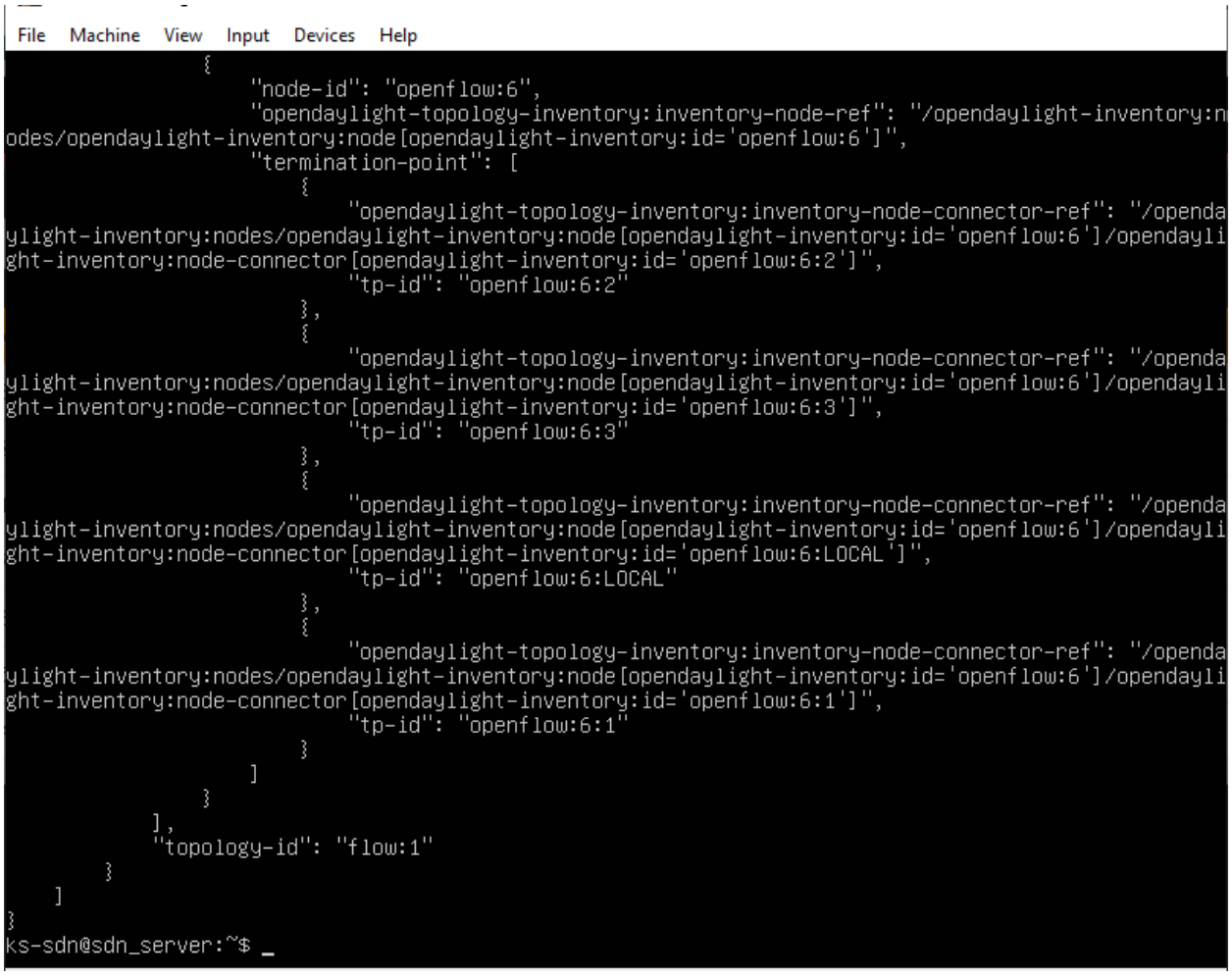




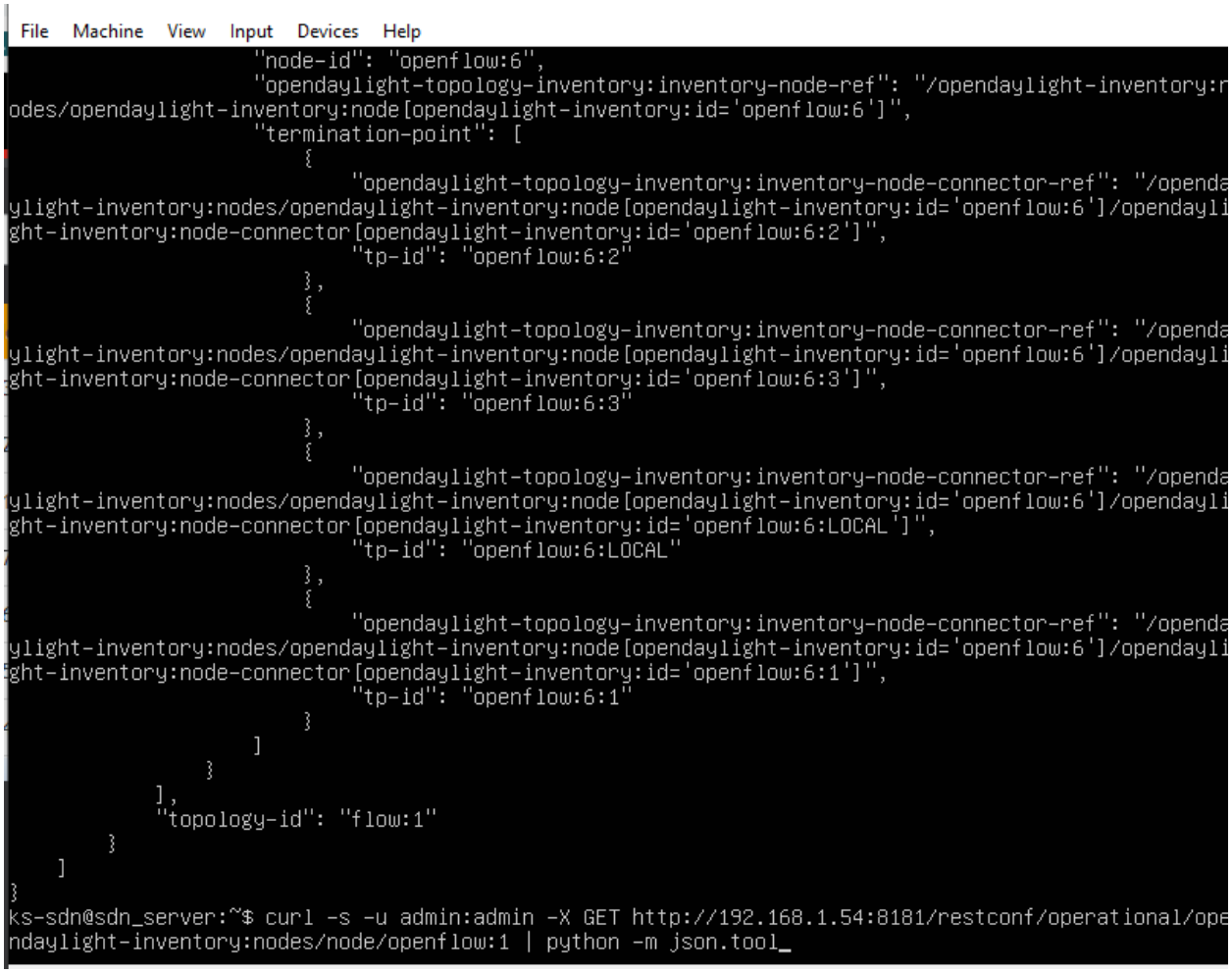
EXERCISE 1

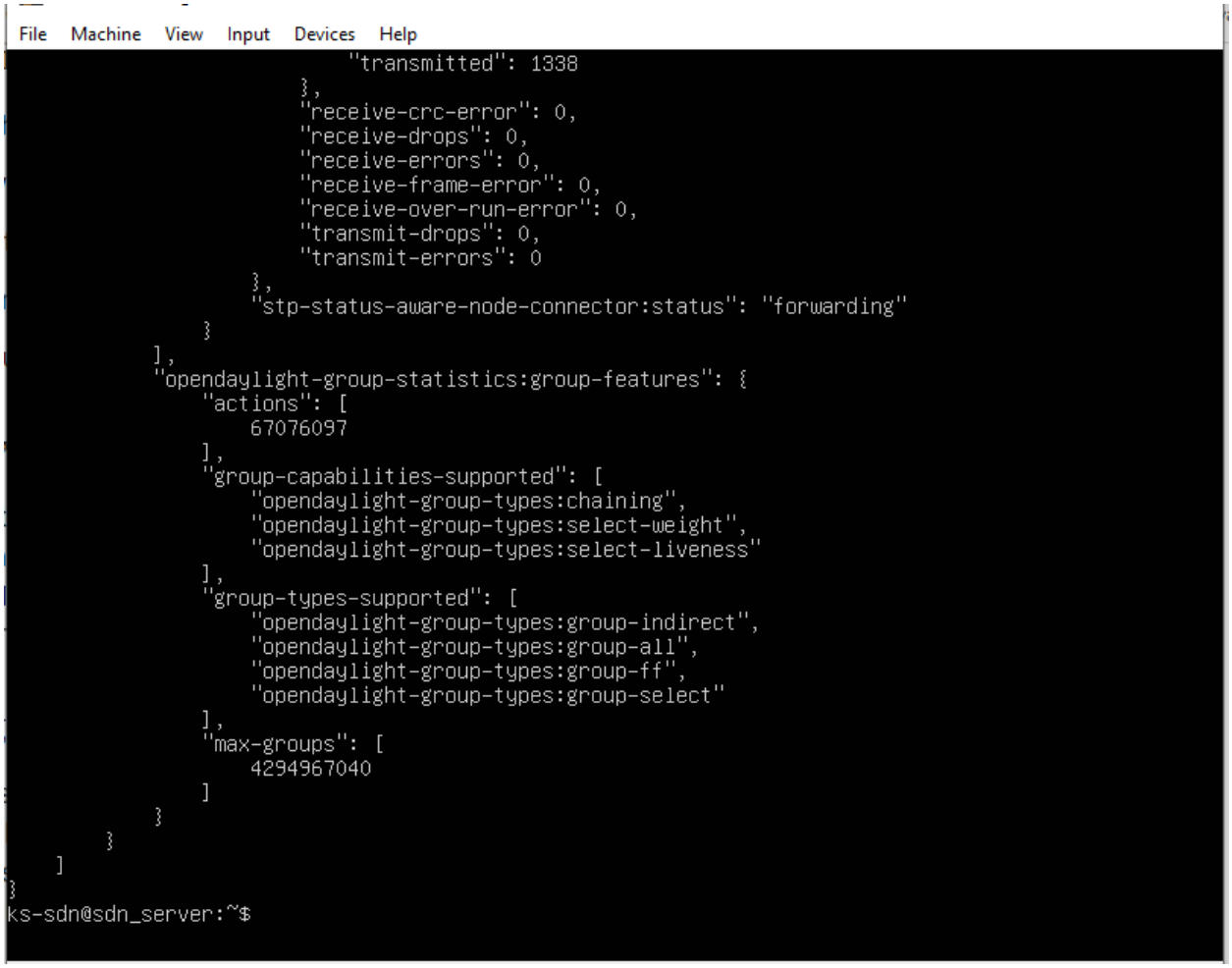
- **Get topology details**



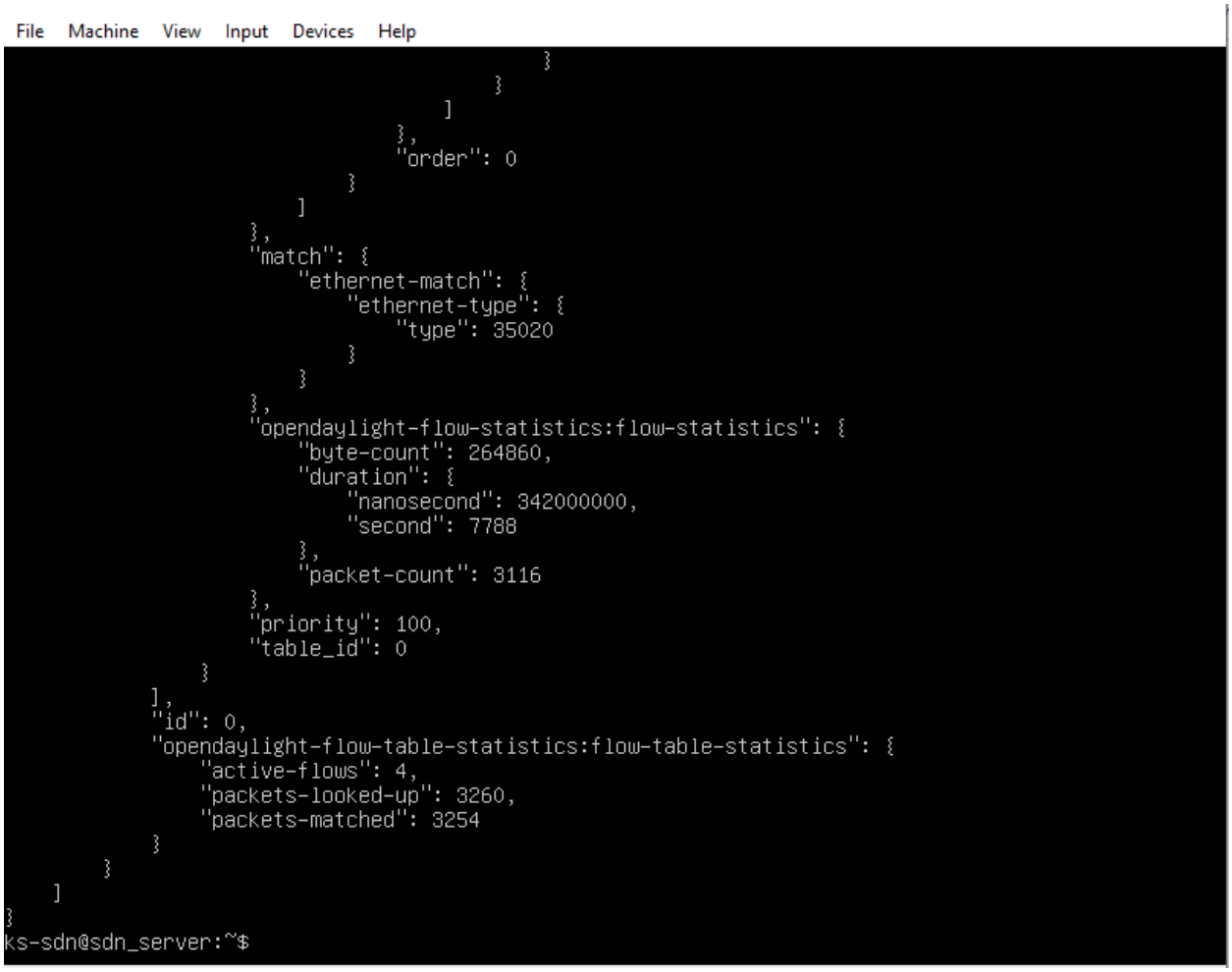


- **Get node details**

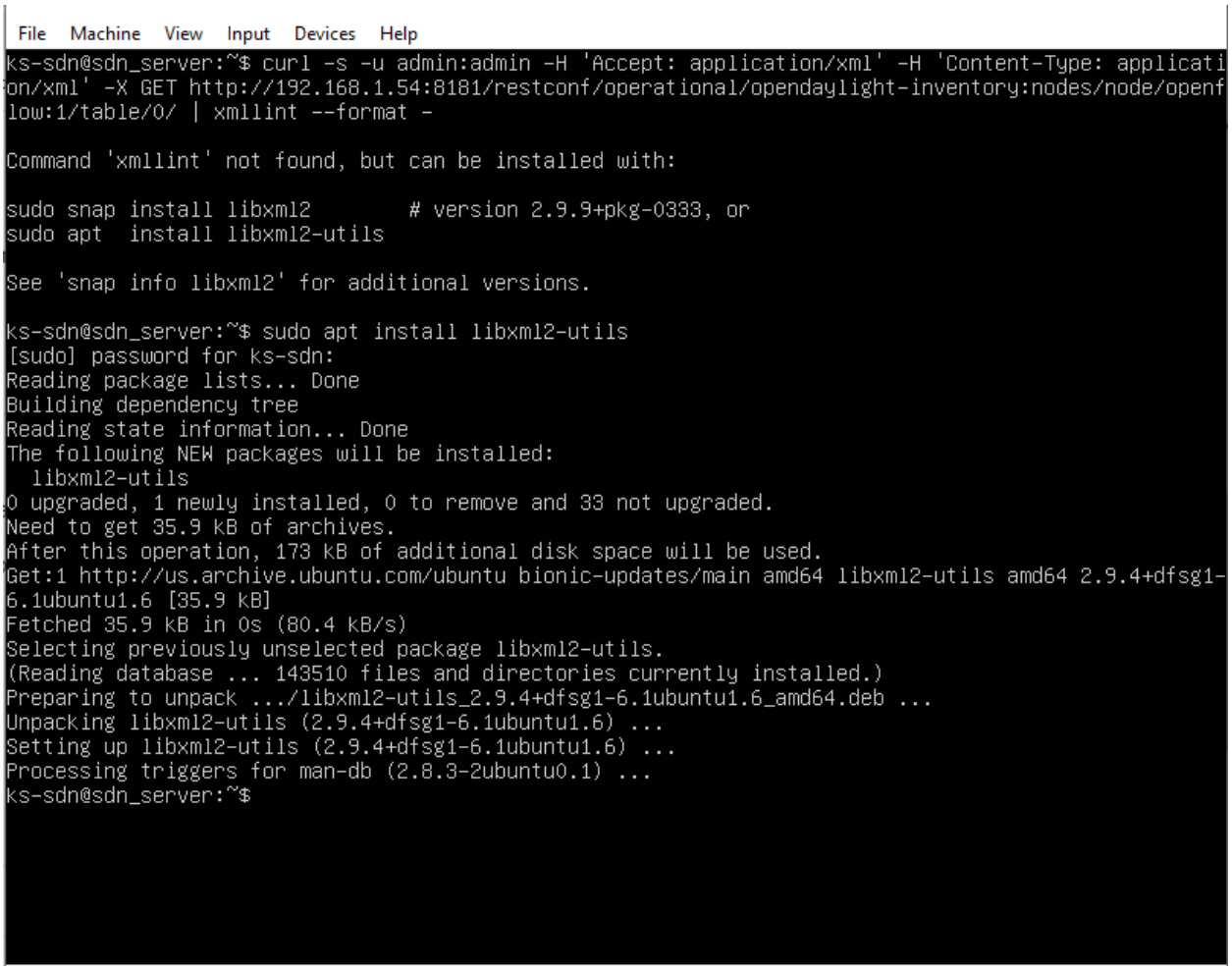

File Machine View Input Devices Help
"node-id": "openflow:6",
"opendaylight-topology-inventory:inventory-node-ref": "/opendaylight-inventory:nodes/opendaylight-inventory:node[opendaylight-inventory:id='openflow:6']",
"termination-point": [
{
"opendaylight-topology-inventory:inventory-node-connector-ref": "/opendaylight-inventory:nodes/opendaylight-inventory:node[opendaylight-inventory:id='openflow:6']/opendaylight-inventory:node-connector[opendaylight-inventory:id='openflow:6:2']",
"tp-id": "openflow:6:2"
},
{
"opendaylight-topology-inventory:inventory-node-connector-ref": "/opendaylight-inventory:nodes/opendaylight-inventory:node[opendaylight-inventory:id='openflow:6']/opendaylight-inventory:node-connector[opendaylight-inventory:id='openflow:6:3']",
"tp-id": "openflow:6:3"
},
{
"opendaylight-topology-inventory:inventory-node-connector-ref": "/opendaylight-inventory:nodes/opendaylight-inventory:node[opendaylight-inventory:id='openflow:6']/opendaylight-inventory:node-connector[opendaylight-inventory:id='openflow:6:LOCAL']",
"tp-id": "openflow:6:LOCAL"
},
{
"opendaylight-topology-inventory:inventory-node-connector-ref": "/opendaylight-inventory:nodes/opendaylight-inventory:node[opendaylight-inventory:id='openflow:6']/opendaylight-inventory:node-connector[opendaylight-inventory:id='openflow:6:1']",
"tp-id": "openflow:6:1"
}
]
}
],
"topology-id": "flow:1"
}
]
}
ks-sdn@sdn_server:~$ curl -s -u admin:admin -X GET http://192.168.1.54:8181/restconf/operational/opendaylight-inventory:nodes/node/openflow:1 | python -m json.tool_

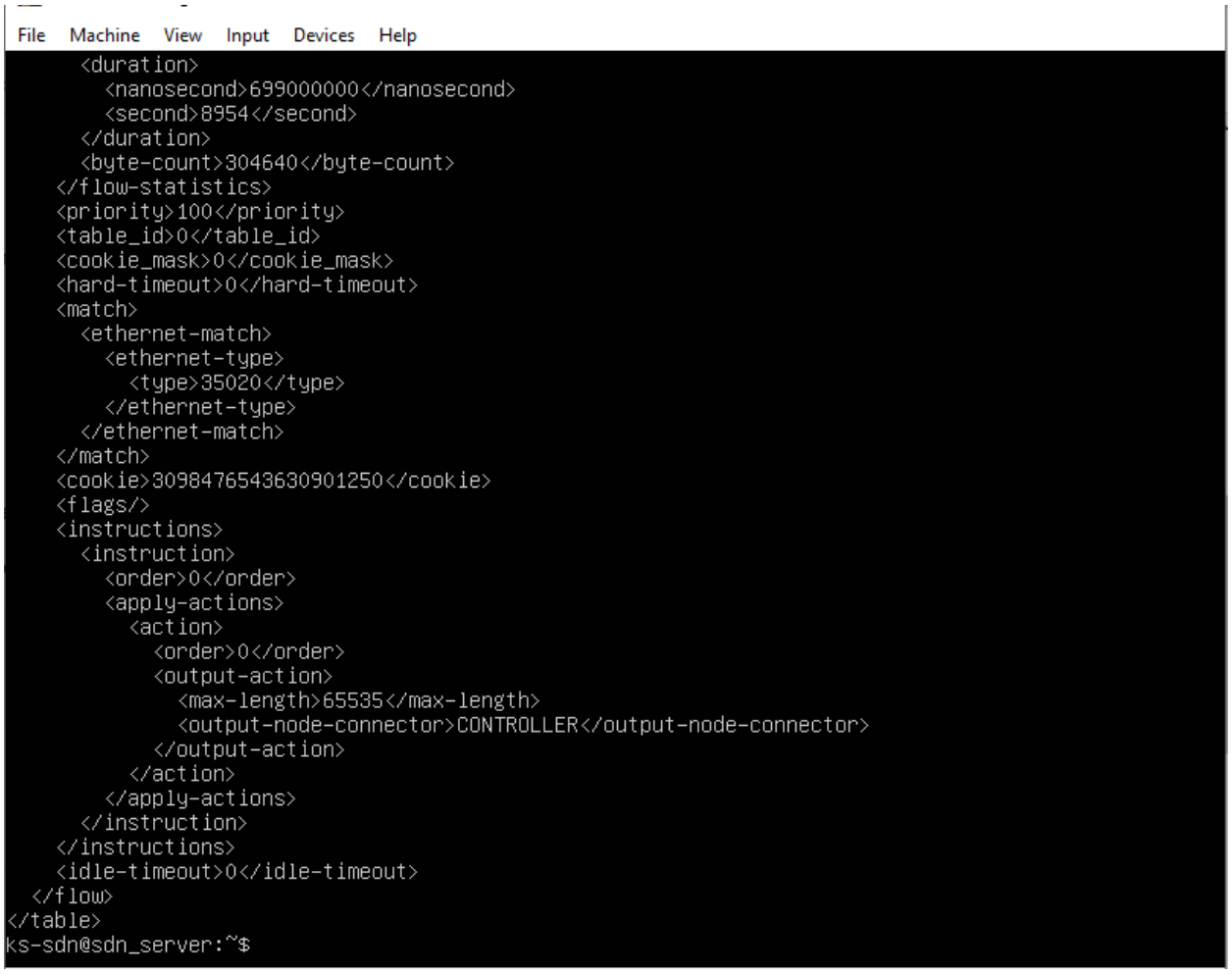


- **Get node flows info (JSON-default)**

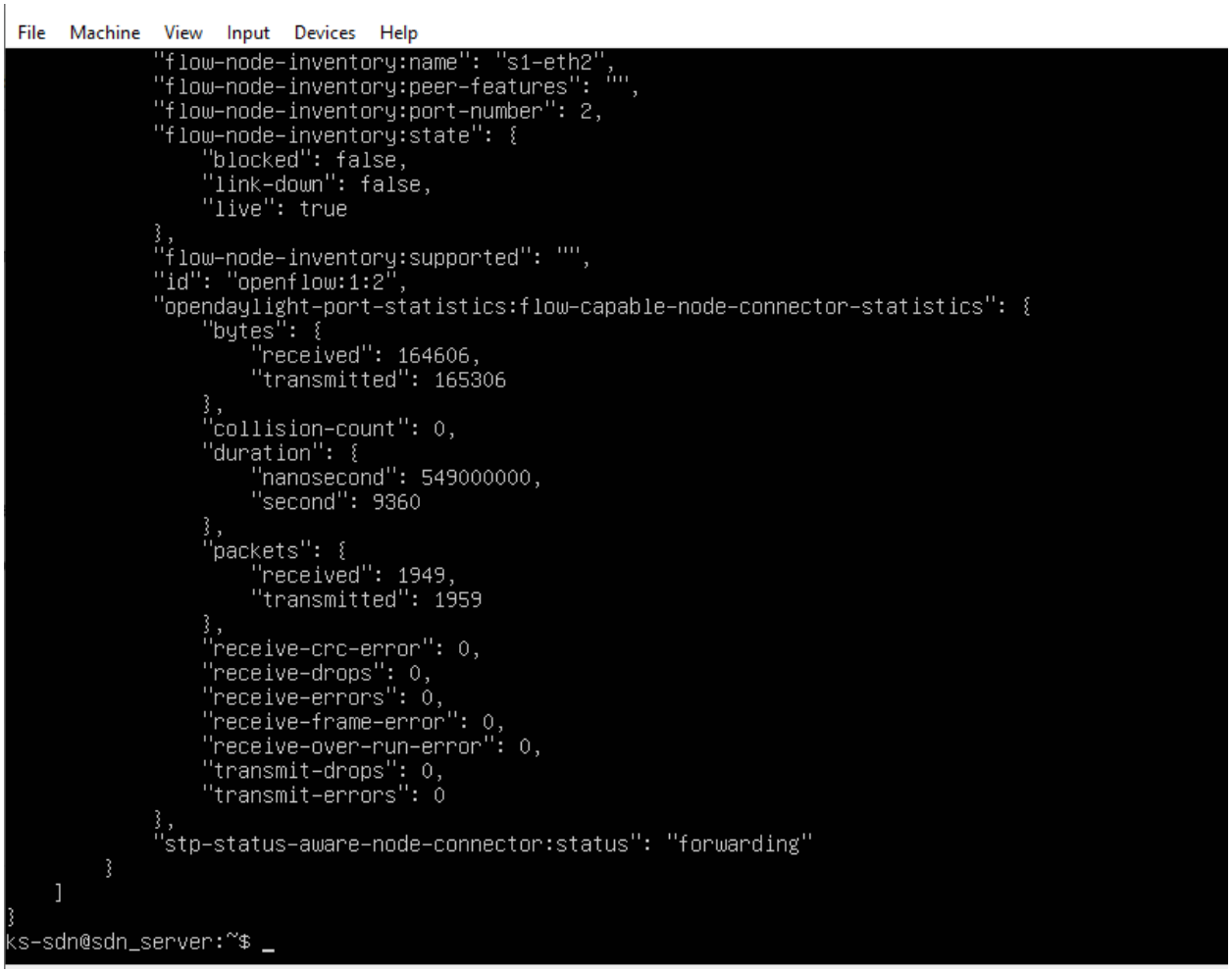


- **Get node flows info (XML)**


File Machine View Input Devices Help
ks-sdn@sdn_server:~$ curl -s -u admin:admin -H 'Accept: application/xml' -H 'Content-Type: applicati
on/xml' -X GET http://192.168.1.54:8181/restconf/operational/opendaylight-inventory:nodes/node/openf
low:1/table/0/ | xmllint --format -
Command 'xmllint' not found, but can be installed with:
sudo snap install libxml2 # version 2.9.9+pkg-0333, or
sudo apt install libxml2-utils
See 'snap info libxml2' for additional versions.
ks-sdn@sdn_server:~$ sudo apt install libxml2-utils
[sudo] password for ks-sdn:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
libxml2-utils
0 upgraded, 1 newly installed, 0 to remove and 33 not upgraded.
Need to get 35.9 kB of archives.
After this operation, 173 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libxml2-utils amd64 2.9.4+dfsg1-
6.1ubuntu1.6 [35.9 kB]
Fetched 35.9 kB in 0s (80.4 kB/s)
Selecting previously unselected package libxml2-utils.
(Reading database ... 143510 files and directories currently installed.)
Preparing to unpack .../libxml2-utils_2.9.4+dfsg1-6.1ubuntu1.6_amd64.deb ...
Unpacking libxml2-utils (2.9.4+dfsg1-6.1ubuntu1.6) ...
Setting up libxml2-utils (2.9.4+dfsg1-6.1ubuntu1.6) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
ks-sdn@sdn_server:~$

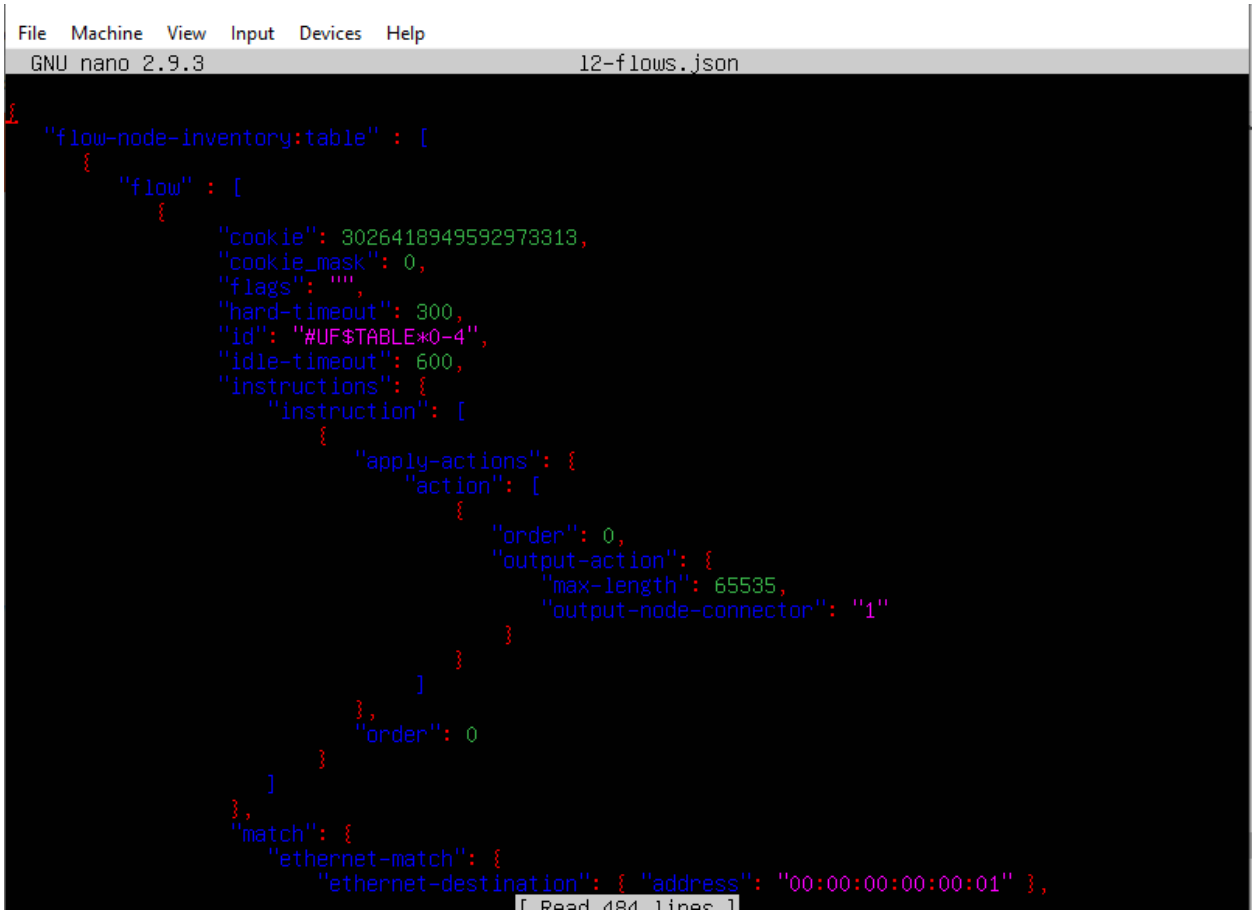


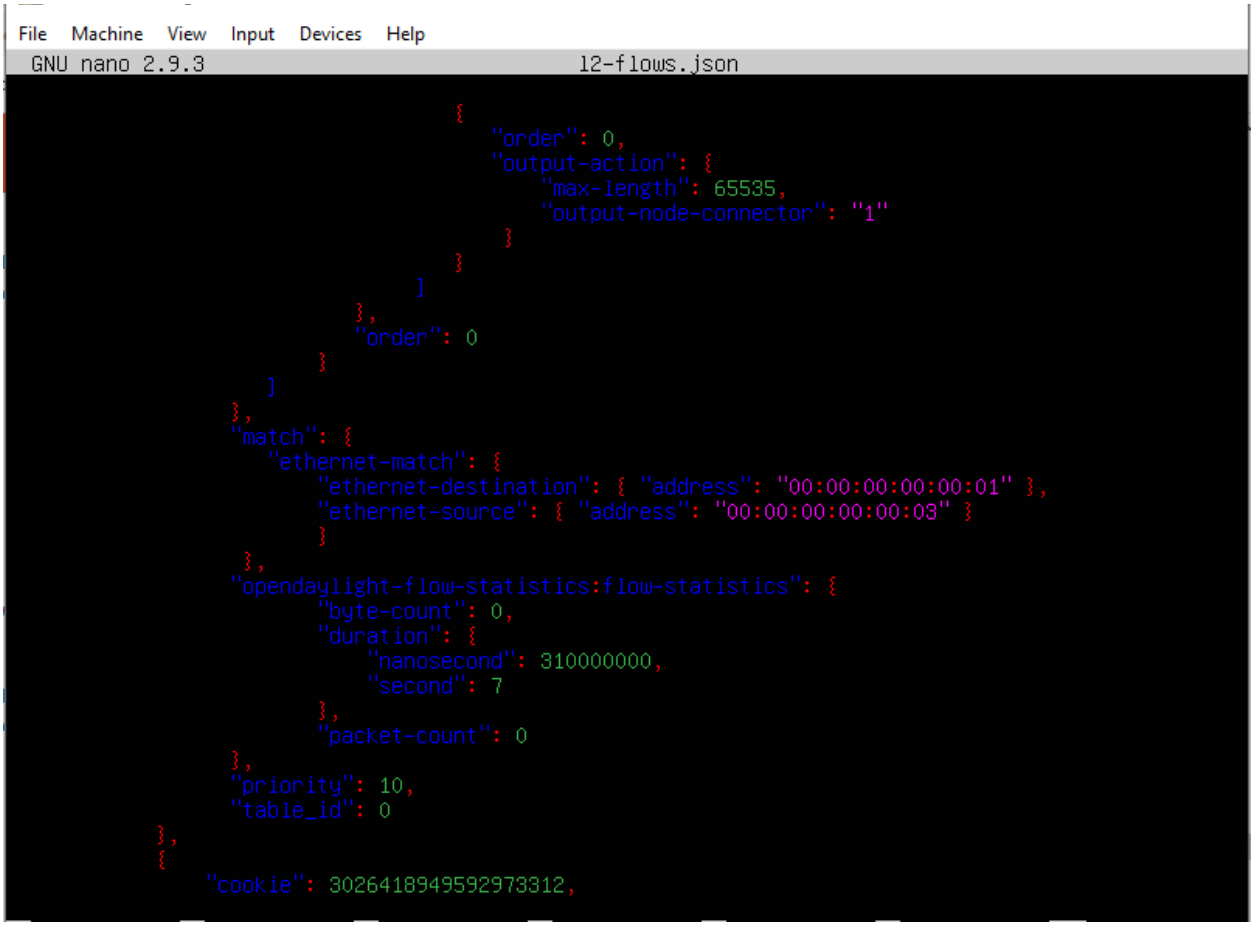
- **Get node port details**



EXERCISE TWO

- **Created flows file**
  - **l2-flows.json**
  - **Shown below**


File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
{
"flow-node-inventory:table" : [
{
"flow" : [
{
"cookie": 3026418949592973313,
"cookie_mask": 0,
"flags": "",
"hard-timeout": 300,
"id": "#UF$TABLE*0-4",
"idle-timeout": 600,
"instructions": {
"instruction": [
{
"apply-actions": {
"action": [
{
"order": 0,
"output-action": {
"max-length": 65535,
"output-node-connector": "1"
}
}
]
},
"order": 0
}
]
},
"match": {
"ethernet-match": {
"ethernet-destination": { "address": "00:00:00:00:00:01" },
[Read 484 lines]


File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
{
"order": 0,
"output-action": {
"max-length": 65535,
"output-node-connector": "1"
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}
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"order": 0
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},
"match": {
"ethernet-match": {
"ethernet-destination": { "address": "00:00:00:00:00:01" },
"ethernet-source": { "address": "00:00:00:00:00:03" }
}
},
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"duration": {
"nanosecond": 310000000,
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"packet-count": 0
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"priority": 10,
"table_id": 0
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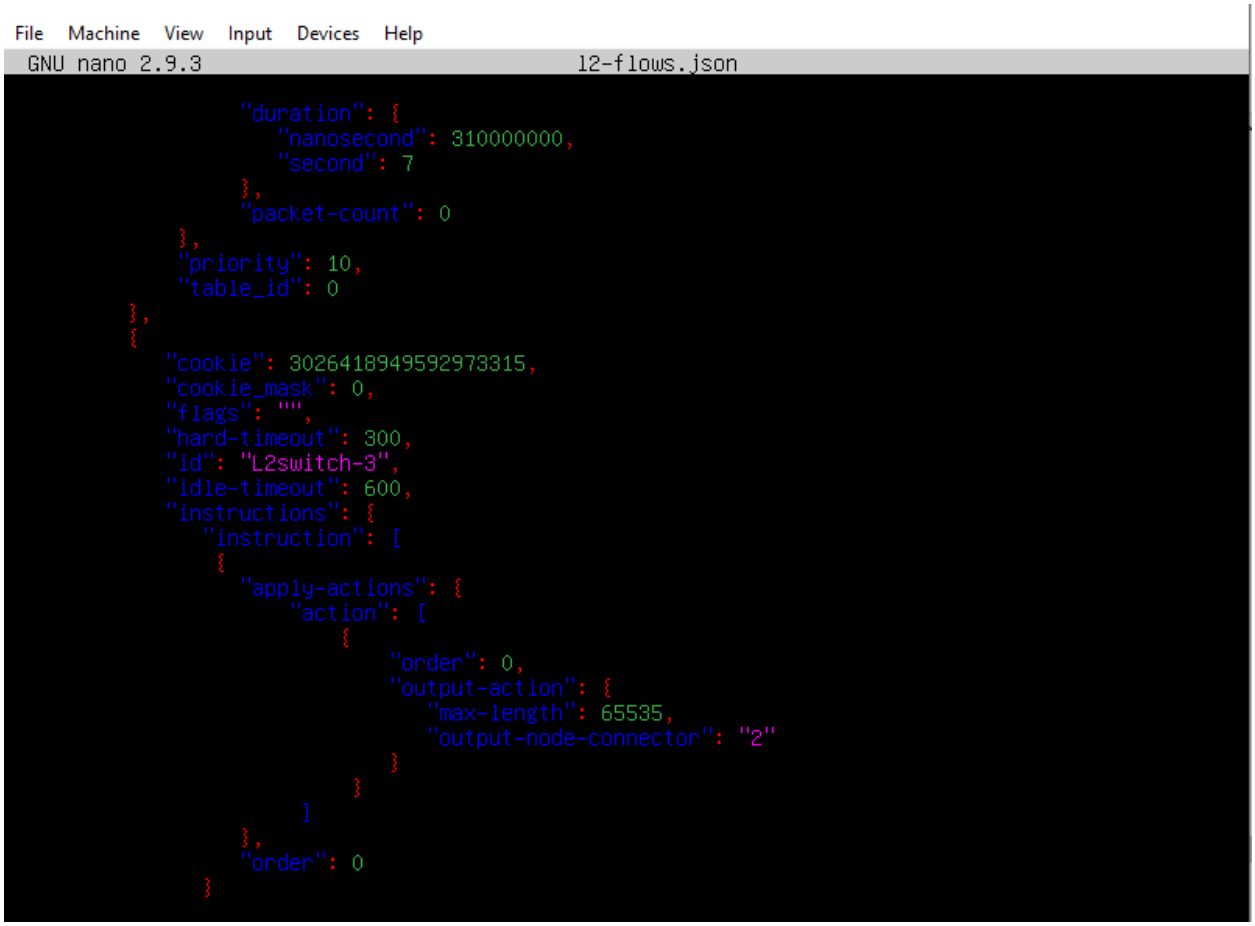
File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
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"priority": 10,
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"apply-actions": {
"action": [
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"output-action": {
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"output-node-connector": "2"
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}
]
},
"order": 0
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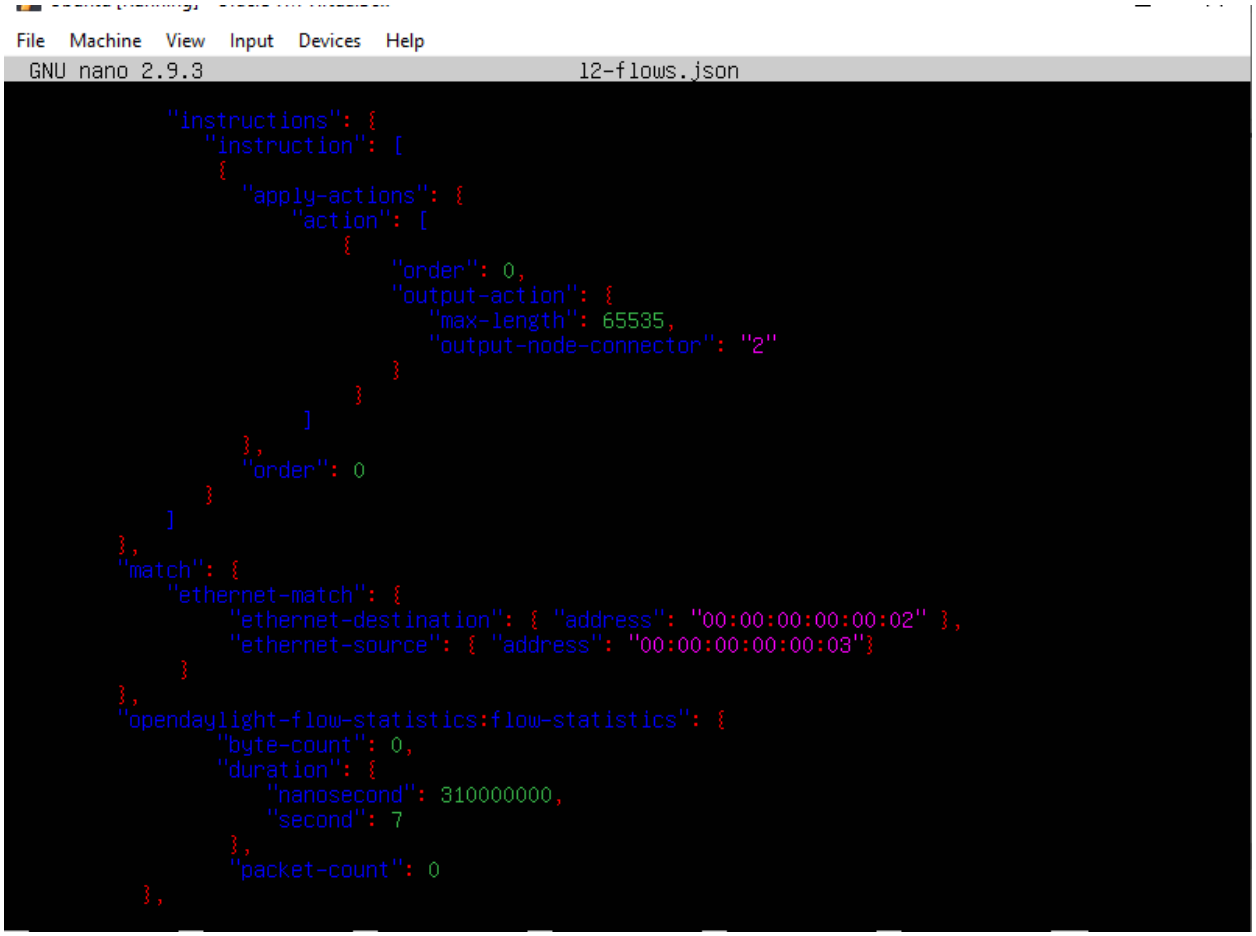
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
"instructions": {
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{
"apply-actions": {
"action": [
{
"order": 0,
"output-action": {
"max-length": 65535,
"output-node-connector": "2"
}
}
]
},
"order": 0
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]
},
"match": {
"ethernet-match": {
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"ethernet-source": { "address": "00:00:00:00:00:03"}
}
},
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"duration": {
"nanosecond": 310000000,
"second": 7
},
"packet-count": 0
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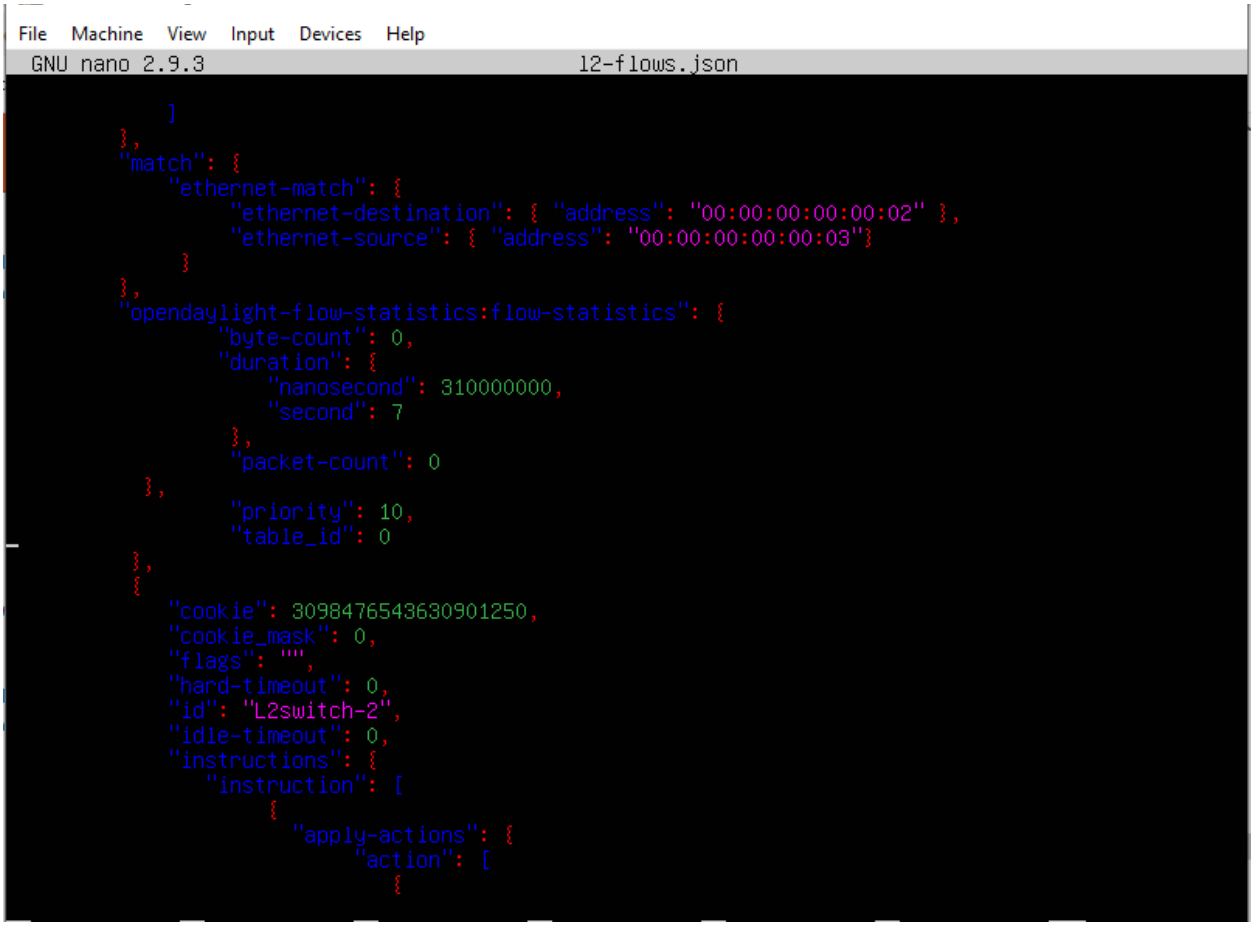
File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
]
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"match": {
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"ethernet-source": { "address": "00:00:00:00:00:03"}
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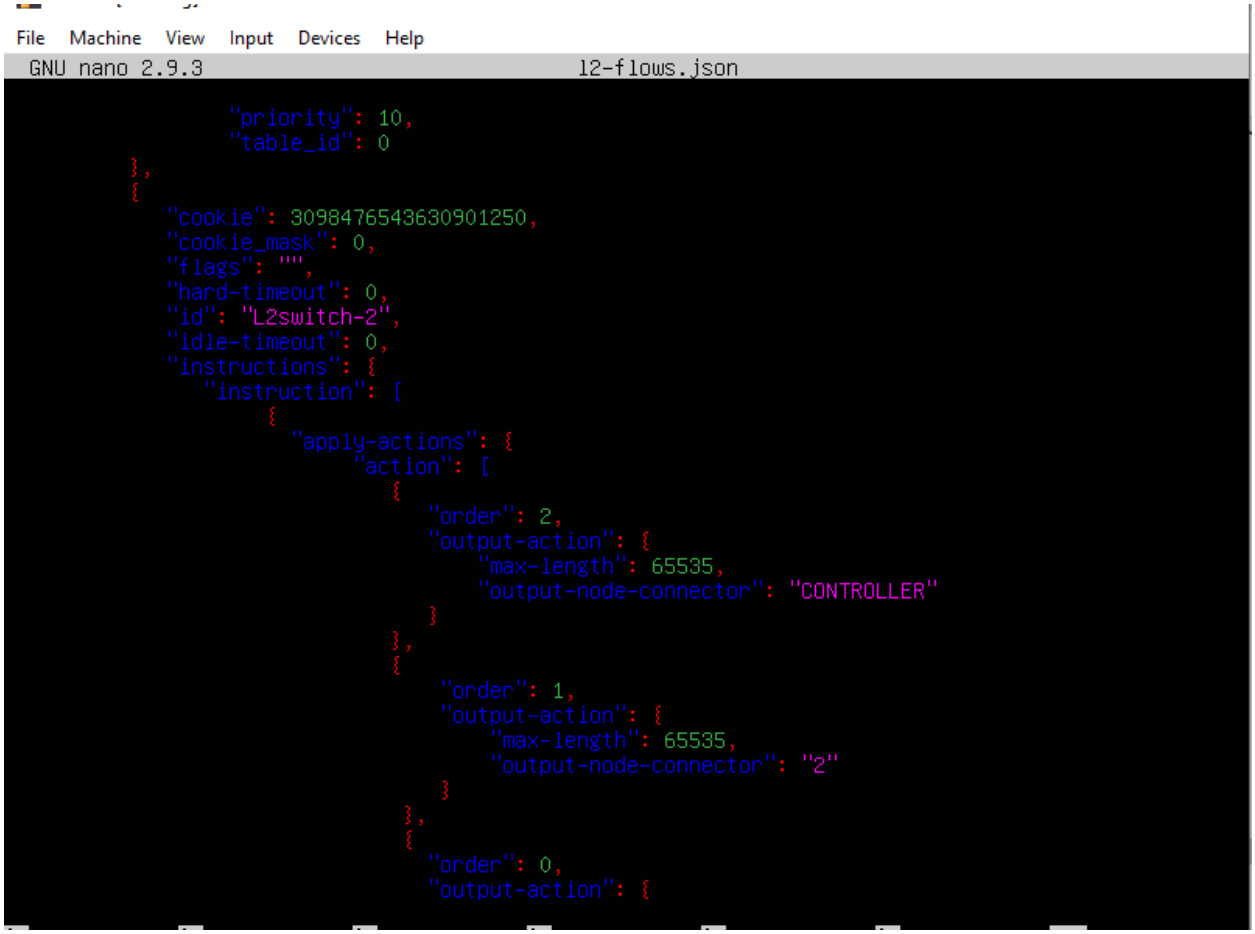
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GNU nano 2.9.3 l2-flows.json
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"flags": "",
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"idle-timeout": 0,
"instructions": {
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"action": [
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"output-action": {
"max-length": 65535,
"output-node-connector": "CONTROLLER"
}
},
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},
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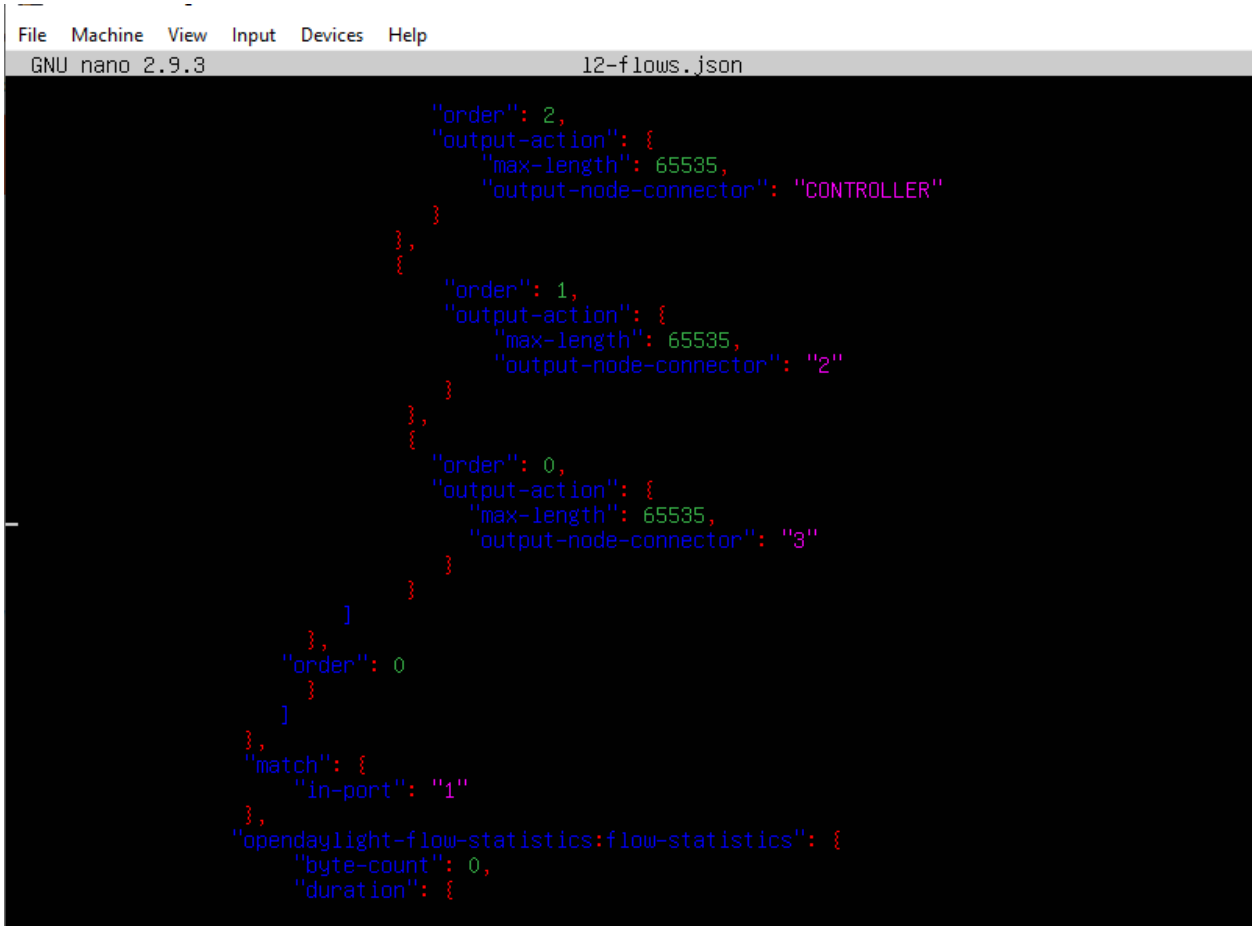
"order": 0,
"output-action": {


File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
"order": 2,
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"max-length": 65535,
"output-node-connector": "2"
}
},
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"output-action": {
"max-length": 65535,
"output-node-connector": "3"
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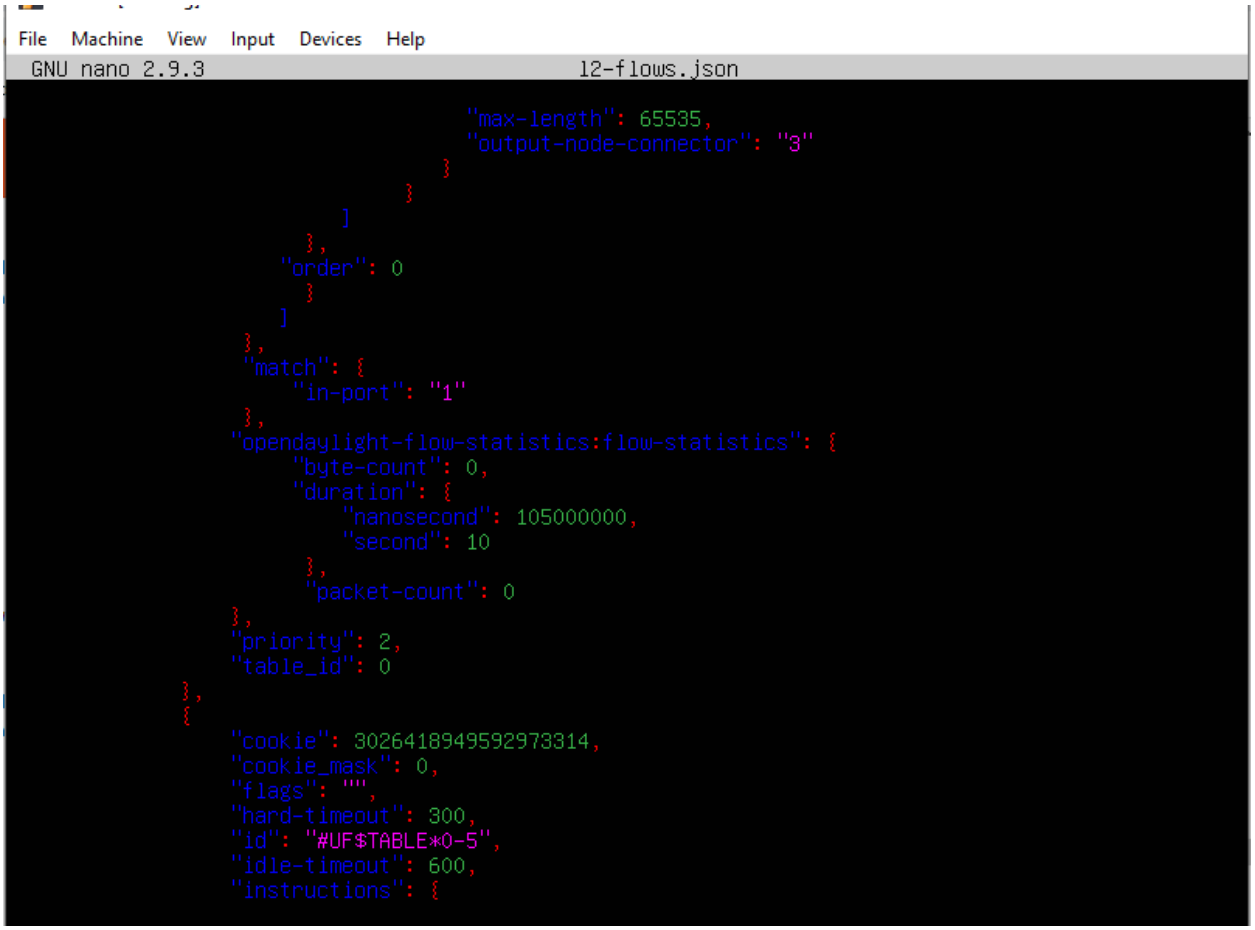
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
"max-length": 65535,
"output-node-connector": "3"
"order": 0
"match": {
"in-port": "1"
"opendaylight-flow-statistics:flow-statistics": {
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"duration": {
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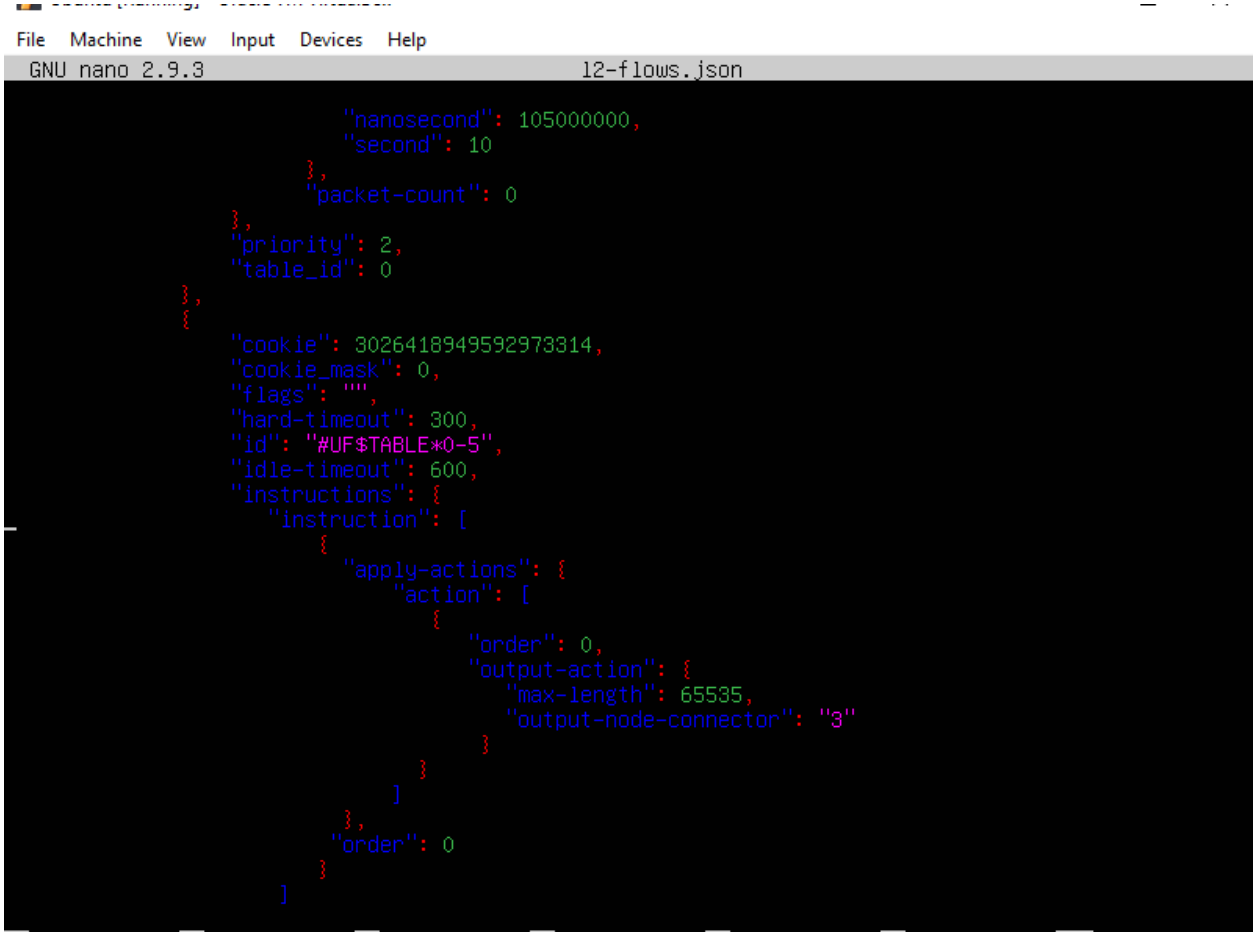
"idle-timeout": 600,
"instructions": {


File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
"nanosecond": 105000000,
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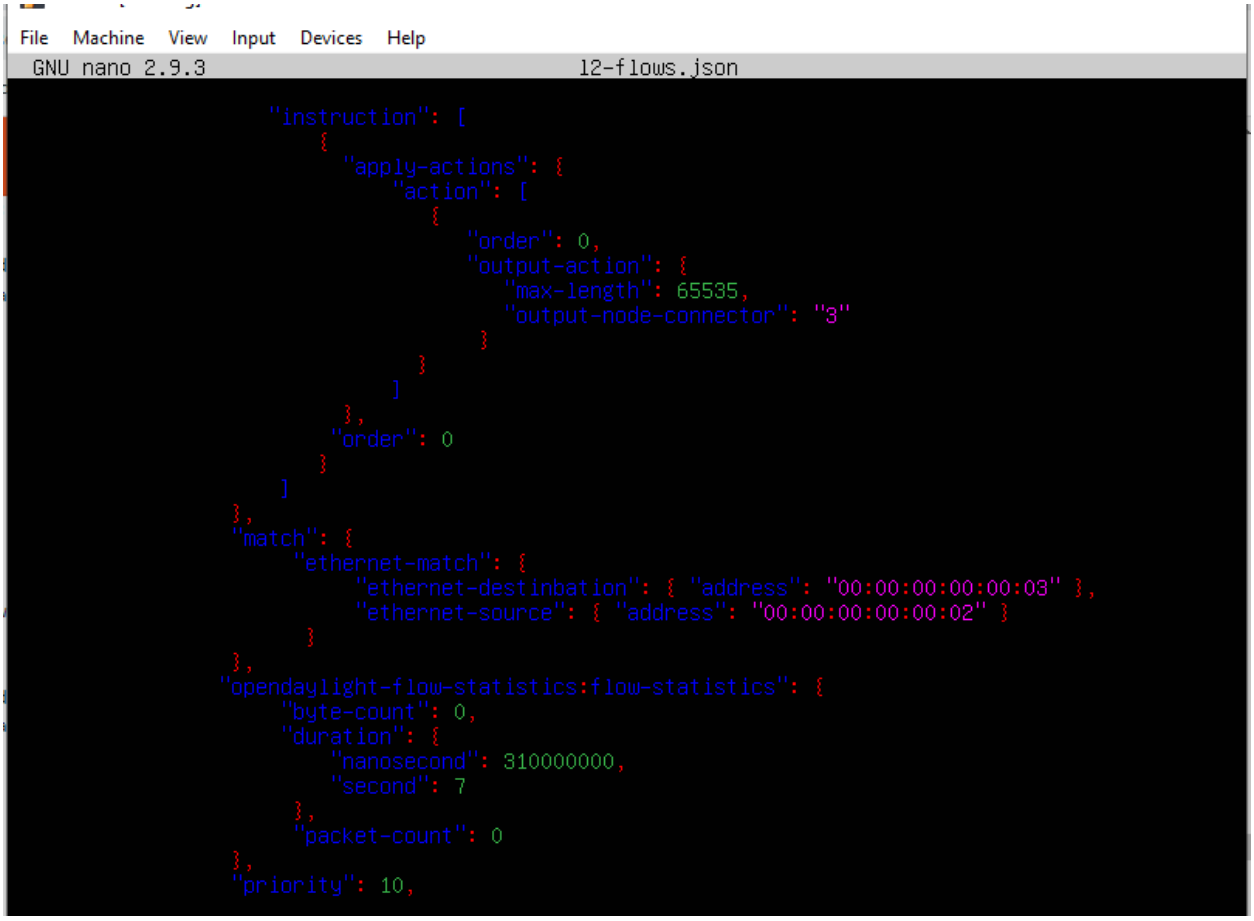
File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
"instruction": [
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"output-node-connector": "3"
}
}
]
},
"order": 0
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]
},
"match": {
"ethernet-match": {
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"ethernet-source": { "address": "00:00:00:00:00:02" }
}
},
"opendaylight-flow-statistics:flow-statistics": {
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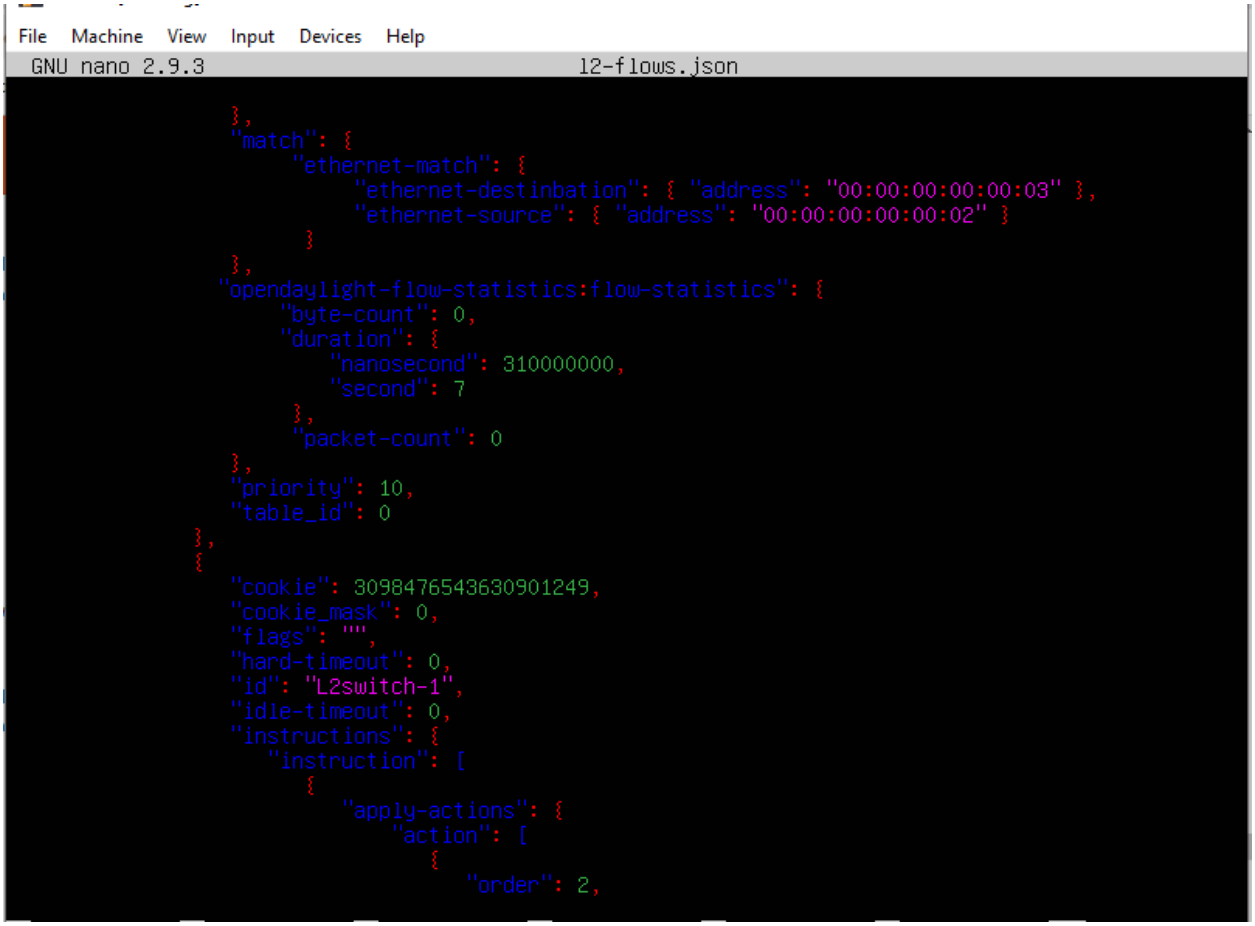
"priority": 10,


File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
},
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}
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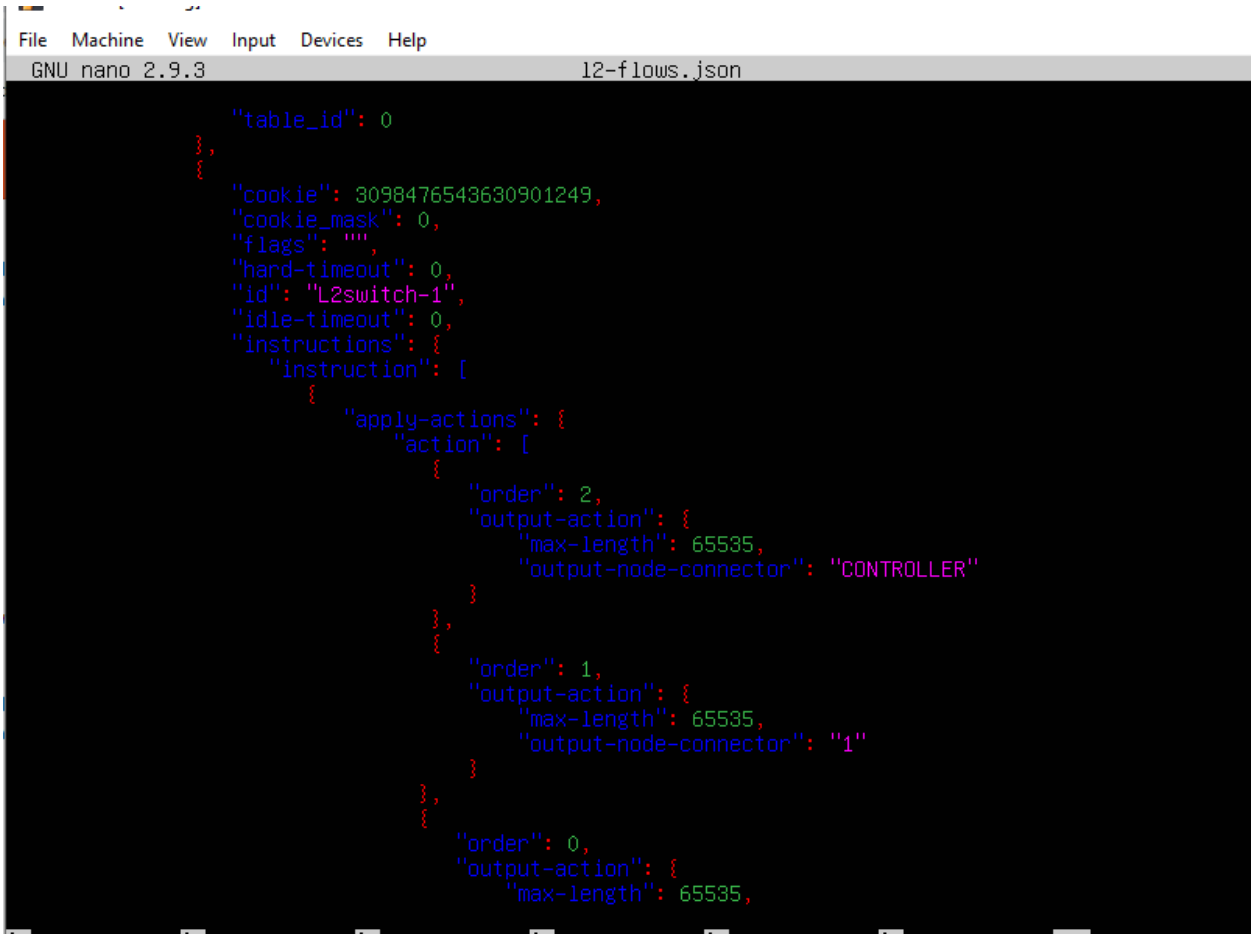
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
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"apply-actions": {
"action": [
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}
},
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"order": 1,
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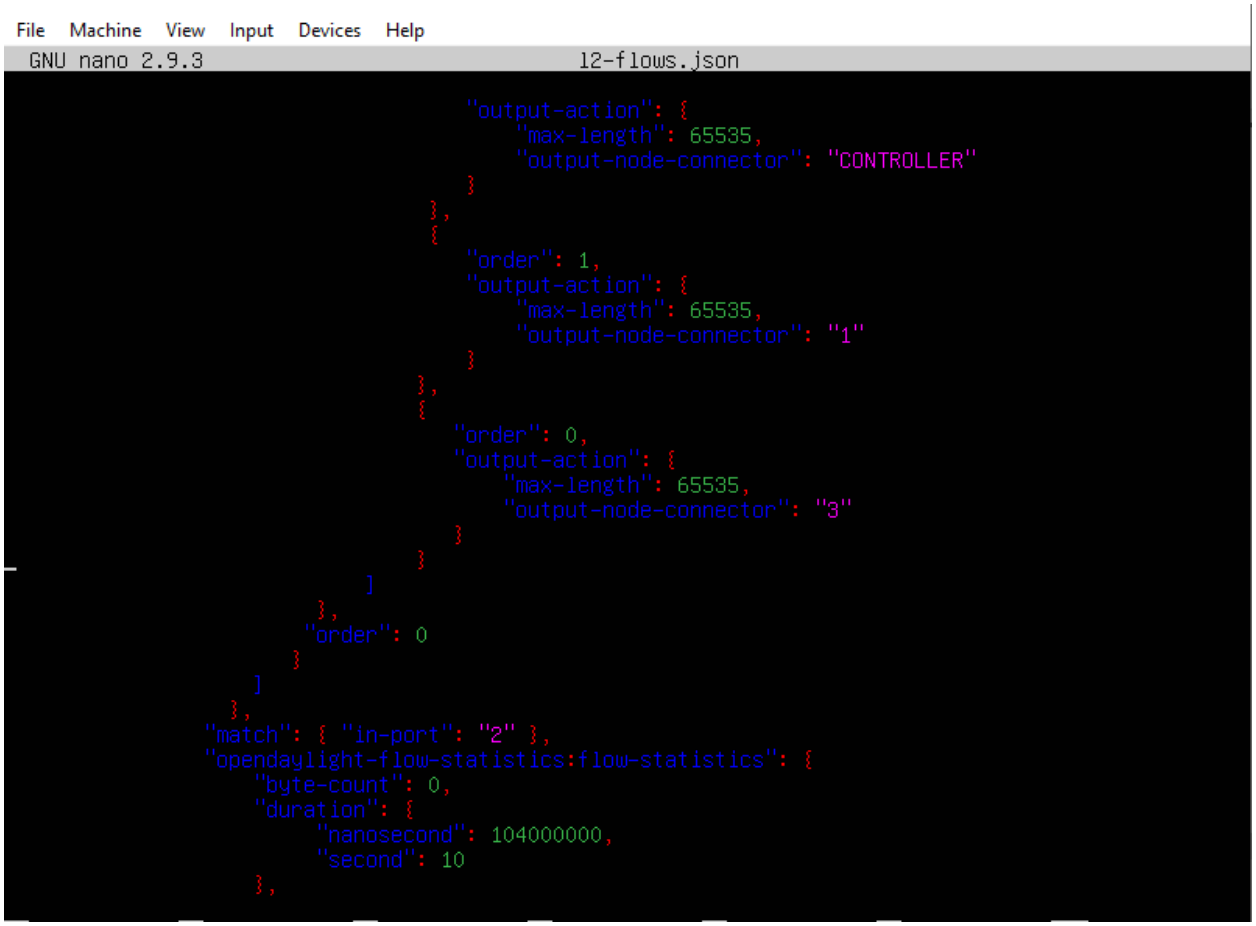
File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
"output-action": {
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"output-node-connector": "1"
},
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"output-node-connector": "3"
}
}
]
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"order": 0
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},
"match": { "in-port": "2" },
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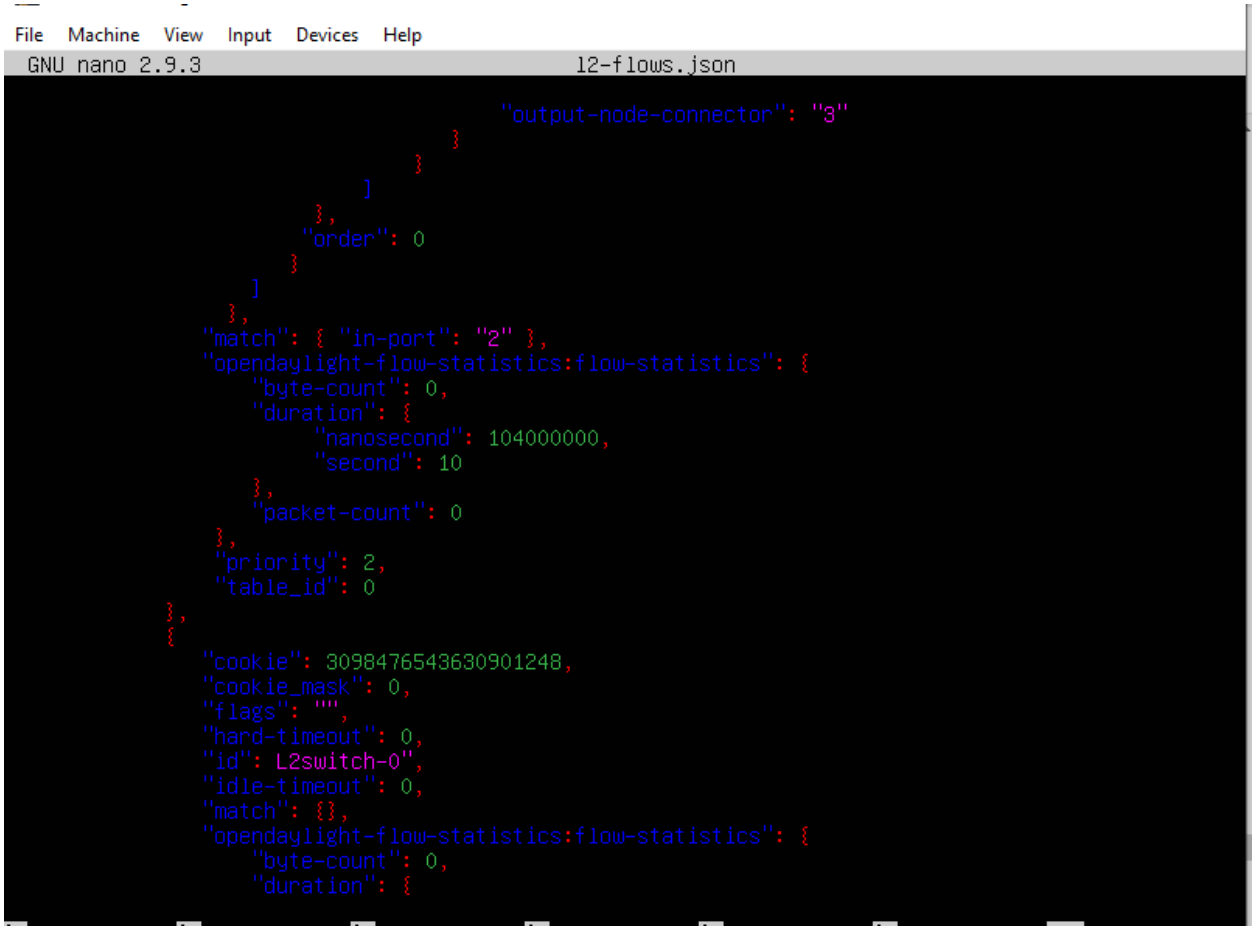
File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
"output-node-connector": "3"
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"match": { "in-port": "2" },
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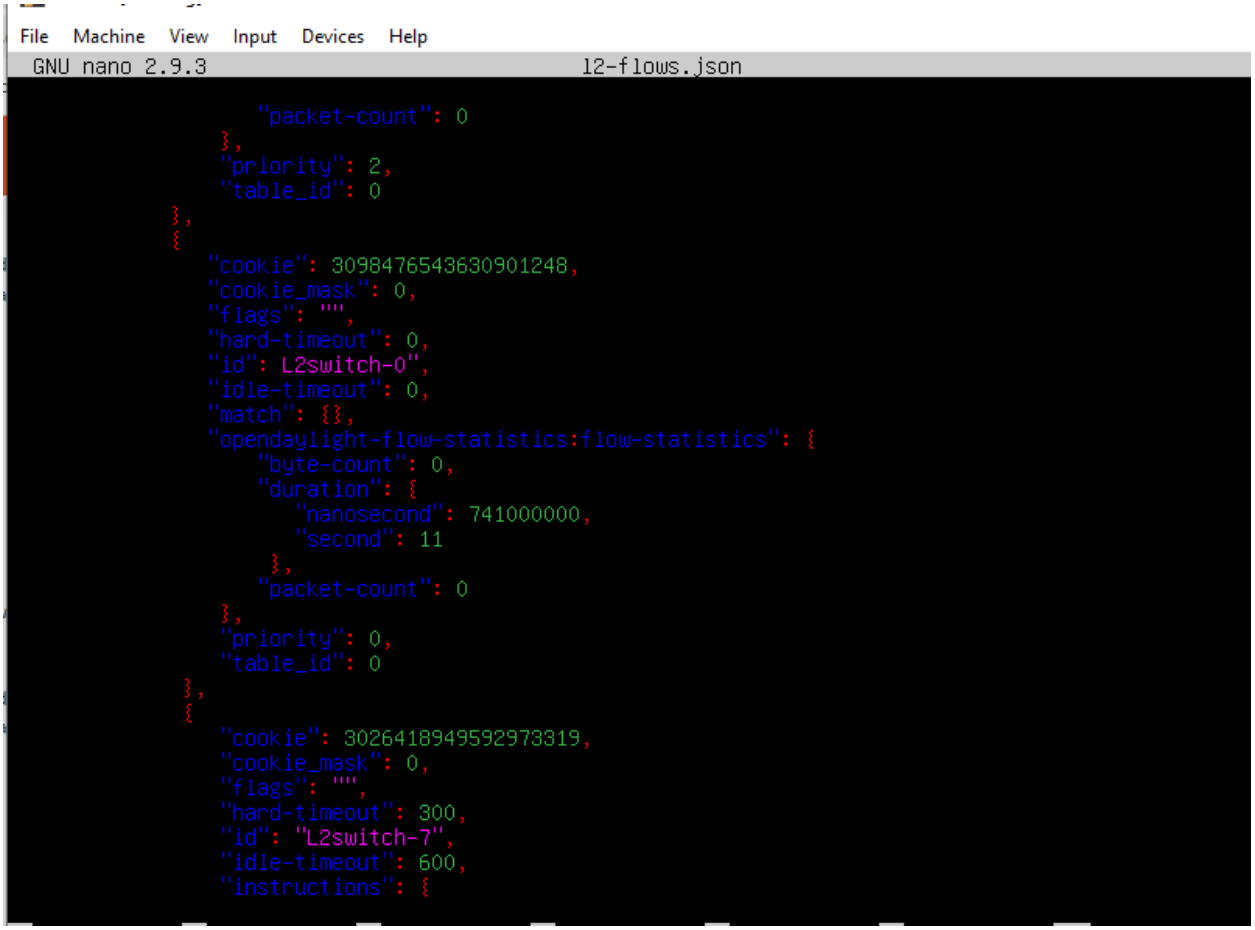
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
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"priority": 0,
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"cookie_mask": 0,
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"id": "L2switch-7",
"idle-timeout": 600,
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File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
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"priority": 0,
"table_id": 0
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"action": [
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"output-node-connector": "2"
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"order": 0
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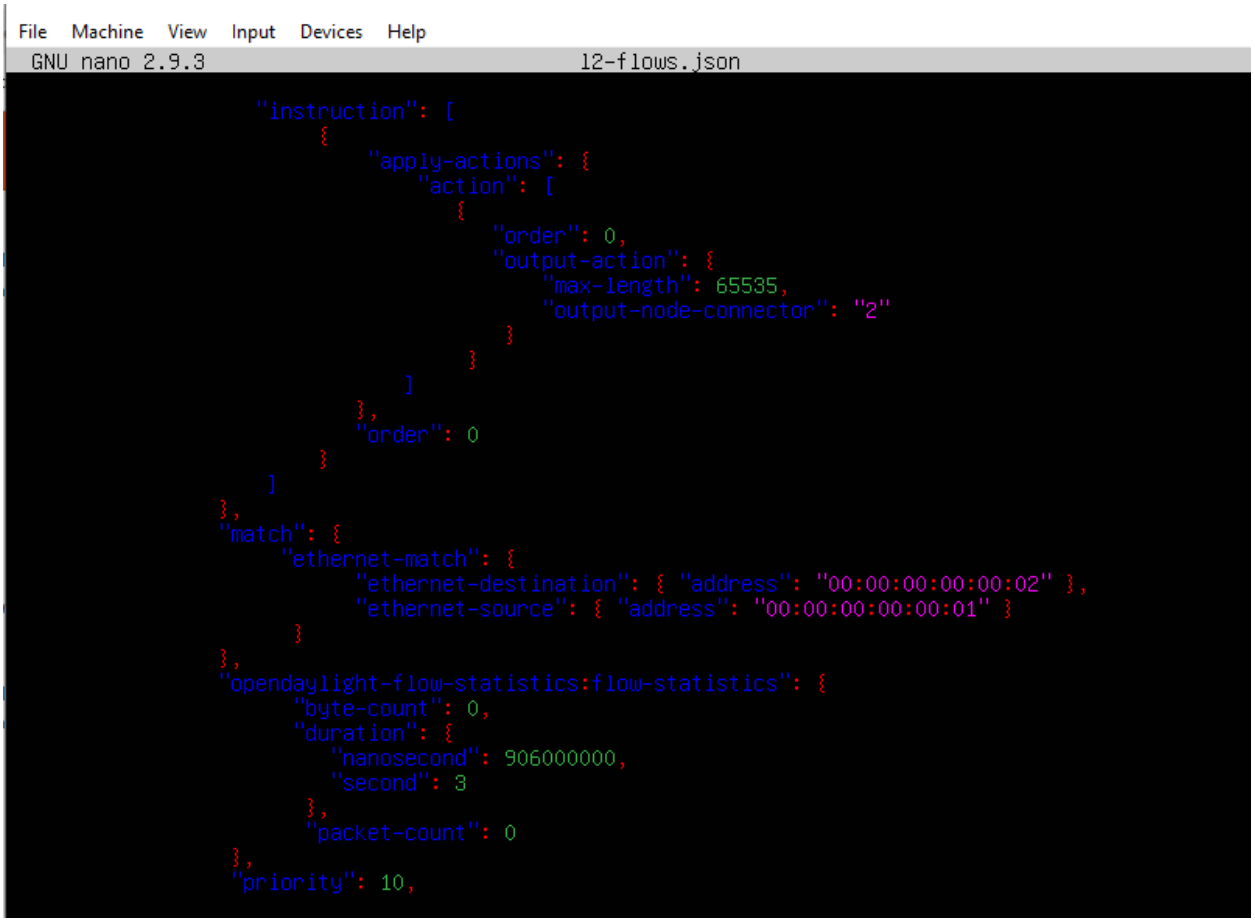
File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
"instruction": [
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"output-node-connector": "2"
}
}
]
},
"order": 0
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]
},
"match": {
"ethernet-match": {
"ethernet-destination": { "address": "00:00:00:00:00:02" },
"ethernet-source": { "address": "00:00:00:00:00:01" }
}
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"opendaylight-flow-statistics:flow-statistics": {
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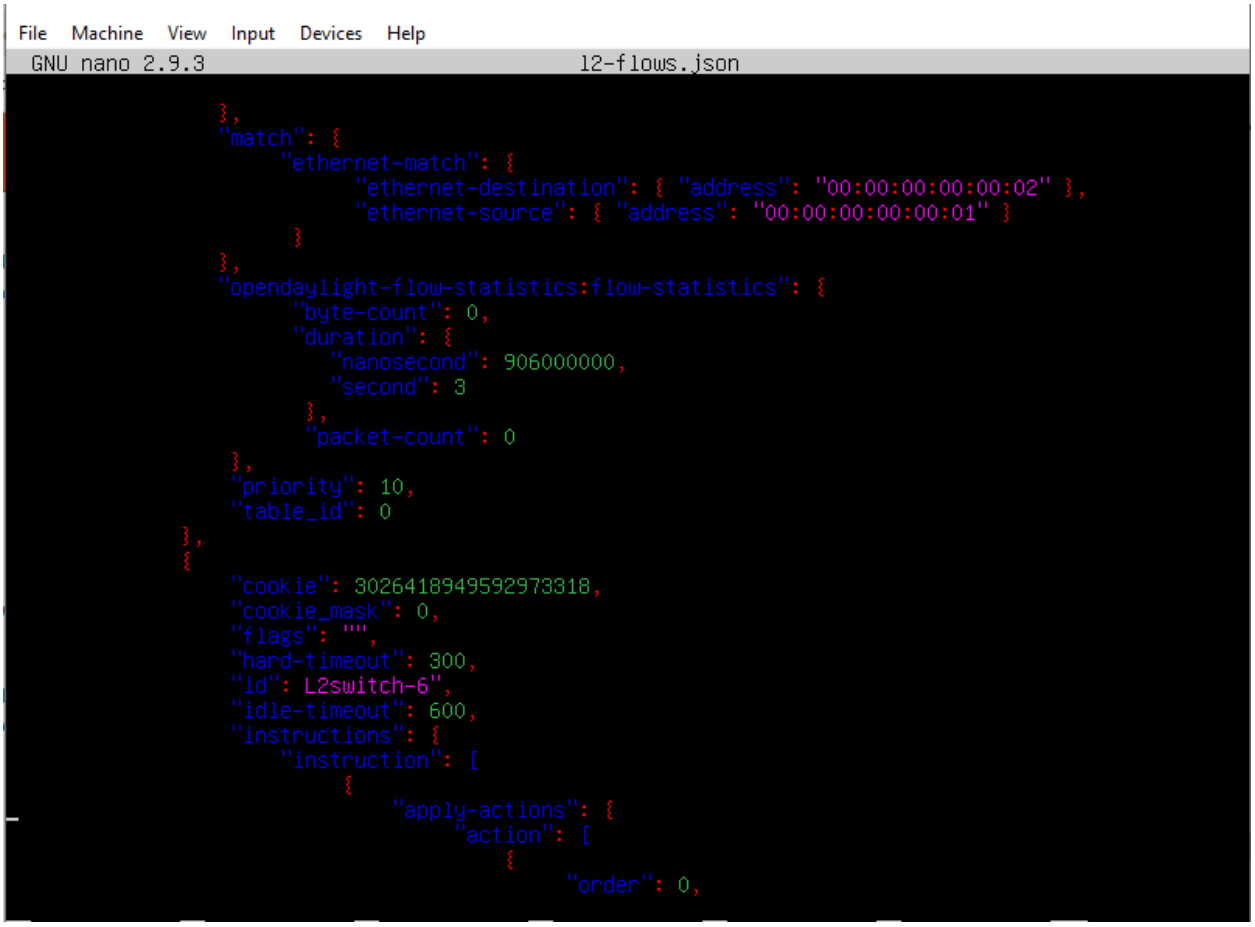
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
},
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"ethernet-match": {
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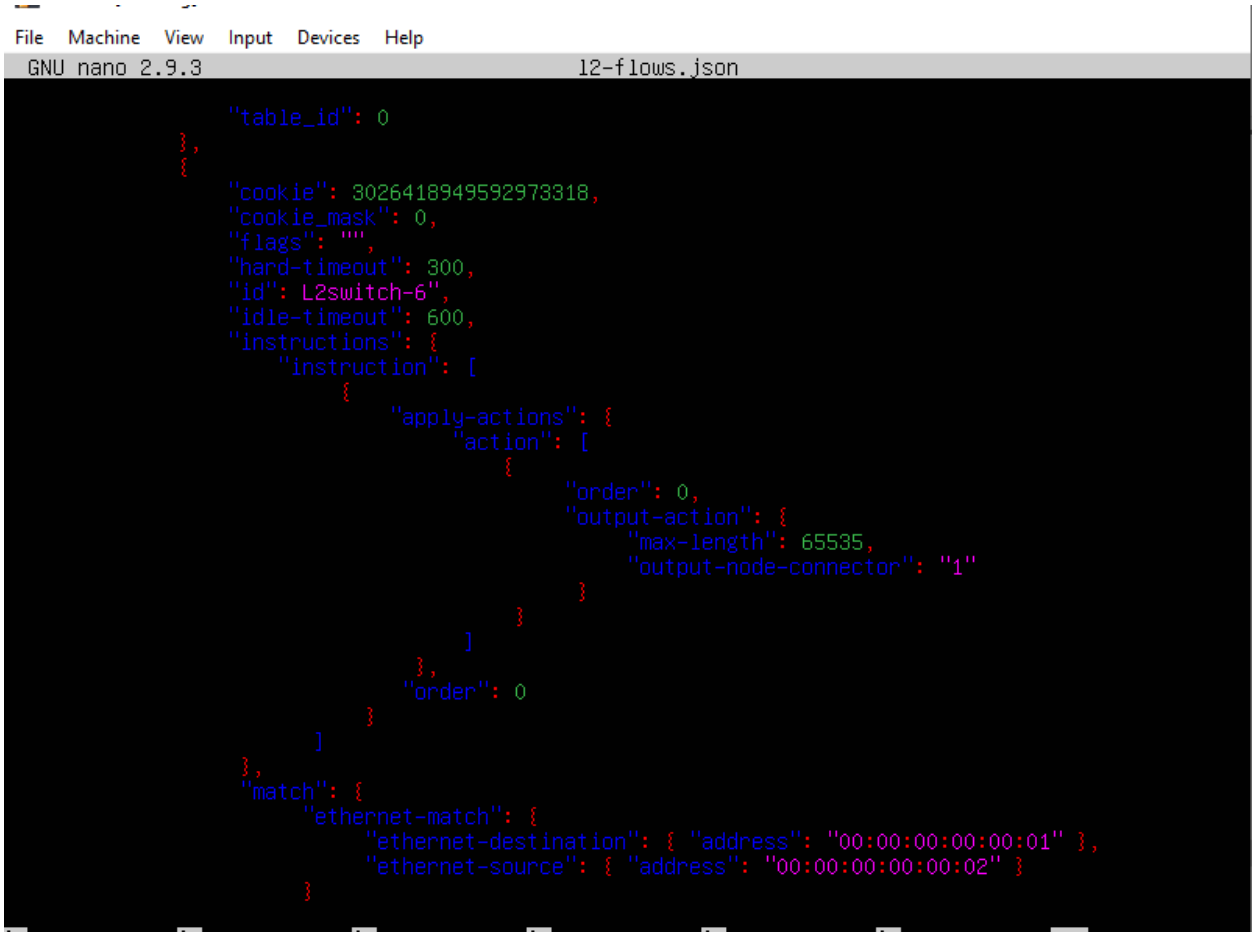
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
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"output-node-connector": "1"
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}
]
},
"order": 0
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]
},
"match": {
"ethernet-match": {
"ethernet-destination": { "address": "00:00:00:00:00:01" },
"ethernet-source": { "address": "00:00:00:00:00:02" }
}

File Machine View Input Devices Help

GNU nano 2.9.3 12-flows.json


```
                                    "output-action": {
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                                    }
                                }
                            ]
                        },
                        "order": 0
                    }
                ]
            },
            "match": {
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                    "ethernet-destination": { "address": "00:00:00:00:00:01" },
                    "ethernet-source": { "address": "00:00:00:00:00:02" }
                }
            },
            "opendaylight-flow-statistics:flow-statistics": {
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                    "second": 3
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                "packet-count": 0
            },
            "priority": 10,
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            "cookie": 3098476543630901248,
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            "flags": "",
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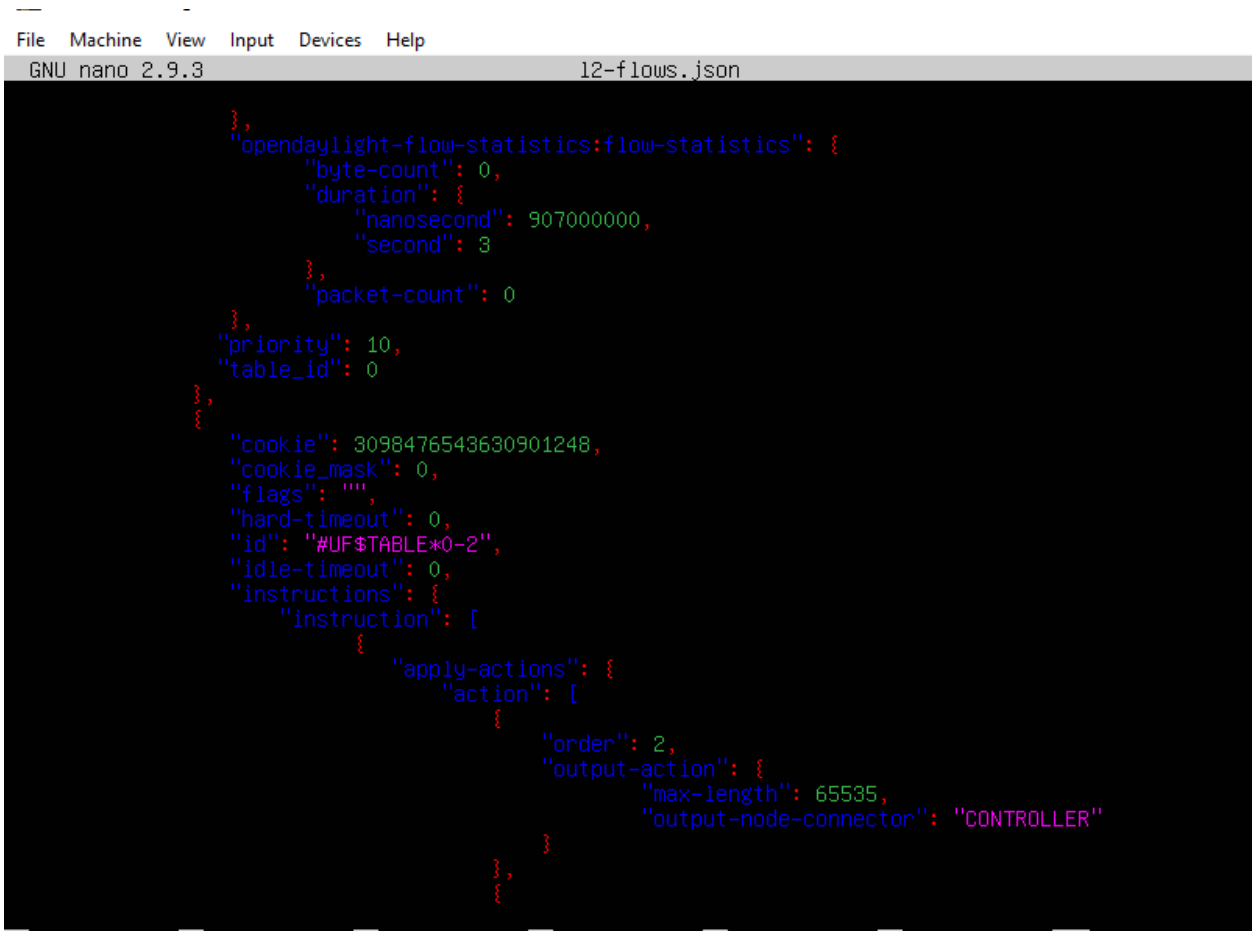
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
},
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"instruction": [
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"apply-actions": {
"action": [
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"order": 2,
"output-action": {
"max-length": 65535,
"output-node-connector": "CONTROLLER"
}
},
{

File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
"hard-timeout": 0,
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"instruction": [
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"output-action": {
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"output-node-connector": "CONTROLLER"
}
},
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}
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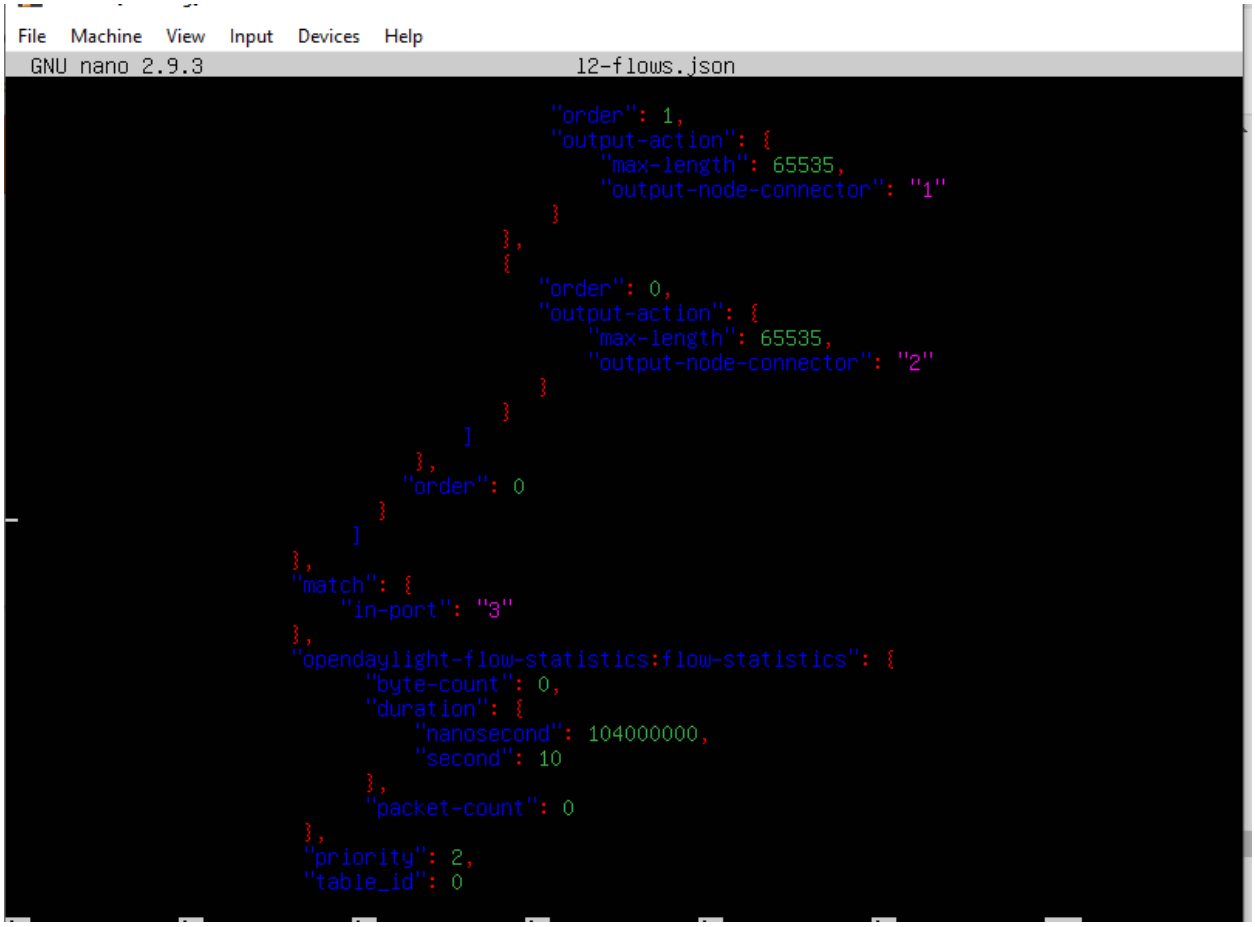
File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
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"output-action": {
"max-length": 65535,
"output-node-connector": "2"
}
}
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},
"order": 0
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]
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"match": {
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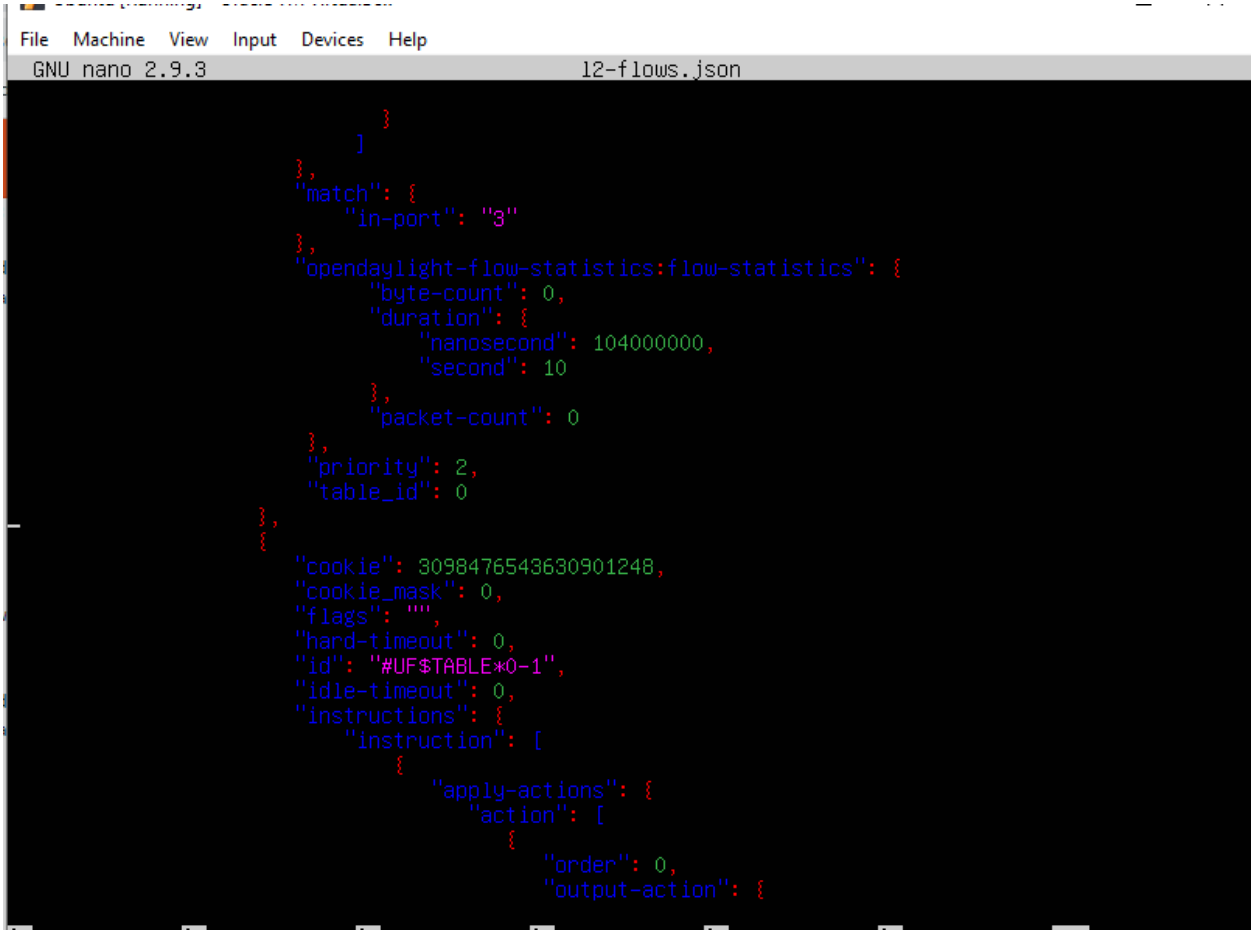
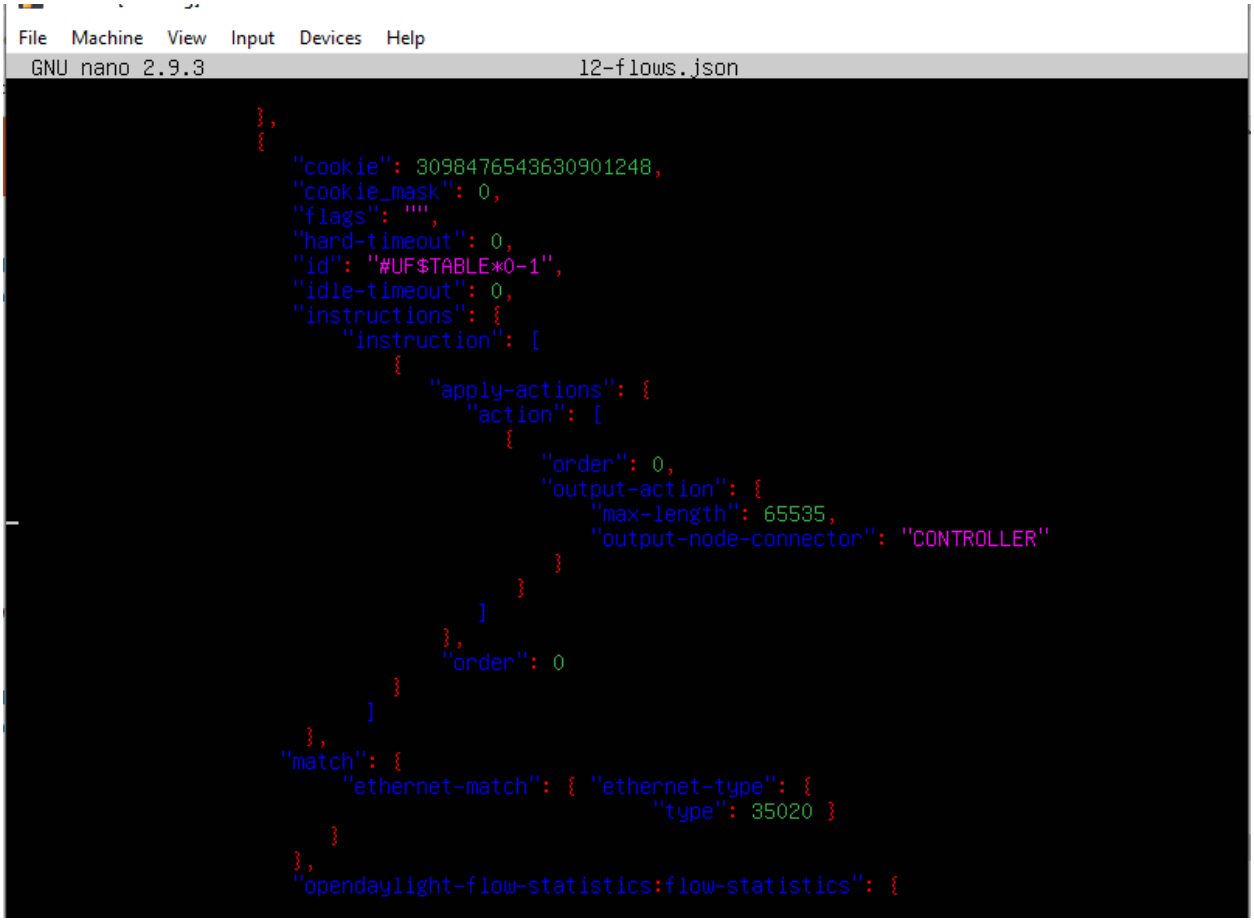
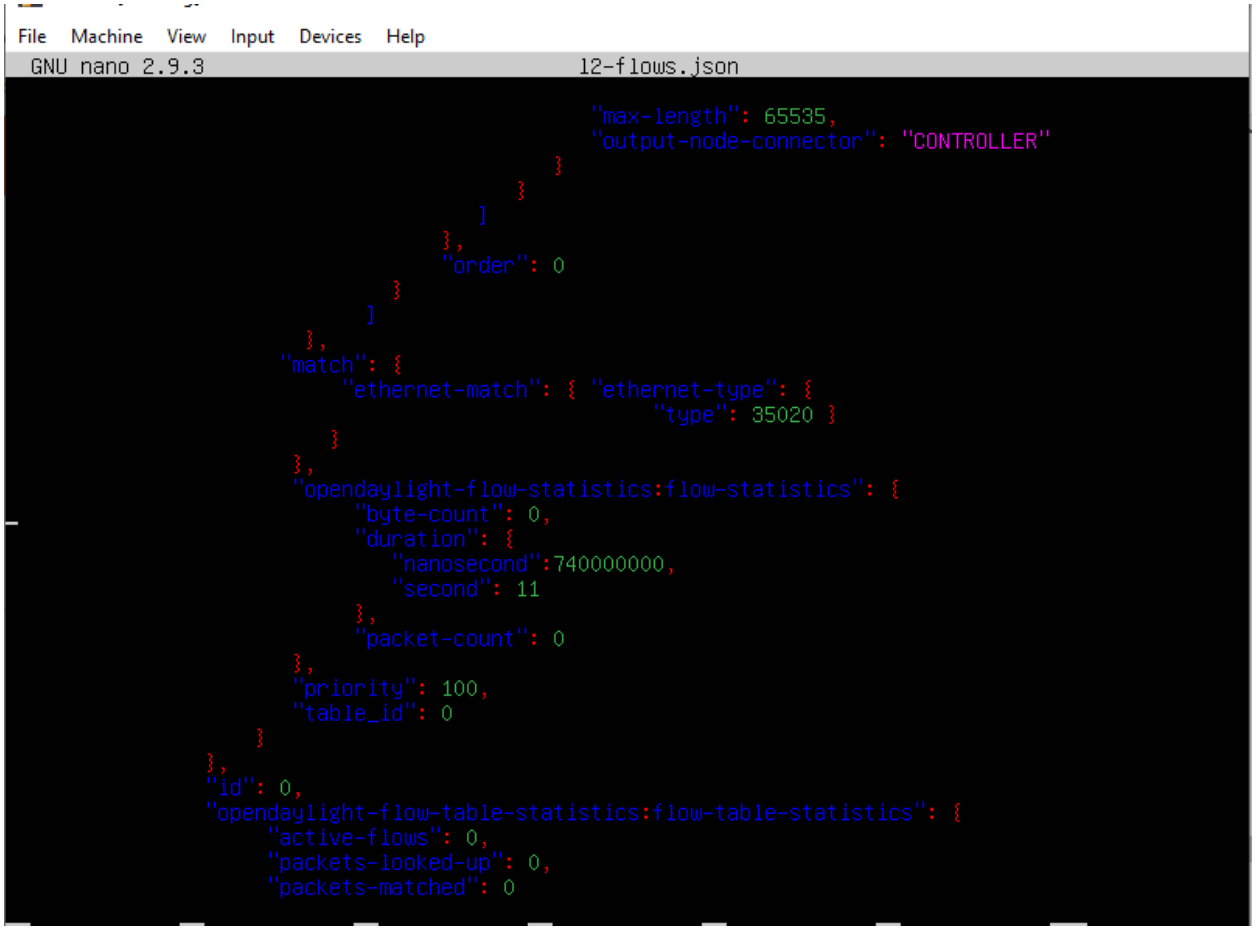
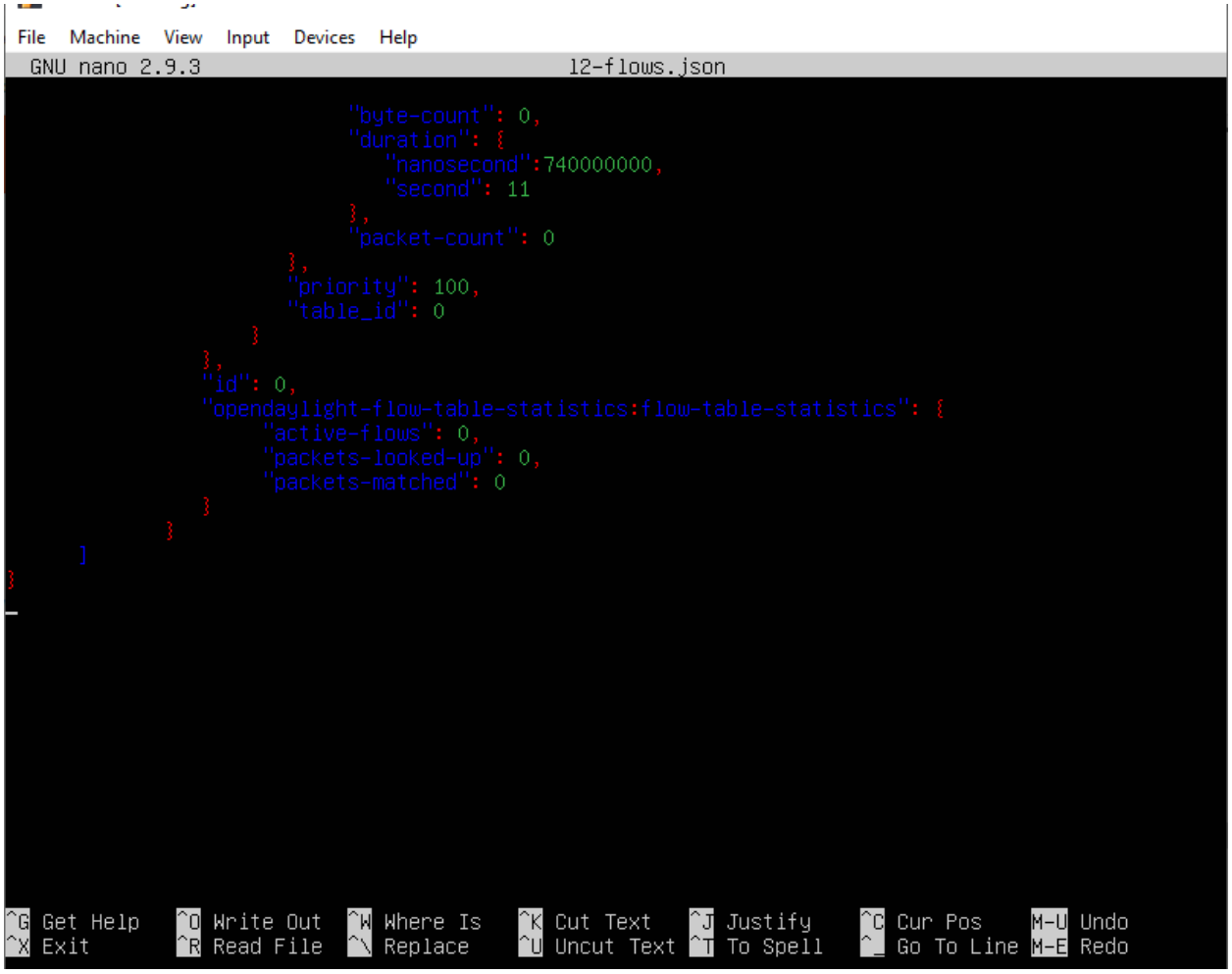
"priority": 2,
"table_id": 0

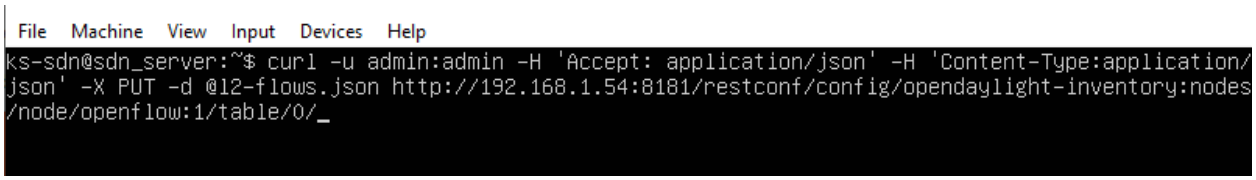

File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
}
]
},
"match": {
"in-port": "3"
},
"opendaylight-flow-statistics:flow-statistics": {
"byte-count": 0,
"duration": {
"nanosecond": 104000000,
"second": 10
},
"packet-count": 0
},
"priority": 2,
"table_id": 0
},
{
"cookie": 3098476543630901248,
"cookie_mask": 0,
"flags": "",
"hard-timeout": 0,
"id": "#UF$TABLE*0-1",
"idle-timeout": 0,
"instructions": {
"instruction": [
{
"apply-actions": {
"action": [
{
"order": 0,
"output-action": {

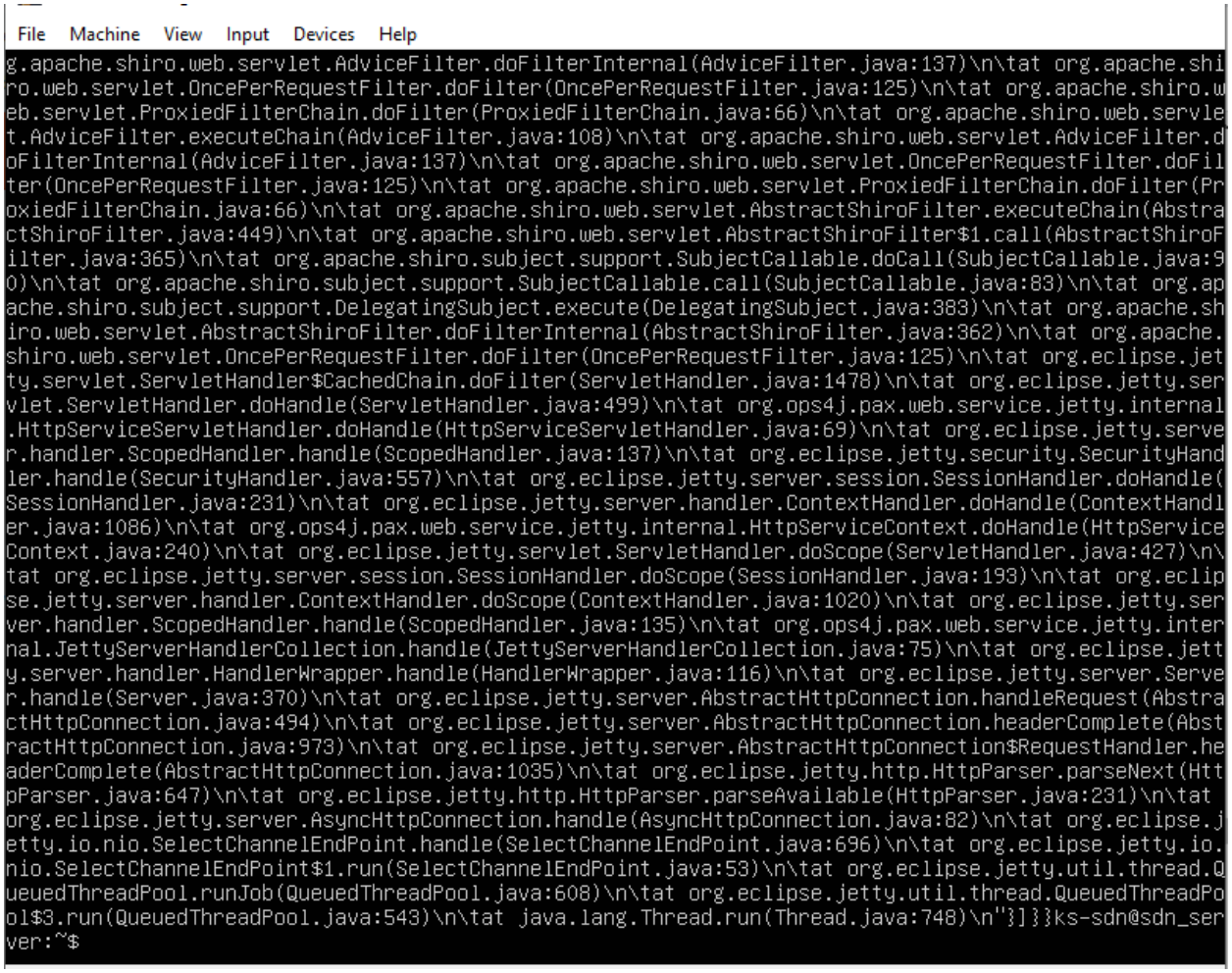

File Machine View Input Devices Help
GNU nano 2.9.3 12-flows.json
},
{
"cookie": 3098476543630901248,
"cookie_mask": 0,
"flags": "",
"hard-timeout": 0,
"id": "#UF$TABLE*0-1",
"idle-timeout": 0,
"instructions": {
"instruction": [
{
"apply-actions": {
"action": [
{
"order": 0,
"output-action": {
"max-length": 65535,
"output-node-connector": "CONTROLLER"
}
}
]
},
"order": 0
}
]
},
"match": {
"ethernet-match": { "ethernet-type": {
"type": 35020 }
}
},
"opendaylight-flow-statistics:flow-statistics": {


File Machine View Input Devices Help
GNU nano 2.9.3 l2-flows.json
"max-length": 65535,
"output-node-connector": "CONTROLLER"
"order": 0
"match": {
"ethernet-match": { "ethernet-type": {
"type": 35020 }
"opendaylight-flow-statistics:flow-statistics": {
"byte-count": 0,
"duration": {
"nanosecond":740000000,
"second": 11
"packet-count": 0
"priority": 100,
"table_id": 0
"id": 0,
"opendaylight-flow-table-statistics:flow-table-statistics": {
"active-flows": 0,
"packets-looked-up": 0,
"packets-matched": 0

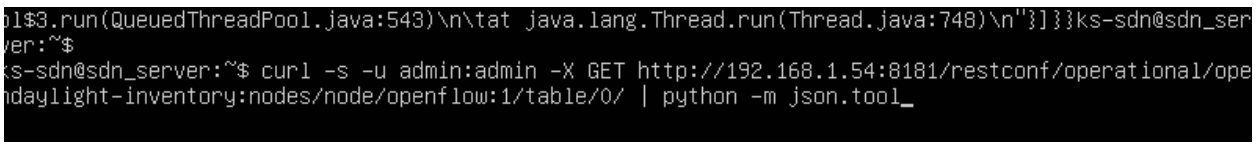


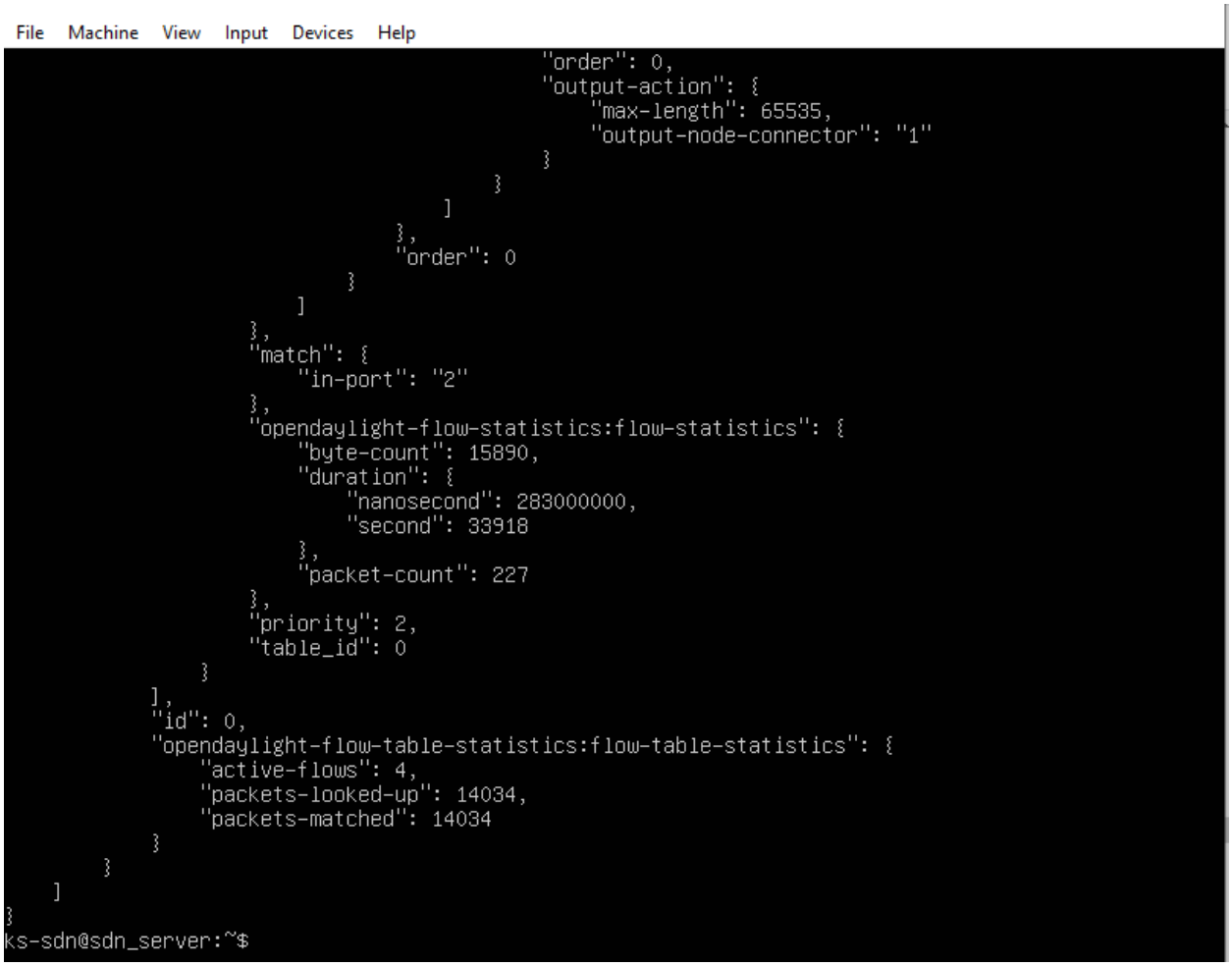
- **Push flows via API**





- **Get flows info via API**





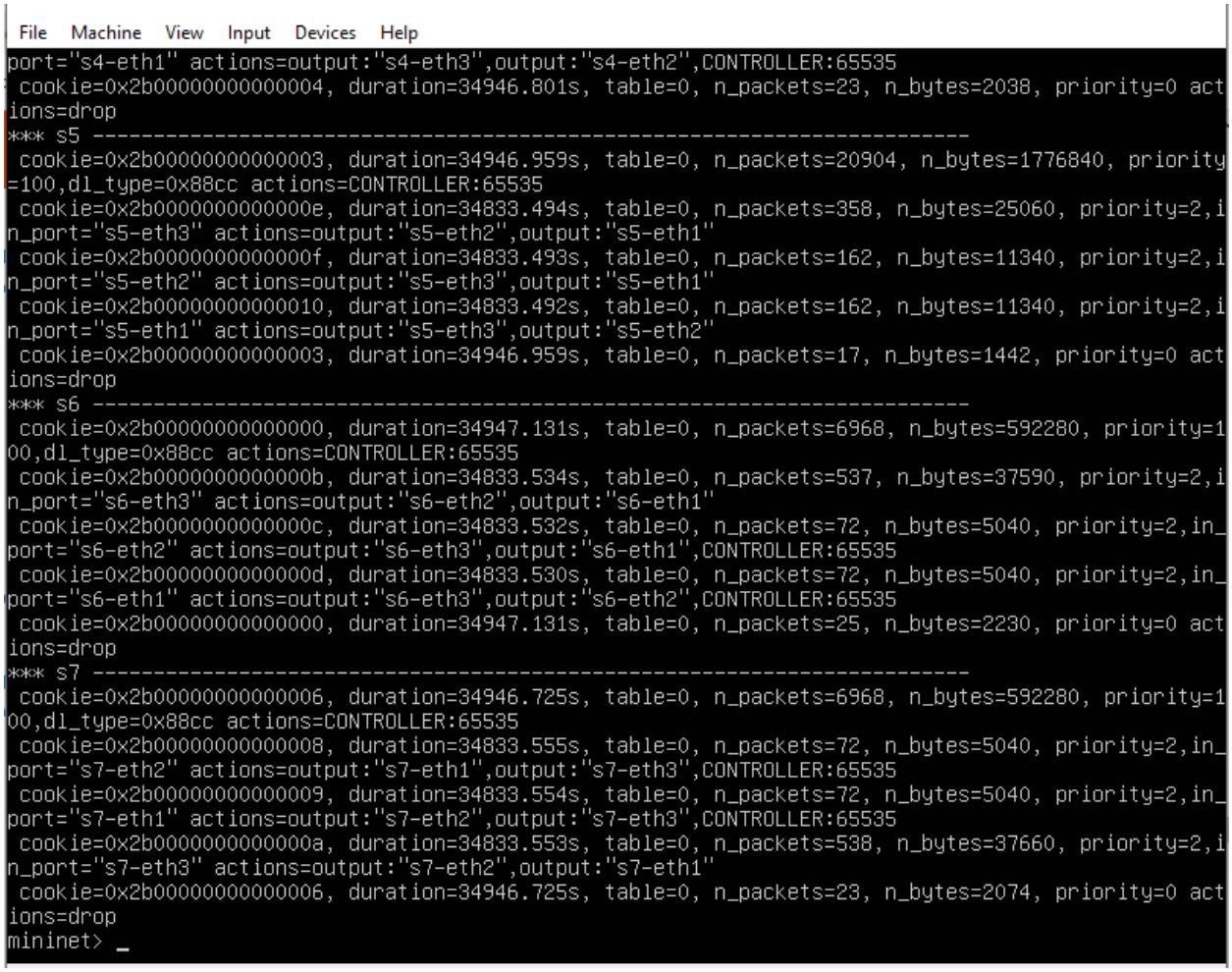
- **Perform the tests via MN console**

```
mininet> dpctl dump-flows - OpenFlow13
*** s1 ------------------------------------------------------------------------
ovs-ofctl: 'dump-flows' command takes at most 2 arguments
*** s2 ------------------------------------------------------------------------
ovs-ofctl: 'dump-flows' command takes at most 2 arguments
*** s3 ------------------------------------------------------------------------
ovs-ofctl: 'dump-flows' command takes at most 2 arguments
*** s4 ------------------------------------------------------------------------
ovs-ofctl: 'dump-flows' command takes at most 2 arguments
*** s5 ------------------------------------------------------------------------
ovs-ofctl: 'dump-flows' command takes at most 2 arguments
*** s6 ------------------------------------------------------------------------
ovs-ofctl: 'dump-flows' command takes at most 2 arguments
*** s7 ------------------------------------------------------------------------
ovs-ofctl: 'dump-flows' command takes at most 2 arguments
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 h4 h5 h6 h7 h8
h2 -> h1 h3 h4 h5 h6 h7 h8
h3 -> h1 h2 h4 h5 h6 h7 h8
h4 -> h1 h2 h3 h5 h6 h7 h8
h5 -> h1 h2 h3 h4 h6 h7 h8
h6 -> h1 h2 h3 h4 h5 h7 h8
h7 -> h1 h2 h3 h4 h5 h6 h8
h8 -> h1 h2 h3 h4 h5 h6 h7
*** Results: 0% dropped (56/56 received)
mininet> _
```

```
ks-sdn@sdn_server:~$ curl -u admin:admin -H 'Accept: application/json' -H 'Content-Type: application
/json' -X DELETE -d @l2-flows.json http://192.168.1.54:8181/restconf/config/opendaylight-inventory:n
odes/node/openflow:1/table/0/
```

```
ks-sdn@sdn_server:~$ curl -u admin:admin -H 'Accept: application/json' -H 'Content-Type: applicatior
/json' -X DELETE -d @l2-flows.json http://192.168.1.54:8181/restconf/config/opendaylight-inventory:r
odes/node/openflow:1/table/0/
{"errors":{"error":[{"error-type":"protocol","error-tag":"data-missing","error-message":"Data does r
ot exist for path: /(urn:opendaylight:inventory?revision=2013-08-19)nodes/node/node[{(urn:opendaylig
ht:inventory?revision=2013-08-19)id=openflow:1}]/AugmentationIdentifier{childNames=[(urn:opendayligh
t:flow:inventory?revision=2013-08-19)supported-match-types, (urn:opendaylight:flow:inventory?revisio
n=2013-08-19)supported-instructions, (urn:opendaylight:flow:inventory?revision=2013-08-19)supported-
actions, (urn:opendaylight:flow:inventory?revision=2013-08-19)switch-features, (urn:opendaylight:flo
w:inventory?revision=2013-08-19)manufacturer, (urn:opendaylight:flow:inventory?revision=2013-08-19)h
ardware, (urn:opendaylight:flow:inventory?revision=2013-08-19)software, (urn:opendaylight:flow:inver
tory?revision=2013-08-19)serial-number, (urn:opendaylight:flow:inventory?revision=2013-08-19)descrip
tion, (urn:opendaylight:flow:inventory?revision=2013-08-19)port-number, (urn:opendaylight:flow:inver
tory?revision=2013-08-19)ip-address, (urn:opendaylight:flow:inventory?revision=2013-08-19)meter, (ur
n:opendaylight:flow:inventory?revision=2013-08-19)stale-meter, (urn:opendaylight:flow:inventory?revi
sion=2013-08-19)group, (urn:opendaylight:flow:inventory?revision=2013-08-19)stale-group, (urn:openda
ylight:flow:inventory?revision=2013-08-19)table, (urn:opendaylight:flow:inventory?revision=2013-08-1
9)table-features]}/(urn:opendaylight:flow:inventory?revision=2013-08-19)table/table[{(urn:opendaylig
ht:flow:inventory?revision=2013-08-19)id=0}]"}]}}ks-sdn@sdn_server:~$
```

```
mininet>
mininet> dpctl dump-flows -O OpenFlow13_
```



EXERCISE THREE

- **Created XML file (flow) PUSH via API**

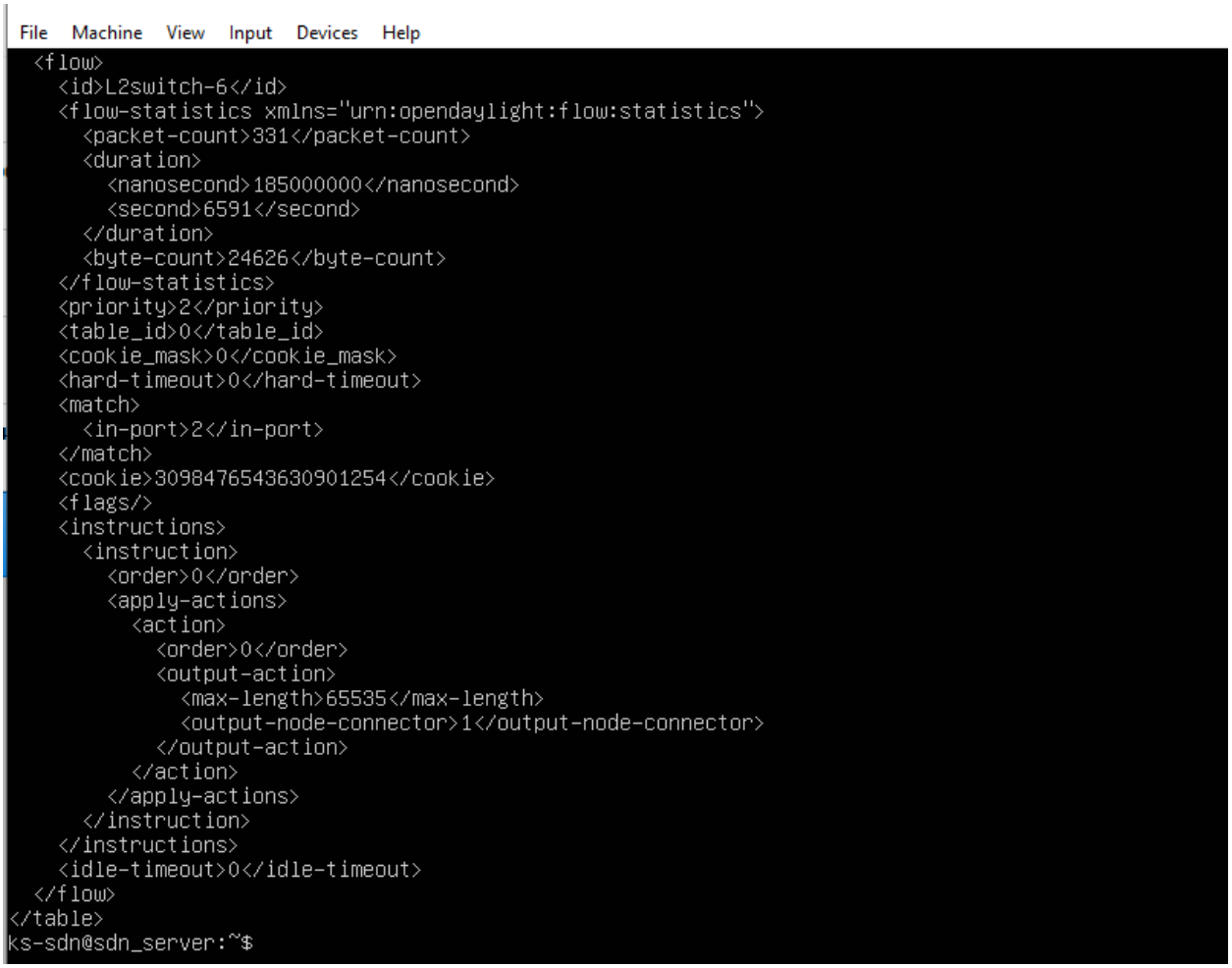
```
File  Machine  View  Input  Devices  Help
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<input xmlns="urn:opendaylight:flow:service">
   <node xmlns:inv="urn:opendaylight:inventory">/inv:nodes/inv:node[inv:id="openflow:1"]</node>
   <table_id>0</table_id>
   <priority>2</priority>
   <match>
       <ethernet-match>
          <ethernet-type>
              <type>2048</type>
          </ethernet-type>
       </ethernet-match>
       <ipv4-destination>10.0.0.0/24</ipv4-destination>
   </match>
   <instructions>
      <instruction>
         <order>0</order>
         <apply-actions>
            <action>
               <output-action>
                  <output-node-connector>1</output-node-connector>
               </output-action>
               <order>0</order>
            </action>
         </apply-actions>
      </instruction>
    </instructions>
</input>



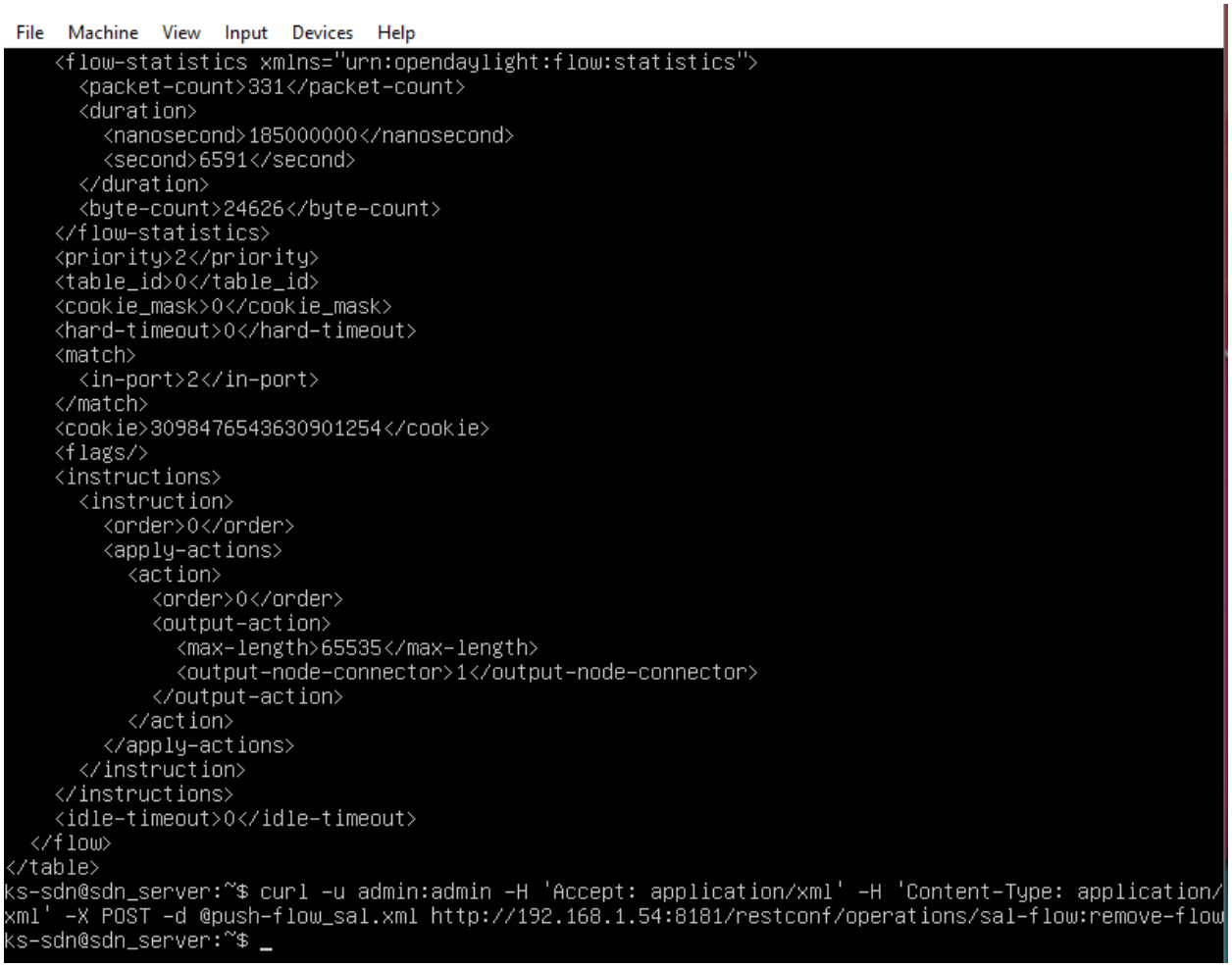

ks-sdn@sdn_server:~$ curl -u admin:admin -H 'Accept: application/xml' -H 'Content-Type: application/
xml' -X POST -d @push-flow_sal.xml http://192.168.1.54:8181/restconf/operations/sal-flow:add-flow
ks-sdn@sdn_server:~$
```

- **View a flow via API**

```
File  Machine  View  Input  Devices  Help
ks-sdn@sdn_server:~$ curl -s -u admin:admin -H 'Accept: application/xml' -H 'Content-Type: applicati
on/xml' -X GET http://192.168.1.54:8181/restconf/operational/opendaylight-inventory:nodes/node/openf
low:1/table/0/ | xmllint --format -
```

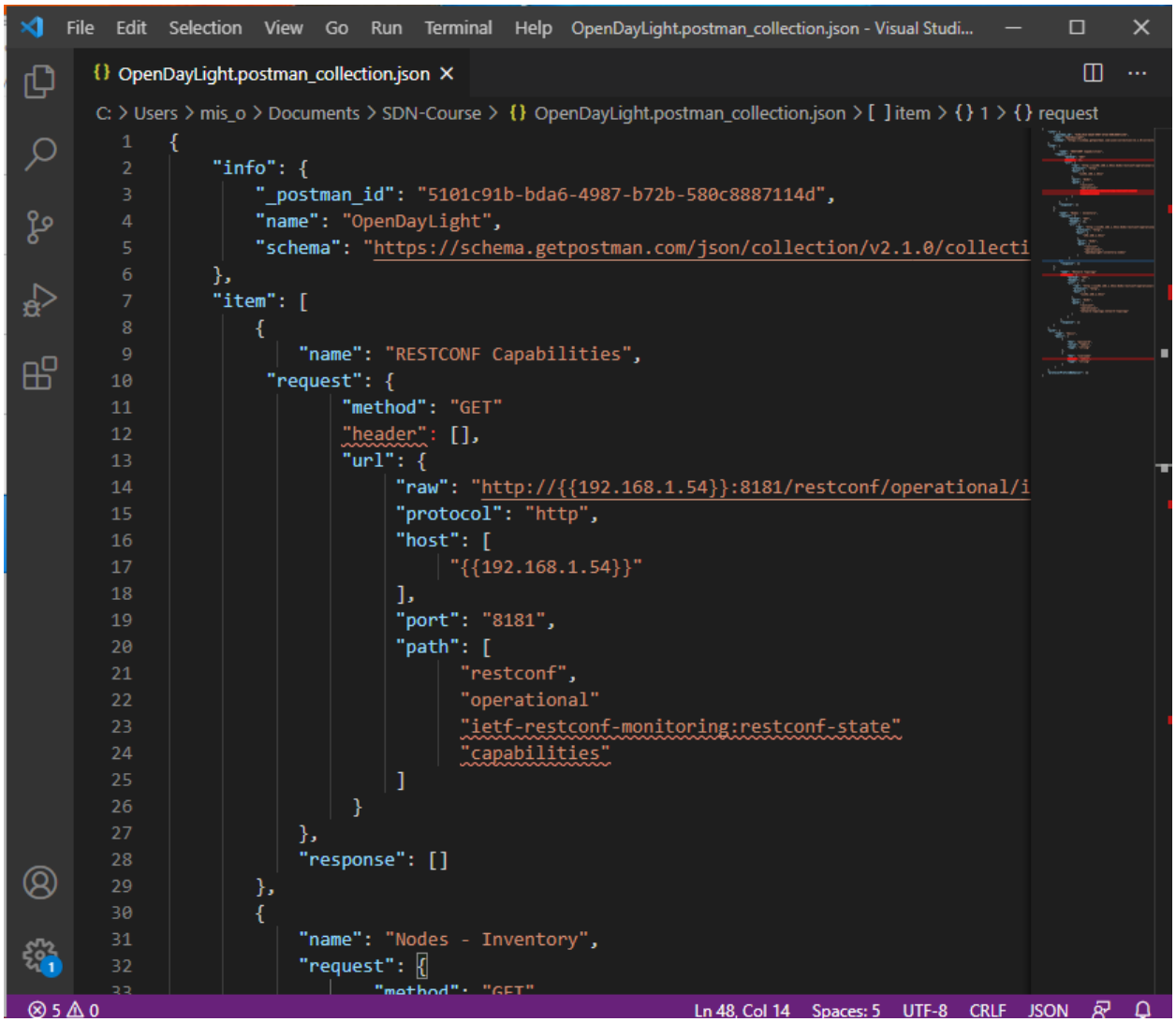


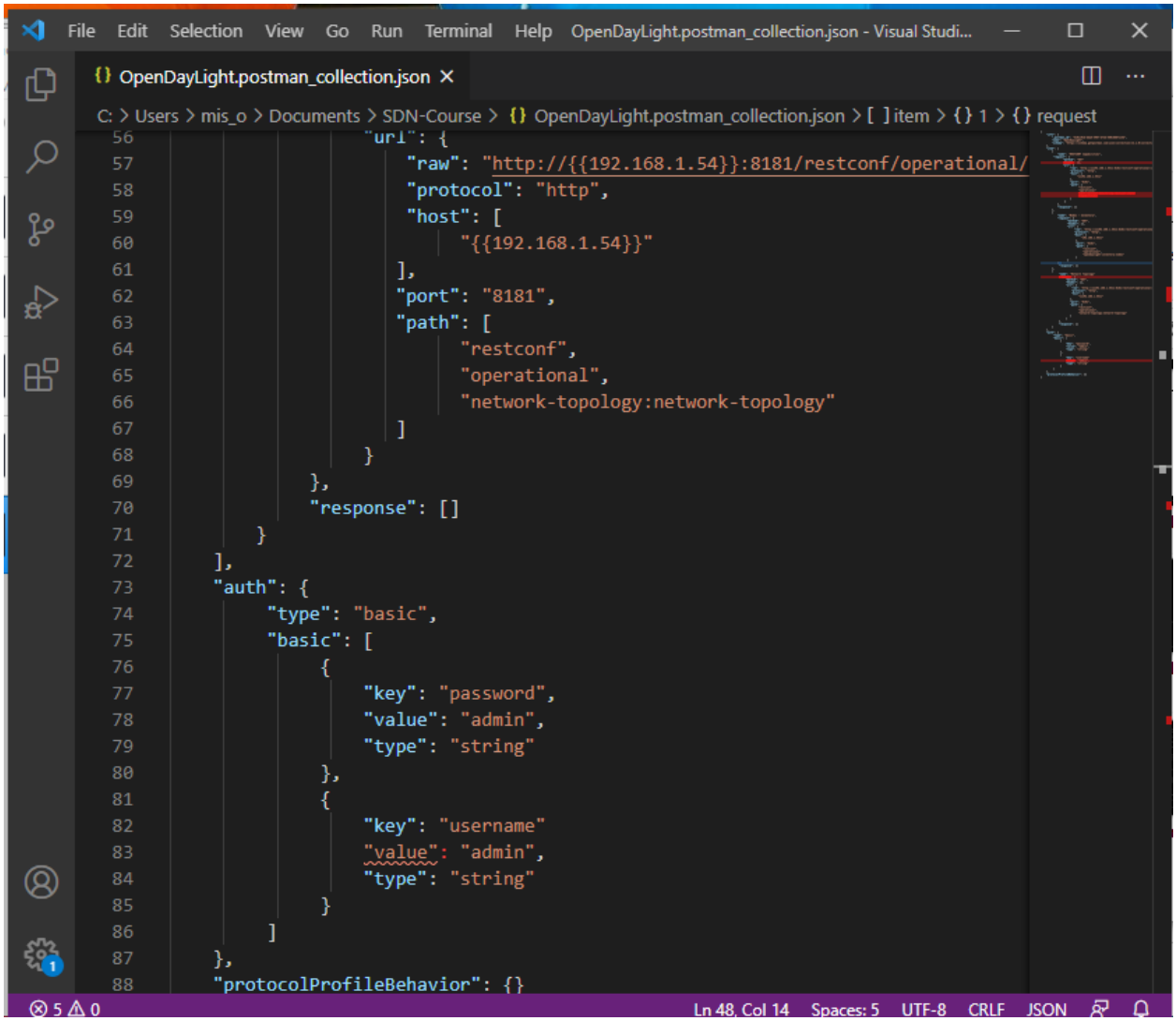
- **Remove a Flow via API**

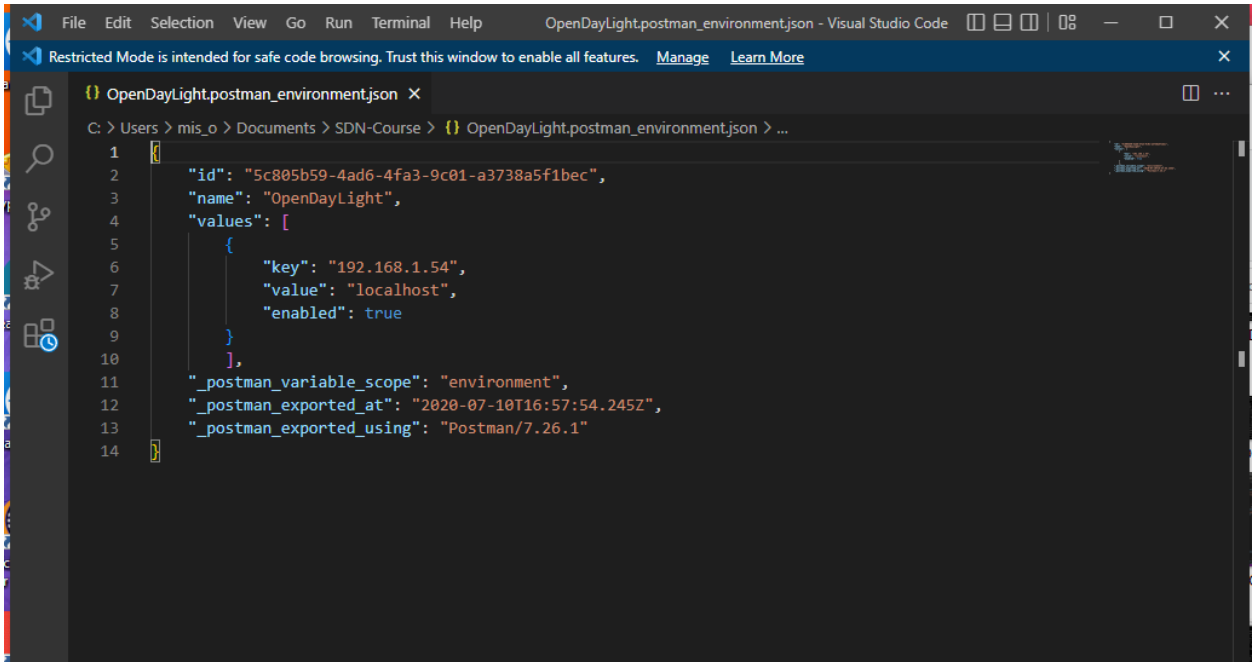


ODL & Postman

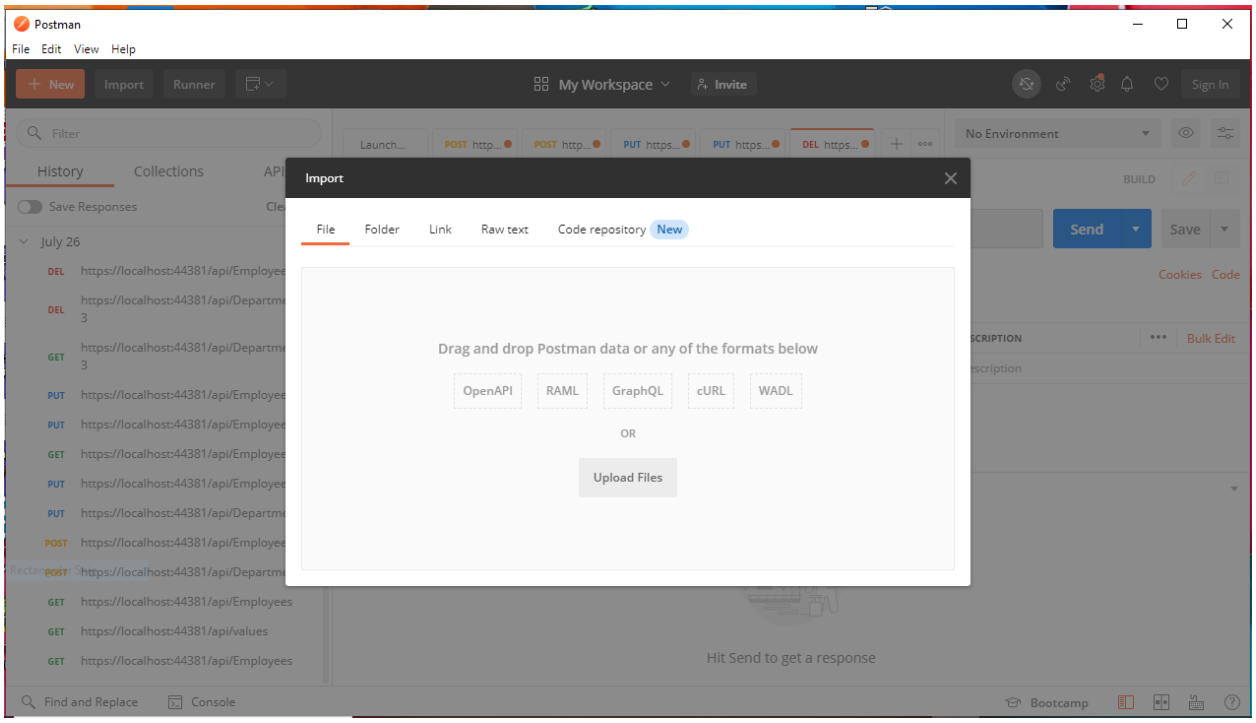
- **Created json files:**
  - Postman collection file: **OpenDayLight.postman_collection.json**
  - Postman environment file: **OpenDayLight.postman_environment.json**

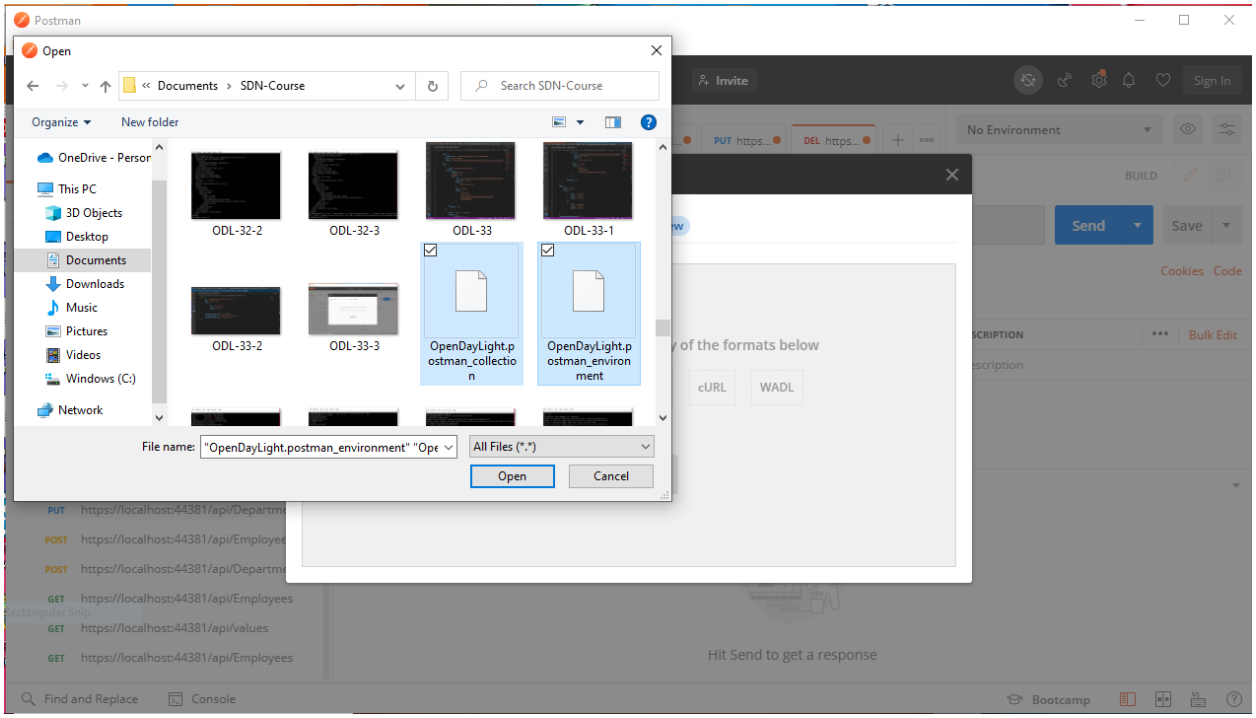

File Edit Selection View Go Run Terminal Help OpenDayLight.postman_collection.json - Visual Studi...
OpenDayLight.postman_collection.json
C: > Users > mis_o > Documents > SDN-Course > {} OpenDayLight.postman_collection.json > [ ] item > {} 1 > {} request
{
"info": {
"_postman_id": "5101c91b-bda6-4987-b72b-580c8887114d",
"name": "OpenDayLight",
"schema": "https://schema.getpostman.com/json/collection/v2.1.0/collecti
},
"item": [
{
"name": "RESTCONF Capabilities",
"request": {
"method": "GET"
"header": [],
"url": {
"raw": "http://{{192.168.1.54}}:8181/restconf/operational/i
"protocol": "http",
"host": [
"{{192.168.1.54}}"
],
"port": "8181",
"path": [
"restconf",
"operational"
"ietf-restconf-monitoring:restconf-state"
"capabilities"
]
}
},
"response": []
},
{
"name": "Nodes - Inventory",
"request": {
"method": "GET"
⊗ 5 ⚠ 0
Ln 48, Col 14 Spaces: 5 UTF-8 CRLF JSON

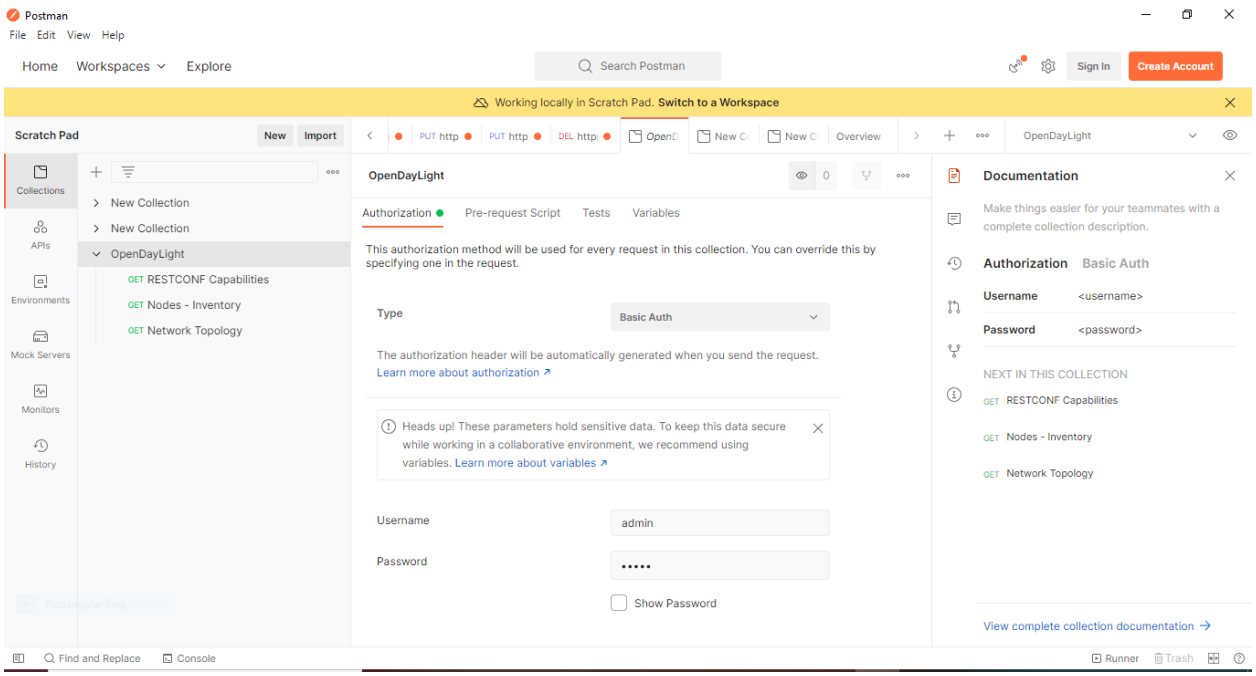

File Edit Selection View Go Run Terminal Help OpenDayLight.postman_collection.json - Visual Studi...
OpenDayLight.postman_collection.json
C: > Users > mis_o > Documents > SDN-Course > {} OpenDayLight.postman_collection.json > [ ] item > {} 1 > {} request
"url": {
"raw": "http://{{192.168.1.54}}:8181/restconf/operational/
"protocol": "http",
"host": [
"{{192.168.1.54}}"
],
"port": "8181",
"path": [
"restconf",
"operational",
"network-topology:network-topology"
]
}
},
"response": []
}
],
"auth": {
"type": "basic",
"basic": [
{
"key": "password",
"value": "admin",
"type": "string"
},
{
"key": "username"
"value": "admin",
"type": "string"
}
]
},
"protocolProfileBehavior": {}
Ln 48, Col 14 Spaces: 5 UTF-8 CRLF JSON



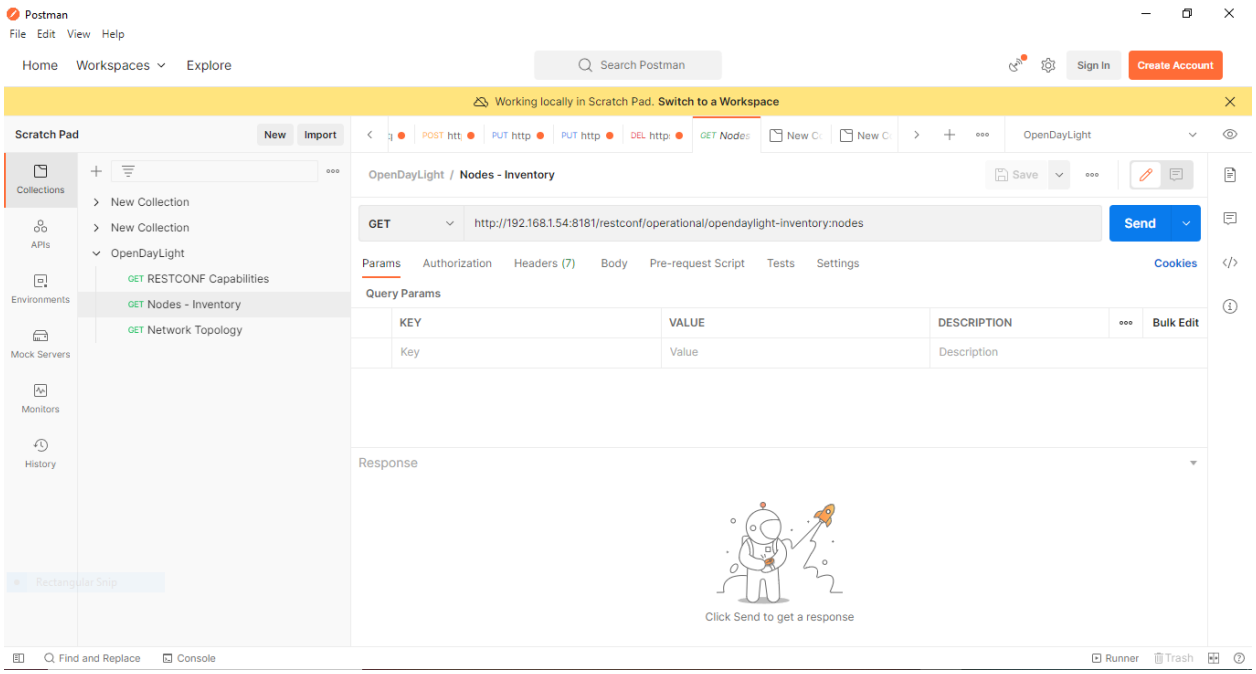
- **Import Configuration files to Postman**
  - Click import button
  - Click Upload Files
  - Select collection, and environment files from local machine



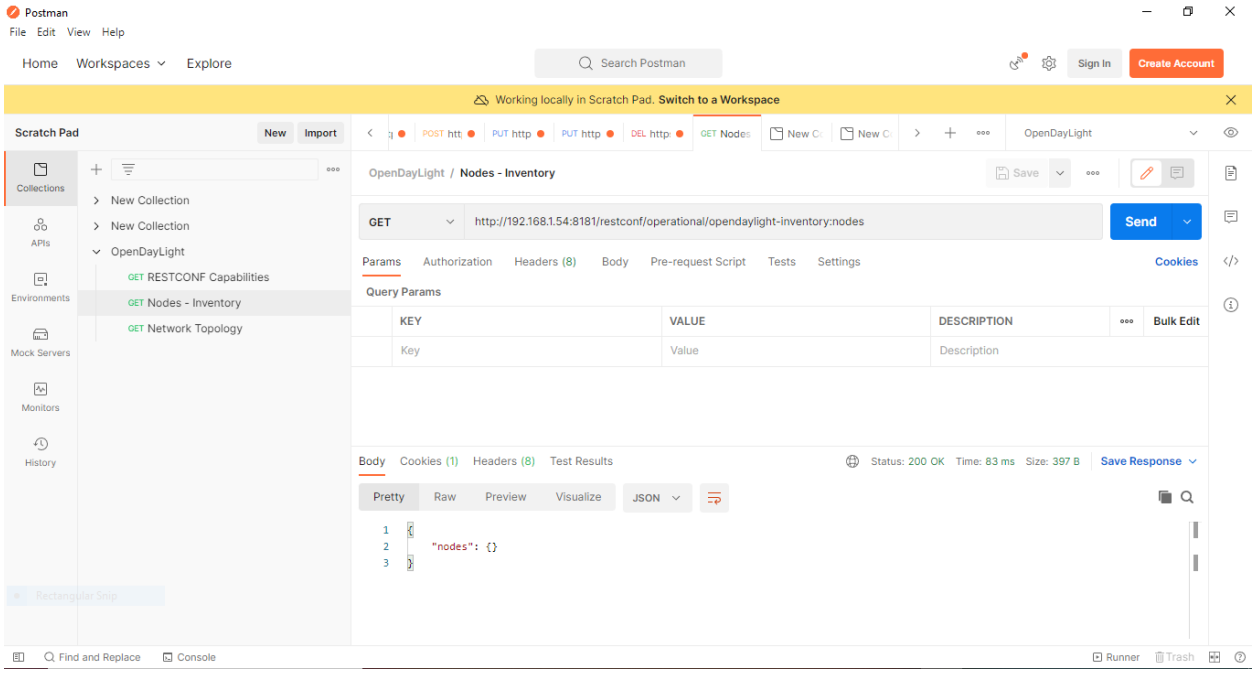




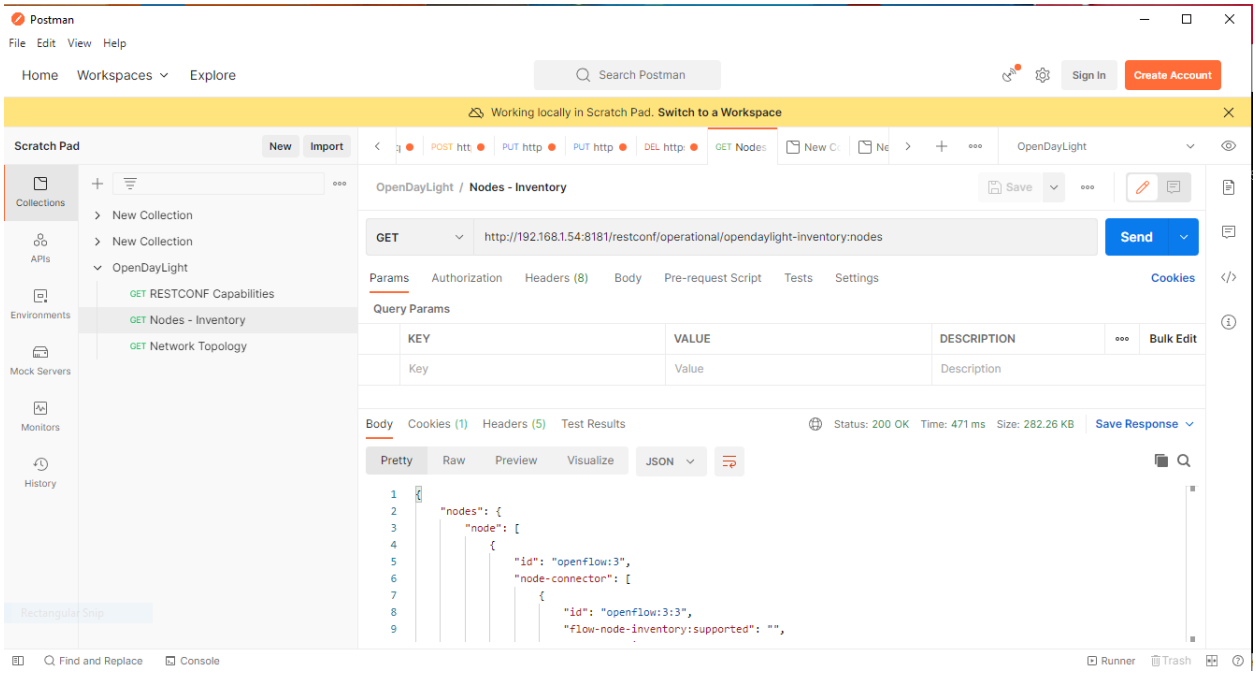
- **Using Postman**



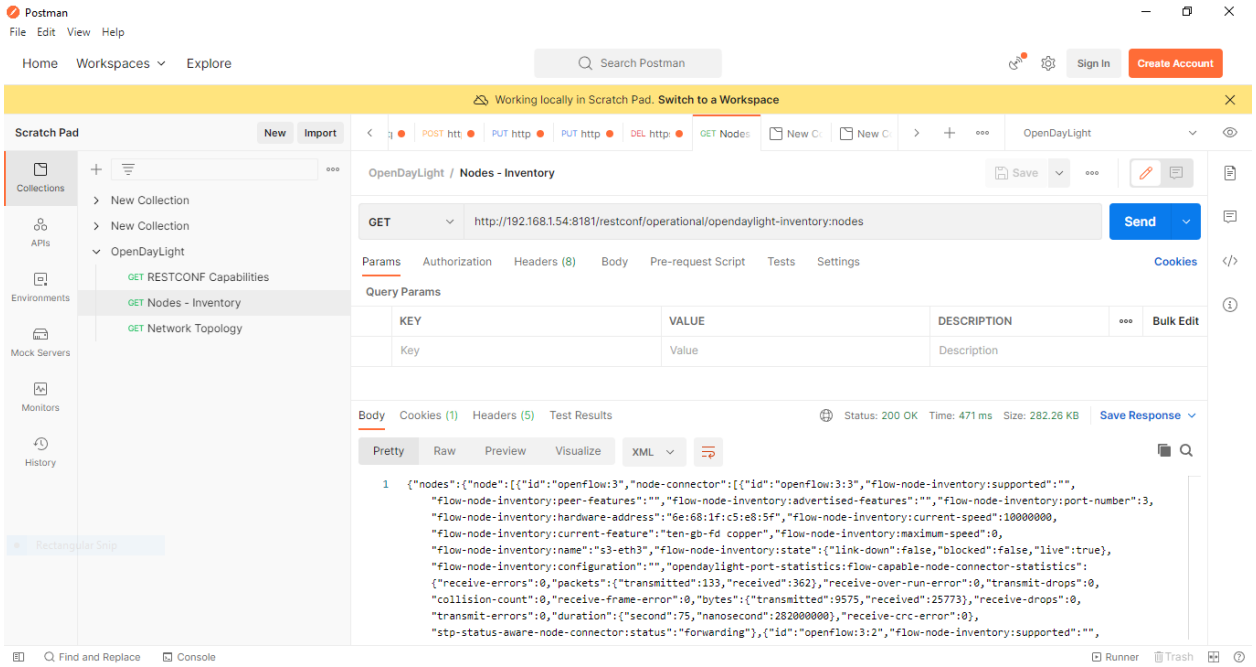
- Mininet Not started
- Checking Node Inventory



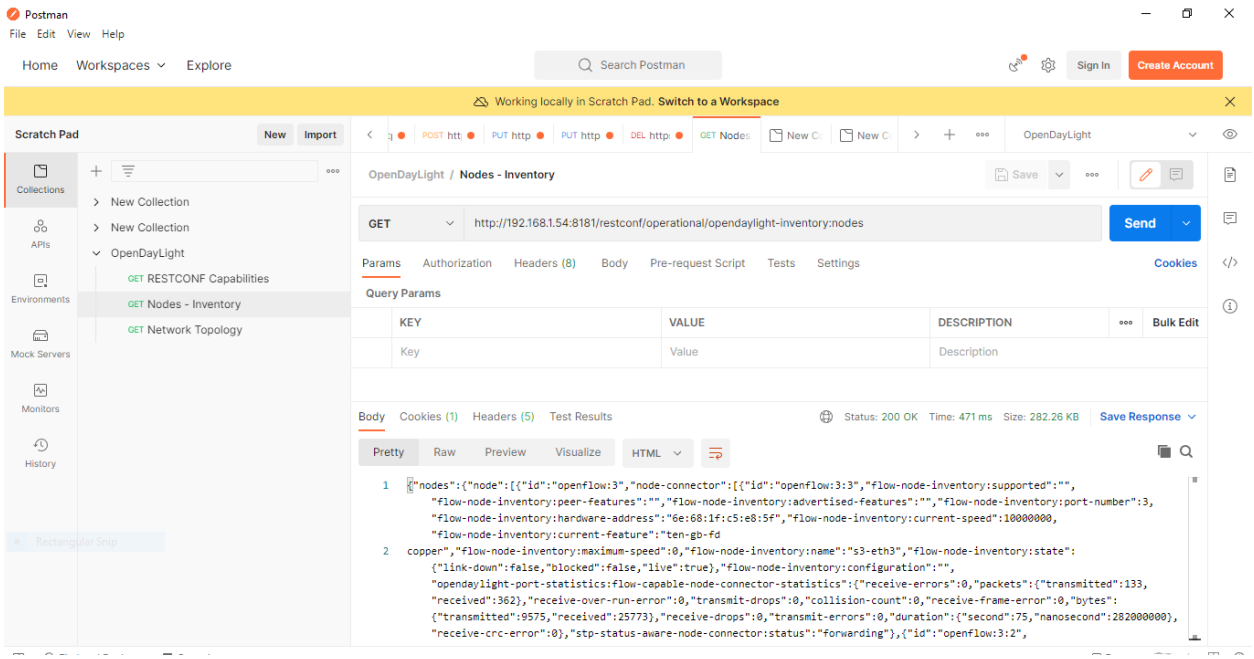
- Start Mininet Network
- Checking Node Inventory



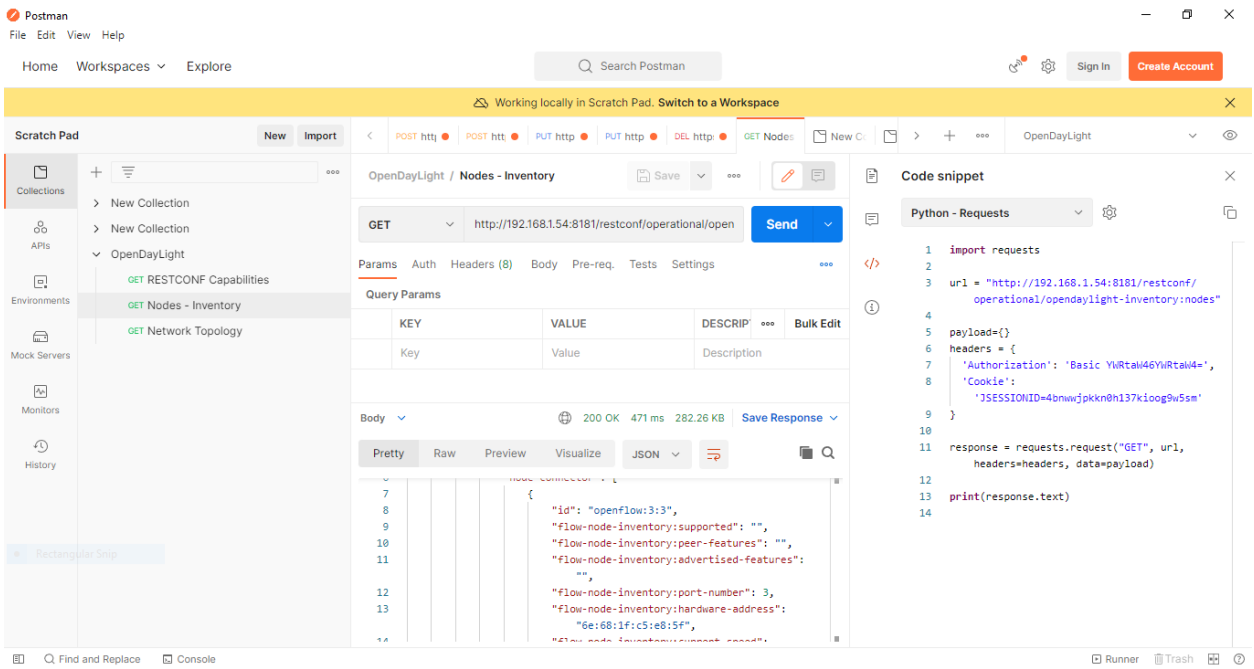
- Viewing REST API call in different Code format
- XML Format



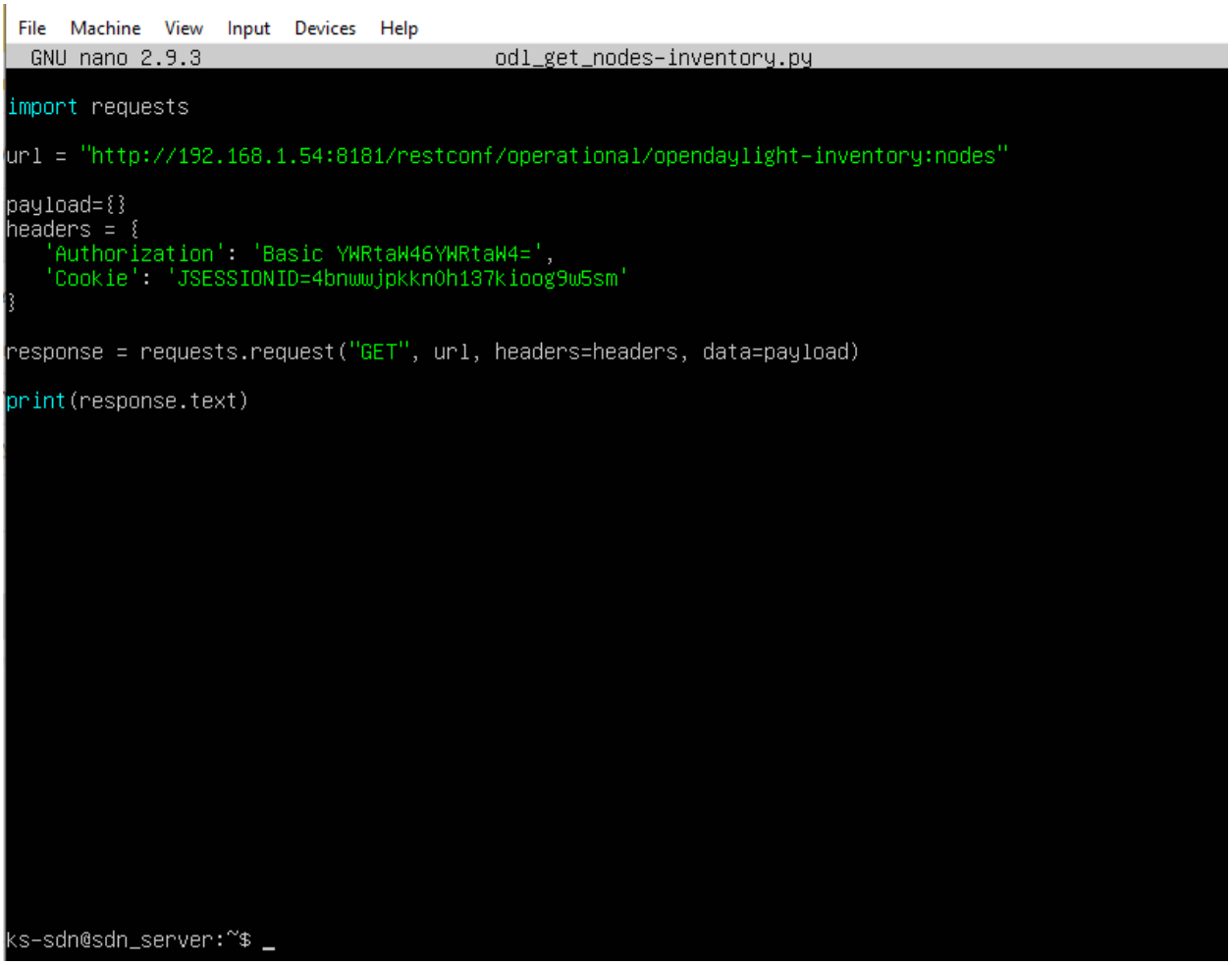
- HTML



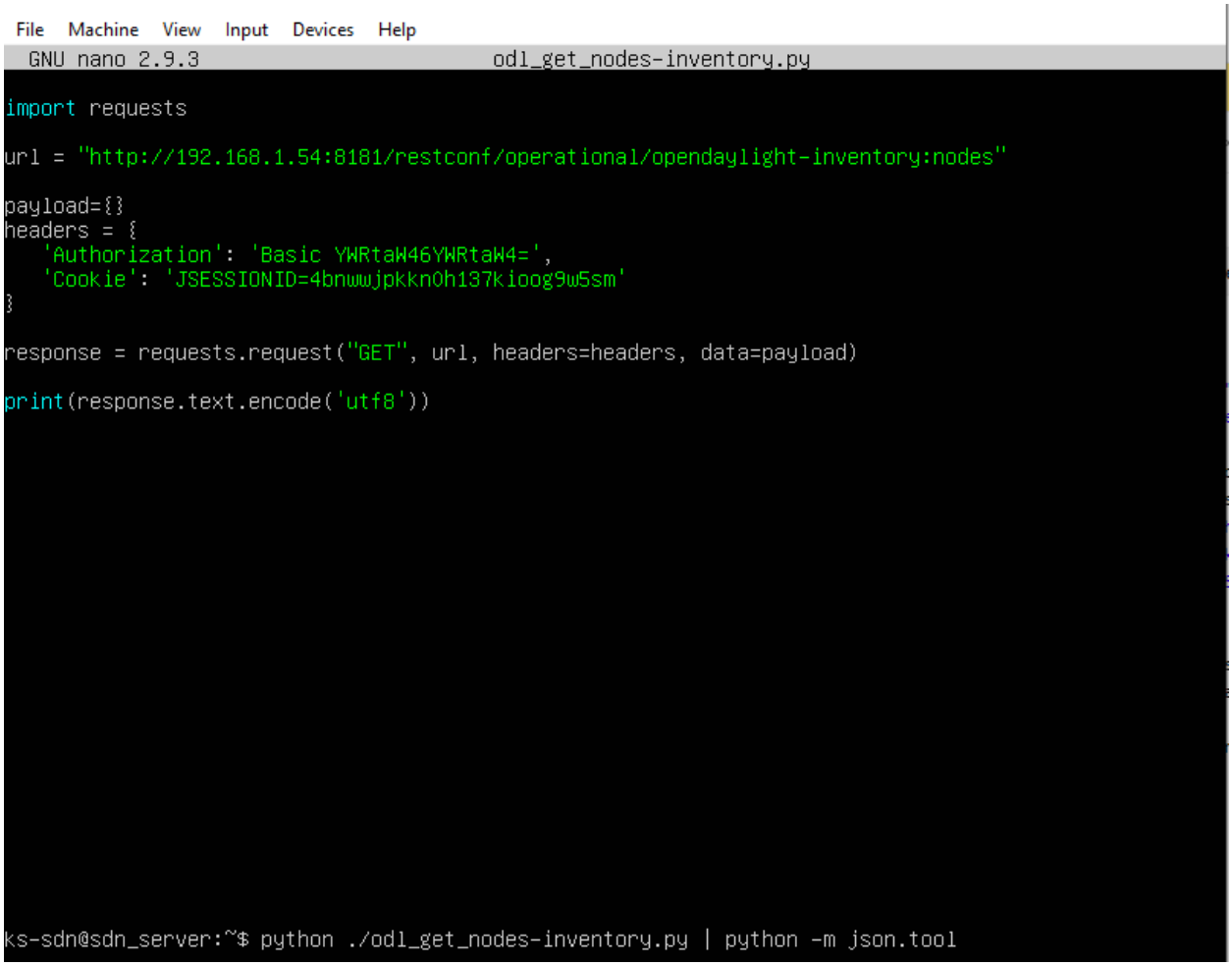
- View REST API call via **Python-Request**

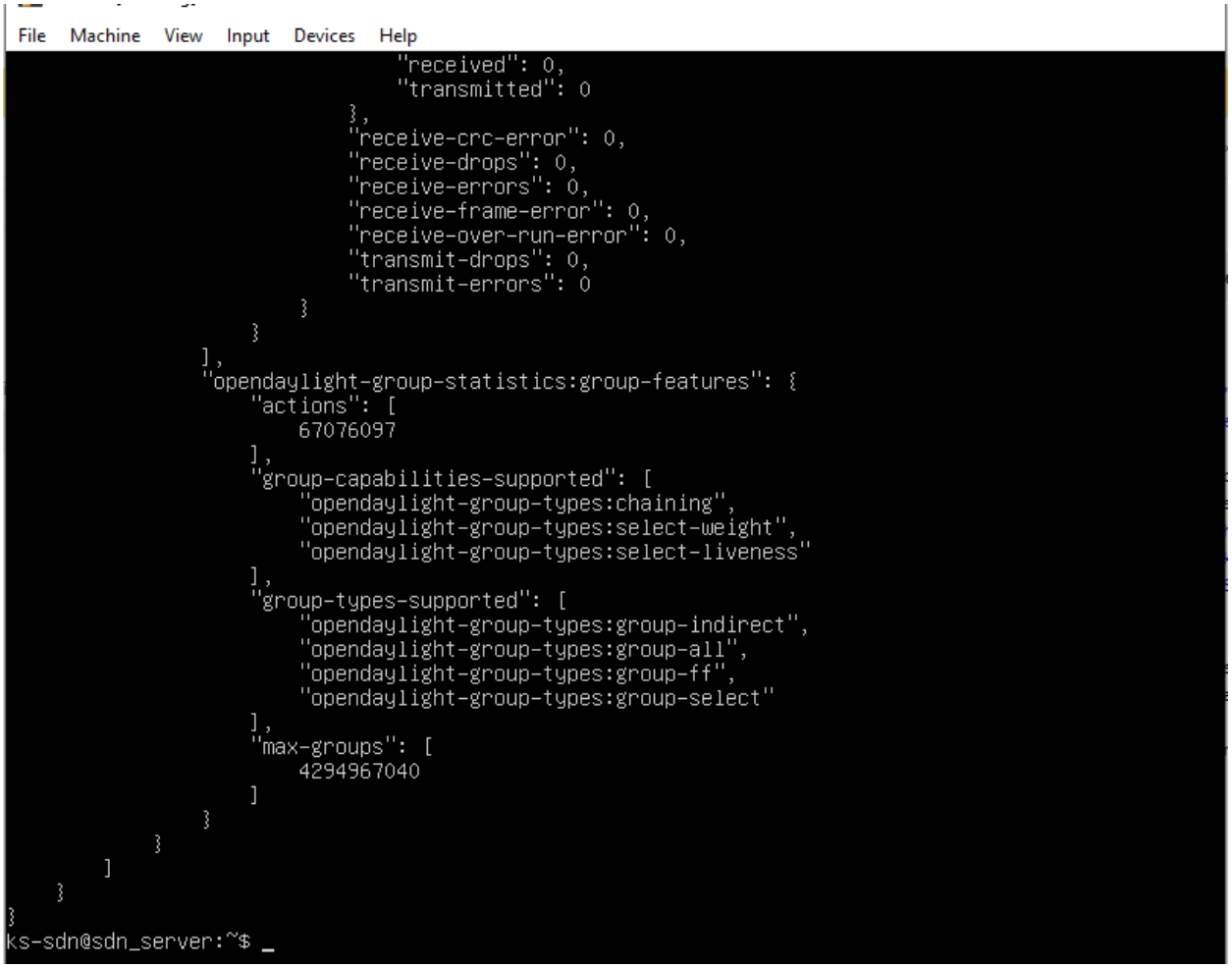


- Create text file of **Python-Request** Code in the ODL server, named: **odl_get_nodes-inventory.py**



- Run the python code REST API call


File Machine View Input Devices Help
GNU nano 2.9.3 odl_get_nodes-inventory.py
import requests
url = "http://192.168.1.54:8181/restconf/operational/opendaylight-inventory:nodes"
payload={}
headers = {
'Authorization': 'Basic YWRtaW46YWRtaW4=',
'Cookie': 'JSESSIONID=4bnwwjpkkn0h137kioog9w5sm'
}
response = requests.request("GET", url, headers=headers, data=payload)
print(response.text.encode('utf8'))
ks-sdn@sdn_server:~$ python ./odl_get_nodes-inventory.py | python -m json.tool


File Machine View Input Devices Help
"received": 0,
"transmitted": 0
},
"receive-crc-error": 0,
"receive-drops": 0,
"receive-errors": 0,
"receive-frame-error": 0,
"receive-over-run-error": 0,
"transmit-drops": 0,
"transmit-errors": 0
}
}
],
"opendaylight-group-statistics:group-features": {
"actions": [
67076097
],
"group-capabilities-supported": [
"opendaylight-group-types:chaining",
"opendaylight-group-types:select-weight",
"opendaylight-group-types:select-liveness"
],
"group-types-supported": [
"opendaylight-group-types:group-indirect",
"opendaylight-group-types:group-all",
"opendaylight-group-types:group-ff",
"opendaylight-group-types:group-select"
],
"max-groups": [
4294967040
]
}
}
]
}
}
ks-sdn@sdn_server:~$ _