OpenMUL Makdi Service Chaining – CLI Guide

Contents

1 Introduction

"MAKDI" (means spider) is one of MUL SDN Controller's applications. MAKDI supports dynamic service (NFV) insertion in a network of OpenFlow Switches (Physical or Virtual) controlled by SDN Controller. For a given incoming flow, MAKDI can perform traffic steering for achieving effective service chaining.

Services may be in the form of Firewall, Video Optimizer, WAN Optimizer, DPI etc. It can also take in to account any pre-analysis of any user data performed by any external DPI in form of meta-data passed via RESTapi communication to the controller

Fundamental elements for the operation of MAKDI are:

1) *NFV* - NFV aims to leverage standard IT virtualization technology to consolidate many network equipment types onto industry standard high volume servers, switches and storage, which could be located in Datacenters, Network Nodes and in the end user premises.

2) *NFV Group* - Multiple instances of same NFV comprises a NFV Group which can be installed on different servers in order to cater on demand scale-up or providing High availability.

3) *User* - User can be identified as a traffic flow. It can be related to end-user (UE) traffic in a 3GPP LTE network. In conjunction with DPI (Deep Packet Inspection engine) any packet metadata can decide the service level granularity for the user and accordingly they can be classified further.

4) *Service Chain* - A service chain simply consists of a set of network services, such as firewalls that are interconnected through the network to support an application.
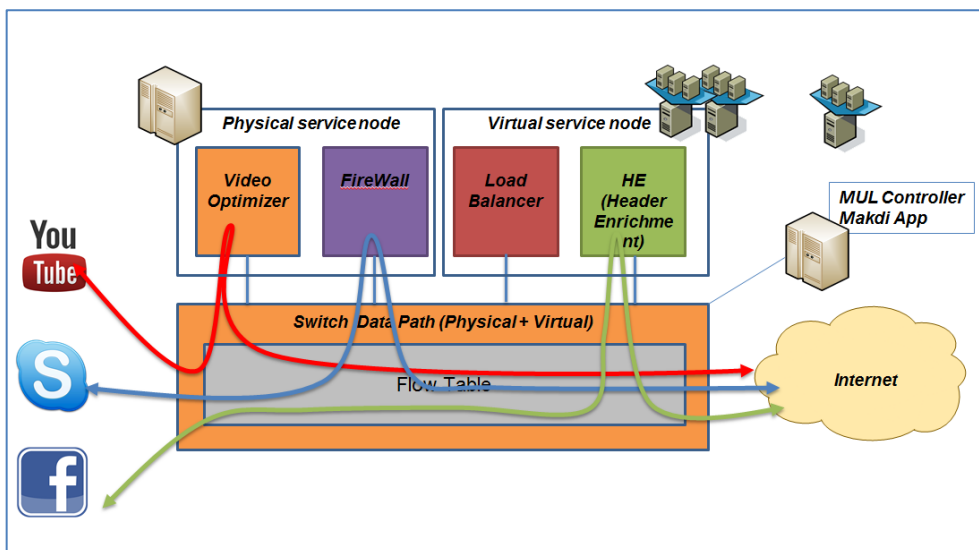
2 Entering the command shell

MUL cli shell is accessible using the following:

```
$ telnet localhost  <cli-port>
```

cli-port: The port which listens for cli clients. (Usually cli-port is 10000)

Note: "mulcli" component needs to be running for users to be able to access the cli shell. Please refer to the release doc: MUL-HOW-TO guide which explains how to run various MuL controller components.

3 MAKDI CLI Commands

Once in configure mode, the cli also provides the option to configure services specific to the MuL controller. The commands available are:

Command	Description
mul-mak-conf	Service Chain configuration. To be used for service, nfv-group and nfv service chain configurations as well as setting various parameters

Example:

```
sdn-server> enable
sdn-server#
sdn-server# configure  terminal
sdn-server(config)#
sdn-server(config)# mul-mak-conf
(mul-mak)#
```

3.1 NFV Group commands

3.1.1 NFV Group add command

Command	Description
add makdi-nfv-group X	NFV Group add command

3.1.2   NFV Group delete command

Command	Description
del makdi-nfv-group X	NFV Group delete command

3.1.3   NFV Group get command

Command	Description
show makdi-nfv-group all	Show every NFV Group command

3.1.4   NFV Group modification examples

```
(mul-mak)#  add makdi-nfv-group A
(mul-mak)#
(mul-mak)# do show makdi-nfv-group all
--------------------------------------------------------------------------------------------------------
NFV Group(E)
 - NFV(internet) : dpid(0x0000000000000001) iif(3) oif(3)
NFV Group(A)
--------------------------------------------------------------------------------------------------------
(mul-mak)# del makdi-nfv-group A
(mul-mak)#
(mul-mak)# do show makdi-nfv-group all
--------------------------------------------------------------------------------------------------------
NFV Group(E)
 - NFV(internet) : dpid(0x0000000000000001) iif(3) oif(3)
--------------------------------------------------------------------------------------------------------
```

3.2   NFV commands

3.2.1   NFV add command

Command	Description
add makdi-nfv group X nfv Y switch <dpid> in-port <0-65535> out-port <0-65535>	NFV add command

- ✓ *X is the nfv-group name.*
- ✓ *Y is the nfv identification name.*

3.2.2   NFV delete command

Command	Description
del makdi-nfv group X nfv Y switch Z in-port <0-65535> out-port <0-65535>	NFV delete command

3.2.3   NFV get command

Command	Description
show makdi-nfv all	Show every NFV command

3.2.4   NFV modification examples

(Exact port number used in commands can be found using the command – "show of-switch <dpid> general-features")

```
(mul-mak)# add makdi-nfv group E nfv h1 switch 0x01 in-port 2 out-port 3
(mul-mak)#
(mul-mak)# do show makdi-nfv all
-------------------------------------------------------------------------------------------------------------
NFV Group(E)
 - NFV(internet) : dpid(0x0000000000000001) iif(3) oif(3)
 - NFV(h1) : dpid(0x0000000000000002) iif(2) oif(3)
(mul-mak)#
(mul-mak)# del makdi-nfv group E nfv h1 switch 0x2 in-port 2 out-port 3
(mul-mak)#
(mul-mak)#do  show makdi-nfv all
-------------------------------------------------------------------------------------------------------------
NFV Group(E)
 - NFV(internet) : dpid(0x0000000000000001) iif(3) oif(3)
-------------------------------------------------------------------------------------------------------------
```

3.3   Service commands

3.3.1   Service add command

Command	Description
add makdi-service X vlan Y	Service add command

- ✓ *X is the service name.*
- ✓ *Y is the VLAN-id for the service.*

3.3.2 Service delete command

Command	Description
del makdi-service X vlan Y	Service delete command

3.3.3 Service show command

Command	Description
show makdi-service all	Show all installed services

3.3.4 Service modification examples

```
(mul-mak)# add makdi-service Google vlan 1
(mul-mak)#
(mul-mak)# add makdi-service Yahoo vlan 2
(mul-mak)# show makdi-service all
-----------------------------------------------------------------------------------------------------------------
Service(Yahoo) vlan(2)
Service(Google) vlan(1)
-----------------------------------------------------------------------------------------------------------------
(mul-mak)# del makdi-service Google
(mul-mak)#
(mul-mak)# do show makdi-service all
-----------------------------------------------------------------------------------------------------------------
Service(Yahoo) vlan(2)
-----------------------------------------------------------------------------------------------------------------
```

3.4 Service Chain commands

3.4.1 Service Chain add command

Command	Description
add makdi-service-chain switch X service Y host-ip (A.B.C.D) nfv-grp1 (X|*) nfv-grp2 (X|*) nfv-grp3 (X|*) nfv-grp4 (X|None) nfv-grp5 (X|*) nfv-grp6 (X|*)	Service chain add command

3.4.2 Service Chain delete command

open MUL

Command	Description
del makdi-service-chain switch X service Y host-ip (A.B.C.D)	Service chain delete command

3.4.3 Service Chain get command

Command	Description
show makdi-service-chain all	Show every Service Chain command

3.4.4 Service Chain modification examples

```
(mul-mak)# add makdi-service-chain switch 0x1 service Google host-ip 10.0.0.1 nfv-grp1 A nfv-
grp2 C nfv-grp3 E nfv-grp4 * nfv-grp5 * nfv-grp6 *
(mul-mak)#
(mul-mak)# do show makdi-service-chain all
-------------------------------------------------------------------------------------------------------- ---
User IP(0xc0a80114) : dpid(0x0000000000000002)
 - NFV Group(A) : NFV(h3) : dpid(0x0000000000000002) iif(6) oif(7)
 - NFV Group(C) : NFV(h4) : dpid(0x0000000000000002) iif(8) oif(9)
 - NFV Group(E) : NFV(internet) : dpid(0x0000000000000001) iif(3) oif(3)
--------------------------------------------------------------------------------------------------------
(mul-mak)# del makdi-service-chain switch 0x2 service Google host-ip 10.0.0.1
(mul-mak)# do show makdi-service-chain all
------------------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------------------
(mul-mak)#
```

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