GFN SDN Controller User Manual

Multicast Service

Release 2.5.0

Table of Contents

1. Acronyms

AD – Administrative Domain

AI – Artificial intelligence

ASIC – Application Specific Integrated Circuit

BGP – Border Gateway Protocol

BNG – Border Network Gateway

BRAS – Broadband Remote Access Server

BSS – Business Support System

CBS – Committed Bust Size

CEN -Carrier Ethernet Network

CG-NAT – Carrier Grade Network Address Translation

CIR – Committed Information Rate

CLI - Command Line Interface

CPU – Central Processing Unit

CRM – Customer Relationship Management

CRUD - Create, Read, Update, Delete

DB - Database

DC – Datacenter

DPI – Deep Packet Inspection

DPID – Data Path Identificator

E2E – End-to-End (services)

E-Access - OVC-based service with at least one UNI OVC End Point and one ENNI End Point

EBS – Excess Burst Size

EIR - Excess Information Rate

E-LAN – multipoint-to-multipoint EVC

E-Line – point-to-point EVC accordingly to MEF

EMS – Element Managements System

ENNI – External Network-to-Network Interface

EP-LAN – Ethernet Private LAN

EPL – Ethernet Private Line

E-Transit - OVC-based Carrier Ethernet service in which all OVC End Points are at ENNIs

E-Tree – point-to-multipoint EVC

ETSI – European Telecommunications Standards Institute

EVC – Ethernet Virtual Circuit

EVPL - Ethernet Virtual Private Line

IGMP – Internet Group Management Protocol

LAN – Local Area Network

LPM - Longest Prefix Match

MEF – Metro Ethernet Forum

MPLS – Multiprotocol Label Switching

NAT – Network Address Translation

NBI – North Bound Interface

NE – Network Element

NPU – Network Processing Unit

NVF – Network Functions Virtualization

NFVI – Network Functions Virtualization Infrastructure

OAM – Operations, Administration and Management

OF – OpenFlow protocol

OF-DPA – OpenFlow Data Plane Abstraction

ONF – Open Networking Foundation

OSS – Operation Support System

OVC – Operator Virtual Connection

OVS – Open vSwitch

PNE – Physical Network element

PNF – Physical Network Element

PoP – Point of Presence, see also Datacenter

QinQ – IEEE 802.1ad standard

QoS – Quality of Service

RFC – Request for Comments

SBI – South Bound Interface

SDN – Software Defined Network

SLA – Service Level Agreement

SQL – Structured Query Language

SR – Segment Routing

SRAM – Static Random Access Memory

TAP – Terminal Access Point

TCAM – Ternary Content Addressable Memory

TE – Traffic Engineering

T/T – Troubleticketing

TTP – Table Type Pattern

UDF - User-Defined Field

UNI – User Network Interface

VLAN – Virtual Local Area Network

VIM – Vurtual Infrastructure Manager

VM – Virtual Machine

VNE – Virtual Network Element

VNF – Virtual Network Function

VNFD – Virtual Network Function Descriptor

VNFM – Virtual Network Function Manager

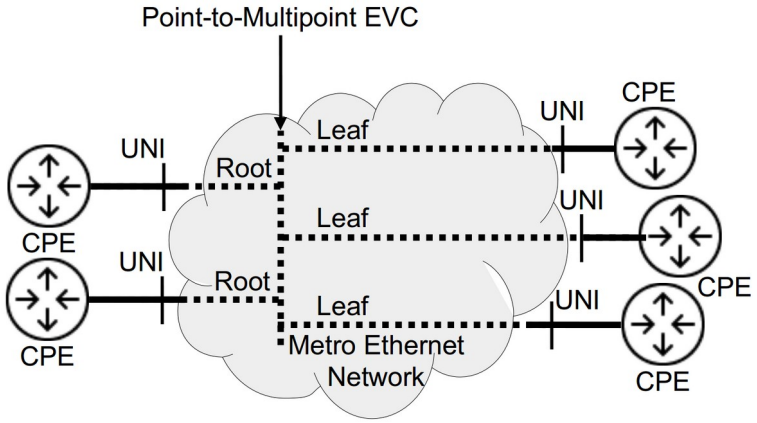
VPLS – Virtual Private Area Network

WAN – Wide Area Network

ZTP – Zero Touch Provisioning

2. Multicast Service Review

Multicast is point-to-multipoint EVC service for Metro Ethernet network accordingly to MEF 6.2 and MEF 10.3 specification. Currently it is implemented as EVP-Tree with redundant root UNI.



Multicast can work either in static mode or with IGMP Snooping support. Both IGMPv2 and IGMPv3 are supported.

Multicast service can span a lot of switches. Multicast is fully protected service, thus its path will be automatically recalculated in case of link/node failure if possible.

Multicast Service Attributes

Multicast service has following general attributes:

- ID
- Address
- Sources

ID is unique Multicast service identifier which is represented as string.

Address is group address.

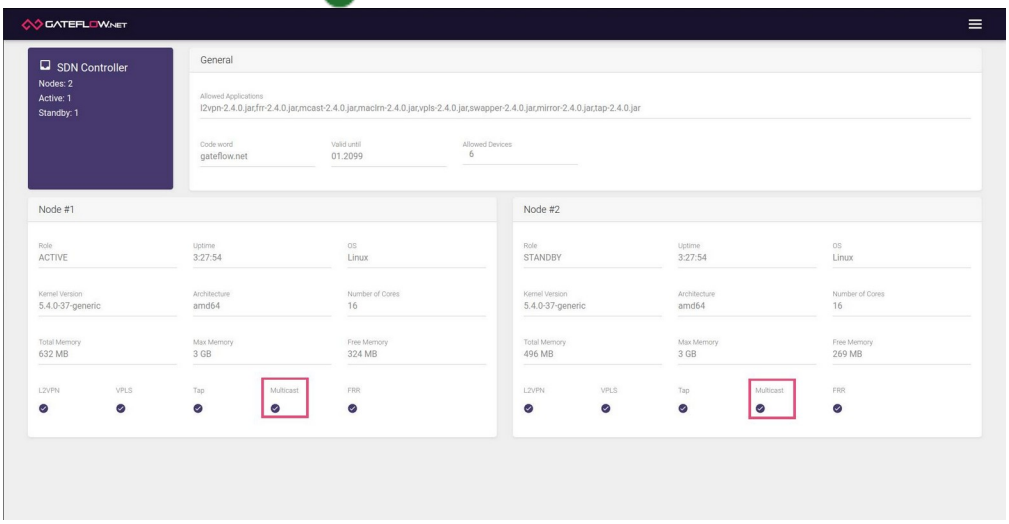
Sources is array of sources.

3. Prerequisites

To use Multicast service Multicast application application has to be running on SDN Controller. Check if Multicast application is running can be done in two ways:

- Via controller CLI by using command *app show,* Multicast application status has to be *running*.
- Via Web UI, by going to controllers page

  (Menu→Inventory→Controllers), Multicast application should be marked with icon



4. Operation of Multicast Service

There are three generic ways to operate Multicast service:

- CLI
- REST API
- Web UI

These interfaces are described in details below.

CLI

CLI provides following command for operating Multicast service:

- multicast services
- multicast show

  These commands will display list of currently existing Multicast services
- multicast subscribers

  This command will display list of Multicast service subscribers
- multicast sources

  This command will display list of currently existing Multicast sources
- multicast tree

  This command will display Multicast topology
- multicast UNI ports

  This command will display all available UNI ports for Multicast services

For creating and updating Multicast services and sources please use either Web UI or REST API.

REST API

Multicast REST API implements a standard CRUD (Create, Read, Update, Delete) data manipulation paradigm. Any REST API call operates with data in JSON format.

Below is an example of JSON file for REST API call to create Multicast service:

```
{
 "id": "mcast_service",
 "address": "224.1.1.1",
 "sources": [
        "10.0.0.10",
        "10.0.0.11"
]
}
```

Below is an example of JSON file for REST API call to create Multicast source:

```
{
   "10.0.0.10" : {
          "main_root": {
                "dpid" : "00:00:00:00:00:00:00:01",
                "port" : 3
           },
           "seoncd_root": {
                "dpid" : "00:00:00:00:00:00:00:02",
                "port" : 3
           }
   }
}
```

REST API Service URLs

There are several REST API URLs available for Multicast:

- Create Multicast services

  http://sdn-node:8084/multicast/service (Method - POST)

- Create Multicast source

  http://sdn-node:8084/multicast/source (Method - POST)

- Get Multicast services

  http://sdn-node:8084/multicast/services (Method - GET)

- Get Multicast sources

  http://sdn-node:8084/multicast/sources (Method - GET)

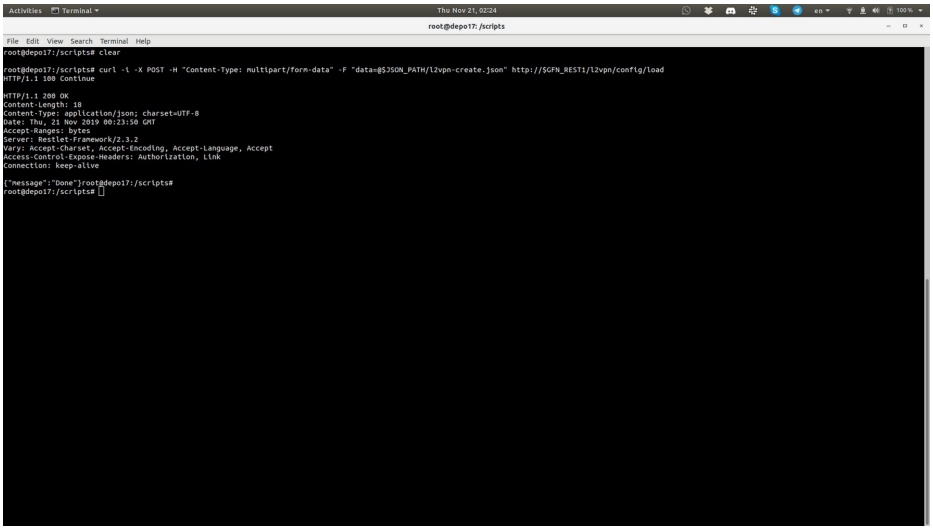
- Delete Multicast service

  http://sdn-node:8084/multicast/service/*{id}* (Method - DELETE)

- Delete Multicast source

  http://sdn-node:8084/multicast/source/*{id} (Method - DELETE)*

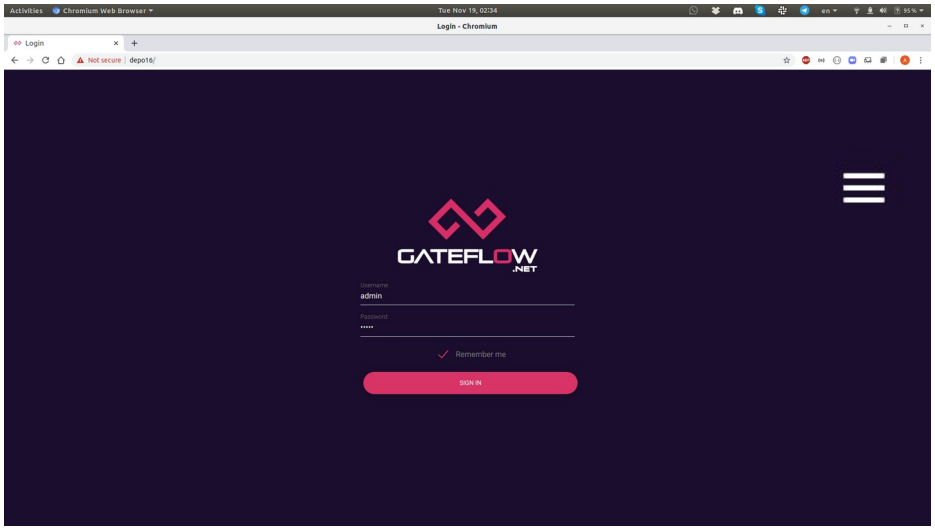
To send a REST API call on Linux command line utility “curl” can be used as shown below:



For detailed description of all Multicast service and source JSON file fields format and constraints please refer to GFN SDN Controller Admin Manual.

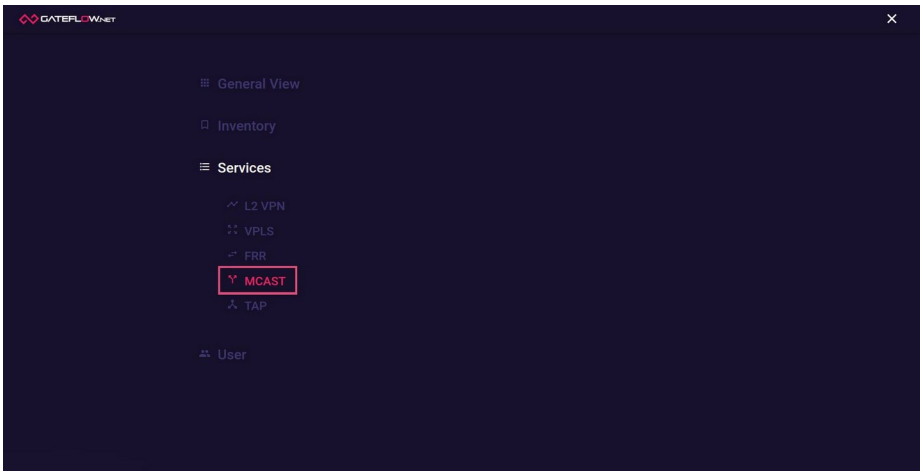
Web UI

To access Multicast management graphic interface via web browser one has to login to GFN SDN Controller Web UI first as shown in the example below:

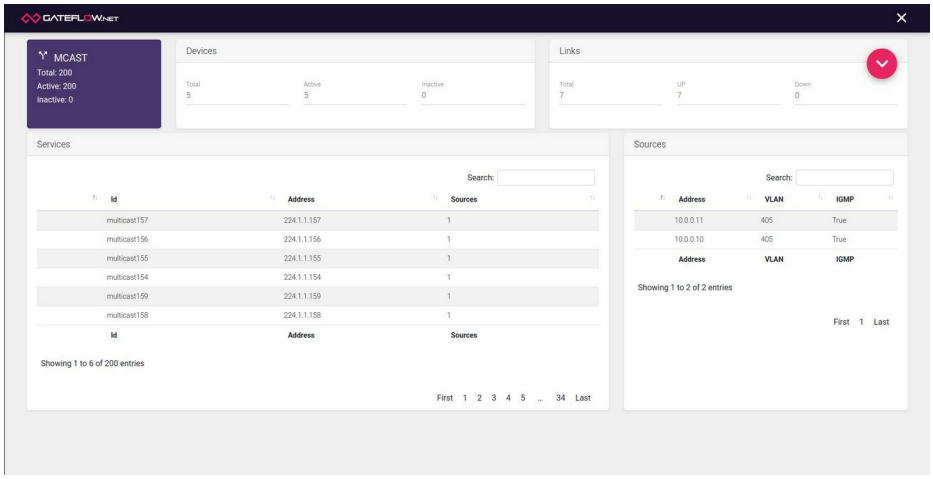


After logging in one has to open a full screen menu using icon

at the top bar and choose drop-down Menu->Services->MCAST section as shown below:

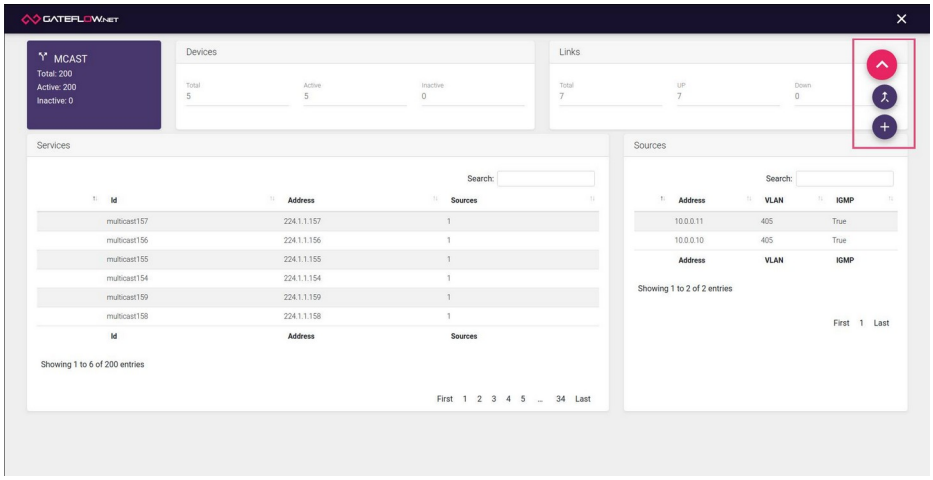


A Multicast services and sources lists will appear. Services list contains brief information about every existing Multicast service. Clicking on a service in the list will open service details page for corresponding service.



Sources list contains brief information about every existing Multicast source. Clicking on a source in the list will open source details page for corresponding source.

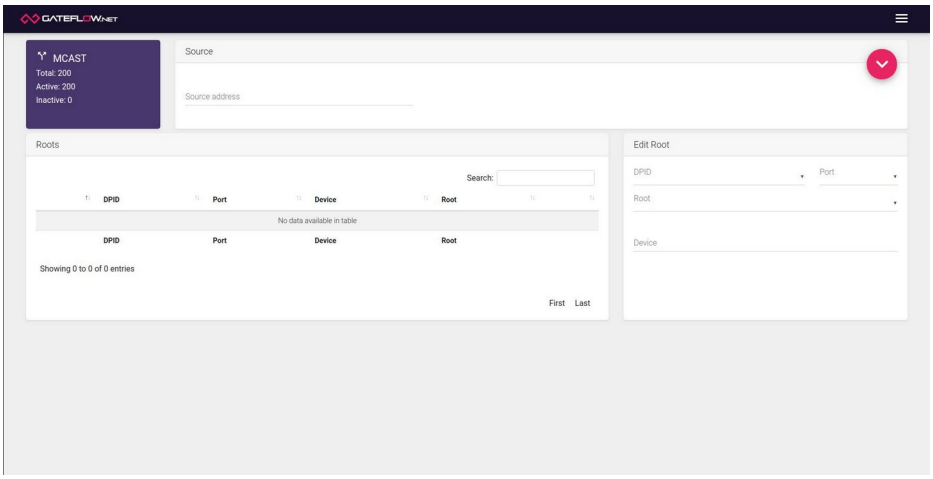
One can open Multicast submenu by clicking the floating button in the top-right corner of the screen.



To create a new Multicast service or source press the corresponding button in the submenu and the creation form will appear.

In the source creation form one can fill in general parameters for the source and add roots by filling in “Edit Root” form and pressing “Add root” button in the submenu.

To create source press “Save” button in the submenu. If source

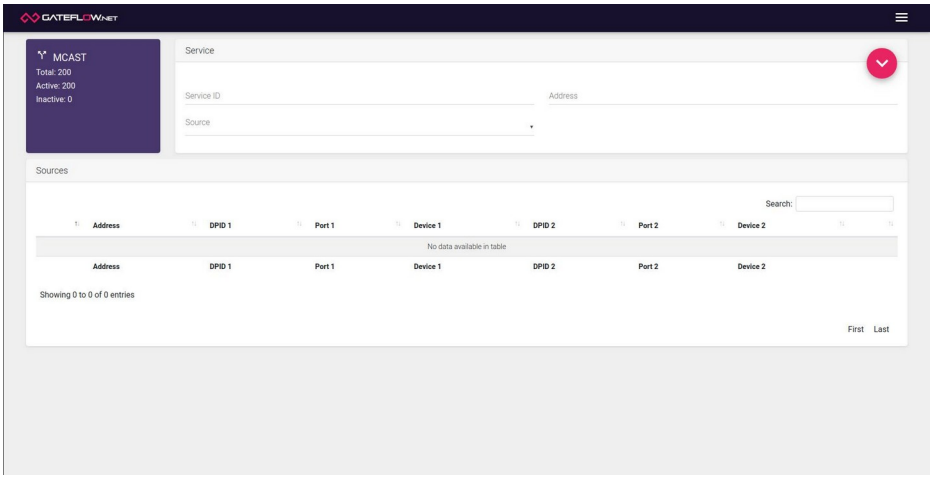


was created successfully one will be redirected to new source details page. If something went wrong – a floating error message will appear.

To delete source press “Edit” button in the submenu, then press “Delete” button in the submenu. Source will be deleted and you will be redirected to Multicast services and sources lists.

Note: creating, editing and deleting services and sources functions are only available for users with admin privileges.

In the service creation form one can fill in general parameters for the service and add sources by selecting source and pressing “Add source” button in the submenu. Added sources can be deleted by pressing “Delete” button on the corresponding source.



To create service press “Save” button in the submenu. If service was created successfully one will be redirected to new service details page. If something went wrong – a floating error message will appear.

To delete service press “Edit” button in the submenu, then press “Delete” button in the submenu. Service will be deleted and you will be redirected to Multicast services and sources lists

Pressing “Back to List” button in the submenu at any point will return one to Multicast services and sources lists.

All changes must be saved by pressing “Save” button in the submenu beforehand, otherwise they will be lost.

