

SFC WG  
Internet-Draft  
Intended status: Standards Track  
Expires: June 30, 2021

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December 27, 2020

YANG data model for SFF  
draft-ao-sfc-yang-03

Abstract

This document is to define the YANG data model for SFF configuration.

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## 1. Introduction

YANG[RFC6020] is a data definition language that was introduced to define the contents of a conceptual data store that allows networked devices to be managed using NETCONF [RFC6241]. This document defines a YANG data model for the configuration of SFF which data plane has been defined in [RFC8300].

## 2. Design tree for SFF YANG data model

```

module: ietf-sff
  +--rw sff
    +--rw sff* [sff-name]
      +--rw sfc-enable?   boolean
      +--rw sff-name      sff-name
      +--rw ip-mgmt-address?  inet:ip-address
      +--rw sff-locator* [name]
        +--rw sff-locator-name      sff-locator-name
        +--rw (sff-transport-locator)?
          +--:(ipv4)
            | +--rw remote-ipv4?      inet:ipv4-address
            +--:(ipv6)
              | +--rw remote-ipv6?    inet:ipv6-address
              +--:(mac)
                +--rw remote-mac?      yang:mac-address
            +--:(vxlan-gpe)
              | +--rw source-ip?      inet:ipv4-address
              | +--rw destination-ip?  inet:ipv4-address
              | +--rw vni              uint32
              +--:(mpls)
                +--rw mpls-label?      uint32

```

```

|   +--rw transport?                               identityref
+--rw connected-sf*[name]
|   +--rw sf-name                                   sf-name
|   +--rw sf-type                                   sf-type
|   +--rw sff-sf-locator*
|   |   +--rw sf-locator-name                       sf-locator-name
|   |   +--rw sff-locator-name                     sff-locator-name
|   +--rw sff-interfaces* [sff-interface]
|   |   +--rw sff-interface                         string
+--rw connected-sff* [name]
|   +--rw sff-name                                   sff-name
|   +--rw sff-sff-locator
|   |   +--rw (locator-type)
|   |   |   +--:(ipv4)
|   |   |   |   +--rw remote-ipv4?                 inet:ipv4-address
|   |   |   +--:(ipv6)
|   |   |   |   +--rw remote-ipv6?                 inet:ipv6-address
|   |   |   +--:(mac)
|   |   |   |   +--rw remote-mac?                 yang:mac-address
|   |   |   +--:(vxlan-gpe)
|   |   |   |   +--rw source-ip?                 inet:ipv4-address
|   |   |   |   +--rw destination-ip?            inet:ipv4-address
|   |   |   |   +--rw vni                         uint32
|   |   |   +--:(mpls)
|   |   |   |   +--rw mpls-label?                 uint32
|   |   +--rw transport?                         identityref
|   |   |   +--rw sff-interfaces* [sff-interface]
|   |   |   |   +--rw sff-interface                 string

```

### 3. YANG data model for SFF configuration

This container defines a YANG model to configurate of SFF. The SF Type listed in this YANG model is referenced by [I-D.ietf-sfc-use-case-mobility] and [I-D.ietf-sfc-dc-use-cases].

<CODEBEGINS> file "ietf-sff@2020-12-10.yang"

```

module ietf-sff {
  yang-version 1.1;

  namespace "urn:ietf:params:xml:ns:yang:ietf-sff";
  prefix "sff";

  import ietf-inet-types {
    prefix "inet";
    reference "RFC6991: Common YANG Data Types";

```

```
    }
import ietf-routing-types {
  prefix "rt-types";
  reference "RFC8294:Common YANG Data Types for the Routing Area";
}
import ietf-yang-types {
  prefix "yang";
  reference "RFC6991: Common YANG Data Types";
}
import ietf-interfaces {
  prefix "if";
  reference "RFC8343: A YANG Data Model for Interface Management";
}
organization "IETF SFC Working Group";

contact
  "WG Web:  <http://tools.ietf.org/wg/sfc/>
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  ";

description
  "The YANG module defines a generic configuration model for SFF.
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  This version of this YANG module is part of RFC XXXX; see
  the RFC itself for full legal notices."

revision "2020-01-20"{
```

```
        description "Initial revision.";
        reference "RFC XXXX: YANG Data Model for SFC Protocol.";
    }

    revision "2020-02-06"{
        description "01 revision.";
        reference "RFC XXXX: YANG Data Model for SFC Protocol.";
    }

    revision "2020-12-10"{
        description "02 revision.";
        reference "RFC XXXX: YANG Data Model for SFC Protocol.";
    }

/* Typedef */
    typedef sff-name {
        type string;
        description "Service Function Forwarder Name";
    }

    typedef sff-locator-name {
        type string;
        description "Service Function Forwarder data-plane-locator name";
    }

    typedef sf-locator-name {
        type string;
        description
            "A unique name for SF data-plane-locator";
    }

    typedef sf-name {
        type string;
        description "Service Function Name";
    }

    typedef sf-type {
        type string;
        description "Service Function type Name";
    }

/* Identities */
    identity transport-type{
        description
            "Base identity from which specific transport types are derived.";
    }

    identity locator-transport-type {
        base "transport-type";
    }
```

```

        description
            "This identity is used as a base for all transport types";
    }
    identity ipv4 {
        base locator-transport-type;
        description
            "This identity represents IPv4 transport type.";
    }
    identity ipv6 {
        base locator-transport-type;
        description
            "This identity represents IPv6 transport-type.";
    }
    identity mac {
        base locator-transport-type;
        description
            "This identity represents sfp mac transport-type .";
    }
    identity vxlan-gpe {
        base locator-transport-type;
        description
            "This identity represents vxlan-gpe transport-type.";
    }
    identity mpls {
        base locator-transport-type;
        description
            "This identity represents mpls transport-type.";
    }
}

/*grouping*/
grouping locator-transport-type {
    description
        "This group presents configuration for the overlay data plane locator. This could be VXLAN-GRE, MPLS, IP, MAC, etc";
    choice transport-type {
        mandatory true;

        case ipv4 {
            description
                "The configuration for overlay data plane which encapsulation type is ethernet&ipv4.";
            leaf ipv4 {
                type inet:ipv4-address ;
                description "Data-plane IPv4 address.";
            }
            description "The configuration for overlay data plane which encapsulation type is ethernet&ipv4.";
        }

        case ipv6{

```

```

        description
            "The configuration for overlay data plane which encapsulation
type is ethernet&ipv6.";
        leaf ipv6 {
            type inet:ipv6-address ;
            description "IPv6 address.";
        }
    }

    case mac{
        description
            "The configuration for overlay data plane which encapsulation
type is mac.";
        leaf mac {
            type yang:mac-address ;
            description "MAC address.";
        }
    }

    case vxlan-gpe-nextthop {
        description
            "The configuration for overlay data plane which encapsulation
n type is vxlan-gpe.";
        leaf source-ip {
            description "The source IP address.";
            type inet:ipv4-address ;
        }
        leaf destination-ip {
            description "The destination address.";
            type inet:ipv4-address ;
        }
        leaf vni {
            type uint32;
            mandatory true;
            description "VNI value of the tunnel.";
        }
    }

    case mpls-nexthop{
        description "The configuration for overlay data plane which encapsula
tion type is mpls.";
        uses rt-types:mpls-label-stack;
        description "The collection of all possible data-plane
locators.";
    }
    leaf transport {
        type identityref {
            base locator-transport-type;
        }
        description
            "The encapsulation used to carry NSH packets";
    }

```

```
    }

    container sff {
      description
        "A service function forwarder is responsible for delivering traffic received from the SFC network forwarder to one or more connected service functions via information carried in the SFC encapsulation."
      ";
      leaf sfc-enable {
        type boolean;
        default false ;
        description "Enable SFC." ;
      }

      list sff {
        key "sff-name";
        description
          "a list of all SFF configurations in the domain.";
        leaf sff-name {
          type sff-name;
          description
            "The unique name of this service function forwarder.";
        }

        leaf ip-mgmt-address {
          type inet:ip-address;
          description
            "The IP and port used to configure this service-function-forwarder";
        }

        list sff-locator{
          key "sff-locator-name";
          leaf sff-locator-name {
            type sff-locator-name ;
            description "A list of all data-plane-locators of this SFF." ;
          }
          container sff-transport-locator{
            description
              "The overlay data plane locator used by this SFF. This could be VXLAN-GRE,MPLS,MAC,etc";
            uses locator-transport-type;
          }
          description
            "The list of sff data plane locator related informations.";
        }

        list connected-sf {
          key "sf-name";
          leaf sf-name {
            type sf-name;

```



```

        description
            "The name of the service function.";
        }
        leaf sf-type {
            type sf-type;
        }
        description
            "Service Function type names such as firewall, dpi,etc";
    }
    container sff-sf-locator {
        description
            "SFF and SF data plane locators to use when sending packets from t
his SFF to the associated SF";
        leaf sf-locator-name {
            type sf-locator-name;
            description
                "The SF data plane locator to use when sending packets to the as
sociated service function";
        }
        leaf sff-locator-name {
            type sff-locator-name;
            description
                "The SFF data plane locator to use when sending
packets to the associated service function.";
        }
    }
    list sff-interfaces {
        key "sff-interface";
        leaf sff-interface {
            type string;
            description
                "An individual interface on the SFF connected to the SF";
        }
    }
    description
        "A list of interfaces on the SFF which are connected to the SF";
}
description
    "A list of all Service Functions attached to this SFF.";
}

list connected-sff{
key "sff-name";
leaf sff-name {
    type sff-name;
    description
        "The name of the SFF connected to this SFF";
}
}
container sff-sff-locator {
    description
        "The SFF uses this data plane locator when sending
packets to the associated SFF";
}

```

```
        uses locator-transport-type;
    }
    list sff-interfaces {
        key "sff-interface";
        leaf sff-interface {
            type string;
            description
                "An individual SFF interface connected to this SFF";
        }
        description
            "A list of SFF interfaces connected to this SFF";
    }
    description
        "A list of all Service Function Forwarders connected to
        this SFF";
    }
    }
}

<CODE ENDS>
```

#### 4. Security Considerations

TBD.

#### 5. IANA Considerations

TBD.

#### 6. References

##### 6.1. Normative References

- [RFC7665] Halpern, J., Ed. and C. Pignataro, Ed., "Service Function Chaining (SFC) Architecture", RFC 7665, DOI 10.17487/RFC7665, October 2015, <<https://www.rfc-editor.org/info/rfc7665>>.
- [RFC8300] Quinn, P., Ed., Elzur, U., Ed., and C. Pignataro, Ed., "Network Service Header (NSH)", RFC 8300, DOI 10.17487/RFC8300, January 2018, <<https://www.rfc-editor.org/info/rfc8300>>.

## 6.2. Information References

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Kumar, S., Tufail, M., Majee, S., Captari, C., and S. Homma, "Service Function Chaining Use Cases In Data Centers", draft-ietf-sfc-dc-use-cases-06 (work in progress), February 2017.

[I-D.ietf-sfc-use-case-mobility]

Haeffner, W., Napper, J., Stiernerling, M., Lopez, D., and J. Uttaro, "Service Function Chaining Use Cases in Mobile Networks", draft-ietf-sfc-use-case-mobility-09 (work in progress), January 2019.

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