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T. Ao  
R. Chen  
W. Wei  
ZTE Corporation  
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YANG data model for SFC  
draft-ao-sfc-yang-00

Abstract

This document is to define the YANG data model for SFC 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 SFC which data plane has been defined in [RFC8300].

## 2. Design tree for SFC YANG data model

```

module: ietf-sfc
+--rw sfc-config
|
|   +--rw sfc-enable?    boolean
|   +--rw sfc-domain* [sfc-domain-id]
|   |   +--rw sfc-domain-id    uint32
|   |   +--rw ipv4-prefix?     inet:ipv4-prefix
|   |   +--rw ipv6-prefix?     inet:ipv6-prefix
|   |   +--rw sfc-sfp* [sfpid si]
|   |   |   +--rw sfpid                uint32
|   |   |   +--rw si                    uint16
|   |   |   +--rw metric?              uint16
|   |   +--rw (nexthop-trans-type)?
|   |   |   +--:(ipv4-nexthop)
|   |   |   |   +--rw nh-node-type?    sfp-nexthop-type
|   |   |   |   +--rw remote-ipv4?     inet:ipv4-address
|   |   |   +--:(ipv6-nexthop)
|   |   |   |   +--rw nh-node-type?    sfp-nexthop-type
|   |   |   |   +--rw remote-ipv6?     inet:ipv6-address
|   |   |   +--:(mac-nexthops)
|   |   |   |   +--rw nh-node-type?    sfp-nexthop-type
|   |   |   |   +--rw remote-mac?      yang:mac-address
|   |   +--:(vxlan-gpe-nexthop)
|   |   |   +--rw nh-node-type?    sfp-nexthop-type
|   |   |   +--rw remote-ip?        inet:ipv4-address
|   |   |   +--rw source-ip?        inet:ipv4-address
|   |   |   +--rw destination-ip?    inet:ipv4-address

```

```

|           |           +---rw vni                uint32
|           |           +---rw last-sff           boolean
+---ro sfc-state
  +---ro sfc-enable?           boolean
  +---ro sfc-domain * [sfc-domain-id]
    +---ro sfc-domain-id           uint32
    +---ro ipv4-prefix?          inet:ipv4-prefix
    +---ro ipv6-prefix?          inet:ipv6-prefix
    +---ro sfc-sfp-state
      +---ro sfc-sfp*[sfpid si]
        +---ro sfpid?            uint32
        +---ro si?               uint16
        +---ro metric?           uint16
        +---ro nexthop-trans-type? enumeration
          +---:(ipv4-nexthop)
            +---ro nx-node-type?  node-type
            +---ro remote-ipv4?   inet:ipv4-address
          +---:(ipv6-nexthop)
            +---ro nx-node-type?  node-type
            +---ro remote-ipv6?   inet:ipv6-address
          +---:(mac-nexthop)
            +---ro nx-node-type?  node-type
            +---ro remote-mac?    yang:mac-address
          +---:(vxlan-gpe-nexthop)
            +---ro nx-node-type?  node-type
            +---ro remote-ip?     inet:ipv4-address
            +---ro source-ip?     inet:ipv4-address
            +---ro destination-ip? inet:ipv4-address
            +---ro vni?           uint32
        +---ro last-sff?         boolean

```

### 3. YANG data model for SFC configuration

This container defines a YANG model to configurate of SFC. 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-sfc@2019-03-10.yang"
module ietf-sfc {
  namespace "urn:ietf:params:xml:ns:yang:ietf-sfc";
  prefix "sfc";
  import ietf-inet-types {
    prefix "inet";
  }

  import ietf-yang-types {
    prefix "yang";
  }

```

```
organization "IETF SFC Working Group";

contact
"WG Web:    <http://tools.ietf.org/wg/sfc/>
WG List:    <mailto:sfc@ietf.org>
WG Chair:Jim Guichard
            <mailto:james.n.guichard@huawei.com>
WG Chair:Joel M. Halpern
            <mailto:jmh@joelhalpern.com>

Editor: Ting Ao
            <mailto:ao.ting@zte.com.cn>
Editor: Ran Chen
            <mailto:chen.ran@zte.com.cn>
Editor: Wei Wei
            <mailto:wei.wei@zte.com.cn>
            ";

description
"The YANG module defines a generic configuration
model for SFC.";

revision 2019-03-07{
description
"Initial revision.";
reference "RFC XXXX: YANG Data Model for SFC Protocol.";
}
/*Typedefs*/
typedef sfp-nextthop-type {

    type enumeration {
enum sff {
    value 1 ;
    }
enum sf-firewall {
    value 2 ;
    }
enum sf-dpi {
    value 3 ;
    }
enum sf-ids {
    value 4 ;
    }
enum sf-edgefw {
    value 5 ;
    }
enum sf-segfw {
    value 6 ;
    }
```

```
        enum sf-appfw {
value 7 ;
        }
        enum sf-adc {
value 8 ;
        }
        enum sf-woc {
value 9 ;
        }
        enum sf-mon {
value 10 ;
        }
        enum sf-sgw {
value 11 ;
        }
        enum sf-pgw {
value 12 ;
        }
        enum sf-hss {
value 13 ;
        }
        enum sf-mme {
value 14 ;
        }
        enum sf-pcrf {
value 15 ;
        }
        enum sf-pcef {
value 16 ;
        }
        enum sf-tdf {
value 17 ;
        }
        enum sf-tssf {
value 18 ;
        }
        enum sf-tds {
value 19 ;
        }
        enum sf-pep {
value 20 ;
        }
        enum sf-ims {
value 21 ;
        }
        enum sf-li {
value 22 ;
        }
```

```
        enum sf-proxy {
            value 23;
        }
    }
    description "The nexthop node type.";
}

container sfc-config {
    leaf sfc-enable {
        type boolean;
        default false ;
        description "Enable SFC." ;
    }
    list sfc-domain {
        key "sfc-domain-id";
        leaf sfc-domain-id {
            type uint32;
            description "The identifier of the sfc domain." ;
        }
        leaf ipv4-prefix {
            type inet:ipv4-prefix ;
            description "The IPv4 address of the sff.";
        }
        leaf ipv6-prefix {
            type inet:ipv6-prefix ;
            description "The IPv6 address of the sff.";
        }
    }
    list sfc-sfp {
        key "sfpid si";
        leaf sfpid {
            type uint32;
            description "The identifier of the SFP";
        }
        leaf si {
            type uint16;
            description "Service index.";
        }
        leaf metric {
            type uint16;
            description "Forwarding metric.";
        }
        choice nexthop-trans-type {
            case ipv4-nexthop {
                leaf nh-node-type {
                    type sfp-nexthop-type ;
                    description "Nexthop node type.";
                }
                leaf remote-ipv4 {
```

```
        type inet:ipv4-address ;
        description "Remote IPv4 address.";
    }
    description "The configuration for SFP nexthop which enc
apsulation type is ethernet&ipv4.";
}

case ipv6-nexthop {
    leaf nh-node-type {
        type sfp-nexthop-type ;
        description "Nexthop node type." ;
    }
    leaf remote-ipv6 {
        type inet:ipv6-address ;
        description "Remote IPv6 address.";
    }
    description "The configuration for SFP nexthop which enc
apsulation type is ethernet&ipv6.";
}

case mac-nexthops {
    leaf nh-node-type {
        type sfp-nexthop-type ;
        description "Nexthop node type.";
    }
    leaf remote-mac {
        type yang:mac-address ;
        description "MAC address.";
    }
    description "The configuration for SFP nexthop which spe
cifies the MAC address." ;
}

case vxlan-gpe-nexthop {
    leaf nh-node-type {
        type sfp-nexthop-type ;
        description "Nexthop node type.";
    }
    leaf remote-ip {
        type inet:ip-address ;
        description "Remote IP address.";
    }
    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.";
    }
    description "The configuration for SFP nexthop is vxlan-
gpe." ;
}
description "The configuration for SFP nexthop." ;
}

leaf last-sff {
    type boolean ;
    default false ;
    description "This is the SFP terminal.";
}
}
}

<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

- [I-D.ietf-bess-nsh-bgp-control-plane]  
Farrel, A., Drake, J., Rosen, E., Uttaro, J., and L. Jalil, "BGP Control Plane for NSH SFC", draft-ietf-bess-nsh-bgp-control-plane-09 (work in progress), March 2019.



[I-D.ietf-sfc-dc-use-cases]

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., Stiemerling, 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.

Authors' Addresses

Ting Ao  
ZTE Corporation  
No.889, BiBo Road  
Shanghai 201203  
China

Phone: +86 21 68897642  
Email: ao.ting@zte.com.cn

Ran Chen  
ZTE Corporation  
  
Email: ran.chen@zte.com.cn

Wei Wei  
ZTE Corporation  
  
Email: wei.wei@zte.com.cn