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BIER TE YANG module
draft-zhang-bier-te-yang-00

Abstract

This document defines a YANG data model for BIER TE configuration and operation.

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[1.](#) Introduction

[I-D.eckert-bier-te-arch] introduces an architecture for BIER-TE: Traffic Engineering for Bit Index Explicit Replication (BIER). This document defines a YANG data model for BIER TE. The content is in keeping with the TE architecture draft.

[2.](#) Design of the Data Model

Instead of using respective sub-domain-id, si and bsl information like in BIER yang draft [\[I-D.chh-bier-bier-yang\]](#), this document tries to group these sub-domain-id, si and bsl information in a new bier-common grouping to simplify the reference. Later yang modules may import the common grouping easily. Further, if this optimization is recognized, then BIER yang draft [\[I-D.chh-bier-bier-yang\]](#) will be updated to group these sub-domain-id, si and bsl information as well.

The TE model is a submodule of the BIER. The augment should be modified later.

```

module: ietf-bier-te
augment /rt:routing:
  +--rw bier-te-config
    +--rw te-subdomain* [subdomain-id]
      +--rw subdomain-id      sub-domain-id
      +--rw adj-id* [adjID]
        | +--rw adjID          adjid
        | +--rw adj-if          uint32
        | +--rw adjID-type      te-adjID-type
      +--rw te-bsl* [fwd-bsl]
        | +--rw fwd-bsl        bsl
        | +--rw te-si* [si]
        |   +--rw si            si

```

```

|      +---rw te-f-index* [te-f-index]
|      +---rw te-f-index    bit-string
|      +---rw f-bm          bit-string
|      +---rw f-intf        uint32
|      +---rw f-type        te-adj-type

```

```

|      +---rw ecmp-index?    uint32
|      +---rw frr-index?    uint32
+---rw ecmp-path* [index]
|  +---rw index      uint32
|  +---rw number* [number]
|      +---rw number    uint16
|      +---rw out-if    uint32
+---rw btaft* [adj-index]
|      +---rw adj-index    uint32
|      +---rw bitposition  bit-string
|      +---rw resetbitmask bit-string
|      +---rw addbitmask   bit-string
augment /rt:routing:
+---ro bier-te-state
+---ro te-subdomain* [subdomain-id]
+---ro subdomain-id    sub-domain-id
+---ro adj-id* [adjID]
|  +---ro adjID        adjid
|  +---ro adj-if        uint32
|  +---ro adjID-type    te-adjID-type
+---ro te-bsl* [fwd-bsl]
|  +---ro fwd-bsl      bsl
|  +---ro te-si* [si]
|      +---ro si        si
|      +---ro te-f-index* [te-f-index]
|      +---ro te-f-index    bit-string
|      +---ro f-bm          bit-string
|      +---ro f-intf        uint32
|      +---ro f-type        te-adj-type
|      +---ro ecmp-index?    uint32
|      +---ro frr-index?    uint32
+---ro ecmp-path* [index]
|  +---ro index      uint32
|  +---ro number* [number]
|      +---ro number    uint16
|      +---ro out-if    uint32

```

```

        +--ro btaft* [adj-index]
            +--ro adj-index      uint32
            +--ro bitposition    bit-string
            +--ro resetbitmask   bit-string
            +--ro addbitmask     bit-string
    notifications:
        +---n bier-te-notification
            +--ro adjID-is-zero* [if-index]
            +--ro if-index      uint32
            +--ro adjID-type?   te-adjID-type

```

[3.](#) BIER-TE configuration

The BIER-TE information is indexed by the sub-domain ID. Maybe there are some global BIER-TE information, it should be added in later version.

One interface can be used in different sub-domain, so the BIER TE adjacency information is managed by BIER TE other than by interface.

Because the BIER-TE is controlled by controller now, the information about IGP is not defined. If in the future the IGP is used to carry the information about BIER-TE, the IGP extension will be added in this document.

[4.](#) Notifications

If the adjacency id of one adjacency is set to zero, the value is invalid. The notification should be sent to controller and network manager.

[5.](#) BIER TE YANG module

```

<CODE BEGINS> file "ietf-bier-te.yang"
module ietf-bier-te {

    namespace "urn:ietf:params:xml:ns:yang:ietf-bier-te";

    prefix bier-te;

```

```

import ietf-routing {
    prefix "rt";
}
/* import bier-common {
    prefix "bier-common";
} */

organization " IETF BIER(Bit Indexed Explicit Replication ) Working Group";
contact
    "WG List:  <mailto:bier@ietf.org>
      WG Chair: Tony Przygienda
                  <mailto:tonysietf@gmail.com>
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```

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```

      Editor:   Ran Chen
                  <mailto:chen.ran@zte.com.cn>
";

description
    "This module contains a collection of YANG definitions for
    managing BIER TE information.";

revision 2016-03-01 {
    description
    "Initial version.";
    reference "https://tools.ietf.org/html/draft-zhang-bier-te-yang";
}

typedef te-adj-type {
    type enumeration {
        enum "connected" {
            description
                "The type of adjacency is connected. Mostly connected interfa
            }
        enum "routed" {
            description

```

```

        "The type of adjacency is routed. Mostly not connected interf
    }
    enum "local-decap" {
        description
        "Means that the packet should be decapsulated and forward out
    }
    enum "ecmp" {
        description
        "There is more than one path in the adjacency with equal cost
    }
    enum "other" {
        description
        "Means that the packet should be discarded.";
    }
}
description "The collection of all possible adjacency type ";
}

typedef te-adjID-type {
    type enumeration {
        enum "p2p" {
            description
            "This enum describes p2p adjacency.";
        }
        enum "bfer" {
            description

```

```

        "This enum describes bfer adjacency.";
    }
    enum "leaf-bfer" {
        description
        "This enum describes leaf-bfer adjacency. There is
        no next BFR that the packet should be forwarded.";
    }
    enum "lan" {
        description
        "This enum describes lan adjacency.";
    }
    enum "spoke" {
        description
        "This enum describes spoke adjacency of hub-and-spoke.";
    }
}

```

```

    enum "ring-clockwise" {
        description
            "This enum describes clockwise adjacency in ring.";
    }
    enum "ring-counterclockwise" {
        description
            "This enum describes counterclockwise adjacency in ring.";
    }
    enum "ecmp" {
        description
            "This enum describes ecmp adjacency.";
    }
    enum "virtual-link" {
        description
            "This enum describes virtual adjacency between two indirect c
    }
    enum "other" {
        description
            "This enum describes other id type of adjacency.";
    }
}
default "lan";
description "The collection of all possible adjacency type ";
}

typedef bsl {
type enumeration{
    enum 64-bit{
        description "bitstringlength is 64";
    }
    enum 128-bit{
        description "bitstringlength is 128";
    }
}

```

```

    enum 256-bit{
        description "bitstringlength is 256";
    }
    enum 512-bit{
        description "bitstringlength is 512";
    }
    enum 1024-bit{
        description "bitstringlength is 1024";
    }

```

```

        }
        enum 2048-bit{
            description "bitstringlength is 2048";
        }
        enum 4096-bit{
            description "bitstringlength is 4096";
        }
    }
    description
        "The bitstringlength type for imposition mode";
}

typedef adjid {
    type uint32;
    description
        "The type for adjacency ID.";
}

/* The definition of si/sub-domain-id/bit-string will be deleted later. */
typedef si {
    type uint16;
    description
        "The type for set identifier";
}

typedef sub-domain-id {
    type uint16;
    description
        "The type for sub-domain-id";
}

typedef bit-string {
    type uint16;
    description
        "The bit mask of one bitstring.";
}

/* The bier-common grouping will be moved to BIER yang. */
grouping bier-common {
    description "Common information in BIER";
}

```

```

leaf subdomain-id {

```



```

        type sub-domain-id;
        description "ID of the sub domain.";
    }
    leaf si {
        type si;
        description "The value of the set identifier.";
    }
    leaf bsl {
        type bsl;
        description "The BitStringLength supported by this node.";
    }
    leaf bit-string {
        type bit-string;
        description "The bit-string for BIER forwarding.";
    }
}

grouping te-adjID {
    list adj-id {
        key "adjID";
        description "This ID information of one adjacency.";
        leaf adjID {
            type adjid;
            mandatory true;
            description "The adjacency id.";
        }
        leaf adj-if {
            /* type if:if-index; */
            type uint32; /* for compilation */
            mandatory true;
            description
                "The corresponding interface of this adjacency.";
        }
        leaf adjID-type {
            type te-adjID-type;
            mandatory true;
            description
                "This is the adjacency ID type
                information for BIER TE.";
        }
    }
    description
        "This group presents adjacency ID
        information for BIER TE.";
}

grouping te-ecmp {

```

```
description "The ecmp information.";
list ecmp-path {
    key "index";
    description "The index of the ecmp paths.";
    leaf index {
        type uint32;
        mandatory true;
        description "The ecmp index.";
    }
    list number {
        key "number";
        description "The list of the ecmp paths.";
        leaf number {
            type uint16;
            mandatory true;
            description "The number of the ecmp paths.";
        }
        leaf out-if {
            /* type if:if-index; */
            type uint32; /* for compilation */
            mandatory true;
            description "The outgoing interface.";
        }
    }
}

grouping te-frr {
    description "The TE fast reroute information.";
    list btaft {
        key "adj-index";
        description "The adjacency index of the frr paths.";
        leaf adj-index {
            type uint32;
            mandatory true;
            description "The frr adjacency index.";
        }
        leaf bitposition {
            type bit-string;
            mandatory true;
            description "The bitposition information.";
        }
        leaf resetbitmask {
            type bit-string;
            mandatory true;
            description "The deleting bitmask of the forwarding item.";
```

```
    }  
    leaf addbitmask {
```

```
        type bit-string;  
        mandatory true;  
        description "The adding bitmask of the forwarding item.";  
    }  
}  
}  
  
grouping te-items {  
    description "The BIER TE forwarding items collection.";   
    leaf f-bm {  
        type bit-string;  
        mandatory true;  
        description "The bitmask of the forwarding item.";   
    }  
    leaf f-intf {  
        /* type if:if-index; */  
        type uint32; /* for compilation */  
        mandatory true;  
        description "The out interface of this forwarding item.";   
    }  
    leaf f-type {  
        type te-adj-type;  
        mandatory true;  
        description "The forwarding type of this forwarding item.";   
    }  
    leaf ecmp-index {  
        type uint32;  
        description "The index of the possible ecmp paths.";   
    }  
    leaf frr-index {  
        type uint32;  
        description "The index of the fast forwarding route.";   
    }  
}  
  
grouping te-fwd-item {  
    list te-si {  
        key "si";  
        description "The forwarding items of one set identifier.";
```

```

leaf si{
    type si;
    mandatory true;
    description
        "The set identifier of this forwarding item.";
}
list te-f-index {
    key "te-f-index";
    description "The forwarding information of one BIER TE item.";
}

```

```

        leaf te-f-index {
            type bit-string;
            mandatory true;
            description
                "Describe the bit index of BIER TE forwarding item.";
        }
        uses te-items;
    }
}

description
    "The forwarding items in one set identifier.";
}

grouping te-info {
    description "The BIER TE forwarding information.";
    list te-subdomain {
        key "subdomain-id";
        description "The forwarding items of one sub-domain.";
        leaf subdomain-id {
            type sub-domain-id;
            description "The sub-domain-id of this sub-domain.";
        }
        uses te-adjID;
    }

    list te-bsl {
        key "fwd-bsl";
        description "The forwarding items in one bitstringlength.";
        leaf fwd-bsl {
            type bsl;
            description "The value of bitstringlength.";
        }
        uses te-fwd-item;
    }
}

```

```

    }
    uses te-ecmp;
    uses te-frr;
  }
}

augment "/rt:routing" {
  description "The BIER TE information.";
  container bier-te-config {
    description "The BIER TE information container.";
    uses te-info;
  }
}

augment "/rt:routing" {
  description "The read-only BIER TE information.";

```

```

    container bier-te-state {
      config false;
      description "The BIER TE information in nodes.";
      uses te-info;
    }
  }

  notification bier-te-notification {
    description
      "This notification is sent when a condition changes in BIER TE.";
    list adjID-is-zero {
      key "if-index";
      description "The adjacency id is zero.";
      leaf if-index {
        type uint32;
        description "The adjacency id of this interface is zero.";
      }
      leaf adjID-type {
        type te-adjID-type;
        description
          "This is the adjacency ID type
            information for BIER TE.";
      }
    }
  }
}

```

```
}  
<CODE ENDS>
```

6. Normative References

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