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BIER TE YANG module
draft-zhang-bier-te-yang-04

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.ietf-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.ietf-bier-bier-yang](#)] will be updated to group these sub-domain-id, si and bsl information as well.

```

module: ietf-bier-te
  augment /rt:routing:
    +--rw bier-te
      +--rw te-subdomain* [subdomain-id]
        +--rw subdomain-id    uint16
      +--rw adj-id* [adjID]
        | +--rw adjID      adjid
        | +--rw adj-if     uint32
        | +--rw (te-adjID-type)
        |   +--:(p2p)
        |   +--:(bfer)
        |   +--:(leaf-bfer)

```

```

|      +---:(lan)
|      +---:(spoke)
|      +---:(ring-clockwise)
|      +---:(ring-counterclockwise)
|      +---:(ecmp)

```

```

|      +---:(virtual-link)
|      +---:(other)
+---rw te-bsl* [fwd-bsl]
|   +---rw fwd-bsl      uint16
|   +---rw te-si* [si]
|       +---rw si          uint16
|       +---rw ft-label?   rt-types:mpls-label
|       +---rw te-f-index* [te-f-index]
|           +---rw te-f-index    bit-string
|           +---rw (te-adj-type)
|               +---:(connected)
|               +---:(routed)
|               +---:(local-decap)
|               +---:(ecmp)
|               +---:(other)
|           +---rw f-bm          bit-string
|           +---rw f-intf        uint32
|           +---rw ecmp?         boolean
|           +---rw ecmp-index?   uint16
|           +---rw frr?          boolean
+---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

```

notifications:

```

+---n bier-te-notification
|   +---ro adjID-is-zero* [if-index]
|   +---ro if-index      uint32
|   +---ro (te-adjID-type)

```

```

+--:(p2p)
+--:(bfer)
+--:(leaf-bfer)
+--:(lan)
+--:(spoke)
+--:(ring-clockwise)
+--:(ring-counterclockwise)
+--:(ecmp)
+--:(virtual-link)
+--:(other)

```

[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 ietf-routing-types {
    prefix "rt-types";
}

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

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```

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```

    Editor:    Cui Wang
                <mailto:wang.cui1@zte.com.cn>
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    Editor:    Mahesh Sivakumar
                <mailto:masivaku@cisco.com>
";

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

revision 2017-10-23 {
    description
        ".";
    reference "https://tools.ietf.org/html/draft-zhang-bier-te-yang";
}

revision 2017-04-26 {
    description

```

```

    "Add label for combination of [SD, SI, BSL].";
    reference "https://tools.ietf.org/html/draft-zhang-bier-te-yang";
}

revision 2016-10-13 {
    description
        "Add reference of BIER common structure.";
    reference "https://tools.ietf.org/html/draft-zhang-bier-te-yang";
}

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

/*
* Features
*/
feature bier-te-frr {
    description
        "Support ECMP feature in BIER TE.";
}

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-adj-type {
    description "The collection of all possible adjacency type.";
    choice te-adj-type {
        mandatory true;
        case connected {
            description "The type of adjacency is connected. Mostly connect";
        }
        case routed {
            description "The type of adjacency is routed. Mostly not connect";
        }
        case local-decap {
            description "Means that the packet should be decapsulated and f";
        }
        case ecmp {
            description "There is more than one path in the adjacency with";
        }
        case other {
            description "Means that the packet should be discarded.";
        }
    }
    description "The collection of all possible adjacency type.";
}

```

```

grouping te-adjID-type {
    description "The collection of all possible adjacency type.";
    choice te-adjID-type {
        mandatory true;
        case p2p {
            description "Describes p2p adjacency.";
        }
        case bfer {

```

```

        description "Describes bfer adjacency.";
    }
    case leaf-bfer {
        description "Describes leaf-bfer adjacency. There is no next BF
    }
    case lan {
        description "Describes lan adjacency..";
    }
    case spoke {
        description "Describes spoke adjacency of hub-and-spoke.";
    }
    case ring-clockwise {
        description "Describes clockwise adjacency in ring.";
    }
    case ring-counterclockwise {
        description "Describes counterclockwise adjacency in ring.";
    }
    case ecmp {
        description "Describes  ecmp adjacency.";
    }
    case virtual-link {
        description "Describes virtual adjacency between two indirect c
    }
    case other {
        description "Describes other id type of adjacency.";
    }
    description "The collection of all possible adjacency type.";
}

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

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

```

```

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.";
    }
    uses te-adjID-type;
}
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-items {
  description "The BIER TE forwarding items collection.";
  uses te-adj-type;
  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 ecmp {
    type boolean;
    description "The capability of ecmp paths.";
  }
  leaf ecmp-index {
    type uint16;
    description "The index of ecmp path.";
  }
  leaf frr {
    type boolean;
    description "The capability of fast re-route.";
  }
}

grouping te-fwd-item {
  list te-si {
    key "si";
    description "The forwarding items of one set identifier.";
    leaf si {
      type uint16;
      mandatory true;
      description "The set identifier of this forwarding item.";
    }
    leaf ft-label {
      type rt-types:mpls-label;
      description "The label of forwarding table.";
    }
  }
  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 "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 uint16;
      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 uint16;
        description "The value of bitstringlength.";
      }
      uses te-fwd-item;
    }
    uses te-ecmp;
    uses te-frr {
      if-feature bier-te-frr;
    }
  }
}

/*
* data nodes
*/
augment "/rt:routing" {
  description "The BIER TE information.";
```

```

        container bier-te {
            description "The BIER TE information container.";
            uses te-info;
        }
    }

    /*
    * Notifications
    */

```

```

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.";
        }
        uses te-adjID-type;
    }
}
<CODE ENDS>

```

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