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BIER TE YANG module
draft-zhang-bier-te-yang-03

Abstract

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

Status of This Memo

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BIER TE YANG module

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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-config
      +--rw te-subdomain* [subdomain-id]
        +--rw subdomain-id    bier:sub-domain-id
        +--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          bier:si
|       +---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
augment /rt:routing-state:
+---ro bier-te-state
|   +---ro te-subdomain* [subdomain-id]
|       +---ro subdomain-id  bier:sub-domain-id
|   +---ro adj-id* [adjID]
|       | +---ro adjID      adjid
|       | +---ro adj-if     uint32

```

```

|   +---ro (te-adjID-type)
|       +---:(p2p)
|       +---:(bfer)
|       +---:(leaf-bfer)
|       +---:(lan)
|       +---:(spoke)
|       +---:(ring-clockwise)
|       +---:(ring-counterclockwise)
|       +---:(ecmp)
|       +---:(virtual-link)
|       +---:(other)
+---ro te-bsl* [fwd-bsl]

```

```

|   +---ro fwd-bsl      uint16
|   +---ro te-si* [si]
|       +---ro si          bier:si
|       +---ro ft-label?   rt-types:mpls-label
|       +---ro te-f-index* [te-f-index]
|           +---ro te-f-index  bit-string
|           +---ro (te-adj-type)
|               | +---:(connected)
|               | +---:(routed)
|               | +---:(local-decap)
|               | +---:(ecmp)
|               | +---:(other)
|           +---ro f-bm          bit-string
|           +---ro f-intf       uint32
|           +---ro ecmp?        boolean
|           +---ro ecmp-index?  uint16
|           +---ro frr?         boolean
+---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 (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-bier {  
        prefix "bier";  
    }  
  
    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
```

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";

description

```

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

revision 2017-04-26 {
    description
    "Add label for forwarding table.";
    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 bier:si;
            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 bier: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 uint16;
                description "The value of bitstringlength.";
            }
            uses te-fwd-item;
        }
        uses te-ecmp;
        uses te-frr {
            if-feature bier-te-frr;
        }
    }
}
}

```

```

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

/*
 * Operational state data nodes
 */
augment "/rt:routing-state" {

```

```

    description "BIER TE state information.";
    container bier-te-state {
        description "The BIER TE information in nodes.";
        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>

```

6. Normative References

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