1. Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects for Multiprotocol Label Switching (MPLS) based fast rerouting.

2. Conventions used in this document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC-2119 [2].
3. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects for Multiprotocol Label Switching (MPLS) based fast rerouting. This MIB should be used in conjunction with [3] and [4].

4. Brief Description of MIB Objects.

The objects described in this section support the detour functionality described in Section 3 of [5]. Bypass tunnels are for further study.

4.1. mplsFrrConstTable

This table contains fast-reroute constraints such as setup and holding priorities and bandwidth for a tunnel instance to be protected by using detour LSPs.

This table is used at the ingress node of the protected tunnel instance to configure detour LSP setup constraints.

4.2. mplsFrrPLRTable

The mplsFrrPLRTable is an optional table that contains lists of PLRs that initiated detour LSPs to protect tunnel instances.

When detour LSPs initiated by different PLRs to protect the same tunnel instance, are merged together before entering an LSR then at this LSR, entries of those PLRs point to the same detour LSP entry in the mplsFrrDetourTable.

4.3. mplsFrrDetourTable

The mplsFrrDetourTable shows the detour LSPs in each node (ingress, transit and egress LSRs). An entry of this table represents a detour LSP. Each detour is identified by:
- tunnel index (which is set to the tunnel-id of the LSP protected by this detour),
- tunnel instance (which is set to the LSP-id of the LSP protected by this detour),
- ingress node (which is set to the ingress node of the LSP protected by this detour),
- egress node (which is set to the egress node of the LSP protected by this detour), and
- detour index.

Multiple detours of the same protected LSP may go through the same node. In this case, the first four identifiers are not sufficient to uniquely identify each detour LSP. Therefore, an additional detour index is introduced.
Each entry describes the properties of the detour LSP like bandwidth, setup and holding priority,... and also whether or not the detour LSP is merged with another detour LSP or with the protected LSP.

mplsFrrDetourTable does not define the in and out segments forming the detour. Instead, these are defined by creating rows in the in-segment and out-segment tables, defining relationships in the cross-connect table and referring to these rows in the mplsFrrDetourTable using a cross-connect row pointer (mplsFrrDetourXCPointer). These segment and cross-connect related objects are defined in [4].

When detour LSPs are merged, then for each individual detour LSP, an entry is created in this table. Each such detour LSP points to a different cross-connect entry. These cross-connect entries have the same mplsXCIndex and mplsOutSegmentIndex. mplsOutSegmentIndex will point to the entry of the out segment table created for the final detour LSP selected as a result of the merging rules. This final detour LSP is given by mplsFrrDetourMergedDetourIndex object in each entry of the merged detour LSPs. In case detour LSPs are merged with the protected LSP, mplsOutSegmentIndex will point to the entry of the out segment table created for the protected LSP. In this case the mplsFrrDetourMergedDetourIndex object is not relevant.

This table is optional and is only required in case mplsFrrPLRTable is supported.

4.4. mplsFrrHopTable

The mplsFrrHopTable contains the list of hops for explicit path (e.g., the content of the ERO of RSVP) and record path (e.g., the content of the RRO of RSVP) of a detour LSP. Each detour has two different sets of hops in this table: a set for the explicit path hops and another set for the record path hops, pointed by mplsFrrDetourExplicitPathIndex and the mplsFrrDetourRecordPathIndex, respectively, from the mplsFrrDetourTable.

This table is optional and is only required in case mplsFrrPLRTable is supported.

4.5. mplsFrrInSegTable

The mplsFrrInSegTable contains a description of the incoming MPLS segment for a particular detour LSP and their associated parameters. The table also includes objects to measure the performance.

This table is optional and not required when LSR-MIB [4] is supported or mplsFrrPLATable is not supported.

4.6. mplsFrrOutSegTable
The mplsFrrOutSegTable contains a description of the outgoing MPLS segment for a particular detour LSP and their associated parameters. The table also includes objects to measure the performance.

This table is optional and not required when LSR-MIB [4] is supported or mplsFrrPLRTable is not supported.

5. MPLS Fast Reroute MIB Definitions

MPLS-FRR-MIB DEFINITIONS ::= BEGIN

IMPORTS
MODULE-IDENTITY, OBJECT-TYPE,
Integer32, Unsigned32, Counter32, Counter64
FROM SNMPv2-SMI
MODULE-COMPLIANCE, OBJECT-GROUP
FROM SNMPv2-CONF
TEXTUAL-CONVENTION, TruthValue, RowStatus, RowPointer,
DisplayString, TimeStamp
FROM SNMPv2-TC
InterfaceIndex
FROM IF-MIB
mplsMIB, MplsTunnelIndex, MplsTunnelInstanceIndex,
MplsTunnelAffinity, MplsLsrIdentifier, MplsLabel
FROM MPLS-TC-MIB
InetAddressIPv4, InetAddressIPv6
FROM INET-ADDRESS-MIB
;

mplsFrrMIB MODULE-IDENTITY
LAST-UPDATED
"200203221200Z" -- 22 March 2002 12:00:00 GMT
ORGANIZATION
"Multiprotocol Label Switching (MPLS) Working Group"
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DESCRIPTION
"This MIB module contains managed object definitions for MPLS Fast Reroute (FRR) as defined in:

-- Revision history.

REVISION
"200203221200Z" -- 18 April 2002 12:00:00 GMT
DESCRIPTION
"Initial draft version."

::= { mplsMIB xxx } Å° to be assigned.

-- MPLS Fast Reroute textual-conventions.

MplsFrrDetourIndex ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "Index into mplsFrrDetourTable."
SYNTAX Integer32 (1..65535)

MplsFrrPathIndex ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "A unique identifier used to identify a specific path (list of hops) used by a detour LSP."
SYNTAX Unsigned32

MplsFrrPathIndexorZero ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "A unique identifier used to identify a specific path (list of hops) used by a detour LSP. If it is set to zero, then there is no path available."
SYNTAX Unsigned32

MplsFrrHopIndex ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"A unique identifier used to identify a specific hop within a
path (list of hops) used by a detour LSP."
SYNTAX Unsigned32

-- End of MPLS Fast Reroute textual-conventions.

-- Top level components of this MIB.

-- tables, scalars
mplsFrrScalars OBJECT IDENTIFIER ::= { mplsFrrMIB 1 }
mplsFrrObjects OBJECT IDENTIFIER ::= { mplsFrrMIB 2 }
mplsFrrConformance OBJECT IDENTIFIER ::= { mplsFrrMIB 3 }

-- MPLS Fast Reroute scalars.

mplsFrrDetourIncoming OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of detour LSPs entering the device."
 ::= { mplsFrrScalars 1 }

mplsFrrOutgoing OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of detour LSPs leaving the device."
 ::= { mplsFrrScalars 2 }

mplsFrrDetourOriginating OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of detour LSPs originated by the device."
 ::= { mplsFrr Scalars 3 }

mplsFrrSwitchover OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of main tunnel instances that are switched over to
their corresponding detour LSP.

This object is only meaningful when this router behaves as
PLR."
 ::= { mplsFrrScalars 4 }

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-- End of MPLS Fast Reroute scalars.

-- MPLS Fast Reroute Constraints table

mplsFrrConstTable OBJECT-TYPE
SYNTAX          SEQUENCE OF MplsFrrConstEntry
MAX-ACCESS      not-accessible
STATUS          current
DESCRIPTION     "This table shows detour setup constraints."
 ::= { mplsFrrObjects 1 }

mplsFrrConstEntry OBJECT-TYPE
SYNTAX          MplsFrrConstEntry
MAX-ACCESS      not-accessible
STATUS          current
DESCRIPTION     "An entry in this table represents detour LSP setup constraints
for a tunnel instance to be protected by detour LSPs. An entry
in this table can only be created by a network administrator
for tunnel instances that require fast-reroute."
INDEX { mplsFrrConstTunnelIndex,
mplsFrrConstTunnelInstance }
 ::= { mplsFrrConstTable 1 }

MplsFrrConstEntry ::= SEQUENCE {
    mplsFrrConstTunnelIndex       MplsTunnelIndex,
    mplsFrrConstTunnelInstance    MplsTunnelInstanceIndex,
    mplsFrrConstProtectionMethod  INTEGER,
    mplsFrrConstProtectionType    INTEGER,
    mplsFrrConstSetupPrio         INTEGER,
    mplsFrrConstHoldingPrio       INTEGER,
    mplsFrrConstInclAnyAffinity   MplsTunnelAffinity,
    mplsFrrConstInclAllAffinity   MplsTunnelAffinity,
    mplsFrrConstExclAllAffinity   MplsTunnelAffinity,
    mplsFrrConstHopLimit          INTEGER,
    mplsFrrConstBandwidth         Integer32,
    mplsFrrConstRowStatus         RowStatus
}

mplsFrrConstTunnelIndex OBJECT-TYPE
SYNTAX          MplsTunnelIndex
MAX-ACCESS      not-accessible
STATUS          current
DESCRIPTION     "Uniquely identifies a tunnel for which fast reroute is
requested."
 ::= { mplsFrrConstEntry 1 }

mplsFrrConstTunnelInstance OBJECT-TYPE
SYNTAX          MplsTunnelInstanceIndex
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
"Uniquely identifies an instance of this tunnel for which fast reroute is requested."
 ::= { mplsFrrConstEntry 2 }

mplsFrrConstProtectionMethod OBJECT-TYPE
SYNTAX       INTEGER { oneToOneBackup(0),
                     facilityBackup(1),
                     oneToOneAndFacilityBackup(2) }
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"Indicates which protection method is to be used for fast-reroute."
DEFVAL { oneToOneAndFacilityBackup }
 ::= { mplsFrrConstEntry 3 }

mplsFrrConstProtectionType OBJECT-TYPE
SYNTAX       INTEGER { linkProtection(0),
                        nodeProtection(1) }
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"Indicates type of the resource protection."
DEFVAL { nodeProtection }
 ::= { mplsFrrConstEntry 4 }

mplsFrrConstSetupPrio OBJECT-TYPE
SYNTAX       INTEGER (0..7)
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"Indicates the setup priority of detour LSP."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al, RFC 3209, December 2001"
DEFVAL { 7 }
 ::= { mplsFrrConstEntry 5 }

mplsFrrConstHoldingPrio OBJECT-TYPE
SYNTAX       INTEGER (0..7)
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"Indicates the holding priority for detour LSP."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al, RFC 3209, December 2001"
DEFVAL { 0 }

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::= { mplsFrrConstEntry 6 }

mplsFrrConstInclAnyAffinity OBJECT-TYPE
SYNTAX   MplsTunnelAffinity
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"A link satisfies the include-any constraint if and only if the
constraint is zero, or the link and the constraint have a
resource class in common."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al,
RFC 3209, December 2001."
DEFVAL { 0 }
::= { mplsFrrConstEntry 7 }

mplsFrrConstInclAllAffinity OBJECT-TYPE
SYNTAX   MplsTunnelAffinity
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"A link satisfies the include-all constraint if and only if the
link contains all of the administrative groups specified in the
constraint."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al,
RFC 3209, December 2001."
DEFVAL { 0 }
::= { mplsFrrConstEntry 8 }

mplsFrrConstExclAllAffinity OBJECT-TYPE
SYNTAX   MplsTunnelAffinity
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"A link satisfies the exclude-all constraint if and only if the
link contains none of the administrative groups specified in
the constraint."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al,
RFC 3209, December 2001."
DEFVAL { 0 }
::= { mplsFrrConstEntry 9 }

mplsFrrConstHopLimit OBJECT-TYPE
SYNTAX   INTEGER (1..255)
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"The maximum number of hops that the detour LSP may traverse."
DEFVAL { 32 }
::= { mplsFrrConstEntry 10 }
mplsFrrConstBandwidth OBJECT-TYPE
SYNTAX        Integer32
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION   "This variable represents the bandwidth for detour LSPs of this
tunnel, in units of thousands of bits per second (Kbps)."
DEFVAL  { 0 }
 ::= { mplsFrrConstEntry 11 }

mplsFrrConstRowStatus OBJECT-TYPE
SYNTAX        RowStatus
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION   "This object is used to create, modify, and/or delete a row in
this table."
 ::= { mplsFrrConstEntry 12 }

-- End of Fast Reroute Constraints table

-- MPLS Fast Reroute Point of Local Repair table

mplsFrrPLRTable  OBJECT-TYPE
SYNTAX        SEQUENCE OF MplsFrrPLREntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION   "This table shows the lists of PLRs that initiated detour LSPs
which affect this node."
 ::= { mplsFrrObjects 2 }

mplsFrrPLREntry  OBJECT-TYPE
SYNTAX        MplsFrrPLREntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION   "An entry in this table represents a PLR together with its
detour instance. An entry in this table is only created by an
SNMP agent as instructed by an MPLS signaling protocol."
INDEX {
    mplsFrrPLRTunnelIndex,
    mplsFrrPLRTunnelInstance,
    mplsFrrPLRTunnelIngressLSRId,
    mplsFrrPLRTunnelEgressLSRId,
    mplsFrrPLRID,
    mplsFrrPLRDetourInstance }
 ::= { mplsFrrPLRTable 1 }
mplsFrrPLRTunnelIndex OBJECT-TYPE
   SYNTAX        MplsLsrIdentifier
   MAX-ACCESS    not-accessible
   STATUS        current
   DESCRIPTION
      "This value represents an identifier of an egress LSR that is
       protected by this PLR."
   ::= { mplsFrrPLREntry 1 }

mplsFrrPLRTunnelInstance OBJECT-TYPE
   SYNTAX        MplsLsrIdentifier
   MAX-ACCESS    not-accessible
   STATUS        current
   DESCRIPTION
      "This value represents the ingress LSR initiating the tunnel
       that is protected by this PLR."
   ::= { mplsFrrPLREntry 2 }

mplsFrrPLRTunnelEgressLSRId OBJECT-TYPE
   SYNTAX        MplsLsrIdentifier
   MAX-ACCESS    not-accessible
   STATUS        current
   DESCRIPTION
      "This value represents the egress LSR of the tunnel that is
       protected by this PLR."
   ::= { mplsFrrPLREntry 3 }

mplsFrrPLRId OBJECT-TYPE
   SYNTAX        MplsLsrIdentifier
   MAX-ACCESS    not-accessible
   STATUS        current
   DESCRIPTION
      "This value represents the LSR initiating the tunnel that is
       protected by this PLR."
   ::= { mplsFrrPLREntry 4 }

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"This value represents the PLR that has initiated a detour LSP to protect a tunnel instance."
 ::= { mplsFrrPLREntry 5 }

mplsFrrPLRDetourInstance OBJECT-TYPE
 SYNTAX Integer32
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "This value represents an instance of a detour initiated by this PLR."
 ::= { mplsFrrPLREntry 6 }

mplsFrrPLRSenderAddrType OBJECT-TYPE
 SYNTAX INTEGER {
   ipV4(1),
   ipV6(2)
 }
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Denotes the address type of this detour instance’s sender address."
 DEFVAL { ipV4 }
 ::= { mplsFrrPLREntry 7 }

mplsFrrPLRSenderIpv4Addr OBJECT-TYPE
 SYNTAX InetAddressIPv4
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "If mplsFrrPLRSenderAddrType is set to ipV4(1), then this value will contain the IPv4 address of this detour instance’s sender. This object is otherwise insignificant and should contain a value of 0."
 ::= { mplsFrrPLREntry 8 }

mplsFrrPLRSenderIpv6Addr OBJECT-TYPE
 SYNTAX InetAddressIPv6
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "If the mplsFrrPLRSenderAddrType is set to ipV6(2), then this variable contains the IPv6 address of this detour instance’s sender. This object is otherwise insignificant and should contain a value of 0."
 ::= { mplsFrrPLREntry 9 }

mplsFrrPLRAvoidNodeAddrType OBJECT-TYPE
 SYNTAX INTEGER {
   ipV4(1),
   ipV6(2)
 }

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### MPLS Fast Reroute Point of Local Repair table

<table>
<thead>
<tr>
<th>OBJECT-TYPE</th>
<th>SYNTAX</th>
<th>MAX-ACCESS</th>
<th>STATUS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>mplsFrrPLRAvoidNodeIpv4Addr</td>
<td>InetAddressIPv4</td>
<td>read-only</td>
<td>current</td>
<td>&quot;If mplsFrrPLRAvoidNodeAddrType is set to ipV4(1), then this value will contain the IPv4 address of the avoid node. This object is otherwise insignificant and should contain a value of 0.&quot;</td>
</tr>
<tr>
<td>mplsFrrPLRAvoidNodeIpv6Addr</td>
<td>InetAddressIPv6</td>
<td>read-only</td>
<td>current</td>
<td>&quot;If the mplsFrrPLRAvoidNodeAddrType is set to ipV6(2), then this variable contains the IPv6 address of the avoid node. This object is otherwise insignificant and should contain a value of 0.&quot;</td>
</tr>
<tr>
<td>mplsFrrPLRDetourIndex</td>
<td>MplsFrrDetourIndex</td>
<td>read-only</td>
<td>current</td>
<td>&quot;The index of the corresponding detour LSP in the mplsFrrDetourTable.&quot;</td>
</tr>
</tbody>
</table>

### MPLS Fast Reroute Detour table

<table>
<thead>
<tr>
<th>OBJECT-TYPE</th>
<th>SYNTAX</th>
<th>MAX-ACCESS</th>
<th>STATUS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>mplsFrrDetourTable</td>
<td>SEQUENCE OF MplsFrrDetourEntry</td>
<td>not-accessible</td>
<td>current</td>
<td>&quot;This table shows all detour LSPs together with their characteristics.&quot;</td>
</tr>
</tbody>
</table>

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SYNTAX        MplsFrrDetourEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION    "An entry in this table represents a detour. An entry in this
table is only created by an SNMP agent as instructed by an MPLS
signaling protocol."
INDEX {
    mplsFrrPLR TunnelIndex,
    mplsFrrPLR TunnelInstance,
    mplsFrrPLR Tunnel Ingress LSR ID,
    mplsFrrPLR Tunnel Egress LSR ID,
    mplsFrrDetourIndex
}
::= { mplsFrrDetourTable 1 }

MplsFrrDetourEntry ::= SEQUENCE {
    mplsFrrDetourIndex              MplsFrrDetourIndex,
    mplsFrrDetourTunnelName         DisplayString,
    mplsFrrDetourRole               INTEGER,
    mplsFrrDetourOperStatus         INTEGER,
    mplsFrrDetourActive             TruthValue,
    mplsFrrDetourMerging            INTEGER,
    mplsFrrDetourMergedDetourIndex  MplsFrrDetourIndex,
    mplsFrrDetourSetupPrio          INTEGER,
    mplsFrrDetourHoldingPrio        INTEGER,
    mplsFrrDetourInclAnyAffinity    MplsTunnelAffinity,
    mplsFrrDetourInclAllAffinity    MplsTunnelAffinity,
    mplsFrrDetourExclAllAffinity    MplsTunnelAffinity,
    mplsFrrDetourHopLimit           INTEGER,
    mplsFrrDetourSignallingProto    INTEGER,
    mplsFrrDetourBandwidth          Integer32,
    mplsFrrDetourExplicitPathIndex  MplsFrrPathIndex,
    mplsFrrDetourRecordPathIndex    MplsFrrPathIndexorZero,
    mplsFrrDetourRecordResvIndex    MplsFrrPathIndexorZero,
    mplsFrrDetourXCPPointer         RowPointer,
    mplsFrrDetourPathChanges        Counter32,
    mplsFrrDetourLastPathChange     TimeStamp,
    mplsFrrDetourCreationTime       TimeStamp
}

mplsFrrDetourIndex OBJECT-TYPE
SYNTAX        MplsFrrDetourIndex
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION    "Uniquely identifies this detour."
::= { mplsFrrDetourEntry 1 }

mplsFrrDetourTunnelName OBJECT-TYPE
SYNTAX        DisplayString
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"The canonical name assigned to the tunnel that this detour is
protecting."
::= { mplsFrrDetourEntry 2 }

mplsFrrDetourRole OBJECT-TYPE
SYNTAX INTEGER { head(1), transit(2), tail(3) }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This value signifies the role that this detour entry
represents. This value MUST be set to head(1) at the PLR
originating the detour. This value MUST be set to transit(2) at
transit points along the detour. This value MUST be set to
tail(3) at the terminating point of the detour.

If detour is merged with another detour or with the protected
tunnel, then the Role is still considered as transit."
::= { mplsFrrDetourEntry 3 }

mplsFrrDetourOperStatus OBJECT-TYPE
SYNTAX INTEGER {
    -- ready to pass packets
    up(1),
    down(2),
    -- status cannot be determined
    unknown(3)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates the actual operational status of this detour. This
is only relevant when the mplsFrrDetourRole is head(1)."
::= { mplsFrrDetourEntry 4 }

mplsFrrDetourActive OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates whether or not the main LSP has switched over to
this detour LSP. This is only relevant when the
mplsFrrDetourRole is head(1)."
::= { mplsFrrDetourEntry 5 }

mplsFrrDetourMerging OBJECT-TYPE
SYNTAX INTEGER { none(0),
    protectedTunnel(1),
    detour(2) }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This value represents whether or not this detour is merged. This value MUST be set to none(0) if this detour is not merged. This value MUST be set to protectedTunnel(1) if this detour is merged with the protected tunnel. This value MUST be set to detour(2) if this detour is merged with another detour protecting the same tunnel."

::= { mplsFrrDetourEntry 6 }

mplsFrrDetourMergedDetourIndex OBJECT-TYPE
SYNTAX        MplsFrrDetourIndex
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"This value represents the detour entry with which this detour is merged. This object is only valid when mplsFrrDetourMerging is set to detour(2)."
::= { mplsFrrDetourEntry 7 }

mplsFrrDetourSetupPrio OBJECT-TYPE
SYNTAX        INTEGER (0..7)
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"Indicates the setup priority of this detour."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al, RFC 3209, December 2001"
::= { mplsFrrDetourEntry 8 }

mplsFrrDetourHoldingPrio OBJECT-TYPE
SYNTAX        INTEGER (0..7)
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"Indicates the holding priority for this detour."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al, RFC 3209, December 2001"
::= { mplsFrrDetourEntry 9 }

mplsFrrDetourInclAnyAffinity OBJECT-TYPE
SYNTAX        MplsTunnelAffinity
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"A link satisfies the include-any constraint if and only if the constraint is zero, or the link and the constraint have a resource class in common."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al, RFC 3209, December 2001"
::= { mplsFrrDetourEntry 10 }

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mplsFrrDetourInclAllAffinity OBJECT-TYPE
SYNTAX       MplsTunnelAffinity
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"A link satisfies the include-all constraint if and only if the
link contains all of the administrative groups specified in the
constraint."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al,
RFC 3209, December 2001."
::= { mplsFrrDetourEntry 11 }

mplsFrrDetourExclAllAffinity OBJECT-TYPE
SYNTAX       MplsTunnelAffinity
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"A link satisfies the exclude-all constraint if and only if the
link contains none of the administrative groups specified in
the constraint."
REFERENCE
"1. RSVP-TE: Extensions to RSVP for LSP Tunnels, Awduche et al,
RFC 3209, December 2001."
::= { mplsFrrDetourEntry 12 }

mplsFrrDetourHopLimit OBJECT-TYPE
SYNTAX       INTEGER(1..255)
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"The maximum number of hops that this detour may traverse. This
is only relevant when the mplsFrrDetourRole is head(1)."
::= { mplsFrrDetourEntry 13 }

mplsFrrDetourSignallingProto OBJECT-TYPE
SYNTAX       INTEGER {
    rsvp(1),
    other(2)
}
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"The signaling protocol, which was used to setup this detour."
DEFVAL       { rsvp }
::= { mplsFrrDetourEntry 14 }

mplsFrrDetourBandwidth OBJECT-TYPE
SYNTAX       Integer32
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  

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"This variable represents the bandwidth for this detour, in units of thousands of bits per second (Kbps)."
::= { mplsFrrDetourEntry 15 }

mplsFrrDetourExplicitPathIndex OBJECT-TYPE
SYNTAX    MplsFrrPathIndex
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Index into the mplsFrrHopTable entry that specifies the explicit path hops for this detour."
::= { mplsFrrDetourEntry 16 }

mplsFrrDetourRecordPathIndex OBJECT-TYPE
SYNTAX    MplsFrrPathIndexorZero
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Index into the mplsFrrHopTable entry that specifies the actual hops traversed by the packets going over this detour before this node.

For a detour LSP originated by the ingress node of the protected LSP, this object is set to zero."
::= { mplsFrrDetourEntry 17 }

mplsFrrDetourRecordResvIndex OBJECT-TYPE
SYNTAX    MplsFrrPathIndexorZero
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Index into the mplsFrrHopTable entry that specifies the actual hops that will be traversed by the packets going over this detour after this node.

For a detour LSP terminated at the egress node of the protected LSP, i.e. the mplsFrrDetourRole is set to tail(3), this object is set to zero."
::= { mplsFrrDetourEntry 18 }

mplsFrrDetourXCPointer OBJECT-TYPE
SYNTAX    RowPointer
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"This variable points to a row in the mplsXCTable. This table identifies the segments that compose this detour, their characteristics, and relationships to each other.

In case multiple detours are merged with each other, then they form a multi-point to point cross connection and each detour points to a branch of it."
This object is optional and it is not required when mplsFrrInSegTable and mplsFrrOutSegTable are supported.

REFERENCE

::= { mplsFrrDetourEntry 19 }

mplsFrrDetourPathChanges OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Specifies the number of times the path has changed for this detour."
::= { mplsFrrDetourEntry 20 }

mplsFrrDetourLastPathChange OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Specifies the value of SysUpTime when the last path change for this detour occurred."
::= { mplsFrrDetourEntry 21 }

mplsFrrDetourCreationTime OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Specifies the value of SysUpTime when the detour came into existence."
::= { mplsFrrDetourEntry 22 }

-- End of Fast Reroute Detour table

-- MPLS Fast Reroute Hop table

mplsFrrHopTable OBJECT-TYPE
SYNTAX SEQUENCE OF MplsFrrHopEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The mplsFrrHopTable is used to indicate the hops of a detour route (explicit and record). Each detour has three different sets of hops in this table: a set for the explicit route path and another two sets for the record path hops, pointed by mplsFrrDetourExplicitPathIndex, mplsFrrDetourRecordPathIndex and mplsFrrDetourRecordResvIndex, respectively, from the mplsFrrDetourTable."
::= { mplsFrrObjects 4 }
mplsFrrHopEntry OBJECT-TYPE
SYNTAX     MplsFrrHopEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"An entry in this table represents a detour explicit or record
path hop. An entry in this table is only created by an SNMP
agent as instructed by an MPLS signaling protocol."
INDEX { mplsFrrHopListIndex, mplsFrrHopIndex }
 ::= { mplsFrrHopTable 1 }

MplsFrrHopEntry ::= SEQUENCE {
  mplsFrrHopListIndex          MplsFrrPathIndex,
  mplsFrrHopIndex              MplsFrrHopIndex,
  mplsFrrHopAddrType           INTEGER,
  mplsFrrHopIpv4Addr           InetAddressIPv4,
  mplsFrrHopIpv4PrefixLen      Unsigned32,
  mplsFrrHopIpv6Addr           InetAddressIPv6,
  mplsFrrHopIpv6PrefixLen      Unsigned32,
  mplsFrrHopType               INTEGER
}

mplsFrrHopListIndex OBJECT-TYPE
SYNTAX     MplsFrrPathIndex
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"Primary index into this table identifying a particular
explicit or record path hop list."
 ::= { mplsFrrHopEntry 1 }

mplsFrrHopIndex OBJECT-TYPE
SYNTAX     MplsFrrHopIndex
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"Secondary index into this table identifying the particular
hop."
 ::= { mplsFrrHopEntry 2 }

mplsFrrHopAddrType OBJECT-TYPE
SYNTAX     INTEGER { ipV4(1),
                          ipV6(2) }
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Denotes the address type of this hop."
DEFVAL     { ipV4 }
 ::= { mplsFrrHopEntry 3 }

mplsFrrHopIpv4Addr OBJECT-TYPE
SYNTAX        InetAddressIPv4
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
  "If mplsFrrHopAddrType is set to ipV4(1), then this value will
  contain the IPv4 address of this hop. This object is otherwise
  insignificant and should contain a value of 0."
 ::= { mplsFrrHopEntry 4 }

mplsFrrHopIpv4PrefixLen OBJECT-TYPE
SYNTAX        Unsigned32 (0..32)
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
  "If mplsFrrHopAddrType is set to ipV4(1), this value will
  contain the prefix length for this hop’s IPv4 address. This
  object is otherwise insignificant and should contain a value of
  0."
 ::= { mplsFrrHopEntry 5 }

mplsFrrHopIpv6Addr OBJECT-TYPE
SYNTAX        InetAddressIPv6
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
  "If the mplsFrrHopAddrType is set to ipV6(2), then this
  variable contains the IPv6 address of this hop. This object is
  otherwise insignificant and should contain a value of 0."
 ::= { mplsFrrHopEntry 6 }

mplsFrrHopIpv6PrefixLen OBJECT-TYPE
SYNTAX        Unsigned32 (0..128)
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
  "If mplsFrrHopAddrType is set to ipV6(2), this value will
  contain the prefix length for this hop’s IPv6 address. This
  object is otherwise insignificant and should contain a value of
  0."
 ::= { mplsFrrHopEntry 7 }

mplsFrrHopType OBJECT-TYPE
SYNTAX        INTEGER {
                      strict(1),
                      loose(2)
                   }
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
  "Denotes whether this detour hop is routed in a strict or loose
  fashion."
 ::= { mplsFrrHopEntry 8 }

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-- End of MPLS Fast Reroute Hop table

-- MPLS Fast Reroute in-segment table

mplsFrrInSegTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MplsFrrInSegEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"This table shows all detour LSPs together with the in-segment
data."
 ::= { mplsFrrObjects 5 }

mplsFrrInSegEntry OBJECT-TYPE
SYNTAX      MplsFrrInSegEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"An entry in this table represents an in-segment of a detour
LSP. There will be one entry in this table for each entry in
the mplsFrrDetourTable where the mplsFrrDetourRole is either
transit(2) or tail(3). An entry in this table is only created
by an SNMP agent as instructed by an MPLS signaling protocol."
INDEX {
  mplsFrrPLRTunnelIndex,
  mplsFrrPLRTunnelInstance,
  mplsFrrPLRTunnelIngressLSRId,
  mplsFrrPLRTunnelEgressLSRId,
  mplsFrrDetourIndex
}
 ::= { mplsFrrInSegTable 1 }

MplsFrrInSegEntry ::= SEQUENCE {
  mplsFrrInSegIfIndex          InterfaceIndex,
  mplsFrrInSegLabel            MplsLabel,
  mplsFrrInSegOctets           Counter32,
  mplsFrrInSegPackets          Counter32,
  mplsFrrInSegErrors           Counter32,
  mplsFrrInSegDiscards         Counter32,
  mplsFrrInSegHCOctets         Counter64,
  mplsFrrInSegCounterDiscTime  TimeStamp
}

mplsFrrInSegIfIndex OBJECT-TYPE
SYNTAX      InterfaceIndex
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This value represents the index of the interface where this
detour came in."
 ::= { mplsFrrInSegEntry 1 }

mplsFrrInSegLabel OBJECT-TYPE
SYNTAX        MplsLabel
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "The incoming label for this detour LSP."
 ::= { mplsFrrInSegEntry 2 }  

mplsFrrInSegOctets OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of octets received by this detour LSP."
 ::= { mplsFrrInSegEntry 3 }  

mplsFrrInSegPackets OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of packets received by this detour LSP."
 ::= { mplsFrrInSegEntry 4 }  

mplsFrrInSegErrors OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of errored packets received by this detour LSP."
 ::= { mplsFrrInSegEntry 5 }  

mplsFrrInSegDiscards OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "The number of labeled packets received on this in-segment,
which were chosen to be discarded even though no errors had
been detected to prevent them from being transmitted. One
possible reason for discarding such a labeled packet could be
to free up buffer space."
 ::= { mplsFrrInSegEntry 6 }  

mplsFrrInSegHCOctets OBJECT-TYPE
SYNTAX        Counter64
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of octets received by this detour LSP. This is
the 64 bit version of mplsFrrInSegOctets."
 ::= { mplsFrrInSegEntry 7 }  

mplsFrrInSegCounterDiscTime OBJECT-TYPE

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SYNTAX        TimeStamp
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"The value of sysUpTime on the most recent occasion at which
any one or more of this segment’s Counter32 or Counter64
suffered a discontinuity. If no such discontinuities have
occurred since the last re-initialization of the local
management subsystem, then this object contains a zero value."
::= { mplsFrrInSegEntry 8 }

-- End of MPLS Fast Reroute in-segment table

-- MPLS Fast Reroute out-segment table

mplsFrrOutSegTable OBJECT-TYPE
SYNTAX        SEQUENCE OF MplsFrrOutSegEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
"This table shows all detour LSPs together with the out-segment
data."
::= { mplsFrrObjects 6 }

MplsFrrOutSegEntry OBJECT-TYPE
SYNTAX        MplsFrrOutSegEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
"An entry in this table represents an out-segment of a detour
LSP. There will be one entry in this table for each entry in
the mplsFrrDetourTable where the mplsFrrDetourRole is either
head(1) or transit(2) and the mplsFrrDetourMerging is none(0).
An entry in this table is only created by an SNMP agent as
instructed by an MPLS signaling protocol."
INDEX {
  mplsFrrPLRTunnelIndex,
  mplsFrrPLRTunnelInstanceId,
  mplsFrrPLRTunnelIngressLSRId,
  mplsFrrPLRTunnelEgressLSRId,
  mplsFrrDetourIndex
}
::= { mplsFrrOutSegTable 1 }

MplsFrrOutSegEntry ::= SEQUENCE {
  mplsFrrOutSegIfIndex           InterfaceIndex,
  mplsFrrOutSegTopLabel          MplsLabel,
  mplsFrrOutSegNHIPvAddrType     INTEGER,
  mplsFrrOutSegNHIPv4Addr        InetAddressIPv4,
  mplsFrrOutSegNHIPv6Addr        InetAddressIPv6,
  mplsFrrOutSegOctets            Counter32,
  mplsFrrOutSegPackets           Counter32,
  mplsFrrOutSegErrors            Counter32,
mplsFrrOutSegDiscards          Counter32,
mplsFrrOutSegHCOctets          Counter64,
mplsFrrOutSegCounterDiscTime   TimeStamp
}

mplsFrrOutSegIfIndex OBJECT-TYPE
SYNTAX        InterfaceIndex
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "This value represents the index of interface where this detour
              is leaving the device."
 ::= { mplsFrrOutSegEntry 1 }

mplsFrrOutSegTopLabel OBJECT-TYPE
SYNTAX        MplsLabel
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "This represents the label that should be pushed onto the top
              of the outgoing packet’s label stack."
 ::= { mplsFrrOutSegEntry 2 }

mplsFrrOutSegNHIpAddrType OBJECT-TYPE
SYNTAX        INTEGER {
               unknown(0),
               ipV4(1),
               ipV6(2)
             }
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Indicates whether the next hop address is IPv4 or IPv6. Note
              that a value of unknown (0) is valid only when the outgoing
              interface is of type point-to-point."
 ::= { mplsFrrOutSegEntry 3 }

mplsFrrOutSegNHIpv4Addr OBJECT-TYPE
SYNTAX        InetAddressIPv4
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "IPv4 Address of the next hop. Its value is significant only
              when mplsFrrOutSegNHIpAddrType is ipV4 (1), otherwise it SHOULD
              return a value of 0."
 ::= { mplsFrrOutSegEntry 4 }

mplsFrrOutSegNHIpv6Addr OBJECT-TYPE
SYNTAX        InetAddressIPv6
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION

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"IPv6 address of the next hop. Its value is significant only when mplsOutSegNHIPvAddrType is ipV6 (2), otherwise it SHOULD return a value of 0."
::= {mplsFrrOutSegEntry 5 }

mplsFrrOutSegOctets OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of octets sent on this detour LSP."
::= {mplsFrrOutSegEntry 6 }

mplsFrrOutSegPackets OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of packets sent on this detour LSP."
::= {mplsFrrOutSegEntry 7 }

mplsFrrOutSegErrors OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of errored packets that could not be sent due to errors on the out-segment of this detour LSP."
::= {mplsFrrOutSegEntry 8 }

mplsFrrOutSegDiscards OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of labeled packets received on this out-segment, which were chosen to be discarded even though no errors had been detected to prevent them from being transmitted. One possible reason for discarding such a labeled packet could be to free up buffer space."
::= {mplsFrrOutSegEntry 9 }

mplsFrrOutSegHCOctets OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of octets sent on this detour LSP. This is the 64 bit version of mplsFrrOutSegOctets."
::= {mplsFrrOutSegEntry 10 }

mplsFrrOutSegCounterDiscTime OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The value of sysUpTime on the most recent occasion at which any one or more of this segment’s Counter32 or Counter64 suffered a discontinuity. If no such discontinuities have occurred since the last re-initialization of the local management subsystem, then this object contains a zero value." ::= { mplsFrrOutSegEntry 11 }

-- End of MPLS fast reroute out-segment table

-- Module Conformance Statement

mplsFrrGroups
OBJECT IDENTIFIER ::= {mplsFrrConformance 1 }

mplsFrrCompliances
OBJECT IDENTIFIER ::= {mplsFrrConformance 2 }

mplsFrrModuleCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"Compliance statements for agents that support the MPLS FRR MIB."
MODULE
  MANDATORY-GROUPS {
    mplsFrrConstGroup
  }

GROUP mplsFrrScalarGroup
DESCRIPTION
"This group is required to gather node level fast reroute statistics."

GROUP mplsFrrConstGroup
DESCRIPTION
"This group is required to configure fast reroute constraints at the ingress LSR of the tunnel that requires fast reroute service."

GROUP mplsFrrDetourGroup
DESCRIPTION
"This group is required to present the detour LSP information at the detour ingress, transit and egress LSRs."

GROUP mplsFrrXCGroup
DESCRIPTION
"This group is required when MPLS-LSR-MIB [4] is supported."

GROUP mplsFrrSegmentGroup
DESCRIPTION
"This group is required when MPLS-LSR-MIB [4] is not supported."

-- mplsFrrConstTable

OBJECT    mplsFrrConstProtectionMethod
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstProtectionType
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstSetupPrio
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstHoldingPrio
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstInclAnyAffinity
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstInclAllAffinity
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstExclAllAffinity
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstHopLimit
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstBandwidth
MIN-ACCESS read-only
DESCRIPTION
  "Write access is not required."

OBJECT    mplsFrrConstRowStatus
MIN-ACCESS read-only
DESCRIPTION

"Write access is not required."

::= { mplsFrrCompliances 1 }

-- Units of conformance

mplsFrrScalarGroup OBJECT-GROUP
OBJECTS {
    mplsFrrDetourIncoming,
    mplsFrrDetourOutgoing,
    mplsFrrDetourOriginating,
    mplsFrrSwitchover
}
STATUS   current
DESCRIPTION
    "Objects that are required to gather node level fast reroute
    statistics."
::= { mplsFrrGroups 1 }

mplsFrrConstGroup OBJECT-GROUP
OBJECTS {
    -- mplsFrrConstTable
    mplsFrrConstProtectionMethod,
    mplsFrrConstProtectionType,
    mplsFrrConstSetupPrio,
    mplsFrrConstHoldingPrio,
    mplsFrrConstInclAnyAffinity,
    mplsFrrConstInclAllAffinity,
    mplsFrrConstExclAllAffinity,
    mplsFrrConstHopLimit,
    mplsFrrConstBandwidth,
    mplsFrrConstRowStatus
}
STATUS   current
DESCRIPTION
    "Objects that are required to configure fast reroute
    constraints at the ingress LSR of the tunnel that requires fast
    reroute service."
::= { mplsFrrGroups 2 }

mplsFrrDetourGroup OBJECT-GROUP
OBJECTS {
    -- mplsFrrPLRTable
    mplsFrrPLRSenderAddrType,
    mplsFrrPLRSenderIpv4Addr,
    mplsFrrPLRSenderIpv6Addr,
    mplsFrrPLRAvoidNodeAddrType,
    mplsFrrPLRAvoidNodeIpv4Addr,
    mplsFrrPLRAvoidNodeIpv6Addr,
    mplsFrrPLRDetourIndex,
    -- mplsFrrDetourTable
    mplsFrrDetourTunnelName,
    mplsFrrDetourRole,
mplsFrrDetourOperStatus,
mplsFrrDetourActive,
mplsFrrDetourMerging,
mplsFrrDetourMergedDetourIndex,
mplsFrrDetourSetupPrio,
mplsFrrDetourHoldingPrio,
mplsFrrDetourInclAnyAffinity,
mplsFrrDetourInclAllAffinity,
mplsFrrDetourExclAllAffinity,
mplsFrrDetourHopLimit,
mplsFrrDetourSignalProto,
mplsFrrDetourBandwidth,
mplsFrrDetourExplicitPathIndex,
mplsFrrDetourRecordPathIndex,
mplsFrrDetourRecordResvIndex,
mplsFrrDetourPathChanges,
mplsFrrDetourLastPathChange,
mplsFrrDetourCreationTime,
  -- mplsFrrHopTable
mplsFrrHopAddrType,
mplsFrrHopIpv4Addr,
mplsFrrHopIpv4PrefixLen,
mplsFrrHopIpv6Addr,
mplsFrrHopIpv6PrefixLen,
mplsFrrHopType
}

STATUS        current
DESCRIPTION
"Objects that are required to present the detour LSP
information at the detour ingress, transit and egress LSRs." :
::= { mplsFrrGroups 3 }

mplsFrrXCGroup OBJECT-GROUP
OBJECTS {
  mplsFrrDetourXCPointer
}
STATUS        current
DESCRIPTION
"Object required when MPLS-LSR-MIB 4] is supported." :
::= { mplsFrrGroups 4 }

mplsFrrSegmentGroup OBJECT-GROUP
OBJECTS {
  -- mplsFrrInSegTable
mplsFrrInSegIfIndex,
mplsFrrInSegLabel,
mplsFrrInSegOctets,
mplsFrrInSegPackets,
mplsFrrInSegErrors,
mplsFrrInSegDiscards,
mplsFrrInSegHCOctets,
mplsFrrInSegCounterDiscTime,
  -- mplsFrrOutSegTable

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mplsFrrOutSegIfIndex,
mplsFrrOutSegTopLabel,
mplsFrrOutSegNHIPAddrType,
mplsFrrOutSegNHIPv4Addr,
mplsFrrOutSegNHIPv6Addr,
mplsFrrOutSegOctets,
mplsFrrOutSegPackets,
mplsFrrOutSegErrors,
mplsFrrOutSegDiscards,
mplsFrrOutSegHCOctets,
mplsFrrOutSegCounterDiscTime
}

STATUS        current
DESCRIPTION    "Object required when MPLS-LSR-MIB [4] is not supported.
::= { mplsFrrGroups 5 }

END

7. Security Considerations

This MIB does not pose any additional security issues compared with [3] and [4].

8. Reference


9. Acknowledgments

We would like to thank Alia Atlas, Yeong Tai and Walter Vanhimbeeck for the helpful discussions.
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