Shared Risk Link Groups for RSVP-Based LSP

In This Chapter

This section provides information about Shared Risk Link Groups for RSVP-Based LSPs.

Topics in this section include:

Applicability

This feature is applicable to all of the 7750, 7450 and 7710 SR series. Tested on release 7.0.R.5. No prerequisite are needed. The 7750 SR-c4 is supported from 8.0.R.4 and higher.

Overview

Introduction

Shared Risk Link Groups (SRLG) is a feature which allows the user to establish a backup secondary LSP (label switched path) path or a FRR (fast-reroute) LSP path which is disjoint from the path of the primary LSP. Links which are members of the same SRLG represent resources which share the same risk. For example, fiber links sharing the same conduit or multiple wavelengths sharing the same fiber.

A typical application of the SRLG feature is to provide an automatic placement of secondary backup LSPs or FRR bypass/detour LSPs that minimizes the probability of fate sharing with the path of the primary LSP.

SRLG groups are used to determine which links belong to the same SRLG. The mechanism is similar to MPLS admin groups. To advertise SRLG, the information is part of the IGP TE parameters in an opaque LSA (link state advertisement). The SRLG is advertised in a new Shared Risk Link Group TLV (type 138) in IS-IS (RFC 4205, *Intermediate System to Intermediate System (IS-IS) Extensions in Support of Generalized Multi-Protocol Label Switching (GMPLS)*). It is advertised in a new SRLG sub-TLV (type 16) of the existing Link TLV in OSPF (RFC 4203, *OSPF Extensions in Support of Generalized Multi-Protocol Label Switching (GMPLS)*.

For FRR a choice can be made on what to do when no FRR tunnel can be found with the SRLG constraints. No FRR tunnel might be signalled or a FRR tunnel might be signalled not taking the SRLG constraints into account.

SRLG

Figure 176 displays the initial topography for this section.

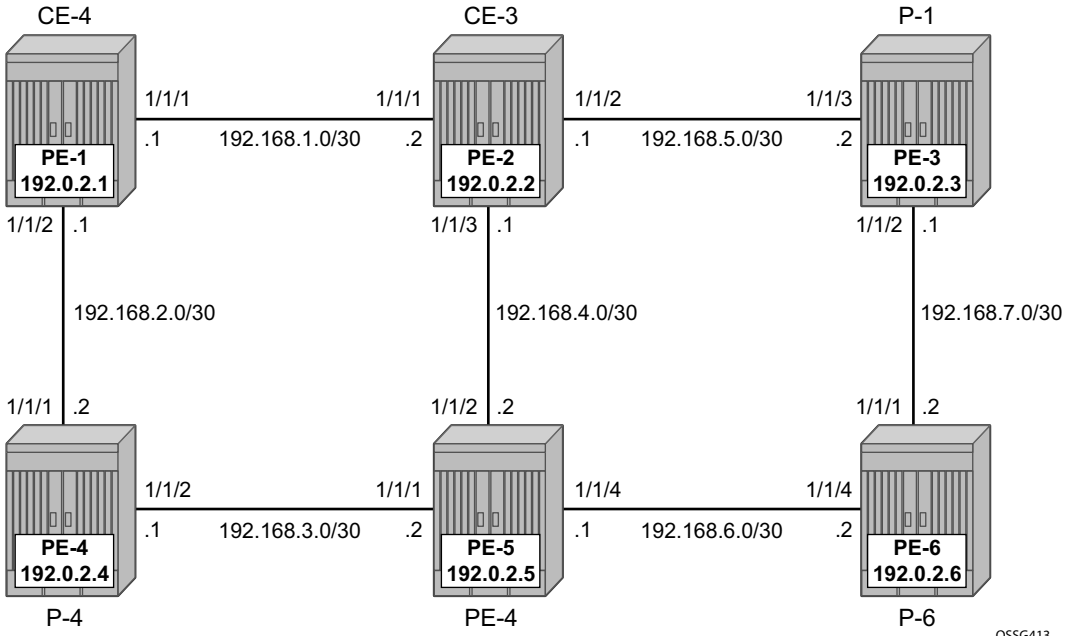

Figure 176: Initial Topology

A single IGP area (IS-IS in this case) with traffic engineering enabled is required for the SRLG feature to work properly.

When OSPF is used as the IGP, the functionality is similar.

Configuration

Step 1. Configuring the IP/MPLS network.

This is part of the general P2P LSP configuration. For more details check the related configurations of the PE-nodes.

In addition, ECMP is set to 2, instead of the default value 1 in order to highlight the application of SRLG in the final example.

```
A:PE-1# configure router ecmp 2
A:PE-1#
```

2. Define the SRLG groups, and link them to the related MPLS interfaces.

There are 2 SRLG groups defined, named blue and grey. On following drawing the related IP/MPLS interfaces are indicated.

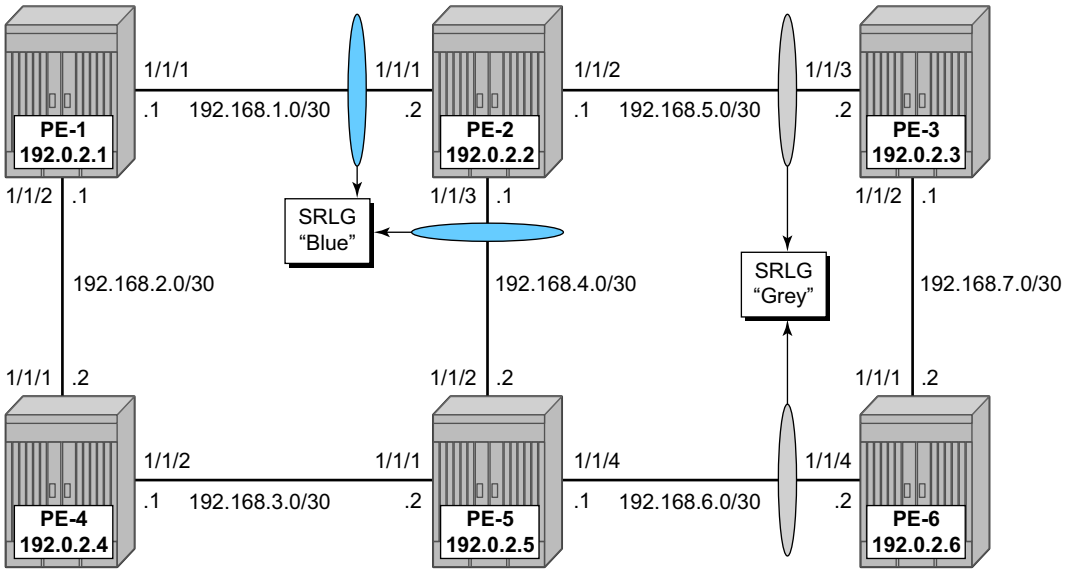

Figure 177: SRLG Topology

From configuration point of view, both SRLG groups must be configured on all nodes as follows.

```
A:PE-2# /configure router mpls srlg-group blue value 1
*A:PE-2# /configure router mpls srlg-group grey value 2
```

The IP/MPLS interfaces need to be linked to the related SRLG group, which is a uni-directional indicator, applying only at the egress direction; hence, it needs to be configured on both sides of

the IP/MPLS interface. For example on PE-1, the interface to PE-2 is part of **srlg-group blue**. Note that an interface can be part of multiple SRLG groups similar to the admin-group functionality.

```
*A:PE-1>config>router>mpls# info
----------------------------------------------
            admin-group "green" 1
            admin-group "red" 2
            srlg-group "blue" value 1
            srlg-group "grey" value 2
            interface "system"
            exit
            interface "int-PE-1-PE-2"
                admin-group "green"
            exit
            interface "int-PE-1-PE-4"
                admin-group "red"
            exit
*A:PE-1>config>router>mpls# interface "int-PE-1-PE-2"
*A:PE-1>config>router>mpls>if# srlg-group blue
```

The same must done on PE-2, PE-3, PE-5 and PE-6. Afterwards, verify the MPLS configuration for example on PE-2, where the SRLG groups are linked to the interfaces, admin-groups are configured in parallel to indicate that both can be configured and will work independently.

```
*A:PE-2>config>router>mpls# info
----------------------------------------------
            admin-group "green" 1
            admin-group "red" 2
            srlg-group "blue" value 1
            srlg-group "grey" value 2
            interface "system"
            exit
            interface "int-PE-2-PE-1"
                admin-group "green"
                srlg-group "blue"
            exit
            interface "int-PE-2-PE-3"
                admin-group "green"
                srlg-group "grey"
            exit
            interface "int-PE-2-PE-5"
                srlg-group "blue"
            exit
            no shutdown
----------------------------------------------
A:PE-2>config>router>mpls#
```

Some useful show commands to verify the SRLG configuration.

To show all SRLG groups on the node and the related interfaces:

```
A:PE-2# show router mpls srlg-group
===============================================================================
MPLS Srlg Groups
===============================================================================
```

```
Group Name                      Group Value   Interfaces
-------------------------------------------------------------------------------
blue                            1             int-PE-2-PE-1
                                              int-PE-2-PE-5
grey                            2             int-PE-2-PE-3
-------------------------------------------------------------------------------
No. of Groups: 2
===============================================================================
A:PE-2#
```

In the list of MPLS interfaces, admin groups and SRLG groups are indicated.

```
A:PE-2# show router mpls interface
===============================================================================
MPLS Interfaces
===============================================================================
Interface                       Port-id           Adm    Opr    TE-metric
-------------------------------------------------------------------------------
system                          system            Up     Up     None
  Admin Groups                  None
int-PE-2-PE-1                   1/1/1             Up     Up     None
  Admin Groups                  green
  Srlg Groups                   blue
int-PE-2-PE-3                   1/1/2             Up     Up     None
  Admin Groups                  green
  Srlg Groups                   grey
int-PE-2-PE-5                   1/1/3             Up     Up     None
  Admin Groups                  None
  Srlg Groups                   blue
-------------------------------------------------------------------------------
Interfaces : 4
===============================================================================
A:PE-2#
```

To verify the SRLG groups in the IGP TE database, the following command can be used. The output can be sizable extensive but searching on the SRLG groups name will lead to the correct interface(s).

As an example we will look to the link-state advertisements of PE-2 (on PE-1 in this case), and we see that the SRLG information is linked to the IP interfaces in a dedicated (TE-)TLV.

```
A:PE-1# show router isis database PE-2.00-00  detail
===============================================================================
ISIS Database
===============================================================================
Displaying Level 1 database
-------------------------------------------------------------------------------
LSP ID    : PE-2.00-00                                  Level     : L1
Sequence  : 0x17                  Checksum  : 0xcc3b   Lifetime  : 732
Version   : 1                     Pkt Type  : 18       Pkt Ver   : 1
Attributes: L1L2                  Max Area  : 3
SysID Len : 6                     Used Len  : 508      Alloc Len : 508

TLVs :

  TE SRLGs     :
    SRLGs : PE-1.00
    Lcl Addr  : 192.168.1.2
    Rem Addr  : 192.168.1.1
    Num SRLGs       : 1
        1

  TE SRLGs     :
    SRLGs : PE-3.00
    Lcl Addr  : 192.168.5.1
    Rem Addr  : 192.168.5.2
    Num SRLGs       : 1
        2

  TE SRLGs     :
    SRLGs : PE-5.00
    Lcl Addr  : 192.168.4.1
    Rem Addr  : 192.168.4.2
    Num SRLGs       : 1
        1
===============================================================================
A:PE-1#
```

On-Line Verification

An on-line verification can be done by a **tools perform** CLI command. This will trigger a real CSPF call to the IGP TE database, and the result will be an ERO object which can potentially be used to set-up a CSPF based LSP.

The following shows the command syntax.

```
*A:PE-1# tools perform router mpls cspf
  - cspf to <ip-addr> [from <ip-addr>] [bandwidth <bandwidth>] [include-bitmap
    <bitmap>] [exclude-bitmap <bitmap>] [hop-limit <limit>] [exclude-address
    <excl-addr> [<excl-addr>...(upto 8 max)]] [use-te-metric] [strict-srlg]
    [srlg-group <grp-id>...(upto 8 max)] [exclude-node <excl-node-id>
    [<excl-node-id>..(upto 8 max)]] [skip-interface <interface-name>]
    [ds-class-type <class-type>] [cspf-reqtype <req-type>] [least-fill-min-thd
    <thd>] [setup-priority <val>] [hold-priority <val>]

 <ip-addr>            : a.b.c.d
 <bandwidth>          : [1..100000] in Mbps
 <bitmap>             : [0..4294967295] - accepted in decimal, hex(0x) or
                        binary(0b)
 <limit>              : [1..255]
 <excl-addr>          : a.b.c.d (outbound interface)
 <use-te-metric>      : keyword
 <strict-srlg>        : keyword
 <grp-id>             : [0..4294967295]
 <excl-node-id>       : [a.b.c.d]
 <interface-name>     : [max 32 chars]
 <class-type>         : [0..7]
 <req-type>           : all|random|least-fill : keywords
 <thd>                : [1..100]
 <priority>           : [0..7]

*A:PE-1#
```

Where the relevant parameters are:

- **to** — Defines the far-end address of the LSP. This is the system-address of the destination LER
- **srlg-group** — Specifies which SRLG groups should be avoided while building the path to the destination (ERO object)
- **strict-srlg** — Indicates whether the SRLG group is a strict requirement or not. When this parameter is given, only paths without traversing the SRLG will be displayed.

An example:

On PE-1 a CSPF calculation is made with PE-3 as destination, without any SRLG restrictions, this will look like the following output:

```
*A:PE-1# tools perform router mpls cspf to 192.0.2.3
Req CSPF for all ECMP paths
    from: this node to: 192.0.2.3 w/(no Diffserv) class: 0 , setup Priority 7, Hold Prior-
ity 0 TE Class: 7

CSPF Path
To        : 192.0.2.3
Path 1    : (cost 20)
    Start: 192.0.2.1
    Egr:   192.168.1.1     -> Ingr:   192.168.1.2     (met 10)
    Egr:   192.168.5.1     -> Ingr:   192.168.5.2     (met 10)
    End:   192.0.2.3

*A:PE-1#
```

Given a restriction on **srlg-group blue** (grp-id =1), the result is as follows.

```
*A:PE-1# tools perform router mpls cspf to 192.0.2.3 srlg-group 1
Req CSPF for all ECMP paths
    from: this node to: 192.0.2.3 w/(no Diffserv) class: 0 , setup Priority 7, Hold Prior-
ity 0 TE Class: 7

CSPF Path
To        : 192.0.2.3
Path 1    : (cost 40)
    Start: 192.0.2.1
    Egr:   192.168.2.1     -> Ingr:   192.168.2.2     (met 10)
    Egr:   192.168.3.1     -> Ingr:   192.168.3.2     (met 10)
    Egr:   192.168.6.1     -> Ingr:   192.168.6.2     (met 10)
      1 SRLGs:  2
    Egr:   192.168.7.2     -> Ingr:   192.168.7.1     (met 10)
    End:   192.0.2.3

*A:PE-1#
```

The path will be through PE-4, PE-5 and PE-6.

When a strict restriction is requested on **srlg-group grey**, no valid CSPF path towards the destination can be found. Removing the **strict** restriction results in a successful return of CSPF.

```
*A:PE-1# tools perform router mpls cspf to 192.0.2.3 srlg-group 2 strict-srlg
Req CSPF for all ECMP paths
    from: this node to: 192.0.2.3 w/(no Diffserv) class: 0 , setup Priority 7, Hold Prior-
ity 0 TE Class: 7

MINOR: CLI No CSPF path to "192.0.2.3" with specified constraints.
*A:PE-1# tools perform router mpls cspf to 192.0.2.3 srlg-group 2
Req CSPF for all ECMP paths
```

```
    from: this node to: 192.0.2.3 w/(no Diffserv) class: 0 , setup Priority 7, Hold Prior-
ity 0 TE Class: 7

CSPF Path
To        : 192.0.2.3 (NOT SRLG DISJOINT)
Path 1    : (cost 20)
    Start: 192.0.2.1
    Egr:   192.168.1.1     -> Ingr:   192.168.1.2     (met 10)
      1 SRLGs:  1
    Egr:   192.168.5.1     -> Ingr:   192.168.5.2     (met 10)
      1 SRLGs:  2
    End:   192.0.2.3

*A:PE-1#
```

The best practice for debugging is to enable debug-tracing on the CSPF process, with following command.

```
A:PE-1# debug router isis cspf
```

SRLG for FRR

The fast-reroute mechanism used here is facility link-protection. The SRLG feature is independent of the FRR type and works for all combinations (facility versus one-to-on, link versus node protection).

Step 1. Configure an LSP.

An LSP from PE-1 to PE-3 will be created, CSPF based.

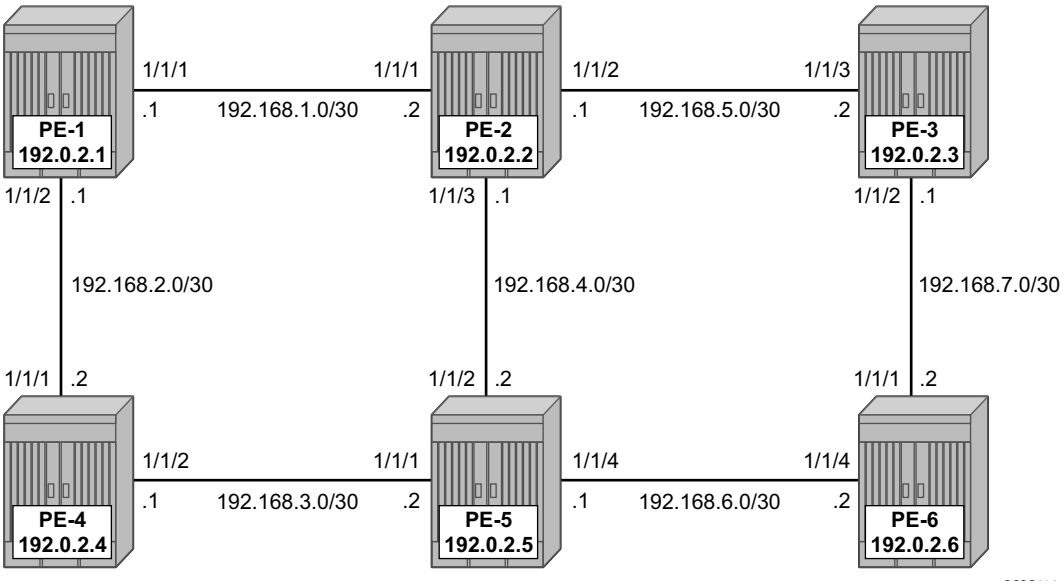

Figure 178: Path Primary RSVP_TE LSP

The configuration of the LSP lsp-PE-1-PE-6-FRR-facility-link is based on an empty path, with FRR facility link protection enabled.

```
*A:PE-1>config>router>mpls# lsp lsp-PE-1-PE-6_FRR_facility-link
*A:PE-1>config>router>mpls>lsp# info
----------------------------------------------
                to 192.0.2.3
                cspf
                fast-reroute facility
                    no node-protect
                exit
                primary "prim"
                exit
                no shutdown
----------------------------------------------
*A:PE-1>config>router>mpls>lsp#
```

To verify the primary path, **oam lsp-trace** command can be used, checking the intermediate nodes.

```
 *A:PE-1# oam lsp-trace lsp-PE-1-PE-6_FRR_facility-link detail
lsp-trace to lsp-PE-1-PE-6_FRR_facility-link: 0 hops min, 0 hops max, 116 byte packets
1  192.0.2.2  rtt=4.32ms rc=8(DSRtrMatchLabel)
     DS 1: IfAddr 192.168.5.2 MRU=1500 label=131071 proto=4(RSVP-TE)
2  192.0.2.3  rtt=11.6ms rc=3(EgressRtr)
*A:PE-1#
```

To check if the bypass tunnels are up and running, an indication (@)can be found in the detail output of **show router mpls ls <x> path detail** as seen in the following output.

```
*A:PE-1# show router mpls lsp lsp-PE-1-PE-6_FRR_facility-link path detail
===============================================================================
MPLS LSP lsp-PE-1-PE-6_FRR_facility-link Path  (Detail)
===============================================================================
Legend :
    @ - Detour Available              # - Detour In Use
    b - Bandwidth Protected           n - Node Protected
    s - Soft Preemption
===============================================================================
-------------------------------------------------------------------------------
LSP lsp-PE-1-PE-6_FRR_facility-link Path prim
-------------------------------------------------------------------------------
LSP Name    : lsp-PE-1-PE-6_FRR_facility-link    Path LSP ID : 12288
From        : 192.0.2.1                          To          : 192.0.2.3
Adm State   : Up                                 Oper State  : Up
Path Name   : prim                               Path Type   : Primary
Path Admin  : Up                                 Path Oper   : Up
OutInterface: 1/1/1                              Out Label   : 131071
Path Up Time: 0d 00:04:18                        Path Dn Time: 0d 00:00:00
Retry Limit : 0                                  Retry Timer : 30 sec
RetryAttempt: 0                                  NextRetryIn : 0 sec
SetupPriori*: 7                                  Hold Priori*: 0
Bandwidth   : No Reservation                     Oper Bw     : 0 Mbps
Hop Limit   : 255                                Class Type  : 0
Record Route: Record                             Record Label: Record
Oper MTU    : 1496                               Neg MTU     : 1496
Adaptive    : Enabled                            Oper Metric : 20
Include Grps:                                    Exclude Grps:
None                                            None
Path Trans  : 1                                  CSPF Queries: 1
Failure Code: noError                            Failure Node: n/a
ExplicitHops:
    No Hops Specified
Actual Hops :
    192.168.1.1(192.0.2.1) @                     Record Label    : N/A
 -> 192.168.1.2(192.0.2.2) @                     Record Label    : 131071
 -> 192.168.5.2(192.0.2.3)                       Record Label    : 131071
ComputedHops:
    192.168.1.1     -> 192.168.1.2     -> 192.168.5.2
ResigEligib*: False
LastResignal: n/a                                CSPF Metric : 20
===============================================================================
* indicates that the corresponding row element may have been truncated.
*A:PE-1#
```

The expected path(s) followed by the bypass tunnels are shown in Figure 179.

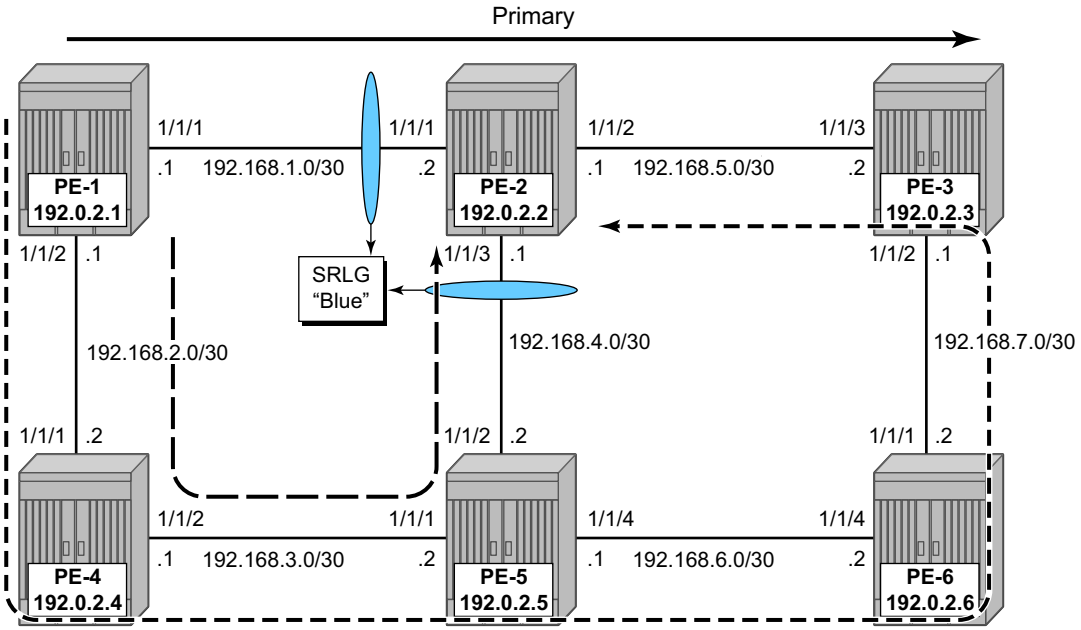

Figure 179: SRLG for FRR Path With and Without SRLG

To verify the data path on the point of local repair (PLR), the next CLI commands can be used.

```
*A:PE-1# show router mpls bypass-tunnel detail
===============================================================================
MPLS Bypass Tunnels (Detail)
===============================================================================
-------------------------------------------------------------------------------
bypass-link192.168.1.2
-------------------------------------------------------------------------------
To               : 192.168.4.1        State               : Up
Out I/F          : 1/1/2              Out Label           : 131071
Up Time          : 0d 00:06:34        Active Time         : n/a
Reserved BW      : 0 Kbps             Protected LSP Count : 1
Type             : Dynamic
SetupPriority    : 7                  Hold Priority       : 0
Class Type       : 0
Actual Hops      :
    192.168.2.1     -> 192.168.2.2     -> 192.168.3.2     -> 192.168.4.1
===============================================================================
*A:PE-1#
```

The SRLG restriction is not taken into account at this moment at PLR PE-1. The actual hops are PE-4, PE-5 and PE-3 visualized by the dashed path in Figure 179.

To take the SRLG restrictions into account, additional configuration is needed for MPLS.

```
*A:PE-1>config>router>mpls# info
----------------------------------------------
            admin-group "green" 1
            admin-group "red" 2
            srlg-group "blue" value 1
            srlg-group "grey" value 2
            srlg-group "red" value 3
            interface "system"
            exit
*A:PE-1>config>router>mpls# srlg-
srlg-database       srlg-frr            srlg-group
*A:PE-1>config>router>mpls# srlg-frr
  - no srlg-frr
  - srlg-frr [strict]
 <strict>             : keyword


*A:PE-1>config>router>mpls# srlg-frr strict
*A:PE-1>config>router>mpls# info
----------------------------------------------
            admin-group "green" 1
            admin-group "red" 2
            srlg-frr strict
            srlg-group "blue" value 1
            srlg-group "grey" value 2
            srlg-group "red" value 3
            interface "system"
            exit
*A:PE-1>config>router>mpls#
```

The option **strict** should only be taken if the logical topology allows this. In other words, one must be sure that an alternative path is possible which avoids SRLG-groups.

After applying the SRLG FRR feature, the related LSP needs to be resignaled in order to set up the bypass tunnel with the new constraints.

```
*A:PE-1# tools perform router mpls resignal lsp lsp-PE-1-PE-6_FRR_facility-link path prim
*A:PE-1#
```

This can be verified with previous commands.

```
*A:PE-1# show router mpls bypass-tunnel detail
===============================================================================
MPLS Bypass Tunnels (Detail)
===============================================================================
-------------------------------------------------------------------------------
bypass-link192.168.1.2
-------------------------------------------------------------------------------
To              : 192.168.5.1        State               : Up
Out I/F         : 1/1/2              Out Label           : 131071
Up Time         : 0d 00:06:53        Active Time         : n/a
Reserved BW     : 0 Kbps             Protected LSP Count : 1
Type            : Dynamic
SetupPriority   : 7                  Hold Priority       : 0
Class Type      : 0
Actual Hops     :
    192.168.2.1     -> 192.168.2.2     -> 192.168.3.2     -> 192.168.6.2
 -> 192.168.7.1     -> 192.168.5.1
===============================================================================
*A:PE-1#
```

This path is represented by the dotted line in previous figure, taking the SRLG constraints into account.

SRLG for Standby Path

Where SRLG groups will be constraints for bypass tunnels, they will also be a constraint to set-up a secondary path. Looking at the following picture, we expect the secondary path to follow the dotted-line instead of passing over the direct link between PE-5 and PE-2.

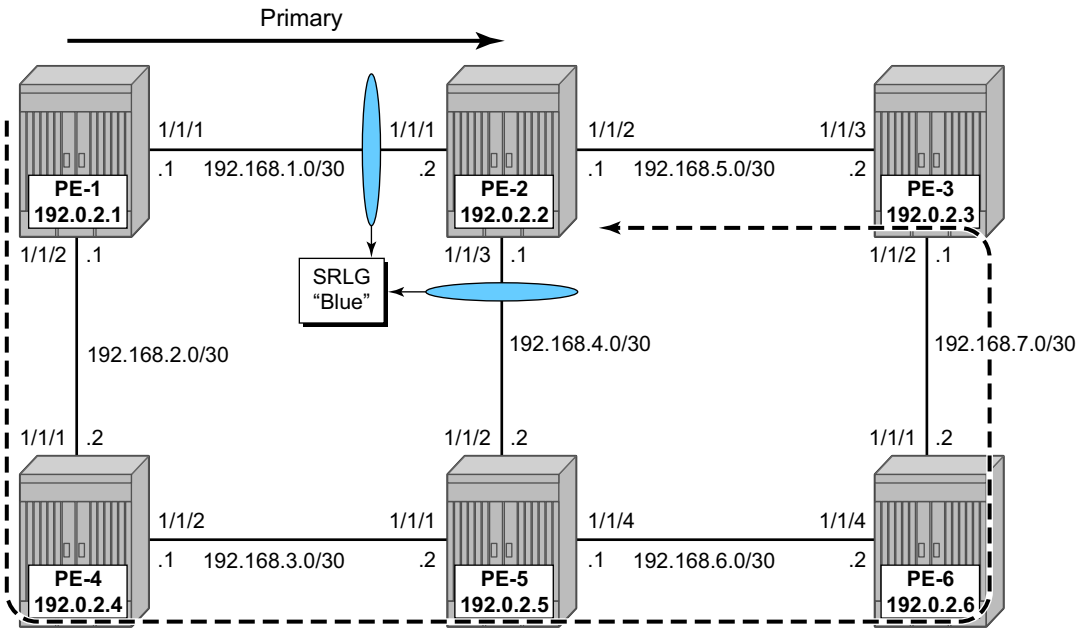

Figure 180: SRLG for Secondary Path

The configuration of the LSP will need a specific indication at the level of the secondary path to enable the restriction on the srlg-groups.

```
*A:PE-1# configure router mpls  lsp "lsp-PE-1-PE-2-srlg"
*A:PE-1>config>router>mpls>lsp# info
----------------------------------------------
                to 192.0.2.2
                cspf
                primary "prim"
                exit
                secondary "secon"
                    standby
                    srlg
                exit
                no shutdown
----------------------------------------------
*A:PE-1>config>router>mpls>lsp#
```

Where both paths are empty paths, the ERO object creation solely relies on CPSF without any specific hop.

To verify the datapath, the detailed output of the **show router mpls** command can be used, as well as the **lsp-trace** OAM command. This output shows both ERO objects of the primary and secondary path.

```
*A:PE-1# show router mpls lsp "lsp-PE-1-PE-2-srlg" path detail
===============================================================================
MPLS LSP lsp-PE-1-PE-2-srlg Path  (Detail)
===============================================================================
Legend :
    @ - Detour Available              # - Detour In Use
    b - Bandwidth Protected           n - Node Protected
    s - Soft Preemption
===============================================================================
-------------------------------------------------------------------------------
LSP lsp-PE-1-PE-2-srlg Path prim
-------------------------------------------------------------------------------
Actual Hops :
    192.168.1.1(192.0.2.1)                       Record Label    : N/A
 -> 192.168.1.2(192.0.2.2)                       Record Label    : 131066
ComputedHops:
    192.168.1.1     -> 192.168.1.2
-------------------------------------------------------------------------------
LSP lsp-PE-1-PE-2-srlg Path secon
-------------------------------------------------------------------------------
Actual Hops :
    192.168.2.1(192.0.2.1)                       Record Label    : N/A
 -> 192.168.2.2(192.168.2.4)                     Record Label    : 131070
 -> 192.168.3.2(192.0.2.5)                       Record Label    : 131069
 -> 192.168.6.2(192.0.2.6)                       Record Label    : 131070
 -> 192.168.7.1(192.0.2.3)                       Record Label    : 131069
 -> 192.168.5.1(192.0.2.2)                       Record Label    : 131069
ComputedHops:
    192.168.2.1     -> 192.168.2.2     -> 192.168.3.2     -> 192.168.6.2
 -> 192.168.7.1     -> 192.168.5.1
Srlg        : Enabled
SrlgDisjoint: True
ResigEligib*: False
LastResignal: n/a                                CSPF Metric : 50
===============================================================================
* indicates that the corresponding row element may have been truncated.
*A:PE-1#
```

The **lsp-trace** command can be used for secondary path as well. The intermediate LSRs and the MPLS labels used can be clearly seen.

```
*A:PE-1# oam lsp-trace lsp-PE-1-PE-2-srlg path secon detail
lsp-trace to lsp-PE-1-PE-2-srlg: 0 hops min, 0 hops max, 116 byte packets
1  192.168.2.4  rtt=1.33ms rc=8(DSRtrMatchLabel)
     DS 1: IfAddr 192.168.3.2 MRU=1500 label=131069 proto=4(RSVP-TE)
2  192.0.2.5  rtt=1.78ms rc=8(DSRtrMatchLabel)
     DS 1: IfAddr 192.168.6.2 MRU=1500 label=131070 proto=4(RSVP-TE)
3  192.0.2.6  rtt=2.46ms rc=8(DSRtrMatchLabel)
     DS 1: IfAddr 192.168.7.1 MRU=1500 label=131069 proto=4(RSVP-TE)
4  192.0.2.3  rtt=2.60ms rc=8(DSRtrMatchLabel)
     DS 1: IfAddr 192.168.5.1 MRU=1500 label=131069 proto=4(RSVP-TE)
5  192.0.2.2  rtt=2.60ms rc=3(EgressRtr)
*A:PE-1#
```

SRLG Database

In case not all IP/MPLS routers in the area support SRLG, a static SRLG database can be created on the systems which will be used as an additional constraint when performing the CSPF calculation to define the path.

An example can be seen Figure 181 where an additional SRLG group (red) is locally on PE-1, with information related to the interface between PE-4 and PE-5.

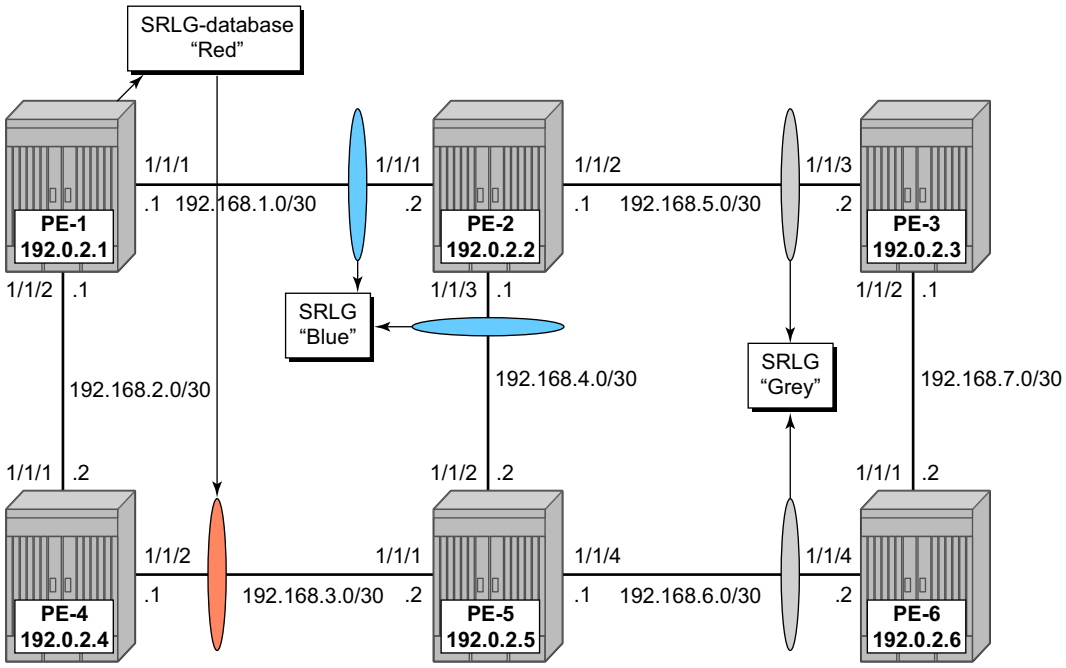

Figure 181: SRLG Database Example

```
*A:PE-1>config>router>mpls# info
----------------------------------------------
            admin-group "green" 1
            admin-group "red" 2
            srlg-group "blue" value 1
            srlg-group "grey" value 2
            srlg-group "red" value 3
            interface "system"
            exit
            interface "int-PE-1-PE-2"
                admin-group "green"
                srlg-group "blue"
            exit
            interface "int-PE-1-PE-4"
                admin-group "red"
            exit
```

```
srlg-database
    router-id 192.0.2.4
        interface 192.168.3.1 srlg-group "red"
        no shutdown
    exit
    router-id 192.0.2.5
        interface 192.168.3.2 srlg-group "red"
        no shutdown
    exit
exit
```

Note that this information is only local and will only have effect on CSPF calculations on PE-1, not on the other nodes.

When a CSPF calculation is done for a path from PE-1 to PE-5, the result will be two equal-cost paths. When adding the **srlg-group red** as a restriction, only a single path will be found, passing PE-2.

Conclusion

Interpreting the SLRG information into the TE database makes it possible to protect an LSP even when multiple IP/MPLS interfaces fail as a result of an underlying transmission failure. Transmission failures can occur quiet often since not all transmission links are 1:1 protected.

SRLG groups in MPLS provide a very dynamic and simple way to assure LSP FRR path protection on every PLR throughout the followed LSP path. The SRLG groups are also taken into account when defining the ERO for secondary paths, at least if the configured secondary path is empty.

For interoperability reasons the SRLG-database is available, as systems can link interface to an SRLG with interconnecting systems that do not support the SRLG feature; hence they can not advertise the SRLG information through the IGP.

Note that the creation and maintenance of an SRLG database requires operational effort and systems that do not support SRLG will never take any SRLG information into account during CSPF calculation for the creation of FRR bypass or detour tunnels.