Background

The NSO service models described in this document were developed as part of the Cisco SP Validated Core Design. For more details on the SP Validated Core, see the Design Guide. The services facilitate a migration from an LDP-enabled core to an Segment Routing (SR) enabled core through a series of small steps that can be independently validated.

Assumptions

Because these services are intended to facilitate a migration, certain assumptions are made about the current configuration and operational state of the network.

- ISIS instance-name: We assume that a fully functional ISIS IGP instance exists in the network with a well-defined instance name. This instance name will be passed as a variable during service configuration.
- ISIS interfaces: The ISIS instance should be enabled for at least one interface. These interfaces will be enabled for Transport Independent Loop Free Alternative (TI-LFA) during service configuration.
- Loopback interface: At least one loopback interface is required for Segment Routing configuration and should already be configured.

SP Validated Core service models are platform independent. They should work on all the platforms that run IOS XR version 6.5.1 and above.

Validation

The following versions were validated:

- **IOS XR Version:** 6.5.1 or above
- **Router Hardware:** NCS 5500
- **NSO Version:** 4.6 or above
- **NED:** All services use a Netconf NED named prouter-ned. This is part of the packages in the repository. The NED version 1.0.
- **NSO Packages:** There are six packages: sr, sr-ms, ti-lfa, disable-ldp, prouter-ned and resource-manager.

```
admin@ncs> show packages package oper-status up
NAME                       UP
-------------------------------------
disable-ldp                X
prouter-ned                X
resource-manager           X
sr                         X
sr-ms                      X
ti-fla                     X
```

Technical Details

Migration Steps

Migration from an existing LDP/RSVP network is done as a series of small steps. Each step has a corresponding package and should be configured in the order described below. For more details on how to validate the state of the network after each package is executed, see the Design Guide.

1. **SR** : This service enables the devices for Segment Routing and assigns a prefix-sid.
2. **TI-LFA** (Topology Independent – Loop Free Alternative) : This step enables TI-LFA on the interfaces defined under the IGP instance.
3. **SR-MS** (Segment Routing – Mapping Server): This service enables a Segment Routing Mapping Server, which enables LDP to SR co-existency by mapping LDP labels to SR labels
4. **Disable-ldp** (Label Distribution Protocol): When SR is fully operational in the core, LDP can be disabled on selected interfaces to enable SR-based Forwarding

SR-Infrastructure

Customers migrating a region of their network to Segment Routing will often want to configure devices in a common way with the same the ISIS instance name, loopback interface and block of labels reserved for Segment Routing (SRGB). To save the user from entering those details multiple times and prevent inconsistencies across the network, the sr-infrastructure resource can be configured. Other services can refer back to the defined sr-infrastructure.

SR-infrastlucture Model

```
module: infrastructure
    +--rw sr-infrastructure!
       +--rw sr-global-block-pools* [name]
       |  +--rw name    -> /ralloc:resource-pools/idalloc:id-pool/name
       +--rw instance-name?           string
             +--rw loopback?                uint32
```

SR-Infrastructure Example 1

In the following example, an sr-infrastructure is created with a global block of SR labels from 16000 to 23999 for ISIS instance “CORE”, and the Loopback0 interface. The sr-pool and sr-infrastructure configurations are internal to NSO: they are not applied to a device unless referenced by another service.

Configuration of the sr-pool and sr-infrastructure in NSO

```
admin@ncs% set resource-pools id-pool sr-pool range start 16000 end 23999
admin@ncs% set sr-infrastructure instance-name CORE loopback 0 sr-global-block-pools sr-
pool
admin@ncs% commit
```

SR

The sr service enables Segment Routing under the ISIS instance and assigns a prefix SID. The sr service can use the ISIS instance-name, loopback and global block defined in sr-infrastructure or specify each value manually. The prefix SID can be manually assigned or auto-assigned. If auto-assignment is used, NSO will select an unused SID from the defined global block in sr-infrastructure, thus ensuring that the prefix SID is unique across the domain.

SR Model

module: sr

```
 augment /ncs:services:
       +--rw sr* [name]
      +--rw name                        string
       +--rw router* [device-name]
          +--rw device-name            -> /ncs:devices/device/name
          +--rw prefix-preference
          |  +--rw (prefix-choice)?
          |     +--:(auto-assign-prefix-sid)
          |     |  +--rw auto-assign-prefix-sid?   empty
          |     +--:(assign-prefix-sid)
          |        +--rw assign-prefix-sid?        uint16
          +--rw instance-preference
             +--rw (instance-choice)?
                +--:(use-sr-infrastructure)
                |  +--rw use-sr-infrastructure?   empty
                +--:(custom-instance)
                   +--rw custom-instance
                      +--rw instance-name?   string
                      +--rw loopback?        uint32
```

SR Example 1: Auto-Assign Prefix SID

In the following scenario; we are asking NSO to configure Router P-0 and P-2. As part of the configuration NSO will auto assign a prefix sid as indicated in the model configuration prefix-preference “auto-assign-prefix-sid”. NSO uses a resource allocator to pick IDs from a pool. These pool is already defined in the sr-infrastructure model. If no pool is assigned, NSO will result into error. Whenever this option auto-assign-prefix-sid is selected NSO will pick up next available ID from the pool until the pool is exhausted.

SR Example 1 Configuration

```
services {
+    sr ACME-west {
+        router P-0 {
+            prefix-preference {
+                auto-assign-prefix-sid;
+            }
+            instance-preference {
+                use-sr-infrastructure;
+            }
+        }
+        router P-2 {
+            prefix-preference {
+                auto-assign-prefix-sid;
+            }
+            instance-preference {
+                use-sr-infrastructure;
+            }
+        }
}
```

SR Example 1 Template

```
<config-template xmlns="http://tail-f.com/ns/config/1.0">
  <devices xmlns="http://tail-f.com/ns/ncs">
    <device>
      <name>{$DEVICENAME}</name>
      <config>
        <isis xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-clns-isis-cfg">
          <instances>
            <instance>
              <instance-name>{$INSTANCE-NAME}</instance-name>
                <srgb>
                  <lower-bound>{$SRGB-START}</lower-bound>
                  <upper-bound>{$SRGB-END}</upper-bound>
                </srgb>
                <afs>
                 <af>
                  <af-name>ipv4</af-name>
                  <saf-name>unicast</saf-name>
                  <af-data>
                    <segment-routing>
                      <mpls>ldp</mpls>
                    </segment-routing>
                    <mpls>
                      <router-id>
                        <interface-name>Loopback{$LOOPBACK}</interface-name>
                      </router-id>
                      <level>
                        <level2>true</level2>
                      </level>
                    </mpls>
                  </af-data>
                </af>
                </afs>
                <interfaces>
                  <interface>
                    <interface-name>Loopback{$LOOPBACK}</interface-name>
                    <interface-afs>
                      <interface-af>
                        <af-name>ipv4</af-name>
                        <saf-name>unicast</saf-name>
                        <interface-af-data>
                          <prefix-sid>
                            <type>absolute</type>
                            <value>{$PREFIX-SID}</value>
                            <php>enable</php>
                            <explicit-null>disable</explicit-null>
                            <nflag-clear>disable</nflag-clear>
                          </prefix-sid>
                        </interface-af-data>
                      </interface-af>
                    </interface-afs>
                    <running/>
                  </interface>
                </interfaces>
                <running/>
            </instance>
          </instances>
        </isis>
      </config></device></devices></config-template>
```

Template variables

Variable name	Value
$INSTANCE_NAME	SR-INFRASTRUCTURE INSTANCE-NAME OR USER DEFINED
$SRGB-START	SR-INFRASTRUCTURE RESOURCE POOL START RANGE VALUE
$SRGB-END	SR-INFRASTRUCTURE RESOURCE POOL END RANGE VALUE
$LOOPBACK	LOOPBACK ID
$PREFIX-SID	NSO ALLOCATED OR USER PROVIDED

SR Example 2: Manual Assignment of Prefix SID

In the following scenario, the sr service is configured using the instance-name and loopback defined in sr-infrastructure but with a manually assigned prefix SID. In this case NSO will not auto assign prefix SID from a pool. The onus in on the user to ensure that NSO has not previously assigned that SID.

SR Example 2 Configuration

```
services {
+    sr ACME-west {
+        router P-4 {
+            prefix-preference {
+                assign-prefix-sid 22004;
+            }
+            instance-preference {
+                use-sr-infrastructure;
+            }
+        }
+    }
 }
```

SR Example 2 Device Modifications

The following output shows the modifications made as a result of apply the configurations above.

```
admin@ncs% request services sr ACME-west get-modifications
cli {
  local-node {
    data  devices {
```

```
  device P-0 {
    config {
      clns-isis-cfg:isis {
        instances {
          instance CORE {
+           srgb {

+             lower-bound 16000;
+             upper-bound 23999;
+           }
            afs {
+             af ipv4 unicast {
+               af-data {
+                 segment-routing {
+                   prefix-sid-map {
+                     advertise-local;
+                   }
+                   mpls ldp;
+                 }
+                 mpls {
+                   router-id {
+                     interface-name Loopback0;
+                   }
+                   level {
+                     level2 true;
+                   }
+                 }
+               }
+             }
            }
            interfaces {
              interface Loopback0 {
            interface-afs {
+                 interface-af ipv4 unicast {
+                   interface-af-data {
+                     prefix-sid {
+                       type absolute;
+                       value 16000;
+                       php enable;
+                       explicit-null disable;
+                       nflag-clear disable;
+                     }
+                   }
+                  }
                 }
+                running;
               }
             }
+            running;
          }
        }
      }
    }
  }
   device P-2 {
    config {
      clns-isis-cfg:isis {
        instances {
+          instance CORE {
+            srgb {
+              lower-bound 16000;
+              upper-bound 23999;
+            }
+            afs {
+              af ipv4 unicast {
+                af-data {
+                  segment-routing {
+                    prefix-sid-map {
+                      advertise-local;
+                    }
+                    mpls ldp;
+                  }

+                  mpls {
+                    router-id {
+                      interface-name Loopback0;
+                    }
+                    level {
+                      level2 true;
+                    }
+                  }
+                }
+              }
+            }
+            interfaces {
+              interface Loopback0 {
```

```
+                        interface-afs {
+                           interface-af ipv4 unicast {
+                              interface-af-data {
+                                 prefix-sid {
+                                    type absolute;
+                                    value 16001;
+                                    php enable;
+                                    explicit-null disable;
+                                    nflag-clear disable;
+                                 }
+                              }
+                           }
+                        }
+                        running;
+                     }
+                  }
+                  running;
    device P-4 {
      config {
         clns-isis-cfg:isis {
            instances {
+               instance CORE {
 +                  srgb {
+                     lower-bound 16000;
 +                     upper-bound 23999;
+                  }
+                  afs {
+                     af ipv4 unicast {
+                        af-data {
+                           segment-routing {
+                              prefix-sid-map {
+                                 advertise-local;
+                              }
+                              mpls ldp;
+                           }
+                           mpls {
+                              router-id {
+                                 interface-name Loopback0;
+                              }
+                              level {
+                                 level2 true;
+                              }
+                           }
+                                 }
+                             }
+                         }
+                         interfaces {
+                             interface Loopback0 {
+                                 interface-afs {
+                                     interface-af ipv4 unicast {
+                                         interface-af-data {
+                                             prefix-sid {
+                                                         type absolute;
+                                                 value 22004;
+                                                 php enable;
+                                                 explicit-null disable;
+                                                 nflag-clear disable;
+                                             }
+                                         }
+                                     }
+                                 }
+                                 running;
+                             }
+                         }
+                         running;
+                     }
                 }
             }
         }
     }
 }
 resource-pools {
     id-pool sr-pool {
+         allocation ACME-west-P-0 {
+             username admin;
+             allocating-service /services/sr:sr[name='ACME-west'];
+             request {
+                 sync false;
+             }
+         }
+         allocation ACME-west-P-2 {
+             username admin;
+             allocating-service /services/sr:sr[name='ACME-west'];
+             request {
+                 sync false;
+             }
+     }

 +     allocation ACME-west-P-3 {
+         username admin;
+         allocating-service /services/sr:sr[name='ACME-west'];
+         request {
+             sync false;
```

SR Example 3: Manual Configuration of Instance-name and Loopback

In this scenario, two more routers are added to the service. Each of the routers shares a different instance-name and loopback that is different from one defined in the SR-infrastructure. In addition, the user wishes to let NSO assign a prefix-sid on one of the Routers while on the other Router, the user wants to self assign a prefix sid. NSO will only assign one id as requested, for the other router NSO will just take the user input and assign to the router.

SR Example 3 Configuration

```
admin@ncs% show | compare
 services {
+    sr ACME-west {
+        router P-1 {
+            prefix-preference {
+                assign-prefix-sid 22001;
+            }
+            instance-preference {
+                custom-instance {
+                    instance-name foobar;
+                    loopback 1;
+                }
+            }
+        router P-3 {
+            prefix-preference {
+                auto-assign-prefix-sid;
+            }
+            instance-preference {
+                custom-instance {
+                    instance-name westzone;
+                    loopback 1;
+                }
+            }
+        }
}
```

SR Example 3 Device Modifications

```
admin@ncs% request services sr ACME-west get-modifications
cli {
   local-node {
      data  devices {
```

```
device P-1 {
         config {
            clns-isis-cfg:isis {
               instances {
   +               instance foobar {
   +                  srgb {
   +                     lower-bound 16000;
   +                     upper-bound 23999;
   +                  }
   +                  afs {
   +                     af ipv4 unicast {
   +                        af-data {
   +                           segment-routing {
   +                              prefix-sid-map {
   +                                 advertise-local;
   +                              }
   +                              mpls ldp;
   +                           }
   +                           mpls {
   +                              router-id {
   +                                 interface-name Loopback1;
   +                              }
   +                              level {
   +                                 level2 true;
   +                              }
   +                           }
   +                        }
   +                     }
   +                  }
   +                  interfaces {
   +                     interface Loopback1 {
   +                        interface-afs {
   +                           interface-af ipv4 unicast {
   +                              interface-af-data {
   +                                 prefix-sid {
   +                                    type absolute;
   +                                    value 22001;
   +                                    php enable;
   +                                    explicit-null disable;
   +                                    nflag-clear disable;
   +                                 }
   +                              }
   +                           }
+               }
+               running;
+             }
+           }
+           running;
+         }
        }
      }
    }
  }
   device P-3 {
    config {
      clns-isis-cfg:isis {
        instances {
+         instance westzone {
+           afs {
+             af ipv4 unicast {
+               af-data {
+                 segment-routing {
+                   prefix-sid-map {
+                     advertise-local;
+                   }
+                   mpls ldp;
+                 }
+                 mpls {
+                   router-id {
+                     interface-name Loopback1;
+                   }

 +                   level {

+                     level2 true;
+                   }
+                 }
+               }
+             }
+           }
+           interfaces {
+             interface Loopback1 {
+               interface-afs {
+                 interface-af ipv4 unicast {
+                   interface-af-data {
+                     prefix-sid {
```

```
           +                        type absolute;
           +                        value 16002;
           +                        php enable;
           +                        explicit-null disable;
           +                        nflag-clear disable;
           +                      }
           +                    }
           +                  }
           +                }
           +                running;

      resource-pools {
          id-pool sr-pool {

           +      allocation ACME-west-P-3 {
           +        username admin;
           +        allocating-service /services/sr:sr[name='ACME-west'];
           +        request {
           +          sync false;
           +        }
           +      }
              }
            }

        }
      }
```

TI-LFA

The TI-LFA model provides two alternatives to configure TI-LFA. One is to allow user to cherry pick interfaces of the device on which TI-FLA needs to be configured, the other is to configure all non-loopback interfaces under the IGP.

TI-LFA Model

```
module: ti-lfa
  augment /ncs:services:
    +--rw ti-lfa* [name]+--rw address-family?         string
       +--rw router* [device-name]
        +--rw device-name              -> /ncs:devices/device/name
        +--rw instance-name-preference
        |  +--rw (instance-name-choice)?
        |     +--:(use-sr-infrastructure)
```

```
      |     |  +--rw use-sr-infrastructure?   empty
      |     +--:(custom-instance)
      |        +--rw custom-instance
      |           +--rw instance-name?   string
      +--rw interface-preference
         +--rw (interfaces)?
              +--:(all-interfaces)
              |  +--rw all-interfaces?     empty
              +--:(select-interface)
             +--rw select-interface* [interface-type interface-id]
                +--rw interface-type    int-type
                +--rw interface-id      int-id
```

TI-LFA Example 1: Custom ISIS Instance-Name, All Interfaces

In the following example, NSO uses a custom ISIS instance-name (i.e. not from sr-infrastructure) and configures TI-LFA on all the non-loopback interfaces already present under that instance.

TI-LFA Example 1 Configuration

```
services {
+     ti-lfa ACME {
+          address-family ipv6;
+          router P-0 {
+               instance-name-preference {
+                    custom-instance {
+                         instance-name CORE;
+                    }
+               }
+               interface-preference {
+                    all-interfaces;
+               }
+          }
+     }
  }
```

TI-LFA Example 1 Template

```
<config-template xmlns="http://tail-f.com/ns/config/1.0">
  <devices xmlns="http://tail-f.com/ns/ncs">
    <device>
      <name>{$DEVICE}</name>
      <config>
        <isis xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-clns-isis-cfg">
          <instances>
            <instance>
              <instance-name>{$INSTANCE-NAME}</instance-name>
              <interfaces>
                <interface>
                  <interface-name>{$INTERFACE-NAME}{$INTERFACE-ID}</interface-name>
                  <interface-afs>
```

```
                    <interface-af>
                      <af-name>{$ADDRESS-FAMILY}</af-name>
                      <saf-name>unicast</saf-name>
                      <interface-af-data>
                        <interface-frr-table>
                          <frrtilfa-types>
                            <frrtilfa-type>
                              <level>not-set</level>
                            </frrtilfa-type>
                          </frrtilfa-types>
                          <frr-types>
                            <frr-type>
                              <level>not-set</level>
                              <type>per-prefix</type>
                            </frr-type>
                          </frr-types>
                        </interface-frr-table>
                      </interface-af-data>
                    </interface-af>
                  </interface-afs>
                  <running/>
                </interface>
              </interfaces>
              <running/>
            </instance>
          </instances>
        </isis>
      </config>
    </device>
  </devices>
</config-template>
```

Template Variables

TEMPLATE VARIABLE	VALUE
$INSTANCE-NAME	SR-INFRASTRUCUTRE OR USER PROVIDED
$INTERFACE-NAME	USER PROVIDER OR NSO FINDS IT QUERYING DEVICE
$INTERFACE-ID	USER PROVIDED OR NSO FINDS IT QUERYING DEVICE
ADDRESS-FAMILY	IPV4 OR IPV6

TI-LFA Example 1 Device Modifications

```
admin@ncs% request services ti-lfa ACME get-modifications
cli {
  local-node {
    data  devices {
          device P-0 {
            config {
              clns-isis-cfg:isis {
                instances {
                  instance CORE {
                    interfaces {
                      interface Bundle-Ether511 {
                        interface-afs {
```

```
+                            interface-af ipv6 unicast {
+                               interface-af-data {
+                                  interface-frr-table {
+                                     frr-types {
+                                        frr-type not-set {
+                                           type per-prefix;
+                                        }
+                                     }
+                                     frrtilfa-types {
+                                        frrtilfa-type not-set;
+                                     }
+                                  }
+                               }
+                            }
                          }
+                          running;
                       }
                       interface TenGigabitEthernet2/1/1 {
                          interface-afs {
+                            interface-af ipv6 unicast {
+                               interface-af-data {
+                                  interface-frr-table {
+                                     frr-types {
+                                        frr-type not-set {
+                                           type per-prefix;
+                                        }
+                                     }
+                                     frrtilfa-types {
+                                        frrtilfa-type not-set;
+                                     }
+                                  }
+                               }
+                            }
                          }
+                          running;
                       }
                       interface TenGigabitEthernet2/1/2 {
                          interface-afs {
+                            interface-af ipv6 unicast {
+                               interface-af-data {
+                                  interface-frr-table {
+                                     frr-types {
+                                        frr-type not-set {
```

```
+                            type per-prefix;
+                          }
+                        }
+                        frrtilfa-types {
+                          frrtilfa-type not-set;
+                        }
+                      }
+                    }
+                  }
                 }
+                 running;
               }
             }
+             running;
           }
```

TI-LFA Example 2: Common instance-name with specific interfaces

The following example uses an instance name defined in the sr-infrastructure and cherry picks a few interfaces to be configured that are part of the instance-name.

TI-LFA Example 2 Configuration

```
admin@ncs% show | compare
 services {
+    ti-lfa ACME {
+        address-family ipv4;
+        router P-0 {
+            instance-name-preference {
+                use-sr-infrastructure;
+            }
+            interface-preference {
+                select-interface Bundle-Ether 611;
+                select-interface Bundle-Ether 711;
+                select-interface Bundle-Ether 811;
+            }
+        }
+    }
 }
```

TI-LFA Example 2 Device Modifications

```
admin@ncs% request services ti-lfa ACME get-modifications
cli {
  local-node {
    data  devices {
```

```
   device P-0 {
      config {
         clns-isis-cfg:isis {
            instances {
               instance CORE {
                  interfaces {
                     interface Bundle-Ether611 {
                        interface-afs {
+                          interface-af ipv4 unicast {
+                             interface-af-data {
+                                interface-frr-table {
+                                   frr-types {
+                                      frr-type not-set {
+                                         type per-prefix;
+                                      }
+                                   }
+                                   frrtilfa-types {
+                                      frrtilfa-type not-set;
+                                   }
+                                }
+                             }
+                          }
                        }
+                       running;
                     }
                     interface Bundle-Ether711 {
                        interface-afs {
+                          interface-af ipv4 unicast {
+                             interface-af-data {
+                                interface-frr-table {
+                                   frr-types {
+                                      frr-type not-set {
+                                         type per-prefix;
 +                                     }
+                                   }
+                                   frrtilfa-types {
+                                      frrtilfa-type not-set;
+                                   }
+                                }
+                             }
+                          }
                        }
+                       running;
```

```
                    }
                    interface Bundle-Ether811 {
                       interface-afs {
+                         interface-af ipv4 unicast {
+                            interface-af-data {
+                               interface-frr-table {
+                                  frr-types {
+                                     frr-type not-set {
+                                        type per-prefix;
+                                     }
+                                  }
+                                  frrtilfa-types {
+                                     frrtilfa-type not-set;
+                                  }
+                               }
+                            }
+                         }
                       }
```

Segment Routing Mapping Server

SR-MS Model

```
module: sr-ms
   augment /ncs:services:
    +--rw sr-ms* [name]
      +--rw name                        string
      +--rw address-family?             string
      +--rw ipv4-address?               inet:ipv4-address
      +--rw prefix-length?              uint16
      +--rw first-sid-value?            uint32
      +--rw number-of-allocated-sids?   uint32
      +--rw router* [device-name]
         +--rw device-name    -> /ncs:devices/device/name
```

The above model takes in various input parameters from user and does template replacement. o NSO specific logic is done.

SR-MS Example 1

Configuration

```
services {
+    sr-ms ACME {
+        address-family ipv4;
+        ipv4-address 192.168.10.1;
+        prefix-length 24;
+        first-sid-value 16001;
+        number-of-allocated-sids 80;
+          router P-0;
+     }
 }
```

SR-MS Example 1 Template

```
<config-template xmlns="http://tail-f.com/ns/config/1.0"
         servicepoint="sr-ms">
 <devices xmlns="http://tail-f.com/ns/ncs">
  <device>
   <name>{/router/device-name}</name>
    <config>
    <sr xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-segment-routing-ms-cfg">
     <mappings>
      <mapping>
       <af>{/address-family}</af>
       <ip>{/ipv4-address}</ip>
       <mask>{/prefix-length}</mask>
       <sid-start>{/first-sid-value}</sid-start>
       <sid-range>{/number-of-allocated-sids}</sid-range>
      </mapping>
     </mappings>
     <enable/>
    </sr>
    </config>
  </device>
 </devices>
</config-template>
```

SR-MS Example 1 Template Variables

TEMPLATE VARIABLE	VALUE
DEVICE-NAME	USER PROVIDED
ADDRESS-FAMILY	USER PROVIDED ipv4 or ipv6
IPV4-ADDRESS	USER PROVIDED
PREFIX-LENGTH	USER PROVIDED
FIRST SID VALUE	USER PROVIDED
NUMBER OF ALLOCATED-SIDS	USER PROVIDED

SR-MS Example 1 Device Modifications

```
admin@ncs% request services sr-ms ACME get-modifications
cli {
   local-node {
      data  devices {
              device P-0 {
                 config {
```

```
          segment-routing-ms-cfg:sr {
            mappings {
    +         mapping ipv4 192.168.10.1 24 {
    +           sid-start 16001;
    +           sid-range 80;
    +         }
            }
    +        enable;
          }
        }
      }
    }
  }
}
```