Multi-Instances Configuration Issues in NETCONF and YANG Models (draft-liu-netconf-multi-instances-00)

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The Scenarios of Multi-Instances

- Multiple Network Element Instance (MNEI)
  - ✓LS: Logic System
  - ✓VS: Virtual System
  - ✓.etc
- Multiple Service Instances (MSI)
  - ✓VRF (Virtual Routing and Forwarding)
  - ✓IGP Multiple process
  - ✓.etc

How to manage the MNEI?

- Management Scenarios
  - ✓ Independent Management
    - Normally, One MNEI is one NE, has one session with NMS.
    - However, MNEI will share main device session in initialing or failure handling scenario.
  - ✓ Central Management
    - The MNEIs as a whole network element, Share one session.
    - NMS need configure the each each instance independently.

- The issue: NETCONF cannot configure multiple agents within one session.
  - ✓ Solution Option 1: NETCONF Context extension (Similar with SNMP).

```
<rpc message-id="101" context="LS=LS1;VS=VS2"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  ......
</rpc>
```

  - ✓ Solution Option 2: explicitly define the semantics of instance ID (e.g. LSID and VSID)

```
<rpc message-id="101" LS="LS1" VS="VS2"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  ......
</rpc>
```

How to design the models to support MSI?

- MSI Use Case Example:
  - ✓OSPF/ISIS can be deployed in the public network as a single IGP process (instance).
  - ✓OSPF/ISIS can also be deployed under multiple VRF instances as different IGP processes (instances) to connect the PE and CE devices.

How to design the models to support MSI?

- ✓ Option 1: define keys in module (e.g. define the VRF-name key in OSPF module)

```
augment "/rt:routing/rt:routing-instance/rt:routin
      + "rt:routing-protocol" {
  list ospf-router {

    description
      "This is a top-level container for the OSPF

    when "./type=ospf";

    key "version name";
    leaf version {
      description
        "OSPF version.";
      type uint8 {
        range "2..3";
      }
    }

    leaf name {
      description
        "Name, combined with
         ospf_router/ospf-vrfs/ospf-vrf/name,
         identify an OSPF protocol instance.";
      type string;
    }
```

- ✓ Option 2: directly use one module in another (e.g. use ietf-routing module in a newly defined module, say, L3VPN)

```
import ietf-routing {
      prefix "rt";
    }
......
augment "/mpls/l3vpn" {
      list l3vpn {

        description
          "l3vpn yang model";

......
```

use-module ietf-routing

Next Steps

- Confirm the problems in the WG
- Collect more scenarios, try to make clear their relationships
- May consider to separate current draft
  - One for NETCONF
    - ✓ discuss NETCONF relevant problems (mostly regarding to MNEI)
    - ✓ discuss solutions in detail
  - One for NETMOD
    - ✓ discuss YANG relevant problems (mostly regarding to MSI)
    - ✓ discuss solutions in detail

Comments?
Thank you!

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