YANG Mode for Scheduled Attributes

draft-united-tvr-schedule-yang

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A Merge of the two YANG models from IETF !!7

- draft-qu-tvr-schedule-yang-00 - YANG Model for Scheduled Attributes (ietf.org)
- draft-kinzie-tvr-link-availability-00 - A YANG Data Model for Time Variant Link Availability (ietf.org)

- Merged based on the WG feedback

Design of the Model

- TVR Schedule Definitions

  Module ietf-tvr-schedule.yang contains schedule definitions that can be used by other modules.

- TVR Node YANG Module

  Module ietf-tvr-node.yang is a device model and designed to manage a single node with scheduled attributes.

- TVR Topology YANG Module

  Module ietf-tvr-topology.yang describes a network topology with a time-variant availability schedule.

Module ietf-tvr-schedule.yang – Grouping schedule

```
grouping schedule:
  +-- start-date-time?       yang:date-and-time
  +-- (end-time)?
  |  +--:(infinite)
  |  |  +-- no-end-time?     empty
  |  +--:(duration)
  |  |  +-- duration?        uint32
  |  +--:(end-date-time)
  |     +-- end-date-time?   yang:date-and-time
  +-- recurrence?            recurrence-type
  +-- value-default
  +-- base-schedule
     +-- intervals* [start-time]
        +-- start-time?   yang:timeticks
        +-- end-time?     yang:timeticks
        +-- value
```

"recurrence" specifies the repetition pattern of the "base- schedule", such as daily or weekly.

```
container value {
  description
   "Attribute value(s). This container should be augmented
   with attributes that apply to the current interval.";
}
```

Module ietf-tvr-node.yang

- Module ietf-tvr-node.yang is a device model and designed to manage a single node with scheduled attributes.

```
container node-schedule {
  description
    "This container defined time variant attributes
     for node's schedule.";

  leaf router-id {
    type yang:dotted-quad;
    description
      "A 32-bit number used to identify a router.";
  }

  list power-schedule {
    key "start-date-time";
    description
      "Power schedule for the node. The node's power is
       represented by a boolean value with 'true' indicating
       the node is powered on and 'false' indicating the node
       is powered off.";
    uses tvr-schd:schedule {
      augment value-default {
        description
          "Augment the default power state.";
        leaf default-power {
          type boolean;
          default false;
          description
            "This indicates the default node power when for
             time periods when no interval is defined. If
             unspecified, the node is powered down by default.";
        }
      }
      augment base-schedule/intervals/value {
        description
          "Augmment the scheduled power state.";
        leaf power {
          type boolean;
          description
            "Indicates whether the node is powered on.";
        }
      }
    }
  }
```

Module ietf-tvr-topology.yang

- Module ietf-tvr-topology.yang describes a network topology with a time-variant availability schedule.
- The module has a list of nodes, identified by a unique "node-id". Each node has a list of links.

```
module: ietf-tvr-topology
  +--rw topology-schedule
     +--rw nodes* [node-id]
     |  +--rw node-id      inet:uri
     |  +--rw available* [start-date-time]
     |     ...
     +--rw links* [source-node source-link-id]
        +--rw source-node          inet:uri
        +--rw destination-node?    inet:uri
        +--rw source-link-id       string
        +--rw available* [start-date-time]
           +  ...
           +--rw bandwidth
                ...
           +--rw delay
                ...
```

Not augmenting the IETF logical network element model [RFC8530]!

Example: Add a scheduled cost to OSPF interface

```
augment "/rt:routing/rt:control-plane-protocols/"
  + "rt:control-plane-protocol/ospf:ospf/ospf:areas/ospf:area/"
  + "ospf:interfaces/ospf:interface" {
  list scheduled-cost {
    key "start-date-time";
    description
      "Augment OSPF interface with a scheduled interface cost.";
    uses tvr-schd:schedule {
      augment base-schedule/intervals/value {
        leaf cost {
          type uint32;
          description
           "interface cost";
        }
      }
    }
  }
}
```

Example augmentation in Appendix. How the protocol should handle this augmentation needs to be defined by the protocol, which is out of scope for this draft.

Discussion Points

- draft-ietf-opsawg-ucl-acl also defines a schedule. A meeting is scheduled to work with the authors about possible collaboration.
- Current TVR YANG modules are not augmenting existing IETF modules (e.g., ietf-te-topology.yang [RFC8795]) to avoid implementation/deployment dependencies.

Next Steps

- Reviews and comments are welcome
- Is this ready for WG adoption?

THANKS!