YANG Mode for Scheduled Attributes

draft-qu-tvr-schedule-yang

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The goal of this model

- To specify an attribute that changes on a recurring schedule
- To be used to augment existing YANG models, applicable to both IP and BP (Bundle Protocol) stacks.
- NOT protocol extensions
Grouping – schedule

"always" means the schedule is always valid and will be effective right after the configuration.

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

The "recurrence" defines the duration of each "base-schedule", so the configured "intervals" should be within this duration.
Augmentation – Interfaces

```
augment "/if:interfaces/if:interface" {
  description
  "Augments interface with scheduled attribute.";
  container scheduled-up-down {
    description
    "Scheduled interface up and down. This is to work with the
    leaf 'enabled' for the configured state of the interface.";

    uses schedule;
  }
}
```

The interfaces defined in the ietf-interface model [RFC8343] is augmented with a scheduled interface up and down.
Augmentation – Logical Network Element

```xml
augment "/*/lne:logical-network-elements"
  + "/*/lne:logical-network-element" {
    description
    "Augments logical network elements with scheduled power shutdown."
    container scheduled-power {
      description
      "Scheduled power up and down."
      uses schedule;
    }
  }
```

The IETF logical network element model [RFC8530] is augmented with a scheduled power shutdown using the grouping "schedule".
Example: OSPF

```
augment "/rt:routing/rt:control-plane-protocols/"
  + "rt:control-plane-protocol/ospf:ospf/ospf:areas/ospf:area/"
  + "ospf:interfaces/ospf:interface" {
    container scheduled-cost {
      description
      "Augment OSPF interface with a scheduled interface cost.";
      uses tvr-schedule:schedule;
    }
  }
```

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

```xml
  <logical-network-element>
    <name>"Router ABC"</name>
    <scheduled-power xmlns="urn:ietf:params:xml:ns:yang:ietf-tvr-schedule">
      <start-date-time>2023-08-12T00:00:00.00Z</start-date-time>
      <end-date-time>2023-08-13T24:00:00.00Z</end-date-time>
      <recurrence>daily</recurrence>
      <value-default>1</value-default>
      <base-schedule>
        <intervals>
          <start-time>360000</start-time>
          <end-time>1800000</end-time>
          <value>0</value>
        </intervals>
        <intervals>
          <start-time>7200000</start-time>
          <end-time>8280000</end-time>
          <value>0</value>
        </intervals>
      </base-schedule>
      </scheduled-power>
  </logical-network-element>
</logical-network-elements>
```
Discussion points

• Ambiguity caused by “recurrence”
  For example, if the recurrence is ‘weekly’, need to define whether week starts on Sunday (Gregorian calendar) or Monday (ISO).

• Months have 28, 29 (leap year), 30, or 31 days. What happens for intervals that fall outside the month? For example, what happens for a day 30 interval in February?

• Similarly for years, what happens for a day 366 interval in a non-leap year?

• What SHOULD happen after the schedule ends?
Next Steps

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

THANKS!