

# YANG Mode for Scheduled Attributes

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[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

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

"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

```
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

```
 1  0      1      0 1  0      1      0 1
+-|-----|-----|-----|-----|-----|-----|-----|-----|
0 1  5      20 23 0 1  5      20 23 24
|          2023/08/12      |          2023/08/13      |
```

```
<logical-network-elements xmlns="urn:ietf:params:xml:ns:yang:
                                ietf-logical-network-element">
  <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!**