

YANG models for ACTN TE Performance Monitoring Telemetry and Network Autonomics

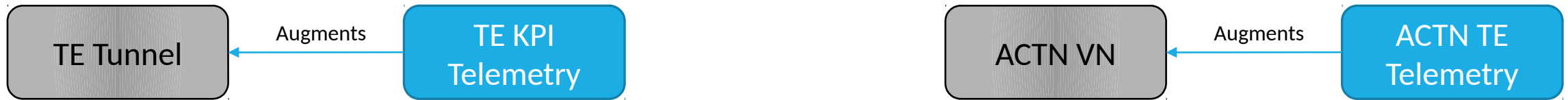
draft-lee-teas-actn-pm-telemetry-autonomics-08

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Overview

- YANG data models that support
 - Performance Monitoring (PM) Telemetry for TE-Tunnels and ACTN VNs:
 - ietf-te-kpi-telemetry
 - ietf-actn-te-kpi-telemetry
 - Network Autonomics for Scaling Intent for TE-tunnels and ACTN VNs.
 - i.e. setting the exact condition when the tunnel or VN should be scaled in/out
 - and the performance parameter on which scaling should be done!

Yang Model Relationships



- TE KPI Telemetry model provides the TE tunnel level performance monitoring.
 - Augment the TE tunnel State with performance attributes
 - Use the notification subscription **(YANG PUSH)**
 - Scaling Intent configurations for auto scaling in/out based on the combination of the performance monitored attributes
- ACTN TE KPI Telemetry model provides the VN level aggregated performance monitoring.
 - Augment the VN state as well as individual VN-member state with performance attributes.
 - Use notification subscription **(YANG PUSH)**
 - Scaling Intent configurations at the VN level to reach to the monitored performance KPI

Example:

(one-way-delay > 50ms) AND (one-way-packet-loss > 1%)

-> Triggers TE Scale In

Status

- Presented in IETF 102 and received good support from the floor.
- The revision imports the grouping defined in the latest **ietf-te-types**, the performance-metric-container grouping (where all one-way and two-way performance-related data for delay are defined such as one-way-min-delay, one-way-max-delay, one-way-delay-variation, two-way-min-delay, two-way-max-delay, two-way-delay-variation)
- STAMP defines much detailed level of delay data, which is not in scope of this draft. Besides, STAMP does not support all b/w related data. This draft imported all B/W related data from the **ietf-routing-types** module (e.g., one-way-residual-bandwidth, one-way-available-bandwidth, one-way-utilized-bandwidth.) and re-use them.
- Besides, what is needed in this draft is "reported" data, not "measured/raw data" (which is the scope of STAMP). The draft is concerned about “concatenated” TE-related data on the level of VN, VN member, or TE tunnel as opposed to the link level.

Changes in the YANG module ietf-te-kpi-telemetry

```
augment "/te:te/te:tunnels/te:tunnel" {
```

```
....
```

```
  container te-telemetry {
```

```
    config false;
```

```
    description
```

```
      "telemetry params";
```

```
    leaf id {
```

```
      type string;
```

```
      description "Id of telemetry param";
```

```
    }
```

```
    uses te-types:performance-metric-container;
```

```
    leaf te-ref{
```

```
      type leafref{ path '/te:te/te:tunnels/te:tunnel/te:name'; }
```

```
      description "Reference to measured te tunnel";
```

```
    }
```

```
  }
```

```
}
```


Re-uses a grouping defined in te-types
for PM data



Changes in the YANG module ietf-actn-te-kpi-telemetry

```
augment "/vn:actn/vn:vn/vn:vn-list" { ....
  container vn-telemetry {
    config false;
    description
      "VN telemetry params";
    uses te-types:performance-metric-container;
    leaf grouping-operation {
      type grouping-operation;
      description "describes the operation to apply to the VN-members";
    }
  }
}
```

Re-uses a grouping defined in te-types
for PM data



ietf-te-kpi-telemetry

```
module: ietf-te-kpi-telemetry
augment /te:te:tunnels/te:tunnel:
+rw te-scaling-intent
| +rw scale-in-intent
| | +rw threshold-time? uint32
| | +rw cooldown-time? uint32
| | +rw scale-in-operation-type? scaling-criteria-operation
| | +rw scale-out-operation-type? scaling-criteria-operation
| | +rw scaling-condition* [performance-type]
| | +rw performance-type identityref
| | +rw te-telemetry-tunnel-ref? -> /te:te:tunnels/tunnel/name
| +rw scale-out-intent
| +rw threshold-time? uint32
| +rw cooldown-time? uint32
| +rw scale-in-operation-type? scaling-criteria-operation
| +rw scale-out-operation-type? scaling-criteria-operation
| +rw scaling-condition* [performance-type]
| +rw performance-type identityref
| +rw te-telemetry-tunnel-ref? -> /te:te:tunnels/tunnel/name
+ro te-telemetry
+ro id? string
+ro performance-metric-one-way
| +ro one-way-delay? uint32
| +ro one-way-min-delay? uint32
| +ro one-way-max-delay? uint32
| +ro one-way-delay-variation? uint32
| +ro one-way-packet-loss? decimal64
| +ro one-way-residual-bandwidth? rt-types:bandwidth-ieee-float32
| +ro one-way-available-bandwidth? rt-types:bandwidth-ieee-float32
| +ro one-way-utilized-bandwidth? rt-types:bandwidth-ieee-float32
+ro performance-metric-two-way
| +ro two-way-delay? uint32
| +ro two-way-min-delay? uint32
| +ro two-way-max-delay? uint32
| +ro two-way-delay-variation? uint32
| +ro two-way-packet-loss? decimal64
+ro te-ref? -> /te:te:tunnels/tunnel/name
```

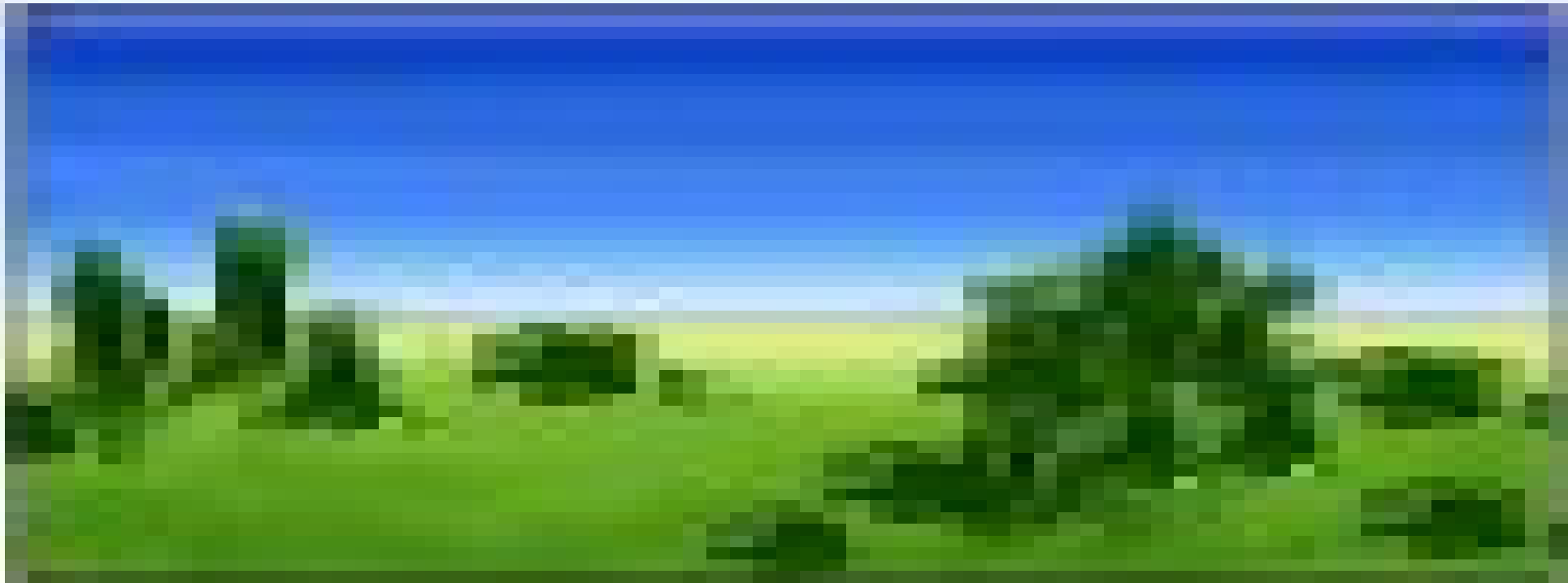
ietf-actn-te-kpi-telemetry

```
module: ietf-actn-te-kpi-telemetry
augment /vn:actn/vn:vn/vn:vn-list:
+rw vn-scaling-intent
| +rw scale-in-intent
| | +rw threshold-time? uint32
| | +rw cooldown-time? uint32
| | +rw scale-in-operation-type? scaling-criteria-operation
| | +rw scale-out-operation-type? scaling-criteria-operation
| | +rw scaling-condition* [performance-type]
| | +rw performance-type identityref
| | +rw te-telemetry-tunnel-ref? -> /te:te:tunnels/tunnel/name
+rw scale-out-intent
+rw threshold-time? uint32
+rw cooldown-time? uint32
+rw scale-in-operation-type? scaling-criteria-operation
+rw scale-out-operation-type? scaling-criteria-operation
+rw scaling-condition* [performance-type]
+rw performance-type identityref
+rw te-telemetry-tunnel-ref? -> /te:te:tunnels/tunnel/name
+ro vn-telemetry
+ro performance-metric-one-way
| +ro one-way-delay? uint32
| +ro one-way-min-delay? uint32
| +ro one-way-max-delay? uint32
| +ro one-way-delay-variation? uint32
| +ro one-way-packet-loss? decimal64
| +ro one-way-residual-bandwidth? rt-types:bandwidth-ieee-float32
| +ro one-way-available-bandwidth? rt-types:bandwidth-ieee-float32
| +ro one-way-utilized-bandwidth? rt-types:bandwidth-ieee-float32
+ro performance-metric-two-way
| +ro two-way-delay? uint32
| +ro two-way-min-delay? uint32
| +ro two-way-max-delay? uint32
| +ro two-way-delay-variation? uint32
| +ro two-way-packet-loss? decimal64
+ro grouping-operation? grouping-operation
augment /vn:actn/vn:vn/vn:vn-list/vn:vn-member-list:
+ro vn-member-telemetry
+ro performance-metric-one-way
| +ro one-way-delay? uint32
| +ro one-way-min-delay? uint32
| +ro one-way-max-delay? uint32
| +ro one-way-delay-variation? uint32
| +ro one-way-packet-loss? decimal64
| +ro one-way-residual-bandwidth? rt-types:bandwidth-ieee-float32
| +ro one-way-available-bandwidth? rt-types:bandwidth-ieee-float32
| +ro one-way-utilized-bandwidth? rt-types:bandwidth-ieee-float32
+ro performance-metric-two-way
| +ro two-way-delay? uint32
| +ro two-way-min-delay? uint32
| +ro two-way-max-delay? uint32
| +ro two-way-delay-variation? uint32
| +ro two-way-packet-loss? decimal64
+ro te-grouped-params* -> /te:te:tunnels/tunnel/te-kpi:te-telemetry/id
+ro grouping-operation? grouping-operation
```

Next Steps

- The authors believe this draft has a good base for WG adoption ^{^^}

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Thanks!