# ACTN/VN Yang Models

draft-ietf-teas-actn-vn-yang-07
draft-ietf-teas-actn-pm-telemetry-autonomics-01
draft-ietf-teas-te-service-mapping-yang-02

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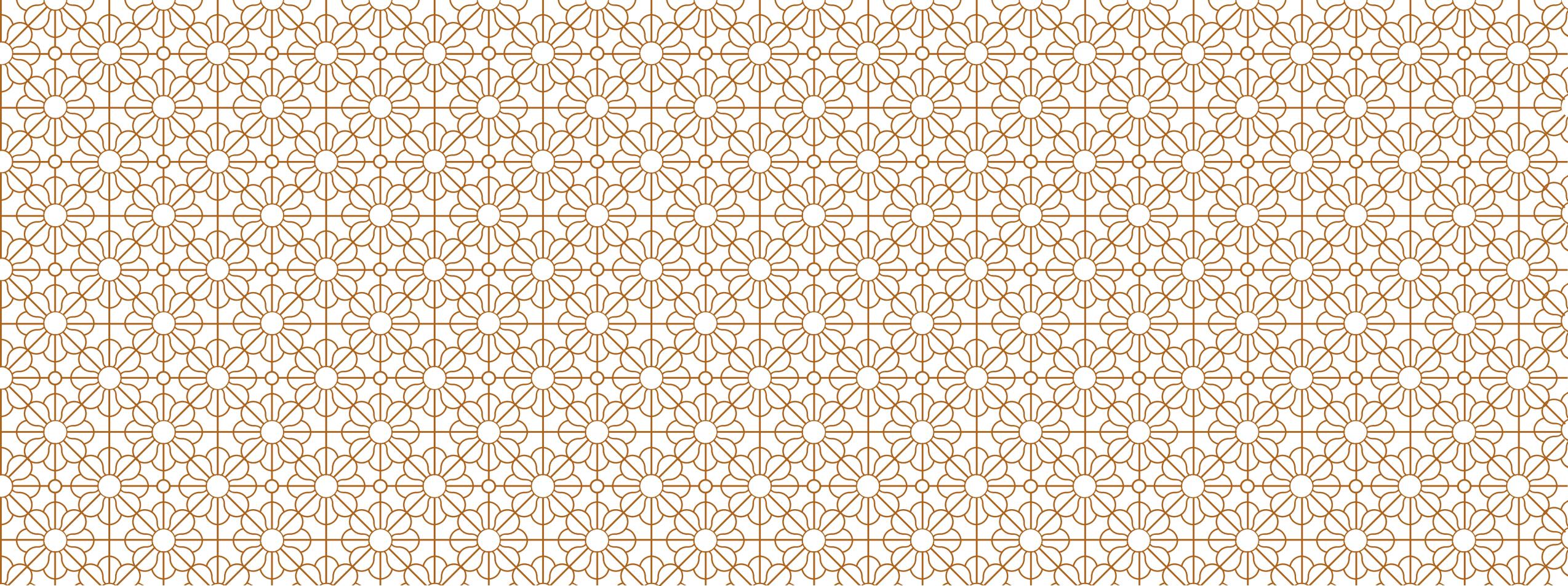# TEAS WG, IETF106 | Singapore

# ACTN / VN YANG MODELS

| VN |
|---|
| • ietf-vn |

| KPI Telemetry |
|---|
| • ietf-te-kpi-telemetry<br>• ietf-vn-kpi-telemetry |

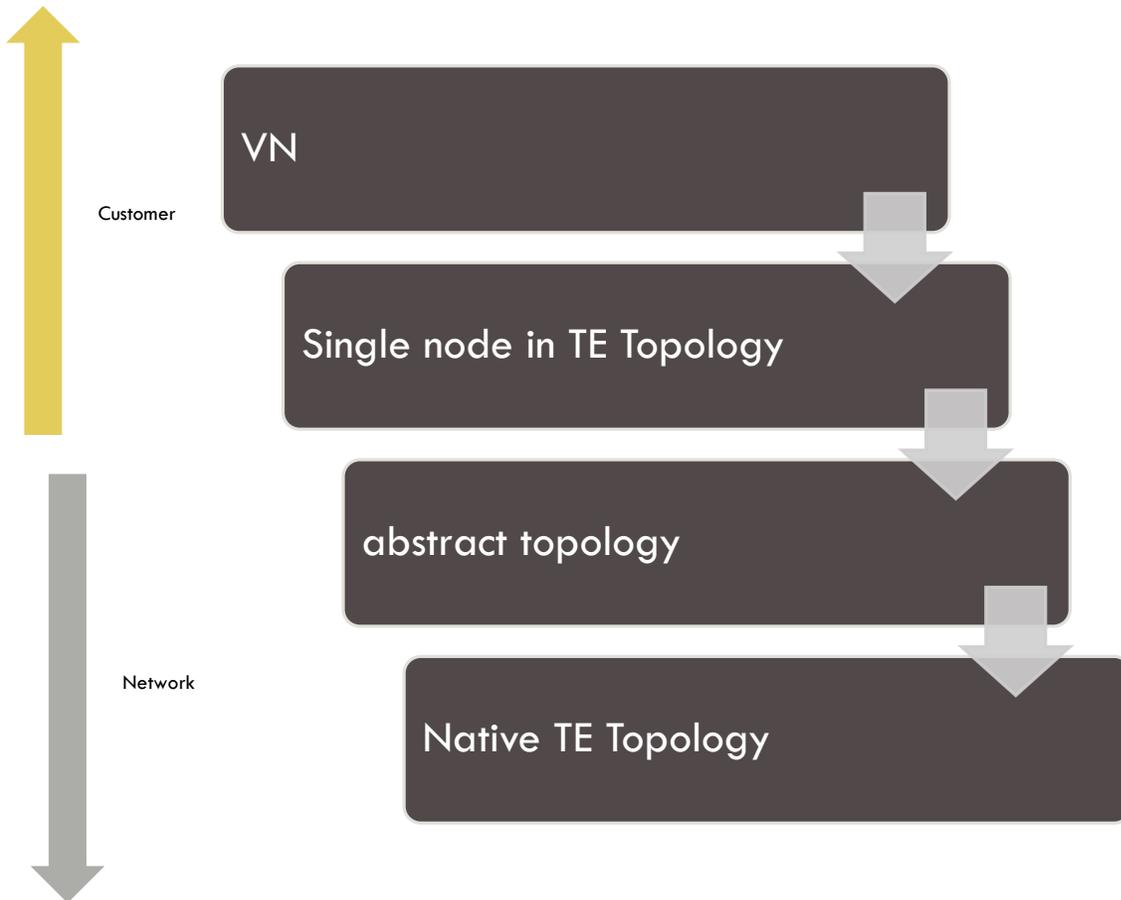| Service Mapping |
|---|
| • ietf-te-service-mapping-types<br>• ietf-l3sm-te-service-mapping<br>• ietf-l2sm-te-service-mapping<br>• ietf-l1csm-te-service-mapping |

Major editorial cleanup included yang formatting, references, style guide changes etc

# VN YANG

draft-ietf-teas-actn-vn-yang-07

# VN YANG

**Customer**

VN

↓

Single node in TE Topology

↓

abstract topology

↓

Native TE Topology

**Network**

Yang model for Virtual Network (VN) operations
- From the point of view of Customer

An abstraction over the TE-Topo and TE-Tunnel
- These models are from the point of view of Network

VN is a higher level of abstraction
- VN model depends tightly on the topology model!
- Use Connectivity Matrices

# VN & AP

- The customer access information may be known at the time of VN creation.
  - A shared logical AP identifier is used between the customer and the operator to identify the access link between CE and PE.
  - This is described in Section 6 of [RFC8453].

- The customer access may not be known at the initial VN creation.
  - The VN operation allow a creation of VN with only PE identifier as well.
  - The customer access information could be added later.
  - The 'ap' container has a leaf for 'pe' node that allows AP to be created with PE information.
  - The vn-member (and vn) could use APs that only have PE information initially.

- Resolves the issue discussed at 105 - Can VN member be set from PE to PE without attaching customer facing access?

# VN & AP

```
module: ietf-vn
  +--rw ap
  |  +--rw access-point-list* [access-point-id]
  |     +--rw access-point-id      uint32
  |     +--rw access-point-name?   string
  |     +--rw pe?
  |     |       -> /nw:networks/network/node/tet:te-node-id
  |     +--rw max-bandwidth?       te-types:te-bandwidth
  |     +--rw avl-bandwidth?       te-types:te-bandwidth
  |     +--rw vn-ap* [vn-ap-id]
  |        +--rw vn-ap-id          uint32
  |        +--rw vn?               -> /vn/vn-list/vn-id
  |        +--rw abstract-node?
  |        |       -> /nw:networks/network/node/tet:te-node-id
  |        +--rw ltp?              leafref
```
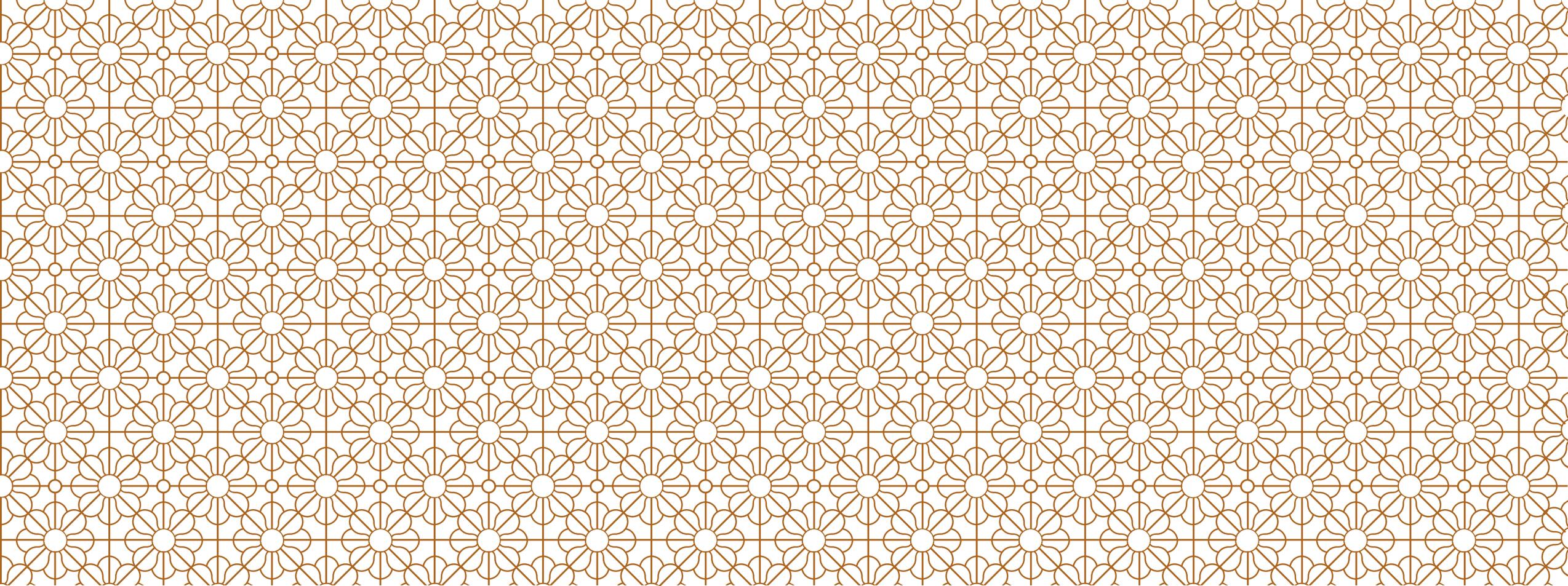
# KPI TELEMETRY YANG

draft-ietf-teas-actn-pm-telemetry-autonomics-01

# YANG MODELS FOR ACTN & TE PM TELEMETRY & NETWORK AUTONOMICS

- YANG data models that support: Performance Monitoring (PM) Telemetry and scaling intent mechanism for TE-Tunnels and VNs to allow customers to subscribe to certain KPI PM.
  - ietf-te-kpi-telemetry
  - ietf-vn-te-kpi-telemetry

- Customer to subscribe and monitor KPI of interest on a particular TE tunnel or a VN.

- Customer could also program autonomic scaling intent

# UPDATE

```
module: ietf-te-kpi-telemetry
  augment /te: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 scaling-condition* [performance-type]
    |  |     +-rw performance-type           identityref
    |  |     +-rw threshold-value?           string
    |  |  ❌-rw te-telemetry-tunnel-ref?
    |  |        -> /te:te/tunnels/tunnel/name
    |  +-rw scale-out-intent
    |     +-rw threshold-time?            uint32
    |     +-rw cooldown-time?             uint32
    |     +-rw scale-out-operation-type?  scaling-criteria-operation
    |     +-rw scaling-condition* [performance-type]
    |        +-rw performance-type           identityref
    |        +-rw threshold-value?           string
    |     ❌-rw te-telemetry-tunnel-ref?
    |           -> /te:te/tunnels/tunnel/name
```

```
module: ietf-te-kpi-telemetry
  augment /te:te/te:tunnels/te:tunnel:
    +--rw te-scaling-intent
    |  +--rw scale-in-intent
    |  |  +--rw threshold-time?     uint32
    |  |  +--rw cooldown-time?      uint32
    |  |  +--rw scaling-condition* [performance-type]
    |  |     +--rw performance-type          identityref
    |  |     +--rw threshold-value?          string
    |  |     +--rw scale-in-operation-type?
    |  |           scaling-criteria-operation
    |  +--rw scale-out-intent
    |     +--rw threshold-time?     uint32
    |     +--rw cooldown-time?      uint32
    |     +--rw scaling-condition* [performance-type]
    |        +--rw performance-type          identityref
    |        +--rw threshold-value?          string
    |        +--rw scale-out-operation-type?
    |              scaling-criteria-operation
```

# UPDATE

- Allowed one to mix "AND" & "OR" for each metric individually!
- No need for reference to tunnel as you are augmenting the same tunnel

```
module: ietf-te-kpi-telemetry
  augment /te: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 scaling-condition* [performance-type]
    |  |     +-rw performance-type          identityref
    |  |     +-rw threshold-value?          string
    |  |  ❌-rw te-telemetry-tunnel-ref?
    |  |        -> /te:te/tunnels/tunnel/name
    |  +-rw scale-out-intent
    |     +-rw threshold-time?              uint32
    |     +-rw cooldown-time?              uint32
    |     +-rw scale-out-operation-type?   scaling-criteria-operation
    |     +-rw scaling-condition* [performance-type]
    |        +-rw performance-type          identityref
    |        +-rw threshold-value?          string
    |     ❌-rw te-telemetry-tunnel-ref?
    |           -> /te:te/tunnels/tunnel/name
```

```
    |  |  +--rw threshold-time?      uint32
    |  |  +--rw cooldown-time?      uint32
    |  |  +--rw scaling-condition* [performance-type]
    |  |     +--rw performance-type         identityref
    |  |     +--rw threshold-value?         string
    |  |     +--rw scale-in-operation-type?
    |  |              scaling-criteria-operation
    |  +--rw scale-out-intent
    |     +--rw threshold-time?      uint32
    |     +--rw cooldown-time?      uint32
    |     +--rw scaling-condition* [performance-type]
    |        +--rw performance-type         identityref
    |        +--rw threshold-value?         string
    |        +--rw scale-out-operation-type?
    |                 scaling-criteria-operation
```

# PENDING COMMENT FROM 105

## Use of percentile or mean [Reference: Stamp Yang]

- Could not find how to use this with TE parameters
- We rely on 'performance-metrics-attributes' as defined in ietf-te-types with definitions in existing RFCs
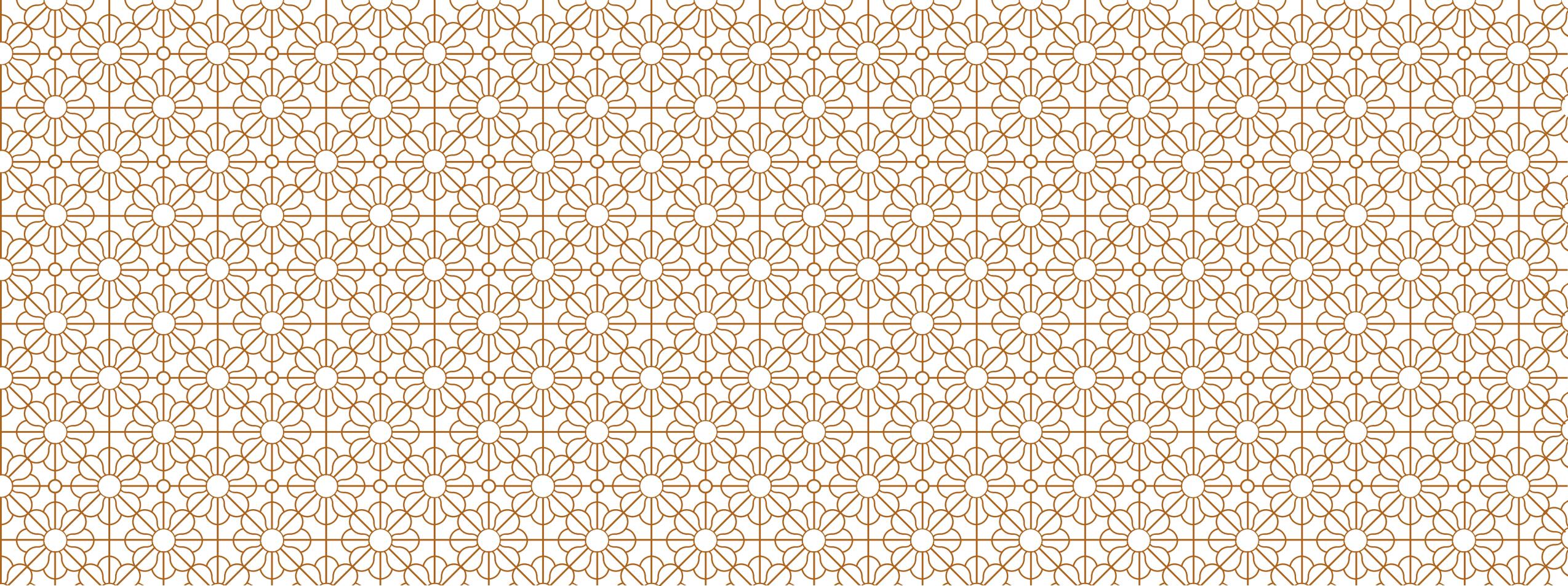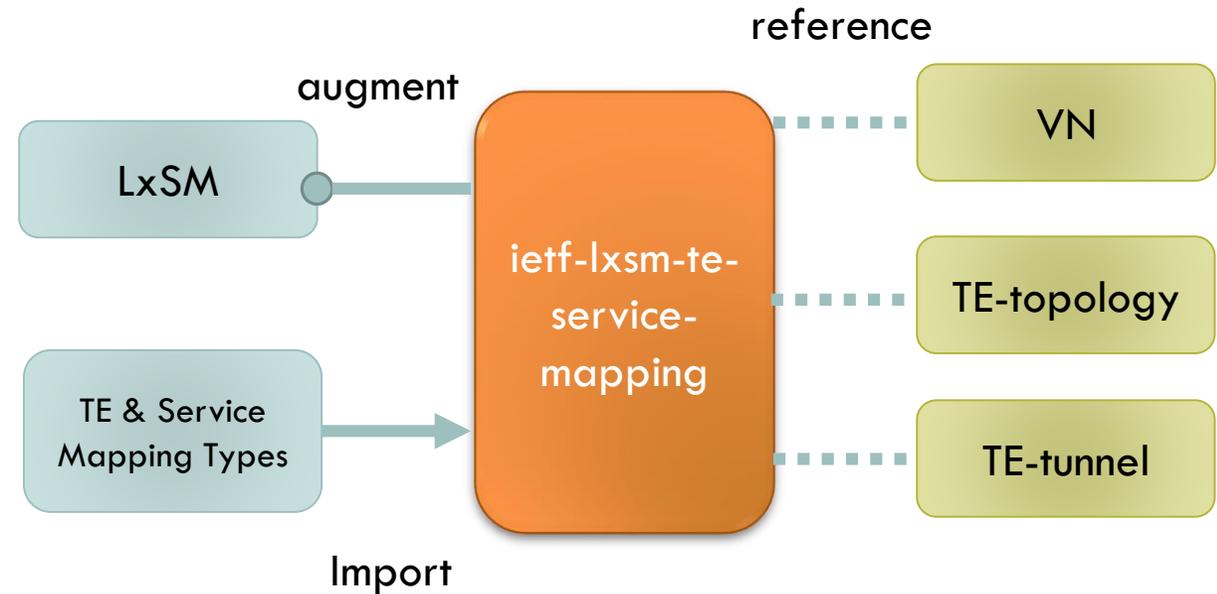
# SERVICE MAPPING YANG

draft-ietf-teas-te-service-mapping-yang-02

# TE-SERVICE MAPPING MODEL

- The role of TE-service Mapping model is to create a mapping relationship between
  - Services – L3SM, L2SM, L1CSM, etc.
  - TE topo, TE tunnel and the VN

- TE-service mapping model also provides service policy/intent (e.g., selection policy, isolation, availability, etc.) for services

- This mapping facilitates a seamless service operation with underlay-TE network visibility and control

- Update in -02: ACTN-VN to VN



reference

augment

LxSM

TE & Service Mapping Types

ietf-lxsm-te-service-mapping

VN

TE-topology

TE-tunnel

Import

# OPEN ISSUES

Can this model be also used by network model - L3NM?

- Make sense to augment L3NM in the same way as L3SM.
- Lets discuss!

Pending issue – Reference for Availability!

- Need help!

# THANK YOU!