

# IETF Network Slice YANG Data Model

draft-liu-teas-transport-network-slice-yang-05

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# Updates Since Last Presentation

- Added support for all communication types described in the latest draft-ietf-teas-ietf-network-slices
  - P2P (already supported previously)
  - P2MP (newly supported)
  - MP2P (newly supported)
  - MP2MP (newly supported)
  - A2A (already supported previously)

# Model Changes 1/2

```
module: ietf-network-slice-connectivity
  augment /nw:networks/nw:network/nw:node/tet:te
    /tet:te-node-attributes/tet:connectivity-matrices
    /tet:connectivity-matrix:
  +-rw replication-group* [id]
  | +-rw id                uint32
  | +-rw entry*           -> ../../tet:id
  +-rw receiver-constraint-group* [id]
    +-rw id                uint32
    +-rw entry*           -> ../../tet:id
    +-rw te-bandwidth
      +-rw (technology)?
        +--:(generic)
          +-rw generic?   te-bandwidth
```

# Model Changes 2/2

```
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:information-source-entry/tet:connectivity-matrices
        /tet:connectivity-matrix:
+--ro replication-group* [id]
|  +--ro id          uint32
|  +--ro entry*     -> ../../tet:id
+--ro receiver-constraint-group* [id]
    +--ro id          uint32
    +--ro entry*     -> ../../tet:id
    +--ro te-bandwidth
        +--ro (technology)?
            +--:(generic)
                +--ro generic?   te-bandwidth
```

# Model Change Description

- Two new modeling constructs
  - Replication Group

A replication group contains a list of connectivity constructs (that are called connectivity matrix entries in RFC 8795). When traffic is sent to one entry in this replication group, the traffic is replicated to all other entries in the same replication group.
  - Receiver Constraint Group

A receiver constraint group contains a list of connectivity constructs (that are called connectivity matrix entries in RFC 8795). When traffic is sent to one or more entries in this receiver constraint group, the constraints specified in this receiver constraint group are applied to the receiver-side termination points referenced by all entries in this receiver constraint group.

# Data Example: P2P

NSE3 <-> NSC7 : Bidirectional P2P connectivity  
NSE4 -> NSE8 : Unidirectional P2P connectivity

```
{"connectivity-matrices": {  
  "connectivity-matrix": [  
    "id": 1,  
    "from": {"tp-ref": "NSE3"},  
    "to": {"tp-ref": "NSE7"}  
  ],  
  "connectivity-matrix": [  
    "id": 2,  
    "from": {"tp-ref": "NSE7"},  
    "to": {"tp-ref": "NSE3"}  
  ],  
  "connectivity-matrix": [  
    "id": 3,  
    "from": {"tp-ref": "NSE4"},  
    "to": {"tp-ref": "NSE8"}  
  ]  
}  
}
```

# Data Example: P2MP

```
NSE5 -> {NSC9, NSE10}
{
  "connectivity-matrices": {
    "connectivity-matrix": [
      {
        "id": 1,
        "from": {
          "tp-ref": "NSE5"
        },
        "to": {
          "tp-ref": "NSE9"
        }
      }
    ],
    "connectivity-matrix": [
      {
        "id": 2,
        "from": {
          "tp-ref": "NSE5"
        },
        "to": {
          "tp-ref": "NSE10"
        }
      }
    ],
    "replication-group": [
      {
        "id": 1,
        "entry": [1, 2]
      }
    ]
  }
}
```

# Data Example: MP2P

{NSE14, NSE15} -> {NSE16}

```
{"connectivity-matrices": {  
  "connectivity-matrix": [{"id": 1,  
    "from": {"tp-ref": "NSE14"},  
    "to": {"tp-ref": "NSE16"}],  
  "connectivity-matrix": [{"id": 3,  
    "from": {"tp-ref": "NSE15"},  
    "to": {"tp-ref": "NSE16"}],  
  "receiver-constraint-group": [{"id": 1,  
    "entry": [1, 3]}  
  ]  
}
```



# Data Example: MP2MP

{NSE14, NSE15} -> {NSE16, NSE17}

```
{"connectivity-matrices": {
  "connectivity-matrix": ["id": 1,
    "from": {"tp-ref": "NSE14"},
    "to": {"tp-ref": "NSE16"}],
  "connectivity-matrix": ["id": 2,
    "from": {"tp-ref": "NSE14"},
    "to": {"tp-ref": "NSE17"}],
  "connectivity-matrix": ["id": 3,
    "from": {"tp-ref": "NSE15"},
    "to": {"tp-ref": "NSE16"}],
  "connectivity-matrix": ["id": 4,
    "from": {"tp-ref": "NSE15"},
    "to": {"tp-ref": "NSE17"}],
  "replication-group": ["id": 1,
    "entry": [1, 2]],
  "replication-group": ["id": 2,
    "entry": [3, 4]],
  "receiver-constraint-group": ["id": 1,
    "entry": [1, 3]],
  "receiver-constraint-group": ["id": 2,
    "entry": [2, 4]]
}
```

# Data Example: A2A

{NSE1, NSE2, NSE6} -> {NSE1, NSE2, NSE6}

```
{"connectivity-matrices": {
  "connectivity-matrix": [{"id": 1,
    "from": {"tp-ref": "NSE1"},
    "to": {"tp-ref": "NSE2"}],
  "connectivity-matrix": [{"id": 2,
    "from": {"tp-ref": "NSE1"},
    "to": {"tp-ref": "NSE6"}],
  "connectivity-matrix": [{"id": 3,
    "from": {"tp-ref": "NSE2"},
    "to": {"tp-ref": "NSE1"}],
  "connectivity-matrix": [{"id": 4,
    "from": {"tp-ref": "NSE2"},
    "to": {"tp-ref": "NSE6"}],
  "connectivity-matrix": [{"id": 5,
    "from": {"tp-ref": "NSE6"},
    "to": {"tp-ref": "NSE1"}],
  "connectivity-matrix": [{"id": 6,
    "from": {"tp-ref": "NSE6"},
    "to": {"tp-ref": "NSE2"}]
}
```

# Next Steps

- Ready for Working Group Adoption.
- Further examine proper attributes to be included in this model.
- Welcome reviews and suggestions.