Network Model

07. December 2021

Logical View for one of the OAM functions

Topological Points and Links between domains (technological – CN, TN, AN; operators, …) (e.g. SIP, E-NNI, …)

To/From other SMO Components (including NSMF)

SMO OAM (e.g. NSSMF CN, AN, TN)

Network (Model) Provider (e.g. RESTCONF/YANG Server)

Abstraction and model translation/mapping layer

Enrichment

OAM Termination (e.g. NETCONF/YANG Client)

5G Core | RAN | Small Cells & Wi-Fi | Packet | Optical | Microwave | Fixed Access

Configuration from NB to SB

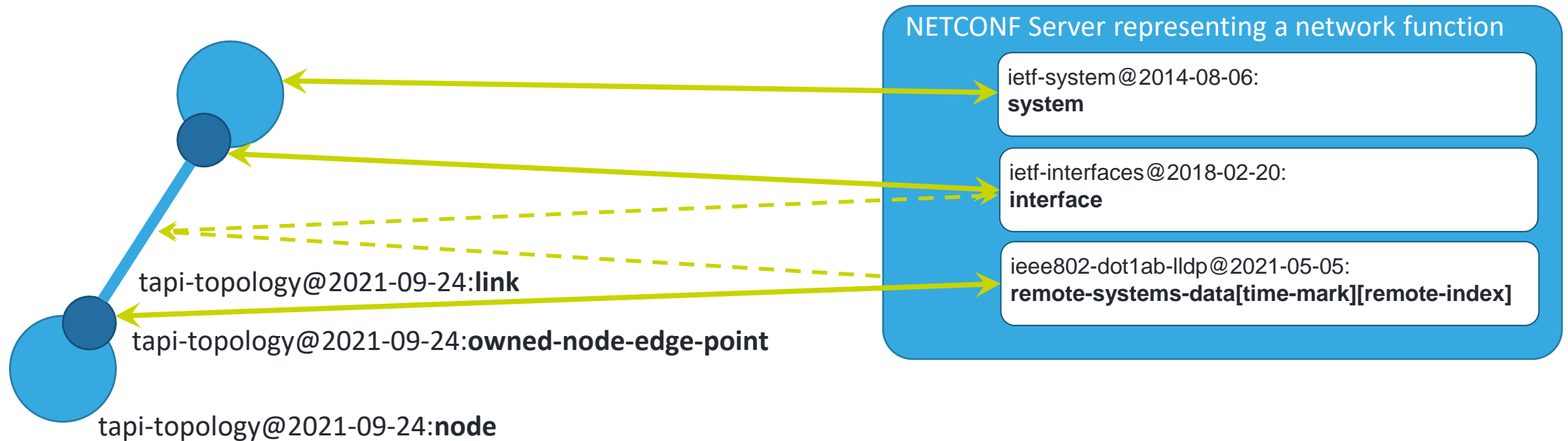# TAPI Topology as Network Model
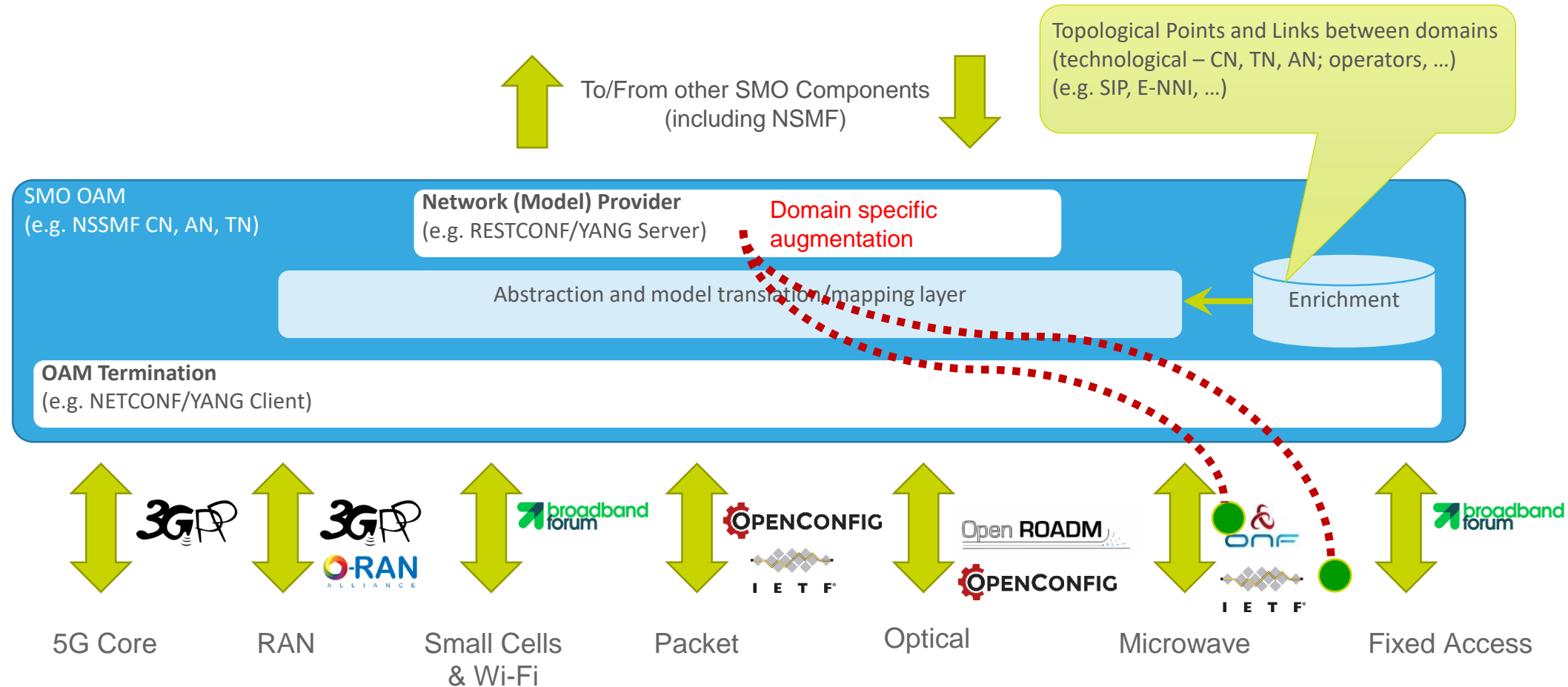
Why using TAPI Topology?

- It provides the required Abstraction according to requirements
  gathered by ONAP based on Operator and Vendor input
  Please see: link

- It fulfils the requirements stated in O-RAN WG9 Management Interfaces document
  (O-RAN.WG9.XTRP-MGT.0-v03.0 – Chapter 6)
  Please see: link

- The functionality was demonstrated to O-RAN in vf2f June 2021
  Please see: link
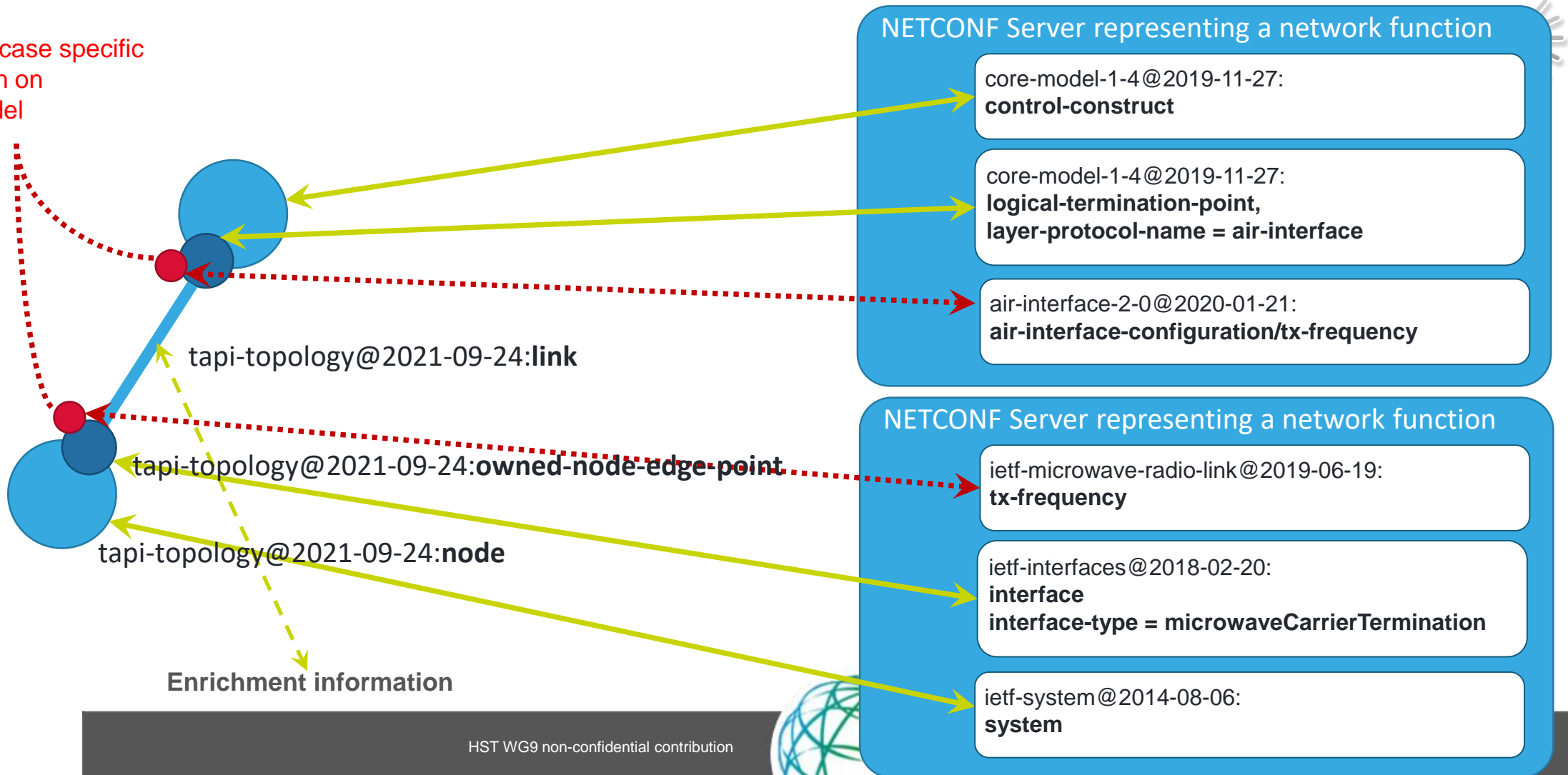
- TAPI has an Apache 2.0 License
  Please see: link

How it works…

… by mapping :)

NETCONF Server representing a network function

ietf-system@2014-08-06:
system

ietf-interfaces@2018-02-20:
interface

ieee802-dot1ab-lldp@2021-05-05:
remote-systems-data[time-mark][remote-index]

tapi-topology@2021-09-24:**link**

tapi-topology@2021-09-24:**owned-node-edge-point**

tapi-topology@2021-09-24:**node**

Configuration example for WT domain

HST WG9 non-confidential contribution

Leaf definitions for WT tx-frequency

ietf-microwave-radio-link@2019-06-19

```
leaf tx-frequency {
    type uint32;
    units "kHz";
    mandatory true;
    description
      "Selected transmitter frequency.";
}
```

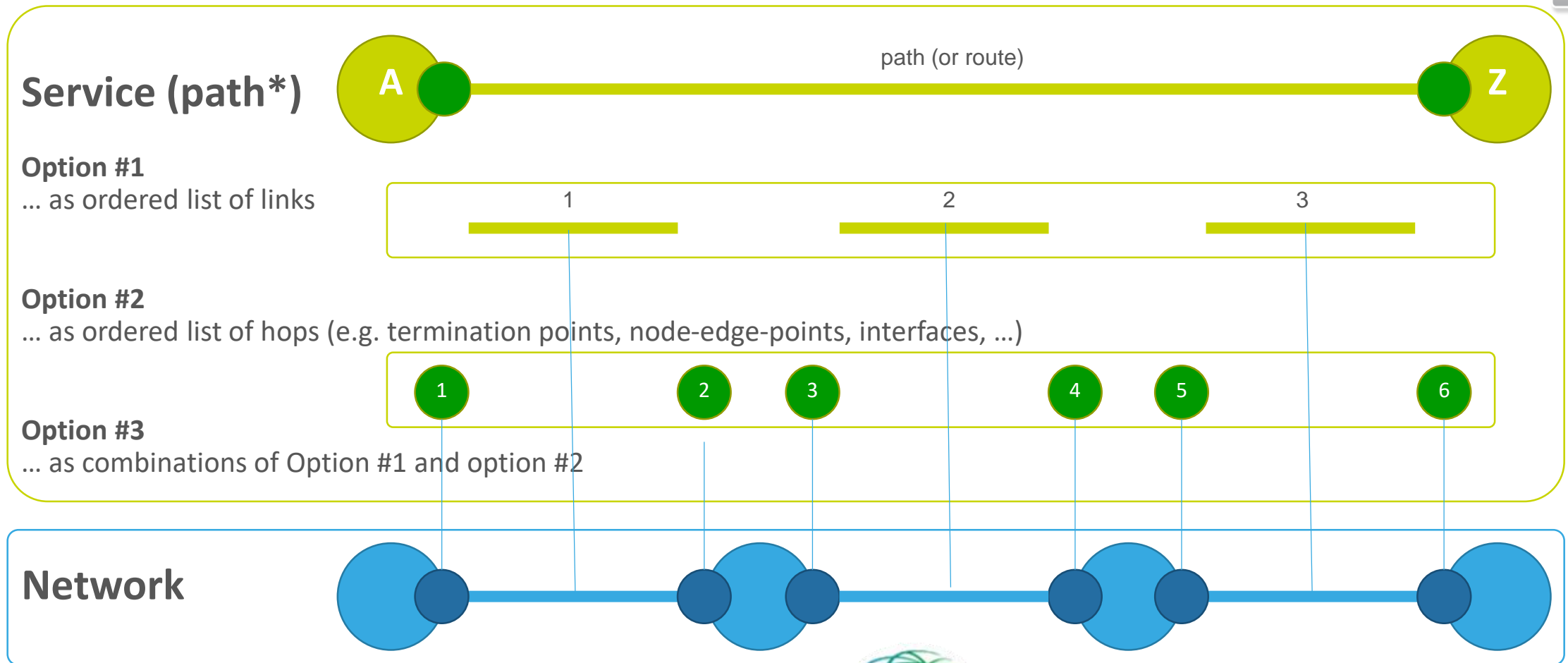/if:interfaces/if:interface/mrl:**tx-frequency**

air-interface-2-0@2020-01-21

```
leaf tx-frequency {
    type int32;
    units "kHz";
    default "-1";
    description
      "Center frequency of the transmit channel. The values to be
configured have to exactly match the values listed in the international
agreement referenced in channelPlanID. In case of automated
selection of the transmit frequency this field shall describe the lowest
center frequency selectable.";
}
```
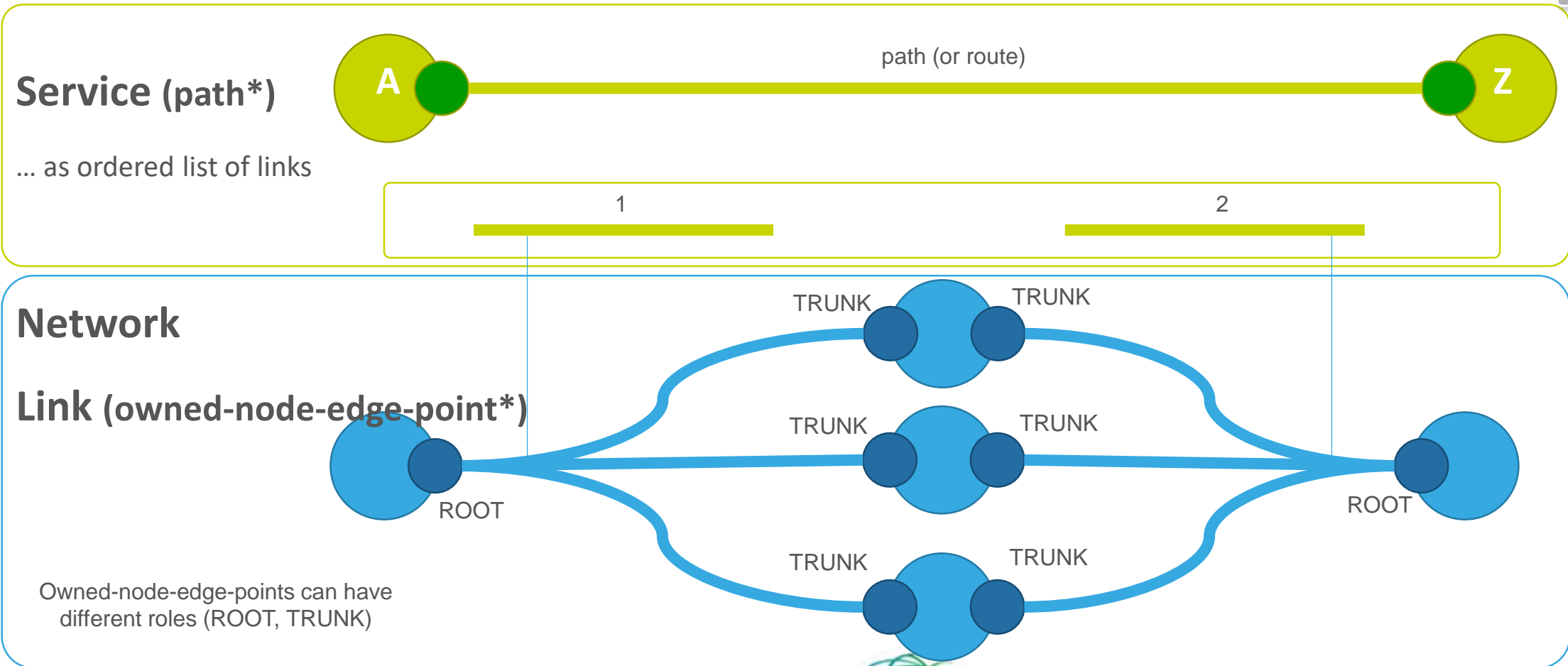
/core-model:control-construct/core-model:logical-termination-point/core-model:layer-protocol/air-interface:air-interface-pac/air-interface:air-interface-configuration/air-interface:**tx-frequency**

Service Model

Service (path*)

A — path (or route) — Z

… as ordered list of links

| 1 | 2 |

Network

Link (owned-node-edge-point*)

ROOT

TRUNK   TRUNK

TRUNK   TRUNK

TRUNK   TRUNK

ROOT

Owned-node-edge-points can have different roles (ROOT, TRUNK)

```
typedef port-role {
    type enumeration {
        enum SYMMETRIC {
            description "A port that can exchange flows (e.g. distinct packet flows) with any other port(s) in a forwarding entity.
                The SYMMETRIC role applies to point to point and multipoint to multipoint connection schemes.";
        }
        enum ROOT {
            description "A port that can exchange flows (e.g. distinct packet flows) with any other port(s) in a forwarding entity.
                The ROOT role is unique to the Rooted Multipoint connection scheme.";
        }
        enum LEAF {
            description "A port that can only exchange flows (e.g. distinct packet flows) with any other ROOT or TRUNK port(s) in a forwarding entity.
                The LEAF role is unique to the Rooted Multipoint connection scheme.";
        }
        enum TRUNK {
            description "The TRUNK role is unique to the ENNI involved in a Rooted Multipoint connection scheme. It provides a way to extend the concept
of ROOT and LEAF bidirectionally across the ENNI without having to create multiple ports (Leaves and Roots) and hairpinning from one to the other.";
        }
        enum UNKNOWN {
            description "Not a normal state. The system is unable to determine the correct value.";
        }
    }
    description "The role of a (conceptual) port of a forwarding entity, e.g. Link, ConnectivityService, Connection, PathComputationService, Path,
VirtualNetworkService.";
}
```

Source: https://raw.githubusercontent.com/OpenNetworkingFoundation/TAPI/v2.3.1/YANG/tapi-common.yang

Thank you!

Questions?