ACTN INFORMATION MODEL

draft-leebelotti-teas-actn-info-03

IETF 96 – Berlin

Young Lee (Huawei)

Sergio Belotti (Alcatel-Lucent)

Daniele Ceccarelli (Ericsson)

Dhruv Dhody (Huawei)

Bin Young Yun (ETRI)

Updates from -02 version

- objects refinements
- new definitions have been added
- Attention is given to compatibility with other information model proposed in the context of different SDO

Action Primitives (no update)

VN Action	Description
VN Instantiate	Customer/application (C/A) requires their VNs (1)
VN Modify	C/A request for modification of a VN (1)
VN Delete	C/A request to delete a VN (1)
VN Path Compute	C/A request for a priory exploration to estimate network resource availability before making a VN instantiate decision (1) (2)
VN Query	Permit to get topology view (pull model)
VN Update	Refers to any update to the VN that need to be reported to the subscribers (push model)
TE Update	TE update from any PNC to MSDC (complete or abstracted filtered view of TEDB)

(1) This primitive can also be applied from an MDSC to a PNC requesting a VN (if the domain the PNC supports can instantiate the entire VN) or a part of VN elements

(2) This action is necessary for an MDSC to PNCs in determining end-to-end multi-domain paths, in this case a double-stage Path Compute is first on the abstracted end-to-end network view (happening at CNC-MDSC), and on the second stage it shall be expanded by each PNC.

Objects (1)

Objects	Description
VN Identifier	Unique VN identifier
VN Service Characteristics	Type of VN service (P2P/P2MP..etc),Traffic matrix parameter (BW + VN Constraints), Survivability (VN recovery level)
VN End-Point	VN's customer end point characteristics
VN Action status	Result of a VN action
VN Associate LSP	LSPs associated per domain from PNC to MSDC in the context of VN Update . The parameter reports instantiated LSPs associated to a specific VN created in response to a CNC request .
VN Service Preference	It refers to (a) End Point Location's support for certain VNF (security, firewall), (b) client-specific preference enforcement to permit correct selection from the network of the destination related at the indicated VNF, (c) End-Point Dynamic Selection Preference if end point can support e.g. (disaster recovery or VM migration) and so can be part of the selection by MDSC following (b))

Objects (2)

- <VN Service Characteristics> ::= <VN Connectivity Type> (<VN Connectivity Matrix>...) <VN Survivability>

<VN Connectivity Matrix> ::= <Bandwidth> [<VN Constraints>]

<VN Constraints> ::= [<Data Transport>] [<Diversity>] [<Shared Risk>] [<Metric>]

<VN Survivability> ::= <VN Recovery Level> [<VN Tunnel Recovery Level>] [<VN Survivability Policy>]

Requested level of resiliency

-unprotected

-per tunnel recovery

-Multi-layer coordinated VN recovery

<VN Survivability Policy> ::= [<Local Reroute Allowed>] [<Domain Preference>] [<Push allowed>] [<Incremental update>] [<Multi-layer VN coordination>]

Mapping of Primitives with Objects

<VN Instantiate> ::= [<VN Service Characteristics>]
        <VN End-Point>
        [<VN Survivability>]
        [<VN Service Preference>]

<VN Modify> ::= <VN identifier>
        [<VN Service Characteristics >]
        <VN End-Point>
        [<VN Survivability>]
        [<VN Service Preference>]

<VN Delete> ::= <VN Identifier>

<VN Update> :: = <VN Identifier>
        <VN Associated LSP>

<VN Path Compute Request> ::= <VN Identifier>
        [<VN Service Characteristics >]
        <VN End-Point>
        [<VN Survivability>]
        [<VN Service Preference>]

<VN Path Compute Reply> ::= <VN Identifier>
        <VN Associated LSP>

<VN Query> ::= <VN Identifier>

<VN Query Reply> ::= <VN Identifier>
        <VN Associated LSP>

Next Steps

- Co-authors believe that the draft is ready for WG adoption

- Exploiting this information model - work has started on solution drafts. E.g.,
    - ACTN VN Yang Model for CMI: draft-lee-teas-actn-vn-yang-00
    - PCE Applicability for ACTN: draft-dhody-pce-applicability-actn-00

BACKUP

ACTN Model background

- The model is described in terms of
    - Action Primitives : they are basic actions needed to support different ACTN network control functions e.g. network topology request/query , VN service instantiation/deletion/modifications, path computation, VN service policy negotiation/enforcement

    - Objects and their properties (attributes) : the object represents ACTN resources needed to be exchanged along interfaces and used in the context of primitives.

TE Update (for TE resource)
entire TED or abstracted TED

MDSC

TE
Update

PNC

PNC

PNC

Abstract Node

Domain 1

Domain 3

Endpoint

Domain 2
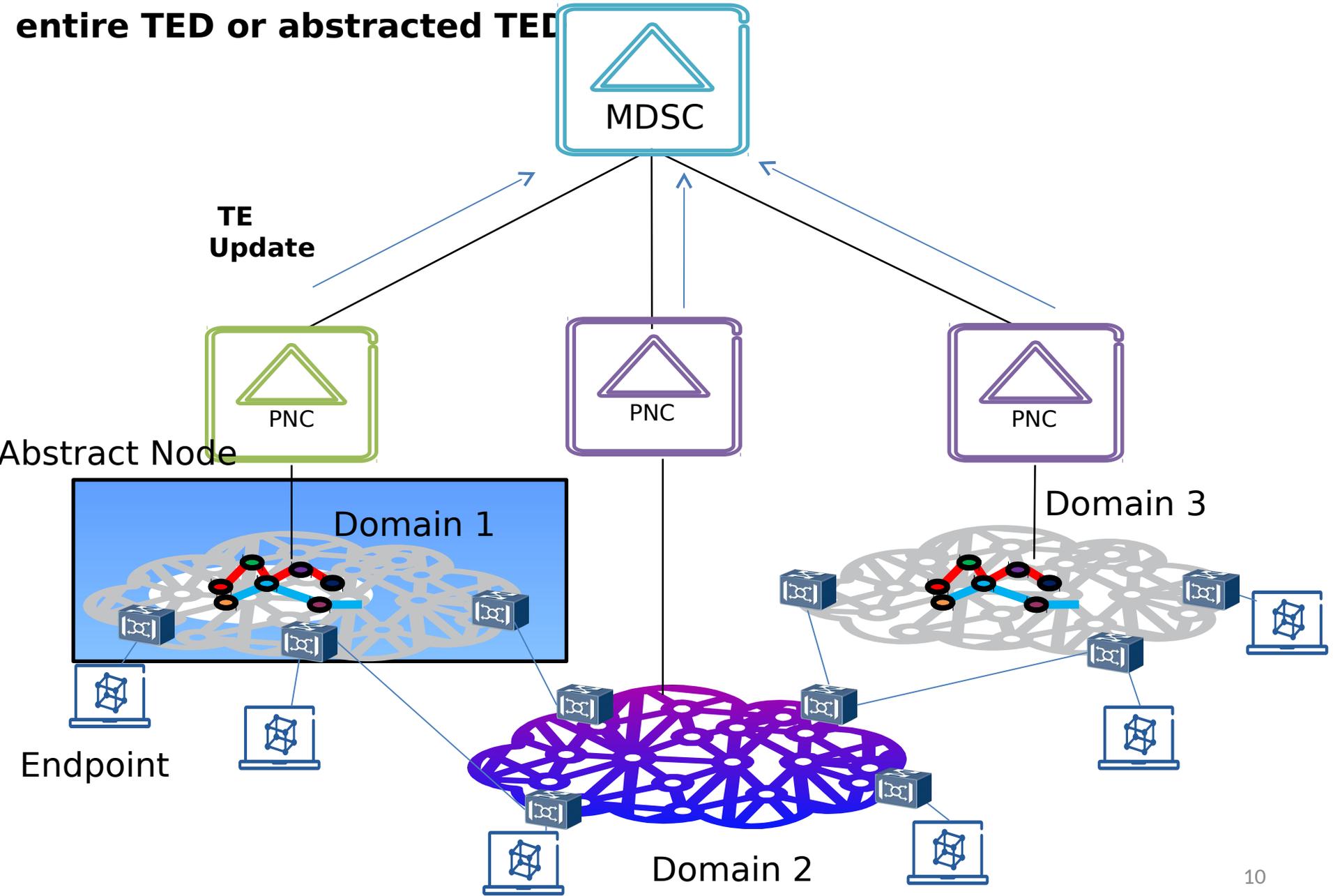
VN Definition

- A Virtual Network is a client view of the transport network. It is composed by a set of physical resources sliced in the provider network and presented to the customer as a set of abstract resources i.e. virtual nodes and virtual links. Depending on the agreement between client and provider a VN can be just represented by how the end points can be connected with given SLA attributes(e.g., re satisfying the customer's objectives), or a pre-configured set of physical resources or can be created as outcome of a dynamic request from customer.
  - In the first case can be seen as an (or set of) e2e connection(s) that can be formed by recursive aggregation of lower level connections at provider level. Such end to end connections include: customer end points, access links (physical or virtual), intra domain tunnels and inter-domain link (physical or virtual).
  - When VN is pre-configured is provided after a static negotiation between customer and provider while in the third case VN can be dynamically created, deleted, or modified in response to requests from the customer. This implies dynamic changes of network resources reserved for the customer.
  - In the second and third case, once that customer has obtained his VN, can act upon the virtual network resources to perform connection management (set-up/release/modify connections).

Virtual Network

EP 1.a

EP 2.a

EP 3.a