draft-ietf-teas-actn-info-model-04

IETF 100 – Singapore

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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.
Updates from 02 and 03 version

• Restructure of the draft separating explicitly types of primitives depending on the type of interface
  – Virtual Network primitives at CMI
  – Traffic Engineering primitives at MPI

• Section objects refinements
  – Added VN Topology and VN Member
  – TE Tunnel Characteristics and TE Topology Update
  – General refinements

• Refinement on Mapping between primitives and objects.

• Change name of PNC: Provisioning Network Controller
Restructure

• Virtual Network primitives at CMI: does not need for detailed TE information since the basic functionality is to translate customer service information into virtual network service operation.

• Traffic Engineering primitives at MPI: at MPI interface, the orchestrator controller (MDSC) has the main scope for multi-domain coordination and creation of a single e2e abstracted network view which is strictly related to TE information.

• Related different definitions regarding Topology:
  – virtual network topology: a customized topology for view and control by the customer.
  – TE topology: TE topology associated with provider network operation which it is possible to apply policy to obtain the required level of abstraction to represent the underlying physical network topology.
## VN Action Primitives

<table>
<thead>
<tr>
<th>VN Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VN Instantiate</td>
<td>Customer/application (C/A) requires creation of VNs (type 1 or type 2) (1)</td>
</tr>
<tr>
<td>VN Modify</td>
<td>C/A request for modification of an instantiated VN</td>
</tr>
<tr>
<td>VN Delete</td>
<td>C/A request to delete an instantiated VN</td>
</tr>
<tr>
<td>VN Path Compute</td>
<td>C/A request for a priori exploration to compute network resource availability and getting a possible VN view which path details can be specified matching C/A constraints. (2)</td>
</tr>
<tr>
<td>VN Query</td>
<td>Permit to get topology view (pull model)</td>
</tr>
<tr>
<td>VN Update</td>
<td>Refers to any update to the VN that need to be reported to the subscribers (push model)</td>
</tr>
</tbody>
</table>

(1) VN type 1: set of edge-to-edge links, VN type 2: VN topology (i.e. topology composed by a set of virtual node(s) and virtual link(s))

(2) This action may not guarantee the availability of computed network resource at the instantiation time
# TE Action Primitives

<table>
<thead>
<tr>
<th>VN Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE Instantiate</td>
<td>An action issued from MDSC to PNC to instantiate new TE tunnels.</td>
</tr>
<tr>
<td>TE Modify</td>
<td>An action issued from MDSC to PNC to modify existing TE tunnels.</td>
</tr>
<tr>
<td>TE Delete</td>
<td>An action issued from MDSC to PNC to delete existing TE tunnels.</td>
</tr>
<tr>
<td>Path Compute</td>
<td>An action composed by a request a reply between MDSC and PNC to request a path computation and obtain related computed paths results.</td>
</tr>
<tr>
<td>TE Topology Update</td>
<td>Action providing TE resource update between any domain controller towards MDSC regarding the actual or abstracted view of TE topology resources depending on negotiated policy.</td>
</tr>
</tbody>
</table>
new Objects

New VN objects

\[
<VN\ Topology> ::= <VN\ node\ list> <VN\ link\ list>
<VN\ node\ list> ::= <VN\ node> [ <VN\ node\ list> ]
<VN\ link\ list> ::= <VN\ link> [ <VN\ link\ list> ]
VN\ Member\ List> ::= <VN\ Member> [ <VN\ Member\ List> ]
VN\ Member> ::= <Ingress\ VN\ End-Point>
[ <VN\ Associated\ LSP> ] <Egress\ VN\ End-Point>
\]

New TE objects

\[
<TE-topology-list> ::= <TE-topology> [ <TE-topology-list> ]
<TE-topology> ::= [ <Abstraction> ] <TE-Topology-identifier>
<TE Termination Point-list> ::= <TE Termination Point>
[ <TE-Termination Point-list> ]
TE Termination Point> ::= <TE Termination Point>
[ <TE-Termination Point-list> ]
<TE Termination Point-list> ::= <TE Termination Point>
[ <Link-list> ]
<TE Termination Point-list> ::= <TE Termination Point>
[ <Link-list> ]
\]

Mapping of Primitives with Objects

**VN Primitives mapping**

- `<VN Instantiate> ::= <VN Service Characteristics>  
  <VN Member-List> [<VN Service Preference>]`  
  `[<VN Topology>]`
- `<VN Modify> ::= <VN identifier> <VN Service Characteristics> <VN Member-List> [<VN Service Preference>] [<VN Topology>]`
- `<VN Delete> ::= <VN Identifier>`
- `<VN Update> ::= <VN Identifier> [<VN Member-List>] [<VN Topology>]`
- `<VN Path Compute Request> ::= <VN Service Characteristic> <VN Member-List> [<VN Service Preference>]`
- `<VN Path Compute Reply> ::= <VN Computed Path>`
- `<VN Query> ::= <VN Identifier>`
- `<VN Query Reply> ::= <VN Identifier> <VN Associated LSP> [<TE Topology Reference>]`

**TE Primitives mapping**

- `<TE Instantiate> ::= <TE Tunnel Characteristics>`
- `<TE Modify> ::= <TE Tunnel Characteristics>`
- `<TE Delete> ::= <Tunnel Id>`
- `<TE Topology Update> ::= <TE-topology-list>`
- `<Path Compute Request> ::= <TE Tunnel Characteristic>`
- `<Path Compute Reply> ::= <TE Computed Path> <TE Tunnel Characteristics>`
Next Steps

• Co-authors believe that the draft is ready for LC