Disaggregated transport network development in NTT Communications

Goal of Transport SDN in NTT Com

<table>
<thead>
<tr>
<th>Environment</th>
<th>Functions (e.g.)</th>
<th>Merits</th>
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<tbody>
<tr>
<td>Multi-layer Multi-domain Multi-vendor</td>
<td>Dynamic Resource Dynamic Bandwidth Dynamic Routing</td>
<td>Shorten lead time Optimize NW Quality Simplify Operations</td>
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Architecture

Disaggregated Transport Network

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<th>Why Disaggregated</th>
<th>Aggregated</th>
<th>Disaggregated</th>
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<td>Cost</td>
<td>Device Selection</td>
<td>Vendor lock-in</td>
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<td></td>
<td>Scaling</td>
<td>One size fits all</td>
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<td>Delivery</td>
<td>Integration</td>
<td>Hardware-driven integration</td>
</tr>
<tr>
<td></td>
<td>Upgrade</td>
<td>Forklift upgrade</td>
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</table>

Contact: tsdn-demo@ntt.com
Disaggregated transport network development in NTT Communications

ONOS Overview

- Open source project
- Governed by ON.Lab
- NTT Communications acts as a partner

Logically Centralized Control
- Optimize resource usage
- Dynamic traffic provisioning
- Multi-layer resiliency

Disaggregated Transport Network
- Reduces CAPEX & OPEX
- Eliminates vendor lock-in
- Allows rightsizing and piece-wise upgrades

Disaggregated Architecture of Demonstration

ONOS

- OpenFlow, SNMP, TL1, NETCONF, REST
- ROADM
- EDFA
- OPS*
- muxponder
- transponder

To optical transport

To packet layer

OPS: Optical Protection Switch

Features in Demonstration

- Multi-layer topology in one view
- Support multiple protocols (NETCONF, TL1, REST, OpenFlow...)
- Hierarchical path management and protection switching

Available paths

Primary path and Backup path

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