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NML-base document

- Recommendation (standard) to describe network topologies
- Went through public comments (final step prior to publication)

- **Good news**: no public comments
- **Bad news**: no public comments

- Review by standards body
- Next year: Experience document
Future documents

- **JSON syntax**: Jeroen, Chin
- **Ethernet extensions**: Jerry, Chin, Freek
- **DWDM extensions**: no interest, drop
- **Additional (‘experimental’) Features**: Freek, Henrik
- **OpenFlow extensions**: on hold, waiting more experience
NML-Base: Features (I)

- **Topology and Node** - virtual nodes and topologies, geographic location or dispersity
- **Hierarchical Topology** - flexible topology abstraction on multiple levels of details
- **Links, Segments and Paths** - Flexible way to segment a path or extend a link
- **Patch Panel and Media Converter** - no need to describe as a Node
NML-Base: Features (II)

• **VLAN and Broadcast Medium** - point to point, point-to-multipoint, multipoint-to-multipoint

• **Multi-Layer, Multi-Domain**

• **Configuration and Potential Capability** - Describe the topology and the connections, including dynamic adaptations

• **Versioning and Lifetime** - Describe and modify scheduled maintenance
Identifiers

• Using GFD 202 identifiers:

  urn:ogf:network:<DNSname>:<YYYYYdate+>:<opaque

• Example:

NML Usage in NSI: documents

• Network Service Interface Topology Service Distribution Mechanisms
  https://redmine.ogf.org/dmsf_files/12980?download=

• Network Service Interface Topology Representation
  http://redmine.ogf.org/dmsf_files/12981?download=

• NML/NSI Topology Service
  https://docs.google.com/document/d/1Az53JdHRI1d1riO5CX0BhMkJswEZX8ghl5uuQd2vbM/edit?pli=1
## NML Usage in NSI: details

<table>
<thead>
<tr>
<th>NSI Concept</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>STP Local ID</td>
<td>2x nml:Port / nml:BidirectionalPort</td>
</tr>
<tr>
<td>Connected To</td>
<td>nml:isAlias</td>
</tr>
<tr>
<td>NSNetwork</td>
<td>nml:Topology</td>
</tr>
<tr>
<td>Has STP</td>
<td>nml:hasPort</td>
</tr>
<tr>
<td>Located at</td>
<td>nml:locatedAt</td>
</tr>
<tr>
<td>Location</td>
<td>nml:Location</td>
</tr>
<tr>
<td>GPS coords</td>
<td>nml:lat, nml:long</td>
</tr>
<tr>
<td>NSA</td>
<td>nsi:NSA</td>
</tr>
<tr>
<td>NSA manages NSNetwork</td>
<td>nsi:manages</td>
</tr>
<tr>
<td>Admin Contact</td>
<td>nsi:adminContact</td>
</tr>
<tr>
<td>NSI Services</td>
<td>nsi:Service</td>
</tr>
<tr>
<td>Control-plane connections</td>
<td>nsi:peersWith</td>
</tr>
</tbody>
</table>

Table 1: Relation of NSI and NML terminology
NSI Topology

- NSI connection service requires pathfinding
- Pathfinding requires topology
- NSI extensions for NML
NML Crawler
Automated GOLE