The Network Markup Language (NML)

OGF 38, Maastricht

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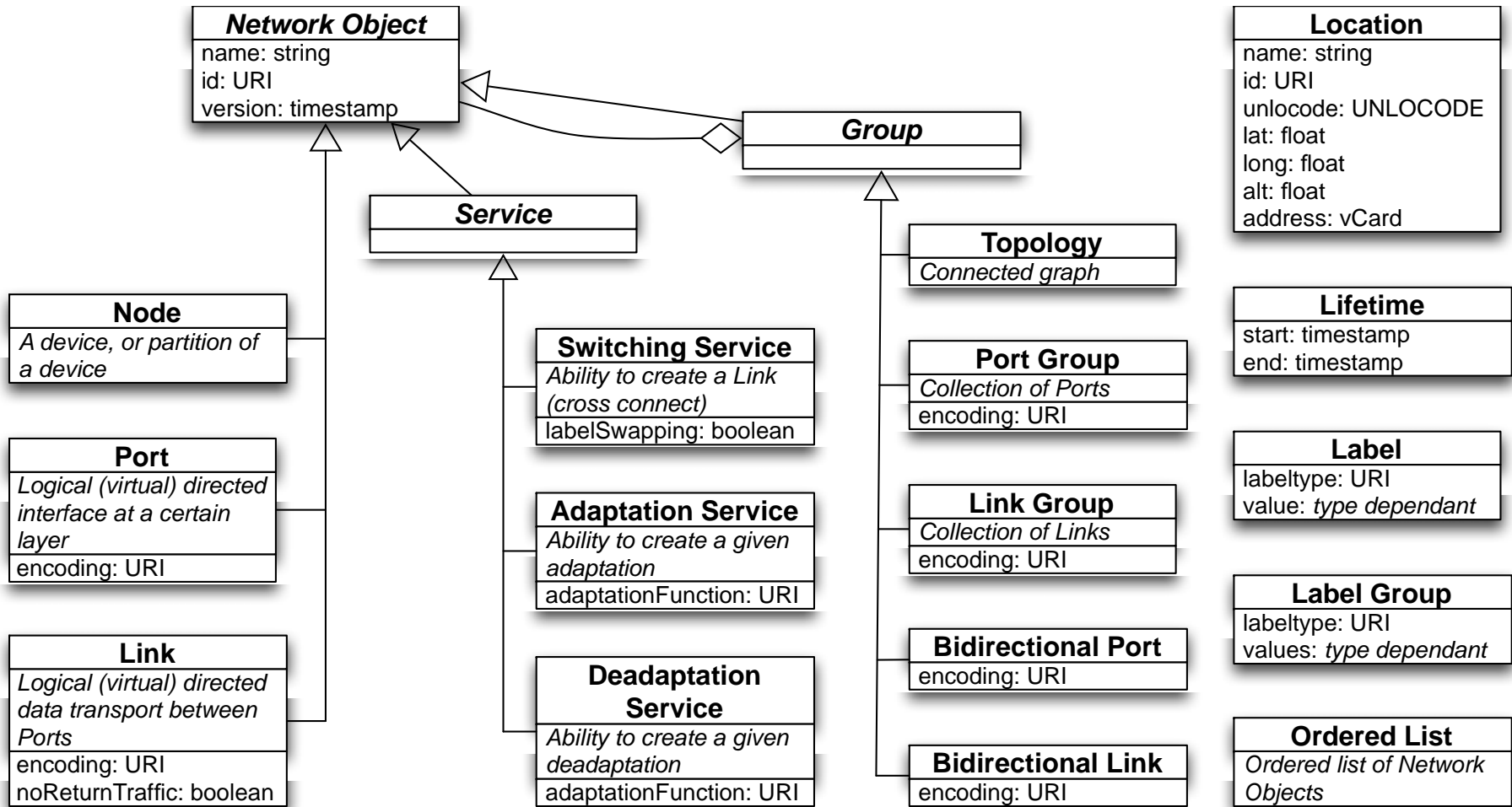
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NML-base document

- 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

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NML-base: Objects

Network Object
name: string
id: URI
version: timestamp

Location
name: string
id: URI
unlocode: UNLOCODE
lat: float
long: float
alt: float
address: vCard

Group

Service

Topology
Connected graph

Node
A device, or partition of a device

Switching Service
Ability to create a Link (cross connect)
labelSwapping: boolean

Port Group
Collection of Ports
encoding: URI

Lifetime
start: timestamp
end: timestamp

Port
Logical (virtual) directed interface at a certain layer
encoding: URI

Adaptation Service
Ability to create a given adaptation
adaptationFunction: URI

Link Group
Collection of Links
encoding: URI

Label
labeltype: URI
value: *type dependant*

Label Group
labeltype: URI
values: *type dependant*

Bidirectional Port
encoding: URI

Link
Logical (virtual) directed data transport between Ports
encoding: URI
noReturnTraffic: boolean

Deadaptation Service
Ability to create a given deadaptation
adaptationFunction: URI

Bidirectional Link
encoding: URI

Ordered List
Ordered list of Network Objects

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 Convertor** - no need to describe as a Node

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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>:<YYYYdate+>:<opaque

- Example:

urn:ogf:network:netherlight.net:2010:Asd001a-ome24:1-5-
4:trunk:out?vlan=1781

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/1Az53JdHRI1d1riO5CX0BhMkOJswEZX8g
  hl5uuQd2vbM/edit?pli=1

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NML Usage in NSI: details

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

Table 1: Relation of NSI and NML terminology

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NSI Topology

- NSI connection service requires pathfinding

- Pathfinding requires topology

- NSI extensions for NML

NML Crawler

Automated GOLE