

Topic

- □ Network Markup Language

- □ Existing Work

Use cases are example applications. NML should meet the requirements of these apps.

- □ Existing Work

- □ Topics

- □ visualization
- □ path finding
- □ network inventory
- □ network measurements

- □ Use Cases

Use cases are example applications. NML should meet the requirements of these apps.

- □ perfSonar: network measurement
 - □ needs concept of end points and actual network connection in between
 - □ description of the entire network connection (the tandem of individual link connections)
- □ fault isolation
 - □ different levels of abstraction
 - □ pointers to information services with detailed/other/more information
 - □ filters showing subset of entire network (e.g. only allowed/available resources)
- □ bandwidth on demand service
 - □ needs concept of end points and potential network connection in between
 - □ need time information, start time, end time, ...
 - □ link-characteristic: bandwidth, jitter, etc.
 - □ concept of "variable" end point (any cluster meeting other requirements)
- □ path finding
 - □ (PCE in GMPLS terminology), need to specify link weight
 - □ is the path computation element part of NML or would it use NML?
 - □ need hooks to authorisation, policy (including device/configuration based policies), reservation/usage database
 - □ do we need pointers from NML to auth/usage, pointers from auth/usage software to NML, or include auth/usage information in NML?
 - □ description of the entire network connection (the tandem of individual link connections)
- □ domain abstraction
- □ inventory
- □ shared links (both conflict of resources; shared risk links?)
- □ multilayer (layer 2, layer 3 characteristics for a link)
- □ logical framework
 - □ links in a network connection are transitive
 - □ semantical framework to allow logical reasoning on network elements

• □ Buckets

Buckets are more or less separate topics. Ideally, there should be few dependencies between the different buckets/topics/subjects/umbrella/schemas/ontologies.

- □ **Topology (single layer)**
*e.g. devices, (virtual) interfaces, links, network connections.
Re-use existing terminology? e.g. ITU-T G.805, Graph theory, GMPLS, ...*
- □ **Physical equipment**
e.g. physical devices, locations, geographic location
- □ **Organisational boundaries**
e.g. domains, owner domain, administrative domain, organization/people
- □ **Device/domain capabilities**
can switch (at which layer), interworking, possible labels
- □ **Device configuration**
internal link connections, available labels
- □ **End-to-end network connection**
usage (path setup request, reservation ID, specific path, hops)
- □ **Time-based data**
Current status, snapshot or time-based, change management, ...
- □ **Technology characteristics**
Thus meta-data to describe a technology, not technologies itself. e.g. layer, technology, adaptation
- □ **Circuit switched properties**
e.g. labels, channels, capacity
- □ **Packet switched properties**
- □ **Layer 1 specifics**
e.g. TDM, WDM, Fiber, UTP, wireless, Fiber bundles (ducts), OTN, ...
- □ **Layer 2 specifics**
e.g. Ethernet (MAC + VLAN), ATM, PPP, L2TP, Myrinet/Infiniband, ...
- □ **Layer 3+ specifics**
e.g. IP, TCP, ...
- □ **Policies**
- □ **Scheduling**