Network Service Layer Abstract Model (NSLAM)

IETF-100 BMWG

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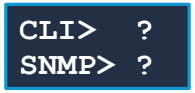
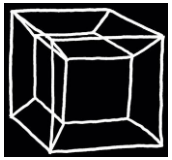
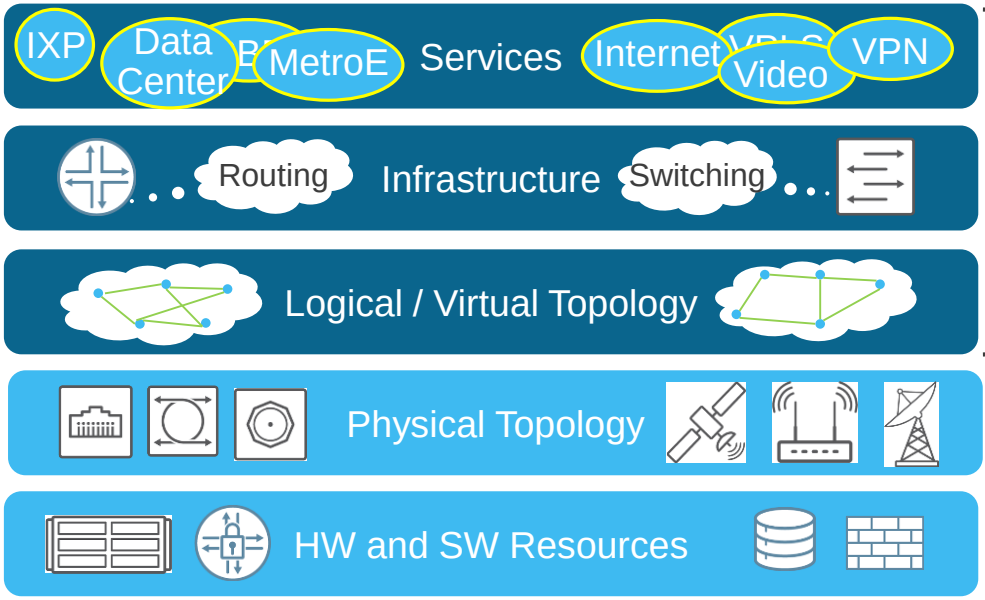
Challenges for Modeling and Benchmarking

Virtual Cloud	YANG Model	Intent Based	Scale Dimension	Converged Services
				
				
Black Network Test	Capability & Capacity	Sufficient & ! Exhaustive	Abstract Model	Tech Agnostic Service Profile

A simplified YANG model is needed for modern network services benchmarking!

Network Service Layer Abstract Model Key Components



Resource Utilization

- Bandwidth Utilization
- System Utilization
  - CPU/Mem/Disk
  - Controller, Line Card
  - Steady and Peak
- Oversubscription
  - 1:N Protection

Service Profile

- Traffic
  - Frame Size, Rate
  - Proto/Flow Distribution
  - Control Plane Eth/Mcast
- Emulation
  - RIB/FIB, OAM, Nbr
  - Size and Distribution
- Resiliency – SLA
  - Convergence Timer
  - Non-Stop Routing
  - RIB/FIB Learning Rate
- Events
  - Node/Link Failure
  - Control Plane Churn
  - Management Activities
  - Mobility

Service Provision

Inventory

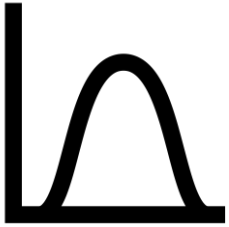
Network Service Layer Abstract Model Design Principles

Leverage YANG
25 RFCs, 100+ IDs

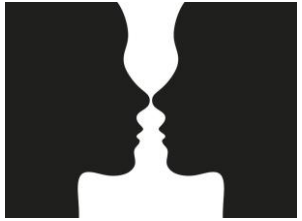
Sufficient
Not Exhaustive

Aggregated
Network View

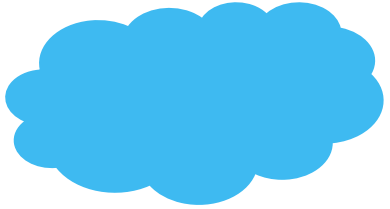
Distribution
Not Mirror



Perspectives of
Customer, Provider,
Manufacturer



Virtual Network
Function Compliant



NSLAM Sample Profile for A Layer 2 Network

```
"l2-services": [
  {
    "service-type": "vlan-based",
    "global-mac-count": 200000,
    "local-mac-max": 40000,
    "interface-mac-max": 20000,
    "vlan-tag-max": 3,
    "site-count": 20,
    "site-per-instance": 5,
    "multi-home": {
      "segments": 2,
      "active": "single"
    },
    "service-instance-count": 400,
    "traffic-profile-id": 10203040
  },
]
```

```
"traffic-profiles": [
  {
    "__id__": 10203040,
    "frame-size": {
      "distrib": "std-normal",
      "range": [64, 256, 512, 1024, 1500]
    },
    "load": {
      "unit": "pps",
      "rate": 10000
    },
    "flow": {
      "type": ["unicast"],
      "mesh": "full-mesh",
      "src-mac-count": 50000
    }
  },
]
```

```
"resources": [
  {
    "state": "steady",
    "cpu": "50%",
    "mem": "12GiB",
    "lc-cpu": "10%",
    "lc-mem": "256MiB",
    "uplink": "50%",
    "forwarding": {
      "throughput-pps": 100000,
      "throughput-bps": 45000000,
      "thrughput-loss": "0%",
      "performance-pps": 150000,
      "performance-bps": 60000000,
      "performance-loss": "10%"
    }
  },
]
```

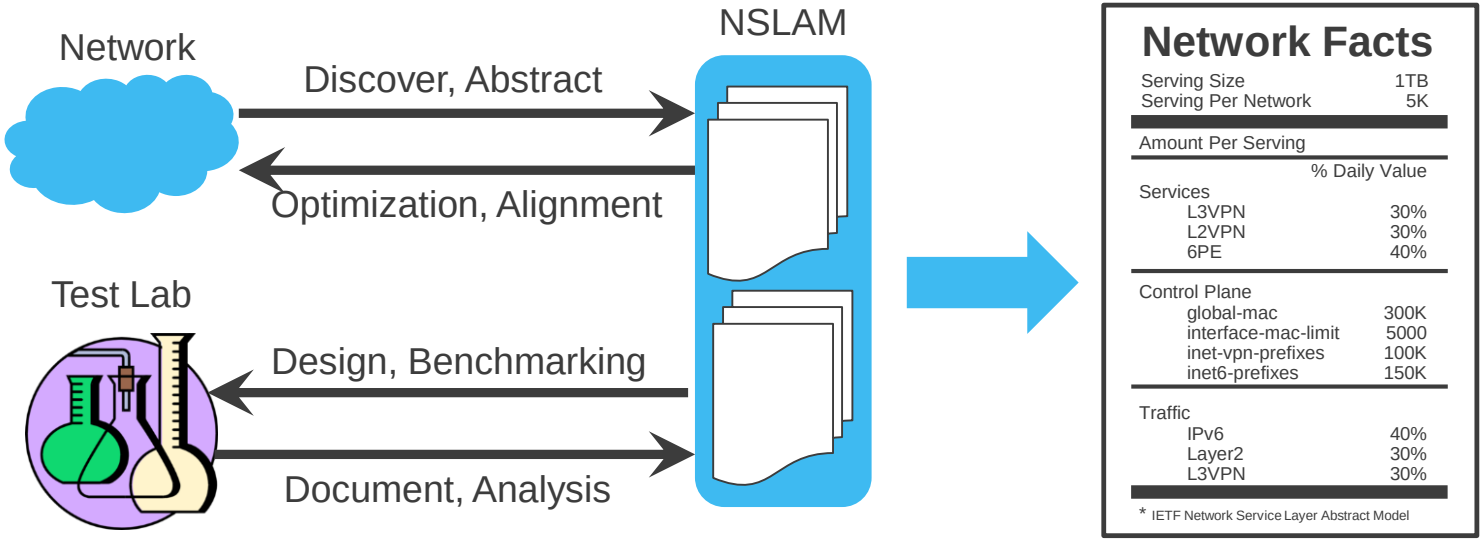
```
"resiliency": {
  "mobility": {
    "type": "mac-move",
    "entries": 3000,
    "convergence": {
      "unit": "msec",
      "time": 200
    }
  },
```

```
"events": [
    {
      "type": "failover-multihome",
      "entries": 3000,
      "convergence": {
        "unit": "msec",
        "time": 200
      }
    },
```

```
    {
      "type": "issu",
      "entries": 200000,
      "convergence": {
        "unit": "sec",
        "time": 2
      }
    }
  ]
```

NSLAM Use Cases

- Benchmarking Defined and Documented in YANG
- A Library of Service Models / Network Deployment Scenarios



Next Step

- Call for Collaborators
- Cleanup and Validate YANG keywords
- Create A Sample NSLAM for Layer 2 Network
- Update I-D https://www.ietf.org/id/draft-xwu-bmwg-nslam-00.txt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NETWORKS
THANK YOU