SIMAP: Concepts, Requirements and Use Cases

draft-ietf-nmop-simap-concept

IETF 124 NMOP

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Montreal, Canada

Authors: Olga Havel (presenting), Benoit Claise, Oscar Gonzalez de Dios, Thomas Graf
Nigel Davis (for modelling)

Agenda

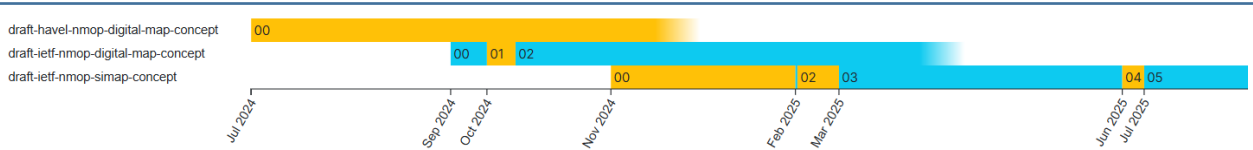
- **draft-ietf-nmop-simap-concept**
  - Quick SIMAP Refresh / Summary
  - Updates since IETF123
  - Open issues and what next for the draft
- **What next for SIMAP**

draft-ietf-nmop-simap-concept (Refresh / Summary)

Expected contribution:

1. Have a *reference document* for the concept of SIMAP (previously known as Digital Map) independent of the modelling approach
2. Agree on *key related terms* and their definitions
3. Inventory of a *focused set of target use cases*
4. Identify *requirements* for solution design
5. Engage with Operators in *IETF Hackathons* to identify and validate requirements

1

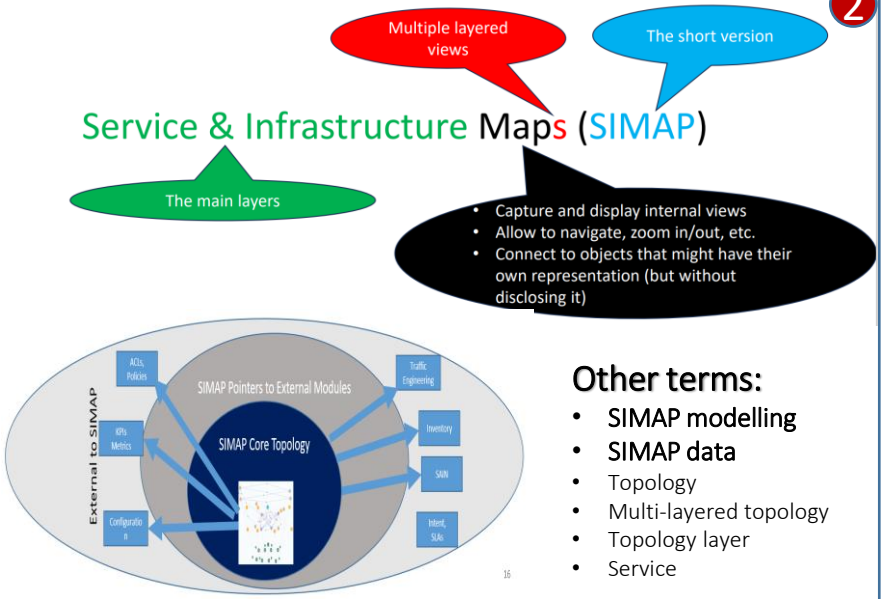


2

SIMAP is a **data model** that provides a **view** of the **operator's networks and services**, including how it is **connected to other models/data** (e.g., inventory, observability sources, and operational knowledge).

It specifically provides an approach to model **multi-layered topology** and an appropriate mechanism to **navigate amongst layers** and **correlate** between them.

This includes layers from **physical topology to service topology**. This model is applicable to multiple domains (access, core, data centers, etc.) and technologies (Optical, IP, etc.).



Other terms:

- SIMAP modelling
- SIMAP data
- Topology
- Multi-layered topology
- Topology layer
- Service

Therefore,

SIMAP defines the **core topological entities**, their **topological role** in the network, **core topological properties**, and **topological relationships** both inside each layer and between the layers.

It is a **basic topological model** with **references/pointers** to other models and **connects them all**: configuration, maintenance, assurance (KPIs, status, health, symptoms, etc.), traffic engineering, different behaviors, simulation, emulation, mathematical abstractions, AI algorithms, etc.

draft-ietf-nmop-simap-concept (Refresh)

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3 Operator Use Cases:

- ✓ Common Enablers for SIMAP:
  - ✓ Navigation Service -> Resource
  - ✓ Navigation Resource -> Service
  - ✓ Traffic Engineering (TE)
  - ✓ Closed Loop
- ✓ Inventory Queries
- ✓ Service Placement Feasibility Checks
- ✓ Intent/Service Assurance
- ✓ Service E2E and Per-Link KPIs
- ✓ Capacity Planning
- ✓ Network Design
- ✓ Network Simulation and Network Emulation
- ✓ Postmortem Replay
- ✓ Network Digital Twin (NDT)

4 Operator Requirements:

- ✓ REQ-BASIC-MODEL-SUPPORT
- ✓ REQ-LAYERED-MODEL
- ✓ REQ-PASSIVE-TOPO
- ✓ REQ-PROG-OPEN-MODEL
- ✓ REQ-STD-API-BASED
- ✓ REQ-COMMON-APP
- ✓ REQ-GRAPH-TRAVERSAL
- ✓ REQ-TOPOLOGY-ABSTRACTION
- ✓ REQ-LIVE
- ✓ REQ-SNAPSHOT
- ✓ REQ-POTENTIAL
- ✓ REQ-SEMANTIC
- ✓ REQ-LAYER-NAVIGATE
- ✓ REQ-EXTENSIBLE
- ✓ REQ-PLUGG
- ✓ REQ-BIDIR
- ✓ REQ-MULTI-POINT
- ✓ REQ-MULTI-DOMAIN
- ✓ REQ-SUBNETWORK
- ✓ REQ-SHARED
- ✓ REQ-SUPPORTING
- ✓ REQ-STATUS
- ✓ REQ-DATA-PLANE-FLOW
- ✓ REQ—CONTROL-PLANE

=> Design Requirements
=> Architectural Requirements

5

Multi-Layered Topology - Layers/Technologies (IETF Hackathons – IETF120, IETF121, IETF122, IETF123, future)

- ✓ L1 Topology, including:
  - ✓ Optical
  - ✓ Active and Passive
- ✓ L2 Topology
- ✓ L3 Topology
- ✓ Control plane routing (underlay control plane correlatable to underlay L3 topology, overlay control plane correlatable to overlay L3 topology)
  - ✓ IGP (OSPF, IS-IS, iBGP)
  - ✓ eBGP
- ✓ Tunnels (MPLS-LDP, MPLS-TE, SRv6)
- ✓ L3VPN Service
- ✓ Application Flow / Data Flow

Updates Since IETF123 (Summary)

- 2 versions, v0.5 in September and v0.6 in October
- Editorial changes and improvement of the definition for SIMAP modelling (to be more generic and not RFC8345 centric)
- Addressed all comments from Reshad (document shepherd): Introduction (4), Terminology (3), Section 3 Use Cases (5), Section 4 Requirements (4), Section 5 Positioning SIMAP (1).
- Comments either clarified on the mailing list or updated in versions 06 and 07

Open Issues and What Next for the draft?

- **Is the document ready for submission to the WG Last Call?**

  All issues are closed, all shepherd's comments addressed

  Working Group Milestone for IESG submission was June 2025

What Next for SIMAP?

- SIMAP YANG Modelling for RFC8345 gaps based on SIMAP requirements: https://datatracker.ietf.org/doc/draft-havel-nmop-simap-yang/01/
  - **Side meeting 'SIMAP Modelling Discussion' at IETF24 on Tue Nov 4 at 6:30 in McGill room**
  - Summary of modelling proposal and the side meeting outcome will be presented at the NMOP Session 2
- IGP Topology: https://datatracker.ietf.org/doc/draft-ogondio-nmop-ospf-topology and https://datatracker.ietf.org/doc/draft-ogondio-nmop-isis-topology
- External relations: https://datatracker.ietf.org/doc/draft-vivek-simap-external-relationship
- Hackathons (IETF124 and future):
  - SIMAP (to be presented in Session 2)
  - SIMAP is the part of the Knowledge Graph for Network Operations (to be presented in Session 2)
  - IETF125+: SIMAP with Anomaly Detection (IETF125+)
  - IETF125+: SIMAP with Anomaly Detection inside Knowledge Graph for Operations

Comments, Questions?

Anyone interested to get involved or to discuss any aspects, please contact any of the co-authors in Montreal or via email.