Problem Statement 01
Service & Infrastructure Maps (SIMAP)

Reference Document: draft-ietf-nmop-simap-concept
Working Group: NMOP

The IETF draft **SIMAP: Concept, Requirements, and Use Cases** defines the concept of Service & Infrastructure Maps (SIMAP)—a layered, multi-topology model providing an integrated view of an operator's infrastructure, services, and how they interconnect with inventory, observability, and operational data. SIMAP aims to enable seamless navigation across layers—from physical infrastructure to service and application flows—and supports use cases including inventory queries, service placement feasibility, intent assurance, and E2E/per-link KPIs.

Challenge

Participants are challenged to **design and implement a working prototype** that demonstrates one or more of the SIMAP use cases, using a layered topology model based on the draft. For instance:

- **Use Case Options:**
    - **Generic inventory query**: Query and visualize where in the network certain services or resources reside.
    - **Service placement feasibility**: Given a desired service topology, assess if underlying infrastructure supports it.
    - **End-to-end service KPIs**: Provide latency, loss, or throughput metrics across a service path.
    - **Intent-based assurance**: Verify if network state meets specified service intent (e.g., SLA thresholds).

Key Requirements

1. **Layered Topology Model :** Build a graph-based model with at least two layers—e.g., physical and service—with support for nodes, links, and interface relationships
2. **Navigation across Layers:** Enable traversing from service entities down to physical resources and vice versa.
3. **Open/Programmable Interface:** Expose an API (e.g., REST, CLI, or YANG) for queries and optional "what-if" manipulation.
4. **External Integration (Optional):** Optionally integrate with external models such as inventory or assurance modules (or mock data), illustrating SIMAP's pluggable nature.

Deliverables

- A working **prototype** (web app, command-line tool, etc.) demonstrating one or more SIMAP use cases.
- Example datasets (can be synthetic)—e.g., physical topology, service definitions, KPI samples.
- **Documentation** outlining:
    - The implemented use cases.
    - Data model and how layers are represented.
    - API design for navigation and querying.
    - Possible extensions (e.g., pluggability, "what-if" scenarios).