Draft in a nutshell

- Presents **an inter-domain brokering approach** on top of the per-domain management and orchestration planes.
  - to assist and coordinate the creation of an End-to-End Network Service (E2ENS) spanning over multi-operator multi-domain networks.
- Design **resorts to the Application-Layer Traffic Optimization (ALTO)** protocol.
  - to provide proper abstractions to discover and adequately represent in confidentiality-preserving fashion the resource and topology information from different administrative domains.
- The draft introduces **an extension to the ALTO base protocol** for inter-domain resource/service/connectivity information discovery.
Updates from -00

- Updated Problem Statement and Challenges section.
- Removed Property Map Extension section.
- Added section on benefits and open questions in our proposed architecture.
- Many minor style and grammar edits.
Required extension (Ver-00):
  ➢ "Response" Specification: For each property name defined in the resource's "capabilities" list, the corresponding property value MUST be encoded as **JSONArray instead of JSONString**.

The **required extension** section for the ALTO Property Map was removed
  ➢ The current Property Map draft [DRAFT-PM] already supports property values encoded as **JSONArray**:

```
... ...

object {
  PropertyName -> JSONValue;
} EntityProps;
```
Benefits

❖ **Avoid the distribution** of topology and resource information in a peer-to-peer fashion (MdO-to-MdO).
❖ The (abstracted) information and offered resources/services are maintained in each local MdO.
❖ An **ALTO-based privacy-preserving information model** to provide topology/resource/service info.
❖ An **MdO discovery method** to determine the underlying network graph and a potential set of paths before bilateral negotiation between MdOs is started.
Open Issues

❖ What kind of organization will manage and support the operation of a broker entity?
  ➢ Future deployment of SDN at IXPs can be used as a trusted third-party platform to support rich business models between different operators [DRAFT-HHSFC]

❖ The broker entity maintains a centralized database and hence it could a point of failure. How avoid this single point of failure?
  ➢ Local restoration/replication options may be applied.

❖ How is the fine-grained/coarse-grained information exchange handled?
  ➢ It requires much more complex database handling and information exchange with the MdOs depending on the policies.
Next Steps

❖ This draft may potentially introduce a new service to ALTO (in the context of Multi-domain orchestration scenarios).
  ➢ Use case examples are needed to support the creation of a new ALTO service

❖ What is still missing in the draft?
  ➢ Identify which issues need further discussion.
    ■ Problem Statement and Challenges
    ■ Terminology, etc.
  ➢ Define a more elaborated NFFG object to support extended parameters. (E.g., Monitoring parameters, Resource requirements, etc.)

❖ Gather feedback from the WG
  ➢ -01 version reviewed by Richard Yang:
    ■ Comments addressed in -02

❖ Interest in adopting the draft in ALTO WG?