ALTO-based Broker-assisted Multi-domain Orchestration - 01

Danny Alex Lachos Perez
Christian Esteve Rothenberg
(University of Campinas, Brazil)

July 16, 2018
Montreal

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.

3

Removed Property Map Extension

❖ 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;
```

4

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?