ALTO Extension: Path Vector

draft-ietf-alto-path-vector-11

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Summary

- The Path Vector extension aims to provide abstracted network components along the path between a source and a destination
- Use cases: bandwidth reservation for large-scale data analytics, context-aware data transfers (capabilities of access network, etc.), CDN and service edge discovery
- Key abstractions:
 - **Abstract Network Element (ANE)**: A network-agnostic abstraction of network components, associated with different properties
 - Path Vector (PV): An array of ANE names that represents the ANEs on the path between a <src, dst> pair
 - ANE Property Map: A Property Map that maps ANE names to the associated properties
- Key designs:
 - The Path Vector extension extends the Cost Map and Endpoint Cost Map to convey how each <src, dst> pair traverses the ANEs: a new cost type is defined
 - The Path Vector extension uses Property Map to convey the association between ANEs and their properties: a new domain is defined, two initial properties are defined, entries are added to corresponding IANA registries following the procedures defined in the Unified Property draft
 - For consistency and server security, the two pieces of information are provided together in a multipart response.
- Current status: Waiting to issue WGLC

The problem and proposed solution are better clarified

- We summarize 3 general additional requirements using the flow scheduling example, along other use cases in the broader context
- ... and present how the extension fulfills the requirements
- In particular, we discuss ephemeral ANE
 (returned by the Path Vector response) and
 persistent ANE (defined by another Unified
 Property Map resource) and how they are
 handled

- The network needs to expose more detailed routing information to show the shared bottlenecks.
- * The network needs to provide the necessary abstraction to hide the real topology information while providing enough information to applications.

The path vector extension defined in this document propose a solution

In general, we can conclude that to support the multiple flow scheduling use case, the ALTO framework must be extended to satisfy the following additional requirements:

AR1: An ALTO server must provide essential information on intermediate network components on the path of a <source, destination> pair that are critical to the QoE of the overlay application.

AR2: An ALTO server must provide essential information on how the paths of different <source, destination> pairs share a common network component.

AR3: An ALTO server must provide essential information on the properties associated to the network components.

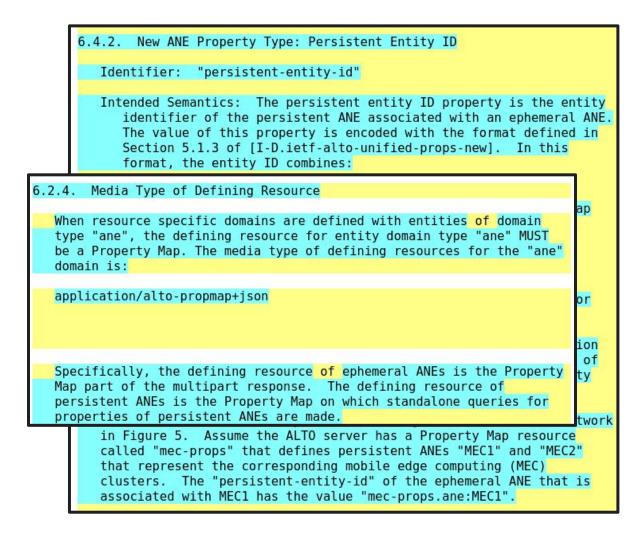
The Path Vector extension defined in this document propose a solution to provide these details.

4.2. Recent Use Cases

While the multiple flow scheduling problem is used to help identify the additional requirements, the Path Vector extension can be applied to a wide range of applications. This section highlights some real use cases that are recently reported. See [I-D.bernstein-alto-topo] for a more comprehensive survey of use cases where extended network topology information is needed.

Path Vector draft is now synchronized with Unified Property Map draft (version -12)

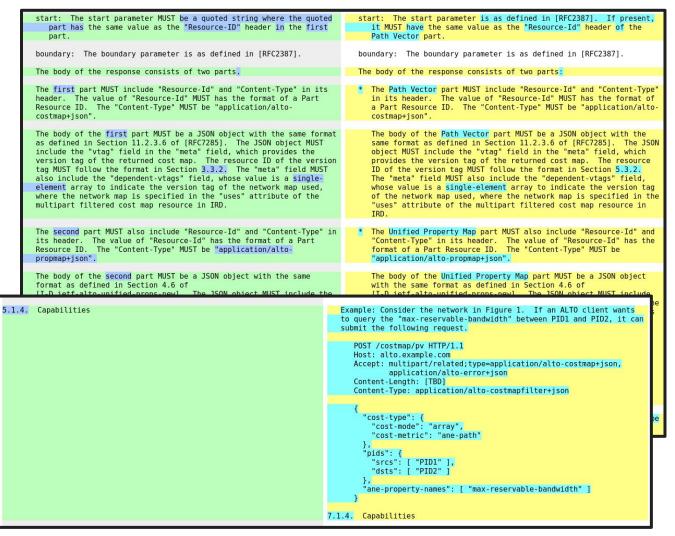
- ANE domain and ANE properties are defined and registered to IANA following the new procedure
- In particular, the defining resource of ANE is now Property Map (with media type application/altopropmap+json) which apply to both ephemeral ANE and persistent ANE
- The entity identifiers used in the ANE Property Map and in the persistent-entity-id follow the naming convention of entity identifiers in the Unified Property Map draft



The specification is better clarified

- Fixed the inconsistent use of the "start" parameter in multipart messages
- Examples are added for request/response
- Fixed inappropriate/inconsistent letter cases (e.g., CAN-> can in a normal sentence, path vector-> Path Vector throughout the paper)

Old version is using "first" part and "second" part to refer to parts in a multipart message, which may be incorrect when "start" parameter is used



Conclusion

- A lot of clarification to make the document easier to follow
- PV-11 is fully synchronized with UP-12, and can move ahead as a bundle

Issue WGLC?

Backup

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 - In particular, we discuss *ephemeral ANE* (returned by the Path Vector response) *and persistent ANE* (defined by another Unified Property Map resource) and how they are handled
- Path Vector draft is now synchronized with Unified Property Map draft (version -12)
 - ANE domain and ANE properties are defined and registered to IANA following the new procedure
 - In particular, the defining resource of ANE is now Property Map (with media type application/alto-propmap+json) which apply to both ephemeral ANE and persistent ANE
 - The entity identifiers used in the ANE Property Map and in the persistent-entity-id follow the naming convention of entity identifiers in the Unified Property Map draft
- The specification is better clarified
 - Fixed the inconsistent use of the "start" parameter in multipart messages
 - Examples are added for request/response
 - Fixed inappropriate/inconsistent letter cases (e.g., CAN -> can in a normal sentence, path vector -> Path Vector throughout the paper)