Extensible Property Maps for the ALTO Protocol

draft-ietf-alto-unified-props-00
replace draft-roome-alto-unified-props-new-01

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Updates from IETF 98

- **2.5 A single property name space**
  - This document defines uniform property names specified in a single property name space rather than being scoped by domain.

- **2.6 Generalize dependency relationship to general case.**
  - PID domain depends on network map
  - ANE domain depends on cost map/endpoint cost map

- **3.1.3**
  - It is important to notice that this longest prefix match rule will ensure no multiple inheritance, and hence no ambiguity.
  - ipv4:192.0.2.16:   P=v1

- **3.1.4**
  - Logically, there is a map of Internet address entities to property values for each network map defined by the ALTO server, plus an additional property map for Internet address entities which are not associated with a network map. So, if there is n network maps, the server may provide n+1 maps of Internet address entities to property values.

Updates from IETF 98

- ## 4.4 Multiple domains and multiple properties

  If the server declares multiple domain-types and multiple prop-types in the capability, each prop-type MUST be supported in each domain in the "capabilities" field

  If a prop-type is NOT supported in a particular domain, the property map MUST be divided into several maps.

```
"default-property-map" : {
    …
    "capabilities" : {
        "domain-types" : [ "ipv4", "pid" ],
        "prop-types" : [ "country", "abc" ]
    }
}
```

```
"default-property-map" : {
    …
    "capabilities" : {
        "domain-types" : [ "ipv4" ],
        "prop-types" : [ "country", "abc" ]
    }
}
```

```
"default-property-map" : {
    …
    "capabilities" : {
        "domain-types" : [ "pid" ],
        "prop-types" : [ "country" ]
    }
}
```

Updates from IETF 98

- ## 4.5 "Uses" field in the IRDResourceEntry

  – If a property map depends on network map resource, the "uses" field MUST include exactly one network map resource.

  – To a general case, the "uses" field MUST NOT contain two resources of the same resource type (media-type)

- ## 4.6 Clarify the value for "defined to have no value"

  – If the property for an entity is defined to have no value, the server MUST set the property value to be a JSON null value
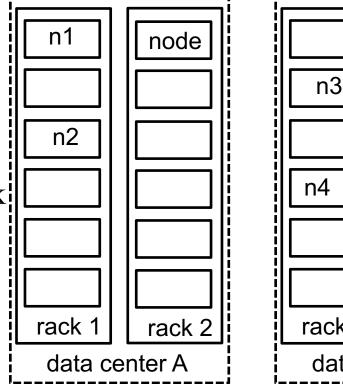
- ## 5.5

  – The same as 4.5

ANE Domain

- ## ANE Domain
  - Domain Name : ane

  - Domain-Specific Entity Addresses: the same as format of the PID name defined in Section 10.1 of [RFC 7285].

  - Hierarchy and Inheritance : there is no hierarchy or inheritance for properties associated with ANEs.

  - Relationship to cost map/ endpoint cost map: The entities in ane domain depends on cost map/ endpoint cost map. The more detailed relationship are TBD
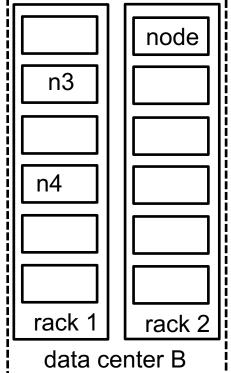
Next Steps

- Specify the relationship between ane domain and cost map/ endpoint cost map.

- Introduce and finalize a Hadoop example
  - An interesting, useful use case
  - May require a new domain

Hadoop Example

- The client needs dataset X as input.
- X has copies in datanode n1 and n4.
- Client compute the distance of each node based on the network location of each node.
- Unified Property Map provides the network location of each node (map n1, n4 to /dA/r1/n1 and /dB/r1/n3 respectively).
- Distance(n1,n4)
  = distance(/dA/r1/n1, /dB/r1/n4)
  = 6

data center A: rack 1 (n1, n2), rack 2 (node); data center B: rack 1 (n3, n4), rack 2 (node)

Hadoop Example

Request

```
POST /propmap/lookup/net-loc HTTP/1.1
Host: alto.example.com
Accept: application/altopropmap+json,
            application/alto-error+json
Content-Length: ###
Content-Type:
application/altopropmapparams+json

{
   "entities" : [ "n1", "n4"],
   "properties": ["network-location"]
```

Response

```
HTTP/1.1 200 OK
Content-Length:  ###
Content-Type:  application/alto-propmap+json

{
   "property-map":{
      "node1": {"network-location": "/d1/r1/n1"},
      "node2": {"network-location": "/d2/r2/n4"}
   }
}
```

The client can use the "network-location" property of different nodes to calculate the distance between nodes