

# ALTO Protocol

draft-ietf-alto-protocol-09

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Grateful to contributions from large number of collaborators;  
see draft for complete list.

# Outline

- What's happened since IETF80?
  - Overhaul to make the protocol really REST-ful (-08 submitted May 20)
  - Comments from interim meeting and list (-09 submitted June 27)
  
- Next Steps and Additions
  
- Discussion

# Change Summary: -07 → -08

## ■ Many misc. cleanups/fixes

- ❑ Removed text explicitly prescribing HTTP usage
- ❑ Query-strings no longer used explicitly in protocol (POST instead)
- ❑ Removed 10% threshold for equality for Map Filtering
- ❑ Added '-' to allowed chars for Cost Type and Endpoint Property names
- ❑ PID name can be 64 characters
- ❑ Removed 'shortcut' (GET request) for endpoint property service
- ❑ Endpoint Properties communicated in capabilities
- ❑ More specific text regarding floating-point precision
- ❑ Network Map change → Version Tag MUST change (was SHOULD)
- ❑ Equivalent ALTO Servers MAY have same Service ID (was SHOULD)
- ❑ Error code cleanup

# REST-ful Design

- Single URI as entry point
  - Learned via Discovery
  - Provides *Information Resource Directory*
- ALTO Client looks up URI for desired info (*Information Resource*) in directory
  - Keyed off of Media Type
  - Capabilities indicated in entries
- Entries may be references to other directories
  - Get them via OPTIONS

Information Resource	Media Type
Server Info	application/ alto-serverinfo+json
Network Map	application/ alto-networkmap+json
Cost Map	application/ alto-costmap+json
Endpoint Properties	application/ alto-endpointprop+json
Endpoint Cost	application/ endpointcost+json
ALTO Error	application/ alto-error+json

# Directory Entry Examples

```
{  
  "resources" : [  
    ...  
    {  
      "uri" : "http://alto.example.com/networkmap",  
      "media-types" : [ "application/alto-networkmap+json" ]  
    }  
    ...  
  ]  
}
```

URI available to the ALTO Client

List of Media Types (Information Resources)  
available via the URI

# Directory Entry Examples

```
{  
  "resources" : [  
    ...  
    {  
      "uri" : "http://alto.example.com/costmap/num/routingcost",  
      "media-types" : [ "application/alto-costmap+json" ],  
      "capabilities" : {  
        "cost-modes" : [ "numerical" ],  
        "cost-types" : [ "routingcost" ]  
      }  
    }  
    ...  
  ]  
}
```

Certain Information Resources (e.g., Cost Map, Endpoint Properties) may declare capabilities implemented via the corresponding URI.

# Directory Entry Examples

```
{
  "resources" : [
    ...
    {
      "uri" : "http://alto.example.com/endpointcost/lookup",
      "media-types" : [ "application/alto-endpointcost+json" ],
      "accepts" : [ "application/alto-endpointcostparams+json" ],
      "capabilities" : {
        "cost-constraints" : true,
        "cost-modes" : [ "numerical" ],
        "cost-types" : [ "routingcost" ]
      }
    }
    ...
  ]
}
```

Certain Information Resources (e.g., Filtered Maps, Endpoint Cost) may accept a parameters via a POST. Format is indicated as an accepted Media Type.

# Change Summary: -08 → -09

## ■ Ordinal Costs

- ❑ Values are non-negative integers
- ❑ Values for a set of destinations (relative to a single source) need not be contiguous
- ❑ Simplifies life for some ALTO Servers

## ■ E\_JSON\_SYNTAX → E\_SYNTAX

- ❑ Includes syntax error when parsing identifiers

## ■ Clarified that server may return addresses in different format from request

- ❑ RFC5952 doesn't really provide a canonical format :(
- ❑ Argument was made that this complexity should live at the client-side

# Change Summary: -08 → -09

- Clarification to discovery of additional resources
  - Indicated that HTTP OPTIONS was the preferred way
- Cost constraints for Filtered Cost Map and Endpoint Cost Services
  - The capabilities for these resources now documents them
- Endpoint Property Parameters
  - Must list at least one property and one endpoint
- Endpoints appearing multiple times in lists silently ignored by server
- A couple editorial changes and corrections to examples

# Next Steps and Additions

## ■ Current List Discussions

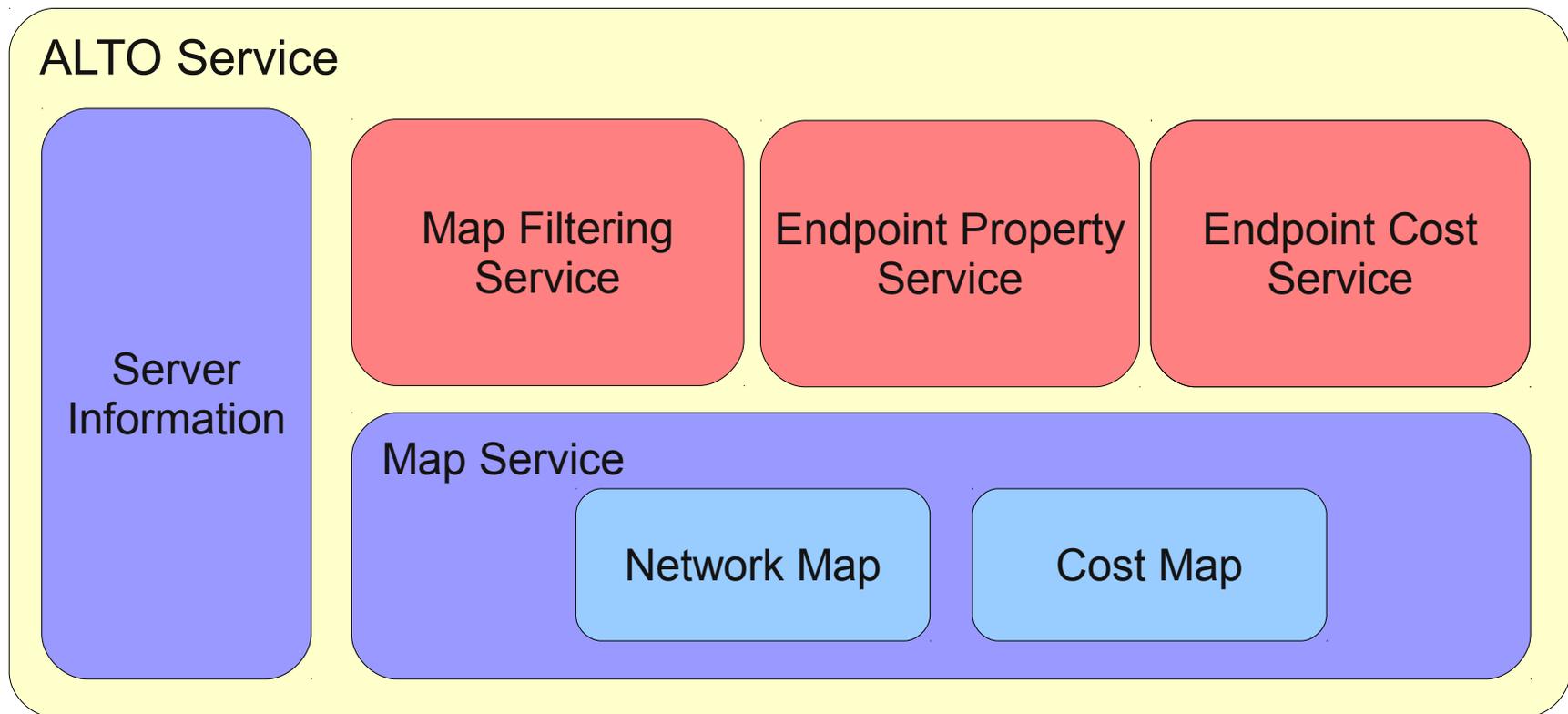
- Multiple Cost Types
- Opaque Cost Types
- PID Properties
- Address Type in Filtered Network Map

## ■ TODOs

- Document allowed error codes explicitly for each request and conditions under which they are returned
- Make Base64 possible in PID names

# Discussion

- Are we still okay with the designation of Required / Optional services?



**KEY:** REQUIRED  
OPTIONAL