

ALTO Protocol

draft-penno-alto-protocol-04

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Protocol Design:

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

Outline

- Changes from -03 to -04
- New Protocol Structure
- Next Steps

Comments since -03

- -03 version represented merge of a number of proposals
 - Many commonalities amongst proposals
 - Merge process attempted to unify many concepts
- Much helpful feedback from IETF75 and mailing list
- Primary issues identified:
 - Overall architecture unclear
 - Not clear why merge was reasonable
 - Too complicated
 - Dislike of XML encoding
 - Details of HTTP usage (e.g., caching headers)

Changes in -04: Protocol Structure

- Split operations into *services*
 - Service includes operations of related functionality
 - Simplifies distinction between REQUIRED and OPTIONAL behavior

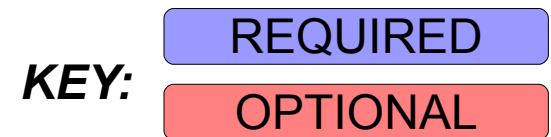
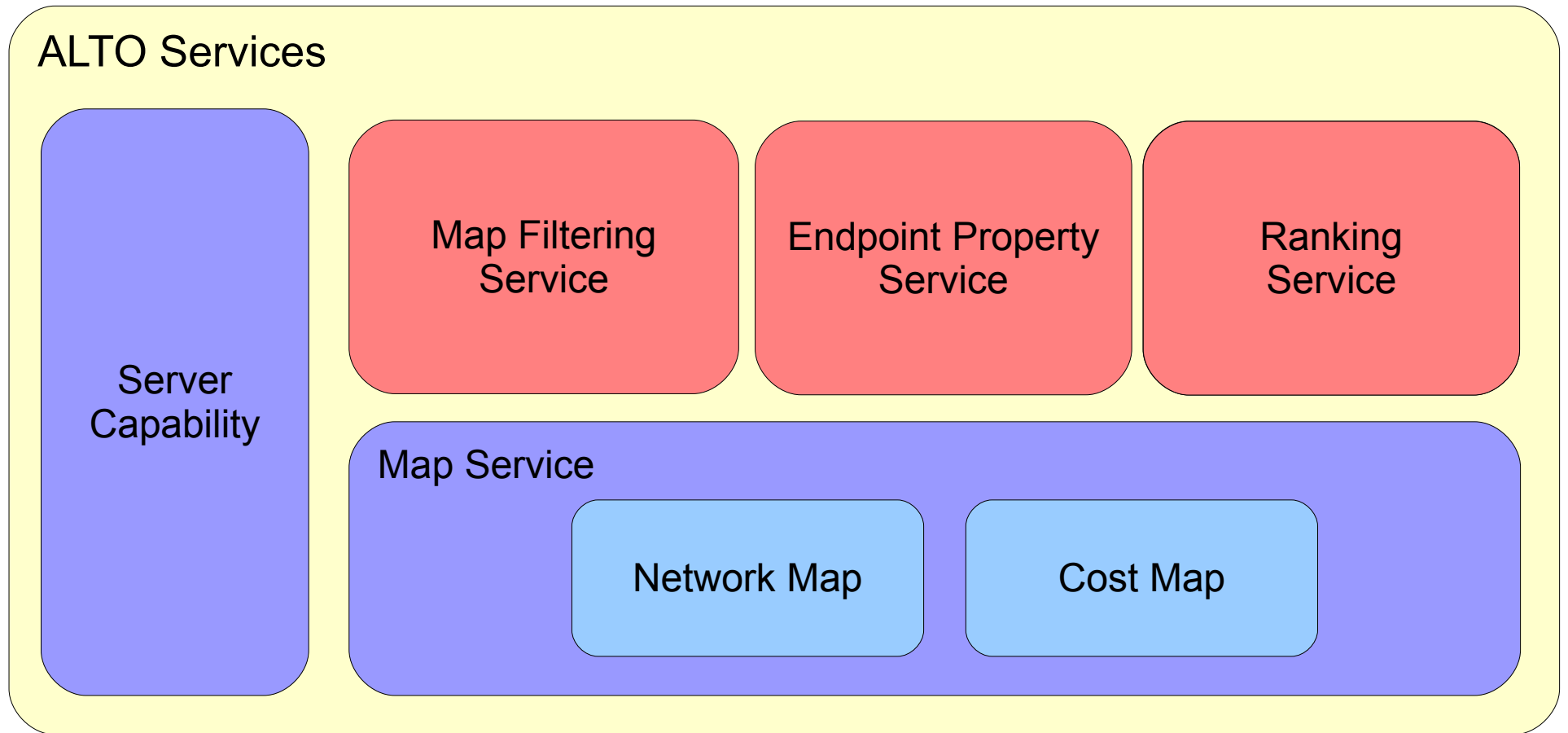
- Allow for extremely simple basic deployment
 - Minimal set of services are REQUIRED
 - Implementable by serving static files from a web server

- Retain flexibility for diverse deployment scenarios
 - Additional OPTIONAL services extend core services

Changes in -04: Encoding

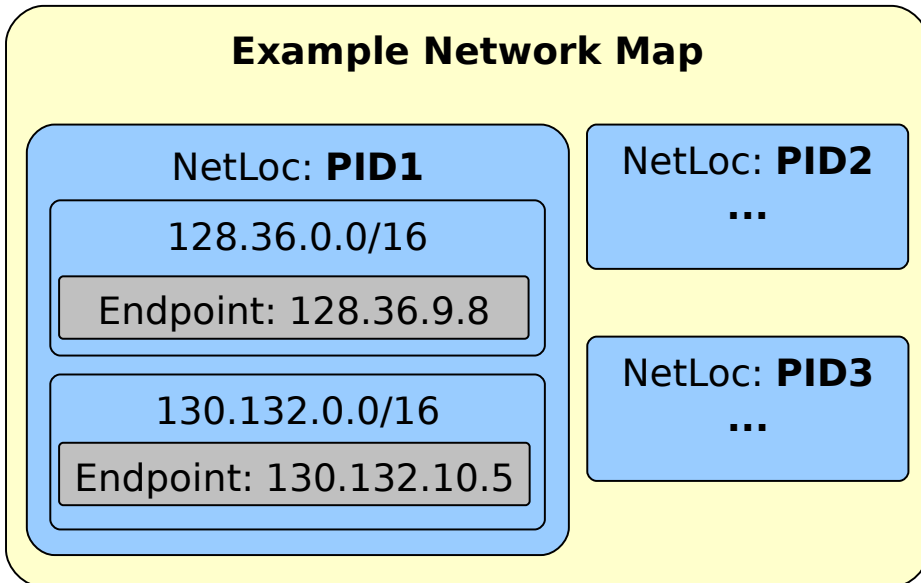
- Focus of -04 is on overall protocol structure and operations
 - (Temporarily) removed specific encodings from document
 - Examples indicate information contained in messages
- Fully specify encoding once structure (mostly) stabilized

Protocol Structure



Map Service: Basic ALTO Information Recap

Example Network Map



Network Location:

Denotes endpoint or group of endpoints

PID:

Provider-defined identifier for group of endpoints

Example Cost Map

Type: Routing Cost
Mode: Numerical

	PID1	PID2	PID3
PID1	1	10	15
PID2	10	1	20
PID3	15	20	1

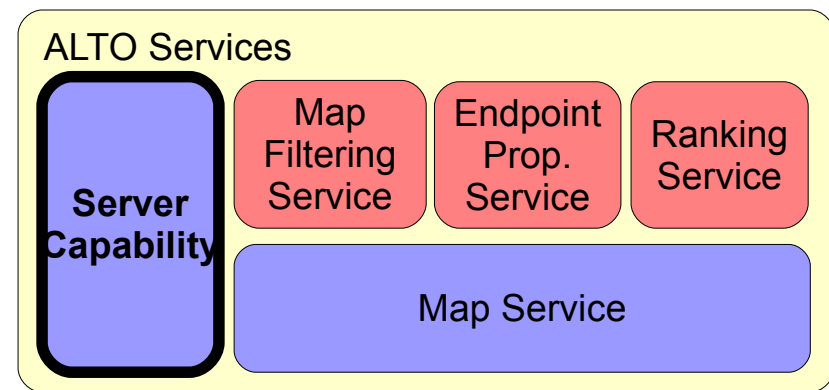
Cost Type:

Indicates what the cost represents (e.g., routing cost, air-miles, hop-count, etc)

Cost Mode:

Indicates how cost is interpreted; either *numerical* or *ordinal*

Server Capability



■ Purpose

- Indicates options supported by the server

 - Supported services, cost metrics, etc

■ Operations

Get Capabilities

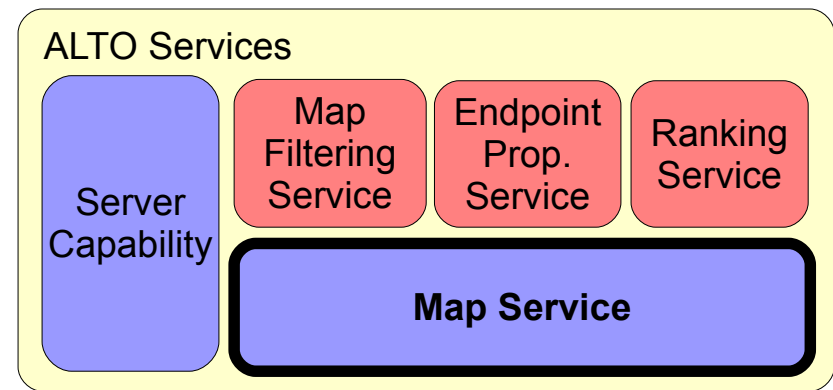
Request:

```
GET /capability
```

Response:

```
Server name  
Supported services  
Supported cost metrics
```


Map Service



■ Purpose

- Provides batch information to ALTO Clients
 - Network Map and Cost Map
 - Based on provider-defined groupings (PIDs)

■ Operations

Get Network Map

Request:

```
GET /prop/pid/map
```

Response:

List of PIDs (and IP Prefixes within each)

Get Cost Map

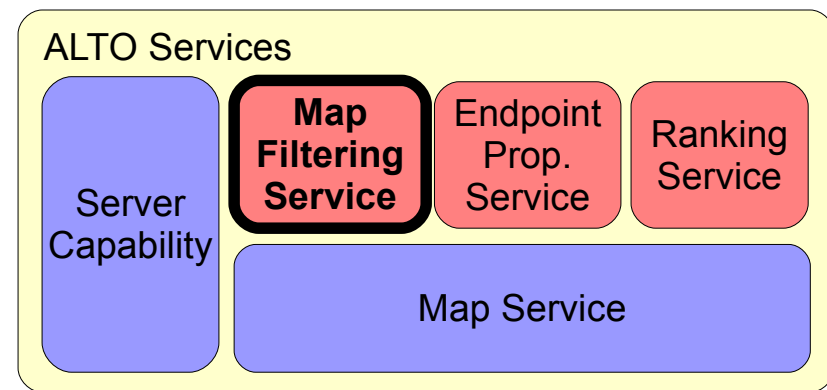
Request:

```
GET /cost/pid/map
```

Response:

Cost Type
Cost Mode
Cost between each pair of PIDs

Map Filtering Service



■ Purpose

- Provides ALTO Information based on additional parameters

 - Server-side filtering for resource-constrained ALTO Clients

■ Operations

Get Network Map

Request:

```
POST /prop/pid/filter
```

List of PIDs

Response:

List of PIDs (and IP Prefixes within each)

Get Cost Map

Request:

```
POST /cost/pid/filter
```

Cost type, mode, and constraints

List of source PIDs

List of destination PIDs

Response:

Cost Type

Cost Mode

Cost between each pair of
source/destination PID

Endpoint Property Service

■ Purpose

- Allows ALTO Clients to look up properties for individual endpoints

- PID property indicates provider-defined grouping of an Endpoint

■ Operations

Get Endpoint Property

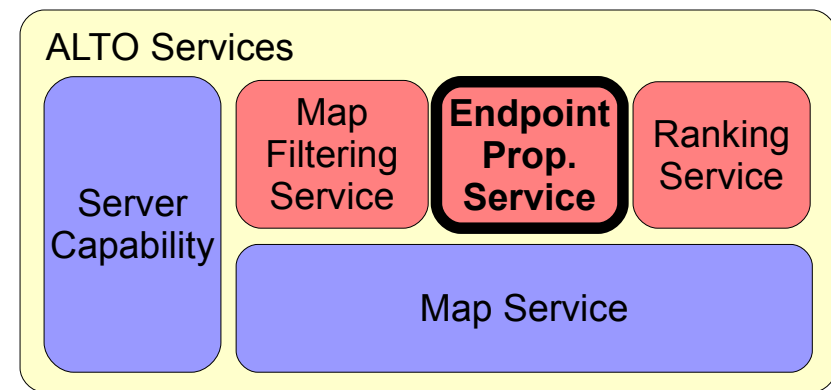
Request:

```
POST /endpoint/m
```

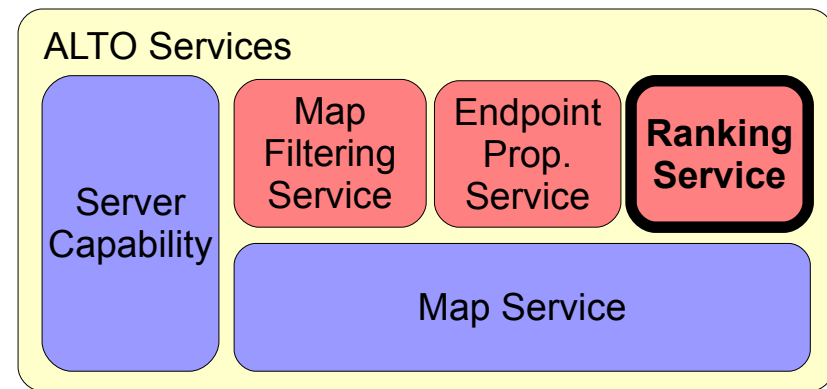
List of Endpoints
List of Properties

Response:

List of Endpoints (and property values for each)



Ranking Service



■ Purpose

- Provide path costs based on other types of network locations
 - Currently defines path costs amongst individual Endpoints

■ Operations

Get Endpoint Ranking

Request:

```
POST /cost/endpoint/ranking
```

Cost type, mode, and constraints

List of source Endpoints

List of destination Endpoints

Response:

Cost Type

Cost Mode

Cost between each pair of
source/destination Endpoints

Ordinal Ranking Response Example:

```
{  
  "Type": "routingcost",  
  "Mode": "ordinal",  
  "Ranking" : {  
    "ipv4:128.30.24.2": {  
      "ipv4:128.30.24.89" : 1,  
      "ipv4:130.132.33.4" : 2,  
      "ipv4:12.32.67.3"   : 3  
    }  
  }  
}
```

Next Steps

- Issues for working group to address
 - Naming of services (“Map Service” → “ALTO-Core”?)
 - Details of HTTP usage (caching, error codes, etc)
 - Encoding specification (grammar)
- ***Adopt as working group item?***