Multi-Cost ALTO

Updates in
draft-randriamasy-alto-multi-cost-06
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Diffs & use cases

• Main part of 05 - Multi-Cost (MC) Services
  – Extensions of ALTO protocol and ALTO services to include several cost types in 1 ALTO transaction
  – Introduces new Multi-Cost specific ALTO services

• New use cases
  – Endsystems needing to spare time by optimizing their ALTO transactions

• Discussions related to i2aex
  – CDN use case
  – Data center use case
  – Need information on more than topology
    • Resources on path and at endpoints
Objectives of Multi-Cost

• Gain time and resources by
  – Transport information on N Cost Types in 1 ALTO transaction rather than in N transactions

• 1 Multi-Cost Map instead of N Cost Maps
  – Less bulky to store than N Cost Maps
  – Represents a smaller data volume to transport
  – 1 MC transaction is faster than N single cost
  – Same for Filtered MC Map

• Suitable ALTO Services for multi-cost
  – Endpoint Multi-Cost service
  – Filtered multi-cost map
Specified Multi-Cost Services

• Multi-Cost Map Service
• Filtered Multi-Cost Map Service
• Endpoint Multi-Cost Service
  – Need to synchronize with current protocol updates
• Example of MC ALTO requests and responses
  – For each of the 3 services
Example request – Filtered MC Map

• Suppose Cost Type « routingcost » = monetary cost.
• Client wants to figure out delay, so it requests Type « hopcount »

POST multi/multicostmap/filtered HTTP/1.1
   Host: alto.example.com
   Content-Type: application/alto-nnncostmapfilter+json
   Accept: application/alto-nnncostmap+json,application/alto-error+json

{
   "cost-mode" : "numerical", "numerical",
   "cost-type" : "routingcost", "hopcount"],
   "pids" : {
      "srcs" : [ "PID1" ],
      "dsts" : [ "PID1", "PID2", "PID3" ]
   }
}
Example response – Filtered MC Map

HTTP/1.1 200 OK
Content-Length: [TODO]
Content-Type: application/alto-NNNcostmap+json

{
  "meta" : {},
  "data" : {
    "cost-mode" : ["numerical", "numerical"],
    "cost-type" : ["routingcost", "hopcount"],
    "map-vtag" : "1266506139",
    "map" : {
      "PID1": { "PID1": [1,6],  "PID2": [5,23],  "PID3": [10,5] } 
    }
  }
}
Thank you

back-up slides follow
ALTO Multi-Cost rules

• Term EP covers
  – Peer, CDN storage location, party in grid computing or on-line gaming or other resources sharing applications.

• Properties have constant values, costs can vary

• Rule1
  – when multiple cost types are requested then the requested Cost Mode MUST be numerical for those Costs Types encoded in JSONNumber
    • Reason: avoid mixing ordinal and numerical costs, requests too complex to handle and ordinal is easy to retrieve from numerical
    • Does not apply to Costs encode with JSONBool, JSONString

• Rule2 – value order specification
  – The ALTO response, MUST include an array of cost-types, arranged the same way as the values
  – The cost values for Source/Destination pairs MUST be provided in the same order as in the array of cost types
UC3: data transfer scheduling with «dynamic» costs

• CDNs need to regularly transfer their data for dissemination purposes
  – Need to avoid interfering with user peak activity
• Particular groups of users have limited access
  – to network and/or resources in time
• In both cases
  – Fixed/limited choice on target locations
  – Need for bandwidth
    ➔ Need to schedule their transfers
    ➔ Need information at various time periods on e.g.
      ☑ Path occupation
      ☑ Routing cost