Multi-Cost ALTO

draft-randriamasy-alto-multi-cost-00

S. Randriamasy
Outline

• Extension of ALTO protocol
  – multiple cost types in one ALTO transaction
• Why Multi-Cost ALTO transactions
  – Gain time, save resources, richer endpoint choice
• Proposed protocol extensions
  – Multiple ALTO CostTypes
  – Additional cost and Endpoint attributes
• Proposed additional Properties and Costs
Proposed Extensions

• Endpoint Cost Service with multiple Cost Types
• All Costs Types in one response with vector cost values
• In this case, the ALTO client MUST require the Cost Mode « numerical »
• Proposed additional Cost Types
• Statistical costs with a timeframe
• Scope
  – Application clients of: CDN, P2P, Gaming, …
  – ALTO services:
    • Endpoint Cost Service, Cost Map, Filtered Cost Map
Why Multi-Cost ALTO transactions

• REQ. ARv05-14: "The ALTO client protocol MUST support the usage of several different rating criteria types«. 

• vector costs provide a robust and natural input to multi-path connections and getting all costs in one single ALTO transaction saves time, traffic, thus resources an energy.

• « Long » (TBD) term statistics or empirical ratings on performance oriented information may still be useful for a reliable choice of candidate endpoints.

• Specific ALTO services can be specified for mobile core networks, which have a smaller scale and can afford and take advantage of using network information at a smaller time-scale

• Adding QoE-enabling metrics to the Network Provider established routing cost benefits to both the end users and the Providers.
Proposed protocol extensions

• Impacted ALTO services and features
  – Endpoint (EP) Cost
  – Cost attributes
  – Cost Map between Network Locations
  – Cost Map filtering
Proposed protocol extensions

• Multi-Cost specific attributes
  – "Cost Length" = number of requested Cost Types
  – extension of Cost Type to a vector of N >= 1 values
  – Definition of Cost Type ID supported by acting ALTO server and mapping to Cost Vector components
  – Optional: associated with Cost Vector components
    • Reliability vector
    • Time frame vector
  – Default values

• Rule:
  – when multiple cost types are requested, then the requested Cost Mode MUST be numerical
Proposed additional Properties and Costs

• Additional Endpoint (EP) properties
  – EP capacity in memory
  – EP nominal bandwidth
  – EP access technology

• Scope of ALTO information
  – Time Frame attribute
  – Time To Expire counter
  – Reliability Level
Proposed additional Properties and Costs

• Additional Cost Types
  – Endpoint availability (score)
  – Endpoint reliability (score)
  – Endpoint Load (class[timeframe])
  – Endpoint path robustness (class[timeframe])

• Other…
Illustrative ALTO use case

Figure 2: features and mechanisms added to the current ALTO scenario for Multi-Cost ALTO services