ALTO Protocol

draft-ietf-alto-protocol-05

**Richard Alimi (Ed.), Reinaldo Penno (Ed.), Stefano Previdi,
Stanislav Shalunov, Richard Woundy, Y. Richard Yang (Ed.)**

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

Outline

- Summary of Changes

- Remaining Issues

Change Summary

- Maps and Costs
  - Preferences via Network Map
  - *Default Cost*

- Redistribution
  - No more "X-" in HTTP Headers
  - *Service ID*

- Feedback from Interim meeting
  - Status codes: specify as strings
  - Protocol versioning: remains within ALTO Protocol

- Discussion Section and Extensions
  - *"Location-only" peer selection*

Default Cost

- No default cost mandated in earlier drafts (before -04)

- May cause problem for ALTO Clients; for example:

  - ALTO Client downloads Network Map and Cost Map
  - ALTO Client discovers peers with addresses 198.51.100.100 and 192.0.2.34
    - 198.51.100.100 maps to PID1
    - 192.0.2.34 is not found in Network Map (thus, cost not available via Cost Map)
  - Problem: What does the ALTO Client do?
    - Is 192.0.2.34 less or more preferred?
    - By how much more or less?

- Since -04, ALTO Server MUST define a cost for each address

  - RECOMMENDED way to satisfy requirement is to define a PID including 0.0.0.0/0 (::/0 for IPv6)

  - ALTO Clients MAY override (e.g., for private addresses)

Why have a ALTO Service ID?

- Example of problem

    - Two ALTO Servers S_A and S_B deployed for load balancing / redundancy

    - ALTO Client C_A maps to S_A via discovery and retrieves ALTO Info

    - ALTO Client C_B maps to S_B via discovery

    - *C_A should be able to redistribute ALTO Info to C_B*

- Solution approach

    - Enable set of ALTO Servers to distribute identical ALTO information
    - ALTO-layer ID to avoid dependence on particular implementation
        - e.g., anycast or DNS
    - Redistributed ALTO Info includes Service ID

ALTO Service ID

- Service ID
  - UUID shared by ALTO Servers distributing identical ALTO Information
  - Servers with same Service ID use same private key for digital sigs

- Discussion
  - Is this mechanism needed?
  - Introduces issue with updating ALTO Info across servers
    - What if updates applied at different times?
      - ALTO Clients should be protected against accepting "old" ALTO Info
    - Version numbers for ALTO info can solve it
    - Is it worth guarding against this?

"Location-only" Peer Selection

- **Simple integration path for applications wishing to utilize ALTO**
  - Peer selection algorithm primarily using Network Map

- **Basic Idea**
  - Select peers in three stages
    - First, select peers from same PID
    - Second, select peers from same ISP
    - Third, select peers from other ISPs
  - Robustness (e.g., including peers from each category) is important

"Location-only" Peer Selection

- **Algorithm already shows benefits**

  - ❑ Experimental Setup for Live Streaming
    - 2790 PPLive (emulated) clients running on PlanetLab
  - ❑ Results for North American ISP
    - 31.6% increase in intra-ISP traffic, 117.8% increase in intra-PID traffic
    - 6% reduction in average startup delay, 51% reduction in # of freezes

- **Extensions needed in ALTO Protocol**

  - ❑ Attribute indicating which PIDs are within same ISP
    - May be useful in other contexts

Remaining Issues

■ Integrate solution for IPv4/IPv6 preferences

   ❑ Waiting on additional feedback to v4/v6 draft

■ Schema for request/response messages

   ❑ json-schema: draft-zyp-json-schema-02

   ❑ Convert to this in a future draft?

■ New draft with sketch of a REST-ful ALTO Protocol

■ Any other comments or feedback?