ALTO Protocol

draft-ietf-alto-protocol-05


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?