Third-party ALTO server discovery

draft-kiesel-alto-3pdisc-01.txt

Sebastian.Kiesel@nw.neclab.eu
Marco.Tomsu@alcatel-lucent.com
Martin.Stiemerling@nw.neclab.eu

IETF-76, Hiroshima, Japan, 2009-11-11
Agenda

• Why third-party ALTO queries?
• Why third-party ALTO server discovery?
• Six solution approaches
• Open issues
Why third-party ALTO queries?

- Network topology with 3 ISP networks, tracker-based P2P app
- Tracker knows that peers 1b, 1c, 2a, 2b are already in swarm
- Peer 1a wants to join, sends query to the tracker
Why third-party ALTO queries?

- Tracker returns short list of randomly chosen peers (2 out of 4 known peers, in reality maybe 50 out of 10,000)
- “Good” peers do not even reach peer-initiated ALTO query
Why third-party ALTO queries?

• Tracker can ask ALTO about all known peers, return “good” ones (probably using P4P/infoexport, not oracle-style query)
• Third-party query needs to consider res. consumer’s location
Why third-party ALTO discovery?

- Theoretically feasible: one (group of) centralized ALTO server(s)
- Needs to know full $from \times to \rightarrow rating$ table
- Scalability, administrative responsibility?
Why third-party ALTO discovery?

- More likely: distribute ALTO knowledge on many servers
- Each ISP operates an ALTO server that can provide guidance to resource consumers in his networks
Why third-party ALTO discovery?

- For third-party ALTO queries: how to make sure that an ALTO query on behalf of a specific resource consumer is answered by the corresponding ALTO server?
Six solution approaches

#1 ALTO client in tracker calls external lookup mechanism to map peer’s IP addr. → “right” ALTO server’s IP addr. (DNS is probably a good choice, maybe similar to BEP-22)

#2 Inter-ALTO server protocol (let them know each other), forward/redirect ALTO query based on peer’s IP address

#3 =#1, #4=#2, but introduce peer ID (e.g., assigned by DHCP) to distinguish peers behind carrier grade NAT

#5 Peer discovers its ALTO server’s IP address (e.g., by DHCP), forwards it to the tracker

#6 Peer discovers (e.g., by DHCP) and queries ALTO server (P4P /infoexport style), forwards reply (+local prefs.) to tracker
Evaluation

• Many criteria, see draft
• Author’s conclusion: we should further investigate and specify Approach #1, i.e., use DNS to map peer’s IP addr. → “right” ALTO server’s IP addr.
  • No assumptions on (P2P) application protocol needed
  • No inter-ALTO server protocol needed
  • ALTO client protocol and discovery mechanism can be specified independently
  • DNS is proven to work and scale, ISPs know it
Open issues

• Do we need third-party ALTO server discovery?
  – Technical reasoning: see above, BUT:
  – Will network operators allow their ALTO servers being queried by remote, untrusted trackers?
  – Will trackers bother querying ALTO servers on behalf of the peers?

• Do we need to support large domains behind NAT?

• Many approaches assume that for any given peer, there is exactly one (ISP provided) “authoritative” ALTO server (may be replicated). Is this acceptable?

• Which approach to follow? How to move forward?
Acknowledgments

The authors would like to thank Haibin Song, Richard Alimi, and Roni Even for fruitful discussions during the 75th IETF meeting.

Sebastian Kiesel and Martin Stiemerling are partially supported by the NAPA-WINE project (Network-Aware P2P-TV Application over Wise Networks, http://www.napa-wine.org), a research project supported by the European Commission under its 7th Framework Program (contract no. 214412). The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of the NAPA-WINE project or the European Commission.

Marco Tomsu is partially supported by the 4WARD project (http://www.4ward-project.eu), a research project supported by the European Commission under its 7th Framework Program (contract no. 216041). The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of the 4WARD project or the European Commission.