

P2P Traffic Localization by Alias Tracker for Tracker-based P2P applications (ATTP)

draft-zhang-alto-attp-02

Yunfei Zhang

China Mobile

Overview

- P2P applications account for more than 50% of the Internet traffic in the daytime and 90% at night for China Telecom, the largest ISP in China
- Bittorent+PPlive (Tracker-based) has taken 75% share of total P2P traffic.
- The international egress of ISPs are jammed seriously by P2P applications almost all the time.

Problems

- The above condition brings
 - Low performance and efficiency
 - High network management
 - High operation
 - High billing
 - Things are esp. serious for small ISPs without a peering with large ISPs with double-direction billing

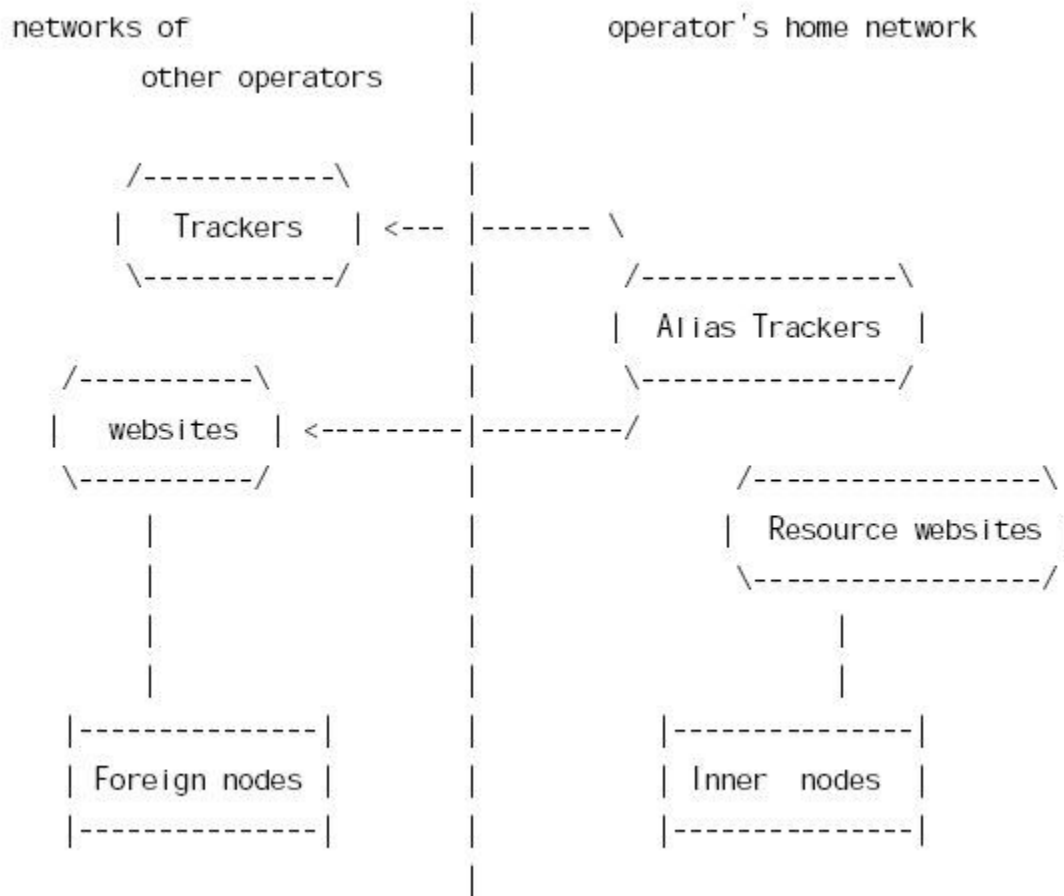
ISP's Considerations on Cooperation between ISP and P2P Service Provider

- The basic idea of ALTO is to let operators/ISPs and service providers of P2P application cooperate with node clustering and traffic localization.
- How to use network topology info?
 - Operator provides topology and/or bandwidth information to P2P applications.
 - P2P applications provides live nodes information to the operator who makes the decision of node clustering and localization based on its network knowledge.
 - We prefer to the 2nd option.

Advantages of the 2nd Option

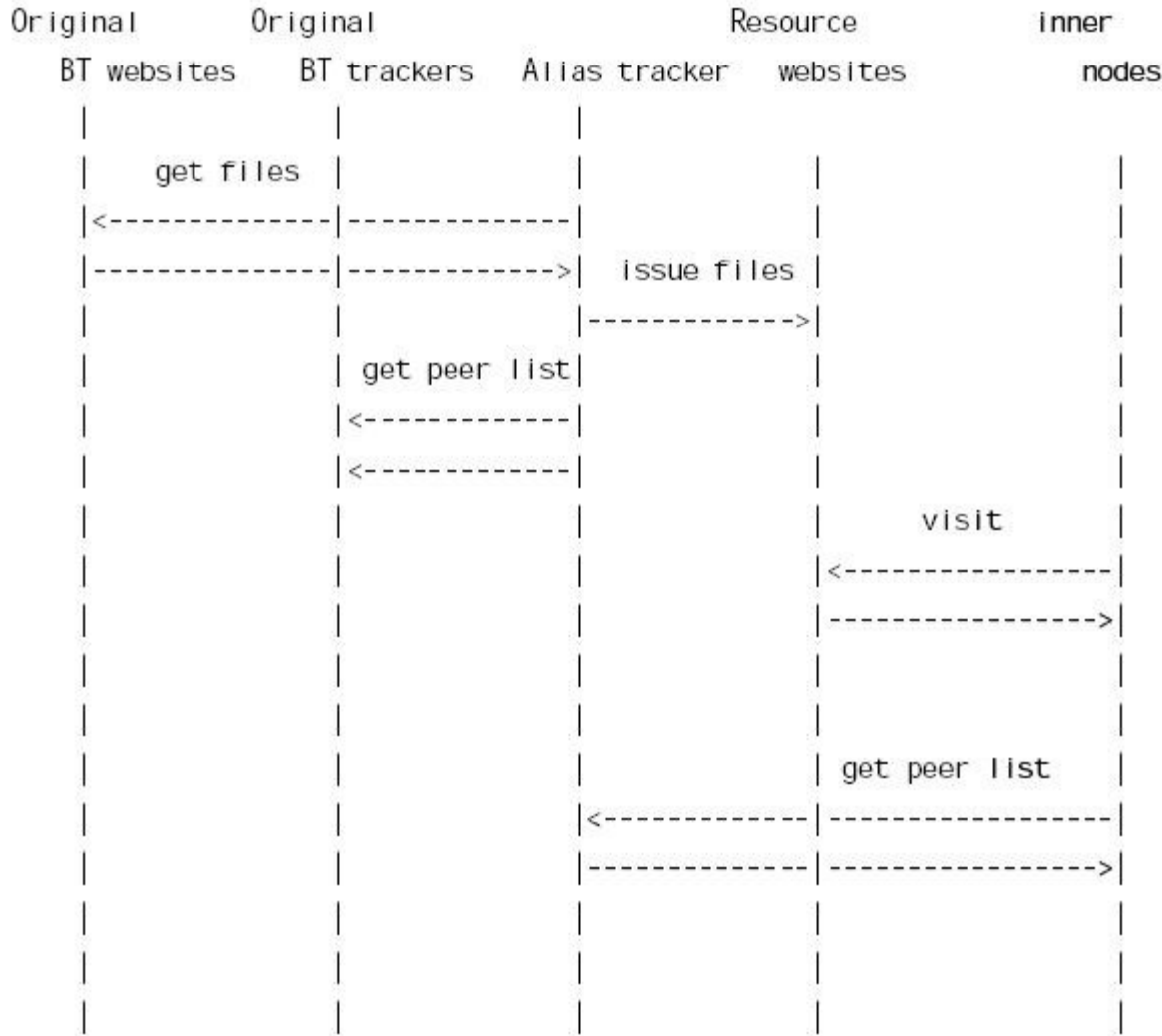
- It can keep operator independence and privacy;
- It can make full use of operator's knowledge to reduce cross-ISP traffic;
- It don't add more burden for the P2P application providers to make node and request localization decision: Meanwhile it achieves the goal of increasing the performance (esp. decreasing latency and increasing throughput by localization).
- So it's a double-win game.

ATTP: One Mechanism for Tracker-based P2P Applications



- Alias tracker is controlled by the ISP and cooperative with original tracker.
 - Monitoring live peer information
 - Getting global peer info from original tracker
- Resource website publishes the most popular resource information(e.g., the related torrent files)
- Inner DNS server REDIRECTS visit for original outside website to inner resource website

ATTP Process



Peer list

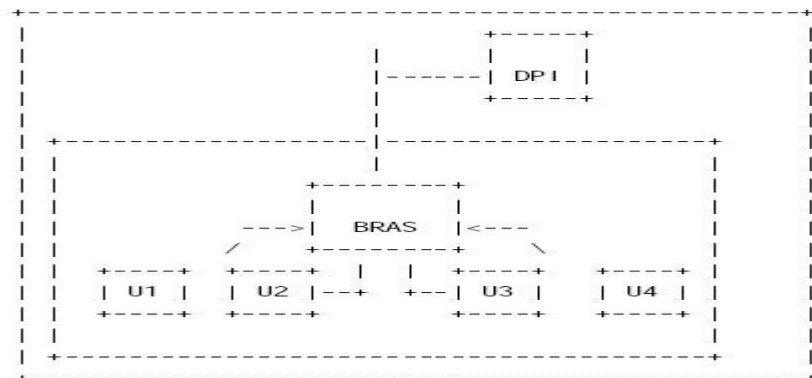
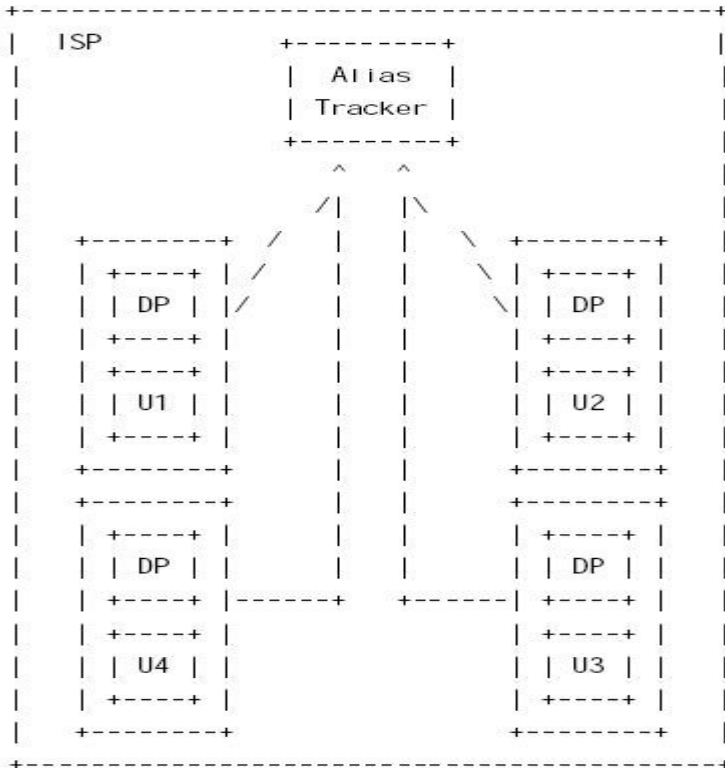
- If the amount of inner nodes of the ISP's network is enough, all of the nodes that are returned by alias tracker are inner nodes.
- Else some outside nodes are returned besides all the inner nodes.

Strategies of Alias Tracker

Choosing Seed Nodes(1)

- According to the network conditions

- DP: Detection Point
- Traffic density = Total of traffic in a period / Number of users
- DP nodes send information of traffic density to the alias tracker periodically
- Alias Tracker chooses seed nodes, with low density first.
- Tradeoff between low density and low node bandwidth



Strategies of Alias Tracker

Choosing Seed Nodes(2)

- According to the seed node service capabilities
 - _ each peer reports performance parameters to the alias tracker periodically.
 - CPU's average utilization ratio
 - average memory usage ratio
 - available network bandwidth
- According to the peering and economic relationship among ASes
 - _ Inside one AS
 - _ Inside one ISP
 - _ Inside one peering ISP
 - _ Others..

Conclusion

- The purpose is to specify tracker cooperative mechanism between ISP and service providers based on ALTO principle.
- A mirror tracker and DNS redirection based method to reduce cross-ISP traffic for P2P tracker-based applications.
- Node selection is based on several factors.

Open Questions and Next Step

- Defining the interface between local tracker and original tracker
- Exploring the possibility of application-agnostic solutions to new proliferating P2P protocols for bulk data
- Is this a problem in current scope of ALTO?
 - Local tracker and original tracker interface
 - Local cache issue?

Thanks for your attention!