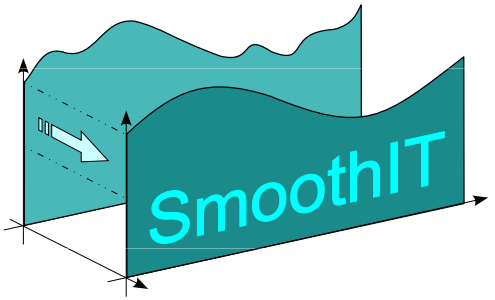
Simple Economic Management Approaches of Overlay Traffic in Heterogeneous Internet Topologies

European Seventh Framework STREP FP7-2007-ICT-216259



ALTO Service based on BGP Routing Information

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Background

- Simple Economic Management Approaches of Overlay Traffic in Heterogeneous Internet Topologies (SmoothIT)
- European Seventh Framework STREP FP7-2007-ICT-216259
- Internal Trial with Telefonica, Madrid, Spain
- External Trial with PrimeTel, Cyprus

BGP-based Mechanism

- Numerous studies of “BitTorrent under locality.” Locality helps, but how to effectively get locality info?
- BGP as source of the locality info (actually, more than that)
- Assumption: ISPs running the ALTO service

1. Peer sends a list of other peers’ IP addresses to the ALTO Server
2. Server sends back the (sorted) list
   - Each address has a value assigned
   - Values computed according to BGP attributes (Local preference, MED flag, AS hops)
3. The querying peer uses the sorted list
   - Ranking based on BGP locality information

Relevant BGP Information

- BGP attributes used for ranking
  - Local Preference: Different ranges of values for different business relations (customer, provider, peer, backup)
  - AS Path: Distance to destination
  - Multi-exit discriminator (MED) : Assigned by neighbors, therefore used only if neighbors do it in the same way
- BGP operation:
  - Prefer the route with the largest local preference value
  - In case of tie, prefer route with shortest AS path
  - In case of tie, prefer route with lowest MED value

BGP based Ranking

- In: IP address with *localPref*, *asHops*, *med* attributes set
- Out: ranking assigned to the address

$$ranking = \begin{cases} localPref \cdot (MAXAS + 1) \cdot (MAXMED + 1) & \\ +(MAXAS - asHops) \cdot (MAXMED + 1) & \text{Remote AS} \\ +MAXMED - med & \\ & \\ (MAXPREF + 1) \cdot (MAXAS + 1) \cdot (MAXMED + 1) & \text{Own AS} \end{cases}$$

Thank you for your attention!