Mythbuster-ing P2P Traffic Localization

draft-marocco-p2prg-mythbustering-01

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- A container for discussions of possible effects of P2P traffic localization
  - Source: various meetings and mailing lists
- A collection of relevant references

- How this relates to ALTO
  - IETF defines a protocol for imparting preferences
  - IRTF investigates how to make the best use of it
    - Both on the provider and on the application side

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- Organized as a collection of:
  - Myth
    - Facts
    - Discussion
    - Conclusions

- Intended as a community effort: -00 is was strawman, but received good feedback

- Please keep providing input!

Myths (to date)

- Reduced Cross-domain Traffic
- Increased Application Performance
- Increased Uplink Bandwidth Usage
- Impacts on Peering Agreements
- Impacts on Transit
- Swarm Weakening
- Improved P2P Caching (W-i-P)

Reduced Cross-domain Traffic

- Facts:
  - ✔ P4P simulations (~70% reduction)
  - ✔ Comcast's trial (34% out, 80% in)
  - ✔ TU Berlin (up to 80% increase in local exchanges)

- Discussion:
  - Well... that's the main point of localization, no?

Increased Application Performance

- Facts:
  - ✔ P4P simulations (up to 23% reduction in dl time)
  - ✔ Comcast's trial (up to 85% increase in dl rate)
  - ✔ Ono experiment (31% avg reduction in dl time)
  - ✔ TU Berlin (up to 34% reduction in dl times)
  - ✘ Ono experiment (slight degradation in low connectivity)
  - ✘ Bell Labs (low effectiveness in some scenarios)

- Discussion:
  - Beneficial in many cases
  - May harm in low connectivity networks
  - Localization should be balanced

Increased Uplink Bandwidth Usage

- ## Facts:
  - ✗ Comcast's trial (no increase in uplink traffic)

- ## Discussion
  - Total uploads equal total downloads
    - Assuming unlimited content and 24x7 downloaders, increasing dl speed means increasing uploads
  - In mature swarms, local leechers (or idle seeders) could be preferred to remote seeders

Localization in Mature Swarms

○ peer   ● seeder

Cross-domain: -3
Upload: +1
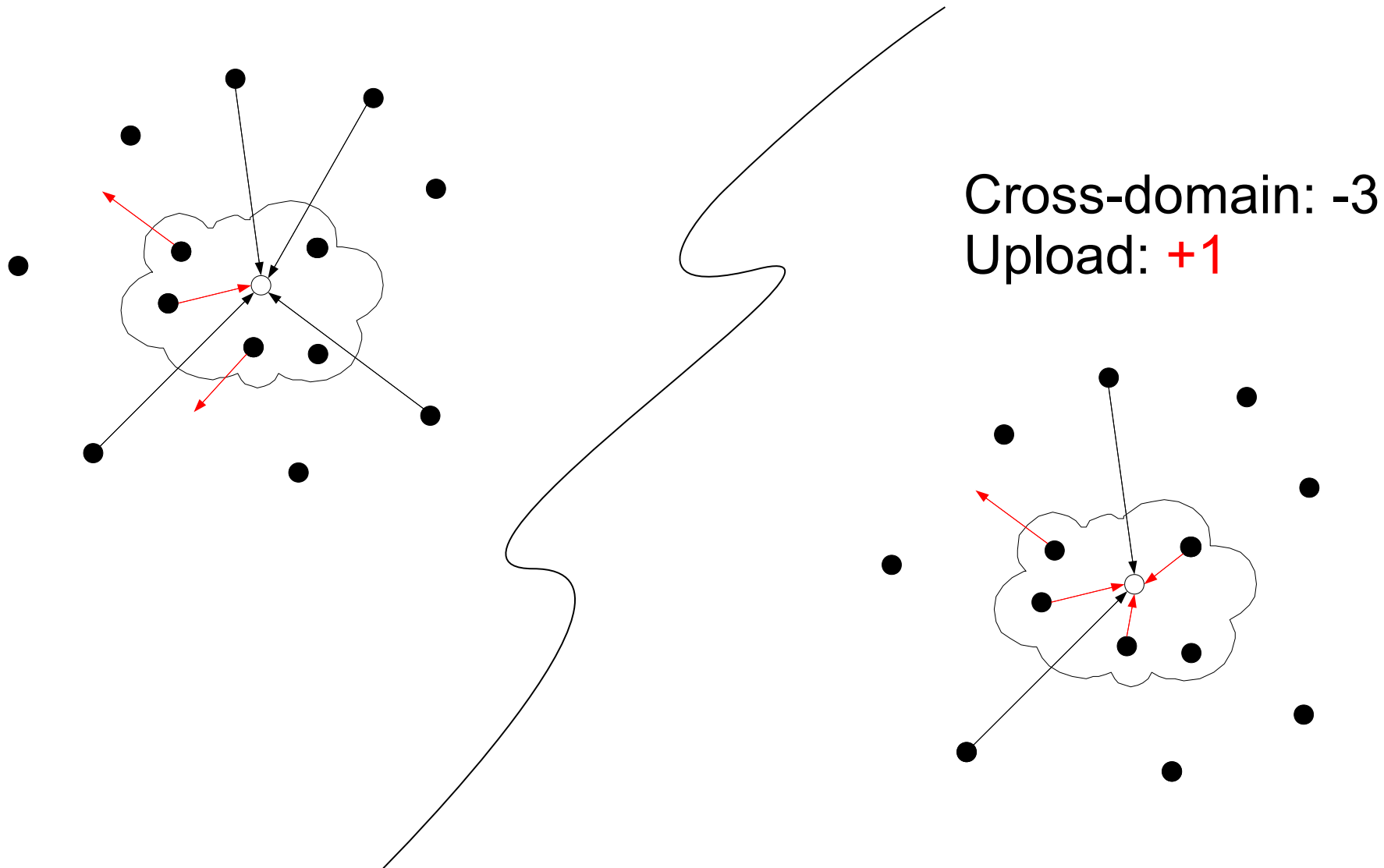
Impacts on Peering

- Smaller ISPs are keen to peer with larger ones
  - They need to increase the volume of traffic exchanged between the two networks
    - P2P traffic (de)localization could play the trick (i.e. send peers in my network toward peers in the target network)
      - Better (subtler?) form of traffic injection
- ISPs with good upload capacity may be in a position to re-negotiate peering agreements
  - Large ISPs with good uplink
  - ISPs with great uplink (FTTH, DOCSIS 3.0...)

Impacts on Transit

- Traffic localization/directing aims at reducing the need for transit service

  - Prefer local or peer networks, avoid transit

- But: what if a tier 1 ISP decided to direct peers in its network toward networks it provides transit service to?