Mythbuster-ing P2P Traffic Localization

draft-marocco-p2prg-mythbustering-01

Enrico Marocco
Antonio Fusco
Ivica Rimac
Vijay Gurbani

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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
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- 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?