P2P and Service Providers
ICNP 2008

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Problem #1  Bandwidth Costs

• P2P is part of larger Internet Video trend: subscriber fees are flat, the cost are increasing due to growing broadband consumption (UGC video, premium online content, Bittorrent)
  – In last 12 months bandwidth capacity in US ISP networks grew by 75-100%, while number subscribers grew at 15-20%

• The capacity is provisioned by peak-time consumption
  – YouTube clips downloads may incur more cost than 24x7 P2P downloading

• For different ISPs, the pain point is in different network segments
  – type of broadband
  – regional network type
  – geographical location
Problem #2 Control

• Peer-to-peer applications optimize for download acceleration
  – Swarming: Use of multiple concurrent connections
  – Peer selection: Selection of best performing peers, regardless of topology and underlying network costs

• Work around traffic engineering
  – Port hopping: Avoid L4 traffic engineering techniques
  – Transport obfuscation: Avoid L7 bandwidth throttling
What’s being done?

• Unilateral control of the costs
  – Quota field trials
  – Fair Share (application-neutral bandwidth throttling)
  – DPI bandwidth throttling (internationally)

• Cooperative network-aware peer selection
  – P4PWG
  – IETF ALTO

• Transport-level support for bulk transfer
  – IETF TANA
P2P Caching

• Cache is a seeder that is always there
  – Provides localization for content that is not available with on-network peers anymore

• Reduces bandwidth costs AND provides application acceleration
  – Combination of on-net caching and peer-to-peer swarming is shown to provide wire-speed delivery (5-10 Mbps)

• Provides basis for ISP-based commercial content delivery services
  – HD content distribution
  – P2P-based “catch-up TV”
  – P2P-based STB network
  – Personal P2P
Thank You