Use of P2P Technology in Internet Access Networks and its Impacts





Internet evolution

Motivation

New networking paradigm: P2P

Peers = Network =



Increasing complexity Growing number of users

Computing/storing resource

Insufficient centralized service structures

- Low scalability & resilience
- High costs for increasing scalability & resilience

Efficient decentralized solutions

• High scalability & resilience

High scalability & resilience = intrinsic features

Problem: Mismatch between P2P overlay and physical underlay

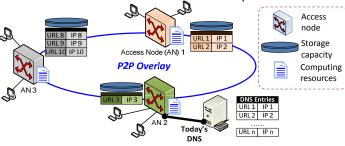
P2P-based Communication Infrastructure

Connect access nodes of access networks with P2P technology

Use available storage capacity and computing resources of access nodes

P-DONAS: A P2P-based Domain Name System

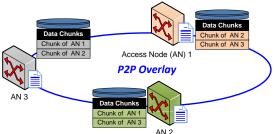
• DNS data storage&functionality • Compatibility with on each access node today's DNS



Supersedes additional DNS server farms

A P2P-based Store&Compute Platform

- Logfiles and statistics storage in RAM of each access node
- Statistics computing on each access node

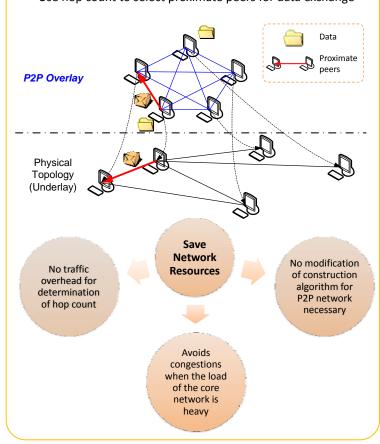


 Supersedes the use of expensive and rarely available flash memory Avoids bottleneck for computing tasks

Improved Peer Selection

New peer selection algorithm for P2P filesharing protocols, e.g., BitTorrent

- Insert initial Time-To-Live value of a packet into P2P payload
- Calculate hop count at the packet's destination
- Use hop count to select proximate peers for data exchange



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