# DECADE Problem Statement

draft-song-decade-problem-statement-02
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# Changes Since Last Version

- Align text with charter
  - Not limited to a single data transport protocol  (multiple underlying protocols will be evaluated)
  - Reuse exiting protocols and mechanisms as much as possible
- Consideration to resource control policies
  - The granularity of resource control policies could be either individual remote peers or application
- Protocol perspective considerations
  - Scale to a large number of users without substantial increase of operational complexity to storage provider
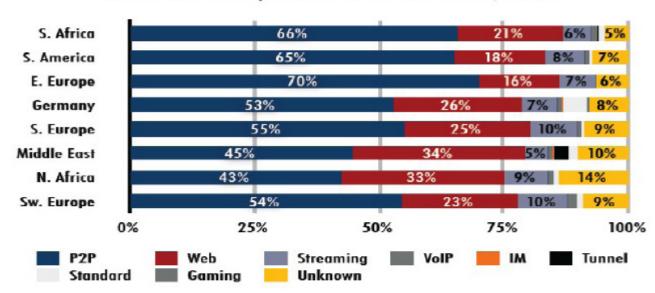  - Easy for applications to integrate

# Open Issues

- Need more analysis on security aspects

# P2P Contributes Significant Traffic

- 40-70% traffic in many networks

## Distribution of protocol classes 2008/2009

| Region | P2P | Web | Streaming | Unknown |
|---|---|---|---|---|
| S. Africa | 66% | 21% | 6% | 5% |
| S. America | 65% | 18% | 8% | 7% |
| E. Europe | 70% | 16% | 7% | 6% |
| Germany | 53% | 26% | 7% | 8% |
| S. Europe | 55% | 25% | 10% | 9% |
| Middle East | 45% | 34% | 5% | 10% |
| N. Africa | 43% | 33% | 9% | 14% |
| Sw. Europe | 54% | 23% | 10% | 9% |

Legend: P2P, Web, Streaming, VoIP, IM, Tunnel, Standard, Gaming, Unknown
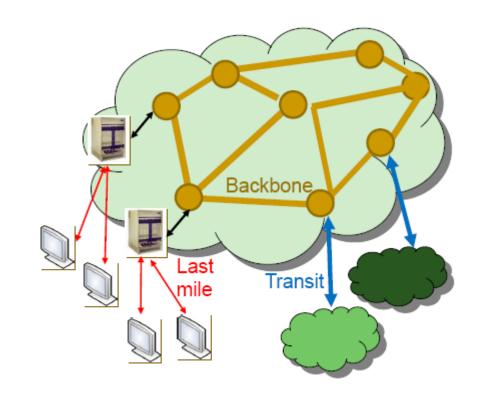
Source: ipoque Internet study 2008/2009

# P2P Stress on Infrastructure

- Pure overlay distribution is inefficient
  - Transit
  - Backbone
  - Last mile

# In-Network Storage

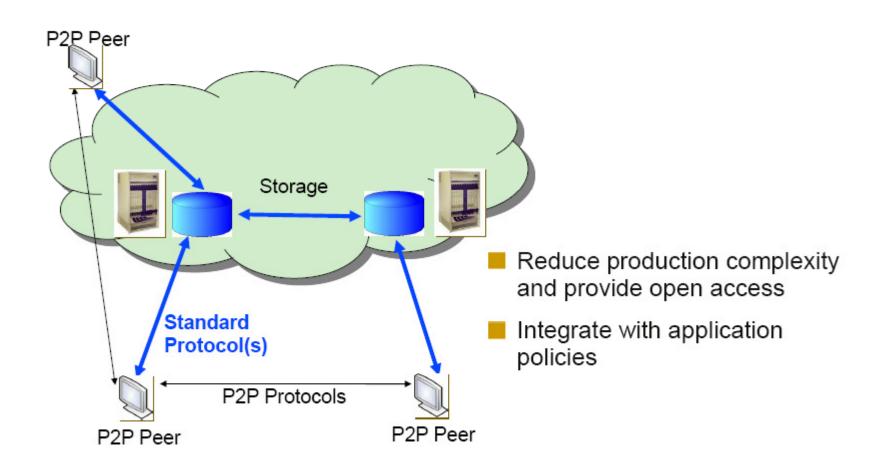Effective technique to increase efficiency is to introduce *In-Network Storage*

# Problem 1: Weakness of Existing P2P Caches

- Tight coupling with P2P application protocol
  - Cache must implement specific protocol for each application
  - Large number of widely-used, evolving P2P protocols
    - File sharing: Bittorrent, eMule, Pando
    - Streaming: PPLive, PPStream, UUSee, Zattoo, Kontiki, TVAnts, Sopcast, Abacast,  Solid State Networks, OctoShape...

- Implication
  - Cache vendor and ISP create and support complex production software

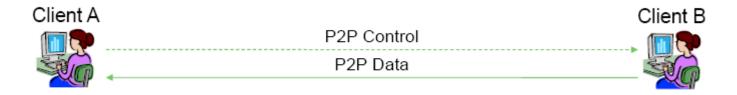# Problem 2: Weak/No Integration with Applications

- Caches only consider policy from ISP perspective
  - *Application is out of the loop*
  - However, some P2P applications rely on resource (e.g. bandwidth) allocation amongst peers
- Implications
  - Application requirements/policies are not reflected by Caches
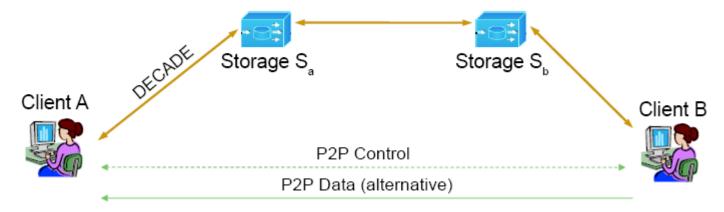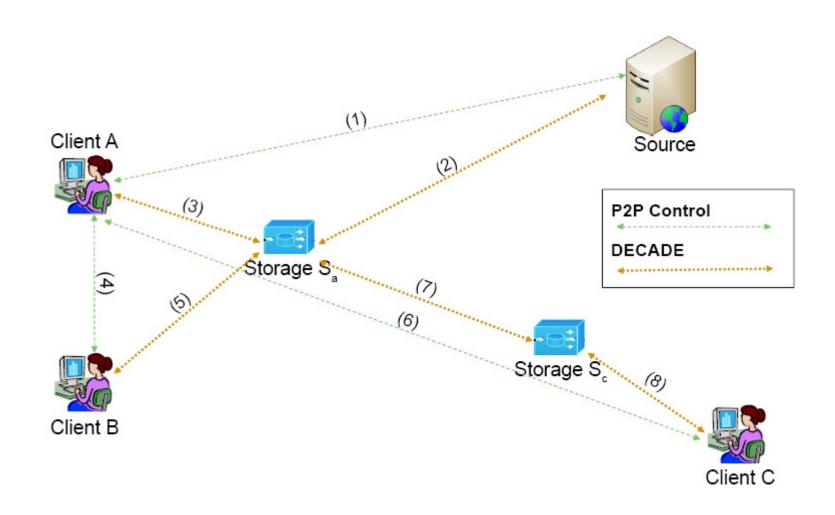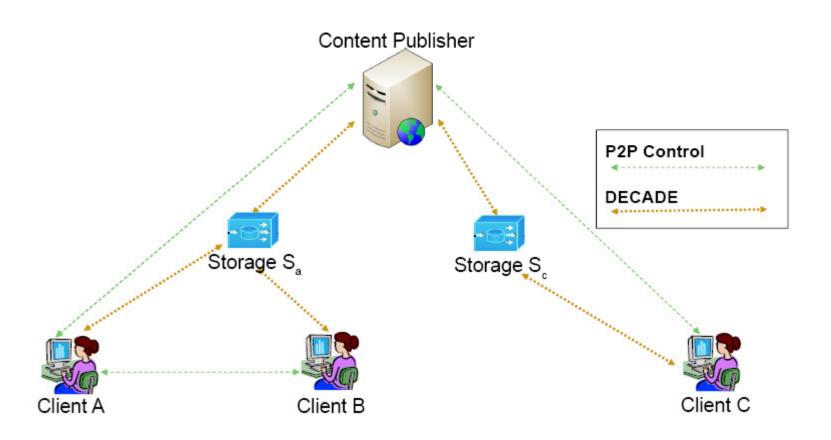
# DECADE Overview

# Example Operation

# Use Case 1: P2P Users Sharing Content

# Use Case 2: Content Publisher Distributing Content

# Key Benefits

- Reduced complexity compared with existing cache

- Integration with application policies

- Robustness and incremental deployment
  - P2P applications can still use existing mechanisms

- Open access to applications

- Open innovation by applications

# Key Components

- Data access
- Authorization
- Resource control

# Next Step

- Ready for a WG draft?

# Thank You!