Xunlei's Peer Selection Mechanism in China Telecom Trial

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Outline

• Introduction
• Peer Selection Mechanism
• Trial Results
• Conclusions
• Next Steps
Introduction

• Goal:
  – Apply ALTO Effect
    • Inter-traffic ----> Intra-traffic
    • Download Speed
  – Better Scheme to Apply ALTO
    • Peer Selection, Tracker Architecture

• Participants:
  – China Telecom (ISP)
  – Xunlei(P2P Application)
  – Yale (initial P2P based design)
Configuration: P2P App (Xunlei)

- Downloads and Media Streaming
- Tracker Server
- Involving Users
Peer Classification Data Structure (without ALTO)

CID

Normal SP
Upload Capability
Province
City
Peers

Peer Classification Data Structure (without ALTO)
Peer Classification Data Structure (with ALTO)
Cost Map Definition

if ( peer_o from ALTO_SP )
    if ( peer_d in the same ALTO_SP ) cost = 0;
    else cost = 100000
else  // peer_o from normal_SP
    if ( peer_d from ALTO_SP ) cost = 1000;
    else  // peer_d from normal_SP
        if ( peer_o and peer_d from different normal_SP )
            cost =1000;
        else if ( peer_o and peer_d from different province )
            cost = 100;
        else if ( peer_o and peer_d from different city )
            cost = 10;
        else
            cost =0;

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A Graph Representation of Cost Derivation

- Costs of non-labeled direction of each shown link are 0.
- Cost of traffic from one node to another node is the max of the costs of the traversed links.
Selection Mechanism Issues

• Multiple ALTO SP
  – Issue: It may not select lower cost of alto sp peers.

• Same SP ID > Upload Capability
  – Issue: The amounts of higher UC peers from other sp reduce.
Proportion of Inter-traffic

The proportion of inter-traffic is higher in the 'Normal' state (0.72) compared to the 'ALTO' state (0.47).
Download Speed

![Bar Chart]

- **Normal**
  - Pure local: 8%
  - Local hot: 18%
  - Local cold: 74%
  - Download speed: 197 KBps

- **ALTO**
  - Pure local: 25% (17%↑)
  - Local hot: 24% (6%↑)
  - Local cold: 51% (23%↓)
  - Download speed: 297 KBps

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Conclusions

• Inter-traffic Reduction
  – The increased *intra-traffic* compensate the *inter-traffic* effectively

• Download Speed
  – *Local hot resources* download speed increase
  – *Local cold resources* download speed reduce
Next Steps

• Peer Selection Mechanism

• Tracker Scalability for Multiple ALTO Services
2nd Phase Tracker Architecture
Benefits

• Peers Distributed Management with ALTO
  – Same Cost Peers Distribute Same Domain
  – Search the Lowest Cost Resources Efficiently

• Scalability for Multiple ALTO Services
  – Easy to Add/Delete/Merge Leaf Nodes for Map Services Change
Thanks