

P2P Networking

Future Internet from the P2P Media Delivery Perspective

NAPA-WINE

Network Aware P2P-TV-Application over Wise Networks

Emilio Leonardi –
Project Coordinator

Politecnico di Torino

leonardi@tlc.polito.it

P2P-Next

Next Generation Peer-to-Peer Delivery Platform

Jari Ahola – Project
Coordinator

VTT Technical Research
Centre of Finland

jari.ahola@vtt.fi

Considerations on Internet

- Current Internet suffers from several structural limitations
 - No QoS (it embraces mainly a best-effort paradigm)
 - No scalable and reliable multicast at IP level
- **But** remember that the success of Internet strongly relies on:
 - Simplicity
 - Low cost

Application Layer and P2P

- In recent years several limitations of Internet have been at least partly solved by pushing the complexity to the edges (application layer) -> P2P paradigm
- As an example, P2P streaming applications have been developed to overcome the major limitations of multicast IP

A new Infrastructure

- A totally new infrastructure could in principle overcome some of the main Internet limitations, providing real QoS, and a scalable support to multicast
- However, let us learn from the unlucky ATM and IPv6 stories.
 - architecture revolutions are unlikely to be successful
 - adding complexity in the network is not always a winning strategy

Key Challenges

- Keep the spirit of Internet alive where all bits are treated equal and no permission is needed to deploy a service -> maximise innovation.
- The Internet core needs to remain lightning fast & cost-efficient.
- P2P is designed as a self-organizing network that adds intelligence and a social dimension to the raw packet transfer fabric.

Cross domain perspective

- Network aware video coding: P2P could be seen as a multipath route – should the coding support this?
- Cross layer interaction: how to combine P2P and IP multicast for example?
- Trust: right of use, identity management, privacy.
- Involment: digital convergence will create new opportunities for new players also for the content distribution value chain.

Issues / Obstacles

- User requirements and behaviour for content delivery over Internet changes faster than the underlying technology can change.
- Rapidly increasing P2P traffic is problematic for telcos.

Research Priorities

- We need to move from file sharing towards "experience sharing" with "Widgets", as proving popular on Facebook.
- Decentralization: zero servers (cost efficient, as compared to centralized services, no global operations, no central administration necessary)
- Scalability: unbounded, no global operations, cost-efficient, less energy-consuming
- Fault tolerance: central peers are destined to fail, decentralized systems reorganize

Conclusion

- Keep the internet simple, fair and make it faster
- The user's behaviour is difficult to predict so do not cast current requirements as lower level Internet specifications