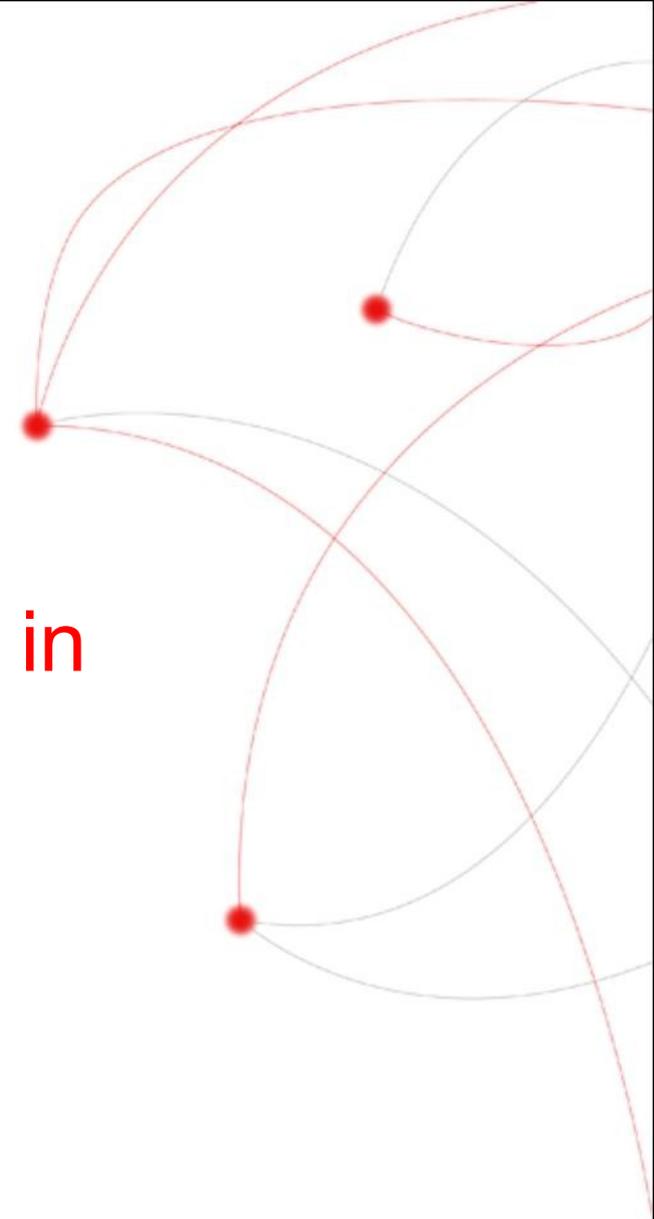


TELECOM ITALIA GROUP

OMA 2nd All-IP Workshop - 1st July

Peer-to-peer activities in IETF

Enrico Marocco
enrico.marocco@telecomitalia.it



Timeline

- ▶ March 2005 – The “basement meeting” (AKA the Skype envy)
- ▶ February 2007 – Peer-to-peer SIP (P2PSIP) Working Group
- ▶ May 2008 – Peer-to-peer Infrastructure (P2PI) Workshop (official)
 - ▶ Low Extra Delay Background Transport (LEDBAT) Working Group
 - ▶ Application-Layer Traffic Optimization (ALTO) Working Group
- ▶ February 2009 – Peer-to-peer IRTF Research Group
- ▶ March 2010 – Peer-to-peer Streaming Protocol (PPSP) Working Group
- ▶ April 2010 – Decoupled Application Data Enroute (DECADE) Working Group
- ▶ June 2010 – Peer-to-peer Streaming Protocol (PPSP) Workshop (unofficial)

P2PSIP Working Group

- ▶ March 2005: “Why is Skype that successful”
- ▶ Idea: Define tools for replacing centralized (expensive) elements in SIP
 - ▶ Registration/Routing/NAT-traversal
 - ▶ Reuse endpoints' resources
- ▶ February 2007: Charter approved
- ▶ Main deliverable:
 - ▶ “Peer protocol” for distributed overlays (Chord, Kademlia, Pastry...)
- ▶ Current Status: RELOAD protocol ~80% done

References:

<http://datatracker.ietf.org/wg/p2psip/charter/>
<http://www.p2psip.org>

Peer-to-peer Infrastructure Workshop

- ▶ MIT, May 2008
- ▶ Network operators, P2P application developers, hardware/software vendors
- ▶ Strongly motivated by the Comcast/BitTorrent mess
- ▶ “What's the problem with P2P (mostly file-sharing) traffic?”
 - ▶ Local/Home Network: Interference with higher priority traffic
 - ▶ Home gateways can't do prioritization effectively
 - ▶ Core Network: High utilization of peering/transit links
 - ▶ Applications can't distinguish between local and remote peers

References:
<http://tools.ietf.org/html/rfc5594>

LEDBAT Working Group

- ▶ November 2008: Charter approved
- ▶ Main deliverable:
 - ▶ Experimental congestion-control **algorithm** that yields to TCP
 - ▶ “Lower-than-best-effort,” for background transfers
 - ▶ Already implemented in uTorrent
- ▶ Side deliverable:
 - ▶ Considerations about multiple connections in application design
- ▶ Future deliverable (needs rechartering):
 - ▶ UDP encapsulation (**protocol**)
- ▶ Current Status: algorithm ~70% done

References:
<http://datatracker.ietf.org/wg/ledbat/charter/>

ALTO Working Group

- ▶ November 2008: Charter approved
- ▶ Main deliverable:
 - ▶ Protocol for exposing network topology information
 - ▶ To help applications make better peer selection
 - ▶ Improve application performance
 - ▶ Reduce cross-domain traffic
- ▶ Current Status: protocol ~70% done

References:
<http://datatracker.ietf.org/wg/alto/charter/>

PPSP Working Group

- ▶ March 2010: Charter approved
- ▶ Main deliverables:
 - ▶ Peer-to-peer protocol for streaming realtime media (may be RTP, HTTP, or something new)
 - ▶ Peer-to-tracker protocol for fetching peers with the desired content (a-la BitTorrent)

References:
<http://datatracker.ietf.org/wg/ppsp/charter/>

DECADE Working Group

- ▶ April 2010: Charter approved
- ▶ Main deliverable:
 - ▶ Protocol for fine-grain resource control of network-hosted storage
 - ▶ For integration in P2P applications

References:
<http://datatracker.ietf.org/wg/decade/charter/>

Peer-to-peer Research Group (P2PRG)

- ▶ February 2009: New charter approved
- ▶ IRTF Research Group: Broader scope than IETF Wgs
 - ▶ Provide input to standardization activities
- ▶ Surveys:
 - ▶ Security (RFC 5693)
 - ▶ P2P traffic optimization
 - ▶ Realtime content distribution
 - ▶ P2P group management

References:
<http://www.irtf.org/charter?gtype=rg&group=p2prg>

Most Active Contributors

- ▶ P2PSIP: Cisco, Columbia University, Skype, Ericsson (chaired by Neustar, independent)
- ▶ LEDBAT: BitTorrent, Juniper, Alcatel-Lucent (chaired by Microsoft, NEC)
- ▶ ALTO: Comcast, BitTorrent, Yale University, Cisco, Juniper, NEC (chaired by Alcatel-Lucent, Telecom Italia, Neustar)
- ▶ PPSP: Huawei, ZTE, China Mobile (chaired by Cisco, China Mobile)
- ▶ DECADE: Yale University, Huawei, Ericsson, Nokia (chaired by Comcast, Huawei)
- ▶ P2PRG: Alcatel-Lucent, Telecom Italia, Columbia University (chaired by Cisco, Alcatel-Lucent)