

Peer-to-Peer over IPv6 (P2Pv6)

Italian IPv6 Task Force

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Motivations

- ▶ IPv6 (Internet Protocol version 6) offers some interesting differences in respect of the IPv4:
 - it restores the end-to-end transparency;
 - it natively offers many features implemented in IPv4 as add-ons.
- ▶ With such foundations, IPv6 appears as an ideal playground for developing Peer-to-Peer (P2P) applications, which relies by design on the interaction between end nodes.

Research Statement

- ▶ We propose to study the joint use of the P2P paradigm and IPv6 in order to:
 - show how the IPv6 protocol can provide an excellent environment for P2P-based applications in order to have also a “killer-application” to support the deployment of IPv6.
 - Study if the transitional mechanisms developed for managing the transition and coexistence of IPv4/IPv6 are critical for P2P applications, providing a pioneer study for future massive deployment campaigns.
 - Discover and solve (if any) algorithm legacies and dependency with the peculiar network level and provide a pioneer roadmap to port and develop P2P applications suitable to work on every IP version.
 - Study how the functionalities (e.g., security) of IPv6 can be used by P2P applications in order to build next-generation of P2P algorithms-applications.

Topics (1)

- ▶ Discussion about P2P over IP:
 - Problems of P2P over v4. How such hazards are solved with v4 (e.g., rendezvous nodes, relaying nodes, push messages...).
 - how hazards could be avoided using v6.
- ▶ “Reverse” problem analysis:
 - How the transition mechanism could endanger the use of P2P applications or adding complexity to the algorithms.

Topics (2)

- ▶ IPv6 to boost p2p – p2p to boost IPv6:
 - How the use of v6 could add functionalities to the actual P2P technology pool or simply allow providing same functionalities but via simpler algorithms.
- ▶ P2P applications and v4 dependencies:
 - Investigation of P2P technologies already standardized by the IETF or under discussion (e.g., MIKEY, P2PSIP).
- ▶ P2P and IPv6 addressing synergies and analogies.