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Protocols and signalling for P2P communications

Hybrid peer-to-peer (P2P) communications: Functional architecture

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Recommendation ITU-T Q.4100

Hybrid peer-to-peer (P2P) communications: Functional architecture

Summary

The hybrid P2P network can be composed of tree-based overlay network and mesh-based overlay network in order to utilize the advantages of each type of overlay network. The tree-based overlay network will be used for fast distribution of small data, and the mesh-based network will be used for distribution of relatively larger sized data. This Recommendation specifies the functional architecture and the reference points for the hybrid peer-to-peer networking with information flows.

Keywords

Hybrid peer-to-peer, functional architecture, overlay network

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Hybrid peer-to-peer (P2P) communications: Functional architecture

1 Scope

This Recommendation describes the functional architecture of hybrid peer-to-peer communications as follows:

- concept of hybrid P2P networking;
- functional descriptions of hybrid P2P networking;
- reference points;
- information flows.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T X.609] Recommendation ITU-T X.609 (2015), *Managed peer-to-peer (P2P) communications: Functional architecture*.
- [ITU-T X.609.3] Recommendation ITU-T X.609.3 (2015), *Managed peer-to-peer (P2P) communications: Multimedia streaming signalling requirements*.
- [ITU-T X.609.4] Recommendation ITU-T X.609.4 (2015), *Managed peer-to-peer (P2P) communications: Multimedia streaming peer protocol*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 overlay network [b-ITU-T X.1162]: An overlay network is a virtual network that runs on top of another network. Like any other network, the overlay network comprises a set of nodes and links between them. Because the links are logical ones, they may correspond to many physical links of the underlying network.

3.1.2 peer [b-ITU-T X.1161]: Communication node on P2P network that functions simultaneously as both "client" and "server" to the other nodes on the network.

3.1.3 peer-to-peer (P2P) [b-ITU-T Y.2206]: A system is considered to be P2P if the nodes of the system share their resources in order to provide the service the system supports. The nodes in the system both provide services to other nodes and request services from other nodes.

NOTE – Peer is the node in a P2P system.

3.1.4 managed P2P [b-ISO/IEC TR 20002]: P2P with manageability features to manage the P2P-based service and P2P network by the P2P participants such as P2P service provider, ISP and peer.

3.1.5 reference point [ITU-T Y.2012]: A conceptual point at the conjunction of two non-overlapping functional entities that can be used to identify the type of information passing between these functional entities.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 Hybrid overlay network: A peer-to-peer overlay network that participating peers exchange data using pull and push method. The hybrid overlay network also provides a way to organize and maintain a tree-style path for pushing data to all peers without loops, as well as fetching data from other peers simultaneously.

3.2.1 Hybrid peer: A peer capable of exchanging data using mesh-based and tree-based methods running over a hybrid overlay network

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

APPI	Application Interface
CMG	Cache Management
CPM	Candidate Path Management
DBC	Data Broadcast
DRCV	Data Recovery
H-PEER	Hybrid Peer
HCI	HOMS Client Interface
HOMS	Hybrid Overlay Management Server
HP2P	Hybrid Peer-to-Peer
HPC	Hybrid Peer Communication
HPI	HOMS Peer Interface
IoT	Internet of Things
MP2P	Managed Peer-to-Peer
OIM	Overlay Information Management
OMG	Overlay Management
OPM	Overlay Peer Management
OSM	Overlay Status Monitoring
P2P	Peer-to-Peer
PCFG	Peer Configuration
PIC	Peer Interaction Communication
PIR	Peer Information Registrar
PLM	Peer List Management
POC	Peer operation control
PPM	Primary Path Management
PSM	Peer Status Monitoring