Question 8/11 – Protocols supporting distributed content networking, information centric network (ICN) technologies for future networks, IMT-2020 network and beyond

(Continuation of Question 8/11)

1 Motivation

Emerging multimedia services and applications require various functions and facilities. One of the key features of multimedia applications with multi-party communication capability is end-to-end multicast transport functions. Based on this motivation, a set of ITU-T Recommendations have been developed on frameworks and protocols for group management and end-to-end multicast communications over IP multicast as well as non-IP multicast network environments. As a result of collaboration work with ISO/IEC JTC 1/SC 6, common text standards have been developed for multi-party communications and include ITU-T X.606-series | ISO/IEC 14476-series, ITU-T X.607-series | ISO/IEC 14476-series, ITU-T X.608-series | ISO/IEC 14476-series, ITU-T X.602 | ISO/IEC 16513, ITU-T X.603-series | ISO/IEC 16512-series, ITU-T X.604-series | ISO/IEC 24793-series, ITU-T X.605 | ISO/IEC 13252. These Recommendations will need to be continuously maintained and may be updated if further requirements from the market arise.

Various distributed and conversational multimedia services, such as IPTV, Digital signage, VoD, telepresence, personal broadcasting service, multimedia streaming and other emerging contents delivery services require efficient communications capability over various network environments and need to support enhanced contents such as AR/VR, UHD (4K, 8K). Distributed service networking protocols based on peer-to-peer (P2P) technology can be one of the useful solutions for supporting new emerging applications which require high performance and scalable communications capability. SG11 has been developing Recommendations on signalling architecture and protocols for managed P2P (MP2P) communications, which can be applied to end-to-end multimedia communications including video streaming and content distribution services. Standards development of protocols for hybrid P2P (HP2P) communications which consist of mesh-based P2P network and tree-based P2P network has also started and will be continued. HP2P communication protocols will provide efficient and flexible information distribution capabilities for IoT related services and Distributed Ledger Technology services. The set of Recommendations to be developed will provide solutions and guidelines for vendors and providers who want to implement and deploy distribution and delivery services for various types of content using P2P technologies.

Information centric network (ICN) has been and continues to be studied in many SDOs and notably in the Information Centric Research Group of IETF. Consideration is given to ICN technologies integrated into the existing Internet through Overlay deployments (ICN over IP), Underlay deployments (ICN islands within IP), or ICN in Virtualized IP infrastructure. These approaches are described in RFC 8763. Protocols and mechanisms for content discovery, distribution and delivery based on information centric network (ICN) technology in overlay, underlay and virtualised IP deployments will constitute very important emerging issues to support related requirement and capabilities of IMT-2020 network and beyond.

Recommendations under responsibility of this Question include: X.601, X.602, X.603, X.603.1, X.603.2, X.604, X.604.1, X.604.2, X.605, X.606, X.606.1, X.607, X.607.1, X.608 and X.608.1, X.609, X.609.1, X.609.2, X.609.3, X.609.4, X.609.5, X.609.6, X.609.7, X.609.8, X.609.9, X.609.10, Q.4100-Q.4139 (for protocols and signalling for P2P communications).

2 Question

Study items to be considered include, but are not limited to:

– What maintenance or enhancements to existing Recommendations need to be developed in response to new market requirements?

– What Recommendations need to be developed to provide protocols for content discovery, distribution and delivery to support requirements and functional architectures of legacy and FNs, IMT-2020 network and beyond?

– What Recommendations need to be developed to provide protocols for content discovery, distribution and delivery based on ICN technology in overlay, underlay and IP virtualisation deployments which are taken into account in FNs, IMT-2020 network and beyond?

– What protocols and mechanisms need to be developed to support managed and hybrid peer-to-peer communications?

– What mechanisms and key technologies need to be defined to realize application defined and network aware?

– What layer 4 interfaces and parameters need to be defined toward upper and lower layer, respectively?

3   Tasks

Tasks include, but are not limited to:

– Maintain and enhance Recommendations X.60x-series, including common text standards for multi-party communications in collaboration with ISO/IEC JTC 1/SC 6 in response to new market requirements;

– Develop Recommendations on protocols to support contents discovery, distribution and delivery issues for legacy network, FNs, IMT-2020 network and beyond;

– Develop Recommendations on protocols to support contents discovery, distribution and delivery issues based on information centric network (ICN) technology in overlay, underlay and IP virtualisation deployments which are taken into account in IMT-2020 network and beyond;

– Develop Recommendations on protocols and mechanisms to support managed and hybrid peer-to-peer communications;

– Develop Recommendations on protocols to support end-to-end multi-party, multimedia communications including personal broadcasting services and applications.

An up-to-date status of work under Q8/11 is contained in the SG11 work programme (https://www.itu.int/ITU-T/workprog/wp_search.aspx?sp=17&q=8/11).

4   Relationships

Recommendations:

– X-series Recommendations on multi-party, multimedia communications

– Y-series Recommendations and Supplements on IPTV, content delivery, DSN, FNs and IMT-2020 network and beyond

– H-series Recommendations on multimedia services and applications

– Q-series Recommendations on signalling, protocols, measurements and test specifications related to the scope of Question

Questions:

– All Questions of SG11

Study Groups:

– ITU-T SG13 on FNs, and IMT-2020 network and beyond

– ITU-T SG16 on multimedia services and applications

– ITU-T SG17 on related security issues

Other bodies:

–   ISO/IEC JTC 1/SC 6

–   IETF, ICNRG

WSIS action lines:

–   C2

Sustainable Development Goals:

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