Question 11/12 – End-to-end performance considerations

(Continuation of Question 11/12)

1 Motivation

There is a continued need for guidance on general transmission planning and keeping it up with technological evolution. Especially in light of a continuous migration of modern telecommunication networks towards new and future technologies (including 5G / IMT-2020), replacing traditional circuit-switched systems, guidance is needed on transmission planning with respect to heterogeneous and interconnected networks.

With the increasing industry focus on new and future technologies (including 5G / IMT-2020 and beyond), there is a need for guidance on the associated end-to-end QoS, performance and resource management issues for multimedia services (e.g. voice, video, data or other applications) and OTT applications carried by such networks, in order to ensure customer satisfaction. This includes interworking aspects between different networks (e.g. cellular, wireless, wireline and also such of different generations) and packet-based technologies.

In traditional networks, management of transmission impairments has been based on a simple but effective concept: networks have been divided into a chain of network sections and impairment budgets allocated accordingly. Responsibility for management of end-to-end QoS in state-of-the-art networks (e.g. packet based ones) is less defined. In some cases multiple networks may be available to the end devices simultaneously. So-called services must therefore be considered as applications including the terminal devices, which have an increased contribution to the quality of experience. Consequently the transport networks are less likely to solely achieve end-to-end QoS, but can provide the basis for QoS differentiation.

Issues and guidelines for transmission performance necessary to ensure high end-user satisfaction must be reconsidered in light of introduction of voice and video services over 4G, 5G and beyond networks and their interconnection with existing networks; however, voice and video services over fixed networks are also to be considered.

The following Recommendations, in force at the time of approval of this Question, fall under its responsibility:

E.847, G.101, G.102, G.103, G.105, G.108, G.108.1, G.108.2, G.109, G.111, G.113, G.114, G.115, G.116, G.117, G.120, G.121, G,122, G.126, G.131, G.136, G.142, G.172, G.173, G.174, G.175, G.176, G.177, G.1028, G.1028.1, G.Sup61, I.352, I.354, I.358, I.359, I.371, I.378, P.11, Y.1221, Y.1222, Y.1223, Y.1530, Y.1531, Y.1542

2 Question

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

– Transmission planning for voice, data and multimedia services taking into account that end-to-end connections are established via heterogeneous and interconnected networks with different transmission technologies.

– Studying the effects of the transmission delay on services and applications including multimedia.

– What guidance can be provided in transmission planning for the interconnection of evolving networks?

–   What are the main performance parameters in end-to-end communication paths and how can the values of performance parameters be managed across multiple network segments?

–   What are the interworking requirements necessary to support interfacing between the many combinations of wireless and wireline networks sufficient to enable service providers to comply with end-to-end performance objectives for QoS and to take into consideration the network performance parameters across network sections?

–   Maintenance of existing documentation on traffic management and traffic engineering.

–   What reference models and parameters should be used as a basis for specifying and measuring the call processing performance of IP-based networks?

–   Studying the effects in cases of service handover in order to elaborate transmission planning guidelines and performance considerations (like e.g. allowable packet loss and handover latency during handover).

–   Determination of the impairment effect of each new coding algorithm, so that it can be considered in the context of Recommendation G.113.

3   Tasks

Tasks include, but are not limited to:

–   analysis of end-to-end QoS aspects of interworking between different network sections (e.g. cellular, wireless, wireline networks);

–   maintenance of existing documentation on traffic management and traffic engineering;

–   analysis of impact of 5G / IMT-2020 technologies on end-to-end QoS;

–   revisions of ITU-T G-Series Recommendations as may be needed to accommodate end-to-end QoS interworking between different network sections (e.g. cellular, wireless, wireline networks);

–   development of new Recommendations specifying the performance of interworking between different network sections (e.g. cellular, wireless, wireline networks);

–   development of new Recommendations specifying performance parameter apportionment functions and methods between different network sections (e.g. cellular, wireless, wireline networks);

–   frequent update of Appendices to G.113;

–   creation of new Recommendations on transmission planning aspects as needed.

An up-to-date status of work under this Question is contained in the SG12 work programme http://www.itu.int/ITU-T/workprog/wp_search.aspx?q=11/12

4   Relationships

WSIS Action Lines

–   C2

Sustainable Development Goals

–   9

Recommendations

– G.100 – G.149, G.170-series, G.1000-series, I.350 series, I.360 series, I.370 series, Y.1541, I.350, I.351, I.353, I.356, I.358, Q-series Recommendations defining layer 3 call processing protocols

Questions

– 12/12, 13/12, 14/12, 15/12, 17/12

Study Groups

– ITU-T SG13, SG15, SG16

Other bodies

– ETSI TC STQ, IETF, Broadband Forum, MEF