Question 16/12 – Intelligent diagnostic functions framework for networks and services

(Continuation of Question 16/12)

1   Motivation

With the increased number of connected devices and the proliferation of IoT (Internet of Things) applications, web and multimedia services and data centre services, the network is likely to be subject to increased network incidents and sporadic network changes resulting in service interruptions. Hence, in order to meet user expectations and provide network visibility, it is important to provide the industry with tools to monitor networks in order to diagnose, anticipate or remediate issues.

Future networks will continue to support multimedia services and objective quality assessment algorithms will continue to be enhanced, but measuring multimedia network performance is not sufficient. Typical QoS/QoE assessments provide a numerical indication of the perceived quality that can indicate unsatisfactory service quality; however it is highly desirable to develop methods for determining the source of the impairments which could be for example network components, terminals or applications.

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

E.475, G.1029

2   Question

The Question is intended to derive a framework for diagnostic functions and to provide guidance on how diagnostic functions can be triggered from network and application logs or reports, from external objective quality predicting models in networks and terminals or from models developed for degradation analysis - irrespective of the type and number of media involved.

The Question will also provide a framework for root cause analysis.

Study items to be considered:

–   identify the service related parameters that could be subject to diagnostics;

–   provide guidance on inter-relations between such parameters;

–   determine the characteristics of an objective measurement or anomaly detection that would help identify the root cause of the impairment using an algorithm or an analytic tool such as data mining and machine learning;

–   define a set of network diagnosis maintenance metrics (e.g. time to repair, time to fault isolation) based on the characteristics of all objective measurements or anomalies;

–   develop a strategy that can use externally and objectively predicted service quality values for the purpose of determining the root cause of a specific problem with a telecommunication link;

–   develop objective models that produce metrics dedicated to diagnostic functions;

–   develop a framework for analytics functions and diagnostics functions and provide guidance on how they interact with each other and objective quality assessment and prediction models in networks and terminals - irrespective of the type and number of media involved.

–   What enhancements to existing Recommendations are required to provide network visibility and analytics directly or indirectly in Information and Communication Technologies (ICTs) or in other industries? What enhancements to developing or new Recommendations are required to provide such network visibility?

3   Tasks

Tasks include, but are not limited to:

–   develop one or more Recommendation(s) to provide guidance on interaction between diagnostic functions and objective models;

–   develop one or more new Recommendation(s) providing guidance for the implementation of diagnostic functions;

–   specification of requirements for methods that can be used for diagnostic functions.

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=16/12

4   Relationships

WSIS Action Lines

–   C2

Sustainable Development Goals

–   9

Recommendations

–   P.86x-series, P.56x-series

Questions

–   9/12, 15/12, 17/12

Study Groups

–   ITU-T SG13, SG20

Other bodies

–   ISO/IEC JTC1 SC6