Question 11/21 – Multimedia systems, terminals, gateways and data conferencing

(Continuation of Question 11/16)

1 Motivation

In line with its lead study group roles, Study Group 21 strives to make advances in multimedia communication systems that take advantage of emerging technologies, as well as advances in and deeper understanding of existing technologies, in an effort to enable new and better forms of communication capabilities.

To that end, Study Group 16 (now Study Group 21) developed several sets of videoconferencing Recommendations: ITU-T H.320 for audiovisual communication systems for N-ISDN environments; ITU-T H.323, one of the most widely used packet-switched communication systems supporting audio, video, and data collaboration; ITU-T H.324 for audiovisual communications over fixed and mobile (wireless) telephone networks; and ITU-T H.310-series for point-to-point and multipoint communications on B-ISDN networks. For data conferencing in point-to-point and multipoint environments, the T.120-series of ITU-T Recommendations was developed, enabling capabilities like file transfer, electronic whiteboarding, and screen sharing. To enable an H.323 gateway to be realized as two components from different vendors distributed across different physical platforms, the ITU-T H.248-series, which decomposes the H.323 gateway function defined in ITU-T H.246 into functional subcomponents called media gateway controllers and media gateways, was developed to specify the protocols these components use to communicate. While originally addressing H.323 gateways, the H.248 protocol is applicable to many different types of gateways.

Several enhancements, with particular attention to the support of advanced coding technologies, security features, interworking with other terminals accommodated in different networks and enhancements to cover other services, may need to be developed in the form of new Recommendations or revision to existing ones to assure existing systems remain competitive in the marketplace. In line with its objective to improve the lives of users through improved multimedia communications capabilities, Study Group 21 continues its study of newer multimedia communications systems and functions that include applications like telepresence, which offers a user-rich immersive experience.

In addition to the core multimedia system specifications, various supporting protocols and functions are essential to successful deployment of terminals, gateways, gatekeepers, multipoint control units, and other elements that comprise a system. This Question explores advanced multimedia functions that will enable videoconferencing, data conferencing, telepresence, distance learning, e-health, interactive multimedia information distribution, real-time multimedia collaboration in future networks environment and existing packet-based networks. Aspects include multimedia directory services, quality of service (QoS), quality of experience (QoE), multimedia security, and multimedia mobility.

This Question considers multimedia gateway architecture and the development of multimedia gateway control protocols for gateways interworking existing networks and new networks.

This Question also deals with extension and maintenance of this large body of multimedia conferencing standards.

2 Study items

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

– enhancements to existing Recommendations by the addition of advanced audio and visual coding (e.g. ITU-T H.265 extensions and beyond);

– enhancements to interoperability of H.300-series terminals by using new and emerging protocols and architectures, such as WebRTC, private media, etc., through additions to ITU-T H.246 and other Recommendations as necessary;
– continued enhancements relating to error resilience in error-prone environments, such as mobile networks;
– specifications of multimedia system characteristics to support non-conversational services, such as retrieval, messaging, or distribution services;
– enhancements to existing H-series Recommendations with respect to accessibility;
– next generation multimedia system and its related functions and capabilities, including system architecture, signalling protocols, downloadable codecs, service discovery, transcoding functions, distributed applications, integrated QoS, gateways, security, mobility, and accessibility;
– architecture and protocols to integrate and enhance advanced service features, such as directory services, QoS/QoE, security, and mobility, with the multimedia system platforms defined by the study group;
– performance monitoring and measurement functions for multimedia applications;
– requirements for metadata in descriptions of user profile, terminal capability, access network characteristics and service profile that relate to service mobility;
– standardizing the means for full interworking between telepresence systems, including means facilitating the coherent presentation of multiple audio and video streams, allowing remote participants to be rendered at their true size for their apparent distance, maintaining correct eye contact, gesticular cues, and simultaneously providing spatial audio that is consistent with the video presentation, as well as taking into account the meeting environment to provide a more immersive experience;
– new functionality to the H.248.x sub-series to enable existing and new network nodes to work as a split media gateway controller and media gateway. Items of study may also include further work on IP-IP connection models such as QoS control, network address translation (NAT) and firewalling, enhanced conferencing, media streaming control, network access control, secure media transport, privacy enhanced transport and new real time communication architectures;
– consideration will also be given to the evolution of media gateways and media gateway controllers with respect to architectures based on cloud, software defined networks (SDN) and network function virtualisation (NFV);
– considerations on how to help measure and mitigate climate change.

3 Tasks

Tasks include, but are not limited to:

– development of new Recommendations pertaining to the study items above as needed;
– produce enhanced QoS/QoE, gateway, security, and mobility mechanisms for multimedia systems;
– enhancement and maintenance of ITU-T F.734, H.100, H.110, H.130, H.140, H.221, H.222.0, H.222.1, H.223, H.224, H.225.0, H.226, H.230, H.231, H.233, H.234, H.235-series, H.239, H.241, H.242, H.243, H.244, H.245, H.246, H.247, H.248-series, H.249, H.281, H.310, H.320, H.321, H.322, H.323, H.324, H.331, H.332, H.341, H.350 series, H.360, H.361, H.362, H.420, H.450-series, H.460-series, H.501, H.510, H.530, T.120-series, T.134, T.135, T.137, T.140 and H-series Supplements 1, 2, 4 to 9, 11 to 14.

An up-to-date status of work under this Question is found in the Study Group 21 work programme (https://itu.int/ITU-T/workprog/wp_search.aspx?sp=18&q=11/21).

4 Relationships

Recommendations:

– ITU-T F.700-series, G.700-series audio codecs, G.1000, G.1010, G.1080, H.260-series video codecs, Q.115.0, Q.931, Q.1707, Q.1950, T.38, V.151, V.152, V.153, X.509, X.680, X.690, X.800-series, X.1303, Y.1540, Y.1541, Y.2111

Questions:

– All Questions of Study Group 21

Study groups:

– ITU-T SG2 for service aspects
– ITU-T SG5 for ICT environmental aspects
– ITU-T SG11 for signalling
– ITU-T SG12 for quality aspects and performance
– ITU-T SG13 for future networks aspects
– ITU-T SG15 for transport aspects
– ITU-T SG17 for security, web services, languages, directories and ASN.1
– ITU-T SG20 for IoT and smart cities
– ITU-R SG5 for IMT
– ITU-R SG6 on broadcasting
– ITU-D SG2 on information and communication infrastructure and technology development, emergency telecommunications and climate change adaptation

Other bodies:

– 3GPP for multimedia security, mobility and gateways incorporating a H.248-based interface
– ETSI NFV on virtualization
– ECMA on QSIG interworking and tunnelling
– IEEE for 802.x WLAN and Link Layer security
– ISO/IEC JTC1/SC27 for digital signature, key management, non-repudiation, etc.
– ISO/IEC JTC1/SC29 for MPEG aspects, content and copy protection, watermarking, IPMP, secure JPEG 2000, etc.
– IETF for HTTP, TLS, media transmission, media packetization, Internet supported services, QoS, security, IP mobility, WebRTC extensions
– IETF AVTCORE, MMUSIC for media gateways and controllers
– IANA for package registration matters
– NIST for AES and other cryptographic algorithms, FIPS security documents, security guidelines, etc.
– W3C for HTML, XML, WebRTC