



IAFI/ India (Republic of)

**PROPOSED MODIFICATIONS TO RESOLUTION -93 - INTERCONNECTION OF 4G, 5G
NETWORKS**

Background

This resolution addresses the evolving landscape of telecommunication networks, emphasizing the shift from circuit-switched to packet-switched networks, specifically focusing on 4G, 5G networks, and beyond. This resolution addresses the evolving landscape of telecommunication networks, emphasizing the shift from circuit-switched to packet-switched networks, specifically focusing on 4G, IMT-2020, 5G networks, and beyond and to address the interconnection of 4G and 5G networks on an international level. It recognizes the shift towards IP-based networks and identifies the need for standards regarding network architectures, roaming, numbering, charging, security, and interoperability testing. The resolution instructs ITU-T Study Groups to collaborate with stakeholders and develop specific Recommendations for network interconnection frameworks, ENUM architecture, and administrative control over international telecommunication resources.

Introduction

The global telecommunications landscape is rapidly evolving, with most operators transitioning from circuit-switched to IP-based networks. Long-term evolution (LTE), a key technology for VoLTE services, operates within this new paradigm. The World Telecommunication Standardization Assembly (Hammamet, 2016; New Delhi, 2024) acknowledges the widespread migration from circuit-switched to packet-switched networks, particularly the prevalence of Internet Protocol (IP) based networks. Long-Term Evolution (LTE) is identified as a key technology for delivering Voice over IP (VoIP) services, necessitating international cooperation to address challenges related to network architectures, roaming, numbering, charging, and security. Recognizing the significance of interconnection in the era of 4G, IMT-2020, 5G, and beyond, the assembly seeks to establish a framework for seamless interoperability.

However, current network architectures, roaming principles, numbering schemes, and security mechanisms are often incompatible with seamless interconnection of IP-based networks like 4G and 5G. This resolution addresses this critical need by advocating for the development of international standards to ensure interoperability and prevent issues related to numbering, roaming, charging, and security.

Proposal

The World Telecommunication Standardization Assembly resolves to expedite ITU T Recommendations addressing the challenges of non-radio interconnection in 4G, IMT-2020, 5G, and beyond. The Director of the Telecommunication Standardization Bureau is instructed to conduct exploratory activities among telecommunication operators, prioritizing the identification of issues related to IP-based network interconnection. The results of these activities are to be submitted to the ITU Council for consideration.

Study groups are directed to identify future ITU T Recommendations associated with non-radio interconnection and collaborate with stakeholders to optimize studies. Specifically, Study Group 11 is tasked with developing Recommendations specifying the framework and signaling architectures for non-radio interconnection. Additionally, Study Group 2 is instructed to develop ENUM architecture recommendations, including administrative control over international telecommunication resources.

Member States and Sector Members are invited to contribute to the implementation of this resolution, with a call to encourage telecommunication operators to assist ITU -T in its execution. This resolution aims to pave the way for standardized interconnection procedures, ensuring global interoperability of high-quality services in the evolving telecommunication landscape.

The results of these activities will be submitted to the ITU Council for further consideration and potential action. By advocating for international standards and collaborative efforts, this resolution aims to facilitate seamless interconnection of 4G and 5G networks, paving the way for a truly global and interoperable telecommunications future.

This document proposes to modify Resolution 93 of WTSA-22.

Annex:

Revision of Resolution 93

Interconnection of 4G, IMT-2020 networks and beyond

(Hammamet, 2016)

The World Telecommunication Standardization Assembly (Hammamet, 2016),

recognizing

- a) that, currently, most of the telecommunication operators in the world are migrating from circuit-switched networks to packet-switched networks, and most of them have already established Internet protocol (IP)-based networks for delivering most of their services using a new concept "all over IP";
- b) that, currently, long-term evolution (LTE) is used on the access stratum of operators' networks as one of the technologies for delivering voice-over-IP services (VoLTE);
- c) that network architectures, roaming principles, numbering issues and charging and security mechanisms that are being used in circuit-switched networks are in most cases not suitable for interconnection of IP-based networks (e.g. 4G, IMT-2020 and beyond) to be used for providing voice and video services;
- d) that the interconnection of IP-based networks needs to be agreed among all Member States in order to prevent the appearance of new issues related to numbering, roaming, charging and security, to name a few;
- e) that VoLTE interconnection as well as other types of interconnection of packet-based networks will require translation from ITU-T E.164 number format to the Universal Resource Identifier (URI), which may be considered as a common identifier of IP-based networks to be used for voice and video communications;
- f) that ENUM is one of the possible solutions to be used for E.164/URI translation for such interconnections;
- g) that Resolution 49 (Rev. Hammamet, 2016) of this assembly instructs Study Group 2 of the ITU Telecommunication Standardization Sector (ITU-T) to study how ITU could have administrative control over changes that could relate to the international telecommunication resources (including naming, numbering, addressing and routing) used for ENUM;
- h) that Resolution 133 (Rev. Busan, 2014) of the Plenipotentiary Conference instructs the Secretary-General and the Directors of the Bureaux to take any necessary action to ensure the sovereignty of ITU Member States with regard to Recommendation ITU-T E.164 numbering plans, whatever the application in which they are used;
- i) that Resolution 76 (Rev. Hammamet, 2016) of this assembly instructs the Director of the Telecommunication Standardization Bureau to continue to conduct as necessary exploratory activities in each region in order to identify and prioritize the problems faced by developing

countries¹¹ related to achieving interoperability of telecommunication/information and communication technology (ICT) equipment and services,

considering

- a) that ENUM is not commonly used around the globe for E.164/URI transfer, and some operators have their private solutions;
- b) that some alliances of operators are developing guidelines for interconnection of VoLTE-based networks but there is still no agreed option to be used for such interconnection;
- c) that the development of interconnection procedures for IP-based networks to be used for providing voice and video services needs to be carried out on an international basis;
- d) that development of the conformance and interoperability requirements to support testing of protocols and technologies used for such interconnection is an essential component for developing interoperable equipment that is based on ITU-T Recommendations,

taking into account

- a) that, according to the communiqué of the chief technology officers (CTO) meeting which ITU-T conducted in Budapest (October 2015), "*CTOs encouraged ITU-T to initiate studies – including studies on accessibility, data formats, and control and management aspects – with the goal of enabling the global interoperability of such high-quality services, inviting contributions to these studies from operators and related industry experts as well as relevant SDOs*";
- b) that, according to the summary report of the ITU Workshop on voice and video services interoperability over fixed-mobile hybrid environments, including IMT-Advanced (LTE) (December 2015, Geneva), "*further ITU standardization activities should focus on the deployment of signalling protocols for VoLTE interconnection, emergency calls on VoLTE-based networks and numbering issues*";
- c) the work of ITU-T Study Group 11 on a framework for interconnection of VoLTE/ViLTE-based networks, which aims to specify common requirements regarding the interconnection of VoLTE/ViLTE-based networks;
- d) that the development of standards relating to a framework for interconnection of VoLTE/ViLTE-based networks is one of the subjects of the established collaboration agreement between ITU-T Study Group 11 and ETSI TC INT;
- e) the successful work of the ITU-T Focus Group on IMT-2020,

resolves

that ITU-T Recommendations to address network architectures, roaming principles, numbering issues, charging and security mechanisms as well as interoperability and conformance testing for interconnection of 4G, IMT-2020 networks and beyond shall be progressed as quickly as possible,

¹¹ These include the least developed countries, small island developing states, landlocked developing countries and countries with economies in transition.

instructs the Director of the Telecommunication Standardization Bureau

1 to continue to conduct, as necessary, exploratory activities among telecommunication operators in order to identify and prioritize the problems related to achieving interconnection of IP-based networks such as 4G, IMT-2020 and beyond;

2 to submit the results of these activities to the ITU Council for its consideration and required action,

instructs the study groups

1 to identify as soon as possible future ITU-T Recommendations that need to be developed associated with the interconnection of 4G, IMT-2020 networks and beyond;

2 to cooperate, as appropriate, with interested stakeholders and alliances in order to optimize studies on this particular subject,

further instructs Study Group 11

to develop ITU-T Recommendations which specify the framework and signalling architectures to be used for establishing interconnection of 4G, IMT-2020 networks and beyond to achieve interoperability worldwide

further instructs Study Group 2

to develop ITU-T Recommendations which specify the ENUM architecture to be used for interconnection of 4G, IMT-2020 networks and beyond, including administrative control that could relate to the international telecommunication resources (including naming, numbering, addressing and routing),

invites Member States and Sector Members

to contribute to the implementation of this resolution,

invites Member States

to encourage telecommunication operators to assist ITU-T in implementing this resolution.

