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**SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS**

Internet protocol aspects – Architecture, access, network
capabilities and resource management

**Framework(s) on network requirements and
capabilities to support emergency
telecommunications over evolving circuit-
switched and packet-switched networks**

Recommendation ITU-T Y.1271

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Recommendation ITU-T Y.1271

Framework(s) on network requirements and capabilities to support emergency telecommunications over evolving circuit-switched and packet-switched networks

Summary

Many challenges and considerations need to be addressed in defining and establishing the functional capabilities to support emergency telecommunications in evolving circuit- and packet-switched telecommunications networks. This Recommendation presents an overview of the basic requirements, features, and concepts for emergency telecommunications that evolving networks are capable of providing.

History

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Introduction

The purpose of emergency telecommunications is to facilitate emergency recovery operations with the goal for restoring the community infrastructure and for returning the population to normal living conditions after serious disasters. In some countries, emergency recovery operations are considered to fall within the scope of public safety organizations. Responders need to assess the damage, coordinate rescue and medical assistance, harmonize restoration endeavours, etc. For supporting this purpose, emergency telecommunications may be provided through shared resources from the public telecommunications infrastructure, and in some cases through additional resources of enterprise networks (e.g., the public safety network), that are evolving from a basic circuit-switched to packet-switched networks with a variety of telecommunication capabilities.

Recommendation ITU-T Y.1271

Framework(s) on network requirements and capabilities to support emergency telecommunications over evolving circuit-switched and packet-switched networks

1 Scope

Contextual understanding and careful thought is required to address the unique challenges faced by emergency telecommunications. This Recommendation presents an overview of the basic requirements, features, and concepts for emergency telecommunications that evolving telecommunication networks are capable of providing. This Recommendation provides guidance to telecommunication network operators on network requirements and capabilities to support emergency telecommunications offerings and to provide responders (users) with useful information for (acquisitions) request of such capabilities.

NOTE – This Recommendation defines requirements for networks which when implemented should help support emergency telecommunication services and facilitate the application of [ITU-T E.106] and [ITU-T E.107] if needed.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T E.106] Recommendation ITU-T E.106 (2003), *International Emergency Preference Scheme (IEPS) for disaster relief operations*.
- [ITU-T E.107] Recommendation ITU-T E.107 (2007), *Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS*.
- [ITU-T J.260] Recommendation ITU-T J.260 (2005), *Requirements for preferential telecommunications over IP-Cablecom networks*.
- [ITU-T J.261] Recommendation ITU-T J.261 (2009), *Framework for implementing preferential telecommunications in IP-Cablecom and IP-Cablecom2 networks*.
- [ITU-T M.3342] Recommendation ITU-T M.3342 (2006), *Guidelines for the definition of SLA representation templates*.
- [ITU-T X.1303] Recommendation ITU-T X.1303 (2007), *Common alerting protocol (CAP 1.1)*.
- [ITU-T Y.2001] Recommendation ITU-T Y.2001 (2004), *General overview of NGN*.
- [ITU-T Y.2205] Recommendation ITU-T Y.2205 (2011), *Next Generation Networks – Emergency telecommunications – Technical considerations*.
- [ITU-T Y.3501] Recommendation ITU-T Y.3501 (2013), *Cloud computing framework and high-level requirements*.
- [ITU-T Y.3510] Recommendation ITU-T Y.3510 (2013), *Cloud computing infrastructure requirements*.

- [ITU-T Y.3520] Recommendation ITU-T Y.3520 (2013), *Cloud computing framework for end to end resource management*.
- [ATIS-1000057] ATIS-1000057 (2014), *Service Requirements for Emergency Telecommunications Service (ETS) in Next Generation Network (NGN)*.
- [ETSI TS 122 011] ETSI TS 122 011 (2013), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Service accessibility (3GPP TS 22.011 version 11.3.0 Release 11)*.
- [ETSI TS 133 401] ETSI TS 133 401 (2013), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; 3GPP System Architecture Evolution (SAE); Security architecture (3GPP TS 33.401 version 11.7.0 Release 11)*.
- [IETF RFC 4412] IETF RFC 4412 (2006), *Communications Resource Priority for the Session Initiation Protocol (SIP)*.
- [IETF RFC 5321] IETF RFC 5321 (2008), *Simple Mail Transfer Protocol*.
- [IETF RFC 5670] IETF RFC 5670 (2009), *Metering and Marking Behaviour of PCN-Nodes*.
- [IETF RFC 6679] IETF RFC 6679 (2012), *Explicit Congestion Notification (ECN) for RTP over UDP*.
- [IETF RFC 6710] IETF RFC 6710 (2012), *Simple Mail Transfer Protocol Extension for Message Transfer Priorities*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 Emergency Telecommunications Service (ETS) [ITU-T E.107]: A national service providing priority telecommunications to the ETS authorized users in times of disaster and emergencies.

3.1.2 next generation network (NGN) [ITU-T Y.2001]: A packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 assured capabilities: Capabilities providing high confidence or certainty that critical telecommunications are available and perform reliably.

3.2.2 authentication: The act or method used to verify a claimed identity.

3.2.3 authorization: The act of determining if a particular privilege, such as access to telecommunications resource, can be granted to the presenter of a particular credential.

3.2.4 authorized emergency telecommunication user: A person or an organization authorized to obtain premium privileges and capabilities in national and/or international emergency situations.

3.2.5 bottom-up emergency declaration: An emergency declaration determined or assumed by individual users. The user or users would then use emergency telecommunications according to individual authorizations or authorities.

3.2.6 buffer-bloat: A situation in a packet-switched network whereby large buffers at various network nodes and end systems cause excessive latency and jitter, as well as reduce the overall network performance. This situation may affect how quickly emergency situations are communicated.

3.2.7 confined emergency situation: An emergency situation within a certain defined relatively small geographic area (e.g., local) not affecting other areas.

3.2.8 declared emergency situation: An emergency publicly recognized and stated by a responsible authoritative official(s) of the responsible government(s).

3.2.9 emergency situation: A situation, of serious nature, that develops suddenly and unexpectedly. Extensive immediate important efforts, facilitated by telecommunications, may be required to restore a state of normality to avoid further risk to people or property. If this situation escalates, it may become a crisis and/or disaster.

3.2.10 international emergency situation: An emergency situation, across international boundaries, that affects more than one country.

3.2.11 label: An identifier occurring within or attached to data elements.

3.2.12 nationwide emergency situation: An emergency situation that affects an entire nation, but remains confined in scope to only one country.

3.2.13 ordinary emergency capability: A special emergency type of telecommunications capability (such as 911, 110, or 112) used on a national level made available to the general public to report local or personal emergencies to government officials or other officially designated civil authorities.

3.2.14 policy: Rules (or methods) for allocating telecommunication network resources among types of traffic that may be differentiated by labels.

3.2.15 precedence: When a privilege exists to enable, or facilitate, the preceding of others.

3.2.16 preferential: A capability offering advantage over regular capabilities.

3.2.17 preferential treatment in congestion control mechanisms: Methodologies to manage telecommunication resources to minimize the impact of congestion on emergency telecommunications. Congestion can be managed via a number of measures, such as network design, network element mechanisms (e.g., machine congestion controls) and network operational capabilities.

3.2.18 priority treatment capabilities: Capabilities that provide premium access to, and/or use of telecommunications network resources.

3.2.19 public safety: An umbrella term used in some regions to encompass emergency recovery operations along with other services such as fire and rescue, ambulance and emergency medical services, police and security guard licensing services, etc. for the welfare and protection of the general public. The primary goal is prevention, and protection of the public from dangers affecting safety such as crimes or disasters.

3.2.20 top down emergency declaration: When responsible official(s) with recognized authority in Government, or industry issue an emergency declaration.