INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION STANDARDIZATION SECTOR

STUDY PERIOD 2009-2012

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Question(s):	13/11	Geneva, 17-21 October 2011

LIAISON STATEMENT

Source:	ITU-T Study group 11
Title:	Request for feedback on attached draft revision of Supplement 62 to ITU-T Q series Recommendations

LIAISON STATEMENT

For action to:	3GPP, 3GPP2, ATIS (All Technical Committees), Broadband Forum, ETSI, IEEE, IETF, Telecommunications Industry Association (TIA), TMForum, WiMAX Forum
For comment to:	
For information to:	
Approval:	**Study Group 11 Plenary (21 October 2011)**
Deadline:	**1 May 2012**

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Please don't change the structure of this table, just insert the necessary information.

The ITU World Telecommunication Standardization Assembly (WTSA-08) assigned to Study Group 11 to study "Question 13 – Coordination of work on Emergency Communications within an NGN environment". The object of this Question was to establish a resource permanently in place to coordinate Emergency Communications work, so that the implementation of specific capabilities can be defined in an integrated rather than piecemeal fashion.

In response to this assigned responsibility, SG 11 is working on a revised "Supplement 62 to ITU-T Q series Recommendations - overview of standards development organizations and other organizations' work on emergency telecommunications service (ETS)" in support of this coordination activity. The current version of the draft revised Supplement 62 is attached to this liaison statement. SG 11 would like to invite you to review the attached draft and provide a feedback in regards to the following:

- Were all standards/specifications/recommendations under your responsibility, which deal with the subject of Emergency Telecommunications Service, identified in this draft Supplement?

- If the answer to the previous is not, we would appreciate obtaining a list of these documents so that we can add them to the draft supplement before it is reissued.

In addition, if your organization has no specific ETS work item(s), but has a work item(s) that may be indirectly related to ETS, please provide such information for inclusion in this draft Supplement, as appropriate.

If there is any need for clarification, please contact Viqar Shaikh at the contacts shown above.

Attachment: TD 736 (GEN/11).

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Question(s):	13/11	Geneva, 17-21 October 2011

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TEMPORARY DOCUMENT

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Source:	Editors TRQ.ETS-overview
Title:	[TRQ.ETS-overview] Output of draft revised Supplement TRQ.ETS-overview (Supp.62) to ITU-T Q series Recommendations "Overview of Standards Development Organizations (SDOs) and Other Organizations' Work on Emergency Telecommunications Service (ETS)"

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Abstract

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This document provides the output baseline text for draft revised Supplement TRQ.ETS-overview (Supp.62) to ITU-T Q series Recommendations *"Overview of Standards Development Organizations (SDOs) and Other Organizations' Work on Emergency Telecommunications Service (ETS)"* from the October 2011 meeting of SG11.

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Draft revised Supplement TRQ.ETS-overview (Supp.62) to ITU-T Q series Recommendations

Overview of Standards Development Organizations (SDOs) and Other Organizations' Work on Emergency Telecommunications Service (ETS)

Summary

This Supplement provides a convenient reference to assist ITU-T Study Groups and other national and international SDOs as they develop Recommendations and standards for Emergency Telecommunications Services (ETS). It identifies published ETS related Recommendations and standards as well as those currently in work programmes.

Keywords

ETS, program management, program coordination

Introduction

The World Telecommunication Standardization Assembly (WTSA-08) assigned Study Group 11 with the responsibility to coordinate Emergency Telecommunications Service (ETS) activities for NGN so that the implementation of specific capabilities can be defined in an integrated rather than piecemeal fashion. This Supplement is the vehicle which will be used to fulfil this coordination obligation and was developed to make available a convenient reference to assist ITU-T Study Groups and other national and international SDOs as they develop Recommendations and Standards for ETS. The intent of this Supplement is to encourage coordination and cooperation in the development of an internationally applicable set of inter-workable ETS implementations.

Table of Contents

1. Scope

Emergency Telecommunications Service (ETS) is a national service providing priority telecommunications to the ETS authorized users in times of disaster and emergencies.

This Supplement identifies both completed and ongoing work related to ETS occurring in various ITU-T Study Groups, as well as the status of their work. This roadmap captures the results from an analysis of existing work activities related to ETS. Specifically, it identifies the study tasks that have been added to the work plans of individual Questions of the relevant Study Groups and their status. It captures identified gaps that exist, as well as the plans which show how these gaps will be addressed.

National standards support the origination and termination of ETS calls in national networks. (This document recognizes that ETS calls may include ETS voice, video and data calls originating or terminating in: the PSTN; wireless networks; and NGN networks.)

These national standards complement the ETS related ITU-T Recommendations, which are intended to support the extension of national ETS calls across international boundaries. It is understood that the ITU-T Recommendations must address situations where invocation of ETS is restricted to users authorized by their respective governments and, where international agreements are needed to honour authorization in the originating network when delivering the call in a destination network which is a different national network from the network in which the invocation of the service occurred.

Provision has been made to capture relevant ETS related national standards, and other SDO international ETS related standards, in this document. However, as these other SDO standards are not the ITU-T's responsibility, the ITU-T takes no position with regards to their integrity or completeness. This document may identify the dependencies of ITU-T ETS work on activities that are, or which should be, underway in other external SDOs.

Individual-to-authority communications are outside the scope of this Supplement, e.g., calls from the general public using national, regional or local emergency and public safety services to seek assistance.

Activities related to the support of Emergency Telecommunications, which are not explicitly related to ETS, are outside the scope of this Supplement.

2. References

2.1. ITU-T References

2.1.1   Published Recommendations and Supplements

[ITU-T E.106]	ITU-T Recommendation E.106 (2003), *International Emergency Preference Scheme (IEPS) for disaster relief operations*
[ITU-T E.107]	ITU-T Recommendation E.107 (2007), *Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS*
[ITU-T E.412]	ITU-T Recommendation E.412 (2003), *Network management controls*
[ITU-T H.246]	ITU-T Recommendation H.246 (2006), *Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN and ISDN*

[ITU-T H.248.1]	ITU-T Recommendation H.248.1 (2005), *Gateway control protocol: Version 3*
[ITU-T H.361]	ITU-T Recommendation H.361 (2006), *End-to-end quality of service (QoS) and service priority signalling in H.323 systems*
[ITU-T H.361 A1]	ITU-T Recommendation H.361 Amendment 1 (2008), *End-to-end quality of service (QoS) and service priority signalling in H.323 systems - Amendment 1 - New Annex A "IntServ/RSVP support for H.323 systems", Annex B "DiffServ support for H.323 systems" and Annex C "Priority support for H.323 systems"*
[ITU-T H.460.4]	ITU-T Recommendation H.460.4 (2007), *Call priority designation and country/international network of call origination identification for H.323 priority calls*
[ITU-T H.Sup 9]	ITU-T H.Series Supplement 9 (2008), *Gateway control protocol: Operation of H.248 with H.225, SIP, and ISUP in support of emergency telecommunications service (ETS)/international emergency preference scheme (IEPS)*
[ITU-T J.160]	ITU-T Recommendation J.160 (2005), *Architectural framework for the delivery of time-critical services over cable television networks using cable modems*
[ITU-T J.163]	ITU-T Recommendation J.163 (2007), *Dynamic quality of service for the provision of real-time services over cable television networks using cable modems*
[ITU-T J.170]	ITU-T Recommendation J.173 (2005), *IPCablecom security specification*
[ITU-T J.260]	ITU-T Recommendation J.260 (2005), *Requirements for preferential telecommunications over IPCablecom networks*
[ITU-T J.261]	ITU-T Recommendation J.261 (2009), *Framework for implementing preferential telecommunications in IPCablecom and IPCablecom2 Networks*
[ITU-T J.262]	ITU-T Recommendation J.262 (2009), *Specifications for Authentication in Preferential Telecommunications over IPCablecom2 Networks*
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[ITU-T J.360]	ITU-T Recommendation J.360 (2006), *IPCablecom2 architecture framework,*
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[ITU-T J.366.3]	ITU-T Recommendation J.366.3: IPCablecom2 IP Multimedia Subsystem: Stage 2 Specification
[ITU-T J.366.4]	ITU-T Recommendation J.366.4: IPCablecom2 IP Multimedia Session Initiation Protocol (SIP) and Session Description Protocol (SDP): Stage 3 Specification

[ITU-T J.366.7]	ITU-T Recommendation J.366.7: IPCablecom2 Access Security for IP-Based Services
[ITU-T Q.761]	ITU-T Recommendation Q.761 (1999), *Signalling System No. 7 - ISDN User Part functional description*
[ITU-T Q.761 A3]	ITU-T Recommendation Q.761 Amendment 3 (2006), *Support for the International Emergency Preference Scheme*
[ITU-T Q.762]	ITU-T Recommendation Q.762 (1999), *Signalling System No. 7 - ISDN User Part general functions of messages and signals*
[ITU-T Q.762 A3]	ITU-T Recommendation Q.762 Amendment 3 (2006), *Support for the International Emergency Preference Scheme*
[ITU-T Q.763]	ITU-T Recommendation Q.763 (1999), *Signalling System No. 7 – ISDN user part formats and codes*
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[ITU-T Q.767 A1]	ITU-T Recommendation Q.767 Amendment 1 (2002), *Support for the International Emergency Preference Scheme*
[ITU-T Q.1902.1]	ITU-T Recommendation Q.1902.1 (2001), *Interworking between Signalling System No. 7 ISDN user part and the Bearer Independent Call Control protocol*
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[ITU-T Q Sup 57]	ITU-T Q.Series Supplement 57 (2008), *Signalling requirements to support the emergency telecommunications service (ETS) in IP networks*
[ITU-T Q.Sup 61]	ITU-T Q.Series Supplement 61 (2010), *Evaluation of signalling protocols to support ITU-T Y.2171 admission control priority levels*

[ITU-T Y.1271]   ITU-T Recommendation Y.1271 (2004), *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

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[ITU-T Y.2201]   ITU-T Recommendation Y.2201 (2009), *NGN release 1 requirements*

[ITU-T Y.2205]   ITU-T Recommendation Y.2205 (2011), *Next Generation Networks - Emergency Telecommunications – Technical considerations*

[ITU-T Y.2262]   ITU-T Recommendation Y.2262 (2006), *PSTN/ISDN emulation and simulation*

[ITU-T Y.2271]   ITU-T Recommendation Y.2271 (2006), *Call server based PSTN/ISDN emulation*

[ITU-T Y.2701]   ITU-T Recommendation Y.2701 (2007), *Security requirements for NGN release 1*

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[ITU-T Y.2704]   ITU-T Recommendation Y.2704 (2010), *NGN security mechanisms and procedures for NGN*

[ITU-T Y.2720]   ITU-T Recommendation Y.2720 (2009), *NGN identity management framework*

[ITU-T Y.2721]   ITU-T Recommendation Y.2721, *NGN identity management requirements and use cases*

[ITU-T Y.2722]   Draft ITU-T Recommendation Y.2722, *NGN Identity Management Mechanisms and Procedures*

 [ITU-T Y.Sup2]   ITU-T Y.2012 Supplement 2 (2006), *Session/border control (S/BC) functions*

[ITU-T HSTP-AMSR]   *HSTP-AMSR Technical paper: AMS Requirements*

[ITU-T H.248.1v3 Amendment 2] ITU-T Recommendation H.248.1v3 Amendment 2, *Gateway Control Protocol: Version 3: New Appendix IV, plus corrections and clarifications*

2.1.2   Draft Recommendations and Supplements

[ITU-T D E.TDR]   Draft ITU-T Recommendation E.TDR, *Service and Operational framework for the provision of Telecommunication for Disaster Relief (TDR)*.

[ITU-T D M.3350]   Draft Revised M.3350 (TD 159 (GEN/2) 2009 – 2012 Period), *TMN service management requirements for information interchange the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)*

[ITU-T D Y.ngncert]   Draft ITU-T Recommendation Y.ngncertificate, Next Generation Network certificate management

[ITU-T D TRQ.ets-protocol] Draft ITU-T TRQ.ets-protocol, *Signaling Protocol Mappings in Support of Emergency Telecommunications Service in IP Networks*

[ITU-T D Y.ETS-Sec]   Draft ITU-T Recommendation Y.ETS Security (ETS-Sec), *Minimum Security Requirements for Interconnection of Emergency Telecommunications Service (ETS)*

[ITU-T D H.248.ECN]   Draft ITU-T Recommendation H.248.ECN, *Gateway control protocol: Explicit Congestion Notification (ECN) Support*

2.2.   Other References

2.2.1   3GPP References

2.2.1.1 3GPP Published References

[3GPP TS 22.153]   *Multimedia Priority Service*

[3GPP TR 22.950]   *Priority Service Feasibility Study*

[3GPP TR 22.952]   *Priority Service Guide*

[3GPP D TR 23.854]   *Enhancements for Multimedia Priority Service (Release 10)*

[3GPP TS 23.401]   *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access*

[3GPP TR 23.854]   *Enhancements for Multimedia Priority Service*

[3GPP TS 23.203]   *Policy and charging control architecture*

[3GPP TS 23.228]   *IP Multimedia Subsystem (IMS); Stage 2*

[3GPP TS 29.212]   *Policy and charging control over Gx reference point*

[3GPP TS 29.213]   *Policy and charging control signalling flows and Quality of Service (QoS) parameter mapping*

[3GPP TS 29.214]   *Policy and charging control over Rx reference point*

[3GPP TS 24.301]   *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*

[3GPP TS 24.008]   *Mobile radio interface Layer 3 specification; Core network protocols; Stage 3*

[3GPP TS 29.118]   *Mobility Management Entity (MME) – Visitor Location Register (VLR) SGs interface specification*

[3GPP TS 29.274]	*3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3*
[3GPP TS 36.331]	*Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*
[3GPP TS 36.413]	*Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)*
[3GPP TS 23.008]	*Organization of subscriber data*
[3GPP TS 24.229]	*IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*
[3GPP TS 29.228]	*IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents*
[3GPP TS 29.229]	*Cx and Dx interfaces based on the Diameter protocol; Protocol details*
[3GPP TS 29.230]	*Diameter applications; 3GPP specific codes and identifiers*
[3GPP TS 29.272]	*Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol*
[3GPP TS 29.328]	*IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents*
[3GPP TS 29.329]	*Sh interface based on the Diameter protocol; Protocol details*

2.2.2   3GPP2 References

2.2.2.1 3GPP2 Published References

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[3GPP2 X.S0057]	*E-UTRAN - eHRPD Connectivity and Interworking: Core Network Aspects*
[3GPP2 X.S0058]	*WiMAX-HRPD Interworking: Core Network Aspects*
[3GPP2 D C.S0005]	*Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems*
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[3GPP2 D C.S0024]	*High Rate Packet Data Air Interface Specification*
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[3GPP2 D A.S0022-0v2.0]	*Interoperability Specification (IOS) for Evolved High Rate Packet Data (eHRPD) Radio Access Network Interfaces and Interworking with Enhanced Universal Terrestrial Radio Access Network (E-UTRAN)*

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2.2.3 ATIS References

2.2.3.1 ATIS Published References

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[A-1000006]	ATIS-1000006 (2005), *Signaling System No.7 (SS7) – Emergency Telecommunications Service (ETS)*
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[ATIS-1000034]	*Next Generation Network (NGN): Security Mechanisms and Procedures*
[ATIS-1000044]	*ATIS Identity Management: Requirements and Use Cases Sta*ndard
[ATIS-1000049]	*End-to-End NGN GETS Call Flows*

2.2.3.2 Draft ATIS References

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[DA ETS SR]	Draft TR: *Service Requirements of ETS in NGN*
[DA ETS WAR]	Draft Standard: *ETS Wireline Access Requirements.*
[DA ETS NER]	Draft Standards: *ETS Phase 2 Network Element Requirements.*
[DA AddenT1.679]	*Draft Addendum to T1.679 (SIP-ISUP Interworking*
[DA ETS AAF]	*Draft ATIS ETS Authentication and Authorization Framework.*

2.2.4 IETF References

2.2.4.1 IETF Published References

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[RFC 4542]	IETF RFC 4542 (2006) Implementing an Emergency Telecommunications Service (ETS) for Real-Time Services in the Internet Protocol Suite
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2.2.4.2 Draft IETF References

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2.2.5 TMF References

2.2.5.1 Published TMF References

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2.2.6 TIA References

2.2.6.1   Published TIA References

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2.2.7 WiMAX References

2.2.7.1   Published WiMAX References

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2.2.8 Broadband Forum References

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[WT-203]   Interworking between Next Generation Fixed and 3GPP Wireless Access, BBF Working Text 203 (Draft), Revision 6, October 2010.

3. Definitions

3.1.   Terms defined elsewhere:

This Recommendation uses the following terms defined elsewhere:

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

3.1.2   ETS user [E.107]: A user authorized to obtain priority telecommunications in national and/or international emergency situations.

3.1.4   IPCablecom [J.162]: An ITU-T project that includes an architecture and a series of Recommendations that enable the delivery of time-critical interactive services over cable television networks.

3.1.5   IPCablecom2 [J.360]: IPCablecom2 is a cable industry effort based on IMS architecture, designed to support the convergence of voice, video, data and mobility technologies.

3.1.6   International Emergency Preference Service (IEPS) [E.106]: The IEPS enables the use of public telecommunications by national authorities for emergency and disaster relief operations. It allows users, authorized by national authorities, to have access to the International Telephone Service, as described in ITU-T Rec. E.105 [1], while this service is restricted either due to damage, congestion or faults, or any combination of these.

3.1.5   priority treatment capabilities [E.107]: Capabilities that provide priority in the use of telecommunications network resources, allowing a higher probability of end-to-end telecommunications and use of telecommunication applications.

3.2.   Terms defined in this Supplement

This Supplement defines the following terms:

None defined in this Supplement.

4. Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

3GPP   3rd Generation Partnership Project

3GPP2   3rd Generation Partnership Project2

ANI   Application to Network Interface

ANSI   American National Standards Institute

ATIS   Alliance for Telecommunications Industry Solutions

BICC   Bearer Independent Call Control

B-ISUP   Broadband ISUP

ENI	ETS national implementation
ET	Emergency Telecommunications
ETS	Emergency Telecommunications Service
ETSMS	ETS Management Service
ETSI	European Telecommunications Standards Institute
GSM	Global System for Mobile Communications
IEMS	International Emergency Multimedia Service
IEPS	International Emergency Preference Scheme
IETF	Internet Engineering Task Force
IMS	IP Multimedia Subsystem
IP	Internet Protocol
ISUP	Integrated Services User Part
ISDN	Integrated Services Digital Network
ITU	International Telecommunications Union
ITU-T	ITU Telecommunication Standardization Sector
MLPP	Multi-Level Precedence and Preemption
NNI	Network to Network Interface
NS/EP	National Security/Emergency Preparedness
PRQC	Performance, Reliability, and Quality of Service
PTSC	Packet Technologies and Systems Committee
QoS	Quality of Service
RACF	Resource Admission and Control Function
RFC	Request for Comments
S/BC	Session/Border Control
SDO	Standards Development Organization
SIP	Session Initiation Protocol
SS7	Signaling System 7
TIA	Telecommunications Industry Association
TDR	Telecommunication for Disaster Relief
TMForum	Telecommunications Management Forum
TMN	Telecommunications Management Network
TSP	Telecommunications Service Priority
UNI	User Network Interface
WiMAX	Worldwide Interoperability for Microwave Access

5. Conventions

1   In this Supplement the term "ETS" is typically used as a noun.

2   In Clause 2 References typically only the base Recommendations have been identified. Readers should assume that this reference is intended to implicitly refer to all related in

force amendments, corrigenda, and implementer's guides. However, in cases where an amendment has been explicitly generated to support ETS or IEPS, and labeled as such, it will be listed separately in the reference clause.

3   As this Supplement is intended to be a management oriented document, it is formatted and structured as follows:

- Clause 6 will provide pointers to example service descriptions

- Clause 7 will provide pointers to example functional requirements

- Clause 8 will provide pointers to example capability documents

- Clause 9 will provide a list of SDO's and other organizations that have or are producing ETS related standards

- Appendix A provides a summary of the standards listed in clause 3 References

4   "In clauses 6, 7 and 8 provision has been made for the identification of ITU-T Recommendations. In some instances one or more Recommendations have been identified. In these cases, the reader should understand that this is not considered to be an all inclusive list. Rather there may be other equally applicable Recommendations that have not been captured in this document." In some instances there are no Recommendations identified. The readers should understand that there may be one or more applicable Recommendations that exist and which have not been captured in this Supplement or that this may truly be a gap, i.e. no Recommendation addresses this particular item.

5   In those cases where a pointer is made to other SDO or other organization standards, it should be noted that the ITU-T has not: reviewed the standards to determine its integrity or if the mapping is correct; takes no position as to the correctness of reference; and has not approved their contents.

6   A Recommendation which addresses a number of topics may appear more than once in clauses 7, 8 and 9.

6. ETS Service Description

6.1   General

ETS, as defined in [ITU-T E.107], is a national implementation utilizing the features, facilities and applications available in national public networks and service offerings. Implementation of ETS by definition is a national matter; however, ETS national implementations are likely to exhibit some of the following characteristics:

a)   ETS users should be able to use their normal telecommunication terminals to initiate ETS calls, sessions or telecommunication during times of crisis or agreed emergency situations.

b)   An originating national network may use various methods to identify an ETS user request for ETS telecommunication.

c)   As a national capability, ETS is specifically designed to serve the telecommunication needs of authorized ETS users. ETS user authentication and authorizion is a national matter.

d)   An ETS call, session or telecommunication is provided end-to-end priority treatment beyond that offered to the general public. The priority treatment is applied during the call/session establishment phase, and should continue to be applied for the duration of the call, session or telecommunication. The priority treatment consists of priority mechanisms

and features applicable to various aspects (e.g., signalling, control, routing, and media traffic) that are essential for the establishment and continuation of the telecommunication, including:

- **Priority treatment**: Priority treatment mechanisms may include priority call/session set-up (e.g., priority queuing schemes for network resources), access to additional resources (e.g., via alternate routing) and exemption from restrictive network traffic management controls (e.g., call gapping). Pre-emption in the public network (i.e., terminating any established telecommunication to release resources to serve a new ETS call/session request) is a national matter.

- **Network interconnection and protocol interworking**: The signalling of ETS indicators transmitted across network boundaries (e.g., between a circuit-switched network and an NGN) and the ETS priority treatment should also be ensured to be interoperable across the relevant networks.

e) An ETS user should be able to communicate with any other available user. For example, any restrictions to call/session completion should be overridden.

f) A national government/administration decides whether user priority levels will be assigned to ETS users, and if assigned, how many levels will be used and the assignment criteria.

g) If a network or network element is not able to distinguish an ETS call/session request from a normal call request, then the routing of an ETS requested call should proceed as a normal call and any ETS markings or indicators associated with the call should be maintained and transmitted if technically feasible.

6.2   Standards related to service descriptions

Sub-clause 6.2 provides a list of example standards that contain information on ETS service descriptions. The status of each is identified.

Note: The documents cited in this sub-clause may contain information other than service description related information.

6.2.1   ITU-T Recommendations

[ITU-T E.106]   International Emergency Preference Scheme (IEPS) for disaster relief operations

Status: Published

Addresses: Service Definition

[ITU-T E.107]   Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS

Status: Published

Addresses: Service Definition

7.   ETS Functional Requirements

7.1   General

This clause provides a list of example standards that contain functional requirements for ETS. The examples are organized based on overall, systems and subsystems as well as for different topic areas like management, bearer mobility, resource admission control, security, signaling, and transport.

Note: Some of the documents cited in this clause are not ETS specific documents. For example, some of the documents has a broader scope, but includes functional requirements pertaining to ETS. Also, some documents cited may include topics other than functional requirements.

7.2 Overall Functional Requirements

This sub-clause captures pointers to standards that contain overall functional requirements

7.2.1 ITU-T

[ITU-T E.106]　　　*International Emergency Preference Scheme (IEPS) for disaster relief operations*

　　　　　　　Status:　　Published

　　　　　　　Addresses: Overall Functional Requirements

[ITU-T D E.TDR]　　Draft ITU-T Recommendation E.TDR, *Service and Operational framework for the provision of Telecommunication for Disaster Relief (TDR)*.

　　　　　　　Status:　　Draft

　　　　　　　Addresses: Overall Functional Requirements

[ITU-T Y.1271]　　*Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

　　　　　　　Status:　　Published

　　　　　　　Addresses: General Network Requirements

[ITU-T Y.2006]　　*Description of capability set 1 of NGN release 1*

　　　　　　　Status:　　Published

　　　　　　　Addresses: General Network Requirements

[ITU-T Y.2012]　　*Functional requirements and architecture of next generation networks*

　　　　　　　Status: Published

　　　　　　　Addresses: General Functional requirements

[ITU-T Y.Sup2]　　*Functional requirements and architecture of next generation networks - Session/border control (S/BC) functions*

　　　　　　　Status: Published

　　　　　　　Addresses: General Functional requirements

[ITU-T Y.2201]　　*NGN release 1 requirements*

　　　　　　　Status:　　Published

　　　　　　　Addresses: General Network Requirements

[ITU-T Y.2205]　　*Next Generation Networks - Emergency Telecommunications – Technical considerations*

　　　　　　　Status:　　Published

Addresses: General Network Functional Requirements for IEPS/ETS Support

[ITU-T Y.2205]   ITU-T Recommendation Y.2205, *Next Generation Networks - Emergency Telecommunications – Technical issues*

Status: Published

Addresses: General Network Functional Requirements for IEPS/ETS Support

[ITU-T Y.2262]   *PSTN/ISDN emulation and simulation*

Status: Published

Addresses: General Network Functional Requirements for IEPS Support

[ITU-T Y.2271]   *Call server based PSTN/ISDN emulation*

Status: Published

Addresses: General Network Functional Requirements for IEPS Support

[ITU-T Q Sup 57]   *Signalling requirements to support the emergency telecommunications service (ETS) in IP networks*

Status: Published

Addresses: Overall functional requirements

7.3   System and Subsystem Functional Requirements

7.3.1   General

This sub-clause provides pointers to example standards that contain system or subsystem functional requirements. Standards are mapped to the functional requirements.

7.3.2   Bearer

7.3.2.1   ITU-T

[ITU-T E.106]   *International Emergency Preference Scheme (IEPS) for disaster relief operations*

Status: Published

Addresses: Priority queuing schemes

[ITU-T J.260]   *Requirements for preferential telecommunications over IPCablecom networks*

Status: Published

Addresses: Support for priority

[ITU-T Y.1271]   *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

Status: Published

Addresses: Support for priority

[ITU-T Y.2171]   *Admission Control Priority Levels in Next Generation Networks*

Status: Published

Addresses: Support for priority

7.3.3   Management

7.3.3.1   ITU-T

[ITU-T E.106]   *International Emergency Preference Scheme (IEPS) for disaster relief operations*

Status: Published

Addresses: Bilateral agreements
            Exemption from restrictive management controls

[ITU-T E.107]   *Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS*

Status: Published

Addresses: Bilateral agreements

[ITU-T E.412]   *Network management controls*

Status: Published

Addresses: Network Management controls

[ITU-T D M.3350]   *TMN service management requirements for information interchange the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)*

Status: Draft

Addresses: Network Management controls

[ITU-T Y.1271]   *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

Status: Published

Addresses: General Network Management Requirements

[ITU-T Y.2172]   *Service Restoration Priority Levels in Next Generation Networks*

Status: Published

Addresses: Network rerouting

[ITU-T D E.TDR]   *Service and Operational framework for the provision of Telecommunication for Disaster Relief (TDR).*

Status: Draft

Addresses: Network Operations

7.3.4   Mobility

7.3.4.1   ITU-T

[ITU-T Y.1271]   *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

Status: Published

Addresses: Mobility

7.3.5   Resource Admission and Control

7.3.5.1 ITU-T

[ITU-T E.106]   *International Emergency Preference Scheme (IEPS) for disaster relief operations*

Status: Published

Addresses: Resource admission and control functions related IEPS support

[ITU-T Y.2111]   *Resource and admission control functions in Next Generation Networks*

Status: Published

Addresses: Resource admission and control functions related IEPS support

[ITU-T Y.2171]   *Admission Control Priority Levels in Next Generation Networks*

Status: Published

Addresses: Resource admission control

7.3.6   Security

7.3.6.1 ITU-T

[ITU-T D E.TDR]   Draft ITU-T Recommendation E.TDR, *Service and Operational framework for the provision of Telecommunication for Disaster Relief (TDR).*

Status: Draft

Addresses: General security requirements

[ITU-T J.260]   *Requirements for preferential telecommunications over IPCablecom networks*

Status: Published

Addresses: General Authentication

[ITU-T Y.2701]   *Security requirements for NGN release 1*

Status: Published

Addresses: Overall Functional Security Requirements. Appendix I – provides security objectives and guidelines for interconnection of emergency telecommunications services

[ITU-T Y.2702]   *Authentication and authorization requirements for NGN release 1*

Status: Published

Addresses: Authentication and Authorization requirements. Appendix II provides information on ETS authentication and authorization.

[ITU-T Y.2704] *Security mechanisms and procedures for NGN*

Status: Published

Addresses: Security mechanisms to fulfill NGN security requirements. Appendix II – provides guidance on network provided security for ETS

[ITU-T Y.2720] *NGN identity management framework*

Status: Published

Addresses: Structured approach for designing, defining, and implementing IdM solutions

[ITU-T Y.2721] *NGN identity management requirements and use cases*

Status: Determined

Addresses: IdM objectives, requirements, guidelines and example use cases for the NGN. Appendix III – provides ETS related IdM use cases.

[ITU-T Y.Sup 12] *Supplement on NGN identity management mechanisms*

Status: Published

Addresses: IdM mechanisms and capabilities for NGN.

[ITU-T D Y.2722] Draft ITU-T Recommendation Y.2722 (T09-SG13-100419-TD-PLEN-0133 2009 – 2012 Period), *NGN Identity Management Mechanisms and Procedures*

Status: Draft

Addresses: IdM mechanisms and capabilities for NGN

7.3.7   Signalling

7.3.7.1   ITU-T

[ITU-T E.106] *International Emergency Preference Scheme (IEPS) for disaster relief operations*

Status: Published

Addresses: Call marking
           Priority call setup
           Priority dial tone

[ITU-T J.260] *Requirements for preferential telecommunications over IPCablecom networks*

Status: Published

Addresses: Support for authentication
           Support for priority

[ITU-T Q Sup 47] *Emergency services for IMT-2000 networks – Requirements for harmonization and convergence*

Status: Published

Addresses: Signalling requirements to support IEPS in IMTS systems

[ITU-T Q Sup 53]   *Signalling requirements to support the International Emergency Preference Scheme (IEPS)*

        Status: Published

        Addresses: Signalling requirements to support IEPS

[ITU-T Q Sup 57]   *Signalling requirements to support the emergency telecommunications service (ETS) in IP networks*

        Status: Published

        Addresses: Signalling requirements to support IEPS

[ITU-T Y.1271]   *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

        Status: Published

        Addresses: Signalling priority

[ITU-T Y.2172]   *Service Restoration Priority Levels in Next Generation Networks*

        Status: Published

        Addresses: Signalling priority

[ITU-T Q Sup 61]   *Evaluation of signalling protocols to support ITU-T Y.2171 admission control priority levels*

        Status: Published

        Addresses: Guidance on how existing signaling protocol extensions can be used to designate the admission control priority requirements in support of ETS

7.3.8 Transport

7.3.8.1 ITU-T

[ITU-T E.106]   *International Emergency Preference Scheme (IEPS) for disaster relief operations*

        Status: Published

        Addresses: Priority queuing schemes
                    Transparency of path to content

8   Standards mapped to capabilities for ETS support

8.1   General

This clause provides example ETS related standards mapped to capabilities identified to support ETS by the ITU-T Study Groups and other SDOs responsible for that particular topic area. The examples are mapped to capability topics that include: admission control, authentication, interworking, management, preferential treatment, preferred routing priority, security, signaling in support of IEPS, Quality of Service, and transport.

Note: Some of the documents cited in this clause are not ETS specific documents. For example, some of the documents has a broader scope, but includes capabilities pertaining to ETS. Also, some documents cited may include topics other than the capability topics cited.

8.2 Admission Control

8.2.1 ITU-T

[ITU-T J.170] *IPCablecom security specification*

    Status: Published

    Addresses: Access control

[ITU-T Y.1271] *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

    Status: Published

    Addresses: Priority
                 Protection against misuse

8.3 Authentication

As a national capability, ETS is specifically designed to serve the telecommunication needs of authorized ETS users. How ETS users are authenticated and authorized is a national matter.

8.3.1 ITU-T Related Recommendations

[ITU-T Y.2702] *Authentication and authorization requirements for NGN release 1*

    Status: Published

    Addresses: Authentication and Authorization requirements. Appendix II provides information on ETS authentication and authorization.

[ITU-T J.160] *Architectural framework for the delivery of time-critical services over cable television networks using cable modems*

    Status: Published

    Addresses: Authentication

[ITU-T J.170] *IPCablecom security specification*

    Status: Published

    Addresses: Authentication

[ITU-T J.261] *Framework for implementing preferential telecommunications in IPCablecom and IPCablecom2 Networks*

    Status: Published

    Addresses: Authentication

[ITU-T J.262] *Specifications for Authentication in Preferential Telecommunications over IPCablecom2 Networks*

    Status: Published

    Addresses: Authentication

8.6 Interworking

8.6.1 Bearer Interworking

8.6.1.1 ITU-T

[H.246]   *Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN and ISDN*

           Status: Published

           Addresses: Gateway interworking of media streams established using H.series protocols, Q.931 and Q.2931 protocols

8.6.2   Protocol Interworking

8.6.2.1 BICC - ISUP

8.6.2.1.1 ITU-T

[ITU-T Q.1902.1 A2]   *Interworking between Signalling System No. 7 ISDN user part and the Bearer Independent Call Control protocol – Amendment 2 - Support for the International Emergency Preference Scheme*

           Status: Published

           Addresses: Extensions to support IEPS

[ITU-T Q.1902.2 A3]   *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: General functions of messages and parameters - Amendment 3 - Support for the International Emergency Preference Scheme*

           Status: Published

           Addresses: Extensions to support IEPS

[ITU-T Q.1902.3 A3]   *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: Formats and codes - Amendment 3 - Support for the International Emergency Preference Scheme*

           Status: Published

           Addresses: Extensions to support IEPS

[ITU-T Q.1902.4 A3]   *Bearer Independent Call Control protocol (Capability Set 2): Basic call procedures - Amendment 3 - Support for the International Emergency Preference Scheme*

           Status: Published

           Addresses: Extensions to support IEPS

8.6.2.2   Gateway – SIP - ISUP

8.6.2.2.1 ITU-T

[ITU-T H.Sup 9]   *ITU-T H.Series* Supplement 9 (2008), *Gateway control protocol: Operation of H.248 with H.225, SIP, and ISUP in support of emergency telecommunications service (ETS)/international emergency preference scheme (IEPS)*

           Status: Published

           Addresses: Interworking between H.248, H.225 and ISUP

8.6.2.3 H.series

8.6.2.3.1 ITU-T

[ITU-T H.246] *Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN and ISDN*

Status: Published

Addresses: Gateway interworking of H.series protocols and H.series protocols with Q.931 and Q.2931 protocols

8.7 Management

8.7.1 ITU-T

For further study.

8.8 Preferential Treatment

8.8.1 ITU-T

[ITU-T J.261] *Framework for implementing preferential telecommunications in IPCablecom and IPCablecom2 Networks*

Status: Published

Addresses: Priority and preferential treatment

[ITU-T J.263] *Specification for priority in preferential telecommunications over IPCablecom2 Networks*

Status: Published

Addresses: Priority and preferential treatment

[ITU-T Y.1271] *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

Status: Published

Addresses: Priority and preferential treatment

8.9 Preferred Routing

8.9.1 ITU-T

For further study.

8.10 Priority

8.10.1 ITU-T

ITU-T H.361 A1] *End-to-end quality of service (QoS) and service priority signalling in H.323 systems - Amendment 1 - New Annex A "IntServ/RSVP support for H.323 systems", Annex B "DiffServ support for H.323 systems" and Annex C "Priority support for H.323 systems"*

Status: Published

Addresses: DiffServ support for H.323 systems
Priority support for H.323 systems

| [ITU-T H.460.4] | *Call priority designation and country/international network of call origination identification for H.323 priority calls* |

Status: Published

Addresses: Call marking
Country/international network of call origin
Definition of messages to be used
Level of priority

| [ITU-T J.163] | *Dynamic quality of service for the provision of real-time services over cable television networks using cable modems* |

Status: Published

Addresses: Priority

| [ITU-T J.261] | *Framework for implementing preferential telecommunications in IPCablecom and IPCablecom2 Networks* |

Status: Published

Addresses: Priority and preferential treatment

| [ITU-T J.263] | *Specification for priority in preferential telecommunications over IPCablecom2 Networks* |

Status: Published

Addresses: Priority and preferential treatment

| [ITU-T Y.1271] | *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks* |

Status: Published

Addresses: Priority

8.11   Security

8.11.1   ITU-T

[ITU-T Y.2704]   Security mechanisms for NGN

Status: Published

Addresses: Security mechanisms.

| [ITU-T J.170] | *IPCablecom security specification* |

Status: Published

Addresses: Security

| [ITU-T Y.1271] | *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks* |

Status: Published

Addresses: Authorization
Confidentiality of content and location

8.12   Signalling to support IEPS/ETS

8.12.1   AAL2 (Capability Set 3) protocol

8.12.1.1 ITU-T

[ITU-T Q.2630.3 A1]   *AAL type 2 signalling protocol - Capability Set 3 AAL type 2 signalling protocol - Capability Set 3 - Amendment 1 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: Extension of AAL2 to support IEPS

8.12.2   BICC protocol

8.12.2.1   ITU-T

[ITU-T Q.1950 A1]   *Bearer independent call bearer control protocol - New Annex G – Call bearer control – International Emergency Preference Scheme*

Status: Published

Addresses: Extension of BICC to support IEPS

8.12.3   B-ISUP

8.12.3.1 ITU-T

[ITU-T Q.2761 A1]   *Functional description of the B-ISDN user part (B-ISUP) of signalling system No. 7 - Amendment 1 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: Extension to support IEPS

[ITU-T Q.2762 A1]   *General functions of messages and signals of the B-ISDN User Part (B-ISUP) of Signalling System No. 7 - Amendment 1- Support for the International Emergency Preference Scheme*

Status: Published

Addresses: Extension to support IEPS

[ITU-T Q.2763 A1]   *Signalling System No. 7 B-ISDN User Part (B-ISUP) - Formats and codes - Amendment 1 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: Extension to support IEPS

[ITU-T Q.2764 A1]   *Signalling System No. 7 B-ISDN User Part (B-ISUP) - Basic call procedures*

Status: Published

Addresses: Extension to support IEPS

[ITU-T Q.2931]   *Digital Subscriber Signalling System No. 2 - User-Network Interface (UNI) layer 3 specification for basic call/connection control*

Status: Published

Addresses: Extensions to support IEPS

8.12.4   Gateway control protocol

8.12.4.1 ITU-T Related Recommendations

[ITU-T H.248.1]   *Gateway control protocol:* Version 3

Status: Published

Addresses: Support of IEPS capability

8.12.5   ISUP capabilities

8.12.5.1 ITU-T

[ITU-T Q.761 A3]   *Signalling System No. 7 - ISDN User Part functional description - Amendment 3 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: ISUP support for provision of capability for identifying call as an IEPS call

[ITU-T Q.762 A3]   *Signalling System No. 7 - ISDN User Part general functions of messages and signals - Amendment 3 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: ISUP new parameter and parameter information for IEPS

[ITU-T Q.763 A4]   *Signalling System No. 7 – ISDN user part formats and codes - Amendment 4 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: ISUP new calling category parameter and IEPS parameter name

[ITU-T Q.764 A4]   *Signalling system No. 7 – ISDN user part signalling procedures - Amendment 4 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: Actions to be taken at international exchanges when support of IEPS is requested

[ITU-T Q.767 A1]   *Application of the ISDN User Part of CCITT signalling system No. 7 for international ISDN interconnections - Amendment 1 - Support for the International Emergency Preference Scheme*

Status: Published

Addresses: Interconnection of non-heterogeneous ISDNs which support IEPS

8.12.6   H.323

8.12.6.1 ITU-T

[ITU-T H.460.4] *Call priority designation and country/international network of call origination identification for H.323 priority calls*

Status: Published

Addresses: Call Marking
            Country/international network of call origin
            Definition of messages to be used
            Priority levels

8.12.7   SIP

8.12.7.1 ITU-T

For further study.

8.13   Quality of Service

8.13.1   ITU-T

[ITU-T H.361 A1] *End-to-end quality of service (QoS) and service priority signalling in H.323 systems - New Annex A "IntServ/RSVP support for H.323 systems", Annex B "DiffServ support for H.323 systems" and Annex C "Priority support for H.323 systems"*

Status: Published

Addresses: IntServ/RSVP QoS support for H.323 systems

8.14   Transport Capabilities

8.14.1   ITU-T

[ITU-T Y.1271] *Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks*

Status: Published

Addresses: General Network Requirements

9   List of SDOs and Other Organizations Involved with ETS

This clause provides an alphabetical list of Standard Development Organizations (SDOs) and other organizations involved in ETS activities. A table identifying ETS related work that is either published or under development is provided for the SDOs. Some of the documents identified in this clause are the same documents identified in clause 8. They are repeated in this clause to provide the reader with an organization based on SDOs.

9.1   3GPP

The original scope of the Third Generation Partnership Project (3GPP) was to produce Technical Specifications and Technical Reports for a 3G Mobile System based on evolved GSM core networks and the radio access technologies that they support (i.e., Universal Terrestrial Radio Access (UTRA) both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes). The scope of 3GPP was amended to include the maintenance and development of the Global System for Mobile communication (GSM) Technical Specifications and Technical Reports including evolved radio access technologies (e.g. General Packet Radio Service (GPRS) and Enhanced Data rates for GSM Evolution (EDGE)).

3GPP SA Working Group (WG) 1 has developed a Stage 1 Technical Specification for Multimedia Priority Service (MPS) that supports for voice, video, and priority data bearer service for MPS.

Based on the Stage 1 requirements, SA WG 2 is developing a Stage 2 Technical Report for enhancements for Multimedia Priority Service (3GPP TR 23.854) to identify changes to existing Stage 2 specifications (e.g., 3GPP TS 23.401, 3GPP TS 23.203, 3GPP TS 23.228, 3GPP TS 23.272), to support MPS, including IP Multimedia Subsystem (IMS) and Policy and Charging Control (PCC) aspects. This TR is intended to clarify the architectural requirements and call/session flows for MPS.

Based on the 3GPP Stage 2 requirements, 3GPP CT and RAN will specify changes to the existing Stage 3 specifications to support MPS.

Access technologies of interest are Universal Mobile Telecommunications System (UMTS) and Long Term Evolution (LTE).

3GPP has ETS related work activities in the context of radio access network (RAN) and IP Multimedia Subsystem (IMS) core network technologies.

Table 1 – Example 3GPP documents and work items related to ETS

Reference	Title	Notes	Status
[3GPP TS 22.153]	Multimedia Priority Service	Stage 1	Published
[3GPP TR 22.950]	Priority Service Feasibility Study		Published
[3GPP TR 22.952]	Priority Service Guide		Published
[3GPP D TR 23.854]	Enhancements for Multimedia Priority Service (Release 10)		Draft
[3GPP TS 23.401]	General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access	Stage 2; MPS; policy control; paging priority	
[3GPP TR 23.854]	Enhancements for Multimedia Priority Service	Stage 2	
[3GPP TS 23.203]	Policy and charging control architecture	Stage 2; Policy control	
[3GPP TS 23.228]	IP Multimedia Subsystem (IMS); Stage 2	Stage 2; Policy control	
[3GPP TS 29.212]	Policy and charging control over Gx reference point	Stage 3; Policy control	
[3GPP TS 29.213]	Policy and charging control signalling flows and Quality of Service (QoS) parameter mapping	Stage 3; Policy control	
[3GPP TS 29.214]	Policy and charging control over Rx reference point	Stage 3; Policy control	

[3GPP TS 24.301]	Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3	Stage 3; paging priority	
[3GPP TS 24.008]	Mobile radio interface Layer 3 specification; Core network protocols; Stage 3	Stage 3; paging priority	
[3GPP TS 29.118]	Mobility Management Entity (MME) – Visitor Location Register (VLR) SGs interface specification	Stage 3; paging priority	
[3GPP TS 29.274]	3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3	Stage 3; paging priority	
[3GPP TS 36.331]	Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification	Stage 3; paging priority	
[3GPP TS 36.413]	Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)	Stage 3; paging priority	
[3GPP TS 23.008]	Organization of subscriber data	Stage 3; MPS Subscription and IMS Priority treatment.	
[3GPP TS 24.229]	IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3	Stage 3; MPS Subscription and IMS Priority treatment	
[3GPP TS 29.228]	IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents	Stage 3; MPS Subscription and IMS Priority treatment	
[3GPP TS 29.229]	Cx and Dx interfaces based on the Diameter protocol; Protocol details	Stage 3; MPS Subscription and IMS Priority treatment	
[3GPP TS 29.230]	Diameter applications; 3GPP specific codes and identifiers	Stage 3; MPS	

		Subscription and IMS Priority treatment	
[3GPP TS 29.272]	Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol	Stage 3; MPS Subscription and IMS Priority treatment	
[3GPP TS 29.328]	IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents	Stage 3; MPS Subscription and IMS Priority treatment	
[3GPP TS 29.329]	Sh interface based on the Diameter protocol; Protocol details	Stage 3; MPS Subscription and IMS Priority treatment	

9.2   3GPP2

The Third Generation Partnership Project 2 (3GPP2) is a collaborative 3G telecommunications standards-setting project comprising North American and Asian interests developing global specifications for ANSI/TIA/EIA-41 "Cellular Radiotelecommunication Intersystem Operations network evolution to 3G, and global specifications for the Radio Transmission Technologies (RTTs) supported by ANSI/TIA/EIA-41.

3GPP2 was born out of the ITU's IMT-2000 initiative, covering high speed, broadband, and IP-based mobile systems featuring network-to-network interconnection, feature/service transparency, global roaming and seamless services independent of location. IMT-2000 is intended to bring high-quality mobile multimedia telecommunications to a worldwide mass market by achieving the goals of increasing the speed and ease of wireless communications, responding to the problems faced by the increased demand to pass data via telecommunications, and providing "anytime, anywhere" services.

3GPP2's specifications are developed within in the Project's four Technical Specification Groups (TSGs) comprised of representatives from the Project's Individual Member companies. The TSGs are:

- TSG-A (Access Network Interfaces),
- TSG-C (cdma2000 Air Interface),
- TSG-S (Services and Systems Aspects),
- TSG-X (Core Networks).

The TSG Access Network Interfaces (TSG-A) is responsible for the specification of interfaces between the radio access network and core network, as well as within the Access Network. TSG-A

is also responsible for interworking between 3GPP2 technologies and with other radio access technologies. While there are no MMPS specific work activities in the Committee, several capabilities such as updating of bearer priority levels were introduced and adopted in network interface standards, and these capabilities may be used for providing MMPS.

The TSG Radio Access (TSG-C) is responsible for the radio access part, including its internal structure, of systems based on 3GPP2 specifications. While there are no MMPS specific work activities in the Committee, several capabilities such as queuing were introduced and adopted in the air interface standards and these capabilities may be used for providing MMPS.

The Services and Systems Aspects TSG (TSG-S) is responsible for the development of service capability requirements for systems based on 3GPP2 specifications. It is also responsible for high level architectural issues, as required, to coordinate service development across the various TSGs. Multimedia Priority Service (MMPS) Stage 1 Requirements were developed in TSG-S and published as 3GPP2 S.R0117-0 v1.0.

The TSG Core Networks (TSG-X) is responsible for the specifications of the Core network part of systems, based on 3GPP2 specifications. Currently TSG-X does not have any active work items in support of MMPS.

Table 2 – Example 3GPP2 documents and work items related to ETS

Reference	Title	Notes	Status
[S.R0117-A v1.0]	Multimedia Priority Service (MMPS) for MMD-based Networks – Stage 1 Requirements		Published
[3GPP2 X.S0057]	E-UTRAN – eHRPD Connectivity and Interworking: Core Network Aspects	Support of MMPS included	Published
[3GPP2 X.S0058]	WiMAX-HRPD Interworking: Core Network Aspects	Support of MMPS included	Published
[3GPP2 D C.S0005]	Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems	Support of Access Overload Class 12 on the air interface for priority mobiles	Draft
[3GPP2 D C.S0099-0]	Guidelines for using cdma2000 1x Revision E Features on Earlier Revisions	To apply Access Overload Class 12 to previous revisions of C.S0005	Draft
[3GPP2 D C.S0024]	High Rate Packet Data Air Interface Specification	Mapping between 1x Access	Draft

		Overload Classes and HRPD aPersistence values	
[3GPP2 D C.S0063]	cdma2000 High Rate Packet Data Supplemental Services	Includes queuing on the EV-DO air interface for priority sessions	Published
[3GPP2 D C.S0024]	cdma2000 High Rate Packet Data Interface Specification	Includes queuing on the EV-DO air interface for priority sessions	Draft
[3GPP2 D A.S0022-0v2.0]	Interoperability Specification (IOS) for Evolved High Rate Packet Data (eHRPD) Radio Access Network Interfaces and Interworking with Enhanced Universal Terrestrial Radio Access Network (E-UTRAN)	Include new information elements for priority flows	Draft
[3GPP2 A.S0008-Cv3.0]	Interoperability Specification (IOS) for High Rate Packet Data (HRPD) Radio Access Network Interfaces with Session Control in the Access Network	Include new information elements for priority flows	Draft

9.3   ATIS Technical Committees

9.3.1   PTSC

PTSC develops and recommends standards and technical reports related to services, architectures, and signalling, in addition to related subjects under consideration in other North American and international standards bodies.

The PTSC works on applicable services, architectures, signaling and associated security related aspects of ETS including wireline access.

9.3.2   Performance, Reliability, and Quality of Service (PRQC)

The ATIS PRQC works on performance, reliability, Quality of Service (QoS) and associated security related aspects of ETS.

PRQC develops and recommends standards, requirements, and technical reports related to the performance, reliability, and associated security aspects of communications networks, as well as the processing of voice, audio, data, image, and video signals, and their multimedia integration.

The ATIS PRQC works on applicable performance, reliability, Quality of Service (QoS) and associated security related aspects of ETS.

9.3.3 WTSC

WTSC develops and recommends standards and technical reports related to wireless and/or mobile services and systems, including service descriptions and wireless technologies. WTSC develops and recommends positions on related subjects under consideration in other North American, regional and international standards bodies.

WTSC works on ETS related issues applicable to wireless and/or mobile services and systems and wireless technologies.

9.3.4 TMOC

The TMOC develops operations, administration, maintenance and provisioning standards, and other documentation related to Operations Support System (OSS) and Network Element (NE) functions and interfaces for communications networks – with an emphasis on standards development related to U.S.A. communication networks in coordination with the development of international standards.

TMOC works on ETS related issues applicable to operations, administration, maintenance and provisioning.

9.3.5 ATIS Documents

Table 3 – Example ATIS documents and work items related to ETS

Reference	Title	Notes	Status
[A-1000005]	ATIS-1000005 (2005), Service Description of ETS		Published
[A-1000010]	ATIS-1000010 (2006), Support of Emergency Telecommunications Service (ETS) in IP Networks		Published
[A-1000023]	ATIS-1000023 (2008), ETS Network Element Requirements		Published
[A-1000020]	ATIS-1000020 (2007), ETS Packet Priority for IP NNI Interfaces – Requirements for a Separate Expedited Forwarding Mechanism.		Published
[A-1000006]	Signaling System No.7 (SS7) – Emergency Telecommunications Service (ETS)		Published
[DA ETS PH2]	Draft Standard: Support of Emergency Telecommunication Services in IP Networks Phase 2		Draft
[DA ETS SR]	Draft TR: Service Requirements of ETS in NGN		Draft
[DA ETS WAR]	Draft Standard: ETS Wireline Access Requirements.		Draft
[DA ETS NER]	Draft Standards: ETS Phase 2 Network Element Requirements		Draft
[A-1000011]	ATIS-1000011 (2006), ETS Packet		Published

	Priority for IP NNI Interfaces – Use of Existing DiffServ Per Hop Behaviors		
[A-0300202]	ATIS-0300202 (2009), Guidelines for Network Management of the Public Switched Networks under Disaster Conditions		Published
[ATIS-1000023.a]	Supplement to the ETS Phase 1 Network Element Requirements (ATIS-1000023.2008)	Corrected an error in the Phase 1	Published
[ATIS-1000049]	End to End NGN GETS Call Flows	End-to-end call flows for ETS showing various access and core network scenarios	Published
[DA AddenT1.679]	Draft Addendum to T1.679 (SIP-ISUP Interworking)	In support of ETS, SIP RPH to ISUP priority information (i.e., CPC NS/EP and Precedence parameter) is specified	Draft
[ATIS-1000034]	Next Generation Network (NGN): Security Mechanisms and Procedures	Appendix II of this standard provides information on Emergency Telecommunications Service (ETS) Interconnection Security	Published
[ATIS-1000044]	ATIS Identity Management: Requirements and Use Cases Standard	Appendix III of this standard provides a set of ETS related use case examples on identity management	Published
[DA ETS AAF]	Draft ATIS ETS Authentication and Authorization Framework.	Framework and requirements for ETS authentication and authorization	Draft

9.6   Broadband Forum

The Broadband Forum (BBF) is the central organization responsible for developing broadband wireline solutions and empowering converged packet networks worldwide to better meet the needs of vendors, service providers and their customers.

The BBF develops multi-service broadband packet networking specifications addressing interoperability, architecture and management. This work enables home, business and converged broadband services, encompassing customer, access and backbone networks.

Currently the End-to-End Architecture Working Group is developing policy related specifications for policy-based decision making in wireline access domains [WT-134]. This group is also engaged in developing a policy-based wireless-wireline interworking specification jointly with the 3GPP [WT-203]. Policy rules apply to the application of Quality of Service (QoS), Security, and Charging rules. Several wireline and wireless-wireline interworking Use Cases have been developed to drive the requirements for these specifications. Emergency Telecommunications Service (ETS) is a critical Use Case that has been accepted for driving these requirements.

9.7   ETSI

For further study.

9.8   IEEE

For further study.

9.9   IETF

The IETF is an international organization that develops standards and specifications applicable to the Internet. They primarily deal with very specific issues and do not concern themselves with systems, service, or architectural aspects. Many ETS-related contributions have been submitted in the form of Internet-Drafts (IDs) and some of these have become RFCs. The following IETF Working Groups are involved in addressing ETS aspects as a secondary function of their major work.

9.9.1   SIPCore Working Group

The Session Initiation Protocol Core (SIPCore) working group is chartered to maintain and continue the development of the core SIP specifications. The SIPCore Working Group defined [RFC 4412] for RPH in support of ETS.

9.9.2   TSVWG Working Group

The Transport Services Working Group (TSVWG) takes on work that is involved in the transport area. The TSVWG Working Group defined [RFC 5865] for a Differentiated Services Code Point (DSCP) for Capacity-Admitted Traffic in support of ETS.

9.9.3   DIME Working Group

The Diameter Maintenance and Extensions WG focuses on maintenance and extensions to the Diameter protocol required to enable its use for authentication, authorization, accounting and provisioning in network access as well as for other applications environments (e.g., IP telephony, mobility). The DIME Working Group defined Diameter AVPs for the Diameter protocol.

9.9.4   IETF Documents

Table 4 – Example IETF documents and work items related to ETS

Reference	Title	Status
[RFC 4542]	Implementing an Emergency Telecommunications Service (ETS) for Real-Time Services in the Internet Protocol Suite	Published
[RFC 4412]	Communications Resource Priority for the Session Initiation Protocol (SIP)	Published

[RFC 5865]	A Differentiated Services Code Point (DSCP) for Capacity-Admitted Traffic	Published
[draft-ietf-dime-priority-avps]	draft-ietf-dime-priority-avps – Diameter Priority Attribute Value Pairs	Draft
[draft-ietf-avtcore-ecn-for-rtp]	draft-ietf-avtcore-ecn-for-rtp-01; Explicit Congestion Notification (ECN) for RTP over UDP	Draft
[draft-melnikov-smtp-priority]	Simple Mail Transfer Protocol extension for Message Priorities	Draft

9.10   ITU-T

The International Telecommunication Union Standardization Sector has a number of Study Groups (SGs) that deal with various aspects of standardization.

9.10.1   SG 2 – Operational aspects of service provision and telecommunications management

SG 2 is the lead study group for service definition, numbering and routing. It is also the lead study group on telecommunication for disaster relief/early warning and on telecommunication management.

Table 5 – SG2 Example documents and work items related to ETS

Reference	Title	Status
[ITU-T E.107]	Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS	Published
[ITU-T E.106]	International Emergency Preference Scheme (IEPS) for disaster relief operations	Published
[ITU-T D E.TDR]	Draft ITU-T Recommendation E.TDR, Service and Operational framework for the provision of Telecommunication for Disaster Relief (TDR).	Draft
[ITU-T E.412]	Network management controls	Published
[ITU-T D M.3350]	TMN service management requirements for information interchange the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)	Draft

9.10.2   SG 9 – Television and sound transmission and integrated broadband cable networks

SG 9 is the lead study group on integrated broadband cable and television networks.

Table 6 – Example SG9 documents and work items related to ETS

Reference	Title	Status
[ITU-T J.260]	Requirements for preferential telecommunications over IPCablecom networks	Published
[ITU-T J.170]	IPCablecom security specification	Published
[ITU-T J.261]	Framework for implementing preferential telecommunications in IPCablecom and IPCablecom2	Published

	Networks	
[ITU-T J.262]	Specifications for Authentication in Preferential Telecommunications over IPCablecom2 Networks	Published
[ITU-T J.263]	Specification for priority in preferential telecommunications over IPCablecom2 Networks	Published
[ITU-T J.163]	Dynamic quality of service for the provision of real-time services over cable television networks using cable modems	Published
[ITU-T J.366.2]	IPCablecom2 IP Multimedia session handling: IM call model: Stage 2 Specification	Published
[ITU-T J.366.3]	IPCablecom2 IP Multimedia Subsystem: Stage 2 Specification	Published
[ITU-T J.366.4]	IPCablecom2 IP Multimedia Session Initiation Protocol (SIP) and Session Description Protocol (SDP): Stage 3 Specification	Published
[ITU-T J.366.7]	IPCablecom2 Access Security for IP-Based Services	Published

9.10.3   SG 11 – Signalling requirements, protocols and test specifications

SG 11 is the lead study group on signalling and protocols. It is also the lead study group on intelligent networks and test specifications.

Table 7 – Example SG11 documents and work items related to ETS/IEPS

Reference	Title	Status
[ITU-T Q Sup 57]	Signalling requirements to support the emergency telecommunications service (ETS) in IP networks	Published
[ITU-T Q Sup 47]	Emergency services for IMT 2000 networks – Requirements for harmonization and convergence	Published
[ITU-T Q Sup 53]	Signalling requirements to support the International Emergency Preference Scheme (IEPS)	Published
[ITU-T Q Sup 57]	Signalling requirements to support the emergency telecommunications service (ETS) in IP networks	Published
[ITU-T Q.Sup 61]	Evaluation of 39ignaling protocols to support ITU-T Y.2171 admission control priority levels	Published
[ITU-T Q.1902.1 A2]	Interworking between Signalling System No. 7 ISDN user part and the Bearer Independent Call Control protocol – Amendment 2 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.1902.2 A3]	Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: General functions of messages and parameters – Amendment 3 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.1902.3 A3]	Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: Formats and	Published

	codes – Amendment 3 – Support for the International Emergency Preference Scheme	
[ITU-T Q.1902.4 A3]	Bearer Independent Call Control protocol (Capability Set 2): Basic call procedures – Amendment 3 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.2630.3 A1]	AAL type 2 signalling protocol – Capability Set 3 AAL type 2 signalling protocol – Capability Set 3 – Amendment 1 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.1950 A1]	Bearer independent call bearer control protocol – New Annex G – Call bearer control – International Emergency Preference Scheme	Published
[ITU-T Q.2761 A1]	Functional description of the B-ISDN user part (B-ISUP) of 40ignaling system No. 7 – Amendment 1 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.2762 A1]	General functions of messages and signals of the B-ISDN User Part (B-ISUP) of Signalling System No. 7 – Amendment 1- Support for the International Emergency Preference Scheme	Published
[ITU-T Q.2763 A1]	Signalling System No. 7 B-ISDN User Part (B-ISUP) – Formats and codes – Amendment 1 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.2764 A1]	Signalling System No. 7 B-ISDN User Part (B-ISUP) – Basic call procedures	Published
[ITU-T Q.2931]	Digital Subscriber Signalling System No. 2 – User-Network Interface (UNI) layer 3 specification for basic call/connection control	Published
[ITU-T Q.761 A3]	Signalling System No. 7 – ISDN User Part functional description – Amendment 3 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.762 A3]	Signalling System No. 7 – ISDN User Part general functions of messages and signals – Amendment 3 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.763 A4]	Signalling System No. 7̃ ISDN user part formats and codes – Amendment 4 – Support for the International Emergency Preference Scheme	Published
[ITU-T Q.764 A4]	Signalling system No. 7 – ISDN user part 40ignaling procedures – Amendment 4 – Support for the International	Published

	Emergency Preference Scheme	
[ITU-T Q.767 A1]	Application of the ISDN User Part of CCITT 41ignaling system No. 7 for international ISDN interconnections – Amendment 1 – Support for the International Emergency Preference Scheme	Published
[ITU-T TRQ.ets-protocol]	Draft New TRQ.ets-protocol – Signaling Protocol Mappings in Support of Emergency Telecommunications Service in IP Networks	Draft

9.10.4   SG 12 - Performance, QoS and QoE

SG 12 is the lead study on quality of service and quality of experience.

SG 12 has no direct activity to report in support of ETS.

9.10.5   SG13 – Future networks including mobile and NGN

SG 13 is the lead study for future networks and NGN. It is also the lead study group on mobility management and fixed-mobile convergence.

Table 8 – Example SG13 documents and work items related to ETS

Reference	Title	Status
[ITU-T Y.1271]	Framework(s) on Network Requirements and Capabilities to Support Emergency Telecommunications Over Evolving Circuit Switched and Packet Switched Networks	Published
[ITU-T Y.2006]	Description of capability set 1 of NGN release 1	Published
[ITU-T Y.2201]	NGN release 1 requirements	Published
[ITU-T Y.2205]	Next Generation Networks – Emergency Telecommunications – Technical considerations	Published
[ITU-T Y.2262]	PSTN/ISDN emulation and simulation	Published
[ITU-T Y.2271]	Call server based PSTN/ISDN emulation	Published
[ITU-T Y.2171]	Admission Control Priority Levels in Next Generation Networks	Published
[ITU-T Y.2172]	Service Restoration Priority Levels in Next Generation Networks	Published
[ITU-T Y.2111]	Resource and admission control functions in Next Generation Networks	Published
[ITU-T Y.2701]	Security requirements for NGN release 1	Published
[ITU-T Y.2702]	Authentication and authorization requirements for NGN release 1	Published
[ITU-T Y.2704]	Security mechanisms and procedures for NGN	Published
[ITU-T Y.2720]	NGN identity management framework	Published
[ITU-T Y.2721]	NGN identity management requirements and use cases	Published
[ITU-T Y.Sup 12]	Supplement on NGN identity management mechanisms	Published

| [ITU-T Y.2722] | Draft ITU-T Recommendation Y.2722, NGN Identity Management Mechanisms and Procedures | Published |
| [ITU-T D Y.ETS-Sec] | Y.ETS Security (ETS-Sec), Minimum Security Requirements for Interconnection of Emergency Telecommunications Service (ETS) | Draft |

9.10.6 SG15 – Optical transport networks and access network infrastructures

SG 15 is the lead study group on access network transport, optical technology, and optical transport networks.

SG 15 has no direct activity to report in support of ETS.

9.10.7 SG16 - Multimedia coding, systems and applications

SG 16 is the lead study group on multimedia coding, systems, and applications. It is also the lead study group on ubiquitous applications ("e-everything", such as e-health) and telecommunication/ICT accessibility for persons with disabilities.

Table 9 – Example SG16 documents and work items related to ETS

Reference	Title	Notes	Status
[ITU-T H.Sup 9]	ITU-T H.Series Supplement 9 (2008), Gateway control protocol: Operation of H.248 with H.225, SIP, and ISUP in support of emergency telecommunications service (ETS)/international emergency preference scheme (IEPS)		Published
[ITU-T H.246]	Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN and ISDN		Published
[ITU-T H.361 A1]	End-to-end quality of service (QoS) and service priority signalling in H.323 systems - Amendment 1 - New Annex A "IntServ/RSVP support for H.323 systems", Annex B "DiffServ support for H.323 systems" and Annex C "Priority support for H.323 systems"		Published
[ITU-T H.460.4]	Call priority designation and country/international network of call origination identification for H.323 priority calls		Published
[ITU-T H.248.1]	Gateway control protocol: Version 3		Published
[ITU-T H.361 A1]	End-to-end quality of service (QoS) and service priority signalling in H.323 systems - New Annex A "IntServ/RSVP support for H.323 systems", Annex B "DiffServ support for H.323 systems" and Annex C "Priority support for H.323 systems"		Published

[ITU-T HSTP-AMSR]	HSTP-AMSR Technical paper: AMS Requirements	Includes requirements for Priority Services (e.g., ETS) in AMS (Project "H.325")	Published
H.248.1v3 Amendment 2	H.248.1v3 Amendment 2 "Gateway Control Protocol: Version 3: New Appendix IV, plus corrections and clarifications"	Provides specifications supporting consistent use of "IEPS call indicator" and "Priority indicator" for ETS.	
[ITU-T H.248.81]	H.248.81"Gateway Control Protocol: Guidelines on the Use of the IEPS Call Indicator and Priority Indicator in H.248 Profiles"		Published
Draft H.248.ECN	Draft H.248.ECN "Gateway control protocol: Explicit Congestion Notification (ECN) Support"		Draft

9.10.8 SG17 – Security

SG 17 is the lead study group on telecommunication security, identity management (IdM) and languages and description techniques.

SG 17 has no direct activity to report in support of ETS.

9.10.9 Telecommunications Industry Association (TIA)

TIA is a leading association in the telecommunications and information technology industry. Three TIA technical standards groups, TR-8, TR-41, and TR-45, have issues related to ETS.

TR-8 develops and maintains standards for private radiocommunications systems and equipment for both voice and data applications. Within the telecommunications industry, TR-8 addresses all technical matters for systems and services including definitions, interoperability, compatibility, and compliance requirements used in systems such as emergency services.

TR-41 deals with standardizing network interfaces from a terminal equipment perspective. TR-41's current standards development centres on two types of interfaces: 1) interfaces to enterprise networks; and 2) interfaces to users.

TR-45 deals with the issues associated with wireless communications. The activity interfaces with international work on this subject in ITU-T on IMT-2000 and beyond and in 3GPP2.

Table 10 – ExampleTIA documents and work items related to ETS

Reference	Title		Status
[TIA-917]	Wireless Priority Service Enhancements for CDMA Systems		Published
[TIA TSB-16]	Assignment of Access Overload Classes in the Cellular Telecommunications Services	Support allocation of Access Overload Class 12 for priority mobiles	Published

9.10.10 TMForum

The TM Forum is the world's leading industry association focused on improving business effectiveness for service providers and their suppliers, including the production of Best Practices and Standards.

Table 11 – Example TMF documents and work items related to ETS

Reference	Title	Status
[GB 917]	Guide Book (GB) 917, SLA Management Handbook – Release 3.0	Published
[GB 934]	Guide Book GB 934, Best Practice: Application Note to the SLA Management Handbook – Voice over IP – Release 2.0	Published

9.10.11 WiMAX Forum

The WiMAX Forum is an industry-led, not-for-profit organization formed to specify WiMAX air interface system profiles and network specifications, certify and promote the compatibility and interoperability of broadband wireless products based upon the harmonized IEEE 802.16/ETSI HiperMAN standard.

Table 12 – Example WiMAX documents and work items related to ETS

Reference	Title	Notes	Status
[WFM Stage 1-r1]	Service Provider Working Group (SPWG) ETS Phase 1 Requirements for Release 1.6, Feb., 2009.		Published
[WFM Stage 1-r2]	WiMAX Forum - WMF-T31-122-R020v01 ETS Phase 2 Stage 1 Requirements, Release 2.0, Nov. 2009.	Extends the use cases and system requirements for IEEE 802.16m air interface	Published
[WFM Stage 2-a1]	WiMAX Forum – WFM-T32-001-R016v01: Network Architecture – Architecture Tenets, Reference Model and Reference Points, Base Specification, Release 1.6,ETS Stage 2 Specification	Includes ETS subscription types, their relationship with ETS invocation and network entry, high	Published

	(Section 7.14), November, 2010.	level priority indication flows, and high level priority treatment procedures in network entry, ETS service invocation, handover, and paging	
[WFM Stage 3-a1]	WiMAX Forum - WFM-T33-001-R016v01: Network Architecture – Detailed Protocols and Procedures, Base Specification, Release 1.6,ETS Stage 3 Specification (Section 4.19), November, 2010	Includes priority indication procedures for network entry, AAA-based ETS invocation/revocation, handover, paging, transporting IP packets; priority treatment mechanisms based on priority resource allocation, scheduling/routing, queuing R1 connection resource requests; as well as priority related R3/R4/R6 messages and parameters	Published
	ETS Phase 2 Stage 2 specification	PCC based priority ETS invocation/revocation, UE initiated priority, and priority handling based on the IEEE 802.16m air interface	Draft

Appendix A

Summaries of Referenced Standards

A.1   ITU-T References and associated summaries

A.1.1   Published Recommendations and Supplements

[ITU-T E.106]	ITU-T Recommendation E.106 (2003), *International Emergency Preference Scheme (IEPS) for disaster relief operations*

This Recommendation describes an international preference scheme for the use of public telecommunications by national authorities for emergency and disaster relief operations. The International Emergency Preference Scheme for Disaster Relief Operations (IEPS) is needed when there is a crisis situation causing an increased demand for telecommunications when use of the International Telephone Service may be restricted due to damage, reduced capacity, congestion or faults. In crisis situations there is a requirement for IEPS users of public telecommunications to have preferential treatment.

[ITU-T E.107]	ITU-T Recommendation E.107 (2007), *Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS*

There is a potential for bilateral/multilateral agreement between cooperating countries/administrations to link their respective Emergency Telecommunications Service (ETS) systems. This Recommendation provides guidance that will enable telecommunications between one ETS national implementation (ENI) and another ENI, in addition to providing a description of ETS.

[ITU-T E.412]	ITU-T Recommendation E.412 (2003), *Network management controls*

Network management controls provide the means to alter the flow of traffic in the network in support of the network management entities given in ITU-T Rec. E.410. Most network management controls are taken by or in the exchange (see ITU-T Rec. Q.542), but certain actions can be taken external to exchange. This Recommendation provides specific information on network management controls and gives guidance concerning their application. However, it should be noted that the suggested use for each network management control is given only for the purpose of illustration. Other controls, separately or in combination, may be more appropriate in any given situation.

[ITU-T H.246]	ITU-T Recommendation H.246 (2006), *Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN and ISDN*

This Recommendation describes Gateways which provide protocol interworking between H-Series multimedia terminals and other H-Series multimedia terminals, voice/voiceband terminals on GSTN or ISDN, V.70 terminals on the GSTN, and multi-call applications on the GSTN. H.246 Gateways provide the required translation of control and media

streams to allow interworking between terminals running different protocols.

[ITU-T H.248.1]	ITU-T Recommendation H.248.1 (2005), *Gateway control protocol: Version 3*

To achieve greater scalability, this Recommendation decomposes the H.323 Gateway function defined in ITU-T Rec. H.246 into functional subcomponents and specifies the protocols these components use to communicate. This allows implementations of H.323 gateways to be highly scalable and encourages leverage of widely deployed Switched Circuit Network (SCN) capabilities such as SS7 switches. This also enables H.323 gateways to be composed of components from multiple vendors distributed across multiple physical platforms. The purpose of this Recommendation is to add capabilities currently defined for H.323 systems and is intended to provide new ways of performing operations already supported in H.323.

This Recommendation includes several enhancements to ITU-T Rec. H.248.1 Version 2: ....

Note: This is abridged text.

[ITU-T H.248.81]	ITU-T Recommendation H.248.81"Gateway Control Protocol: Guidelines on the Use of the IEPS Call Indicator and Priority Indicator in H.248 Profiles"

In support of priority services (e.g., Emergency Telecommunications Service (ETS), Multimedia Priority Service (MPS)), this Recommendation provides guidelines on the use of the International Emergency Preference Scheme (IEPS) call indicator and Priority indicator in H.248 profiles for H.323 and NGN systems. These guidelines may be used by other Standards Developing Organization (SDOs) when defining their H.248.1 profiles in support of priority services (e.g. ETS).

[ITU-T H.361]	ITU-T Recommendation H.361 (2006), *End-to-end quality of service (QoS) and service priority signalling in H.323 systems*

This Recommendation defines the H.323 Quality of Service (QoS) and Service Priority signalling for exchanging, negotiating and controlling QoS and service priority parameters among the H.323 entities in a call. These calls may involve multiple network operator domains, multiple service domains, and heterogeneous transport mechanisms (e.g., mixed IP, ATM, and MPLS environments). In a single network operator domain or H.323 service domain, the QoS policies and mechanisms are usually homogenous and therefore the negotiation and establishment of QoS for a call is relatively simple. However, the same is relatively more complex when a call has to traverse multiple service or network domains each of which has its own set of policies and mechanisms. This Recommendation describes the QoS and priority signalling to enable a H.323-based call to acquire QoS irrespective of the number of domains it traverses.

[ITU-T H.361 A1]   ITU-T Recommendation H.361 Amendment 1 (2008), *End-to-end quality of service (QoS) and service priority signalling in H.323 systems - Amendment 1 - New Annex A "IntServ/RSVP support for H.323 systems", Annex B "DiffServ support for H.323 systems" and Annex C "Priority support for H.323 systems"*

Amendment 1 to Recommendation ITU-T H.361 introduces three new annexes.

Annex A describes the procedures of H.323 quality of service (QoS) signalling when RSVP-based QoS signalling is used in the transport plane. Resource reservation protocol (RSVP) is the QoS signalling protocol used in the integrated services (IntServ) architecture. RSVP is a path-based QoS mechanism which is used to reserve resources for both individual flows and flow aggregates. RSVP can be used in a pure IntServ architecture or can be coupled with differentiated services architecture (DiffServ) to provide IntServ operation over DiffServ network. Annex A describes the procedures for H.323 QoS to allow the use of RSVP in the transport plane.

Annex B describes the procedures of H.323 QoS signalling under the differentiated services (DiffServ) architecture in the transport plane. DiffServ is a class-based QoS architecture which supports in-band signalling. The signalling occurs via a value defined in the differentiated services (DS) field of the IP header. This value is referred to as the differentiated services code point (DSCP). The packet forwarding treatment given to a packet in a network device is based on the DSCP value.

Annex C describes the QoS service priority support signalling used for H.323 systems. The service priority mechanism defines procedures and constructs within the signalling plane that are used to prioritize bearer traffic during periods of resource contention. This allows traffic of higher priority to receive preferred QoS treatment.

[ITU-T H.460.4]   ITU-T Recommendation H.460.4 (2007), *Call priority designation and country/international network of call origination identification for H.323 priority calls*

There is a desire to provide higher than normal priority call services to support several different applications. These applications include calls by authorized emergency personnel during disaster relief efforts, emergency calls by the public, or calls governed by service level agreements which specify a higher than normal probability of call completion. In order to provide these priority call services, it is necessary to signal to network elements such as Gatekeepers, Border Elements and Gateways that a call requires priority handling. This Recommendation defines messages and procedures necessary to signal the desired priority and country/international network of call origination for an H.323 priority call.

[ITU-T H.Sup 9]	ITU-T H.Series Supplement 9 (2008), *Gateway control protocol: Operation of H.248 with H.225, SIP, and ISUP in support of emergency telecommunications service (ETS)/international emergency preference scheme (IEPS)*
	Supplement 9 to ITU-T H-series Recommendations defines the operation of ITU-T H.248.1, version 3, with ITU-T H.225, session initiation protocol (SIP) and integrated services digital network user part (ISUP) in support of emergency telecommunications service (ETS)/international emergency preference scheme (IEPS) priority information.
[ITU-T J.160]	ITU-T Recommendation J.160 (2002), *Architectural framework for the delivery of time-critical services over cable television networks using cable modems*
	This Recommendation provides the architectural framework that will enable cable television operators to provide time-critical services over their networks that have been enhanced to support cable modems.
[ITU-T J.163]	ITU-T Recommendation J.163 (2004), *Dynamic quality of service for the provision of real-time services over cable television networks using cable modems*
	Many cable television operators are upgrading their facilities to provide two-way capability and using this capability to provide high-speed IP data services per ITU-T Recs J.83 and J.112. These operators now want to expand the capability of this delivery platform to include telephony. This Recommendation is one of a series of Recommendations required to achieve this goal. It provides for the dynamic quality of service needed in many real-time applications.
	This Recommendation is revised …….
	Note: This is abridged text
[ITU-T J.170]	ITU-T Recommendation J.173 (2005), *IPCablecom security specification*
	This Recommendation defines the IPCablecom Security architecture, protocols, algorithms, associated functional requirements and any technological requirements that can provide for the security of the system for the IPCablecom network.
[ITU-T J.260]	ITU-T Recommendation J.260 (2005), *Requirements for preferential telecommunications over IPCablecom networks*
	This Recommendation defines requirements for preferential telecommunications over IPCablecom networks. The essential aspects of preferential telecommunications over IPCablecom that this Recommendation covers can be grouped into two areas: prioritization and authentication. These two areas include capabilities to support telecommunications in IPCablecom that may require preferential treatment (e.g., Telecommunications for Disaster Relief and Emergency Telecommunications Service).
	The implementation of priority and authentication is necessary for the support of preferential telecommunications in IPCablecom networks.

[ITU-T J.261]	ITU-T Recommendation J.261 (2009), *Framework for implementing preferential telecommunications in IPCablecom and IPCablecom2 Networks*
	This Recommendation provides a framework for implementing preferential capabilities in IPCablecom and IPCablecom2 networks.
	The approach of this Recommendation is to define a framework for capabilities that can be utilized to meet the requirements in [ITU-T J.260] and forms the basis for detailed IPCablecom and IPCablecom2 Recommendations in support of preferential telecommunications.
[ITU-T J.262]	ITU-T Recommendation J.262 (2009), *Specifications for Authentication in Preferential Telecommunications over IPCablecom2 Networks*
	This Recommendation is one of a series of Recommendations to enable support for preferential telecommunications services over IPCablecom networks. It defines the specifications for authentication in Preferential Telecommunications over IPCablecom2 networks. These specifications satisfy the requirements defined in [ITU-T J.260]. The essential aspects of Preferential Telecommunication over IPCablecom2 can be grouped into two areas: prioritization and authentication. This Recommendation defines specifications for authentication only. Authentication must be utilized to prevent unauthorized use of premium services and for emergency services in IPCablecom2 that may require preferential treatment (e.g. Telecommunications for Disaster Relief and Emergency Telecommunications Service).
	User authentication is necessary to determine whether to authorize a request for preferential telecommunications services. This Recommendation covers only authentication and does not address which services the authenticated user is authorized to use
[ITU-T J.263]	ITU-T Recommendation J.263 (2009), *Specification for priority in preferential telecommunications over IPCablecom2 Networks*
	This Recommendation is one of a series of Recommendations to enable support for preferential telecommunication services over IP Cablecom2 networks. It defines the specifications for priority for preferential telecommunications services over IPCablecom2 networks. These specifications satisfy the [ITU-T J.260] requirements. The essential aspects of preferential telecommunication over IPCablecom2 can be grouped into two areas: prioritization and authentication. This Recommendation provides specifications for priority only. Prioritization may be utilized for premium services and for emergency services in IPCablecom2 that may require preferential treatment (e.g. Telecommunications for Disaster Relief and Emergency Telecommunications Service).
	The implementation of priority and authentication is necessary for the support of preferential telecommunications services in IPCablecom networks. This Recommendation only covers technical aspects for achieving priority treatment in IPCablecom2 networks.

| [ITU-T Q.761] | ITU-T Recommendation Q.761 (1999), *Signalling System No. 7 - ISDN User Part functional description* |

The ISDN user part is the signalling system No. 7 protocol which provides the signalling functions required to support basic bearer services and supplementary services for voice and non-voice applications in an integrated services digital network.

The ISDN user part is also suited for application in dedicated telephone and circuit switched data networks and in analogue and mixed analogue/digital networks. In particular, the ISDN user part meets the requirements defined by the ITU-T for worldwide international semi-automatic and automatic telephone and circuit switched data traffic.

The ISDN user part is furthermore suitable for national applications. Most signalling procedures, information elements and message types specified for international use are also required in typical national applications. Moreover, coding space has been reserved in order to allow national Administrations and recognized operating agencies to introduce network specific signalling messages and elements of information within the internationally standardized protocol structure.

| [ITU-T Q.761 A3] | ITU-T Recommendation Q.761 Amendment 3 (2006), *Signalling System No. 7 - ISDN User Part functional description – Amendment 3 - Support for the International Emergency Preference Scheme* |

This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.761 (1999) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to ITU-T Rec. Q.762, Amendment 4 to ITU-T Rec. Q.763, and Amendment 4 to ITU-T Rec. Q.764. This amendment incorporates Amendment 2 to ITU-T Rec. Q.761 and provides enhancements.

| [ITU-T Q.762] | ITU-T Recommendation Q.762 (1999), *Signalling System No. 7 - ISDN User Part general functions of messages and signals* |

This ITU-T Recommendation describes the messages, parameters and the signalling information contained within parameters used by the ISDN user part protocol, and their function.

| [ITU-T Q.762 A3] | ITU-T Recommendation Q.762 Amendment 3 (2006), *Signalling System No. 7 - ISDN User Part general functions of messages and signals – Amendment 3 - Support for the International Emergency Preference Scheme* |

This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.762 (1999) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to ITU-T Rec. Q.761, Amendment 4 to ITU-T Rec. Q.763,

and Amendment 4 to ITU-T Rec. Q.764. This amendment incorporates Amendment 1 to ITU-T Rec. Q.762 and provides enhancements.

[ITU-T Q.763]   ITU-T Recommendation Q.763 (1999), *Signalling System No. 7 – ISDN user part formats and codes*

This Recommendation specifies the formats and codes of the ISDN user part messages and parameters required to support basic bearer services and supplementary services.

[ITU-T Q.763 A4]   ITU-T Recommendation Q.763 Amendment 4 (1999), *Signalling System No. 7 – ISDN user part formats and codes – Amendment 4 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. This amendment contains the modifications to ITU-T Rec. Q.763 (1999) in order to accommodate these needs. It should be read in conjunction with Amendment 3 to ITU-T Rec. Q.761, Amendment 3 to ITU-T Rec. Q.762, and Amendment 4 to ITU-T Rec. Q.764. This amendment incorporates Amendment 2 to ITU-T Rec. Q.763 and provides enhancements.

[ITU-T Q.764]   ITU-T Recommendation Q.763 (1999), *Signalling system No. 7 – ISDN user part signalling procedures*

This Recommendation describes the ISDN User Part signalling procedures of the set-up and clear down of national and international ISDN connections used for "ISUP 2000". Actions common for all types of exchanges are described only once. Different or additional actions required in an exchange are specified in a separate subclause applicable to that type of exchange. The procedures specified in clause 2 relate to basic call (i.e. calls not involving supplementary services and IN).

[ITU-T Q.764 A4]   ITU-T Recommendation Q.764 Amendment 4 (2006), *Signalling system No. 7 – ISDN user part signalling procedures – Amendment 4 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.764 (1999) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to ITU-T Rec. Q.761, Amendment 3 to ITU-T Rec. Q.762, and Amendment 4 to ITU-T Rec. Q.763. This amendment incorporates Amendment 2 to ITU-T Rec. Q.764 and provides enhancements.

[ITU-T Q.767]   ITU-T Recommendation Q.767 (1991), *Application of the ISDN User Part of CCITT signalling system No. 7 for international ISDN interconnections*

ISDN international interconnections have to be realized between non homogeneous ISDNs that differ in terms of services supported, national network signalling system and national access protocol.

In order to perform such international ISDN interconnections, it is required to specify unambiguously and without options:

- the service capabilities of the international signalling system;

- the international signalling interface, i.e., the signalling information elements and messages sent and received on the international signalling section and the related procedures;

- all additional information, which is not specifically signalling system related, but which is needed to absorb the potential differences between the national networks.

Section 2 ....

Note: This is abridged text.

[ITU-T Q.767 A1]	ITU-T Recommendation Q.767 Amendment 1 (2002), *Application of the ISDN User Part of CCITT signalling system No. 7 for international ISDN interconnections - Amendment 1 - Support for the International Emergency Preference Scheme*
	This amendment was produced to meet the urgent need for the implementation of the International Emergency Preference Scheme (IEPS) as specified in ITU-T Rec. E.106. This amendment contains the modifications to ITU-T Rec. Q.767 (1991) in order to accommodate these needs.
[ITU-T Q.1902.1]	ITU-T Recommendation Q.1902.1 (2001), *Interworking between Signalling System No. 7 ISDN user part and the Bearer Independent Call Control protocol*
	This Recommendation provides a functional description of the Bearer Independent Call Control (BICC) protocol for the support of narrowband ISDN services independent of the bearer technology and signalling message transport technology used.
[ITU-T Q.1902.1 A2]	ITU-T Recommendation Q.1902.1 Amendment 2 (2006*), Interworking between Signalling System No. 7 ISDN user part and the Bearer Independent Call Control protocol – Amendment 2 - Support for the International Emergency Preference Scheme*
	This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.1902.1 (2001) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to ITU-T Rec. Q.1902.2, Amendment 3 to ITU-T Rec. Q.1902.3, and Amendment 3 to ITU-T Rec. Q.1902.4. This amendment incorporates Amendment 1 to ITU-T Rec. Q.1902.1 and provides enhancements.
[ITU-T Q.1902.2]	ITU-T Recommendation Q.1902.2 (2001), *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: General functions of messages and parameters*

This Recommendation describes the messages, parameters and the signalling information contained within parameters used by the Bearer Independent Call Control (BICC) protocol and the ISDN user part, and their functions.

[ITU-T Q.1902.2 A3]   ITU-T Recommendation Q.1902.2 Amendment 3 (2006), *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: General functions of messages and parameters – Amendment 3 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.1902.2 (2001) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 2 to ITU-T Rec. Q.1902.1, Amendment 3 to ITU-T Rec. Q.1902.3, and Amendment 3 to ITU-T Rec. Q.1902.4. This amendment incorporates Amendment 1 to ITU-T Rec. Q.1902.2 and provides enhancements.

[ITU-T Q.1902.3]   ITU-T Recommendation Q.1902.3 (2001), *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: Formats and codes*

This Recommendation specifies the formats and codes of the Bearer Independent Call Control (BICC) protocol for the support of narrow-band ISDN services independent of the bearer technology and signalling message transport technology used. It also specifies ISDN user part messages and parameters required to support basic bearer services and supplementary services according to ITU-T Q.761. Where a message, a parameter, a parameter field or a parameter field value is not supported by one of the two protocols or they interpret a code point differently, it is indicated in this Recommendation

[ITU-T Q.1902.3 A3]   ITU-T Recommendation Q.1902.3 Amendment 3 (2006), *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No.7 ISDN User Part: Formats and codes – Amendment 3 - Support for the International Emergency Preference Scheme*

This Amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.1902.3 (2001) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 2 to ITU-T Rec. Q.1902.1, Amendment 3 to ITU-T Rec. Q.1902.2, and Amendment 3 to ITU-T Rec. Q.1902.4. This amendment incorporates Amendment 1 to ITU-T Rec. Q.1902.3 and provides enhancements.

[ITU-T Q.1902.4]   ITU-T Recommendation Q.1902.4 (2001), *Bearer Independent Call Control protocol (Capability Set 2): Basic call procedures*

This Recommendation describes the Bearer Independent Call Control (BICC) basic call procedures for the support of narrow-band ISDN services independent of the bearer technology and signalling message transport technology used (Capability Set 2).

[ITU-T Q.1902.4 A3] ITU-T Recommendation Q.1902.4 Amendment 3 (2006), *Bearer Independent Call Control protocol (Capability Set 2): Basic call procedures – Amendment 3 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) for disaster recovery operations as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.1902.4 (2001) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 2 to ITU-T Rec. Q.1902.1, Amendment 3 to ITU-T Rec. Q.1902.2, and Amendment 3 to ITU-T Rec. Q.1902.3. This amendment incorporates Amendment 1 to ITU-T Rec. Q.1902.4 and provides enhancements

[ITU-T Q.1950] ITU-T Recommendation Q.1950 (2002), *Bearer independent call bearer control protocol*

This Recommendation provides the procedures, commands, parameters, messages and signalling information of the Bearer Independent Call Bearer Control (CBC) protocol for the support of narrow-band ISDN services independent of the bearer technology and signalling message transport technology used.

[ITU-T Q.1950 A1] ITU-T Recommendation Q.1950 Amendment 1 (2006), *Bearer independent call bearer control protocol - New Annex G – Call bearer control – International Emergency Preference Scheme*
This amendment contains the procedures, formats and codes with regard to the Call Bearer Control function to support the International Emergency Preference Scheme (IEPS), which is specified in ITU-T Rec. E.106, in Bearer Independent Call Control (BICC) based networks.

[ITU-T Q.2630.3] ITU-T Recommendation Q.2630.3 (2003), *AAL type 2 signalling protocol - Capability Set 3*

This Recommendation specifies the inter-node protocol and nodal functions that control AAL type 2 point-to-point connections.

The AAL type 2 signalling protocol specified in this Recommendation is usable in switched and non-switched environments and can operate in public or private networks over a range of signalling transport protocol stacks.

It also provides maintenance capabilities, carriage of user-plane protocol stack information and carriage of an identifier to link the connection control protocol with other higher layer control protocols.

[ITU-T Q.2630.3 A1] ITU-T Recommendation Q.2630.3 (2006) Amendment 1, *AAL type 2 signalling protocol - Capability Set 3- Amendment 1 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.2630.3 (2003) in order to accommodate these needs. This amendment is designed to be compatible with implementations conforming to ITU-T Rec. Q.2630.3 (2003).

[ITU-T Q.2761]   ITU-T Recommendation Q.2761 (1999), *Functional description of the B-ISDN user part (B-ISUP) of signalling system No. 7*

This Recommendation is one of a set of Recommendations that describe the Broadband ISDN User Part. It specifies an overview of the signalling capabilities and functions required to support basic call and bearer services, additional features and supplementary services for B-ISDN applications.

The scope of the B-ISDN User Part covers international B-ISDN networks. However, the B-ISDN User Part is suitable for national applications. Most signalling procedures, information elements and message types specified for international use are also required in typical national applications.

[ITU-T Q.2761 A1]   ITU-T Recommendation Q.2761 Amendment 1(2002), *Functional description of the B-ISDN user part (B-ISUP) of signalling system No. 7 – Amendment - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the urgent need for the implementation of the International Emergency Preference Scheme (IEPS) as specified in ITU-T Rec. E.106. This amendment contains the modifications to ITU-T Rec. Q.2761 (12/99) in order to accommodate these needs. This amendment should be read in connection with the related amendments to ITU-T Recs Q.2762, Q.2763, and Q.2764.

[ITU-T Q.2762]   ITU-T Recommendation Q.2762 (1999), *General functions of messages and signals of the B-ISDN User Part (B-ISUP) of Signalling System No. 7*

This Recommendation is one of a set of Recommendations that describe the Broadband ISDN User Part. It describes the elements of signalling information and their function used by the B-ISDN User Part protocol to support basic bearer services and supplementary services for Capability Set 1 B-ISDN applications.

[ITU-T Q.2762 A1]   ITU-T Recommendation Q.2762 Amendment 1(2002), *General functions of messages and signals of the B-ISDN User Part (B-ISUP) of Signalling System No. 7 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the urgent need for the implementation of the International Emergency Preference Scheme (IEPS) as specified in ITU-T Rec. E.106. This amendment contains the modifications to ITU-T Rec. Q.2762 (12/99) in order to accommodate

these needs. This amendment should be read in connection with the related amendments to ITU-T Recs Q.2761, Q.2763, and Q.2764.

[ITU-T Q.2763] ITU-T Recommendation Q.2763 (1999), *Signalling System No. 7 B-ISDN User Part (B-ISUP) - Formats and codes*

This ITU-T Recommendation is one of a set of ITU-T Recommendations that describe the Broadband ISDN User Part. It specifies the formats and codes of the B-ISDN User Part messages and parameters required to support basic bearer services and supplementary services.

The scope of the B-ISDN User Part covers international B-ISDN networks. However, the B-ISDN User Part is suitable for national applications. Most messages and parameters specified for international use are also required in typical national applications.

[ITU-T Q.2763 A1] ITU-T Recommendation Q.2763 Amendment 1(2002), *Signalling System No. 7 B-ISDN User Part (B-ISUP) - Formats and codes – Amendment 1 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the urgent need for the implementation of the International Emergency Preference Scheme (IEPS) as specified in ITU-T Rec. E.106. This amendment contains the modifications to ITU-T Rec. Q.2763 (12/99) in order to accommodate these needs. This amendment should be read in connection with the related amendments to ITU-T Recs Q.2761, Q.2762, and Q.2764.

[ITU-T Q.2764] ITU-T Recommendation Q.2764 (1999), *Signalling System No. 7 B-ISDN User Part (B-ISUP) - Basic call procedures*

This ITU-T Recommendation is one of a set of Recommendations that describe the Broadband ISDN User Part for Broadband Signalling Capability Set 1 and beyond.

This ITU-T Recommendation describes the procedures relating to:

- Basic call setup and clear down;

- Maintenance facilities.

[ITU-T Q.2764 A1] ITU-T Recommendation Q.2764 Amendment 1(2002), *Signalling System No. 7 B-ISDN User Part (B-ISUP) - Basic call procedures – Amendment 1 - Support for the International Emergency Preference Scheme*

This amendment was produced to meet the urgent need for the implementation of the International Emergency Preference Scheme (IEPS) as specified in ITU-T Rec. E.106. This amendment contains the modifications to ITU-T Rec. Q.2764 (12/99) in order to accommodate these needs. This amendment should be read in connection with the related amendments to ITU-T Recs Q.2761, Q.2762, and Q.2763.

[ITU-T Q.2931] ITU-T Recommendation Q.2931 (1995), *Digital Subscriber Signalling System No. 2 - User-Network Interface (UNI) layer 3 specification for basic call/connection control*

This Recommendation specifies the procedures for the establishing, maintaining and clearing of network connections at the B-ISDN user

network interface. The procedures are defined in terms of messages exchanged.

This Recommendation is intended to specify the essential features, procedures and messages required for call/connection control. However, there are some details of procedure which have not yet been specified, and which will be subject to further study.

[ITU-T Q.2931 A5]   ITU-T Recommendation Q.2931 Amendment 5 (2006), *Digital Subscriber Signalling System No. 2 - User-Network Interface (UNI) layer 3 specification for basic call/connection control – Amendment 5 - Support for the International Emergency Preference Scheme*

ITU-T Rec. Q.2931 provides basic call and connection control for point-to-point connections in a B-ISDN. This amendment was produced to meet the need for the implementation of the International Emergency Preference Scheme (IEPS) as specified in ITU-T Rec. E.106. It contains the modifications to ITU-T Rec. Q.2931 (1995) in order to accommodate these needs. This amendment is designed to be compatible with implementations conforming to ITU-T Rec. Q.2931 (1995) and its Amendments 1, 2, 3 and 4.

[ITU-T Q Sup 47]   ITU-T Q.series Supplement 47 (2003), *Emergency services for IMT-2000 networks – Requirements for harmonization and convergence*

This Supplement is an "information" document and is intended to outline the requirements and provisions for Emergency Services for IMT-2000 systems. This is a compilation from sources outside the ITU (e.g., administrations, Standards Development Organizations, and the Third Generation Partnership Projects (3GPP and 3GPP2)). The scope includes any relevant discussion concerning the provisioning of Emergency Services specifically addressing the IMT-2000 systems during Harmonization and Convergence periods.

[ITU-T Q Sup 53]   ITU-T Q.Series Supplement 53 (2005), *Signalling requirements to support the International Emergency Preference Scheme (IEPS)*

This Supplement is an information document intended to identify the signalling requirements required to support the International Emergency Preference Scheme (IEPS). IEPS is described in ITU-T Rec. E.106 and allows authorized users to have access to the International Telephone Service while the service is restricted due to damage, congestion, and/or other faults. IEPS capabilities provide authorized users with preferential call and connection handling.

[ITU-T Q Sup 57]   ITU-T Q.Series Supplement 57 (2008), *Signalling requirements to support the emergency telecommunications service (ETS) in IP networks*

This supplement identifies the signalling requirements to support preferential capabilities within IP networks for the emergency telecommunications service (ETS).

[ITU-T Y.1271]   ITU-T Recommendation Y.1271 (2004), *Framework(s) on Network Requirements and Capabilities to Support Emergency*

Telecommunications Over Evolving Circuit Switched and Packet Switched Networks

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.

[ITU-T Y.2006]   ITU-T Recommendation Y.2006 (2008), *Description of capability set 1 of NGN release 1*

Recommendation ITU-T Y.2006 provides brief descriptions of capability set 1 of NGN release 1 in terms of the overall requirements and a high-level overview of the functional features to be addressed. The descriptions are from the aspects of environment, capabilities, architecture, and technical specifications.

[ITU-T Y.2012]   ITU-T Recommendation Y.2012 (2010), *Functional requirements and architecture of next generation networks*

The objective of Recommendation ITU-T Y.2012 is to describe the functional requirements and architecture of the next generation network (NGN), taking into account the requirements and capabilities for ITU-T NGN as described in Recommendation ITU-T Y.2201. The functional architecture provided in this Recommendation allows a clear distinction between the definition and specification aspects of services provided by the NGN, and the actual specification of the network technologies used to support those services. In line with Recommendation ITU-T Y.2011 principles, an implementation-independent approach is adopted.

[ITU-T Y.2111]   ITU-T Recommendation Y.2111 (2008), *Resource and admission control functions in Next Generation Networks*

Recommendation ITU-T Y.2111 specifies the functional architecture and requirements for the resource and admission control functions in next generation networks, which may involve a variety of access and core transport technologies and multiple domains. The RACF provides real-time application-driven and policy-based transport resource management in support of end-to-end quality of service (QoS), gate control, network address translation, and traversal of remote network address translators. The RACF is not service-specific. Services can make use of RACF whether the IP multimedia subsystem is involved or not.

In particular, this edition includes extensions to Recommendation ITU-T Y.2111 (2006) to address issues related to multicast in support of IPTV services, nomadicity, and interactions between CPE/CPN and RACF.

[ITU-T Y.2171]   ITU-T Recommendation Y.2171 (2006), *Admission Control Priority Levels in Next Generation Networks*

This Recommendation proposes three levels for admission control priority for services seeking entry into Next Generation Networks. The admission control priority indicator is intended as a guidance in the

development of appropriate signalling protocol extensions, and in the development of the necessary priority enabling mechanisms.

[ITU-T Y.2172]   ITU-T Recommendation Y.2172 (2007), *Service Restoration Priority Levels in Next Generation Networks*

ITU-T Recommendation Y.2172 proposes three levels of restoration priority for services in Next Generation Networks. This indicator is intended as a guidance for the development of appropriate signalling protocol extensions and the restoration/re-route mechanisms.

[ITU-T Y.2201]   ITU-T Recommendation Y.2201 (2009), *NGN release 1 requirements*

This ITU-T Recommendation provides high level requirements for services and capabilities of a Next Generation Network (NGN)

[ITU-T Y.2205]   ITU-T Recommendation Y.2205 (2011), *Next Generation Networks - Emergency Telecommunications – Technical considerations*

ITUT Recommendation Y.2205 specifies technical considerations that may be applied within the next generation network (NGN) to enable emergency telecommunications (ET). In addition, this Recommendation also outlines the underlying technical principles involved in supporting emergency telecommunications.

[ITU-T Y.2262]   ITU-T Recommendation Y.2262 (2006), *PSTN/ISDN emulation and simulation*

This ITU-T Recommendation describes principle aspects of evolving PSTN/ISDN to NGN. It discusses emulation and simulation of PSTN/ISDN. Emulation provides PSTN/ISDN service capabilities and interfaces using adaptation to an IP infrastructure while simulation provides PSTN/ISDN-like service capabilities using session control over IP interfaces and infrastructure

[ITU-T Y.2271]   ITU-T Recommendation Y.2271 (2006), *Call server based PSTN/ISDN emulation*

The NGN shall support PSTN/ISDN emulation. One mechanism for providing this functionality is the use of a Call Server-based architecture. This Recommendation identifies service and network capabilities for this call server-based solution.

[ITU-T Y.2701]   ITU-T Recommendation Y.2701 (2007), *Security requirements for NGN release 1*

This Recommendation provides security requirements for next generation networks (NGNs) against security threats. It is achieved by applying the principles of [ITU-T X.805], Security architecture for systems providing end-to-end communications to [ITU-T Y.2201], NGN release 1 requirements and [ITU-T Y.2012], Functional requirements and architecture of the NGN release 1.

[ITU-T Y.2702]   ITU-T Recommendation Y.2702 (2008), *Authentication and authorization requirements for NGN release 1*

	Recommendation ITU-T Y.2702 specifies authentication and authorization requirements for next generation networks (NGNs).
[ITU-T Y.2704]	ITU-T Recommendation Y.2704 (01/2010), *Security mechanisms and procedures for NGN*
	Recommendation ITU-T Y.2704 highlights some important security mechanisms that can be used to realize the requirements in [ITU-T Y.2701].
[ITU-T Y.2720]	ITU-T Recommendation Y.2720 (2009), *NGN identity management framework*
	Recommendation ITU-T Y.2720 provides a framework for identity management (IdM) in next generation networks (NGN). The primary purpose of this framework is to describe a structured approach for designing, defining, and implementing IdM solutions and for facilitating interoperability in a heterogeneous environment.
[ITU-T Y.2721]	ITU-T Recommendation Y.2721, NGN identity management requirements and use cases
	Recommendation ITU-T Y.2721 provides Identity Management (IdM) objectives, requirements, guidelines and example use cases for the Next Generation Network (NGN) and its interfaces.
[ITU-T Sup 12]	ITU-T Y.2720 Supplement 12: *NGN Identity Management Mechanisms*
	This Supplement to ITU-T Recommendation Y.2720, NGN Identity Management Framework [ITUT Y.2720] provides description of some example mechanisms that can be used to meet certain Identity Management (IdM) requirements and deployment needs of NGN.
[ITU-T Y.Sup2]	ITU-T Y.2012 Supplement 2 (2006), S*ession/border control (S/BC) functions*
	This Supplement provides the functions and implementation realization associated with the session/border control (S/BC).
[ITU-T Q.Sup61]	ITU-T Q.Series Supplement 61 (2010), *Evaluation of signalling protocols to support ITU-T Y.2171 admission control priority levels*
	This Supplement provides guidance on how existing signaling protocol extensions can be used to designate the admission control priority classifications for incoming calls/sessions into next generation networks. Specifically, this supplement defines the relationship between the designated values of these protocol extensions and the admission control priority levels/categories defined in Recommendation ITU-T Y.2171.

A.1.2   Draft Recommendations and Supplements

[ITU-T DRM.3350]	Draft Revised M.3350, *TMN service management requirements for information interchange the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)*
	This Recommendation provides the basic functional requirements, framework, and use-cases for interchange of service management

information across the TMN X-interface between a service customer and service provider, both officially authorized, associated with provision of Emergency Telecommunication Service (ETS). This capability is called the Emergency Telecommunication Service (ETS) Management Service (ETSMS).

[ITU-T D E.TDR]   Draft ITU-T Recommendation E.TDR, *Service and Operational framework for the provision of Telecommunication for Disaster Relief (TDR)*.

When there is a major disaster it is quite likely that telecommunication within the disaster area and to and from the rest of the national network are disrupted if not destroyed. International calls to the disaster country and disaster site increase at an abnormal rate. The fact that calls to the disaster site cannot be terminated increases congestion with repeat call attempts that cannot be completed. International routes to the disaster country can therefore become overloaded. This congestion could be relieved by the restoration of local communications with and within the disaster site. The congestion of the international routes to the disaster country could be alleviated by the provision of a new direct international route to the disaster area bypassing the 'normal' international links.

Whilst access to and from countries participating in the disaster recovery work is a requirement, this does not necessarily impact *the* national communications of those countries. The main concern with telecommunications is speed of response and delivery. In the immediate aftermath of a disaster communications of any quality is preferable to no communications. The initial requirement is for telephone service connectivity. However, as disaster relief operations progress the need for additional communications services becomes greater. (E.g. data, email etc)

Initially there is little or no concern about communications security.

[ITU-T D H.325]   Draft ITU-T Recommendation H325 Advanced Multimedia System (AMS) Requirements.

A.2   3GPP References and associated summaries

A.2.1 Published 3GPP References

[3GPP TS 22.153]   Multimedia Priority Service

This document specifies the service requirements for Multimedia Priority Service (MPS). The scope of this document is to specify those requirements of MPS necessary to provide an end-to-end service and to interwork with external networks where needed. Service interactions with external networks are considered within the scope of this document although these interactions may be specified in other standards.

[3GPP TR 22.950]   Priority Service Feasibility Study

This document presents the results of the Feasibility Study on Priority Service. The intent of this Feasibility Study is to assess the ability of

3GPP specifications to meet high-level requirements identified for Priority Service.

[3GPP TR 22.952]   Priority Service Guide

This document addresses the Service Aspects (Service Description), Network Aspects (Call Flows), and Management Aspects (Operations, Administration, Maintenance, and Provisioning) of Priority Service, based on existing 3GPP specifications.

A.2.2 Draft 3GPP References

[3GPP D TR 23.854]   Enhancements for Multimedia Priority Service

The enhancements for MPS evaluated in this document are priority aspects of EPS packet bearer services and priority related interworking between IMS and EPS packet bearer services. These enhancements enable the network to support end-to-end priority treatment for MPS call/session origination/termination, including the Non Access Stratum (NAS) and Access Stratum (AS) signaling establishment procedures at originating/terminating network side as well as resource allocation in the core and radio networks for bearers. Priority treatment will be applicable to IMS based multimedia services, priority EPS bearer services and CS Fallback.

This document clarifies the architectural requirements for MPS, considers the priority service scenarios, and evaluates solution alternatives. Solutions will be proposed and evaluated based on the following three service categories: IMS based multimedia service (voice, video etc), priority EPS bearer services (PS data without IMS interaction) and CS Fallback. Common issues for multiple service categories should be resolved by single solution to limit the amount of overall functionality and to avoid complexity.

A.3   3GPP2 References and associated summaries

A.3.1 Published 3GPP2 References

[S.R0117-0 v1.0]   Multimedia Priority Service (MMPS) for MMD-based Networks - Stage 1 Requirements

The document contains the Stage 1 requirements that define the MMPS service. This document serves as the basis for any Stage 2 and Stage 3 work related to MMPS in 3GPP2.

A.4   ATIS References and associated summaries

A.4.1 ATIS Published References

[A-TR 84]   ATIS Technical Report T1.TR.84 (2004), *IP Network Priorities and ETS*

This Technical Report identifies the need for establishing a set of priorities for traffic over IP networks. It proposes that communincations services over IP networks be prioritized such that critical services have a higher probability of successful session set up and completion than other types of services. This report also identifies the need for signaling traffic priorities across IP networks and networks of different technologies -

e.g., an originating ETS call over a Wireless circuit-switched access network transported over an IP backbone, with termination over a circuit-switched Wireless egress network. Traffic priority levels over the multiple technologies require mapping agreement, and appropriate signaling protocols will need to be developed such that these levels are recognized.

[A-0100001]   ATIS Technical Report 0100001 (2004), *User Plane Security Guidelines and Requirements for ETS*

This document provides a set of user plane security guidelines and requirements for Emergency Telecommunications Services (ETS) over IP networks. The scope is intended to address security as it relates to user plane performance, reliability, and availability of ETS. ETS does not include E-911.

[A-0100003]   ATIS Technical Report 0100003 (2004), *User Plane Priority Levels for IP Networks and Services*

This Technical Report was developed as a formal response to a request from the ATIS sub-committee PTSC-SAC for guidance on user plane priority levels in IP networks. This TR proposes three levels of connection admission control priority for the user plane communications traffic in IP networks. It also proposes that all emergency communications (e.g., ETS and E911) be given the highest priority for call/session setup.

[A-0100004]   ATIS Technical Report 0100004 (2006), *Availability and Restorability Aspects of Emergency Telecommunications Service (ETS)*

This Technical Report addresses aspects of the functional requirements of Availability and Restorability for ETS.

[A-1000005]   ATIS-1000005 (2005), *Service Description of ETS*

This Technical Report contains a service description of the Emergency Telecommunications Service (ETS). It includes an overview of ETS, descriptions of ETS from the end user perspective and in various types of networks. Information flows are included describing the access, intranetwork signaling, and internetwork signaling. A high-level description of security aspects of ETS is also included.

[A-0100006]   ATIS Technical Report (2006), *Service Restoration Priority Levels for IP Networks*

This Technical Report proposes three levels of service restoration priority for traffic in IP networks. It also proposes that all emergency communications (e.g. ETS and E911) be included in the highest priority for service restoration. This report also provides guidance on restoration compliance with the Telecommunications Priority System as mandated by the Federal Communications Commission. The goal is to formalize restoration priority levels in IP networks such that appropriate signaling requirements can commence.

[A-1000006]   ATIS-1000006 (2005), *Signaling System No.7 (SS7) – Emergency Telecommunications Service (ETS)*

This document builds upon the High Probability of Completion (HPC) Network Capability as described in T1.631-1993 (R1999). The ETS service is expanded to address bearer networks and the ITU-T Recommendation E.106, International Emergency Preference Scheme for Disaster Relief Operations (IEPS). This standard specifies ISUP and BICC call control protocol enhancements and procedures to support ETS.

[A-0100009]   ATIS Technical Report A-0100009 (2006), *Overview of Standards in Support of Emergency Telecommunications Service (ETS)*

This technical report provides a high-level service description of the Emergency Telecommunications Services (ETS), its requirements and objectives, and of current standardization initiatives with a focus on forums and committees of the Alliance for Telecommunications Industry Solutions.

[A-1000010]   ATIS-1000010 (2006), *Support of Emergency Telecommunications Service (ETS) in IP Networks*

This document defines the procedures and capabilities required to support ETS within and between Internet Protocol (IP) based service provider networks.

[A-0100011]   ATIS Technical Report A-0100011 (2007), *Priority for National Security/Emergency Preparedness (NS/EP) Services in NGN – Role of Telecommunications Service Priority*

This document provides guidance regarding the applicability and usage of the Telecommunications Service Priority (TSP) codes for National Security / Emergency Preparedness (NS/EP) in an Next Generation Network (NGN) / IP (Internet Protocol) environment.

[A-1000011]   ATIS-1000011 (2006), *ETS Packet Priority for IP NNI Interfaces – Use of Existing DiffServ Per Hop Behaviors*

This TR provides guidelines for the application of existing Differentiated Service (DiffServ) Per Hop Behaviors (PHB) and their associated DiffServ Code Points (DSCP) when Emergency Telecommunications Service (ETS) Voice over IP (VoIP) packets are transported in the media stream at Network-Network Interfaces (NNI). It recommends that public carriers utilize a local/experimental DSCP to differentiate ETS VoIP traffic from other real-time traffic at NNI interfaces between carriers.

[A-1000020]   ATIS-1000020 (2007), *ETS Packet Priority for IP NNI Interfaces – Requirements for a Separate Expedited Forwarding Mechanism*.

This TR provides the requirements for a separate Expedited Forwarding (EF) mechanism that can recognize a class of traffic for preferential treatment via a unique DiffServ Code Point (DSCP). This class of traffic includes ETS Voice over IP (VoIP) calls/sessions with the requirement of a pre-determined quantity of reserved bandwidth for ETS service.

[A-0100022]   ATIS American National Standard 0100022 (2008), *Priority Classification Levels for Next Generation Networks*

This standard formalizes a set of priority classification levels for admission control and service restoration in Next Generation Networks. The highest priority classifications are reserved for Emergency Telecommunications Service.

[A-1000023]   ATIS-1000023 (2008), *ETS Network Element Requirements*

This document defines network element requirements to ensure that ETS is implementable and interoperable in a multi-vendor environment for an NGN IMS-based network deployment. These requirements further refine the procedures defined in ATIS-1000010.

[A-0300202]   ATIS-0300202 (2009), *Guidelines for Network Management of the Public Switched Networks under Disaster Conditions*

These guidelines encompass the cooperative network management actions (that may be) required of interconnected network operators during emergency conditions associated with disasters that threaten life or property and case congestion in the public telecommunications networks.

[ATIS-1000049]   *End-to-End NGN GETS Call Flows*

This Standard describes end-to-end call/session flows for various wireline and wireless access technologies, in addition to the IMS Core Network call/session flows in support of NGN GETS (Emergency Telecommunications Service (ETS)). These call/session flows illustrate how an NGN GETS call/session can be processed, and address call/session set-up, termination, and on-going activities of the call/session for the various NGN GETS service types and access technologies. The call/session flows are based on various wireline and wireless Standards/Specifications.

A.4.2 ATIS Draft Standards and associated summaries

[DA ETS PH2]   Draft Standard: *Support of Emergency Telecommunication Services in IP Networks Phase 2*

This document will define the procedures and capabilities required to support ETS within and between IP based service provider networks beyond voice.

[DA ETS SR]   Draft TR: *Service Requirements of ETS in NGN*

This TR will develop further descriptions of the various services (such as voice, video, email, instant messaging) for which priority capabilities can be provided under the ETS umbrella. This TR will provide service requirements from an ETS user's perspective, including methods of invocation of ETS and procedures for ETS authentication. In addition, the TR will describe use cases, the application of ETS priority policies from a user and service provider perspective.

[DA ETS WAR]   Draft Standard: *ETS Wireline Access Requirements*.

This standard will define network element requirements for wireline access in support of Emergency Telecommunications Service (ETS) for DSL, Cable, Fiber, and Metro Ethernet access networks.

[DA ETS NER]   Draft Standards: *ETS Phase 2 Network Element Requirements*.

This standard will revise ETS Network Element Requirements (ATIS-1000023.2008) to include: 1) new requirement for additional ATIS NGN Architecture functional entities, 2) revision of existing network elements requirements, and 3) other non-SIP based interfaces.

A.5   IETF RFCs and associated summaries

A.5.1 Published IETF RFCs and associated summaries

[RFC 4412]   IETF RFC 4412 (2006), *Communications Resource Priority for the Session Initiation Protocol (SIP)*

This document defines two new Session Initiation Protocol (SIP) header fields for communicating resource priority, namely, "Resource-Priority" and "Accept-Resource-Priority". The "Resource-Priority" header field can influence the behavior of SIP user agents (such as telephone gateways and IP telephones) and SIP proxies. It does not directly influence the forwarding behavior of IP routers.

[RFC 4542]   IETF RFC 4542 (2006) Implementing an Emergency Telecommunications Service (ETS) for Real-Time Services in the Internet Protocol Suite

RFCs 3689 and 3690 detail requirements for an Emergency Telecommunications Service (ETS), of which an Internet Emergency Preparedness Service (IEPS) would be a part. Some of these types of services require call preemption; others require call queuing or other mechanisms. IEPS requires a Call Admission Control (CAC) procedure and a Per Hop Behavior (PHB) for the data that meet the needs of this architecture. Such a CAC procedure and PHB is appropriate to any service that might use H.323 or SIP to set up real-time sessions. The key requirement is to guarantee an elevated probability of call completion to an authorized user in time of crisis.

This document primarily discusses supporting ETS in the context of the US Government and NATO, because it focuses on the Multi-Level Precedence and Preemption (MLPP) and Government Emergency Telecommunication Service (GETS) standards. The architectures described here are applicable beyond these organizations.

[RFC5865]   IETF RFC 5865, *A Differentiated Services Code Point (DSCP) for Capacity-Admitted Traffic*.

This document requests one Differentiated Services Code Point (DSCP) from the Internet Assigned Numbers Authority (IANA) for a class of real-time traffic. This traffic class conforms to the Expedited Forwarding Per-Hop Behavior. This traffic is also admitted by the network using a Call Admission Control (CAC) procedure involving authentication, authorization, and capacity admission. This differs from a real-time traffic class that conforms to the Expedited Forwarding Per-Hop Behavior but is not subject to capacity admission or subject to very coarse capacity admission.

A.6   TMForum References and associated summaries

A.6.1 Published TMForum References and associated summaries

[GB 917]   Guide Book (GB) 917, SLA Management Handbook - Release 3.0

                           This document defines a framework for planning, design, implementation
                           and operation of SLA Management. It also includes a methodology
                           framework for specifying SLAs, as well as Use Cases to illustrate how
                           the methodology may be applied to specific services (including to ETS).

[GB 934]   Guide Book GB 934, Best Practice: Application Note to the SLA
                           Management Handbook - Voice over IP – Release 2.0

                           This document defines the current Best Practice for Design and
                           Monitoring of Key Quality Indicators (KQIs) contained in SLAs for
                           services (including ETS) provided over VoIP technology. The main focus
                           of the document is on two aspects of VoIP Service Quality: speech
                           quality, and call connectivity quality.

A.7   TIA References and associated summaries

A.7.1 Published TIA References and associated summaries

[TIA-917]   Wireless Priority Service Enhancements for CDMA Systems

                           This document defines the enhancements needed to CDMA systems to
                           support Wireless Priority Service. The document presents a
                           recommended plan for implementation of Wireless Priority Service
                           enhancements in Service Provider networks.

A.8   WiMAX References and associated summaries

A.8.1 Published WiMAX References and associated summaries

[WFM Stage 1-r1]   WiMAX Forum - WFM-T31-122-R016v01: Service Provider Working
                           Group (SPWG) ETS Phase 1 Requirements

                           The ETS Phase 1 requirements document describes the ETS use cases
                           and requirements for the WiMAX networks based on the IEEE 802.16
                           2009 air interface.

[WFM Stage 1-r2]   WiMAX Forum - WFM-T31-122-R020v01: SPWG ETS Requirements,
                           Release 2.0

                           The ETS Phase 1 requirements document enhances the ETS use cases
                           and requirements for the WiMAX networks based on the IEEE 802.16m
                           air interface.

[WFM Stage 2-a1]   WiMAX Forum – WFM-T32-001-R016v01: Architecture – Architecture
                           Tenets, Reference Model and Reference Points, Base Specification,
                           Release 1.6ETS Stage 2 Specification (Section 7.14), November,.2010.

                           This document specifies for ETS the Stage 2 WiMAX network solution
                           framework for Release 1.6 to support the Stage 1 requirements. The

framework addresses priority indication and priority treatment for the Authentication, Authorization, and Accounting (AAA) architecture.

[WFM Stage 3-a1]   WiMAX Forum – WFM-T33-001-R016v01: Network Architecture – Detailed Protocols and Procedures, Base Specification, Release 1.6, ETS Stage 3 Specification (Section 4.19), November, 2010.

The document specifies the Stage 3 WiMAX network procedures and messages for Release 1.6 supporting priority indication and priority treatment, based on the Stage 2 solution framework. A priority indication field is added to the QoS Descriptor parameter of the WiMAX RADIUS and Diameter messages. The priority indication procedures for the AAA architecture, as well as the priority treatment mechanisms in the BS, ASN Gateway, and Connectivity Service Network (CSN) Functional Entities, are also described in this document. The key areas of ETS support in the WiMAX network include initial network entry, handover, paging, and ETS invocation/revocation.

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