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SERIES Q: SWITCHING AND SIGNALLING

Overview of the work of standards development organizations and other organizations on emergency telecommunications service

ITU-T Q-series Recommendations – Supplement 62

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Supplement 62 to ITU-T Q-series Recommendations

Overview of the work of standards development organizations and other organizations on emergency telecommunications service

Summary

Supplement 62 to the ITU-T Q-series Recommendations 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 service (ETS). It identifies published ETS-related Recommendations and standards as well as those currently in work programmes.

History

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FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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

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

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

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Introduction

The World Telecommunication Standardization Assembly (WTSA-08) assigned Study Group 11 with the responsibility to coordinate emergency telecommunications 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 emergency telecommunications service (ETS). The intent of this Supplement is to encourage coordination and cooperation in the development of an internationally applicable set of interworkable ETS implementations.

Supplement 62 to ITU-T Q-series Recommendations

Overview of the work of standards development organizations and other organizations on emergency telecommunications service

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 completed and ongoing work related to emergency telecommunications service (ETS) occurring in various ITU-T study groups, as well as the status of this work. This roadmap captures the results from an analysis of existing work activities related to the development of ETS capabilities for authorized users. 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 Supplement 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 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 national network different 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 ETS-related standards as well, in this Supplement. However, as these other SDO developed and developing standards are not ITU-T's responsibility, ITU-T takes no position with regards to their integrity or completeness. This Supplement may identify the dependencies of ITU-T ETS work on activities that are, or which should be, underway in other external standards development organizations.

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

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2.2.1.2 Draft 3GPP references

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2.2.2 3GPP2 references

2.2.2.1 3GPP2 published 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*.

2.2.4 IETF references

2.2.4.1 IETF published references

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

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2.2.8 Broadband Forum references

[WT-134] *Policy Control Framework, BBF Working Text 134 (Draft)*, Revision 25, November 2010.

[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 Supplement uses the following terms defined elsewhere:

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

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

3.1.3 IPCablecom [ITU-T 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.

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

3.1.5 international emergency preference scheme (IEPS) [ITU-T 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, while this service is restricted either due to damage, congestion or faults, or any combination of these.

3.1.6 priority treatment capabilities [ITU-T 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

None.

4 Abbreviations and acronyms

This Supplement uses the following abbreviations and acronyms:

3GPP	3rd Generation Partnership Project
3GPP2	3rd Generation Partnership Project2
ANI	Application-to-Network Interface
BICC	Bearer Independent Call Control
B-ISUP	Broadband ISUP
ENI	ETS National Implementation
ET	Emergency Telecommunications
ETS	Emergency Telecommunications Service
ETSMS	ETS Management Service
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
ISDN	Integrated Services Digital Network
ISUP	Integrated Services User Part
MLPP	Multi-Level Precedence and Pre-emption
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
S/BC	Session/Border Control
SIP	Session Initiation Protocol
SS7	Signalling System 7
TDR	Telecommunication for Disaster Relief
TM Forum	TeleManagement 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 labelled 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 SDOs and other organizations that have or are producing ETS related standards
   - Appendix I provides a summary of the standards listed in clause 2 References

4) In clauses 6, 7 and 8 provision has been made for the identification of other SDO standards. In some instances, one or more standards 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 standards that have not been captured in this Supplement. In other instances, there are no other SDO standards identified. In these cases, the reader should understand that there may be applicable standards that have not been captured in this Supplement. In both cases, the respective clauses should be considered place holders which could be used to capture additional SDO standards in future issues of this Supplement.

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

6) An ITU-T 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. How ETS users are authenticated and authorized 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

This clause 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 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

6.2.2 Other SDO standards

6.2.2.1 3GPP Specifications

[3GPP TR 22.952] *Priority Service Guide*

Status: Published

Addresses: Service description, call flows, and management aspects of priority service

6.2.2.2 ATIS Standards

[A-1000005] *Service Description 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, signalling, and transport.

NOTE – Some of the documents cited in this clause are not ETS specific documents. For example, some of the documents have a broader scope, but include functional requirements pertaining to ETS. In addition, some documents cited may include topics other than functional requirements.

7.2 Overall functional requirements

This 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, *Framework for the implementation of Telecommunications 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-Sup.2] *Functional requirements and architecture of next generation networks – Session/border control (S/BC) functions*

Status: Published

Addresses: General Functional requirements

[ITU-T Y.2201] *Requirements and capabilities for ITU-T NGN*

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.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

7.2.2 Other SDOs

7.2.2.1 3GPP

[3GPP TS 22.153] *Multimedia Priority Service*

Status: Published

Addresses: General functional requirements for priority service

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

Status: Published

Addresses: Feasibility study on priority service

[3GPP TR 22.952] *Priority Service Guide*

Status: Published

Addresses: Service description, call flows, and management aspects of priority service

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

Status: Draft

Addresses: Stage 2 functional requirements for priority service

7.2.2.2 3GPP2

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

Status: Published

Addresses: General functional requirements for priority service

7.2.2.3 IETF

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

Status: Published

Addresses: General network functional requirements for IEPS support

7.2.2.4 TIA

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

Status: Published

Addresses: General functional requirements for priority service

7.2.2.5 WiMAX Forum

[WFM Stage 1-r1] *Service Provider Working Group (SPWG) ETS Phase 1 Requirements for Release 1.6, Feb. 2009.*

Status: Published

Addresses: WiMAX ETS use cases and requirements based on IEEE 802.16 2009 air interface

[WFM Stage 1-r2] *SPWG ETS Requirements, Release 2.0, Nov. 2009.*

Status: Published

Addresses: WiMAX ETS use cases and requirements based on IEEE 802.16m air interface

7.3 System and subsystem functional requirements

7.3.1 General

This 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

7.3.2.2 Other SDOs

For further study.

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

Status: Published

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] *Framework for the implementation of Telecommunications for Disaster Relief (TDR)*

Status: Draft

Addresses: Network operations

7.3.3.2 Other SDOs

7.3.3.2.1 3GPP

[3GPP TR 22.952] *Priority Service Guide*

Status: Published

Addresses: Service description, call flows, and management aspects of priority service

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

7.3.4.2 Other SDOs

For further study.

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

7.3.5.2 Other SDOs

For further study.

7.3.6 Security

7.3.6.1 ITU-T

[ITU-T D E.TDR] Draft ITU-T Recommendation E.TDR, *Framework for the implementation of Telecommunications 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] ITU-T Y.2720 – *Supplement on NGN identity management mechanisms*

Status: Published

Addresses: IdM mechanisms and capabilities for NGN.

[ITU-T Y.2722] *NGN identity management mechanisms*

Status: Published

Addresses: IdM mechanisms and capabilities for NGN

7.3.6.2 Other SDOs

For further study.

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 set-up

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 signalling protocol extensions can be used to designate the admission control priority requirements in support of ETS

7.3.7.2 Other SDOs

7.3.7.2.1 ATIS

[A-1000010] *Support of Emergency Telecommunications Service (ETS) in IP Network*

Status: Published

Addresses: Signalling requirements

[A-1000023] *ETS Network Element Requirements for a NGN IMS Based Deployments*

Status: Published

Addresses: Signalling requirements

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

Status: Published

Addresses: Need for a separate expedited forwarding mechanism

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

7.3.8.2 Other SDOs

7.3.8.2.1 ATIS

[A-1000020] *ETS Packet Priority for IP NNI Interfaces – Requirements for a Separate Expedited Forwarding Mechanism*

Status: Published

Addresses: Need for a separate expedited forwarding mechanism

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, signalling 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 have a broader scope, but include capabilities pertaining to ETS. In addition, 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

8.2.2 Other SDOs

8.2.2.1 IETF

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

Status: Published

Addresses: Priority

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

8.3.2 Other SDOs

For further study.

8.4 Authorization

8.4.1 ITU-T

For further study.

8.4.2 Other SDOs

For further study.

8.5 Bearer capabilities

8.5.1 ITU-T

For further study.

8.5.2 Other SDOs

For further study.

8.6 Interworking

8.6.1 Bearer interworking

8.6.1.1 ITU-T

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

Status: Published

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

8.6.1.2 Other SDOs

For further study.

8.6.2 Protocol interworking

8.6.2.1 BICC – ISUP

8.6.2.1.1 ITU-T

[ITU-T Q.1902.1 A2] *Bearer Independent Call Control protocol (Capability Set 2): Functional description – 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

8.6.2.1.2 Other SDOs

For further study.

8.6.2.2 Gateway – SIP – ISUP

8.6.2.2.1 ITU-T

[ITU-T H-Sup.9] *Gateway control protocol: Operation of H.248 with H.225.0, SIP, and ISUP in support of emergency telecommunications service (ETS)/international emergency preference scheme (IEPS)*

Status: Published

Addresses: Interworking between ITU-T H.248, ITU-T H.225 and ISUP

8.6.2.2.2 Other SDOs

For further study.

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, ISDN and PLMN*

Status: Published

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

8.6.2.3.2 Other SDOs

For further study.

8.7 Management

8.7.1 ITU-T

For further study.

8.7.2 Other SDOs

8.7.2.1 ATIS standards

[A-0300202] *Internetwork Operations – Guidelines for Network Management of the Public Telecommunications Networks under Disaster Conditions*

Status: Published

Addresses: Network Management under disaster conditions

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

8.8.2 Other SDOs

8.8.2.1 IETF

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

Status: Published

Addresses: Priority and preferential treatment

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

Status: Published

Addresses: Priority and preferential treatment

8.9 Preferred routing

8.9.1 ITU-T

For further study.

8.9.2 Other SDOs

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 ITU-T H.323 systems priority support for ITU-T 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

8.10.2 Other SDOs

8.10.2.1 ATIS standards

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

Status: Published

Addresses: How to use DiffServ Code Points

8.10.2.2 IETF

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

Status: Published

Addresses: Priority

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

Status: Published

Addresses: DiffServ code point for ETS traffic

8.10.2.3 WiMAX Forum

[WFM Stage 2-a1] *Network Architecture – Architecture Tenets, Reference Model and Reference Points, Base Specification, Release 1.6, ETS Stage 2 Specification (Section 7.14)*

Status: Published

Addresses: WiMAX Stage 2 ETS specifications on priority solution framework and high level ETS flows

[WFM Stage 3-a1] *Network Architecture – Detailed Protocols and Procedures, Base Specification, Release 1.6, ETS Stage 3 Specification (Section 4.19)*

Status: Published

Addresses: WiMAX Stage 3 ETS specifications on priority indication and treatment procedures and messages

8.11 Security

8.11.1 ITU-T

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

8.11.2 Other SDOs

For further study.

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 – Amendment 1 – Support for the International Emergency Preference Scheme*

Status: Published

Addresses: Extension of AAL2 to support IEPS

8.12.1.2 Other SDOs

For further study.

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

8.12.2.2 Other SDOs

8.12.2.2.1 ATIS standards

[A-1000006] *Signalling System No.7 (SS7) – Emergency Telecommunications Service (ETS)*

Status: Published

Addresses: Extension of BICC to support ETS

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 – Amendment 1 – Support for the International Emergency Preference Scheme*

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

8.12.3.2 Other SDOs

For further study.

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

8.12.4.2 Other SDOs

For further study.

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 the provision of capability for identifying a 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

8.12.5.2 Other SDOs

8.12.5.2.1 ATIS standards

[A-1000006] *Signalling System No.7 (SS7) – Emergency Telecommunications Service (ETS)*

Status: Published

Addresses: Extension of ISUP to support ETS

8.12.6 ITU-T 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 at Priority levels

8.12.6.2 Other SDOs

For further study.

8.12.7 SIP

8.12.7.1 ITU-T

For further study.

8.12.7.2 Other SDOs

8.12.7.2.1 IETF

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

Status: Published

Addresses: Priority

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 ITU-T H.323 systems

8.13.2 Other SDOs

For further study.

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

8.14.2 Other SDOs

For further study.

9 List of SDOs and other organizations involved with ETS

This clause provides an alphabetical list of Standards 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 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 D 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	Status
[3GPP TS 22.153]	Multimedia Priority Service	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

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

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, signalling 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 USA 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	Status
[A-1000005]	ATIS-1000005 (2005), Service Description of ETS	Published
[A-1000010]	ATIS-1000010 (2006), Support of Emergency Telecommunications Service (ETS) in IP Network	Published
[A-1000023]	ATIS-1000023 (2008), ETS Network Element Requirements for A NGN IMS Based Deployments	Published
[A-1000020]	ATIS-1000020 (2007), ETS Packet Priority for IP NNI Interfaces – Requirements for a Separate Expedited Forwarding Mechanism	Published
[A-1000006]	Signalling 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 Priority for IP NNI Interfaces – Use of Existing DiffServ Per Hop Behaviors	Published
[A-0300202]	ATIS-0300202 (2009), Internetwork Operations – Guidelines for Network Management of the Public Telecommunications Networks under Disaster Conditions	Published

9.4 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-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.

9.5 ETSI

For further study.

9.6 IEEE

For further study.

9.7 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.

9.7.1 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 [IETF RFC 4412] for resource priority header field in support of ETS.

9.7.2 TSVWG Working Group

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

9.7.3 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.

9.7.4 IETF Documents

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

Reference	Title	Status
[IETF RFC 4542]	Implementing an Emergency Telecommunications Service (ETS) for Real-Time Services in the Internet Protocol Suite	Published
[IETF RFC 4412]	Communications Resource Priority for the Session Initiation Protocol (SIP)	Published
[IETF RFC 5865]	A Differentiated Services Code Point (DSCP) for Capacity-Admitted Traffic	Published

9.8 ITU-T

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

9.8.1 SG2 – Operational aspects of service provision and telecommunications management

SG2 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, Framework for the implementation of Telecommunications for Disaster Relief (TDR).	Draft
[ITU-T E.412]	Network management controls	Published
[ITU-T M.3350]	TMN service management requirements for information interchange across the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)	Published

9.8.2 SG9 – Television and sound transmission and integrated broadband cable networks

SG9 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 networks	Published
[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

9.8.3 SG11 – Signalling requirements, protocols and test specifications

SG11 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

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

Reference	Title	Status
[ITU-T Q-Sup.61]	Evaluation of signalling protocols to support ITU-T Y.2171 admission control priority levels	Published
[ITU-T Q.1902.1 A2]	Bearer Independent Call Control protocol (Capability Set 2): Functional description – 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 codes – Amendment 3 – Support for the International Emergency Preference Scheme	Published
[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 – 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 signalling 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 – Amendment 1 – Support for the International Emergency Preference Scheme	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.7 – ISDN user part formats and codes – Amendment 4 – Support for the International Emergency Preference Scheme	Published

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

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

9.8.4 SG12 – Performance, QoS and QoE

SG12 is the lead study group on quality of service and quality of experience.

SG12 has no direct activity to report in support of ETS.

9.8.5 SG13 – Future networks including mobile and NGN

SG13 is the lead study group 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]	Requirements and capabilities for ITU-T NGN	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]	ITU-T Y.2720 – Supplement on NGN identity management mechanisms	Published
[ITU-T Y.2722]	NGN identity management mechanisms	Published

9.8.6 SG15 – Optical transport networks and access network infrastructures

SG15 is the lead study group on access network transport, optical technology, and optical transport networks.

SG15 has no direct activity to report in support of ETS.

9.8.7 SG16 – Multimedia coding, systems and applications

SG16 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	Status
[ITU-T H-Sup.9]	Gateway control protocol: Operation of H.248 with H.225.0, 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, ISDN and PLMN	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

9.8.8 SG17 – Security

SG17 is the lead study group on telecommunication security, identity management (IdM) and languages and description techniques.

SG17 has no direct activity to report in support of ETS.

9.9 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 – Example TIA documents and work items related to ETS

Reference	Title	Status
[TIA-917]	Wireless Priority Service Enhancements for CDMA Systems	Published

9.10 TM Forum

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

9.11 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	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]	SPWG ETS Requirements, Release 2.0, Nov. 2009.	Published
[WFM Stage 2-a1]	Network Architecture – Architecture Tenets, Reference Model and Reference Points, Base Specification, Release 1.6, ETS Stage 2 Specification (Section 7.14), Nov. 2010.	Published
[WFM Stage 3-a1]	Network Architecture – Detailed Protocols and Procedures, Base Specification, Release 1.6, ETS Stage 3 Specification (Section 4.19), Nov. 2010	Published

Appendix I

Summaries of referenced standards

I.1 ITU-T references and associated summaries

I.1.1 Published Recommendations and Supplements

[ITU-T E.106] Recommendation ITU-T 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] Recommendation ITU-T 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] Recommendation ITU-T 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 E.410. Most network management controls are taken by or in the exchange (see ITU-T 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] Recommendation ITU-T H.246 (2006), *Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN, ISDN and PLMN*

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, ITU-T V.70 terminals on the GSTN, and multi-call applications on the GSTN. ITU-T 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] Recommendation ITU-T H.248.1 (2005), *Gateway control protocol: Version 3*

To achieve greater scalability, this Recommendation decomposes the ITU-T H.323 Gateway function defined in ITU-T H.246 into functional subcomponents and specifies the protocols these components use to communicate. This allows implementations of ITU-T 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 ITU-T 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 ITU-T H.323 systems and is intended to provide new ways of performing operations already supported in ITU-T H.323.

This Recommendation includes several enhancements to ITU-T H.248.1 Version 2 (2002), Gateway control protocol

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

This Recommendation defines the ITU-T H.323 quality of service (QoS) and service priority signalling for exchanging, negotiating and controlling QoS and service priority parameters among the ITU-T 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 ITU-T 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 an ITU-T H.323-based call to acquire QoS irrespective of the number of domains it traverses.

[ITU-T H.361 A1] Recommendation ITU-T 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 ITU-T 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 ITU-T H.323 QoS to allow the use of RSVP in the transport plane.

Annex B describes the procedures of ITU-T 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 ITU-T 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] Recommendation ITU-T 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 ITU-T 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.225.0, 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.225.0, 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] Recommendation ITU-T 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] Recommendation ITU-T 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 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.

[ITU-T J.170] Recommendation ITU-T J.170 (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] Recommendation ITU-T 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] Recommendation ITU-T 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] Recommendation ITU-T 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] Recommendation ITU-T 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 M.3350] Recommendation ITU-T 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 a service provider, both officially authorized, associated with the provision of emergency telecommunication service (ETS). This capability is called the emergency telecommunication service management service (ETSMS).

[ITU-T Q.761] Recommendation ITU-T 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 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] Recommendation ITU-T 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 E.106]. It contains the modifications to [ITU-T Q.761] (1999) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to [ITU-T Q.762], Amendment 4 to [ITU-T Q.763], and Amendment 4 to [ITU-T Q.764]. This amendment incorporates Amendment 2 to [ITU-T 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] Recommendation ITU-T 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 E.106]. It contains the modifications to [ITU-T Q.762] (1999) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to [ITU-T Q.761], Amendment 4 to [ITU-T Q.763], and Amendment 4 to [ITU-T Q.764]. This amendment incorporates Amendment 1 to [ITU-T Q.762] and provides enhancements.

[ITU-T Q.763] Recommendation ITU-T 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] Recommendation ITU-T Q.763 Amendment 4 (2006), *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 E.106]. This amendment contains modifications to [ITU-T Q.763] (1999) in order to accommodate these needs. It should be read in conjunction with Amendment 3 to [ITU-T Q.761], Amendment 3 to [ITU-T Q.762], and Amendment 4 to [ITU-T Q.764]. This amendment incorporates Amendment 2 to [ITU-T Q.763] and provides enhancements.

[ITU-T Q.764] Recommendation ITU-T Q.764 (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] Recommendation ITU-T 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 E.106]. It contains modifications to [ITU-T Q.764] (1999) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to [ITU-T Q.761], Amendment 3 to [ITU-T Q.762], and Amendment 4 to [ITU-T Q.763]. This amendment incorporates Amendment 2 to [ITU-T Q.764] and provides enhancements.

[ITU-T Q.767] Recommendation ITU-T 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.

[ITU-T Q.767 A1] Recommendation ITU-T 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 E.106]. This amendment contains modifications to [ITU-T Q.767] (1991) in order to accommodate these needs.

[ITU-T Q.1902.1] Recommendation ITU-T Q.1902.1 (2001), *Bearer Independent Call Control protocol (Capability Set 2): Functional description*

This Recommendation provides a functional description 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.

[ITU-T Q.1902.1 A2] Recommendation ITU-T Q.1902.1 Amendment 2 (2006*), Bearer Independent Call Control protocol (Capability Set 2): Functional description – 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 E.106]. It contains modifications to [ITU-T Q.1902.1] (2001) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 3 to [ITU-T Q.1902.2], Amendment 3 to [ITU-T Q.1902.3], and Amendment 3 to [ITU-T Q.1902.4]. This amendment incorporates Amendment 1 to [ITU-T Q.1902.1] and provides enhancements.

[ITU-T Q.1902.2] Recommendation ITU-T 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] Recommendation ITU-T 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 E.106. It contains modifications to [ITU-T Q.1902.2] (2001) in order to accommodate these needs. This amendment should be read in

conjunction with Amendment 2 to [ITU-T Q.1902.1], Amendment 3 to [ITU-T Q.1902.3], and Amendment 3 to [ITU-T Q.1902.4]. This amendment incorporates Amendment 1 to [ITU-T Q.1902.2] and provides enhancements.

[ITU-T Q.1902.3] Recommendation ITU-T 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] Recommendation ITU-T 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 E.106]. It contains modifications to [ITU-T Q.1902.3] (2001) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 2 to [ITU-T Q.1902.1], Amendment 3 to [ITU-T Q.1902.2], and Amendment 3 to [ITU-T Q.1902.4]. This amendment incorporates Amendment 1 to [ITU-T Q.1902.3] and provides enhancements.

[ITU-T Q.1902.4] Recommendation ITU-T 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] Recommendation ITU-T 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 E.106]. It contains modifications to [ITU-T Q.1902.4] (2001) in order to accommodate these needs. This amendment should be read in conjunction with Amendment 2 to [ITU-T Q.1902.1], Amendment 3 to [ITU-T Q.1902.2], and Amendment 3 to [ITU-T Q.1902.3]. This amendment incorporates Amendment 1 to [ITU-T Q.1902.4] and provides enhancements.

[ITU-T Q.1950] Recommendation ITU-T 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] Recommendation ITU-T 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 E.106], in bearer independent call control (BICC) based networks.

[ITU-T Q.2630.3] Recommendation ITU-T 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] Recommendation ITU-T Q.2630.3 Amendment 1 (2006), *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 E.106]. It contains modifications to [ITU-T Q.2630.3] (2003) in order to accommodate these needs. This amendment is designed to be compatible with implementations conforming to [ITU-T Q.2630.3] (2003).

[ITU-T Q.2761] Recommendation ITU-T 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] Recommendation ITU-T Q.2761 Amendment 1 (2002), *Functional description of the B-ISDN user part (B-ISUP) of signalling system No.7 – 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 E.106]. This amendment contains modifications to [ITU-T Q.2761] (1999) in order to accommodate these needs. This amendment should be read in connection with the related amendments to [ITU-T Q.2762], [ITU-T Q.2763], and [ITU-T Q.2764].

[ITU-T Q.2762] Recommendation ITU-T 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] Recommendation ITU-T Q.2762 Amendment 1 (2002), *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*

This amendment was produced to meet the urgent need for the implementation of the international emergency preference scheme (IEPS), as specified in [ITU-T E.106]. This amendment contains modifications to [ITU-T Q.2762] (1999) in order to accommodate these needs. This amendment should be read in connection with the related amendments to [ITU-T Q.2761], [ITU-T Q.2763], and [ITU-T Q.2764].

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

This Recommendation is one of a set of 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] Recommendation ITU-T 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 E.106]. This amendment contains modifications to [ITU-T Q.2763] (1999) in order to accommodate

these needs. This amendment should be read in connection with the related amendments to [ITU-T Q.2761], [ITU-T Q.2762], and [ITU-T Q.2764].

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

This Recommendation is one of a set of Recommendations that describe the broadband ISDN user part for broadband signalling capability set 1 and beyond.

This Recommendation describes the procedures relating to:

- Basic call set-up and clear-down;
- Maintenance facilities.

[ITU-T Q.2764 A1] Recommendation ITU-T 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 E.106]. This amendment contains modifications to [ITU-T Q.2764] (1999) in order to accommodate these needs. This amendment should be read in connection with the related amendments to [ITU-T Q.2761], [ITU-T Q.2762], and [ITU-T Q.2763].

[ITU-T Q.2931] Recommendation ITU-T 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 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] Recommendation ITU-T 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*

This Recommendation 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 E.106]. It contains modifications to [ITU-T Q.2931] (1995) in order to accommodate these needs. This amendment is designed to be compatible with implementations conforming to [ITU-T 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 relevant discussions 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 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 Q-Sup.61] ITU-T Q-Series Recommendations – Supplement 61 (2010), *Evaluation of signalling protocols to support ITU-T Y.2171 admission control priority levels*

This Supplement provides guidance on how existing signalling 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 [ITU-T Y.2171].

[ITU-T Y.1271] Recommendation ITU-T 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] Recommendation ITU-T Y.2006 (2008), *Description of capability set 1 of NGN release 1*

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

The objective of this Recommendation 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 [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 ITU-T Y.2011 principles, an implementation-independent approach is adopted.

[ITU-T Y.2111] Recommendation ITU-T Y.2111 (2008), *Resource and admission control functions in next generation networks*

This Recommendation 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] Recommendation ITU-T 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] Recommendation ITU-T Y.2172 (2007), *Service restoration priority levels in Next Generation Networks*

This Recommendation 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] Recommendation ITU-T Y.2201 (2009), *Requirements and capabilities for ITU-T NGN*

This Recommendation provides high level requirements for services and capabilities of a next generation network (NGN)

[ITU-T Y.2205] Recommendation ITU-T Y.2205 (2008), *Next Generation Networks – Emergency telecommunications – Technical considerations*

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

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

This Recommendation specifies authentication and authorization requirements for next generation networks (NGNs).

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

This Recommendation highlights some important security mechanisms that can be used to realize the requirements in [ITU-T Y.2701].

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

This Recommendation 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] Recommendation ITU-T Y.2721 (2010), *NGN identity management requirements and use cases*

This Recommendation provides identity management (IdM) objectives, requirements, guidelines and example use cases for the next generation network (NGN) and its interfaces.

[ITU-T Y-Sup.2] ITU-T Y-series Recommendations – Supplement 2 (2006), ITU-T Y.2012 – *Supplement on session/border control (S/BC) functions*

This Supplement provides the functions and implementation realization associated with the session/border control (S/BC).

[ITU-T Y-Sup.12] ITU-T Y-series Recommendations – Supplement 12 (2010), ITU-T Y.2720 – *Supplement on NGN identity management mechanisms*

This Supplement to [ITU-T Y.2720] provides a description of some example mechanisms that can be used to meet certain identity management (IdM) requirements and deployment needs of NGN.

I.1.2 Draft Recommendations

[ITU-T D E.TDR] Draft Recommendation ITU-T E.TDR, *Framework for the implementation of Telecommunications for Disaster Relief (TDR).*

When there is a major disaster, it is quite likely that telecommunications 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 the 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 Recommendation ITU-T H.325, *AMS: Advanced multimedia systems for next generation and other packet-switched networks*.

I.2 3GPP references and associated summaries

I.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.

I.2.2 Draft 3GPP references

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

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) signalling establishment procedures at the 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.

I.3 3GPP2 References and associated summaries

I.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.

I.4 ATIS references and associated summaries

I.4.1 ATIS published references

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

This Technical Report identifies the need for establishing a set of priorities for traffic over IP networks. It proposes that communications 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 signalling 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 signalling protocols will need to be developed such that these levels are recognized.

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

This standard 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 signalling, and internetwork signalling. 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 signalling requirements can commence.

[A-1000006] ATIS-1000006-2005, *Signalling 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 [ITU-T E.106], International Emergency Preference Scheme (IEPS) for disaster relief operations. 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 IP environment – 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 predetermined quantity of reserved bandwidth for ETS service.

[A-0100022] ATIS 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 for A NGN IMS Based Deployments*

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, *Internetwork Operations – Guidelines for Network Management of the Public Telecommunications 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.

I.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, fibre, 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.

I.5 IETF RFCs and associated summaries

I.5.1 Published IETF RFCs and associated summaries

[IETF 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 behaviour of SIP user agents (such as telephone gateways and IP telephones) and SIP proxies. It does not directly influence the forwarding behaviour of IP routers.

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

IETF 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 pre-emption; 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 ITU-T 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 pre-emption (MLPP) and government emergency telecommunication service (GETS) standards. The architectures described here are applicable beyond these organizations.

[IETF RFC 5865] IETF RFC 5865 (2010), *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.

I.6 TM Forum references and associated summaries

I.6.1 Published TM Forum 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 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.

I.7 TIA references and associated summaries

I.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 the implementation of wireless priority service enhancements in service provider networks.

I.8 WiMAX references and associated summaries

I.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 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, *Network Architecture – Architecture Tenets, Reference Model and Reference Points, Base Specification, Release 1.6, ETS Stage 2 Specification (Section 7.14), Nov. 2010*

This document specifies for ETS Stage 2 WiMAX network solution framework for Release 1.6 to support 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), Nov. 2010*

The document specifies Stage 3 WiMAX network procedures and messages for Release 1.6 supporting priority indication and priority treatment, based on 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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