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IPCablecom

Requirements for preferential telecommunications over IPCablecom networks

ITU-T Recommendation J.260

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Summary

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.

Source

ITU-T Recommendation J.260 was approved on 21 January 2005 by ITU-T Study Group 9 (2005-2008) under the WTSA Resolution 1.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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.

NOTE

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

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

Introduction

Emergency/disaster communications for authorized users play a vital role in the health, safety, and welfare of people in all countries. The common thread to facilitate emergency/disaster operations is the utility of assured capabilities for user-friendly emergency telecommunications that may be realized by technical solutions and/or administrative policy. The IPCablecom infrastructure offers an important resource for assured emergency/disaster communications.

Emergency/disaster situations can impact communications infrastructures. Typical impacts may include congestion overload and the need to re-deploy or extend communications capabilities beyond that covered by existing infrastructures. Even when telecommunications infrastructures are not damaged by these situations, demand for telecommunications resources soar during such events. Therefore, priority mechanisms are needed so that limited bandwidth resources can be allocated to authorized emergency workers.

Generally, when preferential or priority treatment telecommunication capabilities are offered, users of the service will be authenticated and authorized. Whether authentication and authorization are required or not is a national decision. However, without authentication and authorization, preferential treatment capabilities may be subject to abuse by non-authorized individuals.

This Recommendation defines requirements for authentication and priority mechanisms in IPCablecom networks to provide preferential/priority treatment to services that need or benefit from such treatment.

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Requirements for preferential telecommunications over IPCablecom networks

1 Scope

The objective of this Recommendation is to provide an initial set of requirements for preferential telecommunications within IPCablecom networks. Aspects of preferential telecommunications include provisions for Authentication and Priority (Special Handling). These requirements do not apply to ordinary emergency calls such as people calling police, fire department, ambulance, etc. This Recommendation defines requirements for capabilities which when implemented should help support emergency telecommunication services.

NOTE – Pre-emption requirements and authorization requirements are outside the scope of this Recommendation and are considered to be national matters.

2 References

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

2.1 Informative references

[1] ITU-T Recommendation Y.1271 (2004), *Framework(s) on network requirements and capabilities to support emergency telecommunications over evolving circuit-switched and packet-switched networks*.

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

3 Definitions

This Recommendation defines the following terms:

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

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

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

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

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

3.6 **label**: An identifier occurring within or attached to data elements. In the context of preferential telecommunications it is an indication of priority. This identifier can be used as a mapping mechanism between different network priority levels.

3.7 **off-net**: Not on an IPCablecom network.

3.8 **on-net**: On an IPCablecom network.

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

3.10 **preferential**: A capability offering advantage over regular capabilities.

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

4 Abbreviations

This Recommendation uses the following abbreviations:

CM Cable Modem

CMS Call Management Server

MTA Media Terminal Adapter

PIN Personal Identification Number

PSTN Public Switched Telephone Network

5 Architectural cases for preferential telecommunications over IPCablecom networks

These architectural cases are defined in order to provide the different cases that need to be specified.

5.1 IPCablecom to/from PSTN

This case includes calls made from the PSTN (Off-Net) to the IPCablecom network (On-Net) as well as calls made On-Net to Off-Net.

5.2 On-net to on-net

These three cases include calls made from a user on an IPCablecom network to a user on the same (or another) IPCablecom network.

5.2.1 Intra-zone

Intra-zone defines calls that remain within the technical control of a single CMS.

5.2.2 Inter-zone, intra-domain

Inter-zone, intra-domain defines calls that remain within the domain of a single Kerberos realm, but travel beyond the technical control of one CMS.

5.2.3 Inter-domain

The inter-domain case is not within the current scope of this Recommendation.

6 Requirements for preferential telecommunications in IPCablecom

The following requirements are for authentication and prioritization capabilities within IPCablecom networks. This initial set of requirements can be implemented utilizing existing mechanisms or extensions to existing mechanisms found within IPCablecom and elsewhere. Future enhancements as well as internetworking details will await the work of other ITU-T Study Groups.

The requirements focus on call control but some of them might also apply to voice traffic as well. Whether mechanisms need to be developed for the voice traffic as well as the call control depend upon the methods used for the priority and authentication.

Ideally, all methods of priority treatment will be applied to a priority call. However, it is recognized that satisfying a subset of the below listed requirements will improve the access for preferential users and that a phased approach to implementation is desirable.

6.1 Requirements for authentication in IPCablecom networks

Users with priority, generally, will be authenticated[1] and authorized. Whether authentication for preferential users is required or not is a national matter. In the case where authentication is not required it is assumed that preferential users are authorized by default. Ideally, at least two authentication mechanisms will be supported in IPCablecom networks. Some services may require only one method, however:

a) One method of authentication of calls originating in an IPCablecom network will be available to a preferential user on any given IPCablecom user's equipment. One way this can be accomplished is by calling a special number and entering a personal identification number (PIN).

b) One method of authentication will be dependent upon the IPCablecom system's recognition of the preferential users' equipment. This authentication will only be available on particular pieces of equipment (e.g., phones, CM/MTAs) and may additionally require further mechanisms (e.g., smartcards, tokens, and/or a PIN). Smartcards specifications are outside the scope of IPCablecom.

6.2 Requirements for priority treatment in IPCablecom networks

1) Preferential users will receive priority treatment. This priority treatment can be provided in several ways.
   a) Priority access to the IPCablecom network: This priority access will be provided after a preferential user is authorized and occurs when initiating a call on an IPCablecom network.
   b) Signalling associated with call activation and call features for preferential users will receive priority handling relative to non-preferential users.
   c) Network resources will be provided to preferential users on a preferential basis whether originating on the IPCablecom network (on-net) or entering from another network (off-net).
   d) Calls originating in an IPCablecom network (on-net) with a priority label should receive priority at the gateways to other networks (e.g., to the PSTN).
2) A priority call originating in an IPCablecom network is required to have a label or some other indication identifying the call as one which should receive priority treatment.

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[1] Authentication is important for priority traffic for several reasons:
a) To avoid denial-of-service attacks by non-authorized use of the priority treatment;
b) To allow the QoS provisioning to take place giving priority to the authorized user;
c) To allow for billing and accounting.

3) Calls with the priority label will receive priority treatment within an IPCablecom network.

4) A gateway device (on the IPCablecom side) connecting an IPCablecom network to the PSTN is required to be able to read the label of a priority call and map this label into priority mechanisms existing in the PSTN. The intent is to preserve the special handling (if available) as the call proceeds on the PSTN.

NOTE – Generally, for the PSTN only one level of priority is available.

5) A gateway device (on the IPCablecom side) is required to be able to read priority label(s) from the PSTN associated with the call and map this label to the appropriate priority label within the IPCablecom network.

6) The priority label of a call that transits an IPCablecom network is required to be preserved throughout an IPCablecom network.

7) A priority call in transit through an IPCablecom network will receive priority treatment in accordance with the capabilities of the IPCablecom network.

8) There will be a minimum capability of supporting one level of priority treatment within an IPCablecom network. Some national options may require more levels (e.g., five levels). National options may require that outside of a "Declared time of Disaster, Crisis or Emergency", no Priority level or indications are active in the network. The number of different labels within an IPCablecom network associated with priority treatment may be extensible (e.g., up to 256) to allow for future extensions.

9) Any call entering an IPCablecom domain with a priority label from a trusted network (e.g., from the PSTN) will receive priority treatment in the IPCablecom network. The definition of "trusted network" is outside the scope of this Recommendation.

BIBLIOGRAPHY

T1* Technical Report T1.TR.79-2003, *Overview of standards in support of Emergency Telecommunications Service (ETS)*.

* T1 standards are maintained since November 2003 by ATIS.

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