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Requirements for preferential telecommunications over IPCablecom networks

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ITU-T Recommendation J.260

Requirements for preferential telecommunications over IP-Cablecom networks

Summary

This Recommendation defines requirements for Preferential Telecommunications over IP-Cablecom networks. The essential aspects of Preferential Telecommunications over IP-Cablecom that this Recommendation covers can be grouped into two areas: prioritization and authentication. These two areas include capabilities to support telecommunications in IP-Cablecom 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 IP-Cablecom networks.

Introduction

Emergency/disaster communications for authorized users plays 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 IP-Cablecom 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 IP-Cablecom networks to provide preferential/priority treatment to services that need or benefit from such treatment.

1 Scope

The objective of this Recommendation is to provide an initial set of requirements for preferential telecommunications within IP-Cablecom 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

Informative References

- [1] ITU-T Recommendation Y.1271 (10/2004), *Framework(s) on Network Requirements and Capabilities to Support Emergency Communications Over Evolving Circuit Switched and Packet Switched Networks*.
- [2] ITU-T Recommendation E.106 (10/2003), *International Emergency Preference Scheme for disaster relief operations (IEPS)*.

3 Definitions

Assured capabilities

Capabilities providing high confidence or certainty that critical telecommunications are available and perform reliably.

Authentication

The act or method used to verify a claimed identity.

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.

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.

International emergency situation

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

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.

Off-Net

Not on an IPCablecom Network.

On-Net

On an IPCablecom Network.

Policy

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

Preferential

A capability offering advantage over regular capabilities.

Priority treatment capabilities

Capabilities that provide premium access to, and/or use of telecommunications network resources.

4 Abbreviations

PIN – Personal Identification Number

PSTN – Public Switched Telephone Network

CM – Cable Modem

CMS - Call Management Server

MTA –Media Terminal Adapter

5 Architectural Cases for Preferential Telecommunications over IP-Cablecom Networks

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

5.1 IP-Cablecom to/from PSTN

This case includes calls made from the PSTN (Off-Net) to the IP-Cablecom 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 IP-Cablecom Network to a user on the same (or another) IP-Cablecom 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 IP-Cablecom

The following requirements are for authentication and prioritization capabilities within IP-Cablecom networks. This initial set of requirements can be implemented utilizing existing mechanisms or extensions to existing mechanisms found within IP-Cablecom 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.

Requirements for Authentication in IP-Cablecom Networks

1) Users with priority, generally, will be authenticated¹ 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 IP-Cablecom networks. Some services may require only one method, however.

1a) One method of authentication of calls originating in an IP-Cablecom network will be available to a preferential user on any given IP-Cablecom user's equipment. One way this can be accomplished is by calling a special number and entering a personal identification number (PIN).

1b) One method of authentication will be dependent upon the IP-Cablecom 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 IP-Cablecom.

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.

Requirements for Priority Treatment in IP-Cablecom Networks

- 2) Preferential users will receive priority treatment. This priority treatment can be provided in several ways.
 - 2a) Priority access to the IP-Cablecom network. This priority access will be provided after a preferential user is authorized and occurs when initiating a call on an IP-Cablecom network.
 - 2b) Signalling associated with call activation and call features for preferential users will receive priority handling relative to non-preferential users.
 - 2c) Network resources will be provided to preferential users on a preferential basis whether originating on the IP-Cablecom network (on-net) or entering from another network (off-net).
 - 2d) Calls originating in an IP-Cablecom network (on-net) with a priority label should receive priority at the gateways to other networks (e.g. to the PSTN).
 - 3) A priority call originating in an IP-Cablecom network is required to have a label or some other indication identifying the call as one which should receive priority treatment.
 - 4) Calls with the priority label will receive priority treatment within an IP-Cablecom network.
 - 5) A gateway device (on the IP-Cablecom side) connecting an IP-Cablecom 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.
- 6) A gateway device (on the IP-Cablecom 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 IP-Cablecom network.
 - 7) The priority label of a call that transits an IP-Cablecom network is required to be preserved throughout an IP-Cablecom network.
 - 8) A priority call in transit through an IP-Cablecom network will receive priority treatment in accordance with the capabilities of the IP-Cablecom network.
 - 9) There will be a minimum capability of supporting 1 level of priority treatment within an IP-Cablecom network. Some national options may require more levels (e.g. 5 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 IP-Cablecom network associated with priority treatment may be extensible (e.g. up to 256) to allow for future extensions.
 - 10) Any call entering an IP-Cablecom domain with a priority label from a trusted network (e.g. from the PSTN) will receive priority treatment in the IP-Cablecom 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)*.
