

International regulations of interoperation of the telecommunication networks in emergency situations.

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Abstract:

Information and communications technologies are developing at a breath-taking pace. This process is chiefly characterised by the globalisation of communications. Telecommunication networks play a vital role in emergencies, particularly for health services, public administrations, defence, recovery and other emergency activities. None of these are possible without reliable and available telecommunications. Telecommunications for field operations are often a matter of life or death. In spite of the trend towards globalisation, today's world is fragmented, and each sovereign country has its own system of laws, regulations, standards, and practices. Governments often have difficulties allowing importation and use of (wireless) telecommunication equipment by foreigners and as a result difficult and time-consuming negotiations are often needed. .

1 Introduction

The purpose of emergency communications is to facilitate emergency recovery operations for restoring the community infrastructure and for returning the population to normal living conditions after serious disasters and events, such as floods, earthquakes, terrorist attacks, and hurricanes. Emergency communications may be provided through shared resources from the public telecommunications infrastructure that is evolving from a basic circuit-switched configuration of today's conventional telephone networks to a packet-switched technology providing a richness of communication capabilities. Many challenges and considerations need to be addressed in defining and establishing the functional capabilities to support emergency communications in telecommunications networks.

1.1 Tampere Convention

The Tampere Convention [1] creates an international framework for the provision of telecommunications resources for disaster mitigation and relief between states and between nations and non-governmental organisations (NGOs). The convention urges nations and NGO entities to co-operate in facilitating the use of telecommunications resources in disaster mitigation and relief. It recommends that nations reduce or remove barriers that currently impede the use of telecommunications resources for disaster mitigation and relief operation. Those barriers are the limitation on importation of telecommunication equipment, the trans-border access for telecommunications experts and the use of radio frequency and equipment. The Convention safeguards the privileges, immunities, and facilities afforded to persons providing disaster assistance, and shall not affect the rights and obligations of States Parties deriving from other international agreements or international law (Tampere Convention Article 10).

In the context of the International Decade for “Natural Disaster Reduction” declared by the United Nations in 1990, the urgent need for an international approach to emergency telecommunications was acknowledged. A group of disaster communication experts who attended. During the 1991 Conference on Disaster Communications in Tampere, Finland, a group of disaster communication experts, agreed on the Tampere Declaration. A second Tampere Conference on Disaster Communications was held in Tampere, Finland, 28-30 May 2001. The Conference urged nations to work towards the earliest possible ratification, acceptance, approval or final signature of the Tampere Convention by the appropriate national authorities. Furthermore the international and regional organisations were invited to include in their agenda the application of the Tampere Convention by their respective nations.

This Convention shall be open for signature by all States, which are members of the United Nations or the International Telecommunication Union at the Intergovernmental Conference on Emergency Telecommunications in Tampere on 18 June 1998, and thereafter at the headquarters of the United Nations, New York, from 22 June 1998 to 21 June 2003.

1.2 Emergency Communications Objectives and Requirements

Fully comprehensive emergency communications need to have a richness of capabilities to support a variety of operational requirements for emergency recovery forces. The following is a list of specific features that could potentially facilitate communications for disaster recovery activities:

- a) Rapid authentication of authorised users
- b) Security protection of traffic

- c) Preferential access to telecommunications facilities
- d) Preferential establishment of communications
- e) Preferential routing of traffic
- f) Preferential use of remaining operational resources for traffic
- g) Preferential completion of traffic to destination
- h) Optional pre-emption of non-emergency traffic
- i) Allowable degradation of service quality for traffic, as infrastructure resources become unavailable
- j) Interchange of critical telecommunications service management information

Communication networks are a vital part of recovery and help functions, but they cannot function without an adequate power supply. Solar panels are an obvious choice. [2]

Not all of these features may be immediately possible, practical, or available universally. It focuses on the basic capabilities that need to be addressed and developed. These capabilities could greatly facilitate effective and timely recovery operations during emergency events.

2. Regulations and Standards

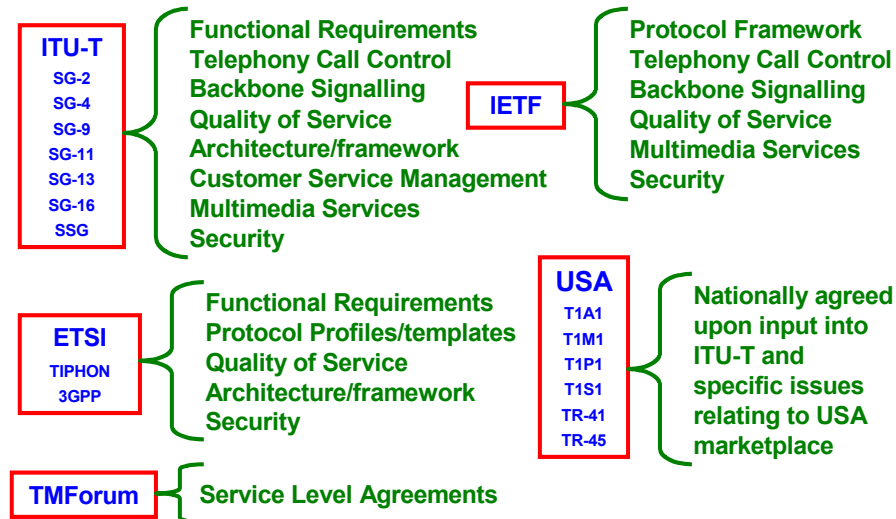
Interoperability and interfacing of services and systems are of paramount importance in emergency telecommunications. Authorities and public safety organizations must be able to communicate across services, and ideally also across borders, to ensure the efficiency and safety of their personnel. Dedicated equipment and priority access are other crucial requirements. Public networks can quickly become saturated in an emergency situation. Standards are needed to make all this possible, so the main task establishing a comprehensive family of standards for Emergency Telecommunications Services (ETS).

Furthermore, recent resolutions in bodies such as the ITU Telecommunication Standards Advisory Group (TSAG), the Global Telecommunications Standards Collaboration (GTSC), the Asia-Pacific Standardization Program (ASTAP) and various ETSI Technical Bodies (in relation to work on Next Generation Networks), as well as the results of the 2002 ETSI EMTEL workshop, all

highlight the need for a coordinated approach to emergency communications. The concept of Emergency Telecommunications (EMTEL) addresses a broad spectrum of aspects related to the provisioning of telecommunications services in emergency situations.

This effort is being worked in cooperation with the telecommunications industry in major national and international standards bodies. This effort addresses the issues of mechanisms in the new protocols and signalling systems to support priority services for preferential handling of ETS communications. This is a multidimensional effort addressing myriad issues that will ensure the provision of a comprehensive and effective ETS in future networks. The issues for transition during a period of convergence from today's telecommunication services to an all packet-based infrastructure of the future are also being addressed. The figure below summarizes the standards activities and issues of focus that are being pursued.

Issues Being Pursued



3. Industry Standards Development Organizations

3.1 International Telecommunication Union, Telecommunication Standardization Sector (ITU-T)

ITU-T [3] – Seven Study Groups have been identified that address various issues related to development of effective and comprehensive standards for the Emergency Telecommunications Service (ETS). Each Study Group has a different, but specific focus of work. The areas of interest in each Study Group are:

Study Group 2 – Operational aspects of service provision, networks and performance.

Study Group 4 – Telecommunication Management, including Telecommunication Management Network (TMN).

Study Group 9 – Integrated broadband cable networks and television and sound transmission.

Study Group 11 – Signalling requirements and protocols. SG11 deals with basic signalling systems for telecommunication networks.

Study Group 13 – Multi-protocol and IP-based Networks and their Internetworking.

Study Group 16 – Multimedia services, systems and terminals. SG16 deals with all aspects of multimedia communications including IP-telephony.

Special Study Group (SSG) – Special Study Group "IMT-2000 and Beyond". The SSG deals with the network aspects of the next generation of standards for wireless communication services.

3.2 Internet Engineering Task Force (IETF)

The IETF is an international activity 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. Several ETS-related contributions have been submitted in the form of Internet-Drafts (IDs). The first ID proposes a framework for various protocols for call control and backbone signalling to support ETS communications. The second ID proposes how the specifications for security should be applied to ETS communications to support

authentication and integrity of sessions. The third ID is the ETS white paper, *Emergency Telecommunications Service in Next-Generation Networks*. The fourth ID is proposal for an ETS class of traffic to be identified in the Real Time Protocol (RTP).

3.3 European Telecommunications Standards Institute (ETSI)

ETSI has opened some of their areas of work as international activities. One area is Project TIPHON (Telecommunication and Internet Protocol Harmonization over Networks) to deal with interworking issues during the period of convergence when the Public Switched Telephone Network (PSTN) transitions to an IP-based packet infrastructure. The other area is Project 3GPP (Third Generation Project Partnership) is dealing with development of the future wireless standards.

In the Project TIPHON work, the requirements for the ETS have been successfully introduced and adopted. TIPHON works in progressive stages called Releases. A major Work Item (WI) has been approved for the ETS issues in Release 4 and Release 5. The ETS WI calls for development of a two-part document: Part 1 specifies the requirements for a comprehensive and global, and Part 2 will be a detailed systems description of how the ETS requirements are being fulfilled by specific standards.

The Project 3GPP work is a very intensive and extensive activity to develop a new family of standards for the next-generation wireless capabilities. The project successfully introduced the ETS requirements into a 3GPP work item. Upon completion of this work, it is anticipated that change requests to existing GSM and 3G standards and work items will be initiated to satisfy ETS requirements.

3.4 USA Standards Activities

The primary participation in the USA standards activities is to reach a national consensus on the many issues that are being introduced into the international standards bodies. As this work is being done in partnership with the US telecommunications industry, it is imperative that a common understanding of the issues is reached and participation in the international work is consistent. There are a lot of groups working in the projects. T1 is the North American body to support standardization in the telecommunications industry. This activity is sponsored by the American National Standards Institute (ANSI). T1 has a number of subcommittees that address many issues for the ETS.

3.5 TeleManagement Forum (TMForum)

The TMForum is a large industry consortium with a membership of approximately 250 organizations from over 30 countries. The Forum specifically addresses implementation and interoperability issues of the operating support systems (OSS) for management operations of the telecommunications infrastructure. One Forum activity of significant interest to the ETS work is the development of an industry handbook for Service Level Agreements (SLA). This handbook provides a mechanism to clearly address Quality of Service issues and certain responsibilities of both service providers and service customers with respect to “delivered services” and customer requirements in the new emerging telecommunications environment. The services will be obtained for supporting emergency recovery operations.

Conclusions

Coordinated standardization activities are necessary, not only between those technical committees within a Standards Development Organization (SDO) that address the various telecommunications solutions that support emergency telecommunications, but also in the form of collaboration between the various SDOs. The comprehensive family of industry standards for an effective ETS are established, the basic groundwork has now been laid. However, there is still much to be done through effective use of limited resources and good cooperation with industry.

References

- [1] Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations (Conference on Emergency Telecommunications, ICET-98, 1998, Genf)
- [2] Dr. Turmezei Péter – Dr. Nemcsics Ákos: Solar Cell Structures Suitable for Military Applications, International Conference on Robot Warfare, Budapest, April 2001, Hadtudományi Tájékoztató 2001/7. pp. 132-138
- [3] Draft new Recommendation Y.roec Framework(s) on Network Requirements and Capabilities To Support Emergency Communications Over Evolving Circuit Switched and Packet Switched Networks