Date: 28 September 2007
Original: English

Document 2/2-E

Contribution to the Second Meeting of the Internet Governance Forum

Summary of ITU-T activities on standardization for Emergency Telecommunications

Summary

ITU, with its competence and technical expertise, is committed to cooperating with ITU members, UN family organizations, the private sector, the scientific community and civil society in a joint effort to develop an integrated early warning system based on modern technologies. ITU's work takes into account the fact that ICTs can save lives regardless of the nature of the disaster, or where it takes place. This is documented in Resolution 136 from the ITU's Plenipotentiary Conference (*The use of telecommunications/information and communication technologies for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief*)

In ITU-T, the Telecommunication Standardization Sector of ITU, technical standards (Recommendations in ITU parlance) have been developed to allow networks to provide facilities needed for Early Warning and Disaster Relief. This document contains a summary of the ITU-T activities relating to telecommunications for disaster relief and early warning (TDR/EW).

1 ITU-T activities on Standardization for Emergency Telecommunications

Although ITU-T is not involved in emergency and disaster relief operations per se, it develops Recommendations that are fundamental to the implementation of interoperable systems and telecommunication facilities that will allow relief workers to smoothly deploy telecom equipment and services. Supplementary information material has also been produced by some of the study groups. In addition, substantial effort has been put into coordination and collaboration with other bodies, including the organization of workshops in 2002 and 2006.

At the Telecommunication Standardization Advisory Group (TSAG) meeting held in Geneva, 7-11 November 2005, a coordinating focal point was defined in ITU-T by designating ITU-T Study Group 2 as the *Lead Study Group for Telecommunication for Disaster Relief/Early Warning*.

1.1 Partnership Coordination Panel on TDR

In order to better support and coordinate its standardization work relating to emergency telecommunications, ITU-T has established a coordination group called the Partnership Coordination Panel on Telecommunications for Disaster Relief (PCT-TDR) as a follow-up action from the ITU-T Workshop on Telecommunications for Disaster Relief (Geneva, 17-19 February 2003; see http://itu.int/ITU-T/worksem/ets). The home page of this group is found at http://itu.int/ITU-T/special-projects/pcptdr.

The PCP-TDR gathers people working with standardization of telecommunications technologies for disaster relief (ITU, ISO, OASIS, etc) and representatives of relief organizations, such as the United Nations High Commissariat for Refugees (UN-HCR), the UN Office for Coordination of Humanitarian Affairs (UN-OCHA), the International Federation of the Red Cross and Red Crescent (IFRC), and Telecoms Sans Frontière (TSF).

1.2 Technical documents for emergency telecommunications

A number of Recommendations have been developed for call priority schemes that ensure that relief workers can get communication lines when they need to. For example E.106 defines the International Emergency Preference Scheme (IEPS), which aims to provide authorised emergency personnel a higher probability of successful communication using the PSTN under high network load conditions, such as those that might occur in an emergency. There are also Recommendations that extend call priority to IP-based systems designed by ITU, such as H.323 and IPCablecom. Telecom network management in emergency situations is dealt with in M.3350, and a Framework for support of emergency communications in the Next Generation Network is found in Y.1271. A further Recommendation, Y.NGN-ET-Tech, on technical issues for emergency telecommunications in Next Generation Networks is being progressed by ITU-T Study Group 13. The intent is to fulfil the requirements and capabilities for emergency telecommunications as specified in Y.2201, indicating what features and mechanisms of an NGN may be used to facilitate the requirements of emergency telecommunications and early warning. ITU-T Study Group 11 is currently working on documents expressing the signalling requirements for Emergency Telecommunication Service (ETS) and for Telecommunication for Disaster Relief (TDR) in IP networks.

Complementary to the need to provide call priority during emergencies is the ability to deliver warnings to users. The new Recommendation H.460.21 provides a message broadcast mechanism in H.323 systems, which are widely deployed worldwide for Voice over IP (VoIP) communications. This mechanism is akin to that of Cell Broadcast for mobile systems and can be used by network operators and service providers to deliver early warning messages to a large number of users on an administrative domain without causing overload of the underlying network infrastructure. ITU-T Study Group 2 initiated work in February 2007 on possible standardization of numbering resources used for the GSM Cell Broadcast service. Additionally, the Common Alert Protocol (CAP) was adopted as ITU-T Recommendation X.1303, which is based on the OASIS CAP v1.1 specification. The ITU-T Focus Group on IPTV has recently included in the draft IPTV service requirement specification the support for emergency alert services.

Enhancements were recently introduced in a number of multimedia system Recommendations to allow transparent signalling of IEPS call priority (H.225.0 and H.460.4). New E.107 concerning Emergency Telecommunications Service (ETS) and Interconnection Framework for National Implementations of ETS has been recently approved.

Additionally, ITU-T Study Group 2 has agreed to the allocation of a special country code to be managed by the United Nations Office for Coordination of Humanitarian Affairs (OCHA) for efficient communications in support of response efforts to disasters. Following up on advice from ITU-T Study Group 2, the Director of TSB has assigned E.164 country code 888 to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) for the purpose of facilitating the provision of an international system of naming and addressing for terminals involved in disaster relief activities in an area of a country that has been cut off from the national telecommunications system of that country. In addition, the Mobile Network Code (MNC) 88 under the E.212 shared Mobile Country Code 901 has been assigned to OCHA for the same purposes. This separate, alternate naming and addressing system will continue in operation until such time as normal telecommunications can be restored and the disaster location is once more part of the national telecommunications infrastructure. The use of any numbering resource will therefore be relatively short lived and the resource may be re-used at a later date for another location. Subsequent digits of the codes (for example, identification codes under the E.164 code) will be allocated and administered by OCHA. The numbering resources are assigned solely for the use of UN emergency responders and not for other purposes. The commercial aspects of the use of the numbering resource will be negotiated between OCHA and the appropriate operators and service providers.

1.3 Joint ITU-T and OASIS event on ICT Standards for Public Warning

ITU-T hosted a Workshop and Demonstration of Advances in ICT Standards for Public Warning in collaboration with the OASIS (Organization for the Advancement of Structured Information Standards) at the ITU headquarters in Geneva, 19-20 October 2006. The event aimed at

- To review progress concerning public warning since 2003, including the Tampere Convention

- To demonstrate the availability and effectiveness of interoperable technologies based on the OASIS Common Alerting Protocol (CAP) content standard which is applicable to all alerts and notifications in disasters and emergency situations
- To identify existing standardization gaps, including authorization and authentication of public warnings and the attendant implications for public policy
- To prepare an action list for filling gaps and promoting public warning standardization, and identify key players that could collaborate in such work.

The presentations, report and other information of the event are publicly available and can be found at: http://itu.int/ITU-T/worksem/ictspw.

1.4 ITU-T Action Plan

ITU-T has also created an *ITU-T Action Plan for Standardization on Telecommunications for Disaster Relief and Early Warning (TDR/EW)*, motivated by the identification of the need for new telecommunication standards following the Indian Ocean tsunami of December 2004. The latest version can be found at http://itu.int/ITU-T/emergencytelecoms/plan-tdrew.html.

All Study Groups were encouraged to increase their activities in the definition of Recommendations and other materials (e.g. handbooks) on emergency telecommunications and to provide feedback to the Telecommunication Standardization Advisory Group (TSAG) and ITU-T Study Group 2 (which is to coordinate the effort) on actions taken and on proposals for improvement to the Action Plan.

2. Summary of ITU-T materials addressing emergency telecommunications

As of the date of publication of this compendium, the following are the ITU-T Recommendations that specifically address emergency telecommunications:

- ITU-T Rec. E.106, "International Emergency Preference Scheme for disaster relief operations (IEPS)"
- ITU-T Rec. E.107, "Emergency Telecommunications Service (ETS) and Interconnection Framework for National Implementations of ETS"
- ITU-T H.246 Amendment 1 "Mapping of user priority level and country/international network of call origination between H.225 and ISUP"
- ITU-T Rec. H.248.44 "Gateway control protocol: Multi-Level Precedence and Pre-emption Package"
- ITU-T Rec. H.460.4, "Call priority designation and country/international network of call origination identification for H.323 priority calls"
- ITU-T Rec. H.460.14, "Support for Multi-Level Precedence and Preemption (MLPP) within H.323 Systems"
- ITU-T Rec. H.460.21 "Message broadcast for H.323 systems"
- ITU-T Rec. J.260, "Requirements for Emergency/Disaster Communications over IPCablecom Networks"
- ITU-T Rec. M.3350, "TMN service management requirements for information interchange across the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)"
- Signalling for IEPS support in ISUP: Q.761 Amd.3, Q.762 Amd.3, Q.763 Amd.4, and Q.764 Amd.4
- Signalling for IEPS support in BICC: Q.1902.1 Amd.2, Q.1902.2 Amd.3, Q.1902.3 Amd.3, and Q.1902.4 Amd.3
- Signalling for IEPS support in CBC: Q.1950 Amd.1 Annex G
- Signalling for IEPS support in ATM AAL2: Q.2630.3 Amd.1
- Signalling for IEPS support in DSS2: Q.2931 Amd.5

- ITU-T Rec. X.1303, "Common Alerting Protocol (CAP V1.1)"
- ITU-T Rec. Y.1271, "Framework(s) on network requirements and capabilities to support emergency communications over evolving circuit-switched and packed-switched networks"

In addition to these Recommendations, there are two non-normative publications:

- Supplement 47 to ITU-T Q-series Recommendations, "Emergency services for IMT-2000 networks – Requirements for harmonization and convergence"
- Supplement 53 to ITU-T Q-series Recommendations "Signalling requirements to support the International Emergency Preferential Scheme (IEPS)"

In the near future, it is expected that a number of new Recommendations and Supplements will be approved:

- Draft new ITU-T Rec. Y.NGN-ET-Tech "Next Generation Networks - Emergency Telecommunications – Technical Considerations"
- Draft new ITU-T Rec. J.pref - "Specifications for preferential telecommunications over IPCablecom networks"
- Draft new ITU-T Rec. J.preffr "Framework for implementing preferential telecommunications in IPCablecom networks"
- Draft new Supplements to the Q-series:
    - Q.Sup.ETS "Signalling Requirements to support the Emergency Telecommunication Service (ETS) in IP Networks"
    - Q.Sup.TDR "Signalling Requirements to support the Telecommunication for Disaster Relief (TDR) in IP Networks"
- Draft new Supplements to the H-series:
    - H.Sup.ETS/IEPS "Gateway Control Protocol: Operation of H.248 with H.225, SIP, and ISUP in Support of Emergency Telecommunications Service (ETS)/International Emergency"

3. Challenges for the future

ITU-T has taken note of the report from the Second Phase of the World Summit on the Information Society (WSIS), in particular in §91 of the *Tunis Agenda for the Information Society* (concerning the important role of ICTs for disaster early warning, management and emergency communications) and the other relevant discussions. ITU-T will contribute to the international efforts aiming at implementing those requests.

ITU's overall strategy is to promote the use of ICT for multi-hazard preparedness, response and relief and to ensure that current efforts to establish early warning systems take into account the need for reliable telecommunications networks that provide a variety of channels of communication for the timely dissemination of information.

It is generally agreed that the most effective approach to telecommunication deployment should be highly focused, taking into account four distinct communication channels:

First, **citizen to authority**: ITU-T's focus here has been on providing last mile solutions. These are solutions that facilitate communications between citizens and authorities in times of emergency. For example, special numbers such as 911 in North America or 112 in Europe, which provide instant connections to emergency response teams. While this may provide some regulatory challenges, these can be overcome with conditions on telecommunication licensing.

Next, communications from **authority to authority**: Ways need to be found to facilitate communications between the national and international agencies involved in disaster management in order to maximize and coordinate relief efforts. For example, radio communications between police and fire brigades, and communications from field health workers to monitoring centres.

Thirdly, **authority to citizen**. This may be the most critical communication step of all, if citizens are to be warned of an impending disaster and to get instructions on what they should

do. Radio and television broadcasts, Internet web sites, and perhaps SMS / cell broadcast messages to mobile phones, can all play an important role here.

Finally, **citizen to citizen**: one must also address the social concerns of those in the affected regions, as well as the anxiety of their relatives who want information as to their health and safety. Again, radio and television, the Internet and mobile telephony are critical methods to address this need.

ITU-T will continue to pursue its core mission of delivering Recommendations that will allow systems developers to add, in an interoperable and consistent fashion, facilities to their systems that will be able to reliably respond to emergency situations.

In the context of standardization, it is necessary to define, together with relevant partners, the extensions or add-ons to enable emergency telecommunications in already deployed telecommunication systems and networks, such as PSTN, ISDN, and IP-based networks, solutions based on globally accepted standards. With regards to new systems such as NGN, they should have built-in features that natively support emergency telecommunications needs using globally defined telecommunications standards.

Concerning early warning systems, most of the issues faced in their design depend on existing systems, this requiring some system integration from the technical point of view. Issues such as types of sensors, location, information needed (i.e. sea bottom maps), models, etc, are usually well understood, but not yet well coordinated or elaborated. There are other issues that need to be taken into account, including understanding the hazards and traditional solutions at local level, dissemination, and capacity building. These have important telecommunications components, either from the infrastructure aspect or from the “tools” aspect (e.g. videoconferencing). In terms of standardization, these could lead to system-specific add-ons or framework recommendations. *The High-Level Expert Meeting on Technical Options for Disaster Management Systems: Tsunamis and Others*, UNESCAP, Bangkok, June 2005 recognized the importance to use true consensus-based international standards, as opposed to *lattu sensu* standards.

Even though outside of the scope of standardization work per se, appropriate regulatory frameworks are needed to facilitate the deployment and use of telecommunication equipment for disaster relief. While this is within the mandate of the ITU Development Sector, ITU-T is committed to contribute with its technical expertise when necessary.

As the Sector goes ahead with its standardization work, it will need support from members that can provide invaluable input of the general requirements and deployment scenarios.

In addition to its standardization activities, ITU-T will pursue promotion of awareness of its related deliverables, including the expected organization of future workshops involving key stakeholders. ITU-T will continue to cooperate with the relevant bodies – be it other SDOs, the many related intergovernmental organizations, NGOs, and Member States, in addition of course to ITU-D and ITU-R. For this, via the PCP-TDR, ITU-T intends to bring closer user groups that would not normally participate in our standards-setting process – as they have actual experience and will certainly contribute to the development of meaningful technical standards.