Report on the Second Plenary Meeting of ITU-T SG2 Standardization of Telecommunication Numbering

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Abstract

The second plenary meeting of the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) Study Group (SG) 2 for the 2022–2024 study period was held virtually from March 13th to 22nd, 2023 with 137 participants from 42 countries. SG2 consists of Working Party (WP) 1, which standardizes numbers and identifiers, and WP2, which standardizes network management. In this article, we report on the status of WP1. As telecommunications services progress, SG2's activities related to numbers and identifiers have become broader. We categorize them into nine issues and report on the status of activities for each issue.

Keywords: telecommunication numbering, international mobile subscriber identity, telephone number mapping

1. Issues addressed by Working Party 1

The issues addressed by Working Party (WP) 1 of the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) Study Group (SG) 2 can be classified into (1) Numbering plan, (2) International mobile subscriber identity (IMSI)/subscriber identification module (SIM) related, (3) Proper use of numbers, (4) Number-recommendation maintenance, management, and allocation, (5) Porting/switching, (6) Interworking, (7) E.164 Number Mapping (ENUM), (8) Disaster calls/emergency calls, and (9) Others. We report on the status of the activities for each issue.

1.1 Numbering plan

This category involves creating a numbering plan for international telecommunications services and creating various regulations such as requirements for allocating number resources.

In the previous study period, SG2 created the new work item E.IoT-NNAI (see **Table 1**) to define and allocate Internet of Things (IoT) numbers to cope with the worldwide rapid increase in the use of numbers for IoT services. Initially, consideration was made with eCall as the main use case, which allows vehicles to use emergency call services no matter where they are located in Europe, and a basic number structure proposal has already been submitted. However, before waiting for E.IoT-NNAI to become a recommendation, many international network operators aiming to provide global IoT services use existing international numbers (International ITU-T E.164-number for Networks). At the interim meeting (held in July 2023) after the second SG2 plenary meeting, a proposal was submitted suggesting that the existing international network numbers starting with 883 be redefined as IoT numbers in a manner consistent with the services already introduced. The limit of the international number length is up to 15 digits. Therefore, the main issue of this change is how to reuse the international numbers for existing

Table 1.   List of draft recommendations (WP1 related).

Grouping	Recommendation number	Recommendation title	Editor's country
Numbering plan	E.IoT-NNAI	Internet of Things Naming Numbering Addressing and Identifiers	UK
IMSI/SIM related	E.212	The international identification plan for public networks and subscriptions	—(No issues currently under consideration)
	E.118	The international telecommunications charge card	Italy
	E.118.1 (E.GAIN)	ITU-T Management of the allocation of globally assigned Issuer Identifier Numbers (IINs)	UK
Proper use of numbers	E.156	Guidelines for ITU-T action on reported misuse of ITU-T E.164 number resources	India
	TR.MMWF	Methodologies to Mitigate Wangiri Fraud	Sudan
	TR.OTTnum	Current use of E.164 numbers as identifiers for OTTs	UAE, US
	E.ACP	Alternative calling procedures	Egypt
	TR.PCM	Permitted call masking	Egypt
	TR.SPN	Spoofing using national number	Egypt
Number-recommendation maintenance, management, and allocation	E.164.1	Criteria and procedures for the reservation, assignment, and reclamation of E.164 country codes and associated identification codes (IC)	UK
	E.190	Principles and responsibilities for the management, assignment and reclamation of E-series international numbering resources	UK
	E.1120 (E.gap)	ITU-T E.Global NNAI Assignment Processes	UK
	E.Audit	Mechanisms and processes for audits of the assignment of global naming, numbering, addressing and identification processes	UK
Porting/switching	E.164 Supplement 2	Number Portability	Japan
	TR.Carrier-Switching	Carrier Switching	UK, India
Interworking	E.370	Service principles when public circuit-switched international telecommunication networks interwork with IP-based networks	Egypt
ENUM	E.ENUMINF	Differentiating between ENUM and Infrastructure ENUM	UAE
Disaster calls/emergency calls	Not yet determined	Artificial Intelligence for Natural Disaster Management (anonym)	Germany (FG AI4NDM Chair)

networks while using previous studies that have enabled the number capacity for IoT numbers to be secured and various services to be selected. The next discussions are scheduled to take place at the third plenary meeting in November 2023.

1.2   IMSI/SIM related

This category includes IMSI, which identifies subscribers of mobile phone terminals, and issuer identifier number (IIN), which identifies SIM card issuers.

1.2.1   IMSI issues

IMSI is assigned on the basis of the provisions of Recommendation E.212 (the international identification plan for public networks and subscriptions) and is written to the SIM of a mobile phone. Regarding IMSI, which takes global IoT into account, the issue of how to expand capacity was discussed in the previous study period within the constraints of the IMSI

length, which is a maximum of 15 digits, like the international number length. Options for capacity expansion included no changes, format extensions, new non-backwards compatible schemes, and hexadecimal coding. However, it is expected that implementation of capacity expansion will be difficult, and although it is difficult to accurately predict the future increase in IoT services, it was determined that there is currently a large number of resources available for new applications. Therefore, it has been decided that there will be no change, and that usage will be analyzed at every SG2 meeting.

1.2.2   IIN assignment

In this study period, SG2 focuses on examining IIN issues. IIN is the issuer number of the SIM card and assigned on the basis of the provisions of Recommendation E.118 (see Table 1). IIN complies with International Organization for Standardization/International

Electrotechnical Commission (ISO/IEC) 7812 card regulations, and the major industry identifier is a number starting with 89, which is specified for telecommunications purposes. IINs had been allocated by each country's numbering authority, but with the development of global services, it is now necessary to directly allocate IINs for global use from the Telecommunication Standardization Bureau (TSB), so Recommendation E.118.1 (see Table 1) was created and approved at the second plenary meeting.

Regarding Recommendation E.118, a revised draft that incorporates the latest information was proposed at the interim meeting (held in July 2023), and discussions are scheduled for the third plenary meeting in November 2023.

1.3 Proper use of numbers

This category involves proper number usage to deal with the misuse of numbers. Most contributions submitted to SG2 are related to this issue. With the shift to Internet protocol (IP) networks and the increase in over-the-top (OTT) services, problems such as calling-number spoofing and unauthorized call-routing changes aimed at changing billing are occurring frequently on an international basis. In particular, there has been an increase in the number of contributions submitted from developing countries, which have suffered a lot of harm, and this has become one of the most important issues for SG2.

1.3.1 Number-misuse reporting guidelines

This issue involves the revision of Recommendation E.156 (see Table 1), which stipulates the procedure for reporting to the TSB and the guidelines for actions to be taken by the TSB when problems caused by misuse of number resources occur. At the first plenary meeting in May 2022, improvements to the misuse-report form and consistency with Resolution 61 (Countermeasures against misuse of international numbers) were discussed, and editors from India continued to discuss the baseline texts. Suggestions were also made to update the text description, and the draft recommendation was revised accordingly.

1.3.2 Wangiri countermeasures

This issue involves the formulation of a technical report, TR.MMWF (see Table 1), which examines countermeasures against Wangiri fraud. The goal was to reach an agreement at the second plenary meeting, but the distributed ledger technology platform, one of the 18 items listed as countermeasures, was determined to be reconsidered from the perspective of quick response. Comments were also made regarding consistency of the content as a whole should be

achieved, and that editorial corrections such as the unification of abbreviations are needed. Therefore, the agreement was postponed until the next plenary meeting.

1.3.3 Using E.164 numbers for OTTs

The use of numbers in OTT services is also included in the appropriate use of numbers, and the technical report TR.OTTnum (see Table 1) on how to use E.164 numbers as identifiers in OTT services is being considered. At this meeting, progress was made toward completion on the basis of the output documents from the drafting meeting held in January 2023.

To advance the consideration of this issue, NTT submitted a contribution classifying use cases for the use of E.164 numbers for OTTs at the first and second plenary meetings. While there was an opinion that it was beyond the scope of this technical report, there were also opinions that the content was extremely useful and should be used. In response, at the interim meeting (held in July 2023), NTT proposed the use of the content in new work items. It was also agreed to continue discussions on the relationship with existing work items, etc. in preparation for the third plenary meeting in November 2023.

1.3.4 Selective-call setup procedure

This issue involves the creation of a new recommendation, E.ACP (see Table 1). Alternative calling procedures (ACP) are different international connections from normal public switched telephone network/public land mobile network (PSTN/PLMN) interworking. ACP uses, for example, OTT applications, interworking with IP networks, SIMboxes, and international callbacks. It is a form of communication that significantly degrades quality of service/quality of experience and performance. Due to international routing being executed using ACP using a different route than usual, many problems have arisen in which international charges are different from those agreed upon internationally. At this meeting, a contribution was submitted from the UK, which pointed out that the ACP that is invalidated differs depending on the regulations of each country. From this perspective, it was agreed that E.ACP should include a requirement to notify the TSB of each country's views and make the information public on bulletin boards, etc.

1.3.5 Other issues

There was a proposal from Sudan stating that reexamination is necessary on TR.SPN approved in 2021 (see Table 1) from the viewpoint of whether it includes, for example, neighbor spoofing using numbers in the vicinity of the called user. In response to

this, it was decided to proceed with the revision process, and requests were made to submit contributions with information on the status of spoofing in each country.

The issue of permissible call masking is targeted for preparation in the technical report TR.PCM (see Table 1), but there was no discussion at this meeting.

1.4 Number-recommendation maintenance, management, and allocation

This category involves revising the recommendations necessary for number assignment, etc. Although many recommendations are being reviewed, the following two issues are of particular interest.

1.4.1 Integration of global NNAI-allocation-process description

This issue involves the creation of a new recommendation, E.gap (see Table 1). From the perspective of ease of understanding number application and allocation procedures, collection of process descriptions in one place is done from related recommendations E.164, E.212, E.118, E.118.1, and E.218. This draft recommendation was approved for Determination at this meeting and given Recommendation Number E.1120, and is scheduled to be approved as a recommendation at the third plenary meeting after going through the Traditional Approval Process consultation.

1.4.2 Audit after international-number-resource allocation

This issue involves the creation of a new recommendation, E.audit (see Table 1). E-series number assignment is based on Recommendation E.190 (see Table 1), but there was no recommendation that stipulated number management after assignment. Therefore, the creation of a new work item with the aim of stipulating the implementation of audits of the usage status of number resources by TSB or ITU-T SG2 number experts in light of the number-resource-allocation requirements was approved at this meeting.

1.4.3 Other issues

At the interim meeting (held in July 2023), discussions regarding the revision of Recommendation E.190 (see Table 1), which stipulates principles and responsibilities of the management, allocation, and reuse of international number resources were made and planned for discussion at the next plenary meeting.

1.5 Porting/switching

This category involves the revision of E.164 Supplement 2 (see Table 1) regarding number portability.

This category also involves the creation of TR.Carrier-Switching (Table 1), which stipulates procedures for changing carriers (carrier switching) by IoT service providers.

At the interim meeting (held in July 2023), NTT, the editor of E.164 Supplement 2, submitted a contribution to consider number portability in IoT services. This proposal is considered useful for the revision of E.164 Supplement 2 and creation of E.IoT-NNAI, and it will continue to be discussed at the third plenary meeting in November 2023.

Regarding TR.Carrier-Switching, the UK and India are currently working as editors, but there was no discussion at this meeting, and contributions were requested for the next meeting.

1.6 Interworking

This is a category that stipulates service principles when interconnecting public-switched international telecommunications networks and IP-based networks and aims to revise Recommendation E.370 (see Table 1).

This is a recommendation regarding services when international networks, such as PSTN, integrated services digital network (ISDN), and PLMN, interwork with IP-based networks, and revision work is underway. At this meeting, there was a discussion on whether the notation "OTT" should be included in the revised draft of E.370 regarding the structure of international networks, and it was decided to continue the discussion at the third plenary meeting in November 2023.

1.7 ENUM

This category stipulates ENUM, a function that maps telephone numbers and Internet addresses.

The main study issue is to create a new recommendation, E.ENUMINF (see Table 1). The goal is to create a clear description for differentiating the original ENUM from Infrastructure ENUM (ENUM-like function), which are being confused in discussions by other SGs.

Another issue with ENUM was raised by Réseaux IP Européens Network Coordination Centre (RIPE NCC), which operates ENUM's top-level domain tier 0 (e164.arpa). Since we received a report from RIPE that only 35 of the 59 tier 1 allocations at the member country level are operated normally, we have decided to check the operating status of ENUM to understand the situation in the countries concerned. The TSB prepared a draft letter asking the authorities to report the operating status of ENUM and decided to proceed

with the discussion at the third plenary meeting in November 2023.

1.8 Disaster calls/emergency calls

Current activities in this category include the Focus Group on Artificial Intelligence for Natural Disaster Management (FG-AI4NDM), which is a group under SG2 that is examining ways to use artificial intelligence (AI) to strengthen resilience from natural disasters.

FG AI4NDM was established under SG2 in December 2020. At this meeting, due to the impact of the coronavirus pandemic on the progress of discussions, it was decided that FG-AI4NDM activities be postponed until March 2024. However, at this meeting several study results were submitted as a formal outcome document. In particular, WG (Work Group)-Comms reported "Communication systems and best practices that utilize AI" and "Best practices for applying AI to communication systems for NDM" as effective communication methods using AI for natural disaster management (NDM). In addition to these best practices, technical studies of specific use cases are progressing in preparation for the final report. As the application of AI to disaster management will be getting more active in each country, attention should be paid to the status of the studies.

1.9 Others

Discussions regarding WTSA (World Telecommunication Standardization Assembly) resolutions are held when issues arise, even if there is no work item for recommendation. Activities, such as international number allocation by Number Coordination Team (NCT), discussion on issues from NCT reports, discussion of measures for resource scarcity in accordance with the allocation status of international number resources, and consulting and other support for domestic numbering plans will be discussed separately from work items.

2. Conclusion

With new developments in telecommunications services and changes in networks, the roles of numbers and identifiers are changing, and the activities of SG2 are becoming broader. SG2 has begun considering activities for the next study period, but there are still many issues that need to be addressed. While considering these trends, SG2 will continue to proactively promote standardization activities related to numbers and identifiers.

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