

## **Question 1/2 – Application of numbering, naming, addressing and identification plans for fixed and mobile telecommunication services**

### **1 Motivation**

Continuation of studies regarding naming, numbering, addressing, and identification resources within the remit of Study Group 2. A significant amount of Q1/2 work throughout a study period is the result of future issues presented by Q1/2 Collaborators. These issues typically resulted in numerous future tasks defined and approved during the previous study periods.

Q1/2 will continue to define, study, and resolve future issues through the approval of additional tasks.

### **2 Question**

How can ITU-T Study Group 2 deal with the issues related to the application of numbering, naming, addressing and identification plans for fixed and mobile telecommunications services including, but not limited to, the Tasks detailed below?

### **3 Tasks**

Tasks include, but are not limited to:

#### **Maintenance of existing ITU-T E-series numbering related Recommendations**

Rationale: This task reviews and revises, where and when appropriate, the existing ITU-T numbering, naming, addressing and identification Recommendations of the ITU-T E-series and F-series, e.g., E.101, E.118, E.129, E.156, E.157, E.164, E.164.1, E.164.2, E.164.3, E.168, E.168.1, E.169, E.169.1, E.169.2, E.169.3, E.190, E.191, E.191.1, E.193, E.195, E.212, E.213, E.214, E.217, E.218, E.370, E.910, E.1100.

This task will ensure that these Recommendations are updated to reflect the current circumstances of the global telecommunications industry and regulatory environment taking into account the requirements of future telecommunication/ICT architectures, capabilities, technologies, applications and services including NGN, IP-based networks or IoT/M2M. As an example, several Recommendations were revised and updated during the last study period. It also includes the development of Recommendations for reporting misuse (Recommendation ITU-T E.156) or providing calling line identity (Recommendation ITU-T E.157). This task also addresses requests for resources described in Recommendations such as ITU-T E.212, E.164 or E.118 resources not covered in any of the tasks below.

#### **UIFN/UIPRN/UISCN registrar coordination**

Rationale: The Question maintains and considers potential evolutions of the use of the resources specified in Recommendations regarding the administration of Universal International Freephone Numbers (UIFN), Universal International Premium Rate Numbers, Universal International Shared Cost Numbers and ITU-T IND ATM End System Addresses (ITU-T AESAs).

Under this task, the Question will consult on an ongoing basis with the Registrar to resolve issues, relative to the above resources and any future resources created in the future, presented by the industry and the Registrar.

#### **Request for numbering resources for future telecommunication/ICT architectures, capabilities, technologies, applications and services**

Rationale: When future global or regional telecommunication/ICT architectures, capabilities, technologies, applications and services are developed and proposed for implementation, they often request/require global numbering resources. This task receives and reviews global numbering resource applications whenever necessary as per WTSA Resolution 20.

This Question will receive, study, and resolve such anticipated requests. Current instances of such requests include IoT/M2M, in-car emergency calling, UPT, UIFS, USCS, GMSS, RMSS, etc.

### **Global evolution of naming, numbering, addressing and identification (NNAI) requirements for telecommunications/ICT architectures capabilities, technologies applications and services**

Rationale: This task will study the evolution of directly assigned global numbering, naming, addressing and identification schemes to accommodate current and future telecommunication/ICT architectures, capabilities, technologies, applications and services. A global understanding of the future use of these methodologies/schemes and their evolution would be of significant value to telecommunications network operators, service providers, vendors, planners, forums, and standards bodies worldwide.

The task would study and document the evolution of numbering, naming, addressing, and identification schemes including the convergence with current and future IP-based systems/networks that also includes the future of NNAI. Additionally, the task would study and analyse NNAI plans that already exist and that are already widely deployed and used; identify mechanisms that permit convergence between these different plans; identify gaps in plans or convergence that need to be addressed, and where appropriate develop future schemes/methodologies.

Specifically, in relation to the future of NNAI there will be a need to revisit issues of personal and terminal mobility, including the concepts of a single terminal being used by multiple subscribers. The future of NNAI studies would also include future and emerging telecommunication/ICT architectures, capabilities, technologies, applications and services.

With regard to geographic location it is anticipated that future IP-based services, future mobile and satellite architectures or IoT/M2M may have additional or different requirements for both terminal and subscriber geographic location compared with existing and legacy systems. This could give rise to the requirement for future numbering, addressing, naming and identification resources or the expanded use of the current NNAI resources.

Undertaking studies into the "future of NNAI" including, for example, requirements related to cloud computing future generations of mobile (including satellite) networks or IoT/M2M.

### **Naming, numbering, addressing and identification for convergence between ITU-T E.164 numbering plan-based networks and IP address-based networks**

Rationale: Convergence of the existing telecommunication networks, both fixed and wireless, with the current and future IP address-based network requires the continuing development of naming, numbering, addressing and identification mechanisms to support this convergence.

The task identifies requirements and develops solutions relating to NNAI for the convergence between the ITU-T E.164 numbering plan-based networks and current and future IP address-based networks. A typical example of such interworking is ENUM, which maps E.164 numbers into Internet identifiers. The development of a solution includes, but is not limited to, the identification of the E.164 resource, the determination of how these resources will be used and administered, the determination of the ITU-T E.164 addressing scheme required to support this type of network, and the determination of which, if any, ITU-T E.164 resources will be made available to IP address-based networks.

In addition, this task will continue identification of future NNAI with respect to the longer term goal of convergence of the naming and addressing schemes used in international telecommunication networks.

The objective is a Recommendation(s), as appropriate, containing the results of the above work.

## **Implementation and activation of ITU-T E.164 numbering resources**

Rationale: The growth of future and existing telecommunication/ICT architectures, capabilities, technologies, applications and services as well as the quantity of network operators and service providers due to the evolution of competition in the telecommunications industry, has resulted in the introduction of numerous new geographic and non-geographic numbering resources domestically, internationally and globally. In order for these resources to be activated effectively, new methods are required to increase awareness and implementation of the resources.

This task will study potential awareness and implementation methods as appropriate and, as a result of the study, will publish these methods in the E-series of Recommendations. The study will include means of identifying better communication of the newly created country codes, assigned ranges under shared codes or their use, alternatives for making the Operational Bulletin more visible and relevant for the evolving telecoms ecosystem, or improvements to the way the current and potentially future methodologies are used.

## **Guidelines for effective and efficient national numbering resources administration**

Rationale: The administration and evolution of national numbering plans involves a diversity of tasks that depends on the approach of the country to its national telecommunications environment (size, geography, regulation, legal framework, structure of the numbering plan, ecosystem of players, etc.). Consideration of such resources to the provision of future telecommunication/ICT architectures, capabilities, technologies, applications and services may benefit from closer cooperation and sharing the experience of the tasks associated with the national environments between the numbering plan administrations.

This task will consider typical elements to be considered for structuring and administering national numbering plans and possibly define good common practices and guidelines for national numbering plan administrators.

## **Number portability**

Rationale: Update the existing Number Portability Supplement to include the necessary technical requirement for the introduction of number portability, including with respect to IP address-based networks and current and future IP based technologies.

## **Future applications for naming, numbering, addressing and identification**

Rationale: Over the past few years there has been a growing interest for global resources, including for machine to machine (M2M) services, that are not tied to a particular country but have a global outreach. Such capabilities, applications and services include (but are not limited to) container tracking, embedded SIMs in various vehicles and machines ("xeroxes", vending machines, etc.), extra-territorial use of resources. A number of M2M service providers, however, rely on global resources in general, and MCC 901 in particular, to deploy such services. Additionally, future types of applications may require NNAI resources (e.g., E.212 MCC + MNC and E.164 CC+IC), both on global and national levels. These types of capabilities, applications and services will put future demands on NNAI resources.

The study will continue to evaluate the applications, the associated risks of exhaustion for the NNAI resources along with mitigation measures and provide guidelines to Administrations on the use of national or globally assigned NNAI resources. The study will also consider means of monitoring the use of the global resources to ensure such resources are used according to their assignments. This will include specification of tools to make such resources globally reachable whenever necessary, templates for assignees to report on the use of such resources, including notification of future use cases, as well as templates for publishing national numbering plan information.

## Definitions

Rationale: This task provides terms and definitions for use in the field of identifiers (e.g., names, numbers, addresses and identifiers (IDs)) for public telecommunication services and networks. Consistent terminology is seen as an important factor in ITU-T Recommendations. For the area covering Identifiers, there are important Recommendations in the E- and F-series, but also in the Q- and X-series. In this task, these terms and definitions have been developed, for the most part, from the practice of the use of IDs in traditional telephone networks such as PSTN, ISDN and PLMN-based networks (e.g., 4G and 5G). These terms will continue to be applicable with their current definitions for future telecommunication/ICT architectures, capabilities, technologies, applications and services that includes NGNs, PLMNs for future generations of mobile (including satellite) and future IP-based networks.

An up-to-date status of work under this Question is contained in the SG2 work programme ([https://itu.int/ITU-T/workprog/wp\\_search.aspx?sp=17&q=1/2](https://itu.int/ITU-T/workprog/wp_search.aspx?sp=17&q=1/2)).

Recommendations and Supplements under responsibility of this Question: ITU-T E.101, E.118, E.112, E.129, E.156, E.157, E.164, E.164.1, E.164.2, E.164.3, E.168, E.168.1, E.169, E.169.1, E.169.2, E.169.3, E.190, E.191, E.191.1, E.193, E.195, E.212, E.213, E.214, E.217, E.218, E.370, E.910, E.1100, E.1110.

Texts under development: E.118, E.157, E.164.1, E.A-ENUM, E.A-N/GoC, E.disab, E.ENUMINF, E.IoT-NNAI, E.sup.OTTnum, E.sup.spoofing to E.157, TR.EENM, TR.G4Dir, TR.OTTnum, TR.TRAFGR.

## 4 Relationships

### WSIS Action Lines:

- C2, C6, C10.

### Sustainable Development Goals:

- 9, 10, 11.

### Recommendations:

- N/A

### Questions:

- N/A

### Study Groups:

- N/A

### Standardization bodies:

- N/A