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SERIES E: OVERALL NETWORK OPERATION, TELEPHONE SERVICE, SERVICE OPERATION AND HUMAN FACTORS

International routing plan

Routing of calls when using international network routing addresses

ITU-T Recommendation E.353

(Formerly CCITT Recommendation)

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ITU-T Recommendation E.353

Routing of calls when using international network routing addresses

Summary

To be able to meet the increasing demand of efficient utilization of numbering resources and to satisfy operational needs which will arise according to deregulation of the telecommunication market, there is a need to create an International Network Routing Addressing system.

Without such an addressing system operators may need to allocate dedicated routing numbers (series) from the E.164 numbering plan for certain types of calls, e.g. calls to global services, due to national regulation and bilateral agreements.

This Recommendation proposes formats for the International Network Routing Addresses, the Serving Service Provider Identification and provides guidance on how to route calls when using International Network Routing Addresses.

Source

ITU-T Recommendation E.353 was prepared by ITU-T Study Group 2 (2001-2004) and approved under the WTSA Resolution 1 procedure on 2 February 2001.

Keywords

Destination Country Code for INRA (DCCI), Destination Service Provider Address (DSPA), International Network Routing Address (INRA), Originating Country Code for INRA (OCCI), Routing Translation Function, Serving Service Provider (SSP), Serving Service Provider Identity (SSPI),

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

INTELLECTUAL PROPERTY RIGHTS

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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ITU-T Recommendation E.353

Routing of calls when using international network routing addresses

1 Scope

This Recommendation identifies the international call routing principles and guidance, which are applicable to routing of calls when using International Network Routing Addresses. This Recommendation will enable early implementations without providing exhaustive or restrictive lists of use. These routing principles are not precluded for national use.

Examples of specific applications are provided in this Recommendation.

The exact mechanism for obtaining the routing information and its implications on security, charging, accounting, etc. are outside the scope of this Recommendation.

In general, the routing of calls when using International Network Routing Addresses follows the routing principles in ITU-T E.170 through E.174.

The service interactions that may take place when routing of calls using International Network Routing Addresses are outside of the scope of this Recommendation.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

– ITU-T E.164 (1997), *The international public telecommunication numbering plan.*

– ITU-T E.170 (1992), *Traffic routing.*

– ITU-T E.171 (1988), *International telephone routing plan.*

– ITU-T E.172 (1992), *ISDN routing pla*n.

– ITU-T E.173 (1991), *Routing plan for interconnection between public land mobile networks and fixed terminal networks.*

– ITU-T E.174 (1995), *Routing principles and guidance for Universal Personal Telecommunications (UPT).*

– ITU-T E.195 (2000), *ITU-T international numbering resource administration.*

3 Terms and definitions

This Recommendation defines the following terms:

3.1 additional address (AA): An address item, which is used to identify a specific termination point within a service provider's network. The use of AA is optional.

3.2 destination country code for INRA (DCCI): Country Code identifying the country in which the final translation of the International Network Routing Address will take place.

3.3 additional identity (AI): An identity element that may be used to identify a specific point within the Serving Service Providers network, which generates the INRA. The use of AI is optional.

3.4 called party number (CPN): A combination of digits used by the network to reach a subscriber or service (called party). The Called Party Number is normally the Dialled Digits (DD) without a prefix. The Called Party Number may be an E.164 number.

3.5 country code for global service: A three-digit Country Code to identify a global service.

3.6 dialled digits: A combination of digits dialled by the calling party (caller) to reach a subscriber or service. The dialled digit is normally not an E.164 number because it may include a prefix.

3.7 global subscriber number (GSN): A number identifying a subscriber for a particular global service.

3.8 global service: A service defined by ITU-T, provisioned on the public switched network, to which ITU-T has assigned a specific country code to enable the provision of that international service between two or more countries and/or integrated numbering plans.

3.9 international network routing address (INRA): An address that is derived and used by the network to route the call towards the service provider for the dialled (called) E.164 number. The INRA is not an E.164 number, and is not diallable.

3.10 national (significant) number (N(S)N): The national (significant) number consists of the National Destination Code (NDC) followed by the Subscriber Number (SN). The function and format of N(S)N is nationally determined. For further details refer to ITU-T E.164.

3.11 national destination code: A national optional code field, within the E.164 number plan, which combined with the Subscriber's number (SN) will constitute the national (significant) number of the international public telecommunication service for geographic areas. For further details refer to ITU-T E.164.

3.12 originating country code for INRA (OCCI): Originating Country Code for INRA identifies the country where the International Network Routing Address (INRA) is generated.

3.13 destination service provider address (DSPA): An address which identifies a service provider within a country for the dialled digits.

3.14 serving service provider (SSP): A service provider that generates the INRA routing information from the dialled digits. The functionality to provide these capabilities may reside in either the originating or transit networks.

3.15 serving service provider identity (SSPI): An identity which identifies the Serving Service Provider (SSP). The SSPI is not an E.164 number.

4 Abbreviations

This Recommendation uses the following abbreviations:

AA Additional Address

AI Additional Identity

CPN Called Party Number

DCCI Destination Country Code for INRA

DD Dialled Digits

DSPA Destination Service Provider Address

GSN Global Subscriber Number

INRA International Network Routing Address

ISDN Integrated Services Digital Network

ISUP ISDN User Part

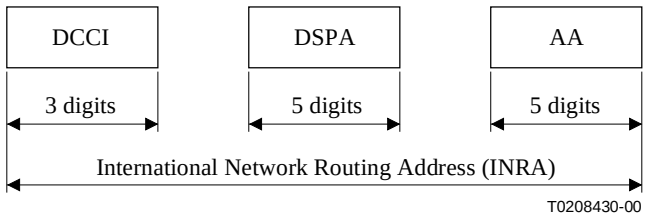
ITU-T International Telecommunication Union – Telecommunication Standardization Sector
NSN National Significant Number
OCCI Originating Country Code for INRA
ON Originating Network
SN Subscriber Number
SSP Serving Service Provider
SSPI Serving Service Provider Identity
TP Termination Point
TSB Telecommunication Standardization Bureau

5 Formats and structure

5.1 International network routing address (INRA)

The International Network Routing Address (INRA) is composed of a number of digits arranged in specific code fields. The INRA code fields are Destination Country Code for INRA (DCCI), Destination Service Provider Address (DSPA) and an Additional Address field (AA).

Figure 1 shows the International Network Routing Address (INRA) structure.



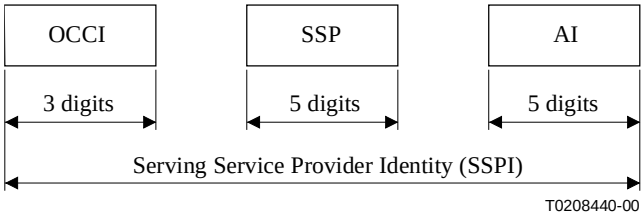
AA Additional Address
DCCI Destination Country Code for INRA
DSPA Destination Service Provider Address

Figure 1/E.353 – International network routing address (INRA)

The Additional Address (AA) field is optional.

5.2 Serving service provider identity (SSPI)

The Serving Service Provider Identity (SSPI) is composed of a number of digits arranged in specific code fields. The SSPI code fields are Originating Country Code for INRA (OCCI), the Serving Service Provider (SSP), which generates the INRA, and an Additional Identity (AI) field. See Figure 2.



AI Additional Identity
OCCI Originating Country Code for INRA
SSP Serving Service Provider

Figure 2/E.353 –Serving service provider identity (SSPI)

The Additional Identity (AI) field is optional.

6 Principles for how the international network routing address information works

This Recommendation addresses information required to be able to route calls when using International Network Routing Addresses. Two different information items are necessary:

a) International Network Routing Address (INRA).

b) Serving Service Provider Identification (SSPI).

The INRA and SSPI do not conform to the E.164 number structure.

The International Network Routing Address INRA is created and used by the Serving Service Provider, which is generating the INRA routing information, to route a call towards the Service Provider for the dialled digits.

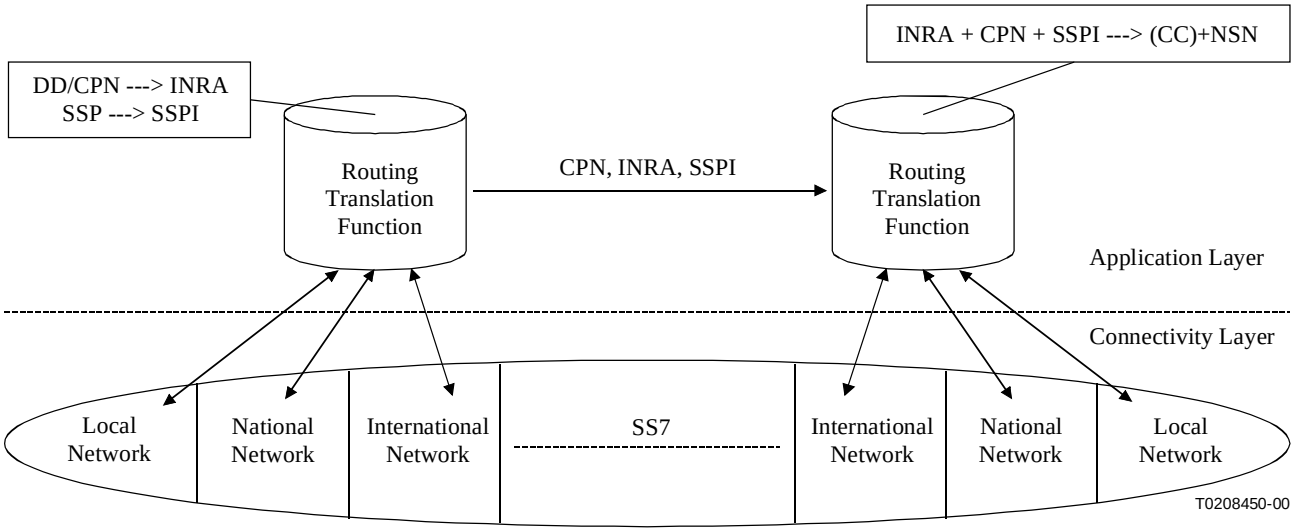
The Serving Service Provider Identity (SSPI) identifies the Serving Service Provider (SSP), which is responsible for generating the INRA routing information.

It is recommended that the two information items, INRA and SSPI, use the same format.

To enable efficient routing and address interworking between international service providers, it is desirable that the international network use a common addressing system.

In particular it is recommended that INRA and SSPI are carried as separate information elements in the call set-up procedure.

Figure 3 will be used to illustrate the general routing and addressing model for routing calls when using International Network Routing Addresses.



CPN	Called Party Number
DD	Dialled Digits
INRA	International Network Routing Address
SSP	Serving Service Provider
SSPI	Serving Service Provider Identity
SS7	Signalling System No. 7

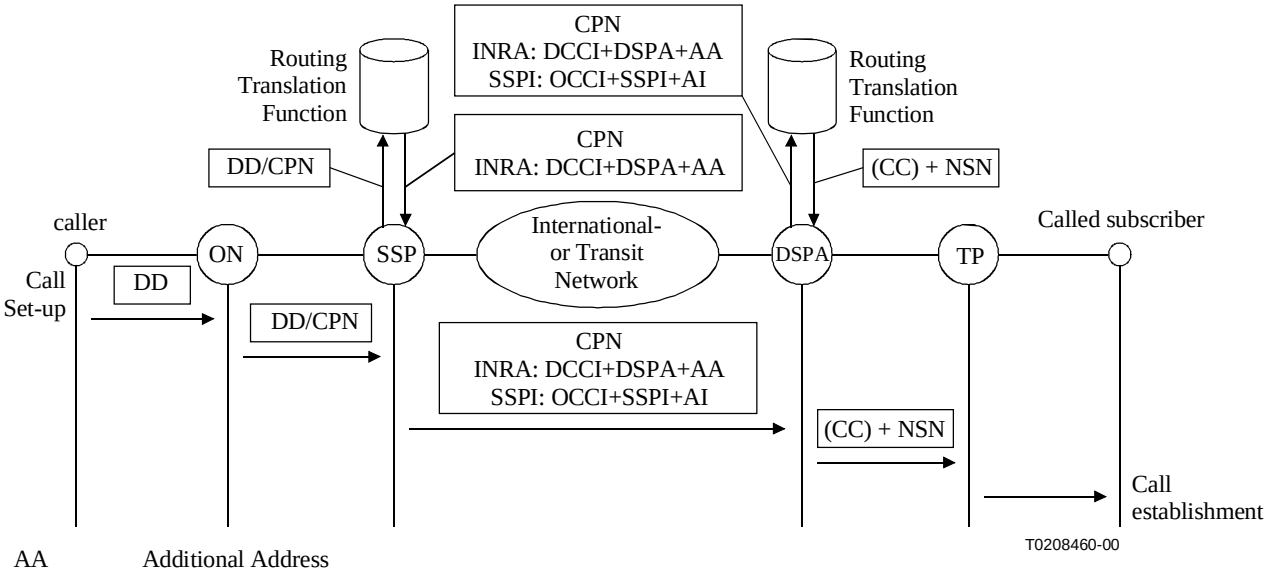
Figure 3/E.353 – INRA, general routing and addressing model

The translation of the Dialled Digits or Called Party Number into an International Network Routing Address and subsequent translation into a National (Significant) Number can take place on any network level.

The routing and addressing system is not precluded for national use.

7 Applications of the international network routing addresses

Figure 4 provides a general routing scenario for calls when using International Network Routing Addresses and Serving Service Provider Identity.



AA	Additional Address
AI	Additional Identity
CC	E.164 Country Code
CPN	Called Party Number
DCCI	Destination Country Code for INRA
DD	Dialled Digits
DSPA	Destination Service Provider Address
INRA	International Network Routing Address
NSN	National Significant Number
ON	Originating Network
SSP	Serving Service Provider
SSPI	Serving Service Provider Identity
TP	Termination Point

Figure 4/E.353 – Illustrating routing model application

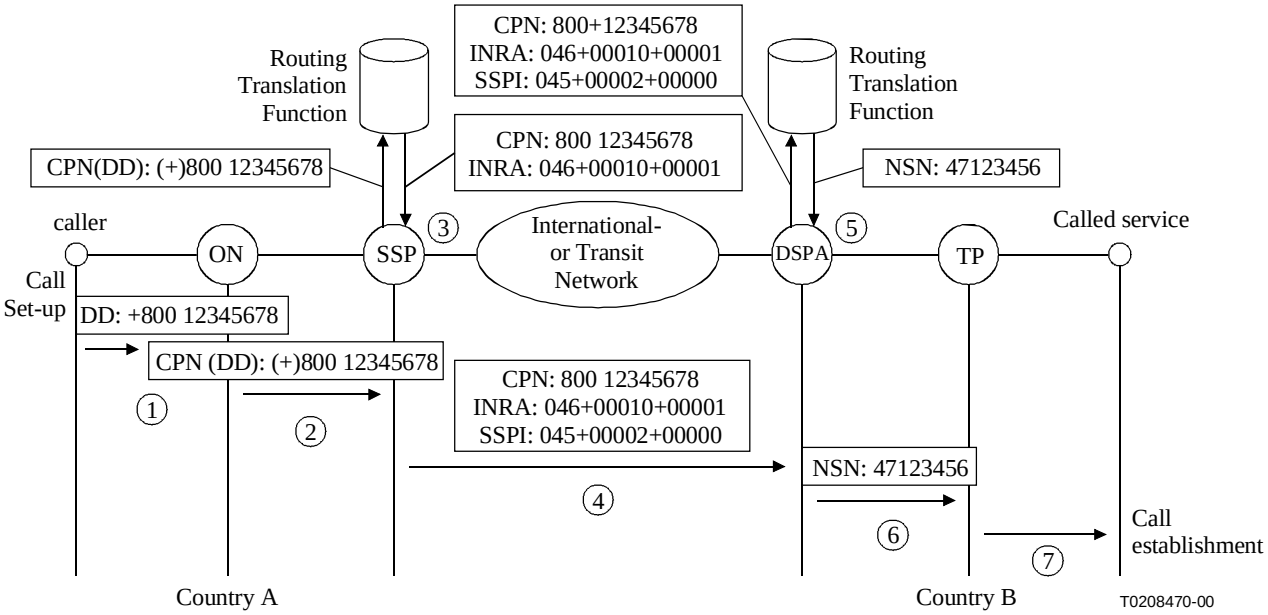
The purpose of the illustrating routing model is to define where the number transformation takes place and the number information required to route a call when using International Network Routing Addresses.

Under the general model a number of applications are possible. The identification of the applications below is not intended to be exhaustive, i.e. other applications may be possible under the general routing and addressing model.

7.1 Routing of E.164 global services when using international network routing address

The example described in this clause illustrates one application of International Network Routing Addresses when routing of a call to a global service, e.g. International Freephone Service (IFS).

A subscriber (caller) in country A dials a global service number, e.g. +800 12345678 for which the correspondent service (IFS) is provided by a service provider in country B. There is an agreement between the Serving Service Provider (SSP) and the Destination Service Provider (DSPA) to interwork by means of International Network Routing Addresses. See Figure 5.



CPN	Called Party Number
DD	Dialled Digits
DSPA	Destination Service Provider Address
INRA	International Network Routing Address
NSN	National Significant Number
ON	Originating Network
SSP	Serving Service Provider
SSPI	Service Provider Identity
TP	Termination Point

Figure 5/E.353 – Example of application when using the international network routing address system

1) The caller dials a global service number, +800 12345678.

2) The originating network (ON) recognizes that it is an international call and routes the call to a gateway/Serving Service Provider (SSP).

3) The Serving Service Provider (SSP) translates the global service number into an International Network Routing Address INRA: 046 + 00010 + 00001, which identifies the Destination Country Code for INRA (DCCI:046), which is the country code of the Destination Service Provider Address (DSPA:00010) and the termination point for the routing, addressed by the Additional Address (AA:00001).

4) The Serving Service Provider (SSP) loads its identity: 045 + 00002 + 00000 into the Serving Service Provider Identity element (SSPI) and routes the call according to the International Network Routing Address (INRA) to the Destination Service Provider Address (DSPA) in country B.

5) The Destination Service Provider Address (DSPA) translates the received global service number into a national significant number NSN: 47123456. The service provider may or may not use the International Network Routing Address INRA and the Serving Service Provider Identity (SSPI) to be able to route the call to the right termination point for the routing, e.g. in case the dialled service is provided in different languages.

6) The Destination Service Provider Address (DSPA) routes the call to the Termination Point (TP) according to the NSN: 47123456.

7) The Termination Point (TP) establishes connection to the called service.

An example on how SSPI is used for routing purposes is as follows:

In country A there exist three different language areas. Each area has it own Serving Service Provider Identity (SSPI) defined in the Additional Identity field (AI). The SSPI is then used to route the call to the Termination Point in country B, which can serve the language area identified by the SSPI.

7.2 Routing of E.164 geographical area numbers when using international network routing address

The same example as described in 7.1 for routing of E.164 Global Services is also applicable for routing of E.164 Geographical Numbers when using the International Network Routing Address method.

7.3 Routing of E.164 network numbers when using international network routing address

The same example as described in 7.1 for routing of E.164 Global Services is also applicable for routing of E.164 Network Numbers when using the International Network Routing Address method.

8 Assignment of international network routing addresses and serving service provider identities

The assignment of INRAs and SSPIs is to be under the control of TSB (ITU-T Secretariat).

This responsibility is included in ITU-T E.195.

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