

# ETSI TS 101 324 V2.1.1 (1999-11)

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*Technical Specification*

## **Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Numbering; Scenarios 1, 2, 3 and 4**

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**Reference**

RTS/TIPHON-04003 (c9c010cr.PDF)

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**Keywords**

addressing, IP, network, VoIP

**ETSI**

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## Foreword

This Technical Specification (TS) has been produced by ETSI Project Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON).

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# 1 Scope

The present document specifies the naming, numbering, and addressing scheme and related functionality required within TIPHON compliant networks for calls:

- from Internet Protocol (IP) based terminals to terminals in a Switched Circuit Network (SCN) (TIPHON scenario 1);
- from terminals in an SCN to IP based terminals (TIPHON scenario 2);
- from a terminal in an SCN through an IP based network and back to a terminal in an SCN (TIPHON scenario 3); and
- from a terminal in an IP based network through an SCN and back to a terminal in an IP based network (TIPHON scenario 4).

The objective of the present document is to ensure satisfactory interworking between TIPHON compliant networks and SCNs. An SCN may be a public network or a private network.

These requirements affect terminal equipment and equipment that performs the roles of gatekeeper and gateway, and the calling procedure for the end user.

Where the text indicates the status of a requirement (i.e. as strict command or prohibition, as authorization leaving freedom, or as a capability or possibility), this may modify the nature of a requirement within a referenced standard used to provide the capability.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] ITU-T Recommendation E.164 (1997): "The international public telecommunication numbering plan".
- [2] ITU-T Recommendation H.323 (1998): "Packet based multimedia communications systems".
- [3] ETS 300 189: "Private Telecommunication Network (PTN); Addressing".
- [4] ISO/IEC 11571: "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Networks - Addressing".
- [5] TR 101 300 (V1.1): "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Description of Technical Issues".
- [6] TR 101 306 (V1.2): "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Requirements for service interoperability; Scenario 1".
- [7] TR 101 307 (V2.2): "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Requirements for service interoperability; Phase 2".

- [8] TR 101 308: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Requirements for service interoperability; Scenario 3"
- [9] TR 101 338: "Telecommunications and Internet Protocol Harmonization Over Network (TIPHON); Analysis of existing roaming techniques applicable to TIPHON mobility services".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

**address:** string or combination of decimal digits, symbols, and additional information which identifies the specific termination point(s) of a connection in a public network(s) or, where applicable, in interconnected private network(s). (e.g. ITU-T Recommendation E.164 [1]).

**carrier:** provider of a transit network or services.

**country code for geographic areas:** combination of one, two or three digits identifying a specific country, countries in an integrated numbering plan, or a specific geographic area. (e.g. ITU-T Recommendation E.164 [1]).

**dialling plan:** string or combination of decimal digits, symbols, and additional information that defines the method by which the numbering plan is used. A dialling plan includes the use of prefixes, suffixes, and additional information, supplemental to the numbering plan, required to complete the call. (e.g. ITU-T Recommendation E.164 [1]).

**gatekeeper:** gatekeeper is an ITU-T Recommendation H.323 [2] entity on the network that provides address translation and controls access to the network for ITU-T Recommendation H.323 [2] terminals, gateways, and Multipoint Control Units (MCUs). The gatekeeper may also provide other services to the terminals, gateways, and MCUs such as bandwidth management and locating gateways (e.g. ITU-T Recommendation H.323 [2]).

**gateway:** ITU-T Recommendation H.323 [2] gateway is an endpoint on a network which provides for real-time, two-way communications between an IP based network and an SCN.

**global service:** service defined by the ITU-T, provisioned on the public switched network, to which the 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 (e.g. ITU-T Recommendation E.164 [1]).

**location portability:** ability for a customer (subscriber) to change location while retaining the same number

**name:** alphanumeric label used for service reference by end users. A name may be portable.

**number:** string of decimal digits from a recognized number plan (e.g. ITU-T Recommendation E.164 [1]).

**numbering plan:** numbering plan specifies the format and structure of the numbers used within that plan. It typically consists of decimal digits segmented into groups in order to identify specific elements used for identification, routing and charging capabilities, e.g. within ITU-T Recommendation E.164 [1] to identify countries, national destinations, and subscribers. A numbering plan does not include prefixes, suffixes and additional information required to complete the call. The national numbering plan is the national implementation of the ITU-T Recommendation E.164 [1] numbering plan.

**Number portability:** ability for a customer (subscriber) to change service provider, location or service while retaining the same number

**prefix:** prefix is an indicator consisting of one or more digits, that allows the selection of different types of number formats, networks and/or services (e.g. ITU-T Recommendation E.164 [1]).

**service provider portability:** ability for a customer (subscriber) to change service provider while retaining the same number

**Switched Circuit Network (SCN):** see TR 101 300 [5].

**TIPHON compliant network:** network that complies with the mandatory requirements in the TIPHON requirements documents:

- TR 101 306 [6] (for compliance with TIPHON phase 1); and
- TR 101 307 [7] (for compliance with TIPHON phase 2),
- TR 101 308 [8] (for compliance with TIPHON scenarios 1,2, 3),

together with compliance to the parts of the TIPHON specifications in which these requirements are embodied.

**E.164 [1] Number:** number conforming to the numbering plan and structure specified in ITU-T Recommendation E.164 [1].

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CLI	Calling Line Identity
IP	Internet Protocol
MCU	Multipoint Control Unit
SCN	Switched Circuit Network

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## 4 Naming scheme for identification of users and terminals within TIPHON compliant networks

**NOTE:** It should be noted that an E.164 [1] number (e.g. ITU-T Recommendation E.164 [1]) and numbers conforming to ETS 300 189 [3] or ISO/IEC 11571 [4] can act in the role of both a name and an address within their respective environment.

### 4.1 Requirements for the naming scheme used within the network

This subclause applies only to scenarios 1, 2 and 4 because in scenario 3 the TIPHON compliant network does not have directly connected terminals that require numbering.

At least one naming scheme used in TIPHON compliant networks shall meet the following objectives:

- 1) the names shall consist solely of the decimal digits;
- 2) the namespace shall be either a global system or consist of inter-operable local systems;
- 3) the names shall be globally unique for public networks;
- 4) the naming scheme shall enable the use of single-stage dialling;
- 5) the naming scheme shall not preclude the support of mobility and roaming according to TR 101 338 [9];
- 6) the naming scheme shall not preclude the support for portability;

**NOTE:** Additional overlaid naming schemes may be used.

## 4.2 Requirements for the naming scheme supported at the interface to SCNs

This subclause applies to all scenarios.

### 4.2.1 Public TIPHON compliant networks

In public TIPHON compliant networks, numbers passed to and from SCNs shall conform to ITU-T Recommendation E.164 [1].

NOTE: ITU-T Recommendation E.164 [1] provides various alternative forms of numbering. One or more forms may be used. There is not necessarily a one-to-one relationship between an E.164 [1] number and each TIPHON compliant terminal. *There may be more than one "user" on a given terminal.*

### 4.2.2 Private TIPHON compliant networks

In private TIPHON compliant networks, numbers passed to and from private SCNs shall conform to ETS 300 189 [3] or ISO/IEC 11571 [4].

In private TIPHON compliant networks, numbers passed directly to and from public SCNs shall conform to ITU-T Recommendation E.164 [1].

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# 5 Functionality required within the TIPHON compliant network

## 5.1 General requirements

This subclause applies to all scenarios.

- 1) TIPHON compliant networks shall accept the international format of the E.164 [1] number of the called party;
- 2) TIPHON compliant networks may accept any other form of E.164 [1] numbers used within the country where they are located;
- 3) TIPHON compliant networks may also accept private network number forms (e.g. in the case of a private IP network connected to a private SCN);
- 4) TIPHON compliant networks shall convey unaltered any user initiated presentation restriction requests concerning the Calling Line Identity (CLI);
- 5) TIPHON compliant networks shall support the carrier selection mechanism as required by relevant bodies (e.g., a national regulatory authority);

NOTE 1: Carrier selection may be set by default, by pre-selection by the subscriber, by dialling a carrier access code and a carrier identification code, or by other methods available within that country.

- 6) TIPHON compliant networks shall support number portability functions (service provider and location) where required.

NOTE 2: Different countries have different requirements for number portability. Some require additional functionality in the originating network, some in the transit network(s) and some in the block (normally the donor) network.



## 5.2 Requirements for Scenario 1 (IP to SCN)

TIPHON compliant networks shall provide the following functionality:

- 1) the calling party in TIPHON compliant networks shall be able to identify the called party on the SCN by the E.164 [1] number, or the number used within the SCN in the case of a private IP network connected to a private SCN;

NOTE 1: It is assumed that if another naming scheme is used in a TIPHON compliant network, the name will be mapped into an E.164 [1] number, or mapped into the number used within the SCN in the case of a private IP network connected to a private SCN.

- 2) TIPHON compliant networks shall provide to the SCN a Calling Line Identity (CLI) for the calling user if required, irrespective of whether the calling user has invoked presentation restriction of the CLI. The CLI shall identify either the terminal, or the user, or both;

NOTE 2: The CLI is required by networks for management purposes even if it is not to be presented to the called user.

- 3) where prefixes are used, TIPHON compliant networks shall support the prefixes used;
- 4) where special numbers are associated with specific services, TIPHON compliant networks shall support the use of these numbers.

NOTE 3: Examples are emergency numbers (911, 112).

## 5.3 Requirements for Scenario 2 (SCN to IP)

TIPHON compliant networks shall provide the following functionality:

- 1) TIPHON compliant networks shall conform to any calling line identity restrictions received from the SCN;

NOTE: National regulations may make use of the "override capability", e.g. in the case of emergency services: even though the user's CLI restriction indication is carried by the network, the destination's CLI presentation supplementary service overrides it.

- 2) where service provider portability is required, TIPHON compliant networks shall support it.

## 5.4 Requirements for Scenario 3 (SCN to IP to SCN)

TIPHON compliant networks shall provide the following functionality:

- 1) TIPHON compliant networks shall convey the calling line identity, and the associated signalling information on provided by the originating SCN and those digits of the called party number required to complete the call.

NOTE: The IP network is providing connectivity between SCNs (or parts thereof), and so whilst the calling user and the called user will have numbers relating to the number plan of the SCN, the users may not have a corresponding IP address. Thus the call will be routed in the IP network based on knowing which SCN the call comes from and knowing that some block of called numbers (e.g. the E.164 [1] country code, or area code, or the private network node number [PABX id]) should result in a connection to a particular point of egress to the destination SCN.

## 5.5 Requirements for Scenario 4 (IP to SCN to IP)

TIPHON compliant networks shall provide the functionality required for scenarios 1 and 2. There are no additional requirements.

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## Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

- TR 101 309: "Not yet started".

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## History

<b>Document history</b>		
V1.1.6	June 1998	Publication
V1.2.5	June 1999	Publication
V2.1.1	November 1999	Publication