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Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Service Capability Definition; Service Capabilities for a simple call

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Technical Specification

Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Service Capability Definition; Service Capabilities for a simple call

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Foreword

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

The functions needed to provide a service application and its constituent Service Capabilities may be replicated in a number of domains that are interconnected to provide, for instance, a call.

Service capabilities are indivisible units of interoperability between TIPHON systems. Using known Service Capabilities, interconnection agreements can specify the Service Capabilities for which the agreement holds.

Service providers and equipment vendors can add value to service capabilities by enhancing them in their networks and equipment beyond the functionality defined by the standardized definition without adversely impacting interoperability.

Introduction

The approach being taken to standardization in TIPHON represents a departure from that used in the past for PSTN, ISDN and GSM. Its aim is to allow much greater scope for competition through innovation in the design of equipment and services. Its aim is also to provide adequate standardization to facilitate the operation of services across interconnected networks, even networks that use different technologies. The present document presents the initial core set of service capabilities envisaged to be required to enable Service Providers to offer services on TIPHON networks that may safely inter-work with existing PSTN services while enabling more advanced services to be subsequently developed.

Figure 1 shows the relationship of the present document with other TIPHON release 3 deliverables.
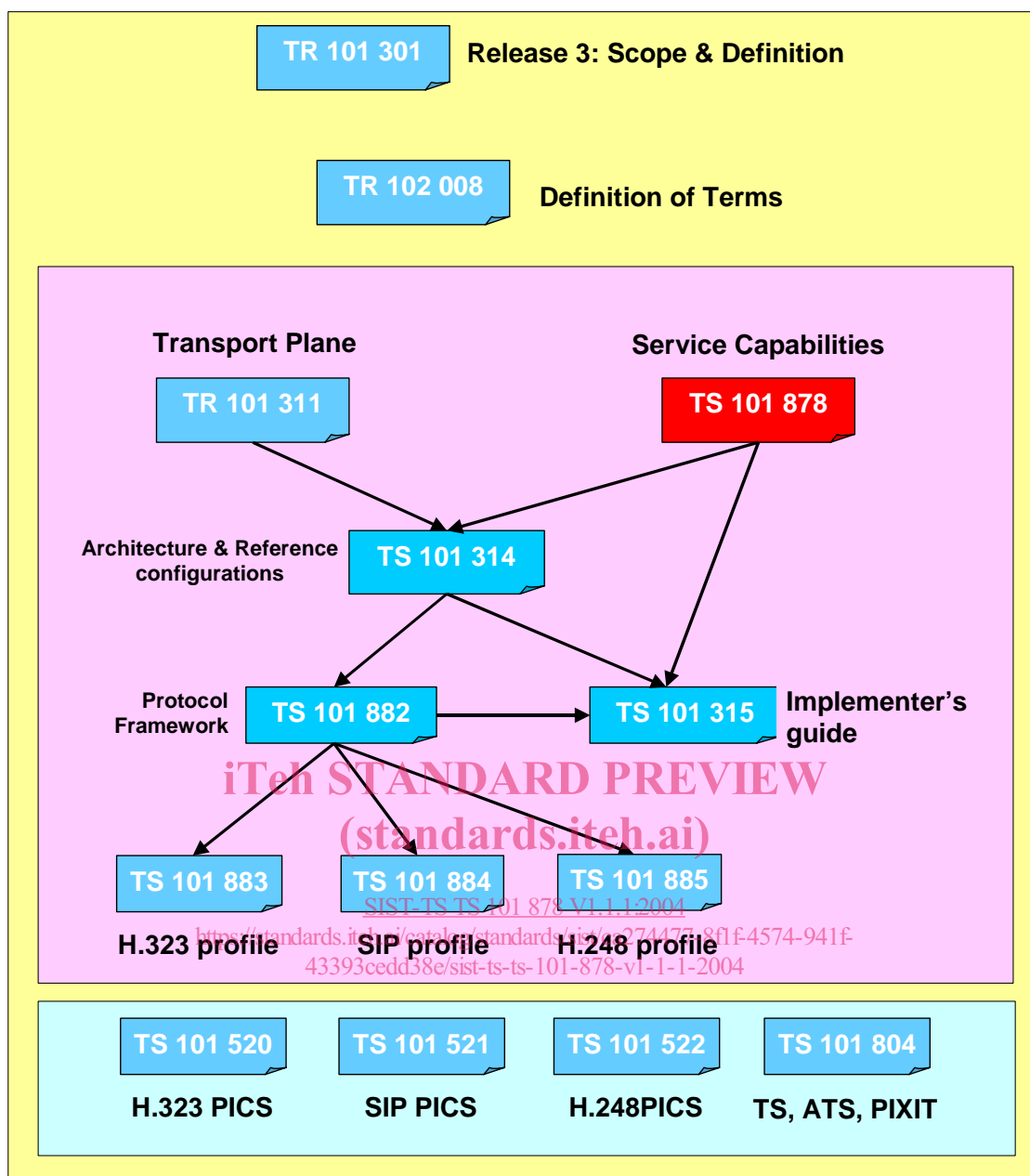
Figure 1: Relationship with other TIPHON release 3 documents

- TR 101 311 [2] provides the requirements on the transport plane,

- TS 101 878 (the present document) defines service capabilities that are used in the TIPHON Release 3 for a simple call,

- TS 101 882 [3] provides the Protocol Framework based on the TIPHON Release 3 architecture to implement the simple call service capabilities as defined in the present document,

- TS 101 315 [4] is an implementer's guide that shows how to use of the meta-protocol to realise the capabilities as defined in the persent document,

- TS 101 883 [5] provides the protocol mappings for the ITU-T H-323 profile,

- TS 101 884 [6] provides the protocol mappings for the SIP profile,

- TS 101 885 [7] provides the protocol mappings for the ITU-T H-248 profile,

- TS 101 314 [10] provides the architecture and reference configurations for TIPHON Release 3.

1   Scope

The present document forms part of TIPHON Release 3 and defines a set of Service Capabilities for the support of simple call service applications.

Service Capabilities are indivisible technical functions that are used to support service applications. They are defined from a technical perspective as technical functions and not from a user's perspective as service elements.

The Service Capabilities and their attributes have been defined so that they are capable of supporting a telephony simple call service application that is compatible with telephony as standardized in ETSI for PSTN and ISDN.

Subsets of the service capabilities defined here can be selected for implementation in equipment and networks to support particular service applications.

The service capabilities defined here may also be used for the support of service applications other than simple call.

TR 101 835 [8] provides details of the steps involved in a TIPHON release.

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 and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

[1]   ETSI TR 101 877: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Requirements Definition Study; Scope and Requirements for a Simple call".

[2]   ETSI TR 101 311: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Service Independent requirements definition; Transport Plane".

[3]   ETSI TS 101 882: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Protocol Framework Definition and Interface Requirement Definition; General (meta-protocol)".

[4]   ETSI TS 101 315: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Functional Entities, Information Flow and Reference Point Definitions; For application of TIPHON functional architecture to inter-domain services".

[5]   ETSI TS 101 883: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Technology Mapping; Implementation of TIPHON architecture using H.323".

[6]   ETSI TS 101 884: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Technology Mapping; Implementation of TIPHON architecture using SIP".

[7]   ETSI TS 101 885: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Technology Mapping; Implementation of TIPHON architecture using H.248".

[8]   ETSI TR 101 835: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Project method definition".

[9]   ETSI TR 101 301: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Release Definition".

[10] ETSI TS 101 314: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Abstract Architecture and Reference Points Definition; Network Architecture and Reference Points".

[11] ETSI TR 101 326: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); The procedure for determining IP addresses for routeing packets on interconnected IP networks that support public telephony".

[12] ETSI TR 101 858: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Number portability and its implications for TIPHON networks".

[13] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[14] ETSI EN 300 089: "Integrated Services Digital Network (ISDN); Calling Line Identification Presentation (CLIP) supplementary service; Service description".

[15] ETSI EN 301 798 (V1.1.1): "Services and Protocols for Advanced Networks (SPAN); Anonymous Call Rejection (ACR) Supplementary Service; Service description".

[16] ETSI TR 102 081 (V1.1.1): "Network Aspects (NA); Number Portability Task Force (NPTF); Signalling requirements to support number portability".

[17] ETSI TS 101 329-2: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; End-to-end Quality of Service in TIPHON Systems; Part 2: Definition of Speech Quality of Service (QoS) Classes".

[18] ETSI TS 101 331: "Telecommunications security; Lawful Interception (LI); Requirements of Law Enforcement Agencies".

[19] ETSI TR 101 750: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Requirements Definition Study; Studies into the Impact of lawful interception".

[20] ITU-T Recommendation H.323: "Packet-based multimedia communications systems".

[21] ITU-T Recommendation E.106: "Description of an international emergency preference scheme (IEPS)".

[22] ITU-T Recommendation F.706: "Service Description for an International Emergency Multimedia Service".

[23] ETSI TR 102 008: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Terms and Definitions".

[24] ETSI TS 101 520: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Implementation Conformance Statement (ICS) proforma for the support of packet based multimedia communications systems; Support of ITU-T Recommendation H.323".

[25] ETSI TS 101 521: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Protocol Implementation Conformance Statement (PICS) proforma for the support of call signalling protocols and media stream packetization for packet-based multimedia communication systems; Support of ITU-T Recommendation H.225.0".

[26] ETSI TS 101 522: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Protocol Implementation Conformance Statement (PICS) proforma for the support of control protocol for multimedia communication; Support of ITU-T Recommendation H.245".

[27] ETSI TS 101 804 (all parts): "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Technology Compliance Specifications".

3 Definitions and abbreviations

3.1 Definitions

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

administrative domain: collection of physical or functional entities under the control of a single administration

aggregate bearer: logical association of functional entities in an IP telephony application and Transport Network which creates one or more concurrent end to end media flows and which is not limited to the duration of a single call

aggregate bearer admission control: functional entity that determines whether or not a flow is to be admitted as part of an established aggregate bearer

aggregate bearer measurement function: functional entity that determines the capacity used and remaining in an aggregate bearer as a result of measuring the actual media flows after taking into account what flows were requested

bearer: logical association of functional entities in an IP telephony application and Transport Network that creates an end to end media flow for no longer than the duration of a call

domain: collection of physical or functional entities within an administrative domain that share a consistent set of policies and common technologies

end-user: entity using the services of an IP telephony Service Provider or Transport Network operator

end-user domain: collection of physical or functional entities under the control of an end-user that share a consistent set of policies and common technologies

first party (call) clearing: first party to hang up, clears the call

functional entity: entity in a system that performs a specific set of functions

functional group: collection of functional entities within a domain

NOTE: In TIPHON systems functional groups are used to structure the necessary functionality to offer IP telephony services across domains.

gateway functional group: functional group containing the functionality of a network functional group also the functionality necessary to connect calls to the SCN

NOTE: Gateway functional groups may be classified as originating or terminating based upon their location within the topology of a specified call.

home network functional group: functional group which is aware of the service application subscribed to by the end-user

NOTE: Home network functional groups may be classified as originating or terminating based upon their location within the topology of a specified call.

information flow: interaction between a communicating pair of functional entities

interface: shared boundary between two communicating systems, devices or equipment

intermediate (transit) network functional group: functional group connecting the serving network functional group to the home network functional group

NOTE: The intermediate network functional group is only present when the serving network functional group and the home network functional group are not directly connected.

IP network: packet Transport Network comprising one or more transport domains each employing the IP protocol

IP telephony: any telephony related service that is supported on an IP network

IP Telephony Service Provider (IPTSP): Service Provider providing IP telephony services

NOTE: The same business entity may act as both a Transport Network operator and an IP telephony Service Provider.

network: telecommunications network that provides telecommunications services

network functional group: functional group containing the functionality required to establish a call between two terminals, a gateway and a terminal, or two gateways

NOTE: Network functional groups may be classified as originating or terminating based upon their location within the topology of a specified call.

network operator: business entity operating a network

number portability: ability of a user to change Service Provider or location without changing their E.164 number

packet flow/transport flow: stream of packets of the same type identified by common address and port numbers

NOTE: The stream may contain either signalling information or content description together with media information.

private: indication of availability to a pre-determined set of users e.g. private network, private service

protocol: set of semantics, syntax and procedures which govern the exchange of information across an interface

public: indication of availability to the general public. e.g. public network, public service

reference point: conceptual point at the conjunction of two communicating functional entities

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service: set of telecommunication related tasks performed for a customer by a Service Provider and supplied in a business context

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service application: way in which a number of service capabilities are combined to provide a service

service capability: specified set of functionalities that are used to provide a component part of a service

service domain: collection of physical or functional entities offering IP telephony services under the control of an IP telephony Service Provider which share a consistent set of policies and common technologies

Service Provider: business entity that provides services to its customers on a contractual basis and is responsible for the services offered

Service Provider identifier: globally unique identifier of a Service Provider (service domain)

serving network functional group: functional group that enables terminal functional groups to connect to an IP telephony Service Provider

Switched Circuit Network (SCN): telecommunications network, e.g. Public Switched Telephone Network (PSTN), Integrated Services Digital Network (ISDN), and General System for Mobile communications (GSM), that uses circuit-switched technologies for the support of voice calls

NOTE: The SCN may be a public network or a private network.

terminal: endpoint within the user equipment on which signalling and media flows originate and/or terminate

terminal functional group: functional group representing all the IP telephony functionality within an end-user's terminal

NOTE: Terminal functional groups may be classified as originating or terminating based upon their location within the topology of a specified call.

terminal registration functional group: functional group representing the registration functionality within an end-user domain

TIPHON compliant system: system that complies with the mandatory requirements identified in the TIPHON specifications

transport domain: collection of transport resources sharing a common set of policies, QoS mechanisms and transport technologies under the control of a Transport Network operator

Transport Network: collection of transport resources which provide IP transport functionality

Transport Network operator: business entity operating a Transport Network

user identifier: information that enables an end user or access to be uniquely known

user profile: service specific information about a user of a service application

3.2 Abbreviations

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

ACR	Anonymous Call Rejection
ASN.1	Abstract Syntax Notation no. 1
BICC	Bearer Independent Call Control
CLI	Calling Line Identification
CLIP	Calling Line Identification Presentation
E.164	ITU-T Recommendation E.164 [13]
GSM	Global System Mobile
H.323	ITU-T Recommendation H.323 [20]
ICANN	The Internet Corporation for Assigned Names and Numbers
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
ITU	International Telecommunications Union
NFG	Network functional group
PSTN	Public Switched Telephony Network
QoR	Query on Release
RpoA	Registration point of Attachment
SCN	Switched Circuit Network
SIP	Session Initiation Protocol
SpoA	Service point of Attachment
SV	SerVice
TIPHON	Telecommunications and Internet Protocol Harmonization Over Networks
TN	Transport Network
ACQ	All Call Query
ECS	Emergency Calling Service
SP	Service Provider

4 Services and service capabilities

4.1 Introduction

In ISDN and GSM, the approach to define services that were fully standardized gave little scope for innovation in the design of the services. This approach was ideally suited to "service inter-working", which was the main goal of the "public telephone service" and will be explained later.

The technology and the market are now at a different stage of development. There is:

- a common movement and convergence towards IP as the basic network technology; and

- diversity in the protocols that can be used above the network layer with the prospect that SIP, H.323 and the various signalling systems from the circuit switched world being used in parallel.

Therefore, there is a need for a methodical approach to inter-working between protocols. The market having reached relative maturity for simple voice communications is now starting a phase of new service development that is best led by commercial innovation.