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Harmonizacija telekomunikacij in internetnega protokola prek omrežij (TIPHON), 3. izdaja - Definicija ogrodja protokola - Splošno (meta-protokol)

Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Protocol Framework Definition; General (meta-protocol)

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Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Protocol Framework Definition; General (meta-protocol)

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Foreword

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

Introduction

The present document is a product in TIPHON release 3 (see TR 101 301 [6]) of step D of the TIPHON development process described in TR 101 835 [7].

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.

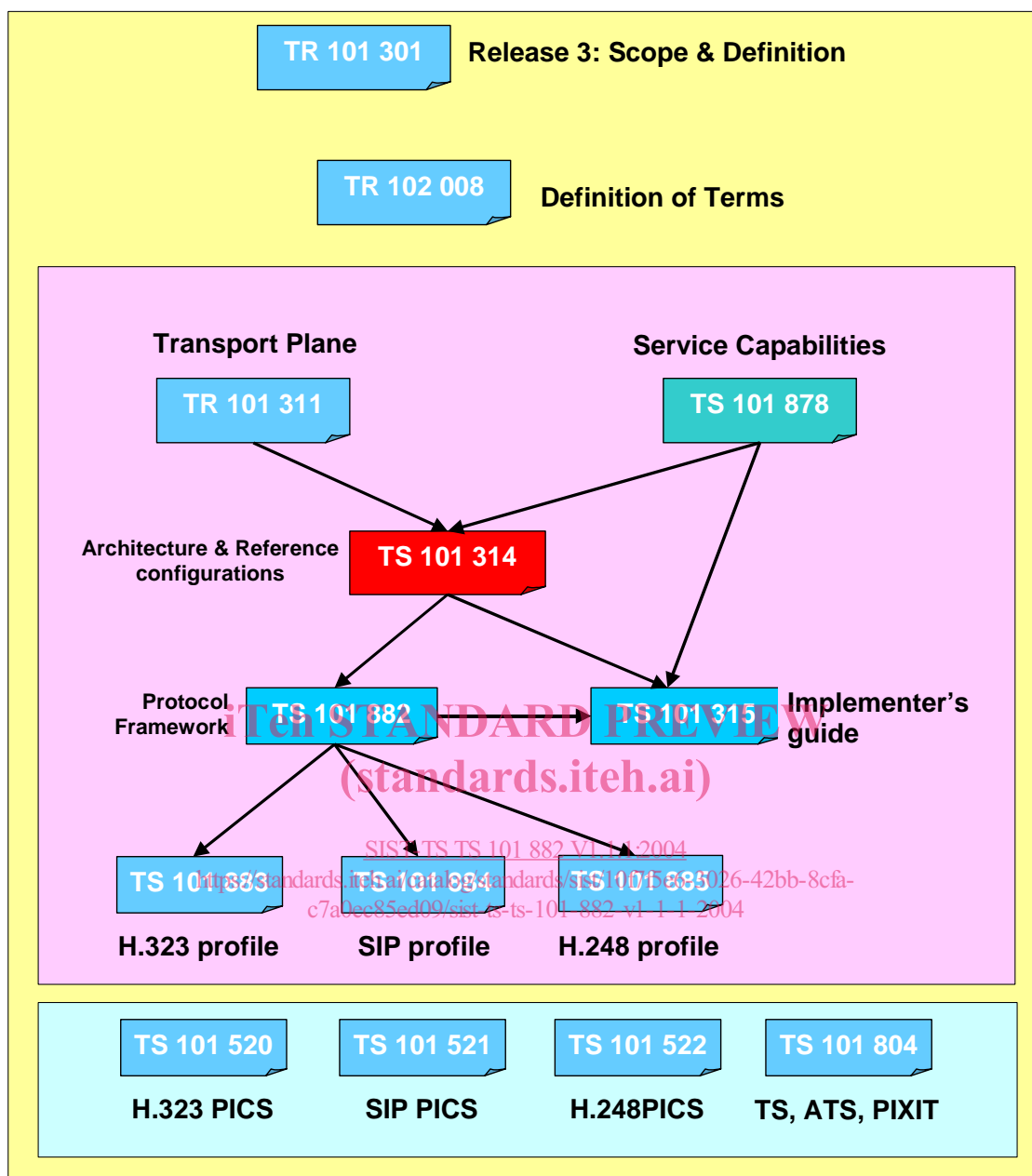


Figure 1: Relationship with other TIPHON Release 3 documents

- TR 101 311 [9] provides the requirements on the transport plane;
- TS 101 878 [3] defines service capabilities that are used in the TIPHON Release 3 for a simple call;
- TS 101 882 (the present document) 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 [5] is an implementer's guide that shows how to use of the meta-protocol to realize the capabilities as defined in TS 101 878 [3];
- TS 101 883 [10] provides the protocol mappings for the ITU-T H-323 profile;
- TS 101 884 provides the protocol mappings for the SIP profile;
- TS 101 885 [11] provides the protocol mappings for the ITU-T H-248 profile;
- TS 101 314 [1] provides the architecture and reference configurations for TIPHON Release 3.

1 Scope

The present document defines protocol frameworks for reference points defined in the TIPHON architecture TS 101 314 [1] that are required to implement the capabilities described in TS 101 878 [3] such that implementations compliant to the framework using candidate protocols interoperate.

The protocol framework takes the form of a set of meta-protocols described both in syntax (using Abstract Syntax Notation 1 (ASN.1 (see bibliography)) and in behaviour (using Message Sequence Charts (MSCs (see ITU-T Recommendation Z.120 in bibliography) and simple Specification and Description Language (SDL (see ITU-T Recommendation Z.100 in bibliography)) diagrams in addition to text). The meta-protocols show both the service primitives used by higher or lower layers to invoke, control and report on the progress of the meta-protocol, and the Meta Protocol Data Units (M-PDUs) used to communicate with peer entities.

Meta-protocols are described in this edition of the present document for the following reference points defined in TS 101 314 [1]: R; C; N and T.

The present document is applicable to the protocols that are necessary to support TIPHON Release 3.

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

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 TS 101 314: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Abstract Architecture and Reference Points Definition; Network Architecture and Reference Points".
- [2] ETSI TR 101 877: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Requirements Definition Study; Scope and Requirements for a Simple call".
- [3] ETSI TS 101 878: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Service Capability Definition; Service Capabilities for a simple call".
- [4] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
- [5] ETSI TS 101 315: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Functional Entities, Information Flow and Reference Point Definitions; Guidelines for application of TIPHON functional architecture to inter-domain services".
- [6] ETSI TR 101 301: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Release Definition; TIPHON Release 3 Definition".
- [7] ETSI TR 101 835: "Telecommunications and Internet Protocol Harmonization over Networks (TIPHON); Project method definition".
- [8] ETSI TR 102 008: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Terms and Definitions".
- [9] ETSI TR 101 311: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Service Independent requirements definition; Transport Plane".

- [10] ETSI TS 101 883: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Technology Mapping; Implementation of TIPHON architecture using H.323".
- [11] ETSI TS 101 885: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Technology Mapping; Technology Mapping of TIPHON reference point N to H.248/MEGACO protocol".
- [12] ETSI TS 101 520: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Support of ITU-T Recommendation H.323".
- [13] 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".
- [14] 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".
- [15] ETSI TS 101 804: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Technology compliance specifications".

3 Definitions and abbreviations

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3.1 Definitions (standards.iteh.ai)

For the purposes of the present document, the terms and definitions given in TR 101 877 [2] and TS 101 878 [3] apply.

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3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in TR 101 877 [2], TS 101 878 [3] and the following apply:

API	Application Programming Interface
ASN.1	Abstract Syntax Notation One
BC	Bearer Control
CC	Call Control
CCUA	Call Control User Agent
FE	Functional Entity
FG	Functional Grouping
GoS	Grade of Service
IP	Internet Protocol
IPTN	IP Telephony Network
ISDN	Integrated Services Digital Network
MC	Media Control
M-PDU	Meta Protocol Data Unit
MSC	Message Sequence Chart
PCM	Pulse Code Modulation
PDU	Protocol Data Unit
PSTN	Public Switched Telephone Network
QoS	Quality of Service
SAP	Service Access Point
SC	Service Control
SCN	Switched Circuit Networks
SDL	Specification and Description Language
SL	Service Layer
SNCC	Serving Network Call Control

TCC-SAP	TIPHON Call Control SAP
TLL-SAP	TIPHON Lower Layer SAP
TNCC	Transit Network Call Control
TRL	TIPHON Resource Location
TR-SAP	TIPHON Registration SAP
TT-SAP	TIPHON Transport SAP
URI	Uniform Resource Identifier

4 Introduction

The annexes in the present document contain normative descriptions of the meta-protocols that apply to the reference points defined in TS 101 314 [1]. Each annex is complete and the interactions between the meta-protocols are further described in TS 101 315 [5].

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Annex A (normative): Meta-protocol at reference point R

TIPHON networks shall offer a Registration point of Attachment (RpoA). If the RpoA is not offered then the network cannot be considered as TIPHON enabled.

EXAMPLE: If a TIPHON network is IP based with configuration of terminals (hosts) offered by DHCP then the DHCP procedure will give the terminal its IP address parameters, DNS parameters, and the Registration point of Attachment (RpoA) as well as "anonymous" services that the user of that transport domain can invoke without prior authorization (e.g. emergency services and information services).

A.1 Overview

The registration meta-protocol operations enable a user (the registrant) to seek and gain authority to invoke service in some domain for which ingress/egress is strictly controlled. The service applications to be offered shall be determined, in part, by data held in the user profile.

Figure 2 shows the relationship of the core elements in registration.



Figure 2: Relationship of registration entities

The registration service shall enable a user to receive service in both home and visited domains. The registrar to which a registrant registers shall maintain a profile of service applications for the registrant. The registrar may authorize access to service applications in the domain in which the registrant is situated or in some other domain in which the entity controlling the service application is located.

Registration may be an implicit service offered at subscription to terminals, in such cases the meta-protocol described in this clause shall not apply.

NOTE: This can be compared with attachment of a telephone set to a PSTN switch or PABX.

The registration meta-protocol is in two stages:

- the registrant registers with the registrar and if successful gains access to the profile of service applications; and
- if successful, the registrar shall supply the credentials for each service application in the form of a ticket to be used by the registrant when requesting service from an application server.

Each service application available to the registrant may be offered by different service providers. These service providers may be in different domains and offer different SpoAs for each of them. The ticket shall indicate that the registrant is authorized to use the service application via the appropriate SpoAs. The ticket shall also identify that registration is valid for a fixed period.

When first performed within a session the registration mode shall be identified by setting the RegistrationMode element (see clause A.5) to "InitialRegistration". Periodic re-registration may occur at any time and shall follow the protocol described in this clause by setting the RegistrationMode element (see clause A.5) to "LocationUpdate".

The terminal has to be registered and authorized before being able to make or receive service, however this "Register before service invocation" may be overridden for certain call types (e.g. emergency calls).

Each registrant has a unique registration identity that shall permit the domain of the home registrar to be identified.

A.1.1 Reachable indication

By successful completion of the registration service the registrant (user) indicates to the registrar (home) that the registrant is reachable and attached.

If the registrant no longer wishes to be reachable for any registered service application in the user profile the registrant shall explicitly detach from that service application by communicating with the SpoA.

If the registrar decides that the user should no longer be reachable for a service application or set of service applications, e.g. if a pre-paid account has been depleted, the registrar shall explicitly initiate the de-registration protocol in order to inform the registrant.

A.1.2 Registration service definition

The registration service shall be offered across a network or set of networks (parts of which may be under different administrative control). The registration service shall be invoked by the use of primitives visible at the TIPHON Registration Service Access Point (TR-SAP) and shown in table 1.

Table 1: Registration primitives visible at TR-SAP

Primitive	Short description	Capability (see note)
TR_RegistrationRequest_req	Allows the user plane to initiate a registration.	
TR_RegistrationRequest_conf	Gives the result of a user initiated registration to the user plane.	
TR_DeRegistrationRequest_req	Allows the user plane to initiate a de-registration.	
TR_DeRegistrationRequest_conf	Gives the result of a user initiated de-registration to the user plane.	
TR_RegistrationStatus_ind	Informs the user plane of any notification from the registrar.	

NOTE: The capability cross references to the capability definition in TS 101 878 [3].

Table 2: Parameters in registration primitives

Primitive	Parameters		
	Request	Confirm	Indication
TR_RegistrationRequest	UserID, [TerminalID] [List of ServiceApplications]	RegistrationResult	-
TR_DeRegistrationRequest	UserID, [List of ServiceApplications]	DeRegistrationResult	-
TR_RegistrationStatus	-	-	TBD

The parameters in the registration primitives shall take the following values:

RegistrationResult =

Success {list of ServiceApplications};

FailureReason {list of ServiceApplications};

No response from Registrar;

Protocol timer expired;

...

DeRegistrationResult =

Success;

No Active Registrations;

...

ServiceApplication =

Service#1;

Service#2;

...

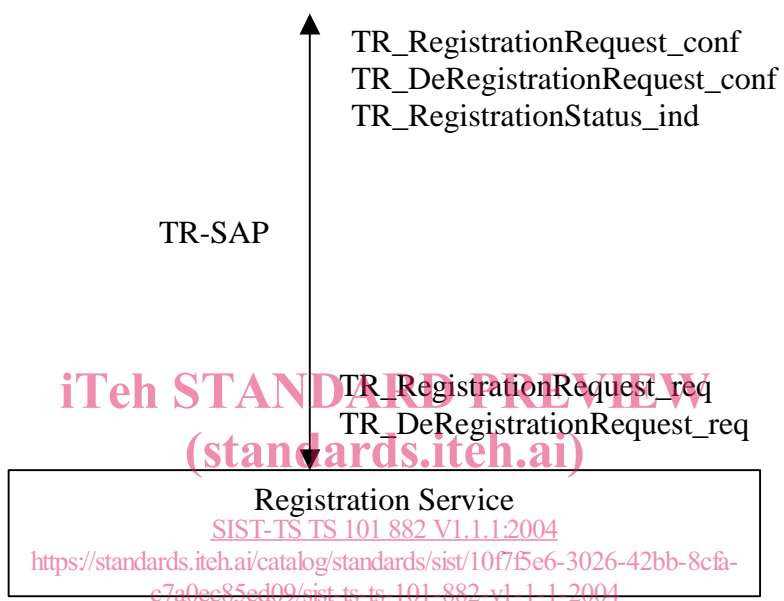


Figure 3: Services offered by the registration service identified by primitives

A.1.3 Ticket content and processing

A service authorization ticket shall:

- identify the user (as registrant);
- identify the registrar (as the issuer of the ticket);
- identify the service application(s);
- identify the service provider for each of the service application(s);
- show the time period during which service application(s) is (are) to be provided to the user; and
- optionally provide a means to cryptographically authenticate the user to the service provider(s).

The user identity in the ticket shall be the identity required by the service application. A single user may have many different identities depending upon the service application(s) chosen. If a user has more than one identity a ticket shall be provided for each identity and this shall contain the list of service applications for the identity.