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ETSI TS 101 315 V1.1.1 (2002-03)

Technical Specification

**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**

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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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Introduction

Figure 1 shows the relationship of the present document with other TIPHON Release 3 deliverables.

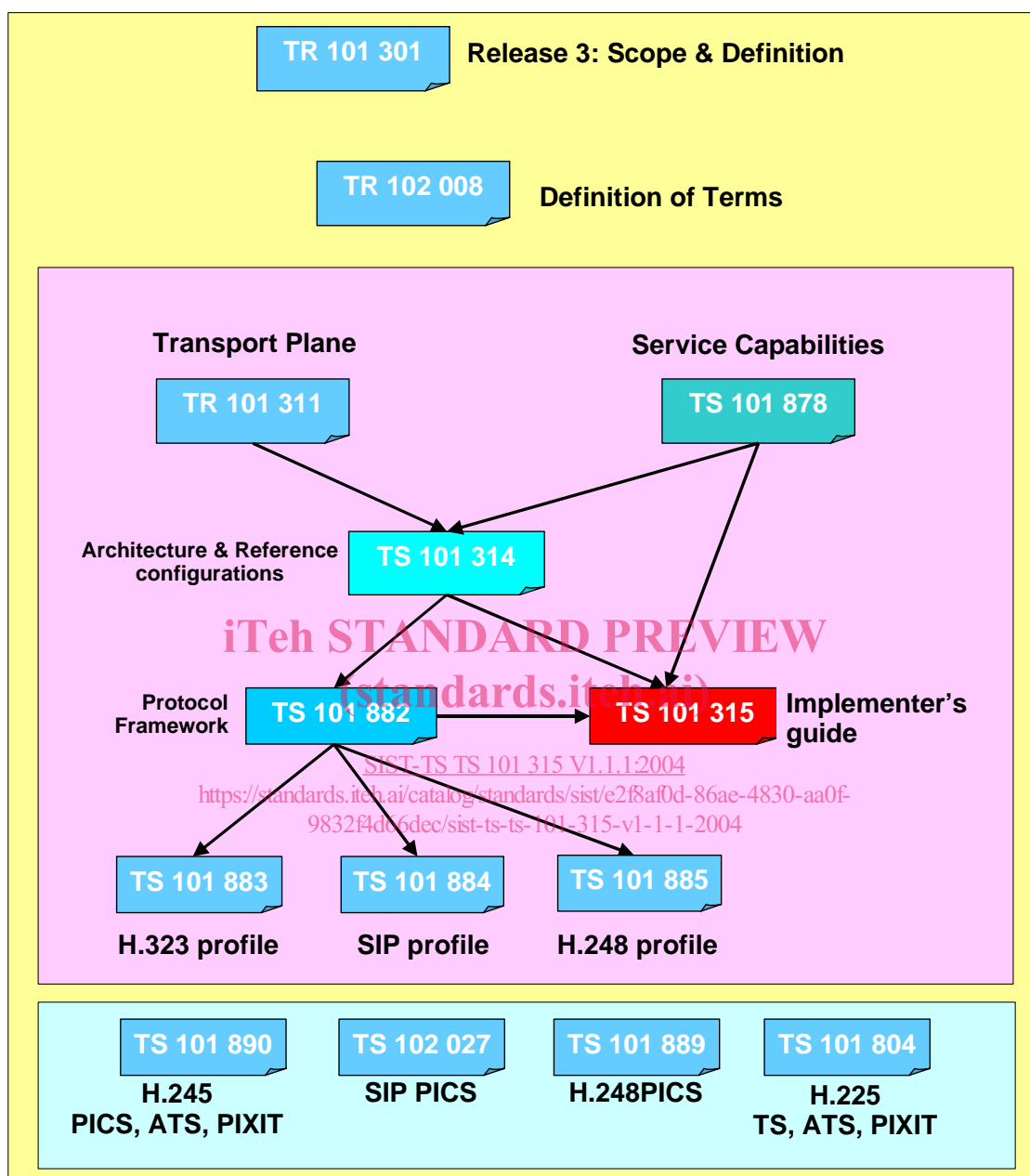


Figure 1: Relationship with other TIPHON Release 3 documents

- TR 101 311 [8] provides the requirements on the transport plane,
- TS 101 878 [1] 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 (the present document) is an implementer's guide that shows how to use of the meta-protocol to realize the capabilities as defined in TS 101 878 [1].
- TS 101 883 [4] provides the protocol mappings for the ITU-T H-323 profile,
- TS 101 884 (see bibliography) provides the protocol mappings for the SIP profile,

- TS 101 885 [5] provides the protocol mappings for the ITU-T H-248 profile,
- TS 101 314 [2] provides the architecture and reference configurations for TIPHON Release 3.

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1 Scope

The present document describes how the generic information flows as specified in the TIPHON baseline architecture [2] and meta-protocol [3] will be used to specify certain inter-domain service capabilities, as required in TS 101 878 [1].

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 101 878: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Service Capability Definition; Service Capabilities for a simple call".
- [2] 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".
- [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 101 883: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Technology Mapping; Implementation of TIPHON architecture using H.323".
- [5] ETSI TS 101 885: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Technology Mapping; Implementation of TIPHON architecture using H.248".
- [6] ETSI TR 101 301: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Release Definition; TIPHON Release 3 Definition".
- [7] ETSI TR 102 008: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Terms and Definitions".
- [8] ETSI TR 101 311: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Service Independent requirements definition; Transport Plane".
- [9] 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".
- [10] 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".
- [11] 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".
- [12] ETSI TS 101 804 (all parts): "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Technology compliance specifications".

3 Abbreviations

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

ACQ	All Call Query
APCS	Authorized Priority Call Service
BC	Bearer Control
BICC	Bearer Independent Call Control
CC	Call Control
CDR	Call Data Records
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CR	Call Routing
FG	Functional Group
ICF	Isochronous Convergence Function
IMP	Instant Messaging and Presence
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
MC	Media Control
MSC	Message Sequence Chart
NAT	Network Address Translation
NNI	Network-to-Network Interface
NWFG	NetWork Functional Group
QoR	Query on Release
QoS	Quality of Service
QoSPE	QoS Policy Element
RAS	Registration Admission and Status
RPoA	Registration Point of Attachment
RTP	Real Time Protocol
SC	Service Control
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SLA	Service Level Agreement
TPE	Transport Policy Entity
TRM	Transport Resource Manager
TU	Transport Usage
UNI	User-Network Interface
VoIP	Voice over IP

4 Introduction

The present document is intended to provide the users of TIPHON specifications with guidelines on their usage for specific scenarios.

4.1 Structure of the present document

Clause 5 gives an overview of the meta-protocol role as defined in the TIPHON process [3]. The remainder of the flows in the present document are expressed in terms of this meta-protocol. Readers interested in the implementation of a scenario described in the present document are encouraged to read the technology mapping documents dealing with each individual technology mentioned in the present document. See TS 101 883 [4], TS 101 884 (see bibliography), TS 101 885 [5] and DTS/TIPHON-03028R4 (see bibliography).

The TIPHON registration method is described in clause 6.

In clause 7 several call scenarios are described. The services being referred to in [1] are:

- Simple call setup,
- Simple call setup with ICF,
- Support for Intra-Domain QoS,
- Support for CLIR/CLIP,
- Billing,
- Lawful Interception,
- SCN Interworking,
- VoIP domains Interconnect supporting NAT,
- VoIP domains Interconnect supporting Inter-domain QoS,
- Roaming,
- Number Portability,
- Priority Calls,
- Emergency Calls,
- Carrier Selection.

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5 TIPHON meta-protocol

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5.1 Introduction

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The telecommunications industry has a long tradition of creating specialist protocols for individual services. Often several flavours of one protocol were used or several protocols existed to address the same problem. From an interworking perspective these multiple protocols represent a significant challenge, because each of them assumes that messages and code points are available to define the service. The consequence is that the service definition is different on either side of an interworking point, often only in a subtle way. This means that interworking is a complex problem involving a large number of compromises. More specifically, if there are n protocols to inter-work then there are $n \times (n-1)$ interworking approximations that need to be developed.

TIPHON Release 3 introduces the use of a meta-protocol to manage the overall complexity to achieve multi-protocol interworking. As shown in figure 2, the process of interworking is defined in terms of rules for encoding the code points, mapping the messages and modifying states. As a consequence, the number of interworking approximations is reduced to n rather than $n \times (n-1)$. A TIPHON service application is therefore defined in meta-protocol terms rather than with any other protocol used at the point of interworking. A mechanism is then defined for interworking with each desired, or candidate protocol. Hence a mapping to and from the meta-protocol (designed to support the services needed) is defined for each concrete protocol to be used. This mapping must also take into account the behaviour of underlying transport layers and protect against message loss. The derivation of these mappings is a complex task. However, it is not always possible to apply the meta-protocol to generate a complete mapping to a given protocol. This either results in writing new meta-protocol extensions or in deficiencies in the chosen concrete protocol.

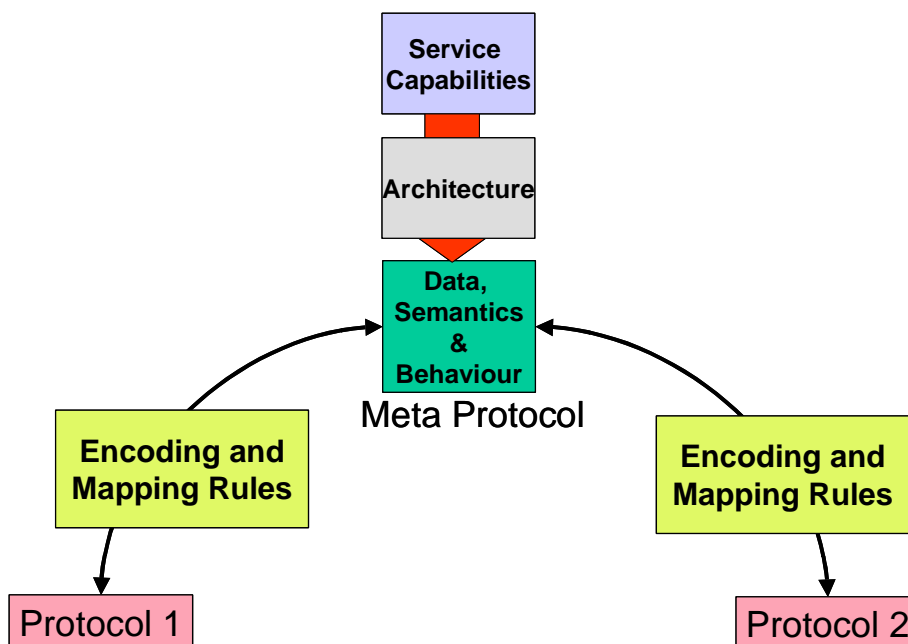


Figure 2: Meta-protocol enabled interworking

More formally, the TIPHON meta-protocol is an application level functionality, which encompasses a whole host of applications required for next generation telephony. It provides a super set of capabilities to support the telephony application, in a protocol and transport technology independent way. The meta-protocol consists of call state machines, which can perform the call processing. Different standard (and non standard) protocols can be mapped to this superset functionality to provide interworking between them. It can be implemented in its entirety to develop communications application servers, or it can be used as a tool to enhance existing protocols and to provide interworking between them.

The basis of the meta-protocol is the TIPHON abstract architecture, which defines functional layers, reference points and interfaces between the functional layers. (See [2] for a full definition of this structure.) A functional layer performs a specific set of tasks, e.g. the Call Control functional layer performs call processing; the Bearer Control functional layer performs bearer setup/negotiation, etc. A set of these layers forms a functional group.

TIPHON architecture defines five layers of functionality, which are:

- Service layer,
- Service Control layer,
- Call Control layer,
- Bearer Control layer,
- Media Control layer.