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Technical Specification

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Network and Service Management; Network Resource Model; Part 1: Requirements

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

The present document is part 1 of a multi-part deliverable covering Network and Service Management; Network Resource Model, as identified below:

Part 1: "Requirements";

Part 2: "Information Service";

Part 3: "eXtensible Markup Language (XML) Schema definition".

The NRM (Network Resource Model) is part of the TISPAN Management Information Model (MIM).

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1 Scope

The present document identifies the requirements for the NGN Network Resource Model (NRM).

This NRM is an information model of the NGN Resources defined in the NGN specified by ETSI TISPAN which captures the management aspects (i.e. the management view of the NGN).

Clause 4 of the present document captures the general requirements for the NRM. Clause 5 identifies the NGN subsystems and entities which are modelled in the NGN NRM. Annex A captures agreed Use Cases and annex B is an informative annex capturing proposed Use Cases.

This version of the document is based on the TISPAN Release 1 architecture and may be updated to reflect changes in subsequent releases.

2 References

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.
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  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI TS 188 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); OSS requirements; OSS definition of requirements and priorities for further network management specifications for NGN".

[2] ETSI TS 132 150: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Telecommunication management; Integration Reference Point (IRP) Concept and definitions (3GPP TS 32.150 version 6.5.0 Release 6)".

[3] ETSI ES 282 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture Release 1".

[4] ETSI ES 282 002: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN Emulation Sub-system (PES); Functional architecture".

[5] ETSI ES 282 004: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture; Network Attachment Sub-System (NASS)".

[6] ETSI ES 282 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control Sub-system (RACS); Functional Architecture".

[7] ETSI ES 282 007: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IP Multimedia Subsystem (IMS); Functional architecture".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area**.** For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1] ETSI TR 180 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Release 1; Release definition".

[i.2] ETSI TS 182 012: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS-based PSTN/ISDN Emulation Subsystem; Functional architecture".

3 Abbreviations

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

AF	Application Function
AGCF	Access Gateway Control Function
AGF	Access Gateway Function
AMF	Access Management Function
A-MGF	Access Media Gateway Function
A-RACF	Access Resource and Admission Control Function
ARF	Access Relay Function
ASF Type 1	Application Server Function Type 1
ASF Type 2	Application Server Function Type 2
ASF	Application Server Function
BGCF	Border Gateway Control Function
BGF	Border Gateway Function
C-BGF	Core Border Gateway Function
CLF	Connectivity session Location and repository Function
CNGCF	Customer Network Gateway Configuration Function
FQDN	Fully Qualified Domain Name
IBCF	Interconnection Border Control Function
I-BGF	Interconnection Border Gateway Function
I-CSCF	Interrogating Call Server Control Function
IMS	IP Multimedia System
ISDN	Integrated Services Digital Network
IWF	InterWorking Function
L2TF	Layer 2 Termination Function
MGCF	Media Gateway Control Function
MRFC	Multimedia Resource Function Controller
MRFP	Multimedia Resource Function Processor
NACF	Network Access Configuration Function
NASS	Network Attachment SubSystem
NAT	Network Address Translation
NGN	Next Generation Network
NRM	Network Resource Module
OSS	Operations Support Team
P-CSCF	Proxy Call Server Control Function
PDBF	Profile Data Base Function
PES	PSTN/ISDN Emulation Subsystem
PSTN	Public Switched Telephony Network

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RACS	Resource Admission Control Subsystem
RCEF	Resource Control Enforcement Function
RGF	Residential Gateway Function
R-MGF	Residential Media Gateway Function
S-CSCF	Serving Call Server Control Function
SGF	Signalling Gateway Function
SLF	Subscription Locator Function
SPDF	Service Policy Decision Function
TE	Terminal Equipment
TISPAN	Telecommunications and Internet Converged Services and Protocols for Advanced Networking
TMF	TeleManagement Team
T-MGF	Trunking Media Gateway Function
UAAF	User Access Authorization Function
UE	User Equipment
UPSF	User profile Service Function

4 General requirements

The following general and high-level requirements apply for the NRM:

- NRM related requirements in TR 180 001 [i.1]. The present document provides a description of the content and capabilities of NGN Release 1 which need to be supported by the NRM.
- NRM related requirements in TS 188 003 [1]. The present document provides high level requirements for the NRM.
- The use of the IRP Methodology in TS 132 150 [2]. The present document provides the documentation structure and concept for the NRM.
- NGN Overall Functional Architecture ES 282 001 [3]. The present document identifies the subsystems and functional entities which make up the NGN.

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4.1 Reuse of specifications

To avoid overlap and duplication, the Network Resource Model should import relevant definitions (e.g. Object classes, attributes, etc.) from the 3GPP, TMF, ITU-T etc. where appropriate.

4.2 Granularity of Managed Objects

This clause states requirements on the level of granularity for managed entities.

4.2.1 Motivation, remarks, or examples

Based on, (see ES 282 001 [3]), the TISPAN NGN overall architecture (see figure 2) is the starting point for decomposition of the TISPAN NGN. Entities of this overall architecture are further decomposed recursively. This decomposition is performed in three dimensions:

- Decomposition into layer entities e.g. Service Layer, Transport Layer (see figure 2), or Transport Control Sublayer (see ES 282 001 [3]). A layer need not map to a manageable entity. Therefore this kind of decomposition does not motivate a requirement.
- Decomposition into subsystems e.g. Core IMS, PSTN/ISDN Emulation Subsystem. This kind of decomposition motivates Requirement 1.
- Decomposition into functional entities e.g. User Profile Service Function, UPSF (see figure 3), Transfer functions (see figure 2). This kind of decomposition motivates Requirement 2.

4.2.2 Requirements

Requirement 1:

- Each subsystem that has manageable aspects which are agreed on the basis of documented technical analysis performed on existing TISPAN specifications or are documented within an agreed Use case for an NGN management interface shall map to one manageable model element of the NGN Network Resource Model.

Requirement 2:

- Each functional entity that has manageable aspects which are agreed on the basis of documented technical analysis performed on existing TISPAN specifications or are documented within an agreed Use case for an NGN management interface shall map to one manageable model element of the NGN Network Resource Model.

4.3 Inter Domain Management

4.3.1 Motivation, remarks, or examples

According to the NGN functional architecture (see ES 282 001 [3]), functional entities or subsystems may be distributed over network/service provider domain borders. E.g. a network attachment subsystem, an I-BGF, or a service-layer subsystem that supports nomadism may be distributed between a visited and a home network. Figure 1 is taken from ES 282 001 [3]. It illustrates this multi-domain context.

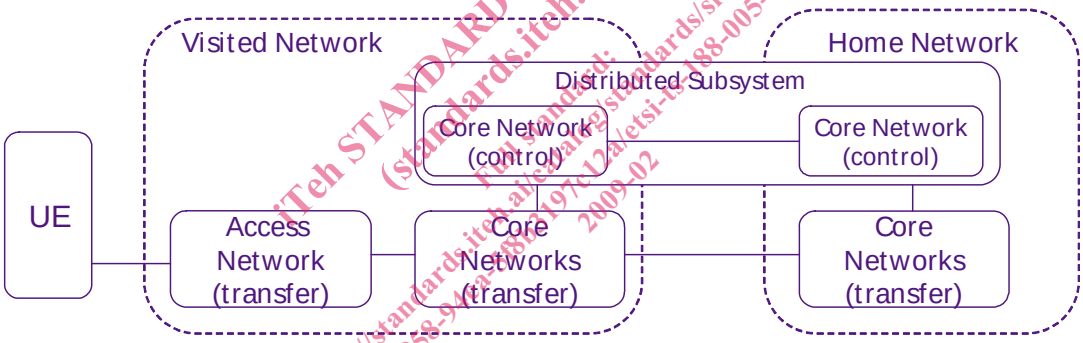

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Figure 1: Example for a distributed Subsystem

4.3.2 Requirements

Requirement 1:

- The Network Resource Model shall allow management of resources which are shared between administrative domains.

5 NGN Managed Entities

ES 282 001 [3] describes the overall TISPAN NGN functional architecture, its subsystems and the relationships between them. The present document, together with the Functional Architectures of the IMS (see ES 282 007 [7]), PES (see ES 282 002 [4]), IMS based PES (see TS 182 012 [i.2]), NAS (see ES 282 004 [5]), and RACS (see ES 282 003 [6]), identifies the entities with the NGN subsystems and the relationships between them.

The requirement to manage these entities is documented in clause 4.3 (requirements A2 and A8) of TS 188 003 [1].

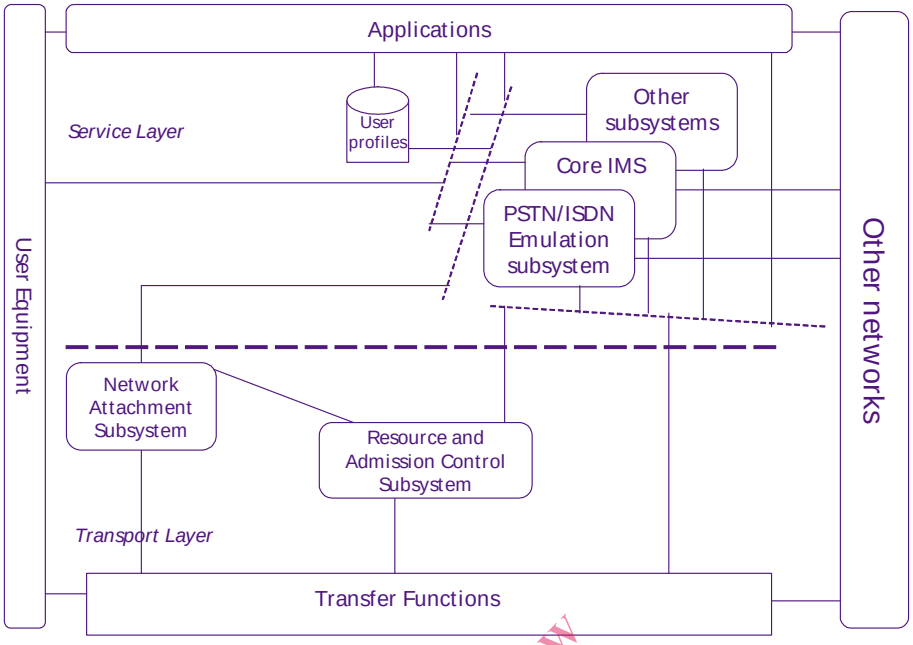

Figure 2: TISPAN NGN overall architecture

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The NGN functional architecture is split into 2 layers, "Service Layer" and "Transport Layer". The Functional Entities which form part of the Service Layer are described in clause 5.1, the Entities which form part of the Transport Layer are described in clause 5.2.

5.1 Analysis of Service Layer

5.1.1 Common Managed Entities

The following entities are defined in ES 282 001 [3].

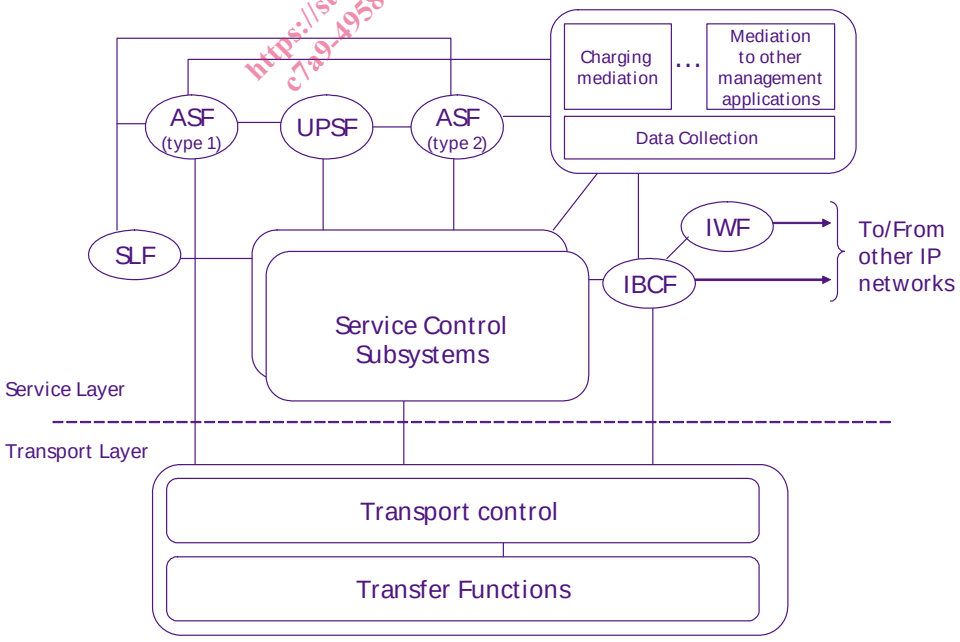

Figure 3: Common components overview

As a result of analysis, the following entities are required to be modelled in the NRM.

TISPAN Entity	Remark
User profile service Function (UPSF)	see note
Subscription Locator Function (SLF)	see note
Application Server Function (ASF) Type 1	see note
Application Server Function (ASF) Type 2	see note
Interworking Function (IWF)	see note
Interconnection Border Control Function (IBCF)	see note
NOTE: This entity meets Requirement 2 of clause 4.2.2 because it is well defined and it is it should be able to generate alarms.	

See clause 5.1.2 for Entities within the IP Multimedia Subsystem (IMS).

See clause 5.1.3 for Entities within the PSTN/ISDN Emulation Subsystem (PES).

The inclusion of the following entities in the NRM is for further study.

Proposed TISPAN Entity	Remark
Charging and Data Collection Function	-

5.1.2 The IMS

The following Core IMS entities are defined in ES 282 007 [7].

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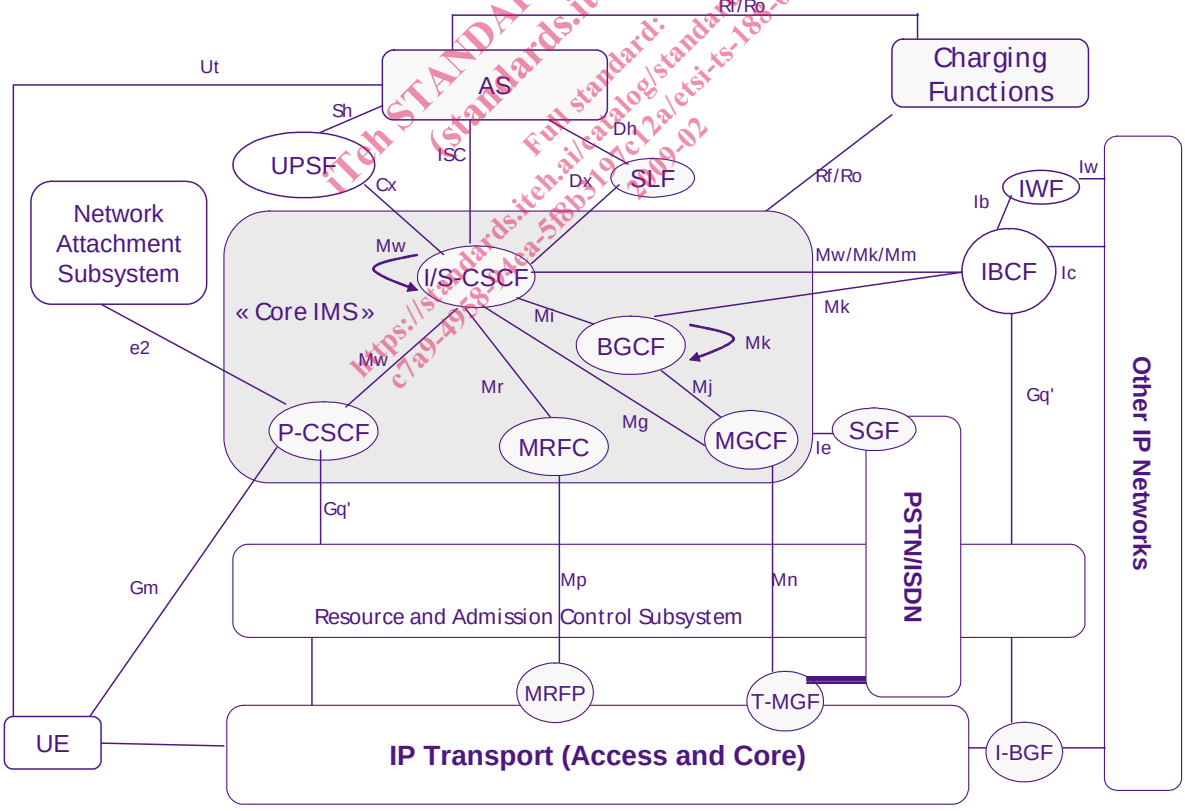

Figure 4: TISPAN IMS Components