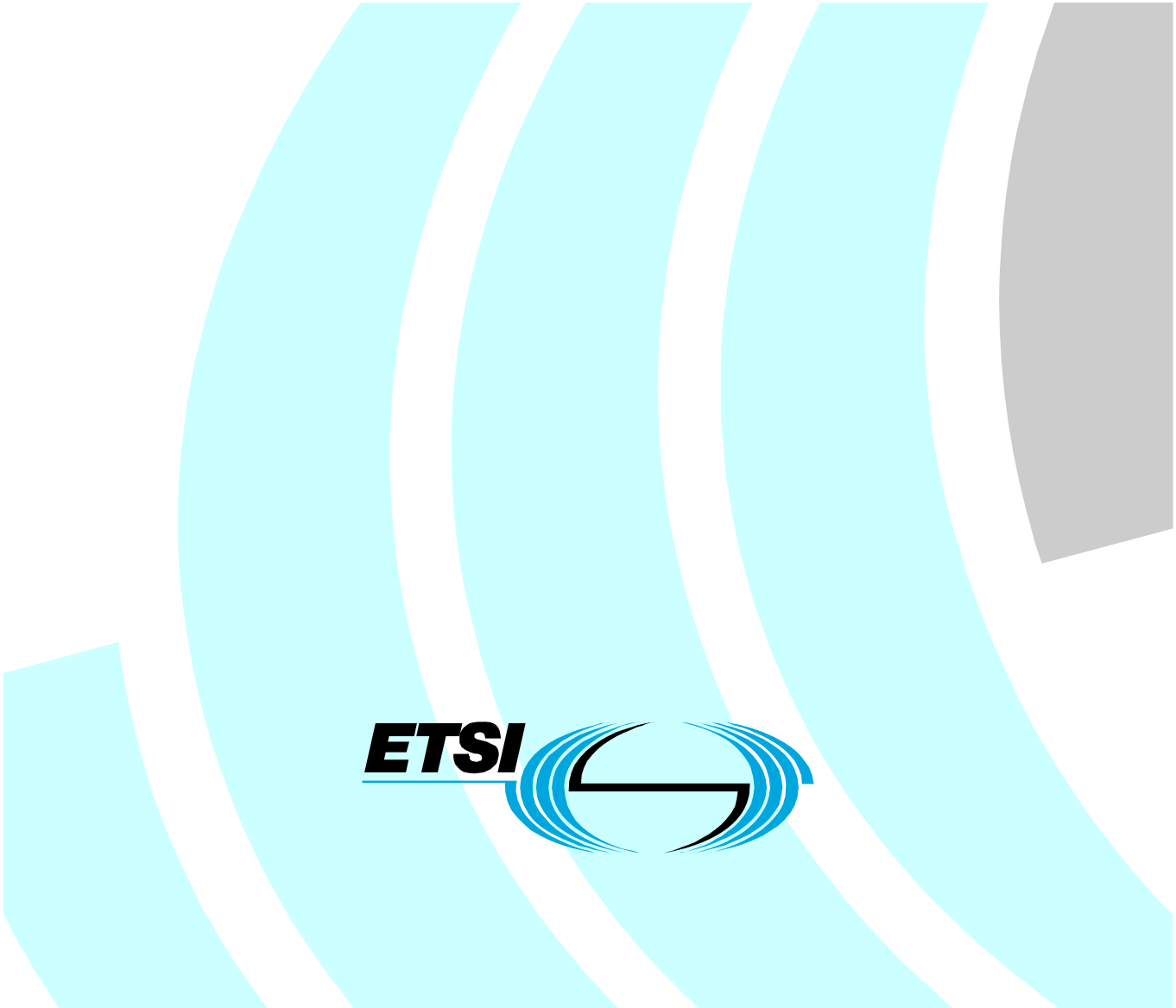
ETSI SR 080 005 V3.1.1 (2011-07)

Special Report

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Regulatory Requirements and Public Interests in NGN standardisation



Reference
DSR/TISPAN-00009-NGN-R3

Keywords
regulation

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://ipr.etsi.org).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document describes the results of the review of NGN standardisation from the regulatory point of view.

1 Scope

The regulatory requirements defined in the existing NGN documents cover only a part of the overall regulatory aspects which should be taken into account. For instance in document TS 181 005 [i.8] (Service and Capability Requirements) requirements are limited to the following issues: Lawful Intercept, Emergency, Malicious Communication Identify, Anonymous Communications Rejection.

The NGN related regulation was studied by ETSI project STF 311. The results were published in SR 002 586 [i.98] (Consequence on the NGN standardization activity from the EU ECN&S regulatory view point). The findings of STF 311 project are used as a basis of the present document.

The present document goes through the whole area of the regulation and provides a high level description of the NGN standardisation. The contents of the EU regulation and TISPAN documents are reviewed to ensure that the regulatory requirements have been properly incorporated into the NGN specifications. In order to keep the volume of the document reasonable only a brief reference is made to the relevant documents.

It should be noted that general regulatory issues (e.g. interoperability and numbering as such) and radio regulated issues (e.g. EMC) are outside the scope of the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive).

[i.2] Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

[i.3] Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive).

[i.4] Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

[i.5] Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users" rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws.

[i.6] Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services.

[i.7] Directive 2002/20/EC of the European Parliament and of THE Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive).

[i.8] ETSI TS 181 005: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Service and Capability Requirements".

[i.9] ETSI TS 122 228: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Service requirements for the Internet Protocol (IP) multimedia core network subsystem (IMS); Stage 1 (3GPP TS 22.228)".

[i.10] ETSI TS 181 014: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Requirements for network transport capabilities to support IPTV services".

[i.11] ETSI TS 181 016: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Service Layer Requirements to integrate NGN Services and IPTV".

[i.12] ITU-T Recommendation Y.2001: "General overview of NGN".

[i.13] ETSI ES 282 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture".

[i.14] ETSI TS 182 012: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS-based PSTN/ISDN Emulation Sub-system (PES); Functional architecture".

[i.15] ETSI TS 182 027: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IPTV Architecture; IPTV functions supported by the IMS subsystem".

[i.16] ETSI TS 182 028: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN integrated IPTV subsystem Architecture". .

[i.17] ETSI ES 282 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control Sub-System (RACS): Functional Architecture".

[i.18] ETSI ES 282 004: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture; Network Attachment Sub-System (NASS)".

[i.19] ETSI TS 185 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Customer Network Gateway (CNG) Architecture and Reference Points".

[i.20] ETSI TS 122 173: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services; Stage 1 (3GPP TS 22.173)".

[i.21] ETSI TR 182 026: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Impact of mobility for access-technology independent networks in the TISPAN NGN architecture".

[i.22] ETSI TR 184 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Portability of telephone numbers between operators for Next Generation Networks (NGNs)".

[i.23] ETSI TR 184 008: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Infrastructure ENUM Options for a TISPAN IPX".

[i.24] ETSI TS 184 002: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Identifiers (IDs) for NGN".

[i.25] ETSI TS 184 011: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Requirements and usage of E.164 numbers in NGN and NGCN".

[i.26] ITU-T Recommendation Q.1706/Y.2801: "Mobility management requirements for NGN".

[i.27] ITU-T Recommendation Q.1762/Y.2801: "Fixed-mobile convergence general requirements".

[i.28] ITU-T Recommendation Q.1708/Y.2805: "Framework of Location Management for NGN".

[i.29] ITU-T Recommendation Y.2018: "Mobility management and control framework and architecture within the NGN transport stratum".

[i.30] ITU-T Recommendation Q.3402: "NGN UNI signalling profile (Protocol set 1)".

[i.31] ITU-T Recommendation Q.3401: "NGN NNI signalling profile (protocol set 1)".

[i.32] ETSI EG 202 057 (all parts): "Speech and multimedia Transmission Quality (STQ); User related QoS parameter definitions and measurements".

[i.33] ETSI TR 182 015: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Next Generation Networks; Architecture for Control of Processing Overload".

[i.34] ETSI TR 182 031: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Remote CPN QoS Control; Study on CPN - RACS Interaction".

[i.35] ETSI TR 102 717: "Speech and multimedia Transmission Quality (STQ); Quality of Service Implications of NGN Architectures".

[i.36] ETSI TR 102 775: "Speech and multimedia Transmission Quality (STQ); Guidance on objectives for Quality related Parameters at VoIP Segment-Connection Points; A support to NGN Transmission planners".

[i.37] ETSI EG 202 009-2: "User Group; Quality of telecom services; Part 2: User related parameters on a service specific basis".

[i.38] ETSI TR 102 805-1: "User Group; End-to-end QoS management at the Network Interfaces; Part 1: User's E2E QoS - Analysis of the NGN interfaces (user case)".

[i.39] ETSI TR 102 805-2: "User Group; End-to-end QoS management at the Network Interfaces; Part 2: Control and management planes solution - QoS continuity".

[i.40] ITU-T Recommendation Y.1541: "Network Performance Objectives for IP-Based Services".

[i.41] ITU-T Recommendation Y.1543: "Measurements in IP networks for inter-domain performance assessment".

[i.42] ITU-T Recommendation Y.2112: "A QoS control architecture for Ethernet-based IP access networks".

[i.43] ITU-T Recommendation Y.1221: "Traffic control and congestion control in IP based networks".

[i.44] Directive 2006/24/EC of the European Parliament and of the Council of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/EC.

[i.45] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

[i.46] ETSI TS 187 001 (V2.1.5): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN SECurity (SEC); Requirements".

[i.47] ETSI TR 187 002: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); TISPAN NGN Security (NGN-SEC); Threat, Vulnerability and Risk Analysis".

[i.48] ETSI TS 187 003 (V2.3.2): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Security; Security Architecture".

[i.49] ETSI TR 187 010: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Security; Report on issues related to security in identity management and their resolution in the NGN".

[i.50] ETSI TR 187 013: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Feasibility study on IPTV Security Architecture".

[i.51] ETSI TS 187 005: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Release 2 Lawful Interception; Stage 1 and Stage 2 definition".

[i.52] ETSI TR 187 012: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Security; Report and recommendations on compliance to the data retention directive for NGN-R2".

[i.53] ETSI TS 187 016: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Security; Identity Protection (Protection Profile)".

[i.54] ETSI TR 187 009: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Feasibility study of prevention of unsolicited communication in the NGN".

[i.55] ETSI TS 122 141: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Presence service; Stage 1 (3GPP TS 22.141)".

[i.56] ITU-T Recommendation Y.2701: "Security requirements for NGN release 1".

[i.57] ITU-T Recommendation Y.2702: "Authentication and authorization requirements for NGN release 1".

[i.58] ITU-T Recommendation Y.2703: "The application of AAA service in NGN".

[i.59] ITU-T Recommendation Y.2704: "Security mechanisms and procedures for NGN".

[i.60] ITU-T Recommendation Y.2720: "NGN identity management framework".

[i.61] Commission Recommendation C(2009) 3200 final of 12.5.2009 on the implementation of privacy and data protection principles in applications supported by radio-frequency identification.

[i.62] Standardization mandate 436: standardisation mandate to the European standardisation organisations CEN, CENELEC and ETSI in the field of information and communication technologies apples to radio frequency identification (RFID) and systems.

[i.63] ETSI ES 283 030: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Presence Service Capability; Protocol Specification [3GPP TS 24.141 V7.0.0, modified and OMA-TS-Presence-SIMPLE-V1-0, modified]".

[i.64] ETSI TS 124 430: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); TISPAN; Presence Service Capability; Protocol Specification [3GPP TS 24.141 V7.0.0, modified and OMA-TS-Presence_SIMPLE-V1_0, modified] (3GPP TS 24.430)".

[i.65] ETSI TS 122 071: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Location Services (LCS); Service description; Stage 1 (3GPP TS 22.071)".

[i.66] ITU-T Recommendation X.1275: "Guidelines on protection of personally identifiable information in the application of RFID technology".

[i.67] ETSI 183 047: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN IMS Supplementary Services; Advice Of Charge (AOC)".

[i.68] ETSI TS 188 001: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); NGN management; Operations Support Systems Architecture".

[i.69] ETSI TS 188 002-1: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Subscription Management; Part 1: Requirements".

[i.70] 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".

[i.71] ETSI TS 132 140: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Subscription Management (SuM) requirements (3GPP TS 32.140)".

[i.72] ITU-T Recommendation Y.2233: "Requirements and Framework Allowing Accounting and Charging Capabilities in NGN".

[i.73] Commission Recommendation 2003/558/EC of 25 July 2003 on the processing of caller location information in electronic communication networks for the purpose of location-enhanced emergency call services.

[i.74] Standardisation Mandate 493: "Standardisation mandate to the European Standardisation Organisations (ESO) in Support of the Location Enhanced Emergency Call Service".

[i.75] ETSI TS 102 424: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Requirements of the NGN network to support Emergency Communication from Citizen to Authority".

[i.76] ETSI TS 123 167: "Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS) emergency sessions (3GPP TS 23.167)".

[i.77] ETSI TS 182 009: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Architecture to support emergency communication from citizen to authority [3GPP TS 23.167]".

[i.78] ETSI TS 123 509: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); TISPAN; NGN Architecture to support emergency communication from citizen to authority [Endorsed document 3GPP TS 23.167] (3GPP TS 23.509)".

[i.79] ETSI TS 102 660: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Signalling Requirements and Signalling Architecture for supporting the various location information protocols for Emergency Service on a NGN".

[i.80] ETSI TR 102 182:"Emergency Communications (EMTEL); Requirements for communications from authorities/organisations to the citizens during emergencies".

[i.81] ETSI TR 102 410: "Emergency Communications (EMTEL); Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress".

[i.82] ETSI TR 102 444: "Emergency Communications (EMTEL); Analysis of the Short Message Service (SMS) and Cell Broadcast Service (CBS) for Emergency Messaging applications; Emergency Messaging; SMS and CBS".

[i.83] ETSI 102 445: "Emergency Communications (EMTEL); Overview of Emergency Communications Network Resilience and Preparedness".

[i.84] ETSI TR 102 476: "Emergency Communications (EMTEL); Emergency calls and VoIP: possible short and long term solutions and standardization activities".

[i.85] ETSI TS 102 181: "Emergency Communications (EMTEL); Requirements for communication between authorities/organizations during emergencies".

[i.86] ITU-T Recommendation Y.2205: "Next Generation Networks - Emergency telecommunications - Technical considerations".

[i.87] ITU-T Recommendation Y.2171: "Admission control priority levels in Next Generation Networks".

[i.88] ITU-T Recommendation Y.2172: "Service restoration priority levels in Next Generation Neworks".

[i.89] ETSI EG 202 116: "Human Factors (HF); Guidelines for ICT products and services; "Design for All"".

[i.90] ETSI EG 202 325: "Human Factors (HF); User Profile Management".

[i.91] ETSI ES 202 746: "Human Factors (HF); Personalization and User Profile Management; User Profile Preferences and Information".

[i.92] ETSI TS 102 747: "Human Factors (HF); Personalization and User Profile Management; Architectural Framework".

[i.93] ETSI TS 122 240: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Service requirements for 3GPP Generic User Profile (GUP); Stage 1 (3GPP TS 22.240)".

[i.94] ITU-T Recommendation F.790: "Telecommunications accessibility guidelines for older persons and persons with disabilities".

[i.95] ITU-T Technical Paper: "Telecommunications Accessibility Checklist".

[i.96] W3C: "Web Content Accessibility Guidelines (WCAG) 2.0".

[i.97] ISO/IEC DTR 29138: "Information Technology - Accessibility Considerations for People with Disabilities".

[i.98] ETSI SR 002 586: "Electronic Communications Networks and Services Consequence on the NGN standardization activity from the EU ECN&S regulatory view point".

[i.99] Commission Recommendation 2010/572/EU of 20 September 2010 on regulated access to Next Generation Access Networks (NGA).

[i.100] ETSI TS 124 447: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); TISPAN; NGN IMS Supplementary Services; Advice Of Charge (AOC) (3GPP TS 24.447)".

3 Abbreviations

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

3GPP	3rd Generation Partnership Project
AAA	Authentication, Authorization, Accounting
ACR	Anonymous Communications Rejection

ADSL	Asymmetric Digital Subscriber Line
AOC	Advice Of Charge
ASP	Application Service Provider
BGS	Border Gateway Services including
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CPN	Customer Premises Network
CSCF	Call Session Control Function
DoS	Denial of Service
DRM	Digital Rights Management
EC	European Commission
EC COCOM	European Commission Communications Committee
ECN&S	Electronic Communications Networks and Services
EMC	ElectroMagnetic Compatibility
EMTEL	Emergency Communications
ENUM	E.164 NUmber Mapping
ETSI	European Telecommunications Standards Institute
EU	European Union
GSM	Global System for Mobile Communications
GUP	Generic User Profile
HF	Human Factors
ID	Identifier
IEC	International Electrotechnical Commission
IMS	IP Multimedia Sub-System
IP	Internet Protocol
IPTV	Internet Protocol Television
IPX	IP Packet eXchange
ISIM	IMS Subscriber Identity Module
ISDN	Integrated Services Digital Network
ISO	International Organisation for Standardization
ITU-T	International Telecommunications Union - Telecommunication Standardization Sector
LI	Lawful Interception
NASS	Network Attachment Sub-System
NAT	Network Address Translator
NGA	Next Generation Access Networks
NGCN	Next Generation Corporate Networks
NGN	Next Generation Network
NP	Network Performance
OIR	Restriction of presentation of originating identity
OSS	Operations Support Systems
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Network
PUC	Prevention of Unsolicited Communication
QoS	Quality of Service
RACS	Resource and Admission Control Sub-System
RFID	Radio Frequency IDentification
R&TTE	Radio and telecommunications terminal equipment
SEC	Security
SIP	Session Initiation Protocol
SMS	Short Message Service
SPDF	Service-based Policy Decision Function
SuM	Subscription Management
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networking
UC	Unsolicited Communication
UE	User Equipment
UICC	Universal Integrated Circuit Card
URI	Uniform Resource Identifier
USO	Universal Service Obligation
VoIP	Voice over IP
W3C	World Wide Web Consortium
WCAG	Web Content Accessibility Guidelines

4 Main purposes of the present document

The main purposes of the present document are:

- to provide an high level overview on the NGN standards from the regulatory point of view,
- to collect together regulatory and public interest issues for NGN standardization,
- to increase the awareness of the regulatory and public interest requirements for the ongoing NGN standardization,
- to carry out a review on the contents of the existing NGN documents in order to ensure that the requirements are properly incorporated into the specifications,
- to inform TISPAN Working Groups if inconsistencies or shortages are found,
- to improve the visibility of the regulatory and public interest topics for the development and deployment of NGN technology,
- to use the standardized concept and terminology (same language) when regulatory and public interest requirements are discussed,
- to assess applicability and feasibility of the mechanisms currently used for traditional networks and evaluate possible new mechanisms provided by NGN.

5 Principles applied in the preparation of the present document

The requirements have been grouped into four areas as follows:

- principles and basic characteristics of NGN;
- network and service provision;
- security and privacy protection; and
- consumer aspects.

Examples of the individual requirements are listed in Figure 1.

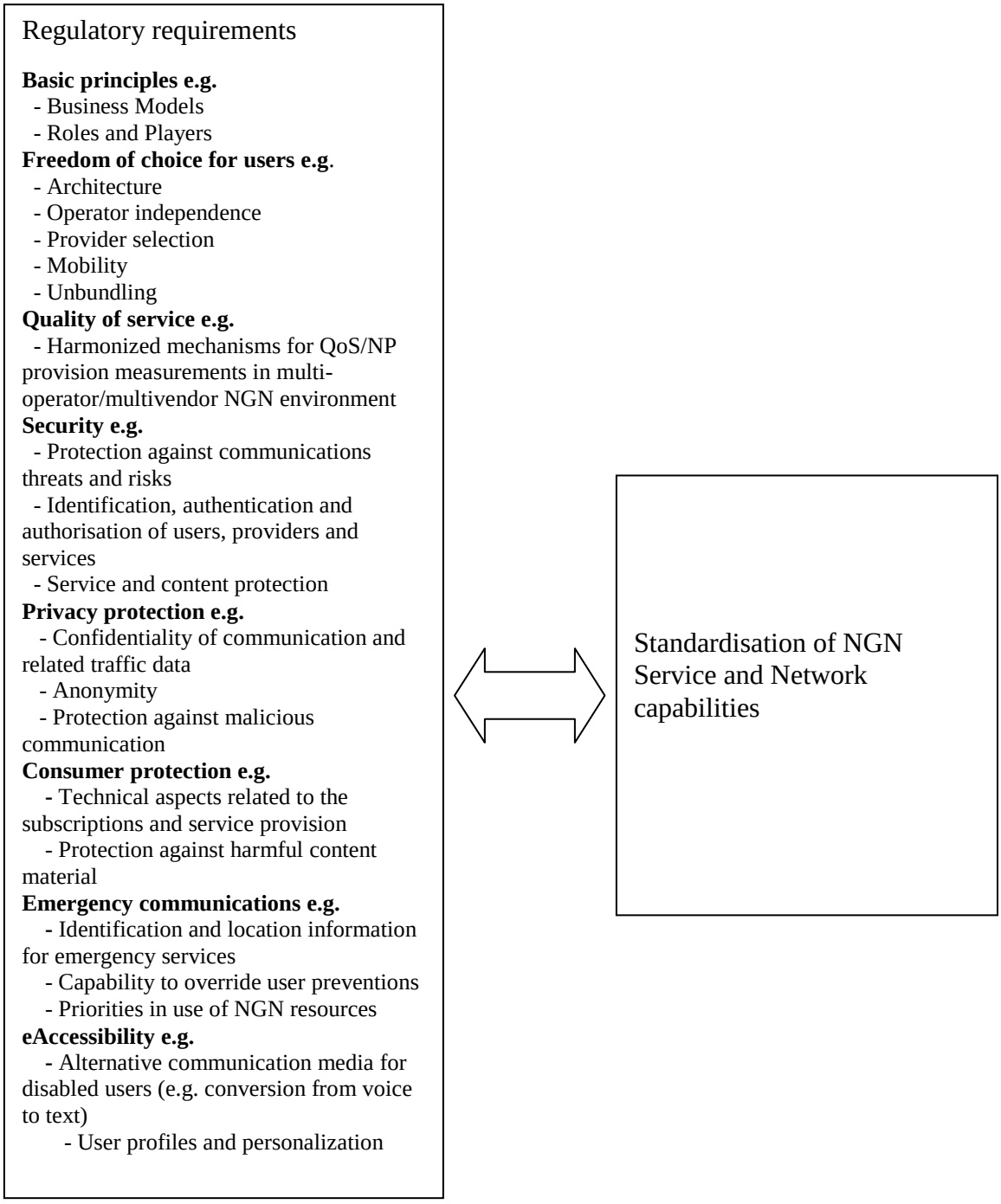


Figure 1: Regulatory requirements vs. NGN standardisation

The preparation of the present document was phased as follows (Figure 2):

1) Regulatory aims

   The regulatory aims were organised into the same categories which were used in the preparation of List of Standards by Expert Group of EC COCOM e.g. freedom of choice for users (alternative solutions, competition) and privacy protection.

2) Identification of technical regulatory requirements

   The requirements in the EU regulations (e.g. Communications Directives 2002 and amendments 2009) were transformed into the technical requirements for the NGN e.g. protection against communication threats.

3) Need for NGN specific network and service capabilities

It was investigated what NGN specific network or service capabilities are needed to fulfil the technical requirement identified in phase 2 e.g. possibility to restrict the presentation of identification or location information.

4) Need for standardisation

It was investigated whether the NGN specific network or service capabilities identified in phase 3 should be standardised or not e.g. in order to ensure the interoperability in multi-operator and multivendor environments.

5) Results of the review

The current TISPAN documents on requirements normally presented in Stage 1 descriptions were reviewed and commented. ITU-T Recommendations were noted when appropriate.

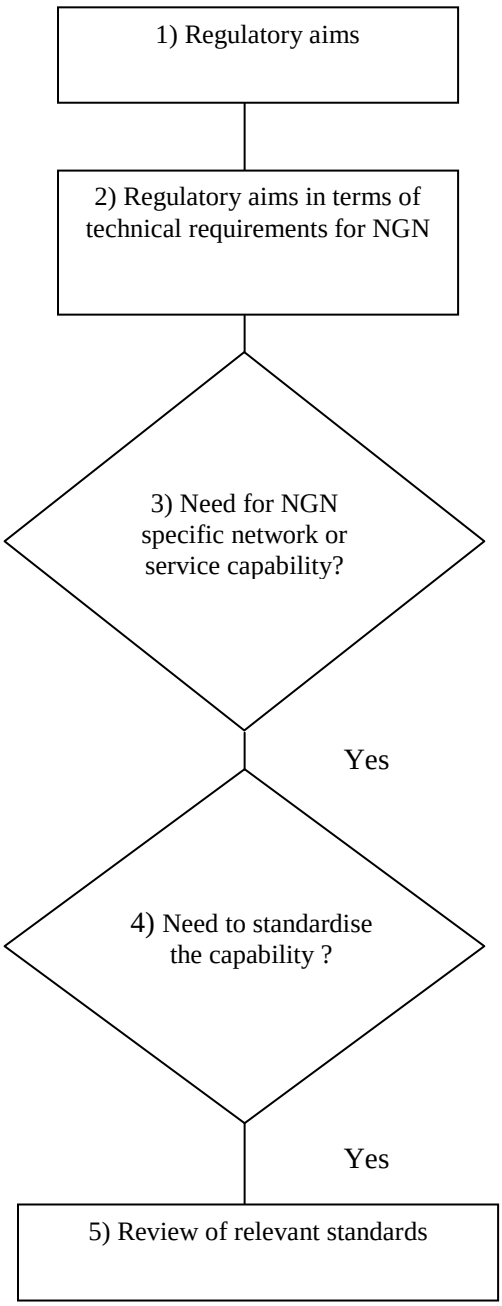


Figure 2: Work process

6 Principles and basic characteristics of NGN

6.1 Regulations

EC Directives

- Directive 2002/21/EC [i.1] on a common regulatory framework
- Directive 2002/22/EC [i.2] on universal service and users' rights
- Directive 2002/19/EC [i.3] on access to, and interconnection of, electronic communications networks and associated facilities
- Directive 2002/58/EC [i.4] concerning the processing of personal data and the protection of privacy

Amended EC Directives

- Directive 2009 /136/EC [i.5] amending Directive 2002/22/EC [i.2] on universal service and users' rights and Directive 2002/58/EC [i.4] concerning the processing of personal data and the protection of privacy
- Directive 2009/140/EC [i.6] amending Directives 2002/21/EC [i.1] on a common regulatory framework, 2002/19/EC [i.3] on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC [i.7] on the authorisation of electronic communications networks and services

6.2 Technical requirements

General characteristics of the NGN from the regulatory point of view.

6.3 NGN network and service capabilities

The general characteristics of the NGN defined in the NGN standards contain features such as:

- Basic principles of the NGN
- Business Models of the NGN
- Roles of the players in the NGN

6.4 Relevant TISPAN documents and other documents

TISPAN documents

- TS 181 005 [i.8] "Service and Capability Requirements"; in particular:
  - Clause 4.6 "Regulatory service requirements"
  - Clause 4.13 "Roles within NGN"
  - Clause 5 "PSTN/ISDN emulation service"
- TS 122 228 [i.9] "IMS Service requirements for the Internet Protocol (IP) multimedia core network subsystem (IMS); Stage 1"; in particular:
  - Clause 5 "High level requirements"
  - Annex B "Business models use cases"
- TS 181 014 [i.10] "Requirements for network transport capabilities to support IPTV services"; in particular:
  - Clause 5 "IPTV Context Requirements"

- TS 181 016 [i.11] "Service Layer Requirements to integrate NGN Services and IPTV"; in particular:
  - Clause 4.1 "IPTV roles"

Other relevant documents

- ITU-T Recommendation Y.2001 [i.12] "General overview of NGN"; in particular:
  - Clause 5 "Objectives of the NGN"
  - Clause 6 "Fundamental characteristics of NGN"

6.5 Contents of documents and conclusions

1) General principles

ITU-T Recommendation Y.2001 [i.12] "General overview of NGN":

The Recommendation provides the NGN with the following basic characteristics:

- *"broadband capabilities with end-to-end Quality of Service* and *converged services between fixed* and *mobile* networks"
- *"independence of service-related functions from underlying transport technologies* and *support of multiple last mile technologies* including *mobility"*
- *"unrestricted access by users to different service providers* and *interworking with legacy networks via open interfaces"*
- *"compliant with all regulatory requirements, for example concerning emergency communications, security, privacy, lawful interception etc."*

Conclusions:

- **The defined NGN concept and its basic principles support the primary aims of the EU regulation.**
- **NGN evolution should be supported by regulators and it should be ensured that the defined principles will be followed in the ongoing NGN standardisation.**

2) Roles

Roles in NGN:

TS 181 005 [i.8] "Service and Capability Requirements":

- Two different roles are identified on the service layer:
  - NGN Service Provider; and
  - Application Provider.
- Three different roles are identified on the transport layer:
  - NGN Access Network Provider;
  - NGN Connectivity Provider; and
  - NGN Core Network Provider.

Roles in IPTV:

TS 181 016 [i.11] "Service Layer Requirements to integrate NGN Services and IPTV":

- Content Provider;
- IPTV Service Provider;

- NGN Service Provider;
- Transport Provider;
- Consumer.

Conclusions:

- **The roles defined for NGN and IPTV environments provide a useful mechanism to be applied in regulatory studies.**
- **From the regulatory point of view it is worthwhile to be noted that the IPTV is standardised to be open for different kind of NGN (IMS, non-IMS) and non-NGN implementations.**

7 Network and service provision related requirements

7.1 Freedom of choice for users

7.1.1 Regulations

EC Directives

- Directive 2002/19/EC [i.3] on access to, and interconnection of, electronic communications networks and associated facilities; in particular:
  - Article 12 "Obligations of access to, and use of, specific network facilities"
    - *"open access to technical interfaces, protocols or other key technologies that are indispensable for the interoperability of services or virtual network services"*
    - *"specified services needed to ensure interoperability of end-to-end services to users, including facilities for intelligent network services or roaming on mobile networks"*
    - *"access to operational support systems or similar software systems necessary to ensure fair competition in the provision of services"*
    - *"interconnect networks or network facilities*."

Amended EC Directives

- Directive 2009 /140/EC [i.6] amending Directive 2002/19/EC [i.3] on access to, and interconnection of, electronic communications networks and associated facilities; in particular:
  - Article 2: "Definitions" (e.g. amendments to the definitions of "Access" and "local loops")
  - Article 12 (amendments): "Obligations of access to, and use of, specific network facilities"
    - *"access to specified network elements and/or facilities, including access to network elements which are not active and/or unbundled access to the local loop, to inter alia allow carrier selection and/or pre-selection and/or subscriber line resale offer"*
    - *"to provide access to associated services such as identity, location and presence service.*"
- Directive 2009 /136/EC [i.5] amending Directive 2002/22/EC [i.2] on universal service and users' rights; in particular:
  - Article 30 "Facilitating change of provider"
    - *"Subscribers with numbers from the national telephone numbering plan who so request can retain their number(s) independently of the* operator."

EU Commission Recommendation on regulated access to Next Generation Access Networks (NGA) [i.99]

NGA is defined by the Commission as fixed access networks which consist wholly or in part of optical elements (fibre). In most cases NGAs are the result of an upgrade of existing copper or coaxial access networks. A key principle is to provide access at different levels of the value chain:

1) Physical infrastructure (ducts)

2) Transmission medium (twisted pair/coax/fibre)

3) Capacity (bitstream)

The NGA Recommendation states that appropriate technical specifications and standards for new wholesale broadband access products in NGA based networks are needed.

7.1.2 Technical requirements

Alternative technical solutions and mechanisms to enhance the freedom of choice for users.

7.1.3 NGN network and service capabilities

Network and service capabilities needed to offer alternative solutions for customers:

- Service/Network provider independence of interconnection interfaces
- Open Access
- Mobility, Nomadism
- Change of provider
- Number Portability

7.1.4 Relevant TISPAN documents and other documents

TISPAN documents:

NGN architecture

- TS 181 005 [i.8] "Service and Capability Requirements"
- ES 282 001 [i.13] "NGN Functional Architecture"
- TS 182 012 [i.14] "IMS-based PSTN/ISDN Emulation Sub-system (PES); Functional architecture"

IPTV architecture

- TS 182 027 [i.15] "IPTV functions supported by the IMS subsystem"
- TS 182 028 [i.16] "NGN integrated IPTV subsystem Architecture"

RACS architecture

- ES 282 003 [i.17] "Resource and Admission Control Sub-System (RACS); Functional Architecture"

NASS architecture

- ES 282 004 [i.18] "NGN Functional Architecture; Network Attachment Sub-System (NASS)"

Customer network interface

- TS 185 003 [i.19] "TISPAN Customer Network Gateway (CNG) Architecture and Reference Points"

IMS services and Supplementary services

- TS 122 173 [i.20]"IMS Multimedia Telephony Service and supplementary services; Stage 1"

Mobility

- TR 182 026 [i.21] "Impact of mobility for access-technology independent networks in the TISPAN NGN architecture"

Number portability

- TR 184 003 [i.22] " Portability of telephone numbers between operators for Next Generation Networks (NGNs)"
- TR 184 008 [i.23] "Infrastructure ENUM Options for a TISPAN IPX"
- TS 184 002 [i.24] "Identifiers (IDs) for NGN"

E.164 numbering

- TS 184 011 [i.25] " Requirements and usage of E.164 numbers in NGN and NGCN"

Other relevant documents:

- ITU-T Recommendation Q.1706/Y.2801 [i.26] "Mobility management requirements for NGN".
- ITU-T Recommendation Q.1762/Y.2802 [i.27] "Fixed-mobile convergence general requirements".
- ITU-T Recommendation Q.1708/Y.2805 [i.28] "Framework of location management for NGN".
- ITU-T Recommendation Y.2018 [i.29] "Mobility management and control framework and architecture within the NGN transport stratum".

7.1.5 Contents of documents and conclusions

Interfaces (reference points) defined for the NGN and IPTV

Access and Transport

ES 282 001 [i.13]"NGN Functional Architecture"

- Di: Access network - Core network
- Dj: UE - Access Network
- Iz: Core network - Other networks
- Ut: UE - SIP Application Servers to manage information related to the services
- Gm: UE - IMS, e.g. for registration and session control

NASS

ES 282 004 [i.18] "NGN Functional Architecture; Network Attachment Sub-System (NASS)"

- e1: UE - NASS to attach user equipment to the network
- e2: NASS - Service control subsystems and Applications
- e3: UE - NASS the user equipment configuration purposes
- e4: NASS - RACS for exporting subscriber access profile information
- e5: NASS (visited) - NASS (home)

RACS

ES 282 003 [i.17] "Resource and Admission Control Sub-System (RACS); Functional Architecture" e.g.

- Gq': RACS - Service control subsystems and Applications for exposing the services it provides
- Re: RACS - Transport processing functions
- Ia: RACS - Transport BGF

Maintenance

- Mw: Reference Point between a CSCF and another CSCF

IPTV

IMS Based IPTV

TS 182 027 [i.15] "IPTV functions supported by the IMS subsystem"

- Xa: UE - SSF (Service Selection Functions) to make appropriate service selections
- Xc: UE - MCF (Media Control Functions) is a logical end-to-end reference point between the UE and the IPTV Media Control
- Xd: UE - MDF (Media Delivery Functions) is a logical end-to-end reference point between the UE and the IPTV Media Delivery Function
- y2: Core IMS - IPTV Media Functions is the reference point between S-CSCF and IPTV Media Control Function (MCF)
- ISC: Core IMS - IPTV Service Control Functions

Non-IMS IPTV

TS 182 028 [i.16] "NGN integrated IPTV subsystem Architecture" e.g.

- Tr: UE - Application Functions; used for UE Authentication and Authorization during initialization
- Sa: IPTV control - Media Control Function
- Xc: UE - IPTV Media Control Function (MCF)
- Xp: IPTV Media Control Function - IPTV Media Delivery Function
- Xd: UE - IPTV Media Delivery Function (MDF)

Conclusions:

- **There is a need to evaluate which ones of the numerous interfaces (reference points) standardised for NGN and IPTV are intended to be operator/service provider independent interfaces and how the interfaces could be mapped with the Roles or Administrative domains.**
- **There is a need to clarify how the user - network interfaces (UNI) could be constructed for direct and corporate network accesses by using the defined interfaces (reference points) including ITU-T Recommendation Q.3402 [i.30] "NGN UNI signalling profile (Protocol set 1)".**
- **There is a need to clarify how the network - network interfaces (NNI) could be constructed for different interworking scenarios by using the defined interfaces (reference points) including ITU-T Recommendation Q.3401 [i.31] "NGN NNI signalling profile (protocol set 1)".**
- **Special attention should be drawn to the regulatory aspects of mobility in its various forms (nomadicity, handover, fixed mobile convergence) including the management of mobility.**

- **It has to be ensured that necessary user information is transferred in a NGN network in order to provide other operators and third parties with an accurate identity and location information for their services and applications.**

- **The numbering, topics such as usage of E.164 numbers, number portability, carrier pre-selection in NGN should be continued.**

- **It should be clarified how the NGN standardisation could contribute to the EC Recommendation on Next Generation Access e.g. open access interface on layer 2.**

7.2 Quality of Service and Network Performance

7.2.1 Regulations

EC Directives

- Directive 2002/22/EC [i.2] on universal service and users' rights; in particular:

  - Article 11: "Quality of service of designated undertakings"

  "National regulatory authorities shall ensure that designated operators *publish adequate and up-to-date information concerning their performance in the provision of universal service, based on the specified quality of service parameters, definitions and measurement methods.* "

  - Article 31:"Must carry obligations"

  "Member States may impose reasonable 'must carry' obligations, for the transmission of specified radio and television broadcast channels and services,…, used for the distribution of radio or television broadcasts to the public where a significant number of end-users of such networks use them as their principal means to receive radio and television broadcasts."

Amended EC Directives

- Directive 2009/136/EC [i.5] amending Directive 2002/22/EC [i.2] on universal service and users' rights; in particular:

  - Article 22 "Quality of service"

    - Operators can be asked "*to publish comparable, adequate and up-to-date information for end-users on the quality of their services and on measures taken to ensure equivalence in access for disabled end-users."*

    - *"National regulatory authorities may specify the quality of service parameters to be measured and the content, form and manner of the information to be published, including possible quality certification mechanisms, in order to ensure that end-users, including disabled end-users, have access to comprehensive, comparable, reliable and user-friendly information."*

    - *"In order to prevent the degradation of service and the hindering or slowing down of traffic over networks"*, minimum quality of service requirements can be set.

  - Annex III "The quality of service parameters, definitions and measurement methods"
    (EG 202 057 [i.32])

    Definition and measurement method for

    - Supply time for initial connection

    - Fault rate per access line

    - Fault repair time

    - Call set up time

    - Response times for directory enquiry services

- Proportion of coin and card operated public pay-telephones in working order
- Bill correctness complaints
- Unsuccessful call ratio

7.2.2 Technical requirements

Harmonized mechanisms for QoS/NP provision and measurements in multi-operator/multivendor NGN environment.

7.2.3 NGN network and service capabilities

Capabilities for End-to-End Quality of Service, Network performance and measurements:

- Provision of unified QoS classes
- QoS/NP measurement mechanisms
- Control of use of network resources (RACS functionality)
- Overload processing
- Traffic and Congestion Control

7.2.4 Relevant TISPAN documents and other documents

TISPAN documents

- ES 282 003 [i.17] "Resource and Admission Control Sub-System (RACS): Functional Architecture"
- TR 182 015 [i.33] "Next Generation Networks; Architecture for Control of Processing Overload"
- TR 182 031 [i.34] "Remote CPN QoS Control; Study on CPN-RACS Interaction"

Other relevant documents

ETSI STQ

- EG 202 057-1 [i.32] "User related QoS parameter definitions and measurements; Part 1: General"
- EG 202 057-2 [i.32] "Part 2: Voice telephony, Group 3 fax, modem data services and SMS"
- EG 202 057-3 [i.32]"Part 3: QoS parameters specific to Public Land Mobile Networks (PLMN)"
- EG 202 057-4 [i.32] "Part 4: Internet access"
- TR 102 717 [i.35] "Quality of Service Implications of NGN Architectures"
- TR 102 775 [i.36] "Guidance on objectives for Quality related Parameters at VoIP Segment-Connection Points; a Support to NGN Transmission Planners"

ETSI USER GROUP

- EG 202 009-2 [i.37] "Quality of telecom services; Part 2: User related parameters on a service specific basis"
- TR 102 805-1 [i.38] "End-to-end QoS management at the Network Interfaces; Part 1: User's E2E QoS - Analysis of the NGN interfaces"
- TR 102 805-2 [i.39] "End-to-end QoS management at the Network Interfaces; Part 2: Control & Management planes solution - QoS continuity"

ITU-T

- Y.1541 [i.40] "Network performance objectives for IP-based services"
- Y.1543 [i.41] " Measurements in IP networks for inter-domain performance assessment"
- Y.2112 [i.42] "A QoS control architecture for Ethernet-based IP access networks"
- Y.1221 [i.43] "Traffic control and congestion control in IP based networks"

7.2.5 Contents of documents and conclusions

ES 282 003 [i.17] "Resource and Admission Control Sub-System (RACS): Functional Architecture"

RACS is the NGN Subsystem responsible for elements of policy control, resource reservation and admission control. In addition, it also supports core Border Gateway Services (BGS) including Network Address Translator (NAT) mechanisms.

Basic functionalities:

RACS offers to applications the following set of functionalities on a one per RACS resource reservation session request basis:

- *Admission Control: RACS implements Admission Control to the access and aggregation segment of the network. One can imagine various types of admission control going from a strict admission control where any overbooking is to be prevented, to admission control that allows for a certain degree of over subscription or even a trivial admission control where the authorization step is considered sufficient to grant access to the service.*
- *Resource reservation: RACS implements a resource reservation mechanism that permits applications to request bearer resources in the access, aggregation, and core networks.*
- *Policy Control: RACS uses service based local policies to determine how to support requests from applications for transport resources. Based on available information about resource availability and on other policy rules, e.g. priority of the application, RACS determines if a request can be supported, authorizes appropriate transport resources and derives L2/L3 traffic polices to be enforced by the bearer service network elements.*
- *NAT transversal: RACS controls the transversal of far end (remote) NAT.*
- *NAT/Gate control: RACS controls near-end NAT at the borders of the NGN core network and at the border between a core network and an access network.*

TR 182 031 [i.34] "Remote CPN QoS Control; Study on CPN-RACS Interaction"

The present document covers a use case analysis for the interaction of the TISPAN Resource and Admission Control Sub-System (RACS) with the Customer Premises Network (CPN), as well as an analysis of required functional entities, reference points and information flows.

Conclusions:

User perspective (QoS)

- **Article 22 (Quality of Service) of the amended USO directive [i.5] regulates that operators shall provide comparable, adequate and up-to-date information on the quality of their services. Where appropriate, the parameters, definitions and measurement methods set out in Annex III of the amended USO directive [i.5] may be used. In order to prevent the degradation of service and the hindering or slowing down of traffic over networks, national regulatory authorities shall be able to set minimum quality of service requirements. Quality of Service parameters, definitions and measurement methods referred in Annex III are specified in document EG 202 057 [i.32]. There is a need to investigate whether any amendments are needed to the EG 202 057-series documents [i.32] to make them applicable to the NGN.**
- **There is a need to review EG 202 009-2 [i.37]from the NGN`s point of view.**

Network performance (NP)

- **RACS specification acts as a basis of resource and admission control and it needs to be reviewed in more details.**
- **The utilisation of ITU-T Recommendation Y.1541 [i.40] to define the end-to-end QoS classes and the allocation of QoS requirements between operators should be studied in more details.**
- **ETSI STQ and User Group are the focal points for QoS and NP matters in ETSI. The QoS and NP guidelines should be prepared in close cooperation with the NGN standardisation.**

8 Security and privacy related requirements

8.1 Security

8.1.1 Regulations

Amended EC Directives

- Directive 2009/140/EC [i.6] amending Directive 2002/21/EC [i.1] on a common regulatory framework; in particular
  - New chapter III a "Security and integrity of networks and services"
  - Article 13a "Security and integrity"
    - *"Appropriate technical and organisational measures* have to be taken *to appropriately manage the risks posed to security of networks and services. Having regard to the state of the art, these measures shall ensure a level of security appropriate to the risk presented. In particular, measures shall be taken to prevent and minimise the impact of security incidents on users and interconnected networks."*
    - *"All appropriate steps* have to be taken *to guarantee the integrity of their networks, and thus ensure the continuity of supply of services provided over those networks*."
- Directive 2009/136/EC [i.5] amending Directive 2002/22/EC [i.2] on universal service and users' rights and Directive 2002/58/EC [i.4] concerning the processing of personal data and the protection of privacy; in particular:
  - Article 28: "Access to numbers and services"
    - The relevant authorities should be able to require "*to block, on a case-by-case basis, access to numbers or services where this is justified by reasons of fraud or misuse*."

EC Directive

- Directive 2006/24/EC [i.44] on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/EC [i.4].

  "The following categories of data are retained:

  - *data necessary to trace and identify the source of a communication*
  - *data necessary to identify the destination of a communication*
  - *data necessary to identify the date, time and duration of a communication*
  - *data necessary to identify the type of communication*
  - *data necessary to identify users' communication equipment or what purports to be their equipment*

- *data necessary to identify the location of mobile communication equipment"*

- Directive 1999/5/EC [i.45] of the European parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

  - Article 3 "Essential requirements"

    - *"(3b) UE does not harm the network or its functioning nor misuse network resources, thereby causing an unacceptable degradation of service;"*

    - *"(3d) UE supports certain features ensuring avoidance of fraud."*

8.1.2 Technical requirements

A secured communication environment is a large area:

- Protection against communications threats and risks
- Identification, authentication and authorisation of users, providers and services
- Service and content protection
- Protection against malicious communication
- Security issues for emergency calls
- Security features of RFIDs
- Lawful Interception (LI)
- Data retention

8.1.3 NGN network and service capabilities

Mechanisms for security:

- Trust Model, Security domains, Security services
- Identification, Authentication, Authorization mechanisms, Identity management, NASS
- Digital Right Management (DRM)
- Prevention of Unsolicited Communication (PUC)
- Network capabilities for Lawful Interception (LI)
- Network capabilities for Data retention

8.1.4 Relevant TISPAN documents and other documents

TISPAN documents

Security

- TS 187 001 [i.46] "NGN SECurity (SEC); Requirements"; in particular:

  - Clause 4 "Security Requirements"

  - Clause 5 "NGN Security Release 2 Requirements Mapping"

  - Annex C (informative): "Trust domains in NGN"

- TR 187 002 [i.47] "TISPAN NGN Security (NGN_SEC);Threat, Vulnerability and Risk Analysis"
- TS 187 003 [i.48] "NGN Security; Security Architecture"
- TR 187 010 [i.49] "Report on issues related to security in identity management and their resolution in the NGN"
- TR 187 013 [i.50] "Feasibility study on IPTV Security Architecture"

NASS attachment

- ES 282 004 [i.18] "Network Attachment Sub-System" (NASS)"

Lawful Interception

- TS 187 005 [i.51] "NGN Release 2 Lawful Interception; Stage 1 and Stage 2 definition"

Data retention

- TR 187 012 [i.52] "NGN Security; Report and recommendations on compliance to the data retention directive for NGN-R2"

Identity management

- TS 187 016 [i.53] "NGN Security; Identity protection (Protection Profile)"

Prevention against Unsolicited Communication

- TR 187 009 [i.54] "Feasibility study on prevention of unsolicited communication in the NGN"

Presence

- TS 122 141 [i.55] "Presence service; Stage 1"
  - clause 7 "Security"

Other relevant documents

NGN

- Y.2701 [i.56] "Security requirements for NGN release 1"
- Y.2702 [i.57] "Authentication and authorization requirements for NGN release 1"
- Y.2703 [i.58] "The application of AAA service in NGN"
- Y.2704 [i.59] "Security mechanisms and procedures for NGN"
- Y.2720 [i.60] "NGN identity management framework"

8.1.5 Contents of documents and conclusions

TS 187 001 [i.46] "The general security objectives are":

"The NGN shall support a secure and trustworthy environment for customers, network operators and service providers... The security objectives are to prevent masquerade, DoS, manipulation of data, fraud and misuse of the network, abuse of one type of network through interconnection from a less secure environment."

It is required that necessary measures will be provided as follows:

- Identity, Secure Registration and Access control; the aim is to provide measures against identity theft, misuse/authorized use of NGN services/applications. NGN providers are required to restrict access to authorized subscribers.
- Authentication/Authorization; NGN providers are required to support capabilities for authenticating subscribers, equipment, network elements and other providers.

- Data confidentiality; NGN providers are required to protect the confidentiality of subscriber traffic, control and management messages by cryptographic or other means.
- Communication security; NGN providers are required to provide mechanisms for ensuring that information is not unlawfully diverted or intercepted.
- Data integrity; NGN providers are required to protect the integrity of subscriber traffic, control and management messages by cryptographic or other means.
- Availability; NGN is required to provide security capabilities to enable NGN providers to prevent or terminate communications with the non-compliant end-user equipment: e.g. to mitigate DoS attacks, spreading of viruses or worms and other attacks. These capabilities may be suspended to allow emergency communications.
- NAT/Firewall Interworking; NGN security protocols shall work with commonly-used firewalls and shall work in environments with NAT/NATP.
- Content protection shall be ensured; e.g. DRM.

Security domains, zones and planes:

- TS 187 003 [i.48] "NGN Security; Security Architecture"
- Y.2702 [i.57] "Authentication and authorization requirements for NGN release 1"
- TS 187 001 [i.46] "NGN SECurity (SEC); Requirements":

The NGN network shall be logically and physically divided into security domains allowing for separation of application (e.g. IMS) and transport (e.g. ADSL).

The security gateway functions shall be responsible for enforcing security policies for the interworking between networks. Authentication of NGN users and authentication of NGN terminals shall be separate.

Use of the IMS Subscriber Identity Module (ISIM) on the Universal Integrated Circuit Card (UICC) is the preferred solution for achieving the security requirements to access the NGN IMS features. This does not preclude existing solutions such as e.g. Digest Authentication to allow early legacy implementations.

In non-early deployment scenarios, IMS authentication shall be independent from access authentication.

Security domains (TS 187 003 [i.48]):

- Customer's domain includes UE and optionally some Residential Gateways (which may be owned by the user/operator). "The UE may either have ISIM in it or the ISIM credentials may be in the IMS residential gateway (IRG). The ISIM may also be in both the devices".
- Access network security domain is hosted by the access network provider. The access network provider may or may not be the same as the NGN provider.
- Visited NGN network security domain is hosted by a visited network provider
- Home NGN network security domain is hosted by the home network provider.
- 3rd party application network security domain is hosted by some ASP different from the operator. The ASP may need to deploy its own AAA infrastructure to interpret the information offered by the visited or home network provider.

Security zones (ITU-T Recommendation Y.2701 [i.56]):

- "Trusted (green) zone is a zone where a NGN provider's network elements and systems reside and never communicate directly with customer equipment" or other domains.
- "Trusted but vulnerable (yellow) zone is a zone where the network elements/devices are operated by the NGN provider... They communicate with elements both in the trusted zone and with elements in the un-trusted zone, which is why they are "vulnerable"".

- "Un-trusted (red) zone includes all network elements of customer networks or possibly peer networks or other NGN provider domains outside of the original domain, which are connected to the NGN provider's network border elements".

Security planes (TS 187 003 [i.48]):

- "NASS security plane encompasses the security operations during network attachment for gaining access to the NGN access network... User authentication takes place prior or during IP address allocation procedure. Authorization of network access is based on user profiles".

- "IMS security plane encompasses the functions which shall be involved in the IMS security procedures for authenticating UE and core network, deciding authorization, as well as for supplying fresh key material".

Bundled security (TS 187003 [i.48]):

- Extending of successful authentication in NASS layer to the service layer.

NGN IMS Residential Gateway (TS 187 003 [i.48]):

- NGN IMS Residential Gateway is an optional functional element within the NGN architecture and serves the purpose to securely connect legacy, non-NGN UE equipment to the NGN that does not have the capability of using an ISIM/UICC.

Device, Subscriber, and End-User Credentials

- Y.2704 [i.59] "Security mechanisms and procedures for NGN"

Three distinct types of credentials are used in the NGN:

- "Device credentials that may be supplied by the manufacturer with the device"

- "Subscriber credentials that are used for association of the originator of an NGN request with a particular account"

- "End-User credentials that are used to identify and authenticate specific end users to the network"

Security aspects of Presence

- TS 122 141 [i.55] "Presence service; Stage 1"

Requirements given in the standard include e.g. that:

- *"The use and access to the presence service shall be supported in a secure manner. It shall only be possible for the presence information to be supplied and/or updated by the presentity or the home environment... It shall be possible to authenticate a principal before allowing registration to the presence service. It shall be possible to authenticate at any time a watcher and/or a presentity requesting access to the presence service".*

- *"It shall be possible to protect the following items from attacks (e.g., eavesdropping, tampering, and replay attacks): Presence information and notifications and Requests for presence information, e.g., requests for subscription and requests for presence information retrieval".*

Conclusions:

- **The concept of Trust model with security domains, security planes and security zones should be recognised.**

- **Identification/authentication/authorisation mechanisms and user profiles are the key elements to provide a secured communication environment. A single sign-on/sign-out and bundled security are important issues to be reviewed in more details. A distinction between Device, Subscriber and End user authentication should be recognised.**

- **It should be ensured that the standards of Lawful Interception and Data retention are sufficiently comprehensive for national implementation within the EU Framework.**

- **Special attention should be paid to the security requirements of RFID systems and Presence service.**

- **It should be noted that EC has initiated a review of the R&TTE Directive [i.45] (ref. Article 3.3) for possible amendments.**

8.2 Privacy protection

8.2.1 Regulations

EC Directives

- Directive 2002/58/EC [i.4] concerning the processing of personal data and the protection of privacy

Amended EC Directives

- Directive 2009 /136/EC [i.5] amending Directive 2002/58/EC [i.4] concerning the processing of personal data and the protection of privacy

  - Article 4: "Security of processing"

  "A provider shall protect personal data stored or transmitted against accidental or unlawful destruction, accidental loss or alteration, and unauthorised or unlawful storage, processing, access or disclosure". A provider must inform the subscribers concerning such risk of a breach of the security of the network

  - Article 5: "Confidentiality of the communications"

  The confidentiality of communications and the related traffic must be ensured. In particular, listening, tapping, storage or other kinds of interception or surveillance of communications and the related traffic data by persons other than users shall be prohibited, without the consent of the users concerned, except when legally authorised to do so.

  The storing of information or the gaining of access to information already stored, in the terminal equipment of a subscriber or user is only allowed on condition that the subscriber or user concerned has given his or her consent.

  - Article 6: "Traffic data"

  "Traffic data relating to subscribers and users processed and stored by the provider must be erased or made anonymous when it is no longer needed for the purpose of the transmission of a communication".

  "For the purpose of marketing electronic communications services or for the provision of value added services, the provider may process the data to the extent and for the duration necessary for such services or marketing, if the subscriber or user to whom the data relate has given his or her prior consent. Users or subscribers shall be given the possibility to withdraw their consent for the processing of traffic data at any time".

  - Article 8: "Presentation and restriction of calling and connected line Identification"

  "Where presentation of calling/connected line identification is offered, the service provider must offer the calling/called user the possibility, using a simple means and free of charge, of preventing the presentation of the calling line identification on a per-call basis".

  - Article 9: "Location data other than traffic data"

  "Where location data can be processed, such data may only be processed when they are made anonymous, or with the consent of the users or subscribers to the extent and for the duration necessary for the provision of a value added service" (also by third parties)

  - Article 12: "Directories of subscribers"

  The subscribers shall be given "*the opportunity to determine whether their personal data are included in a public directory, and if so, which, to the extent that such data are relevant for the purpose of the directory as determined by the provider of the directory, and to verify, correct or withdraw such data"*.

- Article 13: "Unsolicited communications"

  Unsolicited communications for purposes of direct marketing are not allowed without the consent of the subscribers.

- Directive 1999/5/EC [i.45] of the European parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

  - Article 3 "Essential requirements"

  "Commission may decide that apparatus within certain equipment classes or apparatus of particular types shall be so constructed that: 3.(c) it incorporates safeguards to ensure that the personal data and privacy of the user and of the subscriber are protected".

RFID Recommendation and standardisation mandate

- Commission Recommendation of 12.5.2009 [i.61] on the implementation of privacy and data protection principles in applications supported by radio-frequency identification

  Operators should "*conduct an assessment of the implications of the application implementation for the protection of personal data and privacy, including whether the application could be used to monitor an individual*" and "*take appropriate technical and organisational measures to ensure the protection of personal data and privacy"*;

  Operators should "*develop and publish a concise, accurate and easy to understand information policy for each of their RFID applications*".

  Operators should "*inform individuals of the presence of tags that are placed on or embedded in products"*. "*Deactivation of the tags should be understood as any process that stops those interactions of a tag with its environment which do not require the active involvement of the consumer*".

- EC (8 Dec 2008) Standardisation mandate [i.62] to the European standardisation organisations CEN, CENELEC and ETSI in the field on information and communication technologies applied to the radio frequency identification (RFID) and systems

8.2.2 Technical requirements

Privacy requirements:

- Confidentiality of communication and related traffic data
- Anonymity (permanently or temporarily)
- Protection against malicious communication

8.2.3 NGN network and service capabilities

Network capabilities for privacy protection:

- Restriction of presentation of identification and location information including overriding capabilities for emergency authorities e.g. OIR supplementary service and other Supplementary services (e.g. ACR)
- PUC - Prevention of Unsolicited Communication including Identification and protection of Malicious Communication (MCID) supplementary service
- Privacy features of Presence information (presentities and watchers)
- Privacy features of RFIDs

8.2.4 Relevant TISPAN documents and other documents

TISPAN

NGN

- TS 187 001 [i.46] "NGN SECurity (SEC); Requirements"; in particular
  - Clause 4.5 "Privacy Requirements"
- TS 122 173 [i.20] "IMS Multimedia Telephony Service and supplementary services; Stage 1"

PUC

- TR 187 009 [i.54] "Feasibility study n prevention of unsolicited communication in the NGN"

Presence

- TS 122 141 [i.55] "Presence service; Stage 1"
  - Clause 6 "Privacy"

Other relevant documents

3GPP/OMA

- ES 283 030 [i.63]/TS 124 430 [i.64] "Presence Service Capability; Protocol Specification (3GPP TS 24.141 V7.0.0, modified and OMA-TS-Presence_SIMPLE-V1_0, modified)
- TS 122 071 [i.65] "Location Services (LCS); Service description; Stage 1"

ITU-T

- X.1275 [i.66] "Guidelines on protection of personally identifiable information in the application of RFID technology"

8.2.5 Contents of documents and conclusions

General requirements specified in the standards:

TS 187 001 [i.46] "NGN SECurity (SEC); Requirements"

Clause 4.5 "Privacy Requirements"

Identity/location/(usage patterns) protection:

- *"Anonymous communication sessions shall be supported in NGN either in a permanent mode or in a temporary mode communication by call. In this case the originating party identity shall not be presented to the destination party. The network to which the destination party is connected to is responsible to handle this service"*.
- *"User location and usage patterns shall be kept from unwanted disclosure"*.
- *"The Anonymous Communications Rejection (ACR) simulation service shall allow the served user to reject incoming communication from users or subscribers who have restricted the presentation of their originating identity according to the OIR simulation service"*.
- *"NGN shall support the specific case where the destination party has an override right (e.g. emergency communication sessions), and the originating party identity is provided to the destination party independent whether or not this communication session is anonymous"*.
- *"It shall be possible for the sender of the message to request to hide its public ID from the recipient"*.

Network topology/integrity to secure privacy:

- *"It shall be possible to protect the network topology from exposure toward other domains".*
- *"It shall also be possible for a security domain to define and implement protection against traffic analysis for signalling and management protocols".*

Confidentiality of user identity data:

- *"It shall be possible to protect the confidentiality of user identity data".*
- *"The NGN shall support mechanisms for the network operator to guarantee the authenticity of a user identity presented for an incoming call to a user where the call is wholly within that operator's network (i.e. originating and terminating parties are subscribers to, and resident in, a single NGN)".*

TS 122 173 [i.20] "Privacy related the Supplementary Services of Multimedia Telephony Service"

The standard specifies Multimedia Telephony as follows:

- *"The IMS Multimedia Telephony Service should allow multimedia conversational communications between two or more users. It provides real time bidirectional conversational transfer of speech, video or optionally other types of data... IMS Multimedia Telephony service is different from other IMS based services, such as Push to Talk over Cellular (PoC)".*
- "*IMS Multimedia Telephony is a service where speech, and speech combined with other media components, is the typical usage but the service is not limited to always include speech, it also caters for other media or combinations of media (e.g. text and video)".*
- *"The IMS multimedia telephony service includes supplementary services. The behaviour of these services is almost identical to supplementary services for CS voice (TS 11) and PSTN/ISDN".*

Regarding the Supplementary service it has to be noted that when a supplementary service is invoked it applies to all media components of an IMS Multimedia Telephony communication. A supplementary service can be activated by the user for one or more types of media components.

Annex C (normative) of TS 122 173 [i.20] splits IMS Multimedia Telephony supplementary services applicable **to the fixed access** into three categories applicable to CEPT members.

- *"Mandatory services. Selected services that must form the basis of any set of services considered applicable to IMS Multimedia Telephony service. These are considered to meet the requirements of regulation concerning the processing of personal data and the protection of privacy in the electronic communications sector: Originating Identification Presentation (OIP), Originating Identification Restriction (OIR), Terminating Identification Presentation (TIP), Terminating Identification Restriction (TIR), Malicious Communication IDentification (MCID), Anonymous Communication Rejection (ACR)"*
- *"Recommended services. Services that offer service providers with a transition from CS mobile and fixed services to IMS Multimedia Telephony service: Communication DIVersion (CDIV), Communication Waiting (CW), Communication HOLD (HOLD), Communication Barring (CB), Completion of Communications to Busy Subscriber (CCBS), Completion of Communications on No Reply (CCNR), Message Waiting Indication (MWI)."*
- *"Optional services"*

TS 122 141 [i.55] "Presence service; Stage 1"

Requirements:

- *"The privacy aspect of presence information and the need for authorization before providing presence information shall be configurable by the user (i.e. presentity)".*
- *"A principal of a presentity shall, at any time, be able to control to whom, for how long and what (all or part of) presence information of the presentity is provided, and a principal of a watcher shall, at any time, be able to control to whom, for how long and what (all or part of) watcher information of the watcher is provided".*

- "*Any services using the presence information shall ensure privacy agreement before releasing presence information*".
- "*The principal that controls the presentity shall be able to define access rules, in order to control how the presentity's presence information is made available for watchers*".

TR 187 009 [i.54] "Feasibility study of prevention of unsolicited communication in the NGN"

- *"The NGN should provide the ability for users to identify specific communications instances as UC"*
- *"The NGN should provide the ability to mark UC"*
- *"The NGN should provide the ability to react to UC*
  - *blocking the communication attempt in advance;*
  - *redirecting the communication attempt to a specific mailbox;*
  - *direct the marked UC attempts to the end user and let them decide how to deal with it*."
- "*The NGN should provide the ability to a user to personalized the UC profile"*

Conclusions:

- **The definition of Multimedia Telephony Service should be recognised and compared with the traditional PSTN/ISDN Telephony Service and NGN emulation PSTN/ISDN services.**
- **The use of Supplementary Services e.g. OIR, ACR to protect the privacy should be reviewed in more details including the interworking aspects with PSTN/ISDN/GSM supplementary services. It should be noted that location related privacy requirements are described in TS 122 071 [i.65] "Location Services (LCS); Service description; Stage 1" (3GPP).**
- **Annex C (normative) of TS 122 173 [i.20] splits IMS Multimedia Telephony supplementary services applicable to the fixed access into following three categories: mandatory, recommended, optional. Annex D (normative) lists the supplementary services which are applicable to the 3GPP mobile access without categorising them into mandatory or optional services. That is to be reviewed in more details. Furthermore the list of mandatory supplementary services for fixed access seems to be incomplete. Communication DIVersion (CDIV) and Incoming Communications Barring (ICB) are missing.**
- **Special attention should be paid to the security requirements of new concepts such as RFID systems and Presence.**
- **In the RFID standards a reference is made to the R&TTE Directive (Article 3.3) [i.45]. EC has initiated a review of the R&TTE Directive. The issue should be studied further.**

9 Consumer related requirements

9.1 Customer protection

9.1.1 Regulations

EC Directives

- Directive 2002/22/EC [i.2] on universal service and users' rights; in particular:
  - Article 10 "Control of expenditure"

  Specific facilities and services (e.g. Itemised billing and Selective call barring for outgoing calls) shall be provided in order that subscribers can monitor and control expenditure and avoid unwarranted disconnection of service.

Amended EC Directives

- Directive 2009/136/ EC [i.5] amending Directive 2002/22/EC [i.2] on universal service and users' rights; in particular
  - Article 20 Contracts

  "The contract shall specify in a clear, comprehensive and easily accessible form at least:

  the services provided, including in particular:

  - *whether or not access to emergency services and caller location information is being provided, and any limitations on the provision of emergency services,*
  - *information on any other conditions limiting access to and/or use of services and applications,*
  - *the minimum service quality levels offered, namely the time for the initial connection and, where appropriate, other quality of service parameters,*
  - *information on any procedures put in place by the operator to measure and shape traffic so as to avoid filling or overfilling a network link, and information on how those procedures could impact on service quality,*
  - *the types of maintenance service offered and customer support services provided, as well as the means of contacting these services,*
  - *any restrictions imposed by the provider on the use of terminal equipment supplied."*

  - Annex I Description of facilities listed above
- Directive 2009 /136/EC [i.5] amending Directive 2002/58/EC [i.4] concerning the processing of personal data and the protection of privacy; in particular:
  - Article 13:"Unsolicited communications"
    - Permission of consumer for direct marketing, storing of information and access to terminal equipment
    - *"Customers clearly and distinctly are given the opportunity to object, free of charge and in an easy manner, to the use of electronic contact details"*.
    - *"Unsolicited communications for the purposes of direct marketing are not allowed either without the consent of the subscribers or users concerned or in respect of subscribers or users who do not wish to receive these communications"*.

9.1.2 Technical requirements

Customer protection requirements:

- Technical mechanisms to support the aspects related to the subscriptions and service provision
- Protection against harmful content material

9.1.3 NGN network and service capabilities

Network capabilities to take care of the customer protection requirements:

- Subscription management
- Control of expenditure
- Parent control (child lock)

9.1.4 Relevant TISPAN documents and other documents

TISPAN documents

- TS 183 047 **[**i.67**]**/TS 124 447 [i.100] "NGN IMS Supplementary services; Advice of Charge"
- TS 188 001 [i.68] "NGN management; Operations Support Systems Architecture"
- TS 188 002-1 [i.69] "NGN Subscription Management; Part 1: Requirements"
- TS 188 003 [i.70] "OSS requirements; OSS definition of requirements and priorities for further network management specifications for NGN"

3GPP

- TS 132 140 [i.71] "Telecommunication management; Subscription Management (SuM) requirements"]

ITU-T

- Y.2233 [i.72] "Requirements and framework allowing accounting and charging capabilities in NGN"

9.1.5 Contents of documents and conclusions

TS 188 002-1 [i.69**] "NGN Subscription Management; Part 1: Requirements"**

"Subscription Management (SuM) is a key feature that allows service providers and operators to provision their TISPAN NGN network entities with the data necessary for delivering services for a specific subscriber. Moreover, it also allows subscribers to configure their services when they have these capabilities...

SuM is a telecommunications management framework that allows the service providers to leverage their network resources to:

- *Validate (register, authenticate, and authorize) a request for service from a user.*
- *Collect, store, update, and distribute the Service Profile information for the user.*
- *Select the trusted network resources to manage access, distribution, and control of the profile data information for the user.*
- *Direct the network resources to promptly deliver the service requested to the user according to said profile information."*

Subscription Management (SuM) can be summarized as the framework that offer service providers means for efficient management of all the data related to a specific subscription.

TS 188 003 [i.70] "OSS requirements; OSS definition of requirements and priorities for further network management specifications for NGN"

- Customer Centric requirements e.g. Access to services at any time, any place, through any chosen access mechanism and terminal (user equipment), Personalization of services based on access mechanism and terminal (user equipment), Single Sign On, Mobility
- Business Vision Requirements e.g. Support Value Chains of Multiple Service Providers: Multiple Trading Partners with Complex Value Chains and Business Models, Support for a wide range of services, applications and mechanisms
- Technology requirements e.g. Independence of service-related functions from underlying transport, Interworking with legacy networks via open interfaces, Support of multiple last mile technologies, Support a variety of identification schemes, Terminal (user equipment) Management
- Operational requirements e.g. End-to-end QoS, Automated Service Creation processes, Management of NGN resources (physical and logical)
- Regulatory requirements e.g. Emergency communications, Security, Privacy, Lawful interception, Unrestricted access by users to different service providers

TS 183 047 [i.67]/TS 124 447 [i.100] "NGN IMS Supplementary services; Advice of Charge"

"The document specifies the stage three Protocol Description of the Advice Of Charge (AOC) service, based on stage 1 and 2 of the ISDN Supplementary Service Advice Of Charge for all calls (permanent mode). Within the TISPAN NGN Release 2 Next Generation Network (NGN) the stage 3 description is specified using the IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP).

Three AOC services exist:

a) Charging information at communication set-up time (AOC-S); The AOC-S service enables a user to receive information about the charging rates at communication set-up time and also to receive further information during the communication if there is a change of charging rates.

b) Charging information during the communication (AOC-D); The AOC-D service enables a user to receive information on the recorded charges for a communication during the active phase of the communication.

c) Charging information at the end of the communication (AOC-E); The AOC-E service enables a user to receive information on the recorded charges for a communication when the communication is terminated."

Conclusions:

- **Article 10 (Control of expenditure) of USO directive [i.2] regulates that subscribers should be able to monitor and control expenditure and avoid unwarranted disconnection of service. Annex 1 of USO directive lists the facilities which operators have to provide. It must be ensured that the facilities and monitoring capabilities described in the referred TISPAN documents comply with the Article 10 and Annex 1 of USO directive.**
- **The revised Article 20 (Contracts) of the amended USO directive [i.5] regulates what information shall be included in contracts. It must be ensured that facilities and monitoring capabilities described in the referred TISPAN documents comply with the Article 20 of the amended USO directive [i.5].**
- **Subscription management system shall comply with Article 13 (Unsolicited communications) of the amended Privacy directive [i.5] which stipulates that a permission given by a subscriber is needed for direct marketing and other possible unexpected communication interventions through the NGN.**
- **It shall be ensured that NGN provides necessary network and service capabilities for consumer protection e.g. protection against harmful content material and charging information.**

9.2 Emergency communications

9.2.1 Regulations

Amended EC Directives

- Directive 2009/136/EC [i.5] Amending Directive 2002/22/EC [i.2] on universal service and users' rights; in particular
  - Article 26 "Emergency services and single European emergency call number" e.g.

    -- (4) Disabled

    -- (5) Caller location

    - *"Users shall be able to call the emergency services free of charge and without having to use any means of payment, by using the single European emergency call number "112" and any national emergency call number specified by Member States."*
    - *"Access for disabled end-users to emergency services is equivalent to that enjoyed by other end-users."*

        - Operators *"shall make caller location information available free of charge to the authority handling emergency calls as soon as the call reaches that authority. This shall apply to all calls to the single European emergency call number "112". Competent regulatory authorities shall lay down criteria for the accuracy and reliability of the caller location information provided."*

    - Article 27a "Harmonised numbers for harmonised services of social value, including the missing children hotline number", 116 and disabled persons

- Commission Recommendation on the processing of caller location information in electronic communication networks for the purpose of location-enhanced emergency call services (2003/558/EC [i.73])

"For every emergency call made to the European emergency call number 112, public telephone network operators should, initiated by the network, forward (push) to public safety answering points the best information available as to the location of the caller, to the extent technically feasible. For the intermediate period, it is acceptable that operators make available location information on request only (pull).

Fixed public telephone network operators should make available the installation address of the line from which the emergency call is made…

All location information provided should be accompanied by an identification of the network on which the call originates.

Public telephone network operators should keep sources of location information, including address information, accurate and up-to-date.

For each emergency call for which the subscriber or user number has been identified, public telephone network operators should provide the capability to public safety answering points and emergency services of renewing the location information through a call back functionality (pulling) for the purpose of handling the emergency.

In order to facilitate data transfer between operators and public safety answering points, Member States should encourage the use of a common open interface standard, and in particular for a common data transfer protocol, adopted by the European Telecommunications Standards Institute (ETSI), where available. Such a standard should include the necessary flexibility to accommodate future requirements as they may arise, for instance from in-vehicle telematics terminals. Member States should ensure that the interface is best suited to the effective handling of emergencies."

- EC: Standardisation Mandate to the European Standardisation Organisations (ESO) in Support of the Location Enhanced Emergency Call Service [i.74].

It is stated in the draft mandate that for the telephone service provided by traditional circuit switched networks, mobile networks and IP-based networks the determination and conveyance of location information of emergency callers is not sufficiently standardized. European standards do not provide complete architectural models and do not specify all protocol elements needed to support location enhanced emergency calling on existing infrastructures and future networks.

"*The lack of commonly agreed standards in support of the processing of caller location information in electronic communications networks for the purpose of the location enhanced emergency call service in Europe is a barrier for implementing future proof solutions which fulfil the requirements of article 26 of the amended Directive 2002/22/EC. The objective of the Mandate is to stimulate further standardisation work in this field to support harmonized European solutions also with regard to cost effective implementations"*.

- Directive 1999/5/EC [i.45] i.45 of the European parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

    - Article 3 "Essential requirements"

"Commission may decide that apparatus within certain equipment classes or apparatus of particular types shall be so constructed that: 3.(e) EU supports certain features ensuring access to emergency services".

9.2.2 Technical requirements

Special network and service arrangements for Emergency communication and Early Warning.

9.2.3 NGN network and service capabilities

NGN network and service capabilities for emergency communications:

- Identification and location information for emergency services
- Capability to override user prevention of identification and location information in emergency cases
- Priorities in use of NGN resources
- Alternative solutions for disabled persons

9.2.4 Relevant TISPAN documents and other documents

TISPAN documents

- TS 102 424 [i.75] "Requirements of the NGN network to support Emergency Communication from Citizen to Authority"
- TS 123 167 [i.76] "IP Multimedia Subsystem (IMS) emergency sessions"
- TS 182 009 [i.77]/TS 123 509 [i.78] "NGN Architecture to support emergency communication from citizen to authority"
- TS 102 660 [i.79] "Signalling Requirements and Signalling Architecture for supporting the various location information protocols for Emergency Service on a NGN"
- ES 282 003 [i.17] "Resource and Admission Control Sub-System (RACS): Functional Architecture"

Relevant other documents

EMTEL

- TR 102 182 [i.80] "Requirements for communications from authorities/organisations to the citizens during emergencies"
- TR 102 410 [i.81] "Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress"
- TR 102 444 [i.82] "Analysis of the Short Message Service (SMS) and Cell Broadcast Service (CBS) for Emergency Messaging applications; Emergency Messaging; SMS and CBS"
- TR 102 445 [i.83] "Overview of Emergency Communications Network Resilience and Preparedness"
- TR 102 476 [i.84] "Emergency calls and VoIP: possible short and long term solutions and standardization activities"
- TS 102 181 [i.85] "Requirements for communication between authorities/ organizations during emergencies"

ITU-T

- Y.2205 [i.86] "Next Generation Networks - Emergency Telecommunications - Technical considerations"
- Y.2171 [i.87] "Admission Control priority levels in Next Generation Networks"
- Y.2172 [i.88] "Service restoration priority levels in Next Generation Networks"

9.2.5 Contents of documents and conclusions

TS 102 424 [i.75] "Requirements of the NGN network to support Emergency Communication from Citizen to Authority"

- Identification of Emergency numbers:

  "*The NGN Terminal shall be able to place calls on a locally supported Emergency number, it should be able store Emergency numbers, and in the case of a SIP Terminal, to store Emergency SIP URIs. When an Emergency call or session is required, the correct Number/URI is presented to the network on the basis of national knowledge and information made available at the Access to the network. In Europe, this shall be 112, and optionally a national possibly service specific number.*

  Additionally a NGN Terminal may store emergency numbers that may have been downloaded by the serving network".

- Location information derivation and handling

  "The location information shall be derived from the known information available in the network, where possible.

  Upon initiating the emergency session the available location information from the network and/or terminal shall be sent to the PSAP with the set-up of the session.

  The location information is an indication of such information as geodatic, network attachment, and/or postal address."

ES 282 003 [i.17] "Resource and Admission Control Sub-System (RACS); Functional Architecture"

- Priority

"The Application Function (AF) can indicate a service priority level to the Service-based Policy Decision Function (SPDF). In accordance, the SPDF has the ability to define a service priority level for the resource reservation request. As an example, in the case of an emergency session, the AF may indicate to the SPDF that the resource is required for an Application priority session and, as a result, the SPDF indicates to the Generic Resource and Admission Control Function (x-RACF) a service priority for the requested resource."

Conclusions:

- **The priority mechanisms contained in RACS (ES 282 003 [i.17]) need to be reviewed in more details from emergency communications point of view.**
- **Authorisation for communication session without identification and authentication specified in the NASS standards (ES 282 004 [i.18]) needs to be reviewed in more details.**
- **It has to be noted that NGN offers new and converged communication mechanisms (voice, text, picture, video) which could be utilized in emergency communications and early warning systems. This issue should be studied further.**
- **EMTEL is the focal point in ETSI for emergency communications matters. The EMTEL guidelines should be prepared in close cooperation with the NGN standardisation. The future work should contain the issues of the new mandate from the European Commission on the Support of the Location Enhanced Emergency Call Service.**

9.3 eAccessibility

9.3.1 Regulations

EC Directives

- Directive 1999/5/EC [i.45] of the European parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.
  - Article 3 "Essential requirements"
    - "(*3f) UE supports certain features in order to facilitate its use by users with a disability"*.

Amended EC Directives

- Directive 2009/136/EC [i.5] Amending Directive 2002/22/EC [i.2] on universal service and users' rights; in particular
  - Article 7: "Measures for disabled end-users"

"Access to, and affordability of, the services identified in Article 4(3) and Article 5 for disabled end-users is equivalent to the level enjoyed by other end-users. National regulatory authorities may be obliged *to assess the general need and the specific requirements, including the extent and concrete form of such specific measures for disabled end-users*.

In the light of national conditions, specific measures may be taken to ensure that disabled end-users can also take advantage of the choice of operators and service providers available to the majority of end-users."

  - Article 23a: "Ensuring equivalence in access and choice for disabled end-users"

"National authorities shall be enabled to specify, where appropriate, requirements to be met by operators to ensure that disabled end-users:

(a) have access to electronic communications services equivalent to that enjoyed by the majority of end-users; and

(b) benefit from the choice of operators and services available to the majority of end-users.

In order to be able to adopt and implement specific arrangements for disabled end-users, Member States shall encourage the availability of terminal equipment offering the necessary services and functions."

- Directive 2009/140/EC [i.6] amending Directives 2002/21/EC [i.1] on a common regulatory framework, in particular
  - Article 18 c: "*providers of digital TV services and equipment to cooperate in the provision of interoperable TV services for disabled end-users"*.

In order to promote the free flow of information, media pluralism and cultural diversity, providers of digital TV services and equipment shall be encouraged to cooperate in the provision of interoperable TV services for disabled end-users.

- Directive 1999/5/EC [i.45] of the European parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.
  - Article 3 "Essential requirements"

    "Commission may decide that apparatus within certain equipment classes or apparatus of particular types shall be so constructed that:

    3 (f) UE supports certain features in order to facilitate its use by users with a disability."

- Phase 2 of mandate M/376 "Accessibility requirements for public procurement of products and services in the ICT domain" and the related task forces CEN/CENELEC/ETSI Joint Working Group "eAccessibility under M376" and ETSI HF STF 416.

9.3.2 Technical requirements

Needs of disabled and elderly persons

9.3.3 NGN network and service capabilities

Network and service capabilities to enhance the accessibility:

- Alternative communication media for disabled users (e.g. conversion from voice to text)
- User profiles and personalization

9.3.4 Relevant TISPAN documents and other documents

TISPAN documents

- TS 181 005 [i.8] "Service and Capability Requirements"
- TS 188 002-1 [i.69] "NGN Subscription Management; Part 1: Requirements"

Other relevant documents

ETSI HF

- EG 202 116 [i.89] "Guidelines for ICT products and services; "Design for All"
- EG 202 325 [i.90] "User Profile Management"
- ES 202 746 [i.91] "Personalization and User Profile Management; User Profile Preferences and Information"
- TS 102 747 [i.92] "Personalization and User Profile Management: Architectural Framework"

3GPP

- TS 122 240 [i.93] "Service requirements for 3GPP Generic User Profile (GUP); Stage 1"

ITU-T

- F.790 [i.94] "Telecommunications accessibility guidelines for older persons and persons with disabilities"
- Technical Paper: "Telecommunications Accessibility Checklist" [i.95]

W3C

- Web Content Accessibility Guidelines (WCAG) 2.0 [i.96]

ISO-IEC

- ISO-IEC JTC1 DTR 29138 "Accessibility Considerations for People with Disabilities" [i.97]

9.3.5 Contents of documents and conclusions

Conclusions:

- **The "design for all" principles defined in the documents above should be used when further NGN service requirements are specified.**
- **Preferences of disabled people defined in standard ES 202 746 [i.91] should be recognised.**
- **Mapping of user profiles with services and networks (TS 102 747 [i.92], Annex A.1.1) should be recognised.**
- **The utilization of user profiles, user profile management and personalization for the benefits of disabled and elderly persons should be studied further.**

- **Web Content Accessibility Guidelines (WCAG 2.0 [i.96]) should be recognized when the requirements of the web based content services are specified.**
- **There is a need to clarify how the NGN could enhance e-Health and other European wide e-initiatives.**
- **It should be noted that EC has initiated a review of the R&TTE Directive ([i.45] ref. Article 3.3. for disability) for possible amendments.**
- **Technical Body HF is the focal point in ETSI for eAccessibility. The HF guidelines should be prepared in close cooperation with the NGN standardisation.**

10 Main conclusions

The present document collects together regulatory and public interest issues for the NGN standardisation. The effects of the present document are intended to be bidirectional. On one hand the present document provides a comprehensive set of technical regulatory requirements to be recognized in the NGN standardisation. On the other hand the present document is also a source of information for regulators to find the NGN documents which define the technical solutions for the regulatory purposes.

The conclusions drawn up during the review work are listed in each clause to give guidance for further work in the NGN standardisation.

It should be noted that the methodology described in clause 5 is not NGN specific but it could be applied to any other new concept to ensure that the whole regulatory and public interests area is covered when necessary network and service capabilities are considered for the new concept.

History

Document history		
V3.1.1	July 2011	Publication