

# ETSI TS 182 028 V3.5.1 (2011-02)

---

*Technical Specification*

## **Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN integrated IPTV subsystem Architecture**

---

**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ETSI TS 182 028 V3.5.1 \(2011-02\)](https://standards.iteh.ai/catalog/standards/etsi/5e36a649-4504-4678-bf94-206ba44f10b6/etsi-ts-182-028-v3-5-1-2011-02)

<https://standards.iteh.ai/catalog/standards/etsi/5e36a649-4504-4678-bf94-206ba44f10b6/etsi-ts-182-028-v3-5-1-2011-02>



---

Reference

---

RTS/TISPAN-02082-NGN-R3

---

Keywords

---

architecture, IP, TV**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

iteh Standards  
(<https://standards.iteh.ai>)  
Document Preview

---

**Important notice**

---

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

[http://portal.etsi.org/chaicor/ETSI\\_support.asp](http://portal.etsi.org/chaicor/ETSI_support.asp)

---

**Copyright Notification**

---

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2011.  
All rights reserved.

**DECT**<sup>TM</sup>, **PLUGTESTS**<sup>TM</sup>, **UMTS**<sup>TM</sup>, **TIPHON**<sup>TM</sup>, the TIPHON logo and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

**3GPP**<sup>TM</sup> is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

**LTE**<sup>TM</sup> is a Trade Mark of ETSI currently being registered

for the benefit of its Members and of the 3GPP Organizational Partners.

**GSM**<sup>®</sup> and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

|                                                                               |    |
|-------------------------------------------------------------------------------|----|
| Intellectual Property Rights .....                                            | 6  |
| Foreword.....                                                                 | 6  |
| Introduction .....                                                            | 6  |
| 1 Scope .....                                                                 | 7  |
| 2 References .....                                                            | 7  |
| 2.1 Normative references .....                                                | 7  |
| 2.2 Informative references .....                                              | 8  |
| 3 Definitions and abbreviations.....                                          | 9  |
| 3.1 Definitions .....                                                         | 9  |
| 3.2 Abbreviations .....                                                       | 9  |
| 4 NGN IPTV subsystem.....                                                     | 10 |
| 4.1 Concept and Architectural Approach .....                                  | 11 |
| 4.2 High Level Architecture Overview .....                                    | 11 |
| 4.3 Functional groups .....                                                   | 11 |
| 4.3.1 Application Functions.....                                              | 12 |
| 4.3.2 IPTV Service Control and Media Delivery Functions .....                 | 12 |
| 4.3.3 Transport Functions .....                                               | 12 |
| 4.3.4 End User Functions.....                                                 | 12 |
| 4.3.5 Management Functions .....                                              | 12 |
| 4.3.6 Content Provider Functions .....                                        | 13 |
| 4.4 IPTV services .....                                                       | 13 |
| 5 NGN Integrated IPTV subsystem functional architecture.....                  | 14 |
| 5.1 Functional entities .....                                                 | 16 |
| 5.1.1 Core IPTV functions .....                                               | 16 |
| 5.1.2 Supporting IPTV functions .....                                         | 18 |
| 5.1.3 Transport functions .....                                               | 18 |
| 5.1.4 Customer Transport functions .....                                      | 19 |
| 5.2 Reference points .....                                                    | 19 |
| 5.2.1 Tr - IPTV transactional .....                                           | 19 |
| 5.2.2 Ct2 - UE facing IPTV control.....                                       | 20 |
| 5.2.3 Sa - IPTV control and Media Control Function.....                       | 20 |
| 5.2.4 Ss - Service selection .....                                            | 20 |
| 5.2.5 Xc - UE and IPTV Media Control Function .....                           | 20 |
| 5.2.6 Xp - IPTV Media Control Function and IPTV Media Delivery Function ..... | 21 |
| 5.2.7 Xd - UE and IPTV Media Delivery Function .....                          | 21 |
| 5.2.8 e2 - NASS access.....                                                   | 21 |
| 5.2.9 e4 - NASS and RACS .....                                                | 21 |
| 5.2.10 Gq' - RACS .....                                                       | 22 |
| 5.2.11 Ud - access to IPTV user data.....                                     | 22 |
| 5.2.12 Ug - access to NGN user data .....                                     | 22 |
| 5.2.13 Ss' - access to SD&S data .....                                        | 22 |
| 5.3 Generic IPTV Capabilities .....                                           | 23 |
| 5.3.1 Inter-destination media synchronization .....                           | 23 |
| 5.3.1.1 Synchronization architecture .....                                    | 23 |
| 5.3.1.1.1 Functional entities MSAS and SC .....                               | 23 |
| 5.3.1.1.2 Mapping onto the IPTV architecture .....                            | 24 |
| 5.3.1.1.3 Modification and re-origination of media streams .....              | 24 |
| 5.3.1.2 Synchronization reference points .....                                | 25 |
| 5.3.1.2.1 MSAS-SC reference point (Sync) .....                                | 25 |
| 5.3.1.2.2 MSAS-SC' reference point (Sync') .....                              | 25 |
| 5.4 Elementary functions.....                                                 | 26 |
| 6 Operational framework.....                                                  | 27 |

|         |                                                                                                     |    |
|---------|-----------------------------------------------------------------------------------------------------|----|
| 6.1     | IPTV delivery modes.....                                                                            | 27 |
| 6.2     | Operational modes.....                                                                              | 27 |
| 6.2.1   | Coupled mode.....                                                                                   | 28 |
| 6.2.2   | Decoupled mode.....                                                                                 | 29 |
| 6.2.3   | Redirect mode.....                                                                                  | 30 |
| 6.2.4   | Proxy mode.....                                                                                     | 30 |
| 6.3     | Service initialization.....                                                                         | 31 |
| 6.3.1   | Functional steps for UE start-up.....                                                               | 31 |
| 6.3.2   | Service discovery and selection.....                                                                | 32 |
| 6.4     | Nomadism.....                                                                                       | 33 |
| 6.5     | Support of Mobility Capabilities.....                                                               | 33 |
| 7       | Security.....                                                                                       | 34 |
| 7.1     | Content Protection.....                                                                             | 34 |
| 7.2     | Service Protection.....                                                                             | 34 |
| 8       | Management.....                                                                                     | 35 |
| 9       | User data.....                                                                                      | 35 |
| 9.1     | IPTV profiles.....                                                                                  | 35 |
| 9.2     | User data location.....                                                                             | 36 |
| 10      | Charging.....                                                                                       | 37 |
| 11      | Procedures.....                                                                                     | 37 |
| 11.1    | Linear TV.....                                                                                      | 37 |
| 11.2    | Multimedia Content on Demand (CoD).....                                                             | 38 |
| 11.2.1  | Optimized bandwidth utilization during CoD.....                                                     | 40 |
| 11.3    | Media broadcast with trick modes.....                                                               | 41 |
| 11.4    | Near CoD.....                                                                                       | 42 |
| 11.5    | Push CoD.....                                                                                       | 44 |
| 11.5.1  | Push CoD procedures using notification.....                                                         | 44 |
| 11.6    | User generated content.....                                                                         | 45 |
| 11.6.1  | Overview.....                                                                                       | 45 |
| 11.6.2  | UGC creation procedure.....                                                                         | 45 |
| 11.6.3  | UGC watching procedure.....                                                                         | 47 |
| 11.7    | Pay Per View.....                                                                                   | 48 |
| 11.8    | Messaging and notification services.....                                                            | 49 |
| 11.8.1  | Messaging procedures.....                                                                           | 49 |
| 11.8.2  | Notification procedures.....                                                                        | 49 |
| 11.9    | Recommendations.....                                                                                | 50 |
| 11.9.1  | Recommendations overview.....                                                                       | 51 |
| 11.9.2  | Recommendations procedures.....                                                                     | 51 |
| 11.10   | Advertising.....                                                                                    | 53 |
| 11.10.1 | Advertising procedures.....                                                                         | 53 |
| 11.10.2 | Network side unicast based advertisement.....                                                       | 54 |
| 11.10.3 | Advertising procedures using notification.....                                                      | 56 |
| 11.11   | Procedures for inter-destination media synchronization.....                                         | 56 |
| 11.11.1 | Mapping 1: SC in UE.....                                                                            | 56 |
| 11.11.2 | Mapping 2: SC in Transport.....                                                                     | 57 |
| 11.12   | Service continuation.....                                                                           | 57 |
| 11.12.1 | Procedure for unicast service continuation between NGN IPTV UEs.....                                | 57 |
| 11.12.2 | Service continuation between fixed NGN between fixed NGN Integrated IPTV UE and 3GPP mobile UE..... | 59 |
| 11.13   | Remote control of IPTV services.....                                                                | 60 |
| 11.13.1 | Procedure for Remote Mobile Control of IPTV (Provisioning).....                                     | 60 |
| 11.13.2 | Procedure for Remote Mobile Control of IPTV (Operations).....                                       | 61 |
| 11.14   | Personalized Channel.....                                                                           | 62 |
| 11.15   | Time Shift TV.....                                                                                  | 63 |
| 11.16   | PVR service.....                                                                                    | 63 |
| 11.17   | Emergency alert.....                                                                                | 64 |
| 11.18   | Content Bookmark.....                                                                               | 64 |
| 11.19   | Interactive TV procedures.....                                                                      | 65 |

|                               |                                                                                         |           |
|-------------------------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Annex A (informative):</b> | <b>Interactions between other TISpan services and IPTV services.....</b>                | <b>67</b> |
| A.1                           | Interactions based on an OSA/Parlay/Parlay X SCS.....                                   | 67        |
| <b>Annex B (informative):</b> | <b>Interaction procedure between IPTV and other service level subsystems .....</b>      | <b>69</b> |
| <b>Annex C (informative):</b> | <b>Presence attributes for IPTV .....</b>                                               | <b>71</b> |
| <b>Annex D (informative):</b> | <b>Possible evolution path for NGN Integrated IPTV .....</b>                            | <b>72</b> |
| D.1                           | Evolution of IPTV architectures towards NGN .....                                       | 72        |
| D.2                           | Possible migration and switch over scenarios .....                                      | 73        |
| <b>Annex E (informative):</b> | <b>Mapping of elementary functions.....</b>                                             | <b>74</b> |
| E.1                           | Mapping between elementary functions and generic capabilities.....                      | 74        |
| E.2                           | Mapping between elementary functions and functional entities .....                      | 76        |
| E.3                           | Mapping between elementary functions and IPTV services .....                            | 77        |
| <b>Annex F (informative):</b> | <b>NGN integrated IPTV mapping to other IPTV architectures .....</b>                    | <b>79</b> |
| F.1                           | Mapping between NGN integrated IPTV subsystem and ITU-T non-IMS IPTV architecture ..... | 79        |
| <b>Annex G (informative):</b> | <b>Interconnection Models supporting Mobility Capabilities .....</b>                    | <b>81</b> |
| <b>Annex H (informative):</b> | <b>SCTE based targeted advertising architecture .....</b>                               | <b>82</b> |
| H.1                           | Definitions.....                                                                        | 82        |
| H.2                           | SCTE-130 based Advertising Architecture .....                                           | 82        |
| H.3                           | Reference points .....                                                                  | 83        |
| H.3.1                         | IPTV Applications - SCCTE-130 ADS (ADx) .....                                           | 83        |
| H.3.2                         | IPTV Media Function (MF) - SCCTE-130 ADS (ADy).....                                     | 84        |
| H.3.3                         | MF Ad Splicer - TISpan Ad MF (ADc) .....                                                | 84        |
| H.3.4                         | IPTV User Equipment (UE) - SCCTE-130 ADS (ADz).....                                     | 84        |
| H.4                           | Mapping between TISpan entities and SCCTE-130 entities .....                            | 84        |
| <b>Annex I (informative):</b> | <b>NGN integrated IPTV support for hybrid services .....</b>                            | <b>86</b> |
| <b>Annex J (informative):</b> | <b>Bibliography.....</b>                                                                | <b>87</b> |
| <b>Annex K (informative):</b> | <b>Change history .....</b>                                                             | <b>88</b> |
| History .....                 |                                                                                         | 90        |

---

## 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://webapp.etsi.org/IPR/home.asp>).

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

The present document defines the TISPAN NGN Release 3 IPTV architecture: Integrated subsystem for IPTV functions in NGN.

---

## Introduction

The present document provides an architectural framework for the end-to-end Internet Protocol Television (IPTV) subsystem within the Next Generation Networks architecture. The IPTV framework is designed for interoperability with other NGN service subsystems and components.

The present document identifies functional entities and reference point, which needs to be exposed from IPTV subsystem.

[ETSI TS 182 028 V3.5.1 \(2011-02\)](https://standards.iteh.ai/catalog/standards/etsi/5e36a649-4504-4678-bf94-206ba44f10b6/etsi-ts-182-028-v3-5-1-2011-02)

<https://standards.iteh.ai/catalog/standards/etsi/5e36a649-4504-4678-bf94-206ba44f10b6/etsi-ts-182-028-v3-5-1-2011-02>

---

# 1 Scope

The present document describes the IPTV functional architecture and functions of an NGN Integrated IPTV system by integrating of IPTV functions into the NGN architecture. For example, interactions and information flows between the IPTV functional entities and other functional entities will be specified. The specification starts from outlining high-level IPTV functional architecture, functional groups and is further developed into the more detailed functional architecture, reference points and operational modes.

The architecture is intended to support requirements defined by the respective ETSI TISPAN requirement definitions [1] and allow integration new or existing IPTV solutions (such as those defined by DVB, ATIS IIF, ITU, etc.) within the NGN architecture.

The resulting architecture should, should rely as much as possible on common components and integrates, coexist with other TISPAN NGN services.

The following areas are covered:

- Authentication and authorization.
- Content Protection (including DRM).
- Capability exchange.
- Resource Management.
- Policy Management.
- Charging.
- User Profiles.

The architecture focuses on closer integration between IPTV services and NGN networks, migration scenarios from existing solutions (i.e. DVB-IPI, ATIS-IIF) into NGN and common components.

---

## 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 reference 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.

- [1] ETSI TS 181 016 (Release 3): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Service Layer Requirements to integrate NGN services and IPTV".
- [2] ETSI TS 102 034: "Digital Video Broadcasting (DVB); Transport of MPEG-2 TS Based DVB Services over IP Based Networks".
- [3] 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)".