

# ETSI TS 102 855 V1.1.1 (2011-03)

---

*Technical Specification*

**Satellite Earth Stations and Systems (SES);  
Broadband Satellite Multimedia (BSM);  
Interworking and Integration of BSM  
in Next Generation Networks (NGNs)**

---

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

ETSI TS 102 855 V1.1.1 (2011-03)

<https://standards.iteh.ai/catalog/standards/etsi/6c1a3445-584b-4277-85bc-f433b89ed657/etsi-ts-102-855-v1-1-1-2011-03>



---

**Reference**

DTS/SES-00305

---

**Keywords**

broadband, IMS, interworking, IP, satellite

**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

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

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

**LTE™** is a Trade Mark of ETSI currently being registered

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

**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

|                                                                          |    |
|--------------------------------------------------------------------------|----|
| Intellectual Property Rights .....                                       | 5  |
| Foreword.....                                                            | 5  |
| Introduction .....                                                       | 5  |
| 1 Scope .....                                                            | 6  |
| 2 References .....                                                       | 6  |
| 2.1 Normative references .....                                           | 6  |
| 2.2 Informative references.....                                          | 6  |
| 3 Definitions and abbreviations.....                                     | 7  |
| 3.1 Definitions.....                                                     | 7  |
| 3.2 Abbreviations .....                                                  | 8  |
| 4 NGN Impacts on BSM Networks.....                                       | 10 |
| 4.1 Background .....                                                     | 10 |
| 4.2 NGN Network Architecture .....                                       | 11 |
| 4.2.1 Service Stratum.....                                               | 12 |
| 4.2.2 Transport Stratum .....                                            | 12 |
| 4.2.2.1 Transport Control Sublayer .....                                 | 12 |
| 4.2.2.2 Transport Processing Functions .....                             | 13 |
| 4.3 Service requirements .....                                           | 13 |
| 4.3.1 General NGN Service Requirements.....                              | 13 |
| 4.3.2 BSM-Specific Service Requirements.....                             | 14 |
| 4.3.2.1 VOIP and convergence .....                                       | 14 |
| 4.3.2.2 IPTV and IP video.....                                           | 15 |
| 4.3.2.3 Live/linear TV .....                                             | 15 |
| 4.3.2.4 Video on Demand (VoD).....                                       | 15 |
| 4.3.2.5 Emergency/Disaster Services.....                                 | 15 |
| 4.3.2.6 Primary Infrastructure .....                                     | 15 |
| 4.3.2.7 Infrastructure Support .....                                     | 16 |
| 4.3.2.8 Smart Grid/telemetry.....                                        | 16 |
| 4.4 Interworking requirements .....                                      | 16 |
| 5 BSM/NGN Architecture.....                                              | 16 |
| 5.1 BSM-Specific NGN Architecture.....                                   | 16 |
| 5.2 Scenarios .....                                                      | 17 |
| 5.2.1 IMS Service Access - Star network-based (1) .....                  | 18 |
| 5.2.1.1 Message Flow Diagrams .....                                      | 19 |
| 5.2.2 IMS Service Access - Mesh network based (2) .....                  | 21 |
| 5.2.2.1 Message Flow Diagrams .....                                      | 21 |
| 5.2.3 Efficient IMS Peering (3) .....                                    | 23 |
| 5.3 Detailed Functional Architecture.....                                | 23 |
| 5.3.1 BSM RACS .....                                                     | 23 |
| 5.3.1.1 SPDF .....                                                       | 24 |
| 5.3.1.2 A-RACF.....                                                      | 24 |
| 5.3.2 BSM NASS.....                                                      | 25 |
| 5.3.2.1 Network Access Configuration Function (NACF).....                | 26 |
| 5.3.2.2 Connectivity session Location and repository Function (CLF)..... | 26 |
| 5.3.2.3 User Authentication and Authorization Function (UAAF) .....      | 26 |
| 5.3.2.4 Profile Data Base Function (PDBF).....                           | 26 |
| 5.3.2.5 CNG Configuration Function (CNGCF).....                          | 27 |
| 5.4 Interfaces and Reference Points .....                                | 27 |
| 6 BSM Adaptation Functions for NGN.....                                  | 27 |
| 6.1 Signalling Application Server .....                                  | 28 |
| 6.2 BSM IWF .....                                                        | 29 |
| 6.3 Mobile/Fixed Satellite System Convergence.....                       | 29 |

|                               |                                                |           |
|-------------------------------|------------------------------------------------|-----------|
| <b>Annex A (informative):</b> | <b>The IP Multimedia Subsystem (IMS)</b>       | <b>30</b> |
| A.1                           | Overview                                       | 30        |
| A.2                           | IMS Logical Elements                           | 31        |
| A.2.1                         | The Call Session Control Functions (CSCF)      | 31        |
| A.2.2                         | Media Gateway Control Function (MGCF)          | 32        |
| A.2.3                         | Multimedia Resource Function Controller (MRFC) | 32        |
| A.2.4                         | Breakout Gateway Control Function (BGCF)       | 32        |
| A.2.5                         | Interconnection Border Control Function (IBCF) | 32        |
| <b>Annex B (informative):</b> | <b>BSM/IMS Procedures</b>                      | <b>33</b> |
| B.1                           | ST Attachment and Initialization               | 33        |
| B.1.1                         | SIP Usage                                      | 33        |
| B.1.2                         | ST Attachment and Initialization Overview      | 33        |
| B.2                           | ST Registration                                | 35        |
| B.3                           | The SIP-Based Service Discovery Mechanism      | 35        |
| <b>Annex C (informative):</b> | <b>Further Examples of BSM/NGN Scenarios</b>   | <b>36</b> |
| C.1                           | BSM Access-only scenario                       | 36        |
| C.2                           | Satellite-based IMS                            | 36        |
| C.3                           | Enhanced Satellite-based IMS                   | 37        |
| <b>Annex D (informative):</b> | <b>Bibliography</b>                            | <b>38</b> |
| History                       |                                                | 39        |

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

ETSI TS 102 855 V1.1.1 (2011-03)

<https://standards.iteh.ai/catalog/standards/etsi/6c1a3445-584b-4277-85bc-f433b89ed657/etsi-ts-102-855-v1-1-1-2011-03>

---

# 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 Satellite Earth Stations and Systems (SES).

---

## Introduction

The Next Generation Network (NGN) is seen as the future universal network based on IP into which different network technologies will be integrated. The BSM network [1] is an example of one of these technologies. Working groups at ETSI (TISPAN), ITU and others (3GPP, TMF etc) have defined many of the functional characteristics of the NGN [4], [8], [9] and their work is continuing.

The BSM network has been defined with many of the same features (IP protocol based packetised transport, modular and interoperable control plane elements, a largely access agnostic architecture, etc.) necessary for compatibility with the NGN. Hence the BSM network is a candidate for NGN integration.

The BSM system has also been defined as a functional architecture to implement IP-based services in a standardised way over a variety of satellite technologies, and with the potential to operate these services when the BSM network is integrated into heterogeneous networks [i.1], [i.2]. The BSM architecture is characterised by the SI-SAP which defines the separation between common Satellite-Independent (SI) protocol layers and alternative lower Satellite-Dependent (SD) layers [2]. In addition, interfaces with higher-layer protocols and peer external networks and customer equipment are provided where appropriate. This is also very compatible with the NGN architecture which wants to clearly distinguish between transport specific and service specific functions.

One of the main functional building blocks of the NGN is the IP Multimedia Subsystem (IMS) [6]. The IMS provides a means initially for fixed-mobile and now many network convergence and interworking functionality for IP-based services. These include today IPTV, fixed and mobile voice and presence, and potential new services like video conferencing, peer-peer gaming etc. in the future. The definition of the NGN and the specifications of the IMS core functionality are still evolving in the standards bodies, but are sufficiently mature and stable to be able to define the potential interactions with the BSM network. Basic BSM network services could be deployed over the current IMS, but as IMS-based networks and applications mature, converged BSM services can be offered in conjunction with other satellite and terrestrial wireline and wireless networks using a common subscriber management system and control plane.

The present document will specify how BSM networks can be integrated into the NGN architecture.