



NSAI
Standards

Irish Standard
I.S. EN 50585:2014

Communications protocol to transport satellite delivered signals over IP networks

I.S. EN 50585:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN 50585:2014

Published:

2014-05-23

This document was published under the authority of the NSAI and comes into effect on:

2014-06-24

ICS number:

33.170

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

EN 50585

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

ICS 33.170

English Version

Communications protocol to transport satellite delivered signals over IP networks

Protocole de communication pour le transport des signaux
transmis par satellite sur les réseaux IP

Kommunikationsprotokoll zum Transport von
Satellitensignalen über IP-Netze

This European Standard was approved by CENELEC on 2014-03-24. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
Foreword.....	5
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms, definitions and abbreviations	8
3.1 Terms and definitions	8
3.2 Abbreviations	9
4 Basic description of SAT>IP system	10
4.1 SAT>IP concept	10
4.2 Network topology	10
4.3 Client functionality	11
4.4 Specification compliance.....	11
4.5 Usage scenarios	11
5 Protocol specification	11
5.1 General.....	11
5.2 UPnP addressing	13
5.2.1 General.....	13
5.2.2 DHCP addressing	13
5.2.3 Auto-IP addressing.....	13
5.3 UPnP Discovery	13
5.3.1 General.....	13
5.3.2 Simple service description protocol SSDP	13
5.3.3 Server Advertisements.....	14
5.3.4 DEVICE ID negotiation	16
5.3.5 Client Search Requests.....	22
5.4 UPnP Description	23
5.4.1 General.....	23
5.4.2 XML Device Description.....	23
5.5 RTSP Control	26
5.5.1 General.....	26
5.5.2 Real time streaming protocol RTSP	26
5.5.3 Setting up a new session.....	28
5.5.4 Starting the playout of a media stream (<i>PLAY</i>)	33
5.5.5 Maintaining a session (<i>OPTIONS</i>).....	35
5.5.6 Modifying a media stream.....	36
5.5.7 Joining an existing stream	37
5.5.8 Listing available media streams (<i>DESCRIBE</i>)	37
5.5.9 Closing the session and stopping the playout (<i>TEARDOWN</i>)	40
5.5.10 RTSP Methods	41
5.5.11 Uniform Resource Identifier (<i>URI</i>).....	44
5.5.12 Query Syntax.....	44
5.5.13 Example of RTSP sequence diagram	48
5.5.14 Internet Group Management Protocol (IGMP)	49
5.5.15 Status Code Definitions	51
5.5.16 RTCP Announcements.....	57
5.5.17 HTTP based requests	58

5.6	Media Transport	58
5.6.1	RTP Transport	58
5.6.2	HTTP Streaming	59
5.7	Media Formats	59
6	Dynamic versus Static Server Operation	59
6.1	Dynamic Operation (default)	59
6.2	Static Operation	59
6.3	Mixed Operation	60
Annex A	(informative) Usage scenarios	61
A.1	IP Adapter / IP Multiswitch	61
A.2	IP LNB	61
A.3	Master STB	61
A.4	Universal Service Gateway	62
A.5	IP based SMATV / Multi-Dwelling Units	62
Annex B	(informative) Client Implementation Guidelines	64
B.1	General	64
B.2	RTSP Clients	64
B.2.1	Definition	64
B.2.2	Client Setup and Configuration Settings	64
B.2.3	Service Discovery	65
B.2.4	Channel change implementation	66
B.3	IGMPv3 Clients	67
B.3.1	Definition	67
B.3.2	Client Setup and Configuration Settings	67
Annex C	(informative) Example of SAT>IP Message Exchanges	70
C.1	Example 1: Unicast Session Setup (no front-end selected) plus three additional channel changes	70
C.2	Example 2: Multicast Session Setup with front-end selection and destination address/port	72
Annex D	(informative) Support for DVB-T/-T2 (optional)	74
D.1	General	74
D.2	Implementation	74
Annex E	(informative) SAT>IP trademark and certification	76
E.1	Trademark	76
E.2	Artwork	76
E.3	Certification	76
	Bibliography	77
	Figures	
	Figure 1 — Basic principle of the SAT>IP system	7
	Figure 2 — Different types of live media servers	11
	Figure 3 — SAT>IP protocol stack	12
	Figure 4 — Comparison between SAT>IP and DLNA	12
	Figure 5 — NOTIFY message timing	14
	Figure 6 — DEVICE ID allocation timing.....	17
	Figure 8 — RTSP Control Example	26
	Figure 9 — Client with two RTSP sessions on the same SAT>IP server carried in different concurrent TCP connections	27

Figure 10 — Client with two RTSP sessions on the same SAT>IP server carried in one TCP connection at a given time.....	27
Figure 11 — Stream owner setting up a session and defining the transport	31
Figure 12 — Non-stream owner joining an already existing multicast stream and defining the transport	31
Figure 13 — Non-stream owner joining an already existing unicast stream and defining the transport.....	31
Figure 14 — Server Stream Output State Machine.....	35
Figure 15 — RTSP State Machine	42
Figure 16 — Operation of SAT>IP in the presence of multiple satellite positions.....	46
Figure 17 — Server internal source and frontend selection matrix	46
Figure 18 — Media stream object definition	47
Figure 19 — Example of a sequence diagram for RTSP operation	48
Figure 20 — Example of SAT>IP multicast network diagram	49
Figure 21 — General membership query message timing.....	49
Figure 22 — Group specific query timing	51
Figure 23 — Transport stream IP encapsulation.....	59
Figure 24 — Example of SAT>IP system using static server operation.....	60
Figure A.1 — IP Multiswitch application	61
Figure A.2 — SAT>IP conversion inside an IP-LNB	61
Figure A.3 — Master-Slave application	62
Figure A.4 — Universal Service Gateway application	62
Figure A.5 — IP based SMATV application.....	63
Figure B.1 — Example of auto-configuration set-up	66
Figure E.1	76

Foreword

This document (EN 50585:2014) has been prepared by CLC/TC 209 "Cable networks for television signals, sound signals and interactive services".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-03-24
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2017-03-24

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. [CEN / CENELEC / CEN and CENELEC] shall not be held responsible for identifying any or all such patent rights.

Introduction

This standard describes a new communication protocol for the distribution of satellite signals onto IP networks. It effectively “translates” TV signals, received from satellites in the DVB-S and DVB-S2 formats and supplied in the first intermediate frequency range (1st IF range), into signals for use on internet-based devices in the IP world. This technology enables the reception of satellite TV on devices that do not have an integrated satellite receiver. Satellite signals can thus be transported via every IP infrastructure with or without cable.

This way, the entire satellite household can be provided with TV and sound radio programmes on tablets, PCs, laptops, smart phones, connected TVs, game consoles and media players.

This technology concept is commonly referred to as **SAT>IP** ¹⁾.

1) **SAT>IP** is a short-term which covers the complete system for the transposition of SAT-IF signals to IP-based signals. This term is used in a widespread manner for marking software and hardware components used in such systems. More details are given in informative Annex E.

1 Scope

This European Standard describes the SAT>IP communication protocol. It enables a SAT>IP server to forward satellite delivered signals to SAT>IP clients over IP networks. The typical use case would be the transport of television programs that were received from the satellite by the SAT>IP server to the SAT>IP client via the IP network. SAT>IP specifies a control protocol as well as the media transport (Figure 1).

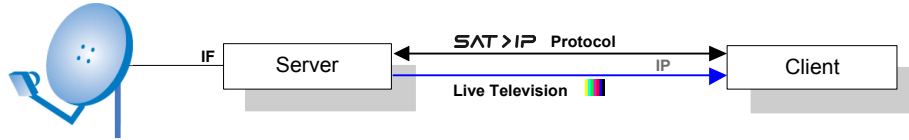


Figure 1 — Basic principle of the SAT>IP system

SAT>IP is **not** a device specification.

The SAT>IP protocol distinguishes between SAT>IP clients and SAT>IP servers.

SAT>IP Clients

SAT>IP clients may reside in set-top boxes equipped with an IP interface or may be implemented as software applications running on programmable hardware such as Tablets, PCs, Smartphones, Connected Televisions.

SAT>IP Servers

SAT>IP servers may take various forms ranging from large MDU headends servicing whole buildings or communities to in-home IP multiswitches to simple IP adapters for a set-top box to, ultimately, IP LNBs.

Actual devices may be clients or servers or both depending on their feature set.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 29341-1-1, *Information technology — UPnP Device Architecture — Part 1.1: UPnP Device Architecture Version 1.1*

ETSI TS 101 154 V1.9.1, Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream

RFC 2113 – IP Router Alert Option (Internet Engineering Task Force (IETF))

RFC 2131 – DHCP (Dynamic Host Configuration Protocol) (Internet Engineering Task Force (IETF))

RFC 2250 – RTP Payload Format for MPEG1/MPEG2 Video (Internet Engineering Task Force (IETF))

RFC 2279 – UTF-8, a transformation format of ISO 10646 (Internet Engineering Task Force (IETF))

RFC 2326 – Real Time Streaming Protocol (RTSP) (Internet Engineering Task Force (IETF))

RFC 3376 – Internet Group Management Protocol, Version 3 (Internet Engineering Task Force (IETF))

RFC 3550 – RTP: A Transport Protocol for Real-Time Applications (Internet Engineering Task Force (IETF))

RFC 4566 – SDP: Session Description Protocol (Internet Engineering Task Force (IETF))

draft-cai-ssdp-v1-03 – Simple Service Discovery Protocol/1.0 (Internet Engineering Task Force (IETF))

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-