

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Internet protocol (IP) and transport stream (TS) based service access

Accès aux services fondé sur le protocole internet (IP) et sur le flux de transport
(TS)

[IEC 62455:2010](#)

<https://standards.iteh.ai/catalog/standards/sist/06712ab9-f074-47f4-96e1-e1c03f4781cb/iec-62455-2010>



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2010 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

<https://standards.iteh.ai/catalog/standards?show=1&sort=0/1/1/1/50>

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC online collection - oc.iec.ch



IEC 62455

Edition 2.0 2010-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Internet protocol (IP) and transport stream (TS) based service access

(standards.iteh.ai)

Accès aux services fondé sur le protocole internet (IP) et sur le flux de transport (TS)

[IEC 62455:2010](#)

<https://standards.iteh.ai/catalog/standards/sist/06712ab9-f074-47f4-96e1-e1c03f4781cb/iec-62455-2010>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.170; 35.100.05; 35.240.99

ISBN 978-2-8322-1048-2

Warning! Make sure that you obtained this publication from an authorized distributor.

Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

FOREWORD	14
1 Scope	16
2 Normative references	16
3 Terms, definitions and abbreviations	18
3.1 Terms and definitions	18
3.2 Symbols	23
3.3 Abbreviations	24
3.4 Identifiers assigned by external entities	28
4 General	28
4.1 Overview	28
4.2 General description of the system and elements	29
4.2.1 General	29
4.2.2 Selected technologies	30
4.2.3 Overview of four-layer model for service protection	31
4.3 End-to-end system	33
4.4 Supported systems and device types	33
4.5 Service protection versus content protection	35
5 General specifications	36
5.1 End-to-end architecture	36
5.2 Special cases	38
5.2.1 Free-to-air services	38
5.2.2 Free-to-view services	38
5.3 Service guide and purchase	38
5.4 Four-layer model – Key hierarchy	39
5.4.1 General	39
5.4.2 Keys on the traffic layer	40
5.4.3 Keys on the key stream layer	40
5.4.4 Keys on the rights management layer (interactive mode)	43
5.4.5 Keys on the rights management layer (broadcast mode)	43
5.4.6 Keys on the registration layer (interactive mode)	43
5.4.7 Keys on the registration layer (broadcast mode)	43
5.4.8 Authentication overview	46
5.5 Deployment for broadcast mode of operation	47
5.5.1 Concept of Domains –Interactive and broadcast domains	47
5.5.2 Addressing (group/subset/device/domain)	48
5.5.3 Zero message broadcast encryption scheme	51
6 Traffic layer	53
6.1 General	53
6.2 IPsec	53
6.2.1 General	53
6.2.2 Selectors	54
6.2.3 Encapsulation protocol and mode	54
6.2.4 Encryption algorithm	55
6.2.5 Authentication algorithm	55
6.2.6 Security association management	55
6.3 ISMACryp	55

6.3.1	Streamed content	55
6.3.2	Downloadable audio/visual content (stored in MP4 files).....	56
6.3.3	Use of ISMACryp with the rights management and key stream layers	57
6.4	SRTP	57
6.4.1	General	57
6.4.2	Key management.....	59
6.4.3	Encryption algorithm.....	60
6.4.4	Authentication algorithm	60
6.5	MPEG2 TS crypt	60
6.5.1	General	60
6.5.2	Transport stream level scrambling	62
6.5.3	PES level scrambling.....	62
6.5.4	Descrambling MPEG2 content	63
6.5.5	Supported ciphers	64
6.5.6	Key management.....	64
7	Key stream layer	65
7.1	General	65
7.2	Format of the key stream message (KSM)	65
7.2.1	Format.....	65
7.2.2	Descriptors for access_criteria_descriptor_loop.....	68
7.2.3	Constants.....	75
7.2.4	Coding and semantics of attributes.....	75
8	Rights management layer	83
8.1	General	83
8.2	Identification of rights objects IEC 62455:2010	83
8.3	Requirements for rights objects IEC 62455:2010	84
8.3.1	Requirements for service ROs	84
8.3.2	Requirements for programme ROs.....	84
8.4	Format of rights objects	85
8.4.1	Format of an Interactivity channel rights object (ICRO).....	85
8.4.2	Format of a broadcast rights object (BCRO)	85
8.4.3	Format of the asset object	89
8.4.4	Format of the permission object.....	92
8.4.5	Format of the action object	93
8.4.6	Format of the constraint object	94
9	Registration layer	100
9.1	General	100
9.2	RI context.....	100
9.3	Registration layer protocols and message specification	101
9.3.1	Interactivity channel registration layer specification	101
9.3.2	Broadcast channel registration layer specification	101
9.3.3	Domain joining and leaving.....	136
9.3.4	Token handling	151
9.3.5	Mixed-mode registration for interactive and broadcast modes of operation	158
10	Signalling and service guide	159
10.1	General	159
10.2	Signalling requirements	160
10.2.1	Signalling information	160

10.2.2 Requirements for signalling the KSM	160	
10.2.3 Requirements for signalling of services	160	
10.3 Service guide requirements	160	
10.4 Service guide recommendations	160	
11 Rights issuer services and rights issuer streams	161	
11.1 General	161	
11.2 Rights issuer services	161	
11.2.1 Requirements for rights issuer services in IPDC over DVB-H systems	161	
11.2.2 Requirements for rights issuer services in DVB-T/C/S systems	162	
11.2.3 Requirements for the support of rights issuer services and streams in IPTV systems	162	
11.3 Usage of rights issuer streams and services	162	
11.3.1 General	162	
11.3.2 Scheduled RI stream	163	
11.3.3 <i>Ad hoc</i> RI stream	163	
11.3.4 In-band RI streams within a media service	163	
12 Service subscription and purchase	165	
12.1 General	165	
12.2 Purchase over an interactivity channel	166	
12.2.1 General	166	
12.2.2 Typical purchase sequences	167	
12.2.3 Protocol	188	
12.2.4 XML schemas for request and response messages	189	
12.2.5 XML schema definition for request and response related XML elements	IEC 62455:2010 https://standards.iteh.ai/catalog/standards/sist/067/12ab9-1074-474-96e1-1e034781cb1c-62455-2010	203
12.3 Purchase for mixed-mode devices	207	
12.4 Out-of-band purchase	208	
12.4.1 Means of purchase – Introduction	208	
12.4.2 Out-of-band purchase from service guide data	208	
12.5 Required service guide Information	210	
12.5.1 General	210	
12.5.2 Service operation centre (including service distribution management)	211	
12.5.3 Customer operation centre (including service subscription management)	211	
12.5.4 Service	212	
12.5.5 ScheduleItem	213	
12.5.6 ContentItem	213	
12.5.7 Purchase item	214	
12.5.8 Purchase data	214	
13 Protection of IPDC over DVB-H systems	214	
13.1 General	214	
13.2 Delivery of traffic layer data in IPDC over DVB-H systems	215	
13.3 Delivery of key stream data in IPDC over DVB-H systems	215	
13.4 Delivery of rights management data in IPDC over DVB-H systems	215	
13.4.1 General	215	
13.4.2 Delivery of ICROs in IPDC over DVB-H systems over interactivity channel	215	
13.4.3 Delivery of BCROs in IPDC over DVB-H systems over broadcast channel	215	
13.5 Delivery of registration data in IPDC over DVB-H systems	215	

13.5.1	General	215
13.5.2	Delivery of registration data in IPDC over DVB-H systems over an interactivity channel.....	216
13.5.3	Delivery of registration data in IPDC over DVB-H systems over a broadcast channel	216
13.6	Signalling and service guides in IPDC over DVB-H systems	216
13.6.1	General	216
13.6.2	Signalling of KSM in IPDC over DVB-H systems	216
13.6.3	The service guide for IPDC over DVB-H systems.....	217
13.7	Format and use of RI streams over IPDC over DVB-H systems	217
13.7.1	General	217
13.7.2	IP characteristics.....	218
13.7.3	RI stream packet format	218
13.7.4	Implementation notes	220
13.7.5	Mapping of messages to RI services and streams	221
13.7.6	Discovery of RI services, streams and schedule Information	221
13.7.7	Certificate chain updates	222
13.7.8	Resending of BCROs	222
13.7.9	Summary of requirements for rights issuers.....	223
13.7.10	Summary of requirements for devices.....	223
13.7.11	Mapping of messages to DVB-H time sliced bursts.....	224
14	Protection of DVB T/C/S systems	224
14.1	General	224
14.2	Delivery of traffic layer data in DVB T/C/S systems	225
14.3	Delivery of key stream data in DVB T/C/S systems.....	225
14.4	Delivery of rights management data in DVB T/C/S systems <small>IEC62455:2010 https://standards.iteh.ai/catalog/standard/sist/06712ab9-f074-47f4-96e1-e1c034781cb/iec-62455-2010</small>	226
14.4.1	General	226
14.4.2	Delivery of ICROs in DVB T/C/S systems over interactivity channel	226
14.4.3	Delivery of BCROs in DVB T/C/S systems over broadcast channel.....	226
14.5	Delivery of registration data in DVB T/C/S systems	227
14.5.1	General	227
14.5.2	Delivery of registration data in DVB T/C/S systems over an interactivity channel	227
14.5.3	Delivery of registration data in DVB T/C/S systems over a broadcast channel	227
14.5.4	Registration message table	228
14.6	Signalling and service guide in DVB T/C/S systems	230
14.6.1	General	230
14.6.2	Signalling of encrypted services in DVB T/C/S systems.....	231
14.6.3	SI tables	239
14.6.4	SI descriptors	248
14.7	User-defined identifiers used in DVB-SI tables	262
14.8	Scope of identifiers used in DVB-SI tables	262
14.9	Format of RI services over DVB-T/C/S systems	263
14.9.1	General	263
14.9.2	RI stream packet format	263
14.9.3	Addressing of objects	263
14.9.4	Mapping of messages to RI services and streams	263
15	Protection of MPEG2 TS-based IP systems	263
15.1	General	263

15.2	Encapsulation of an MPEG2 TS in IP	264
15.3	Delivery of traffic layer data in MPEG2 TS-based IP systems	264
15.4	Delivery of key stream data in MPEG2 TS-based IP systems	264
15.5	Delivery of rights management data in MPEG2 TS-based IP systems.....	264
15.6	Delivery of registration data in MPEG2 TS-based IP systems	264
15.7	Signalling and service guides in MPEG2 TS-based IP systems	264
15.7.1	General	264
15.7.2	Signalling and the service guide in DVB-IPI systems	264
15.7.3	Signalling and service guides in non-DVB-IPI systems	267
15.8	Format of RI services over MPEG2 TS-based IP systems	267
15.9	Content-on-demand support	267
15.9.1	General	267
15.9.2	Content-on-demand trick play support	268
15.10	Use of server-side purchase interfaces	268
15.10.1	General	268
15.10.2	Example showing registration via a web interface.....	269
15.10.3	Example showing purchase via a web interface	269
16	Protection of non-MPEG2 TS-based IP systems	269
16.1	General	269
16.2	Delivery of traffic layer data in non-MPEG2 TS-based IP systems	269
16.3	Delivery of key stream data in non-MPEG2 TS-based IP systems.....	270
16.4	Delivery of rights management data in non-MPEG2 TS-based IP systems	270
16.5	Delivery of registration data in non-MPEG2 TS-based IP systems	270
16.6	Signalling and service guides in non-MPEG2 TS-based IP systems.....	270
16.7	Format of RI services over non-MPEG2 TS-based IP systems.....	270
16.8	Content-on-demand support	270
Annex A (normative)	Supporting specifications	271
Annex B (informative)	Deployment considerations	354
Bibliography.....	406	
Figure 1 – System overview	29	
Figure 2 – Service protection via four-layer model	31	
Figure 3 – Highly simplified view of the end-to-end system	33	
Figure 4 – Service protection versus content protection	35	
Figure 5 – Service protection and purchase entities and names (broadcast architecture)	36	
Figure 6 – Public key infrastructure.....	37	
Figure 7 – Overview of service guide and purchase	39	
Figure 8 – 4-layer key hierarchy – Use of SEK only	41	
Figure 9 – 4-layer key hierarchy – Use of PEK and SEK	42	
Figure 10 – Authentication hierarchy.....	46	
Figure 11 – Explaining the concept of addressing	48	
Figure 12 – (Oversimplified) group BCRO	49	
Figure 13 – (Oversimplified) subscriber group BCRO	49	
Figure 14 – (Oversimplified) unique device BCRO	50	
Figure 15 – (Oversimplified) broadcast domain BCRO	50	
Figure 16 – Example of a zero message tree with three nodes (keys)	51	

Figure 17 – IPsec security association elements	54
Figure 18 – ISMACryp Key Management.....	57
Figure 19 – SRTP cryptographic context management.....	59
Figure 20 – MPEG2 transport stream cryptographic context management.....	61
Figure 21 – Single-key versus dual-key TS over time.....	63
Figure 22 – Registration for broadcast mode of operation with one ROT.....	102
Figure 23 – Offline NDD protocol	103
Figure 24 – Samples of notification displays	104
Figure 25 – Off-line NSD protocol	104
Figure 26 – Action request code (ARC)	104
Figure 27 – Samples of notification displays showing an ARC message.....	106
Figure 28 – Sample of token consumption reporting notification display.....	107
Figure 29 – Sample of TAA report display	108
Figure 30 – 1-pass PDR protocol – (first) device registration.....	109
Figure 31 – 1-pass IRD protocol – RI initiated message to device (here re-registration).....	109
Figure 32 – Unique device number	112
Figure 33 – Device_registration_response() message	122
Figure 34 – Structure of device_registration_response() message.....	123
Figure 35 – Domain_registration_response() message.....	142
Figure 36 – Structure of domain_registration_response() message	143
Figure 37 – Registration for mixed-mode operation with one ROT.....	159
Figure 38 – Relationship between RI service and RI streams and other services and RI Streams	163
Figure 39 – Message flows for service subscription and purchase for the connected mode of operation.....	165
Figure 40 – Message flows for service subscription and purchase for the unconnected mode of operation.....	166
Figure 41 – Interactions for bulk download of service and programme keys	168
Figure 42 – Interactions for bulk download of purchase information	169
Figure 43 – Interactions for announcement of purchase items in service guide	170
Figure 44 – Interactions for pricing inquiry	171
Figure 45 – Interactions for unsuccessful purchase.....	175
Figure 46 – Interactions for successful purchase	179
Figure 47 – Interactions for subscription RO renewal and asynchronous charging	183
Figure 48 – Interactions for asynchronous charging and cancellation of open-ended subscriptions	184
Figure 49 – Interactions for acquisition and charging of tokens	188
Figure 50 – Samples of out-of-band purchase information displays for a registered device.....	209
Figure 51 – Sample of out-of-band purchase information displays for an unregistered device.....	210
Figure 52 – Example mapping of objects to RI stream packets.....	218
Figure 53 – Signalling of encrypted services and their associated key streams	232
Figure 54 – Signalling of encrypted services in the SDT.....	233
Figure 55 – Signalling of the rights issuer service in the SDT.....	234

Figure 56 – Addressing of a rights issuer service	234
Figure 57 – Signalling of purchase information via the SDT	235
Figure 58 – Signalling of purchase information via the CA_descriptor in the CAT	236
Figure 59 – Signalling of purchase information via the private data block of the CA_descriptor in the CAT	237
Figure 60 – Relationship between PCT, PIT, SBT and SDT	238
Figure 61 – Alternative usage of the purchase_item_descriptor in the SDT and EIT	239
Figure A.1 – Sample notification display	272
Figure A.2 – Conversion routes between modified julian date (MJD) and coordinated universal time (UTC)	275
Figure A.3 – Node numbering	280
Figure A.4 – AES for key derivation	281
Figure A.5 – Sample tree with correct node and device numbering	283
Figure A.6 – Computation of the TAA_report_code	288
Figure A.7 – Node numbering	293
Figure A.8 – Computation of the report_authentication_code	299
Figure A.9 – Relationship between DVB-T/C/S PSI/SI tables	312
Figure A.10 – Relationships between the defined types	314
Figure A.11 – XML fragment for SOO identifier	316
Figure A.12 – XML fragment for serviceBaseCID	316
Figure A.13 – Definition of UniversalPurchaseItem.....	317
Figure A.14 – Definition of the ServiceBundleType	317
Figure A.15 – Definition of UniversalServiceInformationType.....	318
Figure A.16 – Definition of UniversalOnDemandServiceType	318
Figure A.17 – Definition of UniversalPurchaseType.....	319
Figure A.18 – Recording and super-distributing the recorded asset.....	329
Figure A.19 – Format of the OMADRMRecordingTimestamp	332
Figure A.20 – Format of the OMADRMRecordingInformationBlock	333
Figure A.21 – 18Crypt namespace declaration	334
Figure B.1 – Rights issuer communication with various types of devices in IPDC over DVB-H systems.....	356
Figure B.2 – Rights issuer communication with various types of devices in DVB-T/C/S systems	359
Figure B.3 – Rights issuer communication with various types of devices in IP systems	361
Figure B.4 – Purchase steps in case of an interactive device	362
Figure B.5 – Purchase steps in case of a broadcast device.....	364
Figure B.6 – Consumption steps from the broadcaster point of view.....	366
Figure B.7 – Consumption steps from the device point of view	367
Figure B.8 – Function blocks of service protection head-end.....	376
Figure B.9 – Systems and network elements of service protection head-end.....	378
Figure B.10 – IEC T/C/S components integrated into DVB SimulCrypt head-end.....	380
Figure B.11 – Locating 18Crypt KSM & BCRO as well as EMM & ECM	382
Figure B.12 – Carrying messages over the network	384
Figure B.13 – Sample network set-ups using the location descriptors	384

Figure B.14 – Expanding the IEC T/C/S head-end components	385
Figure B.15 – Deployment option A (combining DIST Mgmt and RI in SOC) – Local scenario.....	389
Figure B.16 – Deployment option A (combining DIST Mgmt and RI in SOC) – Roaming scenario.....	390
Figure B.17 – Deployment option B (combining SUB Mgmt and RI in COC) – Local scenario.....	392
Figure B.18 – Deployment option B (combining SUB Mgmt and RI in COC) – Roaming scenario.....	393
Figure B.19 – Scenarios 1 and 2 for bosc_masks	397
Figure B.20 – Scenarios 3 and 4 for bosc_masks	399
Figure B.21 – Scenarios 5 and 6 for bosc_masks	400
Figure B.22 – Scenarios 7 and 8 for bosc_masks	401
Figure B.23 – Scenarios 9 and 10 for bosc_masks (precedence)	402
Figure B.24 – Diagram of keyset_block, sessionkey_block and surplus_block.....	404
 Table 1 – Supported systems and device types	34
Table 2 – Keyset in the registration data	44
Table 3 – Definition of transport_scrambling_control bits	62
Table 4 – Definition of pes_scrambling_control field bits	62
Table 5 – Descrambling possibility matrix	64
Table 6 – Supported ciphers for MPEG2 TS Crypt	64
Table 7 – Format of key stream message IEC 62455:2010	66
Table 8 – Descriptors for access_criteria_descriptor_loop	68
Table 9 – Access_criteria_descriptors	68
Table 10 – Parental_rating access criteria descriptor	68
Table 11 – Parental rating values for each parental rating type	69
Table 12 – Copy_control_information access criteria descriptor	70
Table 13 – Bit assignments of copy_control_information_byte	71
Table 14 – CCI bit assignments	71
Table 15 – EMI values and content	71
Table 16 – APS value definitions	71
Table 17 – CIT values and application	72
Table 18 – RCT values and application	72
Table 19 – Blackout_spotbeam access criteria descriptor	73
Table 20 – Operator field values and their meaning	73
Table 21 – Constants in key stream message	75
Table 22 – Content_key_index options	77
Table 23 – cipher_mode options	78
Table 24 – Obtaining the content key	79
Table 25 – Traffic key lifetime	80
Table 26 – Values of permissions_category and their meaning	81
Table 27 – Format of BCRO	85
Table 28 – Address_mode	87

Table 29 – Asset format	89
Table 30 – Asset_type	90
Table 31 – Mapping of address_mode to keys	90
Table 32 – Mapping of address_mode to keys	91
Table 33 – Mapping of address_mode to keys	91
Table 34 – Permission format	92
Table 35 – Action format	93
Table 36 – Action_type	93
Table 37 – Constraint format	94
Table 38 – Format of constraint_descriptor	94
Table 39 – Constraint_tag	95
Table 40 – Format of count_constraint_descriptor	95
Table 41 – Format of timed_count_constraint_descriptor	95
Table 42 – Format of datetime_constraint_descriptor	96
Table 43 – Format of interval_constraint_descriptor	97
Table 44 – Format of accumulated_constraint_descriptor	97
Table 45 – Format of individual_constraint_descriptor	98
Table 46 – Id_type	98
Table 47 – Format of system_constraint_descriptor	98
Table 48 – Format of token_management_constraint_descriptor	99
Table 49 – Registration types	101
Table 50 – NSD action request code fields <small>https://standards.iteh.ai/catalog/standards/sist/06712ab9-1074-4744-96e1-e1c034781eb4/iec-62455-2010</small>	104
Table 51 – NSD action types	105
Table 52 – Token consumption data	107
Table 53 – TAA report data	108
Table 54 – Messages of the 1-pass IRD protocol	110
Table 55 – UDN explanation	112
Table 56 – Major industry identifier	113
Table 57 – longform_udn	113
Table 58 – Notify device data message parameters	114
Table 59 – Device data	114
Table 60 – Message fields	115
Table 61 – Status values	116
Table 62 – Fields of certificate_version parameter	116
Table 63 – Allowed values for ri_certificate_counter	117
Table 64 – Allowed values for ocsp_response_counter	118
Table 65 – Values for flags signalling data absent/data present	118
Table 66 – Allowed values for subscriber_group_key_flag	119
Table 67 – Values and their meaning for signature_type_flag	119
Table 68 – Message syntax	124
Table 69 – Message fields	126
Table 70 – Status values	127
Table 71 – Fields of certificate_version parameter	127

Table 72 – Message syntax	129
Table 73 – Message fields	130
Table 74 – Status values	130
Table 75 – Message syntax	131
Table 76 – Message fields	132
Table 77 – Status values	132
Table 78 – Fields of certificate_version parameter	133
Table 79 – Message syntax	134
Table 80 – Format of contact object	135
Table 81 – Contact_type	135
Table 82 – Encoding rules for contactdata	136
Table 83 – Off-line protocols (from device to RI)	137
Table 84 – 1-pass protocols (from RI to device)	137
Table 85 – Protocol interrelation	137
Table 86 – Message fields	138
Table 87 – Status values	139
Table 88 – Fields of certificate_version parameter	139
Table 89 – Message syntax	144
Table 90 – Message fields	145
Table 91 – Status values	146
Table 92 – Fields of certificate_version parameter	146
Table 93 – Message syntax	148
Table 94 – Message syntax	150
Table 95 – Offline protocols (from device to RI)	151
Table 96 – 1-pass protocols (from RI to device)	151
Table 97 – Protocol interrelation	151
Table 98 – Fields of token delivery response message	152
Table 99 – Address_mode for token delivery response message	153
Table 100 – Message error codes	154
Table 101 – Mapping of address_mode to keys for the token delivery response message	156
Table 102 – Mapping of address_mode to keys for the token delivery response message	156
Table 103 – Syntax of token delivery response message	157
Table 104 – Requirements for the support of RI services and streams by IPDC over DVB-H devices	161
Table 105 – Requirements for the support of rights issuer services and streams by service providers in IPDC over DVB-H systems	162
Table 106 – Definition of mandatory SOC attributes in request/response messages	190
Table 107 – Occurrence of error codes in response messages	192
Table 108 – Data to be provided to the customer operation centre	209
Table 109 – Traffic layer options for transmission over IPDC over DVB-H	215
Table 110 – Format of the rights issuer stream	219
Table 111 – Traffic layer options for transmission over MPEG2 TS-based networks	225

Table 112 – KSM table	225
Table 113 – BCRO table	227
Table 114 – Carrying registration layer messages via MPEG sections in T/C/S system.....	228
Table 115 – Syntax of registration message table (RMT)	229
Table 116 – Purchase channel table	240
Table 117 – Service bundle table	244
Table 118 – Purchase item table.....	247
Table 119 – Private descriptor tags used for 18Crypt.....	248
Table 120 – Possible locations of descriptors	249
Table 121 – Service_ID_descriptor	249
Table 122 – Right issuer ID descriptor	250
Table 123 – Purchase info location descriptor.....	251
Table 124 – Purchase item descriptor	253
Table 125 – Subscription_type values.....	254
Table 126 – Example price with different decimal point location values.....	255
Table 127 – Provider name descriptor.....	256
Table 128 – Eurocrypt addressing descriptor	256
Table 129 – Address_mode.....	257
Table 130 – Info URL descriptor	258
Table 131 – Key URL descriptor	258
Table 132 – Linkage descriptor	259
Table 133 – Linkage type coding	260
Table 134 – IP linkage descriptor	260
Table 135 – User defined IDs.....	262
Table 136 – Additions to the broadcast discovery record	265
Table 137 – Additions to the content-on-demand discovery record.....	266
Table 138 – Sequence of events for purchase and supply of a content-on-demand item	268
Table 139 – Traffic layer options for transmission over non-MPEG2 TS based IP networks	269
Table A.1 – Status/error codes	273
Table A.2 – Local time offset coding	277
Table A.3 – Standard keyset with RSA block size 1024.....	278
Table A.4 – Standard keyset with other RSA block sizes.....	279
Table A.5 – Extended keyset with RSA block size 1024	279
Table A.6 – Extended keyset with other RSA block sizes	280
Table A.7 – Error likelihood in human communication	288
Table A.8 – Defined tag values	292
Table A.9 – Defined length values	294
Table A.10 – Correct usage of length values	294
Table A.11 – TAA descriptor syntax	296
Table A.12 – TAA algorithm values	296
Table A.13 – Message_tag overview.....	297
Table A.14 – Table ID overview	297

Table A.15 – Multilingual text structure	298
Table A.16 – Mapping of required service guide data to the IPDC ESG.....	309
Table A.17 – Mapping of required service guide data to DVB PSI/SI tables.....	311
Table A.18 – Mapping of required service guide data to IPI BCG/TV anytime.....	314
Table A.19 – Updated permission element.....	326
Table A.20 – Access element.....	328
Table A.21 – Semantics of the save element	330
Table A.22 – Use of programme and service keys.....	330
Table A.23 – Fields in the GroupID box.....	331
Table A.24 – CommonHeaders box fields	331
Table A.25 – Conformance table for IPDC over DVB-H systems	343
Table A.26 – Conformance table for DVB-T/C/S systems	347
Table A.27 – Conformance table for IPTV systems	350
Table B.1 – Messages involved in IEC T/C/S systems.....	379
Table B.2 – Reference overview information	383
Table B.3 – Example 1: CGF with cities and regions	396
Table B.4 – Example 2: CGF with sports and regions (independent)	396
Table B.5 – Example 3: CGF with sports and regions (overlapping).....	398
Table B.6 – Category of references.....	405

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

[IEC 62455:2010](#)

<https://standards.iteh.ai/catalog/standards/sist/06712ab9-f074-47f4-96e1-e1c03f4781cb/iec-62455-2010>