

TLN WRO Specification type Document

< Specification and Certification AO VoD Back-End
>



Document Housekeeping

Document Category and type

CAT	TYPE	DOC ID	Comment
i(DTV)	SPEC	TLN_WRO_TA_I_S_PIAA	Specification type documents (-SPEC) are documents specifying logical / physical interfaces / protocols, etc., to which AO equipment/systems need to comply

Document Status

EDITION	DATE	STATUS
1.0	09.10.2013	Final
2.0	29.12.2018	Final
2.1	03.04.2019	Final

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Telenet has appealed the CRC decisions of the VRM, BIPT and CSA of 29 June 2018 concerning the market analysis of the broadband and broadcasting market in Belgium and it consequently reserves all its rights in relation to this document.”

Table of Contents

Table of Contents	3
List of Appendixes	4
List of References	4
Restricted information	4
1 Abstract	5
2 DVB-C VoD Solution Back-End Integration	6
2.1 AO CONTENT LIBRARY HOSTING FUNCTIONAL DESCRIPTION	6
2.2 AO CONTENT LIBRARY HOSTING FUNCTIONAL REQUIREMENTS	7
2.2.1 <i>Telenet VoD CMS Setup General Overview</i>	7
2.2.2 <i>Telenet content server hosting AO content library</i>	8
2.2.3 <i>Telenet content server operational procedures</i>	9
2.2.4 <i>Telenet content encoding specifications</i>	10
2.2.5 <i>AO VoD catalogue structure requirements</i>	10
2.2.6 <i>Telenet content Meta data specifications</i>	10
2.2.7 <i>Restrictions</i>	11
2.2.8 <i>Operational Procedures</i>	11
2.2.9 <i>AO Device Management by Telenet Requirements</i>	11
2.3 AO STB INTERACTIVE DATA RETURN PATH - NON FUNCTIONAL REQUIREMENTS	11
2.4 CERTIFICATION FOR THE AO VoD CONTENT LIBRARY HOSTING ON TELENET VoD CMS TO ENABLE USAGE OF THE TELENET AIDTV	11
2.4.1 <i>Introduction</i>	11
2.4.2 <i>Test score card</i>	12
3 IP VoD Solution Back-End Integration	13
3.1 IP VoD SOLUTION DESCRIPTION	13
3.2 IP VoD SOLUTION INTEGRATION REQUIREMENTS	14
3.2.1 <i>IP VoD Back End overview</i>	14
3.2.2 <i>AO Catalogue Integration</i>	14
3.2.3 <i>AO Content Storage Integration</i>	15
3.2.4 <i>AO DRM Integration</i>	16
3.2.5 <i>Restrictions</i>	17
3.2.6 <i>Operational Procedures</i>	17
3.2.7 <i>AO Device Management by Telenet Requirements</i>	17
3.3 PHYSICAL LINK AND NETWORK INTEGRATION	18
3.4 CERTIFICATION FOR THE AO IP VoD BACK END INTEGRATION TO ENABLE USAGE OF THE TELENET AIDTV	19
3.4.1 <i>Introduction</i>	19
3.4.2 <i>Test score card</i>	19

Table of Figures

Figure 2-1: Content Library Hosting	6
Figure 4-1: VoD CMS Setup	7
Figure 3-1: IP VoD System Overview	13
Figure 3-2: AO Content Storage, Catalogue & DRM Integration	14
Figure 3-3: DRM Integration	16

List of Appendixes

This document may refer to further detailed documents that are added in Appendixes to this document.

A reference to an appendix is in this document highlighted with grey background.

The list with appendixes of this document:

- A. Appendix A, <APP_I_S_PIAA_A> contains :
 - 1) Appendix A - <VoD toolkit for content providers>

The appendix(es) referred to in this section List of Appendixes, contain(s) detailed technical information which is only relevant when a Beneficiary enters in a concrete implementation project to become Beneficiary of the Telenet Reference Offer and/or Annex.

List of References

This document may refer to external documents or information sources.

A reference to an external document or information source is in this document highlighted with grey background.

The list of referred external documents or information sources in this document:

Reference 1: TLN_WRO_TA_G_C_PAAA - General Certification Procedures

Reference 2: TLN_WRO_TA_I_S_PDAA - Specification and Certification AO STB

Reference 3 : TLN_WRO_TA_B_A_PAAA_V1.0 - Architecture ROBB

Reference 4 : TLN_WRO_TA_I_S_PDAB_V1.0 - Specification and Certification iDTV interconnection

Restricted information

This document may contain sections that are not public information and that can be made available only to parties that have executed specific NDA`s.

Information that is subject to NDA is marked in this document as follows:

NDA
NDA

The information in this text box is available only under NDA

Before conversion to PDF format for publication of the document, the information will be made unreadable by converting the background of the text box to black.

1 Abstract

This document describes the requirements the AO must meet in order to integrate its back-end for the DVB-C and the IP based solution. For the DVB-C solution, it discusses the requirements the AO must meet to upload and manage its own VoD content in the Telenet VoD content management system. For the IP solution, it describes the requirements the AO must meet to integrate its VoD content and DRM platform in the wholesale platform.

Generic sections specifying certification procedures applicable to all AO CPE or network equipment that will be connected to the Telenet network are described in General Certification Procedures Document [TLN_WRO_TA_G_C_PAAA - General Certification Procedures](#).

2 DVB-C VoD Solution Back-End Integration

- (1) This section describes the back-end integrations that need to happen to integrate the AO back-end with the Telenet - VoD subsystem to give the AO access to the DVB-C delivery.

2.1 AO Content Library Hosting Functional Description

- (2) AO is allowed to access provision of AO hosted content (media, meta data) catalogue space, including management (upload, add/change/remove assets) and media distribution to network delivery points via Telenet CDN.
- (3) Access includes delivery under session control by AO of AO customer initiated media streams from Telenet CDN egress point until AO STB according to same principles on QoS level (Network stream resource management provided by Telenet) as applied to streams initiated by Telenet retail customers.

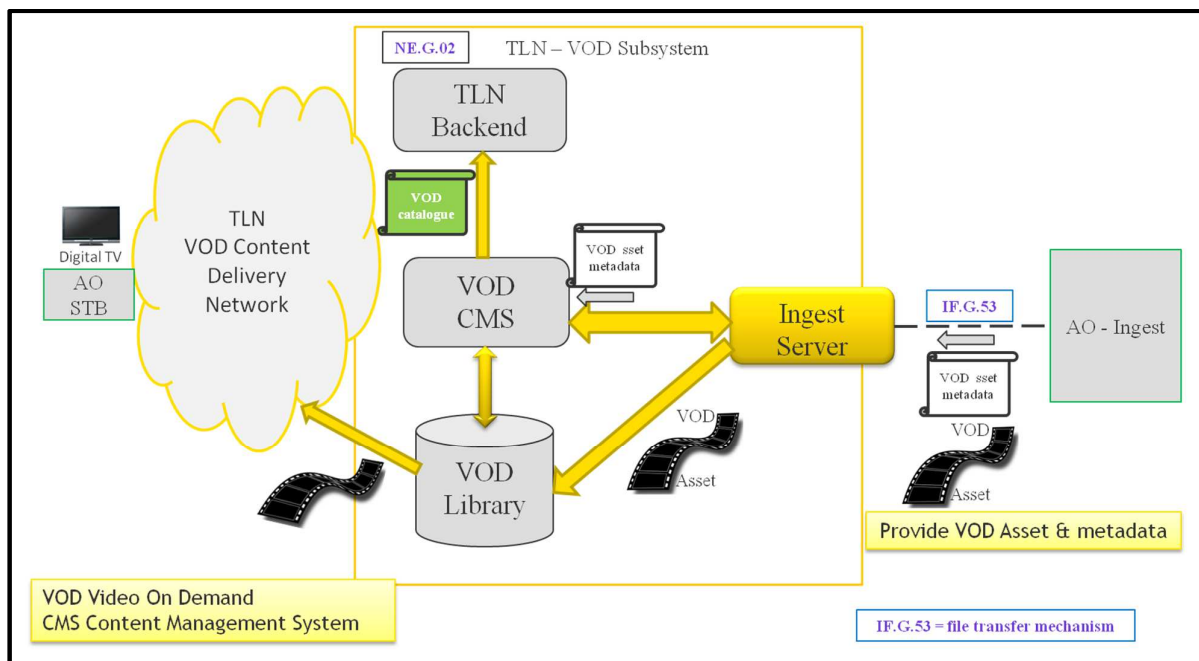


Figure 2-1: Content Library Hosting

2.2 AO Content Library Hosting Functional Requirements

2.2.1 Telenet VoD CMS Setup General Overview

(4) Telenet creates an on demand environment for selected AO as a content provider. This content provider can supply the necessary content, metadata and support material in different ways. Per item to publish, the AO content provider will give Telenet:

- The asset: encoded in MPEG-2 TS
- Metadata (eg title, , ...) in XML format

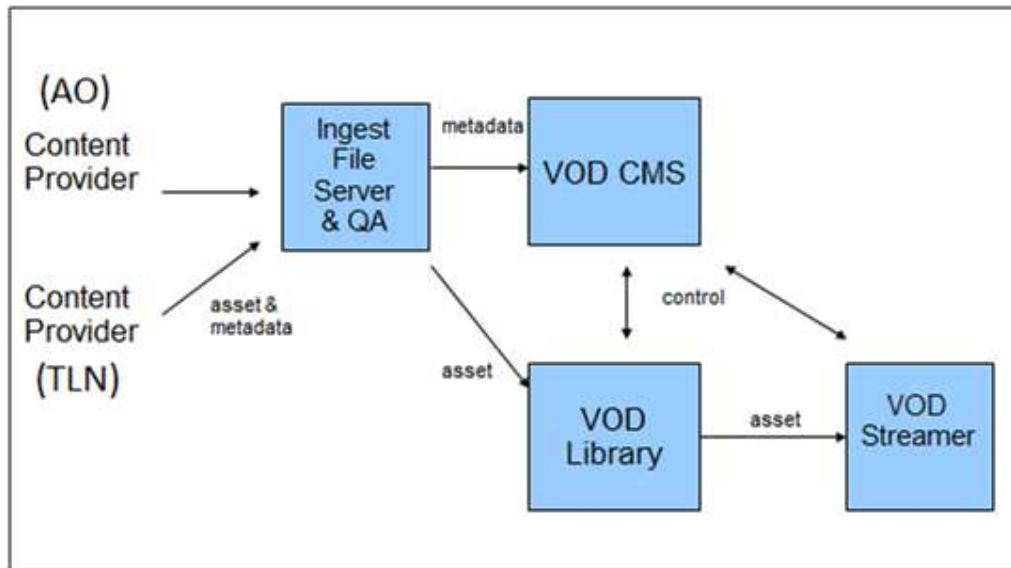


Figure 2-2: VoD CMS Setup

2.2.2 Telenet content server hosting AO content library

2.2.2.1 General

- (5) Telenet content server hosting AO content library describes all the requirements for content that's going to be published on Telenet Digital TV's VoD-platform. It will guide AOs to deliver all the requested material in a correct way to Telenet.

2.2.2.2 Physical Transport connections

- (6) There is a secure connection between AO-VSP and Telenet-VoD systems as described in separate annexes.

2.2.2.3 Content library upload host

- (7) All the content data will be uploaded to a Telenet FTP server in predefined directories or delivered to Telenet according to the predefined arrangements that are made. Telenet provides some IDs which are standardized in the same way for naming both XML and video-asset. The ProviderID is an ID provided by Telenet to separate content from different AOs. The content provider is not allowed to change this. μ
- (8) The AO provides the asset to the staging server by using FTP. File location details can be asked to Telenet project manager.

2.2.2.4 Content library capacity

- (9) Content library capacity is subject to system limitations and forecasting and agreements with individual AO during implementation phase.

2.2.3 Telenet content server operational procedures

2.2.3.1 General

(10)The AO content provider supplies content according to the distribution agreement. The AO content provider can send the content in 2 different ways:

- FTP encoded content to server at Telenet premises
- Deliver content to Telenet (encoded)

(11)At the moment Telenet does not do any content transcoding, it is therefore up to the partner to submit an SD (and optionally HD) file, each with its own XML, if maximum reach and quality is the objective.

2.2.3.2 Upload server scheduling mechanism and time tables

(12)A schedule mechanism provides unique ID, Name and scheduleDate which are mandatory and not allowed to change by AO. There are also some other mandatory ID/titles xml files. Detailed metadata XML specification will be made available during implementation phase to the beneficiary.

2.2.3.3 Propagation of content in CDN and schedules

(13)Content metadata will be provided in an XML file. This XML will be uploaded to the FTP-server, together with the corresponding video-asset. The XML file should be generated in the UTF-8 encoding.

2.2.3.4 Telenet Project Manager and interface with AO Project Manager

(14)In case an AO is unable to access FTP, further arrangements has to be made between the AO Project Manager and Telenet Project Manager.

2.2.4 Telenet content encoding specifications

2.2.4.1 General

- (15) This specification defines the video, audio, and related encoding parameters for both Standard and High-Definition content for distribution to cable television systems.
- (16) The specification defines the content specifications for use with encoding systems, asset management, and distribution. Detailed specifications for this format can be found in the Cablelabs specifications, which can be found on the Internet following the link below. <http://www.cablelabs.com/projects/metadata/downloads/specs/MD-SP-VoD-CEP-I01-040107.pdf>
- (17) It is foreseen that a number of encoding specifications are supported, depending on the quality in which the asset will be delivered. This is a non-exhaustive list that will change further in the future depending on the services that will be offered by Telenet to its subscribers. Initially, support for following types of encodings will be supported:
- SD VoD asset
 - HD VoD asset

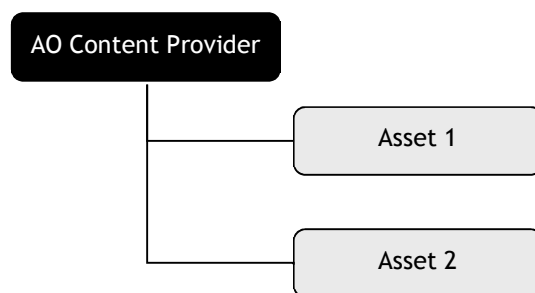
2.2.5 AO VoD catalogue structure requirements

2.2.5.1 General

- (18) Before being able to publish content on the iDTV platform, the structure of the catalogue has to be set up. This allows the content provider to link assets to the catalogue structure, which is necessary to publish the content.

2.2.5.2 VoD catalogue structure

- (19) AO content providers have full flexibility on their VoD catalogue structure as it is presented to their customers through their own CMS.
- (20) To publish the content to the Telenet CMS, the AO needs to put all assets into one AO Content provider Node such that the Telenet CMS can identify the content belonging to the AO.



2.2.6 Telenet content Meta data specifications

2.2.6.1 General

- (21) Metadata will be provided in an XML format. This XML file will be uploaded to the FTP-server, together with the corresponding video-asset.
- (22) The metadata XML format follows TV-Anytime (TVA) standard as defined in ETSI TS 102 822-4 and ETSI TS 102 822-3-1. The exact usage implementation of Telenet will be provided during implementation phase to the beneficiary.

2.2.7 Restrictions

(23)AO needs to foresee in its own VoD content and will not have access to Telenet existing VoD catalogues including the Telenet replay service, etc.

2.2.8 Operational Procedures

(24) Telenet will execute from time to time operational changes on the VoD CMS infrastructure. An AO making use of the Telenet ROTV VoD part should be prepared at all time to adapt its infrastructure, devices and systems, as well as its operational procedures to handle those changes. In addition it is strongly recommended by Telenet that AO will take this into account in the design of its solution, so that impact of future changes will be limited. Below a non exhaustive list is given, showing some examples of operational changes that Telenet has executed in the past and which will be repeated likely in the future:

- Creation of new VoD content, or re-organisation of existing ones
- Updates to the VoD content library
- Re-organization of the VoD catalogue data structures
- Changes in VoD catalogue publishing schedules
- Changes in CDN distribution and propagation schedules and delays
- Changes to the metadata format and/or requirements
- Changes to the supported asset encoding formats

2.2.9 AO Device Management by Telenet Requirements

(25)The applicable requirements are described in [TLN_WRO_TA_I_S_PDAA - Specification and Certification AO STB](#).

2.3 AO STB interactive Data Return path - Non Functional Requirements

(26)The applicable requirements are described in [TLN_WRO_TA_I_S_PDAA - Specification and Certification AO STB](#).

2.4 Certification for the AO VoD content library hosting on Telenet VoD CMS to enable usage of the Telenet AIDTV

2.4.1 Introduction

(27)The tests will cover all of the requirements specified by Telenet in this specification document.

2.4.2 Test score card

CONFORMANCE TEST SCORE CARD					
Conformance Test Score Card Number	TLN-WRO-TA-TSC-C-PIAF				
Test Identification					
Test Execution Date					
Test Run Type	Full / Reduced(without OOS cases)				
Device / Equipment / Interface Name					
Device / Equipment / Interface Type / Class					
AO Device / Equipment / Interface Identification					
Software Version					
Tested by					
Overall Result Status	Pass / Fail				
Applicability	Select 1 or more : ROTV / ROBB / AIDTV				
CONFORMANCE TEST ITEM LIST					
Test Cases Summary	FORMAT	IN SCOPE	MAN	PASS/FAIL	REM
			"Y/N"	"P/F"	(*xy)
2.2. AO Content Library Hosting Functional Requirements	HO				
2.2.1. Telenet VoD CMS System Setup General Overview			Y		
2.2.2. Telenet Content Server Hosting AO Content Library			Y		
2.2.3 Telenet Content Server Operational Procedures			Y		
2.2.4 Telenet Content Encoding Specifications			Y		
2.2.5 AO VoD Catalogue Structure Requirements			Y		
2.2.6 Telenet Content Meta Data Specifications			Y		
2.2.7 Restrictions			Y		
2.2.8 Operational Procedures			Y		
2.2.9 AO Device Management by Telenet Requirements			Y		
2.3. AO Content Library Hosting Non-Functional Requirements	HO		Y		
Remarks					
(*xy) : "Remark explanation comes here"					

3 IP VoD Solution Back-End Integration

3.1 IP VoD Solution description

- (28) This section describes the back-end integrations that is required to integrate the AO back-end with the Telenet - VoD subsystem to give the AO access to the IP VoD delivery solution.
- (29) AO is allowed to integrate assets that are stored in its data center and provision the delivery of these assets over the Telenet network.
- (30) Access includes delivery under session control by AO of AO customer initiated media streams from Telenet CDN egress point until AO STB according to same principles on QoS level (Network stream resource management provided by Telenet) as applied to streams initiated by Telenet retail customers.
- (31) In the back-end side, there are three main integration points for making the VoD service work end-to-end:
1. The storage and catalogue integration is used to connect the AO storage component that stores the video assets with the Telenet Video packager and the overall AO catalogue that is offered for IP VoD delivery. The integration of the AO catalogue is discussed in Section 3.2.2 and the AO storage integration in Section 3.2.3.
 2. The DRM integration ensures that the correct encryption key and DRM information is shared for a particular video asset that will be used by the Video Packager to encrypt and package the asset. This subsystem will be elaborated further in Section 3.2.4.
 3. The AO VSP (Video Service Proxy) integration is needed to exchange all communication from the AO STBs to Telenet Video Delivery Manager (TLN VDM). AO VSP and TLN VDM are involved in VoD ordering and VoD stream delivery. This is described further in document TLN_WRO_TA_I_S_PDAA - Specification and Certification AO STB

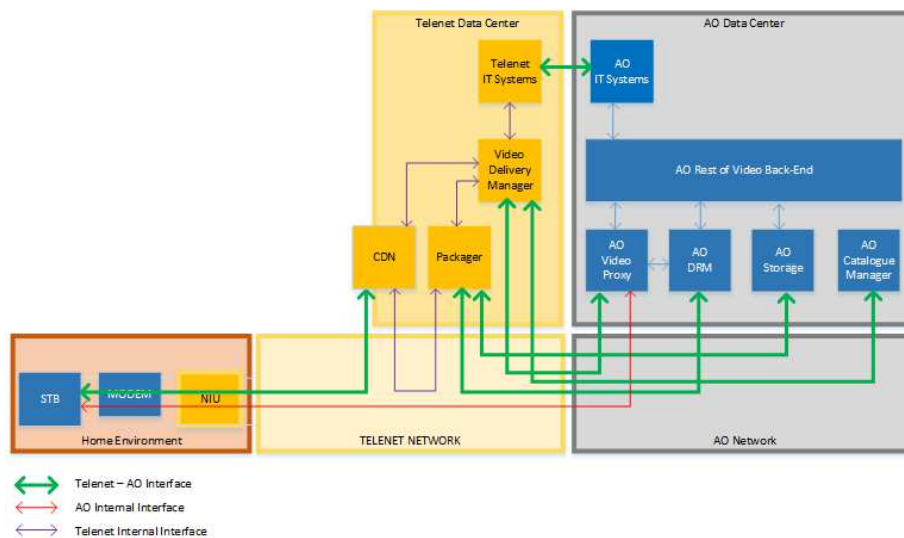


Figure 3-1: IP VoD System Overview

3.2 IP VoD Solution Integration Requirements

3.2.1 IP VoD Back End overview

(32) Telenet offers an on the fly packaging & encryption service to the AO for the delivery of the video assets of the AO to the AO STB over the Telenet network via the Telenet video CDN. To fulfill this functionality, the AO will need to provision its assets in a basic catalogue structure and will need to provide metadata on the individual assets.

(33) Telenet creates an environment where AOs can integrate video assets stored in the AO back-end. This content provider can integrate the necessary content, metadata and support material in different ways. The AO will be required to provision the assets it wants to deliver, this is further described as AO catalogue integration.

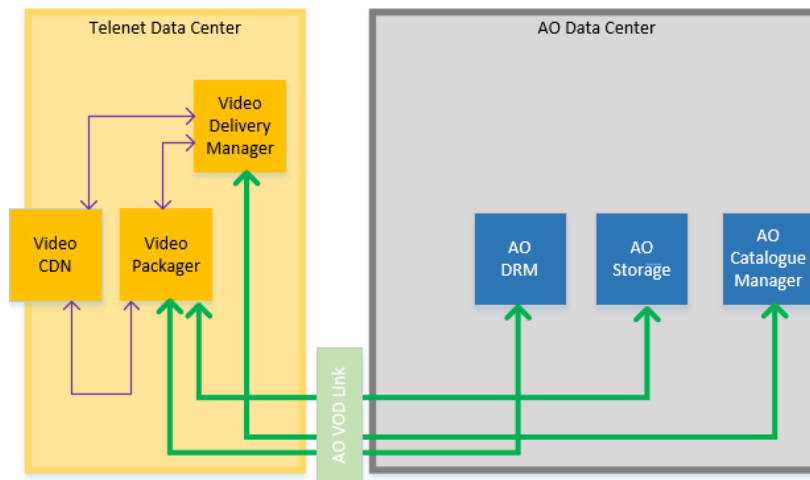


Figure 3-2: AO Content Storage, Catalogue & DRM Integration

3.2.2 AO Catalogue Integration

(34) The AO will need to provide metadata for the assets it wants to make available to the AO subscribers. This section elaborates on how the catalogue is integrated with the Telenet VoD subsystem.

3.2.2.1 Data To Be Provided Per Asset

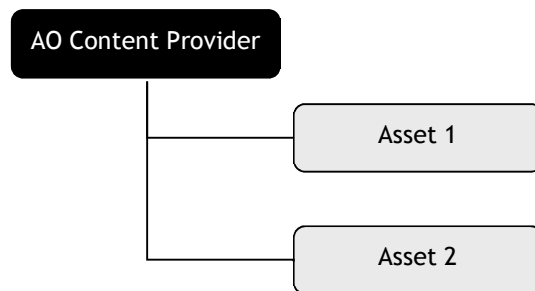
(35) For each assets, a number of data fields will need to be provisioned in advance. These include the following:

- Identifier
- Location on AO storage
- Profile (e.g. SVoD asset, TVoD asset,...)
- Resolution (e.g. SD, HD)
- Location of asset in AO catalogue structure
- Availability Window of the asset
- Other

3.2.2.2 AO VoD catalogue structure requirements

(36) Before being able to publish content on the iTV platform, the structure of the catalogue has to be set up. This allows the content provider to link assets to the catalogue structure, which is necessary to publish the content.

- (37) AO content providers have full flexibility on their VoD catalogue structure as it is presented to their customers through their own CMS.
- (38) AO content providers can add maximum 1 level in the structure of the actual storage.



3.2.2.3 AO Catalogue Integration Protocol

- (39) The AO content provider supplies content according to the distribution agreement. The AO content provider can signal the availability of a new asset for VoD delivery by an API call to the video delivery manager. With this call, the AO will signal the addition of a new asset.
- ~~(40)~~ The catalogue integration protocol will support a number of functions such as adding/deleting/updating a video asset, etc.
- (41) Content metadata should be provided in an XML format. The XML file should be generated in the UTF-8 encoding.
- (42) The exact usage and specification of the protocol for the catalogue integration of Telenet will be provided during implementation phase to the beneficiary.

3.2.2.4 Content library video asset integration and availability

- (43) All the content meta data data will be signalled in advance to the Video Delivery Manager component according to predefined arrangements that are made. Telenet provides some IDs which are standardized in the same way for naming both XML and video-asset. The ProviderID is an ID provided by Telenet to separate content from different AOs. The content provider is not allowed to change this.

3.2.3 AO Content Storage Integration

3.2.3.1 Telenet Content specifications

- (44) This specification defines the video, audio, and related encoding parameters for both Standard and High-Definition content for distribution to cable television systems.
- (45) The AO can integrate content encoded in both H.264 and H.265.
- (46) The content can contain separate Audio/subtitle data
- (47) The content can be made available in a number of video profiles to enable the ABR protocol to function in an optimal way.
- (48) It is foreseen that a number of encoding specifications are supported, depending on the quality in which the asset will be delivered. This is a non-exhaustive list that will change further in the future depending on the services that will be offered by Telenet to its subscribers. Initially, support for following types of encodings will be supported:

- SD VoD asset
- HD VoD asset
- 4K VoD asset

(49) For the content bit rate, a limit will be placed on the bandwidth the content is encoded in to ensure that the network resources can be assigned fairly over Telenet and different AO services. The upper bound for a specific resolution will follow what is offered by Telenet commercially to its own customers.

(50) The details of the content specifications will be provided by Telenet to the AO when the party enters in the implementation phase.

3.2.3.2 AO Storage Integration

(51) Packager should allow integration with remote AO Storage. Exact details on how they can be integrated depends on the capabilities of selected equipment. Further details to be discussed.

3.2.4 AO DRM Integration

(52) The content that is delivered to the AO STB will need to support encryption. The video packager is integrated with the AO DRM system and more specifically a key server provided by the AO.

(53) The DRM system by the AO is responsible for returning encryption key and DRM data that will be used by the video packager for on-the-fly encryption and packaging of the video asset.

(54) The AO will be responsible for providing the correct rights associated with a given content item to the AO STB directly.

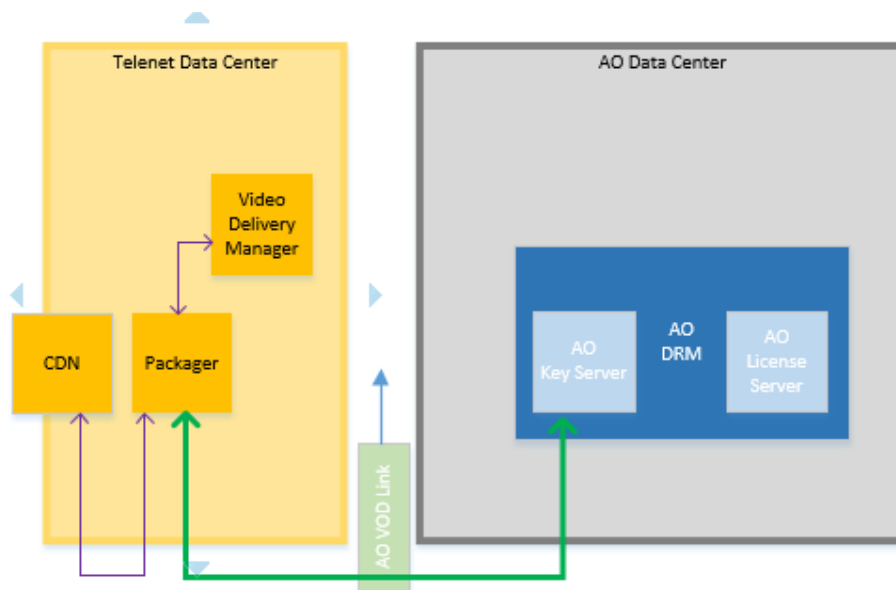


Figure 3-3: DRM Integration

3.2.4.1 Telenet Packager - DRM Integration

(55) For processing a specific request, typically following steps will be performed:

1. The AO catalogue manager signals to the video delivery manager that a new asset is present
2. An asset is requested to the packager from the CDN
3. The packager requests the encryption key and DRM data for the asset
4. The packager encrypts the asset with said encryption key and adds the relevant data on the DRM technology to the video asset

(56) The Telenet Packager offers support for Common Encryption (CENC) allowing PlayReady and WideVine DRM. It will require Common Encryption with the respective DRM to be supported by the AO back-end and AO STB.

(57) The exact usage and specification of the protocol for the key server - packager integration will be provided during implementation phase to the beneficiary.

(58) The AO is responsible for implementing the protocol that will be provided by Telenet when the party enters in the implementation phase.

3.2.5 Restrictions

(59) An encryption key can only be updated exceptional circumstances (e.g. a security breach) and not within a window of 24 hours time. This is done to ensure the content can be cached in the Telenet CDN.

(60) The encryption key shall be applicable on a per asset basis and not on a per session basis.

(61) For each video asset, only one dedicated instance for a given resolution can be added to the end-to-end solution. This is done to ensure the content can be cached in the Telenet CDN.

(62) AO needs to foresee in its own VoD/replay/nPVR content and will not have access to Telenet existing VoD catalogues including the Telenet replay service, Telenet nPVR service, etc.

3.2.6 Operational Procedures

(63) Telenet will execute from time to time operational changes on the VoD infrastructure. An AO making use of the Telenet ROTV VoD part should be prepared at all time to adapt its infrastructure, devices and systems, as well as its operational procedures to handle those changes. In addition it is strongly recommended by Telenet that AO will take this into account in the design of its solution, so that impact of future changes will be limited. Below a non exhaustive list is given, showing some examples of operational changes that Telenet has executed in the past and which will be repeated likely in the future:

- Changes in VoD catalogue publishing schedules
- Changes in CDN distribution and propagation schedules and delays
- Changes to the metadata format and/or requirements
- Changes to the supported asset encoding formats

3.2.7 AO Device Management by Telenet Requirements

(64) The applicable requirements are described in [TLN_WRO_TA_I_S_PDAA - Specification and Certification AO STB](#).

3.3 Physical link and network integration

- (65) The AO VoD link will be used for the communication between the different components in the Telenet network and the AO Back-End components. More information on the AO VoD link can be found in document TLN_WRO_TA_B_A_PAAA_V1.0 - Architecture ROBB and TLN_WRO_TA_I_S_PDAB_V1.0 - Specification and Certification iDTV interconnection.

3.4 Certification for the AO IP VoD Back End Integration to enable usage of the Telenet AIDTV

3.4.1 Introduction

(66)The tests will cover all of the requirements specified by Telenet in this specification document.

3.4.2 Test score card

CONFORMANCE TEST SCORE CARD					
Conformance Test Score Card Number	TLN-WRO-TA-TSC-C-PIAF				
Test Identification					
Test Execution Date					
Test Run Type	Full / Reduced(without OOS cases)				
Device / Equipment / Interface Name					
Device / Equipment / Interface Type / Class					
AO Device / Equipment / Interface Identification					
Software Version					
Tested by					
Overall Result Status	Pass / Fail				
Applicability	Select 1 or more : ROTV / ROBB / AIDTV				
CONFORMANCE TEST ITEM LIST					
Test Cases Summary	FORMAT	IN SCOPE	MAN	PASS/FAIL	REM
			"Y/N"	"P/F"	(*xy)
3.2. IP VoD Solution Integration Requirements	HO				
3.2.1. IP VoD Back End overview			Y		
3.2.2. AO Catalogue Integration			Y		
3.2.3. AO Content Storage Integration			Y		
3.2.4. AO DRM Integration			Y		
3.2.5. Restrictions			Y		
3.2.6. Operational Procedures			Y		
3.2.7. AO Device Management by Telenet Requirements			Y		
3.3. IP VoD Solution Non-Functional Requirements	HO		Y		
Remarks					
(*xy) : "Remark explanation comes here"					