TLN WRO Architecture type Document

< Architecture ROTV and AIDTV >

Document Housekeeping

Document Category and type

CAT	TYPE	DOC ID	Comment
TV	ARCH	TLN_WRO_TA_G_A_PAAB	Architecture type documents (ARCH) mainly have an informational/explanatory purpose to highlight the overall technical set-up.

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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:

None.

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_I_S_PDAA - Specification and Certification AO STB
Reference 2: TLN_WRO_TA_I_S_PIAA - Specification and Certification AO VoD Back-End

A. Appendix A, <APP_G_A_PAAB_A> contains:
    1) Appendix A – <AO VoD interfaces>

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.

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1 Abstract

This document provides a high-level network and service architecture overview of the Telenet Basic TV Wholesale Reference Offer (ROTV/AIDTV). It describes the main building blocks and interfaces on a conceptual level. Furthermore, two extra appendices describe how VoD services can be offered to an AO. The first one focusses on delivery over DVB-C, the second appendix on IP delivery.

2 TLN WRO Overall Reference Architecture

This section displays in "Figure 2-1: Overall Architecture Overview" below the overall architecture and block diagram of the Telenet Wholesale Reference Offer technical set-up. This figure is repeated in each "service specific" architecture document with as purpose to have a clear common reference and a strict application of naming conventions on building blocks and building blocks which are then further described in "specification" type documents which will allow the beneficiaries to implement the required building blocks on their end-user equipment, network and IT CRM systems.

Naming Conventions:
Each Network building block on the overall (General) level has a unique reference naming in the format: NE.G.xy, where xy is the number of the block. (xy <= 50 means TLN Network Element(NE) and xy >= 60 means AO NE
Each Network interface on the overall (General) level has a unique reference naming in the format: IF.G.xy, where xy is the number of the building block.

Four main domains are defined:

- Wholesale Operator (TLN) domain: this is the set of all systems that are/will be present in the Telenet infrastructure to implement the TLN Wholesale reference offer. Per convention they will always be depicted as boxes with yellow borders in all documents.

- Alternative Operator (AO) domain: this is the set of all systems that are/will have to be present in the AO infrastructure to make use of the TLN Wholesale reference offer. Per convention they will always be depicted as boxes with green borders in all documents. Obviously TLN does not impose by any means how the AO should organize its own infrastructure, hence the AO domain components must be mainly seen as an example how the AO could organize its infrastructure to make use of the TLN WRO and for clarity of the TLN WRO by describing clearly the building blocks.

- Household domain: this is the set of all systems that are/will have to be present in the customer home to make use of the TLN Wholesale reference offer. Per convention they will be depicted as boxes with yellow or green borders in all documents, depending if they are TLN owned and/or provided equipments or AO owned and/or provided equipments. Obviously additional equipment may be present in the household, typically owned by the customer and where relevant for the technical explanations these equipments have been depicted as boxes with black borders. The household domain is for clarity reasons always bordered by red dotted lines. Obviously TLN does not impose by any means how the AO should organize its own household equipment, hence the AO elements in this domain components must be mainly seen as an example how the AO could organize this to make use of the TLN WRO and for clarity of the TLN WRO by describing clearly the building blocks.

- Third party domain (3rd party): this is the set of all systems that will be provided and operated by third parties on common behalf of the AO´s and that require interfacing with TLN systems to enable use of the TLN Wholesale reference offer by AO. Per convention they will always be depicted as boxes with blue borders in all documents. Currently only the AO CAS system belongs to this category.

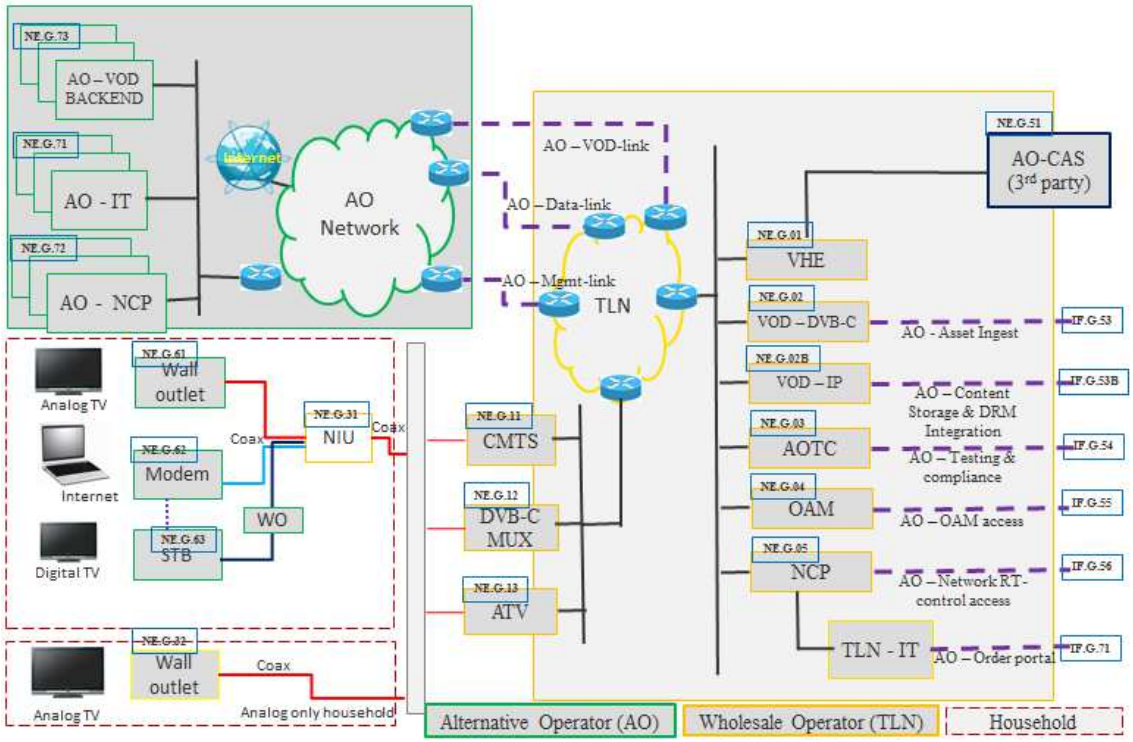

Figure 2-1: Overall Architecture Overview

AO-CAS (NE.G51)

(1) Conditional Access System (CAS) operated by a third party CAS provider. The CAS system is responsible for protecting the premium content and providing selective access on an individual AO subscriber basis to premium packages.

(2) The 3rd party CAS main logical interfaces allow it to perform CAS provisioning and injection of CAS security messages in the DVB-C transport MUX.

(3) AO's are able to select a different CA system than the AO CA system already available on the Telenet network. Only in case of technical impossibilities to implement this different CA system, Telenet will need to reject this request. Also the CA system used by the AO can be used on others networks.

(4) The AO-CAS (3rd party) interfaces to TLN VHE (provisioning and EMM/ECM signaling) are carried over the "AO – Mgmt" physical link.

AO-IT (NE.G71)

(5) AO-IT is used as an umbrella name for the set of systems that together implement the AO CRM and OSS/BSS systems in the broad sense of the definition. The TLN WRO does not make any assumption on the nature or architecture of the AO IT system. The main purpose of including this building block in the architecture drawings is highlighting possible ways of implementing the requirements of the TLN WRO.

(6) The AO – Order Portal interface (IF G.71) gives the AO the possibility to order TLN WRO services management on behalf of its customers

AO-NCP (NE.G72)

(7) The network control platform (NCP) is involved in the real-time session set-up and tear-down interactions between AO CPE and the network components. As such it handles as a destination for control plane message flows originated from AO CPE that are "proxied" by its counterpart the TLN NCP. The TLN WRO does not make any assumption on the nature or architecture of

the AO NCP system. The main purpose of including this building block in the architecture drawings is highlighting possible ways of implementing the requirements of the TLN WRO.

AO-VOD BACKEND (NE.G73)

(8) The AO VOD Backend is the combination of services the AO has to provide in order for VOD over IP services to work, as described further in this document.

(9) The AO – VOD-Link will be used for connecting the Telenet provided services and components with the AO VOD Backend. This will be a separate NNI link between Telenet and the AO as described in the Specification and Certification BB and VOD IP Interconnect document.

DVB-C MUX (NE.G12)

(10) The DVB-C Multiplexers provide transport for digital TV broadcast and VOD signals over the HFC access network using MPEG-2 Transport Stream protocols. A program stream is made of audio, video, service and program specific data (SI/PSI). SI/PSI data contains necessary information such as network, conditional access and program association and mapping information tables as well as Teletext and EPG data. Multiple program streams are joined together to form an MPEG Transport Stream.

(11) The physical layer connection between AO STB CPE and TLN HFC network is realized via the Wall Outlet using a TLN certified coax patch cord cable, carrying QAM modulated RF signals as being the generated by the TLN edge QAM devices (DVB-C MUX).

NCP (NE.G05)

(12) The network control platform (NCP) is involved in the real-time session set-up and tear-down interactions between AO CPE and the network components. As such it handles the control plane message flows originated from AO CPE that wants to initialize and build-up (or tear down) and transport connection (or session) with the network. The TLN NCP will contact its counterpart at the AO side (AO-NCP) to pass those parts of the control flows that require AO interaction. In addition to the real-time flows the TLN NCP will also interact with the AO NCP via non real-time transactions such as pre-loading of AO Docsis modem configuration files. In practice the NCP is a collection of platforms, using different protocols that are together addressed as NCP for clarity and simplicity of the reference offer.

(13) The AO – Network RT Control Access interface (IF G.56) gives the AO the possibility to receive in a controlled way the session set-up messages involved in initiating and closing of network connections by AO CPE devices and in this way participate in this process allowing the AO to build its own value added services.

NIU (NE.G31)

(14) The Network Building block Unit (NIU) is a device that provides the termination and hand-over point between the HFC network plant and the in customer home coaxial network. This device is always owned by TLN. One of its important functions is to protect the network against ingress of inappropriate signals on the RF level.

(15) NIU data and TV ports acts as signal transfer point between TLN and the beneficiary and provide DOCSIS, DVB-C (broadcast, VOD) and analog TV connectivity to the AO provided and/or owned broadband CPE and/or AO set top box for signaling, management and monitoring purposes.

(16) AO will connect to the OAM environment to operate and maintain its end-user equipment over the "AO – Data" physical link as described in section 4.1.9 (TLN Converged Network).

(17) Status information about health of interfaces between TLN network and AO equipment and about TLN network components will be exchanged over the "AO – Mgmt" link as described in section 4.1.9 (TLN Converged Network).

(18) Typical example of a NIU installation is shown above.

OAM (NE.G04)

(19)The OAM environment provides facilities that enable the beneficiaries to operate and maintain their end-user equipment connected to the TLN network as well as to supervise status information about the health of building blocks between AO systems and the TLN network and about TLN network components involved in delivering service to their customers.

(20)AO will connect to the OAM environment to operate and maintain its end-user equipment (excluding the “modem” or “Docsis” part) over secure IP tunnel.

(21) Status information about health of interfaces between TLN network and AO equipment and about TLN network components will be available over the same links.

STB (NE.G63)

(22)Digital TV STB to enable AO (i)DTV service delivery.

(23)The STB has multiple logical interfaces towards TLN and AO network components, such as DVB-C MUX, TLN VOD, TLN VHE, NCP, etc., involved in the E2E service delivery.

(24)AO STB connects to the wall outlet (WO) with certified coax patch cord cable to receive digital TV signals.

(25) Digital TV STB connects to the TLN certified AO HGW, cable modem or through a different return channel other than cable (e.g. DSL) for return path.

TLN Converged Network

(26)The TLN converged network means the complete set of converged backbone and access network infrastructure that transports and routes data, video and voice to its destination and provides interconnection to the Internet. It is in the technical annexes of the TLN WRO often referred to with the generic term “network”.

(27)Its logical interfaces allow general data exchange for all services and all types of traffic between the TLN domains and the AO domains.

(28)The required connections between the TLN network and the AO network will be realized in “interconnection” points, sometimes also called “transit” points. Both terms are used on equivalent basis.

(29)Three types of distinct interconnection points exist as described further.

(30) The interconnect point for “AO Data” physical link between AO and TLN is at minimum one of the RPOI´s which is physically located in one the five Switching Offices (SO). Physical interface between AO and TLN will be established through carrier grade equipment using fiber transport with underlying optical multiplexing equipment interconnecting the TLN interconnect router in minimum one of the RPOI locations with its peer router in the AO premises. The “AO Data” physical link connection carries the AO end-user traffic.

(31) The interconnect point for “AO Mgmt” physical link between AO and TLN is at one of the RPOI´s which is physically located in one the five Switching Offices (SO). Physical interface for this connection between AO and TLN will be established through carrier grade equipment

using fiber transport with underlying optical multiplexing equipment interconnecting the TLN interconnect router in one of the RPOI locations with its peer router in the AO premises. The "AO Mgmt" physical link connection carry "management" type traffic that needs to be exchanged between TLN and AO and provide also the infrastructure to receive e.g. AO 3rd party CAS provisioning commands and VOD asset files.

(32) To make use of the DVB-C VOD service as described in the AIDTV, the AO will also have to use the same physical connection that is used for "AO Mgmt" which is at one of the RPOI´swhich is physically located in one the five Switching Offices (SO). This link will be used to interconnect to the DVB-C VOD Regional Service Area interconnection point. This VOD interconnection point is described in more detail in the annexes describing the AIDTV.

(33) In addition, parts of the "AO Mgmt" physical link between AO and TLN can be established through virtual (VPN) connectivity over the public Internet (such as provisioning, access to test environments, accounting etc)

(34) For offering IP VoD services to the AO, the "AO VoD" physical link is used. The interconnect point for the "AO VoD" physical link has to be, like the "AO Data" link, at minimum one of the RPOI's which is physically located in one of the five Switching Offices (SO). It will also be established through carrier grade equipment using fiber transport with underlying optical multiplexing equipment interconnecting the TLN interconnect router in minimum one of the RPOI locations with its peer router in the AO premise. The RPOI location or locations for the "AO VoD" link might however be different than those for "AO Data". The "AO VoD" link connection carries the AO VoD over IP and the accompanying data path traffic, as described in the ROTV and AIDTV Architecture.

TLN-IT

(35) TLN-IT is used as an umbrella name for the set of systems that together implement the Telenet OSS/BSS system modules involved in supporting the TLN WRO in the broad sense of the definition.

(36) Physical connection is realized over the "AO – Mgmt" physical link.

TV (NE.G13)

(37) The TV modulation equipment injects the standard analog TV signals on the HFC access network for transport to the Wall Outlets in the customer homes.

(38) Telenet encodes analog signals using PAL (Phase Alternating Line) encoding system. Using RF modulation techniques analog TV signals are made available on VHF and UHF carriers on the coax network.

(39) The physical interface for analog TV signals is the TLN certified wall plug and patch cord, carrying Pal encoded analog TV signals and FM modulated analog radio signals.

VHE (NE.G01)

(40) The Video Head-end contains all required systems to capture, encode and multiplex the Digital TV broadcast signals and add the required signaling information to make them ready for transport over the Telenet network towards the DVB-C multiplexers.

VoD – DVB-C
(NE.G02)

(41) The DVB-C VOD subsystem contains all components which include content management systems, encoding systems, streaming systems and session control and resource management systems.

(42) The DVB-C VOD system content management system uses XML based metadata structures for content management.

(43) Play-out of DVB-C VOD asset uses MPEG-2 Transport Stream with a VOD specific SD/HD video and audio format.

(44) The AO – Asset Ingest interface (IF G.53) gives the AO the possibility to ingest its own VOD media files and their related asset Meta data to build up an AO VOD offering library on the TLN VOD platform.

(45)An AO customer can either have VoD over DVB-C or IP, not both combined.

VoD – IP (NE.G02B)

(46)The IP VoD subsystem contains all components which include content management systems, encoding systems, streaming systems and session control and resource management systems.

(47)The IP VoD system content management system uses XML based metadata structures for content management.

(48) Play-out of IP VoD asset uses ABR video streaming in a number of video resolutions

(49)The IP AO – Asset Storage and DRM Integration interface (IF G.53B) gives the AO the possibility to integrate its own VoD media files and their related asset Meta data to build up an AO VoD offering on the TLN VoD platform and the AO DRM system to manage the content rights.

(50)It is important to note that, even in an iDTV-only (Internet-less) context, the AO – NCP and AO – IT, accompanied by the AO – Data-link and AO – Mgmt-link and corresponding systems are required. As described in the ROBB Architecture.

(51)An AO customer can either have VoD over DVB-C or IP, not both combined.

Wall Outlet (NE.G32)

(52) The Wall Outlet (WO) is the signal transfer point for TV and radio signals (both digital and analog). In households were historically never a digital TLN service was present, typically no NIU will be present and in this case the first in line WO acts as the termination and hand-over point for TV and radio signals. In some cases also a hand-over connector or hand-over device may be present, in which case this device is the formal termination and hand-over point. Also in this case a WO will have to be present after this hand-over connector / device, so for the sake of keeping the technical architecture documents of manageable complexity, the first in line WO will be referred as performing the role of signal transfer point for TV and radio signals.

(53)This Wall outlet acts as signal transfer point between TLN and the beneficiary. This wall outlet provides analog/digital TV signal connectivity for AO STB`s, customer TV sets and/or FM radio´s.

(54)The Wall outlet has standard IEC type connectors for connection for AO STB´s, customer TV sets and/or FM radio´s via a RF coax patch cord.

(55)The WO must be TLN certified to support TLN HFC network signal characteristics such as frequency range, impedance, loss, etc.

Wall Outlet (NE.G61)

(56) The Wall Outlet (WO) is the signal transfer point for TV and radio signals (both digital and analog). It is connected to a downstream TV port on the NIU.

3 TLN WRO Basic TV (ROTV - Analogue Signal)

(57)This section provides a high-level network and service architecture overview of the Telenet Basic TV Wholesale Reference Offer. It shows how the distribution of the analogue TV signals fits in the overall architecture referenced in section 3 above in this document.

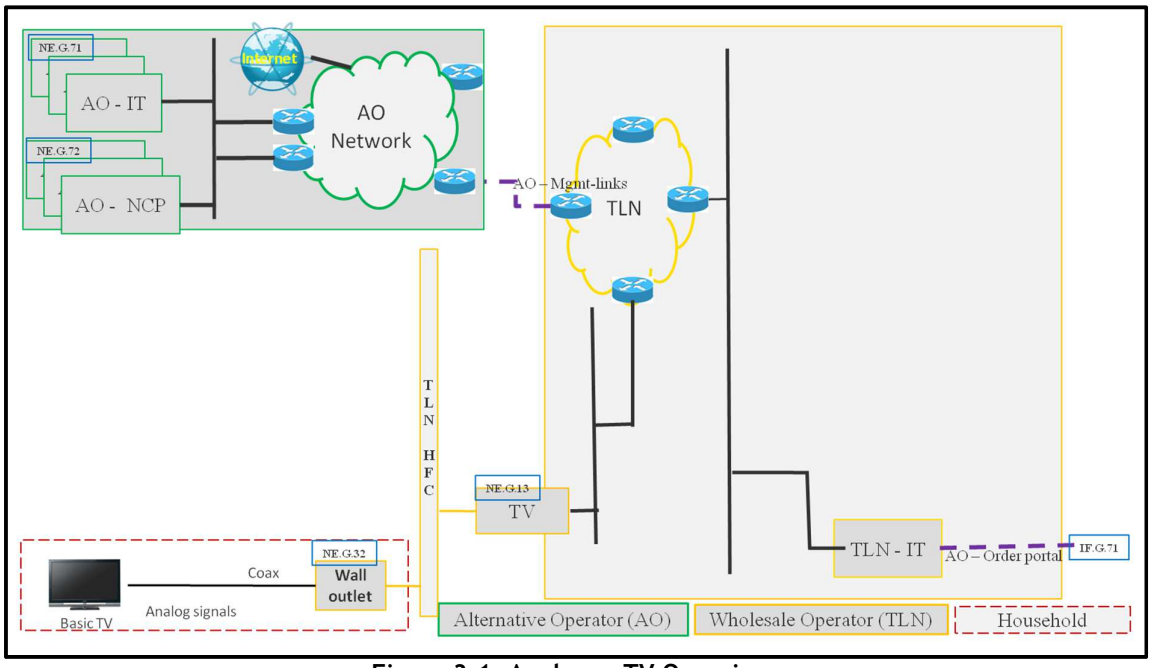

Figure 3-1: Analogue TV Overview

3.1 General Approach

(58) The generic approach (see figure above) that has been chosen is to offer the existing TLN analogue channel offer as well as its potential future evolutions as is towards AO´s.

(59) This implies that no technical interaction between TLN network and AO network components need to be set-up as the TLN analogue TV signal is standard available on the wall outlets in the customer premises.

3.2 Key Analogue TV signal Network Elements

(60) This section gives a brief overview of the purpose and function of some key building blocks involved in the implementation of the Analog TV signal distribution.

3.2.1 TV Head-end (NE G.13)

(61) The TV Head-ends are equipped with modulators that convert and prepare the analogue TV and FM radio signals for transmission on the HFC network. The source signals are fed into the Head-ends over the TLN analogue TV signal distribution backbone, which transports the signals from the original source signal acquisition points.

(62) As the standard analogue TV signal is available on the wall outlets, no interaction from AO systems is required with those Telenet network elements.

4 TLN WRO Basic TV (ROTV)

(63)This section provides a high-level network and service architecture overview of the Telenet Basic TV (ROTV) Wholesale Reference Offer. It shows how the Digital TV part fits in the overall architecture.

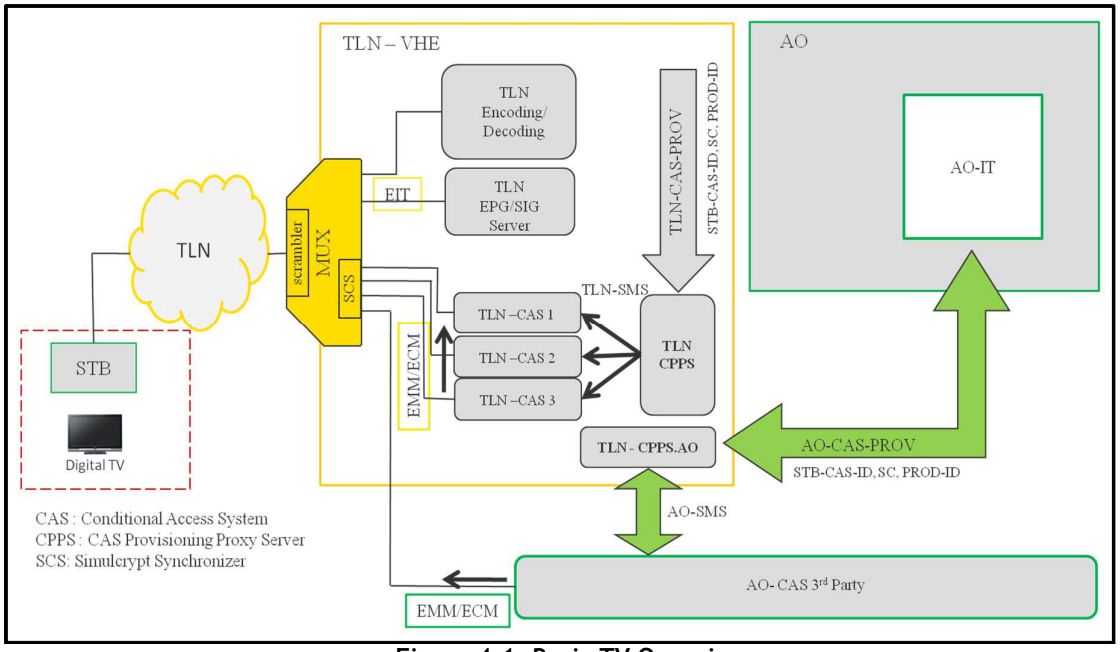

Figure 4-1: Basic TV Overview

4.1 General Approach

(64)The generic approach (see figure above) that has been chosen is to create an architecture that enable the AO systems to take control of the business logic for its customers in its own systems and applications. The TLN Video Head end merely supports the basic secure transport and multiplexing of the video signals over the network towards the AO STB in a transparent way as such implementing on the HFC network an architecture that has a lot of similarity with the way Digital TV wholesale on a Telco DSL network is mostly realized (IP Multicast).

(65)This approach has the advantage that Telenet interference with AO end-user functionality is minimized, offering maximum “service differentiation” freedom towards the AO´s.

(66)In addition it uses a clean virtualization approach that will allow the “hosting” of multiple AO´s on the TLN network and also limiting interferences between different AO`s.

4.2 Key Digital TV (DTV) Network Elements

(67) This section gives a brief overview of the purpose and function of some key building blocks involved in the implementation of the Digital TV part of the ROTV.

4.2.1 VHE: Statistical Multiplexers (MUX)

(68) The statistical multiplexers combine digital video streams with variable bit rate characteristics, received from the encoders with signaling information and CAS information into a combined MPTS streams that fits into a fixed bandwidth stream that can be transported over the HFC network towards the STB`s.

4.2.2 CAS servers and AO 3rd party CAS system

(69) The CAS servers generate the security control messages (EMM, ECM) that allow the individual STB´s to decrypt those parts of the video content streams to which they are entitled, based upon their subscriptions stored in the AO CRM systems.

(70) The 3rd party CAS system performs identical functions as the TLN own CAS systems. AO's are able to select a different CA system than the AO CA system already available on the Telenet network. Only in case of technical impossibilities to implement this different CA system, Telenet will need to reject this request. Also the CA system used by the AO can be used on others networks.

(71) The signaling output of all CAS servers is "merged" into a "simul-crypt" approach and injected into the transport streams by the multiplexers, enabling an architecture where different STB´s can use different CAS system while still sharing the same content streams.

(72) The provisioning interface to make the link between the AO CRM and the CAS systems is realized on the CPPS server. Just like towards the TLN CRM, Telenet also offers this same interface with the same capabilities to the AO CRM`s enabling an efficient wholesale architecture.

4.2.3 EPG/Signalling server

(73) This server generates the DVB-C signalling streams to be inserted into the multiplexers, containing information on the location of the MUX in the spectrum, the MPTS services present in a MUX and the related EPG information.

5 TLN WRO Annex DVB-C VoD Interactive Services (AIDTV)

(74) This section provides a high-level network and service architecture overview of the Telenet Interactive Services Annex part of the ROTV. It shows how the Interactive Digital TV part fits in the overall architecture referenced in section 2 above in this document.

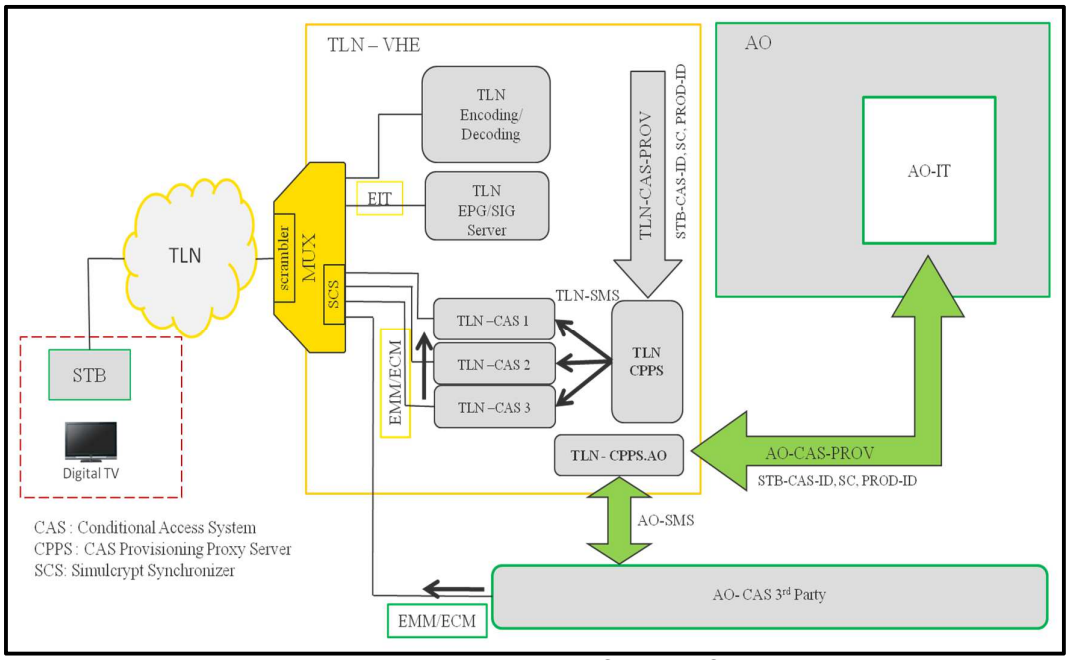

Figure 5-1: Interactive Services Overview

5.1 Key Interactive Digital TV (iDTV) Network Elements

(75) This section gives a brief overview of the purpose and function of some key building blocks involved in the implementation of the Interactive Services Annex part of the ROTV. See also chapter 4 for the basic ROTV offer.

5.1.1 IP Data return path

(76) The function of the iDTV interactive Data Return Path is to allow IP communication between the AO STB, the AO iDTV back-end systems and the TLN IP network components involved in delivering service (e.g. TLN Video Data pumps in TLN CDN) to the AO STB.

(77) It can be implemented over the TLN cable network, using a modem or the AO can provide this connection by other means.

(78) In case the IP Data return path is implemented over the TLN cable network, Telenet will deliver the aggregated return path traffic of AO STB customers towards AO via TLN to AO interconnect links.

(79) Traffic management rules and policies, as well as bandwidth restrictions will apply on the IP Data return path over the Telenet cable network and its use is strictly limited to providing TV related interactivity services in the framework of the ROTV.

5.1.2 VoD ordering and VoD stream delivery

(80) Implementation of a VoD delivery system: a conceptual block diagram showing the major interaction flows is shown in the figure below.

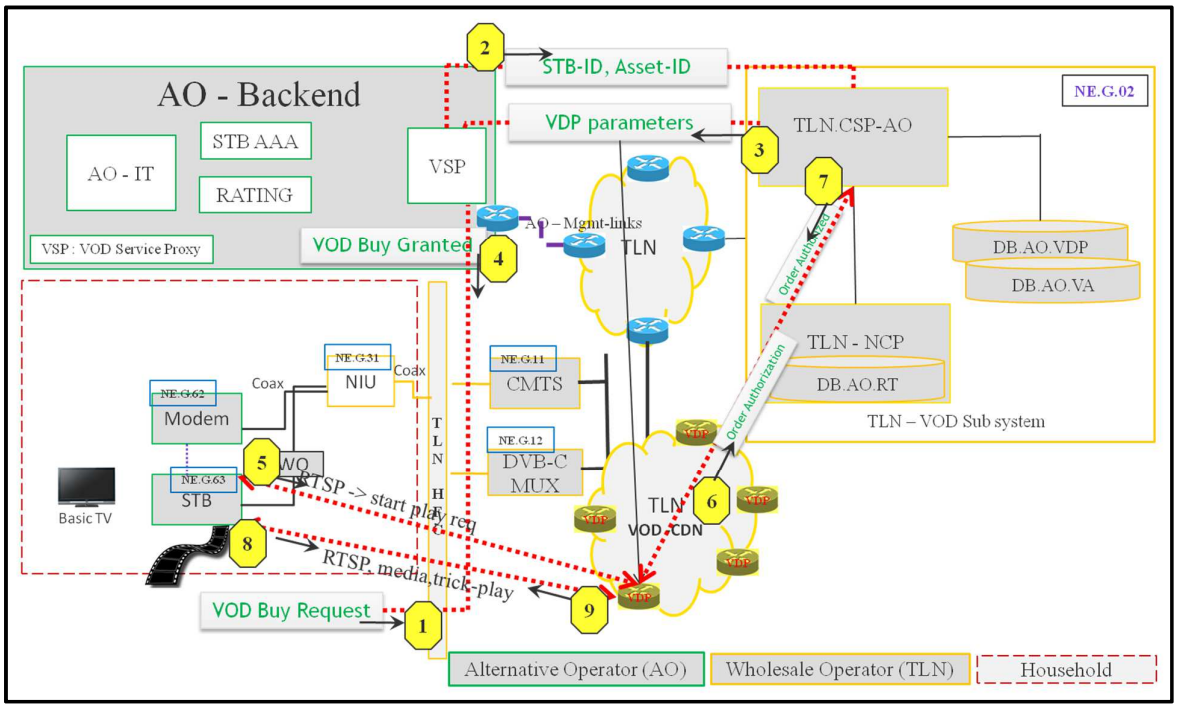

Figure 5-2: VoD Ordering and Delivery

(81) The AO will be in control of the VoD order flow by implementation of a VSP (VoD Services Proxy) that acts as an intermediate between the AO STB`s and the TLN VoD delivery platform and network. It will also allow the AO CRM to stay in control of sessions and do essential functions like subscriber authentication, accounting and billing.

(82)The TLN CSP-AO platform is the main interface towards the AO VSP. It acts as a proxy allowing the AO application to have control over the TLN network resources involved in the delivery of VoD and to allow making resource reservations for playing streams and get the connection parameters of the particular streaming server that will perform the play out to the STB.

(83)Details about the interface are documented in Appendix A - <AO VoD interfaces>.

5.1.3 VoD Content Management

(84)A conceptual block diagram showing the major building blocks of the Content Management System (CMS) and the interaction flows is shown in the figure below.

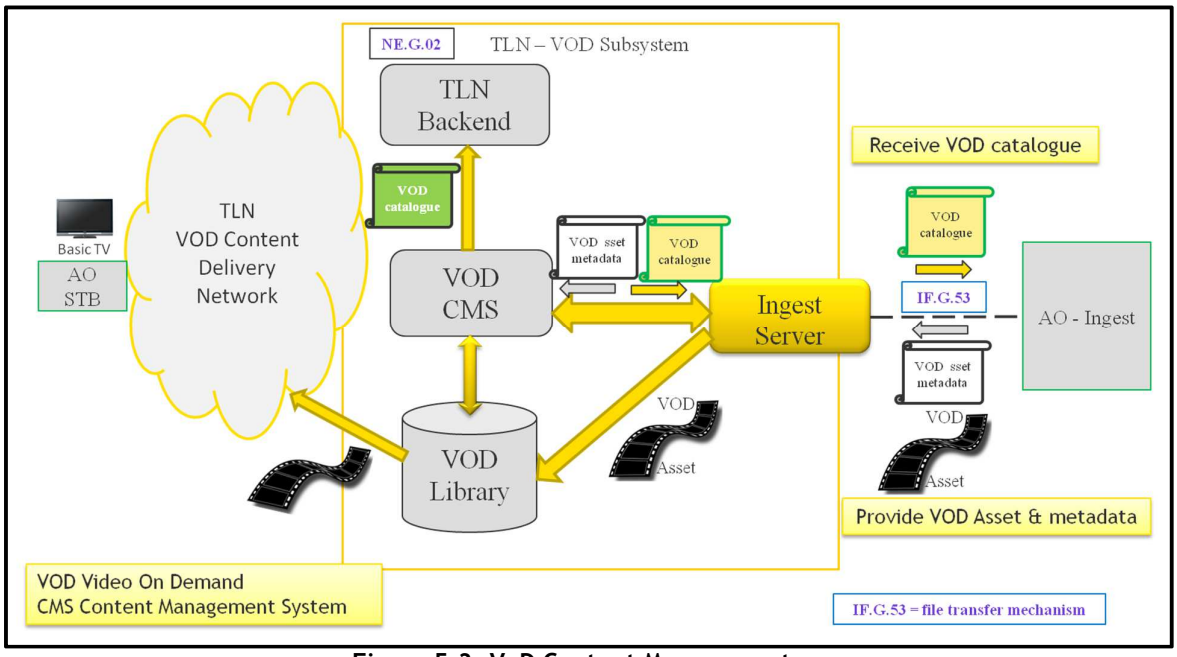

Figure 5-3: VoD Content Management

(85) The AO ingest server is an platform that allows an AO to upload VoD media and metadata files in a pre-defined format and to trigger ingest of those files via a well defined schedule towards the TLN ingest server. It also allow the AO to receive technical catalogue files that contain the necessary technical reference data in order to allow AO STB`s and systems to use those assets in their network locations.

(86)The VoD CMS system contains all necessary information on the VoD assets to create technical streaming parameters. It will push the content to the VoD central library from where distribution is triggered into and over the TLN CDN so that the content comes available in the regional play-out points on the VDP´s in each VoD serving area.

6 TLN WRO Annex IP Interactive Services (AIDTV)

(87) This section provides a high-level network and service architecture overview of the Telenet Interactive Services Annex part of the ROTV. It shows how the Interactive Digital TV part fits in the overall architecture referenced in section 2 above in this document and also highlights the different subsystems of NE.G02B. The details on how this works in terms of STB integration and Back-End integration can be found in References 1 and 2 respectively.

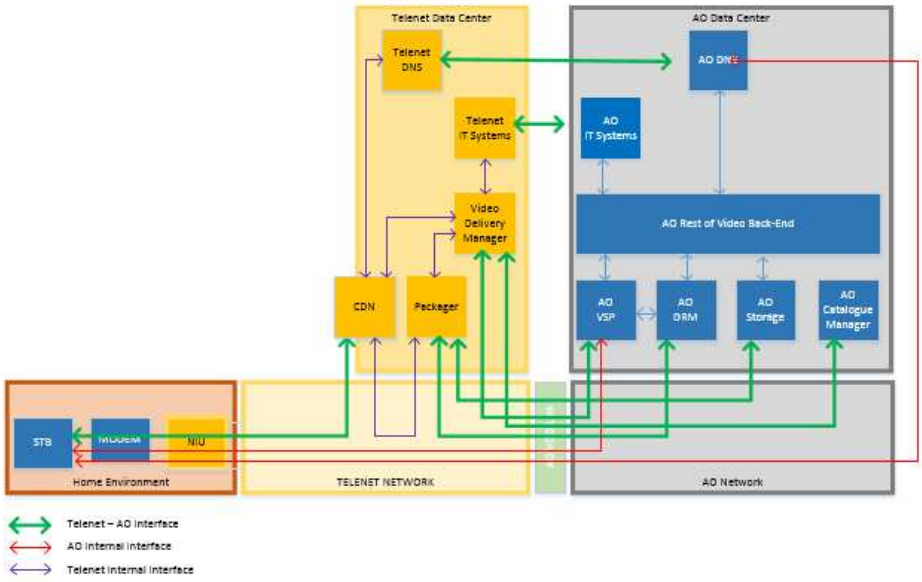

Figure 6-1: Additional components to be introduced beyond the platform required for ROTV

6.1 Key Interactive Digital TV (iDTV) Network Elements for VoD over IP

(88) This section gives a brief overview of the purpose and function of some key building blocks involved in the implementation of the Interactive Services Annex part of the ROTV for enabling VoD over IP delivery. See also chapter 4 for the basic ROTV offer.

6.1.1 VoD ordering and VoD stream delivery

(89) In Figure 6-2 a high-level view of the steps and components for integrating the AO platform with the Telenet components to enable VoD delivery over IP.

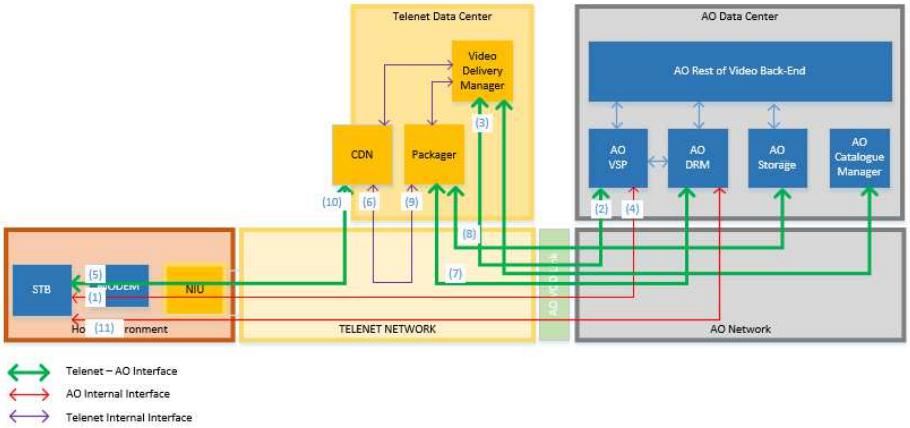

Figure 6-2: VoD Ordering and Delivery

(90)The AO STB will communicate with the AO back-end over the AO VoD link to enable the UI interactions, browse the catalogue, retrieve metadata etc. It is up to the AO to implement the expected behaviour. For accessing the IP VoD functionality, a different approach is followed.

(91)The AO is in control of the VoD order flow by implementation of a VSP (VoD Services Proxy) that acts as an intermediate between the AO STB`s and the TLN VoD delivery platform and network. It also allows the AO CRM to stay in control of sessions and do essential functions like subscriber authentication, accounting and billing.

(92)The TLN VDM (VOD Delivery Manager) platform is the main interface towards the AO VSP. It acts as a proxy allowing the AO application to have control over the TLN network resources involved in the delivery of VoD and to ensure the right resources are available for playing streams and get the connection parameters of the particular streaming server that will perform the play out to the STB.

(93)In the end-to-end flow, Telenet makes available a packager component that will perform just-in-time packaging and encryption.

(94)The AO STB will interface with the AO DRM subsystem, and more specifically with the license server component. This will enable the STB to retrieve the required DRM license to be able to decrypt the video asset if it has the rights.

(95)The TLN CDN platform will be responsible for the playout of the HTTP(S) streams towards the AO STB. This layer will act as an active Content Delivery Network, effectively being a reverse HTTP(S) proxy with caching capabilities.

6.1.2 VoD Content Storage and DRM Integration

(96)A conceptual block diagram showing the major building blocks of the Content Storage and DRM integration are shown in the figure below.

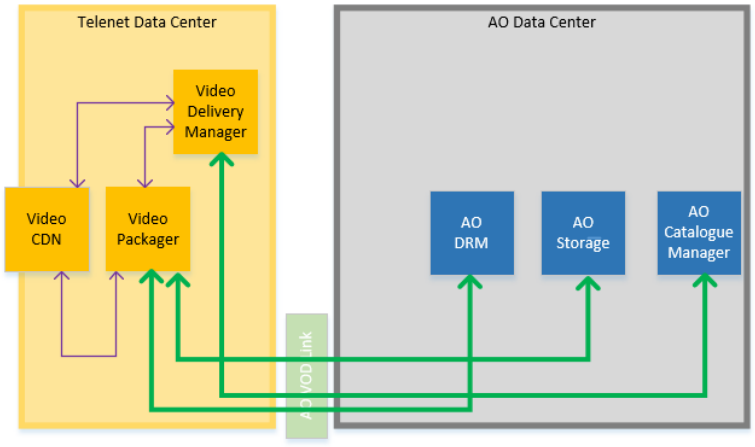

Figure 6-3: VoD Content and DRM Integration

(97) The Video Delivery Manager is a platform that allows an AO to signal the availability of new VoD media assets in a pre-defined format. It also allows the AO to receive technical catalogue files that contain the necessary technical reference data in order to allow AO STB`s and systems to use those assets in their network locations.

(98)The Video Packager will fulfill the role of component for on-the-fly packaging and encryption for the video assets.

(99) For the on-the-fly encryption function, the packager will be integrated with the DRM platform of the AO. For this part, it will be integrated with the AO key server. Common Encryption allowing PlayReady DRM and Widevine DRM is supported by the packager.

(100) The AO will also integrate an AO storage component with this platform. The video assets themselves will be stored at the AO side in a number of video profiles and in accordance with content specifications provided by Telenet.

(101) The packager will support the ISO BMFF on demand profile of the MPEG-DASH standard and will require use of Common Encryption (CENC).

6.1.3 IP Data Path

(102) The function of the IP Data Path is to allow IP communication between the AO STB and both the AO iDTV back-end systems and the TLN IP network components involved in delivering service (e.g. TLN CDN). This thus includes the VOD over IP delivery of assets.

(103) It needs to be implemented over the TLN cable network, using a certified modem as per internet product requirements.

(104) A standalone from the Internet DOCSIS Service Flow will be provided for this connectivity.

(105) Traffic management rules and policies, as well as bandwidth restrictions will apply on the IP Data return path over the Telenet cable network and its use is strictly limited to providing TV related interactivity services in the framework of the TLN WHS VOD over IP offering.

6.1.4 AO VoD Link

(106) The AO VoD Link will be used for connecting the Telenet provided services and components with the AO VoD Backend. This will be a separate NNI link between Telenet and the AO as described in the Specification and Certification BB and VoD IP Interconnect document.

(107) Telenet will deliver the required traffic of AO STB customers towards AO via the AO VoD Link interconnect, as detailed in Architecture ROBB.

(108) As described in the ROBB Architecture document, both AO – NCP and AO – IT accompanied by the Data-link and Mgmt-link and corresponding systems are always required.

Traffic management rules and policies, as well as bandwidth restrictions will apply on the AO VoD link and its use is strictly limited to providing TV related interactivity services in the framework of the TLN WHS VoD over IP offering.