Linear TV Channel Origination – Amendment ‘OTT Linear Streaming in the Cloud’ - solution engineering description

Video Product Specifications

Version 1.0, June 2022

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# 1. Solution Description

The ‘OTT Linear Streaming in the Cloud’ product is not a stand-alone product but an optional feature available for the SES Cloud playout solution.

For inquiries for which SES Cloud Playout is not the channel’s origin or additional features are required, please contact [Product Management](mailto:stephan.baez@@ses.com) to check available options.

DEPLOYMENT: It is tuned into its distribution workflow and allows a flexible and fast onboarding. The OTT Linear Streaming system is deployed identical to the Cloud playout in Azure Western Europe region, Availability Zone 1. There is no necessity any longer to send the channel to SES on-prem facilities for OTT encoding, but rather stay in the cloud during the whole processing chain and eliminate cloud egress costs between both deployments and SES’ Akamai CDN.

SETUP: The OTT service is using the encoding software VOS360, provided by third-party vendor Harmonic, which is deployed in SES’ Azure subscription. Both, VOS360 and Azure subscription are completely managed and maintained by Harmonic (including network security). Our SES NOC in Bucharest is the face to the customer, but delegates incidents to Harmonic’s 24/7 DevOps team, who are responsible for incident handling and resolution.

PRODUCT: The product (MVP) provides a simple ABR OTT transcoding with predefined bitrate profiles, ready for being delivered via push, in either HLS or MPEG DASH packaging, to a CDN.

CDN: When adding SES CDN (Akamai) to the solution, no egress costs will arise even on this path as Microsoft and Akamai have a special no-egress deal in place. For SES to benefit from this deal, a relationship between SES Cloud OTT environment and SES Akamai CDN had to be established once and now accounts for all future onboarded channels in combination with SES CDN.

SES360: VOS360 is integrated via APIs into SES360 channel management. SES360 is being used on the one hand as the main dashboard for status monitoring and on the other hand gives self-managed playout customers the possibility to connect the playout channel to VOS360, load preselected encoding templates and start the OTT service directly from there.

CONFIGURATION: Aside from SES360, the services are usually configured within the VOS360 UI by SES DVB Engineering. However, there are operational limitations especially when it comes to adjusting existing or adding new transcoding profiles. These can only be created by Harmonic themselves and therefore require their chargeable contribution. See also ‘Limitations of the solution’ page within this document.

# 2. Capabilities, Features List and SES Standards

Please see parent Linear TV Channel Origination - solution engineering description document for Cloud Playout capabilities and features.

The ‘OTT Linear Streaming in the Cloud’ platform offers the following features in the list below.

|  |  |
| --- | --- |
| **Technical capabilities** | **Comments** |
| Redundancy/ Failover | Kubernetes Pod Failover (managed by Harmonic) |
| Multi-tenancy for customers and channels |  |
| Launch new channels in SES360 |  |
| Access Channel status view in SES360 |  |
| ABR transcoding | h.264 AVC |
| Audio | Up to 8 stereo audio channels |
| **Input capabilities** |  |
| Input types | ZIXI (for other solutions also possible: SRT, RTMP, CloudLink, Appliance (HSP), Live Routing Service (LRS)) |
| Video format | tbc |
| Audio format | tbc |
| Multiple audio tracks |  |
| **Output capabilities** |  |
| Signal output packaging | HLS & MPEG DASH |
| CDN Push/ Pull | Push to CDN recommended |
| **SLA** |  |
| Uptime commitment on yearly base | 99.95% (Premium), 99.70% (Complete), 99.00% (Standard) |
| Availability rate end-to-end | No |
| Support hours | 24x7x365 (NOC) |
| After hours phone support | Included (NOC) |
| Monitoring | 24x7x365 (SES NOC Bucharest 1. Level, Harmonic DevOps 2. Level); TAG; DataMiner |
| Technical Contacts | NOC/ Service Management |
| Severity level and response times in case of error | For further details, please see SLA document |
| Severity Level 1 | 5min (Premium), 10min (Complete), 15min (Standard) |
| Severity Level 2 | 5min (Premium), 10min (Complete), 15min (Standard) |
| Severity Level 3 | 5min (Premium), 10min (Complete), 15min (Standard) |
| Channel onboarding time | 1 day |

# 3. Mandatory/Optional Information to collect

## 3.1 OTT Linear Streaming in the Cloud Capabilities

List of mandatory/optional capabilities for Fully-Managed Cloud Playout - SE to collect as part of the solution design:

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Optional/Mandatory** | **Capability/feature** | **Information SE to collect/Points to consider and verify** |
| Channel Format | Mandatory | HD/ SD | -SD or HD channel  -Do predefined transcoding profiles fit? |
| Channel Packaging | Mandatory | HLS/ MPEG DASH | -Which output format is desired |
| CDN | Optional | SES’ (Akamai) or other CDN | Entry point to be defined by DVB/ Content Distribution for SES’ CDN, else customer to provide info |

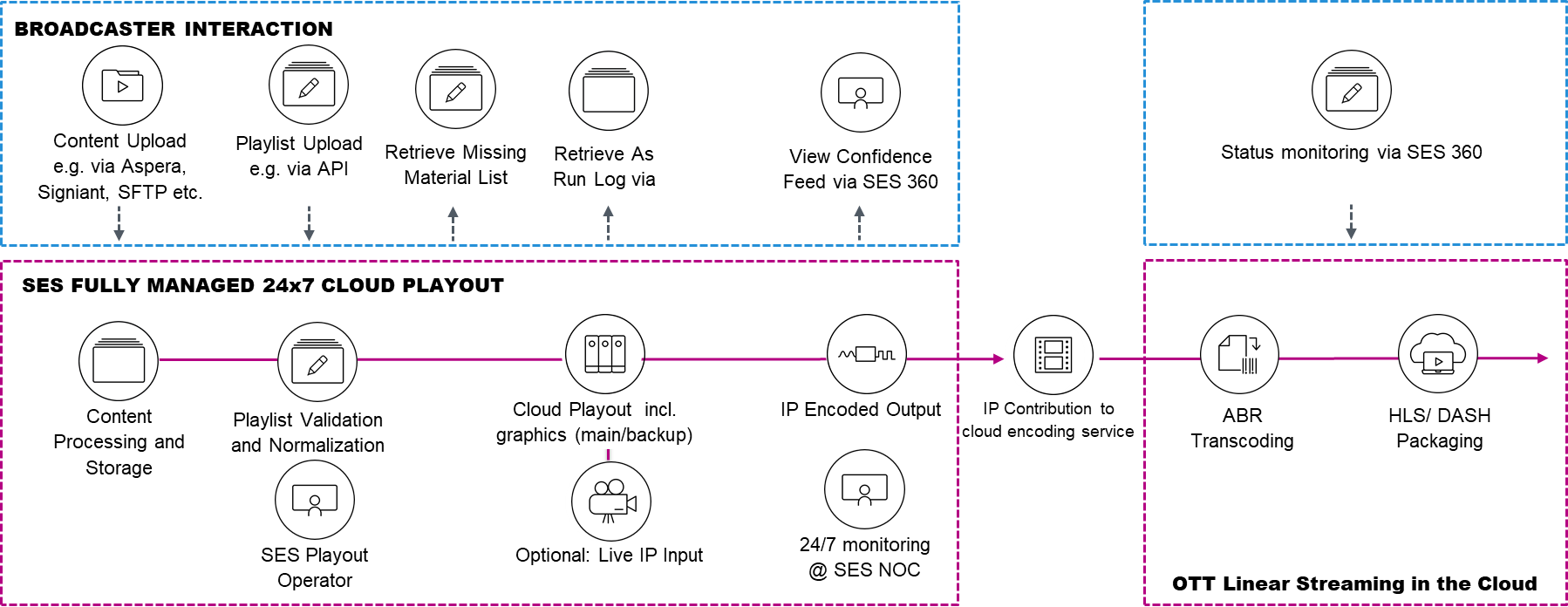
## 3.2 Roadmap

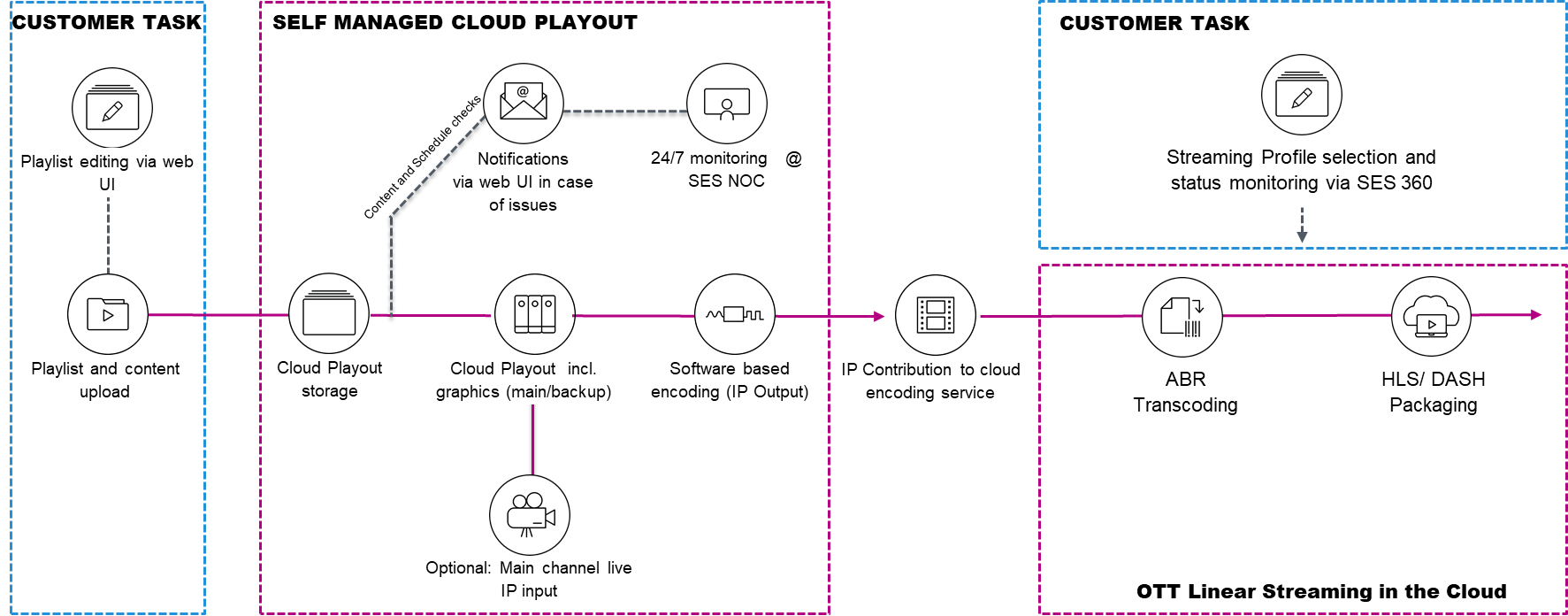
|  |  |
| --- | --- |
| **End of Q2 2022** |  |
| **Release CP 1.8** | **Product MVP Ready to Operate** |
| **Q3 2022** |  |
| **Release CP 1.9** | **Additional features (e.g. SCTE-35 support, Pull by CDN)** |
| **Q4 2022** |  |
| **Release** | **tbd** |

# 4. Technical Solution Overview

## 4.1 Cloud Playout General Workflow Diagram

Schematics Fully-Managed Cloud Playout:



Schematics Self-Managed Cloud Playout:

The detailed technical solution for Self-Managed Cloud Playout Solution is described in the Technical Description:

<https://sesglobal.sharepoint.com/:w:/r/sites/msteams_4c35ba/Shared%20Documents/Documentation/Self-managed/Documentation/Linear%20TV%20Channel%20Origination%20-%20Self%20Managed%20-%20technical%20specification.docx?d=we8921c4e91334ae3883d17a7708cd203&csf=1&web=1&e=9W7F9c>

## 4.2 Technical Workflow Diagram

**Diagram

Description automatically generated**



## 4.3 Monitoring Components

* Cloud playout output is distributed via Zixi to SES teleports where the signals can be made available on the monitoring systems, like TAG and/or BMM. And compliance recording like Xentaurix.
* The VOS360 is monitored by Harmonic (as this is SAAS) and also by our Dataminer
* OTT linear streams themselves (only the service status) can be monitored via VOS360 and SES360. In case it is going to our CDN or we are getting a monitoring link from the customer’s CDN, we do TAG monitoring as well. The streams are monitored by Harmonic 24/7 DevOps too (in cooperation with the SES NOC).
* Harmonic will monitor the system and the channel via 24/7 DevOps for any issue related to the system and underlying infrastructure too.

## 4.4 Limitation Of The Solution

* It is required to use IP Contribution (ZIXI) for connecting the Cloud Playout channel with Cloud OTT system. This connection happens automatically when using SES360 for starting the service
* There is only a predefined set of encoding profiles, which can’t be edited by SES. As an example: The customer specific adjustment of a bitrate or resolution of the ABR transcoding requires chargeable action from Harmonic. This must be requested by SES.
* Currently only Push to CDN option is enabled for the product, but the system is capable to also perform origin services (Pull By CDN). This will be made available after the MVP release.
* Only for SES’ Akamai CDN, no egress costs apply. If a customer wants to use its own CDN, these costs arise and must then be covered by the respective Azure egress product.
* SES does not have control over the system, architecture, network security or infrastructure itself, as this is a managed service by Harmonic. It runs within a SES Azure subscription, but without any SES involvement, except the commercial relationship with Microsoft.
* 1+1 cloud redundancy is not in place right now. This could be achieved with a second geo-redundant VOS360 deployment, which would double the costs and therefore is not yet considered as an option.
* In case a customer requires for one channel both push and pull distribution, each scenario needs an own transcoding and packaging. It is not possible from the system to transcode and package a channel once and simultaneously provide it as push and pull.

# 5. SES Demo and POC Channels

SES has 2 Cloud Playout Channels for internal use:

## 5.1 Demo Channel

A demo channel for SE team, used for demonstration of the Cloud Playout Solution to potential customers. This channel includes demo content, playlist, graphic elements, subtitles, cue-tone and live events features that built-in in the channel for an easy demonstration.

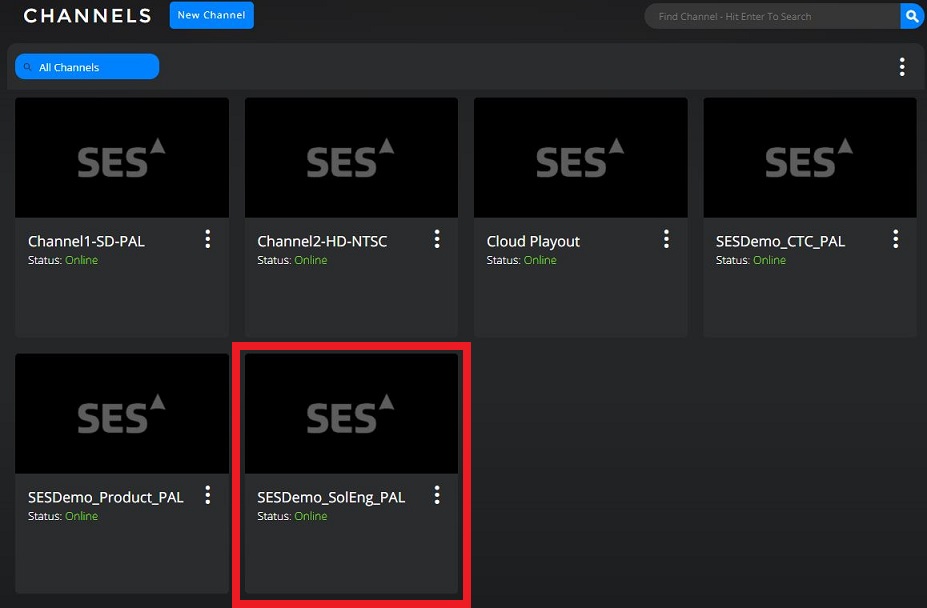
Self-managed channels are entitled to select ‘Distribution’ on the channel’s action menu and configure the OTT distribution. Please see the Operational Handbook for more details.

Channel Name in SES-360: “SESDemo\_SolEng\_PAL”

Log-in details:

User: presale.demo

Password: Pre5460!



## 5.2 POC Channel

A Cloud Playout POC channel can be provided in general to a customer but does not include any distribution. Therefore, OTT Linear Streaming in the Cloud is not included.

# 6. Operational Concept

The detailed Operational and SLA Concept for ‘Linear TV Channel Origination – Amendment ‘OTT Linear Streaming in the Cloud’ – Operations Handbook can be found here:

<https://sesglobal.sharepoint.com/:w:/r/sites/msteams_4c35ba/Shared%20Documents/Documentation/OTT%20Linear%20Streaming%20in%20the%20Cloud/Documentation/Linear%20TV%20Channel%20Origination%20-%20Amendment%20OTT%20-%20Operational%20Handbook.docx?d=w77ae4ecf6dee44abae8e8dd763641fd8&csf=1&web=1&e=QSONQc>

# 7. Customer Related Pre-requirements

## 7.1 Needed Technical Resources

* See parent Cloud Playout [document](https://sesglobal.sharepoint.com/:w:/r/sites/msteams_4c35ba/Shared%20Documents/Documentation/Self-managed/Documentation/Linear%20TV%20Channel%20Origination%20-%20Self%20Managed%20-%20Solution%20engineering%20description.docx?d=w419284b4414d43f6b88d4f06fb2a1f99&csf=1&web=1&e=Eozrgh)

## 7.2 Needed Software Tools

* See parent Cloud Playout [document](https://sesglobal.sharepoint.com/:w:/r/sites/msteams_4c35ba/Shared%20Documents/Documentation/Self-managed/Documentation/Linear%20TV%20Channel%20Origination%20-%20Self%20Managed%20-%20Solution%20engineering%20description.docx?d=w419284b4414d43f6b88d4f06fb2a1f99&csf=1&web=1&e=Eozrgh)

# 8. Business Plan

Can be requested from Stephan Baez

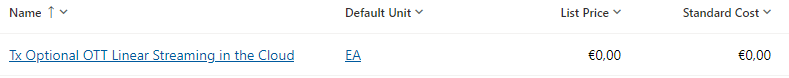
# 9. OTT Linear Streaming in the Cloud Product

## 9.1 Products list and links

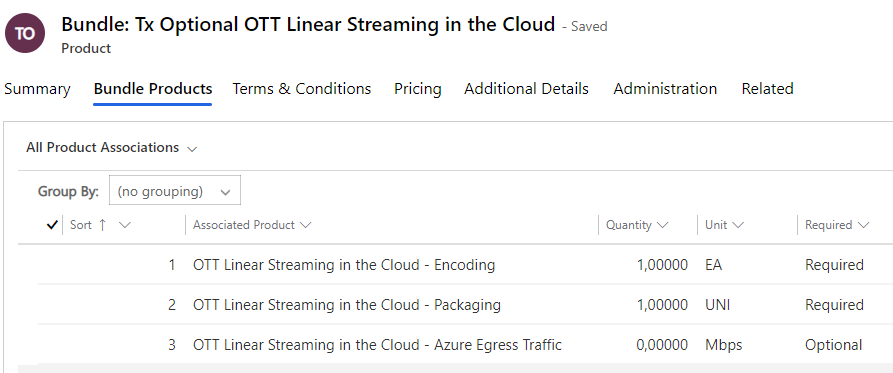
|  |  |  |  |
| --- | --- | --- | --- |
| **Product** | **D365 ID** | **Comments** | **link to CRM system** |
| Tx Optional OTT Linear Streaming in the Cloud | ASES-1005677 | Bundle wrapper | <https://ses.crm4.dynamics.com/main.aspx?appid=80e43a22-6105-ea11-a811-000d3abaa54f&pagetype=entityrecord&etn=product&id=2d3581a9-278e-eb11-b1ac-002248812d24> |
| OTT Linear Streaming in the Cloud - Encoding | ASES-1005673 | Mandatory component | <https://ses.crm4.dynamics.com/main.aspx?appid=80e43a22-6105-ea11-a811-000d3abaa54f&pagetype=entityrecord&etn=product&id=3373a5b4-af8d-eb11-b1ac-002248812d24> |
| OTT Linear Streaming in the Cloud - Packaging | ASES-1006191 | Mandatory component | <https://ses.crm4.dynamics.com/main.aspx?appid=80e43a22-6105-ea11-a811-000d3abaa54f&pagetype=entityrecord&etn=product&id=3ee76cbc-5a7f-ec11-8d21-000d3a659161> |
| OTT Linear Streaming in the Cloud – Azure Egress Traffic | ASES-1006964 | Optional component; necessary when CDN is not SES’ Akamai or Azure | <https://ses.crm4.dynamics.com/main.aspx?appid=80e43a22-6105-ea11-a811-000d3abaa54f&pagetype=entityrecord&etn=product&id=040a814f-2d6e-ec11-8943-00224880aebc> |

## 9.2 Products D365 List

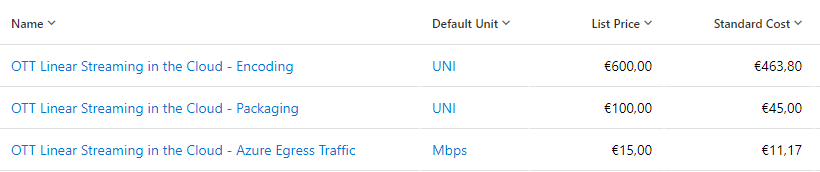
Bundle wrapper:



Bundle containing products:



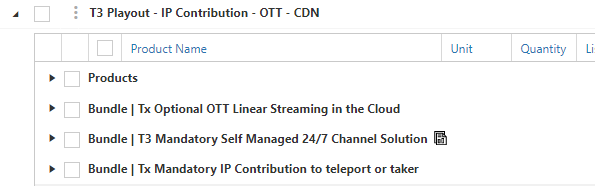
Product price:



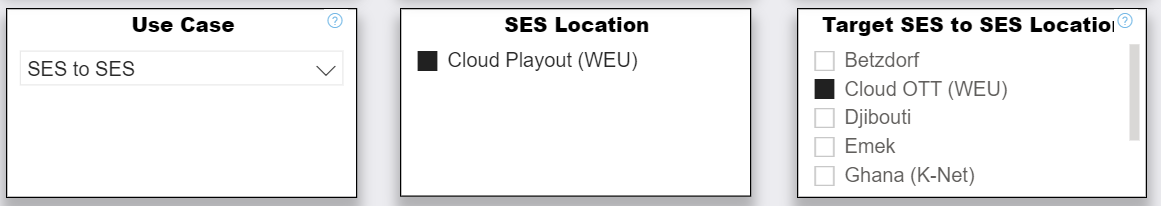
## 9.3 D365 Offer Example

Example Scenario 1: T3 Cloud Playout + IP Contribution + OTT Cloud (1x HLS) + SES CDN

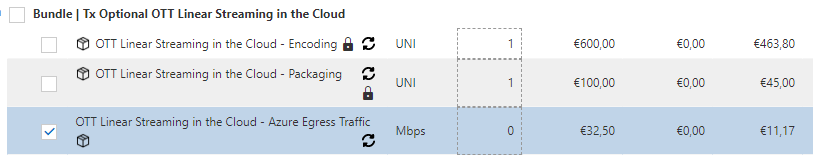
1. Schedule overview:



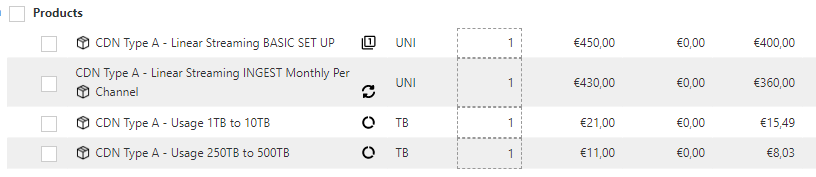
1. For Playout Bundle configuration see parent document
2. IP Contribution: Use this selection via PowerBI product configurator:



1. OTT Linear Streaming in the Cloud Bundle: Please remove the Azure Egress product from the schedule

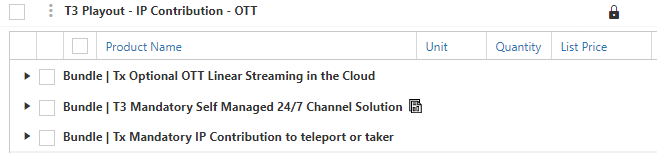


1. CDN: For Push to CDN the following products shall be added to the schedule. Bear in mind that all six usage volume products must be added (‘Usage 1TB to 10 TB‘ until ‘Usage 250 TB to 500 TB’)

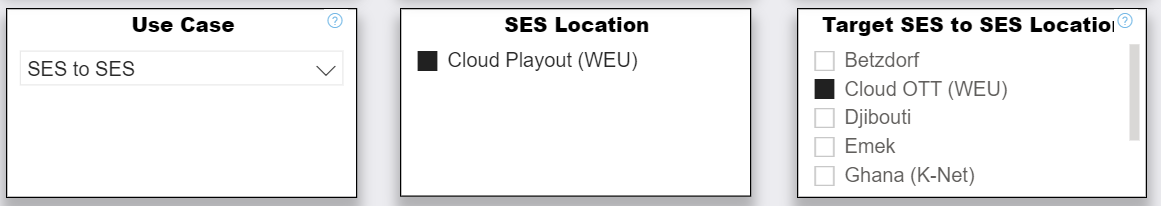


Example Scenario 2: T3 Cloud Playout + IP Contribution + OTT Cloud (1x HLS & 1x MPEG DASH) + Customer CDN

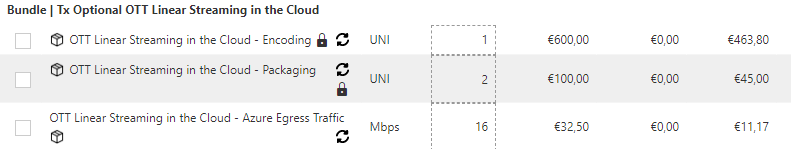
1. Schedule overview:



1. For Playout Bundle configuration see parent document
2. IP Contribution: Use this selection via PowerBI product configurator:



1. OTT Linear Streaming in the Cloud Bundle: *The customer requires two outputs, one HLS and one MPEG DASH packaged streams, whereas the ABR transcoding profile stays the same. Both to be pushed to the customer’s CDN:* Please select the quantity ‘2’ for the packaging product and enter the total bitrate for both streams into Azure Egresses’ quantity field.



## 9.4 Available Transcoding Profiles

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SES Profile | Harmonic Name | Resolution | Video bitrate (kbps) | Video codec | Framerate | Audio bitrate (kbps) | Audio codec |
| **HD 1a AVC** | **AVC OTT HD Main** | 1920x1080 | 3500 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 1280x720 | 2200 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 960x540 | 1500 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 640x360 | 500 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 426x240 | 300 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | Total bitrate | 8000 |  |  | 480 |  |
|  |  |  |  |  |  |  |  |
| **HD 1b AVC** | **AVC OTT HD Entry** | 1280x720 | 2200 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 960x540 | 1500 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 768x432 | 750 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 640x360 | 500 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 426x240 | 300 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | Total | 5250 |  |  | 480 |  |
|  |  |  |  |  |  |  |  |
| **SD 1a AVC** | **AVC OTT SD** | 1024x576 | 1200 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 768x432 | 600 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 640x360 | 500 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | 426x240 | 300 | AVC/ h.264 | 30p | 96 | AAC |
|  |  | Total | 2600 |  |  | 384 |  |