Request for Information (RFI)
IPTV Platform
2024 – 2029

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1 Introduction

1.1 Objective

The intent of this document is to gather information and proposals for future development of IPTV technical platform and IPTV as a service for BH Telecom. BH Telecom is in the IPTV world for more a decade now (2007 – IPTV Pilot, 2009 – MojaTV commercial start, 2021/2022 complete new Platform). With last installation of the IPTV system, BH Telecom, in addition to the previous Linux STBs, stepped into the Android world and enabled its users to use Android STB devices. BH Telecom wants to explore the market and the further development of this service and to accept and implement technology improvements that will make sure that the service deployed remains a commercial success for years to come. Although all the components of the IPTV system are currently new, we are interested in new potential possibilities and functionalities of the IPTV service, especially in the Android segment.

1.2 Intended Audience

Intended audience for this document are IPTV Middleware vendors and their integrators. IPTV Middleware solutions that are not currently deployed in at least 2 European countries with at least 190K active subscribers will not be considered as acceptable. As part of the proposal we expect detailed description of at least 2 references as requested in part 4 of this document.

1.3 Terminology

IPTV – Internet Protocol Television, is the delivery of television content over Internet Protocol (IP) networks. This is in contrast to delivery through traditional terrestrial, satellite, and cable television formats. Unlike downloaded media, IPTV offers the ability to stream the source media continuously. In regards to this document we consider IPTV to consider UDP delivery of video through a controled private network.

Middleware is a software that provides services to software applications beyond those available from the operating system. It can be described as "software glue". In regards to this document we refer to IPTV Middleware as the control, management and application stack that communicates with the clients on the set-top boxes and orchestrates service deployment with the rest of the service components.

OTT – Over the Top

STB – Set-top Box

PPV – Pay per View

VoD – Video on Demand

SVoD – Subscription Video on Demand

TVoD – Transaction based Video on Demand

API - Application Programm Interface

SOAP - Simple Object Access Protocol, a protocol specification for exchanging structured information in the implementation of web services in computer networks

CDR - Call Detail Record, a record of a (billing) event produced by a telecom network element

OSS/BSS - Operations Support System / Business Support System.

SDK – Software Development Kit

CA/DRM – Conditional access/ Digital Rights Management

RTES – Real time encryption server

VCAS – Verimatrix Conditional Access System

RTSP – Real time streaming protocol

DHCP – Dynamic host configuration protocol

DNS – Domain name system

NTP – Network time protocol

DB – Database

RAC – Real Application Cluster (Oracle DB Cluster)

VDN – Video Delivery Network

CDN – Content Delivery Network

FCC – Fast Channel Change

NAS – Network Attached Storage

NFS – Network File System

TB – Terabyte

DVB – Digital video broadcasting

DVB-x – DVB-S (Satellite), DVB-C (Cable), DVB-T (Terrestrial)

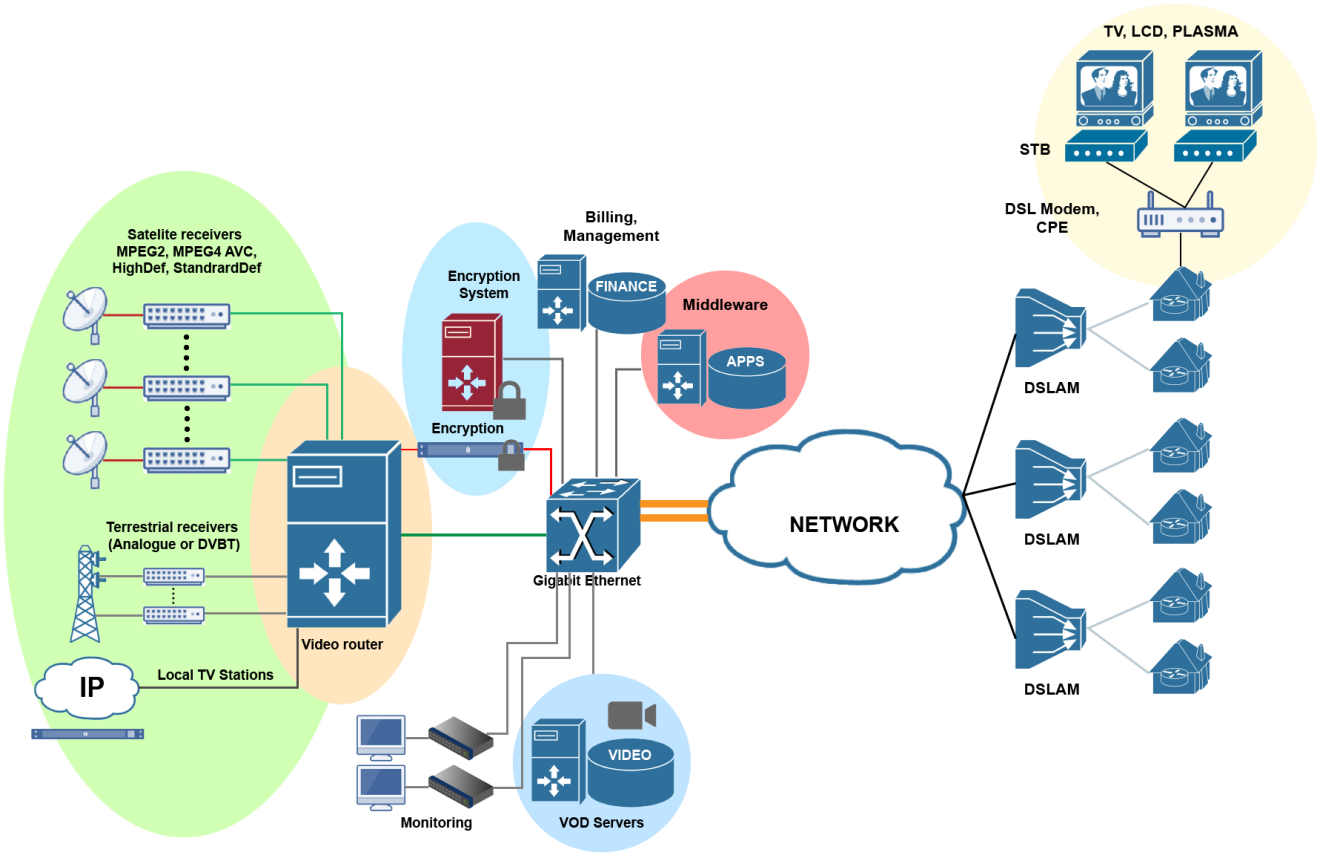
UI – User interface

2 Architecture of the current solution

BH Telecom currently has a typical IPTV architecture, comprised of subsystems which are mutually dependent:

- TV receiving headend
- System for video preparation
- IPTV middleware
- DB component
- VOD/Timeshift subsystems
- CA/DRM subsystems
- Monitoring system

A generic scheme is a very close depiction of the architecture.



2.1 IPTV Middleware

IPTV middleware which is used in BH Telecom is Beesmart middleware (owned and integreated by Beenius Ljubljana), server version 10. This system version is installed in 2021 and has been in use since 2022.

IPTV middleware is cluster based solution which is comprised of ten middleware servers (three frontend servers for load balancing, two are for administration and provisioning services and five servers for client connections).

Beenius software is designed on a microservice architecture and service functionally is divided into the following segments:

- Core application
- VOD delivery
- Statistic
- Recommendation
- Database: Oracle

Cluster is based on JBOSS application layer while nginx servers are used for client connection. System is currently scaled for 270.000 unique clients (subscribers/licenses) and 450.000 unique devices with possibility of expansion to 500.000 unique clients and 800.000 unique devices. At the moment of writing there are 228.000 active clients and over 350.000 active devices on system.

All components in the system are deployed as virtual machines in BH Telecoms VMware virtualization environment (VSphere hypervisor) based on BH Telecom’s own hardware, except Oracle database. Company policy mandates usage of its own hardware resources in every case possible to gain efficacy, and to minimize OPEX and CAPEX for all systems in the future.

2.1.1 DB Component

Middleware application nodes are connected to Oracle Database 19g. There are two DB nodes in active-active HA configuration stack which are managed by Oracle RAC and those nodes are connected to shared storage.

2.2 VoD/Timeshift CDN

Edgeware CDN solution is the currently implemented as VoD/Timeshift CDN. Edgeware CDN solution breaks down into 2 main components: streaming and managing components. Management of the Convoy CDN specific servicesis handled by nine virtual machines (3x convoy management, 3x convoy database and 3x request router). Streaming component is distributed on six different locations:

Sarajevo (4 x 10Gbps) – central location
Tuzla (4 x 10Gbps) – edge location
Zenica (4 x 10Gbps) – edge location
Bihać (1 x 10Gbps) – edge location
Mostar (1 x 10Gbps) – edge location
Travnik (1 x 10Gbps) – edge location

Edgeware Orbit 4020 devices are used on those six location as streaming servers which in total give 150 Gbps of throughput. Content distribution is based on content usage statistics - which means that the most requested content is copied to edge location and served from it. Orbit serves on locations also perform ingest of multicast for timeshift recordings. Additionally for timeshift service and channel recordings two additional Orbit 4020 devices are used as content ingest servers. Edgeware Convoy CDN also has two additional Orbit 4020 devices used for FCC on central location.

2.2.1 VoD Media storage

As VoD Media storage a Scale-out NAS based storage is used. NFS shared partitions are used as endpoints for media content (VOD titles and timeshift recordings). Current VoD media storage system in BH Telecom is Isilon OneFS. Total capacity of the storage is 2 PB.

2.3 CA/DRM

CA/DRM system which is currently used on BH Telecom IPTV system is Verimatrix (version 4.3). CA/DRM system consist of two RTES servers for real time live channel encryption, two servers for providing authorized clients with decryption keys, two servers for management and middleware integration and one server for VOD encryption.

Verimatrix CA/DRM system supports live channels encryption, VoD content encryption, copy control and clone detection. Through administrative interface it is possible to add new live streams for encryption, add VoD content, authorize or revoke client certificate, etc. BH Telecom currently encrypts 70 channels, with licenses available to potentially encrypt 170 live channels. There are currently 350K authorized IPTV STB devices with licenses for up to 365K.

2.4 STB

2.4.1 STB Software stack

BH Telecom uses Linux OS based STBs and Android OS based STBs as clients for the IPTV service. Client engine on the linux STBs is Ekioh SVG client (version 2.x or higher depending on the model). Android STBs are Google certified Android TV devices with preinstalled Moja TV app. UDP is used as the means of multicast delivery of live channels. RTSP is used as the protocol for unicast content (VOD/timeshift) streaming (Edgeware – standardized RTSP with RTSP redirect). Also STBs

use DHCP, with different models getting different boot options such as DNS, NTP, Middleware portal URL, Upgrade portal URL, multicast upgrade URL, etc. All Linux STBs have Verimatrix client installed and have different versions of Verimatrix client on STBs but all are supported and function on VCAS 4.3 version. For android STB-s Verimatrix client is integrated in STB firmware and use decryption on hardware (chip) level.

2.4.2 Current STB vendor and model list

There are currently four different STB vendors in the BH Telecom IPTV system with eigth different models of STBs. The total number of STB in system that are currently active is 350.000. STB vendors and models in production are:

Android STB:
Sei Robotics – 10.000

Linux STB:
Arris - cca 65.000, model:
- VIP 1113

Albis – cca 45.000 models:
- SceneGate 8000
- SceneGate 8100 (Hybrid – IP + DVB-C – cca 1000)
- SceneGate 8080
- SceneGate 8083
- SceneGate 8073

ZTE – cca 252.000, model:
- ZXV10 B700V5C

2.5 OSS/BSS integration

Current IPTV Middleware solution is fully integrated in the OSS/BSS processes. The nourthbound (SOAP based) provisioning API is currently used for:

- user creation
- user management
- user deactivation
- user termination
- device provisioning
- user – device provisioning
- user – channel package provisioning
- user – additional service provisioning

IPTV Middleware generates CDRs that are mediated and consumed by the BSS system. CDRs are generated for:

- VoD consumption
- User based device management
- PPV Live events
- Products (combinations of VoD, Channel packages and events)

All other aspect of the service (channel provisioning, VoD ingest, package definition, etc) are directly managed through a web-based administration console.

3 Proposal requirements

3.1 IPTV Middleware requirements

The primary requirement is to retain the CDN and CA/DRM components that should be integrated into the proposed middleware system. It is necessary to reuse the existing Edgeware Orbit 4020 with the possibility of using the existing convoy system or installing a new one for integration into the middleware system. Also it is necessary to use and integrate the existing Verimatrix CA/DRM system. Additionally requirement is the ability to incorporate as much as possible of the currently installed STB base into the proposed solution. Middleware components need to be deployed as virtual machines in BH Telecom's VMware virtualization environment (VSphere hypervisor) based on BH Telecom's own hardware, except for the database component if database vendor requires to be installed on the bare metal server. Regarding the resources on BH Telecoms virtual infrastructure, the necessary resources should be specified in the proposal as defined in the table in chapter 3.2. The proposal should be for a period of 5 years (1 year of the guarantee period and 4 years of the post-guarantee period). Informative prices for the middleware component, installation, licenses and integration as well as for all other offered components (CA/DRM, statistic, recommendation engine, system monitoring…) should be shown in the table as stated in chapter 4. Financial aspect of each proposal will benefit from being able to reuse any or each part of the current system.

Other mandatory functional requirements are as follow:

- Scaling for 300K active subscribers, 500K active devices
- Proven ability to handle 300K+ active subscribers
- Minimum of supported services: Live TV, Channel packages, Subscription packages, EPG, Timeshift, SVoD, TVoD, PPV, Parental controls
- Availability of SDK for development of new services
- Availability of an API for development of themes, android and third-party clients
- Availability of an API for all actions on Middleware system (so maximum automation of actions is available)
- Deployment in a virtualization environment
- Middleware support for deployment of Hybrid STB / Clients (DVB-x, OTT)
- Global and personalized content recommendation (Live and on demand)
- Marketing opportunities integrated into the client UI, with detailed analytical tools to track marketing consumption
- Detailed analytical data of client behavior, usage patterns, viewership data, with the ability to generate reports
- 4K (UHD) ready UI, with support for 4K 60fps STBs
- availability of native Android/Android TV client

3.2 Resources on a virtual platform

The amount of resources needed for middleware components on the BH Telecom's virtual platform should be specified in the table below.

SITE	*vCPU amount*	*RAM amount (GB)*	*STORAGE amount (TB)*
PRIMAR SITE			
DR SITE			
TEST SITE			
TOTAL			

If middleware vendor requires additional resources for some part of the system other than the middleware component, a shown table with the required resources must be provided for each such part.

3.3 STB stack requirements

It is necessary to list all STB models that are already integrated into the proposed middleware solution (Linux and Android) with detailed technical specification of integrated STBs. Proposal should contain propostion of UI that is used for Linux and Andorid STBs that are integrated on propsed middleware solution. Regarding Android STBs that are already integrated into the proposed middleware, it is necessary to specify whether it is Android AOSP or Android TV. Requirements regarding STB integration need to be specified in two options listed below.

3.3.1 STB integration – Option 1

Through the proposal, demonstrate and explain in detail the possibility of integrating all existing STB devices from the current BH Telecom IPTV system into the proposed solution. Show a proposed UI layout for Linux and Android STB devices and explain all its functionalities in detail.

3.3.2 STB integration – Option 2

Through the proposal, integrate only the existing Android STB devices from the current BH Telecom IPTV system. Android STBs should be running the Android TV operating system. Show a proposed UI layout for Android STB devices and explain all its functionalities in detail. If this option for STB integration is offered, it is allowed to offer a new CA/DRM system for android STBs. In that case virtual resources for offered CA/DRM system should be listed according to the table shown in the chapter 3.2. Also informative prices for CA/DRM component, licenses, installation and integration should be shown in the table as stated in chapter 4.

3.3.3 STB certification

Within the proposal, it is necessary to express and clarify willingness for the integration of particular Android STB to the proposed solution at the request of BH Telecom. Android STB integration implies that the System vendor, at the request of BH Telecom, integrates the desired Android STB into the IPTV system for a certain price, which implies all the necessary actions for certification and integration to all components of the IPTV System (Google STB certification, Verimatrix certification, integration with middleware, CA/DRM and CDN system components). It is necessary to specify the minimum technical specification for an Android STB that can be integrated into the proposed system. It is also necessary to provide information on the duration of the integration and to provide an informative price for this type of integration.

4 Informative prices and implementation deadlines

It is necessary to submit the table of informative prices in the form as shown below. Additional specification of proposed items, as well as adding new items to the table is allowed.

1	2	3	4	5	6
Item no.	**Item**	**Type of quantity**	**Quantity**	**Unit price per item**	**Total price per item**
I	**COMPONENTS**				
1.	**Middleware - software**		**1**		
2.	**Middleware – subscrieber license (if is offered full STB stack integration – option 1)**	**pcs**	**270.000**		
3.	**Middleware – subscrieber license (if is offered android STB stack integration – option2)** ***It could be scaled up to 300.000.***	**pcs**	**50.000**		
4.	**CA/DRM hardware- if is offered**	**pcs**	**1**		
5.	**CA/DRM software - if is offered**	**pcs**	**1**		
6.	**CA/DRM – licence (if is offered android STB stack integration – option 2)** ***It could be scaled up to 450.000.***	**pcs**	**75.000**		
7.	**Statistic modul**	**pcs**	**1**		
8.	**Monitoring and management system**	**pcs**	**1**		
9.	**Recommendation engine**	**pcs**	**1**		
	TOTAL				
II	**SERVICES**				
1.	**Middleware instalation**	**pcs**	**1**		
2.	**CA/DRM instalation - if is offered**	**pcs**	**1**		
3.	**Integration, subscrieber migration and STB migration**	**pcs**	**1**		
4.	**OSS/BSS integration**	**pcs**	**1**		
5.	**Training for 6 workers**	**pcs**	**1**		
6.	**STB certification acording request from chapter 3.3.3**	**per integration**			
7.	**Price for support services during the warranty period**	**per month**	**12**		
8.	**Price for support services during the post- warranty period**	**per month**	**48**		
	TOTAL				
	TOTAL COMPONENTS + SERVICES				

In addition to informative prices, it is necessary to specify the approximate duration of implementation for proposed solution. How long it will take to implement the offered solution and perform user migration to new middleware system. It is also necessary to submit proposal for detail technical implementation of subscribers and STB's migration to the new middleware system.

5 Description of mandatory references

As part of the proposal and the future development path we expect to receive detailed description of at least two Europe based active references with at least 190K active IPTV subscribers. Proposals without the required description of the references will not be taken into account.

When describing the reference sites highlight following information:

- Number of active subscribers
- Type of installation: Greenfield or replacement of an existing vendor
- Years of active deployment
- Number of upgrades made during the lifespan of the installed platform
- Number of STBs, and STB models in use on the installation
- Representation of UI used on STBs
- CA/DRM used in the platform
- As detailed as possible information about the CDN deployment
- Information about statistic module
- Information about recommendation module

As part of the proposal, we expect willingness to organize a site visit to one of the reference sites from the proposal.