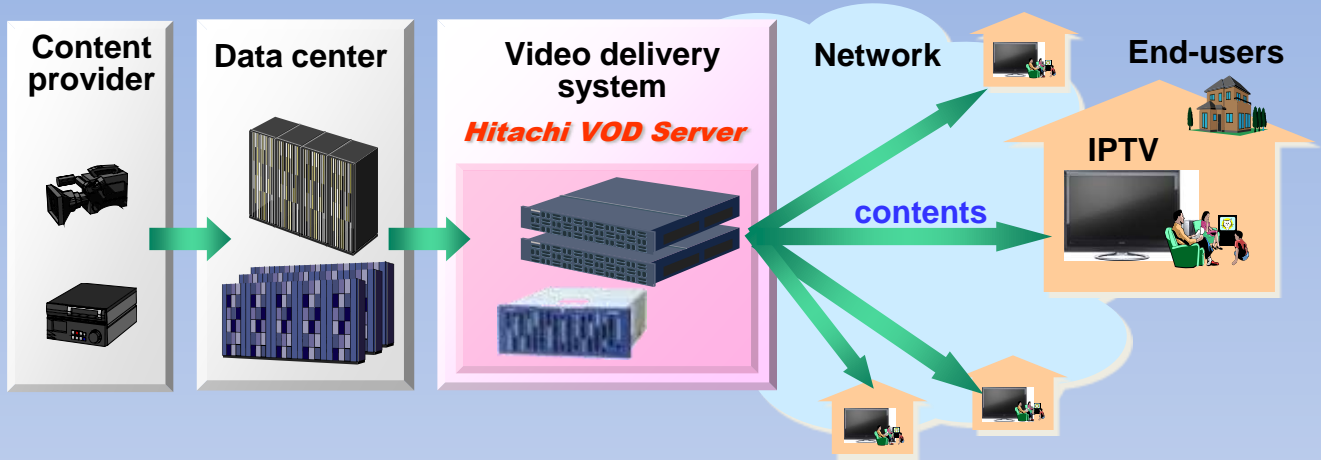


The Video Delivery System

Hitachi VOD Server



HTTP Server

HTTP Streaming Server System

RTP Server

RTP Streaming Server System

Creator

Contents Creation Assistance System

Meta Server

Meta File Creation/Delivery System

CAS/DRM

Digital Content Rights Management System

HTTP Server

HTTP Streaming Server System

HTTP Server Features:

❖ HTTP Streaming and Download

- Delivers contents to IPTV terminal via HTTP. (complies with VOD HTTP Streaming/Download)
- Supports H.264/AVC in addition to MPEG-2 for Video format. (TS & TTS(*1))
- Supports DRM “Marlin IPTV-ES”(*2) which is the standard to protect Digital Content Rights. (Optional)

❖ High Quality Video Play-back Function

- Implements GOP(*3) boundary aware Delivery Control System which enables smooth switch of video on IPTV terminal.
- Monitors TS packet loss and status to enable high quality contents play-back.

❖ Illegal access protection

- One-Time URL certification function blocks illegal/unauthorized access to the contents.

❖ Large-scale Delivery service

- Prevents access congestion by automatically selecting appropriate storage according to the traffic status and requests from IPTV terminals.
- Delivers contents ever efficiently by optimizing the size of reading data and read cycle of storage.
- Prevents a particular server from over-load (access and bandwidth) by setting thresholds for CPU usage, network rate, and the number of concurrent sessions.

❖ Upper limit settings of delivery rate

- Upper limit settings of delivery rate for each NIC enables your service to avoid delay of delivery and system down.

❖ GUI Interface

- Intuitive GUI allows administrator to register content and monitor system status simply & easily.

❖ Contents registration interface

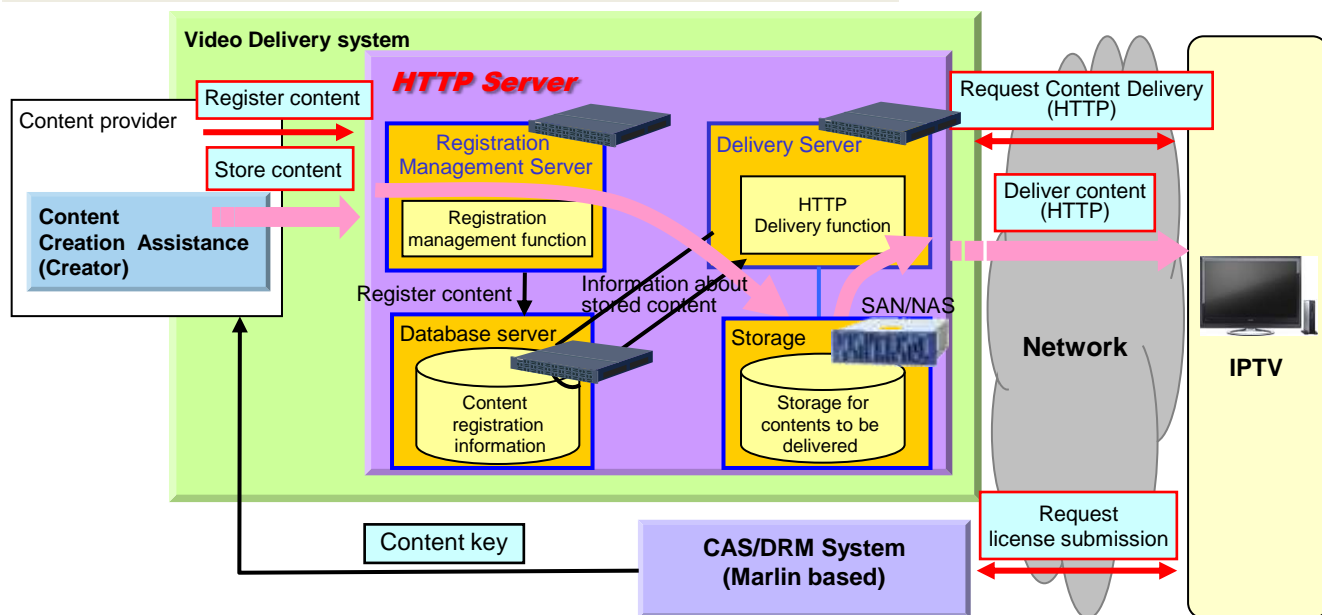
- Has interface (CSV file format) to integrate with third party systems for contents registration. (besides GUI)

(*1)TTS: Time-stamped Transport Stream.

(*2)Marlin IPTV-ES: Technical Standard to protect Digital Content Rights which technical specification is formulated by the Marlin Developer Community.

(*3)GOP: (Group of Picture)Grouped video data that is compressed or played back in MPEG-2 format.

Sample configuration



- **Registration Management Server:** Registers and manages content Information (ex. lifetime and expiry of a content) on Contents Information DB.
- **Delivery Server:** Delivers contents to clients via HTTP.
- **Contents Creation Assistance (Optional):** Automatically generates "double-speed play-back/rewind content) from a source MPEG-2 or H.264/AVC TS files .(e.g.scale x2,x4,x8...)
- **Marlin based CAS/DRM System (Optional) :** Generates and distributes licenses to IPTV terminals.

Specifications

❖ Hardware requirements

	Registration Management server	Delivery server	Storage
CPU	More than Xeon 3.0GHz × 2	More than Xeon 3.0GHz × 2	—
Memory	More than 4GByte	More than 4GByte	Cache2GByte
HDD	More than 100GByte	More than 100GByte	860GByte : FC (RAID5) (200hours/10Mbps)

※Storage capacity depends on video quality , amount, duration and retention period of contents.

❖ OS and DBMS requirements

	Registration Management server	Delivery server	Storage
OS	Windows Server 2008	Windows Server 2008	—
DBMS	SQL Server 2008	SQL Server 2008	—

❖ Software specifications

	Content	Note
Number of sessions for contents delivery	max. 1,000 [/server]	—
Number of registered contents	max. 20,000 titles	—
Network bit-rate for HTTP	max. 5,000 Mbps [/server]	HTTP streaming with 10Gbps NIC
Video format	MPEG-2 TS, TTS, H.264/AVC TS, TTS	—
IP protocol	IPv4 / IPv6	—

RTP Server

RTP Streaming Server System

RTP Server Features:

❖ Supports RTP/RTSP Streaming

- Delivers contents to IPTV terminals via RTSP/RTP streaming.
- Supports H.264/AVC in addition to MPEG-2 for Video format. (TS & TTS(*1))
- Supports DRM “Marlin IPTV-ES”(*2) which is the standard to protect Digital Content Rights. (Optional)

❖ High Quality Video Play-back Function

- Implements GOP(*3) boundary aware Delivery Control System which enables smooth switch of video on IPTV terminal.
- FEC(*4) (ProMPEG method) corrects packet-deficit and enables quality and stable contents play-back at IPTV terminals.
- Monitors TS packet loss and status to enable high quality contents play-back.

❖ Illegal access protection

- One-Time URL certification function blocks illegal/unauthorized access to the contents.

❖ Large-scale Delivery service

- Prevents access congestion by automatically selecting appropriate storage according to the traffic status and requests from IPTV terminals.
- Delivers contents ever efficiently by optimizing the size of reading data and read cycle of storage.
- Prevents a particular server from over-load (access and bandwidth) by setting thresholds for CPU usage, network rate, and the number of concurrent sessions.

❖ Upper limit settings of delivery rate

- Upper limit settings of delivery rate for each NIC enables your service to avoid delay of delivery and system down.

❖ GUI Interface

- Intuitive GUI allows administrator to register content and monitor system status simply & easily.

❖ Contents registration interface

- Has interface (CSV file format) to integrate with third party systems for contents registration. (besides GUI)

(*1)TTS: Time-stamped Transport Stream.

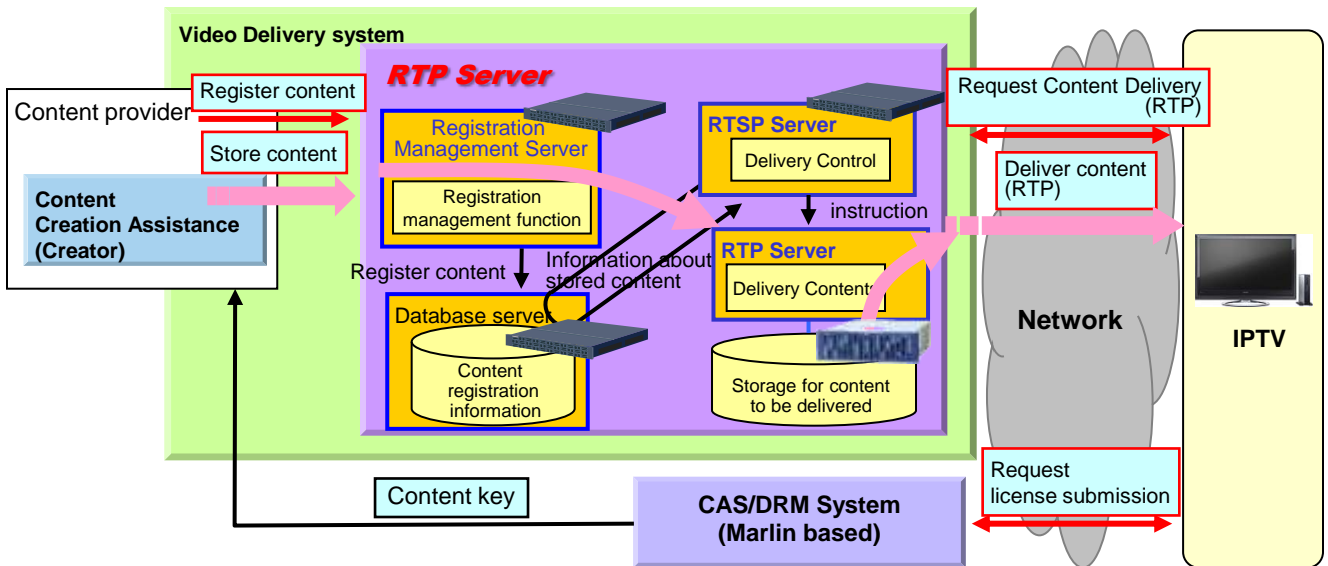
(*2)Marlin IPTV-ES: Technical Standard to protect Digital Content Rights which technical specification is formulated by the Marlin Developer Community.

(*3)GOP (Group of Picture): Grouped video data that is compressed or played back in MPEG2 format.

(*4)FEC(Forward Error Correction) :

The method which correct packet-deficit on Network.

Sample configuration



- **Registration Management Function:** Registers and manages content Information (ex. lifetime and expiry of a content) on Contents Information DB.
- **RTSP Server (VOD Delivery Control):** Controls RTP server (Delivery Control) on request from IPTV terminals/
- **RTP Server (Delivery Contents) :** Delivers contents registered in storage according to an instruction from Delivery Control .
- **Contents Creation Assistance (Optional):** Automatically generates "double-speed play-back/rewind content) from a source MPEG-2 or H.264/AVC TS files. (e.g.scale x2,x4,x8...)
- **Marlin based CAS/DRM System (Optional) :** Generates and distributes licenses to IPTV terminals.

Specifications

❖ Hardware requirements

	Registration Management server	Delivery server	Storage
CPU	More than Xeon 3.0GHz × 2	More than Xeon 3.0GHz × 2	—
Memory	More than 4GByte	More than 4GByte	Cache2GByte
HDD	More than 100GByte	More than 100GByte	860GByte : FC (RAID5) (200hours/10Mbps)

※ Storage capacity depends on video quality , amount, duration and retention period of contents.

❖ OS and DBMS requirements

	Registration Management server	Delivery server	Storage
OS	Windows Server 2008	Red Hat Enterprise Linux 5	—
DBMS	Oracle 11g	Oracle 11g	—

※GUI program works on Windows 2008 Server.

❖ Software specifications

	Content	Note
Number of sessions for RTSP	max. 1,000 [/server]	—
Number in which registered contents is managed	max. 20,000 titles	—
Network bit-rate for RTP	max. 700 Mbps [/server]	RTP streaming with 1Gbps NIC
Video format	MPEG-2 TS, TTS, H.264/AVC TS, TTS	—
IP protocol	IPv4 / IPv6	—

Contents Creation Assistance System

Creator Features:

❖ Converts encoded contents into deliverable contents for IPTV

- Contents creation assistance program converts encoded contents into deliverable contents for IPTV terminals.
- Supports H.264/AVC in addition to MPEG-2 for Video format. (TS & TTS(*1))

❖ Corrects transmission delay in Network

- Generates contents file with time-stamp which allows intelligent IPTV terminal to control play-back timing and correct transmission delay in network.

❖ Smooth and High-quality Trick Play

- Generates multiple-speed contents (besides MPEG-2 speed, H.264/AVC) for smooth and high-quality trick play including fast-forwarding, rewinding, pause and cueing, etc. in IPTV.

❖ Safe Delivery Contents (optional)

- Encrypts contents to prevent illegal play-back and falsification.
- Complies with DRM "Marlin IPTV-ES"(*2) which is the standard to protect Digital Content Rights.

❖ GUI Interface

- Intuitive GUI allows administrator to create content simply & easily.

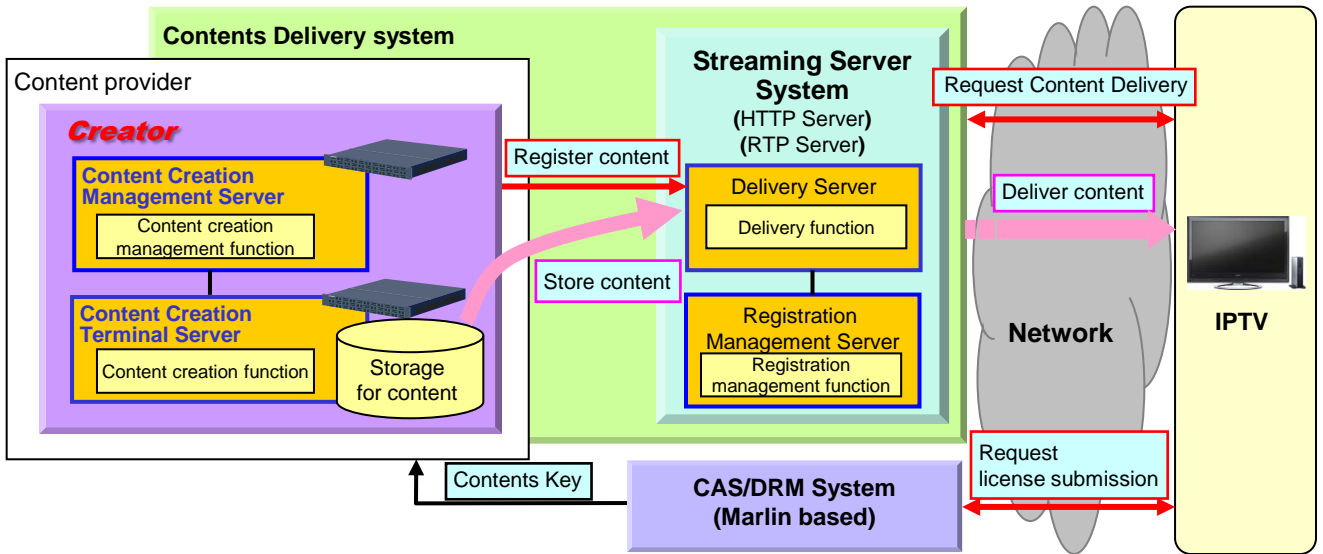
❖ Contents creation interface

- Has interface (CSV file format) to integrate with third party system for contents creation. (besides GUI)

(*1)TTS: Time-stamped Transport Stream.

(*2)Marlin IPTV-ES: Technical Standard to protect Digital Content Rights which technical specification is formulated by the Marlin Developer Community.

Sample Configuration



- **Contents Creation Management Server:** Controls the flow of contents creation, based on registration parameters described in CSV file or GUI input.
- **Contents Creation Terminal Server:** Generates multiple-speed contents automatically source from MPEG-2 or H.264/AVC TS files according to the instruction from the Content Creation Management Server.
- **Streaming Server System (option):** Delivers contents to IPTV terminals via HTTP or RTP.
- **Marlin based CAS/DRM System (option):** Generates and distributes the licenses to IPTV terminals.

Specifications

❖ Hardware requirements

	Contents Creation Management server	Contents Creation Terminal server	Note
CPU	More than Xeon 3.0GHz × 2	More than Xeon 3.0GHz × 2	—
Memory	More than 4GByte	More than 4GByte	—
HDD	More than 100GByte	More than 100GByte	According to capacity of creation management, additional storage capacity may be required.

❖ OS and DBMS requirements

	Contents Creation Management server	Contents Creation Terminal server	Note
OS	Windows Server 2008	Windows Server 2008	—
Middleware	—	—	—

❖ Software specifications

	Content	Note
Number of sessions for creation terminal server	3 servers	Standard license
multiple-speed contents	normal speed, 5 time speed, 10 time speed, -5 time speed, -10 time speed,	When four types or more contents are produced at the same time, an additional license is needed.
Output format	MPEG-2 TS, TTS, H.264/AVC TS, TTS	—
IP protocol	IPv4 / IPv6	—
Others	Encryption library	Optional

Meta Server

Meta File Creation/Delivery System

Meta Server Features:

❖ Generates and delivers meta file for contents playback

- IPTV terminals need information to play-back contents, such as content URL and license URL including encoding key for encrypted contents.
- Generates and delivers XML based meta file. (*1)
- Reduce workload for the delivery of the information such as contents URL, license URL and etc to IPTV terminals.

❖ Supports HTTP and RTP protocol

- Generates a meta file for contents delivery system through HTTP and RTP protocol.

❖ Support for service using encrypted contents

- Supports service using encrypted contents by setting license related information in the meta file.

❖ Cooperation with Hitachi VOD Server series

- Meta data is automatically generated by cooperation with Hitachi VOD Server series.
- Without load-balancing system, it selects appropriate HTTP delivery server. (Hitach VOD Server/HTTP Server) based on work-load information such as CPU usage rate, the number of sessions etc. (Load balance function)
- Generates and provides One-Time URL to block illegal/unauthorized access to the contents.

❖ GUI Interface

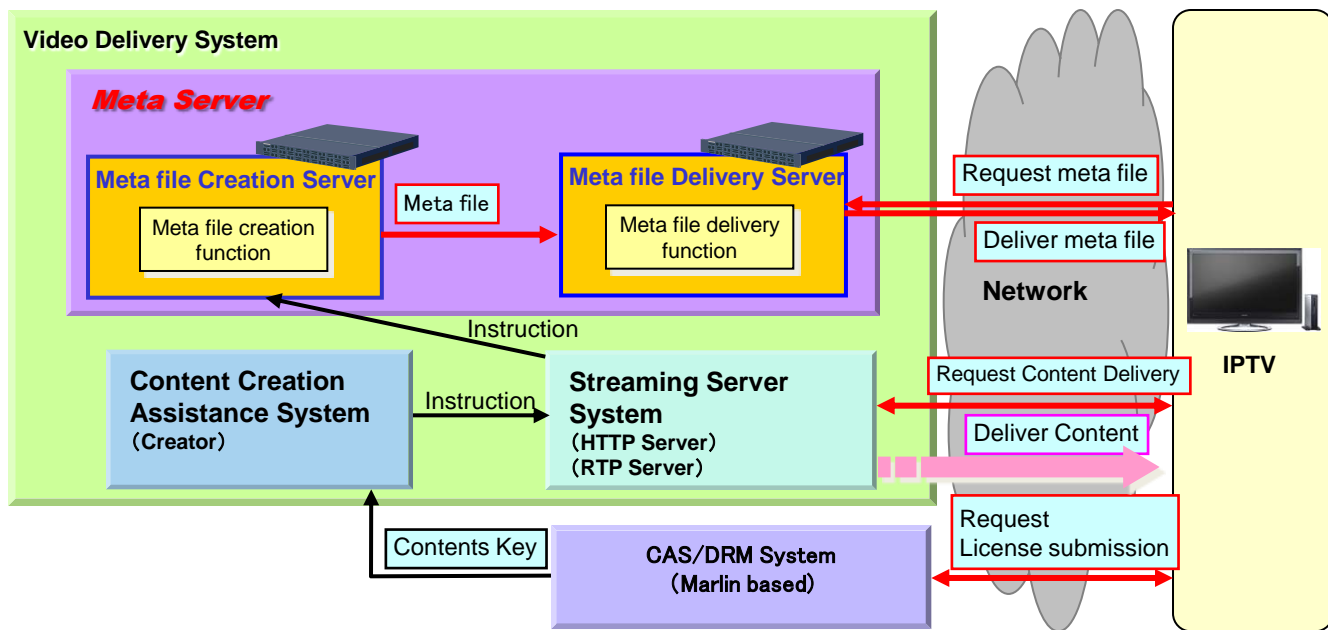
- Intuitive GUI allows administrator to generate meta files simply & easily.

❖ Meta file generation interfaces

- Has interface (CSV file format) to integrate with third party systems for Meta file generation. (besides GUI)

(*1)meta file: Format of the file complies with specification in Japan.

Sample configuration



- **Meta file Creation Server**: Generates a meta file based on input parameters from GUI or CSV.
- **Meta file Delivery Server**: Delivers a meta file generated by Meta file Creation Server to IPTV on request from IPTV.
- **Contents Creation Assistance (Optional)** : Generates double speed Play-back content from source MPEG-2 or H.264/AVC TS files. (e.g.scale x2,x4,x8...)
- **Streaming Server System (option)** : Delivers Contents on request from IPTV terminals.
- **CAS/DRM System (Marlin based)(option)**: Generates and delivers to IPTV the licenses compliant to Marlin IPTV-ES.

Specifications

❖ Hardware requirement

	Meta file Creation Server	Meta file Delivery Server	Note
CPU	Xeon 3.0GHz × 2	Xeon 3.0GHz × 2	—
Memory	4GByte	4GByte	—
HDD	100GByte	100GByte	—

❖ OS and DBMS requirement

	Meta file Creation Server	Meta file Delivery Server	Note
OS	Windows Server 2008	Windows Server 2008	—
DBMS	—	SQL Server 2008	—

❖ Software specifications

	Content	Note
Support service	HTTP(Streaming/Download) RTSP/RTP(Streaming)	—
Network	IPv4 / IPv6	—

CAS/DRM

Digital Content Rights Management System

CAS/DRM Features:

❖ CAS/DRM software compliant to Marlin technical spec

- Generates and distributes license compliant to Marlin IPTV-ES(*1) on request from IPTV terminals.

❖ Supports various contents delivery services

- Supports various type of delivery service such as VOD, Live VOD, IP multicast, video downloading, etc.

❖ Offers encryption for various contents delivery services

- Encrypts contents delivered under various type of delivery service such as IP multicast or digital TV service in real-time.
- Encrypts contents for VOD service.
- Delivers scramble function and real-time encryption function as program library so that encrypted functions can be integrated into other systems.

❖ Consolidated license management for various contents delivery services

- Controls scramble function, encryption function and real-time encryption function through the key management server and enables consolidated management of licenses of each service.
- Each service can share license delivery server which is more efficient use of server resources.

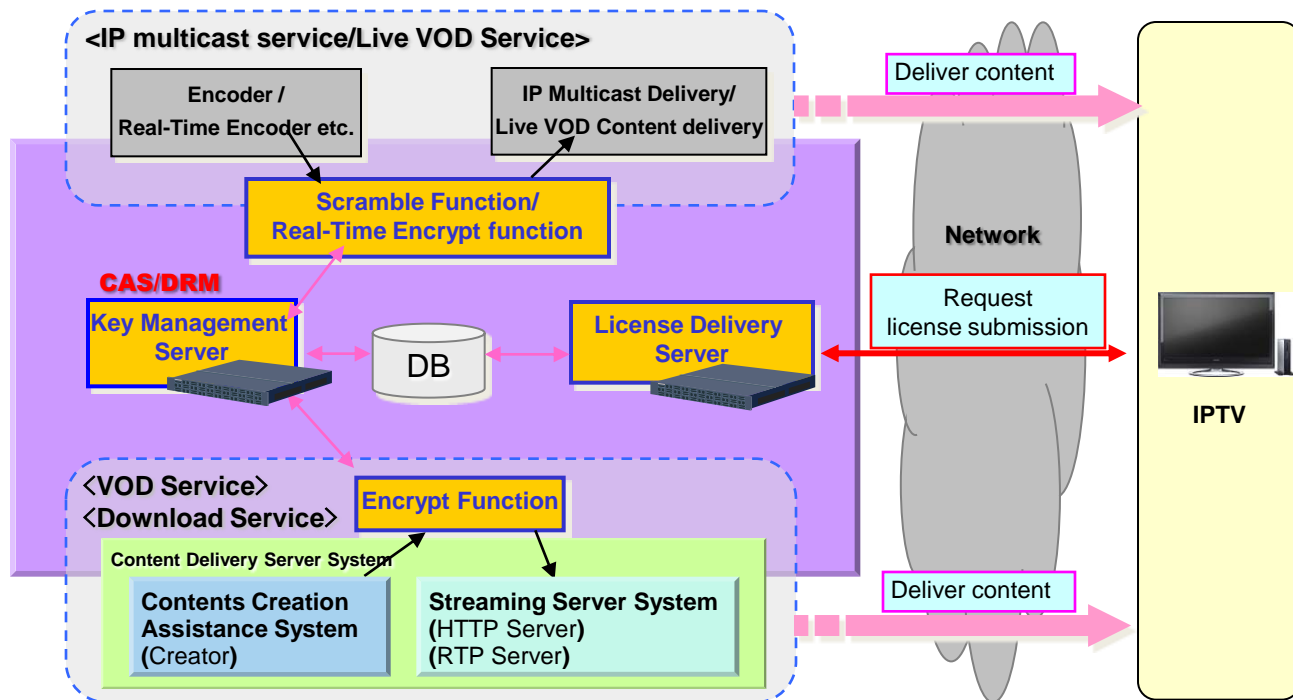
(*1)Marlin IPTV-ES:

Technical Standard to protect Digital Content Rights which technical specification is formulated by the Marlin Developer Community.

(*2)ECM (Entitlement Control Message) :

Information of use to release scramble. This is provided by Marlin IPTV-ES.

Sample Configuration



- **Key Management Server**: Manages and generates content key and work key.
 - **License Delivery Server**: License is generated and distributed on request from IPTV terminal.
 - **Scramble Function(*3)**: Encrypts content for IP multicast service.
 - **Real Time Encrypt Function (*3)**: Encrypts live content for live VOD service on real time.
 - **Encrypt Function (*3)**: Encrypts content for VOD/downloading service.
- (*3)It is possible to construct configuration for each service.
- **Streaming Server System(*4)**: Delivers contents on request from IPTV client.
- (*4)Hitachi VOD Server/RTP Server doesn't support download service.
- **Contents Creation Assistance (Option)**: Generates double speed Play-back content from source MPEG-2 or H.264/AVC TS files. (e.g.scale x2,x4,x8...)

Specifications

❖ Hardware requirements

	License Delivery Server	Key Management Server	Real-time Encrypt Server
CPU	More than Quadcore Xeon 2.33GHz	More than Dualcore Xeon 3.0GHz	More than Quadcore Xeon 2.33GHz
memory	More than 4GByte	More than 4GByte	More than 4GByte
HDD	More than 40GByte	More than 40GByte	More than 40GByte

❖ OS and DBMS requirements

	License Delivery Server	Key Management Server	Note
OS	Red Hat Enterprise Linux 5	Red Hat Enterprise Linux 5	—
DBMS	Oracle 11g or PostgreSQL	Oracle 11g or PostgreSQL	—

❖ Software specifications

	Content	Note
Digital contents copyright protection method	Marlin IPTV-ES	—
Correspondence service	VOD, Live VOD, Download, IP multicast	—
IP protocol	IPv4 / IPv6	—

Correspondence between Hitachi VOD Server and contents delivery service

Major functions	Network	VOD	Download
Contents Delivery	NGN/CDN	RTP Server	
	Internet	HTTP Server	
Contents Creation Assistance	NGN/CDN Internet	Creator	
Meta File Creation/Delivery	NGN/CDN Internet	Meta Server	
Digital Content Rights Management	NGN/CDN Internet	CAS/DRM	

❖ We can provide IP multicast, retransmission of terrestrial digital broadcasting as a solution with our package.

Other examples of contents delivery service

In company training



Self-learning



Promotion



Facility Guide



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■ Information service ■

Information on Hitachi VOD Server series is available at the following website:

<http://www.hitachi.com/products/it/network/SDP/products/>

- The content described in this document concerns functions and specifications of product lineup of Hitachi VOD Server series in February, 2012. Functions and specifications are subject to change without notice.

