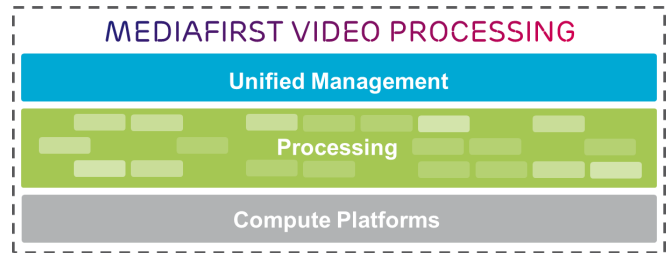




MEDIAFIRST VIDEO PROCESSING ON DEMAND ENCODING



The Inspired Solution for Increased Video on Demand Output

The Ericsson MediaFirst Video Processing on demand encoding capabilities provide a fast, high performance file based transcoding solution, specifically tuned for compelling premium services such as video on demand (VOD) and catch-up TV, delivered to a full range of devices.

MediaFirst Video Processing on demand encoding can process standard definition content at a rate of 25x real time - that makes it one of the fastest true software based transcoding solutions on the market. While other solutions may require specific hardware acceleration to achieve these speeds or quality, this processing speed is built into the MediaFirst Video Processing application. Plus, an all software solution means future enhancements are just an update away.

An all software solution also means that the MediaFirst Video Processing on demand encoding capabilities can excel in almost any environment: on bare servers, in a virtual environment or in the private or public cloud.

MediaFirst Video Processing on demand encoding is part of the Ericsson MediaFirst Video Processing suite of high quality media processing applications satisfying a range of business solutions across the media value chain and providing maximum flexibility for Service Providers, Operators and Broadcasters.

DELIVER A PREMIUM QUALITY ENHANCED EXPERIENCE

The Extreme and UP! codecs incorporated in MediaFirst Video Processing on demand encoding, developed by and unique to Ericsson have been tailored to provide the highest quality video on each device, from ultra HD to mobile resolutions for smart phones. MediaFirst Video Processing deploys many advanced adaptive pre-processing techniques to prepare the input whilst keeping the video sharp. These techniques include motion compensated temporal filter (MCTF), de-blocking filter, advanced de-interlacing for multiple screens, adjustable resolutions to match display capabilities and aspect ratio management amongst others. MediaFirst Video Processing on demand encoding also provides upscaling, downscaling and cross scaling capabilities.

For an immersive experience MediaFirst Video Processing on demand encoding supports ultra HD video definition, a wider color space and 10 bit encoding in HEVC and is also compatible with high dynamic range (HDR) technologies.

In order to make the audio and home theater experience richer MediaFirst Video Processing on demand encoding checks and adjusts the incoming sound level and carries up to eight audio tracks per channel. Dolby Digital + and Dolby Digital 5.1 are both supported.

TRANSCODE AT LIGHTNING SPEEDS

Benefiting from the quality and speed optimization focus of the Ericsson research and development teams, the MediaFirst Video Processing on demand encoding capabilities are amongst the fastest high-quality, file-based transcoders available. It can encode files in 12x real time depending on the number of output and resolutions required. It is also highly scalable, capable of transcoding thousands of hours of HD content in five resolutions and three packetization formats for any-screen delivery.

Not only is MediaFirst Video Processing on demand encoding exceptionally fast, it gets a head start by transcoding content as soon as it is ingested. The system is also capable of partially transcoding sources, leaving portions of the unwanted video out. These unique capabilities make it possible for service providers to make catch up TV assets available to viewers almost immediately after the live broadcast.

PART OF THE CONTENT PREPARATION BUSINESS SOLUTION

Although it can be used as a standalone component, it is when it is combined with other applications from the MediaFirst Video Processing suite that the on demand encoding capabilities really shine.

The other applications that are part of the Content Preparation business solution are;

- MediaFirst Video Processing Load Balancing
- MediaFirst Video Processing Packaging
- MediaFirst Video Processing VidChecker

The Content Preparation business solution manages on demand transcoding and distribution to any device.

MEDIAFIRST VIDEO PROCESSING LOAD BALANCING

ON DEMAND YET IN BALANCE

The MediaFirst Video Processing load balancing capabilities are an essential component of the Content Preparation solution and bring automation and control by optimizing the allocation of transcoding and processing resources. Load balancing is the key to transforming the maximum amount of content in the least amount of time and achieving the highest Quality of Experience (QoE) for subscribers.

OPTIMIZE SPEED, WORKFLOW AND OPERATIONS

A single load balancer can distribute processing jobs across a pool of up to 100 MediaFirst Video Processing on demand encoding instances dedicated to offline file transcoding. As video is being ingested, jobs are being created either using a watch folder or through the use of an external content management system (CMS). The load balancer assigns priorities to schedule the jobs based on predetermined workflows and awareness of current system conditions. As with MediaFirst Video Processing on demand encoding, the MediaFirst Video Processing load balancing application can be deployed on standard servers, in a virtual environment or in the private or public cloud. It simplifies operations and increases efficiency by creating a single, integrated solution that can process thousands of content files per day.

HIGH AVAILABILITY

Quality of experience is the key to subscriber satisfaction and MediaFirst Video Processing load balancer features a number of mechanisms to ensure high availability;

- Automatic reassignment of jobs in the event of interruption on the encoder
- Built in 1+1 redundancy maintains the current job list even in the event of significant disruption to the load balancer server hardware
- MediaFirst Video Processing load balancer supports redundant interfaces and power supplies while an integrated and comprehensive reporting interface supports job management and simplifies troubleshooting

CONTENT QUALITY CONTROL

MediaFirst Video Processing load balancer is fully integrated with MediaFirst Video Processing VidChecker as well as other third party video quality checking products to perform automatic asset verification within its workflow. Assets that do not meet user defined quality levels are automatically corrected or rejected saving hours of an operators time that would have been spent performing visual verification. Furthermore, through being integrated with MediaFirst Video Processing Management, aggregated alarms and reports can be integrated into the end to end service management.

CONTENT PREPARATION, THE STREAMLINED SOLUTION

The Ericsson Content Preparation solution offers an unmatched workflow: it can ingest multiple files, transform them into mezzanine files in various resolutions, check their quality automatically, then encrypt and package them just in time for each targeted network and device. The whole workflow is automated and was designed to limit storage space and the need for re-encoding when a new format surfaces.

Our Content Preparation solution benefits from years of collaboration with device manufacturers, the experience built from large scale deployments, and from intense research and development in video compression and IP delivery.

- **Automated Workflow:** From file ingestion, dynamic ad insertion, transcoding, quality control packaging and DRM formatting, the entire process is automated and interfaced with mainstream content management systems and digital rights management servers.
- **Quality Control:** The MediaFirst Video Processing VidChecker™ automated quality control and monitoring software checks files upon ingest and after encoding to ensure that the desired level of quality is obtained. This optional module can save thousands of hours of visual checking.
- **Dynamic Ad Insertion:** The metadata insertion workflow prepares the content for pre-roll, mid-roll and post-roll video advertising as well as ad replacement.
- **Massive Scale:** The solution is designed to handle hundreds of thousands of assets every day, without interruption.
- **Optimized Storage:** The output is left in a mezzanine file format and packaged for the right network or formats just in time, i.e. only when required. This leads to impressive 2x to 4x storage space savings.
- **Optimal Distribution:** Thanks to its efficient compression MediaFirst Video Processing on demand encoding software generates an estimated 20% OPEX savings on CDN distribution costs compared to other solutions.
- **Deploy Anywhere:** The entire solution is software-based and therefore can be deployed on bare-bone servers, in a virtualized environment or in public or private clouds.



Ericsson MediaFirst Video Processing On Demand Specifications

MediaFirst Video Processing On Demand Encoding

Use Case	Multiscreen Server Platform	IPTV, Cable TV, DTH/DTT Server Platform
Input⁽¹⁾		
Input Type	Up to 2 IP Ports	
File Types	A/V files: MPEG 2 TS (MPTS and SPTS), MPEG 2 PS (.ts, .mpg, .ps), MPEG 4 (.mp4, .f4v), MXF OP1-a, Quicktime (.mov, .mp4) Subtitle files: SRT	
Audio and Video Codecs (Decode)	Video: MPEG 2 SD/HD, MPEG 4/AVC (H.264) SD/HD, HEVC (H.265), IMX, XDCAM (HD & EX), HDV, XAVC, ProRes, DVCPro HD SD/HD Audio: MPEG 1 Layer II, AC3, E-AC3, AAC, HE AAC and HE ACC v2, PCM, LPCM	

Pre-Processing

File Processing	Progressive ingest, partial file processing	
Aspect Ratio	WSS; AFD; Video Index	
Metadata and VBI	IA 608/708 Closed Caption; SCTE-20, DVB Teletext; DVB-VBI, SCTE 27 (subtitles)	
Image Settings	Brightness; Contrast; Saturation; Hue; Gamma; Temperature	
Enhancement Filters	Video: De-interlacing, cropping, letter boxing, stretching, 3:2 pull down, MCTF and spatial denoising ⁽²⁾ , MPEG 2 deblocking ⁽²⁾ and smart sharpening ⁽²⁾ , cross talk filter ⁽²⁾ Audio: Loudness Control, audio gain adjustment, mute	
Image Insertion	Logo insertion	

Video Encoding

Video Codec	Extreme video codec: HEVC main/main 10 profile, H.264 baseline/main profile, H.263 profile 0, MPEG 4 Part 2 simple profile, VC-1 simple/main/advanced	Extreme video codec: H.264 baseline/main/high profile, MPEG 2 main profile
Rate Control	CBR/VBR/ABR multi-bitrate with GOP alignment for adaptive bitrate formats	CBR/Capped VBR/ABR
Data Rate	From 20 kbps to 25 Mbps ⁽³⁾	From 128 kbps to 20 Mbps ⁽³⁾
Resolutions	Ranging from 80x64 to 1920x1080 (1080p) HEVC only: 2160p/1080p x 25/30/50/60 fps Custom resolutions	576i and 480i @ 25/29.97/30 fps 1080i and 1080p @ 25/29.97/30 fps 720p @ 50/59.94/60 fps
Multistream Output	Common encoding and adaptive bitrate (ABR)	PiP ⁽²⁾ : 96x96, 128x96, 192x192

Audio Encoding

Audio Channels per Service	Up to 4 stereo pairs	Up to 8 stereo pairs
Audio Encoding	MPEG 4/MPEG 2 AAC, HE-AAC v1 and v2, MPEG 1 Layer II, AMR-NB, AMR-WB Windows Media Audio/Audio Pro	MPEG 4/MPEG 2 AAC, HE-AAC v1 and v2, MPEG 1 Layer II, MPEG 2 Layer II
Pass Through	MPEG 1 Layer II, MPEG 2 Layer II, AC-3, Dolby Digital Plus (E-AC3) 5.1-ch or stereo	MPEG 1 Layer II, MPEG 2 Layer II, AC-3, Dolby Digital Plus (E-AC3) 5.1-ch or stereo
Data Rate	From 4.75 kbps to 320 kbps	From 32 kbps to 384 kbps



Ericsson MediaFirst Video Processing On Demand Specifications

MediaFirst Video Processing On Demand Encoding

Use Case	Multiscreen Server Platform	IPTV, Cable TV, DTH/DTT Server Platform
Post Processing		
Metadata	Thumbnail Generation: HTTP live streaming (HLS) Subtitles: DVB subtitle, web VTT, DVB txt, DFXP, Closed Caption, SCTE 20, SCTE 35 pass through, Nielsen watermarking conversion to ID3	EIA 608/708 closed caption, DVB teletext, SCTE 35 pass through
Encryption⁽²⁾	AES encryption for HTTP Live Streaming (HLS), PlayReady for Smooth Streaming, internal or external key generation with interface for major DRM and CAS vendors	

Monitoring and Control

Control and System Protocols	SOAP, HTTP, NTP, FTP, IGMP v2/v3, SNMP v2
Reliability	High availability with MediaFirst Video Processing load balancing

Output

File Format	3GPP single and multi-rate (.3gp), ISMA (.mp4), HTTP Live Streaming (.ts), MPEG 4 and Flash (.mp4), Windows Media (.wmv), Smooth Streaming (.ismv)	MPEG 2 TS (.ts)
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Compatible Deployment Models

Standard Servers	MediaFirst Video Processing G6, 4Caster G4, 4Caster C4 Gen III
Software Only	Guaranteed performance on HP BladeSystem and Cisco UPS blades ⁽⁴⁾

(1) Check standard server datasheet for availability. (2) Option. (3) Depends on codec and resolution. (4) For more details contact Ericsson

MediaFirst Video Processing Load Balancing

External Interfaces

Interface to Quality Control MediaFirst Video Processing VidChecker	SOAP/XML
Interface to MediaFirst Video Processing On Demand Encoding	SOAP/XML for up to 100 managed devices
Interface to Content Management System (CMS)	SOAP/XML API to job provisioning system

Encoding Preset Management

Format Type	XML Create, download, remove preset Default preset
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Encoding Job Management

Encoding Job Distribution	First in/first out and prioritized encoding job distribution to encoder pool Job history Partial encoding Interface with CMS
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Ericsson MediaFirst Video Processing On Demand Specifications

MediaFirst Video Processing Load Balancing

Use Case

**Multiscreen
Server Platform**

**IPTV, Cable TV, DTH/DTT
Server Platform**

Encoding Job Management

Watch Folder

Encoding job associated per watch folder
Watch folder access: Common Internet File System (CIFS), FTP/SFTP

Dynamic Ad Insertion

Dynamic ad insertion workflow support: from CMS metadata provisioning, assets are conditioned for pre/mid/post roll and cue point metadata are inserted

Security

User profiles and rights management

Integrated QC Software

Quality control (QC) software integration with MediaFirst Video Processing VidChecker and Interra Baton

Reporting

Encoding job status display on web-based interface
Encoding job status notification by SNMP, syslog or email (SMTP) to multiple destinations
Encoding job history report with configurable history period in XML format
Job video quality available in the user interface

Monitor and Control

Remote

Control and system protocols: SOAP, HTTP, NTP
Web based interface for monitoring and control
Alarm protocols: SNMP v 2
Firmware remotely upgradable

Application Data Protection

1+1 Active passive redundancy mode
External encoding job list and status storage: CIFS
Save/Restore configuration

Compatible Deployment Models

Software Only

Guaranteed performance on HP BladeSystem and Cisco UPS blades⁽¹⁾

⁽¹⁾ For more details contact Ericsson