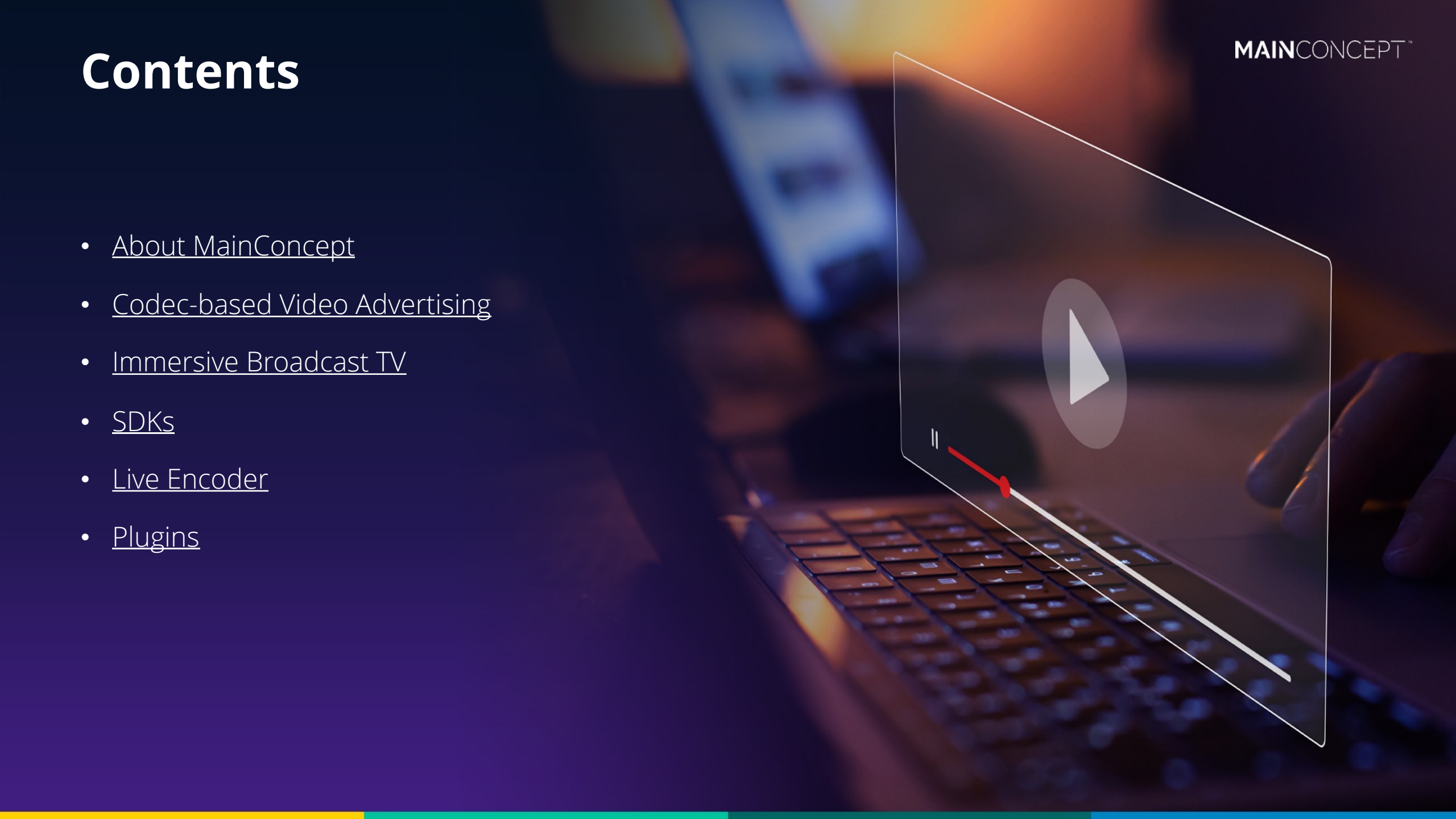
MAINCONCEPT

NAB 2023

April 16, 2023 | Las Vegas Convention Center, NV

Contents



Notable news

- Advertising advancement with HEVC and VVC
- Next-generation broadcast capabilities
- 1st multilayer VVC live encoding: 8K, 4K, 1080p
- VVC encoder & decoder available now
- MainConcept's 30th anniversary

MainConcept @ CELEBRATING 100 NABSHOW

1993 2023 30 years

MAINCONCEPT

VVC SDK & FFMPEG PLUGIN

MainConcept VVC Encoder & Decoder SDK

MainConcept VVC Encoder Plugin for FFmpeg

Industry 1st: Multilayer live streaming: 8K60, 4K60, 1080p60

CODEC-BASED AD TECHNOLOGY

Uses VVC and HEVC to deliver ads in new ways

Enhance ad platforms with more engaging ads

Simple, efficient and immersive

IMMERSIVE BROADCAST TV

Next-generation broadcast capabilities with VVC

Brazil trials with Fraunhofer IIS, InterDigital, Philips & V-Nova in support of SBTVD TV 2.5 & 3.0

Fraunhofer IIS: MPEG-H and xHE-AAC Audio collaborations

BaM abm AWARDS 2023 FINALIST

DID YOU KNOW?
MainConcept technologies are used to process over 90% of today's professional videos

Production

Broadcast

Streaming

Gaming

Surveillance

Medical

Digital Signage

Ad-Tech

The MainConcept Portfolio

PRODUCTS

SDKs

- VVC
- HEVC
- AVC
- MPEG-2
- AV1
- Apple ProRes
- Dolby Digital
- Fraunhofer
- Audio (AAC, PCM...)
- Streaming

...and many more

Plugins

- FFmpeg
- Blackmagic Design
- Adobe
- Decoders

Applications

- Live
- Cloud
- Transcoding

OPERATING SYSTEMS

FRAMEWORKS

SILICON

arm

INGEST

- MP4/ISO BMFF
- MPEG PS/TS/SS
- MXF

- ASF/WMV

- 3GP
- DV/DIF
- F4V
- MJ2
- DCI

- RTP/RTSP
- RTMP
- ICECAST
- DASH/HLS
- SRT
- Zixi*

- AVCHD
- Sony XAVC
- Sony XAVC 2.0/XAVC HS
- Sony XDCAM
- Panasonic DVCPRO
- Panasonic AVC Ultra
- Canon XF-HEVC

- IMF RDD-45
- DVD/Blu-ray

DECODE

- AVC/H.264
- HEVC/H.265
- VVC/H.266
- MPEG-1/2
- JPEG 2000

- DV/DVCPRO 25/50/HD
- Avid DNxHD/DNxHR
- Apple ProRes

- MJPEG
- MPEG-4 Part 2/H.263
- VC-1

- DXVA MPEG-2
- DXVA AVC/H.264
- DXVA HEVC/H.265
- AVC/H.264 Intel QSV
- HEVC/H.265 Intel QSV
- AVC/H.264 NVIDIA NVDEC
- HEVC/H.265 NVIDIA NVDEC

- AAC & HE-AAC
- AMR
- Dolby Digital
- MPEG Audio Layer I-III
- PCM
- WMA

PROCESS

- Color Space Converter
- Framerate Converter

- SCTE-35

- Smart Rendering AVC/H.264
- Smart Rendering MPEG-2

- Audio Converter

ENCODE

- AVC/H.264
- HEVC/H.265
- AV1
- VVC/H.266
- LCEVC/MPEG-5 Part 2*
- EVC/MPEG-5*
- MPEG-1/2
- JPEG 2000

- DV/DVCPRO 25/50/HD
- Avid DNxHD/DNxHR

- MJPEG
- MPEG-4 Part 2/H.263
- VC-1

- AVC/H.264 Intel QSV
- HEVC/H.265 GPU Acceleration
- HEVC/H.265 Intel QSV
- AVC/H.264 NVIDIA NVENC
- HEVC/H.265 NVIDIA NVENC

- AAC & HE-AAC
- xHE-AAC
- MPEG-H
- AMR
- Dolby Digital
- MPEG Audio Layer I-III
- PCM
- WMA

FORMAT

- MP4/ISO BMFF
- MP4
- MPEG PS/TS/SS
- MXF

- ASF/WMV

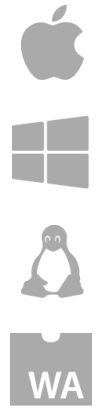
- 3GP
- DV/DIF
- F4V
- MJ2
- DCI

- AVCHD
- Sony XAVC
- Sony XDCAM
- Panasonic DVCPRO
- Panasonic AVC Ultra

DELIVER

- MPEG DASH
- Apple HLS
- CMAF
- SRT
- Zixi*
- OTT Live/VOD

- RTMP/RTMPS
- RTP/RTSP
- UDP



* Future products

Feature Licensing: Options to Enhance the Core SDK

AVC Decoder

Broadcast – 4:4:4 12-bit, unlimited resolution, more audio and demultiplexing options

AVC Encoder

Broadcast – 4:2:2 10-bit, more audio & multiplexing options

SVR360 – encode in virtually unlimited resolution, designed for 360/VR applications

HEVC Encoder

422 Chroma – 4:2:2 enabled

SABET – Smart Adaptive Bitrate Encoding Technology (multi-layer)

Hybrid GPU acceleration – GPU Accelerated Encoding on NVIDIA RTX boards

Broadcast Streaming

Network Client SDK – RTMP, HLS and Microsoft Smooth Streaming support

Network Server SDK – RTSP server sample source code with RTMP and RTMPS support

HDR Conversion

PQ/HDR-10 to HLG, HLG to PQ/HDR-10 and PQ/HDR-10 to SDR transformation available for:

AVC Video Decoder, HEVC Decoder, Apple ProRes Decoder, Color Space Converter

Audio Encoder

xHE-AAC – multi-pass encoding for DRC measurement and USAC (xHE-AAC) audio

Our Focus

CORE CODECS

VVC
HEVC
AVC

PACKAGING

Mux
Demux
File formats

OPTIMIZATION

ARM
GPU
Servers
Cloud

SERVICES

Support
OSS Integration
Customization
Legacy

Why MainConcept?

REDUCE COSTS

Leverage MainConcept support and professional services instead of increasing your staff

MINIMIZE RISK

Count on MainConcept experts to make sure you have the right tools to do the job

FUTURE-PROOF WORKFLOWS

Keep your content accessible today and every day with our expansive (and still growing) library of codecs

ENDEAVOR

OUR NETWORK

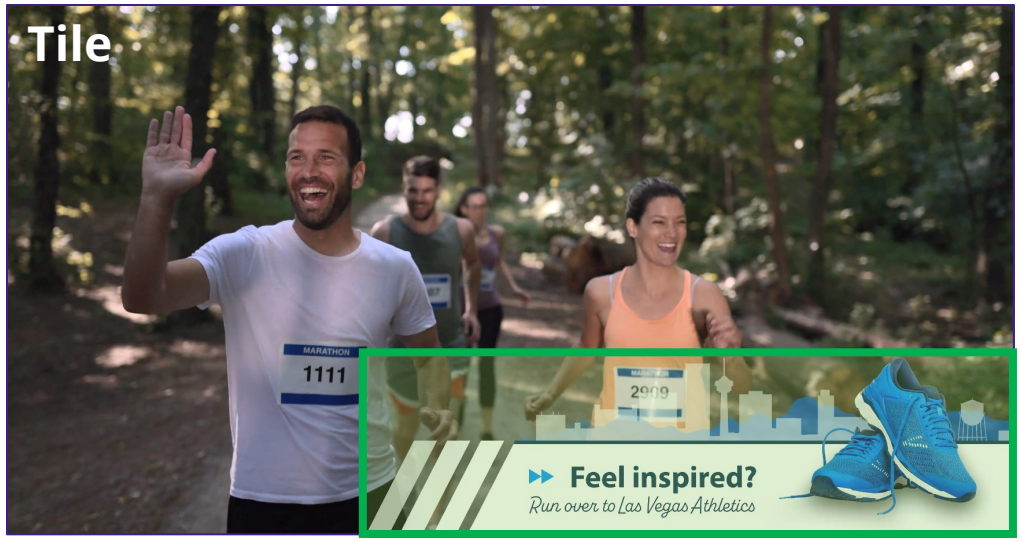
WME
IMG
UFC
ON LOCATION
RIO OPEN
ONE SIXTY NINETY
Euroleague Basketball
NYFW THE SHOWS
frieze
ENDEAVOR STREAMING
MAINCONCEPT
IMGARENA
WME SPORTS
PBR
SAILGP
SPORT 24
Hyde Park Winter Wonderland
IMG ACADEMY
IMG MODELS
IMG MEDIA
miami open presented by Itaú

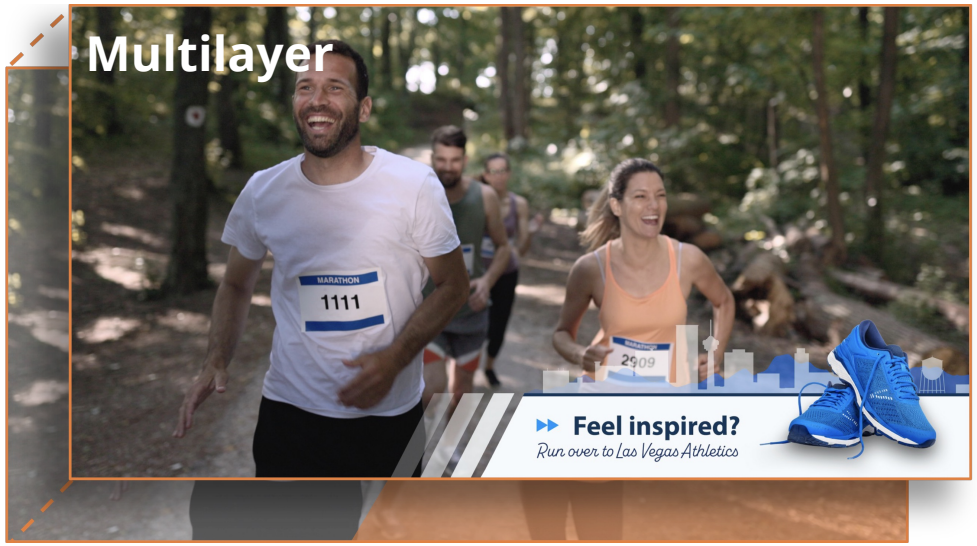
Codec-Based Video Advertising

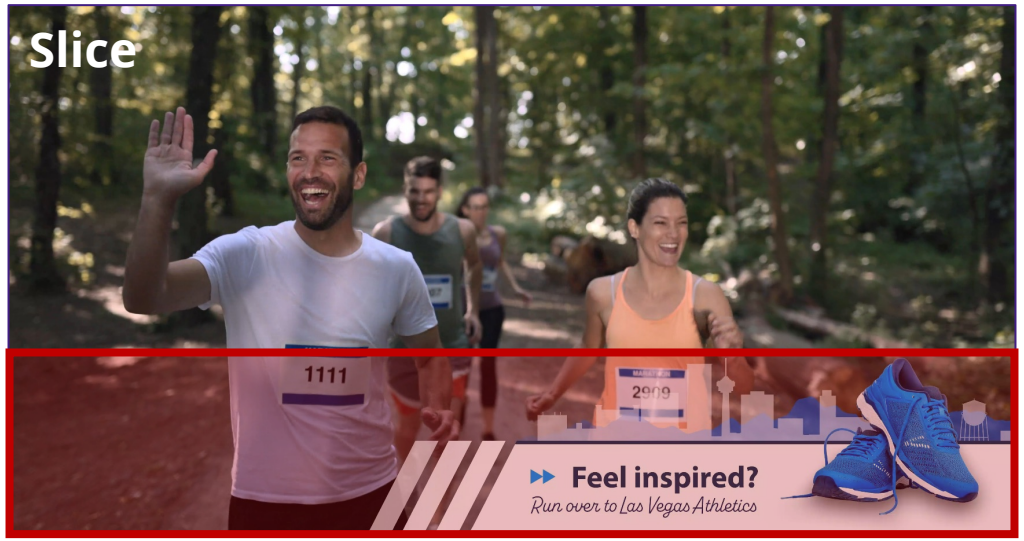
Enhance your platform with more engaging ads

Ad insertion

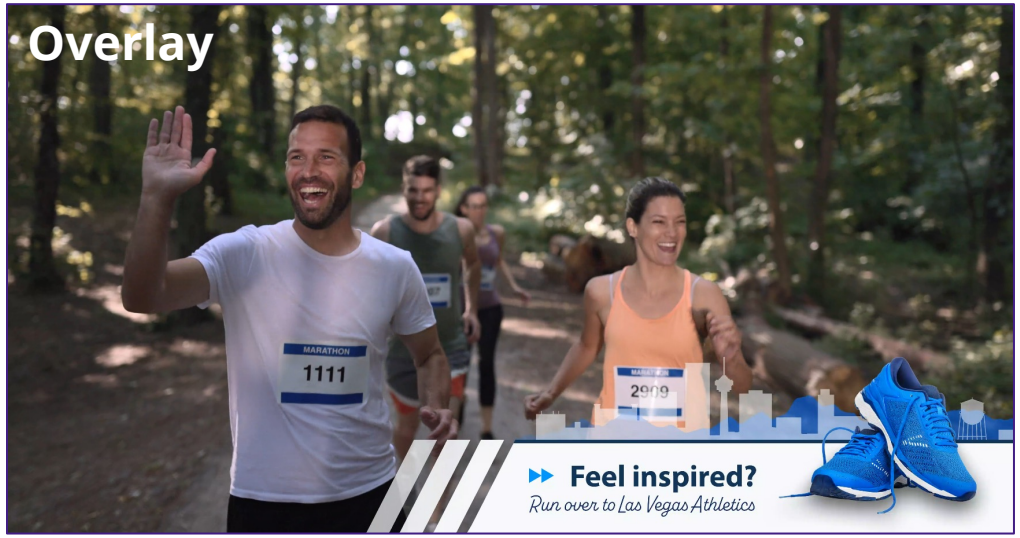
Types

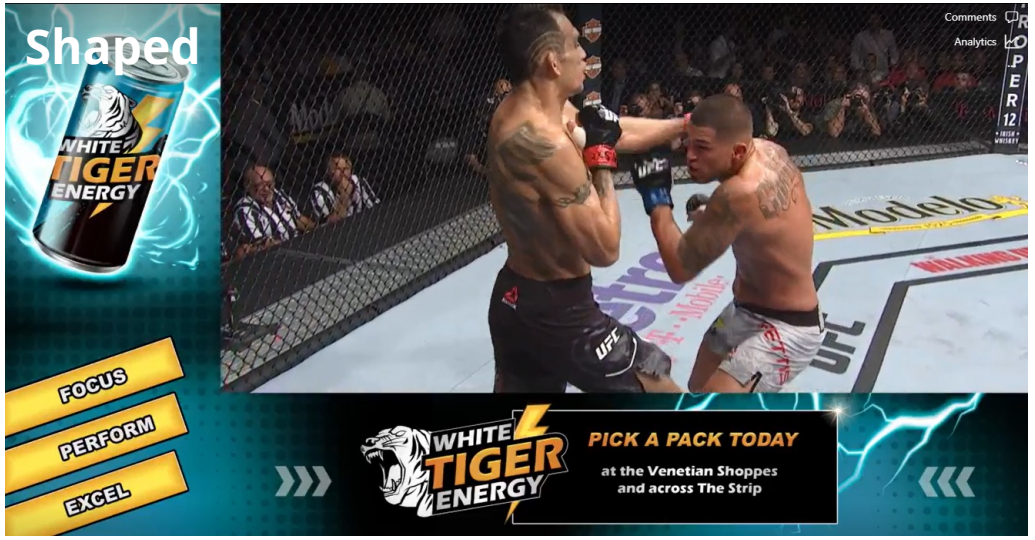






Ad placement





Products

	Insertion Type			Placement		
Codec	**Tile**	**Multilayer**	**Slice**	**Overlay**	**Shaped**	**Immersive**
VVC	√	√	√	√	√	√
HEVC	√		√	√	√	√
AVC			√	√		
AV1	√		√	√		√

SCTE-35 is used for marking start and stop times of ad placement no matter the codec

Server-Side Ad Insertion

Benefits

DEVICE INDEPENDENT

Deliver ads to any device, even legacy

BYPASS ADBLOCKERS

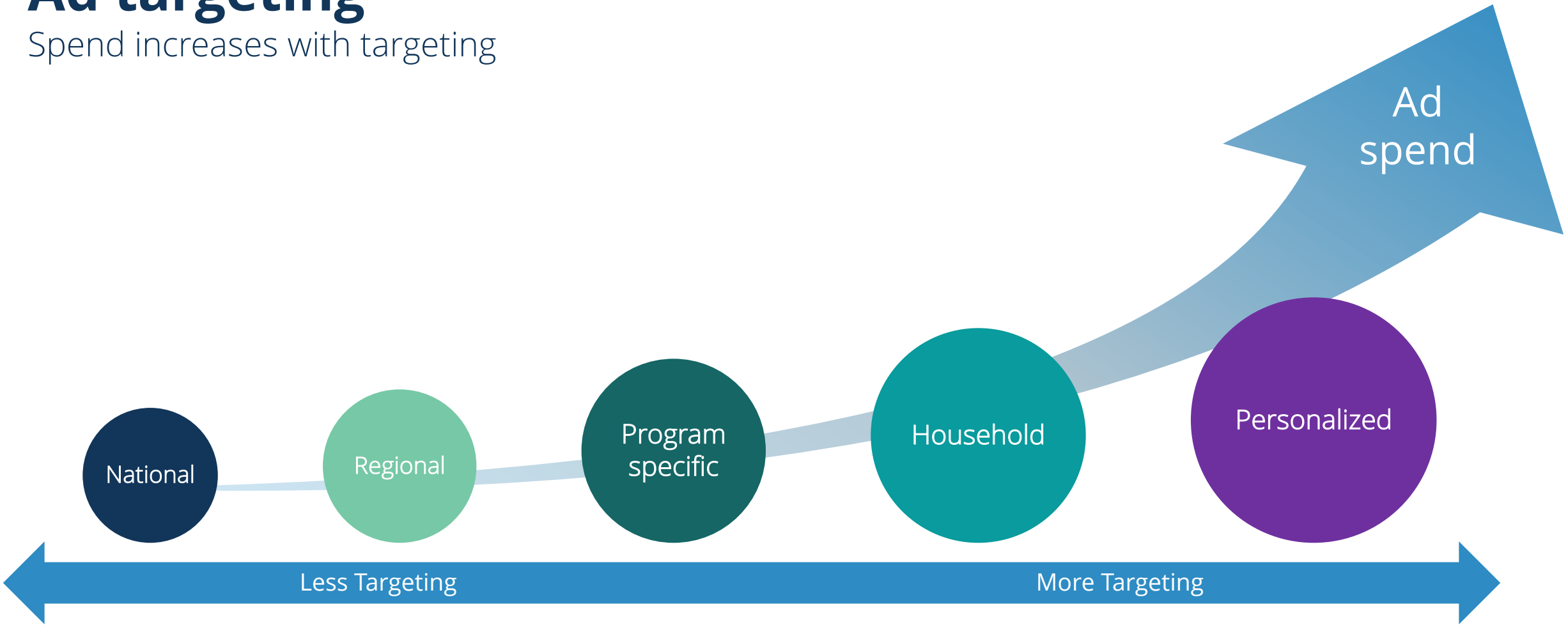
Better prevents ad skipping or forwarding

ALLOWS CONTENT-SPECIFIC AD PLACEMENTS

Enables the highest level of ad immersion

Ad targeting

Spend increases with targeting



Broadcasters want better targeting and greater personalization

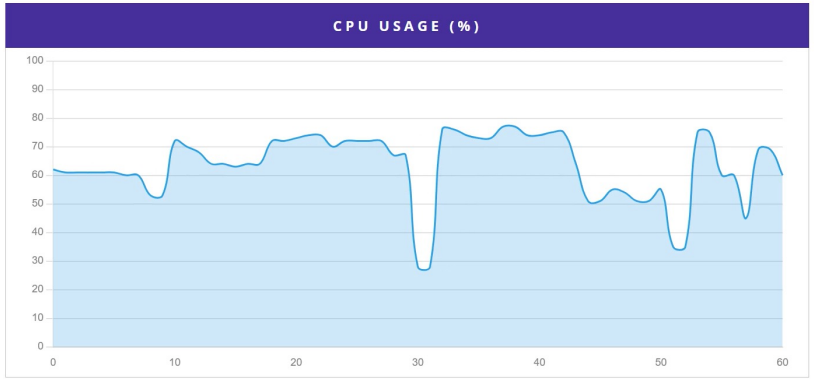
How are you using ad tech today?

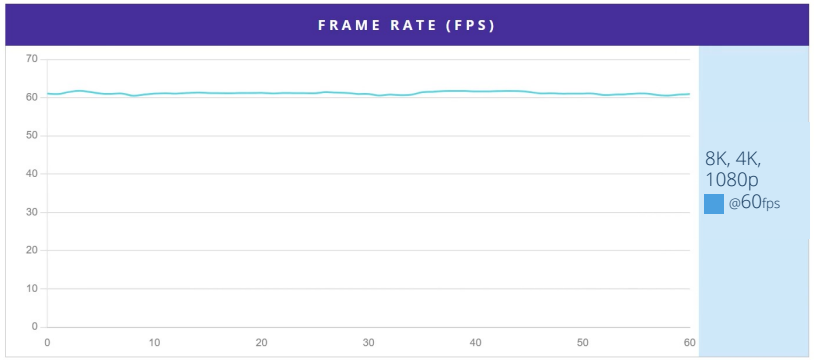
Immersive Broadcast TV

Adopt next-generation standards with VVC, LCEVC and MPEG-H

VVC live at 60fps in 8K, 4K and HD

Industry 1st: simultaneous multilayer VVC/H.266 live encoding





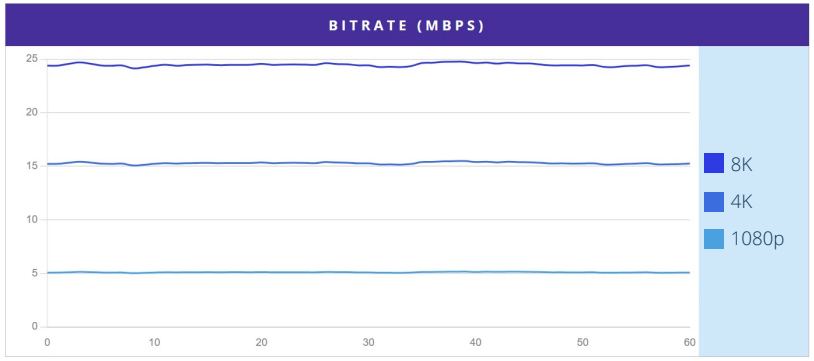
NEXT-GENERATION DELIVERY CODEC FOR OTT & BROADCAST

Cloud-enabled VVC Live & VOD Encoding Solutions

- Multi-layer DASH VVC 10-bit encoding in AWS
- Future format embedded in SBTVD TV 3.0 and DVB specifications
- Huge cost savings compared to HEVC/H.265 & AVC/H.264
- Available as an SDK, FFmpeg Plugin and with MainConcept Live Encoder

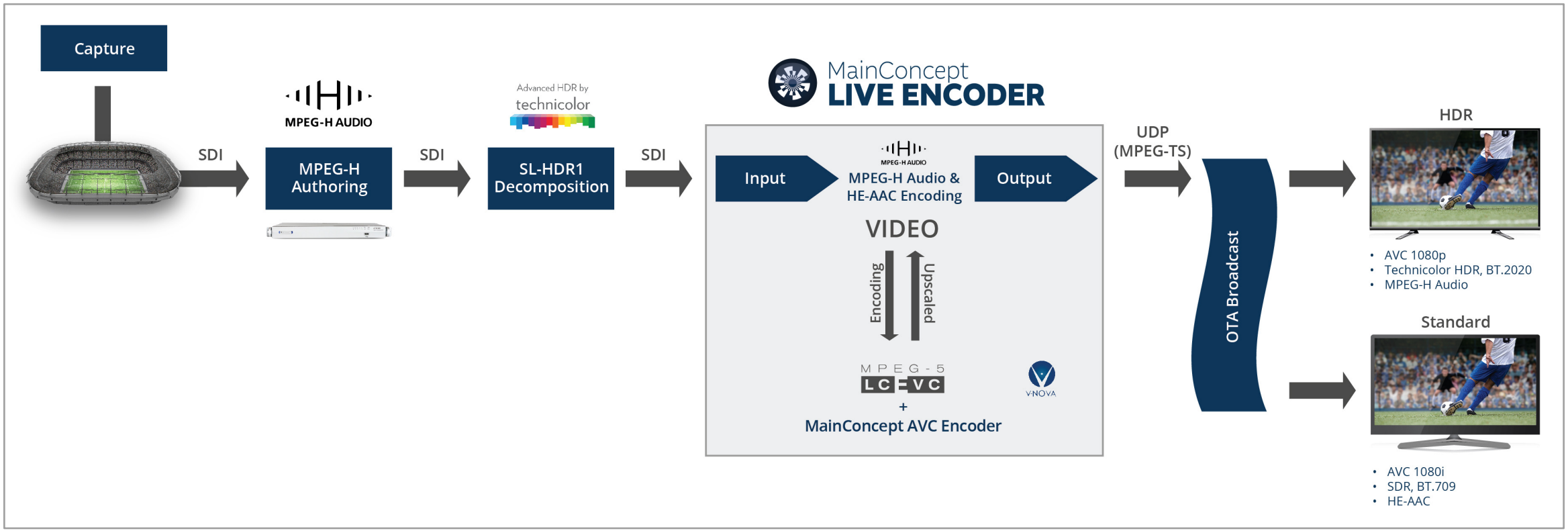
vvc

aws



Traditional+ Workflow

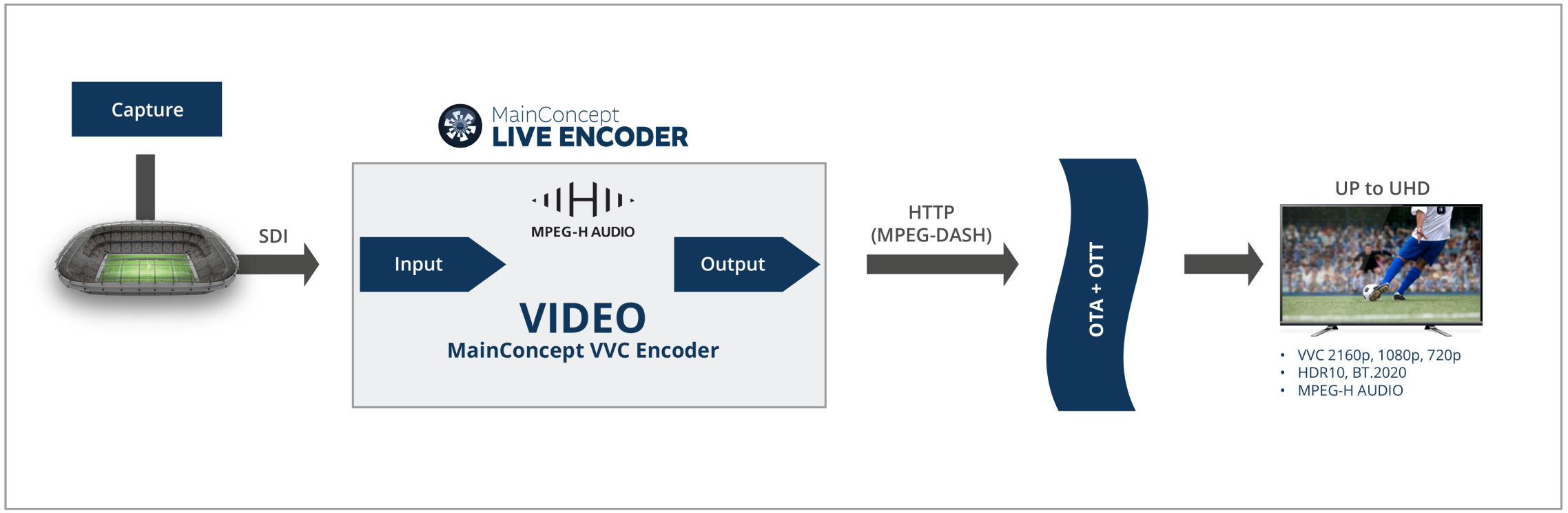
MPEG-H Audio + SL-HDR1 + AVC + LCEVC



- MainConcept Live Encoder with AVC SDK processes the video and audio content
- Allows higher video and audio quality on existing playback devices
- Part of the SBTVD TV 2.5 standard in Brazil

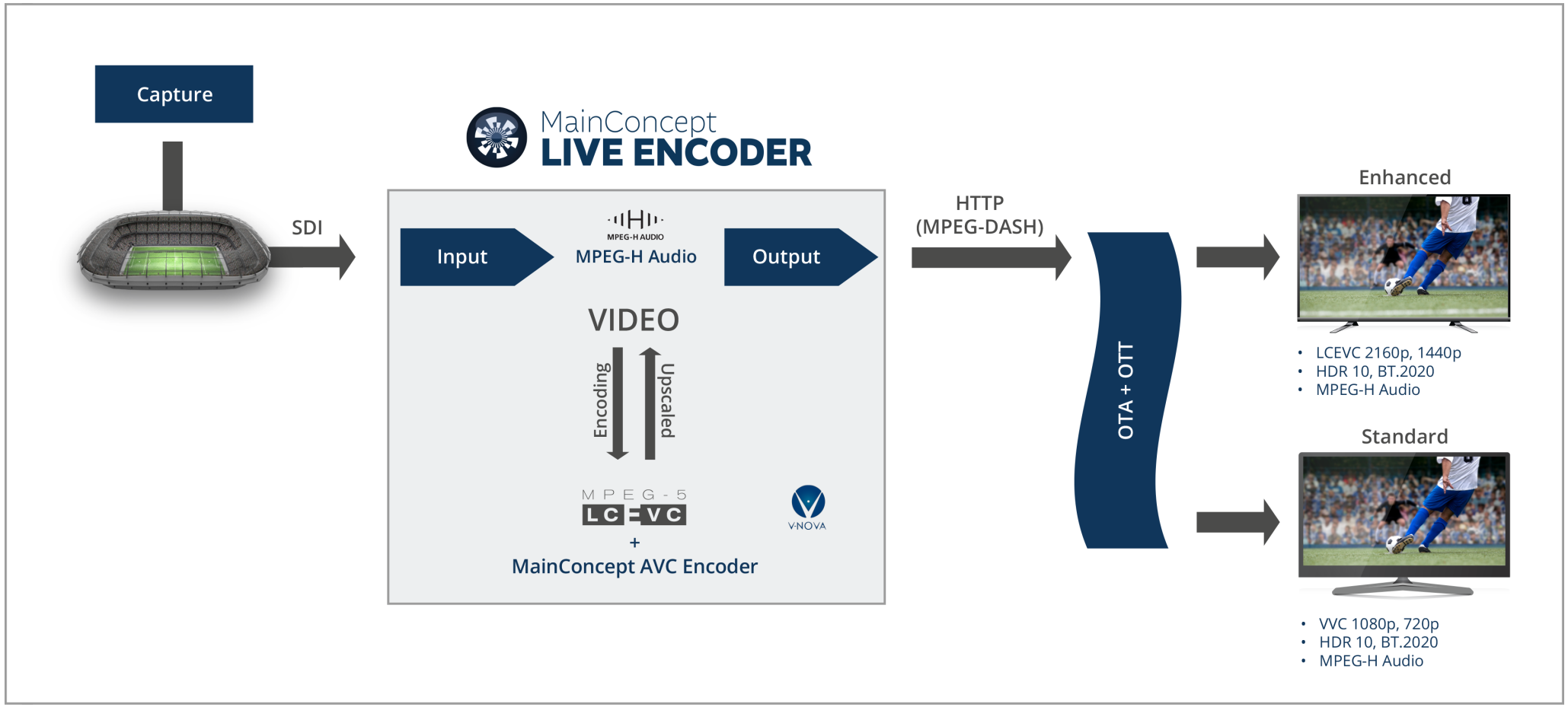
Next-Generation Workflow

Option 1: VVC



Next-Generation Workflow

Option 2: VVC + LCEVC

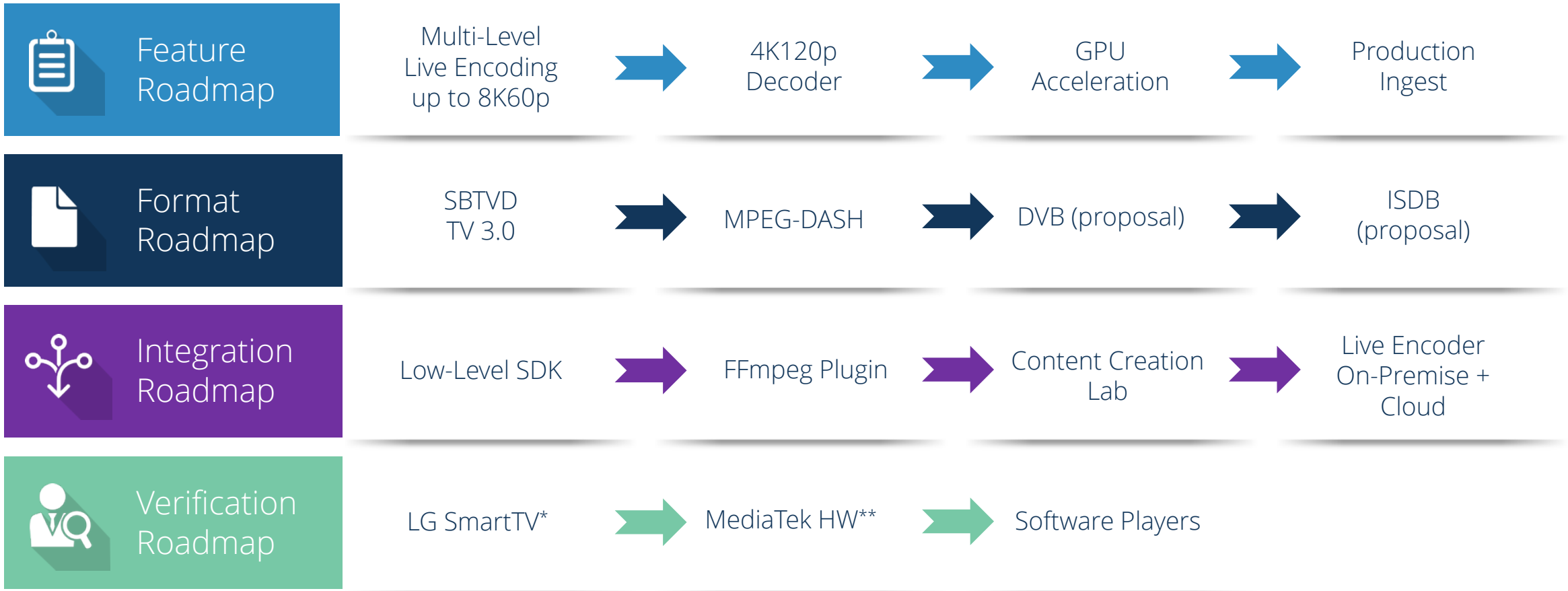


SDKs and more

VVC, HEVC, AVC, MPEG-2, WebAssembly, GStreamer

MainConcept VVC/H.266

Codec Evolution for the Next Level of Broadcast Experience



* Requires firmware update to support VVC

** Pre-release MediaTek development hardware up to 8K

VVC/H.266 Encoder & Decoder

Next-generation 4K and 8K delivery

FAST

Real-time right from the start

INNOVATIVE

Extended resolution at same bitrate over existing channels

BROADCAST AND OTT

Ready for distribution

TODAY

Encoder

- Live & VOD 10-bit in up to 8K
- HDR signaling
- Embedded in SBTVD and DVB
- New coding tools for up to 8K resolution
- MPEG-2 TS & MP4 multiplexing
- MPEG-DASH output & MPD generation

Decoder

- 4:2:0 10-bit real-time playback
- Multilayer streaming of 8K, 4K, 1080p

COMING SOON

Encoder

- GPU acceleration
- SABET (Adaptive Bitrate Encoding)
- Additional Rate control modes
- MMT multiplexing

AVAILABILE NOW

VVC Encoder SDK
VVC Decoder SDK
VVC Encoder Plugin for FFmpeg

COMING SOON

Live Encoder with VVC

HEVC/H.265

Unmatched quality and performance

EFFICIENT

30% more efficient than open source[1]

VERSATILE

Decode & Encode add-ons deliver even higher performance

FLEXIBLE

Optimized for low-, adaptive-, and high-bitrate 8K quality

FEATURES

- 8K60 Hybrid GPU accelerated 10-bit live video encoding[2]
- 4:2:2 10-bit sampling
- HDR decoder with support for HLG/PQ and SDR conversion
- Extended HDR format signaling for DVB Video encoding
- Available for x86 and ARM chipsets
- NVIDIA & Intel QSV hardware encoding & decoding

PACKAGES

HEVC Encoder SDK

+ 4:2:2 support[2]
+ Hybrid GPU acceleration[2]
+ SABET

HEVC Decoder SDK

+ Canon XF-HEVC Ingest
+ HDR Conversion
+ WebASM[2]

[1] Source: MSU 4K codec performance comparison
[2] Optional add-on

AVC/H.264

High-definition video has never been faster or looked better!

FAST

2x faster than open source[1] & 20% faster than previous generation[2]

FLEXIBLE

2-pass encoding & support for UHD and HDR

SCALABLE

NVIDIA & Intel QSV hardware encoding & decoding

FEATURES

- Precise bitrate adherence for encoding to on-demand video targets
- HDR support for HLG and PQ/HDR-10 encoding
- Unrivaled range of encoding presets
- Professional camera support for Sony XAVC & Panasonic AVC Ultra
- Frame-accurate smart rendering for AVC Intra and other pro formats
- One API for software or hardware (NVIDIA NVENC & Intel QSV) encoding

PACKAGES

AVC Encoder SDK
AVC Broadcast Encoder SDK
\+ SVR360[2]
\+ Smart Rendering[2]

AVC Decoder SDK
AVC Broadcast Decoder SDK

[1] According to recent encoder test data comparing MainConcept AVC against x264
[2] Compared to previous version of MainConcept AVC

MainConcept + LCEVC

Enhancing current and next-gen codecs

LIGHTWEIGHT

Reduces processing time for encoding and decoding

FLEXIBLE

Enhances any base codec up to 45% in comp. efficiency

COMPATIBLE

Playback even on legacy devices

ENCODING

- Integrated with MainConcept AVC, HEVC and VVC
- Supports MPEG-DASH live streaming
- SBTVD TV 2.5 & TV 3.0 approved

DECODING

- Device support for Smart TVs and STBs
- Software players for PC/Mac and x86/Arm
- Browser players
- Mobile device players for iOS and Android

AVAILABLE SOON

- FFmpeg Plugin
- Live Encoder
- Content Creation Test Lab
- SDK

V-NOVA | MPEG-5 LCEVC | FÓRUM SBTVD

MPEG-2

Fast, flexible and feature-rich

FAST

2x faster than the prior generation

COMPATIBLE

Supports legacy formats and frameworks

FEATURE RICH

2-pass encoding, 4:2:2 10-bit support

PRE-CONFIGURED ENCODING PROFILES

- MPEG-2 based digital TV formats like DVB and ATSC
- Professional camcorders like Ikegami GF and Sony XDCAM
- Real-time decoding of consumer, professional & broadcast MPEG-2 formats

STREAM TYPES & FORMATS

- **Elementary Stream**: Generic MPEG-1 and MPEG-2 Elementary Streams
- **Transport Stream**: Blu-ray Disc, HD DVD, DVB, ATSC, ATSCHI, DVHS, D10 & HD configs
- **Program Stream**: VCD, SVCD, DVD MPEG-1
- **System Stream (LL)**: Generic MPEG-1 System Streams
- **MP4**: Sony XDCAM EX
- **MXF**: Sony XDCAM HD, Sony XDCAM IMX, Ikegami GFCAM, D10

PACKAGES

MPEG-2 Encoder SDK
MPEG-2 Decoder SDK
MPEG-2 Smart Rendering SDK

WebASM HEVC Decoder

Browser-based preview, playback, editing and monitoring

SCALABLE

Broad browser, OS and device support

SECURE

Safe viewing of videos anywhere

EFFICIENT

Industry leading HEVC decoder

ADD HEVC PLAYBACK TO ALMOST ANY BROWSER TO GET

- High quality video in up to 8K 14-bit 4:4:4
- Minimized bandwidth via high compression
- Optimized CPU usage with multi-threading support

IDEAL FOR

- Low latency playback
- Previewing live IP camera feeds within a secure internet browser
- Low-bandwidth and mobile data connections

Browsers

Devices

Performance Gains v2.1 vs. v2.0

up to 20%

up to 35%

GStreamer

A complete encoding and transcoding pipeline for OTT and broadcast workflows

SIMPLE

Develop & deliver live and on-demand video content

FLEXIBLE

Deliver content to any device

SCALABLE

NVIDIA NVENC & IQSV hardware encoding

BROADCAST DELIVERY

- Closed caption support
- PID for elementary stream
- Program names in SDT tables
- DVB subtitles support
- SCTE-35 messaging

Includes

- HEVC/H.265 encoder
- AVC/H.264 encoder
- Fraunhofer AAC and MPEG audio encoders
- MPEG-2 TS multiplexer

OTT CONTENT CREATION

- CMAF-DASH, MPEG-DASH and Apple HLS
- OTT ladder presets
- Multi-language track
- Intel QSV and NVIDIA NVENC
- Hybrid GPU for HEVC (optional)

Includes

- HEVC/H.265 encoder
- AVC/H.264 encoder
- Fraunhofer AAC encoder
- CMAF/DASH/HLS presets
- Multiplexers and file generators

MainConcept on ARM

Seamless Transition / Optimized Performance / Pro Camera Support

DESKTOP COMPONENTS

Video

- HEVC
- AVC
- MPEG-2
- MPEG-4
- DVCPRO
- DV25/50
- DV
- Subpicture Decoder
- DNxHR (macOS)

Audio

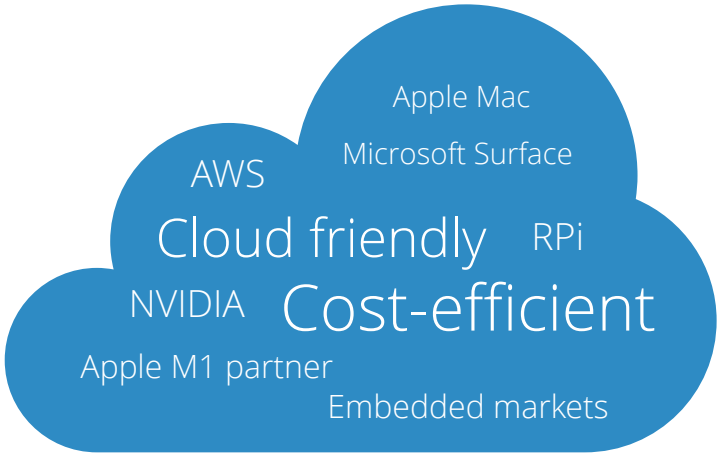
- AAC
- MPEG-Audio
- PCM

Format

- MP2
- MP4
- MXF
- MPEG-DASH
- CMAF
- HLS

Transform

- Audio Converter
- Color Space Converter
- HDR Converter
- Framerate Converter



MainConcept Live Encoder

Live Encoder

Real-time AVC/HEVC video encoding for adaptive streaming in up to 8K 10-bit

EFFICIENT

Cost-effective HEVC 8K60 10-bit live encoding

FLEXIBLE

Deployment via intuitive web UI or powerful REST API

SCALABLE

Works on-premise, in-the-cloud and with hybrid workflows

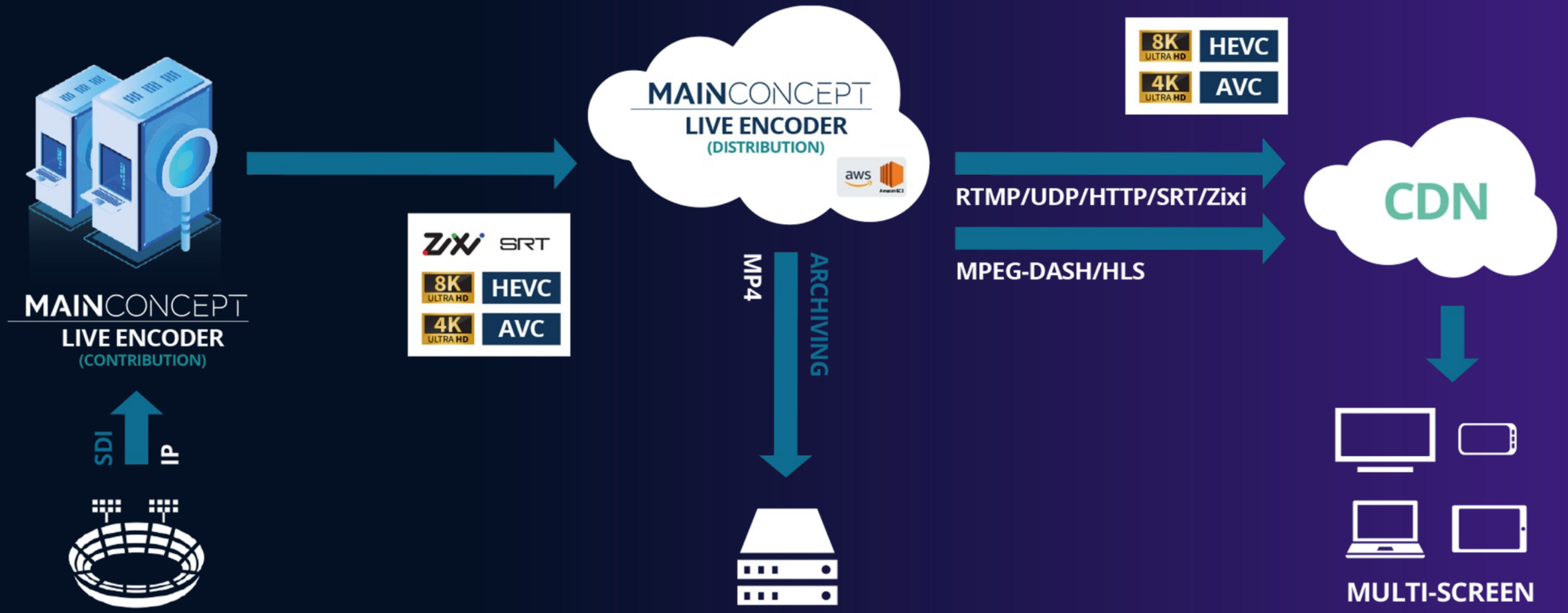
FEATURES

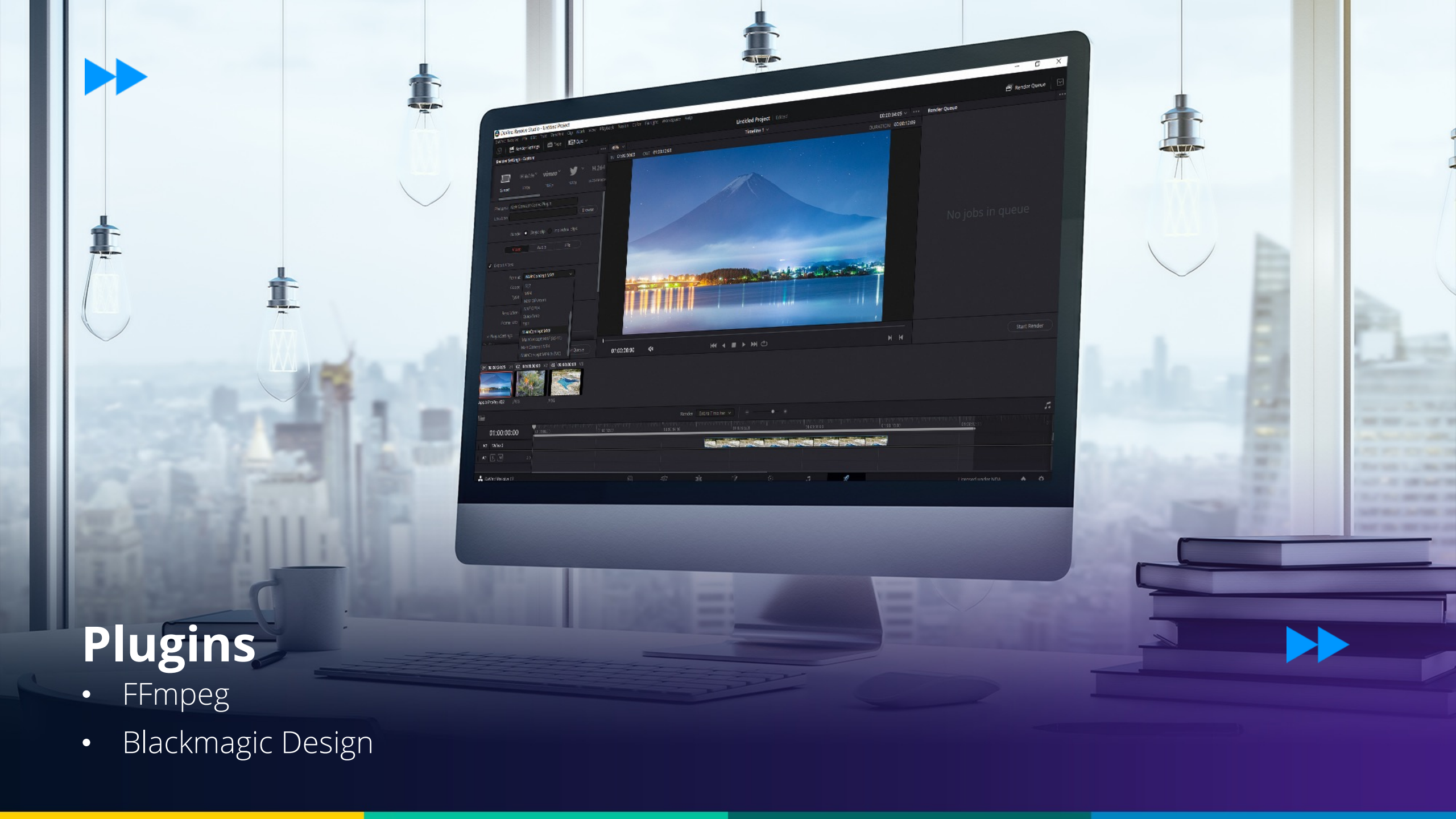
- Common SDI and IP input sources
- Intel & NVIDIA powered hardware and MainConcept software decoding for ingest
- AVC & HEVC hardware and software encoding modes
- GPU accelerated HEVC 8K60p encoding on NVIDIA RTX boards
- Object-based MPEG-H 3D audio creation
- MPEG-DASH, Apple HLS, SRT, RTMP, RTSP, HTTP, etc. output (incl. MP4 archiving)
- TS over UDP/HTTP output, incl. Program / Service Name, ID, Provider support
- Integrated CDN support for Akamai & Amazon CloudFront
- Redundancy & failover management
- Available for Windows and Linux

COMING SOON

- Zixi ingest and output
- NVENC AVC encoding
- VVC/H.266 live encoding up to 8K
- LCEVC plus AVC, HEVC & VVC
- SBTVD TV 2.5 & TV 3.0 presets
- Accelerated AV1 live encoding
- Full AWS, Google Cloud and Microsoft Azure deployment
- CMAF-DASH low latency encoding and packaging

Live Encoder Workflow

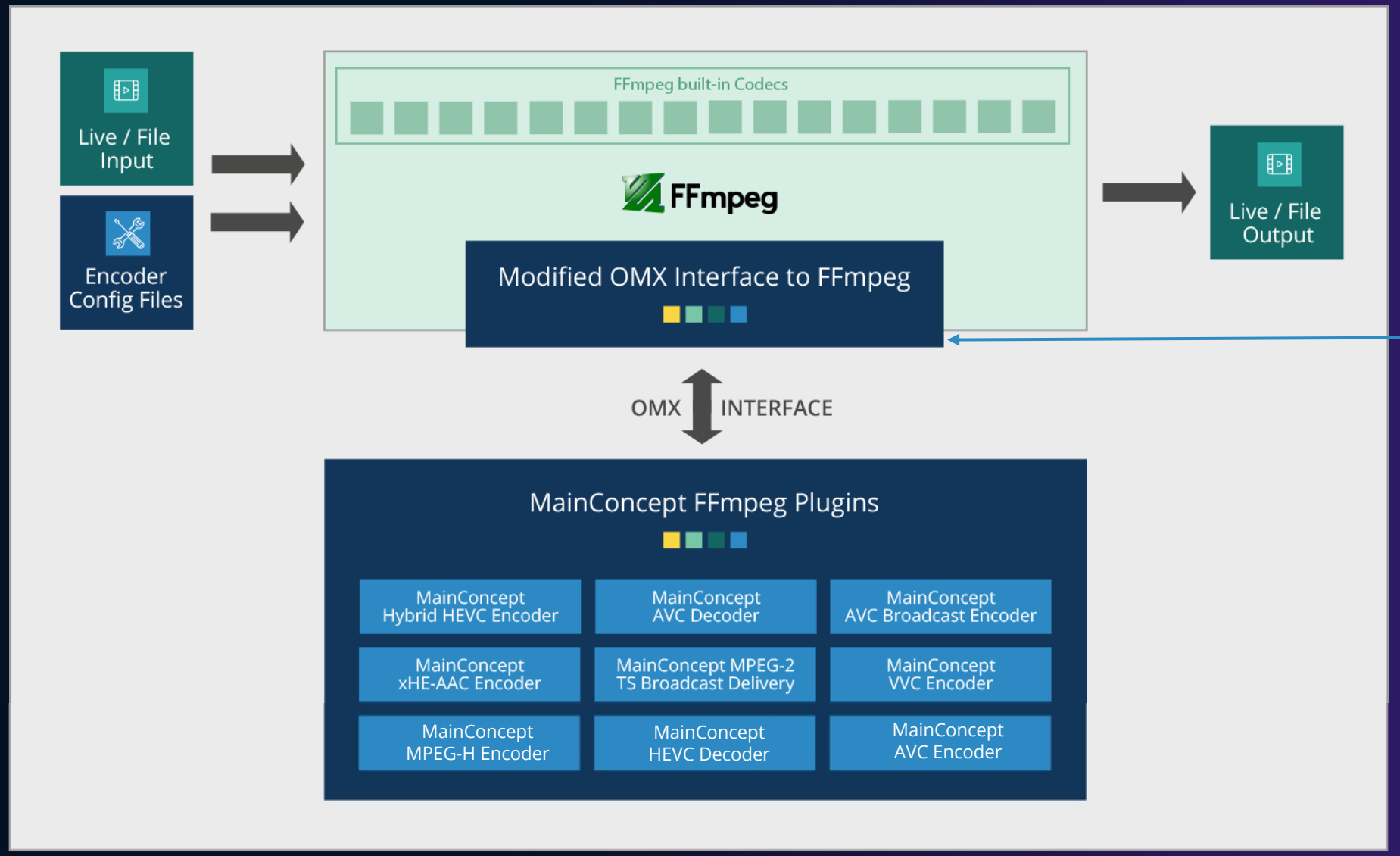




Plugins

- FFmpeg
- Blackmagic Design

MainConcept FFmpeg Plugins — Architecture



MainConcept provides source code for the interface on public GitHub, so you can build your own version of FFmpeg with our modifications.

MainConcept FFmpeg Plugins

The world's best codecs available in FFmpeg

VVC Encoder—NEW

Features

- VVC/H.266, next-generation codec for OTT and Broadcast
- Live and VOD workflows
- VVC/H.266 Main 10 profile, 8-bit and 10-bit, 4:2:0 up to 8K
- Different rate control modes, Quarter Pixel motion compensation, deblocking, SAO, etc.
- Interlacing, Scene Change Detection, Pyramid B-Frames, etc.
- Main and High Tier; Levels up to 6.3
- Future format embedded in SBTVD and DVB specifications
- Windows and Linux x86 support

MPEG-H Encoder—NEW

Features

- Integration of Fraunhofer's MPEG-H software encoder in FFmpeg
- Immersive, object-based MPEG-H 3D audio
- Live encoding workflows
- Baseline and Low Complexity Profiles
- Automatic Fallback mode in case of Control Track loss or interruption
- Encoding for MPEG-DASH compliant streaming use-cases
- Standard adopted by ATSC, DVB, TTA (South Korea), SBTVD (Brazil) and ATSC 3.0 (South Korea) TV standards
- Windows and Linux x86 support

xHE-AAC Encoder—UPDATED

Features

- Integration of Fraunhofer's xHE-AAC software encoder in FFmpeg
- Future audio format for Android and iOS devices
- xHE-AAC as well as legacy LC AAC, HE-AAC v1 and HE- AAC v2 audio formats
- VOD and live encoding workflows
- NEW: Live encoding for xHE-AAC
- Encoding for MPEG-DASH and Apple HLS compliant streaming use cases
- Bitrates of 12-500 kb/s for stereo
- Loudness and dynamic range control
- Windows, Linux x86 and Linux ARM

MainConcept FFmpeg Plugins

The world's best codecs available in FFmpeg

HEVC

Hybrid Encoding

- Leading HEVC codec outperforming x265
- MPEG-DASH, HLS, Main, Main 10, 4:2:0, 4:2:2
- GPU-accelerated encoding modes for up to 8K 10-bit live
- Options for Intel Quick Sync Video & NVIDIA NVENC

Decoding

- Decode and transcode workflows in superior quality and speed
- Main, Main 10, Main 12, Main 4:2:2 (& 10), Main 4:4:4 10 & 12 profiles
- Interlaced decoding support, including deinterlacing
- Hardware acceleration by Intel Quick Sync Video & NVIDIA NVDEC

AVC

Encoding

- Optimized for low bitrate encoding with superior quality & speed
- MPEG-DASH & Apple HLS
- Options for Intel Quick Sync Video & NVIDIA NVENC
- 2-pass encoding for best VOD quality

Broadcast Encoding (Encoding +)

- 4:2:2 10-bit and level 6.2 (8K)
- Verified presets for Sony XAVC & Panasonic P2 AVC Ultra

Decoding

- Decode and transcode workflows in superior quality and speed
- Baseline, Main, High, High 4:2:2/4:4:4 profiles, 8-bit/ 10-bit/12-bit
- Hardware acceleration by Intel Quick Sync Video & NVIDIA NVDEC

MPEG-2 TS

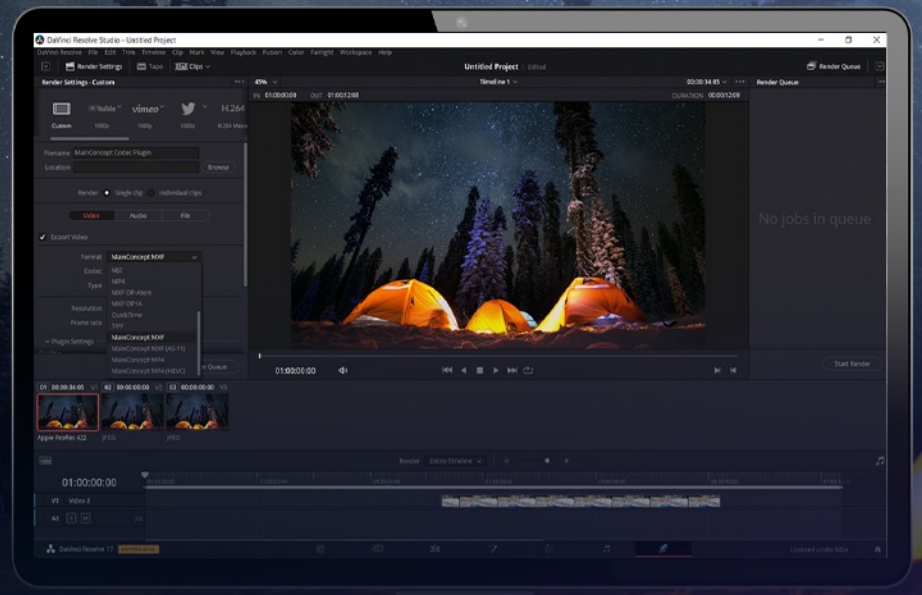
Broadcast Delivery

- Multiplexing support for broadcast delivery formats
- Ready-to-use multiplexer profiles for ATSC and DVB
- SPTS and MPTS format support

ART MEETS DIGITAL ALCHEMY:

Blackmagic DaVinci Resolve and the MainConcept Codec Plugin

Blackmagicdesign | MAINCONCEPT



MainConcept Codec Plugin for DaVinci Resolve Studio

Fast

Encode in HEVC up to 20% faster than open source[1].

Efficient

Experience a seamless workflow in DaVinci Resolve Studio.

Reliable

First plugin for DaVinci Resolve Studio approved by Blackmagic Design.

(1) Source: MSU 4K codec performance comparison

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Creators rejoice, now you can render project timelines into professional camera formats!

Native access to HEVC Main and Main 10 encoding plus accelerated Hybrid HEVC in up to 8K

Export compliant AS-11 UK DPP content directly from your timeline

Render project timelines into the same professional camera format the video was recorded in

The complete production chain from filming, capturing, editing and playout, without leaving the app

Supports

- Sony XAVC & XDCAM
- Panasonic P2 AVC Ultra & DVCPRO
- Blu-ray UHD, Blu-ray & DVD and more

- Windows
- macOS – Intel x86 & Apple M1/M2
- Linux


MAINCONCEPT
What technologies interest you?
8K
Dolby Vision
EVC
LCEVC
MPEG-H
VVC
AC-4
ATSC 3.0
Microservices
SMPTE 2110
Zixi
HEIF
Docker
SRT
JPEG XS
AV1
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Thank You

More questions?
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