SILICON IP

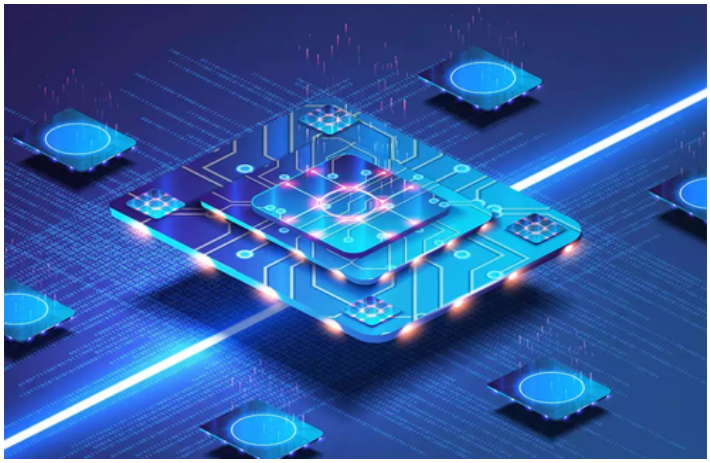
VIDEO: H.265 CODEC

The H.265 Codec enables high-efficiency video compression, reducing bandwidth and storage needs while maintaining high video quality.

For sales, please contact info@xtremesilica.com

OVERVIEW

H.265, also known as HEVC (High Efficiency Video Coding), is a video compression standard that provides significantly improved video quality at lower bit rates compared to its predecessor, H.264/AVC. Developed by the ITU-T Video Coding Experts Group and the ISO/IEC Moving Picture Experts Group, H.265 efficiently compresses high-definition (HD) and ultra-high-definition (UHD) video, making it ideal for streaming, broadcasting, and video conferencing. The codec employs advanced encoding techniques, such as improved motion vector prediction and larger block sizes, enabling high-quality video playback even in limited bandwidth conditions. H.265 is widely used across various industries, including online streaming services and digital broadcasting, allowing for smoother streaming experiences while maintaining superior video quality.



KEY FEATURES

Improved Compression Efficiency

- H.265 can compress video files to about half the size of H.264 while maintaining the same level of visual quality. This significant reduction in file size allows for more efficient storage and transmission of video content.

Support for Higher Resolutions

- H.265 is designed to handle ultra-high-definition (UHD) resolutions, including 4K and 8K video, making it suitable for modern high-resolution displays and streaming services.

Advanced Encoding Techniques

- The codec employs sophisticated techniques like larger coding tree units (CTUs), which can range from 16x16 to 64x64 pixels. This allows for more flexible and efficient encoding, optimizing data representation based on the content.

Parallel Processing

- The codec supports parallel processing, allowing for faster encoding and decoding by utilizing multiple cores. This is particularly beneficial for real-time applications and high-resolution video playback.

Flexible Bit Rate Control

- H.265 provides flexible control over bit rates, enabling it to adapt to varying network conditions. This is crucial for streaming applications, where maintaining quality during bandwidth fluctuations is important.

Enhanced Motion Compensation

- H.265 improves motion vector prediction, reducing redundancy and enhancing video compression.

Color Depth and Dynamic Range

- H.265 supports high dynamic range (HDR) and a wider color gamut, allowing for richer and more vibrant colors in video content, which enhances the viewing experience.

Error Resilience

- The codec incorporates features for better error resilience, which is essential for reliable video transmission over unstable networks, such as those used in streaming services.

MIPI APPLICATIONS

Streaming Services

- H.265's efficient compression enables HD and UHD streaming on platforms like Netflix and YouTube, even with limited bandwidth.

Broadcasting

- H.265 enables TV broadcasters to deliver higher-quality 4K and 8K content while minimizing bandwidth for over-the-air and satellite transmissions.

Video Conferencing

- H.265 improves video quality at lower bit rates, ensuring smooth communication in video conferencing, ideal for remote work.

Blu-ray Discs

- The H.265 codec is utilized in UHD Blu-ray discs, allowing for the storage and playback of high-resolution video content while optimizing storage capacity.

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Virtual Reality and Gaming

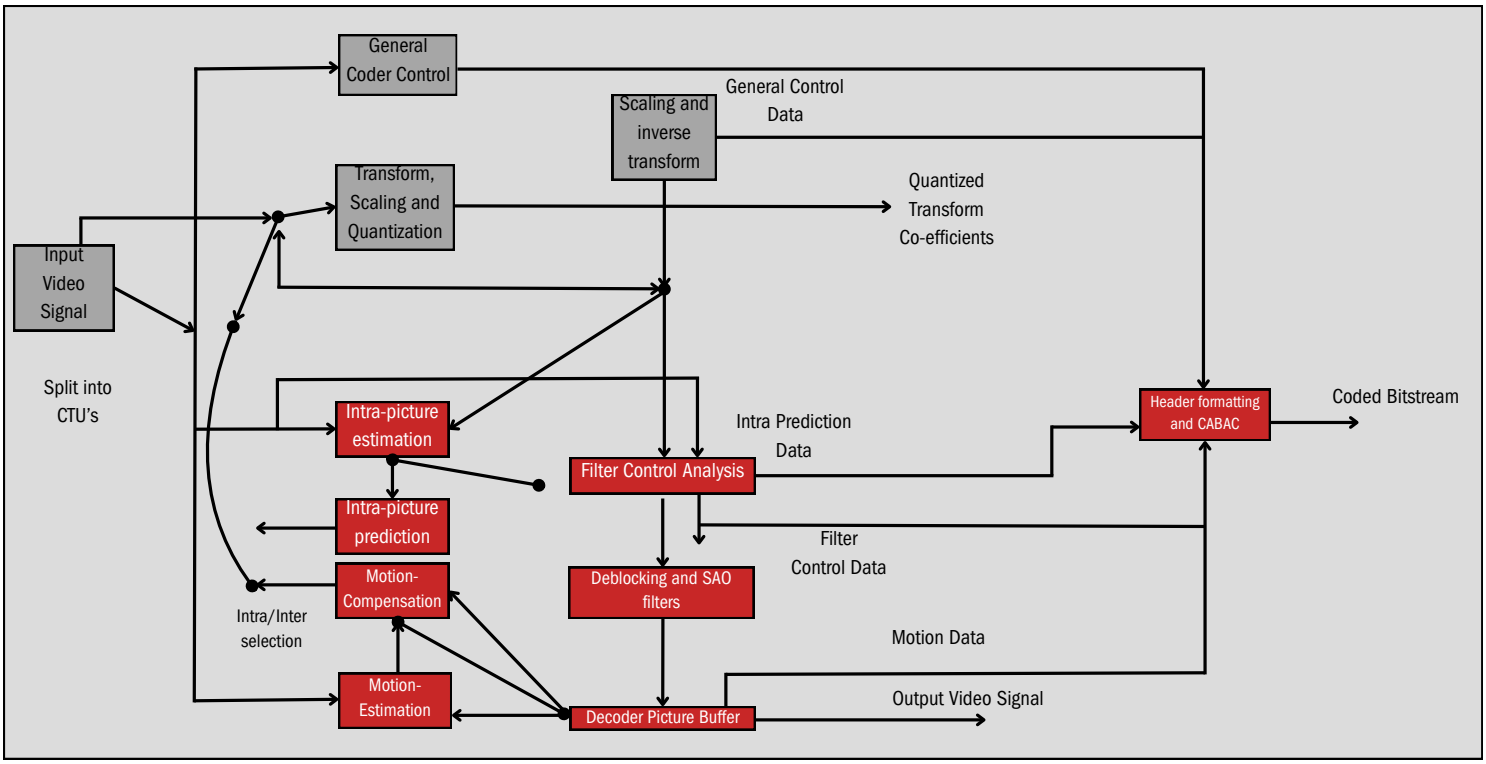
- In virtual reality (VR) and gaming, H.265 helps deliver immersive experiences by compressing high-resolution video streams efficiently, allowing for smoother gameplay and higher fidelity graphics.

Video Editing

- Professional video editing software often supports H.265, enabling editors to work with high-quality video footage while minimizing storage needs and optimizing rendering times.

H.265 CODEC ARCHITECTURE

H.265 Codec Architecture



XtremeSilica Technologies Private Limited
494, 2nd Floor, CMH Road, Indiranagar
Bengaluru, Karnataka 560038 India
www.xtremesilica.com
info@xtremesilica.com
+91 79932 79934