Trilinear

HDCP Authentication Transmitter

The Trilinear Technologies High-bandwidth Digital Content Protection (HDCP) Authentication Software Stack implements HDCP capability in a Trilinear DisplayPort interface (transmitter or receiver IP core) or the Trilinear HDCP Encryption-Decryption Engine core.

The software enables customers to shorten time to market and reduce design risk using pre-tested, ready-to-deploy software. Compliant with the latest standards, the authentication software is designed for a Source or Sink device application, including link authentication, SRM, and encryption management functions.

It automatically manages the AUX transactions necessary to authenticate and maintain the link. Hardware acceleration is used throughout the stack to reduce the load on the system processor.

The HDCP Authentication Software stack requires less than 32K of RAM to operate and can be configured to use static allocation, malloc, or a custom RAM allocation scheme.

AT A GLANCE:

- Training and field support, assistance in all stages of the design

- Periodic Software updates, including defect repairs as they become available

- Full HDCP 1.x/2.x Support

- Hardware-accelerated AES (HDCP2)

- Hardware-accelerated Random Number Generator (RNG)

- Easy to configure to different platforms

- Deeply documented source code

- Fully portable embedded C

- Source code deliverables, or a compiled library

- Fully documented API

- Compliance Test Suite

- Meets ASIL-B

- Meets MISRA-2016

Ready for deployment to a Trilinear IP core application, the HDCP software stack is also available for demonstration and early software prototyping on the Trilinear "Cobra" development system.

Software Testing

Using advanced design techniques, Trilinear thoroughly tests each software component. The Trilinear sofrware verification process includes the following:

- Unit level testing—extensive functional coverage and reliability tests.

- Deployment on the Trilinear FPGA development platform—each stack is tested for compliance with standards and for compability with existing production devices.

- Deployed in safety-critical and security-critical applications

- Validated with multiple compliers, including x86, MIPS, and ARM

Trilinear Software Stack for DisplayPort Architecture

The HDCP Authentication Software Stack is a component of the Trilinear Software Stack for DisplayPort architecture. The architecture includes components that create a suite of fully tested, production-ready software for integration into customer systems using Trilinear DisplayPort IP cores.

The architecture includes a link policy maker that is responsible for sink device discovery, link training, and link management. The link policy maker can be extended with advanced capabilities, such as HDCP, MST, MSO, eDP, audio, and DSC.
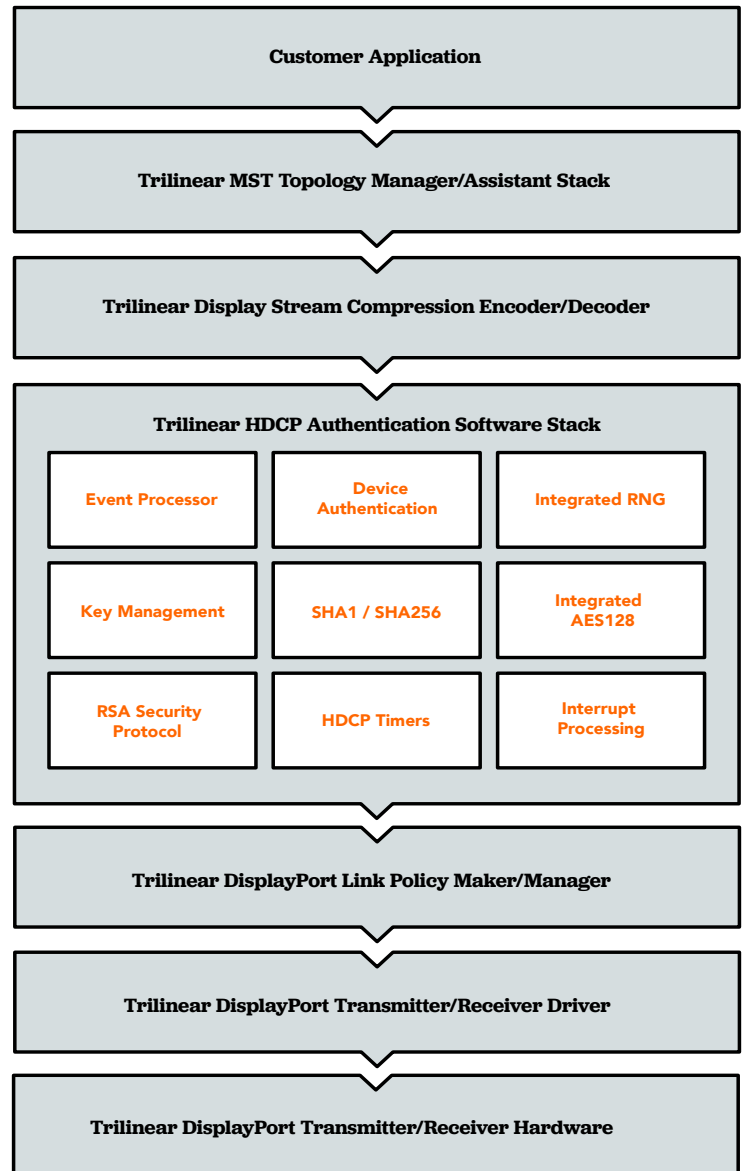

Figure 1. Trilinear HDCP Authentication Software Stack

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STANDING THE TEST — EVERY TEST, EVERY TIME.

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State Machine

The HDCP stack is based on an event-driven state machine. Each state machine instance (RX/TX, HDCP 1.x/2.x) follows the HDCP specification exactly. Nomenclature from the HDCP standard is used extensively in the code, so it is easy to follow state transitions.

Event Generation

The HDCP stack operates entirely on internal/external events. This module converts external events into state machine events and forwards them to the appropriate state machine.

User-provided Functions

Several user-provided functions are required. These are used to manage customer private keys and handle common memory management tasks. The user may also provide optional call-back functions that can notify the customer application of HDCP events and state.

Additional Libraries

External to the HDCP library is a support library that contains functions including trace, sha1, sha256, and other system-level operations required for HDCP but not part of HDCP specification directly.

Testing/ Tracing Call-Backs

The HDCP library includes an extensive test suite that runs on a desktop operating system. These tests not only verify proper HDCP stack operation but are a working example on how to use the stack. The HDCP stack also employs level-based tracing that displays extensive stack information during operation. Last, there is a call-back system. Each event can be selectively reported back to the system application.

R E A D Y ?

Trilinear Technologies offers the HDCP Encryption-Decryption Engine IP core under several licensing models. Please contact Trilinear Technologies for pricing and additional information: trilineartech.com

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