Securing the connected world

Flexible and scalable embedded security IP

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Overview

- Silex Insight Introduction
- Embedded security markets and applications
- Security requirements
- Scalability and flexibility
- Configurable and scalable secure enclave: eSecure

This is Silex Insight!

What we do: ***IP provider for security in embedded systems***

- Headquarters in Brussels, Belgium
- Global presence
- Worldwide customer base
- Founded in 1991 – 28 years experience
- Silex Insight = Silicon experts with know-how
- 45 employees

A history of growth and innovation

1991 — Founded as ASIC design house in Louvain-la-Neuve, Belgium

1995 — Becomes part of the Barco group

1999 — 1st SoC development for payment terminal

2003 — Introduction of JPEG2000 IP cores for FPGAs

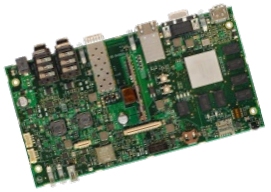
2011 — Introduction of Public Key and AES cryptographic IP cores

2015 — Technology & Engineering Emmy Award for J2K Interop

2016 — Introduction of VIPER (HDMI over IP OEM board) and eSecure: (Embedded Security IP)

2018 — Barco Silex becomes Silex Insight (Private Equity funded MBO)

2019 — Global presence (US office)



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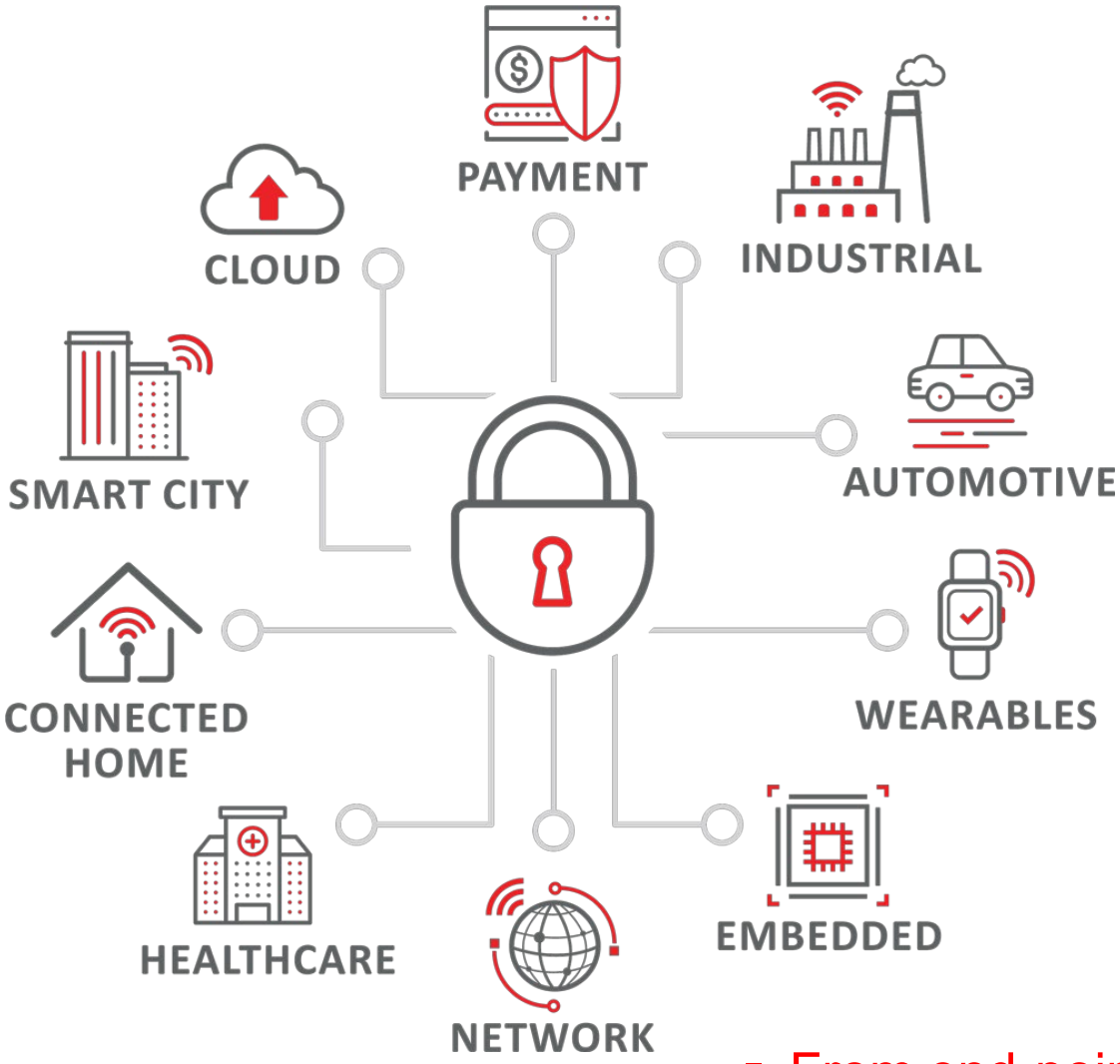
Security Markets/Applications



- From end-point, edge device to data center

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Security requirements

Features/solutions

SECURED SYSTEM-ON-CHIPS (SOC)

DEVICE UNIQUE IDENTITY

SECURE STORAGE OF SECRET INFORMATION

SECURE DEBUGGING

SIDE-CHANNEL ATTACK PROTECTION

SECURE COMMUNICATION

Security requirments

Algorithms/modes and protocols

- Asymmetric algorithms
  - RSA/DH/DSA/CRT/ECC/ECDSA/ECDH
    - ECC Curves: NIST, Brainpool, Koblitz, Montgomery, Edwards and others…
  - Apple HomeKit/TLS1.3: Curve25519, EdDSA, SRP
  - Thread Protocol: J-PAKE
  - Rabin-Miller (primality check) and Key Generation
  - SM2 (OSCCA), EC-KCDSA, ECIES, ECMQV
- Random Number Generators
  - TRNG (NIST 800-90B and AIS-31)
  - DRBG (NIST 800-90A)
- Symmetric algorithms
  - AES supporting all modes (GCM, CCM, CFB, CBC…)
  - Ultra High performance AES-GCM/CTR/XTS
  - 3GPP algorithms (Snow3G, Kasumi, ZUC)
  - Chacha20_poly1305 – TLS 1.3/Apple HomeKit
  - SHA1/2/3, SM3 (OSCCA) & 3-DES core
  - SM4 (OSCCA)
- Secure communication protocols
  - TLS/SSL
  - IPsec
  - MACsec

Security requirments

Application and market specifications

- Performance
  - Asymmetric crypto
    - High perf: V2X, fast boot apps, crypto currency, TLS connection engine
    - Low perf: IoT end-points
  - Symmetric crypto (incl IP/MACsec)
    - High perf: DC/cloud, networking, automotive
    - Low perf: IoT end-points
- Power
  - IoT end points: Low power requirements
  - Others: flexible power requirements
- Resources
  - Optimal resource/perf ratio: IoT end-points
  - Flexible: DC/cloud, networking
- Features
  - IoT: wide variety of features, protocols/radio (crypto) to be supported
  - DC/cloud: limited modes/protocols but at high speed and wide variety of features required

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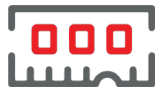
Combinable products

Configure it, the way - YOU - want it!

Security enclave

eSecure ROT provides full system security



Memory protection

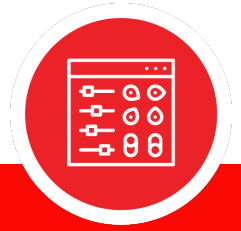
Secure your flash and DDR

Networking solutions

Accelerate your complete TLS, MACsec and IPsec traffic

Crypto accelerators & processors

Accelerate your crypto operations



CONFIGURABLE
Include features as needed

SCALABLE
Define performance and footprint depending on your requirement

CUSTOMIZABLE
Adapt to your specific needs

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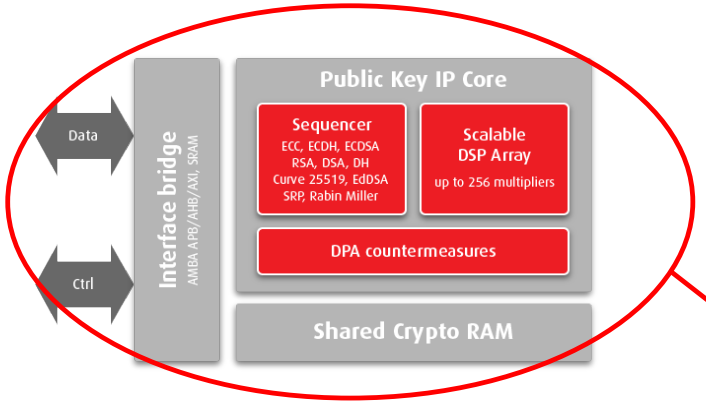
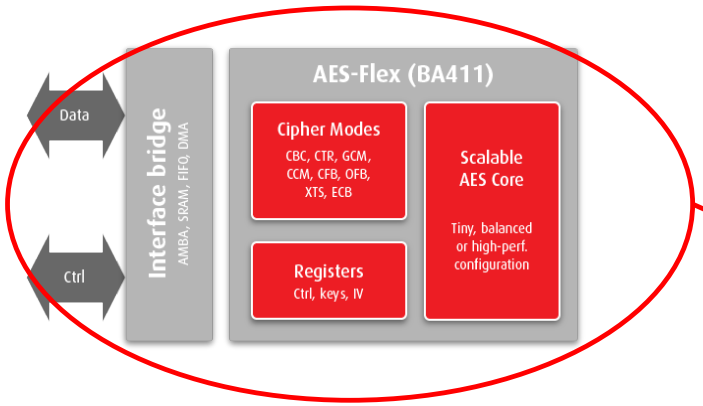
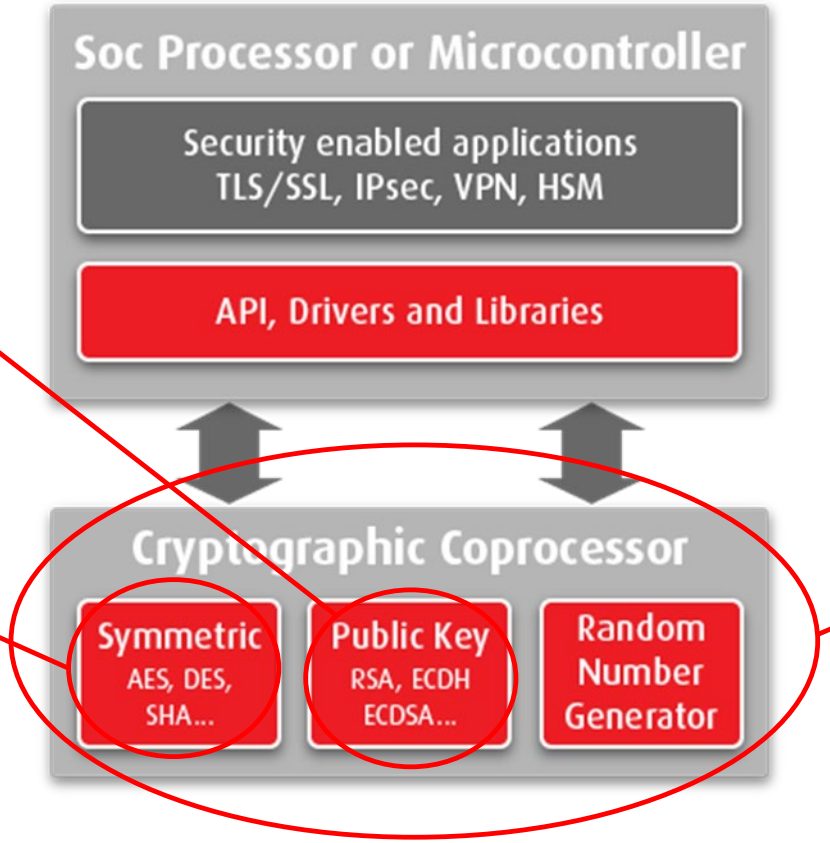
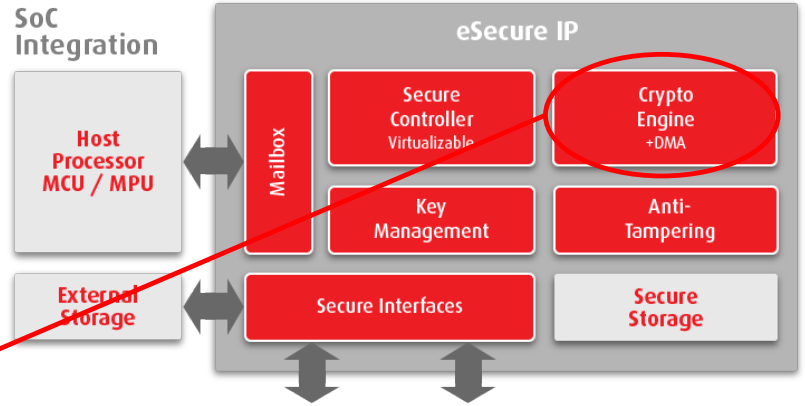
Scalability

From block to solution









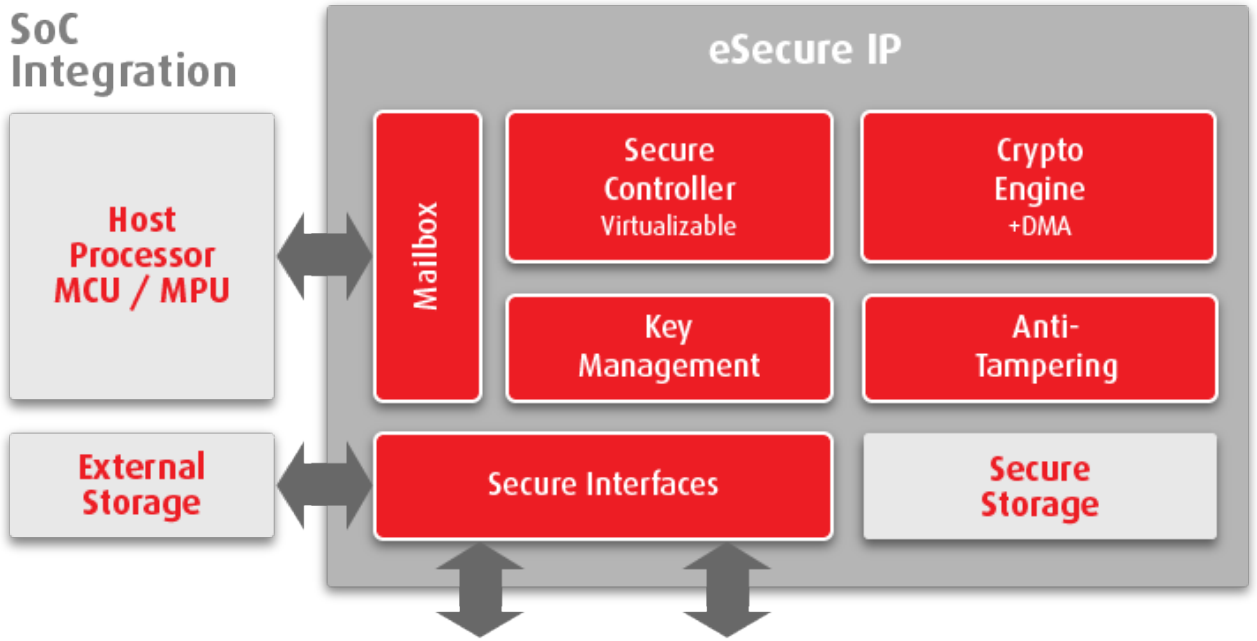
Stand-alone, scalable, flexible and configurable cores for perfect application fit

Combined into scalable and configurable crypto accelerator

Added to scalable and flexible secure enclave to target any connected device SoC

eSecure: BA470

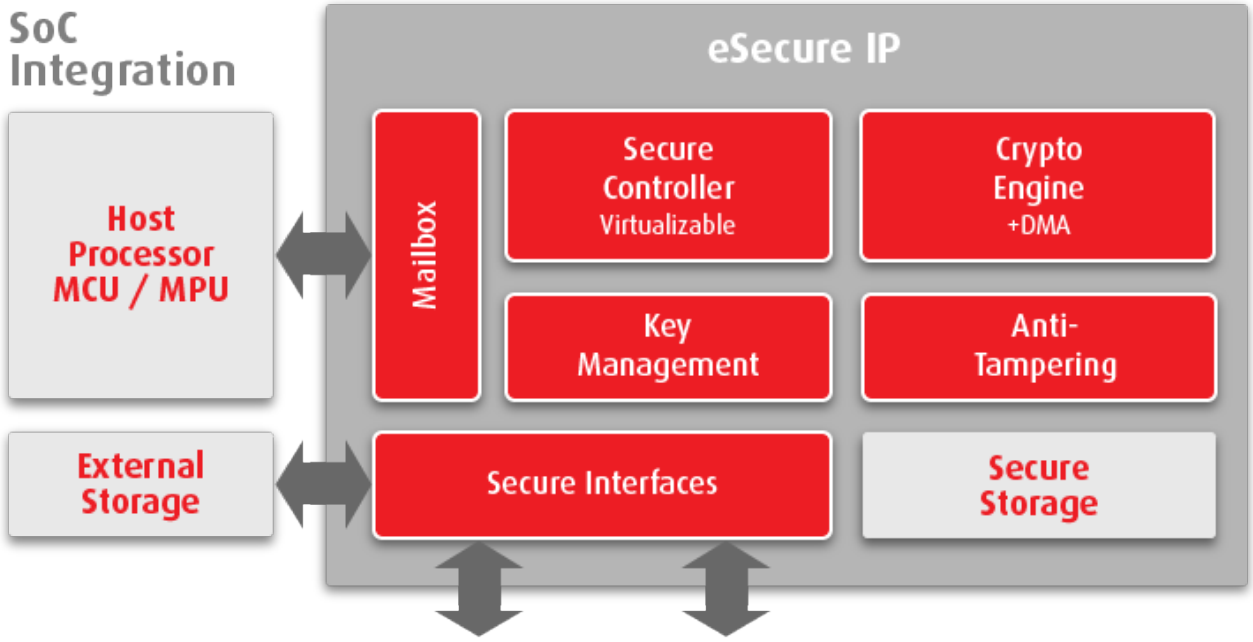
- Security Enclave - HW Root-of-trust
- Scalable and flexible solution to serve many IoT markets/devices
- Offer secure services to the Host (via mailbox)
- EVITA compliance + AutoSAR API



eSecure: BA470

Configurable features

- eSecure (HW Root Of Trust, Security Enclave)
  - Secure Boot
  - Secure Debugging
  - Secure Key Storage
  - Device Authentication
  - Anti-tampering – Side Channel Attack protection
  - PUF available
  - Low power features (retention, power down)
  - Several processors integrated
    - RISC-V Controller (from various partners)
    - ARM
    - MIPS
  - Wide range of cryptographic algorithms
  - Silicon proven

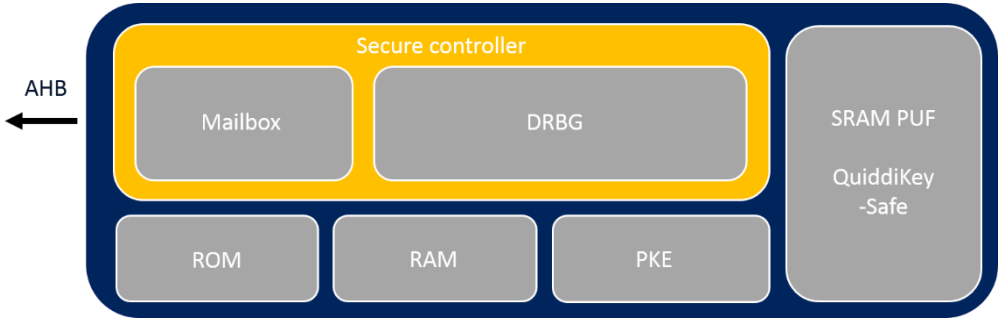


- Applications: Automotive, Industrial, DC/Cloud computing, IoT end Node device, Wireless communications

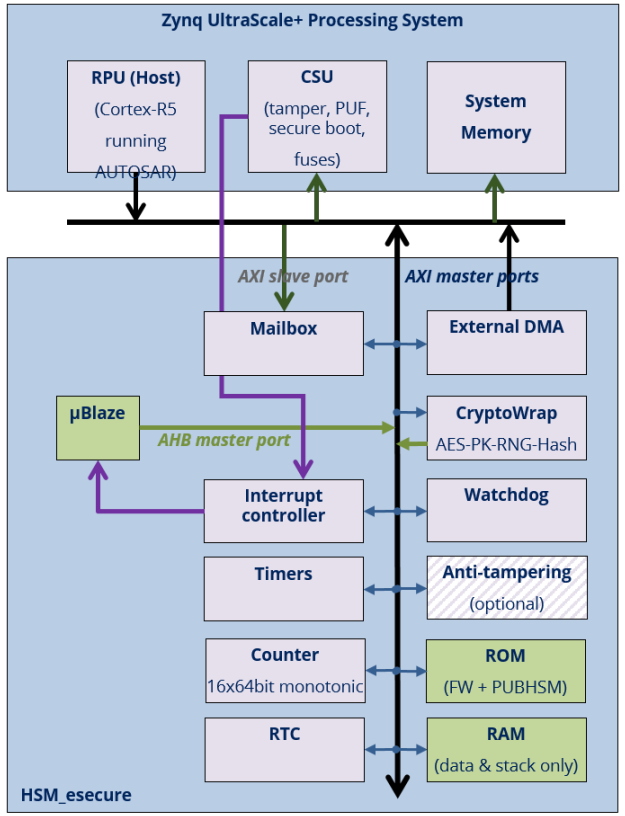
Flexibility example

KeySecure + eSecure for FPGA

- KeySecure (with intrinsic ID)
  - Securely generates, stores and manages any type of key
  - No access to keys by the host



- eSecure-HSM
  - FPGA HSM for industrial and automotive applications
  - EVITA compliant



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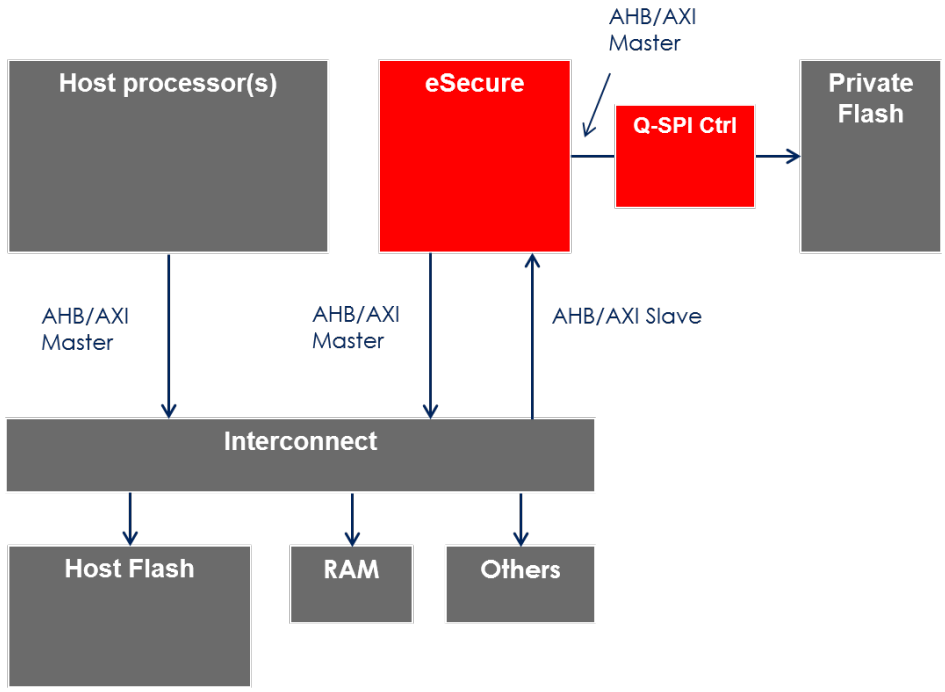
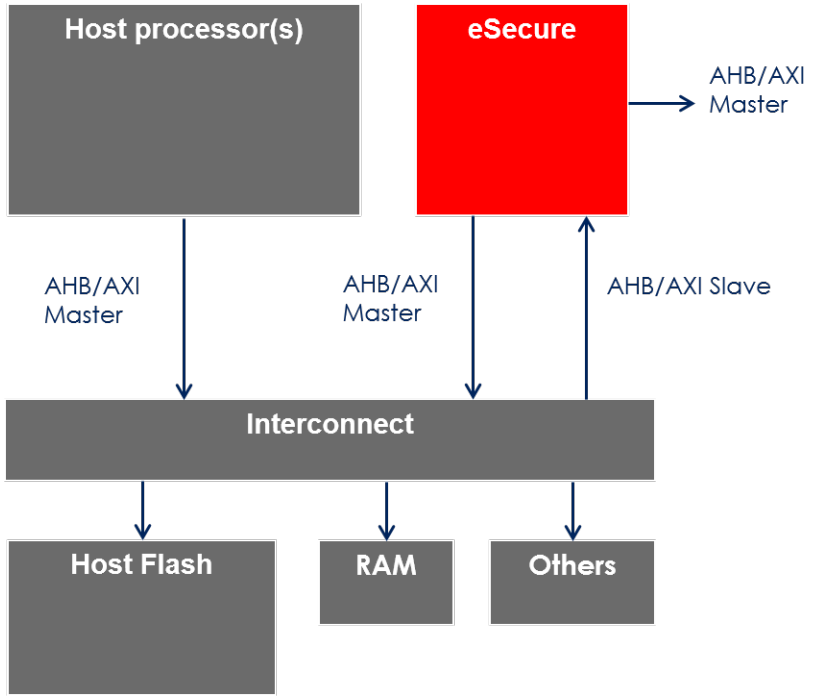
Integration Flexibility

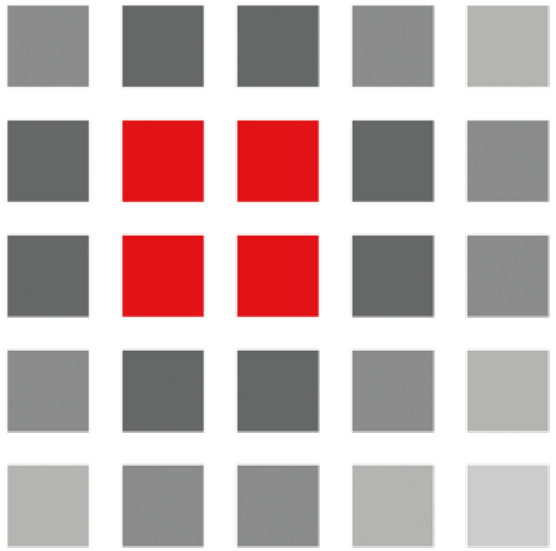
Private/host flash



- Private Flash
  - Embedded
  - External



- Host Flash
  - Embedded
  - External



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