_TrustFence Concept

Atlantik Elektronik GmbH

Digi International Inc.

Agenda

_ATXX Company Structure

_Embedded Device Security

_TrustFence

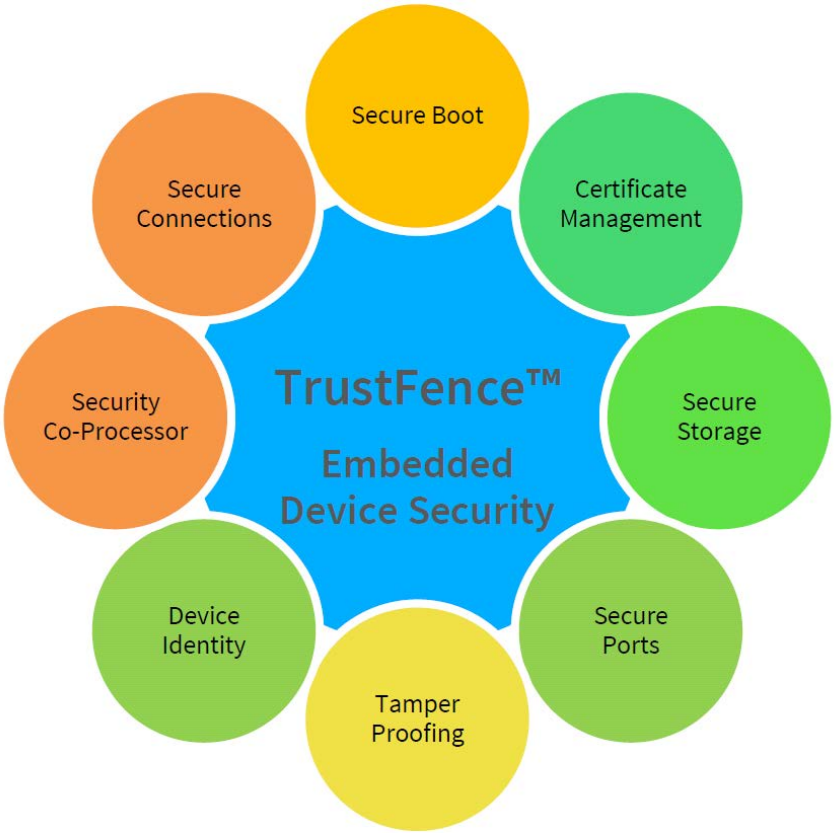
_Atlantik Elektronik Business Unit / Linecard

_Locations

Marketer of semiconductors and IT-products

atlantik networxx AKTIENGESELLSCHAFT

Semiconductor Division		IT- Products Division	
atlantik elektronik	astradis elektronik	atlantik systeme	allmos electronic
_Marketer & Design-In specialist of innovative semiconductors _Marketer of innovative embedded solutions & services	_Independent Sourcing	_Marketer of network- and communication products and management solutions	_Specialist in Network Analysis and Monitoring _Marketer of Security Solutions



Security for embedded devices is a critical design aspect

- Security by obscurity is an outdated “concept” - embedded devices are already a high profile target
- IoT already further amplifying existing concerns/issues
- Embedded products require a device security approach supporting their 7-10+ year product lifecycles
- Going beyond secure connections – Access Control, Device Identity/Authentication, Secure Configuration/Deployment/Updates, Encryption, Certificate Management, Secure Boot, Tamper Detection …

Our Goal:
Offer complete, consistent security story for connected embedded devices.

Secure Boot

What it is

- Secure Boot is a form of verified booting
- The system firmware checks that the system boot loader is signed with a cryptographic key

How it works

- Before handoff to the OS loader, the firmware checks the signature of code
- High Availability Boot (HAB) component of the on-chip ROM enables the ROM to authenticate the program image by using digital signatures.
- This device code will continue the process by ensuring that the peripheral is prepared for handoff to the operating system.
- Signatures are stored in databases in firmware. These databases are the “allowed” and “disallowed” lists that cannot be switched off by software

Why we need it

- On the most basic level, Secure Boot prevents running unsigned boot loaders
- Prevents malware to manipulate the boot procedure
- Prevents that malware can bypass OS security features
- Prevents the loading of drivers or OS loaders that are not signed with an acceptable digital signature

Certificate Management

What it is

- Creates a comprehensive certificate and key inventory
- Digital certificates are core to implementing a true multi-layered, identity-based security environment.

How it works

- Steps: Enrollment, Provisioning, Validation, Monitoring, Notification
- See details about your certificates, modify them, delete them, or request new ones

Why we need it

- Certificates and encryption keys protect communications across the Internet
- Making conveniences such as secure online banking, bill paying and shopping possible
- Authenticate identities, verify devices, secure applications and email, and even safeguard website

Secure Storage

What it is

- Saves data in an encrypted form
- Uses your operating system account information to provide a single sign-on experience

How it works

- Creating a secure encrypted disk
- Your password is passed as data to secure storage.
- Secure storage uses a "master" password to encrypt it and store the encrypted password in a file on disk.
- When data is saved with secure storage, the password provider is selected based on the priorities from the list of enabled password providers. Only that provider can be used in future to decrypt the data.

Why we need it

- Protect your data

Secure Ports

What it is

- Management of the TCP/IP Ports of your device

How it works

- Ensure that only the bare minimum of ports are exposed
- Protect open ports, and close the ones that are not used
- Ensure that your firewall is closed to all traffic other than to the ports you know should be open…
- …and software connected to them is as up to date as possible.


PCWorld

Attackers hijack CCTV cameras and network-attached storage devices to launch DDoS attacks

Default and weak credentials on embedded devices can lead to powerful botnets

Why we need it

- Hackers are constantly trying to discover new ways to connect to machines
- Whatever their goal, the starting point is the same: the port.

Tamper Proofing

What it is

- Tamper-proofing detects changes in the protected software or its behavior.

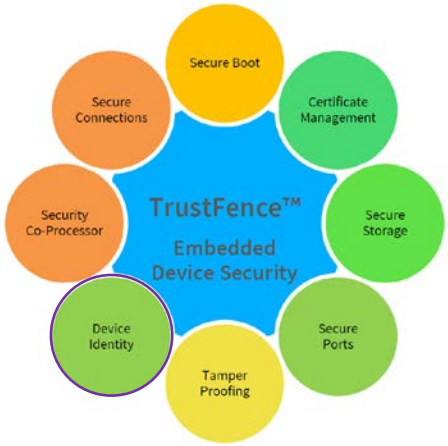
How it works

- Encrypted software needs to be decrypted first before an attacker knows what it does
- Tamper proofing uses lots of encryption but adds an extra element: it hides how the decryption works or what key is used.
- Typically users employ encryption to protect data and tamper-proofing to protect the code
- Contains elements of checksums and hash codes

Why we need it

- Tamper-proofing is an active defense against modern attacks
- Used to hinder, deter or detect unauthorized access to a device or circumvention of a security system.
- Protected against reverse engineering and modification

Device Identity



What it is

- Specifies unique per-device identifiers
- Distinctive number associated with a specific device

How it works

- Method for authenticating that the device is uniquely bound to that identifier
- Device identification numbers should remain constant for the lifetime of the device

Why we need it

- No standard ways to identify devices across network architectures
- MAC addresses are not sufficient
  - Multiple per device
  - Reconfigurable
  - Not cryptographically bound
- Device identity is important for completing chains of trust

Security Co-Processor

What it is

- Dedicated computer on a chip or microprocessor for carrying out cryptographic operations

How it Works

- The purpose of a secure crypto processor is to act as the keystone of a security sub-system, eliminating the need to protect the rest of the sub-system with physical security measures.
- Physical attempts to gain access to the internal state of the coprocessor will result in resetting the state of the secure coprocessor

Why we need it

- Guarantees the privacy and integrity of the secure system
- Enhances performance and security of cryptographic operations

Secure Connections

What it is

- Secure connections are designed to protect data sent between two computers via the Internet

How it works

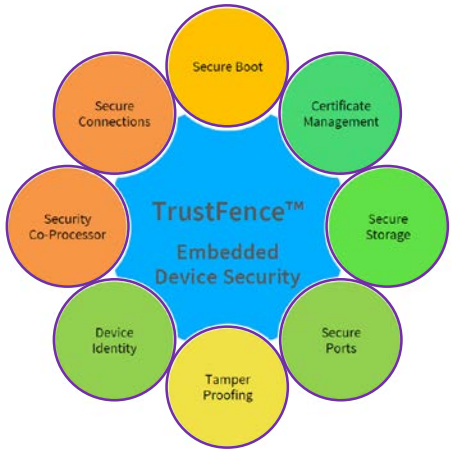
- Data encryption: masking information (emails, for example) from third parties and sender verification
- Encrypting a transfer channel: concealing the entire contents of the network connection and verifying the authenticity of all computers participating in the network connection

Why we need it

- Mask confidential data from third parties
- Verify the identification of the party with whom information is being exchanged
- Protect information from being viewed or modified by a third party

System architecture and software platform integration framework

- U-Boot
- Yocto Linux
- Tools
- Documentation



Customer configures level of device security through device personalities

- No implementation effort

Distributed in binary only

- Locked to Digi hardware platforms
- Source code available to customers

Connected and Secure Embedded Communication Platform

- NXP i.MX6UL-2, up to 2 GB NAND (SLC), up to 1 GB DDR3
- Cortex-A7 running at up to 528 MHz (1.9 DMIPS/MHz)
- Cortex-M0+ Microcontroller Assist™ (MKL03Z32CAF4R)
- Integrated very low power and wake-up management assist
- 802.11a/b/g/n/ac 1x1 , Bluetooth 4.1, ANT+, Dual Ethernet connectivity
- On-module U.FL antenna connector, or connector-less through pads
- Dedicated on-module security + authentication controller
- UART, USB, SD, CAN, SPI, I2C, I2S, ADC, PWM, GPIO, LCD, camera
- Low-profile, easy-to-use, reliable Digi SMTplus ™ surface mount form factor (29x29 mm)
- Industrial operating temperature and long-term availability

Innovative, cost-efficient, and easy-to-use module solution

- Secure industrial embedded connectivity platform with long-term availability
- Surface mount module, 29x29mm, allowing automated and manual placement
- Dual-Ethernet and pre-certified dual-band Wi-Fi + Bluetooth 4.1 option using common footprint

Industrial General Purpose SBC and development board (Pico-ITX)

- General Purpose SBC with IEC 60068-2 temp/shock/vibe compliance

However beautiful the strategy,
you should occasionally look at the results.

Sir Winston Churchill

_Line Card / Business Units

Atlantik Elektronik GmbH

Business Unit Embedded – A Closer Look

Manufacturers

atlantik elektronik services

bel COMPONENTS FOR AN CONNECTED PLANET

DIGI

HOLTEK

LANTRONIX

nuvoTon founded by winbond

SparkLAN Connections Made Easy

Product Portfolio

_Microcontroller

- 8 / 16-bit MCU (8051 & proprietary), 32-bit ARM Cortex M0/M3/M4 MCU

_System On Modules - SoM (ARM based)

- ARM®9 based System on Module w & w/o Wi-Fi & Bluetooth, ARM Cortex A9 (multicore) based System on Module w & w/o Wi-Fi & Bluetooth

_Single Board Computers - SBC (ARM based)

- ARM Cortex A9 (multicore) based SBCs w & w/o Wi-Fi & Bluetooth

_Industrial Wi-Fi & Wi-Fi / Bluetooth Combo Frontend Modules

- USB 2.0 to Wi-Fi / BT Frontend Modules, MiniPCIe to Wi-Fi / BT Frontend Modules, SDIO to Wi-Fi / BT Frontend

_Serial to Ethernet/Wi-Fi Converter (Device Server)

- Serial to Ethernet, Serial to Wi-Fi, System on Modules

_100/1G/10G Ethernet Products

- Mag Jacks, Transformer, Jacks, Cables & Plugs

_x86 Peripheral ICs

- Super I/O controller, Hardware Monitor IC, Power Management IC, Level Shift IC, GPIO Expander, Trusted Platform Module (TPM) solutions

Manufacturers

ALPHA DISPLAY, AsahiKASEI, atlantik elektronik services, DATA IMAGE, LHD 華田信科 HTDisplay, JIYA, nuvoTon founded by winbond, plessey, THine, TRULY®

Product Portfolio

_Audio/Video

- Audio ADC, Audio DAC , Audio Codecs , Audio DSP, Digital Audio Interfaces, Video Encoder/Decoder

_Sensors

- Magnetic Sensors, Automotive, Current, Infrared, Pressure, Compass

_RF

- Keyless entry, Mixer, PLL, Two Way Radio

_Displays

- Passive LCD, Industrial TFT, Automotive TFT, Epaper, Touch panel, Optical optimization

Business Unit Wireless – A Closer Look

Manufacturers

antenova m2m
atlantik elektronik services
Blue Creation
Flairmicro
Greenvity Communications
MITSUMI
plessey
PnpNetwork Technologies Inc
QUALCOMM
qorvo
QUECTEL Wireless Module Expert
Siano MOBILE SILICON

Product Portfolio

_Bluetooth Smart Ready

- BT Audio and Connectivity ICs and Modules

_Bluetooth Smart

- BT Smart IC/ Modules and Software running on IC/ Module and Apps for Smart Phone

_Wi-Fi

- Wi-Fi ICs and Modules; Wi-Fi/ BT Combos

_Powerline

- Home Plug Green Phy PLC

_Location

- SiRFstarV Multi-GNSS platform and GNSS modules

DAB & DTV

- Digital Audio & Video Broadcasting, WWR (Radio Chipset & Solution)

Cellular

- GSM/ GPRS/ UMTS/ HSPA and LTE Modems

_Antenna solutions

Manufacturers

FLEXON

winbond

Product Portfolio

_SSD NAND Flash Speicher

- Industrial SSD, SATA/PATA Flash Module, microSD/SD Cards, CF Cards, USB Flash Module, SATA Flash Module (DOM)

_Serial Flash (512 Kb - 512Mb)

_NAND Flash (1Gb, 2Gb)

_Parallel Flash (32Mb-512 Mb)

_SDRAM (16Mb-256Mb)

_DDR (64Mb- 256Mb)

_DDR2 (128Mb- 2Gb)

_DDR3 (512Mb - 4Gb)

_Pseudo SRAM (4Mb-256Mb)

_Low Power SDR & DDR SDRAM (1,2V / 1,8V)

_KGD

_2Wire serial EEPROM (2Kb - 1Mb)

_Locations

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Any Questions?

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