Applying Flash in the Industrial IoT

How to include existing systems into IIOT?

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Introduction

- Todays Situation
- Challenges for Industrial Applications
- How can NAND Storage systems help IIoT?
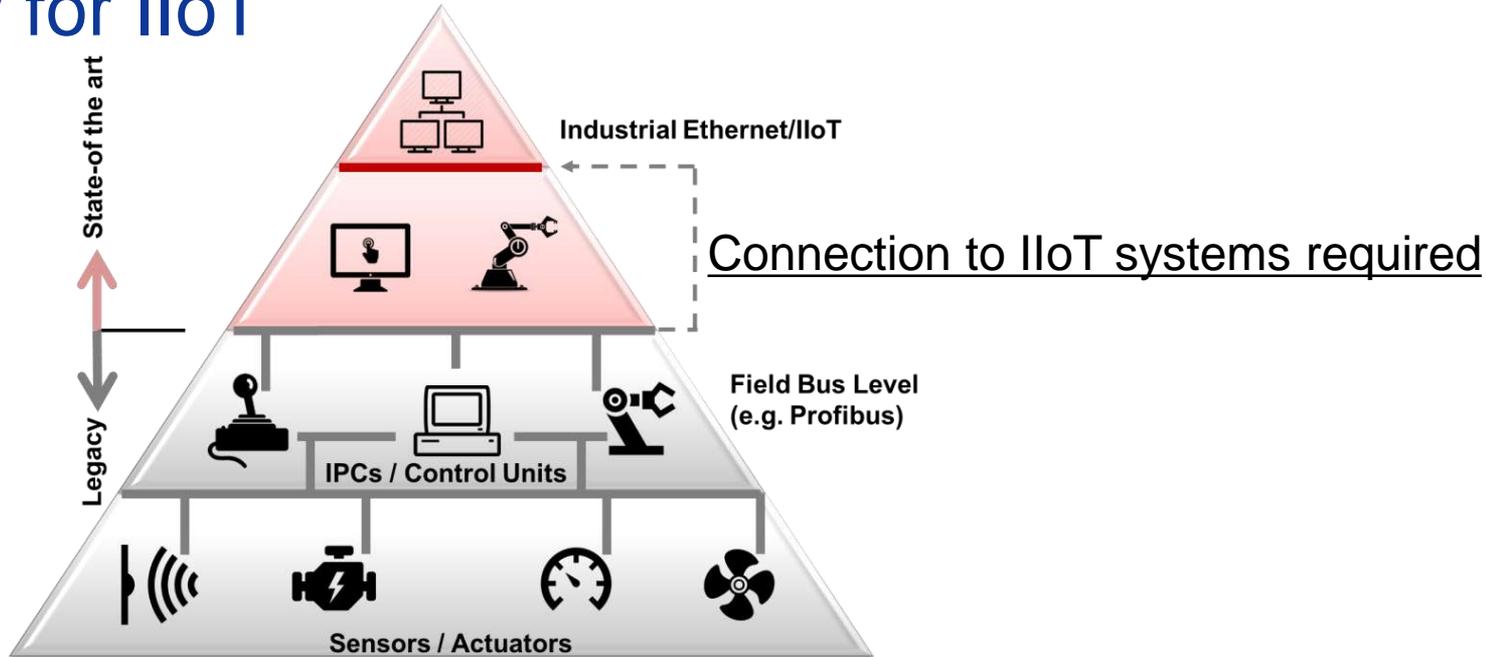- Solutions and Examples

Todays Situation

- **Millions of existing systems on low-level not ready for IIoT**
  - Sensors/actuators, PLC, IPC, embedded Solutions, etc.
  - Not prepared for IIoT
    - No or bad connection to IIoT environment/networks (sensor to sensor or sensor to Data Acquisitions Systems)
    - Data integrity not guaranteed
    - Data privacy not ensured

Todays Situation

- Millions of existing systems on low-level not ready for IIoT

State-of the art

Legacy

Industrial Ethernet/IIoT

Connection to IIoT systems required

Field Bus Level (e.g. Profibus)

IPCs / Control Units

Sensors / Actuators

Challenges for Industrial Applications

- IIoT needs to integrate existing systems flawlessly
- Technology gap must be closed
  - Wireless network connection
  - Secure data storage/Encryption
  - Data integrity measures
  - Different communication standards

How can NAND systems help?

- Existing Industrial systems usually provide a removable media slot/connection
  - CF
  - SD/MMC
  - USB
- Why not use this removable media slot/connection to upgrade existing systems for IIoT?

How can NAND systems help?

- **Requirements for upgrades**
  - Removable media slot or connection
    - SD/MMC or CF slot
    - USB connector
  - Use case specific data integrity measures
  - Encryption of data
  - Flexibility for different communication standards
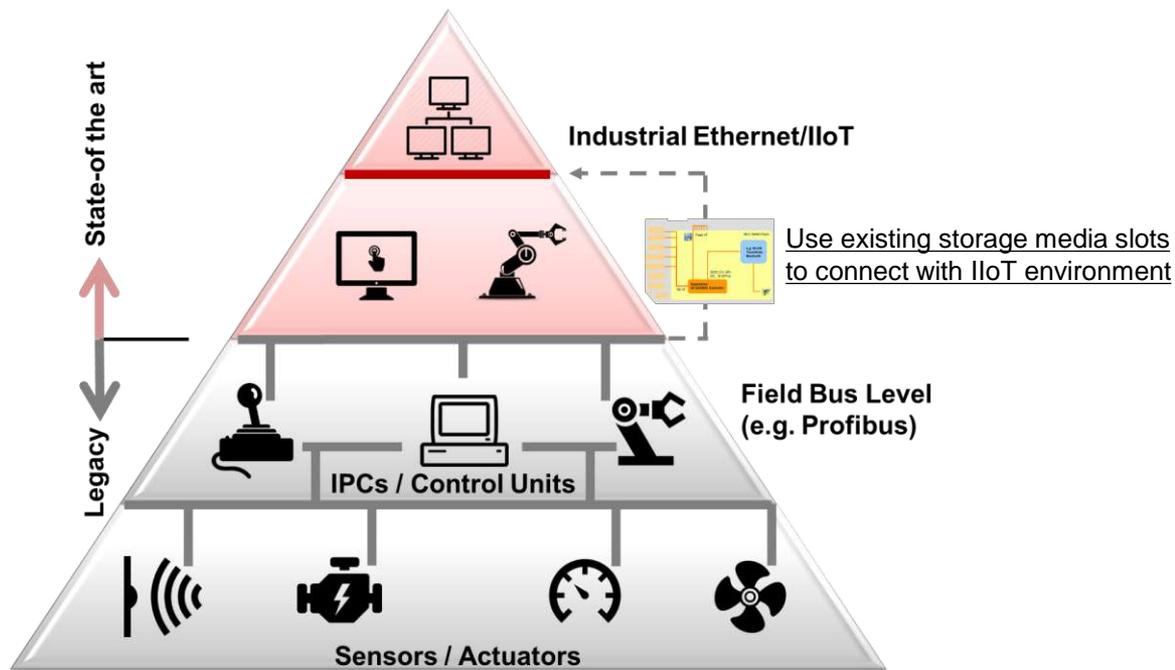   - WiFi
    - Bluetooth or others

How can NAND systems help?

- Easy Upgrade of existing systems
  - Exchange current storage solution with IIoT targeted solution
  - Or in case of no removable media slot use an existing USB interface to connect USB-based IIoT targeted solution

How can NAND systems help?

- **Easy Upgrade of existing systems**

Industrial Ethernet/IIoT

Use existing storage media slots to connect with IIoT environment

Field Bus Level (e.g. Profibus)

IPCs / Control Units

Sensors / Actuators

State-of the art

Legacy

Solutions and Examples

- Controllers must be designed to enable existing systems to work in an IIoT environment

- All necessary (legacy) interfaces must be supported
 - SD/MMC
  - CF
  - USB
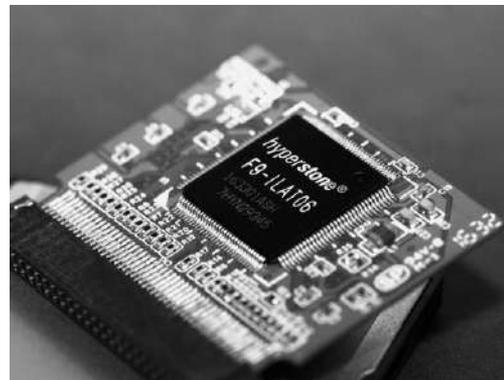
Solutions and Examples

- Key is not the interface to the Embedded System but
  - Enabling communication with the centralized Data Acquisition System
  - Provide data privacy
  - Ensure data integrity

  → Controllers (Hardware and Firmware) must provide an interface to connect with external systems

Solutions and Examples

- Interfacing between existing and new IIoT systems
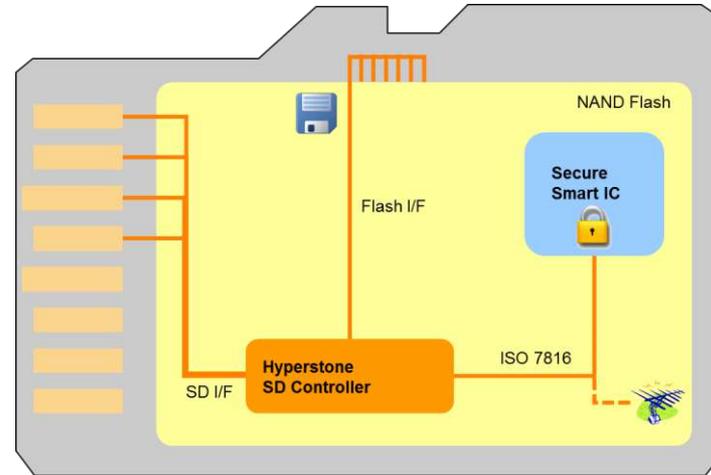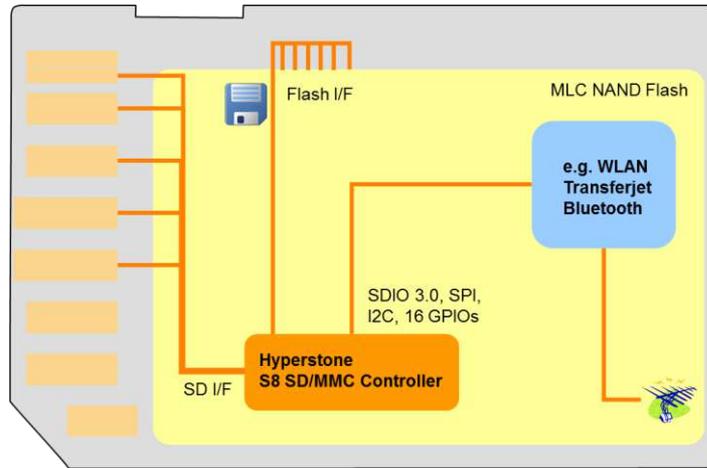
Solutions and Examples

- Hyperstone enables System Integrators to provide custom-tailored solutions for integrating existing systems into IIoT

- All Hyperstone controllers provide interfaces to integrate external systems into the storage media
  - WiFi/Bluetooth/etc. via GPIOs
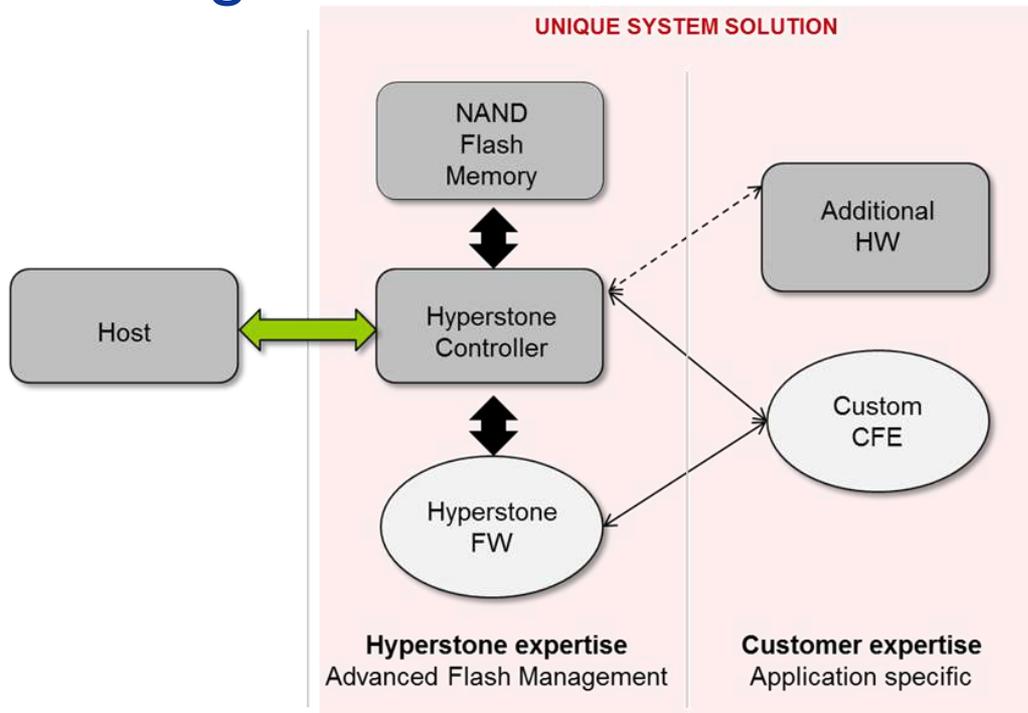 - Internal AES and ISO7816 for Smart Card chips

Solutions and Examples

- **Of course this integration needs FW adaptation**
  - Application Programming Interface (API) to develop own Customer Firmware Extension (CFE) making storage media work with external components (Smart Card or WiFi/Bluetooth chipsets
  - Legacy systems can now cope with security requirements from today and in the future
  - Authentication, validation and secrecy

Solutions and Examples

- Of course this integration needs FW adaptation

UNIQUE SYSTEM SOLUTION

NAND Flash Memory

Host

Hyperstone Controller

Additional HW

Custom CFE

Hyperstone FW

Hyperstone expertise
Advanced Flash Management

Customer expertise
Application specific

Invitation

- ## Please visit us at our Booth 618 in the Exhibition area for a demo (may be too late due to the late presentation schedule)

- ## But you can also contact us as follows

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