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**
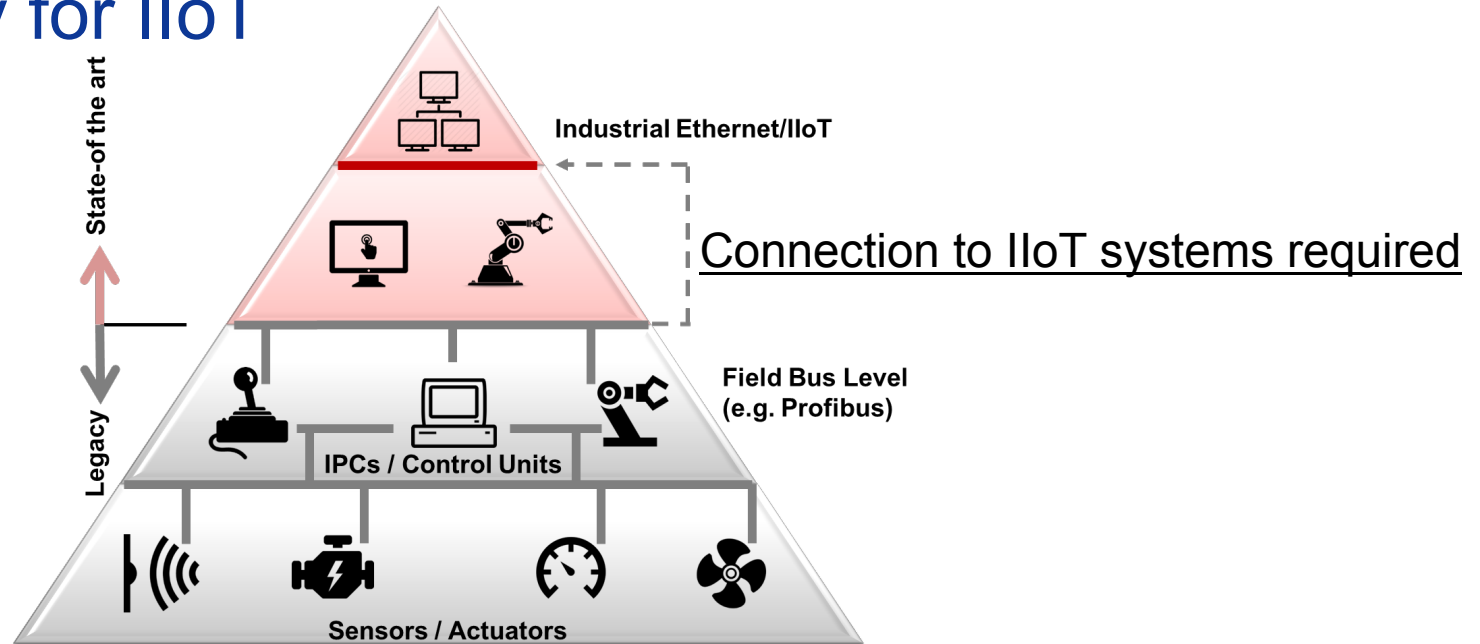
Todays Situation

- **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
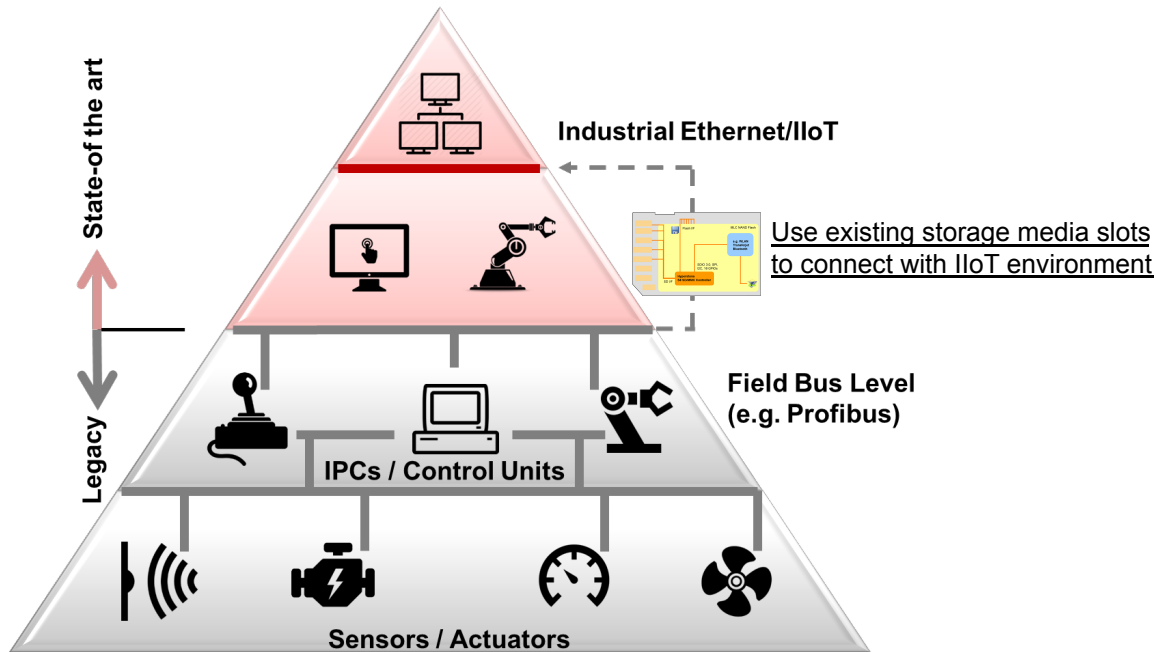   - WiFi
    - Bluetooth or others

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

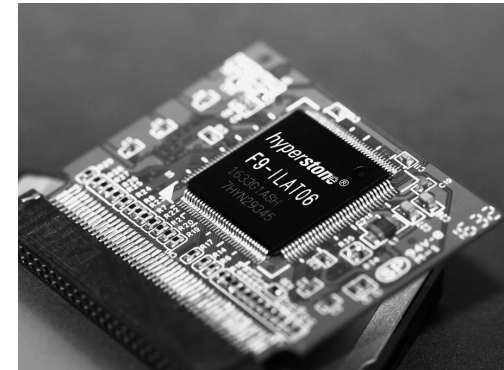# How can NAND systems help?

- ## Easy Upgrade of existing systems

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
    - $\rightarrow$ Controllers (Hardware and Firmware) must provide an interface to connect with external systems

Solutions and Examples

- Interfacing between existing and new IIoT systems
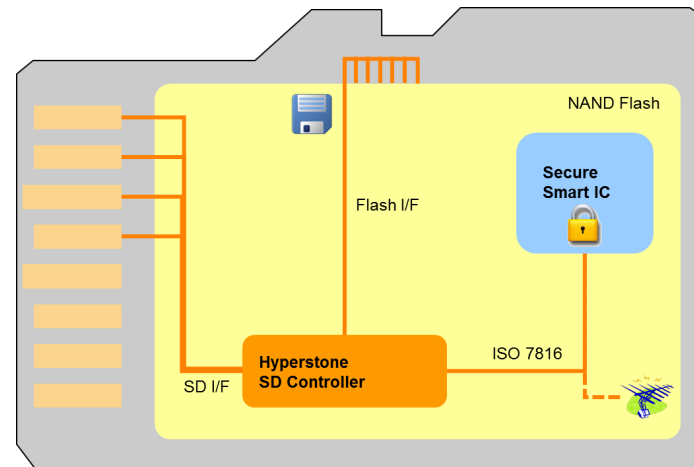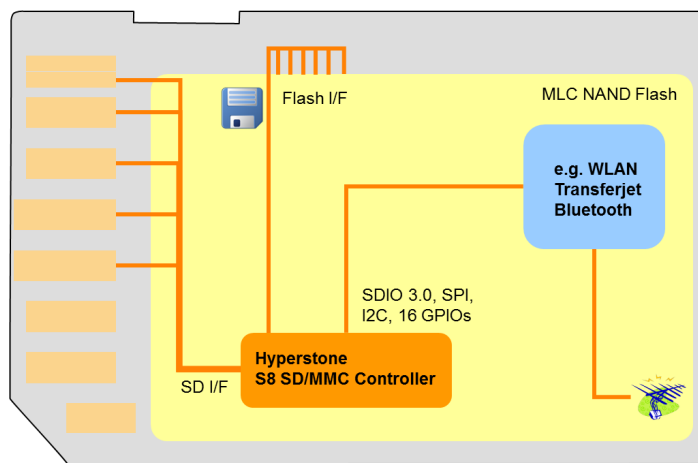
Solutions and Examples

- **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
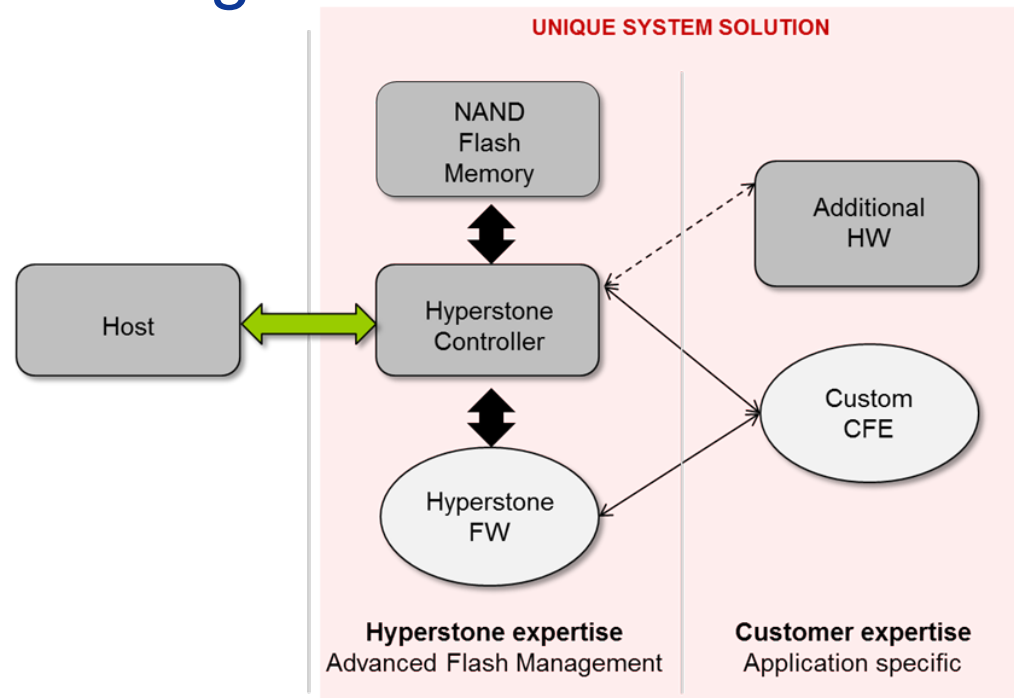 - Internal AES and ISO7816 for Smart Card chips

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

Host — Hyperstone Controller

NAND Flash Memory

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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