ATCA Carrier Board
with Dedicated IPMI Controller (1)

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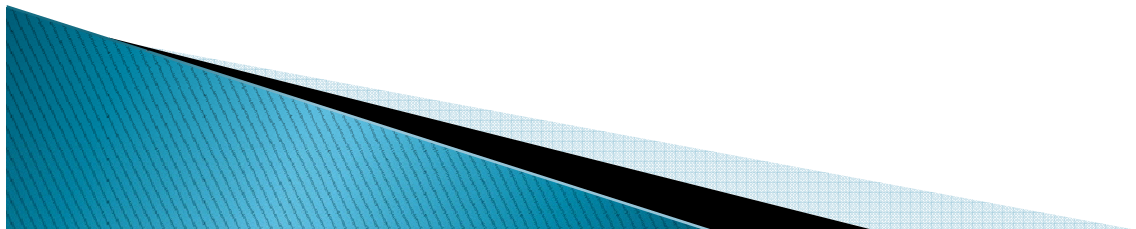
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Outline

- ATCA-based LLRF Control System of XFEL

- Intelligent Platform Management Controller

- Previous and current IPMC solutions

- Summary

# LLRF Control System of XFEL

- Tasks of LLRF system of XFEL accelerator:
  - Control of the cavity resonance frequency,
  - Data acquisition,
  - High-frequency signal processing.

- This system requires stable continous operation.

- It was decided to build the prototype system based on ATCA specification.
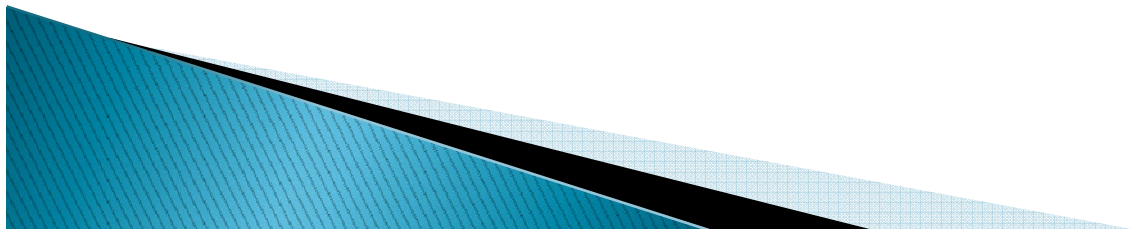
ATCA standard

- ATCA standard ensures high level of:
  - Reliability,
  - Availability,
  - Serviceability.
- Modular design allows flexible configuration.
- Hot Swap mechanism allows modules exchange during normal system operation.
- Providing all these functionalities is possible thanks to use of a complex IPMI management system.
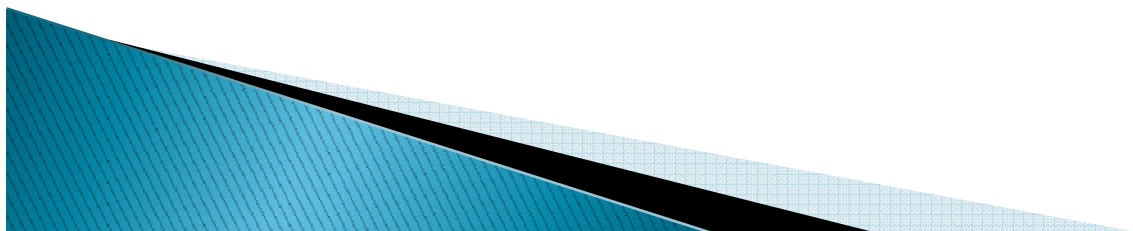
# Intelligent Platform Management in ATCA shelf
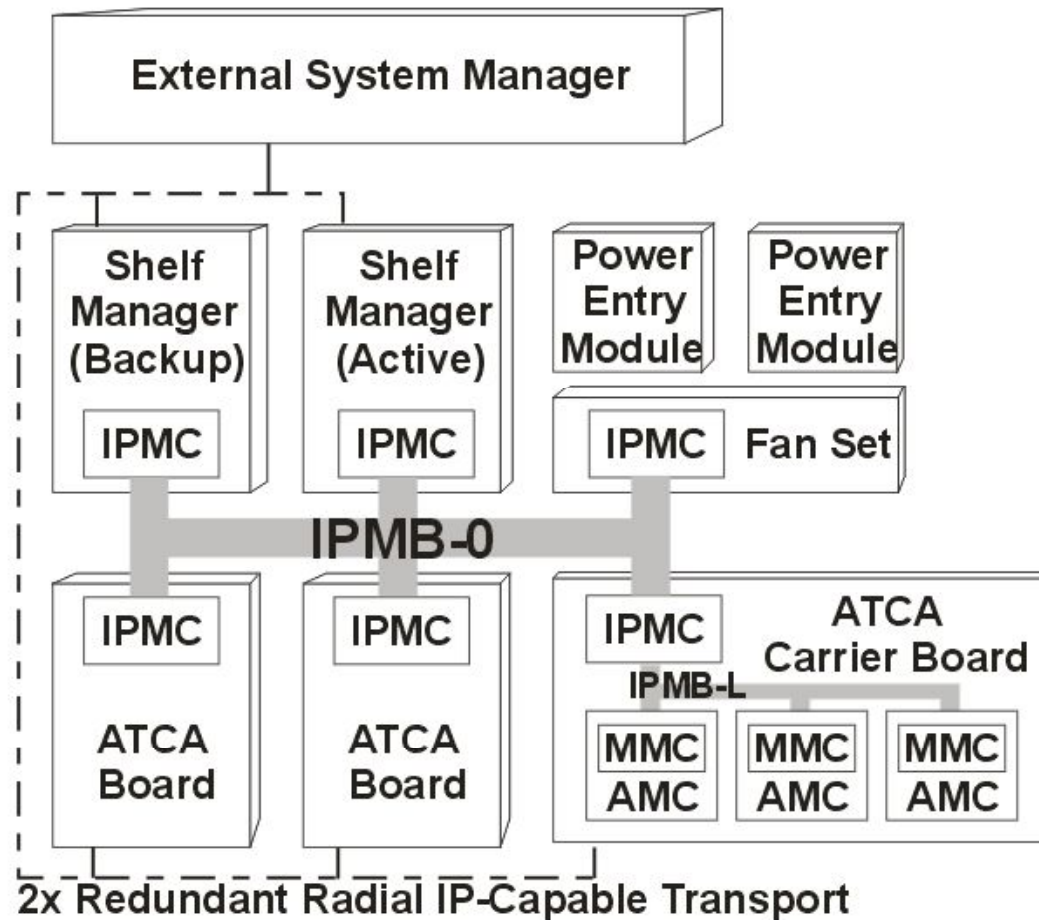
The Role of IPMC

- Control of hot-swap activation and deactivation,
- Management of on-board sensors,
- Early detection of faults – event generation,
- Electronic Keying management,
- Supervision of Advanced Mezzanine Cards.
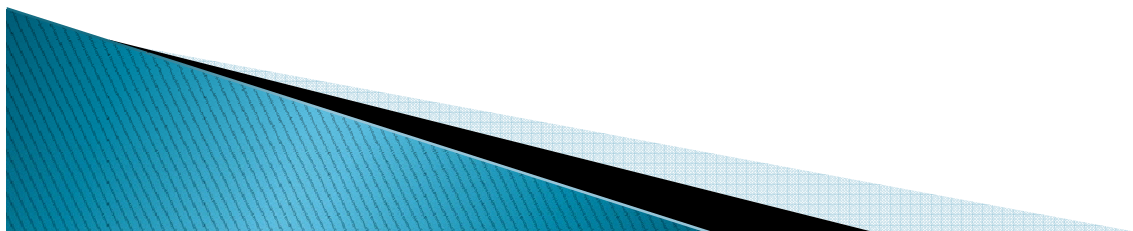
Previous solutions of IPMC

- IPMC consists of two devices:
  - Atmel Atmega1281
  - Xilinx Spartan 3

- Faults of microcontroller:
  - Only one built-in I2C interface
  - Small number of I/O pins
  - Low frequency of CPU operation
  - Small amount of RAM
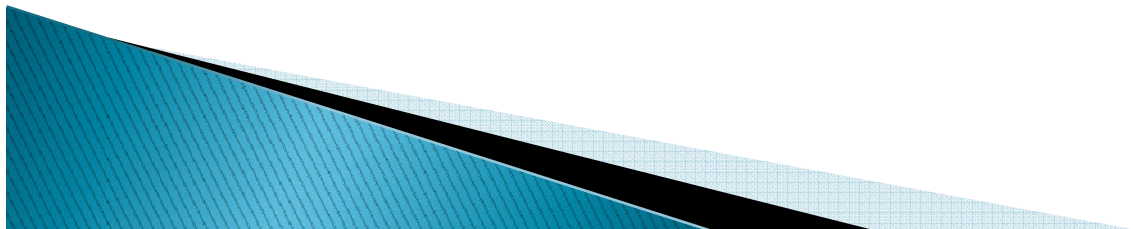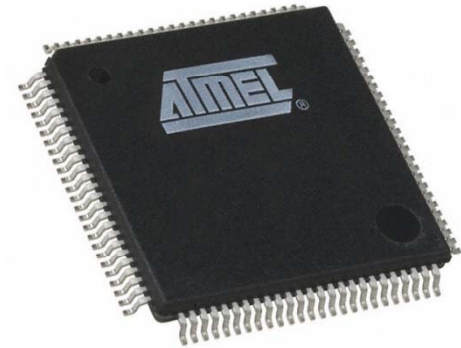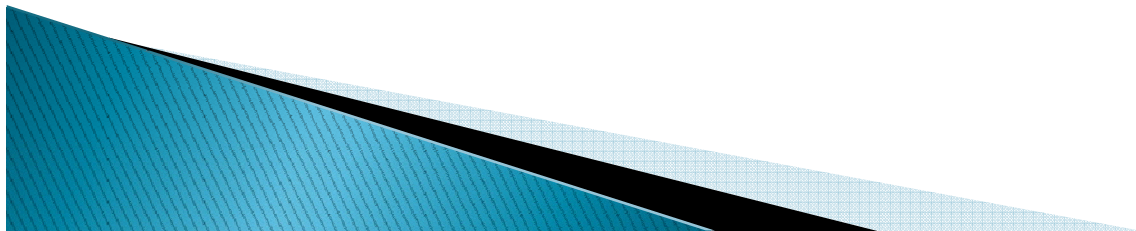
Renesas H8S/2166

- Microcontroller dedicated for management systems in telecomunication applications
- Essential features:
  - 16-bit CPU operating at a frequency of 32 MHz
  - ROM: 512 kbytes, RAM: 40kbytes
  - Six-channel I2C bus interface
  - General I/O pins: 106
- Meets all the requirements
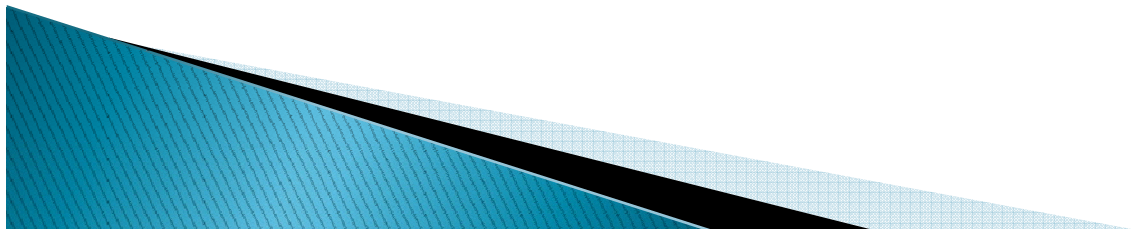
Summary

- Greater clock frequency speeds up the operation of the device
- Six I2C channels provide stable and parallel communication with all the components on the IPMB
- Single-device IPMC
  - Increases the reliability
  - Facilitates the software development and maintenance
  - Removes the need for interfacing between devices

THE END

- Questions?
- Comments?