

**Embedded Platform Management Architecture  
Proposal  
VSO Meeting 5.18.2005**



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# Platform Management Highlights

In 1998 Intel published the first Intelligent Platform Management Interface Specification, IPMI V1.0

- It's an “open standard” – license free
- Current Version is Version 2.0,Rev 1.0
- Adopted by cPCI, VME64, ATCA and proprietary server architectures – in varying degrees
- Provides a standard interface between OS and hardware-based sensor environment

# IPMI Components

- SMBus – Derived from Philips I2C
  - Basic communication for sensor data
- ICMB – Chassis Management Bus
  - Buffered version for Chassis-to-Chassis
- BMC – Baseboard Management Controller
  - Main component of IPMI implementations

# IPMI Attributes

- Requires independent smart PM subsystem (BMC) on board “motherboard”
  - Provides medium-to-complex feature set
  - Certainly adds cost to base design
- “PC –Centric”
  - BIOS Issues
  - Legacy x86 Architecture Issues
  - PC Power supply dependencies

# IPMI Adopters

- High Availability Systems (telecom)
  - High uptime requirements dictate health monitoring and fault isolation
  - Environmental control
  - Failure prediction & aversion
- Server Farms
  - Managing and monitoring 100's of servers is a complex task
  - Central “data concentrators” required here

# PM & The VSO

- ✓ The VSO has made initial provision for IPMI implementation in ANSI/VITA 38-2003 for VME. Pin re-assignment to support SMBus + connector for IPMB
- ✓ VITA 41 inherits this work, but has more “justification” due to more complex topography
- ✓ The VITA 46 WG is now actively investigating how and to what degree IPMI adds benefit and at what “cost” in real estate and \$/unit
- ✓ VITA 48 will most certainly drive enhanced environmental monitoring due to “extreme” deployment conditions. (\$ less of an issue here)

# Enter OPMA

- AMD, in a very timely manner, just publicly introduced the “Open Platform Management Architecture Specification” or OPMA (circa February 2005)
- It builds upon the IPMI foundation and utilizes IPMI concepts and “components”
- AMD released it as an “Open Standard” without license.

# OPMA Justification

- OPMA was developed specifically for the server market which, not coincidentally, AMD targets with its 64-bit processors.
- OPMA provides a modular, scalable method of implementing IPMI functionality with the intent of enabling a third-party support infrastructure.
- OPMA-enabled servers can address the cost-to-benefit issues with minimal additional base cost per “motherboard” due to three distinct, but feature differentiated levels of implementation.

# OPMA Features in Brief

- “mCard” concept provides plug-in IPMI-based Platform Management using SODIMM socket technology
- 4 Option Levels
  - M1: IPMI 1.5 w/o dedicated NIC
  - M2: M1 + dedicated NIC
  - M3: High-end w/Graphics capture/redirection
  - Mx: Upgrade option to “down solution”
- New IPMI technology supported
  - SoL: Serial Console over LAN
  - KVMoIP: Kbd, Video, Mouse over Internet Protocol

# OPMA Supports

- 5+ SMBus for sensor connection
- 6 Analog Voltage Inputs
- 2x Serial Console Ports (1 Dedicated SoL)
- Dedicated Management NIC
- 1 ICMB
- 13 Status Inputs
- 3 Button I/F; PWR, RST, NMI
- Numerous FAN, PWM Tach Controls
- LPC I/O Bus
- DVI Video Capture
- Control of remote “CMOS” clear and speaker & LEDs

# OPMA Requires

- A SODIMM socket, RA or straight
- Some logic, primarily FET switches, on “motherboard”
  - Allows interception of console serial
  - Allows pass-thru or dedicated NIC port
  - Allows remote control functions
- A Console serial connection
- A RJ45 NIC connection

# So What?

- Leveraging AMD's OPMA work to develop a similar Platform Management architecture and module for embedded, or "ePMA" might be worthwhile as a VSO activity.
- This could remove possible redundant PM efforts from individual specs by allowing a central resource specification to be developed.

# ePMA Goals

- Provide embedded-centric mix of sensor and control signals – for example more temperature in lieu of multiple fan/tachs.
- Define a suitable “eCard” for mezzanine style mounting that can be “ruggedized”
- Reduce or eliminate “PC Centric” functions to provide processor/OS generic functions
- Find a “RAND” connector

# ePMA Benefits

- Supporting PM would not significantly add cost or real-estate to VME, V41, V46 or ? Boards.
- PM support can be added later or selectively on an “as needed” basis
- Third-party developers with expertise in IPMI and PM could contribute products to the marketplace and/or develop technology partnerships with core board vendors.
- The customer should get better, more interoperable solutions to their PM requirements

# Discussion & Questions

Thank you VITA and the VSO membership.

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