Advances in Intelligent Platform Management: IPMI v2.0 in Action

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Agenda

- Initiative and Architecture Update
- IPMI v2.0 Technology Update
- IPMI in Action
- IPMI Futures
IPMI

Intelligent Platform Management Interface

- Defines a standardized, abstracted, message-based interface to intelligent platform management hardware
- Defines standardized records for describing platform management devices and their characteristics

Promoters: Intel, HP, NEC, DELL

Adopters: 171 and growing

IPMI Enables Cross-Platform Management Software
New v2.0 / v1.5 Errata, Latest 32- and 64-bit Drivers, & IPMI Conformance Test Suite

Includes IPMI v1.5 automated conformance tests, IPMI v1.5, and support for IPMI v1.5 new interfaces including LAN, Serial and SMBus. ICITS 5.02 is an update to ICITS 5.01 and adds new tests for IPMI 1.5 commands and includes a new driver implementation for IA-64 and IA-32 under Net2000 OS available to IPMI adapters only.

For more information:
www.intel.com/design/servers/ipmi
v2.0 Adopter’s Agreement

- IPMI v2.0 Second Generation Specification is under RAND (Reasonable And Non-Discriminatory) licensing model
  - Aligns with Industry standards licensing models (e.g. DMTF*, PICMG*, Infiniband*, etc.)
- IPMI v2.0 Adopters agreement required to implement IPMI v2.0 spec
  - Existing IPMI 1.5 adopters can continue to implement IPMI v1.5 under old licensing terms
  - IPMI v2.0 agreement required to implement new IPMI v2.0 features

Sign Up as IPMI 2.0 Adopter Today!

* Other names and brands may be claimed as the property of others
Typical Modular Application

- **In Band**
  - Compute node A
  - Compute node B
  - BMC
  - BP I/F
  - Sys I/F
  - Satellite Controller
  - mgmt module
  - Mgmt. Module Processor
  - BP I/F
  - Backplane Mgmt Interconnect
  - Out Of Band
  - FAN
  - Satellite Controller
  - temp
  - PS
  - IPMI Messages

- **LAN**
- **Remote Mgmt Console System**
- **CIM to IPMI**
IPMI helps reduce TTM and development cost for cross-platform management.

Where it fits...

Management Applications

Service Provider

Instrumentation Provider

IPMI Interface Code

IPMI H/W Interface

Baseboard Mgmt. Controller and monitoring h/w

OOB I/F

Out-Of-Band

Network, Serial, Modem, Inter-Chassis Mgmt Bus

IPMI helps reduce TTM and development cost for cross-platform management.
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v2.0 Addenda & Errata

- **RMCP+ Clarifications**
  - packet format and RAKP protocol operation
  - corrected inconsistencies in authentication, confidentiality, and integrity algorithm descriptions

- **Firmware Firewall**
  - added ability to report and configure OEM-defined commands

- **SSIF**
  - SMBus System Interface legitimized for use with IPMI v1.5 implementations

- **Platform Event Filtering**
  - added option for filtering on OEM events
v2.0 Addenda & Errata

- **“Alert Immediate” command**
  - new option to allow event data to be incorporated in alert

- **Extended Sensor types:**
  - System Boot / Restart Initiated
    - formerly “System Boot” - extended for reporting OS startup events
  - OS Stop / Shutdown
    - formerly “Critical Stop” - extended for reporting graceful and watchdog-triggered OS shutdown -related events
  - Management Subsystem Health
    - extended to report failures of sensors and FRU devices
v2.0 Addenda & Errata

- New Units types
  - grams, fatal error
- New Entity types:
  - system Real Time Clock (RTC)
- New Configuration parameters:
  - Optional parameter for returning serial bit rate support

IPMI provides solid foundation for platform management implementations
Agenda

• Initiative and Architecture Update
• IPMI v2.0 Technology Update
• IPMI in Action
• IPMI Futures
• IPMI v2.0 Payloads enable multiple types of traffic to be carried over a single IPMI session
  – payloads can also be launched to a separate session

• Standard and OEM Payload Types supported
  – OEM payload types: Enable value-added features on IPMI session infrastructure

• Payloads leverage IPMI Session infrastructure
  – User Authentication, Configuration, Protocols
Embedded KVM over LAN Technology

- BMC
  - Packetization
  - Video redir payload protocol
  - K/M redir payload protocol

- Video Controller

- KVM Chip
  - Network Controller Link I/F
  - Video Capture
  - Video Compression
  - K/M I/F

- Network Controller Link

- Intel Network Controller

- LAN

- Capture RAM

- PS/2 keyboard & mouse signals

Intel Developer FORUM
Embedded KVM over LAN Technology

Managed System

KVM Hardware
- Keybd I/O
- Mouse I/O
- Video Compress

BMC Firmware
- IPMI Msks

RMCP+ (IPMI Session)

UDP

Ethernet

Console

Browser Applet

Viewer Routines
- Keybd I/O
- Mouse I/O
- Video Decompress
- IPMI Msks

RMCP+ (IPMI Session)

UDP

Ethernet

JAVA

See demo in Intel Pavilion

Session Payloads Enable “1-port” Management
IPMI and WMX*

Proof-of-Concept – Microsoft and Intel demonstrate local and remote management using IPMI and WMX technology at WinHEC 2004

* Other names and brands may be claimed as the property of others
What is WMX?

• A SOAP-based protocol, originated by Microsoft*, that defines a small number of fixed operations for system management access
  – Includes functions for enumerating the information and functions that can be accessed on a given platform
• Based on Web-Services standards and technologies
• Uses URIs and XML data for access to management information and control functions
  – Conceptually and technologically aligned with Web Services – based interfaces being looked at by DMTF*

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Common Local and Remote Management

IPMI v2.0 in Action

Local Mgmt Access
- Management Applications
  - WMX Interface
  - WMX ↔ WMI
  - Instrumentation Provider
  - WMI ↔ IPMI
- IPMI Driver
  - IPMI H/W I/F
  - BMC and monitoring h/w

Remote Mgmt Access
- Management Applications
  - WMX Interface
  - WMX Over LAN "In-Band"
- XML/soap

"Embedded Provider"

WMX Over LAN "Out-of-Band"
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Convergence on Platform Interfaces

- DMTF striving for common cross-platform OOB management interface
  - Web-services-based structured protocol
  - CLI for human access, scriptable
  - CIM Schema, profiles for compliance

- IPMI continues to be
  - Infrastructure for implementation under DMTF interfaces
  - ‘Inside-the-Box’ interface, e.g.
    - Between BMC and system components
    - Between CMM and blades
  - Alternative OOB interface when Manageability Access Point is a SW Proxy
    - For ‘low-end’ implementations
    - For migration and support of installed base
Advancing Platform Management

IPMI Futures

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**IPMI v1.5**
- Monitoring (temp, volt, fan, etc.)
- Control (power on/off/cycle, reset, diag, interrupt)
- System Event Logging
- FRU & SDR Information
- Watchdog Timer
- Serial and LAN access
- Serial and LAN alerts
- Platform Event Filtering
- Serial Port sharing
- Management busses

**v2.0 Additions**
- Session and Security Enhancements
- Serial Over LAN
- SSIF
- Alignment with ASF Authentication
- Encryption support
- Firmware Firewall
- Command Discovery
- Modular (blade) support

**v2.0+ …**
- New Payload Types
- Enhanced Configuration Interfaces
- Links to Directory-based Authentication
- Improved Group Control
- Auxiliary Log Access
- Integration with Web Interfaces
- Web services-based access

**IPMI v1.5**

**v2.0 Additions**

**v2.0+ …**
New Capabilities Under Consideration

- Interfaces to Directory-based authentication
  - Support for Authentication Proxy
- Additional redirection payloads
  - e.g. KVM, USB-media
- Enhanced configuration interfaces
  - Simplified save/restore of configuration settings
  - Secure migration of user configuration
  - Integration with configuration of ‘Alternative Access’ features, e.g. Web Server, Telnet
IPMI Futures

New Capabilities Under Consideration

- More efficient options for ‘group control’
  - E.g. option for ‘persistent’ connections
- Auxiliary Log access
- Web-services – based interface support
  - Alignment with DMTF
  - “IPMI for Web Services” technologies

IPMI will continue to evolve with valuable new capabilities
Summary

- IPMI reduces TTM and development cost for platform management
- IPMI provides solid foundation for platform management implementations
- IPMI v2.0 technology supports value-added extensibility
- IPMI will continue to evolve with valuable new capabilities
Advances in Intelligent Platform Management
Tom Slaight, Intel Corporation

Questions?

More on IPMI and IPMI v2.0 at IDF:

• “Birds Of a Feather”
  Join us today for dialog and Q&A on IPMI and related technologies

• Technology Showcase
  See demos of IPMI-based systems in the Intel Pavilion

Please remember to turn in your session survey form