

# Servers and Wired for Management

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# Session Outline

- **Introduction to Wired for Management**
- **DMI SDK for Servers:**
  - ◆ **Tools for instrumenting NetWare\* servers.**
  - ◆ **Tools for enterprise integration.**
- **ACPI (Advanced Configuration and Power Interface) for Servers (experiences prototyping ACPI on servers).**

# **Servers and Wired for Management**

- **Introduction to Wired for Management**
- **DMI SDK for Servers**
- **ACPI for Servers**

# Wired for Management

**Make PC systems universally manageable and universally managed.**

- ◆ **A consistent baseline of management capabilities and function delivered in the platform.**
- ◆ **A consistent target for application developers.**

***Reduce Total Cost of Ownership***

# WfM Technologies

- ***Instrumentation***

Guaranteed set of management information available to management application.

– ***DMI 2.0 + std groups***

- ***Remote New System Setup***

Boot from network to install std load.

– ***Preboot eXecution Environment***

- ***Wake-Up on LAN***

Ability to wake platform to perform after-hours maintenance.

– ***MagicPacket\****

- ***Power Management***

HW, BIOS interfaces to allow OS to manage platform and subsystems power policy.

– ***ACPI***

# WfM Server Recommendations

## ● Instrumentation

You'll need either:

- DMI 2.0 (Server-specific DMTF standard groups).
- or SNMP.
  - ◆ Host Resources MIB
  - ◆ MIB-II

# WfM Server Recommendations (continued)

*We  
Recommend*

- Remote New System Setup
- Power Management (ACPI required for Microsoft's Windows NT\* 5.0 certification).

*Optional*

Wake-Up on LAN

# Servers and Wired for Management

- Introduction to Wired for Management
- **DMI SDK for Servers**
- ACPI for Servers



# **DMI SDK for Servers**

## **Overview**

- **Who Needs this SDK?**
- **DMI 2.0 SP for Novell NetWare\***
- **Enterprise Integration via DMI-to-SNMP Translators**
- **SDK Contents**
- **Call to Action**

# Who Needs this SDK?

- **Server OEMs, IHVs and ISVs who need to support NetWare\* servers.**
- **Instrumentation developers who require integration into enterprise management consoles.**

# DMI SDK for Servers

- Who Needs this SDK?
- DMI 2.0 SP for Novell NetWare\*
- Enterprise Integration via DMI-to-SNMP Translators

# Instrumenting WfM 1.1 Servers

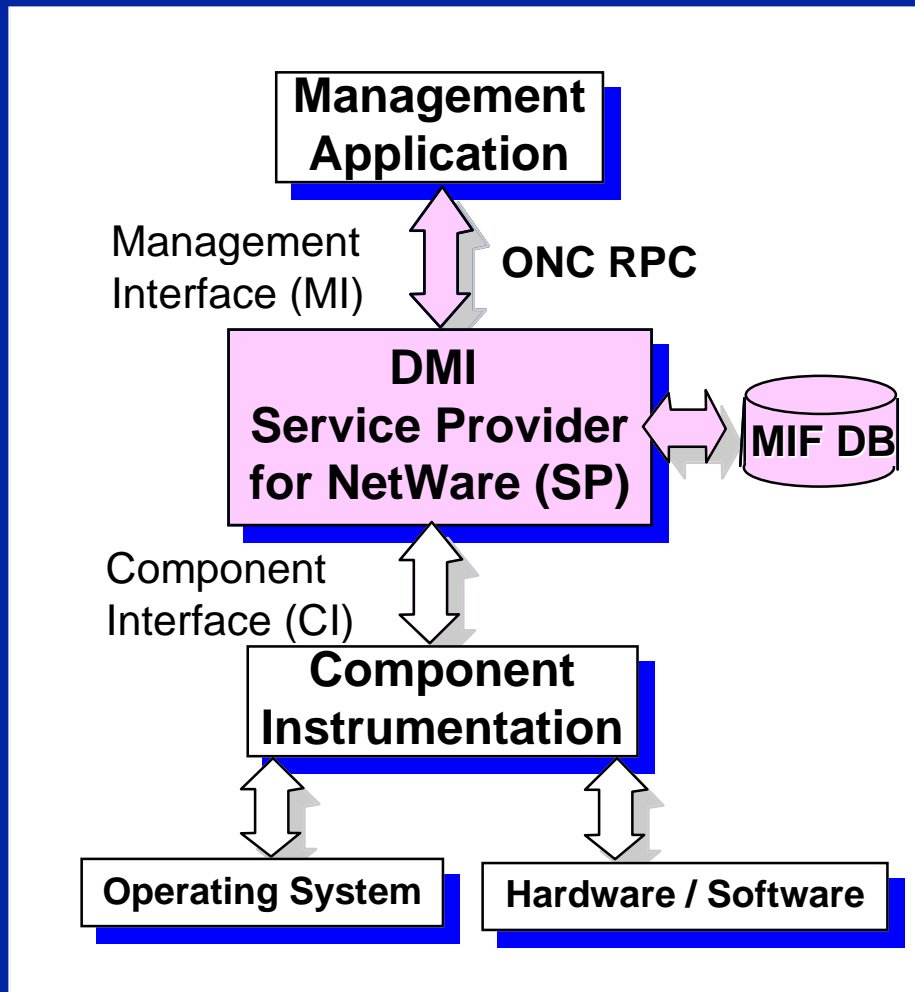
- DMI groups common to all platform types (keyboard, mouse, video, video BIOS are optional).
- **Server-specific groups** support RAS features

- Power Supply
- Power Unit Global Table
- System Power Controls
- Cooling Device
- Temperature, Voltage Probes
- System Hardware Security
- FRU, Operational State



**Getting started: consider Desktop or Mobile Instrumentation SDKs**

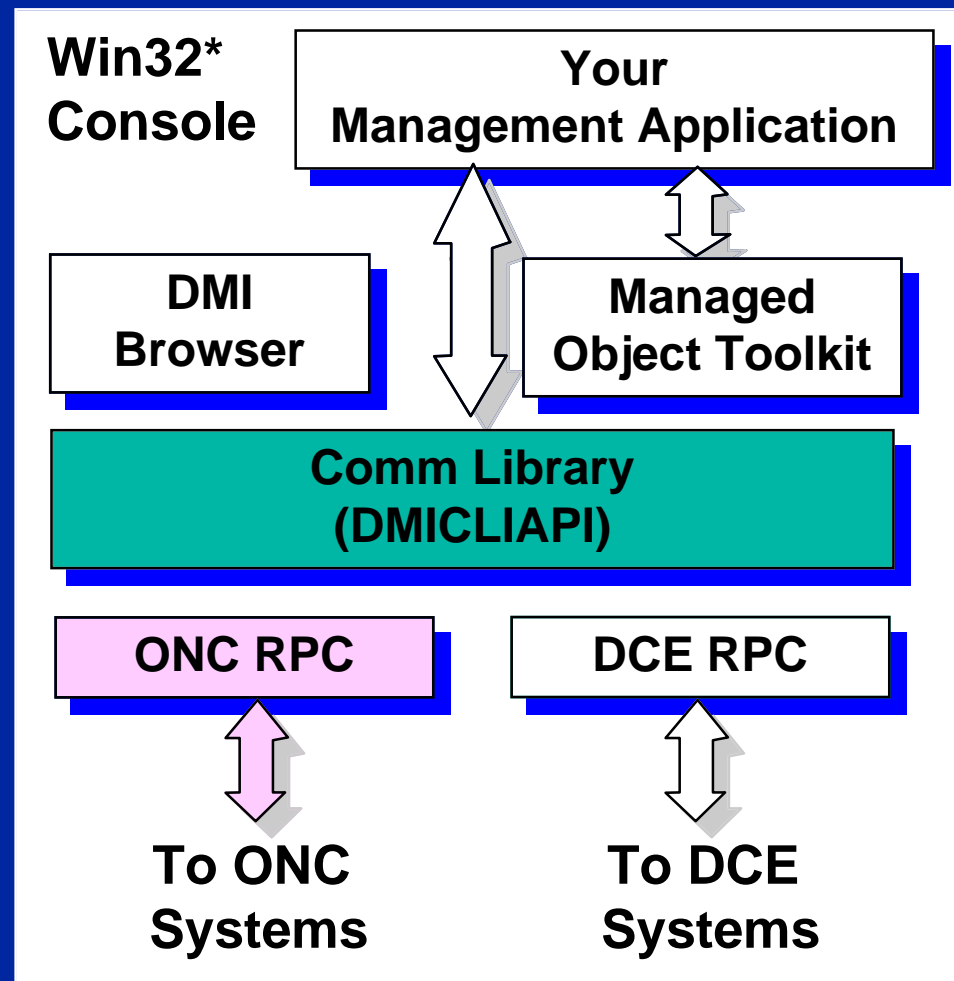
# DMI 2.0 Service Provider for Novell NetWare\*



- Full DMI 2.0 compliance.
- Supports NetWare\* 4.1x.
- Server-side ONC RPC (Novell TIRPC version 1.1).

# Remote Access to NetWare\* Service Provider

- **Client comm library** supports both **ONC & DCE RPC** (transparent to caller).
- **ONC RPC** in Win32 DMI 2.0 SP SDK (currently unavailable).



# DMI SDK for Servers

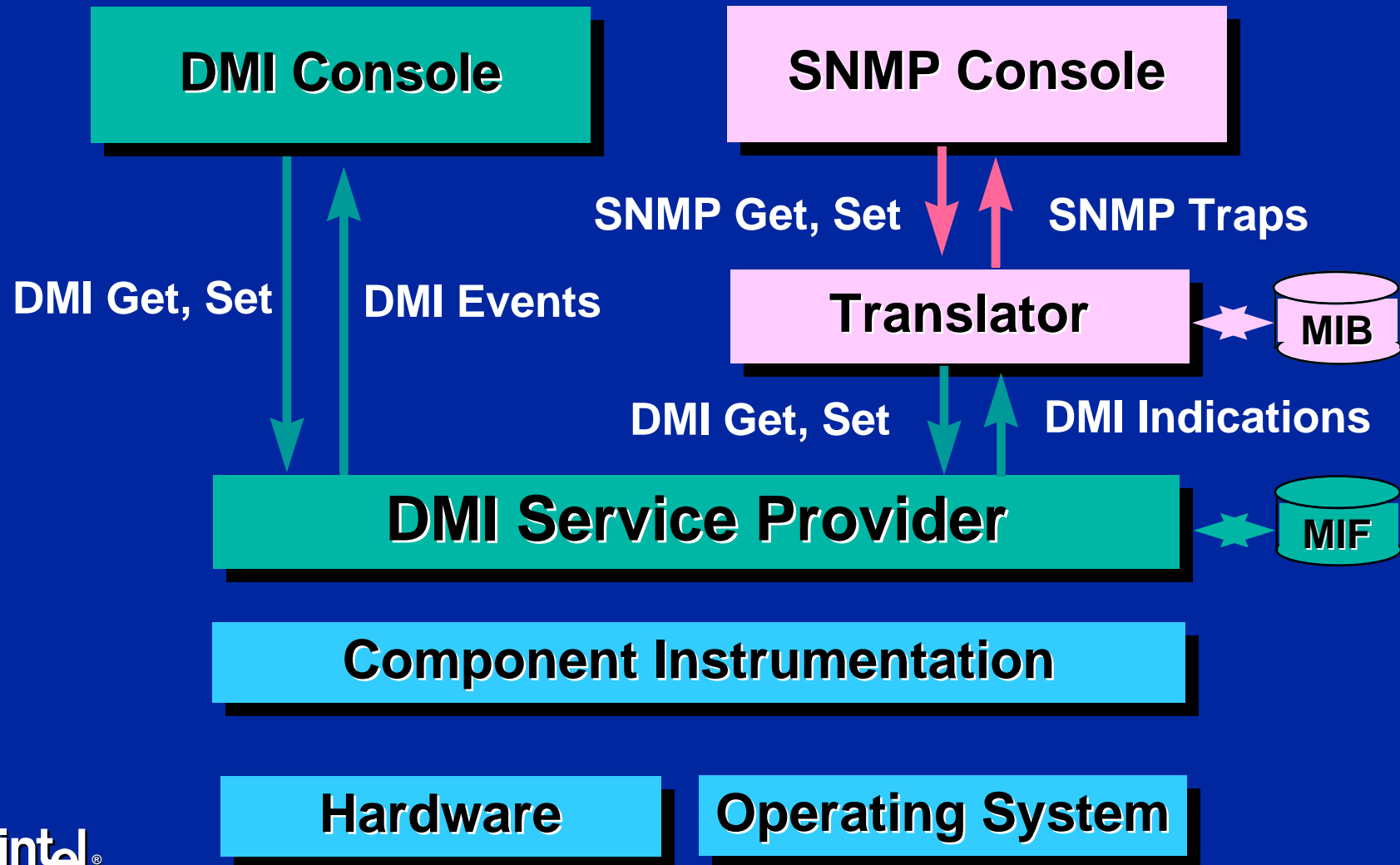
- Who Needs this SDK?
- DMI 2.0 SP for Novell NetWare\*
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# Enterprise Console Integration

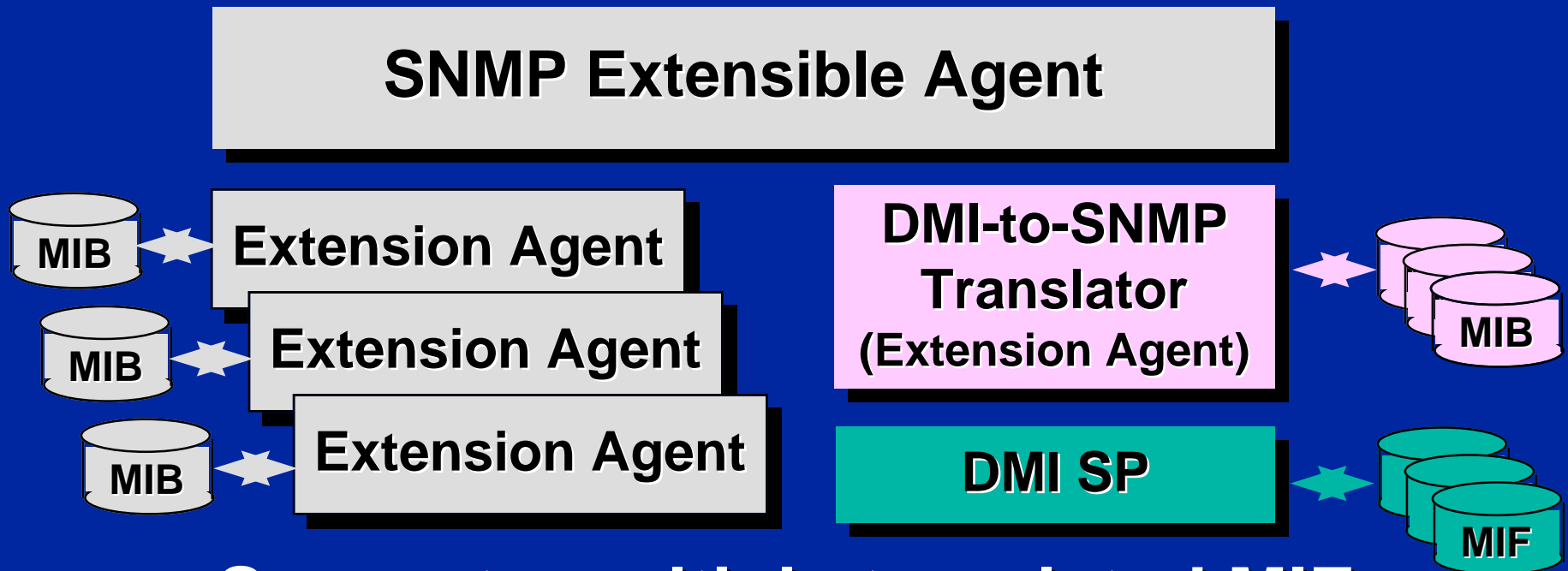
- Instrument once using DMI 2.0.
- Support two console types:
  - ◆ DMI
  - ◆ SNMP
- Windows NT\* and NetWare\* servers.



# DMI-to-SNMP Translation



# Heterogeneous Instrumentation



- Supports multiple translated MIFs.
- Coexists with additional SNMP instrumentation on the same system.

# Preparing for Translation

- Include the MIFTOMIB group in your MIF (uniquely define your MIB in the SNMP name space).
- Convert your MIF to your MIB by running the MIFtoMIB.exe (Win32\* application).

## Group

Intel|MIFTOMIB|1.0

## Attributes

MIB Name: string

MIB OID: string,  
required

Disable Trap: toggle  
trap delivery from  
instrumented  
system

# Installing the Translator

- **Install your MIB on target and console:**
  - ◆ Requires relinking MIB into translator NLM (requires the NetWare\* NMS SDK from Novell).
  - ◆ Windows NT\* translator is fully dynamic.
- **Install the translator as an extension agent of the SNMP Agent on the target (OS-specific instructions provided).**

# Translator Details

- **SNMP OID schema defined in DMI v1.1 Specification, Chapter 7.**
- **Supports DMI 1.1 and 2.0 instrumentation.**
- **Supports standard and proprietary groups.**
- **Supports DMI 2.0 standard events.**
- **Uses DMI 1.1 MI (local only) to SP.**

# SDK Contents on the WfM Toolkit CD

- **NetWare\* DMI 2.0 SP SDK:**
  - ◆ Binaries
  - ◆ Header files
  - ◆ Examples - multi-timer management application, trusted CI
  - ◆ Initial MIF database
  - ◆ Setup
  - ◆ Documentation
- **DMI-to-SNMP Translators:**
  - ◆ SDLINK.DLL (Win32\*)
  - ◆ SDLINK.NLM (NetWare)
  - ◆ MIFtoMIB.EXE
  - ◆ Documentation

# Information Sources

- **Support for DMI SDK for Servers (1-800-628-8686).**
- **SDK Updates:**
  - ◆ [www.intel.com/managedpc](http://www.intel.com/managedpc)
  - ◆ Win32\* DMI 2.0 SP SDK updates
- **DMI 2.0 Specification, other DMTF documents:**
  - ◆ WfM Toolkit CD
  - ◆ [www.dmtf.org](http://www.dmtf.org)

# **DMI SDK for Servers**

## **Call to Action**

- **Instrument WfM 1.1-compliant servers and peripherals using DMI 2.0:**
  - ◆ **Novell NetWare\*.**
  - ◆ **Windows NT\* Server.**
- **Instrument once, reach workgroup and enterprise consoles through DMI-to-SNMP translation.**



# Servers and Wired for Management

- Introduction to Wired for Management
- DMI SDK for Servers
- ACPI for Servers

# ACPI for Servers

## Overview

- **What is ACPI?**
- **Why is ACPI needed?**
- **Platform Support for ACPI**
- **MP Prototype Discoveries**
- **Summary**
- **Call to Action**

# ACPI - What is it?

Configuration + Power Management

- **Advanced Configuration and Power Interface** (specification from Intel, Microsoft, & Toshiba).
- Platform configuration information (replaces EISA & PnP Configuration Data and MP Specification tables).
- OS power management interfaces.

# ACPI for Servers

## Overview

- What is ACPI?
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# Why is ACPI needed?

- **Compliance:**

- ◆ **Windows NT\* 5.0 “Sticker”:**

- PC 98 guidelines define “Designed for Windows NT” hardware requirements for NT 5.0 - July 1, 1998.

- ◆ **Wired for Management Baseline 2.0.**

- 1998

# Why is ACPI needed?

(Continued)

- Provides useful power-control features for server management:
  - ◆ OS interfaces for Power Management
    - Cooperative and clean system power shutdown.
  - ◆ Green is good:
    - Server power requirements increasing.
    - Servers unused or lightly used at night.
    - Power savings particularly valued where electricity costs are high.

# ACPI for Servers

## Overview

- What is ACPI?
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- **Platform Support for ACPI**
- MP Prototype Discoveries

# Platform Support for ACPI

- **Hardware**

- ◆ **Chip set component with ACPI support registers and power control logic (for example, Intel 82371AB “PIIX4”).**
- ◆ **Soft Power Control:**
  - **Compatible power push-button, power override functions.**
  - **Issue: integration with existing server power control options.**
- ◆ **“Sleeping” indicator light.**



# Platform Support for ACPI

## (Continued)

- BIOS

- ◆ ACPI tables in BIOS.

- ◆ ASL Code in ACPI tables.

- For resource description.

- For accessing alternate hardware implementations.

- ◆ ACPI initialization routine in SMI handler.

- ◆ Int 15 0xE820 and other memory-reporting APIs.

- ◆ POST code for S2-S4 BIOS sleep-state support.

# ACPI for Servers

## Overview

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# MP Prototype Discoveries

- **MP Server Prototype program:**
  - ◆ **Share hardware & discovery feedback with Microsoft.**
  - ◆ **“White Wired” Dual Pentium® II processor server system board:**
    - Intel 440LX chip set.
    - Intel 82371AB “PIIX4” IDE/ISA Xccelerator.
  - ◆ **Server ‘RAS’ chassis with pre-existing Server Management soft power control functions.**

# MP Prototype Discoveries

## (Continued)

- **Windows NT\* 5.0 MP Discoveries:**
  - ◆ **Early versions exhibit some growing pains functioning in ACPI mode.**
  - ◆ **APIC table changes required in specification:**
    - **ACPI calls out IRQ0 - IRQ15 to identity map into the APIC. Incompatible with the MP specification implementation.**
    - **Working to add interrupt redirection into APIC tables to fix this issue.**
  - ◆ **\_PIC (8259) method not documented as an ACPI reserved word yet.**

# MP Prototype Discoveries

## (Continued)

- **Hardware Discoveries:**
  - ◆ **Integration with existing Managed Power Control features:**
    - PII X4 resume state machines still running when system is powered down.
    - Power control firmware modifications required to support ‘ACPI Mode’ and ‘non-ACPI Mode’ power control.
    - Server Management power control must cooperate with PII X4 to enable Wake-on-RTC feature.
    - Firmware and hardware for “sleep” light.

# MP Prototype Discoveries

## (Continued)

- **Hardware Discoveries (continued):**
  - ◆ **PIIX4 needs Stop Clock grant from all processors to enter S4 or S5 state.**
  - ◆ **C1, C2, & C3 support requires per processor stop clock hardware:**
    - **Can't share stop clock lines and support C2 & C3 states. --> PIIX4 only supports one CPU in the C2 or C3 state.**
    - **Additional Logic to support C2/C3 & processor throttling.**
  - ◆ **No ASL required for power features.**

# Summary

- **ACPI requirements in PC 98 and Wired for Management 2.0 initiative.**
- **ACPI-compliant hardware and BIOS required - it's not a retrofit.**
- **Pay special attention to integrating with existing Server Management power control.**
- **MP Server issues being worked - stay tuned...**

# ACPI for Servers Call to Action

- **Start server ACPI implementation now.**
- **Get the specifications:**
  - **Advanced Configuration and Power Interface Specification, v 1.0**  
<http://www.teleport.com/~acpi/>
  - **Wired for Management Baseline Specification, v1.1.**  
<http://www.intel.com/managedpc/wired/wired.htm>
  - **PC 98 System Design Guide**  
<http://www.microsoft.com/hwdev/pc98.htm>
  - **82371AB PCI-to-ISA/IDE Xcelerator (PIIX4)**  
<http://www.intel.com/design/pcisets/datashts/>