Processor Utilization with Microsoft® Windows® Media Center Edition on Systems Enabled with Cool'n'Quiet™ and AMD PowerNow!™ Technologies

Application Note

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Revision History

Date	Revision	Description
May 2005	3.00	Initial public release.

1 Overview

Audience

This document is intended for OEMs and system builders building systems utilizing the Microsoft® Windows® XP Media Center Edition (MCE) operating system.

Intent of Document

This document describes the procedure for measuring processor utilization on systems enabled for P-state transitions (Cool'n'Quiet™ and AMD PowerNow!™ technologies) and Windows XP MCE.

2 Technical Content

The P-state transitions (Cool'n'Quiet and AMD PowerNow! technologies) allow a computer to dynamically switch between different processor performance states depending on the processor utilization. In mobile applications these transitions can help extend battery life while delivering maximum processor performance on demand. In desktop applications they can reduce heat dissipation of the processor, resulting in less use of the fan and less noise.

The document *Microsoft Windows XP MCE 2005 Hardware Requirements* (available from Microsoft) helps specify maximum processor utilization for various user scenarios. OEMs and system builders are required to measure processor utilization for Windows XP MCE system compliance. OEMs and system builders must meet these requirements in order to receive the Windows XP MCE logo and to market their products as Windows XP MCE computers.

Observation

When running processor utilization compliance tests on Windows XP MCE systems with P-state transitions enabled, OEMs and system builders may observe processor utilization rates exceeding the acceptable threshold for Windows XP MCE.

Explanation

This behavior is by design. P-state transitions adjust the operating frequency of the processor in response to the required processor performance. Processor usage as implemented by Microsoft in Task Manager can measure only processor utilization at the current frequency of the processor, not the potential processor utilization at the maximum processor frequency. If a P-state transition reduces the processor frequency, processor utilization rises because it is now being calculated for a lower processor frequency. Audio and video playback remain smooth and uninterrupted because, as additional processor performance is required, the P-states transition to higher frequencies. With P-state transitions enabled, Windows XP MCE processor utilization results are invalid because they do not represent the true utilization potential of the system.

Workaround Solution

To accurately measure processor utilization for Windows XP MCE compliance on a P-state capable system, the OEM or system builder must disable P-state transitions by selecting the **Always ON** power scheme. To select **Always ON**:

1. Go to the Control Panel.
2. Select **Power Options**.
3. Select the **Always ON** power scheme.
4. Click **OK**.
5. Perform processor utilization compliance tests as required in *Microsoft Windows XP MCE 2005 Hardware Requirements*.
6. Re-enable P-state transitions upon completion of the processor utilization compliance tests by returning the system to the AMD-recommended setting of **Minimal Power Management** for desktop systems or **Portable/Laptop** for mobile systems.

These changes are for Microsoft Windows XP Media Center Edition processor utilization testing only. OEMs should set the default power scheme at the AMD-recommended setting of **Minimal Power Management** for desktop systems or **Portable/Laptop** for mobile systems. These settings can help extend battery life in mobile applications and reduce dissipated heat and noise in desktop applications.