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1 Preface

With Intel® vPro™ technology you can power on and power off your Intel vPro based clients on a schedule. This allows you to save energy by shutting down the systems in your environment every day and waking them up again locally on the managed client. Intel® Active Management Technology (Intel® AMT) 6.1 and above have a new capability to schedule the system to wake up through the use of the Alarm Clock Feature. This Intel vPro solution can be deployed through any management console to schedule alarm clock settings that power on at a specific time every day and schedule a local soft shutdown.

1.1 Intended Audience

This document is intended for Information Technology (IT) professionals who use a management console to manage Intel vPro technology based systems. These IT professionals should have access to the full functionality of their company's third-party management console. Readers should have a good working familiarity with Intel vPro Technology, including configuration and use of the Intel AMT platform for out-of-band management. Readers should also be familiar with the basics of IT infrastructure, especially networked environments and their component technologies.

2 Introduction

This solution allows you to wake and shut down your managed clients locally. Using local Intel® Active Management Technology (Intel® AMT) resources on the managed client reduces network traffic compared to pushing startup and shutdown commands down to each managed client every morning and evening.

This document describes the features and usage of the Enhanced Wake and Sleep Suite, which consists of PowerMgmt.exe, Turnoff.exe, ExecSCCM.exe, and several Intel AMT High Level API DLL files (included in this solution's download file). In this document, we'll refer to these files as "tools."

You can use any management console to deploy these tools to your managed clients. The PowerMgmt.exe tool schedules the Alarm Clock on systems with Intel AMT 6.1 and above. Turnoff.exe shuts the local system down, and can be called by PowerMgmt.exe or by the management console's scheduler.



NOTE

The Intel AMT power off commands are not used so that the OS graceful shutdown can be performed instead of a hard power off, which is like unplugging the system's power cord.

The deployment process essentially consists of creating a package for the PowerMgmt.exe tool and deploying it through your management console's scheduling feature. PowerMgmt.exe can be used for both Wake and Shutdown. For the Wake function, PowerMgmt.exe sets the local Intel AMT alarm clock on the managed client and the client wakes at the specified date/time. Schedules can be single occurrence or recurring. For the Shutdown function, the Turnoff.exe tool must be copied down to the managed client machine in the same folder as the PowerMgmt.exe tool. Turnoff.exe can be run from PowerMgmt.exe or from your management console's task scheduler. A log file is created at the time of execution in the same directory where the PowerMgmt.exe tool is executed.

If using Microsoft* System Center Configuration Manager (ConfigMgr), copy the ExecSCCM.exe file to the same directory as the other Enhanced Wake and Sleep tools. The ExecSCCM.exe tool works only with ConfigMgr, but requires the entire Enhanced Wake and Sleep Suite (PowerMgmt.exe, Turnoff.exe, and the HLAPI dlls). Once executed on the client, this tool will determine when the next wake package is set to occur, and will schedule the alarm clock before that time. The ExecSCCM.exe tool defaults to five minutes before wake up time, but can be changed using a parameter.



NOTE

Only one alarm clock can be scheduled at a time on systems that have Intel AMT 6.1 up to Intel AMT 7.X. Therefore, when using the ExecSCCM.exe tool, configure it to run several times a day. This will ensure that patches to the awakened system occur in a timely fashion and in the correct order.

2.1 PowerMgmt.exe

When the wake parameter is supplied, PowerMgt.exe calls the Intel AMT Alarm Clock to wake the system at the specified date/time.

When the shutdown parameter is supplied, PowerMgmt.exe will schedule a task in the Microsoft Windows* task scheduler and execute the Turnoff.exe tool at a scheduled time. The tool also allows the user to cancel the shutdown and has a built-in timer that is scheduled through the deployment tool. This is a great way to schedule wake and sleep so that network bandwidth is conserved by not pushing individual remote commands.

The PowerMgmt.exe tool has several required parameters, shown in the table below.

-p [1/0]	Value 1 or 0. A value of 1 means the system needs to be scheduled to be Powered On. A value of 0 means the system needs to be scheduled to shut down
-m <i>month</i>	The month to begin powering on or off the managed clients. Values 1 through 12 signifying January through December.
-d <i>day</i>	The day of the month to begin powering on or off the managed clients. Values are 1 to 31 . NOTE: If the day inputted does not exist in that month (for example, 2/31), PowerMgmt.exe will log the error and will not continue.
-y <i>year</i>	The year to begin powering on or off the managed clients. Value must be inputted as 4 digits (for example, 2011).
-c HH:MM or HH:MM AM/PM	The time of day to begin powering on or off the managed clients. Time can be inputted either using the 24 hour clock as HH:MM or using standard time as HH:MM AM/PM (for example, 13:00 or 1:00 PM).
-o [0/1]	Recurrence. Values 0 or 1 . 0 for single occurrence or 1 for reoccurring schedule.
-s [0/1]	Security, values 0 or 1 . Value 0 for Non-TLS, value 1 for TLS. This depends on how the client was provisioned. Later versions may support other transport layers. Note: If using the shut down option, this parameter should NOT be used. It is required for the power on capability.
-t <i>minutes</i>	OPTIONAL. Countdown until shutdown. Value <i>minutes</i> is the number of minutes before system shuts down. This value is passed to Turnoff.exe. Note: This is an optional parameter and is only needed when performing a power off. If this setting is not used the delay will default to 1 minute.
-a	Digest account information. If the -a parameter is used, you must supply the Intel AMT username and password after the parameter.

	<p>Example: -a admin P@ssw0rd</p> <p>For Kerberos, do not use the -a parameter and ensure that the management console deploying the PowerMgmt.exe tool has Intel AMT local access when scheduling to Intel AMT or the task scheduler.</p> <p>Note: If using the shut down option, this parameter should NOT be used. It is required for the power on capability.</p>
-del	<p>OPTIONAL. This command provides the ability to delete all the set alarm clocks on the given client.</p> <p>To delete all the alarm clocks, use the -del parameter with the -s 0:1 parameter for non-TLS or TLS. If using a Digest account, include the -a admin password parameters.</p> <p>Examples: -del -s 1 to delete alarm clocks using Kerberos with TLS. To delete using Digest: -del -s 0 -a admin password</p>

2.2 Turn off.exe

The Turnoff.exe tool is the local shutdown tool. Turnoff.exe will need to be copied down to the managed client by the management console. You can put the Turnoff.exe tool in any directory on the managed client that the management console has access to.



NOTE

Turnoff.exe can be used with the PowerMgmt.exe tool which uses the task scheduler to power off the system at a specific time. If your management console has its own task scheduler, then the Turnoff.exe tool can be deployed on its own.

If no information is provided to the Turnoff.exe tool, it will default to 1 minute. The standard shutdown feature included with Windows 7 and above does not provide the ability for the user to cancel the shutdown. Turnoff.exe tool allows the user to cancel out of the shutdown in the allotted time and not shutdown the system as scheduled. This will be helpful for organizations that may have users still on their systems when they are going to be shutdown.

Number of minutes	<p>The number of minutes to delay shutdown.</p> <p>Example: Turnoff.exe 5</p> <p>Shutdown will be delayed 5 minutes</p>
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2.3 ExecSCCM.exe

The ExecSCCM.exe tool must be copied to the same directory as PowerMgmt.exe and Turnoff.exe.

The ExecSCCM.exe tool integrates with Configuration Manager to determine when the next package is scheduled to be sent to the managed client PCs, so that the clients can be awakened at the appropriate time to receive and execute the package from Configuration Manager. The ExecSCCM.exe tool can also ensure that the client is not automatically powered down during package execution by adjusting any scheduled power downs to account for package execution.

Since multiple packages can be delivered to the same client, the ExecSCCM.exe tool parses the Configuration Manager scheduling information to determine when the next package will be sent. It then passes the package schedule information to PowerMgmt.exe, which schedules the client to be powered on at the appropriate time and date.

This tool should be run several times a day to ensure that as the Configuration Manager schedule for package deliveries changes throughout the day, those schedule changes are passed to PowerMgmt.exe to schedule client power on at the appropriate time.



NOTE

Not all packages require the client to be powered on in order to be executed. The ExecSCCM.exe tool checks the "Manufacturer" field on each package's properties to determine whether the client needs to be powered on for that particular package or not. Before creating a package for client patches, determine whether the client must be powered on before package execution. If so, set the "Manufacturer" field to "PowerOn" in the package's properties, so that ExecSCCM.exe will power on the client for that package.

Since this tool schedules the alarm clock, the only data that must be entered is the recurrence and the security transport. There is also an optional parameter for the number of minutes prior to package delivery/execution to power on the client machine. The default is set to 5 minutes.

-o [0/1]	Recurrence. Values 0 or 1 . 0 for single occurrence or 1 for reoccurring schedule.
-s [0/1]	Security, values 0 or 1 . Value 0 for Non-TLS, value 1 for TLS. This will be dependent on how the client was provisioned. Later versions may support other transport layers.

-a	<p>Digest account information. If the -a parameter is used, you must supply the Intel AMT username and password after the parameter.</p> <p>Example: -a admin P@ssw0rd</p> <p>For Kerberos, do not use the -a parameter and ensure that the management console deploying the PowerMgmt.exe tool has Intel AMT local access when scheduling to Intel AMT or the task scheduler.</p>
-w <i>minutes</i>	<p>OPTIONAL. Number of minutes prior to package delivery to power on the client. If the -w parameter is not used, the default is to wake the clients 5 minutes before the next scheduled package delivery. The maximum window of time is 30 minutes.</p>

3 Deployment and Usage

This section provides instructions for deploying and using the Enhanced Wake and Patch Suite's tools.

3.1 Prerequisites

- Intel AMT must be configured on the managed clients either using Digest or Kerberos
- Client systems must have Windows 7 or above installed
- IT professional must have full access to the third-party management console
- IT professional must have accounts and passwords for Intel AMT functions on the managed clients
- All tools must be unzipped into the same directory. Please ensure that you have downloaded PowerMgmt.exe, Turnoff.exe, and ExecSCCM.exe, as well as the Intel® AMT High Level API DLL files, and placed them all in the same directory on each of the managed clients
- Microsoft .NET framework 4 must be installed on the managed clients before PowerMgmt.exe and Turnoff.exe can be run on the clients.
<http://msdn.microsoft.com/en-us/netframework/aa569263>



NOTE

The management console must have access to the directory where the programs and .dll files are copied.

The PowerMgmt.exe tool must have write access to the local directory where it runs, since it writes a log file in that directory.

3.2 Scheduling a Remote Power On



NOTE

For integrated power on with Microsoft Configuration Manager, see section 3.5.

The IT Professional deploys the PowerMgmt.exe tool to the client machine with the desired parameters as noted above. Create a task sequence in your management console and supply the Kerberos user account access to the task. The Kerberos account information ensures that when the commands are run for the remote power on, the Kerberos authentication will be passed at execution.

Once scheduled, the client will perform the power on using the local Intel AMT Alarm Clock.

Follow the steps below, adjusting the tool parameters as desired. See section 2.1 for a complete listing of parameters and their values.

1. Using your management console, deploy **PowerMgmt.exe -p 1 -m month -d day -y year -c HH:MM -o 1 -s 1** (be sure to include the Intel AMT High Level API dlls in the package).
2. Client receives package, and enables the alarm clock to create reoccurring wake at the specified date and time without password defaults to Kerberos using TLS.

3.3 Scheduling a Remote Power Off

The IT Professional can either use the PowerMgmt.exe to use the OS task scheduler to deploy the power off command using Turnoff.exe or if the management console has a task scheduler, use that task scheduler to run the Turnoff.exe tool. If using the OS Task Scheduler, ensure the task sequence is sent using an account that has access to create an OS task schedule on the local client. This is to ensure that the power off commands have the right administrative access to create the shutdown OS task.



NOTE

The issue arises when the management console task scheduler tries to run turnoff.exe at a specific time and it gets missed, the system will shut down unless there is a setting in the management console task scheduler that says only run at this specific time. If not, please use the OS task scheduler through the PowerMgmt.exe tool.

3.3.1 Power Off Using the Operating System's Task Scheduler

Follow the steps below, adjusting the tool parameters as desired. See section 2.1 for a complete listing of parameters and their values.

1. Using your management console, deploy **Turnoff.exe** to the client machine to the same directory as the **PowerMgmt.exe**. When delivering the package using your management console, ensure that the package is run as by an account that has access to create an OS task schedule on the client.



NOTE

If your management console deletes files after execution, copy the files to another location on the client (instead of copying the files to a temporary directory), then execute PowerMgmt.exe. The OS task scheduler will return to whatever directory is specified for PowerMgmt.exe to execute Turnoff.exe at the scheduled time.

2. Deploy **PowerMgmt.exe -p 0 -m month -d day -y year -c HH:MM -o 1 -t 5** (be sure to include the Intel AMT High Level API dlls in the package).
3. Client receives package, and enables the task scheduler to run Turnoff.exe with the delay switch of 5 minutes.

3.3.2 Power Off Using the Management Console's Task Scheduler

Some management consoles have their own task scheduler that will deploy one schedule to the client and will run locally on the client. If this is the way your task scheduler works, then use this method for scheduling the shutdown.

The Turnoff.exe tool's code can run by itself (without PowerMgmt.exe). This allows you to create a package for it in your management console using its task scheduler, just like you would with any software deployment package. Once the package is created, you deploy it like any other patch, but you can specify a single occurrence or recurring schedule.

The date/time are set through the management console's interface along with the reoccurrence. Specifying TLS or Non-TLS is not needed when deploying Turnoff.exe standalone, nor is the Digest and Kerberos information. Turnoff.exe will assume the management console has access permissions to run and schedule this patch.

The only optional parameter needed is the **number of minutes to shutdown**. If the parameter is not used, the default shutdown time will be 1 minute. If **number of minutes** is used, the IT administrator can set the delay time in minutes for the client system shutdown.

Use the management console's task scheduler to execute **Turnoff.exe** on the managed client at a specific date/time and its recurrence (single or recurring) through the management console's interface.

3.4 PowerMgmt.exe Command Line Examples

Below are some examples of the PowerMgmt.exe command and the parameters used for specific purposes. See section 2.3 for a complete listing of parameters and their values.

To power on once using Kerberos with TLS NOTE: The management console deploying the package must have permissions to Intel AMT.	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 0 -s 1
To power on once using Kerberos with Non-TLS	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 0 -s 0
To set a recurring power on using Kerberos with TLS	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 1 -s 1
To set a recurring power on using Kerberos with Non-TLS	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 1 -s 0

To power on once using Digest with TLS	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 0 -s 1 -a <i>username password</i>
To power on once using Digest with Non-TLS	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 0 -s 0 -a <i>username password</i>
To set a recurring power on using Digest with TLS	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 1 -s 1 -a <i>username password</i>
To set a recurring power on using Digest with Non-TLS	PowerMgmt.exe -p 1 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 1 -s 0 -a <i>username password</i>

To set a single occurrence shutdown using PowerMgmt.exe NOTE: The management console deploying the package must already have access to the client system to be able to schedule the task.	PowerMgmt.exe -p 0 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 0 -t <i>minutes</i>
To schedule a recurring shutdown using PowerMgmt.exe	PowerMgmt.exe -p 0 -m <i>month</i> -d <i>day</i> -y <i>year</i> -c <i>HH:MM</i> -o 1 -t <i>minutes</i>

3.5 Powering On Using the Integrated Configuration Manager Tool

For an overview of the ExecSCCM.exe tool, see section 2.3.



NOTE

Not all packages require the client to be powered on in order to be executed. The ExecSCCM.exe tool checks the "Manufacturer" field on each package's properties to determine whether the client needs to be powered on for that particular package or not. Before creating a package for client patches, determine whether the client must be powered on before package execution. If so, set the "Manufacturer" field to "PowerOn" in the package's properties, so that ExecSCCM.exe will power on the client for that package.

Perform the following steps to deploy the Enhanced Wake and Sleep Suite tools to each managed client and begin automatically setting client power-on schedules that are aligned with Configuration Manager package deliveries to the clients.

1. Create a software package in Configuration Manager that contains all the Enhanced Wake and Sleep files and the Intel® AMT High Level APIs down to the managed clients (all files in the same directory). Ensure that the ExecSCCM.exe is in the same directory.
2. Once the software package is created, create a task sequence pointing to the distribution package. The **Run As** parameter should be set to an account that has Kerberos access. The task should consist of a "run command line" component that executes a batch file which runs the ExecSCCM.exe with the desired parameters (minimally, you will need to supply the **-o** and **-s** parameters). See section 2.3 for a complete list of parameters and their values. Using the batch file allows for output to be redirected to log files. Configuration Manager allows command line components to be executed with a custom active directory user which is required for proper functioning of the supplied executable file.
3. Deploy the package you just created to the managed clients.

The ExecSCCM.exe tool will now run automatically on each client (based on the recurrence parameters set in the command line above) to check the Configuration Manager package schedule (and "Manufacturer" field) and wake the client at the appropriate time.

3.6 Powering Off Using Configuration Manager and the OS Task Scheduler

Perform the following steps to deploy the Enhanced Wake and Sleep Suite tools to each managed client and begin setting client power-off schedules

1. Create a software package in Configuration Manager that contains all the Enhanced Wake and Sleep files and the Intel® AMT High Level APIs down to the managed clients (all files in the same directory).
2. Once the software package is created, create a task sequence pointing to the distribution package. The **Run As** parameter should be set to an account that has administrative access to create OS tasks on the local client. The task should consist of a "run command line" component that executes a batch file that runs the PowerMgmt.exe with the desired parameters. See section 2.1 for a complete list of parameters and their values. Using the batch file allows for output to be redirected to log files. Configuration Manager allows command line components to be executed with a custom Active Directory user which is required for proper functioning of ExecSCCM.exe.



NOTE

Ensure that all the files are copied to a persistent location on the client. The Configuration Manager agent will delete the package files after execution of

PowerMgmt.exe, so the package components should be duplicated on the client's hard drive and executed from the duplicate folder so that Turnoff.exe and the supporting DLLs are still present when the OS scheduler runs turnoff.exe later after the original package folder is deleted.

3. Deploy the package you just created to the managed clients.

The PowerMgmt.exe tool will now run on each client (based on the recurrence parameters set in the command line above) and schedule when the client systems should be shutdown.

3.7 ExecSCCM.exe Command Line Examples

Below are some examples of the exe_SCCM.exe command and the parameters used for specific purposes. See section 2.3 for a complete listing of parameters and their values.

To run on once using Kerberos with TLS with Configuration Manager integration NOTE: The management console deploying the package must have permissions to Intel AMT.	ExecSCCM.exe -o 0 -s 1
To power on once using Kerberos with Non-TLS with Configuration Manager integration	ExecSCCM.exe -o 0 -s 0
To set a recurring power on using Kerberos with TLS with Configuration Manager integration	ExecSCCM.exe -o 1 -s 1
To set a recurring power on using Kerberos with Non-TLS with Configuration Manager integration	ExecSCCM.exe -o 1 -s 0
To power on once using Digest with TLS with Configuration Manager integration	ExecSCCM.exe -o 0 -s 1 -a <i>username password</i>

To power on once using Digest with Non-TLS with Configuration Manager integration	ExecSCCM.exe -o 0 -s 0 -a <i>username password</i>
To set a recurring power on using Digest with TLS with Configuration Manager integration	ExecSCCM.exe -o 1 -s 1 -a <i>username password</i>
To set a recurring power on using Digest with Non-TLS with Configuration Manager integration	ExecSCCM.exe -o 1 -s 0 -a <i>username password</i>