

Intel® vPro™ Technology Module for Microsoft* Windows* PowerShell*

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Intel® Active Management Technology requires the computer system to have an Intel(R) AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see www.intel.com/technology/platform-technology/intel-amt/

Throughout this document Intel ME refers to Intel® Management Engine and Intel® AMT refers to Intel® Active Management Technology.

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1 Preface

Microsoft* Windows* PowerShell* is becoming more prevalent as an automation scripting language within many Information Technology (IT) environments. Whether writing scripts to automate tasks or taking advantage of native Windows PowerShell extensibility within existing management tools, the ability to Out of Band manage Intel® Active Management Technology (Intel® AMT) enabled clients with Windows PowerShell is a very attractive solution.

1.1 Document Scope

This document covers the requirements, installation and usage of the Windows PowerShell Module for Intel® vPro™ Technology.

1.2 Intended Audience

Windows PowerShell command line shell and scripting language helps IT professionals achieve greater control and productivity. Using a new administrator-focused scripting language and consistent syntax and utilities Windows PowerShell allows IT professionals to more easily control system administration and accelerate automation. This document is intended for IT professionals who desire to learn more about using the Intel® vPro™ Module for Windows PowerShell.

1.3 Related Documentation and Software

The download package, module installer and supporting files referenced in this document can be found at the following link:

<http://www.intel.com/go/powershell>

Microsoft Windows Management Framework (which includes Windows PowerShell):

<http://support.microsoft.com/kb/968929>

Microsoft Windows Remote Manager (WinRM):

<http://www.microsoft.com/downloads/details.aspx?familyid=845289ca-16cc-4c73-8934-dd46b5ed1d33&displaylang=en>

2 Introduction

The Windows PowerShell command line shell and scripting language helps IT professionals achieve greater control and productivity. Using a new administrator focused scripting language and consistent syntax and utilities, Windows PowerShell allows IT professionals to more easily control system administration and accelerate automation. Windows PowerShell is easy to adopt, learn, and use. It works with existing IT infrastructure and cmdlet investments. It runs on Windows XP, Windows Vista*, Windows Server* 2003 and is included as part of Windows 7, Windows Server 2008, and Windows Server 2008 R2. For more information on Windows PowerShell, please visit:

<http://www.microsoft.com/windowsserver2003/technologies/management/powershell/default.aspx>

By leveraging the Out of Band Management cmdlets within the Windows PowerShell Module for Intel vPro Technology IT professionals can extend their PowerShell reach to include direct manageability of Intel AMT enabled clients independent of power or operating system health.

2.1 Requirements

IT / Console PC	<p>Any PC with Microsoft Windows XP or later with:</p> <ul style="list-style-type: none"> • Windows PowerShell 2.0 installed • Windows Remote Management (WinRM) <p>Note: WinRM is not natively included with Windows XP and Windows Server 2003. Please ensure WinRM is installed prior to use: http://www.microsoft.com/downloads/details.aspx?familyid=845289ca-16cc-4c73-8934-dd46b5ed1d33&displaylang=en</p> <p>Note: Windows PowerShell is not included by default in Windows XP, Windows Vista, and Windows 2003 Server. Please ensure Windows PowerShell 2.0 is installed prior to use: http://technet.microsoft.com/en-us/scriptcenter/dd772288.aspx or http://support.microsoft.com/kb/968929</p>
Managed Client with Intel vPro technology	<ul style="list-style-type: none"> • Intel® Active Management Technology (Intel® AMT) 3.0 or higher. • Intel® Management Engine is provisioned. • See subsections 2.1.1, 2.1.2, and 2.1.3 for further client requirements.

2.1.1 Setup and Configuration of the Intel® vPro™ Technology Based Client Prior to Module Use

Prior to using the Intel® vPro™ Technology module for Windows PowerShell the client's Intel AMT firmware must be set up and configured. Use existing Configuration Management software or reference the material on the Intel® vPro™ Expert Center below on how to set up and configure an Intel AMT enabled client.

<http://communities.intel.com/community/openportit/vproexpert>

The Intel vPro PowerShell module can be used to set up and configure an Intel AMT enabled client.

See section 5.10.2 for information on the **Enter-AMTRemoteConfiguration** cmdlet.

2.1.2 Cmdlet and Function Authentication

Credentials must be specified in order to invoke commands against the Intel vPro technology enabled client. Typical behavior of the Windows PowerShell Module for Intel vPro technology cmdlets and functions are as follows:

- When no credentials are provided, the cmdlets and functions will use the locally logged on Kerberos credential.
- When only the username (Kerberos or Digest) parameter is included a prompt will be displayed to provide the associated password.
- If the credentials are stored as a PowerShell variable, they may be passed into the cmdlets and functions with the credential parameter.



NOTE

For Active Directory authentication to work correctly, a hostname or the Fully Qualified Domain Name (FQDN) must be specified.

2.1.3 Cmdlet and Function Communication Encryption

If the Intel vPro technology enabled client is configured to use Transport Layer Security (TLS) by having a web server certificate issued to the Intel Management Engine the -TLS switch must be passed to the cmdlet.

When managing an Intel vPro technology enabled client over TLS (Port 16993), it is important that the computer name match the primary subject name of the issued TLS certificate. Typically, this is the Fully Qualified Domain Name (FQDN).

2.2 Configuration and Usage Process Overview

The Windows Powershell configuration and usage process consists of three primary steps:

1. Install Windows PowerShell if necessary.
2. Install the Windows PowerShell Module for Intel vPro Technology.
3. Use the Intel vPro PowerShell cmdlets.

3 Windows* PowerShell Setup and Configuration

This chapter and its subsections step through setting up and configuring the console PC to use Windows PowerShell, installing the Windows PowerShell Module for Intel vPro technology, and importing the module once it has been installed.

3.1 Installing Windows* PowerShell

Windows PowerShell is natively included with Windows Server 2008, Windows Server 2008 R2, and Windows 7.

Windows Management Framework makes some updated management functionality in Windows 7 and in Windows Server 2008 R2 available to be installed on Windows XP, Windows Server 2003, Windows Vista, and Windows Server 2008. Windows Management Framework contains Windows Remote Management (WinRM) 2.0, Windows PowerShell 2.0, and Background Intelligent Transfer Service (BITS) 4.0.

To obtain a copy of the Windows Management Framework and install Windows PowerShell, click the link below.

<http://support.microsoft.com/kb/968929>

3.1.1 Configuring Windows PowerShell

By default Windows PowerShell has its ExecutionPolicy set to Restricted. This setting must be changed to execute the Out of Band Management PowerShell cmdlets and functions provided within the PowerShell Module for Intel vPro technology.

All the cmdlets and functions within the PowerShell Module for Intel vPro technology have been signed. At a minimum the PowerShell Execution Policy needs to be changed to RemoteSigned to execute the cmdlets and functions. If there are more restrictive security requirements set the ExecutionPolicy to AllSigned.

To apply the ExecutionPolicy to the LocalMachine run the following command within the Windows PowerShell Console (be sure to start the console with "Run as administrator"):

Set-ExecutionPolicy RemoteSigned

Or

Set-ExecutionPolicy -Scope LocalMachine RemoteSigned

To apply the ExecutionPolicy to the current user only run the following command within the Windows PowerShell Console:

Set-ExecutionPolicy -Scope CurrentUser RemoteSigned

To apply the ExecutionPolicy to the process only run the following command within the Windows PowerShell Console:

Set-ExecutionPolicy –Scope Process RemoteSigned



NOTE

If using an ExecutionPolicy based process, it will be required to run Set-ExecutionPolicy each time a Windows PowerShell Console is launched.

For more information on setting the Windows PowerShell ExecutionPolicy, please visit the following site:

[http://msdn.microsoft.com/en-us/library/bb648601\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/bb648601(VS.85).aspx)

3.2 Installing the Windows PowerShell Module for Intel vPro Technology

This section describes how to install the Windows PowerShell Module for Intel vPro technology.

3.2.1 Downloading the Module

Download the latest copy of the Windows PowerShell Module for Intel vPro technology from the following location:

<http://www.intel.com/go/powershell>

3.2.2 Installing the Module

Install the Windows PowerShell Module for Intel vPro technology using the following procedure:

1. Uninstall previous versions of the Windows PowerShell Module for Intel vPro technology.
2. Decompress the zip file to a directory.
3. Navigate to the directory where the file was decompressed.
4. From within the **x64** or **x32 directory** run **setup.exe**.



NOTE

The installer must be run from an account with administrative rights.

5. When the Installation Wizard appears click **Next**.
6. On the License Agreement confirmation screen, click **I Agree** and then click **Next** to continue with the installation.
7. There will be an opportunity to change the module installation folder. It is recommended that it be left to the default c:\Program Files\Intel Corporation\PowerShell\Modules. Click **Next**.
8. Click **Next** to confirm the installation.
9. If User Account Control is turned on a prompt will appear to continue.
10. When the installation complete screen appears, click **Close**.

The module installs into the following default directory:

C:\Program Files\Intel Corporation\PowerShell\Modules

3.2.3 Uninstalling the Module

To uninstall the Windows PowerShell Module for Intel vPro technology, use the Windows Add or Remove Programs feature or run the Module Installer of the version to uninstall.

3.2.3.1 Add or Remove Programs

1. In Windows under the Control Panel navigate to **Uninstall or change programs**.
2. Select **PowerShell Module for Intel(R) vPro(tm)** and select **Uninstall**.
3. If User Account Control is turned on a prompt will appear to continue.



NOTE

*When uninstalling Version 1 of the Windows PowerShell Module for Intel vPro technology, it will be listed as **IntelvPro Module for PowerShell**.*

3.2.3.2 Running the Module Installer

1. Navigate to the directory where the file was decompressed.
2. From within the **x64** or **x32** directory, run **setup.exe**.
3. Select **Remove PowerShell Module for Intel(R) vPro(tm)** and click **Finish**.



NOTE

*When uninstalling Version 1 of the Windows PowerShell Module for Intel vPro technology, it will be listed as **IntelvPro Module for PowerShell**.*

3.3 Configuring a Profile for the Windows PowerShell Module for Intel vPro Technology

Microsoft states "A well-designed profile can make it even easier to use Windows PowerShell and to administer your system". This holds true for administering Intel vPro technology enabled devices. A well-designed PowerShell profile can make that task even easier.

Please view the link below from Microsoft for more information about PowerShell profiles:

[http://msdn.microsoft.com/en-us/library/bb613488\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/bb613488(v=vs.85).aspx)

3.3.1 Setting Up a Profile for Intel vPro Technology

Below is an example of a profile you can put in

%my documents%/WindowsPowerShell/Microsoft.PowerShell_profile.ps1.

```
function vPro
{
    Import-Module IntelvPro
}
```

Once you have created this profile, you can type **vPro** from within PowerShell to load the module.

3.3.2 Using Intel® AMT Credential Secure Storage

Intel AMT credentials can be securely stored in a PowerShell encrypted string using the Write-AMTCredential cmdlet. This allows the privileged administrator to store the Intel AMT required credentials without the credentials being exposed in plain text for any user to view.

Once credentials are stored once with Write-AMTCredential (see section 5.10.4) a later Powershell session can read them with Read-AMTCredential without exposing them.

To set your profile to load the module and set the Intel AMT credentials when you type **vPro** in a PowerShell session, change your profile as follows:

```
function vPro
{
    Import-Module IntelvPro
    New-Variable -Name AmtCred -Value (Read-AmtCredential)
}
```

3.3.3 Making Everything Load Automatically

To make the module load and the \$AmtCred variable set (store first once with Write-AMTCredential (see section 5.10.4)) every time a PowerShell session is started modify the profile to include the following (not in a function block):

```
Import-Module IntelvPro  
New-Variable -Name AmtCred -Value (Read-AmtCredential)
```

3.3.4 Easily Mounting an AMTSystem PowerShell Drive

To easily mount an AMTSystem Powershell Drive add the following function to the profile:

```
function mount-AMTDrive  
{  
    Param([string]$HostName,  
    [System.Management.Automation.PSCredential]$AMTCredential)  
    process{  
        New-PSdrive -scope global -name $HostName -psprovider amtsystem  
        -root \ -computername $HostName -credential $AMTCredential  
    }  
}
```

Now mounting an AMTSystem Powershell drive by typing:

Mount-AMTDrive \$HostName

The drive name will be \$HostName and is listed when typing:

PSDrive



NOTE

The New-PSDrive cmdlet does not accept ~ / \ . : characters. It is recommended to use the Hostname instead of an IP address.

4 Using the Windows PowerShell Module for Intel vPro Technology

The Windows PowerShell console provides access to multiple modules at any given time. Before using a module's cmdlets and functions it must be imported. The module must be imported in each shell that the module will be used in.

4.1 Importing the Module

Run the Import-Module command to use a module's cmdlets and functions. To list the available modules type **Get-Module -ListAvailable** within Windows PowerShell. If the Windows PowerShell Module for Intel® vPro™ Technology is installed as described in section 3.2, **IntelvPro** will be listed as one of the available modules.

To import the Windows PowerShell Module for Intel vPro Technology type **Import-Module IntelvPro**, as shown below.

```

Windows PowerShell
PS C:\PS> Get-Module -ListAvailable
ModuleType Name ExportedCommands
-----
Manifest AppLocker {}
Manifest BitsTransfer {}
Manifest IntelvPro {}
Manifest PSDiagnostics {}
Manifest TroubleshootingPack {}

PS C:\PS> Import-Module IntelvPro
PS C:\PS> Get-Module -ListAvailable
ModuleType Name ExportedCommands
-----
Manifest AppLocker {}
Manifest BitsTransfer {}
Manifest IntelvPro (Clear-AMT3PDS, Set-AMTSystemDefense, Set-AMT3PDS, Clear-AMTSystemDefens...
Manifest PSDiagnostics {}
Manifest TroubleshootingPack {}

PS C:\PS> _

```

Figure 1: Importing the Module

After import type **Get-Module -ListAvailable** to show that the module has been imported along with the available Exported Commands.

To automatically load then module when Windows PowerShell is started, add **Import-Module IntelvPro** to the Windows PowerShell Profile.ps1 file.

Once the module has been imported, its cmdlets can be listed by using the **Get-Command -Module IntelvPro** command, as shown in Figure 2 below.

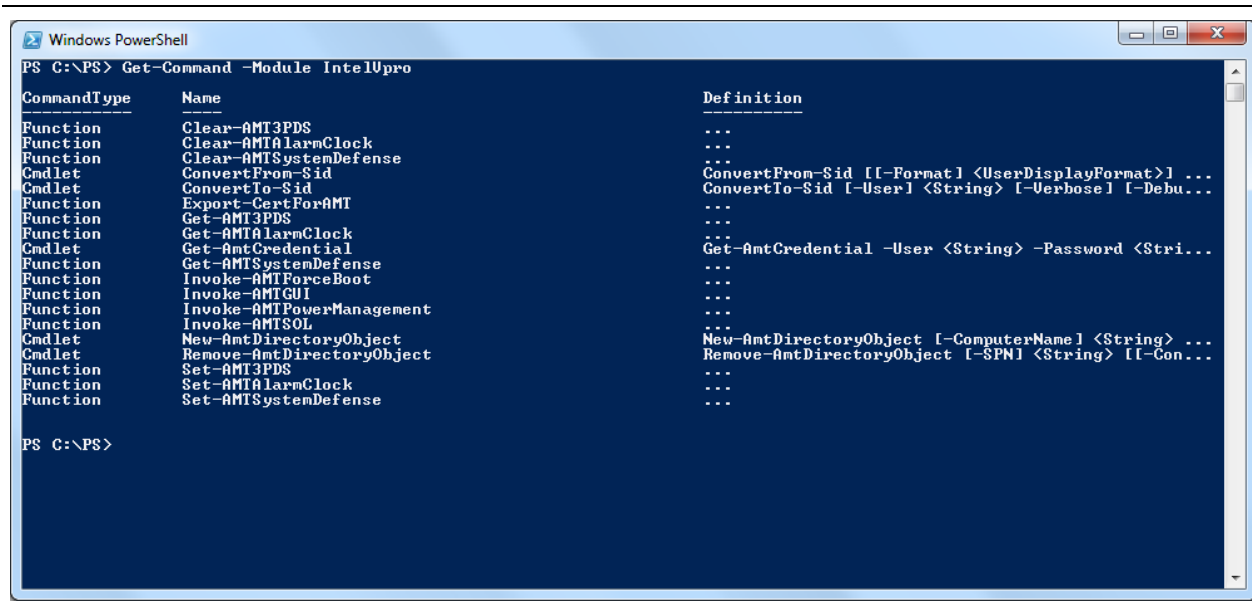


Figure 2: Listing the Available Cmdlets and Functions

4.2 Checking the Module Version

View the manifest for the module to see the installed version.

Type **Get-Module -ListAvailable -name intelvpro | format-list**

4.3 Usages

- Use Invoke-AMTPowerManagement (see section 5.1.1) to remotely power up, power down or power cycle the client Intel vPro system.
- Need to perform remediation on a system? Use Invoke-AMTForceBoot (see section 5.2.1) to redirect the system's boot process, forcing it to boot from a network share, bootable CD-ROM or DVD, remediation drive, PXE or other boot device.
- Invoke-AMTForceBoot (section 5.2.1) will also redirect the system's I/O via console redirection through serial over LAN (SOL). This feature supports remote troubleshooting, remote repair, software upgrades, and similar processes.
- To access and change BIOS settings remotely use Invoke-AMTForceBoot (section 5.2.1). Even if the system's power is off, the OS is down, or hardware has failed you can still perform remote updates and corrections of configuration settings.

- Use Get-AMTAccessMonitor (see section 5.11.1) and Get-AMTEventLog (see section 5.11.2) to display persistent logs stored in protected memory. The event log is available even if the OS is down or the hardware has already failed.
- Store information in the Third Party data Store with Set-AMT3PDS (see section 5.6.1). For example, an Anti-Virus program could store version information in the protected memory that is available for out of band access. A different cmdlet could then use Get-AMT3PDS (see section 5.6.2) to identify systems that need updating.
- To see what hardware a system has use Get-AMTHardwareAsset (see section 5.11.4) to perform a hardware inventory. Hardware asset information is updated every time the system runs through power-on self-test (POST).
- The Intel vPro PowerShell Module does not natively support KVM Remote Control, but PowerShell can be used to start an application that does. For instance, to start RealVNC VNC* Viewer Plus, type the following:
.\vncviewerplus.exe \$ComputerName -amtusername=admin

5 Cmdlet Information

Table 1: Cmdlet Support of Intel AMT Versions

	3.0	3.2	5.1	6.0 and greater
Invoke-AMTPowerManagement	X	X	X	X
Invoke-AMTForceBoot	X	X	X	X
Invoke-AMTSOL	X	X	X	X
Set-AMTAlarmClock			X	X
Get-AMTAlarmClock			X	X
Set-AMTSystemDefense	X	X	X	X
Clear-AMTSystemDefense	X	X	X	X
Set-AMT3PDS	X	X	X	X
Get-AMT3PDS	X	X	X	X
Clear-AMT3PDS	X	X	X	X
Invoke-AMGUI	X	X	X	X
Get-AMTIDER	X	X	X	X
Start-AMTIDER	X	X	X	X
Stop-AMTIDER	X	X	X	X
Get-AMTAccessMonitor		X	X	X
Get-AMTEventLog		X	X	X
Get-AMTFirmwareVersion		X	X	X
Get-AMTHardwareAsset		X	X	X
Get-AMTPowerState		X	X	X

5.1 Intel AMT Power Management

Intel AMT Power Management can remotely power up, power down, or reset a client independent of Operating System or hardware state.

5.1.1 Invoke-AMTPowerManagement

NAME

Invoke-AMTPowerManagement

SYNOPSIS

Invokes an Intel Active Management Technology power control command

SYNTAX

```
Invoke-AMTPowerManagement [-ComputerName] <String[]> [-Port] <String> [-Operation] <String> [-TLS] [-Username <String>] [-Password <String>] [[-Credential] <PSCredential>] [<CommonParameters>]
```

The valid parameters for -Operation are {PowerOn, PowerOff, Reset}.

DESCRIPTION

This cmdlet invokes an Intel Active Management Technology power control operations (Power On, Power Off, and Power Reset) from clients that have Intel AMT firmware version 3.0 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Invoke-AMTPowerManagement -Full

```
----- EXAMPLE 1 -----
C:\PS>Invoke-AMTPowerManagement -computer:vproclient.vprodemo.com -TLS
-Operation:PowerOn

ComputerName      Port      Operation      Status
-----
vproclient.vprodemo.com 16993      PowerOn        Successful

----- EXAMPLE 2 -----
C:\PS>Invoke-AMTPowerManagement vproclient -Operation:Reset -Username:amtuser

will prompt for digest username password.

ComputerName      Port      Operation      Status
-----
vproclient        16992      Reset          Successful

----- EXAMPLE 3 -----
C:\PS>Invoke-AMTPowerManagement vproclient.vprodemo.com -Operation PowerOff
-Username:vprodemo\ITHelpDesk
```

will prompt for Kerberos username password.

ComputerName	Port	Operation	Status
vproclient.vprodemo.com	16992	PowerOff	Successful

----- EXAMPLE 4 -----

```
C:\PS>Invoke-AMTPowerManagement -ComputerName:vproclient.vprodemo.com
-Operation:PowerOff -credential $AMTCredential -TLS
```

ComputerName	Port	Operation	Status
vproclient.vprodemo.com	16993	PowerOff	Successful

5.2 Intel AMT Force Boot

The Intel AMT Force Boot cmdlet remotely boots a client to a specified boot device such as PXE, CD/DVD, or local hard drive.

5.2.1 Invoke-AMTForceBoot

NAME

Invoke-AMTForceBoot

SYNOPSIS

Invokes the Intel Active Management Technology force boot command

SYNTAX

```
Invoke-AMTForceBoot [-ComputerName] <String[]> [[-Port] <String>] [-TLS] [-
Operation] <String> [-Device] <String> [ [-IDERPath] <String>] [[-Console]
<String>] [[-SOLTerminalPath] <String>] [[-SOLTerminalArgList] <String>] [-Userna
me <String>] [-Password <String>] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

The valid parameters for -Operation are {PowerOn, Reset}.

The valid parameters for -Device are {HardDrive, PXE, Optical, IDER, BIOSSetup}.

- HardDrive forces a boot to the hard drive, regardless of inserted bootable media.
- PXE forces a PXE boot.
- Optical forces a boot from the media in the optical drive.

- IDER forces an Intel vPro IDE Redirection boot.
- BIOSSetup forces a boot to the BIOS Setup configuration screens.

The valid parameter for -Console is {SOL}

If SOL is specified then a Serial Over LAN connection is made to the target system. The local endpoint of this serial session is 127.0.0.1. A path to terminal program as well as arguments to invoke that terminal program must be specified. The Invoke-AMTForceBoot cmdlet will determine the port to connect to, so the argument list must define a '%Port' variable so the cmdlet knows where to put the actual port number.

For example to use Microsoft telnet the following would be defined:

```
$SOLTerminalPath = "telnet"
```

```
$SOLTerminalArgList = "-t ANSI 127.0.0.1 %Port"
```

DESCRIPTION

This cmdlet invokes an Intel Active Management Technology force boot to a PXE server, the local hard drive, CD/DVD ROM drive, or remote DVD/CD ISO image from clients that have Intel AMT firmware version 3.0 or higher.

For more details, review the PowerShell integrated help by typing:

Get-Help Invoke-AMTForceBoot -Full

```
----- EXAMPLE 1 -----
C:\PS>Invoke-AMTForceBoot -Computer:vproclient.vprodemo.com -TLS
-Operation:PowerOn -Device:PXE

ComputerName      Port  Operation  Device  Status
-----
vproclient.vprodemo.com 16993 PowerOn    PXE     Successful

----- EXAMPLE 2 -----
C:\PS>Invoke-AMTForceBoot 192.168.1.100 PowerOn PXE -credential $AMTCredential
-TLS

ComputerName      Port  Operation  Device  Status
-----
192.168.1.100     16992 PowerOn    PXE     Successful

----- EXAMPLE 3 -----
C:\PS>Invoke-AMTForceBoot vproclient Reset -Device:Optical -Username:amtuser

will prompt for digest username password.
```

ComputerName	Port	Operation	Device	Status
vproclient	16992	Reset	Optical	Successful

----- EXAMPLE 4 -----

```
C:\PS>Invoke-AMTForceBoot vproclient.vprodemo.com -Operation PowerOn
-Device:HardDrive -Username:vprodemo\ITHelpDesk
```

will prompt for Kerberos username password.

ComputerName	Port	Operation	Device	Status
vproclient.vprodemo.com	16992	PowerOn	HardDrive	Successful

----- EXAMPLE 5 -----

```
C:\PS>Invoke-AMTForceBoot -Computer:vproclient.vprodemo.com -Operation:Reset
-Device:IDER -IDERPath:"C:\bootable_image.iso"
```

ComputerName	Port	Operation	Device	Status
vproclient.vprodemo.com	16992	PowerOn	IDER	Successful

----- EXAMPLE 6 -----

```
C:\PS>Invoke-AMTForceBoot -ComputerName computer1.vprodemo.com,
doesnotexist.vprodemo.com -TLS -Operation Reset -Device:Optical | Where {$_.Status
-eq "Failed"}
```

will perform the power operation on every AMT client in the list, but only display the ones that failed.

ComputerName	Port	Operation	Device	Status
doesnotexist.vprodem...	16993	Reset	Optical	Failed

----- EXAMPLE 7 -----

```
C:\PS>Get-SomeDataFromOtherCMDlet | Select ComputerName | Invoke-AMTForceBoot
-TLS -Operation PowerOn -Device:HardDrive
```

Get-SomeDataFromOtherCMDlet is a custom cmdlet that has an output of ComputerName, Port, and Operation; however, you only select ComputerName. Remaining parameters are manually provided.

ComputerName	Port	Operation	Device	Status
computer1.vprodemo.com	16993		PowerOn	HardDrive
computer2.vprodemo.com	16993		PowerOn	HardDrive
computer3.vprodemo.com	16993		PowerOn	HardDrive

```

----- EXAMPLE 8 -----

C:\PS>Invoke-AMTForceBoot vproclient.vprodemo.com -Operation:Reset
-Device:BIOSSetup -Credential $AMTCredential -Console SOL -SOLTerminalPath "telnet"
-SOLTerminalArgList "-t ANSI 127.0.0.1 %Port"

This will reboot the client to the BIOS Setup screens while connecting SOL to a
telnet window.

ok

ComputerName : 192.168.1.106
Port         : 16992
Operation    : reset
Device       : BIOSSetup
Status       : Successful

```

5.3 Intel AMT Serial Over LAN

Serial Over LAN (SOL) is an Intel AMT capability that enables the input and output of the serial port of a managed system to be sent over the network. Console redirection can be performed over this SOL interface.

5.3.1 Invoke-AMTSOL

NAME

Invoke-AMTSOL

SYNOPSIS

Establishes a Serial Over LAN (SOL) session

SYNTAX

```

Invoke-AMTSOL [-ComputerName] <String[]> [-Port] <String> [-TLS] [-Username
<String>] [-Password <String>] [[-Credential] <PSCredential>]
[<CommonParameters>]

```

DESCRIPTION

This cmdlet establishes a Serial Over LAN communication to interact with clients that have Intel AMT firmware version 3.0 or higher.

For more details, review the PowerShell integrated help by typing:

Get-Help Invoke-AMTSOL -Full

```
----- EXAMPLE 1 -----  
C:\PS>Invoke-AMTSOL -computer:vproclient.vprodemo.com -username:admin  
  
----- EXAMPLE 2 -----  
C:\PS>Invoke-AMTSOL 192.168.1.100 -credential $AMTCredential -TLS
```

5.4 Intel AMT Alarm Clock

The Intel AMT Alarm Clock can be configured to wake a managed system once at a specific time or multiple times with a periodical interval.

5.4.1 Set-AMTAlarmClock

NAME

Set-AMTAlarmClock

SYNOPSIS

Sets a Intel® Active Management Technology alarm clock timer

SYNTAX

```
Set-AMTAlarmClock [-ComputerName] <String[]> [-Port <String>] [-AlarmTime]  
<String> [-Interval <String>] [-AlarmName <String>] [-DeleteCompletion] [-TLS] [-  
Username <String>] [-Password <String>] [[-Credential] <PSCredential>]  
[<CommonParameters>]
```

AlarmTime:

The AlarmTime parameter is the date and time to wake the client. It is set as [YYYY]-[MM]-[DD]T[HH]:[MM]:[SS] Example: 2010-07-14T02:00:00 would wake the client on July 14, 2010 @ 02:00.

If the user sets the alarm date and time on a client in a different time zone, the alarm time specified will be set to the proper GMT for the client. For example, if running the cmdlet from a client in the Pacific Time zone to configure the wake up time on a client

configured with Eastern Time for 08:00, the alarm clock will wake the client at 08:00 Eastern time.

Interval:

Interval parameter is the desired reoccurrence interval for the alarm to be set. The format is: [DD]-[HH]-[MM]-[SS] Example: 07-00:00:00 would have a reoccurrence of every seven day at the same time. Example: 00-02:30:00 would have a reoccurrence of every 2 hours 30 minutes.

DESCRIPTION

This CmdLet allows the user to set a wake timer on clients that have Intel Active Management Technology (AMT) firmware version 5.1 or higher.

Since Intel AMT firmware version 8.0 or higher, multiple alarm clock timers are supported, so when setting an alarm clock, an alarm name must be provided.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Set-AMTAlarmClock -Full

```
----- EXAMPLE 1 -----
C:\PS>Set-AMTAlarmClock -ComputerName:vproclient.vprodemo.com -TLS
-AlarmTime:2010-07-14T02:00:00

Sets one time occurrence for wake up alarmclock.

ComputerName : vproclient.vprodemo.com
Port         : 16993
NextAlarmTime : Wednesday, July 14, 2010 2:00:00 AM
Status       : Successful

----- EXAMPLE 2 -----
C:\PS>Set-AMTAlarmClock -ComputerName:vproclient.vprodemo.com -TLS
-AlarmTime:2010-07-14T02:00:00 -AlarmName MyDefaultAlarm -DeleteCompletion

Sets one time occurrence for wake up alarmclock, the alarm name will be
MyDefaultAlarm and it will be deleted automatically once it occurs.

ComputerName : vproclient.vprodemo.com
Port         : 16993
NextAlarmTime : Wednesday, July 14, 2010 2:00:00 AM

----- EXAMPLE 3 -----
C:\PS>Set-AMTAlarmClock vproclient.vprodemo.com -TLS -AlarmTime:2010-07-
14T02:00:00 -UserName vprodemo\administrator

will prompt for Kerberos User Password then Sets one time occurrence for wake
up alarmclock.

ComputerName : vproclient.vprodemo.com
Port         : 16993
NextAlarmTime : Wednesday, July 14, 2010 2:00:00 AM
Status       : Successful
```

----- EXAMPLE 4 -----

```
C:\PS>Set-AMTAlarmClock vproclient -UserName:admin -AlarmTime:2010-07-14T02:00:00 -Interval:07-00:00:00
```

will prompt for Digest User Password then sets reoccurring wake up alarmclock for once a week at that time.

```
ComputerName      : vproclient
Port              : 16992
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : P0Y0M07DT00H00M
Status            : Successful
```

----- EXAMPLE 5 -----

```
C:\PS>Get-Content computers.txt | Set-AMTAlarmClock -credential $AMTCredential -TLS -AlarmTime:2010-07-14T02:00:00 -Interval:00-01:00:00 -credential $SomeStoredPSCredential
```

will pull the list of amt clients from a text file and pipe them in the Set-AMTAlarmClock CMDlet.
Sets reoccurring wake up alarmclock for once every hour on and after that time.

```
ComputerName      : computer1.vprodemo.com
Port              : 16993
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : P0Y0M00DT02H00M
Status            : Successful

ComputerName      : computer2.vprodemo.com
Port              : 16993
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : P0Y0M00DT02H00M
Status            : Successful
```

5.4.2 Get-AMTAlarmClock

NAME

Get-AMTAlarmClock

SYNOPSIS

Returns status of the Intel Active Management Technology alarm clock timers

SYNTAX


```
Get-AMTAlarmClock [-ComputerName] <String[]> [-Port] <String> [-TLS] [-
Username <String>] [-Password <String>] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

DESCRIPTION

This cmdlet returns the status of Intel Active Management Technology alarm clock timers from clients that have Intel AMT firmware version 5.1 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTAlarmClock -Full

```
----- EXAMPLE 1 -----
C:\PS>Get-AMTAlarmClock -computer:vproclient.vprodemo.com -TLS

ComputerName      : vproclient.vprodemo.com
Port              : 16993
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : [None Set]
Status            : Successful

----- EXAMPLE 2 -----
C:\PS>Get-AMTAlarmClock vproclient -Username:amtuser -TLS

will prompt for digest username password.

ComputerName      : vproclient
Port              : 16993
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : 7 days, 0 hours, 0 minutes, 0 seconds
Status            : Successful

----- EXAMPLE 3 -----
C:\PS>Get-AMTAlarmClock vproclient.vprodemo.com -Username
vprodemo\administrator-TLS

will prompt for Kerberos username password.

ComputerName      : vproclient
Port              : 16993
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : [None Set]
Status            : Successful

----- EXAMPLE 4 -----
C:\PS>Get-AMTAlarmClock -ComputerName:vproclient.vprodemo.com -credential
$AMTCredential -TLS

ComputerName      : vproclient
Port              : 16993
```

```

NextAlarmTime : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval : [None Set]
Status : Successful

----- EXAMPLE 5 -----

C:\PS>Get-AMTAlarmClock -ComputerName
computer1.vprodemo.com,doesnotexist.vprodemo.com -TLS | where {$_.Status -eq
"Failed"}

will perform the clear Alarm clock operation on every AMT client in the list,
but only display the ones that failed
.

ComputerName      : doesnotexist.vprodemo.com
Port              : 16993
Status            : Failed
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]

----- EXAMPLE 6 -----

C:\PS>Get-Content computers.txt | Get-AMTAlarmClock -Port:16993

will pull the list of amt clients from a text file and pipe them into Get-
AMTAlarmClock.

ComputerName      : computer1.vprodemo.com
Port              : 16993
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful

ComputerName      : computer2.vprodemo.com
Port              : 16993
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : 7 days, 0 hours, 0 minutes, 0 seconds
Status            : Successful

ComputerName      : computer3.vprodemo.com
Port              : 16993
NextAlarmTime     : Wednesday, July 14, 2010 2:00:00 AM
PeriodicInterval  : [None Set]
Status            : Successful

```

5.4.3 Clear-AMTAlarmClock

NAME

Clear-AMTAlarmClock

SYNOPSIS

Clears Intel Active Management Technology alarm clock timers

SYNTAX

```
Clear-AMTAlarmClock [-ComputerName] <String[]> [-Port <String>] [-TLS]
[-AlarmName <String>] [-Username <String>] [-Password <String>] [[-Credential]
<PSCredential>] [<CommonParameters>]
```

DESCRIPTION

This cmdlet clears the Intel Active Management Technology alarm clock timers from clients that have Intel AMT firmware version 5.1 or higher.

From AMT firmware version 8.0 or higher, user can supply a specific alarm name to delete. Otherwise, all alarm timers will be deleted.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Clear-AMTAlarmClock -Full

```
C:\PS>Clear-AMTAlarmClock -computer:vproclient.vprodemo.com

ComputerName      : vproclient.vprodemo.com
Port              : 16992
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful

----- EXAMPLE 2 -----

C:\PS>Clear-AMTAlarmClock -computer:vproclient.vprodemo.com -AlarmName
MyDefaultAlarm

will delete only the alarm named: MyDefaultAlarm

ComputerName      : vproclient.vprodemo.com
Port              : 16992
AlarmName         : MyDefaultAlarm
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
DeleteOption      : [None Set]
Status            : Successful

ComputerName      : vproclient.vprodemo.com
Port              : 16992
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful

----- EXAMPLE 3 -----

C:\PS>Clear-AMTAlarmClock vproclient -Username:amtuser

will prompt for digest username password.

ComputerName      : vproclient
Port              : 16992
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful
```

----- EXAMPLE 4 -----

```
C:\PS>Clear-AMTAlarmClock vproclient.vprodemo.com -Username
vprodemo\administrator
```

will prompt for Kerberos username password.

```
ComputerName      : vproclient.vprodemo.com
Port              : 16993
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful
```

----- EXAMPLE 5 -----

```
C:\PS>Clear-AMTAlarmClock -ComputerName:vproclient.vprodemo.com -credential
$AMTCredential -TLS
```

```
ComputerName      : vproclient.vprodemo.com
Port              : 16993
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful
```

----- EXAMPLE 6 -----

```
C:\PS>Clear-AMTAlarmClock -ComputerName
computer1.vprodemo.com,doesnotexist.vprodemo.com | where {$_.Status -eq "Fa
iled"}
```

will perform the clear Alarm clock operation on every AMT client in the list, but only display the ones that failed.

```
ComputerName      : doesnotexist.vprodemo.com
Port              : 16992
Status            : Failed
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
```

----- EXAMPLE 7 -----

```
C:\PS>Get-Content computers.txt | Clear-AMTAlarmClock -TLS
```

will pull the list of amt clients from a text file and pipe them into the Clear-AMTAlarmClock CMDlet.

```
ComputerName      : computer1.vprodemo.com
Port              : 16993
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful
```

```
ComputerName      : computer2.vprodemo.com
Port              : 16993
NextAlarmTime     : [None Set]
PeriodicInterval  : [None Set]
Status            : Successful
```

```

ComputerName : computer3.vprodemo.com
Port         : 16993
NextAlarmTime : [None Set]
PeriodicInterval : [None Set]
Status       : Successful

```

5.5 Intel AMT System Defense

System Defense is an Intel AMT capability that enforces network security policies such as filtering and preventing network traffic from getting to the operating system while still managing the client Out of Band with Intel AMT.

5.5.1 Set-AMTSystemDefense

NAME

Set-AMTSystemDefense

SYNOPSIS

Enables Intel Active Management Technology System Defense

SYNTAX

```

Set-AMTSystemDefense [-ComputerName] <String[]> [-Port] <String> [-TLS] [-
Username <String>] [-Password <String>] [[-Credential] <PSCredential>]
[<CommonParameters>]

```

DESCRIPTION

This cmdlet disables network access using Intel Active Management Technology System Defense from clients that have Intel AMT Firmware version 3.0 and Higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Set-AMTSystemDefense -Full

----- EXAMPLE 1 -----

```
C:\PS>Set-AMTSystemDefense vproclient.vprodemo.com -TLS
```

ComputerName	Port	Status	EnabledOnInterfaces
vproclient.vprodemo.com	16993	Successful	Wireless1, Wired

----- EXAMPLE 2 -----

```
C:\PS>Set-AMTSystemDefense vproclient 16992 -username:amtuser
```

will prompt for digest username password.

ComputerName	Port	Status	EnabledOnInterfaces
vproclient	16992	Successful	Wireless1, Wired0

----- EXAMPLE 3 -----

```
C:\PS>Get-Content computers.txt | Set-AMTSystemDefense -TLS
```

will pull the list of amt clients from a text file and pipe them in the set-AMTSystemDefense Cmdlet.

ComputerName	Port	Status	EnabledOnInterfaces
Computer1.vprodemo.com	16993	Successful	Wireless1, Wired0
Computer2.vprodemo.com	16993	Successful	Wired0

5.5.2 Get-AMTSystemDefense

NAME

Get-AMTSystemDefense

SYNOPSIS

Returns status of Intel Active Management Technology System Defense policies

SYNTAX

```
Get-AMTSystemDefense [-ComputerName] <String[]> [-Port] <String> [-TLS] [-
Username <String>] [-Password <String>] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

DESCRIPTION

This cmdlet returns status of Intel Active Management Technology System Defense network access policies from clients that have Intel AMT firmware version 3.0 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTSystemDefense -Full

```
----- EXAMPLE 1 -----
C:\PS>Get-AMTSystemDefense vproclient.vprodemo.com -TLS
```

```

ComputerName          Port      Status      EnabledOnInterfaces
-----
vproclient.vprodemo.com 16993    Successful  [None]

----- EXAMPLE 2 -----
C:\PS>Get-AMTSystemDefense vproclient 16992 -username:amtuser

will prompt for digest username password.

ComputerName          Port      Status      EnabledOnInterfaces
-----
vproclient            16992    Successful  Wireless1, Wired0

----- EXAMPLE 3 -----
C:\PS>Get-AMTSystemDefense -ComputerName:vproclient.vprodemo.com -credential
$AMTCredential -TLS

ComputerName          Port      Status      EnabledOnInterfaces
-----
vproclient.vprodemo.com 16993    Successful  Wired0

----- EXAMPLE 4 -----
C:\PS>Get-Content computers.txt | Set-AMTSystemDefense -TLS

will pull the list of amt clients from a text file and pipe them into set-
AMTSystemDefense.

ComputerName          Port      Status      EnabledOnInterfaces
-----
Computer1.vprodemo.com 16993    Successful  Wireless1, Wired0
Computer2.vprodemo.com 16993    Successful  [None]

```

5.5.3 Clear-AMTSystemDefense

NAME

Clear-AMTSystemDefense

SYNOPSIS

Clears the Intel Active Management Technology System Defense policy

SYNTAX

```
Clear-AMTSystemDefense [-ComputerName] <String[]> [-Port <String>] [-CleanFlag
<Boolean>] [-TLS] [-Username <String>] [-Password <String>] [[-Credential]
<PSCredential>] [<CommonParameters>]
```

DESCRIPTION

This cmdlet clears the Intel Active Management Technology network access policy from clients that have Intel AMT firmware version 3.0 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Clear-AMTSystemDefense -Full

```
----- EXAMPLE 1 -----
C:\PS>Clear-AMTSystemDefense vproclient.vprodemo.com -TLS

ComputerName      Port      Status      EnabledOnInterfaces
-----
vproclient.vprodemo.com 16993     Successful  [None]

----- EXAMPLE 2 -----
C:\PS>Clear-AMTSystemDefense vproclient 16992 -username:amtuser

will prompt for digest username password.

ComputerName      Port      Status      EnabledOnInterfaces
-----
vproclient        16992     Successful  [None]

----- EXAMPLE 3 -----
C:\PS>Clear-AMTSystemDefense -ComputerName:vproclient.vprodemo.com -credential
$AMTCredential -TLS

ComputerName      Port      Status      EnabledOnInterfaces
-----
vproclient.vprodemo.com 16993     Successful  [None]

----- EXAMPLE 4 -----
C:\PS>Get-Content computers.txt | Clear-AMTSystemDefense -TLS

will pull the list of clients from a text file and pipe them into Clear-
AMTSystemDefense.

ComputerName      Port      Status      EnabledOnInterfaces
```

vproclient1.vprodemo.com	16993	Successful	[None]
vproclient2.vprodemo.com	16993	Successful	[None]

5.6 Intel AMT Third Party Data Storage (3PDS)

The Intel AMT 3PDS is a persistent, nonvolatile memory space available to write and read data even when the OS is unresponsive or management agents are missing.

5.6.1 Set-AMT3PDS

NAME

Set-AMT3PDS

SYNOPSIS

Stores data in the Intel Active Management Technology Third Party Data Storage (3PDS)

SYNTAX

```
Set-AMT3PDS [-ComputerName] <String[]> [-Port] <String> [-Operation] <String>
[-Enterprise] <String> [-Vendor] <String> [-Application] <String> [-Block] <String>
[[-BlockData] <String>] [-BlockHidden <Boolean>] [-AppendWrite <Boolean>] [-TLS]
[-Username <String>] [-Password <String>] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

The valid parameters for -Operation are {Create, Write, CreateWrite}.

- *Create* makes a new block.
- *Write* writes the data to the block. All data is overwritten unless the -AppendWrite switch is specified.
- *CreateWrite* is a combination of the two operations - create a new block and write data to it.

Understanding 3PDS structure:

Data stored within the 3PDS is stored within blocks of nonvolatile memory in a hierarchical structure. Each block must be associated to a tiered structure of Enterprise -> Vendor -> Application -> Block Name.

3PDS Machine UUID:

When a block is created the application that created the block will specify a GUID to identify itself as the entity that created the block. When modifying blocks that were

created by a different entity it may be necessary to specify the Machine UUID as part of the cmdlet parameter.

DESCRIPTION

This cmdlet stores data into the Intel Active Management Technology Third Party Data Storage (3PDS) of clients that have Intel® AMT firmware version 3.0 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Set-AMT3PDS -Full

```

----- EXAMPLE 1 -----

C:\PS>Set-AMT3PDS -computer:vproclient.vprodemo.com -TLS -Operation:Create
-Enterprise:Intel -Vendor:Intel -Application:PowerShell -Block:TestName

Creates Block using Kerberos credentials.

ComputerName          Port          Operation      Status
-----
vproclient.vprodemo.com 16993         Create         Successful

----- EXAMPLE 2 -----

C:\PS>Set-AMT3PDS 192.168.1.100 write -credential $AMTCredential -
Enterprise:Intel -Vendor:Intel -Application:Power
Shell -Block:TestName -BlockData:"This is test"

Creates Block and write data to block

ComputerName          Port          Operation      Status
-----
192.168.1.100         16992         Create         Successful

----- EXAMPLE 3 -----

C:\PS>Set-AMT3PDS -ComputerName:vproclient.vprodemo.com -TLS -Operation:Write
-Enterprise:Intel -Vendor:Intel -Application:PowerShell -Block:TestName -
BlockData:"Append this to existing data in block" -AppendWrite $true

Appends the data to data in existing block.

ComputerName          Port          Operation      Status
-----
vproclient.vprodemo.com 16993         Write         Successful

----- EXAMPLE 4 -----

C:\PS>Get-Content computers.txt | Set-AMT3PDS -TLS -Operation:Write
-Enterprise:Intel -Vendor:Intel -Application:PowerShell -Block:TestName
-BlockData:"This is test"

```

```
will pull the list of amt clients from a text file and pipe them in the Set-AMT3PDS CMDlet.
```

5.6.2 Get-AMT3PDS

NAME

Get-AMT3PDS

SYNOPSIS

Retrieves data from the Intel Active Management Technology Third Party Data Storage

SYNTAX

```
Get-AMT3PDS [-ComputerName] <String[]> [-Port] <String> [-Operation] <String>
[[-Enterprise] <String>] [[-Vendor] <String>] [[-Application] <String>] [[-Block]
<String>] [[-MachineUUID] <String>] [-TLS] [-Username <String>] [-Password
<String>] [[-Credential] <PSCredential>] [<CommonParameters>]
```

The valid parameters for -Operation are {Read, ListBlocks}.

- Read reads the data.
- ListBlocks retrieves all the available blocks.

DESCRIPTION

This cmdlet enables the user to retrieve data from Intel® Active Management Technology Third Party Data Storage (3PDS) from clients that have Intel® AMT firmware version 3.0 or higher.

When accessing the 3PDS the Enterprise, Vendor, Application must be set. A UUID may be optional. When reading data from the 3PDS the Get-AMT3PDS cmdlet will have read access to all blocks made using the same Enterprise, Vendor, and Application.

Understanding 3PDS structure:

Data stored within the 3PDS is stored within blocks of nonvolatile memory in a hierarchical structure. Each block must be associated to a tiered structure of Enterprise -> Vendor -> Application -> Block Name.

3PDS Machine UUID:

When a block is created the application that created the block will specify a GUID to identify itself as the entity that created the block. When modifying blocks that were created by a different entity it may be necessary to specify the Machine UUID as part of the cmdlet parameter

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMT3PDS -Full

```

----- EXAMPLE 1 -----
C:\PS>Get-AMT3PDS -computerName:vproclient.vprodemo.com -TLS
-Operation:ListBlocks

Retrieves all the available blocks.

ComputerName      : vproclient.vprodemo.com
Port              : 16993
Operation         : listblocks
Status            : Success
UUID              : BEAEE8BF2C09406DAE533F16080D2A6F
Enterprise        : Virtualization
Vendor            : Microsoft
Application       : System Center ConfigMgr
BlockName         : Out Of Band Management
NumberOfBlocks    : 1

----- EXAMPLE 2 -----
C:\PS>Get-AMT3PDS 192.168.1.100 -Operation ListBlocks -credential
$AMT3Credential -TLS

ComputerName      : 192.168.1.100
Port              : 16993
Operation         : listblocks
Status            : Success
UUID              : A1DF77DC16E2469188B2E1F389E5A472
Enterprise        : Intel
Vendor            : Intel
Application       : PowerShell
BlockName         : Test
NumberOfBlocks    : 1

----- EXAMPLE 3 -----
C:\PS>Get-AMT3PDS vproclient.vprodemo.com -Operation:Read
-Username:vprodemo\ITHelpDesk -Enterprise:Intel -Vendor:Intel
-Application:PowerShell -Block:Test

will prompt for Kerberos username password and then retrieve Data.

ComputerName      : vproclient.vprodemo.com
Port              : 16992
Operation         : read
Status            : Success
Blocks           : 1
Data              : Test Data

----- EXAMPLE 4 -----
C:\PS>Get-Content computers.txt | Get-AMT3PDS -TLS -Operation:ListBlocks

will pull the list of amt clients from a text file and pipe them in Get-
AMT3PDS.

```

```
----- EXAMPLE 5 -----
C:\PS>Get-AMT3PDS-computerName:vproclient.vprodemo.com -port:16993
-Operation:read -Enterprise:"Virtualization" -Vendor:"Microsoft"
-Application:"System Center ConfigMgr"
-Block:"Out of Band Management"
-MachineUUID:"BEAEE8BF2C09406DAE533F16080D2A6F"
```

Example to pull data from the AMT 3PDS accessible by System Center Configuration Manager

5.6.3 Clear-AMT3PDS

NAME

Clear-AMT3PDS

SYNOPSIS

Deletes data from the Intel® Active Management Technology Third Party Data Storage

SYNTAX

```
Clear-AMT3PDS [-ComputerName] <String[]> [-Port] <String> [-Enterprise] <String>
[[-Vendor] <String>] [[-Application] <String>] [[-Block] <String>] [[-MachineUUID]
<String>] [-TLS] [-Username <String>] [-Password <String>] [[-Credential]
<PSCredential>] [<CommonParameters>]
```

DESCRIPTION

This cmdlet deletes data from the Intel® Active Management Technology Third Party Data Storage (3PDS) from clients that have Intel® AMT firmware version 3.0 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Clear-AMT3PDS -Full

```
----- EXAMPLE 1 -----
C:\PS>Clear-AMT3PDS -computer:vproclient.vprodemo.com -TLS -Enterprise:Intel

will delete all block data under enterprise value specified.

ComputerName          Port          Operation      Status
-----
vproclient.vprodemo.com 16993         Delete        Successful

----- EXAMPLE 2 -----
C:\PS>Clear-AMT3PDS 192.168.1.100 -credential $AMTCredential -Enterprise:Intel
-Vendor:Intel

will delete all block data under Enterprise, Vendor value specified.
```

ComputerName -----	Port ----	Operation -----	Status -----
192.168.1.100	16992	Delete	Successful

----- EXAMPLE 3 -----

```
C:\PS>Clear-AMT3PDS vproclient 16992 -Username:amtuser -Enterprise:Intel
-Vendor:Intel -Application:PowerShell
```

will delete all block data under Enterprise, Vendor, Application value specified.

ComputerName -----	Port ----	Operation -----	Status -----
vproclient	16992	Delete	Successful

----- EXAMPLE 4 -----

```
C:\PS>Clear-AMT3PDS vproclient.vprodemo.com -credential $AMTCredential
-Enterprise:Intel -Vendor:Intel -Application
:PowerShell -Block:Test
```

will delete block data under Enterprise, Vendor, Application, Block specified.

ComputerName -----	Port ----	Operation -----	Status -----
vproclient.vprodemo.com	16992	Delete	Successful

----- EXAMPLE 5 -----

```
C:\PS>Get-Content computers.txt | Clear-AMT3PDS -TLS -Enterprise:Intel
-Vendor:Intel -Application:PowerShell -Block
:Test
```

ComputerName -----	Port ----	Operation -----	Status -----
computer1.vprodemo.com	16993	Delete	Successful
computer2.vprodemo.com	16993	Delete	Successful
computer3.vprodemo.com	16993	Delete	Successful

5.7 Intel AMT PowerShell GUI

The Intel AMT PowerShell Graphical User Interface (GUI) provides a simple interface for invoking a majority of the commands supported within the module.

5.7.1 Invoke-AMTGUI

NAME

Invoke-AMTGUI

SYNOPSIS

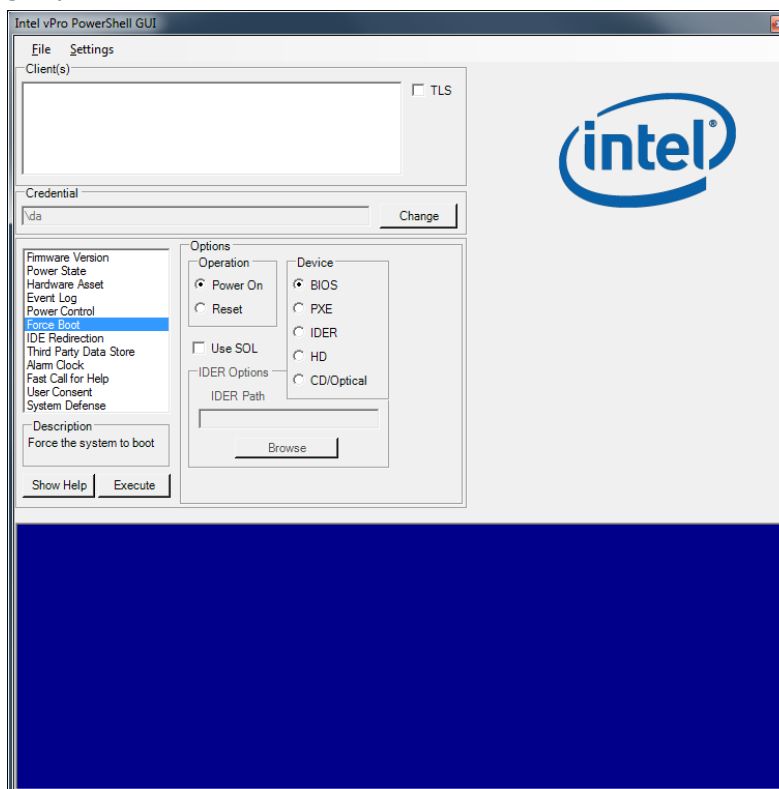
GUI that invokes PowerShell Module for Intel® vPro™ technology cmdlets

SYNTAX

```
Invoke-AMTGUI [[-ComputerName] <String[]>] [-Credential <PSCredential>] [-xmlConfig] <string> [<CommonParameters>]
```

DESCRIPTION

The Intel AMT PowerShell Graphical User Interface (GUI) provides a simple interface for invoking a majority of the commands supported within the module. An xml configuration file can be passed in to configure the GUI. See the default XML in the invoke-amtgui.ps1 file.



For more details, review the Windows PowerShell integrated help by typing:

Get-Help Invoke-AMTGUI -Full

----- EXAMPLE 1 -----

```
C:\PS>Invoke-AMTGUI
```

----- EXAMPLE 2 -----

```
C:\PS>Invoke-AMTGUI $computerName
```

----- EXAMPLE 3 -----

```
C:\PS>Invoke-AMTGUI $computerName -Credential $AmtCredential
```

----- EXAMPLE 4 -----

```
C:\PS>Invoke-AMTGUI -xmlConfig sample.xml
```

5.8 Intel AMT User Consent

Intel AMT User Consent is a method to query a user for consent to remotely manage the client. To enforce the user's consent to opt-in for a redirection session, a secure output window ("sprite") is displayed on the user's screen on top of any other window. The user is prompted to read out to the IT administrator a randomly-generated number. Only if the IT administrator types in the correct number will the redirection session be allowed to begin. Once a valid KVM Remote Control session is invoked, the user's entire screen will be surrounded by a red bar indicating that an IT administrator is in the process of a KVM Remote Control session.

5.8.1 Get-AMTUserConsent

NAME

Get-AMTUserConsent

SYNOPSIS

Gets the Intel AMT user consent state

SYNTAX

```
Get-AMTUserConsent [-ComputerName] <String[]> [[-Port] <String>] [-Username
<String>] [-Password <String>] [-TLS] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

DESCRIPTION

This cmdlet gets the Intel AMT user consent state from clients that have Intel AMT firmware version 3.0 and higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTUserConsent -Full

```
----- EXAMPLE 1 -----
C:\PS>Write-AmtCredential

----- EXAMPLE 2 -----
C:\PS>$AMTCredential = Write-AmtCredential (will assume the digest account
"admin")

----- EXAMPLE 3 -----
C:\PS>$AMTCredential = Get-Credential

Write-AmtCredential -Username $AMTCredential.Username -Password
$AMTCredential.Password
```

5.8.2 Start-AMTUserConsent

NAME

Start-AMTUserConsent

SYNOPSIS

Starts the Intel AMT user consent process

SYNTAX

```
Start-AMTUserConsent [-ComputerName] <String[]> [-Port] <String> [-Username
<String>] [-Password <String>] [-TLS] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

DESCRIPTION

This cmdlet starts the user consent process on clients that have Intel AMT firmware version 3.0 and higher. The user consent screen is displayed on the remote client and the code must be passed into this cmdlet.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Start-AMTUserConsent -Full

----- EXAMPLE 1 -----

```
C:\PS>Start-AMTUserConsent vproclient.vprodemo.com -credential $AMTCredential
```

5.8.3 Stop-AMTUserConsent

NAME

Stop-AMTUserConsent

SYNOPSIS

Stops the Intel AMT user consent process

SYNTAX

```
Stop-AMTUserConsent [-ComputerName] <String[]> [-Port] <String> [-Username
<String>] [-Password <String>] [-TLS] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

DESCRIPTION

This cmdlet stops the user consent process on clients that have Intel AMT firmware version 3.0 and higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Stop-AMTUserConsent -Full

```
----- EXAMPLE 1 -----  
C:\PS>Stop-AMTUserConsent vproclient.vprodemo.com -credential $AMTCredential  
  
ComputerName          Port          Status  
-----  
vproclient.vprodemo.com 16992        Successful
```

5.9 Intel AMT IDER

Intel AMT IDE Redirection (IDER) is a technology that allows redirecting the floppy disk (IMG) or CD-ROM (ISO) from the console to a remote client. This client can then be booted from an ISO or IMG file for management or remediation.

5.9.1 Get-AMTIDER

NAME

Get-AMTIDER

SYNOPSIS

Lists the Intel AMT IDE Redirection sessions

SYNTAX

Get-AMTIDER [<CommonParameters>]

DESCRIPTION

This cmdlet lists the Intel AMT IDE redirection (IDER) sessions.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTIDER -Full

```
----- EXAMPLE 1 -----
C:\PS>Get-AMTIDER

ComputerName      IDERSessionID  IDERPath      IDERState
-----
192.168.1.100      1 boot.iso      Disabled
```

5.9.2 Start-AMTIDER

NAME

Start-AMTIDER

SYNOPSIS

Starts an Intel AMTIDE redirection session

SYNTAX

```
Start-AMTIDER [-ComputerName] <String[]> [-Operation] <String> [[-IDERPath]
<String>] [-TLS] [-Username <String>] [-Password <String>] [[-Credential]
<PSCredential>] [<CommonParameters>]
```

The valid parameters for -Operation are {PowerOn, Reset}.

DESCRIPTION

This cmdlet starts an Intel AMT IDE redirection (IDER) session to clients that have Intel AMT firmware version 3.0 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Start-AMTIDER -Full

```
----- EXAMPLE 1 -----
C:\PS>Start-AMTider -computername:192.168.1.100 -operation:Reset
-iderpath:.\boot.iso -credential:$AMTCredential
```

ComputerName	IDERSessionID	IDERPath	Status
192.168.1.100	1	boot.iso	Successful

5.9.3 Stop-AMTIDER

NAME

Stop-AMTIDER

SYNOPSIS

Stops a specified Intel AMT IDE redirection session

SYNTAX

```
Stop-AMTIDER [[-IDERSessionID] <String[]>] [-CloseAllSessions]
[<CommonParameters>]
```

DESCRIPTION

Stops a specified Intel AMT IDE Redirection (IDER) session. If no ID is specified the oldest IDER session is closed.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Stop-AMTIDER -Full

```
----- EXAMPLE 1 -----
C:\PS>Stop-AMTider $SessionID

----- EXAMPLE 2 -----
C:\PS>Stop-AMTIDER

If no ID is specified the oldest IDER session is closed.
```

```
----- EXAMPLE 3 -----  
C:\PS>Stop-AMTIDER -CloseAllSessions  
  
Shuts down all IDER sessions
```

5.10 Configuration Cmdlets

This section describes cmdlets that help configure a system or provide more information about a client's configuration state.

5.10.1 Get-AMTSetup

NAME

Get-AMTSetup

SYNOPSIS

Returns Intel AMT setup information

SYNTAX

Get-AMTSetup [<CommonParameters>]

DESCRIPTION

This cmdlet gets Intel AMT setup information from the local system.

NOTES

Intel ME device drivers need to be installed.

This cmdlet requires elevated administrator privileges.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTSetup –Full

```
----- EXAMPLE 1 -----
C:\PS>Get-AmtSetup

SetupStatus           : Unconfigured
CoreVersion           : 7.0.0
BiosVersion           : ASNBCPT1.86C.0036.B00.1008051344
RemoteConfigurationSupported :
ConfigurationNonce    : bEYmf32WD19zvRvnNIjOzKGTg0U=
ClientControlSupported : True
HostConfigurationSupported : True
ActiveHashes          : {742C3192E607E424EB4549542BE1BBC53E6174E2, 132D0
                        D45534B6997CDB2D5C339E25576609B5CC6,
                        2796BAE63F1
                        801E277261BA0D77770028F20EEE4,
                        D1EB23A46D17D68FD
                        92564C2F1F1601764D8E349...}
HostName              : VPROC COMPUTER
IPAddress              : {192.168.1.100, fe80::84a1:ffcc:d82e:90d3}
DNSDomain              : vprodemo.com
DHCPEnabled            : True
UUID                  : 88888888-8887-8888-8888-878888888888
```

5.10.2 Enter-AMTRemoteConfiguration

NAME

Enter-AMTRemoteConfiguration

SYNOPSIS

Enters a Remote Configuration Session with an Intel AMT enabled client

SYNTAX

```
Enter-AmtRemoteConfiguration [-Session] <PSSession> [-Certificate]
<X509Certificate> [[-otp] <String>] [-Force] [<CommonParameters>]
```

```
Enter-AmtRemoteConfiguration [-ComputerName] <String> [-Certificate]
<X509Certificate> [[-Credential] <PSCredential>] [[-otp] <String>] [-Force]
[<CommonParameters>]
```

DESCRIPTION

The Enter-AmtRemoteConfiguration cmdlet starts an interactive configuration session with an unconfigured Intel AMT enabled client with firmware version 3.2 and higher.

A PSRemoting session is required in order to discover information about the device and start the configuration service. A remote WS-MAN session is then established with the device and remains the active session until Stop-AMTConfiguration is called.

NOTES

Intel AMT Provisioning:

Intel AMT must in an unconfigured or remoteStarted state.

HECI Drivers must be installed and working on the target Intel® AMT system.

Intel AMT must be enabled in the BIOS.

Configuration Sessions are not supported over wireless connections.

The Intel onboard Wired LAN must be connected.

This command can only be used remotely.

\$ConfigurationCertificate must be set to the thumbprint of the desired certificate in the directory Microsoft.PowerShell.Security\Certificate::CurrentUser\my

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Enter-AMTRemoteConfiguration -Full

```
----- EXAMPLE 1 -----  
C:\PS>Enter-AmtRemoteConfiguration vprocomputer.vprodemo.com  
$ConfigurationCertificate
```

5.10.3 Read-AMTCredential

NAME

Read-AmtCredential

SYNOPSIS

Reads an Intel AMT credential from secure string storage

SYNTAX

```
Read-AmtCredential [[-FilePath] <String>] [[-Key] <String>]  
[<CommonParameters>]
```

DESCRIPTION

Reads an Intel AMT credential from secure string storage.

NOTES

Reads System.Security.SecureString from the default user path.

An Intel AMT credential can be securely stored in a PowerShell encrypted string using the Write-AMTCredential cmdlet. This allows the privileged administrator to store the Intel AMT credential without them being exposed in plaintext for any user to view.

Once stored, a Powershell cmdlet in a later Powershell session can read the Intel AMT credential with Read-AMTCredential without exposing it.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Read-AMTCredential -Full

```
----- EXAMPLE 1 -----  
C:\PS>Read-AmtCredential  
  
----- EXAMPLE 2 -----  
C:\PS>$AMTCredential = read-AmtCredential
```

5.10.4 Write-AMTCredential

NAME

Write-AmtCredential

SYNOPSIS

Writes an Intel AMT credential to secure string storage

SYNTAX

```
Write-AmtCredential [[-FilePath] <String>] [[-Key] <String>] [[-Hint] <String>] [[-AsPlainText]] [[-Force]] [[-Username] <String>] [-Password] <SecureString> [  
  <CommonParameters>]
```

DESCRIPTION

Writes an Intel AMT credential to secure string storage.

An Intel AMT credential can be securely stored in a PowerShell encrypted string using the Write-AMTCredential cmdlet. This allows the privileged administrator to store the Intel AMT credential without them being exposed in plaintext for any user to view.

Once stored, a Powershell cmdlet in a later Powershell session can read the Intel AMT credential with Read-AMTCredential without exposing it. For testing purposes the -force switch can be used to store plaintext credentials.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Write-AMTCredential -Full

```

----- EXAMPLE 1 -----
C:\PS>Write-AmtCredential

----- EXAMPLE 2 -----
C:\PS>$AMTCredential = Write-AmtCredential (will assume the digest account
"admin")

----- EXAMPLE 3 -----
C:\PS>$AMTCredential = Get-Credential

Write-AmtCredential -Username $AMTCredential.Username -Password
$AMTCredential.Password

```

5.11 Informational Cmdlets

This section describes the cmdlets that directly communicate with the client's Intel AMT firmware to return information about the client system.

5.11.1 Get-AMTAccessMonitor

NAME

Get-AMTAccessMonitor

SYNOPSIS

Returns Intel AMT access events

SYNTAX

```
Get-AMTAccessMonitor [-ComputerName] <String[]> [-Username <String>] [-
Password <String>] [-TLS] [[-Credential] <PSCredential>] [<CommonParameters>]
```

DESCRIPTION

This cmdlet returns the Intel AMT access events from clients that have Intel AMT firmware version 3.2 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTAccessMonitor -Full

```

----- EXAMPLE 1 -----
C:\PS>Get-AMTAccessMonitor -computername:vProClient

```

```

ComputerName : vProClient
TimeStamp    : 1/01/2011 11:46:55 PM
Message      : AMT Provisioning Started
Location     :
User         :

```

----- EXAMPLE 2 -----

```
C:\PS>Get-AMTAccessMonitor vProClient -Credential $amtcred - TLS | Format-Table
```

ComputerName	TimeStamp	Message	Location	User
vProClient	1/01/2011 11:46:55 PM	AMT Provisioning Sta...		

5.11.2 Get-AMTEventLog

NAME

Get-AMTEventLog

SYNOPSIS

Returns the Intel AMT event log

SYNTAX

```
Get-AMTEventLog [-ComputerName] <String[]> [-Username <String>] [-Password
<String>] [-TLS] [[-Credential] <PSCredential>] [<CommonParameters>]
```

DESCRIPTION

This cmdlet returns the Intel AMT event log from clients that have Intel AMT firmware version 3.2 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTEventLog -Full

----- EXAMPLE 1 -----

```
C:\PS>Get-AMTEventLog -computername:vProClient
```

```

ComputerName : vProClient
Severity      : 8
TimeStamp     : 2010/01/01 7:28:20 AM
Source        : BIOS
Message       : Starting operating system boot process

```

----- EXAMPLE 2 -----

```
C:\PS>Get-AMTEventLog -computername:vProClient | Format-Table
```

ComputerName	Severity	TimeStamp	Source	Message
vProClient	8	2010/01/01 7:28:20 AM	BIOS	Starting

5.11.3 Get-AMTFirmwareVersion

NAME

Get-AMTFirmwareVersion

SYNOPSIS

Returns the core Intel AMT firmware version

SYNTAX

Get-AMTFirmwareVersion [-ComputerName] <String[]> [-Username <String>] [-Password <String>] [-TLS] [[-Credential] <PSCredential>] [<CommonParameters>]

DESCRIPTION

This cmdlet returns the Intel AMT core firmware version from clients that have Intel AMT firmware version 3.2 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTFirmwareVersion -Full

```
----- EXAMPLE 1 -----
C:\PS>Get-AMTFirmwareVersion -computername:vProClient
```

ComputerName	Property	Value
vProClient	AMT FW Core Version	7.1.3.1053

5.11.4 Get-AMTHardwareAsset

NAME

Get-AMTHardwareAsset

SYNOPSIS

Shows hardware information about the system

SYNTAX

```
Get-AMTHardwareAsset [-ComputerName] <String[]> [[-Port] <String>] [-Username
<String>] [-Password <String>] [-TLS][[-TextOutput] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

DESCRIPTION

This cmdlet returns the hardware information from clients that have Intel AMT firmware version 3.2 or higher.

Use the -TextOutput switch to show the data in a text only tree format.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTHardwareAsset -Full

```
----- EXAMPLE 1 -----
C:\PS>get-AMTHardwareAsset vProClient.vprodemo.com -Credential $AMTCredential

ComputerName      PSParentPath      Name
Value
-----
vProClient.vprodemo.com  \HardwareAssets\BIOS\Prima... Version
1.16
vProClient.vprodemo.com  \HardwareAssets\BIOS\Prima... ReleaseDate
2010/10/21 12:00:00 AM
vProClient.vprodemo.com  \HardwareAssets\BIOS\Prima... Manufacturer
American Megatrends Inc.
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    CPUStatus
CPU Enabled
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    CurrentClockSpeed
2700
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    ExternalBusClockSpeed
100
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    Family
Intel(R) Core(TM) i7 proc
e...
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    MaxClockSpeed
2700
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    UpgradeMethod
ZIF Socket
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    Manufacturer
Intel(R) Corporation
vProClient.vprodemo.com  \HardwareAssets\Cpu\CPU 0    Version
Intel(R) Core(TM) i7-2620
M...

----- EXAMPLE 2 -----
C:\PS>Get-AMTHardwareAsset -ComputerName vProClient.vProDemo.com -Credential
$AMTCredential | Where-Object -Filters
c#ript {$_.PSPPath -like "*BIOS*"}

ComputerName      PSParentPath      Name
Value
-----
vProClient.vprodemo.com  \HardwareAssets\BIOS\Prima... Version
1.16
```

```

vProClient.vprodemo.com      \HardwareAssets\BIOS\Prima... ReleaseDate
2010/10/21 12:00:00 AM
vProClient.vprodemo.com      \HardwareAssets\BIOS\Prima... Manufacturer
American Megatrends Inc.

```

Displays only the results that contain "BIOS" in their path

----- EXAMPLE 3 -----

```

C:\PS>Get-AMTHardwareAsset -ComputerName vProClient.vProDemo.com -Credential
$AMTCredential | Where-Object -Filters
c#ript {$_.PSPPath -like "*BIOS*"} | format-list

```

```

ComputerName : vProClient.vprodemo.com
PSParentPath : AmtSystem::\HardwareAssets\BIOS\Primary BIOS
Name         : Version
Value        : 1.16

```

```

ComputerName : vProClient.vprodemo.com
PSParentPath : AmtSystem::\HardwareAssets\BIOS\Primary BIOS
Name         : ReleaseDate
Value        : 2010/10/21 12:00:00 AM

```

```

ComputerName : vProClient.vprodemo.com
PSParentPath : AmtSystem::\HardwareAssets\BIOS\Primary BIOS
Name         : Manufacturer
Value        : American Megatrends Inc.

```

Displays only the results that contain "BIOS" in their path and formatted into a list.

----- EXAMPLE 4 -----

```

C:\PS>Get-AMTHardwareAsset -ComputerName vProClient -Credential $AMTCredential
-TextOutput

```

```

vProClient BIOS
vProClient  BIOS:Primary BIOS
  Version..... 1.16
  ReleaseDate..... 2010/10/21 12:00:00 AM
  Manufacturer..... American Megatrends Inc.
vProClient Cpu
vProClient  Cpu:CPU 0
  CPUStatus..... CPU Enabled
  CurrentClockSpeed... 2700
  ExternalBusClockSpeed 100
  Family..... Intel(R) Core(TM) i7 processor
  MaxClockSpeed..... 2700
  UpgradeMethod..... ZIF Socket
  Manufacturer..... Intel(R) Corporation
  Version..... Intel(R) Core(TM) i7-2620M CPU @ 2.70GHz

```

Displays results formatted as text.

5.11.5 Get-AMTPowerState

NAME

Get-AMTPowerState

SYNOPSIS

Returns the system power state

SYNTAX

```
Get-AMTPowerState [-ComputerName] <String[]> [[-Port] <String>] [-Username
<String>] [-Password <String>] [-TLS] [[-Credential] <PSCredential>]
[<CommonParameters>]
```

DESCRIPTION

This cmdlet returns the system power state from clients that have Intel AMT firmware version 3.2 or higher.

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTPowerState -Full

```
----- EXAMPLE 1 -----
C:\PS>Get-AMTPowerState -computername:vproclient.vprodemo.com

Computer Name          Power State ID          Power State Description
-----
vproclient.vprodemo.com          2          On (S0)

----- EXAMPLE 2 -----
C:\PS>Get-AMTPowerState -computername:vproclient.vprodemo.com -credential
$AMTcredential -TLS

Computer Name          Power State ID          Power State Description
-----
vproclient.vprodemo.com          2          On (S0)
```


5.12 Intel Fast Call for Help

This section describes the cmdlets that allow configuration of an environment that supports Intel Fast Call for Help. Once the MPS proxies are setup using set-AMTMPS clients can be added to the MPS interface with set-AMTMPSClient. Afterwards all AMT cmdlets will transparently route to the client through the MPS interface.

- Setup proxy information with set-AMTMPS
- Identify when client connects to MPS.
- Add client with set-AMTMPSClient
- Call cmdlets with no change.

5.12.1 Get-AMTMPSStatus

NAME

Get-AMTMPSStatus

SYNOPSIS

Returns the status of the Intel Fast Call for Help Management Presence Server (MPS) interface settings

SYNTAX

Get-AMTMPSStatus [<CommonParameters>]

DESCRIPTION

Returns the status of the Intel Fast Call for Help Management Presence Server (MPS) interface settings

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Get-AMTMPSStatus -Full

```
----- EXAMPLE 1 -----
get-AMTMPSStatus

HTTPProxy      SOCKSProxy      Client      Enabled
-----
HTTP Proxy address  SOCKS Proxy address      -----      True
```

5.12.2 Set-AMTMPS

NAME

Set-AMTMPS

SYNOPSIS

Set proxy information for the Intel Fast Call for Help Management Presence Server (MPS) interface

SYNTAX

```
Set-AMTMPS [-HTTPProxy] <String[]> [-SOCKSProxy] <String[]>  
[<CommonParameters>]
```

DESCRIPTION

Set proxy information for the Intel Fast Call for Help Management Presence Server (MPS) interface

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Set-AMTMPS -Full

```
----- EXAMPLE 1 -----  
set-AMTMPS -HTTPProxy HTTPProxy -SOCKSProxy SocksProxy  
  
HTTPProxy      SOCKSProxy      Client      Enabled  
-----  
HTTP Proxy address  SOCKS Proxy address      True
```

5.12.3 Set-AMTMPSClient

NAME

Set-AMTMPSClient

SYNOPSIS

Add and remove clients from the Intel Fast Call for Help Management Presence Server (MPS) interface

SYNTAX

```
Set-AMTMPSClient [-action] <String[]> [-hostname] <String[]>  
[<CommonParameters>]
```

The valid parameters for -action are {add, remove}

DESCRIPTION

Add and remove clients from the Intel Fast Call for Help Management Presence Server (MPS) interface

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Set-AMTMPSClient -Full

```

----- EXAMPLE 1 -----
set-AMTMPSClient -action add -hostname DemoClient
Added DemoClient to MPS client list

----- EXAMPLE 2 -----
set-AMTMPSClient -action remove -hostname DemoClient
Removed DemoClient from MPS client list

```

5.12.4 Clear-AMTMPS

NAME

Clear-AMTMPS

SYNOPSIS

Clears the Intel Fast Call for Help Management Presence Server (MPS) interface settings

SYNTAX

Clear-AMTMPS [<CommonParameters>]

DESCRIPTION

Clears the Intel Fast Call for Help Management Presence Server (MPS) interface settings

For more details, review the Windows PowerShell integrated help by typing:

Get-Help Clear-AMTMPS -Full

```

----- EXAMPLE 1 -----
clear-AMTMPS
MPS settings cleared

```

6 AMTSystem PowerShell Drive Provider

Microsoft has added the concept of a Windows PowerShell drive to Windows PowerShell version 2.0. These drives are information stores that can be accessed like a file system drive. Many drives are created automatically, such as the Registry (HKCU: and HKLM:), the certificate store (Cert:) and the Environment (ENV:)

<http://technet.microsoft.com/en-us/library/dd315335.aspx>

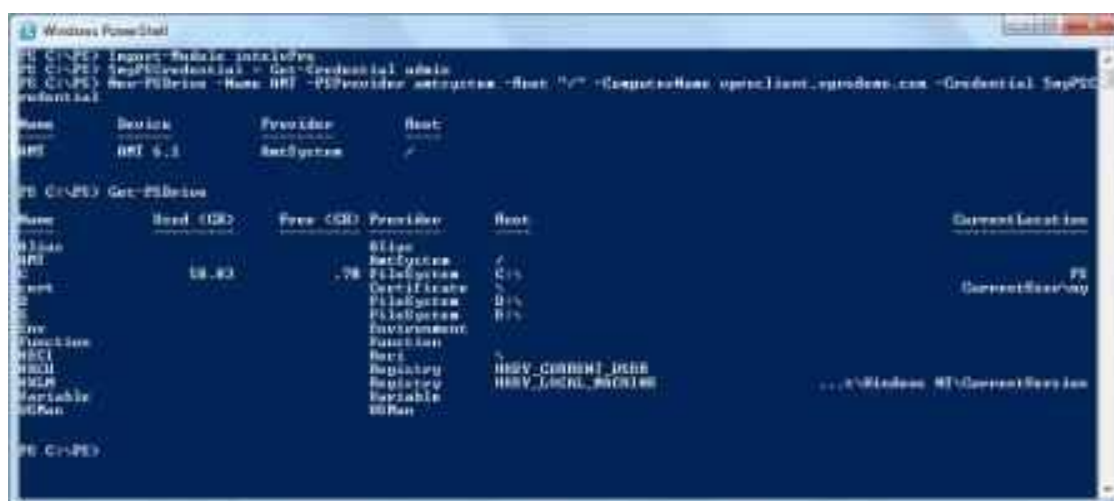
Intel has created a PowerShell Drive provider called AMTSystem that allows a remote Intel vPro technology enabled client to be accessed like a drive. This powerful feature allows the remote system's Intel vPro technology settings to easily be listed, accessed and changed.

Map a New-PSDrive called "AMT" to a remote system with Intel vPro technology. To do so, run the following command from the PowerShell console:

New-PSDrive -Name AMT -PSProvider amtssystem -Root "\" -ComputerName vproclient.vprodemo.com -Credential \$myPScredential

If your AMT client is configured in TLS mode (TLS encrypted traffic over AMT Port 16993), add the -TLS switch to the command.

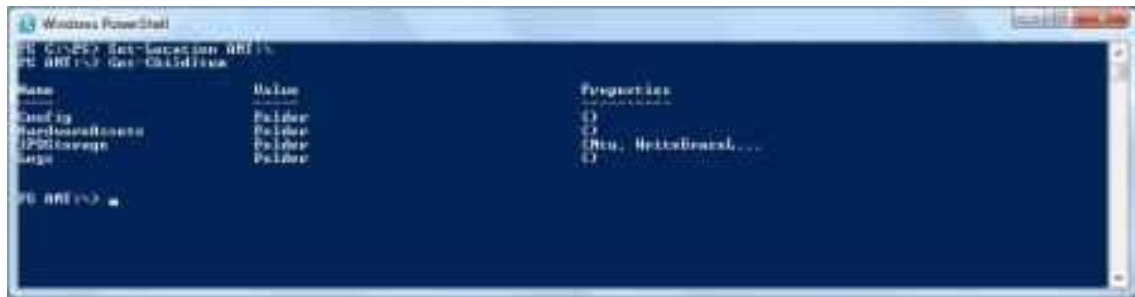
Type **Get-PSDrive** to list the available drives



Now that the AMT PowerShell Drive is mapped, browse and navigate the remote system in a similar fashion as a normal file system drive:

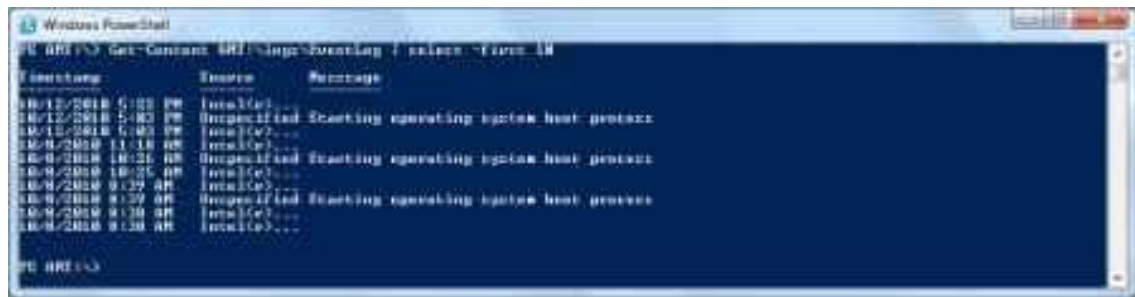
cd AMT:

dir



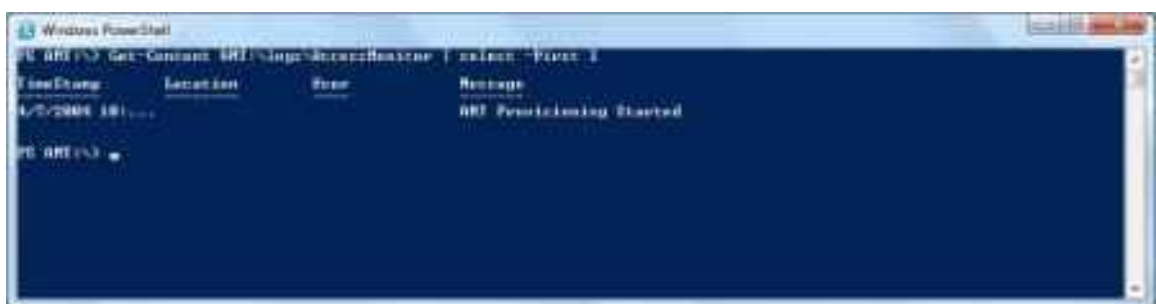
What can be done with this newly mapped drive? To display the AMT Event log:

Get-Content AMT:\logs\EventLog



And the same for the AMT Access Monitor (Audit Log):

Get-Content AMT:\logs\AccessMonitor



We can enumerate the system Hardware Inventory and dump the data to a file for auditing purposes:

Get-ChildItem -Recurse AMT:\HardwareAssets | Out-File C:\PS\HWInv.txt

If that is too much info focus on the BIOS items only:

Get-ChildItem -Recurse AMT:\HardwareAssets\BIOS



To turn IDE-R on:

Set-Item AMT:\Config\Redirection\IderEnabled -value "True"

To turn KVM User consent off:

Set-Item AMT:\Config\KVM\UserConsent -value "False"

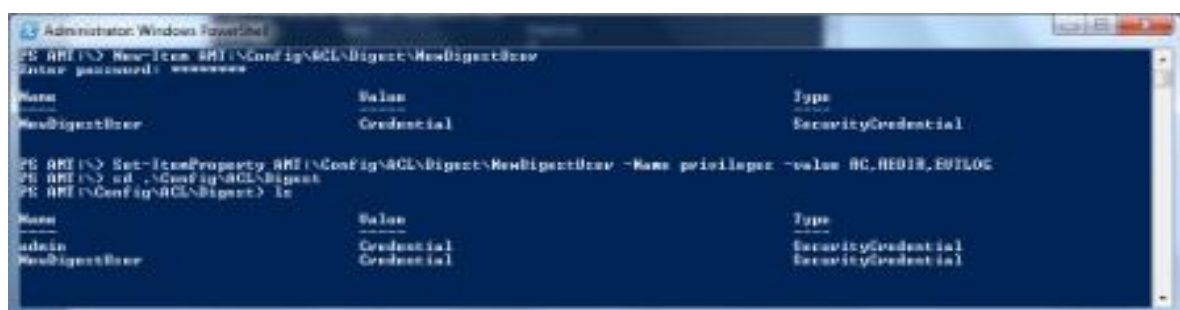
To change the AMT hostname:

Set-Item AMT:\Config\etc\Hosts\HostName "NewHostName"

Add a new user and give them rights:

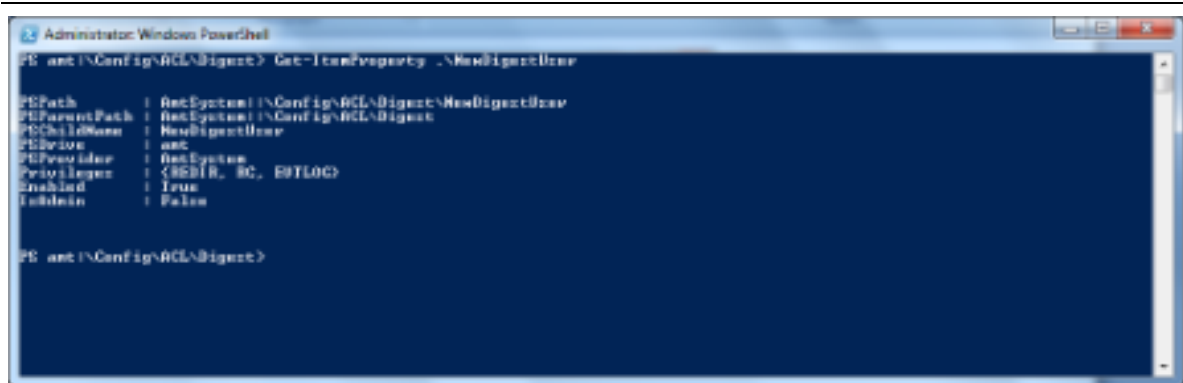
New-Item AMT:\Config\ACL\Digest\NewDigestUser -Password P@ssw0rd

Set-ItemProperty AMT:\Config\ACL\Digest\NewDigestUser -Name Privileges -Value RC,REDIR,EVTLOG



Check the properties of the newly added user:

Get-ItemProperty NewDigestUser



```
Administrator: Windows PowerShell
PS ant:\Config\ACL\Digest> Get-ItemProperty .\NewDigestUser

PSPath           : ant\System\ant\Config\ACL\Digest\NewDigestUser
PSParentPath     : ant\System\ant\Config\ACL\Digest
PSChildName      : NewDigestUser
PSDrive          : ant
PSProvider       : ant
Privileges       : {SEBTR, SE, ESTLOD}
Enabled          : True
IsAdmin          : False

PS ant:\Config\ACL\Digest>
```

A Appendix A: QuickStart Guide

This appendix provides minimal information to quickly install setup and use the Intel vPro Technology Module for Microsoft Windows PowerShell.

A.1 Download the Module

Download the latest version of the module from www.intel.com/go/powershell

A.2 Install the Module

Start setup.exe for the version of windows you are running.



NOTE

The installer must be run from an account with administrative rights.

A.3 Set Execution Level

Open a PowerShell console as an administrator and type

Set-ExecutionPolicy RemoteSigned

A.4 Set Credentials

In the PowerShell console type

\$AMTCred = get-credential

A.5 Run Cmdlets

Now use cmdlets to manage the Intel vPro technology enabled client.

Get-AMTPowerState "ComputerName" -Credential \$AMTCred

**Invoke-AMTPowerManagement "ComputerName" -Credential \$AMTCred -
Operation PowerOn**

Invoke-AMTGUI "ComputerName" -Credential \$AMTCred

B Appendix B: General Cmdlet and Function Methodology

This appendix provides further information on the methodology used in developing the cmdlets and functions for the Windows PowerShell Module for Intel vPro Technology.

B.1 Verb-Noun Pair Compliance

The Windows PowerShell Module for Intel vPro Technology actively complies with Windows PowerShell verb-noun pair convention for the names of cmdlets and functions. The verb part of the name identifies the action that the cmdlets and functions perform. The noun part of the name identifies the entity on which the action is performed. For more information on the Windows PowerShell verb-noun methodology, please visit the following link.

[http://msdn.microsoft.com/en-us/library/ms714428\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/ms714428(VS.85).aspx)

B.2 Cmdlet and Function Parameters

With every Windows PowerShell Module for Intel vPro Technology cmdlets and functions, there is a consistent set of parameters that all the cmdlets use.

Table 2: Cmdlet and Function Parameters

Parameter	Description	Positional Input	Pipeline Input	Required
ComputerName	Managed Client hostname, FQDN, IP address, or array of the previous	Yes	ByValue, ByPropertyName	True
TLS	Switch to specify if TLS should be used to communicate with the client. 16992 for non-TLS, 16993 for TLS. Default is 16992 if TLS is not specified.	No	ByPropertyName	False
Username	Digest or Kerberos User to authenticate with	No	ByPropertyName	False
Password	Password for Digest	No	ByPropertyName	False

	or Kerberos User			
Credential	Preferred mechanism for authentication using PS-Credential	Yes	ByPropertyName	False

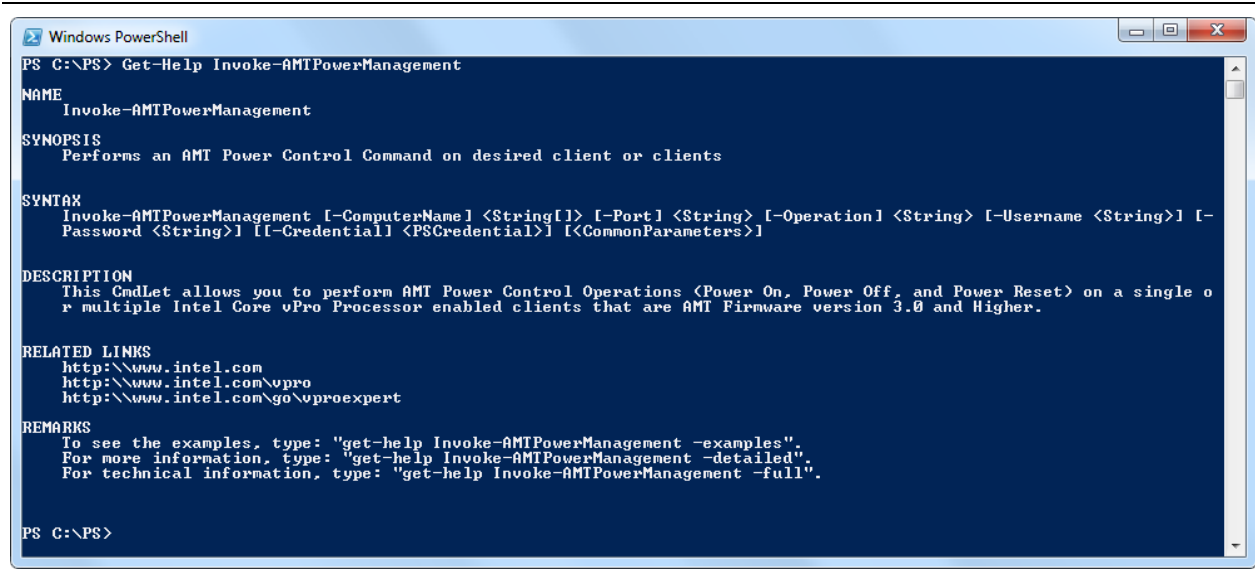
Although it may not exist in every cmdlet and function the following parameters are consistently used:

Parameter	Description	Positional Input	Pipeline Input	Required
Operation	Typically a sub operation of the cmdlets or functions	Yes	ByPropertyName	True

The Windows PowerShell Get-Help command can be used on the desired cmdlets and functions show any additional parameters that may be optional or required.

B.3 Cmdlets and Functions Integrated Help

Each Windows PowerShell Intel vPro Module cmdlet and function support the **Get-Help** command. Example use of the Get-Help command is the following:



```
Windows PowerShell
PS C:\PS> Get-Help Invoke-AMIPowerManagement

NAME
    Invoke-AMIPowerManagement

SYNOPSIS
    Performs an AMT Power Control Command on desired client or clients

SYNTAX
    Invoke-AMIPowerManagement [-ComputerName] <String[]> [-Port] <String> [-Operation] <String> [-Username <String>] [-Password <String>] [-Credential] <PSCredential>] [<CommonParameters>]

DESCRIPTION
    This Cmdlet allows you to perform AMT Power Control Operations (Power On, Power Off, and Power Reset) on a single or multiple Intel Core vPro Processor enabled clients that are AMT Firmware version 3.0 and Higher.

RELATED LINKS
    http://www.intel.com
    http://www.intel.com/vpro
    http://www.intel.com/go/vproexpert

REMARKS
    To see the examples, type: "get-help Invoke-AMIPowerManagement -examples".
    For more information, type: "get-help Invoke-AMIPowerManagement -detailed".
    For technical information, type: "get-help Invoke-AMIPowerManagement -full".

PS C:\PS>
```

Figure 3: Module Help

By using the **Full**, **Detailed**, and **Examples** parameters with Get-Help more detailed information on the cmdlet and function and how to use it is provided.