



Intel® vPro™ Technology Use Case Reference Design

Local Setup and Configuration Using a USB Flash Drive

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1 Preface

With the release of Intel® Active Management Technology (Intel® AMT) 4, Intel® vPro™ technology added the capability to set up and configure PCs with Intel vPro technology locally using a USB flash drive. For small and medium businesses that prefer local setup and configuration, this can speed up the setup and configuration process. This use case will demonstrate a simplification of this process.

**NOTE**

Local setup and configuration is also known as SMB mode or Basic Mode setup and configuration.

1.1 Document Scope

This document describes a process using prebuilt tools from the Intel AMT SDK to perform basic, local setup and configuration of Intel AMT versions 4, 5, and 6. It also points out some of the potential pitfalls and shortcomings for the process. We recommend that you test this process in your environment and adapt it to your specific needs.

**NOTE**

This document does not cover Host Based Setup and Configuration, a feature introduced in Intel AMT version 7.

1.2 Intended Audience

This document is intended for Information Technology (IT) professionals who want to perform local Intel AMT setup and configuration on PCs with Intel vPro technology. This method requires physical system interaction, including insertion of a USB drive and a reboot. As such, we expect that this method will be used primarily by small and medium businesses that typically perform setup and configuration tasks locally. This method may also work well for an MSP or Enterprise that performs initial setup and configuration tasks locally. This method may not work well for those who wish to perform remote setup and configuration.

2 Introduction

2.1 Example Deployment Illustrated in This Document

The steps in this document reference several PC roles which have the following requirements:

Role	Requirement
Reference Client with Intel vPro Technology	<ul style="list-style-type: none"> Intel AMT 4.0 or higher. Example uses a Fujitsu Lifebook E8420
Target Client(s) with Intel vPro Technology	<ul style="list-style-type: none"> Intel AMT 4.0 or higher. May be same as reference Intel vPro client for testing Example uses a Fujitsu Lifebook E8420
Other Hardware	<ul style="list-style-type: none"> USB flash drive supporting USB Based One Touch Setup and Configuration on the Target Clients. http://communities.intel.com/docs/DOC-1247#USB_Provisioning Contact your OEM for specific details.

Other types of deployments, management consoles, Intel AMT states, etc. are beyond the scope of this document.

2.2 Process Overview

It is possible to set up and configure Intel AMT 4.0 and above locally (in SMB or Basic Mode) using a USB flash drive. This alleviates the need to enter the Intel® Management Engine BIOS Extension (Intel® MEBX) and type data like host name, domain suffix, etc. It is also possible to create a batch file which, when run from the client's host OS, will create a setup.bin customized (host name and domain suffix for example) for that client. In this way, minimal human interaction is required to perform Basic Mode setup and configuration. Simply boot the OS, insert the USB flash drive, run the batch file, and then after a reboot Intel AMT will prompt you to accept its customized setup and configuration information.

In this document, the process is broken into two main phases: Setup and Deploy. These two phases are described at a high level in the following two overview subsections to give you a general idea of the process, then described in explicit detail throughout the body of this document. The steps in the overview tables correspond to the major subsections of the Setup and Deploy chapters, respectively.

The process is broken into two steps so that different individuals can perform each step. That is, an engineering-level IT professional can perform the initial setup, leaving the task of performing the USB Based One Touch Setup and Configuration to an IT installation technician. This process may be adapted depending on business size, number of systems, desired settings, and security.



NOTES

We recommend that you follow this process for each OEM / model / Intel AMT version combination (which we will refer to as a “platform” going forward). This is because the possible configuration options will vary by OEM, model, and Intel AMT version. While it is likely that a setup from one platform will work on another, some desired items may not be set due to a mismatch between the platforms. When attempting to use a setup from one platform for deployment on another platform, we recommend you perform a quick test to ensure everything is applied as desired.

Intel AMT version 7 introduces Host Base Setup and Configuration, which further simplifies the setup and configuration process. This document does not cover Host Based Setup and Configuration. See the Intel® vPro™ Expert Center at the link below for more information on Host Based Setup and Configuration.

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

2.2.1 Setup

The majority of the work is in the Setup phase, in which you will be creating and assembling the tools and scripts needed to locally set up and configure Intel AMT.

Phase description	The IT professional performs tasks to prepare for local USB flash drive based Intel AMT setup and configuration.
Phase prerequisites	<ul style="list-style-type: none"> • Requirements in section 2.1 are met. • OS is installed with current drivers on the system to be configured. • Computer name has been verified to be correct • Intel Management Engine is enabled, but Intel AMT is not set up or configured.
Phase flow	<ol style="list-style-type: none"> 1. Obtain the files. 2. Configure the Reference Client manually. 3. Create a USB flash drive and batch file to automate the process.
Phase outcome	USB flash drive is ready for semi-automatic one-touch provisioning.

2.2.2 Deploy

Once you have created and assembled the files on the USB flash drive, tools, and script, you will need to insert the USB flash drive into each Target Client and run the batch file. Then you will need to verify successful setup and configuration.

Phase description	The IT professional or IT install technician inserts the USB flash drive and runs through the script and subsequent steps.
Phase prerequisites	<ul style="list-style-type: none">• USB flash drive created in the Setup Phase is in hand.• OS on Target Client is installed with current drivers on the system to be configured.• Computer name has been verified to be correct.• Intel AMT is active but not set up or configured and ready to accept setup and configuration data from the USB flash drive.
Phase flow	<ol style="list-style-type: none">1. Insert USB flash drive into Target Client and follow steps.2. Verify successful setup and configuration.3. Repeats these steps for each Target Client.
Phase outcome	Target Clients are set up and configured. Intel AMT is ready for use.

3 Setup

This chapter and its subsections describe the process to prepare the USB flash drive, tools, and script.

3.1 Obtain the Files

Follow the steps in this section to obtain the necessary files to prepare the USB flash drive.

1. Obtain the latest Intel AMT SDK from <http://communities.intel.com/docs/DOC-1171>.
2. Obtain a USB flash drive. This USB flash drive will be used exclusively for this process as it will be formatted repeatedly.



NOTE

The USB flash drive must meet certain requirements. First, it must be capable of being formatted to FAT16, which means you cannot use USB flash drives over 2 GB. Second, the file setup.bin, which will result from this process, must be at the beginning of the USB flash drive. Some vendors place special or hidden partitions and/or data at the beginning of their USB flash drives. As such, these USB flash drives may not work without modification. Finally, due to BIOS implementations, some systems may have additional restrictions on supported drives. The link below provides more details on supported USB flash drives.

http://communities.intel.com/docs/DOC-1247#USB_Provisioning

3.2 Set Up and Configure the Reference Client

You are now ready to set up and configure the Reference Client.

3.2.1 Manually Create the Setup.bin File

Follow the steps below to create the setup.bin file. For systems with Intel AMT 6, see Section 3.2.1.1 on page 11.

1. Extract the SDK zip file to a location of your choosing on the Reference Client.
2. Navigate to the SDK folder to find the utility to create a Setup.bin file. Setup.bin is required for one-touch configuration.

Example:

<drive>:\SDK\Windows\Intel_Manageability_Configuration\Bin\ConfigScripts
where <drive>: represents the path to the SDK folder location.

- Within the ConfigScripts folder, find USBFile.exe and copy it to a folder off of the root of C: for ease of access and use (we suggest you create a folder called **USBTemp** on the root of C: and copy the file there).
- Open a command prompt.
- Click **Start > Run** and enter **cmd**, then click **OK**.
- Navigate to the USBTemp folder.
- To create the Setup.bin file, type **USBFile** followed by the parameters for your configuration. To see syntax and possible parameters type **USBFile /?** and then **<Enter>**.

Example:

```
USBfile -create setup.bin admin P@ssw0rd -amt -consume 1 -pm 1 -pp
30800DEE09C07843AF287868A2DBBE3A -redir 7 -hostname vProRef -domain
vprodemo.com -v 2.1 -conf 1
```

Table 1: Definitions of Parameters in This Example

Admin	Default or current password for Intel ME. Note: <i>out of the box the password is admin. If you enter Intel MEBX or setup and configure using this method the password will change. For most production environments where you run this only once, leaving this set to admin is what you want. However, in testing, where you may need to unconfigure to run through this process multiple times, you'll need to adjust this to the current Intel MEBX password.</i>
P@ssw0rd	The new password to be used in the Intel ME.
-amt	This will set the manageability selection value to Intel AMT.
-consume 0 1	Generate inconsumable record or consumable record(s), 0 (inconsumable) by default.
-pm 0 1	Enterprise/SMB setup and configuration mode, 0 (Enterprise) by default.
-pp <GUID>	Set the power package ,GUID should be in network order. See appendix for more details on Power Policy GUIDs.
-redir <n>	This is an integer that is calculated as follows (cumulative): <ul style="list-style-type: none"> • bit 0 : 1 (Enable) or 0 (Disable) - SOL feature • bit 1 : 1 (Enable) or 0 (Disable) – IDER feature • bit 2 : 1 (Enable) or 0 (Disable) - Username/password
-hostname <hostname>	ASCII representation of host name (maximum length 63). Note: This option is not valid when generating an inconsumable record. Also, this value should match the host name in the OS.
-domainname <domain name>	Domain name (maximum length 255 characters).
-v	The version of the setup.bin file. Note: we are using version 2.1 because it is compatible with Intel AMT 4 and above. If you are working on Intel AMT 6 you may wish to specify version 3 so you can configure new features such KVM. See below for more information. Note: USBfile.exe from the Intel AMT6 SDK or higher is required for version 3.
conf 0 1	Denotes automated (0) or manual (1) configuration

**NOTE**

Your parameters will vary with your needs. That is, the hostname of the computer to be configured, domain name, password, etc. Write down the parameters you used. You will need this information later.

3. Verify that the Setup.bin file was created in the USBTemp folder.

3.2.1.1 For Systems with Intel AMT 6 and 7

If you are satisfied with the default KVM Remote Control settings, or do not need to configure KVM Remote Control, the procedure in Section 3.2.1 above will suffice. If you wish to set KVM Remote Control options, below are an example command line and a list of commands to do this:

```
USBFile.exe -create setup.bin admin P@ssw0rd -amt -consume 1 -pp
30800DEE09C07843AF287868A2DBBE3A -redir 7 -hostname p2 -domname vprodemo.com -v 3
-kvm 1 -UserConsentOption 1 -UserConsentPolicy 1 -conf 1
```

Table 2: Definitions of New Parameters in This Example

-pm	Removed – this is deprecated in version 3.0 of setup.bin
-kvm	0 1: disable/enable KVM
- UserConsentOption	0 1 255 user consent disabled/enabled for kvm only/enabled for all features ('255' –enabled for all features is supported starting from version 4)
- UserConsentPolicy	0 1: user consent policy configurable remotely
-v	The version of the setup.bin file. more information.

3.2.2 Configure the Reference Client

Perform the following steps to configure the Reference Client.

1. Format your USB flash drive with a FAT16 file system. For example, use the following command:

```
format <drive letter> /q /fs:FAT /v:
```
2. Copy the Setup.bin file that you just created onto the root of the USB flash drive.
3. Reboot the Reference Client with the USB flash drive still inserted. (The system should detect the Setup.bin file on the USB flash drive during the boot process).
4. When prompted, select **Y** to configure. Allow some time for the configuration.
5. Press a key to continue. The system will boot to the OS.

At this point, you have set up and configured your Reference Client locally using a USB flash drive. If you would like to verify this, follow the instructions in Section 4.2 on page 15. After verifying, continue to section 3.3, Create a USB Flash Drive and Batch File to Automate the Process.

3.3 Create a USB Flash Drive and Batch File to Automate the Process

Now that you know all the commands needed to perform this task, you can automate much of this process with a simple batch file. The batch file you create in this section will do the following:

1. Copy contents of the USB flash drive to a temp folder in the user's home directory.
2. Store the USB flash drive's drive letter (example, e:).
3. Start a new batch file from the user's home directory that will do the following:
 - f) Create setup.bin.
 - g) Format the USB flash drive.
 - h) Copy setup.bin to the USB flash drive.
 - i) Move the temp files back to the USB flash drive.

Follow the steps below to create the batch file.

1. Insert your USB flash drive.
2. Copy the contents of c:\USBTmp to the USB flash drive. The USB flash drive should now contain setup.bin and usbfile.exe.
3. Copy the sample files from this Use Case Reference Design to your USB flash drive.
4. Edit the cfg_me.txt file to include the USBfile command line you used above. Remember to replace the hostname value with %COMPUTERNAME%.
 - j) Open the cfg_me.txt in a text editor such as Notepad.
 - k) Search for the following line and replace it with your USBfile command line.

```
rem ### your USBfile command goes here ###
```

Example:

```
USBFile.exe -create setup.bin admin P@ssw0rd -amt -consume 1 -pp
30800DEE09C07843AF287868A2DBBE3A -redir 7 -hostname %COMPUTERNAME% -
domname vprodemo.com -v 3 -kvm 1 -UserConsentOption 1 -UserConsentPolicy 1
-conf 1
```

Note: Your parameters may be different depending on your needs. Using %COMPUTERNAME% for the host name allows the setup.bin file to be created using the current systems name that the USB flash drive is plugged into when the .bat file is executed.

- l) Save the file.

At this point, you are now ready to deploy this to all your Target Clients. Continue to section 3.4, Make the Process Easier (Optional), then continue on to section 4, Deploy.

3.4 Make the Process Easier (Optional)

The following optional steps can make the USB Based One Touch Setup and Configuration process even easier.

3.4.1 Auto reboot

To make the target system automatically reboot after the USB flash drive has been prepared, add the following command line at the end of the clean.bat file (included in the sample code of this use case reference design's download package):

```
Shutdown -r -t 0
```

3.4.2 Auto run

To make the USB flash drive automatically prepare itself upon insertion, add the file autorun.inf in the root directory of the USB flash drive. The autorun.inf file should include the following contents:

```
[autorun]
open=Start.bat
```



NOTE

Auto run will only function if Windows is configured for auto run.

4 Deploy

This chapter leads you through configuring the Target Clients.

4.1 Insert USB Flash Drive Into Target Client and Configure System

Follow the steps below:

1. Boot the Target Client to the OS if this has not already been done.
2. Insert the USB flash drive into a USB port on the Target Client.
3. Open a window to display the contents of the USB flash drive.
4. Double-click the file Start.bat to run it. This will create the file Setup.bin on the root of the USB flash drive.
5. Reboot the Target Client (the system should detect the Setup.bin file on the USB flash drive during boot process).
6. When prompted, select **Y** to configure. **Note:** Allow some time for the configuration.
7. Press a key to continue. The system will boot to the OS.
8. After the Target Client boots to the OS remove the USB flash drive.

4.2 Verify Successful Setup and Configuration

To verify configuration, open the Intel Management and Security Status (IMSS) tool and verify that the **Status** is **Configured**. In later versions of the IMSS tool this can be found in the Advanced tab.



Figure 1: Intel® Management and Security Status Screen Showing Configured Status

4.3 Repeat for Each Target Client

Now that you know the process works, you or one of your colleagues can set up and configure all the remaining Target Clients. For existing systems you'll have to go visit them one at a time. For new systems, keep this USB flash drive handy and use it as part of your initial deployment.



NOTE

As new Intel AMT versions are released new features will be made available. When this happens you'll want to get the latest usbfile.exe and modify your batch file so it has the parameters needed to take advantage of the new features.

Appendix: Troubleshooting Tips

Refer to the notes below for help in addressing issues encountered while performing the steps outlined in this document.

General Power Policy Lists by Intel AMT Versions



NOTE

The power policies may vary by OEM/Model.

Table 3: General Power Policy Lists by Intel® AMT Version

Intel AMT Version	Power Policies
Intel AMT 4	<p>PowerPackage Policy 1: Base64: djmXEQtWUEOlcJgS85G1YA== GUID: 11973976-560B-4350-8870-9812F391B560 USBFile Input: 763997110B56504388709812F391B560 Description: Mobile: ON in S0</p> <p>PowerPackage Policy 2: Base64: JtMcdocIxOu7Xzh0QxWI/w== GUID: 761CD326-0887-4BC7-BB5F-38744315A5FF USBFile Input: 26D31C768708C74BBB5F38744315A5FF Description: Mobile: ON in S0, S3/AC</p> <p>PowerPackage Policy 3: Base64: Uw4I22wP2Uiyo0IY0/EVbg== GUID: DB080E53-0F6C-48D9-B2D2-8958D3F1156E USBFile Input: 530E08DB6C0FD948B2D28958D3F1156E Description: Mobile: ON in S0, S3/AC, S4-5/AC</p> <p>PowerPackage Policy 4: Base64: BV3Vtkykh02lqLR8FN7aXw== GUID: B6D55D05-A44C-4D87-A5A8-B47C14DEDA5F USBFile Input: 055DD5B64CA4874DA5A8B47C14DEDA5F Description: Mobile: ON in S0, ME Wake in S3/AC</p> <p>PowerPackage Policy 5: Base64: MIAN7gnAeEOvKHhootu+Og== GUID: EE0D8030-C009-4378-AF28-7868A2DBBE3A USBFile Input: 30800DEE09C07843AF287868A2DBBE3A</p>

	Description: Mobile: ON in S0, ME Wake in S3/AC, S4-5/AC
Intel AMT 5	<p>PowerPackage Policy 1: Base64: IE+DEvsQT9yWjh4jKwyQZQ== GUID: 12834F94-10FB-DC4F-968E-1E232B0C9065 USBFile Input: 944F8312FB104FDC968E1E232B0C9065 Description: Desktop: ON in S0</p> <p>PowerPackage Policy 2: Base64: oYYAq5p/TEKm5rskOildng== GUID: AB0086A1-7F9A-424C-A6E6-BB243A295D9E USBFile Input: A18600AB9A7F4C42A6E6BB243A295D9E Description: Desktop: ON in S0, S3</p> <p>PowerPackage Policy 3: Base64: coarrJa0SOKbnpt9+Rx/1A== GUID: 7286ABAC-96B4-48E2-9B9E-9B7DF91C7FD4 USBFile Input: ACAB8672-B496-E248-9B9E-9B7DF91C7FD4 Description: Desktop: ON in S0, S3, S4-5</p> <p>PowerPackage Policy 4: Base64: ezLNTWu+Q4mmKk172NvQJg== GUID: 4DCD327B-BE6B-8943-A62A-4D7BD8DBD026 USBFile Input: 7B32CD4D6BBE4389A62A4D7BD8DBD026 Description: Desktop: ON in S0, ME Wake in S3</p> <p>PowerPackage Policy 5: Base64: cyJzRiPcQy+pihPTeYLYVQ== GUID: 46732273-DC23-2F43-A98A-13D37982D855 USBFile Input: 7322734623DC432FA98A13D37982D855 Description: Desktop: ON in S0, ME Wake in S3, S4-5</p> <p>PowerPackage Policy 6: Base64: xRmkum5vjU2yJ1F/fkWV2w== GUID: C519A4BA-6E6F-8D4D-B227517F7E4595DB USBFile Input: BAA419C56F6E4D8DB227517F7E4595DB Description: Desktop: ON in S0, S3, S4-5, OFF After Power Loss</p> <p>PowerPackage Policy 7: Base64: 1gvj7QTFLEa3ctGAGO4vxA== GUID: D60BE3ED-04C5-2C46-B772D18018EE2FC4 USBFile Input: EDE30BD6C504462CB772D18018EE2FC4 Description: Desktop: ON in S0, ME Wake in S3, S4-5, OFF After Power Loss</p>

Intel AMT 6 & 7 - Desktop	<p>PowerPackage Policy 1:</p> <p>Base64: IE+DEvsQT9yWjh4jKwyQZQ==</p> <p>GUID: 12834F94-10FB-DC4F-968E-1E232B0C9065</p> <p>USBFile Input: 944F8312-FB10-4FDC-968E-1E232B0C9065</p> <p>Description: Desktop: ON in S0</p> <p>PowerPackage Policy 2:</p> <p>Base64: cyJzRiPcQy+pihPTeYLYVQ==</p> <p>GUID: 46732273-DC23-2F43-A98A-13D37982D855</p> <p>USBFile Input: 7322734623DC432FA98A13D37982D855</p> <p>Description: Desktop: ON in S0, ME Wake in S3, S4-5</p>
Intel AMT 6 & 7 - Mobile	<p>PowerPackage Policy 1:</p> <p>Base64: djmXEQtWUEOlcJgS85G1YA==</p> <p>GUID: 11973976-560B-4350-8870-9812F391B560</p> <p>USBFile Input: 763997110B56504388709812F391B560</p> <p>Description: Mobile: ON in S0</p> <p>PowerPackage Policy 2:</p> <p>Base64: MIAN7gnAeEOvKHhootu+Og==</p> <p>GUID: EE0D8030-C009-4378-AF28-7868A2DBBE3A</p> <p>USBFile Input: 30800DEE09C07843AF287868A2DBBE3A</p> <p>Description: Mobile: ON in S0, ME Wake in S3, S4-5 (AC only)</p>

Getting the Power Policy List From Your Platform

To determine the Power Policy capabilities and corresponding GUIDs for your platform you may use the WebUI or a command line tool from the Intel AMT SDK.

WebUI

1. After provisioning the first system.
2. Use a web browser on another system to connect to Intel AMT's WebUI:
3. %TLS%://%AMT_Direct%:%AMT_PORT% - See chart below
4. Log in as an Intel AMT administrator account. For example, as admin.
5. Click the Power Policies Link.
6. The page will list all supported power policies. Use the above chart to determine the corresponding USBFile Input.

%TLS%	http or https for non-TLS and TLS respectively. Note that when setting up and configuring locally this will be http. If you are unsure, try http first, then try https. Remember to match the
-------	---

	%AMT_PORT% setting listed below.
%AMT_Direct%	The Fully Qualified Domain name or IP address of the client with Intel® vPro™ technology.
%AMT_PORT%	16992 or 16993 for non-TLS & TLS respectively.

Command line

1. Download the latest AMT SDK: <http://software.intel.com/en-us/articles/download-the-latest-intel-amt-software-development-kit-sdk/>
2. Extract it and find PowerPackage.exe. If you copy it, be sure to include all 4 .dlls in the same folder.
3. Run the command on another system:

PowerPackage -host %AMT_Direct% -user %USER% -pass %PASS% <-tls> -
enumerate.

Where:

%TLS%	http or https for non-TLS & TLS respectively. Note that when setting up and configuring locally this will be http. If you are unsure, try http first, then try https. Remember to match the %AMT_PORT% setting listed below.
%AMT_Direct%	The Fully Qualified Domain name or IP address of the client with Intel® vPro™ technology.
%AMT_PORT%	16992 or 16993 for non-TLS & TLS respectively.

4. The command will connect to AMT and enumerate the power packages. Output will be in base64. Use the chart above to find the corresponding USBFile input value.

Unconfiguring Intel AMT

Unconfiguring Intel AMT allows for setup and configuration of the same system repeatedly during testing. Just be sure to temporarily adjust the parameter for the existing Intel MEBX password.

For detailed instructions on how to unconfigure Intel AMT, see the section titled "Unprovisioning" in the *Intel® Management Engine BIOS Extension (Intel® MEBX) User's Guide*, available at the link below:

<http://communities.intel.com/docs/DOC-2658>