Intel® Management Engine Software

Installation and Configuration Guide

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Contents

1 Introduction

This guide describes how to install, configure and troubleshoot the Intel® Management Engine (Intel® ME) software components.

For a list of software components, see *Software Components Overview* (Section 2).

The Intel® ME software installer has a separate version for each Intel® ME generation (6.x, 7.x, 8.x etc.).

2 Software Components Overview

This section lists the software components supplied with the firmware kit and provides a short overview of each component.

Note: Applications and drivers are installed based on the system's specific hardware and firmware features. For example, if none of the following technologies (Intel® Active Management Technology (Intel® AMT), Intel® Small Business Technology (Intel® SBT) or Intel® Standard Manageability) exists on the system, the Intel® Management and Security Status application is not installed.

To view the installer options, enter the following in a Command window: **setup.exe -?**

2.1 Intel® Management Engine Interface (Intel® MEI)

This driver is the interface between the Intel® Management Engine (Intel® ME) firmware and the operating system. Drivers and applications on the host that wish to interact with Intel® ME can use the Intel® MEI host Windows* driver.

2.2 Serial Over LAN (SOL) driver

This driver enables the remote display of managed client's user interface through management console and emulates serial communication over standard network connection. This driver supports systems with one of the following technologies: Intel® AMT, Intel® Standard Manageability.

2.3 Local Manageability Service (LMS)

This service enables local applications running on Intel® AMT, Intel® SBT or Intel® Standard Manageability supported devices to use common SOAP and WS-Management functionality that is available to remote applications. It listens to the Intel® ME IANA (Internet Assigned Names Authority) ports and routes all traffic to the firmware through the Intel® MEI.

2.4 User Notification Service (UNS)

This service provides Intel® ME with various host operation abilities. For instance, it enables Intel® ME technologies to write user notifications to the local host OS event log for the purpose of notifying end users of predefined events, such as when support personnel connect remotely to the platform for a healing session. Intel provides documentation on how ISVs can extract these events from the event log for use in their applications.

2.5 Intel® ME WMI Provider

The Intel® ME WMI provider enables ISV and IT administrators to perform AMT discovery and configuration operations using WMI technology. The Intel ME WMI provider complements the existing WS-Management API by abstracting low-level Intel® MEI operations through WMI. In addition, the provider enables the user to subscribe to UNS events and receive them via WMI events.

Following are the main functionalities implemented in the Intel® ME WMI provider:

- Discovery of Intel® ME and Intel® AMT related attributes, such as firmware version and provisioning state.
- Local activation operation, performed as part of Remote Configuration.
- Hardware events.

The Intel® ME WMI provider is implemented as a DLL (MeProv.dll) and operates as part of Windows* WMI service. The provider is installed as part of the kit.

2.6 Intel® Management and Security Status Application

This application is a Microsoft* Windows* application that displays information about a platform's Intel® Active Management Technology (Intel® AMT), Intel® Small Business Technology (Intel® SBT), Intel® Standard Manageability, and Intel® Anti-Theft services. The Intel® Management and Security Status application indicates whether Intel® AMT, Intel® SBT, Intel® AT and Intel® Standard Manageability are running on the platform. The application is installed and executed as part of the Intel® ME SW installation program.

When Intel® Management and Security Status application is running on the platform, an icon is displayed in the notification area. Clicking the icon opens the application.

By default, the icon is loaded and displayed every time Windows* starts.

Note: If the Intel® Management and Security Status application starts automatically as a result of the user logging on to Windows, the icon will be loaded to the notification area only if Intel® AMT, Intel® SBT or Intel® Standard Manageability exists on the system. If the Intel® Management and Security Status application is started manually (via the Start menu or file manager), the icon is loaded even if none of these technologies exists.

Note: The information displayed in the Intel® Management and Security Status application is refreshed at different intervals.

2.7 Intel® AMT NAC Posture Plug-in

This is an application that allows a Cisco* Trusted agent to start its authentication process in order to retrieve a posture from the Intel® AMT firmware for the purpose of providing the Intel® AMT posture to the NAC backend.

2.8 Intel® AMT NAP Plug-in

This is an application that enables authentication from the Intel® AMT firmware to a Microsoft* Network Access Protection (NAP) backend.

2.9 Intel® Dynamic Application Loader (Intel® DAL)

This is a service which exposes the host interface to usage of the Intel® Dynamic Application Loader infrastructure abilities, for loading/unloading applications and communicating with them. It will only be installed if the platform is Intel® Dynamic Application Loader capable. It is not available over Windows* Server 2003 or Windows* Server 2008.

2.10 Intel® Identity Protection Technology (Intel® IPT)

This software contains the components and APIs required for ISV applications to utilize Intel® IPT abilities (i.e. One Time Password and True Cove). It will only be installed if the platform is Intel® Dynamic Application Loader capable. It is not available over Windows* Server 2003 or Windows* Server 2008.

2.11 Intel® Manageability Engine Firmware Recovery Agent and Intel® Manageability Engine Service

This software and service are required for Intel Independent Firmware Recovery (IFR). They will be installed only if the IFR feature is enabled on the system. The Intel® ME FW Recovery Agent will periodically check for critical update to the Intel ME Firmware and will offer the user to initiate installation of update if available. The service is required for proper operation of the Intel® ME FW Recovery Agent.

2.12 Intel® Control Center

Intel® Control Center (Intel® CC) is a Windows* application that provides a unified launching point for Intel applications. Similar to a Control Panel, it displays a list of the registered applications on the system and allows the user to launch them.

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3 Installer List

This section describes the installation packages for the Intel® ME software.

3.1 ME_SW

This installation program installs the Intel® ME software components required for the platform on which you are installing, and installs only those components that match your platform's capabilities.

Following is a complete list of the components:

- Intel® Management Engine Interface (Intel® ME Interface)
- Serial Over LAN (SOL) driver
- Local Manageability Service (LMS)
- User Notification Service (UNS)
- Intel® ME WMI provider
- Intel® Active Management Technology NAC Posture Plug-in
- Intel® Active Management Technology NAP Plug-inIntel® Management and Security Status application
- Intel® Dynamic Application Loader (Intel® DAL)
- Intel® Identity Protection Technology (Intel® IPT)
- Intel® Manageability Engine Firmware Recovery Agent
- Intel® Manageability Engine Service
- Intel® Control Center (optional)

The following table describes the components that are installed for the different platform capabilities:

If the platform includes this capability….	These software components are installed	Comments
Intel® AMT, Intel® SBT, Intel® Standard Manageability	Intel® MEI driver, SOL driver, LMS, UNS, Intel® ME WMI provider, Plug-ins, Intel® Management and Security Status application	
Intel® Dynamic Application Loader	Intel® MEI driver, Intel® DAL service, Intel® IPT Client Middleware	The Installer provides the option to install only Intel® MEI driver, Intel® DAL service and Intel® IPT Client Middleware by running the installer with the following flag: setup.exe –meidalonly
PAVP	Intel® MEI driver, LMS, UNS	Intel® ME WMI provider is not installed on 1.5 MB SKU
None of the above	Intel® MEI driver	

If the Intel Independent Firmware Recovery (IFR) feature is enabled on the system, the following components are installed as well, regardless of the platform capabilities: Intel® Manageability Engine Firmware Recovery Agent and Intel® Manageability Engine Service.

3.2 ME_SW_IS

This package installs the same components as ME_SW via InstallShield.

3.3 MEI-Only Installer

This package installs the Intel® MEI driver only. This is available on the 5 MB SKU only.

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4 System Requirements

To enable installation and use of the Intel® ME software components, the following are required on the platform:

- Windows* XP / Windows* 7 / Windows* Server 2003 / Windows* Server 2008 32/64 bit versions / Windows* Server 2008 R2 – Latest Service Packs
- Microsoft* .NET Framework: From version 2.0 through 4.0 (recommended: 3.5 or above) (Required if the Intel® Management and Security Status application is installed on the platform)

Note: If working with Windows* XP, one may consider adding the EnableSignCheck key to the Registry to avoid the possibility of UNS performance issues. See more details under UNS Registry Configuration Parameters.

5 Installing Microsoft* .NET Framework

If Intel® AMT, Intel® SBT or Intel® Standard Manageability are included on the platform, the installer installs the Intel® Management and Security Status application.

Before installing the Intel® Management and Security Status application, installation of Microsoft* .NET framework is required.

1. Download, for instance, Microsoft* .NET Framework 3.5 (**dotnetfx35.exe**) from Microsoft's* website. One link to the installer application is: http://download.microsoft.com/download/6/0/f/60fc5854-3cb8-4892-b6db-bd4f42510f28/dotnetfx35.exe.

   The downloading process may take several minutes.

   Double-click the downloaded application.

2. The installer extracts the contents and displays the **Supplemental License Terms** screen.

3. Read the license content and select the **Accept** option to proceed with the installation.

4. When the installer finishes, press the **Finish** button.

6 Installing Intel® ME Software Components

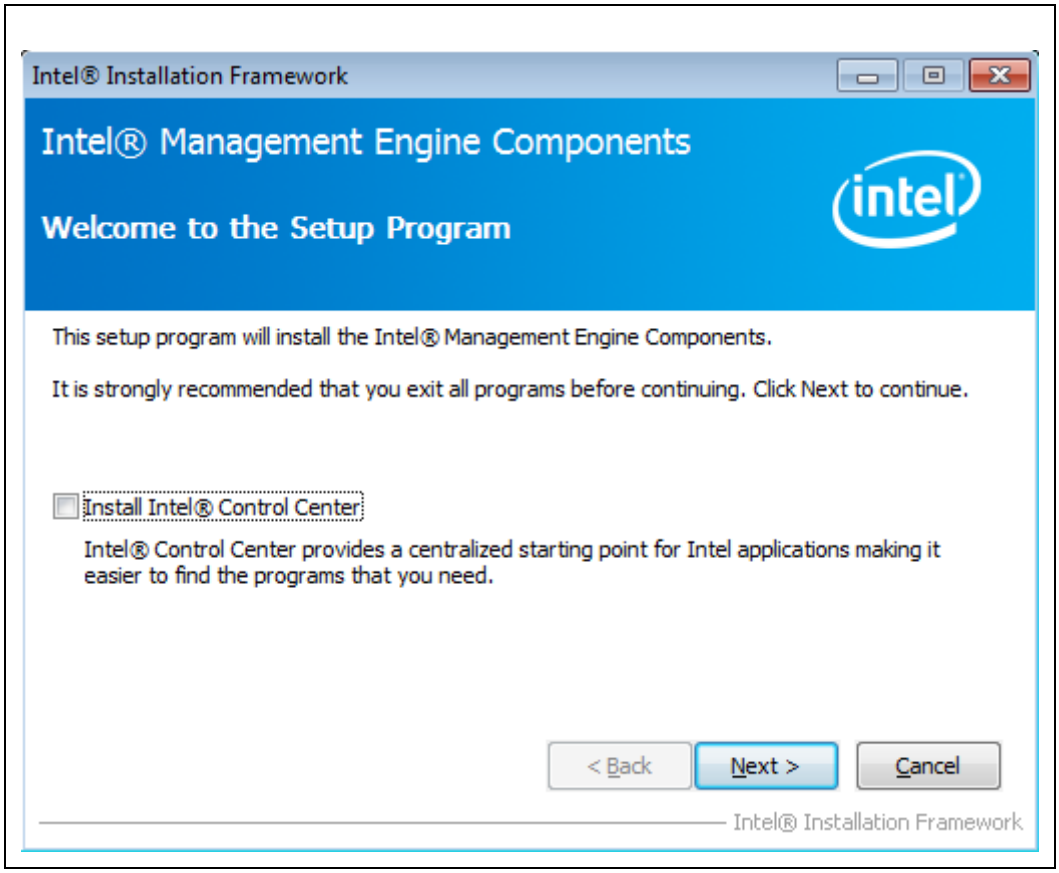
The installer (**Setup.exe**) is located in the firmware kit at **Installers\ME_SW** (and in the zip file at **Installers\ME_SW_IS** for the InstallShield version).

Note: The location and name of the installation program may be different, depending on the OEM's choice.

Note: The list of installed components is subject to the platform's capabilities.

1. Double-click the installer to install the software components.

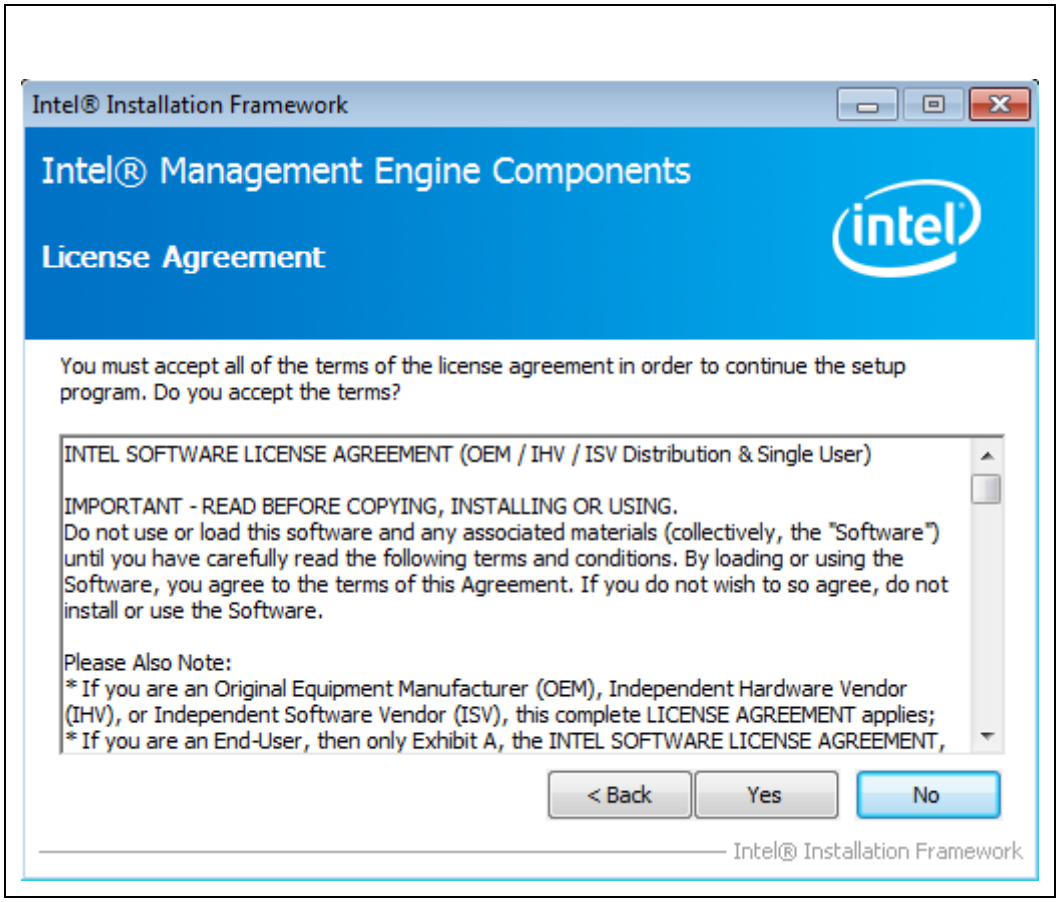
   The Welcome window opens.



Installing Intel® Control Center is optional.

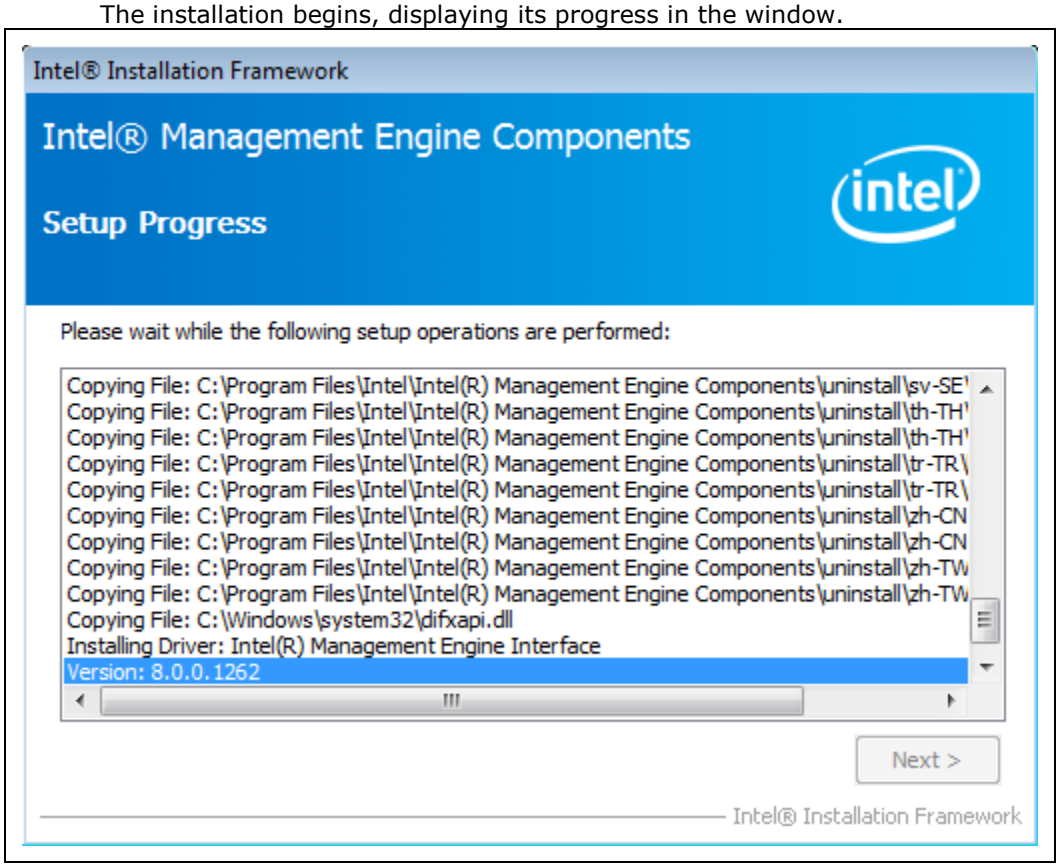
2. Click **Next**.

   The License window opens.

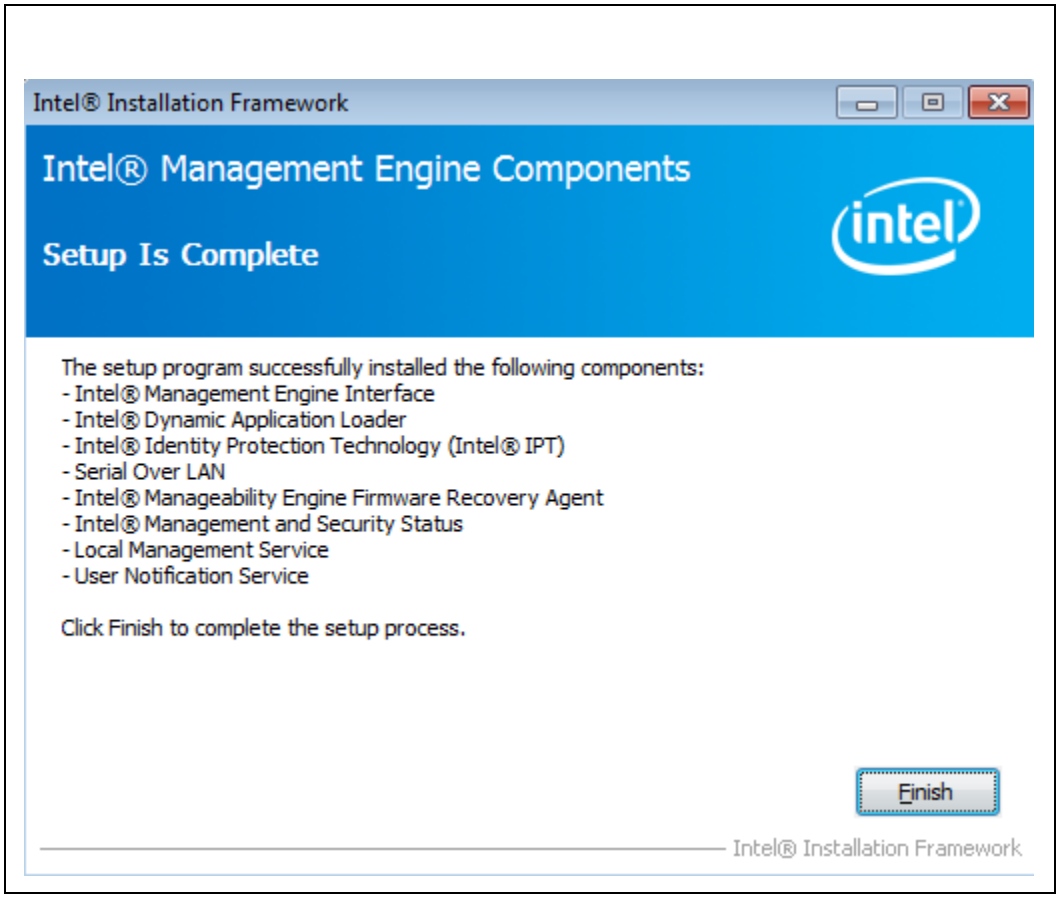


3. Read the license conditions and click **Yes** to accept them.

   The installation begins, displaying its progress in the window.



4. When the installation is complete, click **Next** in the Setup Progress window, then click **Finish** in the Setup is Complete window.



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7 Advanced Configuration of the Intel® Management and Security Status Application

7.1 General Tab Logo

The logo displayed in the general tab can be substituted in order to match the visual identity of the computer supplier. For example, a particular manufacturer may prefer to display the company's logo.

To change the logo, add a bitmap file called **oemlogo.bmp** to the Intel® Management and Security Status application folder (located at **Program Files\ Intel\ Intel ® Management Engine Components\IMSS,** or at **Program Files (x86)\ Intel\ Intel ® Management Engine Components\IMSS** for 64-bit operating systems). The default logo will appear if the bitmap file is invalid or missing.

Note: The bitmap dimensions should be 62 (width) by 48 (height) and size of file no larger than 8 KB. If the image file shall exceed 8 KB, the logo may not be well visible. If the bitmap dimensions are smaller than 62x48, the logo image will be centered into its designated area.

7.2 Load on Start-Up Options

Note: By default, Intel® Management and Security Status application loads on Windows startup. A user can uncheck the **Intel® Management and Security Status will be available next time I log on to Windows** check box to prevent it from happening.

To disable application load on startup for all users, add a value named **AppAutoStartDefaultVal** with value **0** to the following registry location **HKLM\SOFTWARE\Intel\PIcon\Setting**.

To return to the default behavior, change the data of the same value to **1**, or delete the value.

Note: The application will still be available from the Start Menu, regardless of the value in this registry key.

Note: The user selection overrides system values in the registry key.

7.3 Load in Disabled State

Note: By default, Intel® Management and Security Status application will not load in case all ME technologies are permanently disabled or not present on the platform.

To enable application load in ”disabled state” add a value named **AutoStartInDisabled** with value **1** to the following registry location **HKLM\SOFTWARE\Intel\PIcon\Setting**.

To return to the default behavior, change the data of the same value to **0**, or delete the value.

Note: The application will still be available from the Start Menu, regardless of the value in this registry key.

Note: The user selection overrides system values in the registry key. Meaning that in case the user will uncheck the Intel® Management and Security Status will be available next time I log on to Windows check box the application will not load in ”disabled state”.

7.4 Specifying the Delay before the Intel® Management and Security Status Application Loads

By default the Intel® Management and Security Status application starts loading 2 minutes after the user logs on. If you need the Intel® Management and Security Status application to load later because of other applications loading at log-on time, you can increase this period by changing the value of the **IMSS** registry key in the **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run** branch (this branch is correct for 32-bit operating systems; for 64-bit operating systems the location of the key in the registry is **HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\Windows\CurrentVersion\Run).** The timeout could be set to be shorter or longer, ranging from 1 second to a maximum of 180 seconds.

For example, to cause a delay of 90 seconds before the Intel® Management and Security Status application loads, change the **IMSS** registry key’s value to the following:

“C:\Program Files\Intel\Intel ® Management Engine Components\IMSS\PIconStartup.exe” 90

Note: The lowest value you can enter here is 1. If you enter the value 0, the Intel® Management and Security Status application will load after the default period (2 minutes). To cause the Intel® Management and Security Status application to load without any delay, change the value of the IMSS key to **“C:\Program Files\Intel\Intel ® Management Engine Components\IMSS\PrivacyIconCLient.exe” -startup**

(For 64-bit systems, **“C:\Program Files (x86)\ Intel\ Intel ® Management Engine Components\IMSS\PrivacyIconCLient.exe” –startup)**

(These are the default installation locations; you can choose a different location during installation).

7.5 Show Notification Option

By default, Enable User Notification check box in the Intel® Management and Security Status application – General tab is checked.

To change the default behavior, add a value named **ShowUserNotification** with value **0** to the following registry location **HKLM\SOFTWARE\Intel\PIcon\Setting.**

To return to the default behavior, change the data of the same value to **1**, or delete the value. The user selection overrides system values in the registry key.

7.6 Disabling the Intel® AT Tab

By default, the Intel® AT tab is displayed if the platform supports Intel® AT. To disable Intel® AT tab in Intel® Management and Security Status application, assign the value **1** to the **DisableAT** registry key in the **HKLM\SOFTWARE\Intel\PIcon\Setting** registry directory. A DWORD key should be created upon missing such key. Applying this setting will hide the Intel® AT tab starting at the next time the application starts.

7.7 "Click here for more details" Link

By default, clicking the "**Click here for more details**" inside the **Learn More** dialog will direct the user to the official Intel Corporation - Privacy website.

The link pointed *to* by the "**Click here for more details**" text inside the **Learn more** dialog can be modified to point to a page of the manufacturer's choice.

To perform this change, add a value named **HelpURL** with the URL of your choice (e.g. *http://www.intel.com/*) to the **HKLM\SOFTWARE\Intel\PIcon\Setting** key in the registry. To return to the default behavior, delete the value.

8 Configuring the UNS

UNS is able to write user notifications to the local host OS event log for the purpose of notifying end users of predefined events, such as when critical System Defense policies are applied by the Intel® ME firmware. UNS also has additional functionalities, such as synchronizing the network configuration information between the host and the firmware. Intel provides documentation on how the ISV can extract these events from the event log for use in their application.

The UNS also provides NAC (via a plug-in) and NAP functionality. To enable NAP, see the installation note below.

UNS.exe is installed along with the other software components. Note the following installation circumstances:

8.1 UNS Registry Configuration Parameters

User can add the following registry keys under **HKEY_LOCAL_MACHINE\SOFTWARE\Intel\IntelAMTUNS**:

Note: The following keys are not mandatory and UNS will function as required without their existence.

EnableSignCheck: This registry key is relevant to Windows* XP only. It enables or disables DLL signature checking by UNS. With Operating Systems other than Windows* XP, signature checking will always be enabled. With Windows* XP, adding the EnableSignCheck key as a DWORD value and setting its value to 0 will disable the signature checks. Setting its value to 1 will enable the signature checks. Default behavior (i.e. no value) is signature checking enabled even when in Windows* XP.

Starting with Intel® ME 8.0, UNS loads a series of dynamic software libraries (DLLs) per need. When loading a DLL, UNS by default will check for a valid signature, for security purposes. On Windows* XP, the DLL signature checking may impact the performance of UNS. A significant performance issue may be experienced if the machine is connected to an internal network, but not to the Internet. Disabling the signature checking, by adding the EnableSignCheck key and setting its value to 0, may improve UNS performance in Windows* XP in the stated above network situation, but is not recommended from a security standpoint.

AllowFlashUpdate: Allows UNS to invoke Partial FW Updates. This is a DWORD Value. Setting value to 0 will prohibit UNS from invoking Partial FW Update, while setting value to 1 allows Partial FW Update by UNS. Default behavior (i.e. no value) is Partial FW Update allowed.
Note: Disabling Partial FW Update will eliminate the user's ability to change the user consent language and to replace the wireless adapter type without affecting Intel® AMT functionality over wireless LAN.

PartialFWUImagePath: A custom path to the update partitions file, including the filename (using absolute or relative path), e.g. **C:\<path>\pfwupdateimg.bin**. Default is the UNS.exe path.

You can configure the following parameters in the HKEY_LOCAL_MACHINE\SOFTWARE\Intel\IntelAMTUNS\ConfigData registry key:

The following Registry keys could be added for configuring which events will be shown in Event Log. This is a DWORD Value. Setting value to 0 will prevent the event from appearing, while setting value to 1 will cause the relevant event to appear.

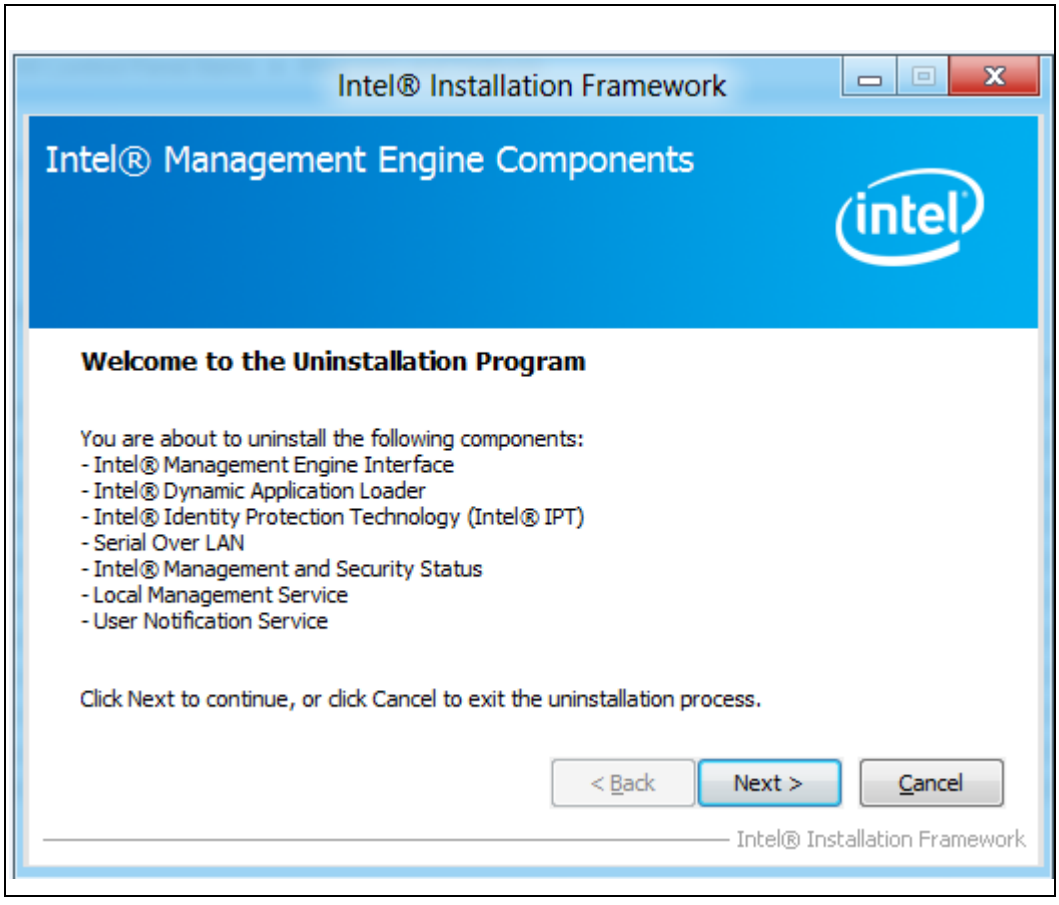
Registry Key	Event Log event
NETWORK_TRAFFIC_TX_CEASED	Security policy invoked. Some or all network traffic (TX) was stopped
NETWORK_CONNECTIVITY_TX_REDUCED	Security policy invoked. TX Network connectivity was reduced
NETWORK_TRAFFIC_RX_CEASED	Security policy invoked. Some or all network traffic (RX) was stopped
NETWORK_CONNECTIVITY_RX_REDUCED	Security policy invoked. RX Network connectivity was reduced
WLAN_WIRELESS_PROFILE_STATE_CHANGED	WLAN Wireless Profile sync enablement state changed WLAN interface
WLAN_SESSION_ESTABLISHED	Control preference for WLAN interface assigned to Intel(R) Management Engine. Intel(R) ME will take control of WLAN interface when it is able
WLAN_SESSION_ENDED	Preference for WLAN interface assigned to operating system. Operating system will take control of WLAN interface when it is able
REMOTE_SOL_STARTED	A remote Serial Over LAN session was established
REMOTE_SOL_ENDED	Remote Serial Over LAN session finished. User control was restored
REMOTE_IDER_STARTED	A remote IDE-Redirection session was established
REMOTE_IDER_ENDED	Remote IDE-Redirection session finished. User control was restored

9 Uninstalling the Intel® ME Software

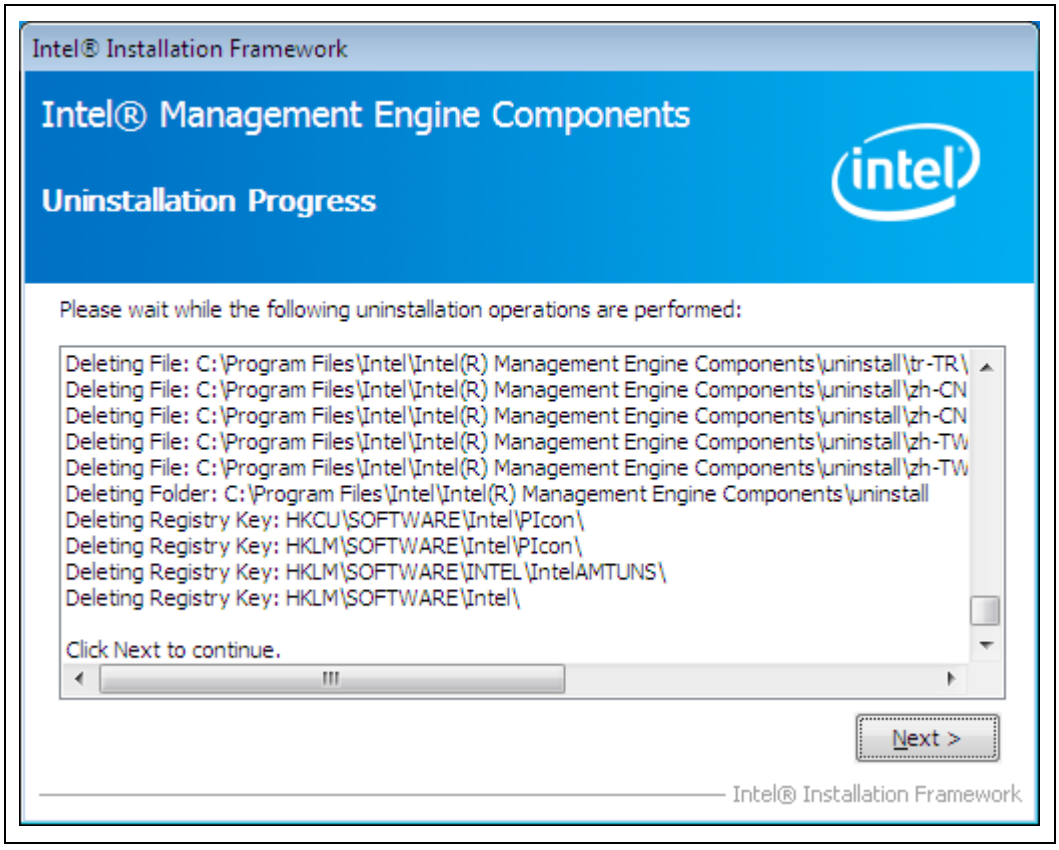
Uninstall the software via the Windows Control Panel.

1. Double-click Intel® Management Engine Components to uninstall the Intel® ME software components.

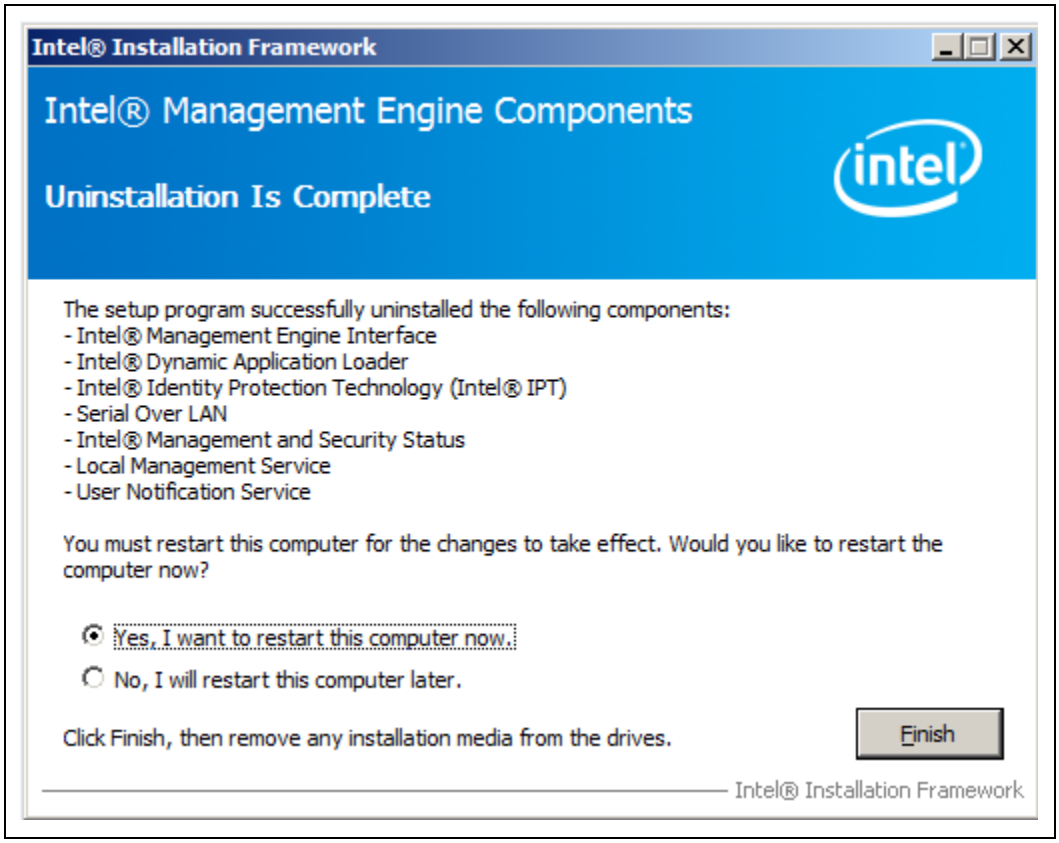
   The uninstall welcome window opens.



2. Click **Next**. Uninstall will be performed.



3. After uninstall operations are completed, click **Next** to reach the uninstall completion window.



4. Restart is required for changes to take effect. Click **Finish** to end the uninstall.

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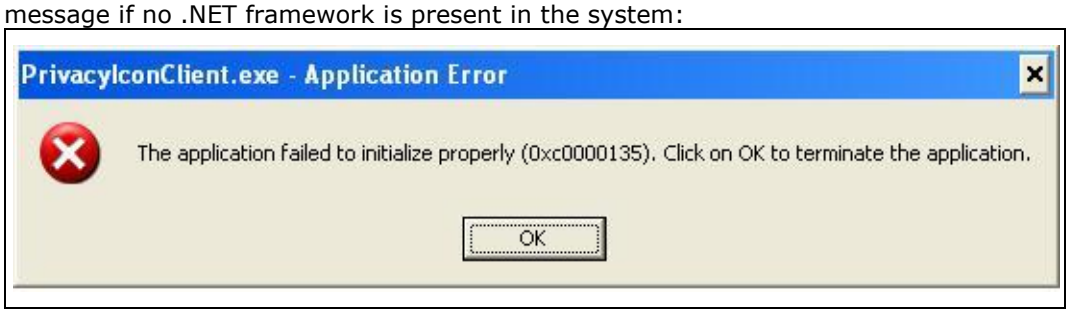
10 Troubleshooting Intel® Management and Security Status Application

10.1 Error Message when Intel® Management and Security Status Application Loads

.NET applications fail when executed in an environment that has no .NET framework installed. Microsoft does not provide a safeguard mechanism in such conditions.

The Intel® Management and Security Status application will display the following error message if no .NET framework is present in the system:



If this happens, install Microsoft* .NET Framework version 3.5 or above and then re-open the application.

10.2 "Information Unavailable" Displayed instead of Status

The **General** tab provides basic information about the Intel® AMT, Intel® SBT, Intel® Standard Manageability, and Intel® Anti-Theft status and events.

The Intel® Management and Security Status icon relies on the User Notification Service, which is installed together with the Intel® Management and Security Status application, to obtain information about the status of the resident technologies. Please make sure that:

1. The User Notification Service (UNS) is running and starts automatically on Windows* startup. If UNS is not installed, reinstall the software components.

2. The Local Manageability Service (LMS) is running and starts automatically on Windows* startup. If LMS is not installed, reinstall the software components.

3. The Intel® MEI driver is installed, enabled and functioning properly. Please review the Bring-Up Guide document for more information concerning this driver.

10.3 Client Initiated Remote Access Connection Failure

Failure to connect to the Information Technology network can be caused by the following:

1. The User Notification Service is not running. It can be started through the Services pane in the Computer Management window. If it is not installed, reinstall the software components.

2. The network cable is disconnected, or the network connection is not configured properly.

If the actions above don't resolve the problem, it is recommended to contact your Information Technology department.

10.4 Grayed-Out Notification Icon

Whenever either Intel® AMT, Intel® SBT or Intel® Standard Manageability is enabled, Intel® Management and Security Status icon is loaded into the notification area when Windows* starts. It can also be started by clicking **Start> All Programs\Intel\Intel® Management and Security Status\ Intel® Management and Security Status**.

While the Intel® Management and Security Status application is running, the Intel® Management and Security Status icon is visible in the notification area. This icon will appear blue if any one of the aforementioned technologies is enabled on the computer. In any other case, the icon will appear gray. (**Note:** The icon will also be gray if the UNS service is not running or the Intel® MEI driver is disabled or unavailable.)

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