

# **Intel® Converged Security and Management Engine Software**

**Installation and Configuration Guide**

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***March 2021***

***Revision 3.9***



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## Revision History

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| Revision Number | Description  | Revision Date |
|-----------------|--|---------------|
| 0.7             | <ul style="list-style-type: none"><li>• Initial Release</li></ul>  | December 2016 |
| 0.8             | <ul style="list-style-type: none"><li>• Updated supported FW versions</li><li>• Updated OS support</li><li>• Updated LMS Registry Configuration Parameters</li></ul>   | May 2017      |
| 0.81            | <ul style="list-style-type: none"><li>• Add note that CNL /CFL not supporting WIN7 OS</li></ul>  | June 2017     |
| 0.9             | <ul style="list-style-type: none"><li>• Add -ioc installation feature in IOC description</li><li>• revise system requirements</li><li>• add iCLS client in section 3.1</li></ul>   | August 2017   |
| 0.91            | <ul style="list-style-type: none"><li>• Added description for iCLS Client in section 2.8</li></ul>   | October 2017  |
| 0.92            | <ul style="list-style-type: none"><li>• Change the full name definition of iCLS</li></ul>  | October 2017  |
| 1.0             | <ul style="list-style-type: none"><li>• Section 8.4 : change location of ShowUserNotification</li><li>• Section 9.1 : change location of LMS registry key</li><li>• Remove the description of specifying Delay before IMSS Loads</li></ul>   | December 2017 |
| 1.1             | <ul style="list-style-type: none"><li>• Remove Intel® AMT NAC Posture Plug-in , Intel® AMT NAP Plug-in and Intel® Identity Protection Technology (Intel® IPT)</li><li>• Add section 6.6 for support of Windows* 10 RS3 and beyond</li><li>• Add description of setupME.exe command line option</li></ul> | April 2018    |
| 1.2             | <ul style="list-style-type: none"><li>• Add description about release version numbering in section 7</li></ul>   | April 2018    |
| 1.3             | <ul style="list-style-type: none"><li>• Add LMS and JHI INF in section 6.6</li></ul>   | April 2018    |
| 1.4             | <ul style="list-style-type: none"><li>• Add OemExtension INF and driver description in section 6.6</li></ul>   | April 2018    |
| 1.5             | <ul style="list-style-type: none"><li>• Add Firewall policy in section 6.7</li><li>• Add PartialFWUImagePath limitation in section 9.1</li></ul>   | May 2018      |
| 1.6             | <ul style="list-style-type: none"><li>• Add Windows 7 support in section 4</li></ul>   | May 2018      |
| 1.7             | <ul style="list-style-type: none"><li>• Add -noIMSS option of setupme.exe</li></ul>  | May 2018      |
| 1.8             | <ul style="list-style-type: none"><li>• Add installation of IMSS APPX in section 6</li><li>• Add uninstall steps for extension INF drivers in section 10</li></ul>   | July 2018     |
| 1.9             | <ul style="list-style-type: none"><li>• Section 5: .NET framework is required for Windows 7 only</li><li>• Update content in section 6.1</li></ul>   | August 2018   |
| 2.0             | <ul style="list-style-type: none"><li>• Add warning for user who chooses to use -p flag in section 6.1.1</li><li>• Add identification for LMS, JHI, iCLS in section 7</li><li>• Add more description about IMSS APPX in section 6.1.3</li></ul>  | August 2018   |



|     |  |               |
|-----|--|---------------|
| 2.1 | <ul style="list-style-type: none"> <li>• Add skipstartmenu in the options of setupme.exe in section 6.1.1</li> <li>• Add more note about UWP drivers in section 6.1.2</li> </ul>   | August 2018   |
| 2.2 | <ul style="list-style-type: none"> <li>• Update IMSS APPX in section 6.1.3</li> <li>• Add section 3.3 ME_SW_DCH</li> <li>• Update table in section 3.1 : LMS is installed for WMI provider</li> </ul>  | November 2018 |
| 2.3 | <ul style="list-style-type: none"> <li>• Add notice for section 3.3: ME_SW_DCH only for Corp sku currently</li> <li>• Add section 3.4 for WindowsDriverPackages and update section 6.1.2 accordingly</li> <li>• Add Wiman driver description in section 2.9, section 3.1 and section 3.3</li> <li>• Add –nowiman in section 6.1.1</li> </ul> | November 2018 |
| 2.4 | <ul style="list-style-type: none"> <li>• update .NET framework requirement for IMSS in section 4, 5 and 11.1</li> </ul>  | November 2018 |
| 2.5 | <ul style="list-style-type: none"> <li>• Add note for –nodrv parameter in section 6.1.1</li> </ul>   | December 2018 |
| 2.6 | <ul style="list-style-type: none"> <li>• Add information about wiman INF in section 3.4 and section 6.1.2</li> </ul>   | January 2019  |
| 2.7 | <ul style="list-style-type: none"> <li>• Update IMSS APPX requirement in section 4 and section 6.1.3</li> </ul>  | January 2019  |
| 2.8 | <ul style="list-style-type: none"> <li>• Update wiman comment in section 3.1</li> <li>• Update MSI and DCH installer for cons sku in section 3.1 and 3.3</li> <li>• Update uninstallation method in section 10</li> </ul>  | February 2019 |
| 2.9 | <ul style="list-style-type: none"> <li>• Add note for DCH installer upgrade in section 6.1.2</li> </ul>  | March 2019    |
| 3.0 | <ul style="list-style-type: none"> <li>• Change current copyright year to 2019</li> <li>• Remove Intel confidential remark</li> </ul>  | April 2019    |
| 3.1 | <ul style="list-style-type: none"> <li>• KB2533623 is required in Win7 installation. Updated in section 6.3</li> </ul>   | May 2019      |
| 3.2 | <ul style="list-style-type: none"> <li>• Update the registry path in section 7</li> <li>• Update the installation steps in section 6.1</li> <li>• Remove IPT in –meidalonly in section 6.1.1</li> </ul>  | Aug 2019      |
| 3.3 | <ul style="list-style-type: none"> <li>• Change copyright year to 2020</li> <li>• Remove Intel® Online Connect (IOC)</li> <li>• Update uninstall method for INF drivers in section 10</li> <li>• Update section 6.1.2</li> <li>• Add section 11.5 : add OEMextension INF for removing Redundant SW components in device manager.</li> </ul>  | Febuary 2020  |
| 3.4 | <ul style="list-style-type: none"> <li>• Update description of installer option in section 5.1</li> <li>• Update solution for section 11.5</li> </ul>  | March 2020    |
| 3.5 | <ul style="list-style-type: none"> <li>• Update requirement for Windows* 7 in section 6.3</li> </ul>   | March 2020    |



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|-----|---|----------------|
|     | <ul style="list-style-type: none"> <li>• Update section 5 and 6.3 : SOL installation require Microsoft* .NET framework 4.6.2</li> </ul>   |                |
| 3.6 | <ul style="list-style-type: none"> <li>• Replace Intel® iCLS with Intel® TCS</li> <li>• Add description: Intel® DAL also known as JHI</li> </ul>  | July 2020      |
| 3.7 | <ul style="list-style-type: none"> <li>• Add flag -wmionly in section 5.1</li> <li>• Remove OEM extension INF since the function has been migrated to MEI driver, update in section 3.4</li> </ul>  | September 2020 |
| 3.8 | <ul style="list-style-type: none"> <li>• Update copyright year to 2021</li> <li>• Change the display name of MEI device in section 6.1.2</li> <li>• Revise LMS, TCS and DAL description in section 3.3</li> <li>• Update the table for different platform capabilities in section 3.1 and 3.3</li> <li>• Update supporting OS in section 4</li> <li>• Add description about requirement of Intel® Wiman in section 2.8</li> </ul> | January 2021   |
| 3.9 | <ul style="list-style-type: none"> <li>• Update Intel® Wiman driver requirement in section 2.8 and 3.3</li> <li>• Remove PAVP column in table in section 3.3</li> <li>• Remove section: Installing Microsoft* .NET Framework</li> <li>• Update titles in section 3 to align with SW package layout</li> <li>• Add IMSS_HSA_EXTENSION in section 3.4 and section 5.1.3</li> </ul>  | March 2021     |



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# ***1 Introduction***

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

For a list of software components, see *Software Components Overview*.





## 2 Software Components Overview

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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 Advantage (Intel® SBA), or Intel® Standard Manageability exists on the system, the Intel® Management and Security Status application will not be installed.

To view the installer options, enter the following in a Command window:  
**SetupMe.exe -?** and the help dialog should appear.

### 2.1 Intel® Management Engine Interface (Intel® MEI)

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

### 2.2 Intel® 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 Intel® Local Manageability Service (LMS)

This service enables local applications running on Intel® AMT, Intel® SBA 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® CSME IANA (Internet Assigned Names Authority) ports and routes all traffic to the firmware through the Intel® MEI.

It also provides Intel® CSME with various host operation abilities. For instance, it enables Intel® CSME 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.



## 2.4 Intel® CSME WMI Provider

The Intel® CSME WMI provider enables ISV and IT administrators to perform Intel® AMT discovery and configuration operations using WMI technology. The Intel® CSME 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 LMS events and receive them via WMI events.

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

Discovery of Intel® CSME 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® CSME 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.

## 2.5 Intel® Management and Security Status (IMSS) Application

**Note:** This application is a Microsoft\* Windows\* application that displays information about a platform's Intel® Active Management Technology (Intel® AMT), Intel® Small Business Advantage (Intel® SBA), Intel® Standard Manageability, and Intel® Anti-Theft services. The Intel® Management and Security Status application indicates whether Intel® AMT, Intel® SBA, Intel® AT and Intel® Standard Manageability are running on the platform. The application is installed and executed as part of the Intel® CSME 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. The icon will be gray if the Intel® Management and Security Application Local Management Service is not running or the Intel® Management Engine Interface (Intel® MEI) driver is disabled or unavailable.

**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® SBA 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 pre-defined intervals. The application dynamically hides tabs that are not relevant. For example, on platforms that do not support Intel® AT, the Intel® AT tab is hidden.



## 2.6 Intel® Dynamic Application Loader (Intel® DAL)

Also known as Intel® JHI. This is a service which exposes the host interface to usage of the Intel® Dynamic Application Loader infrastructure abilities, for loading/unloading signed applications to the Trusted Execution Environment and communicating with them. It will only be installed if the platform is Intel® Dynamic Application Loader capable.

## 2.7 Intel® Trusted Connect Service (Intel® TCS)

Also known as Intel® Capability Licensing Services (Intel® iCLS). It is a set of applications, services and dynamic libraries used to establish a trusted connection between FW and Intel's backend. It is responsible for:

- EPID group certificates provisioning to the FW
- Trusted Computing Base Recovery: EPID rekey
- Platform Trust Technology (firmware TPM) recertification
- Delivering assets to the FW (i.e. DRM keying material, signed permits)

## 2.8 Intel® Wireless Manageability (Wiman)

This driver includes CSME-related flows which once were in Windows WIFI driver. This driver is placed on the WLAN device stack and will be capable of filtering OS request, especially System-state and device power state queries and transitions. In addition this driver will be capable of filtering WDI - IHV requests and notifications, filtering and diverting Tx and Rx data traffic to CSME, injecting CSME data traffic to WLAN Tx path.

Intel® Wiman driver is only present and functional on Corporate sku FW image for coffee lake platform and above.



## 3 Installer List

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

### 3.1 ME\_SW\_MSI

This installation program installs the Intel® CSME 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 in the installer:

- Intel® Management Engine Interface (Intel® ME Interface) which is DC-compliant
- Intel® Serial Over LAN (Intel® SOL) driver which is DC-compliant
- Intel® Local Manageability Service (Intel® LMS)
- Intel® CSME WMI provider
- Intel® Management and Security Status application
- Intel® Dynamic Application Loader (Intel® DAL)
- Intel® Trusted Connect Service (Intel® TCS)
- Intel® Wireless Manageability (Intel® Wiman) which is DC-compliant

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® SBA, Intel® Standard Manageability | Intel® MEI driver, Intel® SOL driver, Intel® DAL service, Intel® TCS, Intel® LMS, Intel® CSME WMI provider, Intel® Management and Security Status application, Intel® Wiman | Intel® Wiman driver is only installed and functional on Intel® Vpro system for coffee lake platform and above.   |
| Intel® Dynamic Application Loader                     | Intel® MEI driver, SOL driver, Intel® DAL service, Intel® TCS, Intel® LMS, Intel® CSME WMI provider   | The Installer provides the option to install only Intel® MEI driver and Intel® DAL service by running the installer with the following flag: setup.exe -meidalonly. Intel® LMS is installed along with WMI provider and only used by WMI provider. |
| None of the above                                     | Intel® MEI driver, Intel® TCS   |  |



## 3.2 MEI-Only Installer MSI

This package installs the Intel® MEI driver only.

## 3.3 ME\_SW\_DCH

This installation program installs the Intel® CSME 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 in the installer:

- Intel® Management Engine Interface (Intel® ME Interface) driver which is DC-compliant
- Intel® Serial Over LAN (Intel® SOL) driver which is DC-compliant
- Intel® Local Manageability Service (Intel® LMS) which is DC-compliant
- Intel® CSME WMI provider
- Intel® Dynamic Application Loader (Intel® DAL) which is DC-compliant
- Intel® Trusted Connect Service (Intel® TCS) which is DC-compliant
- Intel® Wireless Manageability (Intel® Wiman) is DC-compliant

**Note:** IMSS application is not be installed by DCH installer. For installation of IMSS please refer to section 6.1.3.

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® SBA, Intel® Standard Manageability | Intel® MEI driver, Intel® SOL driver, Intel® DAL, Intel® TCS, Intel® LMS, Intel® CSME WMI provider, Intel® Wiman | Intel® Wiman driver is only present and functional on Corporate sku FW image for coffee lake platform and above.  |
| Intel® Dynamic Application Loader                     | Intel® MEI driver, Intel® DAL  | The Installer provides the option to install only Intel® MEI driver and Intel® DAL service by running the installer with the following flag: setup.exe -meidalonly. |
| None of the above                                     | Intel® MEI driver, Intel® TCS  |   |



## 3.4 WindowsDriverPackages

This package includes the drivers as UWD INF installer and IMSS APPX package.

- MEI: heci.inf in Installers\WindowsDriverPackages\MEI\
- SOL: mesrl.inf in Installers\WindowsDriverPackages\SOL (only available in corporate sku)
- TCS: iclsClient.inf in Installers\WindowsDriverPackages\iclsClientUWD
- LMS: LMS.inf in Installers\WindowsDriverPackages\LMS (only available in corporate sku)
- DAL: DAL.inf in Installers\WindowsDriverPackages\JHI\win10
- IMSS APPX: Installers\WindowsDriverPackages\IMSS (only available in corporate sku)
- Wiman driver: Installers\WindowsDriverPackages\WiMan (only available in corporate sku)
- Wiman extension: Installers\WindowsDriverPackages\wiman\_wlan\_extension (only available in corporate sku)
- IMSS HSA extension: Installers\WindowsDriverPackages\IMSS\_HSA\_EXTENSION (only available in corporate sku)





## **4      *System Requirements***

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

- Windows\* 7 / Windows Server\* 2019.
- Microsoft\* .NET Framework: version 4.6.2 or above, required if the Intel® Management and Security Status application or SOL driver is to be installed on the platform.
- Microsoft\* Visual C++ 2015 Redistributable: version 14.0.26905.0 or above, required if the Intel® Management and Security Status application is to be installed on the platform.







## 5 Installing Intel® CSME Software Components

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### 5.1 How to Install

#### 5.1.1 Windows\* 10 RS2 and before

The software installer **SetupME.exe** is located in the firmware kit in the **Installers\ME\_SW\_MSI** folder and it is for backward compatibility only.

There is also a version of the installer that installs only the MEI driver, and not the other software components. It is called **MEISetup.exe**, and is located at **Installers\MEI-Only Installer MSI**.

**Note:** The components installed are subject to the platform's capabilities.

- 1) Double-click the installer to install the software components
- 2) Follow the steps in the installation wizard to complete the installation.
- 3) When the installation is complete, click **Next** in the *Setup Progress* window, then click **Finish** in the *Setup is Complete* window.

The software installer has command line options for specific installing configuration, under command line mode execute setupME.exe -? Will display the available options as follows:

-?

Displays this help dialog.

-b

Reboots the system without prompting after setup is complete, if reboot is required.

-l <LCID>

Specifies the language of the setup dialogs.

-nodrv

Does not install the driver.

**Note:** with this parameter, installer in ME SW for corporate sku will install IMSS anyway. If IMSS is not required , please add -noimss to skip it.

-overwrite

Ignores the overwrite warning.

-p <path>

Changes default directory location for application files.



**Warning:** User who chooses to use -p flag must make sure the destination directory is a secure folder (write access by admin). Otherwise it can lead to a security issue.

-report <path>  
Changes the default log path.

-s  
Does not display any setup dialogs (silent install).

-ver  
Displays driver versions.

-drvonly  
Installs drivers only.

-noIMSS  
Does not install Intel® IMSS.

-meidalonly  
Installs Intel® Management Engine Interface, Intel® Dynamic Application Loader only.

-preinst  
Installs all drivers even if hardware is not present.

-tcs  
Installs only Intel® TCS.

-skipstartmenu  
Does not add the Intel® IMSS shortcut to the Start menu

-nowiman  
Does not install Intel® Wireless Manageability

-wmionly  
Install and register only Intel® CSME WMI Provider.

The installation logs can be found at <user folder>\Intel\Logs.

### **5.1.2 Windows\* 10 RS3 and beyond**

The driver for MEI , SOL, LMS, DAL, TCS and Wiman are provided as UWD INF installer. The component INFs are located in the firmware kit in the **Installers\WindowsDriverPackages** folder.

To install the drivers, right click on INF file, and click on install.



System manufacturers can take advantage of the components in **Installers\WindowsDriverPackages** to do offline injection e.g. via DISM. More information about DISM can be found at:

<https://docs.microsoft.com/en-us/windows-hardware/manufacture/desktop/what-is-dism>

**Note:** MEI driver is required to be installed before other drivers.

Wiman Extension is required to be installed along with installation of wiman driver.

The following devices will be shown in the device manager if the according drivers are installed on compatible devices:

MEI: System devices \ Intel(R) Management Engine Interface or Intel(R) Management Engine Interface #1

**Note:** The MEI driver INF in \Installers\WindowsDriverPackages\MEI\win10 is signed for Win10 RS5 and later, while the MEI driver INF in \Installers\WindowsDriverPackages\MEI\win8 is signed for win8.1 and later. Refer to CCL#618680 for more detail.

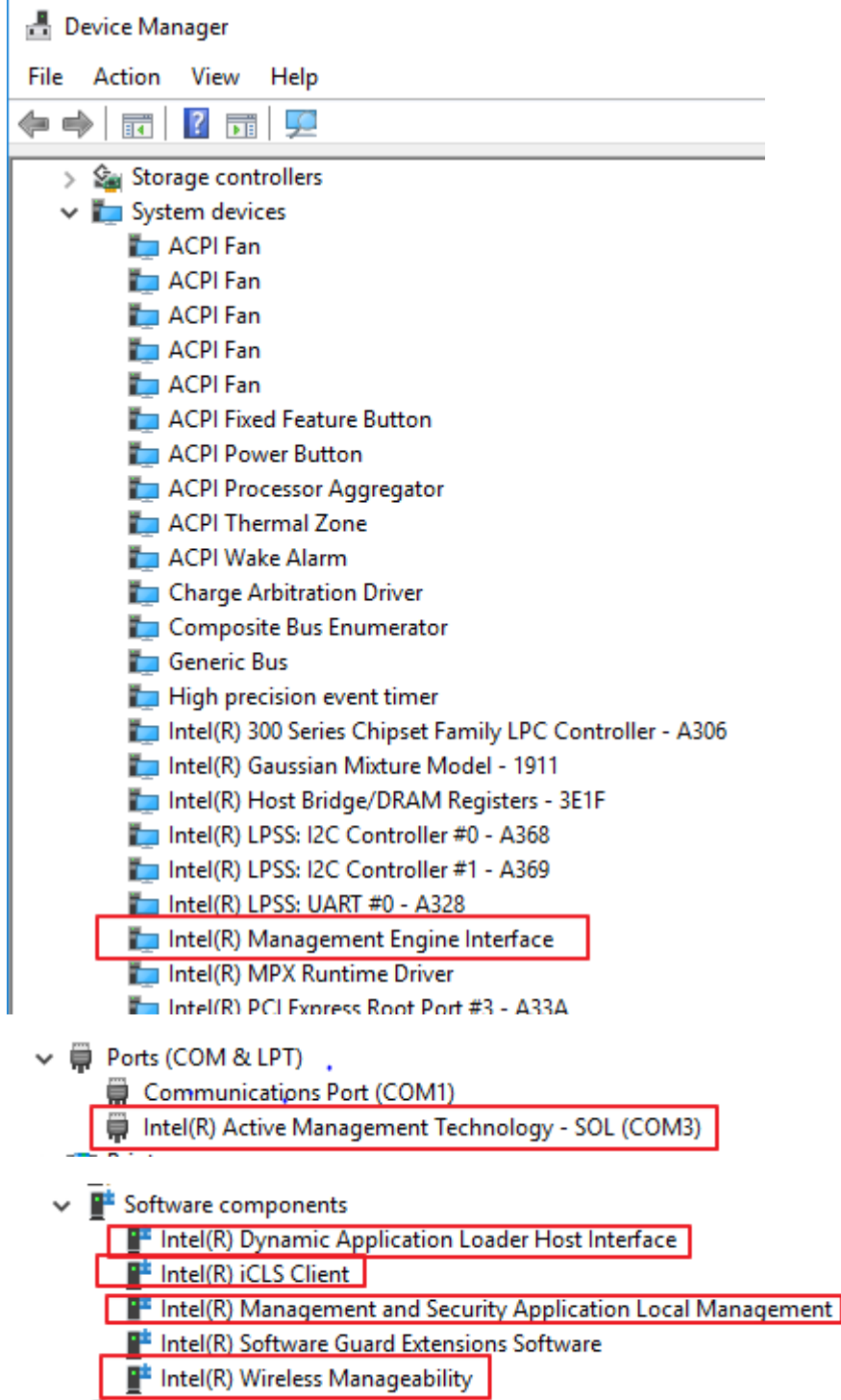
SOL: Ports(COM & LPT) \ Intel(R) Active Management Technology - SOL

DAL: Software components \ Intel(R) Dynamic Application Loader Host Interface

LMS: Software components \ Intel(R) Management and Security Application Local Management

TCS: Software components \ Intel(R) iCLS Client

Wiman : Software components \ Intel(R) Wireless Manageability





User may use installer **SetupME.exe** located in the firmware kit in the **Installers\ME\_SW\_DCH** folder to install drivers required for the platform on which you are installing, and install only those components that match your platform's capabilities.

- 1) Double-click the installer to install the software components
- 2) Follow the steps in the installation wizard to complete the installation.
- 3) When the installation is complete, click **Next** in the *Setup Progress* window, then click **Finish** in the *Setup is Complete* window.

The software installer has command line options for specific installing configuration, under command line mode execute setupME.exe -? will display the available options as follows:

-?

Displays this help dialog.

-b

Reboots the system without prompting after setup is complete, if reboot is required.

-l <LCID>

Specifies the language of the setup dialogs.

-nodrv

Does not install the driver.

-overwrite

Ignores the overwrite warning.

-p <path>

Changes default directory location for application files.

**Warning :** User who chooses to use -p flag must make sure the destination directory is a secure folder (write access by admin). Otherwise it can lead to a security issue.

-report <path>

Changes the default log path.

-s

Does not display any setup dialogs (silent install).

-ver

Displays driver versions.

-drvonly

Installs drivers only.

-meidalonly

Installs Intel® Management Engine Interface and Intel® Dynamic Application Loader only.



-preinst  
Installs all drivers even if hardware is not present.

-tcs  
Installs only Intel® TCS.

-nowiman  
Does not install Intel® Wireless Manageability

-wmionly  
Install and register only WMI Provider.

The installation logs can be found at <user folder>\Intel\Logs.

### 5.1.3 IMSS

**Note:** IMSS is for AMT system only, it is not required to be installed on NON AMT system.

User may download and install IMSS from Microsoft store, or install IMSS\_HSA\_EXTENSION INF, which will pull IMSS from the store when SOL device exists and install IMSS in the background.

IMSS APPX for pre-install is located in the firmware kit in the **Installers\WindowsDriverPackages\IMSS** folder.

DISM is required to install IMSS APPX. Refer to <https://docs.microsoft.com/en-us/windows-hardware/manufacture/desktop/preinstall-apps-using-dism> for more detail.

For the OS without Microsoft Visual C++ 2015 Redistributable 14.0.26905.0 or later (e.g. fresh OS or pre-install OS without windows update), the DependencyPackagePath is required for installing Microsoft Visual C++ 2015 Redistributable along with IMSS APPX

the example command for pre-install OS as below:

```
Dism /Image:c:\test\offline /Add-ProvisionedAppxPackage /PackagePath:<pre-install kit Folder Path>\<IMSS APPX appxbundle file> /LicensePath:<pre-install kit Folder Path>\<IMSS APPX License xml file> /DependencyPackagePath: :<pre-install kit Folder Path>\Microsoft.VCLibs_xxx_<OS sku>_xxx.appx
```

where c:\test\offline is the folder where you mounted the WIM image

<pre-install kit Folder Path> is the folder where the package is extracted to

the example DISM command for running OS as below:

```
Dism /online /Add-ProvisionedAppxPackage /PackagePath:<pre-install kit Folder Path>\<IMSS APPX appxbundle file> /LicensePath:<pre-install kit Folder
```



Path>\<IMSS APPX License xml file> /DependencyPackagePath: :<pre-install kit  
Folder Path>\Microsoft.VCLibs\_xxx\_<OS sku>\_xxx.appx /region=all

## 5.2 Error Codes during Installation

| Error code | Error String                       | Description   |
|------------|------------------------------------|---|
| 0          | ERROR_SUCCESS                      | Operation was successful and a reboot is not needed. Use of the -b switch will not cause a reboot in this case.   |
| 1602       | ERROR_INSTALL_USEREXIT             | One of: <ul style="list-style-type: none"> <li>The user canceled the operation</li> <li>Setup was run silently but a downgrade was detected and the -overwrite switch was not used.</li> </ul>  |
| 1603       | ERROR_INSTALL_FAILURE              | General failure code. The error could have been an unanticipated error or one of the expected errors such as: <ul style="list-style-type: none"> <li>Not admin</li> <li>No device matches</li> <li>OS requirement not met</li> <li>.NET requirement not met</li> </ul>  |
| 1633       | ERROR_INSTALL_PLATFORM_UNSUPPORTED | Architectures not supported   |
| 1641       | ERROR_SUCCESS_REBOOT_INITIATED     | A system reboot has been initiated either by the user choosing to "reboot now" or the -b switch was used in silent mode and setup requires a reboot.<br><br>Note that depending on the OS and platform speed, the calling process may never get this code due to it being terminated as part of the shutdown procedure. |
| 3010       | ERROR_SUCCESS_REBOOT_REQUIRED      | Successful, but a reboot is required to complete the process.   |

Note that the installer may return other error codes in cases where an application or other process called returns one. The error code returned will be passed through.

## 5.3 Windows\* 7

Note: Windows\* 7 is not supported after Cannon Lake/ Coffee Lake Platforms. It is in the Installer for backward compatibility.

To run Intel® MEI driver on Windows\*7, the following Microsoft security update must be installed:



- KB2533623
- KB2685811
- KB2921916
- KB3033929
- KB3035131
- KB3123479
- KB4474419
- KB4490628

It is recommended to update to latest OS version via windows update.

When the Intel® Management and Security Status application is installed on a Windows\* 7 operating system, it may need to install the Microsoft\* KMDF Co-installer which is not present by default on these systems. In these cases, the installation of the KMDF Co-installer will prompt the user for a restart of the system at the end of the installation process.

Note that if the KMDF Co-installer was already present on the system (due to some other installation installing it, or Microsoft\* Windows Update downloading it), no restart will be required.

Before the Intel® Management and Security Status application or SOL driver is installed on a Windows\* 7 operating system, Microsoft\* .NET framework 4.6.2 is required. Download and install Microsoft\* .NET Framework 4.6.2 from Microsoft's\* website.

When Local Manageability Service (LMS) is installed on a Windows\* 7 operating system, system need to have the updated root certificates in order to allow LMS service to start.

The required certificates are contained in:

- x86: Update for Root Certificates for Windows 7 [November 2013] (KB931125)
- x64: Update for Root Certificates for Windows 7 for x64-based Systems [November 2013] (KB931125)
- Certificates can be found in <http://catalog.update.microsoft.com/v7/site/Search.aspx?q=root%20certificate%20update>

## **5.4 Windows\* 8.x and Beyond**

When the Intel® Management and Security Status application is installed on a Windows\* 8 or 8.1 operating system, a Windows\* tile is placed on the start screen. This tile is used by the Intel® Management and Security Status application to post Toast\* notifications to the Windows\* UI.

This tile may be removed by an System manufacturers before the platform is shipped. It will be re-created by the Intel® Management and Security Status application if Intel® Active Management Technology (Intel® AMT) is provisioned on the platform.





## 5.5 Windows\* PE

The Intel® MEI driver can be installed on Windows\* PE OS, and this is primarily used during manufacturing, when attempting to run Windows\*-based manufacturing line tools.

When running the Intel® MEI driver on Windows\* PE 3 (based on Windows\* 7), it is necessary to ensure that the KMDF 1.11 coininstallers are added to the Windows\* PE image build, using the DISM command.

More information can be found at:

<http://msdn.microsoft.com/en-us/library/windows/hardware/ff544208%28v=vs.85%29.aspx>

The required coininstallers can be found at:

<http://msdn.microsoft.com/en-US/windows/hardware/br259104>

## 5.6 Firewall policy

To use DAL, applications need to be able to communicate with the DAL service over a network interface. The following traffic must not be blocked:

- Incoming traffic
  - From: Localhost
  - To process: jhi\_service.exe
  - Port: Any





## 6 Identifying Intel® CSME Software Components

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Once the Intel® CSME software stack is installed on a system, the contents that kit can be identified via a single Software Package Version (SPV) marker. The Single Package Versioning feature provides one unique version identifier for a package (i.e. anything that is updated in the package iterates the version number). This SPV is useful for systems which need to identify and manage installations such as Software Inventory Control applications used in large IT organizations.

Each Intel® CSME Software Installer package contains a file called the 'mup.xml' which can be used to identify the SPV. The mup.xml describes the following information: Example:

```
<fullpackageidentifier>
  <msis>
    <msi componentID="100950">
      <identifyingnumber>{1CEAC85D-2590-4760-800F-
8DE5E91F3700}</identifyingnumber>
      <upgradecode>{1CEAC85D-2590-4760-800F-8DE5E91F3700}</upgradecode>

      <version>yyww.mm.nn.bbbb</version>
    </msi>
  </msis>
</fullpackageidentifier>
```

The 'fullpackageidentifier' section points out where to look for the package version and what it should be in order to be the latest. The 'DisplayVersion' and {GUID} above are found Microsoft\* Windows\* registry in the locations below:

HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{GUID}\DisplayVersion

Typical release version numbering is as follows, yyww.mm.nn.bbbb where:

- yy – Build year
- ww – Build WorkWeek
- mm – Major version
- nn – Minor version
- bbbb – Build number

Service name for LMS, DAL or TCS can be found in Services tab in task manager or services in Microsoft Management Console:

LMS: LMS / Intel(R) Management and Security Application Local Management Service

DAL: jhi\_service / Intel(R) Dynamic Application Loader Host Interface Service

TCS: SocketHeciServer.exe / Intel(R) Capability Licensing Service TCP IP Interface

TPMProvisioningService.exe / Intel(R) TPM Provisioning Service



If LMS, DAL or TCS are installed via installer SetupME.exe in ME\_SW\_MSI, the components file location is C:\Program Files (x86)\Intel\Intel(R) Management Engine Components

If LMS, DAL or TCS is installed via INF or via installer SetupME.exe in ME\_SW\_DCH, the components file locations are in C:\Windows\System32\DriverStore\FileRepository.





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

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**Note:** This section is not applicable for IMSS APPX, please refer to MSS user guide for more detail.

### 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

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

By default, Intel® Management and Security Status application will not load in case all Intel CSME 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 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 **HKEY\_CURRENT\_USER\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.

## 7.5 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.

## 7.6 “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 link to a page of the manufacturer's choice.



## ***Advanced Configuration of Intel® Management and Security Status Application***

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 LMS

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LMS 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® CSME firmware. LMS 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.

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

### 8.1 LMS Registry Configuration Parameters

User can add the following registry keys under **HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\LMS\IntelAMTUNS**:

**Note:** The following keys are not mandatory and LMS will function as required without their existence. All changes to registry keys are noted at LMS startup only. To force the changes to be noted, restart LMS.

**AllowFlashUpdate:** Allows LMS to invoke Partial FW Updates. This is a DWORD Value. Setting value to 0 will prohibit LMS from invoking Partial FW Update, while setting value to 1 allows Partial FW Update by LMS. Default behavior (i.e. no value) is Partial FW Update allowed.

**Note:** Partial Firmware Update is a feature new from Intel® ME 8 that allows update of specific sections of Intel ME, without requiring a system reset.

**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.

**PartialFWUIImagePath:** 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 LMS.exe path.

**Note:** The path can't point to a network shared folder. It must point to a local folder.

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. Note that the settings only take effect when LMS is (re)started.



| 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) Converged Security and Management Engine. Intel(R) CSME 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. For platforms supporting USB-Redirection instead of IDE-Redirection, remote USB-Redirection session was established.                                      |
| REMOTE_IDER_ENDED                   | Remote IDE-Redirection session finished. User control was restored. For platforms supporting USB-Redirection instead of IDE-Redirection, Remote USB-Redirection session finished. User control was restored |

## 8.2 Intel® PROSet/Wireless Software Adapter Switching Override

The Intel® CSME firmware configuration of the Intel® PROSet/Wireless Software Adapter Switching override is disabled by default. However, on systems without Intel® LAN support (as defined by hardware configuration settings), it is enabled by default. When enabled, and when Adapter Switching is active (as notified by Intel® PROSet/Wireless Software to Intel® CSME firmware), the Intel® CSME firmware will configure the WLAN to override the Host software RF-Kill and establish its own wireless connection when wireless Intel® AMT is configured. When Adapter Switching





is inactive or if the Host WLAN driver is healthy, the Intel® CSME firmware will not configure the WLAN to override the Host software RF-Kill, nor establish its own wireless connection.

Users wishing to override the default setting in Intel® CSME firmware may add the following registry key under:

**HKEY\_LOCAL\_MACHINE\SOFTWARE\Intel\IntelAMTUNS**

**OverrideProsetAdapterSwitching:** This registry key is relevant for Windows\* 7 only. Adding OverrideProsetAdapterSwitching key as a DWORD and setting the value to 0 will disable the Intel® PROSet/Wireless Software Adapter Switching override feature in the Intel® CSME firmware. Setting the value to 1 will enable the Intel® PROSet/Wireless Software Adapter Switching override feature in the Intel® CSME firmware.

Adapter Switching notifications to Intel® CSME firmware from Intel® PROSet/Wireless Software are only available systems running Windows\* 7. For more information about the Adapter Switching feature, consult the Intel® PROSet/Wireless Software user guide.

The Intel® PROSet/Wireless Software Adapter Switching override feature in Intel® CSME firmware is available only on systems with Intel® AMT 11.6 or later.





## 9 Uninstalling Intel® CSME Software and Drivers

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If you are installing CSME SW using any installer – ME\_SW\_MSI or ME\_SW\_DCH, uninstall the software via the Windows Control Panel:

- Double-click Intel® Management Engine Components to uninstall the Intel® CSME software components.
- The uninstall welcome window opens.
- Click **Next**. Uninstall will be performed.
- After uninstall operations are completed, click **Next** to reach the uninstall completion window.
- Restart is required for changes to take effect. Click **Finish** to end the uninstall.

If you are installing the inf drivers manually – from the WindowsDriverPackages folder, you should uninstall them manually from device manager

- Right click the device name in device manger and choose **uninstall**

**Note:** If some system dlls have been removed between the installation and uninstallation of the Intel® CSME software, the uninstallation may fail. This has been noted, for example, when uninstalling Microsoft\* Visual C.

**Note:** Don't manually uninstall ME SW components via device manager if you are installing CSME SW using installer





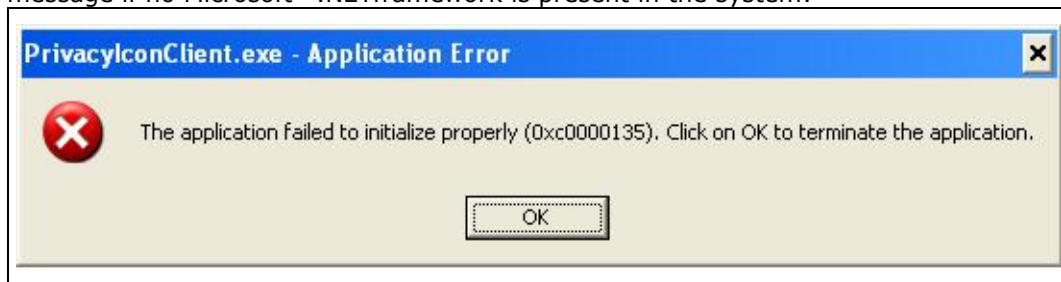
## 10 Troubleshooting Intel® Management and Security Status Application

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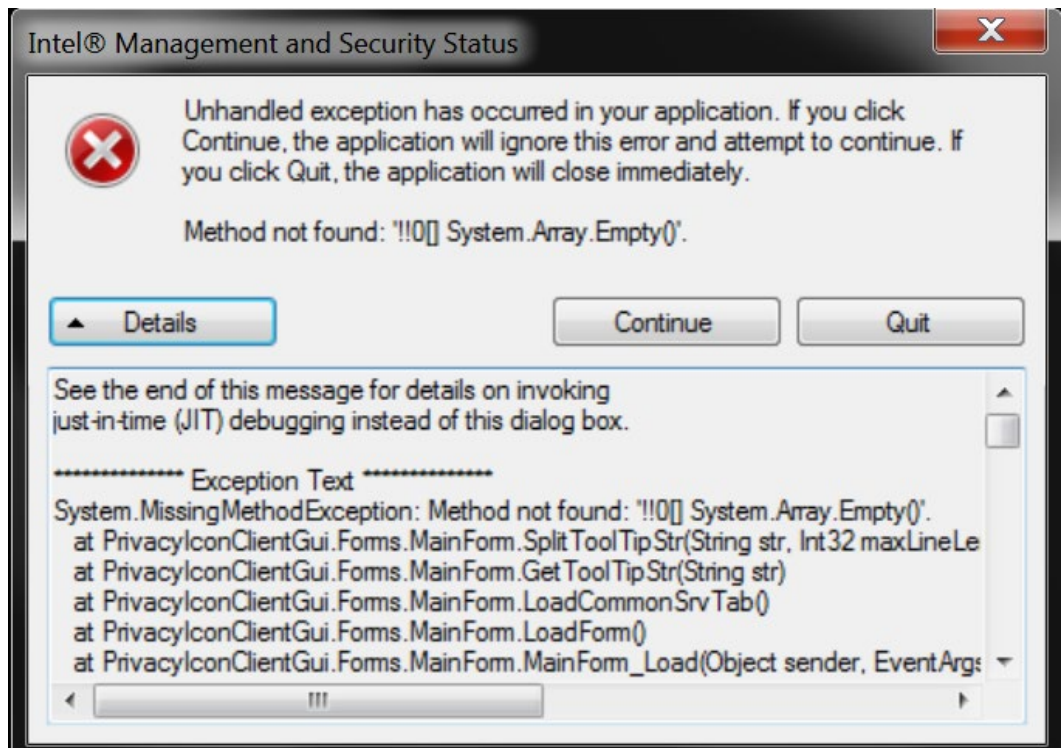
### 10.1 Error Message when Intel® Management and Security Status Application Loads

Microsoft\* .NETapplications fail when executed in an environment that has no Microsoft\* .NETframework 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 Microsoft\* .NETframework is present in the system:



The Intel® Management and Security Status application will display the following error message if no Microsoft\* .NETframework version is not 4.6.2 or above:



If these happen, install Microsoft\* .NET Framework version 4.6.2 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® SBA, Intel® Standard Manageability, and Intel® Anti-Theft Technology status and events.

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

1. The Local Manageability Service (LMS) is running and starts automatically on Windows\* startup. If LMS is not installed, reinstall the software components.
2. The Intel® MEI driver is installed, enabled and functioning properly. 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 Local Management 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 do not resolve the problem, it is recommended to contact your Information Technology department.

## **10.4 Grayed-Out Notification Icon**

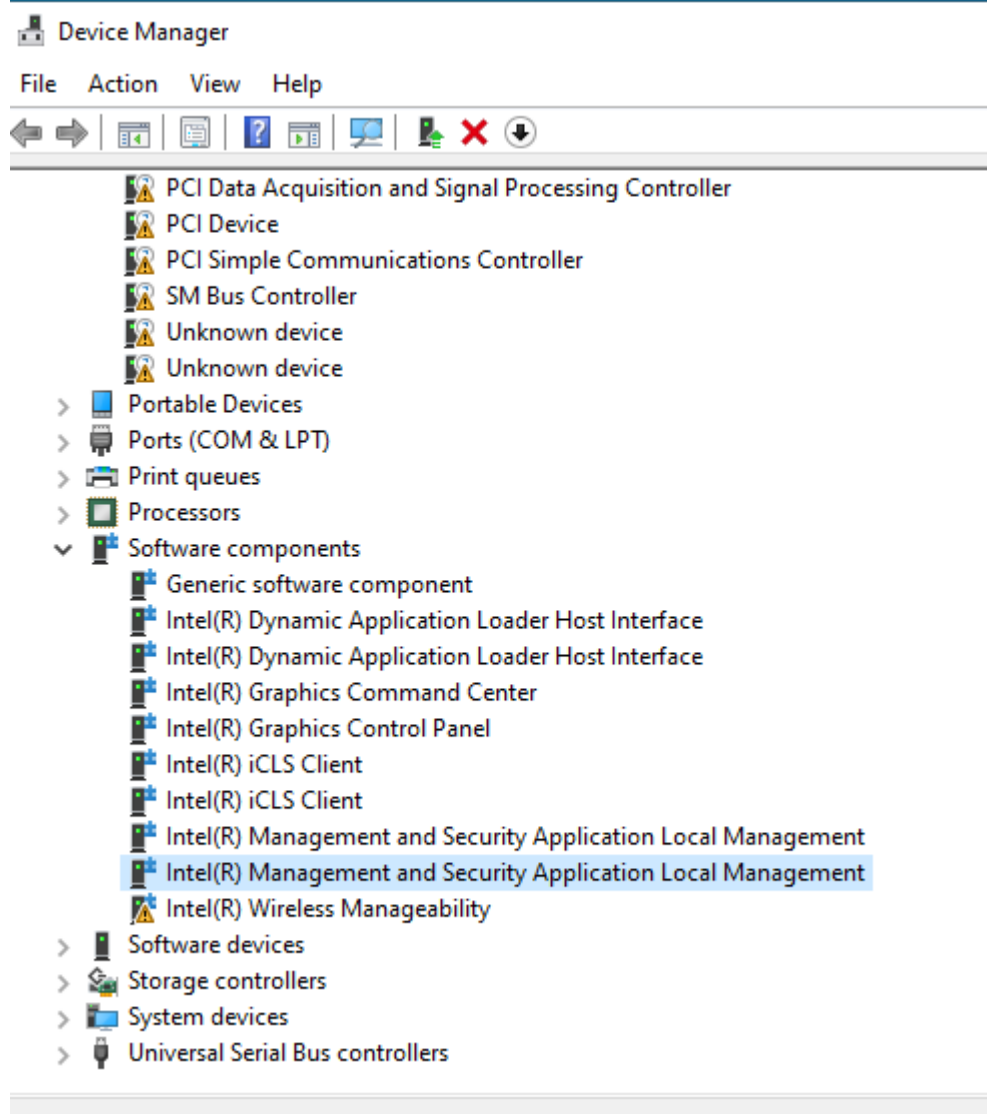
Whenever either Intel® AMT, Intel® SBA or Intel® Standard Manageability is enabled, Intel® Management and Security Status icon is loaded into the notification area when Windows\* starts. It can also be started by clicking **Start> All Programs\Intel\Intel® Management and Security Status\ Intel® Management 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 LMS service is not running or the Intel® MEI driver is disabled or unavailable.

## **10.5 Redundant SW components in device manager**

After MEI driver 1931.14.0.1323, the functionality of add components (for DC-compliant driver LMS, DAL, TCS) is migrated from oemextension INF to MEI driver. For the system on which the legacy OEM extension INF has been installed (and not removed) with INF file in **Installers\WindowsDriverPackages**, user will see redundant SW components in device manager after MEI driver is installed/updated with version 1931.14.0.1323 or later.



This symptom doesn't impact the functionality of TCS, DAL and LMS. If user still wants to remove these duplicate components from device manager, user may remove oemextension INF via pnputil, or update with new oemextension INF in VIP#135036.

## §