

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

**Installation and Configuration Guide**

***Supporting Intel® CSME firmware version: 11.8 , 12, 14 and 15***

***October 2021***

***Revision 1.1***



INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

A "Mission Critical Application" is any application in which failure of the Intel Product could result, directly or indirectly, in personal injury or death. SHOULD YOU PURCHASE OR USE INTEL'S PRODUCTS FOR ANY SUCH MISSION CRITICAL APPLICATION, YOU SHALL INDEMNIFY AND HOLD INTEL AND ITS SUBSIDIARIES, SUBCONTRACTORS AND AFFILIATES, AND THE DIRECTORS, OFFICERS, AND EMPLOYEES OF EACH, HARMLESS AGAINST ALL CLAIMS COSTS, DAMAGES, AND EXPENSES AND REASONABLE ATTORNEYS' FEES ARISING OUT OF, DIRECTLY OR INDIRECTLY, ANY CLAIM OF PRODUCT LIABILITY, PERSONAL INJURY, OR DEATH ARISING IN ANY WAY OUT OF SUCH MISSION CRITICAL APPLICATION, WHETHER OR NOT INTEL OR ITS SUBCONTRACTOR WAS NEGLIGENT IN THE DESIGN, MANUFACTURE, OR WARNING OF THE INTEL PRODUCT OR ANY OF ITS PARTS.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or go to: <http://www.intel.com/design/literature.htm%20>

All products, platforms, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice. All dates specified are target dates, are provided for planning purposes only and are subject to change.

This document contains information on products in the design phase of development. Do not finalize a design with this information. Revised information will be published when the product is available. Verify with your local sales office that you have the latest datasheet before finalizing a design.

Intel® Active Management Technology requires activation and a system with a corporate network connection, an Intel® AMT-enabled chipset, network hardware and software. For notebooks, Intel AMT may be unavailable or limited over a host OS-based VPN, when connecting wirelessly, on battery power, sleeping, hibernating or powered off. Results dependent upon hardware, setup and configuration. For more information, visit Intel® Active Management Technology.

No system can provide absolute security under all conditions. Intel® Anti-Theft Technology (Intel® AT) requires an enabled chipset, BIOS, firmware and software, and a subscription with a capable Service Provider. Consult your system manufacturer and Service Provider for availability and functionality. Service may not be available in all countries. Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof. For more information, visit <http://www.intel.com/go/anti-theft>.

No system can provide absolute security under all conditions. Requires an Intel® Identity Protection Technology-enabled system, including a 2<sup>nd</sup> gen Intel® Core™ processor enabled chipset, firmware and software, and participating website. Consult your system manufacturer. Intel assumes no liability for lost or stolen data and/or systems or any resulting damages. For more information, visit <http://ipt.intel.com>.

Code names featured are used internally within Intel to identify products that are in development and not yet publicly announced for release. Customers, licensees and other third parties are not authorized by Intel to use code names in advertising, promotion or marketing of any product or services and any such use of Intel's internal code names is at the sole risk of the user.

Intel, Core, and the Intel logo are trademarks of Intel Corporation in the U.S. and other countries.

\*Other names and brands may be claimed as the property of others.

Copyright © 2017-2021 Intel Corporation. All rights reserved



**IMPORTANT—READ BEFORE COPYING, INSTALLING OR USING.**

Do not use or load this software or any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.

**LICENSE**—Subject to the restrictions below, Intel Corporation ("Intel") grants you the following limited, revocable, non-exclusive, non-assignable, royalty-free copyright licenses in the Software.

The Software may contain the software and other property of third party suppliers, some of which may be identified in, and licensed in accordance with, the "license.txt" file or other text or file in the Software:

**DEVELOPER TOOLS**—including developer documentation, installation or development utilities, and other materials, including documentation. You may use, modify and copy them internally for the purposes of using the Software as herein licensed, but you may not distribute all or any portion of them.

**RESTRICTIONS**—You will make reasonable efforts to discontinue use of the Software licensed hereunder upon Intel's release of an update, upgrade or new version of the Software.

You shall not reverse-assemble, reverse-compile, or otherwise reverse-engineer all or any portion of the Software.

Use of the Software is also subject to the following limitations:

You,

- (1) are solely responsible to your customers for any update or support obligation or other liability which may arise from the distribution of your product(s)
- (ii) shall not make any statement that your product is "certified," or that its performance is guaranteed in any way by Intel
- (iii) shall not use Intel's name or trademarks to market your product without written permission
- (iv) shall prohibit disassembly and reverse engineering, and
- (v) shall indemnify, hold harmless, and defend Intel and its suppliers from and against any claims or lawsuits, including attorney's fees, that arise or result from your distribution of any product.

**OWNERSHIP OF SOFTWARE AND COPYRIGHTS**—Title to all copies of the Software remains with Intel or its suppliers. The Software is copyrighted and protected by the laws of the United States and other countries, and international treaty provisions. You will not remove, alter, deface or obscure any copyright notices in the Software. Intel may make changes to the Software or to items referenced therein at any time without notice, but is not obligated to support or update the Software. Except as otherwise expressly provided, Intel grants no express or implied right under Intel patents, copyrights, trademarks, or other intellectual property rights. You may transfer the Software only if the recipient agrees to be fully bound by these terms and if you retain no copies of the Software.

**LIMITED MEDIA WARRANTY**—If the Software has been delivered by Intel on physical media, Intel warrants the media to be free from material physical defects for a period of ninety (90) days after delivery by Intel. If such a defect is found, return the media to Intel for replacement or alternate delivery of the Software as Intel may select.

**EXCLUSION OF OTHER WARRANTIES**—EXCEPT AS PROVIDED ABOVE, THE SOFTWARE IS PROVIDED "AS IS" WITHOUT ANY EXPRESS OR IMPLIED WARRANTY OF ANY KIND INCLUDING WARRANTIES OF MERCHANTABILITY, NONINFRINGEMENT, OR FITNESS FOR A PARTICULAR PURPOSE. Intel or its suppliers do not warrant or assume responsibility for the accuracy or completeness of any information, text, graphics, links or other items contained in the Software.

**LIMITATION OF LIABILITY**—IN NO EVENT SHALL INTEL OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, LOST PROFITS, BUSINESS INTERRUPTION, OR LOST INFORMATION) ARISING OUT OF THE USE OF OR INABILITY TO USE THE SOFTWARE, EVEN IF INTEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME JURISDICTIONS PROHIBIT EXCLUSION OR LIMITATION OF LIABILITY FOR IMPLIED WARRANTIES OR CONSEQUENTIAL OR INCIDENTAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. YOU MAY ALSO HAVE OTHER LEGAL RIGHTS THAT VARY FROM JURISDICTION TO JURISDICTION.



## ***Revision History***

---

<b>Revision Number</b>	<b>Description</b>	<b>Revision Date</b>
1.0	•initial release	November 2019



1.1	<ul style="list-style-type: none"><li>• Change copyright year to 2021</li><li>• Remove Intel® Online Connect (IOC)</li><li>• Remove MEI-only installer</li><li>• Update uninstall method for INF drivers</li><li>• update OEMextension INF for removing Redundant software components in device manager.</li><li>• Update requirement for Windows* 7</li><li>• Update SOL installation require Microsoft* .NET framework 4.6.2</li><li>• Replace Intel® iCLS with Intel® TCS</li><li>• Add description: Intel® DAL also known as JHI</li><li>• Add flag -wmionly in installer options</li><li>• Change the display name of MEI device</li><li>• Update the table for different platform capabilities</li><li>• Update supporting OS</li><li>• Add requirement of Intel® Wiman</li><li>• Add note for Wiman uninstallation</li><li>• Add extension INF description: IMSS_HSA_EXTENSION and WMIProvider</li><li>• Update description for "Information Unavailable" Displayed instead of Status</li></ul>	October 2021
-----	--	--------------



# Contents

---

1	Introduction .....	8
2	Software Components Overview .....	9
2.1	Intel® Management Engine Interface (Intel® MEI) .....	9
2.2	Intel® Serial Over LAN (SOL) Driver .....	9
2.3	Intel® Local Manageability Service (Intel® LMS) .....	9
2.4	Intel® CSME WMI Provider .....	10
2.5	Intel® Management and Security Status (Intel® MSS) Application .....	10
2.6	Intel® Dynamic Application Loader (Intel® DAL) .....	11
2.7	Intel® Trusted Connect Service (Intel® TCS) .....	11
2.8	Intel® Wireless Manageability (Wiman) Driver .....	11
3	Installer List .....	12
3.1	ME_SW_MSI .....	12
3.2	ME_SW_DCH .....	13
3.3	Drivers .....	14
4	System Requirements .....	15
5	Installing Intel® CSME Software Components .....	16
5.1	How to Install .....	16
5.1.1	Windows* 10 RS2 and before .....	16
5.1.2	Windows* 10 RS3 and beyond .....	17
5.1.3	Intel® MSS .....	21
5.2	Error Codes during Installation .....	22
5.3	Windows* 7 .....	22
5.4	Windows* 8.x and Beyond .....	23
5.5	Windows* PE .....	23
5.6	Firewall policy .....	24
6	Identifying Intel® CSME Software Components .....	25
7	Advanced Configuration of Intel® Management and Security Status Application .....	27
7.1	General Tab Logo .....	27
7.2	Load on Start-Up Options .....	27
7.3	Load in Disabled State .....	28
7.4	Show Notification Option .....	28
7.5	Disabling the Intel® AT Tab .....	28
7.6	“Click Here for More Details” Link .....	28
8	Configuring Intel® LMS .....	30
8.1	LMS Registry Configuration Parameters .....	30
8.2	Intel® PROSet/Wireless Software Adapter Switching Override .....	31
9	Uninstalling Intel® CSME Software and Drivers .....	33
10	Troubleshooting Intel® Management and Security Status Application .....	34
10.1	Error Message when Intel® Management and Security Status Application Loads .....	34



10.2	"Information Unavailable" Displayed instead of Status .....	35
10.3	Client Initiated Remote Access Connection Failure .....	35
10.4	Grayed-Out Notification Icon .....	36
10.5	Redundant software components in device manager .....	36



# **1 Introduction**

---

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

---

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 (Intel® 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 Intel® 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.

Intel® CSME WMI Provider has switched to INF installation support. Refer to section 5.1 for more detail of installing method.

## 2.5 Intel® Management and Security Status (Intel® MSS) 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.

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) Driver

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

To comply with Microsoft DC requirement, Intel® Wiman extension INF is required to be installed along with installation of Intel® Wireless Manageability driver. Intel® Wireless Manageability driver will be functional only if Intel® Wiman extension INF is installed.



## 3 Installer List

---

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

### 3.1 ME\_SW\_MSI

The installation program in this folder 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® MEI)
- Intel® Serial Over LAN (SOL) driver
- Intel® Local Manageability Service (Intel® LMS)
- Intel® CSME WMI provider
- Intel® Management and Security Status application (Intel® MSS)
- Intel® Dynamic Application Loader (Intel® DAL)
- Intel® Trusted Connect Service (Intel® TCS)
- Intel® Wireless Manageability (Wiman) driver

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

<b>If the platform includes this capability....</b>	<b>These software components are installed</b>	<b>Comments</b>
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 driver, Intel® MSS	Intel® Wiman driver is only present and functional on Corporate sku FW image for coffee lake platform and above.  Intel® Wiman Extension is installed along with Intel® Wiman driver.



If the platform includes this capability....	These software components are installed	Comments
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	

### 3.2 ME\_SW\_DCH

The installation program in this folder 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® MEI) driver
- Intel® Serial Over LAN (Intel® SOL) driver
- Intel® Local Manageability Service (Intel® LMS)
- Intel® CSME WMI provider
- Intel® Dynamic Application Loader (Intel® DAL)
- Intel® Trusted Connect Service (Intel® TCS)
- Intel® Wireless Manageability (Wiman) driver

**Note:** Intel® MSS application is not be installed by DCH installer. For installation of Intel® MSS please refer to section 5.1.3.

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



If the platform includes this capability....	These software components are installed	Comments
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	

### 3.3 Drivers

This package includes the INF installers for Intel® CSME software components and Intel® MSS APPX package.

- Intel® MEI: heci.inf in Drivers\MEI\
- Intel® SOL: mesrl.inf in Drivers\SOL (only available in corporate sku)
- Intel® TCS: iclsClient.inf in Drivers\ICLS
- Intel® LMS: LMS.inf in Drivers\LMS (only available in corporate sku)
- Intel® DAL: DAL.inf in Drivers\JHI\win10
- Intel® MSS APPX: Drivers\IMSS (only available in corporate sku)
- Intel® Wiman driver: Drivers\WiMan (only available in corporate sku)
- Intel® Wiman extension: Drivers\wiman\_wlan\_extension (only available in corporate sku)
- Intel® CSME WMI Provider: MEWMIProv.inf in Drivers\WMIProvider
- Intel® MSS HSA extension: ImssHsaExtension.inf in Drivers\IMSS\_HSA\_EXTENSION (only available in corporate sku)
- OemExtension: OemExtension.inf in Drivers\OemExtension





## 4 System Requirements

---

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

- Windows\* 7 / Windows\* 8 / Windows\* 8.1 / Windows\* 10 / Windows Server\* 2008 R2 64 bit versions / Windows Server\* 2012 64 bit versions / Windows Server\* 2012 R2 64 bit versions / Windows Server\* 2016 64 bit versions / 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

---

## 5.1 How to Install

### 5.1.1 Windows\* 10 RS2 and before

For the systems running Windows\* 10 RS2 or older, use the installer **SetupME.exe** in **ME\_SW\_MSI** folder.

**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 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, the installer will install Intel® MSS anyway. If Intel® MSS 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® MSS.
- 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® MSS 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\Log.

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

To comply with Microsoft DC requirement, it is recommended to use the INF installers for Intel® CSME Software components in **Drivers** folder.

Users or system manufacturers should follow the table in section 3.3 to install required software components.

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

System manufacturers can take advantage of the INF installer of components 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:** Intel® MEI driver is required to be installed before other drivers/components.

Intel® Wiman Extension is required to be installed along with installation of Intel® Wiman driver. Intel® Wiman will be functional only if Intel® Wiman extension INF is installed.

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

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

**Note:** The MEI driver INF in Drivers\MEI\win10 is signed for Windows\* 10 RS5 and later, while the MEI driver INF in Drivers\MEI\win8 is signed for windows\* 8.1 and later. Refer to DOC#618680 in RDC for more detail.

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

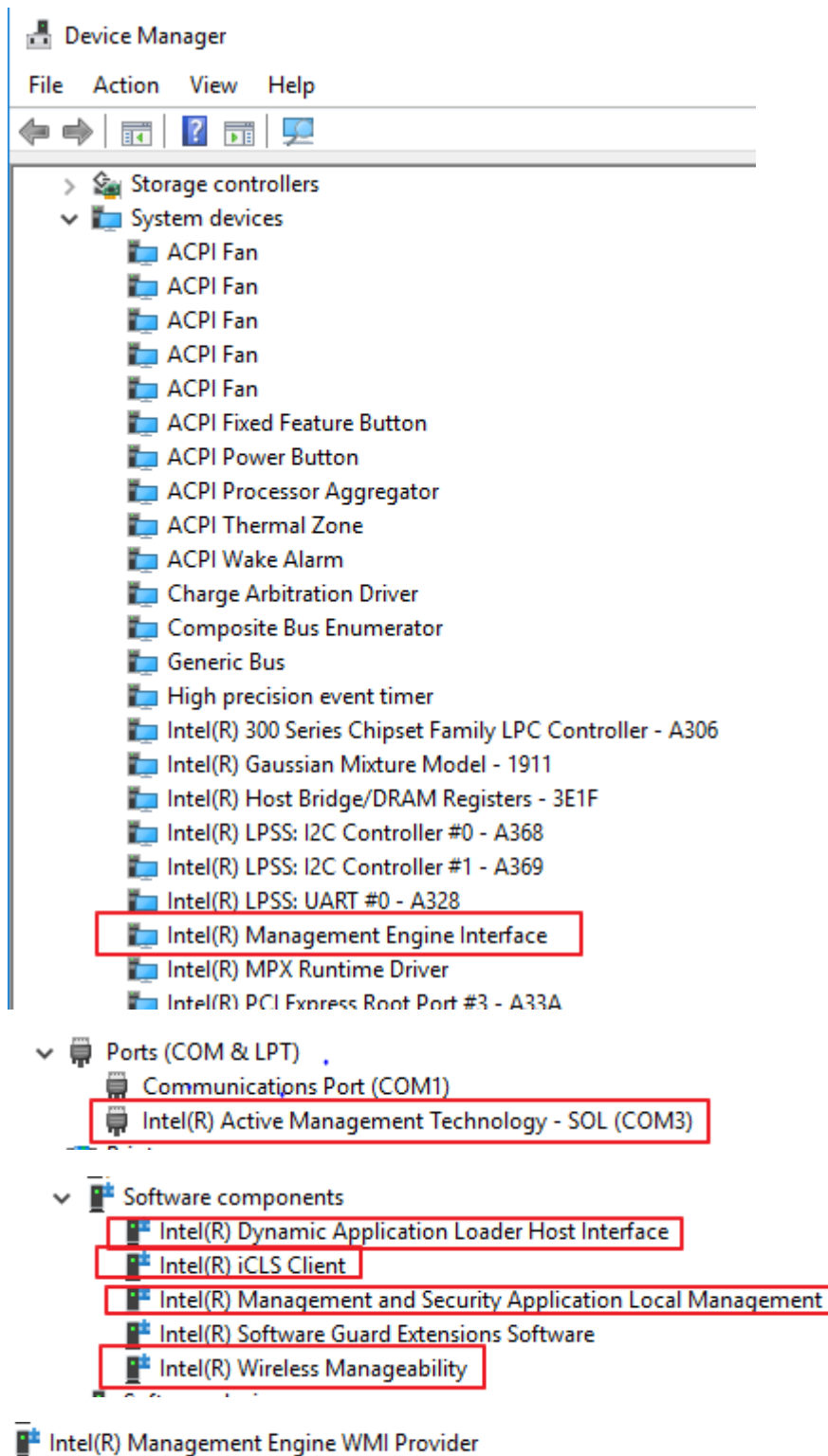
Intel® DAL: Software components \ Intel(R) Dynamic Application Loader Host Interface

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

Intel® TCS: Software components \ Intel(R) iCLS Client

Intel® Wiman : Software components \ Intel(R) Wireless Manageability

Intel® CSME WMI Provider: Software components \ Intel(R) Management Engine WMI Provider





User may use installer **SetupME.exe** in the **ME\_SW\_DCH** folder.

- 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 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 Intel® CSME WMI Provider.

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

### 5.1.3 Intel® MSS

Intel® MSS is for Intel® AMT system only, it is not required to be installed on NON Intel® AMT system.

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

Intel® MSS APPX for pre-install is in the **Drivers\IMSS** folder.

DISM is required to install Intel® MSS 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 Intel® MSS APPX.

the example DISM command for pre-install OS as below:

```
Dism /Image:c:\test\offline /Add-ProvisionedAppxPackage /PackagePath:<pre-install kit Folder Path>\< Intel® MSS APPX appxbundle file> /LicensePath:<pre-install kit Folder Path>\< Intel® MSS 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>\< Intel® MSS APPX appxbundle file> /LicensePath:<pre-install kit Folder Path>\< Intel® MSS 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.  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 (Intel® 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

---

Once the Intel® CSME software stack is installed by the installer SetupME.exe, the contents of the 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 Intel® LMS, Intel® DAL or Intel® TCS can be found in Services tab in task manager or services in Microsoft Management Console:

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

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



## ***Identifying Intel® CSME Software Components***

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

TPMProvisioningService.exe / Intel(R) TPM Provisioning Service

If Intel® LMS, Intel® DAL or Intel® 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.





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

---

**Note:** This section is not applicable for Intel® MSS APPX, please refer to Intel® 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.



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 Intel® LMS

---

Intel® 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. Intel® 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 Intel® LMS will function as required without their existence. All changes to registry keys are noted at Intel® LMS startup only. To force the changes to be noted, restart Intel® LMS.

**AllowFlashUpdate:** Allows Intel® LMS to invoke Partial FW Updates. This is a DWORD Value. Setting value to 0 will prohibit Intel® 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 Intel® 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

---

If you are installing Intel® CSME software using any installer – in 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 Drivers 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 Intel® CSME software components via device manager if you are installing CSME software using installer

Intel® WiMan install will add wiman and wiman\_extension. Therefore, when uninstalling manually from device manager it will uninstall only the WiMan. User then need to uninstall manually the wiman\_extension that is shown in device manager as "Generic Software Component".

There are 3 different Intel® WiMan's (WiMan-WiFi for CNL/WHL, WiManH for CML/TGL, WiManHu for ADL and above). When user use NIC that is relevant for CNL/WHL on upper platform version he will get the WiMan-WiFi as hidden device in device manager and it will be as a "zombie".



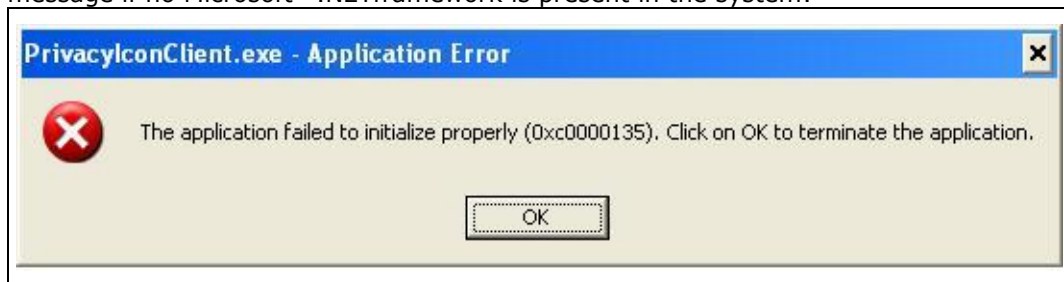
# 10 Troubleshooting Intel® Management and Security Status Application

---

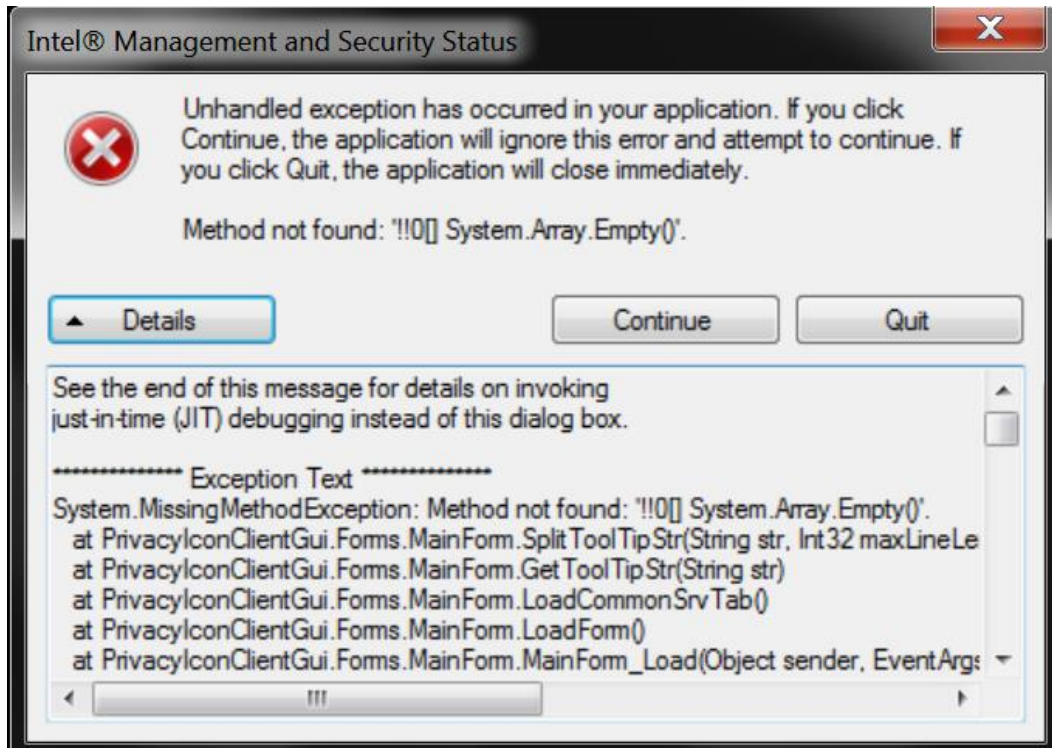
## 10.1 Error Message when Intel® Management and Security Status Application Loads

Microsoft\* .NET applications fail when executed in an environment that has no Microsoft\* .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 Microsoft\* .NET framework is present in the system:



The Intel® Management and Security Status application will display the following error message if no Microsoft\* .NET framework 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 service status of Intel® Active Management Technology or Intel® Standard Manageability in the General tab depends on which technology is operational on the system.

If “Information Unavailable” displays on the systems supporting Intel® Active Management Technology or Intel® Standard Manageability, Check that:

1. Intel® Active Management Technology or Intel® Standard Manageability is functioning properly in Intel® CSME firmware.
2. Intel® LMS is installed, running normally and starts automatically on Windows\* startup.
3. Intel® MEI driver is installed, enabled and functioning properly.

## 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

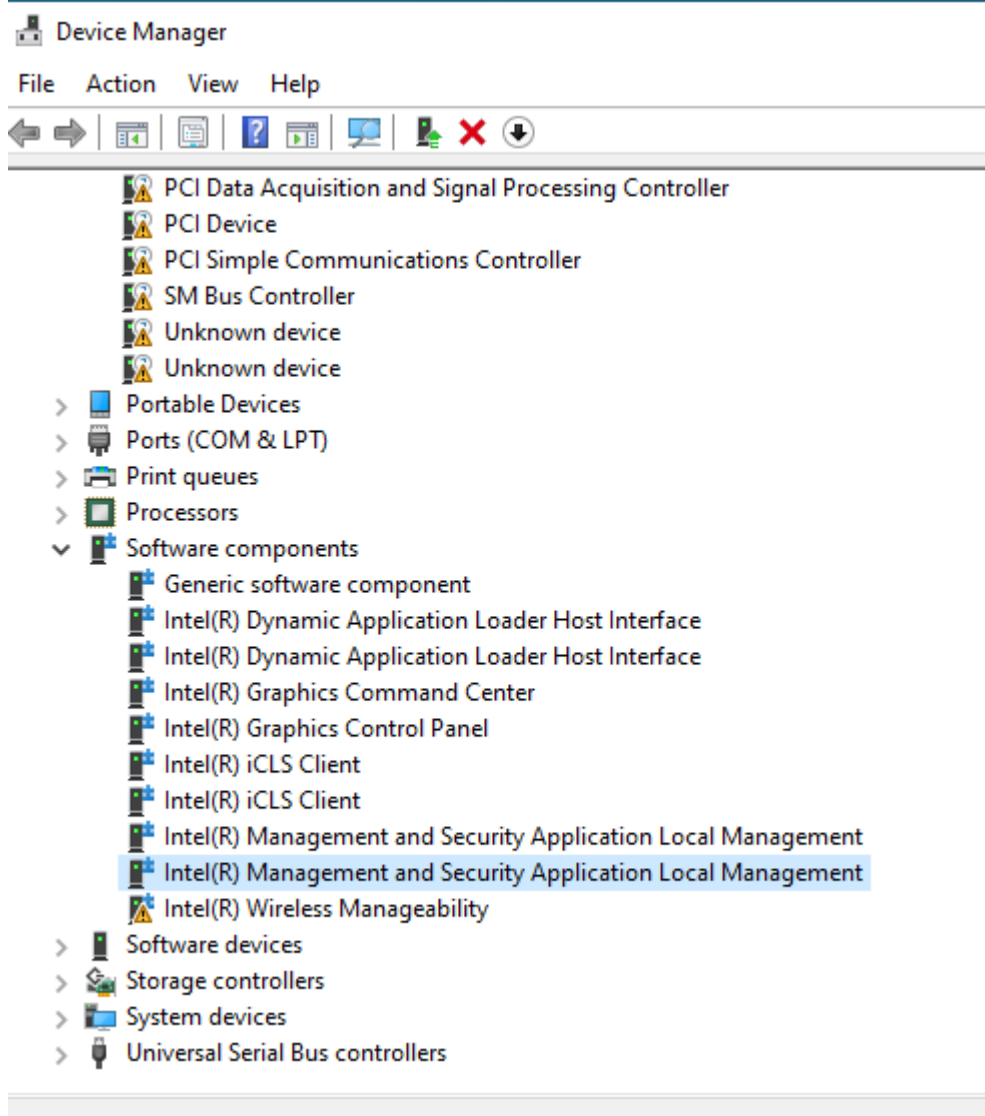
Whenever either Intel® AMT, Intel® SBA or Intel® Standard Manageability is enabled, Intel® Management and Security Status icon is loaded into the notification area when Windows\* starts. It can also be started by clicking **Start> All Programs\Intel\Intel® Management and Security Status\ Intel® Management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

After Intel® MEI driver 1931.14.0.1323, the functionality of add components is migrated from oemextension INF to Intel® MEI driver. For the system on which the legacy OEM extension INF has been installed (and not removed), user will see redundant software components in device manager after Intel® MEI driver is installed/updated with version 1931.14.0.1323 or later.



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

§