

Intel® Converged Security and Management Engine Software

Installation and Configuration Guide

Supporting Intel® CSME firmware version: 10 and above

June 2019

Revision 1.0

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Revision History

| Revision Number | Description | Revision Date |
|-----------------|--|----------------|
| 0.6 | <ul style="list-style-type: none">• Initial Release | January 2018 |
| 0.7 | <ul style="list-style-type: none">• WiAMT driver added | January 2018 |
| 0.8 | <ul style="list-style-type: none">• Remove Intel® AMT NAC Posture Plug-in , Intel® AMT NAP Plug-in and Intel® Identity Protection Technology (Intel® IPT)• Add section 6.6 for support of Windows* 10 RS3 and beyond• Add description of setupME.exe command line option• Add description about release version numbering in section 7• Add LMS, JHI and OemExtension INF and driver description in section 6.6• Add Firewall policy in section 6.7• Add PartialFWUImagePath limitation in section 9.1 | April 2018 |
| 0.9 | <ul style="list-style-type: none">• Revised based on the ME12 SW installation guide | September 2018 |
| 1.0 | <ul style="list-style-type: none">• Revised based on the ME12 SW installation guide• Remove IMSS and AMT related functionality | June 2019 |



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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*.

The Intel® CSME software installer has a separate version for each Intel® CSME generation. The installers provided with each version also supports earlier platforms, so, for example, the installers provided with 9.x also supports Intel® CSME 8.x platforms. Due to Intel CSME SW backwards compatibility requirement, the CSME 13 software supports any OS supported since Intel® ME 10 and onwards.

§



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 Advatage (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:
MEISetup.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 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.

2.3 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.

2.4 Intel® Dynamic Application Loader (Intel® DAL)

This is a service which exposes the host interface to usage of the Intel® Dynamic Application Loader infrastructure abilities, for loading/unloading 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. It is not available over Windows Server* 2003, Windows Server* 2008, Windows Server* 2012 or Windows Server* 2016.

2.5 Intel® Capability Licensing Services Client (iCLS Client)

Intel® Capability Licensing Services Client 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)



3 Installer List

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

3.1 Intel® 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:

- Intel® Management Engine Interface (Intel® ME Interface)
- Local Manageability Service (LMS)
- Intel® CSME WMI provider
- Intel® Dynamic Application Loader (Intel® DAL)
- Intel® Capability Licensing Service Client (iCLS Client)

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® Dynamic Application Loader | Intel® MEI driver, SOL driver, Intel® DAL service, Intel® iCLS, Intel® LMS, Intel® CSME WMI provider, Plug-ins | 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 |
| PAVP | Intel® MEI driver, SOL driver, Intel® iCLS, Intel LMS, Intel® CSME WMI provider, Plug-ins | N/A |
| None of the above | Intel® MEI driver, Intel® LMS, Intel® CSME WMI provider | LMS is installed for WMI provider, not exposed to user |

3.2 Intel® MEI-Only Installer

This package installs the Intel® MEI driver only.



3.3 Intel® ME_SW_DCH

This installation program installs the Intel® CSME software components which are DC compliant and WMI provider. Note that the installer for corp and cons sku are different and please use the appropriate installer according to the platform sku.

For the installer in the ME SW package for consumer sku, the following components will be installed by default:

- Intel® Management Engine Interface (Intel® ME Interface) driver which is DC-compliant
- Local Manageability Service (LMS) driver which is DC-compliant
- Intel® CSME WMI provider
- Intel® Dynamic Application Loader (Intel® DAL) driver which is DC-compliant
- Intel® Capability Licensing Service Client (iCLS Client) driver which is DC-compliant

3.4 WindowsDriverPackages

This package includes the drivers as UWD INF installer.

- MEI: heci.inf in Installers\WindowsDriverPackages\MEI\
- iCLS: iclsClient.inf in Installers\WindowsDriverPackages\iclsClientUWD
- JHI: DAL.inf in Installers\WindowsDriverPackages\JHI\win10
- OemExtension: OemExtension.inf in
Installers\WindowsDriverPackages\OemExtension





4 *System Requirements*

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

- Windows* 8 / Windows* 8.1 / Windows* 10 / Windows Server* 2008 64 bit versions / Windows Server* 2008 R2 / Windows Server* 2012 / Windows Server* 2016 – Latest Service Packs.





5 Installing Intel® CSME Software Components

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** folder .

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 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 installation wizard screens, and accept the license conditions.
- 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 also have command line option 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.

-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, Intel® Dynamic Application Loader, and Intel® Identity Protection Technology (Intel® IPT) components only.

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

-tcs
Installs only TCS.

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

5.1.2 Windows* 10 RS3 and beyond

The driver for MEI , JHI and iCLS 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.

User may use installer **SetupME.exe** located in the firmware kit in the **Installers\ME_SW_DCH** folder to install all UWD INFs.

System manufacturers can take advantage of the components in this folder 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 that MEI driver is required to be installed before other drivers.

MEI: heci.inf in Installers\WindowsDriverPackages\MEI\win10

iCLS: iclsClient.inf in Installers\WindowsDriverPackages\iclsClientUWD

JHI: DAL.inf in Installers\WindowsDriverPackages\JHI\win10

OemExtension: OemExtension.inf in Installers\WindowsDriverPackages\OemExtension

OemExtension is required to be installed along with installation of JHI or iCLS drivers.

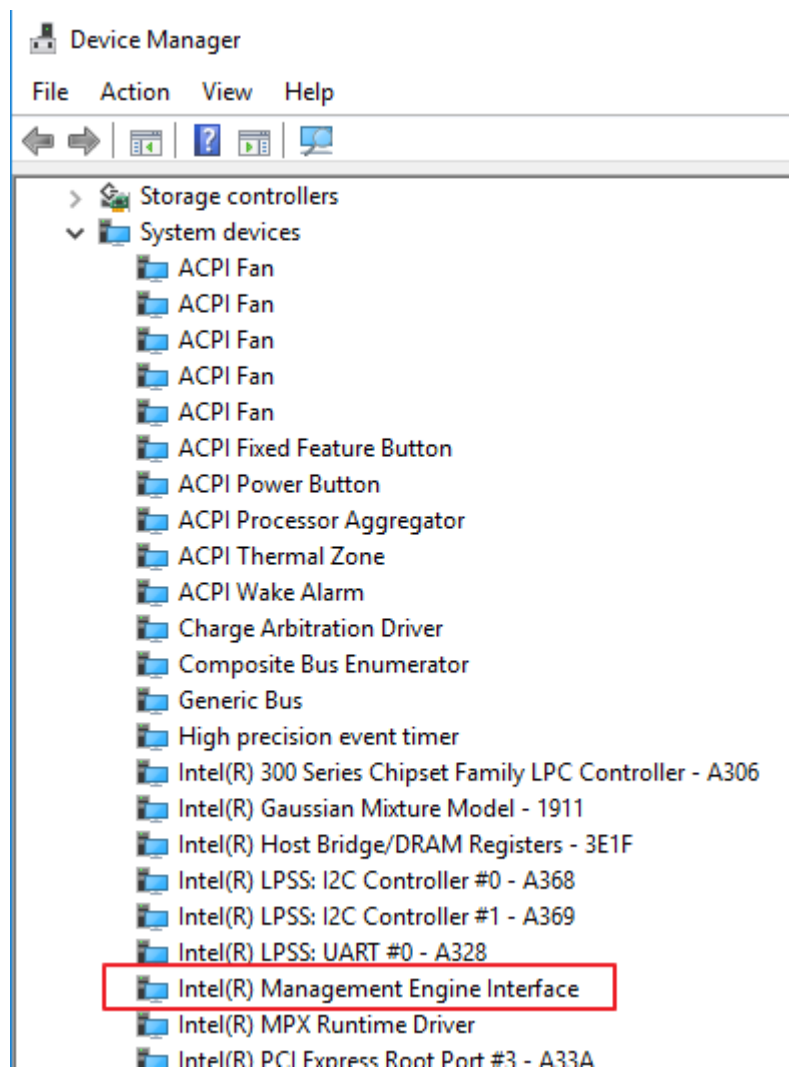


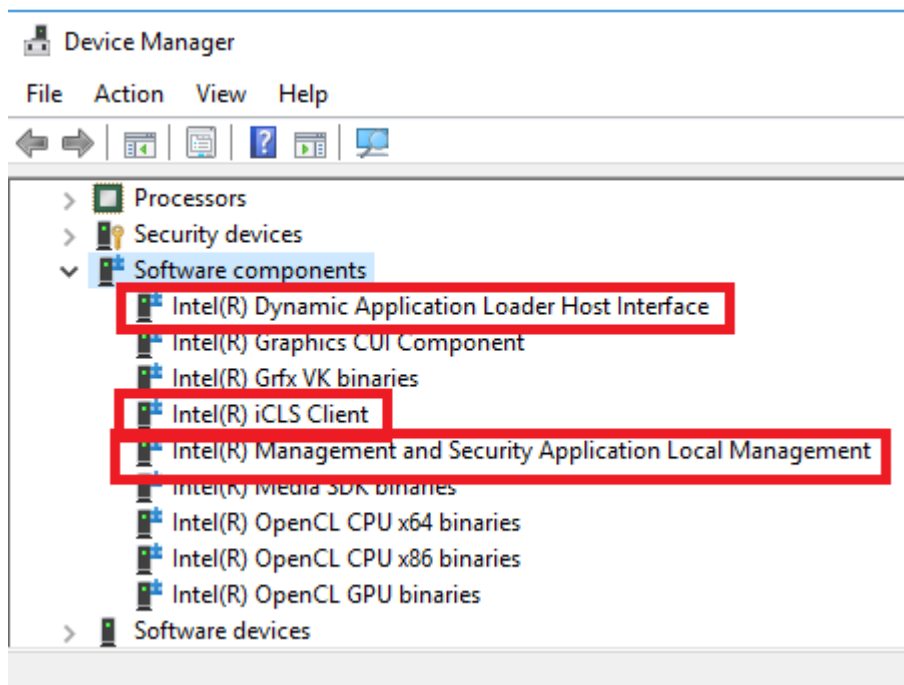
There are devices shown in the device manager as following:

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

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

iCLS: Software components \ Intel(R) iCLS Client





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"> The user canceled the operation Setup was run silently but a downgrade was detected and the -overwrite switch was not used. |
| 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"> Not admin No device matches OS requirement not met .NET requirement not met |
| 1633 | ERROR_INSTALL_PLATFORM_UNSUPPORTED | Architectures not supported |



| Error code | Error String | Description |
|------------|--------------------------------|---|
| 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* 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.

5.4 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>



5.5 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 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.13.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:

Win32:
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{GUID}\DisplayVersion

Win64:
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\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, set as 13 for ME13
- nn – Minor version
- bbbb – Build number

E.g. If the FW kit that was built on WW09'18 is: 13.0.0.xxxx, the SW kit will be: 1809.13.0.bbbb

Service name for JHI or iCLS can be found in Services tab in task manager or services in Microsoft Management Console:



JHI: jhi_service / Intel(R) Dynamic Application Loader Host Interface Service

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

TPMProvisioningService.exe / Intel(R) TPM Provisioning Service

If JHI or iCLS is installed via installer **SetupME.exe**, the components file location is C:\Program Files (x86)\Intel\Intel(R) Management Engine Components

If JHI or iCLS is installed via **UWD INF installer**, the components file locations are different from that installed by setupme.exe:

Jhi_service.exe and related files: %SystemRoot%\system32\

iCLS: %SystemRoot%\system32\Intel\iCLS Client





7 Uninstalling Intel® CSME Software and Drivers

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, uninstall them manually from device manager.

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.

For the extension INF driver(LMS, iCLS , JHI and oemextension)

- Before uninstalling an extension driver, you must first uninstall the base devicer(MEI, SOL). Next, run PnPUtil on the extension INF.
- Run pnputil /enum-drivers, search original name of the extension INF driver and get the published Name
- Run pnputil /delete-driver <published name> /uninstall

Note: Don't manually uninstall ME SW components via device manager if you install CSME SW using installer.

