

Intel Atom Processor z2760 Installer

User Guide

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1 Overview

The Intel Atom Processor z2760 (aka, “Clover Trail”) installer is a highly configurable install manager that uses a generic XML configuration file to install a collection of drivers and firmware on a family of tablets that use the Intel z2760 Intel processor. The installer package delivered by Intel will contain the Intel Delivered platform drivers for the Clover Trail platform and, for illustrative purposes only, the BIOS for the Intel reference platform. OEMs must customize this installer to include their specific BIOS, and they may also remove unneeded Intel drivers, add Third Party Vendor (TPV) drivers, and OEM specific device firmware updates.

The following are the important features of this installer:

- Supports installation of all Intel Drivers for Clover Trail Platform
- Supports BIOS Upgrade
- Support Device Firmware upgrade
- Supports configurability to add TPV driver installation

1.1 BIOS/Firmware Upgrade

Installer operates in two modes SOC and non-SOC (SOC mode is determined by the presence of the <RegistryKey> section, see Section 3.1.3) . In SOC mode BIOS update is mandatory and is optional in non-SOC mode. In SOC mode, the installer will force firmware update package installation. Due to dependency between drivers and system firmware, it is recommended to install drivers together with system firmware (BIOS) to ensure integrity of the platform SW stack.

Note: The expectation is that SOC mode is used for Over The Air (OTA) updates, and non-SOC mode is supported for development and factory image generation purposes.

System and device firmware update packages should be authored and signed according *Windows UEFI Firmware Update* specification and *Intel Firmware Over The Air Developers' Guide*.

For authoring device FW update packages, OEMs should engage with Independent BIOS Vendor (IBV) and Independent Hardware Vendors (IHVs) to ensure proper UEFI capsule implementation for specific devices. Intel has enabled IBVs to build production BIOS, with access to Clover Trail documentation to fully develop capsule source code. Refer to the I2C Programming Guide(*Clover Trail, Tablet Platform I2C Programming*) provided by Intel to implement the EFI code.

2 References

MS Connect documents:

- Minimum WoA ACPI Requirements
<http://connect.microsoft.com/site1094/Downloads/DownloadDetails.aspx?DownloadID=31643>
- Windows UEFI Firmware Update Platform
<http://connect.microsoft.com/site1094/Downloads/DownloadDetails.aspx?DownloadID=45429>
- Validating Windows UEFI Firmware Update Platform Functionality
<http://connect.microsoft.com/site1094/Downloads/DownloadDetails.aspx?DownloadID=46319>
- Reducing PNP Requirements for SOC Drivers
<http://connect.microsoft.com/site1094/Downloads/DownloadDetails.aspx?DownloadID=46270>
- Recommendations for Populating SMBIOS SKU Field
<http://connect.microsoft.com/site1094/Downloads/DownloadDetails.aspx?DownloadID=43299>
- Mixed State Toolkit
<http://connect.microsoft.com/site1094/Downloads/DownloadDetails.aspx?DownloadID=46821>

Intel Documents:

- Clover Trail FOTA (Firmware Over the Air) Alpha Release Version 0.5, Kit # 46527
- Clover Trail, Tablet Platform I2C Programming – Application Notes / Briefs – Rev. 0.8, Doc # 504349.
- RS – Intel® ATOM™ Processor Z2760 (Formerly Cloverview SoC) BIOS Writer's Guide, Doc # 318273

3 *Installer Components*

The installer package contains the components as shown in the picture below:

Name	Type
 Drivers	File folder
 Config.xml	XML Document
 Setup.exe	Application

3.1 Config.xml

The config.xml helps to customize the installer to meet the OEM requirements. This file contains the following sub-sections:

3.1.1 INF File list

The <OrderedInfFileList> section in the XML file contains the list of INF files to be installed. By referencing an array of drivers in a folder named Drivers that exists in the same root directory as the installer, it will start by scanning the 'Drivers' folder for all available INFs, match the INFs listed in the configuration file to the INFs in the 'Drivers' folder and then proceed to install each one. The config.xml INF file entries appear as follows. This list can be changed to add other TPV driver INFs, as per the OEM installation requirements. (The below list is an example, and can differ between BSP releases)

```

<File>
  <Name>MBI.inf</Name>
</File>
<File>
  <Name>LNWIPC.inf</Name>
</File>
...
<File>
  <Name>OEMAddedDriver.inf</Name>
</File>
...

```

The installer will recursively search within the Drivers folder to find the INF files listed in the XML file.

Alternatively, the relative path within the Drivers folder can also be mentioned in the XML file. For instance,

```
<File>
    <Name>Test Folder\Test.inf</Name>
</File>
```

This will force the installer to look for *Test.inf* in *Drivers\Test* Folder.

3.1.2 SOC Package Info

The installer supports the notion of a “meta-version” that represents the version of the SOC bundle as a whole, independent from the versions of the constituent driver and firmware packages. This information may be optionally specified in the <Configuration> section of the **config.xml** file.

```
<SocPackageInfo>
    <Version>xxxxxxxx</Version>
    <VersionRegistryKey>
        <Root>regroot</Root>
        <Key>regkeypath</Key>
        <Value>regvalname</Value>
        <StringValue>
            <StringValueName>regszvalname</StringValueName>
            <StringValueData>regszvaldata</StringValueData>
        </StringValue>
    </VersionRegistryKey>
</SocPackageInfo>
```

Where:

- **xxxxxxxx** is a DWORD value representing the version of the SOC package described by the **config.xml**. The versioning scheme can be whatever the OEM wants, e.g., simple number, number broken down into fields for major, minor, build, revision number, etc.). The only requirement is that the numbering scheme should be comparable based on simple DWORD check.

- **regroot** is the registry root key where the SOC bundle version is recorded (e.g., HKLM)
- **regkeypath** is the path (relative to **regroot**) where the currently-installed SOC bundle version is recorded (e.g., SOFTWARE\Intel\SOCPackageInfo)
- **regvaluname** is the name of the REG_DWORD value entry (located within **regkeypath**) where the currently installed SOC bundle version is recorded (e.g., 0x01).
- <StringValue> is an optional section that can be used to provide a human-readable string representing the SOC package version in a format of the OEM's choosing.
- **regszvalname** is an optional string that specifies the name of the REG_SZ value entry (located within **regkeypath**) where the human-readable SOC package version string is to be stored. If this string is omitted (i.e., empty string), then this will be stored in the default (i.e., unnamed) registry value for this key.
- **regszvaldata** is the human-readable string representing the SOC package version.

When the installer is run in SOC mode, after assessing the package's applicability to the platform (based on <Registry> info described in Section 3.1.3), the installer will retrieve the REG_DWORD value at the location specified in <VersionRegistryKey>, and compare it against the value specified in the <Version> element. If the registry specifies a new (i.e., higher) number then Master Installer will give the user a warning that the SOC update bundle they're attempting to install is not newer than what is already on the system. The user will be able to continue with the install (hence downgrading the drivers) or they can cancel the installation.

Note: if M.I. is being run in silent mode and the package is determined to not be newer than what is already installed, the install will automatically fail with 1602 (user cancelled, just as if the user had explicitly cancelled in the non-silent case). To force the installation of an older SOC bundle in silent mode, the "force older" command line argument must be used.

If the Master Installer completes successfully, it will overwrite the value registered at <VersionRegistryKey> with the version specified by <Version>. Additionally, if the <StringValue> section is present, the specified string representing the SOC package version will be written to the same registry key, using the value entry name specified.

OEMs can also have other code that independently checks the SOC version registry key, in order to assess whether they should offer a new version to the user from their own auto-update facility, for example.

3.1.3 Registry Keys

Presence of the <RegistryKey> section causes the installer to run in SOC Mode. The setup will check for the list of parameters listed under this section. (Specifying the registry location follows the same format outlined in Section 3.1.2 above.) The

installation will proceed only if the registry entry on the target system, matches with the entries listed in the config file. IF there is any mismatch, the installation will be aborted, and an error code will be returned. OEMs will need to change this section to match the values corresponding to their design. By default, the config.xml will have the following keys, and values matching that of Intel FFRD.

SystemManufacturer: Intel Corp.

SystemProductName: PINOLE C 2

Please refer the “Recommendations for Populating SMBIOS SKU Field” from MS for details on populating these fields.

3.1.4 BIOS File

In SOC mode, the installer uses the <BiosFile> section to indicate the driver package containing the UEFI system firmware update capsule to be installed. This section has a single child node, <Name>, which contains the name of the BIOS INF file. The existence of this sub-root and child are mandatory (an omitted or blank value for ‘Name’ will result in the installer aborting the installation). After driver installation, the installer will ask for a reboot. On this reboot, the BIOS will be updated with the OEM specific BIOS update file that was staged by the BIOS update package.

In non-SOC mode, the <BiosFile> xml subtree is optional and can be removed from the config.xml file.

Refer the *Windows UEFI Firmware Update Platform* document for details on UEFI update process.

3.2 Drivers Folder

This folder contains the Driver binaries, any device firmware update packages, and the BIOS update package. In the package delivered by Intel, an OEM can replace the driver binaries with custom drivers. OEMs need to ensure that the name of the INF file is same as the existing one in the package. If the INF file name is different, then corresponding change needs to be made in the INF section in the config.xml.

If third party drivers are added to the Driver folder, then the TPV INF entries need to be made in the config.xml.

3.3 Setup.exe

Setup.exe is the installer executable file which will install the driver INFs listed in the config.xml.

3.3.1 The following command line arguments are supported:

-?

Displays this help dialog.

-b

Reboots the system without prompting after setup is complete.

-report *<path>*

Changes the default log path.

-s

Does not display any setup dialogs (silent install).

-nfd

Does not display the final dialog.

-fo

Forces the installation of older version of drivers. To be used with -s.

-nr

Does not require the system to reboot before another installation is initiated.

3.3.2 Diagnostics

After installation the log files get generated in the following folder location:

C:\Users\<user directory>\Intel\Logs

4 *Exit Codes*

The installer supports the following exit codes:

Exit Code	Description
1602	Installation cancelled by the user
1603	Fatal error during installation
3010	The requested operation is successful. Changes will not be effective until the system is rebooted
350	Installation was aborted due to an existing pending reboot

5 Appendix A (Driver Package Extraction)

The instructions below are for illustrative purposes only, and assume you are creating a new BKC update in \update, and have the raw BKC in \20120930_pr1 and Master Installer preview located in \MI_Preview. Folder structure and contents of Intel Delivered BKC releases is subject to change.

1. Copy setup.exe and config.xml into a new folder, make a Drivers sub folder.
Md \update
Copy \MI_Preview\setup.exe \update
Copy \MI_Preview\config.xml \update
Md \update\Drivers

2. In the drivers sub-folder copy the contents of the BKC 20120930_pr1\Installers\MasterInstaller\Drivers to this folder. E.g.,
Xcopy /s \20120930_pr1\Installers\MasterInstaller\Drivers \update\Drivers

3. In the drivers sub-folder copy the contents of the BKC 20120930_pr1\Installers\GraphicsWithMediaSDK to this folder. E.g.,
Xcopy /s \20120930_pr1\Installers\GraphicsWithMediaSDK \update\Drivers\GraphicsWithMediaSDK

4. For SOC update, package system firmware and put into update\Drivers\ifwi
5. Clean the tree as follows.

```
Cd \update\Drivers

del /s /q *.pdb *.docx *.zip *.pdf
rd /s /q GraphicsWithMediaSDK\Graphics\sym
rd /s /q GraphicsWithMediaSDK\mediasdk
rd /s /q GraphicsWithMediaSDK\lang
del /q GraphicsWithMediaSDK\*
del /q Security
rd /s /q Security\BCryptKernEx_2012-07-31
rd /s /q pep\dbgextn
rd /s /q pep\doc
rd /s /q pep\manifest
del pep\*.txt
rd /s /q dptf\installer\lang
del /q dptf\installer
```

6. Edit the config.xml in \update\config.xml to choose the drivers and firmware you will be installing.

6 *Release Notes*

- *If Master Installer finds any non-driver INFs (e.g., autorun.inf) in the Drivers hierarchy, it will abort the installation.*