

WES2009/XPE Platform Package for the Intel® Desktop Board D945GCLF2 with Integrated Intel® Atom™ Processor 330

User Guide

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1 Introduction

Windows Embedded Standard 2009 / Windows XP Embedded are special versions of Windows XP Professional that allow Original Equipment Manufacturers (OEMs) to customize the XP operating system (OS) for their embedded products. The Platform Package for the D945GCLF2 contains the hardware macro component that provides the hardware layer to create a custom image for the Intel® D945GCLF2 Atom™-based motherboard.

Note: *The package presented here has only been tested with Windows Embedded Studio 2009.*

1.1 About this Document

The documentation provides the foundation to get started building OS images for the Intel D945GCLF2 Atom-based motherboard. Although the documentation is a teaching tool, more detailed information on developing images with Target Designer and Component Designer can be found in several other references:

- Book: *Windows XP Embedded Advanced*.
- Book: *Windows XP Embedded Supplemental Toolkit* - covers XPe SP2.
- seanliming.com – www.seanliming.com

1.2 Development Requirements

The documentation assumes that you have a D945GCLF2 system complete with monitor, power supply, keyboard, and mouse attached. A USB 2.0 Flash disk will be needed to boot the OS in the exercise. Memorex USB flash drives are recommended.

2 Platform Package Installation

The zip file contains the components and files necessary to be imported into the WES/XPe database. The following instructions explain how to install the IDK components:

1. Make sure that you have installed WES2009 / XP Embedded tools and have the database active and running.
2. On the system with the WES / XPe database, extract the Zip file.
3. Open Component Database Manager.
4. Import the D945GCLF2_SJJ_Package.sld. This SLD contains all the components and the exercise. The next section discusses the SLD file in more detail.

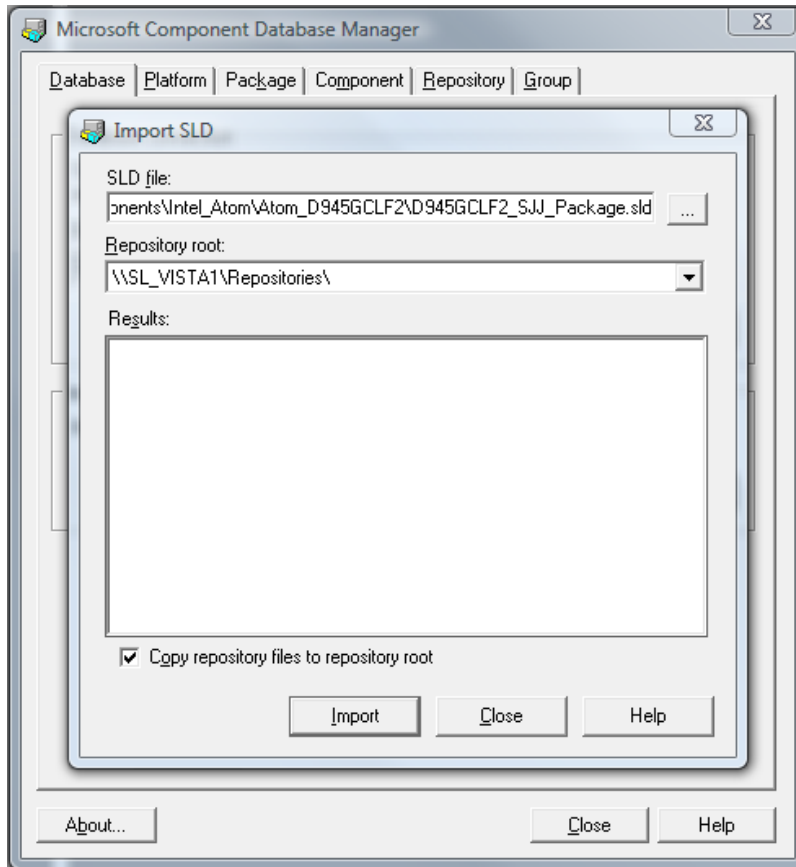


Figure 1 - Import the SLD File Using Component Database Manager

5. After the import process is completed, close Component Database Manager

3 Component Architecture and Descriptions

There are over 11,000 components in the WES / XP Embedded database. To make rebuilding the OS image simpler and to achieve the goals of the project, macro components are used to group multiple individual components into a single block. The database categories are divided into two major groups: hardware and software. The hardware category contains all the device driver and hardware layer components needed to boot the OS on the hardware. The software category contains the Core OS feature components that add functionality to the image such as file system support and various application support components.

By grouping individual components into a few macro components, the architecture is flexible so the Core OS can support different hardware platforms simply by changing the platform macro component.

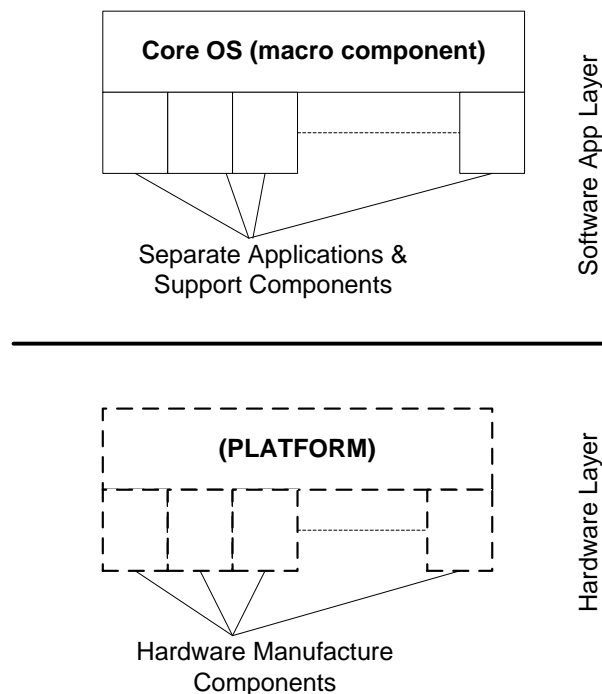


Figure 2 - Software / Hardware Implementation

There is also the added benefit, when developing a new configuration, that only 2 Macro components are needed instead of tracking down a large number of different components to start the new WES / XPe configuration.

3.1 D945GCLF2_SJJ_Package.sld

The D945GCLF2_SJJ_Package.sld file contains all the device driver components and the platform macro component. All device driver components have a (SJJ) in the name to help distinguish these custom components from those that come in the database.

3.1.1 Intel D945GCLF2

The Intel D945GCLF2 is the platform macro component for the Intel D945GCLF2 ITX desktop board. It was created with the help of Target Analyzer. The missing device driver components are part of the SLD and are component dependencies in the platform macro component.

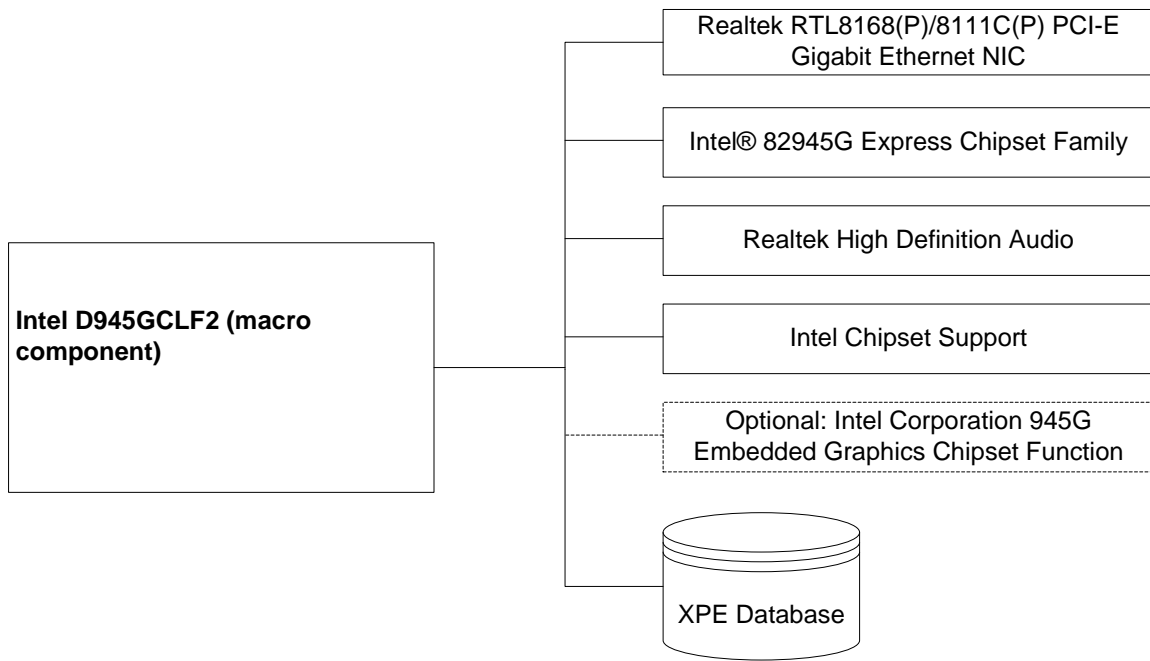


Figure 3 - Intel D945GCLF2 Platform Component

3.1.2 Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC

This is the wired Ethernet driver component.

3.1.3 Intel® 82945G Express Chipset Family

This is the video driver component for the built in video graphics engine, the Intel 82945G Graphics Controller Hub. This component was created from the video driver INF file, and extra registry keys were added with the use of SJJ's Component Helper. Please see issues with the driver in the exercise.

3.1.4 Realtek High Definition Audio

This is the device driver component for the audio driver created from the audio driver INF file.

3.1.5 Intel Chipset Support

This component contains Intel chipset drivers and was created from various INF files that would normally get installed from the driver CD during a standard desktop Windows installation.

3.1.6 Intel Corporation 945G Embedded Graphics Chipset Function

The Intel® 82945G Express Chipset Family driver that was supplied with the motherboard driver support CD has an issue loading during FBA. The latest driver called the Intel® Embedded Graphics Driver gets around this issue and provides more capability. The driver files are NOT provided in this package and must be downloaded from the Intel Embedded Design Center: <http://edc.intel.com/Software/Downloads/>. You must go to the Intel Embedded Design Center and register to download this latest driver.

Additional information on the Intel Embedded Graphics Driver, IEGD, can be found here:

http://www.intel.com/design/intarch/swsup/graphics_drivers.htm

You will have to install the package to extract the driver development package. The driver files are buried several subdirectories deep: (\\IEGD_10_0\\plugins\\com.intel.iegd.drivers_10.0.0\\Windows) and stored in a ZIP file

(IEGD_10_0_Windows.zip). The driver files and the utilities files are need for the SLD. Copy the driver files and the 3 utility files to the repository folder called IEGD and re-import the SLD file. The Intel Corporation 945G Embedded Graphics Chipset Function component's file resources contain the list of files needed. The utilities provide both standalone and integrate driver control. The IEGDGUI.exe is a standalone configuration utility. The iegdgui.dll gets registered and linked into the Display Control Panel's advanced properties.

The Intel D945GCLF2 macro component has the two driver components disabled. Go into the setting page and enable both drivers by checking the boxes next to each driver name.

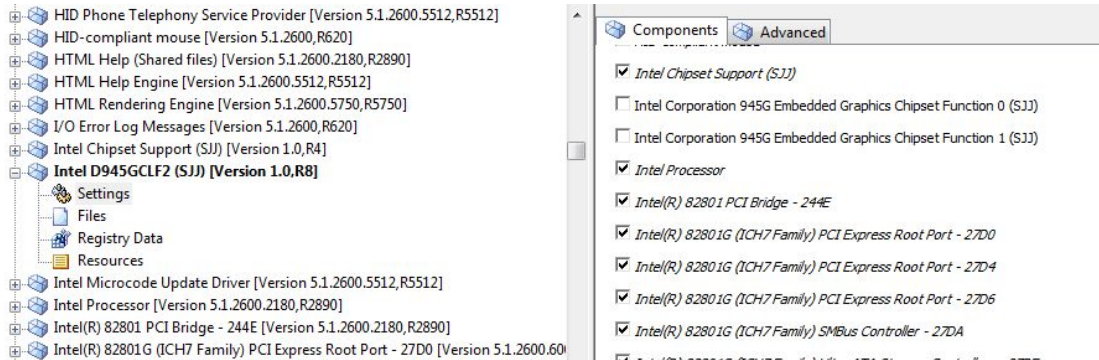


Figure 4 - Enabling the IEGD Drivers

A dependency check with auto-resolve enabled will pull in the drivers. During FBA the new driver will override the older Intel® 82945G Express Chipset Family.

4 Creating a Basic Test Image

4.1 Create a new configuration

If you have XPE SP2 FP2007 or greater, you can build a bootable USB image.

1. **Open** Target Designer.
2. From the menu, select **File->New**.
3. The New configuration dialog appears. **Type** in the new configuration name: **Image_Test**.
4. Add the following components to the configuration.
 - Intel D945GCLF2
 - Runtime Quick Start Helper Macro
 - USB Boot 2.0 *Note: There may be a KB update associated with this component*
5. Make sure the Auto-Resolve Dependencies option in the Tools->Options->Dependency Check is selected.

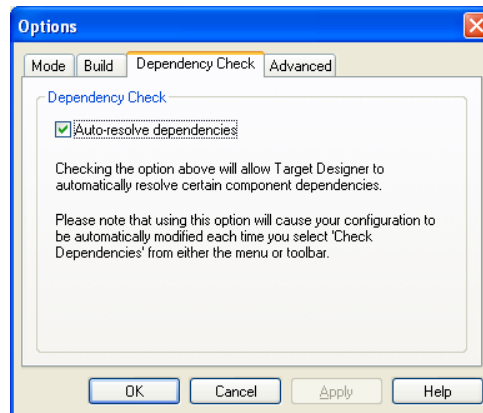


Figure 5 - Enable Auto-Resolve

6. Run the **Check Dependencies** on the configuration. The Auto-Resolve will pull in all the dependent components into the configuration. The dependency check should complete without errors and further component issues to resolve.
7. **Save** the configuration to the hard drive.
8. Now it is time to build the image. On the Configuration menu, click Build Target Image.
9. In the Build type box, click Release.
10. In the Destination box, type the full path where you want to store the run-time image. If an image already exists in the same folder, it is overwritten when you build the new image.
11. In the Log file box, type the full path and file name for the log file.
12. Click Build.

4.2 Prep and Boot from USB 2.0 Flash Disk

1. Insert the USB flash disk in to the development PC.
2. **Open** a command window.
3. There are two options to prepare the USB flash disk:
 - If developing on Windows XP Pro, run the **UFDprep.exe** utility found under **Program Files\Windows Embedded\utilities**. In the command window enter:

c:\>ufdprep <drive>, where <drive> is the drive letter for the USB flash disk you want to format.

- If you are developing in Windows Vista, then you don't need to run UFDprep.exe. Windows Vista lays down the correct boot sector, but you must rename the image's NTLDR to BOOTMGR or the image will fail to boot.
4. Once the format has completed, **copy** the image to the USB flash disk.
 5. **Undock** the USB flash disk.
 6. Insert the USB flash disk into the Intel D945GCLF2 system.
 7. Set the BIOS in the target ntel D945GCLF2 system to boot USB 2.0 (or USB HDD), and let the system boot from the USB flash disk.

The system will run through FBA and the image build will boot to Explorer shell.

Note: As described above, the Intel® 82945G Express Chipset Family video driver that was supplied with the motherboard driver support CD has some known issues with WES2009/XPe. In Device Manager, you may see the driver listed under a '?' mark. The driver is working fine, however. Doing an Update of the driver and then a Scan for Hardware changes will place the driver in the correct listing.