

Tip to develop a Display Driver
in WinCE

Sunny Shah



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One of the fastest ways to develop a display driver under WinCE is to clone the existing driver from catalog and customize it according to your display controller's configuration. The WinCE development platform provides quite a few sample drivers for ARM and x86 boards.

This tip will help you clone the existing display driver in Windows CE sub-system and customize it for a target processor.

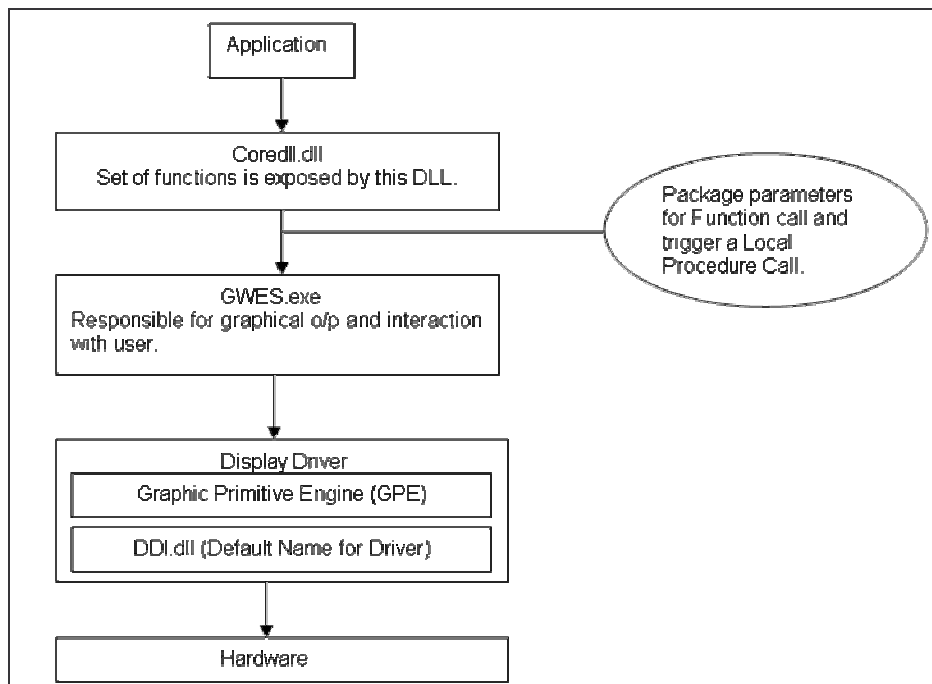


Figure 1: Elements that constitute the WINCE graphics pipeline

- ❖ The following points will help you understand the display subsystem and WinCE driver architecture:
 - The **GPE Base Classes** implements all the basic drawing functionality for video adapters.
 - The Driver consists of two sections:
 - **Ddi_if**: This module will expose 27 function points through DrvEnableDriver function. These functions call the member functions of the class derived from GPE Base Class.
 - **Display_Driver**: This module consists of classes that are derived from GPE Base Classes.

The main classes are:

- a) DerivedGPE : This class is derived from GPE Base class.
- b) DerivedGPESurf : This class is derived from GPE Surface base class.
- c) DerivedNode2D : This class is derived from Node2D base class.

- **DerivedGPE** is the most important class which overrides all Configuration methods, Blit methods, Line method, Cursor methods, Palette methods, Timing method and Power Handler methods of the GPE Base Class.

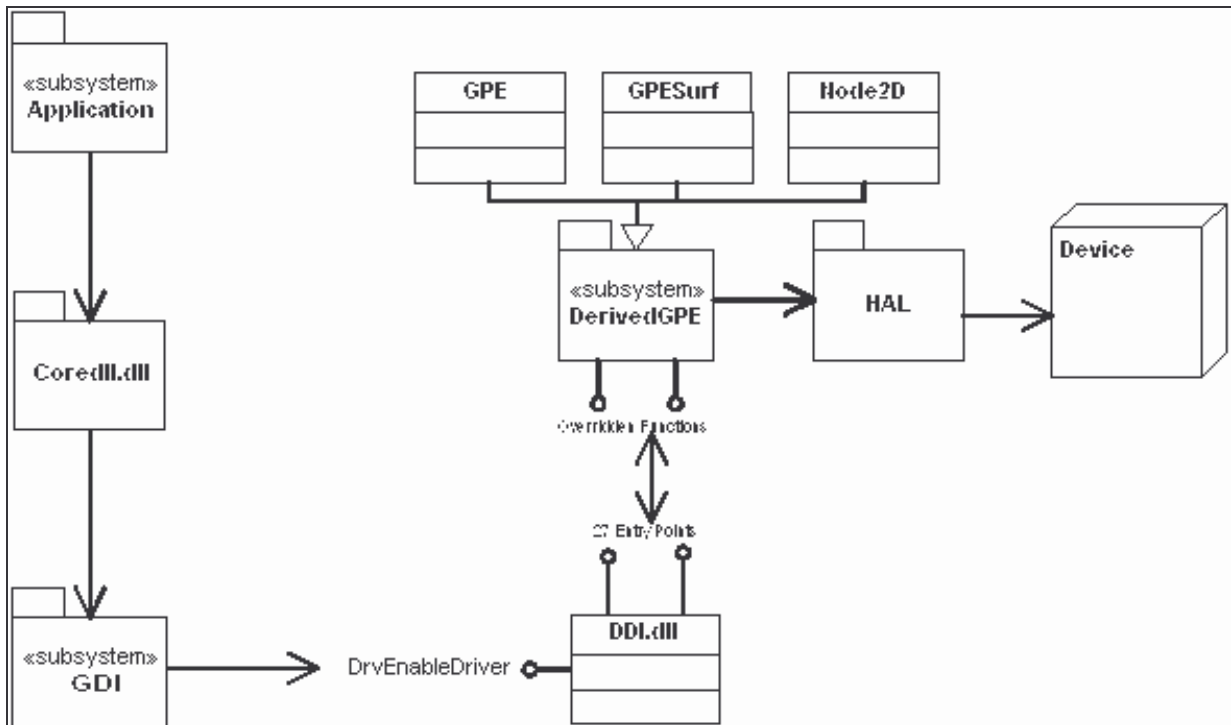


Figure 2: Working of Display Sub-System and Driver in WinCE Architecture

- WinCE does not have native BIOS support for video controller like CEPC. The **SetMode()** and **AllocSurface()** methods allows driver to initialize display controller and set proper mode.
- **Steps for cloning display driver:**
 - From the catalog item add the Null (Stub) Driver.
 - Add Minimal GDI Configuration and Minimal GWES Configuration to the OS design.
 - Clone the Null Driver.
 - Implement the hardware dependent code in the cloned driver.
 - Of all the overridden functions SetMode and AllocSurface are the most important functions:
 - a) **SetMode:** This function performs the mode and corresponding hardware initialization.

b) AllocSurface: It allocates memory for GDI objects.

- Make appropriate registry entries under:

```
[HKEY_LOCAL_MACHINE\System\GDI\Drivers]
"Display"="DisplayDriver.dll"
[HKEY_LOCAL_MACHINE\Drivers\Display\<Name of driver>]
; 640x480x16
"CxScreen"=dword:280
"CyScreen"=dword: 1E0
"BPP"=dword:10
"Freq"=dword:3C
```

- You can insert appropriate shell into your OS image.
- The entry will be automatically updated in the BIB file. The driver DLL is copied automatically into runtime image. This will be automatically loaded by GWES and ***initialize display controller***.