

## **HD4600+/HD4000/HD3000 Framebuffer Edits**

Match motherboard connector to framebuffer connector

Configure multiple monitors

Enable HD4600+/HD4000/HD3000 HDMI audio

Find HD4600+/HD4000 HDMI port-number (HD3000 similar)

## **Framebuffer Edit Repo**

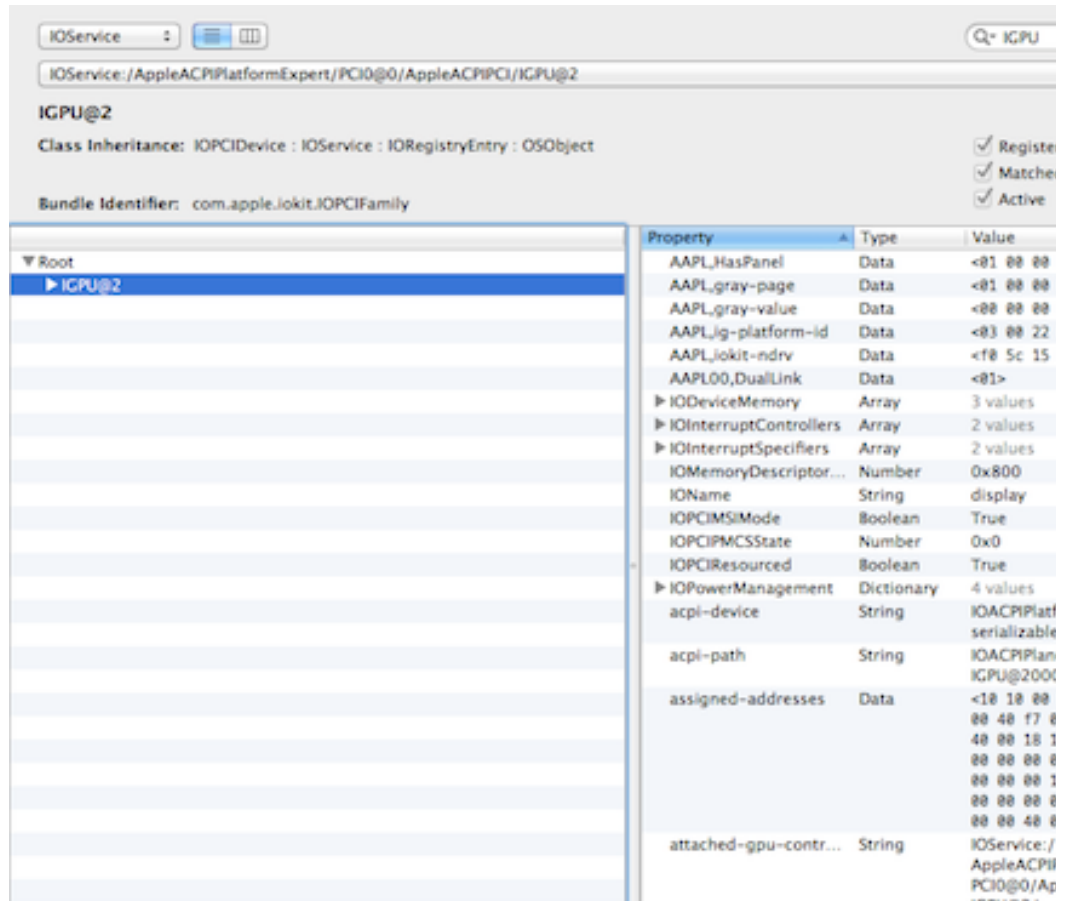
1. [github.com/toleda/graphics\\_Intel\\_framebuffers](https://github.com/toleda/graphics_Intel_framebuffers)

## **Requirements**

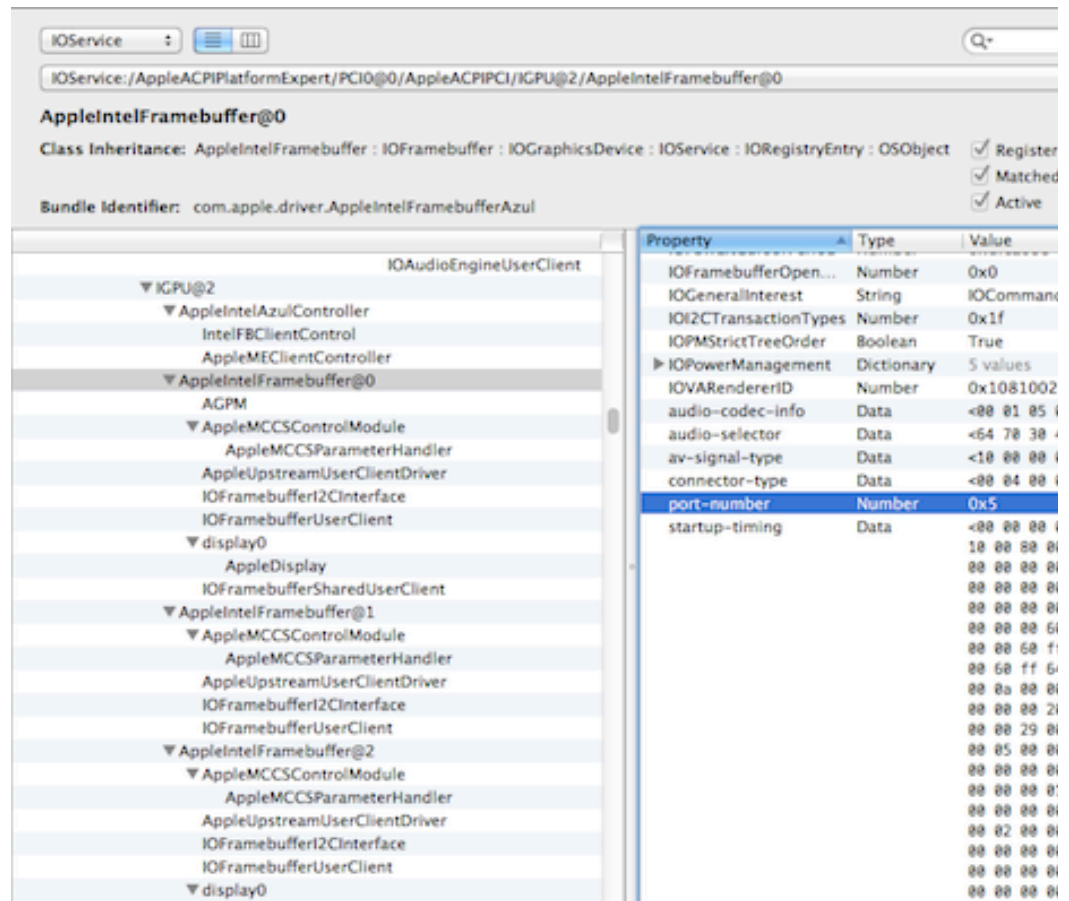
1. Desktop only
2. Framebuffer Injection
  1. HDMI audio dsdt/ssdt
2. Chimera/org.chameleon.Boot.plist
  1. IGPEnabler=Yes (Azul/Capri/SNB)
3. Chameleon/org.chameleon.Boot.plist
  1. IntelAzulFB/10
  2. IntelCapriFB/10
4. Clover/config.plist
  1. Azul: Graphics/ig-platform-id/0x0300220D
  2. Capri: Graphics/ig-platform-id/0x0a006601

## **Find HD4600+/HD4000 HDMI port-number** (HD3000 similar)

1. Boot system with only HDMI display connected
2. Open Downloads/IOJones
3. Search: IGPU (or GFX0)
  1. Screenshot



4. Note Framebuffer
  1. Azul/Capri - AAPL,ig-plartform-id/03 00 22 0d
  2. SNB - AAPL,snb-platform-id/10 00 03 00
5. Cancel Search (X)
6. Scroll Up
7. Select: AppleIntelFramebuffer (above AppleDisplay)
8. Scroll Property window to port-number
  1. Note port-number
9. Example: DP Display connected to AppleIntelFramebuffer@0/Port 0x5
  1. Screenshot



10. Example: DVI Display connected to AppleIntelFramebuffer@1/  
Port 0x6

1. Screenshot

IOService: /AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/IGPU@2/AppleIntelFramebuffer@1

**AppleIntelFramebuffer@1**

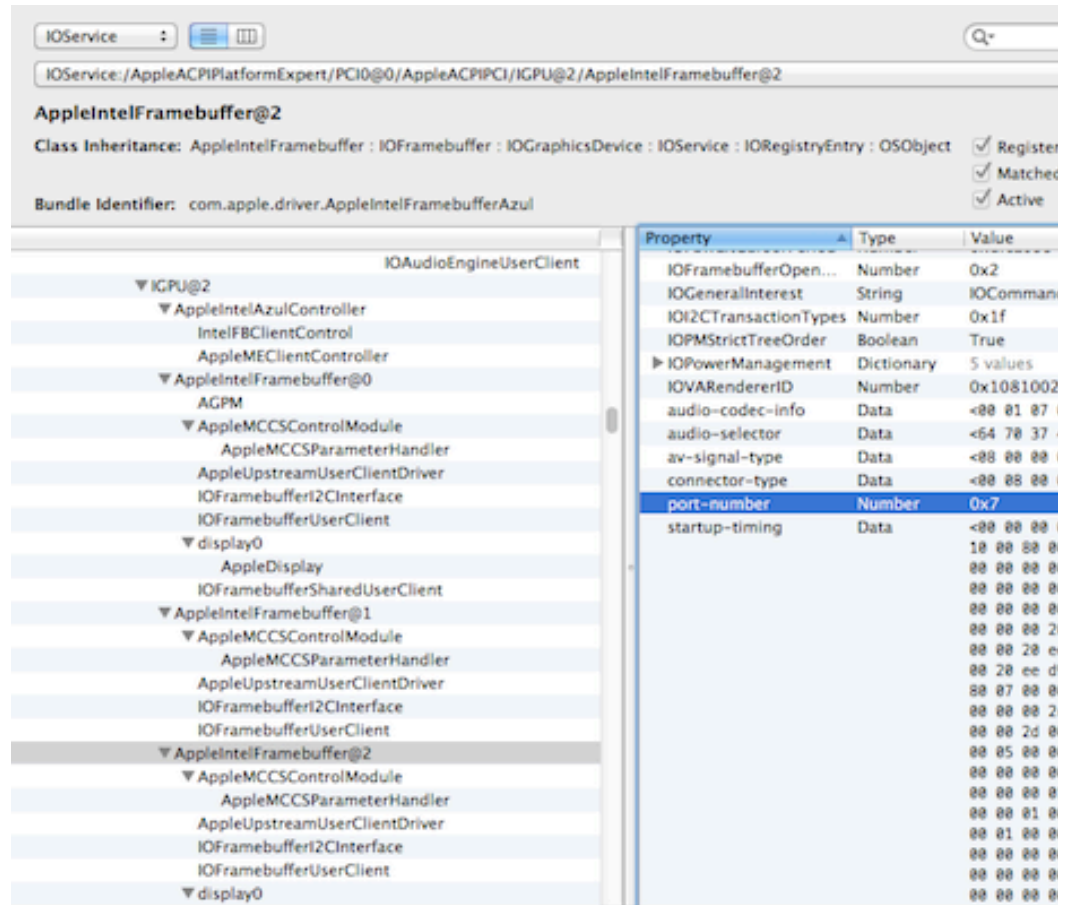
Class Inheritance: AppleIntelFramebuffer : IOFramebuffer : IOGraphicsDevice : IOService : IORegistryEntry : OSObject ☒ Register ☒ Match ☒ Active

Bundle Identifier: com.apple.driver.AppleIntelFramebufferAzul

Property	Type	Value
IOAudioEngineUserClient		01 01 00
IGPU@2		20 00 00
AppleIntelAzulController		00 00 00
IntelFBClientControl		00 00 00
AppleMEClientControl		00 00 00
AppleIntelFramebuffer@0		00 00 ff
AGPM		00 ff 1f
AppleMCCSControlModule		00 00 00
AppleMCCSParameterHandler		00 00 00
AppleUpstreamUserClientDriver		00 00 00
IOFramebufferI2CInterface		00 00 00
IOFramebufferUserClient		00 00 00
IOFramebufferSharedUserClient		00 00 00
display0		
AppleDisplay		
AppleIntelFramebuffer@1		
AppleMCCSControlModule		
AppleMCCSParameterHandler		
AppleUpstreamUserClientDriver		
IOFramebufferI2CInterface		
IOFramebufferUserClient		
display0		
AppleDisplay		
AppleIntelFramebuffer@2		
AppleMCCSControlModule		
AppleMCCSParameterHandler		
AppleUpstreamUserClientDriver		
IOFramebufferI2CInterface		
IOFBTransform	Number	0x0
IOFBUIScale	Data	<01 00 00
IOFBWaitCursorFrames	Number	0x17
IOFBWaitCursorPeriod	Number	0x1fca055
IOFramebufferOpen...	Number	0x1
IOGeneralInterest	String	IOComma
IOI2CTransactionTypes	Number	0x1f
IOPMStrictTreeOrder	Boolean	True
IOPowerManagement	Dictionary	5 values
IOVARendererID	Number	0x108100
audio-codec-info	Data	<00 01 06
audio-selector	Data	<64 70 46
av-signal-type	Data	<00 00 00
connector-type	Data	<00 00 00
port-number	Number	0x6

11. Example: HDMI Display connected to AppleIntelFramebuffer@2/  
Port 0x7

1. Screenshot



12. Repeat for additional displays (HDMI/DVI/DP)

13. Results (Note display connection(s))

Displays/Ports	Port 0x5	Port 0x6	Port 0x7
HDMI/DVI			
DP			
No Display (ND)			

14. Match Display Connections to Framebuffer Connector Edits

Connector Edits/ Ports	Port 0x5	Port 0x6	Port 0x7
Native SNB	DP or ND	DP or ND	HDMI
Native Azul	DP or ND	DP or ND	DP or ND
a - SNB/Capri/ Azul	DP or ND	HDMI/DVI	HDMI/DVI
b - SNB/Capri/ Azul	HDMI/DVI	DP or ND	HDMI/DVI
c - Azul	HDMI/DVI	HDMI/DVI	DP or ND
d - Azul	HDMI/DVI	HDMI/DVI	HDMI/DVI

e - Azul	DP or ND	HDMI/DVI	DP or ND
f - Azul	HDMI/DVI	DP or ND	DP or ND

## 15. Framebuffer Edits (Mavericks 10.9.x, -90/applies to all releases)

### 1. HD4600+/Azul

- a - graphics\_intel\_hd5k-azul-a-9v\_patch.command
- b - graphics\_intel\_hd5k-azul-b-9x\_patch.command
- c - graphics\_intel\_hd5k-azul-c-9x\_patch.command
- d - graphics\_intel\_hd5k-azul-d-9x\_patch.command
- e - graphics\_intel\_hd5k-azul-e-9x\_patch.command
- f - graphics\_intel\_hd5k-azul-f-9x\_patch.command

### 2. HD4000/Capri

- a - graphics\_intel\_hd4k-capri-a-90\_patch.command
- b - graphics\_intel\_hd4k-capri-b-90\_patch.command

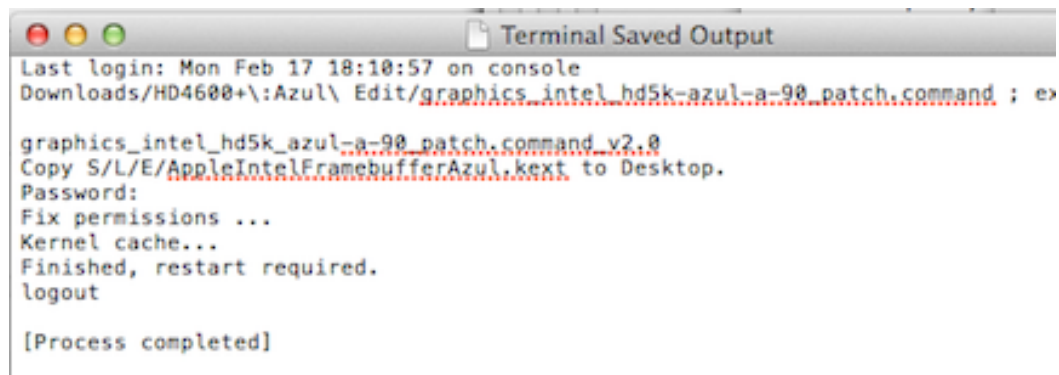
### 3. HD3000/SNB

- a - graphics\_intel\_hd3k-snb-a-90\_patch.command
- b - graphics\_intel\_hd3k-snb-b-90\_patch.command

## 16. Download script, [github.com/toleda/intel.....patch.command](https://github.com/toleda/intel.....patch.command)

## 17. Downloads/graphics\_intel.....patch.command (Do not move file)

1. Double click on file name
2. Enter Password
3. No errors, restart
1. Screenshot



```

Terminal Saved Output
Last login: Mon Feb 17 18:10:57 on console
Downloads/HD4600+/:Azul\ Edit/graphics_intel_hd5k-azul-a-90_patch.command ; e>

graphics_intel_hd5k_azul-a-90_patch.command v2.0
Copy S/L/E/AppleIntelFramebufferAzul.kext to Desktop.
Password:
Fix permissions ...
Kernel cache...
Finished, restart required.
logout

[Process completed]

```

## Tools

### 1. IOReg

1. IOReg (View Raw) - [https://github.com/toleda/audio\\_ALCInjection/blob/master/IORegistryExplorer\\_v2.1.zip](https://github.com/toleda/audio_ALCInjection/blob/master/IORegistryExplorer_v2.1.zip)
2. IOJones - <http://ge.tt/api/1/files/6C79yoh/0/blob?download>

2. DPCIManager - <http://sourceforge.net/projects/dpcimanager/>

### **Troubleshooting**

1. DPCIManager/Rebuild Cache
2. Restart

### **Restore Native Framebuffer kext**

1. Desktop/AppleIntel....-orig.kext
2. Rename AppleIntel....-orig.kext to AppleIntel.....kext
3. Install with Kext Installer (Kext Utility, DPCIManager, KextBeast, etc.)

### **Problem Reporting** (include the following information)

1. Description of HDMI audio problem
  1. OS X version/motherboard model/BIOS version/processor/graphics
  2. Procedure/Guide Used
  3. Copy of IOReg - IOReg\_v2.1/File/Save a Copy As..., verify file (no ioreg.txt)
  4. Chimera/Chameleon
    1. Extra/org.chameleon.Boot.plist
    2. Extra/dsdt.aml (if installed)
    3. Extra/ssdt.aml (if installed)
  5. Clover
    1. EFI/Clover/config.plist
    2. EFI/Clover/ACPI/Patched/dsdt.aml (if installed)
    3. EFI/Clover/ACPI/Patched/ssdt.aml (if installed)
2. Post to:
  1. <http://www.tonymacx86.com/hdmi-audio/112469-mavericks-hdmi-audio-applehda.html>
  2. <http://www.insanelymac.com/forum/topic/292999-mavericks-applehda-hdmi-audio/>

Credit bcc9: Editing Custom connector info for Intel HD 3000 Graphics (sandy bridge, OSX Lion) - Intel - InsanelyMac Forum

<http://www.insanelymac.com/forum/topic/259705-editing-custom-connectorinfo-for-intel-hd-3000-graphics-sandy-bridge-osx-lion/>