

read\_me\_first  
hd4000\_hdmi\_audio\_dsdt\_editing\_kit\_v1  
8/3/12 - toleda

#### Benefits

1. Automated HDMI audio dsdt editing
2. Works with most Ivy Bridge dsdts
3. Enables HD4000 HDMI audio (determined by Audio ID)
4. Installs AMD/Nvidia discrete graphics card HDMI audio

#### Before You Start:

1. OS X does not provide HDMI audio controls (No volume, no mute, no balance, etc.)
2. The connected HDMI device (TV, receiver, etc.) provides any and all audio controls

#### Requirements

1. Ivy Bridge System
  - a. Ivy Bridge motherboard
  - b. Ivy Bridge/HD4000 processor
2. OS X
  - a. Mountain Lion - 10.8 and newer
3. dsdt Version (either)
  - a. current dsdt version matching BIOS version
  - b. earlier dsdt version than BIOS version
4. dsdt Status (either)
  - a. tonymacx86 - DSDT Database
  - b. Extracted dsdt, complies without errors
5. AppleHDA.kext on board audio version 2.2.0 or newer from MultiBeast/Patched AppleHDA
6. Realtek supported audio codecs (8xy): 887, 888, 889, 892, 898
7. Chimera - 1.11 or newer

#### Approach

1. The files in the hdmi\_audio\_dsdt\_editing\_kit folder represent the HDMI audio dsdt edit source code.
2. Changes in the HDMI audio dsdt edits are made with a text editor to the appropriate file in the hdmi\_audio\_dsdt\_editing\_kit and installed with DSDT Editor.
3. The hdmi\_audio\_dsdt\_editing\_kit folder is preserved for BIOS updates and new installations.

#### Tools

1. DSDT Editor - Registration required, olarila.com • View topic - DSDT editor and patcher
2. IORegistryExplorer see [Guide] How to Make a Copy of IOReg
3. Applications/Utilities/Console
4. Applications/TextEdit
5. Carbon Copy Cloner or SuperDuper

#### Audio ID

1. Determine motherboard audio codec device\_id
  - a. See Key Information below
  - i. Example: 10ec0889
2. Determine Audio ID
  - a. ALC887, use Audio ID: 387
  - b. ALC888, use Audio ID: 388
  - c. ALC889, use Audio ID: 389
  - d. ALC892, use Audio ID: 392

- e. ALC898, use Audio ID: 398
3. HD4000 Audio IDs are the same as HD3000 Audio IDs.

#### Installation

1. Back up current system (recommend Carbon Copy Cloner or SuperDuper bootable backup)
2. Copy Downloads/DSDT Editor Folder /DSDT Editor.app to Applications
3. Copy Downloads/hd4000\_hdmi\_audio\_dsdt\_editing\_kit to Desktop

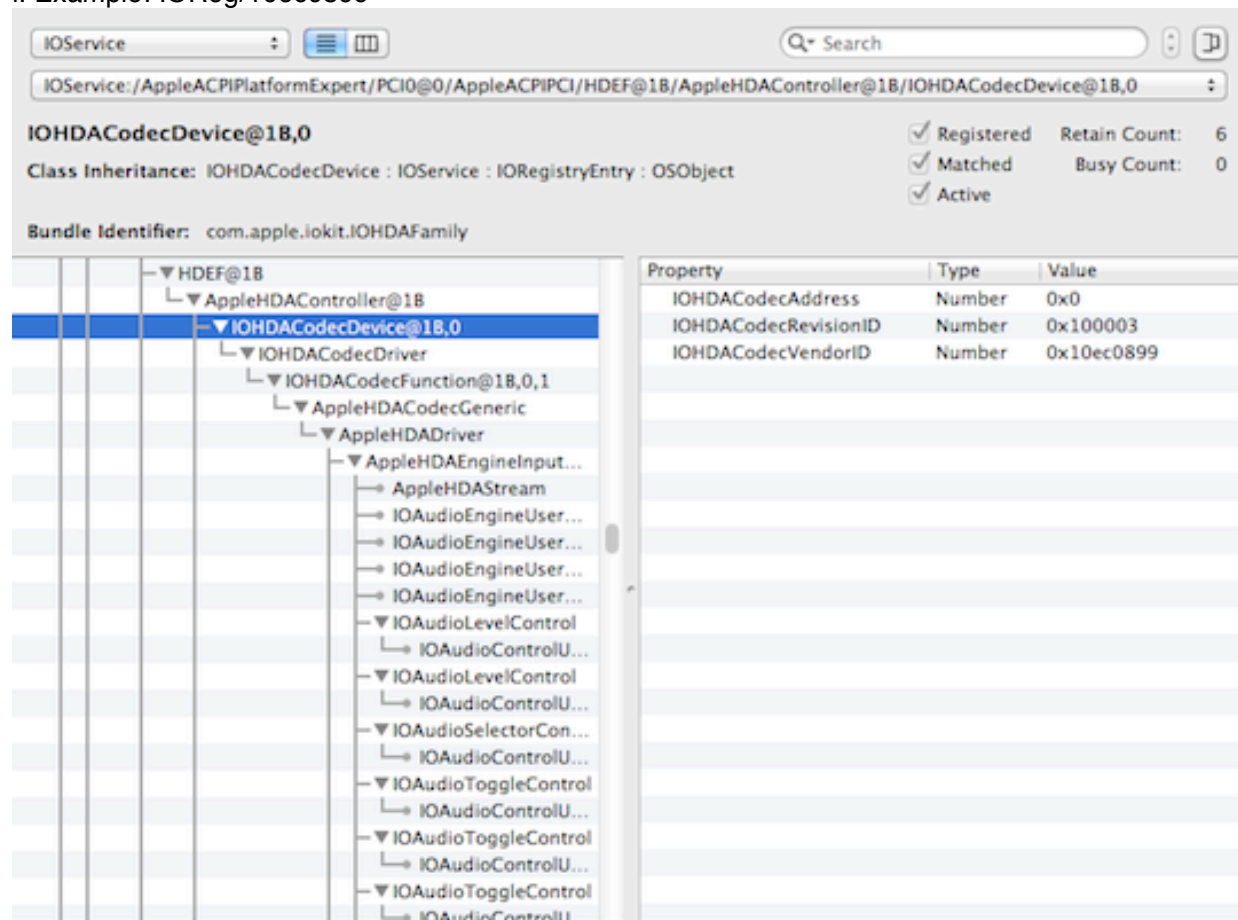
#### Attachment

1. hd4000\_hdmi\_audio\_dsdt\_editing\_kit

#### Key Information

##### A. IOReg

1. Determine motherboard audio codec device\_id
  - a. IOReg/AppleHDAController/OHDACodecDevice/OHDACodecVendorId
  - i. Example: IOReg/10ec0899



##### B. dsdt

1. Copy dsdt.aml to Desktop/hd4000-/hdmi\_audio\_dsdt\_editing\_kit
2. DSDT Editor/Open Desktop/hd4000\_hdmi\_audio\_dsdt\_editing\_kit/dsdt.aml
3. DSDT Editor/Compile
4. If no errors, jump to Preparation
5. if errors, fix and jump to 3. DSDT Editor/Compile

#### Preparation - TextEdit

1. TextEdit/Edit Desktop/hd4000\_hdmi\_audio\_dsdt\_edit\_kit/hdmi\_audio\_ivy\_bridge.txt

## 2. TextEdit/Find layout-id

a. Note: default layout-id is 18E, Audio ID: 398

```
"layout-id", \n
Buffer (0x04)\n
{\n
    0x8E, 0x01, 0x00, 0x00\n
}, \n
```

## 3. TextEdit/Edit layout-id

- a. ALC887, use Audio ID: 387, layout-id 0x83, 0x01, 0x00, 0x00
- b. ALC888, use Audio ID: 388, layout-id 0x84, 0x01, 0x00, 0x00
- c. ALC889, use Audio ID: 389, layout-id 0x85, 0x01, 0x00, 0x00
- d. ALC892, use Audio ID: 392, layout-id 0x88, 0x01, 0x00, 0x00
- e. ALC898, use Audio ID: 398, layout-id 0x8E, 0x01, 0x00, 0x00

## 4. TextEdit/Save

### Apply Edits - DSDT Editor

- 1. DSDT Editor/Open Desktop/hd4000\_hdmi\_audio\_dsdt\_editing\_kit/dsdt.aml
- 2. DSDT Editor/Patch/Open Desktop/hd4000\_hdmi\_audio\_dsdt\_editing\_kit/hdmi\_audio\_ivy\_bridge.txt
- 3. DSDT Editor/Patch/Preview Before/After - Optional
- 4. DSDT Editor/Patch/Apply
- 5. DSDT Editor/iASL/Compile
  - a. If no errors, jump to Verify
  - b. If errors. fix errors, jump to 5. DSDT Editor/iASL/Compile

### Verify Edits - DSDT Editor

- 1. DSDT Editor/Find IGPU (1x), Next until represented as Device (IGPU)

```
Device (IGPU)
{
    Name (_ADR, 0x00020000)
....
....

    Method (_DSM, 4, NotSerialized)
    {
        Store (Package (0x06)
        {
            "device-id",
            Buffer (0x04)
            {
                0x66, 0x01, 0x00, 0x00
            },

            "AAPL,ig-platform-id",
            Buffer (0x04)
            {
                0x0A, 0x00, 0x66, 0x01
            },

            "hda-gfx",
```

```

        Buffer (0x0A)
        {
            "onboard-1"
        }
    }, Local0)
    DTGP (Arg0, Arg1, Arg2, Arg3, RefOf (Local0))
    Return (Local0)
}
}

```

## 2. DSDT Editor/Find HDEF (1x), until represented as Device (HDEF)

```

Device (HDEF)
{
    Name (_ADR, 0x001B0000)
....
....

    Method (_DSM, 4, NotSerialized)
    {
        Store (Package (0x06)
        {
            "hda-gfx",
            Buffer (0x0A)
            {
                "onboard-1"
            },

            "layout-id",
            Buffer (0x04)
            {
                0x8E, 0x01, 0x00, 0x00
            },

            "PinConfigurations",
            Buffer (Zero) {}
        }, Local0)
        DTGP (Arg0, Arg1, Arg2, Arg3, RefOf (Local0))
        Return (Local0)
    }
}

```

## 4. If any Verify Edit failures, start over and/or seek assistance.

### Save dsdt - DSDT Editor

1. DSDT Editor/iASL/Save .aml As... Desktop//hd4000\_hdmi\_audio\_dsdt\_editing\_kit/dsdt. aml (add extension)
2. DSDT Editor/File//Save .dsl As... Desktop//Hd4000\_hdmi\_audio\_dsdt\_editing\_kit/dsdt-motherboard model-BIOS ver-.dsl (add extension)

### Install dsdt.aml - DSDT Editor

1. DSDT Editor/iASL/Save .aml As...Extra/dsdt.aml (add extension)

Verify S/L/E/AppleHDA.kext

1. MultiBeast/Patched AppleHDA/ALC 8xy/AppleHDA.kext\_v2.2.0

Restart

Verify HDMI Audio

1. System Preferences/Sound/Outputs

Notes

1. Audio ID: 398 (Default) in hdmi\_audio\_ivy\_bridge.txt

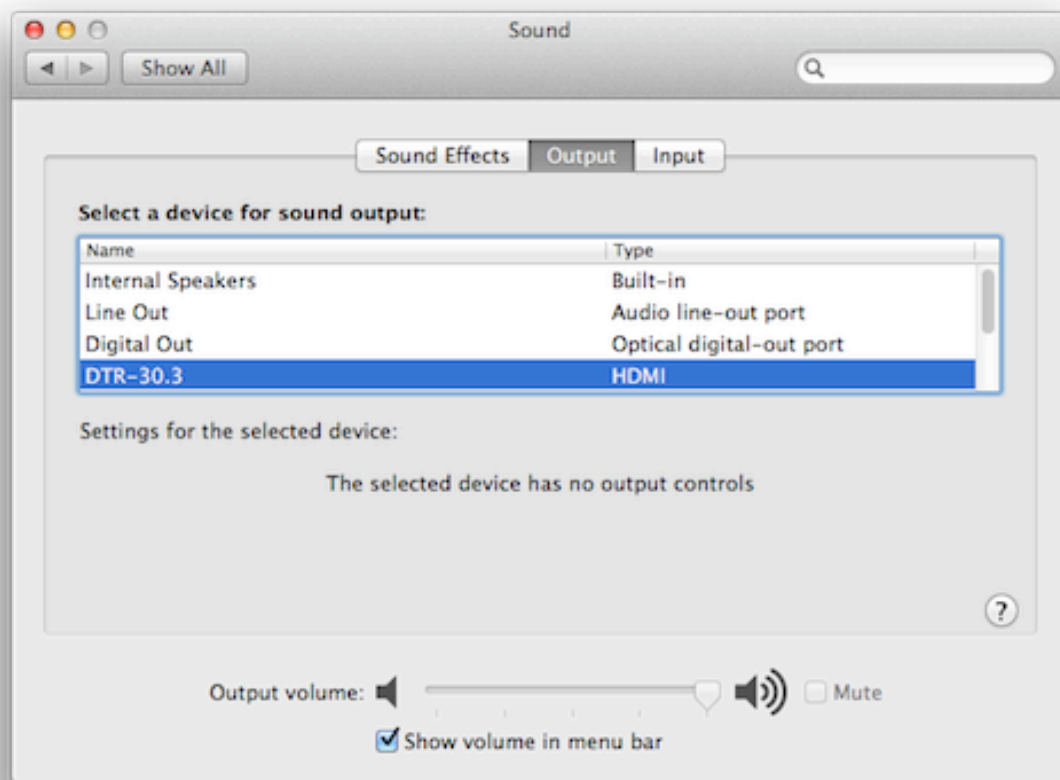
2. No frame buffer edits (AppleIntelFramebufferCapri.kext) with the following AAPL,ig-platform-id

a. 0a 00 66 01

b. 0b 00 66 01

Screen Shots

System Preferences/Sound/Output



System Information/Audio/Audio ID:398 (387, 388, 389 and 392 similar)

▼ Hardware	Audio
ATA	▼ Devices
Audio	AirPlay
Bluetooth	Built-in Input
Card Reader	Built-in Line Input
Diagnostics	Built-in Output
Disc Burning	Built-in Line Output
Ethernet Cards	Built-in Digital Output
Fibre Channel	HDMI
FireWire	▼ Intel High Definition Audio
Graphics/Displays	Speaker
Hardware RAID	Line Output
Memory	Internal Microphone
PCI Cards	Line Input
Parallel SCSI	Line Input
Power	Headphone
Printers	S/PDIF Optical Digital Audio Output
SAS	HDMI / DisplayPort Output
Serial-ATA	
Thunderbolt	
USB	
▼ Network	Intel High Definition Audio:
Firewall	Audio ID: 398
Locations	
Modems	<b>Speaker:</b>
Volumes	Connection: 1/8-Inch Jack
WWAN	<b>Line Output:</b>
Wi-Fi	Connection: 1/8-Inch Jack
▼ Software	<b>Internal Microphone:</b>
Accessibility	Connection: Internal
Applications	<b>Line Input:</b>
Components	Connection: 1/8-Inch Jack
Developer	<b>Line Input:</b>
Extensions	Connection: 1/8-Inch Jack
Fonts	<b>Headphone:</b>
Frameworks	Connection: 1/8-Inch Jack
Installations	<b>S/PDIF Optical Digital Audio Output:</b>
Logs	Connection: Combination Output
Managed Client	<b>HDMI / DisplayPort Output:</b>
Preference Panes	Connection: Display
Printer Software	
Profiles	
Startup Items	
Sync Services	

IOReg/IGPU

IOService

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

IGPU@2

Class Inheritance: IOPCIDevice : IOService : IORegistryEntry : OSObject

Bundle Identifier: com.apple.iokit.IOPCIFamily

Registered

Retain Count: 25

Matched

Busy Count: 0

Active

▼ IGPU@2

AppleIntelCapriController

AppleMEClientController

AppleIntelFramebuffer@0

AGPM

gpu-control

IOHWCControl

AppleMCCSControlModule

AppleMCCSParameterHandler

AppleUpstreamUserClientDriver

IOFramebuffer12CInterface

IOFramebufferUserClient

AppleIntelFramebuffer@1

AppleMCCSControlModule

AppleMCCSParameterHandler

AppleUpstreamUserClientDriver

IOFramebuffer12CInterface

IOFramebufferUserClient

AppleIntelFramebuffer@2

AppleMCCSControlModule

AppleMCCSParameterHandler

AppleUpstreamUserClientDriver

display0

AppleDisplay

IOFramebuffer12CInterface

Property	Type	Value
AAPL,gray-page	Data	<01 00 00 00>
AAPL,gray-value	Data	<c3 8c 64 00>
AAPL,ig-platform-id	Data	<0a 00 66 01>
AAPL,iokit-ndrv	Data	<20 fd db 80 7f ff ff ff>
AAPL,os-info	Data	<30 49 01 12 12 12 08 00 00 01 f0 1f 01 00 00 00 10 07 00 00>
AAPL,tbl-info	Data	<30 44 02 02 02 02 00 00 00 00 02 02 02 02 01 01 01 01>
acpi-device	String	IOACPIPlatformDev ice is not serializable
acpi-path	String	IOACPIPlane: /_SB/ PCI0@0/ IGPU@20000
assigned-addresses	Data	<10 10 00 82 00 00 00 00 00 00 80 f7 00 00 00 00>

IOReg/HDEF/HD4000 HDMI Audio

