[Guide] airport_pcie-hm_details.pdf

[Guide] airport_pcie-hm_details
Airport working OOB on Mountain Lion with Broadcom BCM4360 HMS and Atheros AR9280 Mountain Lion (10.8.5 and newer) reports as Airport Extreme. Wake on Wireless (Atheros) and AirDrop supported. Newer Broadcom WiFi cards not longer require rebranding to work in OS X.

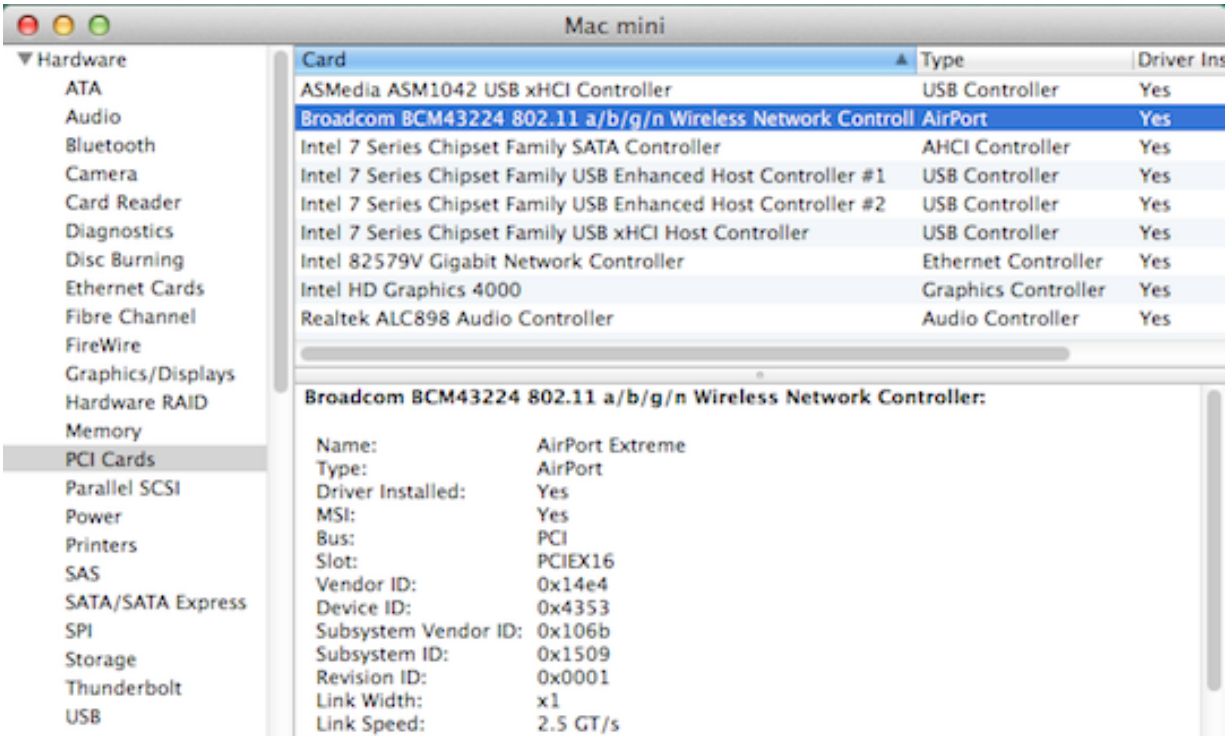
BCM943224 HMS, BCM943225 HMB and BCM94352 HMB PCIe Half Mini versions tested. AR9280, AR9285 and AR9287 PCIe Half Mini versions tested. Mini PCIe versions and Mini PCIe to PCIe versions expected to work.

WiFi + BT
1. BCM943352 HMB/AzureWave AW-CE123H supports both Airport and Bluetooth 4.0 (see Installation below)
    1. The Asus Superfast 802.11ac (Z87 Pro & Deluxe motherboards) is the BCM94352
2. BCM943225 HMB supports both Airport and Bluetooth 3.0 (requires dsdt edits or kext edits or kext injection or ssdt injection, see below).
3. For any working WiFi without BT, suggest: GMYLE Micro USB Bluetooth 4.0 Dongle Dual Mode Wireless Adapter | GMYLE Wake, dual mode with Low Energy Technology., native

Requirements
1. 10.8.5 or newer (The techniques in this thread do not work in 10.8.4 or earlier)
2. Supported Vendor/Device_ID (see Note 1)

User Responsibilities
1. WiFi card sources - the usual
2. Antennas - yes
3. Mini PCIe to PCI/PCIe adapters - no suggestions

I. Broadcom



Details/Native

1. Half Mini PCIe
    1. BCM4360 - 2.4/5 GHz ac+abgn, 3 Stream, 1300 Mbs (PCIe x1, not half mini at this time)

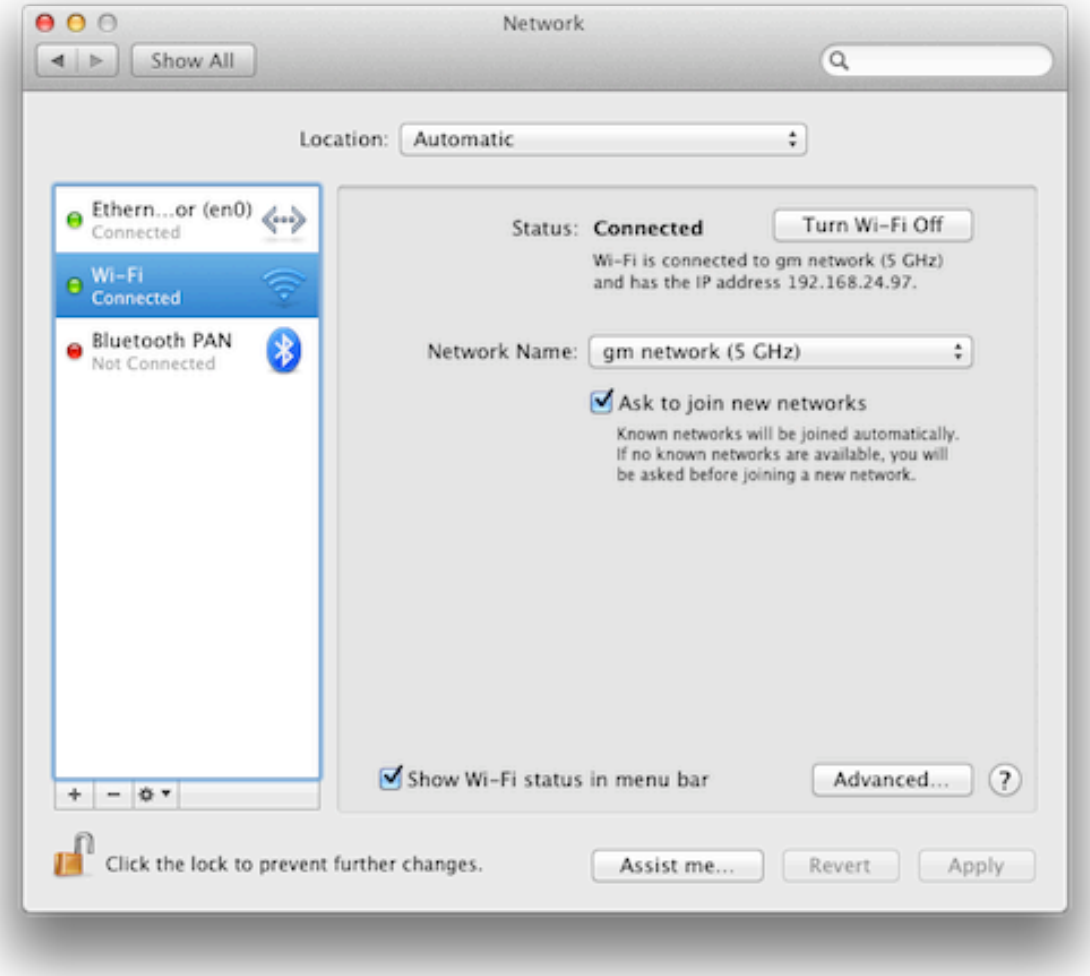
Alternatives (require dsdt or kext editing or kext or ssdt injection)

1. BCM943224 HMS - 2.4/5 GHz, bgn, 2 stream, 300 Mbs
2. BCM943225 HMB - 2.4, bgn, 2 stream, 108Mbs + BT (3.0)
3. BCM94352 HMB - 2.4/5 GHz, ac+abgn, 2 stream, 867 Mbs + BT (4.0)

Installation

1. Install Broadcom BCM94xxx Wi-Fi card
    1. BCM943224, BCM943225 and BCM94352
2. Enable airport (select 1 method)
    1. Install edited S/L/E/IO80211Family.kext with kext installer
    2. Install edited Extra/dsdt (airport edited dsdt)
    3. Install S/L/E/toledaARPT.kext with kext installer
    4. Instal Extra/SSDT (airport edited ssdt)
3. Restart
4. Open System Preferences/Network
5. Select +
6. In new dialog box:
    1. Interface WI-FI
    2. Service Name Wi-Fi
    3. Create
7. Select Turn Wi-Fi On

8. In new dialog box:
    1. Apply
9. Check Show WI-FI stays in menu bar
10. Select Join Other Networks, Enter
    1. Network Name
    2. Security
    3. Join
11. Wi-Fi Connected



Tools

1. IORegistryExplorer - audio_ALCInjection/IORegistryExplorer_v2.1.zip at master · toleda/audio_ALCInjection
2. dsdt editor- MaciASL Download MaciASL from SourceForge.net
3. property list editor - Xcode, Property List Editor, Plist Editor, or TextEdit
4. Rebuild cache - Download DPCIManager from SourceForge.net
5. kext installer - KextBeast, Kext Utility, DPCIManager

Non-Native Airport (select one, verify WiFi. If no WiFI - install native, restart)

1. **airport_kext_enabler** - toledaARPT.kext (see below for Device_IDs)
    1. Advantages: No edits, survives Software Updates and BIOS Updates
    2. Disadvantages: Potential signing issue (likely resolved with FakeSMC signing)
    3. Download toledaARPT.kext from https://github.com/toleda/airport_pcie-hm/tree/master/airport_kext_enabler
    4. Copy Downloads/toledaARPT.kext to Desktop
    5. Run kext installer
2. **kext edit**
    1. Advantages: Simple edits
    2. Disadvantages: Apply after each Software Update, Potential signing issue
    3. Backup S/L/E/IO80211Family.kext
    4. Property List Editor/Open/S/L/E/IO80211Family.kext/Contents/Plugins/AirPortBrcm4360.kext/Contents/Info.plist
        1. find: <string>pci14e4,43a0</string> Native (select one)
            1. add: <string>pci14e4,4353</string> For BCM943224
            2. add: <string>pci14e4,4357</string> For BCM943225
            3. add: <string>pci14e4,43b1</string> For BCM94352
    5. Save
    6. Move to Desktop
    7. Run kext installer
    8. More info: see [Guide] airport_pcie-hm_plist_edits.pdf
3. **dsdt edit**
    1. Advantages: Native, no signing issue
    2. Disadvantages: Apply after each BIOS/UEFI Update, advanced technique
    3. Backup Extra/dsdt.aml
    4. IOReg/Find PEX? or RP0? or ?@1C,? with VendorID of 14e4
    5. For MaciASL/airport_pcie-hm_dsdt_edits see [Guide] airport_pcie-hm_dsdt_edits.pdf
    6. dsdt/add:

```
Method (_DSM, 4, NotSerialized)
{
    If (LEqual (Arg2, Zero))
    {
        Return (Buffer (One)
        {
            0x03
        })
    }

    Return (Package (0x0C)
    {
        "AAPL,slot-name",
        "AirPort",
        "built-in",
```

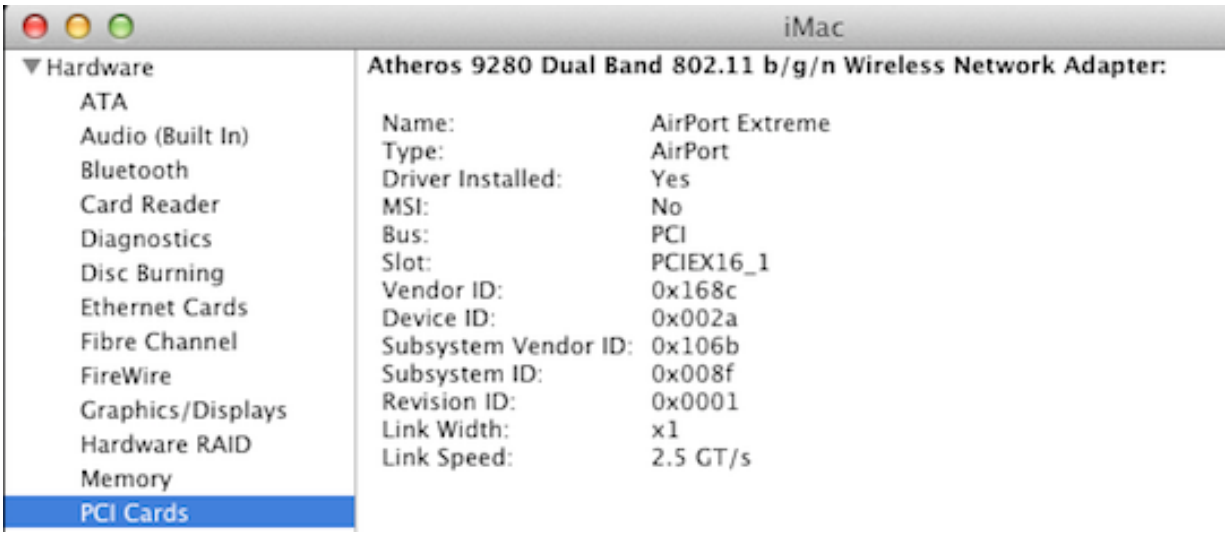
```
                    Buffer (One)
                    {
                       0x00
                    },

                    "device_type",
                    "AirPort",
                    "model",
                    "Broadcom BCM4322x 802.11 a/b/g/n Wireless Network
Controller",
                    "name",
                    "AirPort Extreme",
                    "compatible",
                    "pci14e4,43a0"
                })
            }
```

7. Compile
8. Save
9. Install: Finder/Copy dsdt.aml and Paste/Extra/dsdt.aml

4. airport_ssdt_enabler - airport_ssdt-bcm943xx_v1

1. Advantages: No edits, survives Software Updates and BIOS Updates
2. Disadvantages: forget it is there
3. Download airport_ssdt-bcm943xx_v1.zip from https://github.com/toleda/airport_pcie-hm/tree/master/airport_ssdt_enabler
4. Copy Downloads/airport_ssdt-.. . ./SSDT-2.aml to Extra
    1. If Extra/SSDT.aml is present and no SSDT-1.aml, install SSDT-2.aml as is: Extra/SSDT-1.aml
    2. If no Extra/SSDT.aml, rename SSDT-2.aml to SSDT.aml and install as: Extra/SSDT.aml
    3. The 1st SSDT is SSDT, 2nd is SSDT-1, 3rd is SSDT-2, etc.; no gaps
5. Enable SSDT (Chameleon/Chimera - DropSSDT, Clover - DropOem)
6. DPCIManager/Rebuild cache
7. Restart

II Atheros



Details/Native

1. AR9280 - 2.4/5 GHz abgn, 2 Stream, 300 Mbs
2. AR9380 - 2.4/5 GHz abgn, 3 Stream, 450 Mbs
3. Half Mini PCIe

Alternatives (require dsdt or kext editing or kext or ssdt injection)

1. AR9285 - 2.4 GHz, abgn, 1 stream, 54 Mbs
2. AR9287 - 2.4 GHz, abgn, 2 stream, 108 Mbs
3. Combo - AR928x + Bluetooth (no OS X support for Atheros bluetooth)

Installation

1. Install Atheros AR928x Wi-Fi card
    1. If AR9280 or AR9380 installed jump to Step 4
    2. If AR9285 or AR9287 installed edit kext or dsdt
2. Enable airport (select 1 method)
    1. Install edited S/L/E/IO80211Family.kext with kext installer
    2. Install edited Extra/dsdt/ARPT with Finder
    3. Install S/L/E/toledaARPT.kext with kext installer4. Restart
3. Restart
4. Open System Preferences/Network
5. Select +

6. In new dialog box:
    1. Interface WI-FI
    2. Service Name Wi-Fi
    3. Create
7. Select Turn Wi-Fi On
8. In new dialog box:
    1. Apply
9. Check Show WI-FI stays in menu bar
10. Select Join Other Networks, Enter
    1. Network Name
    2. Security
    3. Join
11. Wi-Fi Connected (see screenshot above)

Tools

1. IORegistryExplorer - audio_ALCInjection/IORegistryExplorer_v2.1.zip at master · toleda/audio_ALCInjection
2. dsdt editor- MaciASL Download MaciASL from SourceForge.net
3. property list editor - Xcode, Property List Editor, Plist Editor, or TextEdit
4. Rebuild cache - Download DPCIManager from SourceForge.net
5. kext installer - KextBeast, Kext Utility, DPCIManager

Non-Native Airport (select one, verify WiFi. If no WiFI - install native, restart)

1. **airport_kext_enabler** - toledaARPT.kext (see below for Device_IDs)
    1. Advantages: No edits, survives Software Updates and BIOS Updates
    2. Disadvantages: Potential signing issue (likely resolved with FakeSMC signing)
    3. Download toledaARPT.kext from https://github.com/toleda/airport_pcie-hm/tree/master/airport_kext_enabler
    4. Copy Downloads/toledaARPT.kext to Desktop
    5. Run kext installer
2. **kext edit**
    1. Advantages: Simple edits
    2. Disadvantages: Apply after each Software Update, Potential signing issue
    3. Backup S/L/E/IO80211Family.kext
    4. S/L/E/IO80211Family.kext/Contents/Plugins/AirPortAtheros40.kext/Contents/Info.plist
        1. find: <string>pci168c,2a</string> Native (select one)
            1. add: <string>pci168c,2b</string> For AR9285
            2. add: <string>pci168c,2e</string> For AR9287
    5. Save
    6. Move to Desktop
    7. Run kext installer
    8. More info: see [Guide] airport_pcie-hm_plist_edits.pdf
3. **dsdt Edit**
    1. Advantages: Native, no signing issue

2. Disadvantages: Apply after each BIOS/UEFI Update, advanced technique
3. Backup Extra/dsdt.aml
4. IOReg/Find PEX? of RP0? or ?@1C,? with VendorID of 168c
5. For MaciASL/airport_pcie-hm_dsdt_edits see [Guide] airport_pcie-hm_dsdt_edits.pdf
6. dsdt/add:

```
Method (_DSM, 4, NotSerialized)
 {
    If (LEqual (Arg2, Zero))
    {
       Return (Buffer (One)
       {
          0x03
       })
    }

    Return (Package (0x0C)
    {
       "AAPL,slot-name",
       "AirPort",
       "built-in",
       Buffer (One)
       {
          0x00
       },

       "device-type",
       "AirPort",
       "model",
       "Atheros AR9x8x 802.11 a/b/g/n Wireless Network
Controller",
       "name",
       "AirPort Extreme",
       "compatible",
       "pci168c,30"
    })
 }
```

7. Compile
8. Save
9. Install: Finder/Copy dsdt.aml and Paste/Extra/dsdt.aml

Note: After installation, dsdt.aml shows:

```
"device-id",
 Unicode ("0"),
```

Same as:

```
"device-id",
```

```
Buffer (0x04)
 {
    0x30, 0x00, 0x00, 0x00
 },
```

Extra credit: For either Broadcom or Atheros dsdt edits
Note:
Do not apply the edit below if Device (PXSX) exists in Device (RP0x)

For IOReg cosmetic reasons, edit dsdt
after:

```
Device (RP0x)
{
Name (_ADR, 0x001C000x)
```

add:

```
Device (ARPT)
{
      Name (_ADR, Zero)
      Name (_SUN, One)
      Name (_PRW, Package (0x02)
      {
      0x09,
            0x04
      })
}
```

before:

```
Method (_DSM, 4, NotSerialized)
```

4. **airport_ssdt_enabler** - airport_ssdt-ar928x_v1
    1. Advantages: No edits, survives Software Updates and BIOS Updates
    2. Disadvantages: forget it is there
    3. Download airport_ssdt-ar928x_v1.zip from https://github.com/toleda/airport_pcie-hm/tree/master/airport_ssdt_enabler
    4. Copy Downloads/airport_ssdt-.. . ./SSDT-2.aml to Extra
        1. If Extra/SSDT.aml is present and no SSDT-1.aml, install SSDT-2.aml as is: Extra/SSDT-1.aml
        2. If no Extra/SSDT.aml, rename SSDT-2.aml to SSDT.aml and install as: Extra/SSDT.aml
        3. The 1st SSDT is SSDT, 2nd is SSDT-1, 3rd is SSDT-2, etc.; no gaps
    5. Enable SSDT (Chameleon/Chimera - DropSSDT, Clover - DropOem)
    6. DPCIManager/Rebuild cache
    7. Restart

Troubleshooting

1. Verify WiFi card installed and antennas connected
    1. System Information/Network
    2. System Information/Network/WiFi

2. Verify Extra/dsdt.aml is
    1. .aml file
    2. edited
3. IOReg/Find PEX? or RP0? or ?@1C,? with VendorID of 14e4 or 168c
    1. Device_ID
    2. compatible
    3. name
4. Problem Reporting/Post to
    1. Motherboard/BIOS version/processor/graphics/OS and version/WiFi card info
    2. Procedure/Guide Used
    3. dsdt/native (.dsl)
    4. dsdt/edited (.dsl)
    5. copy of IOReg

toledaARPT.kext_v1.0/Contents/Info.plist/Device_IDs/Supported (*native, not present)

1. Broadcom 802.11 PCI
    1. pci14e4,43b1
    2. pci14e4,43a0*
    3. pci14e4,4357
    4. pci14e4,4353
2. Atheros Wireless LAN PCI
    1. pci168c,30*
    2. pci168c,2e
    3. pci168c,2b
    4. pci168c,2a*
3. Broadcom2046FamilyUSBBluetoothHCIController_10
    1. idProduct: 6069 (0x17b5)
    2. idVendor: 2821 (0x0b05- Toshiba/Broadcom BCM20702/BCM943225)

EEPROM Programming
See Credit posts

Credit
THe KiNG http://www.projectosx.com/forum/index.php?showtopic=1416
Andy Vandijck http://www.insanelymac.com/forum/index.php?showtopic=234570