Aptio MMTool 5.01 User Guide

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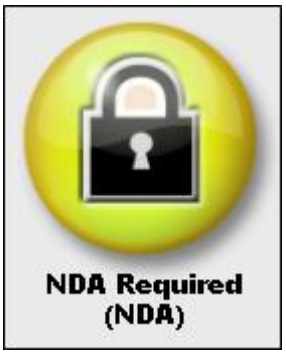

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Revision History

Date	Revision	Description
2004-08-16		Initial release
2005-11-28		Updated to reflect changes made in incorporating support for Aptio 4 projects.
2007-03-02		FVDLL with complete FFS spec support. Modifications to GUI. PEIRebase support added.
2007-08-23		Updated document format.
2007-09-12		Added product version number to page 1.
2007-09-19		Updated product version number, feature, screenshot in page 4 and document format.
2008-02-05		Single executable released with new FWLIB.
2009-01-21	1.02	Add CPU Patch and ROM hole features.
2009-08-04	1.03	Updated title and legal page.
2010-02-10	1.04	Updated product version and copyright year. Included command line options.
2011-06-13	1.05	Update with capsule and CPU patch changes.
2011-07-15	1.06	Updated document standards and Option ROM's Volume index input for insert operation.
2012-01-09	1.07	AMI secure capsule.
2012-09-17	1.08	Updated the Notes section under the CPU Patch Tab.
2012-12-04	1.09	Updated build number for MMTool 4.53.0040 release.
2013-06-21	1.11	Updated build number and version number for MMTool 5.00.000 release
2013-08-22	1.12	Updated for AptioV Option Rom support
2013-10-10	1.13	Updated screen shots for Option rom tab
2014-01-02	1.14	Updated supported OS list
2014-02-20	1.15	Updated With New feature for the Option Rom Tab and command line to display Vendor Id and Device Id for the Option Rom. Added New Option Rom Screen Shot in Page No:29
2014-12-10	1.16	Added information on replace section data support. Updated tool version number to 5.01 and updated feature list. Other documentation standards changes.

Table of Contents

Revision History 3
Introduction 6
Overview 6
MMTOOL Features 6
Requirements 8
Getting Started 9
Installation 9
Basic Screen Information 9
Sample Screen 9

Chapter 1 MMTOOL Operation 10

Overview 10
Buttons 11
Fields 11

Chapter 2 Features and Functions 12

Overview 12
Insert Module Tab 12
Insert Module Tab, Continued 13
Fields 13
Buttons 13
Option Buttons 14
Inserting Modules 14
Insert Module Tab, Continued 14
Insert Option ROM (Aptio4) 14
Replace Module Tab 16
Fields 16
Replace Module Tab, Continued 17
Replace Modules 17
Buttons 17
Replace Module Tab, Continued 18
Replace Option ROM (Aptio4) 18
Delete Module Tab 19
Fields 19
Delete Module Tab, Continued 20
Deleting Modules 20
Delete Option ROM (Aptio 4) 20
Extract Module Tab 21
Fields 21
Extract Module Tab, Continued 22
Buttons 22
Extracting Modules 22
Extract Module Tab, Continued 23
Extract Option ROM (Aptio 4) 23
CPU Patch Tab 24

Fields 24
ROM Hole Tab 25
Fields 25
Option ROM Tab 26
Fields 26
Chapter 3 Command Line Options in MMTool for Aptio 30
Usage Examples: 38

Introduction

Overview

MMTOOL stands for Module Management Tool. Basically, it allows you to manage the Firmware file modules that are contained in the Aptio firmware image.

These operation modes are explained in detail in chapter 3, MMTOOL Operation Modes.

MMTOOL Features

The MMTOOL Module Management Utility offers the following features:

- Insert Module
- Replace Module
- Delete Module
- Extract Module
- Manage Compressed Modules
- Support PEI/DXE Modules
- Compatible with the FFS Spec
- Supports Command Line Options
- Modifies the F/w Image without requiring rebuild
- User Friendly Graphical User Interface
- Displays all Modules contained in the F/w Image.
- Insert Option ROM
- Extract Option ROM
- Replace Option ROM
- Delete Option ROM
- Display CPU microcode patches
- Extract CPU microcode patch
- Replace CPU microcode patch
- Insert CPU microcode patch
- Insert, extract, and replace ROM holes
- Create Report of the contents of opened F/w Image
- Supports LZMA
- Single executable
- Supports AptioV
- Supports multiple CPU Microcode Patch files.
- Block execution on non Aptio V ROM image.
- Support to update unsigned areas without invalidating signature.
- Support for BIOS with FIT.
- Replace section data support (command line mode).

These features are explained in detail in chapter 3, Features and Functions.

Requirements

Supported Operating System

MMTOOL Firmware Module Management Utility is supported by the following operating systems:

- Microsoft® Windows® 2000
- Microsoft® Windows® XP
- Microsoft® Windows® 2003
- Microsoft® Windows® Vista
- Microsoft® Windows® 7
- Microsoft® Windows® 8
- Microsoft® Windows® 8.1
- Microsoft® Windows® Server 2008 R2
- Microsoft® Windows® Server 2012 R2

Firmware Requirements

MMTOOL Firmware Module Management Utility requires that the input file be an Aptio Firmware file.

The Aptio Firmware file can be loaded to your host system from the hard disk drive.

Compatible with AptioV. For Aptio 4.6 it is recommended to use MMTool at least version 4.39.

Capsule File Support

MMTOOL identifies a capsule file in one of two ways, if the file has a '.cap' extension or if the file type in the open file dialog box is set to Capsule Files (or '/cap' in command line). Once the file is identified as a capsule file, the image open process will return a load error if the image file does not have a valid capsule header.

Users must take care not to replace or cause to move a module that requires PE image relocation (rebasing).

MMTool allows the user to save a secure capsule file by invalidating the capsule signature and will display a warning. If only unsigned areas are updated, the signature won't be invalidated and there won't be any warning. It also allows saving AMI secure/unsecure capsule files as ROM. Non AMI capsules can only be saved as CAP file.

See the MMTool Specification for technical details.

Getting Started

Installation

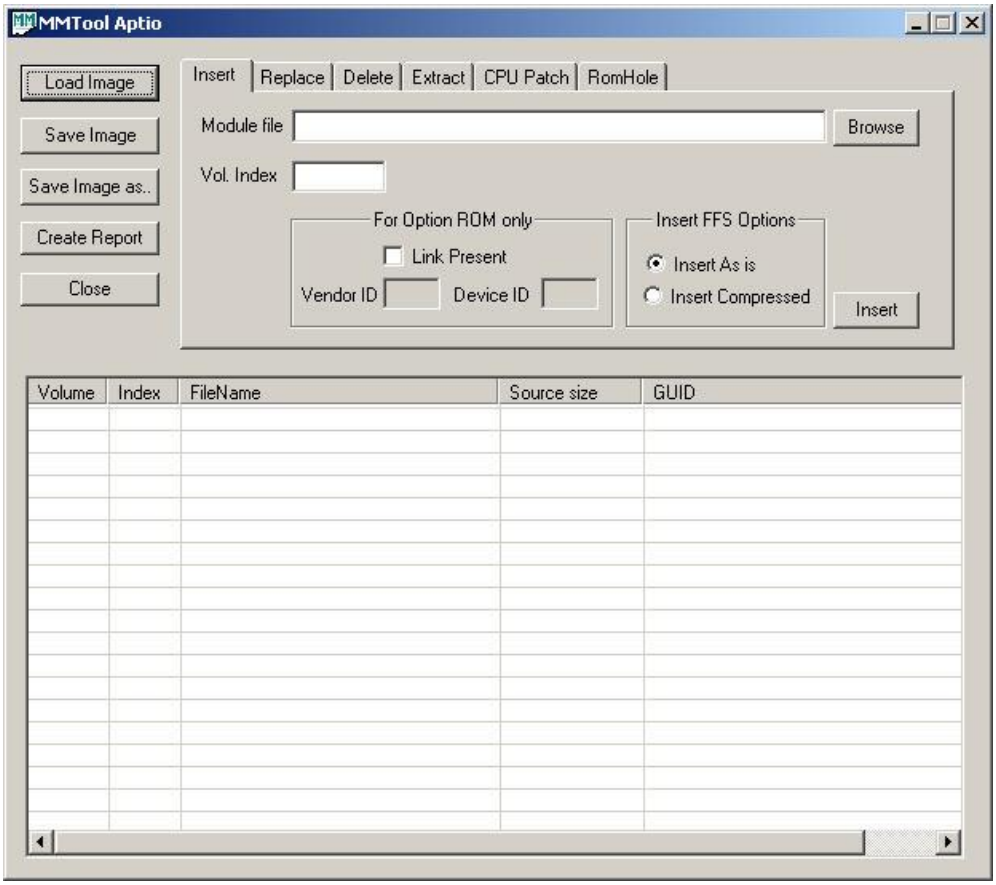
To install MMTOOL into your host system, unzip the MMTOOL.zip file and copy its contents to the hard disk drive.

To run the MMTOOL program, double left click on the MMTOOL.exe icon.

Basic Screen Information

Sample Screen

The MMTool *Utility* sample screen is shown below:



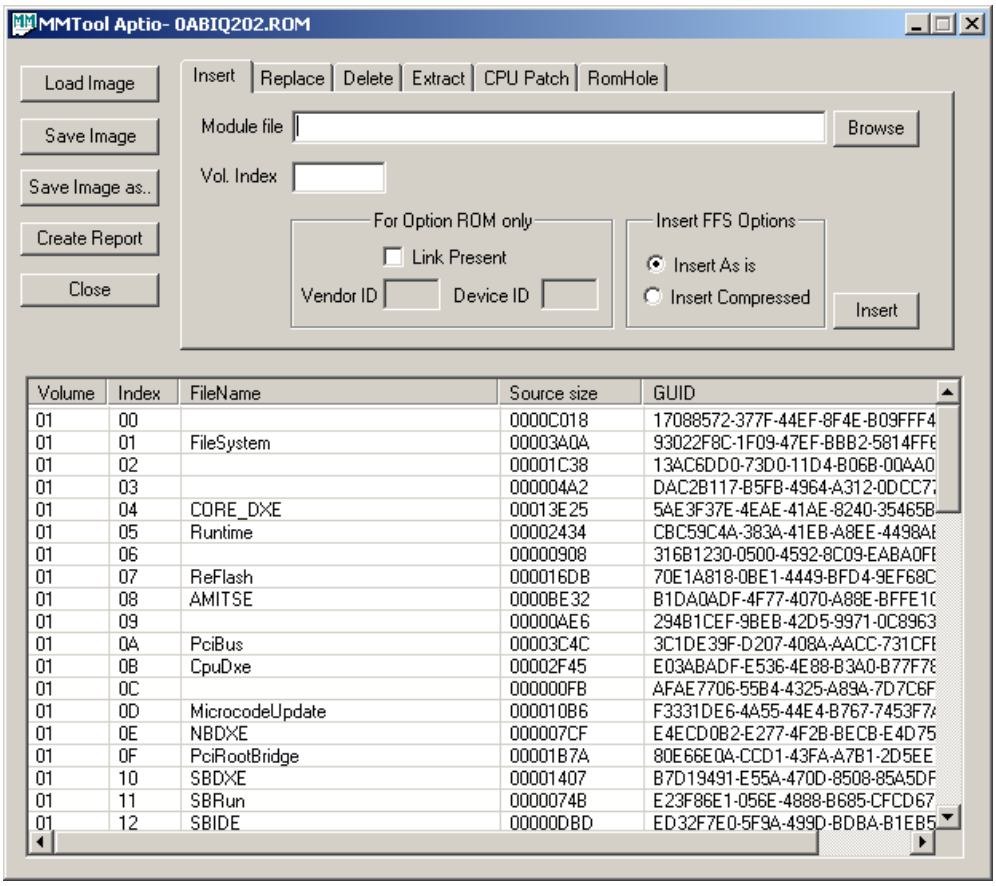
Chapter 1 MMTOOL Operation

Overview

This chapter explains the operation of MMTool.

The MMTOOL operation mode includes all of the MMTOOL features such as *Insert, Replace, Delete,* and *Extract* Aptio modules/Option ROMs.

An example of MMTOOL operation mode screen is shown below:



Buttons

Power MMTOOL buttons are explained in the following table:

Name	Button	Description
Load Image		The *Load Image* button allows you to load a Aptio firmware file from the hard disk drive, floppy disk drive or any other storage location
Save Image		The *Save Image* button allows you to save the changes you have made to the Firmware file that is currently opened.
Save ROM as		The *Save Image* as button has the same features as the Save Image button, but in addition, it allows you to specify the location and to change the existing file name. **Note:** It is recommended that you save your files periodically. You can lose all work performed if you experience an interruption during an edit session.
Create Report		The *CreateReport* button allows you to create report of the Firmware image, firmware volumes, FFS drivers, sections etc.. .
Close		The *Close* button allows you to exit the MMTOOL program. **Note:** You can also exit MMTOOL program by left click on the upper right corner of the MMTOOL window.

Fields

After you load a new Aptio Firmware Image, MMTOOL displays information about all present file modules in the Aptio Firmware Image. It displays files in all available Firmware Volumes.

Information about each field is explained in the following table:

Field	Description
Volume	This field displays volume number.
Index	Index of firmware file in current volume.
FileName	This field displays filename (If available)
Source size	This field displays the original module size in hex.
GUID	Displays GUID of the file.

Chapter 2 Features and Functions

Overview

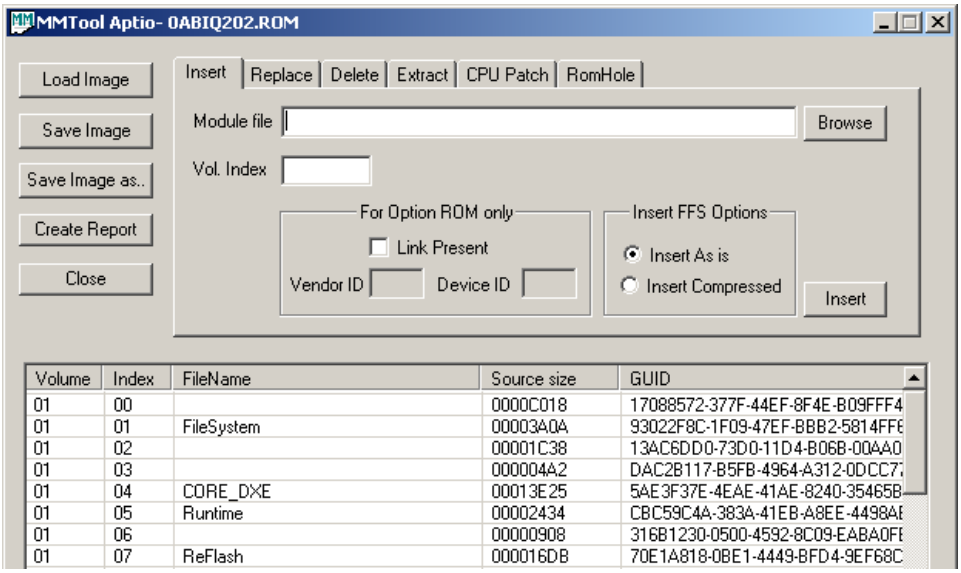
The MMTOOL Firmware Module Management Utility offers the following features:

- Insert Module
- Replace Module
- Delete Module
- Extract Module
- Insert Option ROM
- Replace Option ROM
- Delete Option ROM
- Extract Option ROM
- List CPU microcode patches
- Extract CPU microcode patch
- Delete CPU microcode patch
- Insert CPU microcode patch
- Insert, Extract, and Replace ROM hole files
- Create Report of the contents of opened F/w image
- Single executable
- Supports AptioV
- Supports multiple Microcode Patch files.
- Block execution on non Aptio V ROM image.
- Support to update unsigned areas without invalidating signature.
- Support BIOS with FIT.
- Replace section data support (command line mode).

These features are explained in more detail in this chapter.

Insert Module Tab

The *Insert Module* tab allows you to add a new Firmware module/Option ROM inside the Aptio Firmware file.



Insert Module Tab, Continued

Fields

The Insert Module tab fields and buttons are explained in the following table:

Field	Description
Module File	This field allows you to specify a new module file name.
Volume Index	The volume Index where the file needs to be inserted. This field updates automatically when user selects a volume in filelist.
Insert As is	Selecting this enables MMTool to insert given module as is. MMTool assumes given file as valid Firmware File System File.
Insert compressed	Selecting this enables MMTool insert file compressed.
Vendor ID	Provide the Vendor ID for Option ROM.
Device ID	Provide the Device ID for Option ROM.
Link Present	Selecting this enables MMTool insert Option ROM.

Note: MMTOOL does not check to see if the module file is a valid Firmware File Sytem (FFS) file. File gets inserted as last file in selected volume.

Buttons

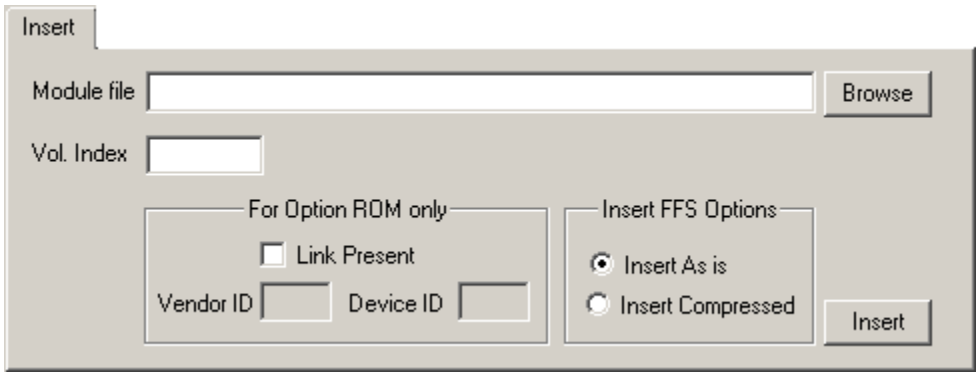
The *Insert Module* tab buttons are explained in the following table:

Name	Button	Description
Browse	Browse	The Browse button allows you to search for a new module file from the hard disk drive, the floppy disk drive, or any other storage location. For example: `C:\Project\mmtool\1B.bin`
Insert	Insert	The *Insert* button allows you to add a new module into the Aptio Firmware file.
Insert Option ROM	Insert	The *Insert* button allows you to add a new option ROM into the Aptio Firmware file.

Option Buttons

The *Insert Module* tab option buttons are explained in the following table:

Inserting Modules



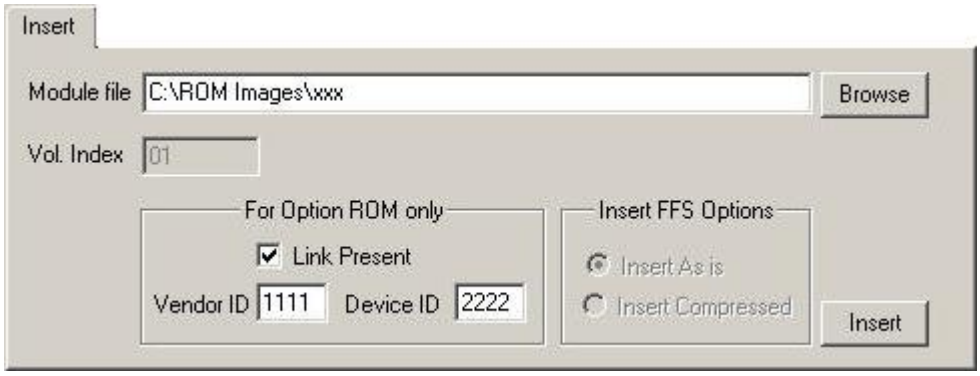
Insert Module Tab, Continued

You can insert new FFS file modules by following the steps outlined in the following table:

Steps	Description
1	Left click on the *Browse* button to specify the new module file location. **Note:** You can simply type the path and the file name in the *Module file* field.
2	Type volume Index where file to be inserted
3	To choose how the new module is to be inserted, select one of the option buttons (*Compress Module, or Insert as is*).
4	Left click on the Insert button to insert the new module into the firmware file.

Note: All fields in the *Insert Module* tab must be filled in properly before the Insert button is pressed.

Insert Option ROM (Aptio4)

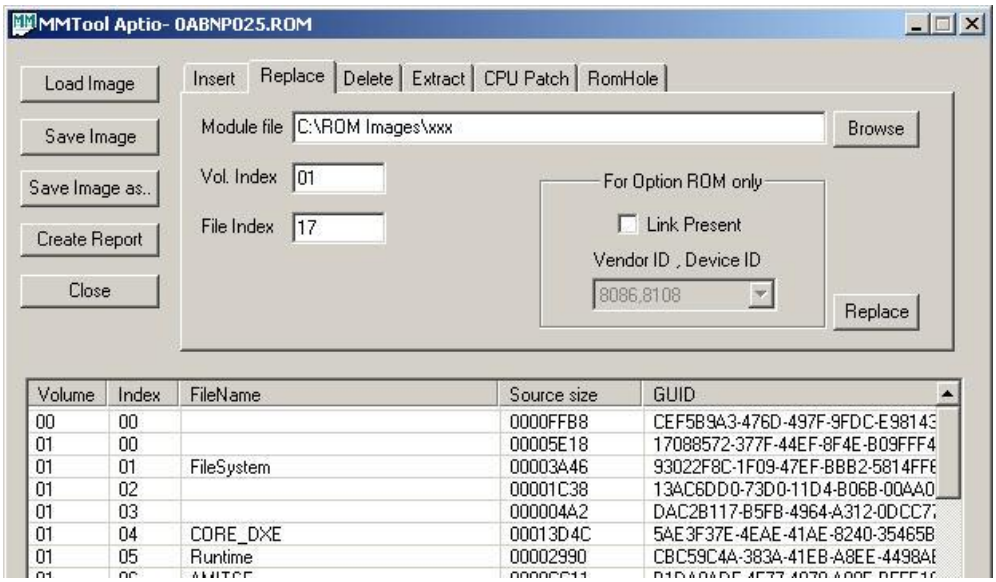


You can insert new Option ROM by following the steps outlined in the following table:

Step	Description
1	Left click on the Browse button to specify the new module file location. **Note:** You can simply type the path and the file name in the Module file field.
2	Type volume Index where file to be inserted
3	Check Link Present
4	Give 2 byte values for Vendor ID and Device ID
5	Press Insert button in the Option ROMs only group box

Replace Module Tab

The *Replace* Module tab allows you to substitute an existing Firmware file module /Option ROM inside the Aptio firmware image file with a new one.



Note: MMTOOL assumes that the replacement module file is a valid FFS file module.

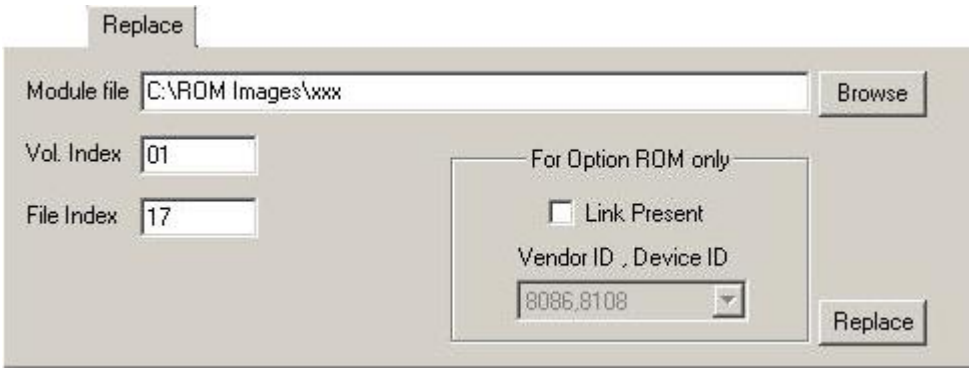
Fields

The *Replace* Module tab fields are explained in the following table:

Field	Description
Module File	This field allows you to specify the replacement module file name.
File Index	This field index number of file to be replaced.
Volume Index	This field holds index of Volume where the file resides.
Link Present	When the Link Present is checked, Option ROM can be replaced.
Combo Box	This will give the list of the Option ROMs present in the Firmware image

Replace Module Tab, Continued

Replace Modules



Buttons

The *Replace Module* tab buttons are explained in the following table:

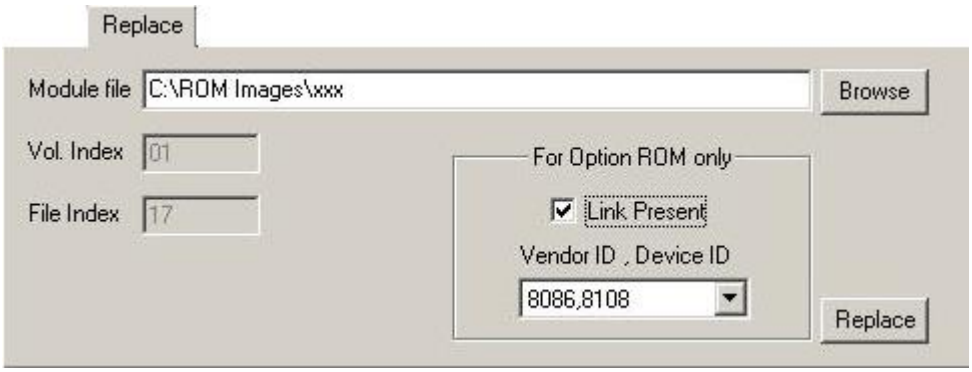
Name	Button	Description
Browse	Browse	The *Browse* button allows you to search for the module file from the hard disk drive, the floppy disk drive, or any other storage location. For example: `C:\Project\mmtool\1B.bin`
Replace	Replace	The *Replace* button allows you to substitute an existing module inside the Aptio firmware file with a new one.
Replace Option ROM	Replace	The *Replace* button in the "Option ROMs only" group box allows you to substitute an existing Option ROM inside the Aptio firmware file with a new one.

Replace Module Tab, Continued

You can replace the new Firmware modules by following the steps outlined in the following table:

Steps	Description
1	Left click on the Browse button to select a new module file location. **Note:** You can also simply type the path and the file name in Module File field.
2	Select file to be replaced from the file list or type file index number
3	Select file to be replaced from the file list or type volume number
4	To replace the existing module with the new module, left click on the Replace button. The new module will be replaced with the selected file.

Replace Option ROM (Aptio4)

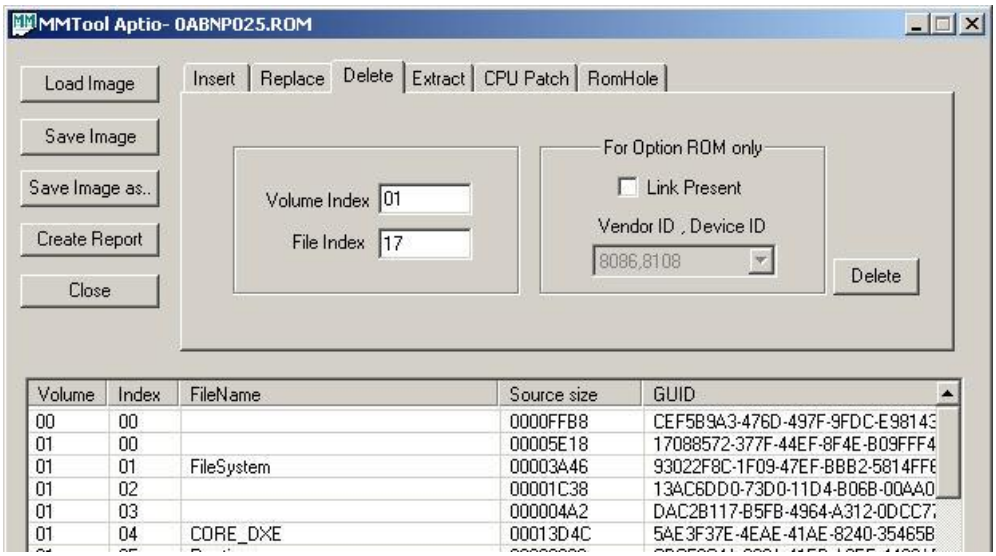


You can replace Option ROM by following the steps outlined in the following table:

Step	Description
1	Left click on the Browse button to specify the new module file location. **Note:** You can simply type the path and the file name in the *Module file* field.
2	Select one of the option ROMs in the combo box if any
3	Check Link Present
4	Press Replace button

Delete Module Tab

The *Delete Module* tab allows you to remove any Firmware module/Option ROM from the Aptio Firmware file.



Note: A deleted module is no longer available in the firmware file and cannot be recovered by using MMTOOL.

Fields

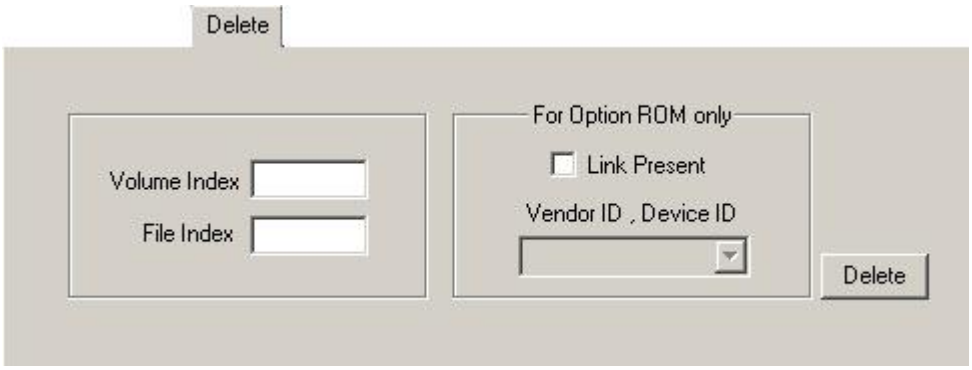
The *Delete Module* tab fields and buttons are explained in the following table:

Field/Button	Description
File Index	This field allows you to enter Index of file to be deleted.
Volume Index	This field allows you to enter Index of volume where file to be deleted is present.
Link Present	When the Link Present is checked, Option ROM can be deleted
Combo Box	This will give the list of the Option ROMs present in the Firmware image

Note: The original firmware image is not modified unless you use the *Save Image* or the *Save Image* As buttons to save changes.

Delete Module Tab, Continued

Deleting Modules

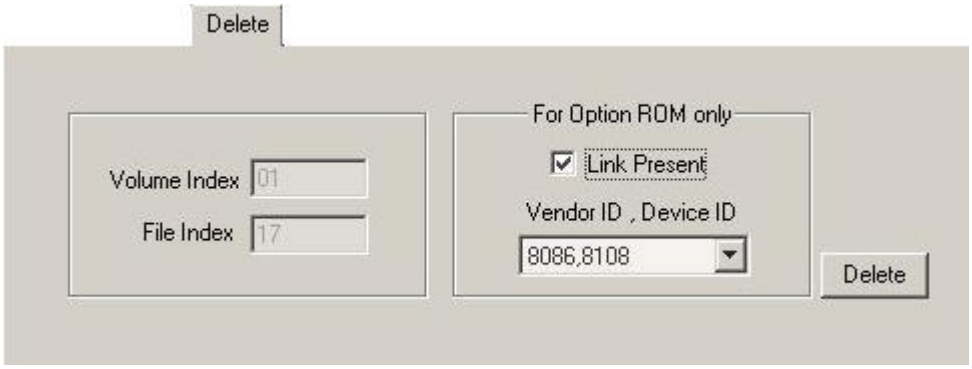


You can delete any Firmware module by following the steps outlined in the following table:

Step	Description
1	Enter file index of file to be deleted
2	Enter volume index of volume where file to be deleted present
3	Left click on the Delete button to remove the module.

Note: Deleting a firmware file module can cause critical errors. It can also cause the system failure to boot.

Delete Option ROM (Aptio 4)

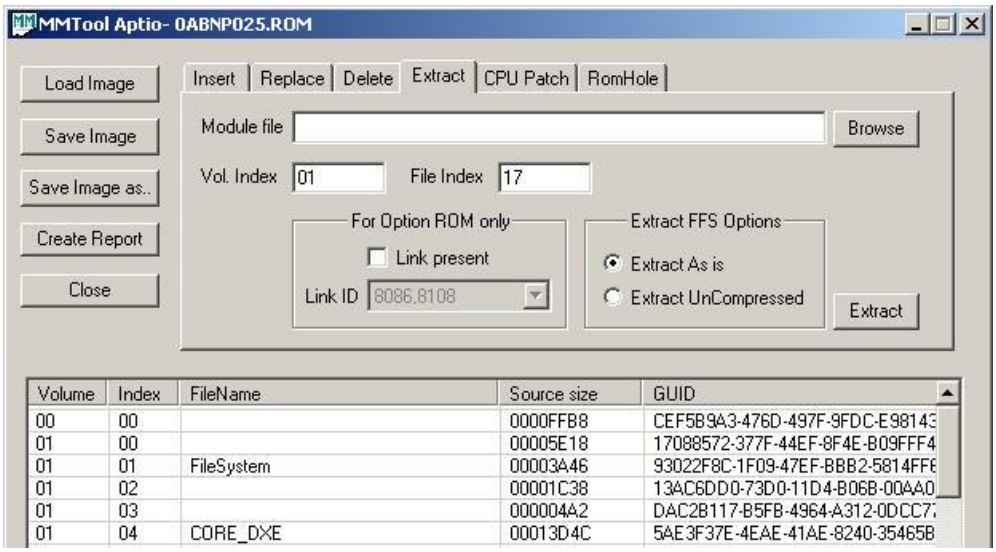


You can delete any Option ROM by following the steps outlined in the following table:

Step	Description
1	Check the Link present checkbox
2	Select one of the Options in the list(combobox)
3	Click on Delete button

Extract Module Tab

The *Extract Module* tab allows you to copy any Firmware module/Option ROM from the Firmware Image file.



Note: The Firmware Module is saved to the selected file.

Fields

The *Extract Module* tab fields and buttons are explained in the following table:

Field	Description
Module File	This field allows you to specify the module file name.
File Index	This field allows you to enter index of the file to be extracted.
Volume Index	This field allows you to enter index of the volume where file to be extracted located.
As is	This option extracts file “as is”. The file will be in FFS format.
Uncompressed	This option creates a uncompressed version of the FFS file. File will be in FFS format.
Link Present	This option is for extracting the Option ROMs.
Combobox	This gives the list of the option ROMs present in the Firmware image.

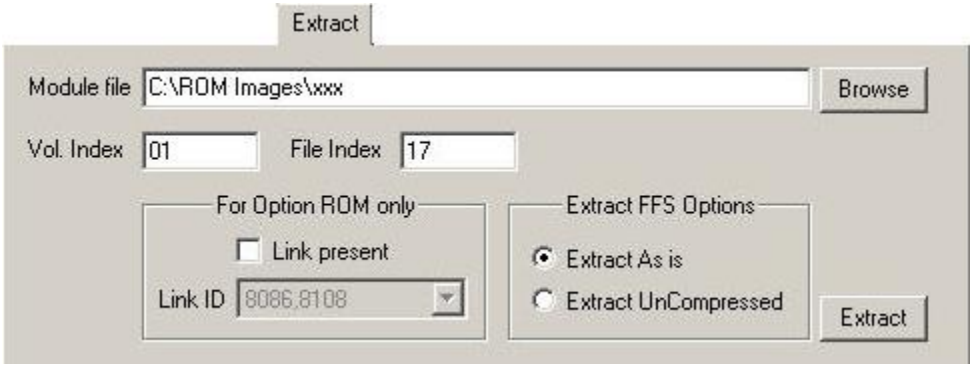
Extract Module Tab, Continued

Buttons

The *Extract Module* tab buttons are explained in the following table:

Name	Button	Description
Browse	Browse	This button allows you to search for the module files from the hard disk drive, the floppy disk drive, or any other storage location. For example: `C:\Project\mmtool\1B.bin`
Extract	Extract	This button allows you to save the selected module to the named file in the *Module File* field.
Extract Option ROM	Extract	This button, when the Link Present is checked allows you to save the selected Option ROM to the named file in the *Module File* field.

Extracting Modules



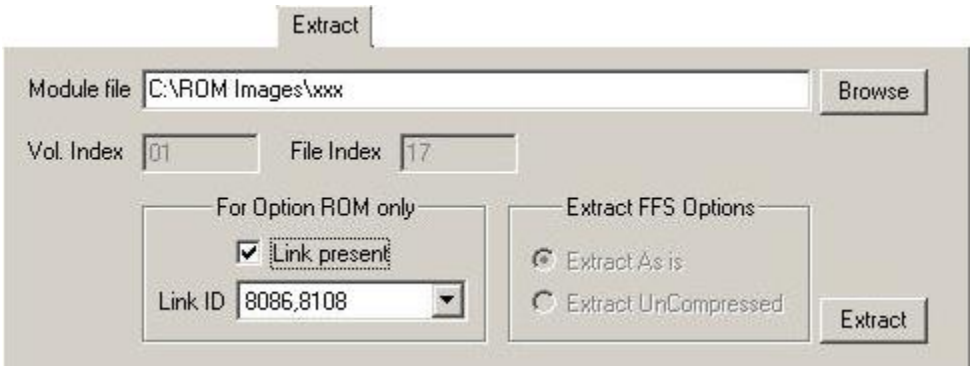
Note: Extracting a FFS file module will not affect the firmware image.

You can extract new FFS file modules by following the steps outlined in the following table:

Step	Description
1	Left click on the Browse button to select the module file location. **Note:** You can also simply type the path and the file name in *Module File* field.
2	Type file index and volume index
3	Select one of “As is” or “UnCompressed” options.
4	Left click on the Extract button to extract the existing module.

Extract Module Tab, Continued

Extract Option ROM (Aptio 4)

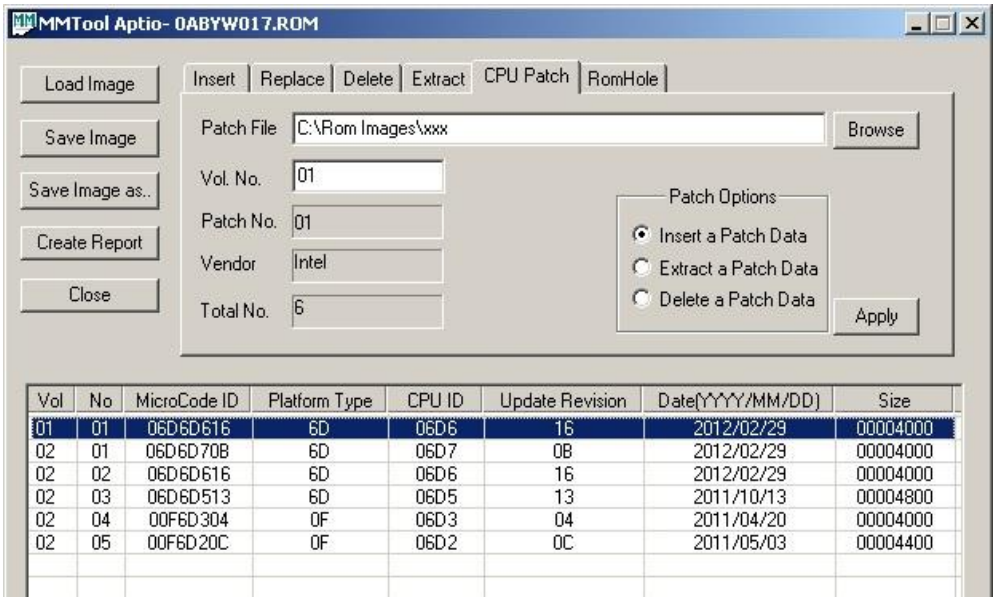


You can extract option ROM file by following the steps outlined in the following table:

Step	Description
1	Left click on the Browse button to select the module file location. **Note:** You can also simply type the path and the file name in Module File field.
2	Check Link Present in the "Option ROM only" group box.
3	Select one of the option roms present in the combo box.
4	Left click on the *Extract button* to extract the existing Option ROM.

CPU Patch Tab

The *CPU Patch* tab allows you to extract, delete and insert CPU microcode patches from the Aptio Firmware file.



Fields

The *CPU Patch* tab fields and buttons are explained in the following table:

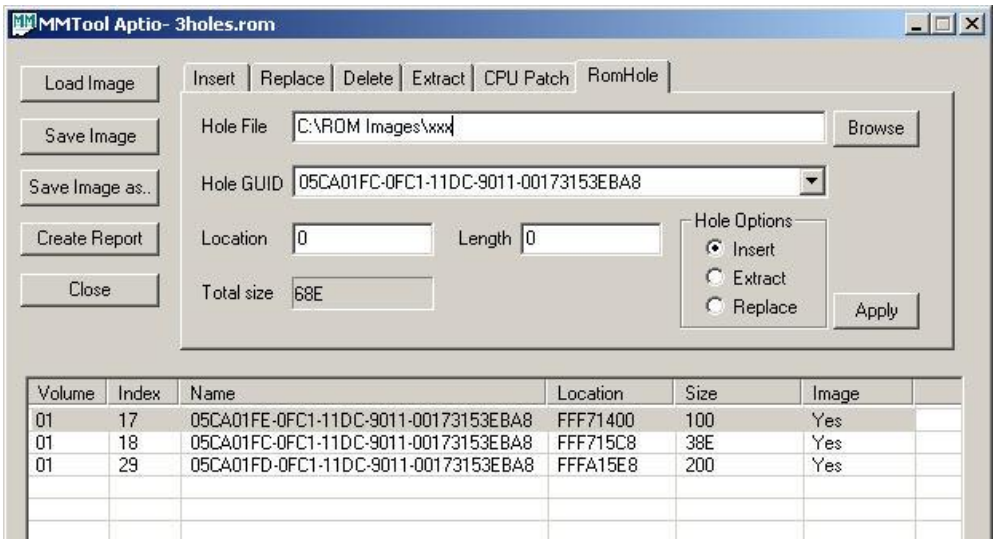
Field/Button	Description
Patch File	This field allows you to enter a file name for extraction, insertion or deletion.
Vol. No.	This field allows you to enter the index of the volume, to which the file needs to be inserted.
Insert a Patch Data	When this radio button is selected the file in the “Patch File” field is inserted into the image when the “APPLY” button is clicked.
Extract a Patch Data	Selecting this radio button enables extraction of the patch in the currently selected row from the list of patches. Upon selection of the “APPLY” button the patch is written to the file named in the “Patch File” field.
Delete a Patch Data	This radio button enables deletion of the patch in the selected row. Selecting the “APPLY” button removes the row from the list and from the loaded firmware image.
Browse	This button allows you to browse for the file to put into the Patch File field
Apply	This button executes the action selected by the radio buttons.

Note 1: The original firmware image is not modified unless you use the Save Image or the Save Image As buttons to save changes.

Note 2: For Intel patches, operations which require updates to the patch firmware file will not succeed because it is not possible for MMTool to reliably determine the patch block size. This is a problem only if the descriptor info is missing at end of file.

ROM Hole Tab

The ROM hole tab enables you to insert, extract, and replace ROM hole files.



Fields

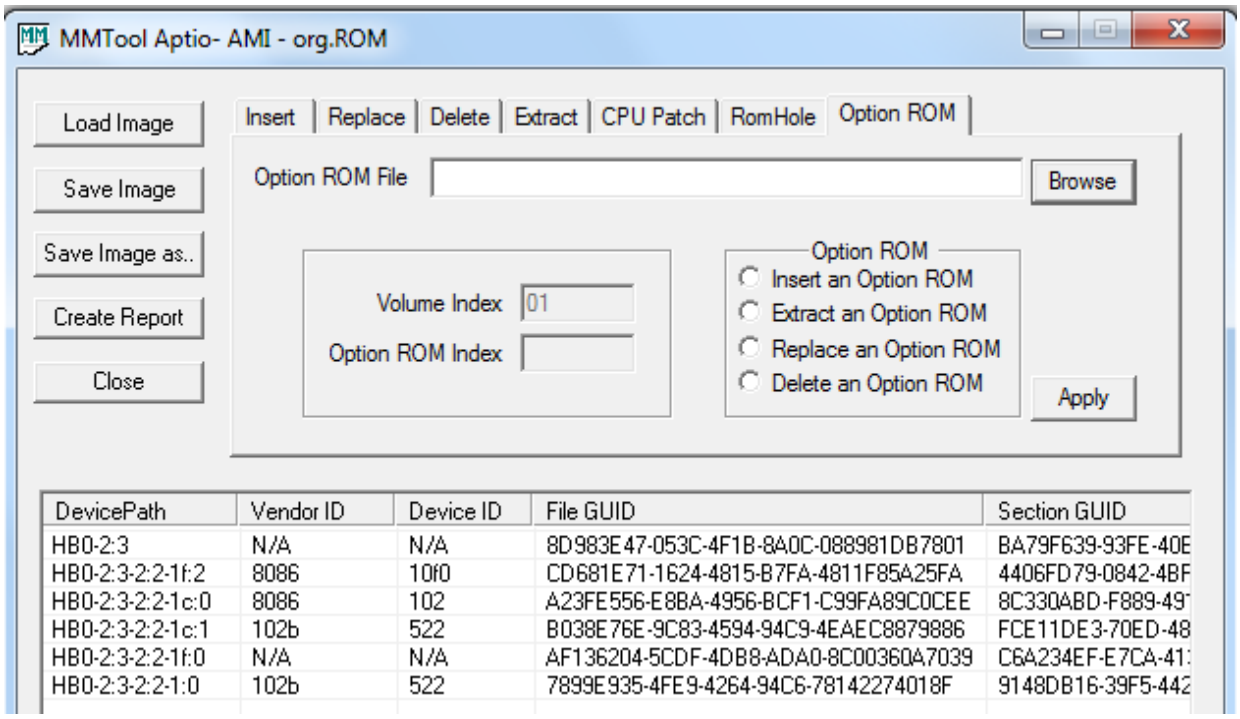
The ROM hole tab fields and buttons are explained in the following table:

Field/Button	Description
Hole File	This field allows you to enter a file name for extraction, replacement or insertion.
Hole GUID	This drop-down menu allows you to select one of 16 GUIDs reserved for hole files for insertion.
Location	Runtime address of the hole (The ROM is assumed to be located at the highest part of the address space.).
Length	Length of the hole.
Insert	When this radio button is selected the file in the “Patch File” field is inserted into the image when the “APPLY” button is selected.
Extract	Selecting this radio button enables extraction of the hole content in the currently selected row from the list of holes. Upon selection of the “APPLY” button the hole content is written to the file named in the “Hole File” field.
Replace	This radio button enables replacement of the hole in the selected row. Selecting the “APPLY” button removes the row from the list and from the loaded firmware image.
Browse	This button allows you to browse for the file to put into the Hole File field
Apply	This button executes the action selected by the radio buttons.

Note: The original firmware image is not modified unless you use the *Save Image* or *the Save Image As* buttons to save changes.

Option ROM Tab

The Option ROM tab enables you to insert, extract, replace and delete Option ROMs for AptioV firmware images.



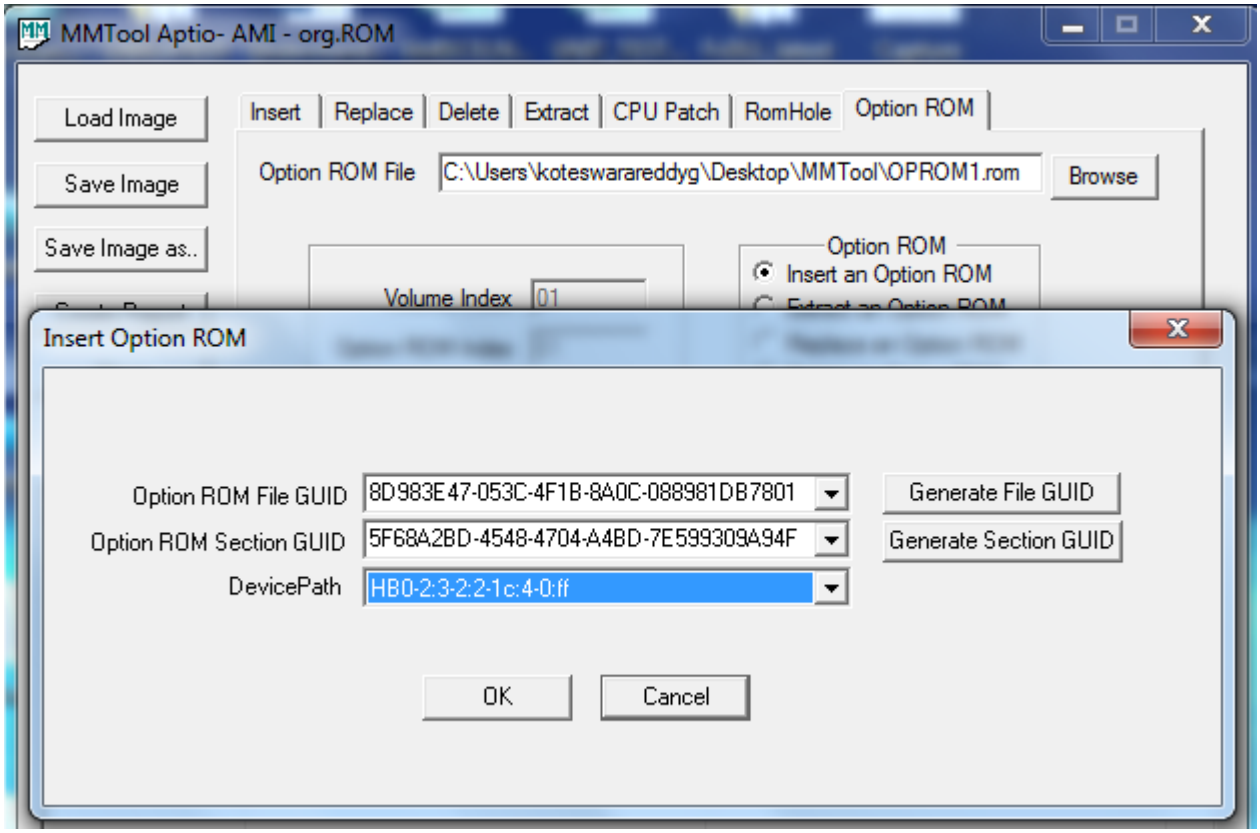
Fields

The Option ROM tab fields and buttons are explained in the following table:

Field/Button	Description
Option ROM File	This field allows you to enter a file name for extraction, replacement or insertion.
Volume Index	This field displays the volume Index where the Option ROM files present.
Option ROM Index	This field displays the Option ROM file Index selected from the list.
Insert an Option ROM	When this radio button is selected the file in the “Option ROM File” field is inserted into the image when the “APPLY” button is selected.
Extract an Option ROM	Selecting this radio button enables extraction of the Option ROM content in the currently selected row from the list of Option ROMs. Upon selection of the “APPLY” button the Option ROM content is written to the file named in the “Option ROM File” field.
Replace an Option ROM	This radio button enables replacement of the Option ROM in the selected row. Selecting the “APPLY” button replaces the content of the selected row from the list with the content of the Option ROM file given in “Option ROM File” field.
Delete an Option ROM	This radio button enables deletion of the Option ROM in the selected row. Selecting the “APPLY” button removes the row from the list and from the

	loaded firmware image.
Browse	This button allows you to browse for the file to put into the Hole File field
Apply	This button executes the action selected by the radio buttons.
Device Path	This column in the list of Option ROMs displays the Device Path of the corresponding Option ROM.
Vendor ID	This column in the list of Option ROMs displays the Devce ID of the corresponding Option ROM
Device ID	This column in the list of Option ROMs displays the Vendor ID of the corresponding Option ROM
File GUID	This column in the list of Option ROMs displays the GUID of the FFS file in which the Option ROM exists.
Section GUID	This column in the list of Option ROMs displays the GUID of the Section in which the Option ROM exists.

Insert an Option ROM:



Note: The MMTool GUI needs to associate a new Option ROM with an existing PCI device; this will be done by showing the device path. A new option ROM cannot be inserted, if none exists, as it has to associate the new one with an existing PCI device. MMTool allows sharing of option roms for different PCI devices.

Fields & Buttons :
The Insert Option ROM popup fields and buttons are explained in the following table:

Field/Button	Description
Option ROM File GUID	This drop-down menu allows to select one of the FFS guids for inserting Option ROM section. If you select any guid from this menu , then the OpROM is added to this existing FFS file. You can also enter a new guid in the edit field(in which case a new FFS file will be created for the OpRom section) or use the Generate File Guid button to generate a new guid.
Option ROM Section GUID	Thid drop down menu allows you to select a guid for the OpROM section. You can also use the Generate Section Guid to create a new guid or enter the value in the edit field.
DevicePath	This drop down menu allows you to select a particular device path of an existing Option ROM whose attributes needs to be cloned for the new OpROm section. The attributes that will be copied are : Device, Function, PciDevFlags, NameStringOffset.
Generate File GUID	This button generates a new FFS file guid for the OpROM section.
Generate Section GUID	This button generates a new guid for the OpROM section.
Ok	This button allows you to Insert the Option Rom section into the existing FFS file/new FFS file based on the selections in the drop downs. A corresponding entry is added to the PCIIRQ table.
Cancel	This button allows you to abort the insertion operation of Option ROM section into existing ROM image.

User can insert an Option ROM file by following the steps outlined in the following table:

Step	Description
1	Left click on the Browse button to select the module file location. **Note:** You can also simply type the path and the file name in Module File field.
2	Selecy “Insert an Option ROM” radio button.
3	Left click on the “Apply” button.
4	In “Insert Option ROM” dialog, in “Option ROM File GUID” provide the File GUID by typing or by left clicking on “Generate File GUID” button to generate File GUID randomly.
5	In “Insert Option ROM” dialog, in “Option ROM Section GUID” provide the Section GUID by typing or by left clicking on “Generate Section GUID” button to generate Section GUID randomly.
6	Select the “Device Path” from the existing Device Paths listed in the listbox.
7	Left click on “OK” button to insert a new Option ROM.

Extract an Option ROM:

User can extract an Option ROM file by following the steps outlined in the following table:

Step	Description
1	Left click on the Browse button to select the module file location. **Note:** You can also simply type the path and the file name in Module File field.
2	Select "Extract an Option ROM" radio button.
3	Select an Option ROM from the list which is to be extracted to the file.
4	Left click on the "Apply" button.

Replace an Option ROM:

User can replace an Option ROM file by following the steps outlined in the following table:

Step	Description
1	Left click on the Browse button to select the module file location. **Note:** You can also simply type the path and the file name in Module File field.
2	Select "Replace an Option ROM" radio button.
3	Select an Option ROM from the list which is to be replaced with the file given.
4	Left click on the "Apply" button.

Delete an Option ROM:

User can delete an Option ROM file by following the steps outlined in the following table:

Step	Description
1	Select "Delete an Option ROM" radio button.
2	Select an Option ROM from the list which is to be deleted from the image.
3	Left click on the "Apply" button.

Note: If more than one PCI device share the same option rom deletion of one will not delete the section, it will just remove the link between the pci device and option rom

Chapter 3 Command Line Options in MMTool for Aptio

1) Extract Module

MMTOOL <ROM file> </e or /ec> <module id> <module file>

Parameters:

ROM File	-	Firmware Image
/e or /ec	-	Extract file (/e – “uncompressed mode” /ec “as is”)
<Module id>	-	GUID
Module file	-	input file

NOTE: For this and all other commands, to treat a “ROM file” that does not have the .cap extension as a capsule file, add “/cap” parameter.

2) Extract PCI Option ROM

For Aptio4,

MMTOOL <ROM file> </e> </l> <Mod File> <vid> <did>

Parameters:

ROM File	-	Firmware Image
/e	-	Extract PCI Option ROM with specified Vendor ID and Device ID
/l	-	For PCI Option ROM (it should always accompany with /e)
Module file	-	input file
vid	-	Vendor ID
did	-	Device ID

For AptioV,

MMTOOL <ROM file> </e> </l> <Mod File> <FileGuid> <SectionGuid>

Parameters:

ROM File	-	Firmware Image
/e	-	Extract PCI Option ROM with FileGuid and SectionGuid
/l	-	For PCI Option ROM (it should always accompany with /e)
Module file	-	input file
FileGuid	-	FileGuid
SectionGuid	-	SectionGuid

3) Replace Module (any module)

MMTOOL <ROM file> </r or /rc > <module id> <module file>

Parameters:

ROM file	-	Firmware Image
/r or /rc	-	replace file (/r or /rc doesn't matter)
Module Id	-	GUID in the Rom image to be replaced.
Module file	-	input file

4) Replace Module (PCI Option ROM)

For Aptio4,

MMTOOL <ROM file> </r> </l > <module file> <vid> <did>

Parameters:

ROM file	-	Firmware Image
/r	-	replace file
/l	-	for PCI Option ROMs (it should always accompany with /r)
module file	-	input file
vid	-	Vendor ID
did	-	Device ID

For AptioV,

MMTOOL <ROM file> </r> </l> <module file> <FileGuid> <SectionGuid>

Parameters:

ROM file	-	Firmware Image
/r	-	replace file
/l	-	for PCI Option ROMs (it should always accompany with /r)
module file	-	input file
FileGuid	-	FileGuid
SectionGuid	-	SectionGuid

5) Insert Module (any module)

MMTOOL <ROM file> </i or /ic > <module id> <module file> <VolIndex>

Parameters :

ROM file	-	Firmware Image
/i	-	insert a file (/i for "as is" whether it is compressed or not)
/ic	-	module being inserted is already compressed.

Module Id - GUID
Module file - input file
VolIndex - Volume Index

6) Insert Module (any module):

MMTOOL <ROM file> </i> </y> <module id> <module file> <VolIndex>

Parameters:

ROM file - Firmware Image
/i - insert a file
/y - compress the file if it is not compressed.
(This flag should always accompany with /i)
Module Id - GUID
Module file - input file
VolIndex - Volume Index

7) Insert Module (PCI Option ROM):

For Aptio4,

MMTOOL <ROM file> </i> </l> <module file> <VolIndex> <vid> <did>

Note.1 : For Aptio firmware Image, user should have the list of FFS File GUID's for PCI Option ROMs of that Image (each build or board has different GUID set.) For Alaska, only one FFS file will have Option ROMs in the file along with other sections. They can be replaced or inserted.

Note 2: VolIndex parameter is considered if and only if a new Option Rom firmware file is created in the ROM image. If there are Option ROMs already existing in the ROM image, then the volume index input argument is ignored silently.

Parameters:

ROM file - Firmware Image
/i - insert a file
/l - for PCI Option ROMs (it should always accompany with /i)
Module file - input file
VolIndex - Volume Index
vid - Vendor ID
did - Device ID

For AptioV,

MMTOOL <ROM file> </i> </l> <module file> <DevicePath> <FileGuid> <SectionGuid>

Parameters:

ROM file - Firmware Image

/i	-	insert a file
/l	-	for PCI Option ROMs (it should always accompany with /i)
Module file	-	input file
DevicePath	-	DevicePath
FileGuid	-	FileGuid
SectionGuid	-	SectionGuid

Note: The DeviePath needs to be provided within inverted comma.

8) Delete Module:

MMTOOL <ROM file> </d> <module id>

Parameters:

ROM file	-	Firmware Image
/d	-	delete file from Image
module Id	-	GUID of the FFS file

9) Delete PCI Option ROM:

For Aptio4,

MMTOOL <ROM file> </d> </l> <vid> <did>

Parameters:

ROM file	-	Firmware Image
/d	-	delete file from Image
/l	-	for PCI Option ROM(it should always accompany with /d)
vid	-	Vendor ID
did	-	Device ID

For AptioV,

MMTOOL <ROM file> </d> </l> <DevicePath> <FileGuid> <SectionGuid>

Parameters:

ROM file	-	Firmware Image
/d	-	delete file from Image
/l	-	for PCI Option ROM(it should always accompany with /d)
DevicePath	-	DevicePath
FileGuid	-	FileGuid
SectionGuid	-	SectionGuid

10) List Option ROMs:

MMTool.exe <ROM file> /l

Parameters:

ROM file	-	Firmware Image
/l	-	Option ROMs

Note : it will displays the Option Rom Details with DevicePath,Device ID,Vendor ID,File GUID,Section GUID.

11) List CPU microcode patches:

MMTOOL <ROM file> /p [<VolIndex>]

Parameters:

ROM file	-	Firmware Image
/p	-	Patches
VolIndex	-	Volume Index (Optional, if there is only one patch file)

Note: The line number shown in the first column of the display is used as the patch number in the following patch commands.

12) Extract CPU microcode Patch:

MMTOOL <ROM file> /e /p <patch number> <patch file> [<VolIndex>]
Parameters:

ROM file	-	Firmware Image
/e	-	Extract
/p	-	Patches
Patch number	-	Number of the patch as shown in list command
Patch file	-	output patch file
VolIndex	-	Volume Index (Optional, if there is only one patch file)

13) Replace CPU microcode Patch:

MMTOOL <ROM file> /r /p <patch number> <patch file> [<VolIndex>]

Parameters:

ROM file	-	Firmware Image
/r	-	Replace
/p	-	Patch
Patch number	-	Number of the patch to replace as shown in list command
Patch file	-	Input replacement patch file
VolIndex	-	Volume Index (Optional, if there is only one patch file)

Note: For Intel patches, operations which require updates to the patch firmware file will not succeed because it is not possible for MMTool to reliably determine the patch block size.

14) Insert CPU microcode Patch:

MMTOOL <ROM file> /i /p <patch file> [<VolIndex>]

Parameters:

ROM file	-	Firmware Image
/i	-	Insert
/p	-	Patch
Patch number	-	Number of the patch as shown in list command
Patch file	-	Input patch file
VolIndex	-	Volume Index (Optional, if there is only one patch file).

15) Delete CPU microcode Patch:

MMTOOL <ROM file> /d /p <patch number> [<VolIndex>]

Parameters:

ROM file	-	Firmware Image
/d	-	Delete
/p	-	Patch
Patch number	-	Number of the patch as shown in list command
VolIndex	-	Volume Index (Optional, if there is only one patch file)

16) List ROM hole files:

MMTOOL <ROM file> /h

Parameters:

ROM file	-	Firmware Image
/h	-	Hole Files

Note: This command lists the holes using the same headings and attributes as the GUI. The first column is a line number that is used to designate a specific hole for the other operations.

17) Extract ROM hole file:

MMTOOL <ROM file> /e /h <hole number> <hole file>
MMTOOL <ROM file> /e /hg <hole GUID> <hole file> [VolIndex]
MMTOOL <ROM file> /e /hx <GUID Index> <hole file> [VolIndex]

Parameters:

ROM file	-	Firmware Image
/e	-	Extract
/h	-	Hole
/hg	-	GUID for hole follows
/hx	-	GUID number index follows
Hole number	-	Number of the hole as shown in list command (hex)
Hole file	-	output hole file
Hole GUID	-	one of the 16 GUIDs reserved for hole files
GUID Index	-	This number is added to the first DWORD of the first hole GUID
VolIndex	-	Volume Index (hex)

Note: The hole contents will be extracted and written to a file without including its file header.

18) Replace ROM hole file:

MMTOOL <ROM file> /r /h <hole number> <hole file>
MMTOOL <ROM file> /r /hg <hole GUID> <hole file> [VolIndex]
MMTOOL <ROM file> /r /hx <GUID Index> <hole file> [VolIndex]
Parameters:

ROM file	-	Firmware Image
/r	-	Replace
/h	-	Hole
/hg	-	GUID for hole follows
/hx	-	GUID number index follows
Hole number	-	Number of the hole as shown in list command
Hole file	-	replacement hole file
Hole GUID	-	one of the 16 GUIDs reserved for hole files
GUID Index	-	This number is added to the first DWORD of the first hole GUID
VolIndex	-	Volume Index (hex)

Note: The contents of the given hole region are over-written with the contents of the file. The file must not be larger than the size of the hole. Space not covered by the file is set to the erase polarity.

19) Insert ROM hole file:

MMTOOL <ROM file> /i /h <hole GUID> <location> <length> [<hole file>]

Parameters:

ROM file	-	Firmware Image
/i	-	Insert
/h	-	Hole
Hole GUID	-	GUID (name) of the new hole
Location	-	runtime address of the hole
Length	-	Length of hole region (excluding header)

Hole file - Optional new hole file content

After checking for duplication of the GUID and making sure that the hole will fit within a volume, the program places a file header of EFI_SECTION_RAW with data checksum attribute disabled below the designated region. Any space not occupied by the file is set to the erase polarity of the containing volume. The GUID must be one of a set of 16 reserved for this purpose beginning with 05ca01fc-0fc1-11dc-901100173153eba8. The remaining 15 are generated by incrementing the first double word from 05ca01fc through 05ca020b.

If <file name> is omitted, the program will create a hole given by <length>. If <length> is zero, then the hole will be the same size as the file.
Note: There is no delete command for holes because you can delete the file (module).

20) Save Capsule file :

MMTOOL <CAP file> /c <ROM file>

MMTOOL <CAP file> /c <CAP file>

Parameters:

CAP file	-	Firmware Capsule Image
/c	-	Save
ROM file	-	New firmware image file with .ROM extension
CAP file	-	New firmware image file with .CAP extension

Note: Only AMI capsule (secure or unsecure) file can be saved as a ROM file.
Non AMI capsule files can be saved as a CAP file only.

21) Create Report of the F/w image:

Summary Report
MMTOOL <ROM file> </s>

Verbose Report
MMTOOL <ROM file> </v>

Parameters:

ROM file	-	Firmware Image
/s	-	creates summary report, which includes only the information about the firmware volumes and holes etc.
/v	-	creates verbose report, which gives details about the Firmware volumes, holes and FFS drivers etc.

22) Replace Section Data:

MMTOOL <ROM file> </r> </si> <File GUID> <Section Type> <Instance Number> <Section Data>

Parameters:

ROM file	-	Firmware Image.
/r	-	Replace option.
/si	-	Replace section data by instance number option.
File GUID	-	GUID of the File containing the Section.
Section Type	-	Type of the Section to be replaced.
Instance Number	-	Instance number of the Section to be replaced. The instance number is counted considering only sections of type '<Section Type>'.
Section Data	-	input Section Data file (without section header).

Usage Examples:

GUID of the FFS file, which will be given as input should be in the following format. xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx with all the hexadecimal number representation.

The following are the usage examples

1) Delete Module:
   i) Delete FFS file
      MMtool test.fd /d 17088572-377F-44EF-8F4E-B09FFF46A070

   ii) Delete PCI Option ROM :
      MMtool test.fd /d /l 1010 108c

2) Extract Module:
   i) Extract in uncompressed mode
      MMTool test.fd /e 17088572-377F-44EF-8F4E-B09FFF46A070 uncomp.ffs

   ii) Extract as is
      MMTool test.fd /ec 17088572-377F-44EF-8F4E-B09FFF46A070 1.ffs

   iii) Extract PCI Option ROM
      MMTool test.fd /e /l 1.bin 1010 2020

3) Replace Module:
   i) Replace Module (any module):
      MMTool test.fd /rc 17088572-377F-44EF-8F4E-B09FFF46A070 test.ffs
      MMTool test.fd /r 17088572-377F-44EF-8F4E-B09FFF46A070 test.ffs

ii) Replace Module (PCI ROM):
MMTOOL test.fd /r /l 1.bin 1010 108c

4) Insert module:
i) Insert module (any module):
MMTool test.fd /i 17088572-377F-44EF-8F4E-B09FFF46A070 test.ffs 01
MMTool test.fd /ic 17088572-377F-44EF-8F4E-B09FFF46A070 test.ffs 01
MMTool test.fd /i /y 17088572-377F-44EF-8F4E-B09FFF46A070 test.ffs 01

ii) Insert module(PCI ROM file):
MMTool test.fd /i /l 1.bin 02 1010 2020

5) List Patch:
i) list all the patch files:
MMtool test.fd /p
ii) list the patch files in a specific volume:
MMtool test.fd /p 1

6) Extract Patch:
MMtool test.fd /e /p 2 patch2 1

7) Replace Patch:
MMtool test.fd /r /p 2 patch2r 1

8) Insert Patch:
MMtool test.fd /i /p patch 1

9) Delete Patch:
MMtool test.fd /d /p 3 1

10) List ROM Holes:
MMtool test.fd /h

11) Extract ROM Hole:
MMtool test.fd /e /h 3 hole.bin
MMtool test.fd /e /hg 05ca01fd-0fc1-11dc-901100173153eba hole.bin

12) Replace ROM Hole:
MMtool test.fd /r /h 3 newhole.bin
MMtool test.fd /r /hx 2 newhole.bin

13) Insert ROM Hole:
MMtool test.fd /i /h 05ca01fc-0fc1-11dc-901100173153eba8 fff11000 2000 newhole.bin

14) Save Capsule file:
MMTool test.cap /c new.rom
MMTool test.cap /c new.cap

15) Create report
i) Create summary report:
MMTool test.fd /s
ii) Create verbose report:
MMTool test.fd /v

16) Replace Section Data:
MMTool test.fd /r /si 17088572-377F-44EF-8F4E-B09FFF46A070
EFI_SECTION_DXE_DEPEX 1 sectiondata.bin

