AMD

AMDVBFLASH
User Guide

Revision History

Date	Revision	Changes
June 2022	1.00	Initial version of the document

Table of Contents

OVERVIEW

➢ AMDVBFlash is a console mode utility for AMD GPU device in a diagnostics environment providing ability to flash the VBIOS.

➢ AMDVBFlash utility supports erasing and programming video VBIOS on multiple platforms, including
– Windows 64 bit
– Linux

SET UP

Tool Execution Step

➢ **Windows (Windows 64 bit)**
  o Install the amdvbflash installer package
    ▪ This will internally install the required tools driver required to run the tool.
  o From the windows command prompt, go to the installed folder.
    ▪ Tool will be installed under "C:\Program Files\AMD\AMDVbFlash" or
  o Run "amdvbflash.exe" with suitable command line arguments as required.

➢ **Linux**
  o Unzip the tar.gz file to any folder.
  o Run "./amdvbflash" with suitable command line arguments as required.

COMMAND LINE OPTIONS

version Command

➢ Run amdvbflash –version command to fetch the tool version

```
root@ub180404dk64:~/aniket/AMDVBFlash_updated/v5.0.305/official# ./amdvbflash --version
AMD VBIOS Flasher Tool Version 5.0.305.0. Copyright© 2020-2022 Advanced Micro Devices, Inc. All rights reserved.
```

Help Command

➢ Run amdvbflash (or amdvbflash –h, amdvbflash –help, amdvbflash -?) command to display the help

```
Command line switches for the flash capability:
  -s [ --save ] arg                  This flag instructs the tool to save the VBIOS
                                     image. This has to be used along-with the
                                     --device switch and the --vbios-info. If
                                     --vbios-file is not specified then the file
                                     name is constructed at run time with the
                                     following format [ASIC]_[BDF]_[Index].rom
  -p [ --flash ] arg                 Write VBIOS image in file <file> to flash ROM
                                     in ASIC <Num>.
                                     Usage:
                                         -p <Num> <File>, or
                                         --flash --device [Num] --vbios-file <File>
  --vbios-info                       This flag when used along with --show flag
                                     instructs the tool to show the VBIOS
                                     Information from the file specified by using
                                     the --vbios-file option
  --vbios-file arg                   Specify the VBIOS file to work with. This
                                     option can be used to save the VBIOS image to
                                     this file as well as to read VBIOS image from
                                     this file
  --bios-file-info arg               Display the BIOS info in the given file
  --savefile-at-end                  This flag instructs the tool to save the whole
                                     VBIOS content read from the ROM Controller at
                                     the end of read operation. This should always
                                     be used only with --save flag. If not used, by
                                     default the tool keeps writing ROM contents
                                     read in each iteration to the file.
  --save-flashed-bytes               This flag instructs the tool to save the bytes
                                     being flashed to the SPIROM to a file for
                                     debugging purpose. This will enable the user to
                                     additionaly verify what and how many bytes have
                                     been written to the SPIROM at the end of flash
                                     operation. This flag should always be used with
                                     --flash command only. If not used, by default
                                     the bytes won't be additionally saved to a
                                     file.
  --fa                               This flag enables force flashing the same IFWI
                                     version. Should be used with the --flash
                                     switch.
                                     Usage:
                                         -p <Num> <File> -fa, or
                                         --flash --device [Num] --vbios-file <File>
                                     --fa
  --fp                               This flag instructs the tool to bypass BIOS
                                     part number check and perform a force flash.
```

```
                        part number check and perform a force flash.
                        This flag should always be used with --flash
                        command only.
                        Usage:
                            -p <Num> <File> -fp, or
                            --flash --device [Num] --vbios-file <File>
                        --fp
--fv                    This flag enables downgrading the IFWI by
                        performing a force flash. This bypasses
                        checking the VBIOS/IFWI version. This flag
                        should always be used with --flash command.
                        Usage:
                            -p <Num> <File> -fv, or
                            --flash --device [Num] --vbios-file <File>
                        --fv
--checkpn arg           Compare Part Number of the current IFWI in the
                        device with the Part Number in the IFWI image
                        specified.
                        Usage:
                            --/-checkpn <Num> <File>, or
                            --/-checkpn --device <DeviceIndex>
                        --vbios-file <IFWI Image>

--cr arg                Calculates the 16-bit ROM checksum for device
                        <Index> of size if size is specified and
                        compare with sum if expected sum is specified.
                        Usage:
                            -cr <Num> <size> <sum>, or
                            --cr --device [Num] <size> <sum>

--complete              This flag instructs the tool to calculate
                        checksum of Complete IFWI.This flag should be
                        used with --cr/--cf command only.
                        Usage:
                            -cr <Num> <size> <sum> -complete, or
                            --cr --device [Num] <size> <sum> --complete

--biosimage             This flag instructs the tool to calculate
                        checksum of VBIOS image in IFWI.This flag
                        should be used with --cr command only.
                        Usage:
                            -cr <Num> <size> <sum> -biosimage, or
                            --cr --device [Num] <size> <sum>
                        --biosimage

--cf arg                Calculate 16-bit checksum for file <File> and
                        if expected checksum has been specified then
                        compare the calculated checksum with the
                        specified checksum.
```

Display Information Command (-i)

➢ Display all AMD graphic cards information detected on the system
➢ General graphic cards information

COMMAND:
    amdvbflash -i \<Num\>
    amdvbflash --show --device \<Num\>
        Display information of all the AMD adapter on the system or for specific adapter
        \<Num\> if specified.

```
root@ub180404dk64:~/aniket/AMDVBFlash_updated/v5.0.305/official# ./amdvbflash -i
SNo BDF             DID ASIC        SPIROM          Size Test BIOS P/N

  0 0000:03:00.0 73f0 Navi33        GD25Q16E      0x200000 Pass 113-D7460101
  1 0000:06:00.0 73f0 Navi33        GD25Q16E      0x200000 Pass 113-D7460101
```

```
root@ub180404dk64:~/aniket/AMDVBFlash_updated/v5.0.305/official# ./amdvbflash -i 1
SNo BDF             DID ASIC        SPIROM          Size Test BIOS P/N

  1 0000:06:00.0 73f0 Navi33        GD25Q16E      0x200000 Pass 113-D7460101
```

Display Information Command (-ai)

➢ Advanced graphic cards information
➢ Displays other details like Product name, Config file, Version, date and time
   information along with all UEFI GOP Driver image information

COMMAND:
    amdvbflash -ai \<Num\>
    amdvbflash --show --advanced --device \<Num\>
        Display advanced information of all the AMD adapter on the system or for
        specific adapter \<Num\> if specified.

```
root@ub180404dk64:~/aniket/AMDVBFlash_updated/v5.0.305/official# ./amdvbflash -ai 0

Adapter 0 (0x0000:03:00.0)
    ASIC Family              Navi33
    Flash Type               GD25Q16E
    Product Name             D746_XT_A0_8GB_Bringup_NAVI33_Test_00479.sbin
    Bios Config File         NAVI33.bin
    Bios P/N                 113-D7460101
    Bios Version             022.003.000.047.000001
    Bios Date                03/29/22 11:51:32

Image 0 -- Offset 0x0000
_____
  ROM header contents:
    Signature                0xaa55
    PCIR Offset              0x03ac
  PCI Data Structure:
    Signature                PCIR
    Vendor ID                0x1002
    Device ID                0x73f0
    PCI Revision             0x0
    Image Size               0x3400
    Code Revision            0x1603
    Indicator                0x0     (Not Last Image)
    Code Type                0x0     (Intel IA-32, PC-AT compatible)
    Legacy BIOS File Name    NAVI33.bin
    Legacy BIOS Part Number  113-D7460101
    Legacy BIOS Build Number 00009903
    Legacy BIOS Change List  0000
    Binary BIOS Identifier (IDTF) 0x80d4b29e

Image 1 -- Offset 0x3400
_____
    Signature                0xaa55
    PCIR Offset              0x001c
  PCI Data Structure:
    Signature                PCIR
    Vendor ID                0x1002
    Device ID                0x73f0
    PCI Revision             0x0
    Image Size               0xae00
    Code Revision            0x0000
    Indicator                0x0     (Last Image)
    Code Type                0x0     (EFI)
    Image Size               0x00000ef1
    Compression Type         0x0     (Compressed)
    MachineType              0x8664  (X64 Machine Type)
    Subsystem                0x0b    (EFI Boot Service Driver)
```

```
EFI Image Offset              0x5c     (abs: 0x4345c)
UEFI IDs from EFI_PCI_EXPANSION_ROM_HEADER
 UEFI Source Revision          GOP AMD REV: 000.000.000.022.003
 UEFI Source Change List       0000
 UEFI BIOS Build Number        9903
GOP Driver Info:
 Machine Type Code             0x8664    (AMD64 (K8))
 Authenticode Signed           false
 GOP Image Size                0x13460   (77KB)
 Driver Name                   AMD GOP X64 Rel Driver Rev.3.3.4.Feb 24 2022.23:00:30
 UEFI Major Revision           0x0
 UEFI Minor Revision           0x0
 UEFI Fix Revision             0x0
 Legacy Major Version          0x0
 Legacy Minor Version          0x0
 GOP AMD Build
 GOP AMD CL
 GOP BIOS Identifier (IDTF)    0xdeadbeef
 Driver Carries legacy tables  false
```

Save VBIOS Command

➢ Save the VBIOS image from the ROM to a specified file.

COMMAND:

amdvbflash -s <Num> <File>
amdvbflash --save --device <Num> --vbios-file <File>

> Read the VBIOS image into file <File> to save the ROM contents in Adapter <Num>

```
root@ub180404dk64:~/aniket/AMDVBFlash_updated/v5.0.305/official# ./amdvbflash -s 0 D746101.sbin
VBIOS Image of Size: 0x200000 Saved.
```

Program VBIOS Command

➢ Program VBIOS image into the ROM
➢ Flash VBIOS at specific graphic card

COMMAND:

amdvbflash -p <Num> <File>
amdvbflash --flash --device <Num> --vbios-file <File>

Write VBIOS image in file <File> to flash ROM in Adapter <Num>

```
root@ub180404dk64:~/aniket/AMDVBFlash_updated/v5.0.305/official# ./amdvbflash -p 0 D746_XT_A0_8GB_Bringup_NAVI33_Test_00479.sbin
Existing VBIOS version:            022.003.000.047.000001
VBIOS version To be flashed:       022.003.000.047.000001
---------------------------
Existing VBIOS part number:        113-D7460101
VBIOS part number To be flashed:   113-D7460101
---------------------------
Existing VBIOS SSID:               0xE41
SSID To be flashed:                0xE41
---------------------------
Flashed: 0x200000 Bytes Successfully.

Please REBOOT the System to Complete VBIOS Update.
```

Get VBIOS File information Command

➢ Fetch detailed bios file information for the IFWI file provided by user

COMMAND:
amdvbflash --bios-file-info <File>

```
root@ub180404dk64:~/aniket/AMDVBFlash_updated/v5.0.305/official# ./amdvbflash --bios-file-info D746101.sbin
    Product Name                D746_XT_A0_8GB_Bringup_NAVI33_Test_00479.sbin
    Bios Config File            NAVI33.bin
    Bios P/N                    113-D7460101
    Bios Version                022.003.000.047.000001
    Bios Date                   03/29/22 11:51:32

Image 0 -- Offset 0x0000

    ROM header contents:
    Signature                   0xaa55
    PCIR Offset                 0x03ac
  PCI Data Structure:
    Signature                   PCI
    Vendor ID                   0x1002
    Device ID                   0x73f0
    PCI Revision                0x0
    Image Size                  0x3400
    Code Revision               0x1603
    Indicator                   0x0     (Not Last Image)
    Code Type                   0x0     (Intel IA-32, PC-AT compatible)
    Legacy BIOS File Name       NAVI33.bin
    Legacy BIOS Part Number     113-D7460101
    Legacy BIOS Build Number    00009903
    Legacy BIOS Change List     0000
    Binary BIOS Identifier (IDTF) 0x80d4b29e

Image 1 -- Offset 0x3400

    Signature                   0xaa55
    PCIR Offset                 0x001c
  PCI Data Structure:
    Signature                   PCIR
    Vendor ID                   0x1002
    Device ID                   0x73f0
    PCI Revision                0x0
    Image Size                  0xae00
    Code Revision               0x0000
    Indicator                   0x0     (Last Image)
    Code Type                   0x0     (EFI)
    Image Size                  0x00000ef1
    Compression Type            0x0     (Compressed)
    MachineType                 0x8664  (X64 Machine Type)
    Subsystem                   0x0b    (EFI Boot Service Driver)
    EFI Image Offset            0x5c    (abs: 0x4345c)
```

```
UEFI IDs from EFI_PCI_EXPANSION_ROM_HEADER
   UEFI Source Revision           GOP AMD REV: 000.000.000.022.003
   UEFI Source Change List        0000
   UEFI BIOS Build Number         9903
GOP Driver Info:
   Machine Type Code              0x8664    (AMD64 (K8))
   Authenticode Signed            false
   GOP Image Size                 0x13460   (77KB)
   Driver Name                    AMD GOP X64 Rel Driver Rev.3.3.4.Feb 24 2022.23:00:30
   UEFI Major Revision            0x0
   UEFI Minor Revision            0x0
   UEFI Fix Revision              0x0
   Legacy Major Version           0x0
   Legacy Minor Version           0x0
   GOP AMD Build
   GOP AMD CL
   GOP BIOS Identifier (IDTF)     0xdeadbeef
   Driver Carries legacy tables   false
```

Compare Checksum Command

➢ Compare the VBIOS image and ROM content checksum

COMMAND:

amdvbflash -cf <File> [Sum]

> Calculate 16-bit checksum for <File>. Checksum for the file is compared to [Sum] which is the expected checksum.

amdvbflash -cr <Num> [Size] [Sum]

> Calculate 16-bit ROM checksum for adapter <Num> and compare it to the [Sum] specified. This command is the same as -cb if [Size] is specified.