
MSI Firmware Update SOP

REVISION – June, 2025

Revision History

<i>Author</i>	<i>Date</i>	<i>Revision</i>	<i>Description</i>	<i>Review</i>
<u>Jinhong</u>	March - 2025	1.0	Initial Release of MSI Firmware Update SOP	<u>Sherry</u> , <u>Evans</u>
<u>Jinhong</u>	June - 2025	1.1	Add fw update step for systems supporting ROT	<u>Sherry</u> , <u>Evans</u>

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Chapter 1 Introduction

Purpose

This sop document describes in detail the steps for updating BMC, BIOS, and CPLD firmware using the yafuflash tool, redfish, and webGUI.

Audience

MSI-Server Customers and Customer Support Teams.

Tools Require

Mode	Tools	remark
yafuflash tool	yafuflash tool	Get the tool from MSI
redfish	API tool	Recommended tool : Postman,curl
webGUI	Browser	Recommended tool : Google Chrome, Firefox NOT recommended : Microsoft Edge Legacy,IE11

Note : There wont be any debug support if any issues occurring in tools which are not recommended.

Yafuflash

Usage

Command line input format : Yafuflash [OPTION] [MEDIUM] [FW_IMAGE_FILE]

Option	
-?	Displays the utility usage
-h	Displays the utility usage
-V	Displays the utility usage
-e	List outs a few examples of the tool

-info	Displays information about current FW and new FW.
-msi,-img-section-info	Displays information about current FW Sections.
-mi,-img-info	Displays information about current FW Versions.
-fb,-force-boot	Option to FORCE BootLoader upgrade during full upgrade. Also, skips user interaction in Interactive Upgrade mode. This option is not allowed with interactive upgrade option
-bu,-block-upgrade	Option to Flash using Block by Block method
-netfn 0xXX	Option to Flash using OEM specific Netfunction
-pc,-preserve-config	Option to preserve Config Module during full upgrade. If platform supports Dual Image, this option skips user interaction, preserves config and continues update process. This option is not allowed with interactive upgrade option.
-ipc,-ignore-platform-check	If this image is for a different platform, this option skips user interaction and continues update process.
-ipc,-ignore-platform-check	If this image is for a different platform, this option skips user interaction and continues update process.
-idi,-ignore-diff-image	If this image differs from the one currently programmed, this option skips user interaction and continues update process.
-isi,-ignore-same-image	If this image is same as the one currently programmed, this option skips user interaction and continues update process.
-iml,-ignore-module-location	If module(s) of this image is/are in a different location, this option skips user interaction and continues update process.
-ibv,-ignore-boot-version	If bootloader version is different and -force-boot is not specified, this option skips user interaction and continues update process.

	The bootloader will be updated.
-iri,-ignore-reselect-image	This option skips reselecting the active image.
-inc,-ignore-non-preserve-config	If the Images of both flash share the same Configuration area. Not preserving will restore to default factory settings, this option skips it.
-msp,-split-img	Use this option to flash split image.
-f-XXX,-flash-XXX	Use this option to flash spection section where XXX denotes name of the section, example -flash-conf. If it is split image need to give -split-img along with this option.
-q,-quiet	Use the option to show the minimum flash progress details.
-f,-full	Performs full upgrade in Interactive Upgrade mode. Skips module wise upgrade.
-sc,-skip-crc	Option to skip the CRC check
-sf,-skip-fmh	Option to skip the FMH check
-d	Option to specify the peripheral <BIT0> - BMC <BIT1> - BIOS <BIT2> - CPLD <BIT4> - ME
-mse,-img-select	Option to specify the Image to be updated 0- Inactive Image 1- Image 1 2- Image 2 3- Both Images

-a,-activate	Option to activate peripheral devices <BIT0> - BMC <BIT1> - BIOS <BIT2> - CPLD
-spi , -mmc	Option to Flash HPM Image Component wise 0-BOTH 1-SPI Image 2- MMC Image
-nr,-no-reboot	Option to skip the reboot
-pXXX,- preserve-XXX	Option to preserve XXX configuration. Where XXX falls in sdr, fru, sel, ipmi, auth, net, ntp, snmp, ssh, kvm, syslog. If the preserve status of another configuration is enabled, then it will ask to confirm that those configuration is to be preserved.
-pXXX,- preserve-XXX - ieo	Option to preserve only XXX configuration
-ignore-existing- overrides	-ignore-existing-overrides must be used with preserve-XXX option
-rp,-replace- publickey	Option to replace the Signed Image Key in Existing Firmware
-vcf,-version- cmp-flash	Option to skip flashing modules only if the versions are same by selecting (N/n). Option (Y/y) Selects full firmware upgrade mode.
-non-interactive	This option skips user interaction. This option cannot be used along with 'ignore-diff-image', 'ignore-same-image', '-ignore-module-location' & '-ignore-boot-version' options.

-pfr	Option to flash PFR component manager plugin
--active	Option to flash image on Active region
--recovery	Option to flash image on Recovery region
Medium	
-cd	Option to use USB Medium
-nw,-ip,-u,-p,-host,-P	Option to use Network Medium '-ip' Option to enter IP, when using Network Medium '-host' Option to enter host name, When using Network Medium '-u' Option to enter UserName, When using Network Medium '-p' Option to enter Password, When using Network Medium '-P' Option to enter Port Number
-kcs	Option to use KCS Medium

Installation

Installation in Windows

- 1) Place and Extract the file in the required location
- 2) This contains, Yafuflash.exe, LIBIPMI.dll and amifldr64.sys.
- 3) Open command prompt and go to path/Yafuflash
- 4) Run Yafuflash.exe

Installation in Linux

- 1) OpenSSL is pre-requisite for Yafuflash
- 2) Place and Extract the file in the required location
- 3) This contains Yafuflash
- 4) Open terminal and go to path/Yafuflash
- 5) Run ./Yafuflash

For more information about the yafuflash tool, please refer to the corresponding user guide, this document provides only a brief introduction

Chapter 2 Update BMC Firmware

Update BMC Firmware by Yafuflash

by Yafuflash remotely (Take windows as an example)

- 1) Install yafuflash on your PC ([Refer to the installation of yafuflash in Chapter 1](#)).
- 2) Open command prompt and go to path\Yafuflash.

```
C:\Users\jinhongchen\Desktop\S381K123\S381K123\Yafuflash_v7.01.0122\Win64>yafuflash.exe -?
INFO: Yafu INI Configuration File not found... Default options will not be applied...
Usage: Yafuflash [OPTION] [FW_IMAGE_FILE]
Perform BMC Flash Update
-?                Displays the utility usage
-h                Displays the utility usage
-V                Displays the version of the tool
-e                List out a few examples of the tool
OPTION :
-info             Displays information about current FW and new FW.
-msi,-img-section-info Displays information about current FW Sections.
-mi,-img-info     Displays information about current FW Versions.
-showerr,-showerrorcode Displays YAFU command specific failure error code when flashing failed
-fb,-force-boot   Option to FORCE BootLoader upgrade during full upgrade.
                  Also, skips user interaction in Interactive Upgrade mode.
                  This option is not allowed with interactive upgrade option
-npb,-no-preserve-boot This option skips preserving uboot env variables
-fe              This option erases full SPI
-image-size-dump, -isd This option takes backup of SPI data with Running Image Size
-dumpspi         This option takes backup of SPI data
-dumpfile        This option takes file name to store SPI flash dump data
-bu,-block-upgrade Option to Flash using Block by Block method
-netfn 0xXX      Option to Flash using OEM specific Netfunction
-pc,-preserve-config Option to preserve Config Module during full upgrade.
                  If platform supports Dual Image, this option skips user
                  interaction, preserves config and continues update process.
                  This option is not allowed with interactive upgrade option.
-pcwe,-preserve-config-web-enable Option to preserve all the configs by enabling preserve items in web
-ipc,-ignore-platform-check If this image is for a different platform, this option skips
                             user interaction and continues update process.
-idi,-ignore-diff-image If this image differs from the one currently programmed, this
                        option skips user interaction and continues update process.
-isi,-ignore-same-image If this image is same as the one currently programmed, this
                        option skips user interaction and continues update process.
-impl,-ignore-module-location If module(s) of this image is/are in a different location, this
                             option skips user interaction and continues update process.
-ibv,-ignore-boot-version If bootloader version is different and -force-boot is not specified,
                           this option skips user interaction and continues update process.
                           The bootloader will be updated.
-iri,-ignore-reselect-image This option skips reselecting the active image.
```

Figure 1 : Yafuflash tool command line

- 3) Enter the command.

Command line format : Yafuflash [OPTION] [MEDIUM] [FW_IMAGE_FILE]

key parameter :

- pfr (Option to flash PFR component manager plugin),
- active (Option to flash image on Active region),
- recovery (Option to flash image on Recovery region),
- mse,-img-select (Option to specify the Image to be updated) :

0- Inactive Image

1- Image 1

2- Image 2

3- Both Images

4) Example.

1. (Without ROT) Remotely update image1 using network media :

Yafuflash.exe -nw -ip 192.168.11.44 -U admin -P admin123 -fb -non-interactive -mse 1 3801.ima

```
C:\Users\jinhongchen\Desktop\S381K123\S381K123\Yafuflash_v7.01.0122\Win64>Yafuflash.exe -nw -ip 192.168.11.44 -U admin
-P admin123 -fb -non-interactive -mse 1 3801.ima
INFO: Yafu INI Configuration File not found... Default options will not be applied...

Creating IPMI session via network with address 192.168.11.44...Done

+-----+
| YAFUFlash - Firmware Upgrade Utility v7.01.0122 |
| Copyright (c) 2020 American Megatrends International, LLC |
+-----+

Image To be updated is (Image-1)
=====
Firmware Details
=====
```

	RomImage	Image 1	Image 2
Module Name	Description	Version	Version
1. boot	BootLoader	13.7.000000	13.7.000000
2. conf	ConfigParams	13.7.000000	13.7.000000
3. root	Root	13.7.000000	13.7.000000
4. osimage	Linux OS	13.7.000060	13.7.000060
5. www	Web Pages	13.7.000000	13.7.000060
6. ast2600e		1.20.000000	1.18.000000

```
Existing Image and Current Image are Same
Continuing with Full Firmware Update

*****
WARNING!
FIRMWARE UPGRADE MUST NOT BE INTERRUPTED ONCE IT IS STARTED.
PLEASE DO NOT USE THIS FLASH TOOL FROM THE REDIRECTION CONSOLE.
*****
Preserving Env Variables... done
Regenerating Boot Variables
Uploading Firmware Image : 100%... done
Flashing [boot] Module ...
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Setting Env variables... done
Flashing [conf] Module ...
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [root] Module ...
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [osimage] Module ...
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [www] Module ...
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [ast2600e] Module ...
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Resetting the firmware.....
```

Figure 2 : Update BMC image1 by Yafuflash remotely (Without ROT)

2. (With ROT) Remotely update BMC active region using network media :

Yafuflash.exe -nw -ip 192.168.11.65 -U admin -P admin123 -fb -non-interactive -pfr -active
S381K128_svn2.bin

Note: In systems that support ROT, updating the BMC firmware requires the **PFR is provisioned**

```

C:\Users\jinhongchen\Desktop\S381K128_rbx_release\S381K128_rbx_release>Yafuflash.exe -nw -ip 192.168.11
.30 -U admin -P qwer@123 -fb -non-interactive -pfr --active S381K128_svn2.bin
INFO: Yafu INI Configuration File not found... Default options will not be applied...

Creating IPMI session via network with address 192.168.11.30...Done

+-----+
|   YAFUFlash - Firmware Upgrade Utility v7.01.0122   |
| Copyright (c) 2020 American Megatrends International, LLC |
+-----+
Detected PFR Capsule --> BMC

Provision Status --> Provisioned

Platform State --> Unknown CPLD state

Block 0 magic Number validation successful..

PFM magic number validation successful
Please type (Y/y) to continue PFR Update or (N/n) to Cancel
Enter your Option : Y

-----
YAFUFlash -Updating PFR Image
-----

Uploading Firmware Image: 100%... done
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Resetting the firmware.....

```

Figure 3 : Update BMC active region by Yafuflash remotely (With ROT)

by Yafuflash locally (Take Linux as an example)

- 1) Install yafuflash on server os (Refer to the installation of yafuflash in Chapter 1).
- 2) Open terminal and go to path/Yafuflash.
- 3) Check the file "Yafuflash" has the execution permission.

```

root@study-server:/home/chenjh/Desktop/Linux_x86_64# ls -l
total 66408
-rw-rw-r-- 1 chenjh chenjh 67108864 3月 25 10:50 3801.ima
-rwxrwxr-x 1 chenjh chenjh 887907 3月 25 10:50 Yafuflash
-rwxrwxr-x 1 chenjh chenjh 60 3月 25 11:06 yafuflash.sh

```

Figure 4 : Yafuflash tool

- 4) Enter the command in the following format : Yafuflash [OPTION] [MEDIUM] [FW_IMAGE_FILE].

key parameter :

- pfr (Option to flash PFR component manager plugin),
- active (Option to flash image on Active region),
- recovery (Option to flash image on Recovery region),
- mse,-img-select (Option to specify the Image to be updated) :
- 0 - Inactive Image

- 1 - Image 1
- 2 - Image 2
- 3 - Both Images

5) Example.

1. (Without ROT) Locally update image1 using kcs :

```
./Yafuflash -fb -kcs -non-interactive -mse 1 3801.ima
```

```
chenjh@study-server:~/Desktop/Linux_x86_64$ sudo ./Yafuflash -fb -kcs -non-interactive -mse 1 3801.ima
INFO: Yafu INI Configuration File not found... Default options will not be applied...
-----
Open IPMI Drivers
-----
Un-Loading ipmi_devintf
Un-Loading acpi_ipmi
Un-Loading ipmi_ssif
Un-Loading ipmi_msghandler
-----
+-----+
| YAFUFlash - Firmware Upgrade Utility v7.01.0122 |
| Copyright (c) 2020 American Megatrends International, LLC |
+-----+
Image To be updated is (Image-1)
=====
Firmware Details
=====
```

			RomImage	Image 1	Image 2
1.	boot	BootLoader	13.7.000000	13.7.000000	13.6.000000
2.	conf	ConfigParams	13.7.000000	13.7.000000	13.6.000000
3.	root	Root	13.7.000000	13.7.000000	13.6.000000
4.	osimage	Linux OS	13.7.000000	13.7.000000	13.6.000000
5.	www	Web Pages	13.7.000000	13.7.000000	13.6.000000
6.	ast2600e		1.20.000000	1.20.000000	1.11.000000

```
Existing Image and Current Image are Same
Continuing with Full Firmware Update

*****
WARNING!
FIRMWARE UPGRADE MUST NOT BE INTERRUPTED ONCE IT IS STARTED.
PLEASE DO NOT USE THIS FLASH TOOL FROM THE REDIRECTION CONSOLE.
*****
Preserving Env Variables... done
Regenerating Boot Variables
Uploading Firmware Image : 100%... done
```

Figure 5 : Update BMC image1 by Yafuflash locally

2. (With ROT) Locally update BMC active region using kcs :

```
./Yafuflash -fb -kcs -non-interactive -pfr--active S381K128_svn2.bin
```

Note: In systems that support ROT, updating the BMC firmware requires the **PFR is provisioned**.

Update BMC Firmware by Redfish

Note: In systems that support ROT, the update of BMC firmware via Redfish is not currently supported.

- 1) Create a JSON file parameters.json.

If you want to update the image 1, Write the following :

```
{  
  "Targets": [  
    "/redfish/v1/UpdateService/FirmwareInventory/BMCImage1"  
  ]  
}
```

If you want to update the image 2, Write the following :

```
{  
  "Targets": [  
    "/redfish/v1/UpdateService/FirmwareInventory/BMCImage2"  
  ]  
}
```

Create a JSON file oem_parameters.json, Write the following :

```
{  
  "ImageType": "BMC"  
}
```

- 2) Open POSTMAN and enter the URI to POST the request.

URL : `https://{IP}/redfish/v1/UpdateService/upload`

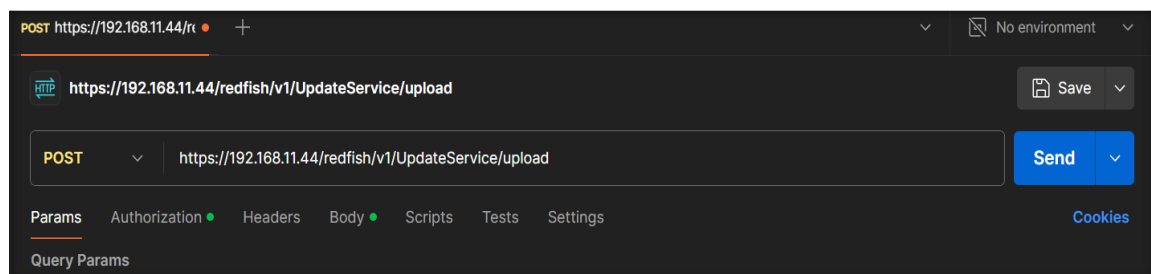


Figure 6 : postman Enter the url

- 3) In the Authorization tab, Auth Type select Basic Auth, enter the BMC account password

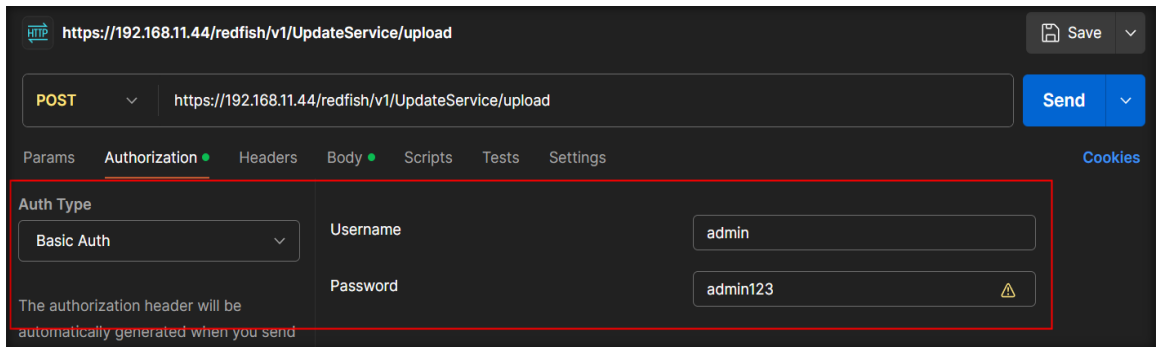


Figure 7 : postman Authorization

- 4) In the body tab, select form-data, enter the first key: UpdateFile, select the type as file, and select the image file at value

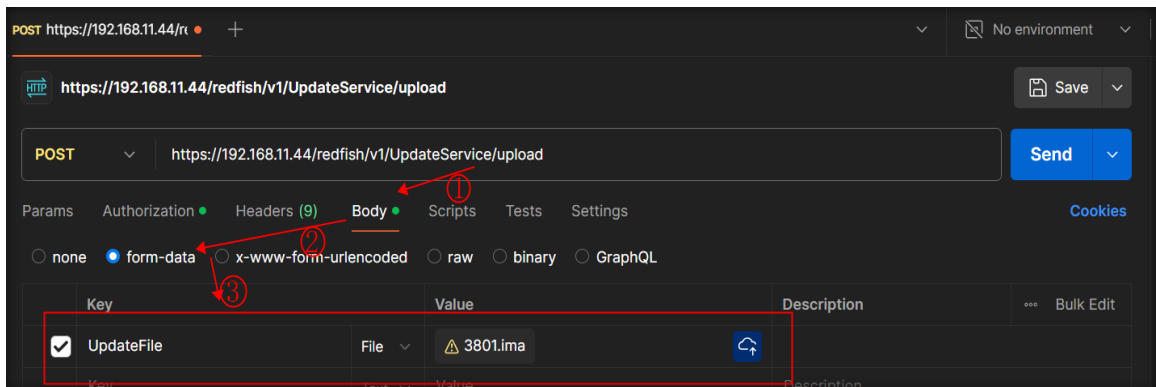


Figure 8 : Select the image file

- 5) enter the second key: UpdateParameters, select the type as file, and select the file created in step 1
- 6) enter the third key: **OemParameters**, select the type as file, and select the file created in step 2

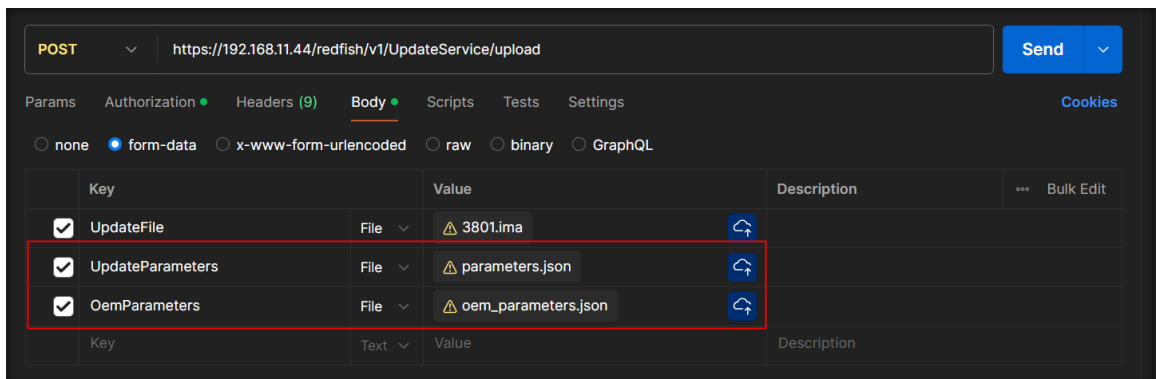


Figure 9 : Select the parameters.json file and oem_parameters.json

- 7) Click Send, and if successful, with the response shown in Figure 9, the BMC will start updating, at which point you will be disconnected from the BMC for a few minutes.

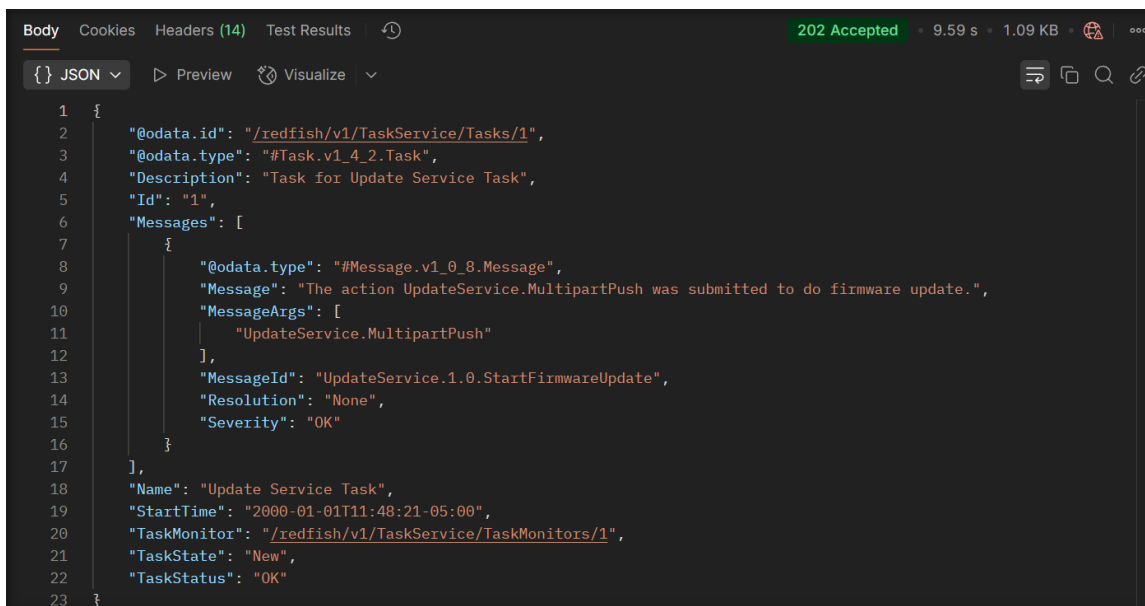


Figure 10 : Request successful

- 8) View update results :
1. Take the "@odata.id" value returned from the previous step and fill in the end of the BMC IP, such As : <https://192.168.11.44/redfish/v1/TaskService/Task/1>
 2. Open a new tab in postman and fill in the url from the previous step
 3. In the Authorization tab, Auth Type select Basic Auth, enter the BMC account password

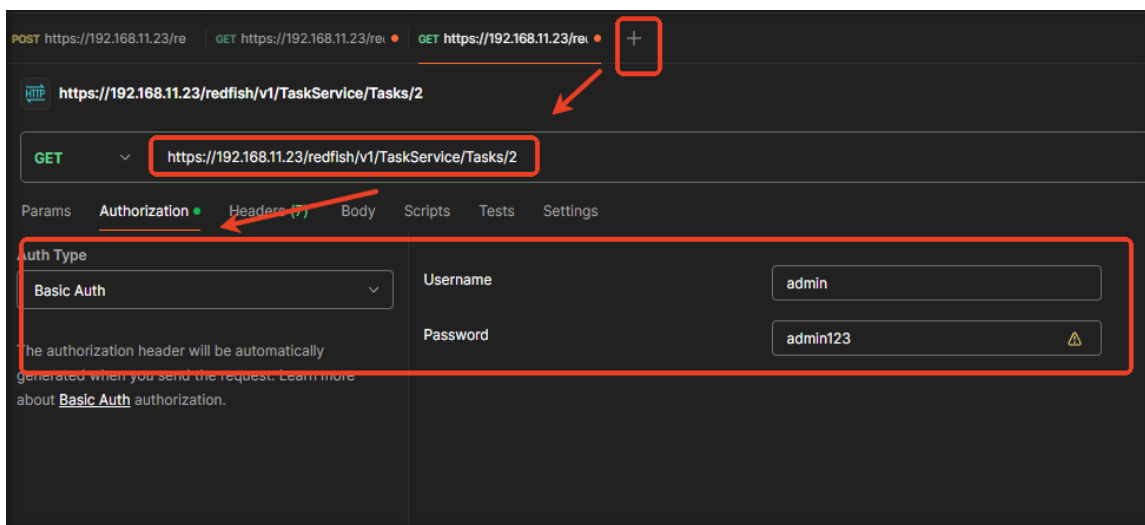


Figure 11 : Configuring Postman

4. Click send to return the updated status

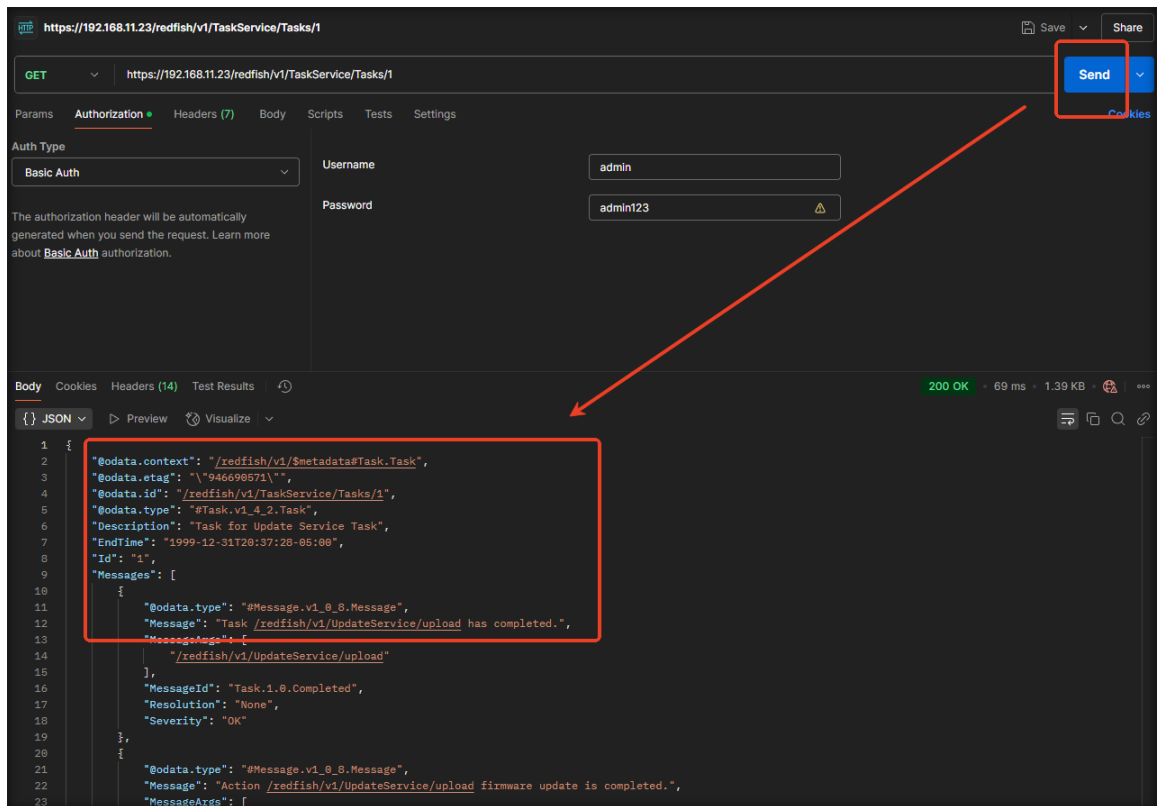


Figure 12 : Get updated status

Update BMC Firmware by WebGUI

In systems that do not support ROT

- 1) Login in BMC WebGUI via browser.
- 2) Firmware Update page Path : Maintenance -> Firmware Update

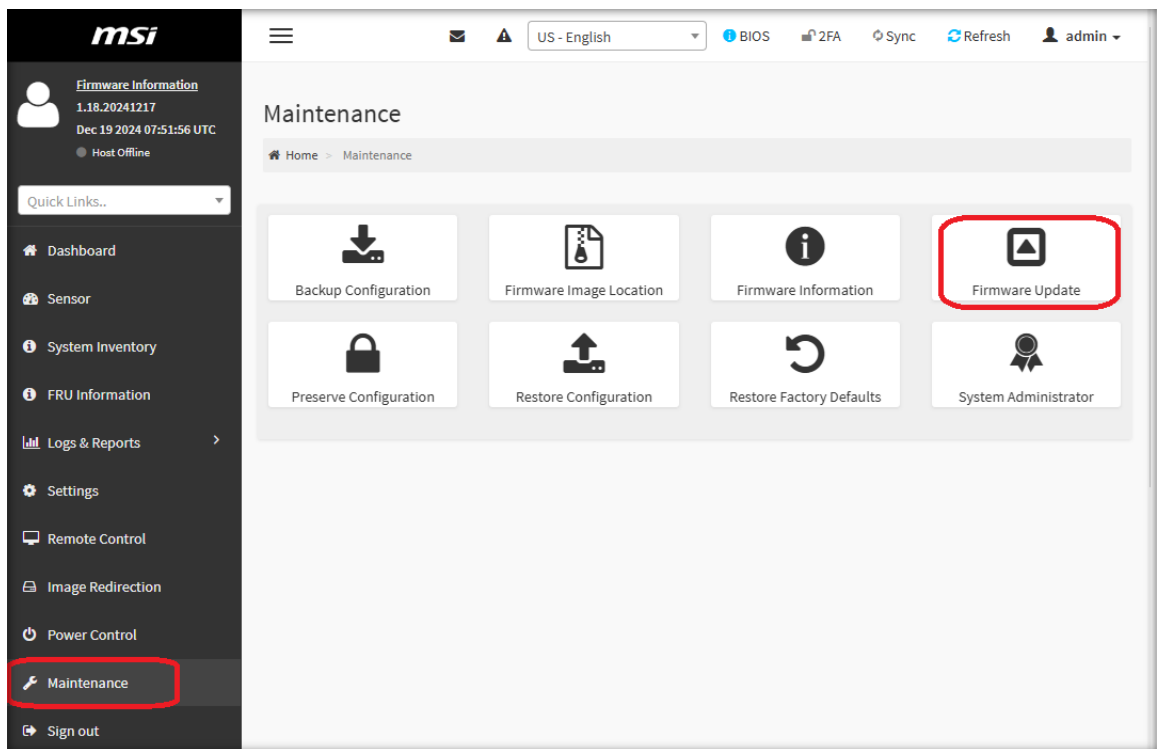


Figure 13 : Firmware Update page Path

- 3) Select the image file and click Start firmware update.

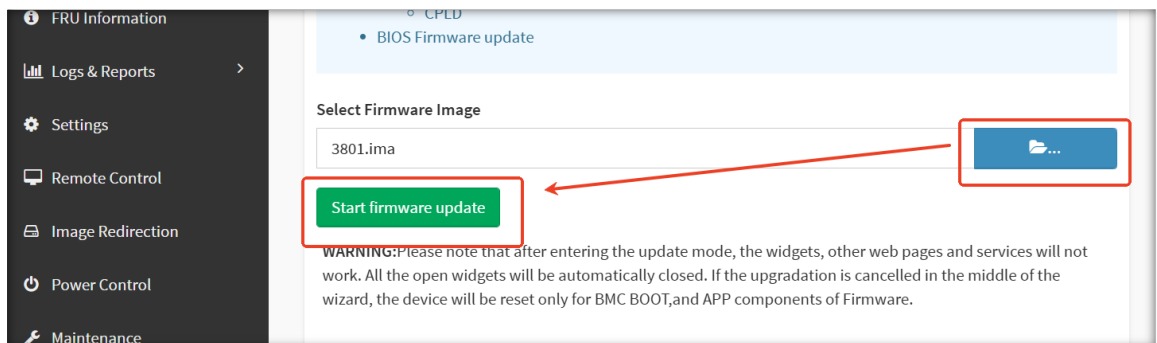


Figure 14 : Firmware Update page

- 4) Select the image to be updated. Users can enable the "Preserve All Configuration" option to preserve configured settings through the upgradation.

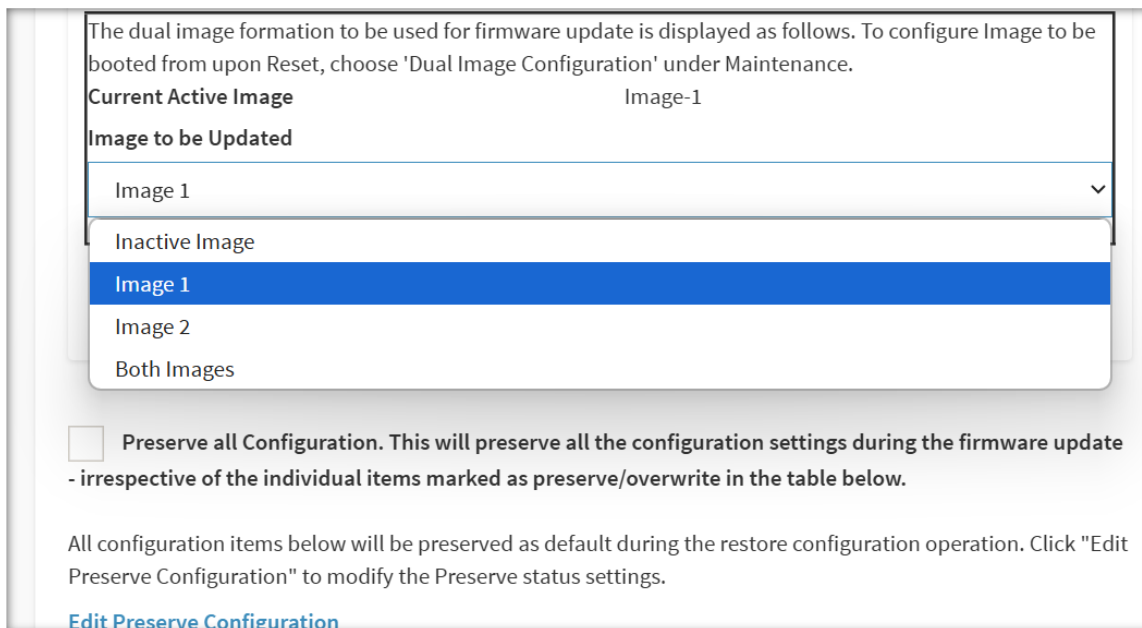


Figure 15 : BMC Update configuration

- 5) Click Proceed to Flash.

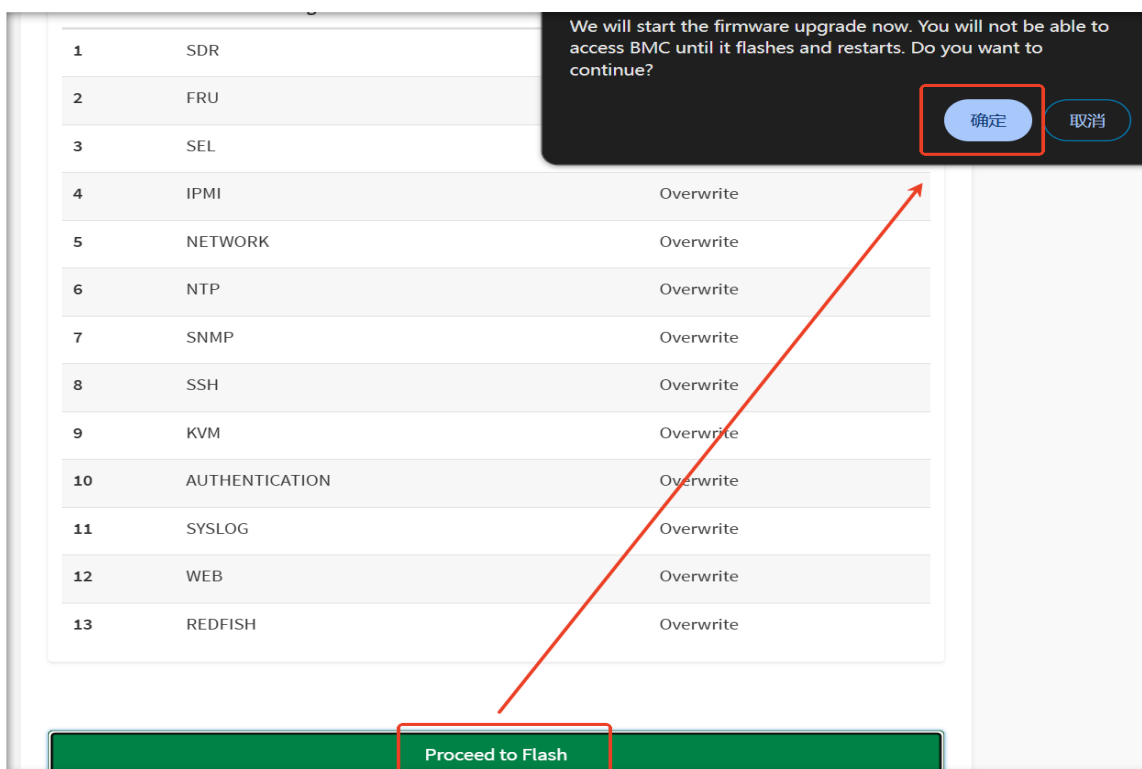


Figure 16 : Proceed to Flash

- 6) After the upload progress is 100%, click Flash to Proceed. After the update starts, you will lose contact with BMC for a few minutes

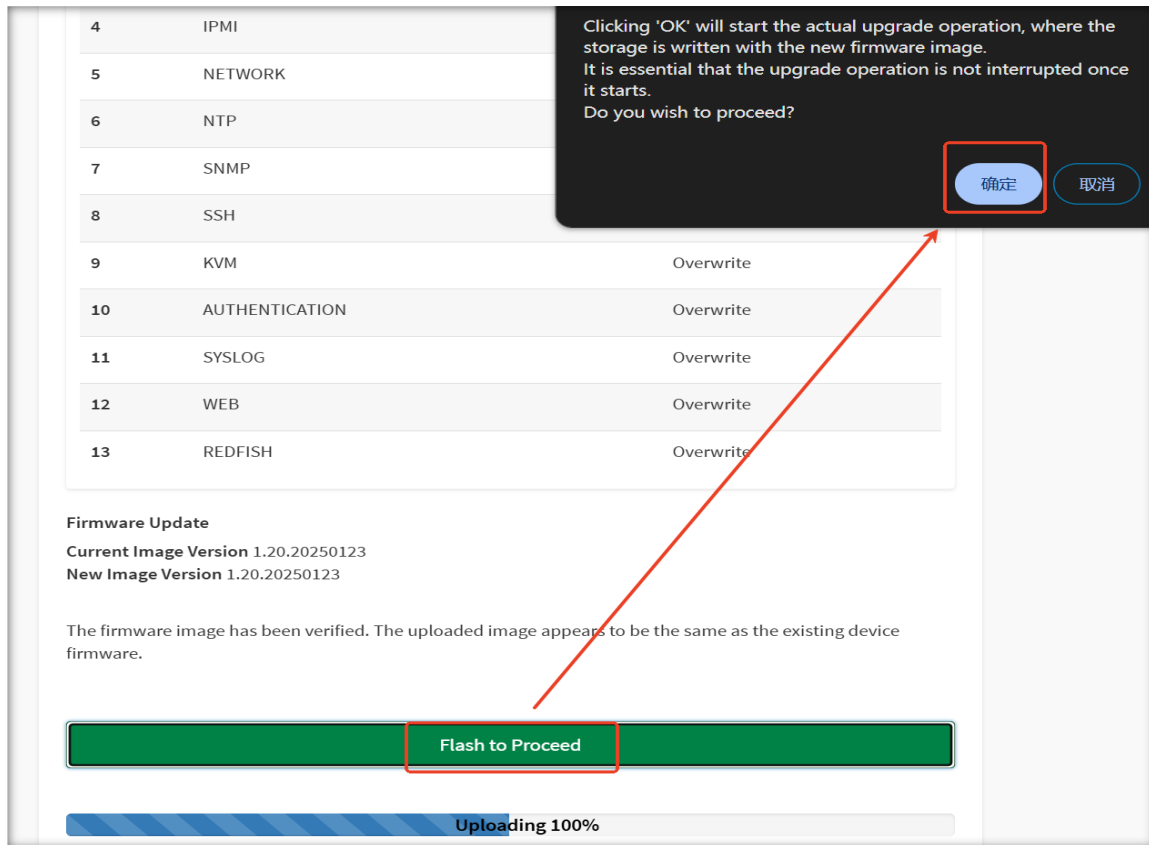


Figure 17 : Flash to Proceed

In systems that support ROT

- 1) Login in BMC WebGUI via browser.
- 2) Firmware Update page Path : Maintenance -> Firmware Update

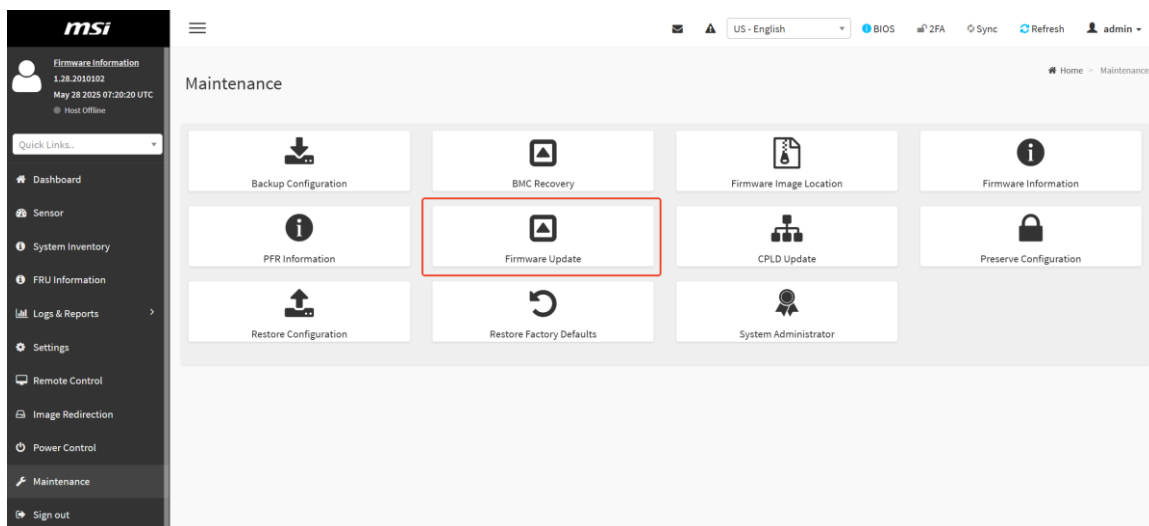


Figure 18 : Firmware Update page Path

- 3) Select the BMC capsule image file and click Start firmware update.

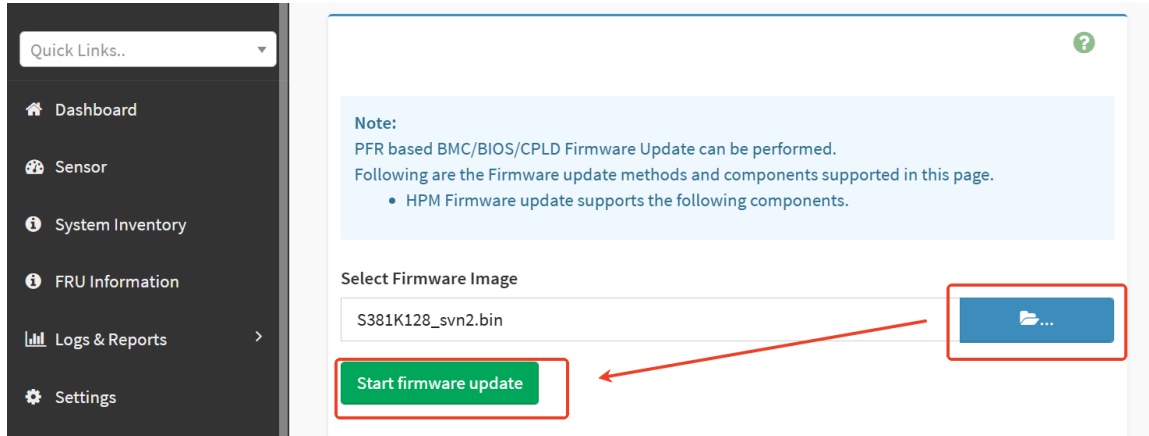


Figure 19 : Firmware Update page

- 4) Select the firmware update option, then Click Proceed to Flash, the BMC firmware will start to update. You will lose contact with BMC for about twenty minutes.

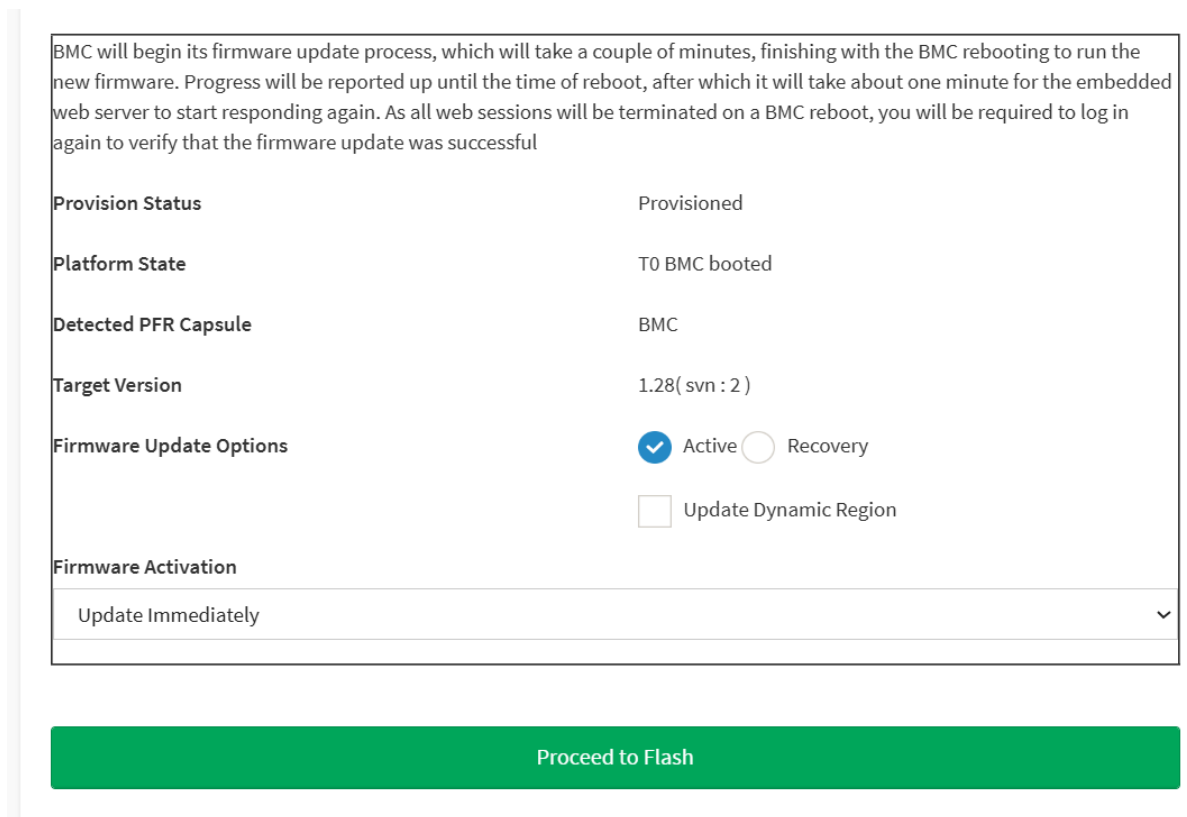


Figure 20 : BMC Update configuration

Chapter 3 Update BIOS Firmware

Update BIOS Firmware by Yafuflash

by Yafuflash remotely (Take windows as an example)

- 1) Install yafuflash on your PC (Refer to the installation of yafuflash in Chapter 1)
- 2) Open command prompt and go to path\Yafuflash

```
C:\Users\jinhongchen\Desktop\S381K123\S381K123\Yafuflash_v7.01.0122\Win64>yafuflash.exe -?
INFO: Yafu INI Configuration File not found... Default options will not be applied...
Usage: Yafuflash [OPTION] [FW_IMAGE_FILE]
Perform BMC Flash Update
-? Displays the utility usage
-h Displays the utility usage
-V Displays the version of the tool
-e List out a few examples of the tool
OPTION :
-info Displays information about current FW and new FW.
-msi,-img-section-info Displays information about current FW Sections.
-mi,-img-info Displays information about current FW Versions.
-showerr,-showerrorcode Displays YAFU command specific failure error code when flashing failed
-fb,-force-boot Option to FORCE BootLoader upgrade during full upgrade.
Also, skips user interaction in Interactive Upgrade mode.
This option is not allowed with interactive upgrade option
-npb,-no-preserve-boot This option skips preserving uboot env variables
-fe This option erases full SPI
-image-size-dump, -isd This option takes backup of SPI data with Running Image Size
-dumpspi This option takes backup of SPI data
-dumpfile This option takes file name to store SPI flash dump data
-bu,-block-upgrade Option to Flash using Block by Block method
-netfn 0xXX Option to Flash using OEM specific Netfunction
-pc,-preserve-config Option to preserve Config Module during full upgrade.
If platform supports Dual Image, this option skips user interaction, preserves config and continues update process.
This option is not allowed with interactive upgrade option.
-pcwe,-preserve-config-web-enable Option to preserve all the configs by enabling preserve items in web
-ipc,-ignore-platform-check If this image is for a different platform, this option skips user interaction and continues update process.
-idi,-ignore-diff-image If this image differs from the one currently programmed, this option skips user interaction and continues update process.
-isi,-ignore-same-image If this image is same as the one currently programmed, this option skips user interaction and continues update process.
-impl,-ignore-module-location If module(s) of this image is/are in a different location, this option skips user interaction and continues update process.
-ibv,-ignore-boot-version If bootloader version is different and -force-boot is not specified, this option skips user interaction and continues update process.
The bootloader will be updated.
-iri,-ignore-reselect-image This option skips reselecting the active image.
-inc,-ignore-non-preserve-config If the Images of both flash share the same Configuration area.
Not preserving will restore to default factory settings, this option s
```

Figure 21 : Yafuflash tool command line

- 3) For dual image, use ipmitool to switch to the image you want to update .

Note : If your system supports ROT, ignore this step.

the command :

- Image1 : `Ipmitool -I lanplus -H ${BMCIP} -U ${USERNAME} -P ${PWD} raw 0x28 0x0a 0x10 0`
- Image2 : `Ipmitool -I lanplus -H ${BMCIP} -U ${USERNAME} -P ${PWD} raw 0x28 0x0a 0x10 1`

```
C:\Users\jinhongchen>ipmitool -I lanplus -H 192.168.11.32 -U admin -P admin123 raw 0x28 0x0a 0x10 0 00
C:\Users\jinhongchen>ipmitool -I lanplus -H 192.168.11.32 -U admin -P admin123 raw 0x28 0x0a 0x10 1 01
```

Figure 22 : switch the BIOS image

4) Enter the command.

Command line format : Yafuflash [OPTION] [MEDIUM] [FW_IMAGE_FILE]

key parameter :

- pfr (Option to flash PFR component manager plugin),
- active (Option to flash image on Active region),
- recovery (Option to flash image on Recovery region),
- d (Option to specify the peripheral) :
 - 0 - BMC
 - 2 - BIOS
 - 4 - CPLD

5) Example

1. (Without ROT) Remotely update BIOS using network media :

Yafuflash.exe -nw -ip 192.168.11.32 -U admin -P admin123 -d 2 ES381AMS.bin

```
C:\Users\jinhongchen\Desktop\S381K123\S381K123\Yafuflash_v7.01.0122\Win64>yafuflash.exe -nw -ip 192.168.11.32 -u admin -p admin123 -d 2 ES381AMS.bin
INFO: Yafu INI Configuration File not found... Default options will not be applied...

Creating IPMI session via network with address 192.168.11.32...Done

+-----+
| YAFUFlash - Firmware Upgrade Utility v7.01.0122 |
| Copyright (c) 2020 American Megatrends International, LLC |
+-----+

=====
BIOS Firmware Details
=====
+-----+
| Description | RomImage | ExistingImage |
+-----+
| BIOS Version | 381MS207 | 381MS206 |
+-----+

Beginning BIOS Update...
Please type (Y/y) to Update or (N/n) to Cancel
Enter your Option : y
Uploading Image : 100%... done
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Resetting the firmware.....
```

Figure 23 : Update BIOS Firmware by Yafuflash remotely (Without ROT)

2. (With ROT) Remotely update BIOS active region using network media :

```
Yafuflash.exe -nw -ip 192.168.11.30 -U admin -P qwer@123 -fb -non-interactive -pfr --active
ES381ARB_203_WebUpdate_SVN1.bin
```

Note: In systems that support ROT, updating the BIOS firmware requires the **PFR is provisioned**

```
C:\Users\jinhongchen\Desktop\ES381ARB.203\ES381ARB.203\Anti-Rollback>Yafuflash.exe -nw -ip 192.168.11.30 -U admin
-P qwer@123 -fb -non-interactive -pfr --active ES381ARB_203_WebUpdate_SVN1.bin
INFO: Yafu INI Configuration File not found... Default options will not be applied...

Creating IPMI session via network with address 192.168.11.30...Done

+-----+
| YAFUFlash - Firmware Upgrade Utility v7.01.0122 |
| Copyright (c) 2020 American Megatrends International, LLC |
+-----+
Detected PFR Capsule --> PCH

Provision Status --> Provisioned

Platform State --> Unknown CPLD state

Block 0 magic Number validation successful..

PFM magic number validation successful
Please type (Y/y) to continue PFR Update or (N/n) to Cancel
Enter your Option : y

-----
YAFUFlash -Updating PFR Image
-----

Uploading Firmware Image: 100%... done
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Resetting the firmware.....
```

Figure 24 : Update BIOS Firmware by Yafuflash remotely (With ROT)

by Yafuflash locally (Take Linux as an example)

- 1) Install yafuflash on server os. ([Refer to the installation of yafuflash in Chapter 1](#))
- 2) Open terminal and go to path/Yafuflash
- 3) Check the file "Yafuflash" has the execution permission

```
root@study-server:/home/chenjh/Desktop/Linux_x86_64# ls -l
total 66408
-rw-rw-r-- 1 chenjh chenjh 67108864 3月 25 10:50 3801.ima
-rwxrwxr-x 1 chenjh chenjh 887907 3月 25 10:50 Yafuflash
-rwxrwxr-x 1 chenjh chenjh 60 3月 25 11:06 yafuflash.sh
```

Figure 25 : Yafuflash tool

- 4) For dual image, use ipmitool to switch to the image you want to update.

Note : If your system supports ROT, ignore this step.

the command :

- Image1 : Ipmitool raw 0x28 0x0a 0x10 0
- Image2 : Ipmitool raw 0x28 0x0a 0x10 1

```
root@study-server:/home/chenjh/Desktop/Linux_x86_64(yafuflash)# ipmitool raw 0x28 0x0a 0x10 0
root@study-server:/home/chenjh/Desktop/Linux_x86_64(yafuflash)# ipmitool raw 0x28 0x0a 0x10 1
```

Figure 26 : switch the BIOS image

- 5) Enter the command in the following format : Yafuflash [OPTION] [MEDIUM] [FW_IMAGE_FILE].

key parameter :

- pfr (Option to flash PFR component manager plugin),
- active (Option to flash image on Active region),
- recovery (Option to flash image on Recovery region),
- d (Option to specify the peripheral) :
- 0 - BMC
- 2 - BIOS
- 4 - CPLD

- 6) Example

1. (Without ROT) locally update BIOS using kcs :

`./Yafuflash -kcs -d 2 ES381AMS.bin`

```
root@study-server:/home/chenjh/Desktop/Linux_x86_64(yafuflash)# ./Yafuflash -kcs -d 2 ES381AMS.bin
INFO: Yafu INI Configuration File not found... Default options will not be applied
...

+-----+
| YAFUFlash - Firmware Upgrade Utility v7.01.0122 |
| Copyright (c) 2020 American Megatrends International, LLC |
+-----+

=====
BIOS Firmware Details
=====
Description      RomImage      ExistingImage
-----
BIOS Version      381MS207      381MS206
=====
Beginning BIOS Update...
Please type (Y/y) to Update or (N/n) to Cancel
Enter your Option : y
Uploading Image : 100%... done
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Resetting the firmware.....
```

Figure 27 : Update BIOS image by Yafuflash locally

2. (With ROT) locally update BIOS active region using kcs :

```
./Yafuflash -kcs -fb -non-interactive -pfr --active ES381ARB_203_WebUpdate_SVN1.bin
```

Note: In systems that support ROT, updating the BIOS firmware requires the **PFR is provisioned**

Update BIOS Firmware by Redfish

Note: In systems that support ROT, the update of BIOS firmware via Redfish is not currently supported.

- 1) For dual image, use ipmitool to switch to the image you want to update , the command :

- Image1 : Ipmitool raw 0x28 0x0a 0x10 0
- Image2 : Ipmitool raw 0x28 0x0a 0x10 1

- 2) Create a JSON file parameters.json. Write the following :

```
{
  "Targets":[
    "/redfish/v1/UpdateService/FirmwareInventory/BIOS "
  ]
}
```

- 3) Create a JSON file oem_parameters.json, Write the following :

```
{
  " ImageType":"BIOS"
}
```

- 4) Open POSTMAN and enter the URI to POST the request.

URL : <https://{{IP}}/redfish/v1/UpdateService/upload>

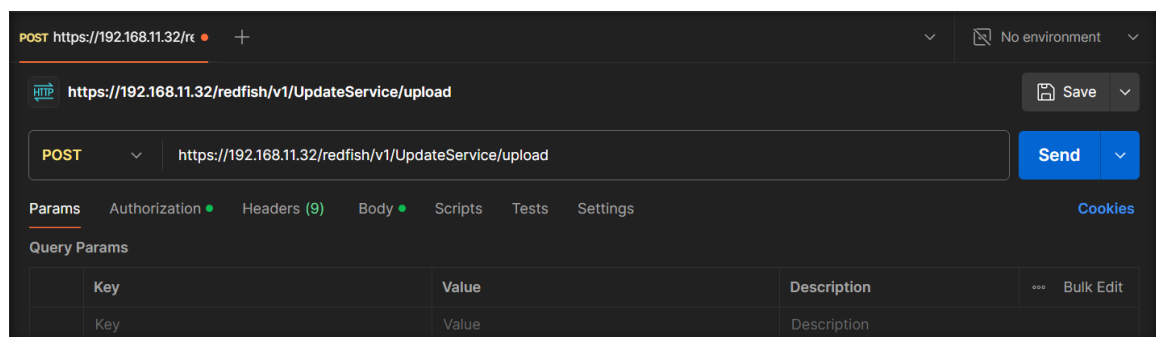


Figure 28 : postman Enter the url

- 5) In the Authorization tab, Auth Type select Basic Auth, enter the BMC account password

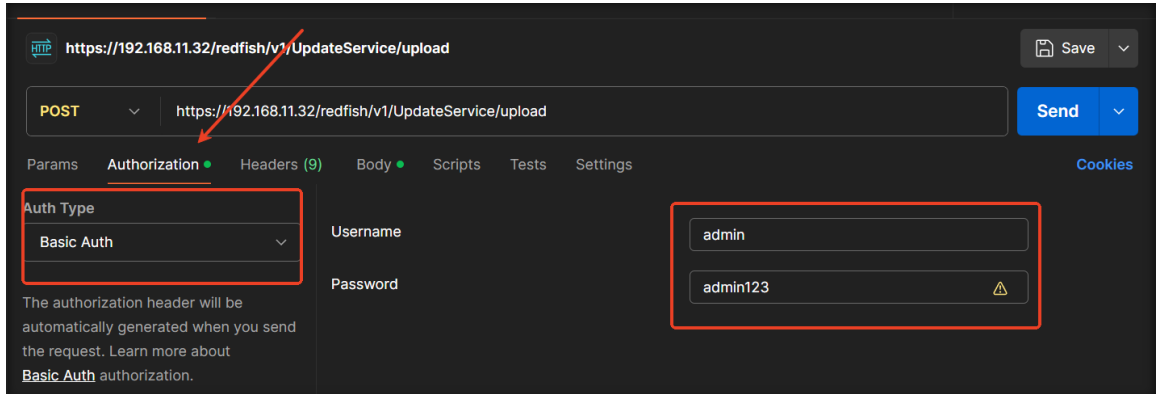


Figure 29 : postman Authorization

- 6) In the body tab, select form-data, enter the first key: UpdateFile, select the type as file, and select the image file at value

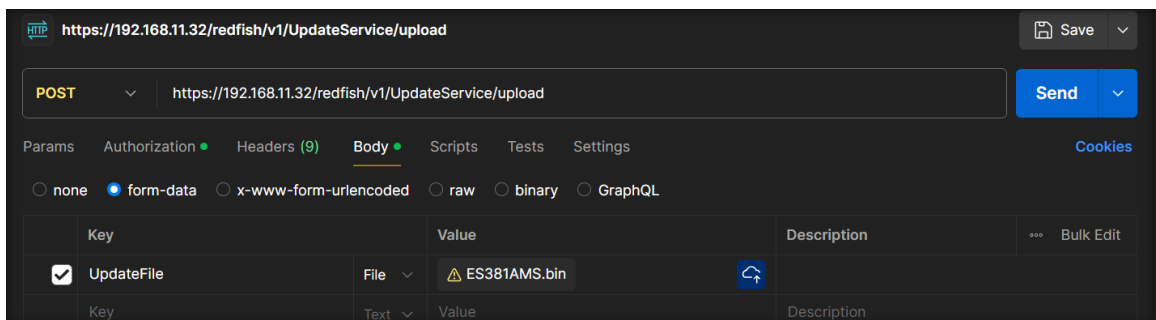


Figure 30 : Select the image file

- 7) enter the second key: UpdateParameters, select the type as file, and select the file created in step 2
- 8) enter the third key: OemParameters, select the type as file, and select the file created in step 3

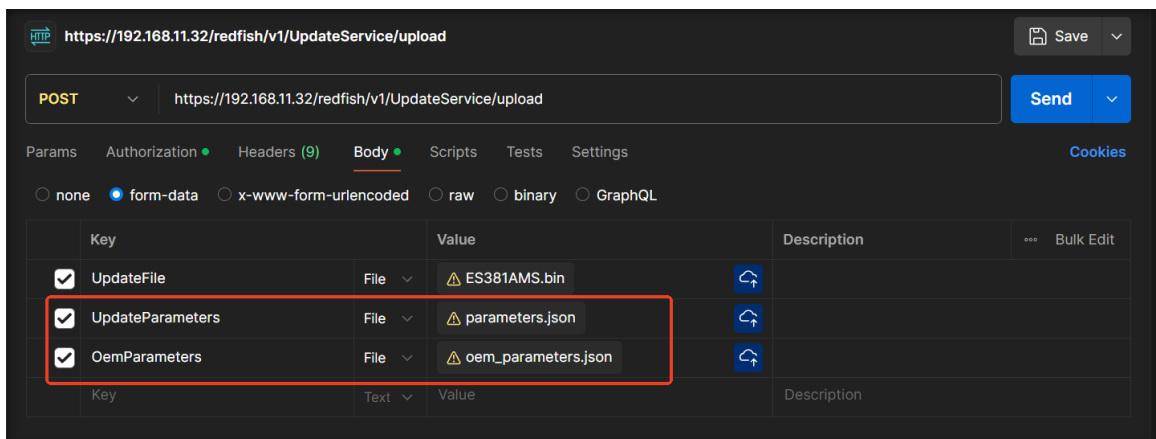
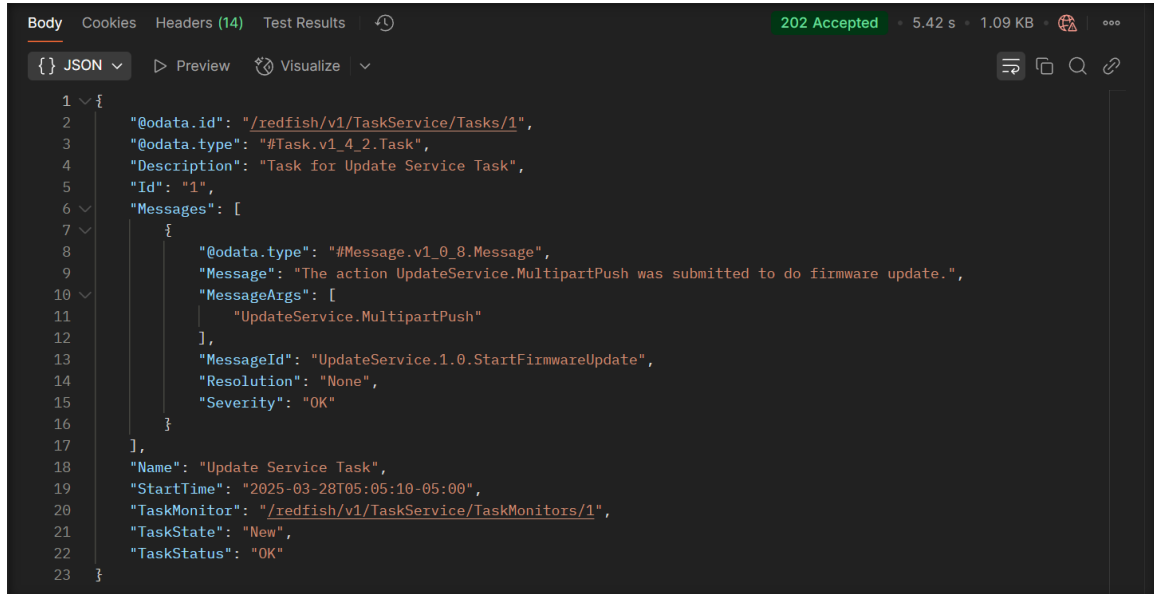


Figure 31 : Select the parameters.json file and oem_parameters.json file

- 9) Click Send, and if successful, with the response shown in Figure 25. The BIOS will start updating



```
1 {
2   "@odata.id": "/redfish/v1/TaskService/Tasks/1",
3   "@odata.type": "#Task.v1_4_2.Task",
4   "Description": "Task for Update Service Task",
5   "Id": "1",
6   "Messages": [
7     {
8       "@odata.type": "#Message.v1_0_8.Message",
9       "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.",
10      "MessageArgs": [
11        "UpdateService.MultipartPush"
12      ],
13      "MessageId": "UpdateService.1.0.StartFirmwareUpdate",
14      "Resolution": "None",
15      "Severity": "OK"
16    }
17  ],
18  "Name": "Update Service Task",
19  "StartTime": "2025-03-28T05:05:10-05:00",
20  "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/1",
21  "TaskState": "New",
22  "TaskStatus": "OK"
23 }
```

Figure 32: Request successful

- 10) View update results : Refer to Step 9 of Update BMC Firmware by Redfish in Chapter 2. [Click here to jump](#)

Update BIOS Firmware by WebGUI

In systems that do not support ROT

- 1) Login in BMC WebGUI via browser.
- 2) Firmware Update page Path : Maintenance -> Firmware Update

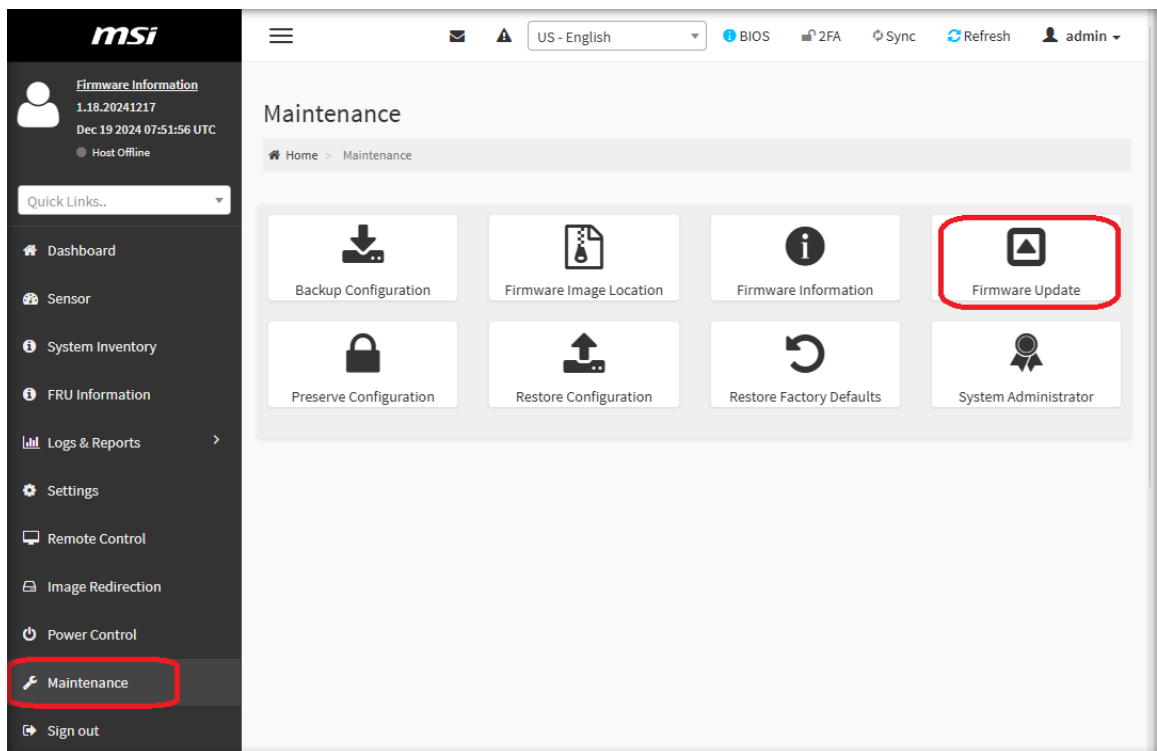


Figure 33 : Firmware Update page Path

- 3) Select the image file and click Start firmware update.

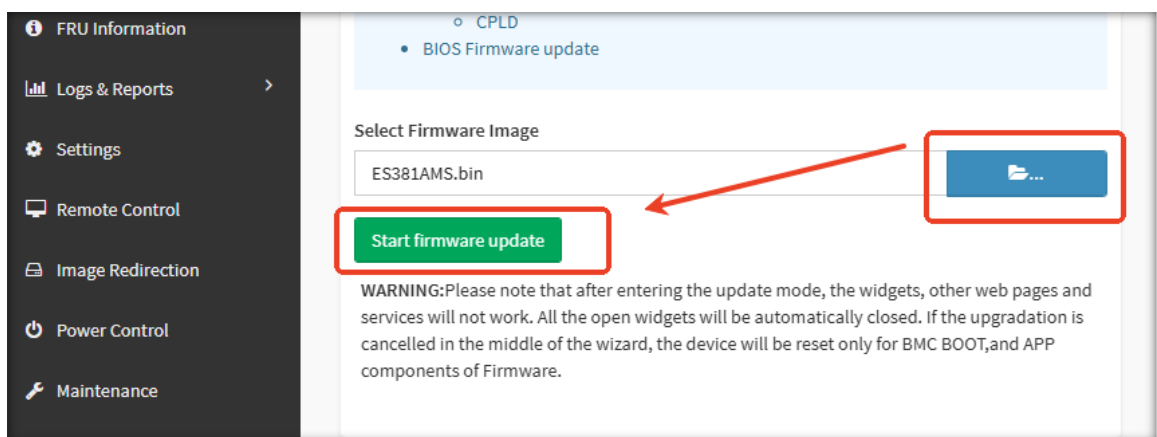


Figure 34 : Firmware Update page

- 4) Click proceed and confirm the pop-up information.

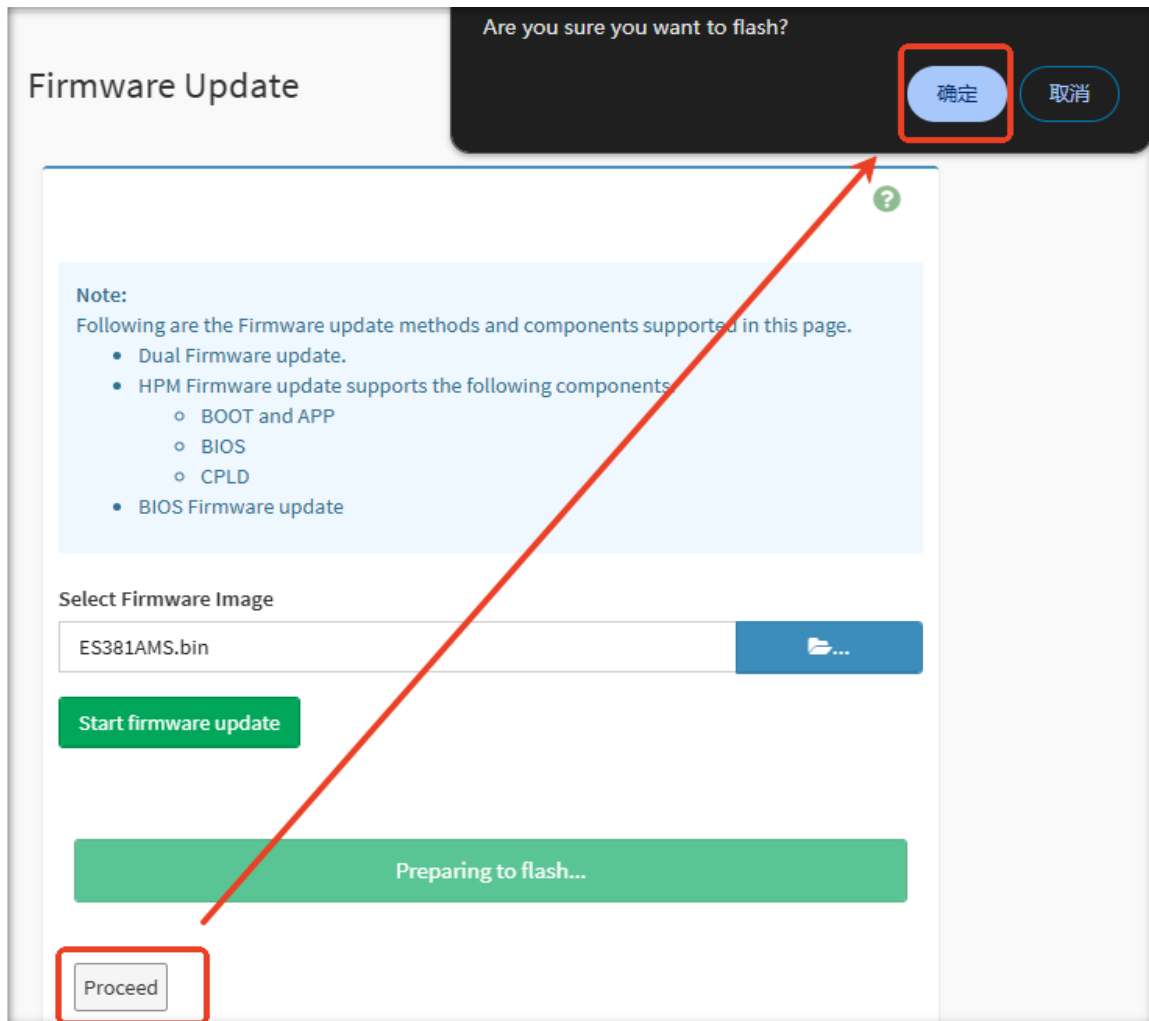


Figure 35 : BIOS Update Proceed

- 5) After the upload progress is 100%, click Proceed to flash image. The BIOS will start updating

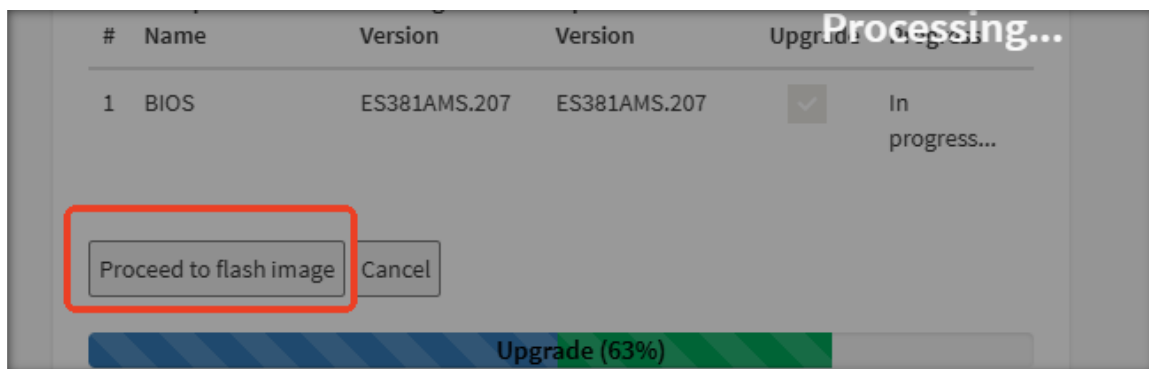


Figure 36 : Proceed to flash image

In systems that support ROT

- 1) Login in BMC WebGUI via browser.
- 2) Firmware Update page Path : Maintenance -> Firmware Update

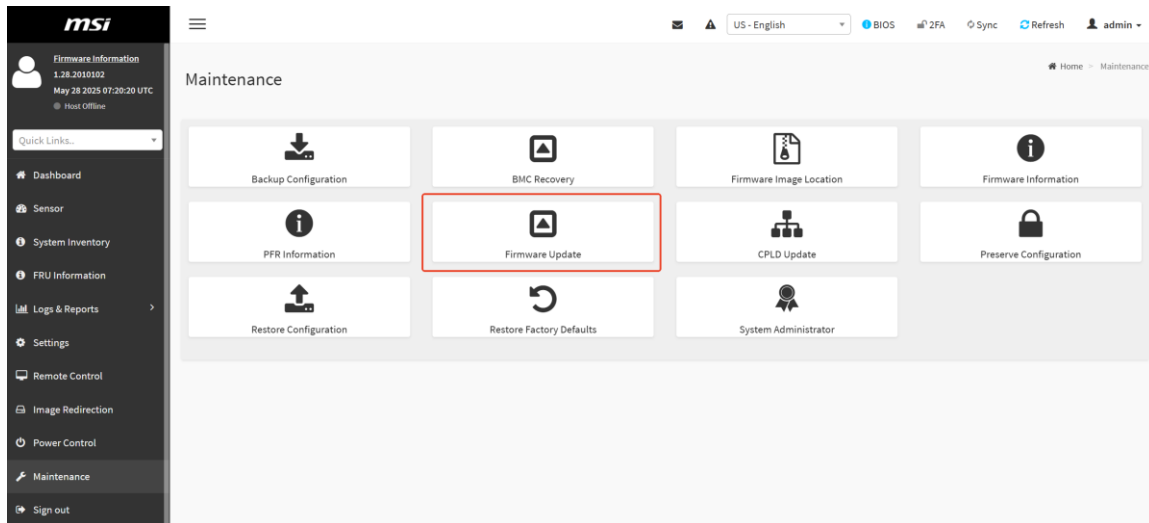


Figure 37 : Firmware Update page Path

- 3) Select the BIOS capsule image file and click Start firmware update.

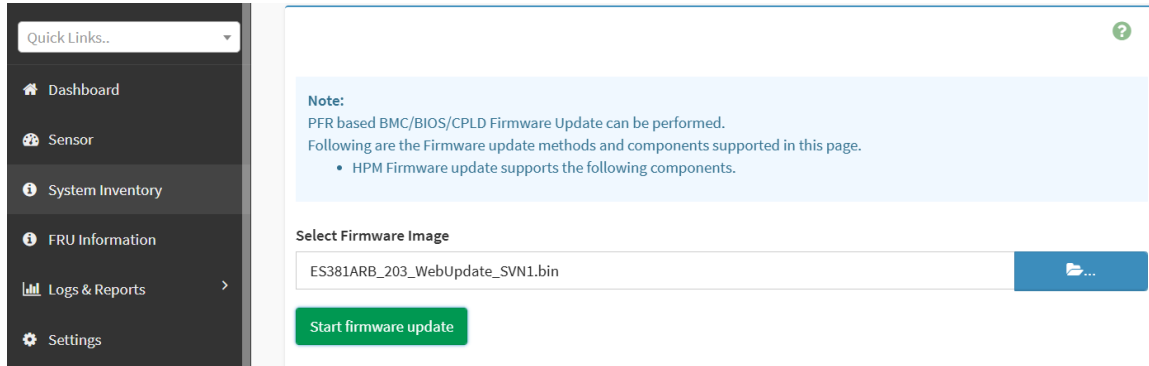


Figure 38 : Firmware Update page

- 4) Select the firmware update option, then Click Proceed to Flash, the BIOS firmware will start to update. You will lose contact with BMC for about twenty minutes.

Select Firmware Image

ES381ARB_203_WebUpdate_SVN1.bin

...

Start firmware update

BMC will begin its firmware update process, which will take a couple of minutes, finishing with the BMC rebooting to run the new firmware. Progress will be reported up until the time of reboot, after which it will take about one minute for the embedded web server to start responding again. As all web sessions will be terminated on a BMC reboot, you will be required to log in again to verify that the firmware update was successful

Provision Status	Provisioned
Platform State	T0 BMC booted
Detected PFR Capsule	BIOS
Target Version	3.2(svn : 1)
Firmware Update Options	<input checked="" type="radio"/> Active <input type="radio"/> Recovery <input type="checkbox"/> Update Dynamic Region
Firmware Activation	Update Immediately ▼

Proceed to Flash

Figure 39 : BMC Update configuration

Chapter 4 Update CPLD Firmware

Warning

Update CPLD only when the Global System States are s5 ! Otherwise, problems may arise.

Update CPLD Firmware by Yafuflash

by Yafuflash remotely (Take windows as an example)

- 1) Install yafuflash on your PC ([Refer to the installation of yafuflash in Chapter 1](#))
- 2) Open command prompt and go to path\Yafuflash

```
INFO: Yafu INI Configuration File not found... Default options will not be applied...
Usage: Yafuflash [OPTION] [FW_IMAGE_FILE]
Perform BMC Flash Update
-? Displays the utility usage
-h Displays the utility usage
-V Displays the version of the tool
-e List out a few examples of the tool
OPTION :
-info Displays information about current FW and new FW.
-msi,-img-section-info Displays information about current FW Sections.
-mi,-img-info Displays information about current FW Versions.
-showerr,-showerrorcode Displays YAFU command specific failure error code when flashing failed
-fb,-force-boot Option to FORCE BootLoader upgrade during full upgrade.
Also, skips user interaction in Interactive Upgrade mode.
This option is not allowed with interactive upgrade option
-npb,-no-preserve-boot This option skips preserving uboot env variables
-fe This option erases full SPI
-image-size-dump, -isd This option takes backup of SPI data with Running Image Size
-dumpspi This option takes backup of SPI data
-dumpfile This option takes file name to store SPI flash dump data
-bu,-block-upgrade Option to Flash using Block by Block method
-netfn 0xXX Option to Flash using OEM specific Netfunction
-pc,-preserve-config Option to preserve Config Module during full upgrade.
If platform supports Dual Image, this option skips user
interaction, preserves config and continues update process.
This option is not allowed with interactive upgrade option.
-pcwe,-preserve-config-web-enable Option to preserve all the configs by enabling preserve items in web
-ipc,-ignore-platform-check If this image is for a different platform, this option skips
user interaction and continues update process.
-idi,-ignore-diff-image If this image differs from the one currently programmed, this
option skips user interaction and continues update process.
-isi,-ignore-same-image If this image is same as the one currently programmed, this
option skips user interaction and continues update process.
-impl,-ignore-module-location If module(s) of this image is/are in a different location, this
option skips user interaction and continues update process.
-ibv,-ignore-boot-version If bootloader version is different and -force-boot is not specified,
this option skips user interaction and continues update process.
The bootloader will be updated.
-iri,-ignore-reselect-image This option skips reselecting the active image
```

Figure 40: Yafuflash tool command line

- 3) Command line format : Yafuflash [OPTION] [MEDIUM] [FW_IMAGE_FILE]

key parameter : -d (Option to specify the peripheral) :

- 0 - BMC
- 2 - BIOS
- 4 - CPLD

- 4) For example, Remotely update CPLD using network media :

Yafuflash.exe -nw -ip 192.168.11.23 -U admin -P admin123 -d 4 S4021-0124-1500.hpm

- 5) Enter the device number of the CPLD you want to update:

```
PS C:\Users\jinhongchen\Desktop> Yafuflash.exe -nw -ip 192.168.11.23 -U admin -P admin123 -d 4 S4021-0124-1500.hpm
INFO: Yafu INI Configuration File not found... Default options will not be applied...

Creating IPMI session via network with address 192.168.11.23...Done

+-----+
| YAFUFlash - Firmware Upgrade Utility v7.01.0122 |
| Copyright (c) 2020 American Megatrends International, LLC |
+-----+
Beginning CPLD Update...

Total CPLD Device Count: 1

-----
Device Number: 0
-----

Device Name: LATTICE MachX03LF-4300C
ID Code: 612bc043
User Code: 40210003
Interface: JTAG
Interface Number: 0
Slave Address : 12
-----

Enter a Device Number to Enable CPLD Firmware Update Mode: 0
```

Figure 41 : Select the CPLD device

- 6) Enter “y”, and the CPLD will start updating

```
Enter a Device Number to Enable CPLD Firmware Update Mode: 0
Enabled CPLD Firmware Update Mode ...
Please type (Y/y) to Update or (N/n) to Cancel
Enter your Option : y
Uploading Image : 100%... done
Flashing Firmware Image : 50%
```

Figure 42 : the CPLD device updating

Update CPLD Firmware by Redfish

- 1) Create a JSON file parameters.json . Write the following :

```
{  
  "Targets": [  
    "/redfish/v1/UpdateService/FirmwareInventory/CPLD "  
  ]  
}
```

- 2) Create a JSON file oem_parameters.json. Write the following :

```
{  
  " ImageType": "HPM"  
}
```

- 3) Open POSTMAN and enter the URI to POST the request.

URL : `https://{IP}/redfish/v1/UpdateService/upload`

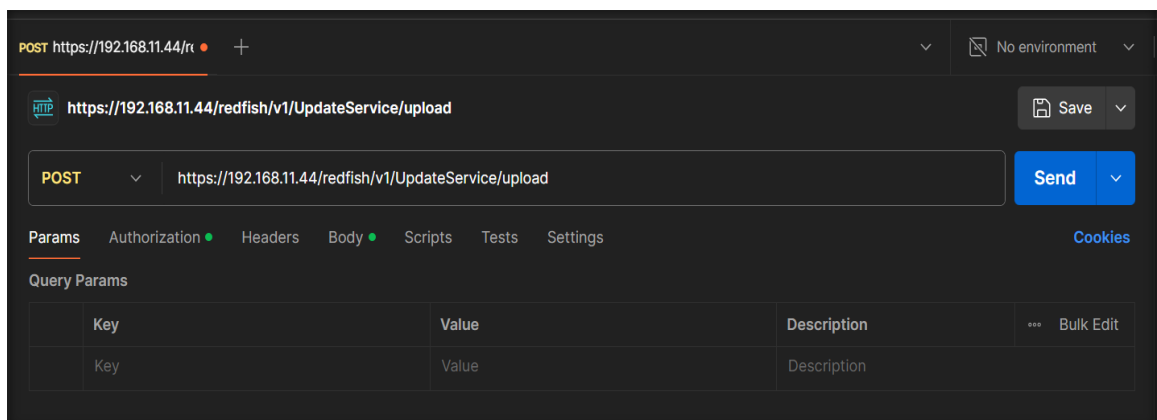


Figure 43 : postman Enter the url

- 4) In the Authorization tab, Auth Type select Basic Auth, enter the BMC account and password

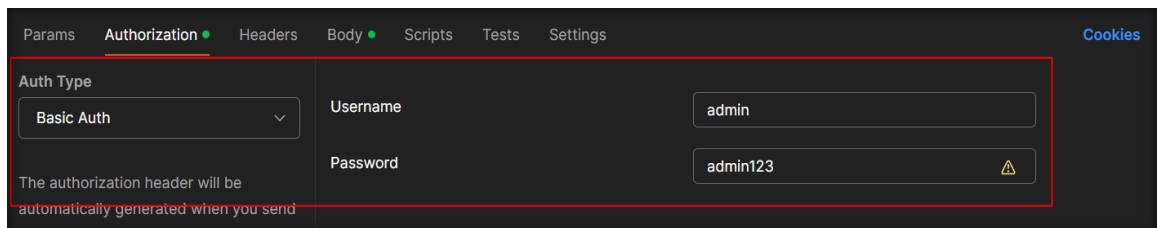


Figure 44 : postman Authorization

- 5) In the body tab, select form-data, enter the first key: UpdateFile, select the type as file, and select the firmware file at value

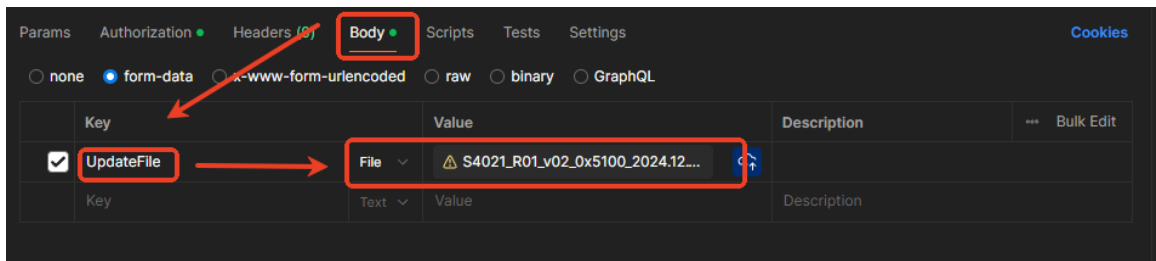


Figure 45 : Select the firmware file

- 6) enter the second key: UpdateParameters, select the type as file, and select the file created in step 1
- 7) enter the third key: OemParameters, select the type as file, and select the file created in step 2

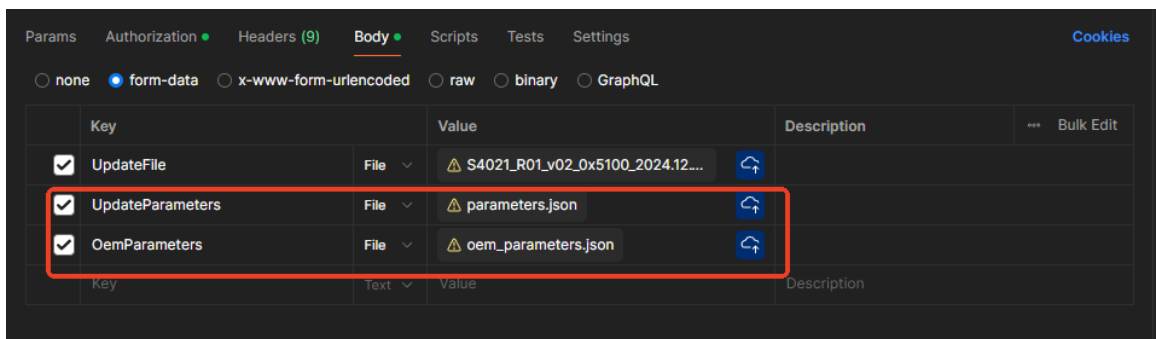


Figure 46 : Select the parameters.json file and oem_parameters.json

- 8) Click Send, and if successful, with the response shown in Figure 9, the CPLD will start updating.



Figure 47 : Request successful

- 9) View update results : Refer to Step 9 of Update BMC Firmware by Redfish in Chapter 2. [Click here to jump](#)

Update CPLD Firmware by WebGUI

1) Login in BMC WebGUI via browser.

2) Firmware Update page Path

In systems that do not support ROT : Maintenance -> Firmware Update

In systems that support ROT : Maintenance -> CPLD Update

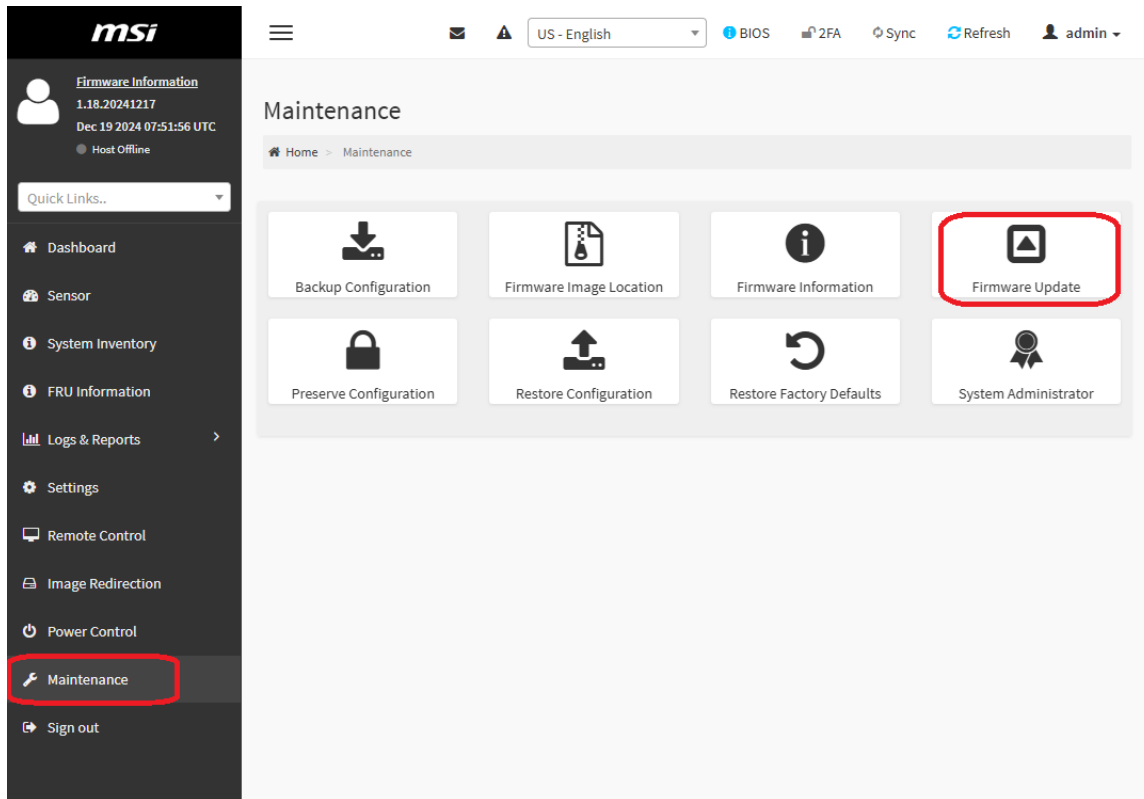


Figure 48 : Firmware Update page Path(without ROT)

3) Select the image file and click Start firmware update.

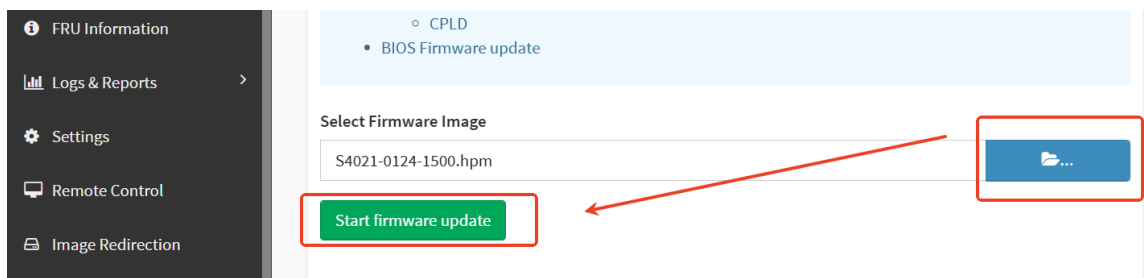


Figure 49 : select the CPLD firmware

- 4) Click proceed and confirm the pop-up information. The CPLD will start updating

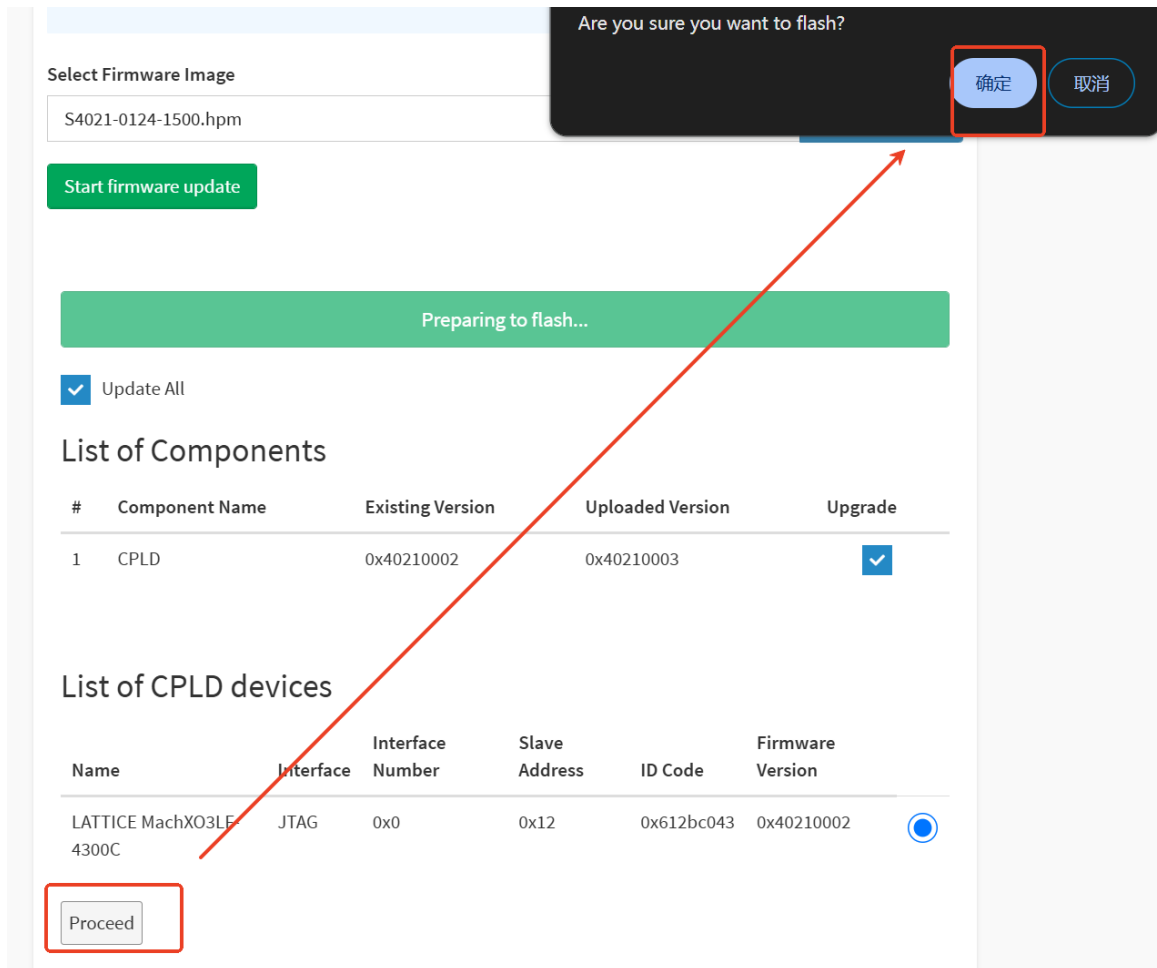


Figure 50 : CPLD Update information confirmation