Intel® One Boot Flash Update Utility

User Guide

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Legal Statements

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Introduction

The Intel® One-Boot Flash Update Utility (Intel® OFU) is used to update the BIOS and firmware on the Intel server boards while the operating system is running. The utility may be launched from a command prompt in either the Windows* or Linux* Operating Systems. This utility can also be executed remotely through a secure network connection using a Telnet Client and Terminal Services in Windows* or using a Telnet Client and Remote Shell under Linux*.

Intel server boards may also be updated using the Intel® Deployment Assistant. This utility is shipped with each Intel® Server Board and provides an easy to use graphical user interface that may be used to update the BIOS and firmware and configure key BIOS and firmware settings.

The Intel® OFU application is available in English only.

Supported Firmware Components

The Intel® OFU Utility, with the update package for your platform, can be used to update the following firmware components:

- System BIOS (All supported platforms)
- Baseboard Management Controller (BMC) integrated firmware (S1200BT, S1200V3RP, S1400, S1600, S2400, S2600, and S4600 platforms with an integrated BMC)
- Field Replaceable Unit (FRU) firmware (S1200BT, S1200V3RP, S1400, S1600, S2400, S2600, and S4600 platforms with an integrated BMC)
- Sensor Data Record (SDR) firmware (All supported platforms with a BMC)
- Intel® Remote Management Module 4 (Intel® RMM4) firmware (Supported on S1200BT, S1200V3RP, S1400, S1600, S2400, S2600, and S4600 server families if the Intel® RMM4 module is installed)
- Management Engine (ME) firmware (Supported on S1200BT, S1200V3RP, S1400, S1600, S2400, S2600, and S4600 server families)

Firmware Update Package (for IDA, OFU, WinPE* and EFI) is available from http://support.intel.com under each platform.

When Updates Take Effect

Starting with S1200BT, S1200V3RP, S1400, S1600, S2400, S2600, and S4600 platforms, the Intel® OFU utility updates the FW and BIOS images passively via BMC controller or BIOS. The utility hands off the required image files to BMC Controller or to BIOS. After verification of the images (signature verification and/or authenticity verification), the Base Board Management Controller FW or BIOS, would update the images by their own. After firmware update the firmware will immediately switch to updated firmware; while the effect of the BIOS update would be seen in the next reboot.

FRU updates only have one firmware area so the updates will take effect immediately when the utility executes. In some cases, the System BIOS, BMC FW, SDR updates are programmed into their respective secondary flash areas and the utility sets an internal flag in the BIOS and BMC to indicate that the update occurred. After a system reset, the newer version of the System BIOS, BMC, and SDRs are validated and then activated.

Table 1. When Firmware Updates Take Effect by Platform

Firmware Component	Intel® Server Board
	Intel ® S1200BT, S1200V3RP, S1400, S1600, S2400, S2600, and S4600
BIOS	Immediate
BMC	Immediate
SDR	Immediate
FRU	Immediate
HSC/PSoC†	Depending on platform; mostly next boot
Intel® RMM4	Depending on platform; mostly next boot
ME Firmware Update	Depending on platform

Supported Operating Systems

The Intel® OFU utility runs on the Microsoft Windows*, Red Hat* Enterprise Linux, and SuSE* Linux Enterprise Server operating systems unless otherwise noted in the *Intel® OFU Release Notes* or the *Supported Operating System List* for your specific Intel server platform. Both IA-32 and Intel® 64 Architecture versions are supported for the operating systems listed below. The following list shows the supported operating systems and platforms when this document was published.

Table 2. Supported Operating Systems

Operating System	Supported Platforms
Windows Server 2008 R2 SP1* x64	S1200BT, S1400, S1600, S2400, S2600, and S4600
Windows Server 2008 SP2* x64 and x32	S1200BT, S1400, S1600, S2400, S2600, and S4600
Windows Server 2012*	S1400, S1600, S2400, S2600, and S4600
Windows 7* x64 and x32	S1200BT, S1400, S1600, S2400, S2600, and S4600 Workstation Server platforms
SuSE* Linux Enterprise Server 11 SP1	S1200BT, S1400, S1600, S2400, S2600, and S4600
SuSE* Linux Enterprise Server 11 SP2	S1200BT, S1400, S1600, S2400, S2600, and S4600
Red Hat* Enterprise Linux 6 update 1 x64 and x32	S1200BT, S1400, S1600, S2400, S2600, and S4600
Red Hat* Enterprise Linux 6 update 2 x64 and x32	S1200BT, S1400, S1600, S2400, S2600, and S4600
Red Hat* Enterprise Linux 6 update 3 x64 and x32	S1200BT, S1400, S1600, S2400, S2600, and S4600
Red Hat* Enterprise Linux 6 update 4 x64 and x32	S1200V3RP

Installation and Uninstallation

Pre-request before Install Intel® OFU

1. Boot to Windows 2008* (R2/SP1) or Red Hat 6* or SuSE* 11 Operating System.
2. In order to use the Microsoft IPMI* driver or Open IPMI driver for OFU to update BIOS/BMC/FRUSDR, user needs to Enable "Plug and Play BMC Detection" setting under "Server Management" in the BIOS F2 screen.
3. Install all the development and optional packages during RHEL* and SuSE* Operating system installation.
4. In Red Hat 6* OS
   a. If the utility fails with error message
   "error while loading shared libraries: libncurses.so.5: cannot open shared object file:
   No such file or directory"
   Then install libstdc++-4.4.4-13.el6.i686.rpm and ncurses-libs-5.7-3.20090208.el6.i686.rpm from the OS CD itself using the below commands.
   #rpm -ivh libstdc++-4.4.4-13.el6.i686.rpm
   #rpm -ivh ncurses-libs-5.7-3.20090208.el6.i686.rpm
   Example: rpm -ivh media\Packages\libstdc++-4.4.4-13.el6.i686.rpm
   where CD/DVD is mounted to "media" directory.
   b. If the utility fails with error message
   "Error: /lib/ld-linux.so.2: Bad ELF interpreter: No such file or directory"
   This indicates development and optional packages are not installed, please install the necessary packages accordingly.
5. Windows Server 2008* OSes
   The utility will error out if the "Plug and Play BMC Detection" setting is disabled, User needs to install Intel IPMI driver manually using
   Example: Devicesetup.exe -v install imbdrv.inf *IMBDRV from the drivers folder.

Installing Intel® OFU

If you downloaded the Intel® OFU package from the Intel support website, use one of the following procedures:

On Windows* Operating Systems

1. Copy the OFU zip package to local folder.
2. Unzip to local folder(example: .\flashupdt). Go to flashupdt folder (cd Flashupdt).
3. Go to the Drivers\Win folder, choose x86 or x64 (depending on the operating system).
4. Run "install.cmd ." to install the drivers.

5. Go to Win_x86 folder to execute flashupdt utility, the binaries are common for both x86 and x64 versions of Windows* Operating system.
6. Now you can run command with options (example: "flashupdt -u /tmp/flashupdt.cfg").

On Red Hat* Enterprise Linux or SuSE* Enterprise Server Linux Operating Systems

A. Regular Installation

1. Copy the OFU zip package (for RHEL or SLES) to local folder.
2. Unzip to local folder(example: .\flashupdt). Go to flashupdt folder (cd flashupdt).
3. # chmod 755 install.sh.
4. Install the utility using the command: "#./install.sh".
5. Go to the RHEL or SLES directory (based on operating system).
6. # chmod 755 chaff2l.sh.
7. Unzip the file flashupdt.zip to get flashupdt executable for Linux* OS.
8. Now you can run command with options (example: "# ./flashupdt -u /tmp/flashupdt.cfg").

B. RPM Installation

1. Copy flashupdt rpm from Linux-RPM-package (for RHEL or SLES) to local folder.
2. Install flasupdt utility by using "rpm -Uvh flashupdt-Vxx.x-Bxx.ixxx.rpm". This will install the utility in "/usr/bin/flashupdt/"
3. On RHEL/SLES after installing the rpm close the terminal from which rpm was installed and then execute utility from a new terminal (example: "# flashupdt -u /tmp/flashupdt.cfg").

   For HTTP and FTP based updates please execute the utility from "/usr/bin/flashupdt/" as 'curl' and 'chaff2l.sh' files are needed for HTTP and FTP based updates.

Uninstalling Intel® OFU

In Windows* -

1. Run uninstall.cmd to uninstall all the drivers.
2. Remove the flashupdt folder structure.

In Linux* –

1. Remove the flashupdt folder structure. Or unintsall the rpm using

   rpm –e flashupdt

Running the Intel® One Boot Flash Update

The Intel® OFU utility is run by executing the flashupdt command from a command prompt.

NOTES

In order to run this utility, you must first set the working directory to the directory where the utility is installed. This is required because the utility depends on certain files that are expected to be located in the working directory.

Intel® OFU requires Windows administrative or Linux* root permissions.*

Command Line Syntax

Syntax:

flashupdt [**-i**] [**-u** *<URL or path>*] [**-c**] [**-h**|**?**]

Description:

Updates the System BIOS or firmware on the local server with the System BIOS or firmware specified in the Intel® OFU configuration file provided with the update package.

Options:

[-i]	Displays the version information for the currently running System BIOS, BMC, and SDR. If the –i option is specified with the –u option, the utility displays the version information of the update package files.
[-u]	Performs the System BIOS and firmware update. The <*URL or path*> parameter specifies the location where the files required for the update are located. The value of <*URL or path*> can be a local file system path, an FTP server, or an HTTP server. Examples of using the –u option: –u — Specifies the current local directory. –u http://<IP address or URL>/<path> — Specifies an HTTP server. –u ftp://<login:password>@<server name or IP address>/<path> — Specifies an FTP server. If –u is used in conjunction with –i, no update is performed. Only the package information is displayed.
[-h|?]	Displays command line help information.
[-set]	Sets different FRU area as below (for BMC systems) flashupdt /set "area name" "frufield" "value" Where areaname can be "product" or "chassis" depending on the FRU area to be modified. The following are the frufield parameters. Pn – indicates product name Pnum – indicates the part number Pver – Indicates the product version Snum – indicates the serial number Mn – indicates the manufacturer name At – asset tag Note: For the chassis area, the fields "at", "pn" and Pver are not supported.

Syntax examples:

```
flashupdt –u ftp://ftp.example.com/UpdatePkg/ServerName/flashupdt.cfg

flashupdt –u ftp://Kevin:87w09@ftp.example.com/UpdatePkg/ServerName/flashupdt.cfg

For Windows:

flashupdt –u flashupdt.cfg

For Linux:

flashupdt –u /flashupdt.cfg

flashupdt -set product Pn intelco

flashupdt -set product At xx123456

flashupdt -set chassis Mn intelco
```

Note: flashupdt.cfg can be found from Firmware Update Package for IDA, OFU, WinPE* and EFI under http://support.intel.com for each platform.

Updating the Server from a Remote Client

This utility can be executed remotely via a secure network connection using a Telnet Client and Terminal Services in Windows*, or using a Telnet Client and Remote Shell under Linux. See your operating system documentation for further information on remotely logging-in and executing commands.

Once you have logged-in remotely, you can use the syntax described above. This process can be scripted to allow remote updates of multiple servers.

Note to Users:

- After performing CFG based update using flashupdt utility, it is highly recommended to perform a power cycle. Continuous updates through CFG file without power cycle/reboot in between could cause system unstability.
- Starting from S1200BT, S1200V3RP, S1400, S1600, S2400, S2600, and S4600 platforms the flashupdt utility or otherwise known as OFU utility supports preserving OEM data through CFG file based update. For details of usage and command please refer to the white paper "Supporting OEM Activation 2.x on Intel® Server Boards".
- For CFG based update it is assumed that the HTTP/FTP server does not require any user name password. In order to access password protected servers, please change the chaff2l.sh or the batch file and include the username/password.

  The defualt in the .sh file -

  ```
  ./curl $1 -o $2 -s
  ```

  For password protected server please change the above as below -

  ```
  ./curl $1 --user admin:pwd -o $2 -s
  ```

  where admin and pwd are the username and password respectively.

Error Exit Codes

The following error codes may be used when the Intel® OFU utility is run from a script.

Note: the update configuration file (.cfg) may use the ERRORLEVEL command to override these values.

Value	Description
0	Successful termination
1	Invalid invocation or unknown command line argument
2	File was not found
3	Unable to read a file
4	A file in the update package is incompatible with the target server
5	A file in the update package is invalid or unsupported
6	Firmware interface failure (an error occurred when reading or writing to the BMC, setting the update notification, or updating the BMC, FRU, HSC, Intel® Local Control Panel, or SDR)
7	BIOS interface failure (an error occurred when reading the BIOS ID, setting the update notification, or updating the System BIOS)
8	Insufficient rights (the user must have Administrator or root rights)
9	Instance of another utility already running. If so, wait for the instance to finish and then start again.
10	Unknown error

Supported Intel® Server Boards

This version of the Intel® OFU utility supports the Intel® Server Boards listed below. (Intel® Server Systems based on the Intel® Server Boards listed below are also supported unless otherwise noted in the product documentation for the Intel® Server System.)

- Intel® Server Board S1200BT
- Intel® Server Board S1200V3RP
- Intel® Server Board S1400
- Intel® Server Board S1600
- Intel® Server Board S2400
- Intel® Server Board S2600
- Intel® Server Board S4600

To find the latest Intel® OFU update package for your server, refer to http://support.intel.com/motherboards/server/.

Glossary

The following abbreviations are used in this document:

Term	Definition
BCD	Binary Coded Decimal
BIOS	Basic Input Output System
BMC	Baseboard Management Controller. The primary microcontroller that controls the operation of the Intel® server management subsystem.
CFG	Configuration (file)
CHAFF2L	Copy HTTP And FTP Files To Local – program used by the One-Boot Flash Update utility to download files from http and ftp servers.
EPS	External Product Specification
FRU	Field Replaceable Unit
FUD	Flash Update Driver
FW	Firmware
HSC	Hot-Swap Controller
HW	Hardware
IA	Intel® Architecture
ID	Identification
IMB	Intelligent Management Bus
IPMB	Intelligent Platform Management Bus. Name for the architecture, protocol, and implementation of a special bus that interconnects the baseboard and chassis electronics and provides a communications media for system platform management information.
IPMI	Intelligent Platform Management Interface
ME	Management Engine
OEM	Original Equipment Manufacturer
Op Code	Operational Code
PIA	Platform Information Area
POST	Power On Self Test
RPM	Red Hat* Package Manager
SDR	Sensor Data Record
SEL	System Event Log
SM	Server Management
SMS	Server Management Software
URL	Universal Resource Locator