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Adding New Firmware Versions to the UpdateXpress CD

1. Introduction

This white paper shows how to integrate new firmware update packages into the bootable portion of the UpdateXpress CD and create a new UpdateXpress.iso image file. Newer firmware updates may be downloaded manually from the IBM server support website or obtained via UpdateXpress Live.

Note that this whitepaper only applies to the UpdateXpress bootable environment. It does not affect the UpdateXpress packages or device driver updates. This whitepaper also does not cover adding new machine support to the UpdateXpress CD. It only covers adding newer firmware updates to machines that are already supported.

For blade servers, modify UpdateXpress CD #3, for non-blade servers, modify UpdateXpress CD#1.

This white paper was written for use with UpdateXpress version 4.02 and higher.

For demonstration purposes, this whitepaper uses an x235 server.

		Adding Firmware and Driver Packages to UpdateXpress CD Whitepaper
IBM	@server	
	Page 3 **of** 12	Written By: Paul Tippett, Tyrone Baird and Peter Donovan

2. Significant UpdateXpress CD File and Directories

Below is a list and a brief description of the files and directories that are significant to upgrade the contents of the UpdateXpress device drivers.

> \SGUIDE\ADAPT   - All device driver and some common firmware updates.
> \SGUIDE\MACH   - Machine specific firmware and driver updates
> \SGUIDE\MACH*MachineType*   - Parent directory for firmware updates for server type *MachineType*
> \SGUIDE\ini   - location of .ini files. These are text files that can be modified to change the behavior of the firmware update portion of *UpdateXpress.*

This whitepaper will use the following files and directories listed below for this x235 tutorial example:

> \SGUIDE\MACH\8671   - x235 firmware parent directory
> \SGUIDE\INI\FLASHIT.INI   - text file containing firmware location and version information
> \SGUIDE\INI\SYSCFG.INI   - text file containing directory, support, and name information used by the firmware update engine.

3. Format of the INI files.

It is important to first understand the formatting of the UpdateXpress ini files. These are the main files the UpdateXpress firmware update engine uses to determine what servers and firmware are currently available on the CD.

You must use extreme caution when modifying these files as any mistakes could cause UpdateXpress to malfunction. Some sections of the ini files are not explained. If a specific line or section isn't mentioned, do not modify it.

3.1 Format of the syscfg.ini file.

In syscfg.ini, each machine will have a section that looks like this:

8671   = XSERIES_235
XSERIES_235 = 8671
PRETTYNAME_8671   = xSeries 235

The text to the right of the <machinetype>= is the section in flashit.ini that contains
the information for the particular machinetype. So to find information for the x235, we would
search for XSERIES_235 in flashit.ini

3.2 Format of the Flashit.ini file.

3.2.1 Machine specific section:

Below is the flashit.ini section for the x235 server.

[XSERIES_235]
SYSTEM_BIOS_Exec=Z:\SGUIDE\MACH\8671\BIOS\FLASH2.EXE
SYSTEM_BIOS_Apply=/u
SYSTEM_BIOS_CD=51C

SYSTEM_DIAGNOSTICS_Exec=Z:\SGUIDE\MACH\8671\DIAG\FLASH2.EXE
SYSTEM_DIAGNOSTICS_Apply=/u /d
SYSTEM_DIAGNOSTICS_CD=T27

HUMMINGBIRD_Exec=Z:\SGUIDE\MACH\8671\HUMMING\FLASH2.EXE
HUMMINGBIRD_Apply=/u /e
HUMMINGBIRD_CD=27A

IBM_REMOTE_SUPERVISOR_ADAPTER_Exec=Z:\SGUIDE\MACH\8671\REMOTSUP\callflsh.exe
IBM_REMOTE_SUPERVISOR_ADAPTER_Apply=/u /c /b /m
IBM_REMOTE_SUPERVISOR_ADAPTER_CD=GRET23A

BROADCOM_FW_Exec=Z:\SGUIDE\MACH\bcfw\BIOS\call
BROADCOM_FW_Apply=Y:\FIRMWARE\bcfw.bat 8671
BROADCOM_FW_CD=2.35

This section tells a few things:
1. Looking at the SYSTEM_BIOS_EXEC line:

   SYSTEM_BIOS_Exec=Z:\SGUIDE\MACH\8671\BIOS\FLASH2.EXE
   We can determine that the bios flash files are in the
   SGUIDE\MACH\8671\BIOS\ directory on the CD.
2. The end of the _EXEC line tells us the flash program to call. In this case, the flash program is FLASH2.EXE.
3. The _APPLY line lists any switches that are applied to the flash program listed in the _EXEC line above.
4. The _CD line lists the version of the update currently on the CD.

NOTES:

HUMMINGBIRD originally referred only to the Integrated Systems Management Processor. This section is now used to flash whatever systems management processor is integrated onto the system board of the server. For some machines, this will be an Integrated Systems Management Processor and for others it will be a Baseboard Management Controller. This section is NOT used to flash a Remote Supervisor I or II adapter, even if it was preinstalled in the server.

Normally, the flash program (specified on the _EXEC line) and the switches (specified on the _APPLY line) will not change between different versions of the update. To verify which flash program to call and the appropriate switches, check the readme file that accompanied the update.

3.2.2 Common section.

Near the top of flashit.ini is a common section. This lists updates that can be applied to ANY server.

The format for each update is the same as in the machine specific sections. Note that if an update contains a _CD line that contains a version of UNKNOWN. UpdateXpress cannot determine the version of the update and leaves it to the update program to do version checking. In this case, the update will be run every time.

Since the common updates apply to more than one machine, they are either found in the \SGUIDE\MACH\ directory or the \SGUIDE\ADAPT directory.

3.3 Finding the version of a firmware update.

UpdateXpress uses the Build ID to compare one firmware version to another. To find the build id for most update, refer to the .txt file that accompanies the update. Specific instructions for the different update types are in the sections below.

3.3.1 Finding the version of a Bios or Diagnostic firmware update.

A heading similar to the following will be near the top of the .txt file:

IBM eServer xSeries 235 Windows BIOS Update

Version 1.04 (Build ID KPJT27A)
Installation README File

For most firmware updates, including System BIOS and Diagnostics, the last 3 characters of the build ID are what should be put on the _CD line in flashit.ini.

Change the SYSTEM_BIOS_CD=25A line in flashit.ini to:
SYSTEM_BIOS_CD=27A

Finding the version of the Broadcom NIC Firmware Update

The version information for the Broadcom NIC firmware update is also listed in the readme.txt that accompanies the update. An excerpt from a sample readme is below:

2.0 Change History
_____

This package updates the Broadcom firmware for the following items:

73P9030	to firmware level 3.21
26K4842	to firmware level 3.21
6216	to firmware level 2.37
8671	to firmware level 2.37

Again, using the xSeries 235 as an example, the above readme shows that the broadcom firmware level included in the update is version 3.29a. This is the version that will go on the _CD line for broadcom firmware in the flashit.ini file.
Specifically, change:

BROADCOM_FW_CD=2.35

To:

BROADCOM_FW_CD=2.37

NOTE: Do not modify any of the other BROADCOM_ lines.

3.3.2 Finding the version of the ServeRAID Adapter BIOS/Firmware

See section 5.3 <u>Finding Versions for and Upgrading ServeRAID Bios/Firmware</u>

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3.3.3 Finding the Version of the RSA2 Video Adapter Bios

The version of the RSA2 video bios is listed at the top of the readme.txt that accompanies the update. Often, the new version is the same as the old version. This may be due to the fact that the flash utility is updated to support new adapters, but the flash image itself remains the same.

Since UpdateXpress cannot detect the current version of the RSA2 video adapter bios, it will be applied all the time, even if the old version and new version match.

Below is an excerpt from the current RSA2 video adapter bios update with the version highlighted in blue.

ATI RV100 Video FLASH Utility -Version yi010468.001

4. Retrieving New Updates with UpdateXpress Live

Below are brief instructions on how to retrieve new updates from IBM using UpdateXpress Live.

1. Insert the UpdateXpress CD into any system that has a direct connection (not via a proxy) to the internet.

2. Click on the "UpdateXpress Live" button.

3. Enter the four digit machine type and click the "OK" button. We used 8671 for the IBM eServer xSeries 235. This will retrieve a list of updates from IBM that are newer than those on the current UpdateXpress CD.

4. Click on the "Download" button. This will download all of the available updates to the %SystemDrive%\Program Files\IBM\UpdateXpress\Live directory and then display a web page that describes all of the updates that were retrieved.

   a. Clicking on any of the links for the updates will display a page that has the details for the update. You will need to get the package name of the update(s) you want from the details page(s).

   b. You must note the path and name of the new packages that were downloaded as they will be used later in these instructions.

5. To extract the contents of a firmware update to diskette, run the Update package and choose the option "Extract to Floppy" to get the appropriate DOS based update.

		Adding Firmware and Driver Packages to UpdateXpress CD Whitepaper
IBM	**@server**	
	Page 8 of 12	Written By: Paul Tippett, Tyrone Baird and Peter Donovan

      6.   Click on the "Exit" button then the "OK" button to exit UpdateXpress.

5. Upgrading the UpdateXpress CD

Now that you understand the format of the .ini files and have downloaded the latest updates with UpdateXpress Live, you can follow the instructions below to upgrade the current UpdateXpress CD.

Please note that D:\CustomUXCD directory used throughout the rest of these instructions is a fictitious directory. You can substitute any valid directory name you wish.

5.1 Upgrading Bios, Diagnostics, ISMP, Remote Supervisor Adapter, Broadcom Firmware, RSA2 Video adapter BIOS, and Hard Disk Drive Microcode.

The instructions for updating the System Bios, Diagnostics, Integrated Systems Management Processor, Remote Supervisor adapter firmware, Broadcom firmware, and RSA2 Video adapter bios are almost identical. These instructions are using an x235 and the System Bios update as and example.
Note: The RSA2 video adapter BIOS and Hard disk drive microcode are found in the [Common] section of flashit.ini instead of the individual system sections.

1. Copy the entire contents of the UpdateXpress CD to a working directory.
    a. Create a working directory (D:\CustomUX)

    b. Xcopy all of the contents of the UpdateXpress CD to the working directory.
    c. Remove the read-only attributes of the files that were copied (attrib D:\CustomUX*.* –r /s).

2. Copy the new update to the CD.
    a. Find the proper directory. (See sections 3.1 and 3.2 above).
        For our example, the proper directory is
        D:\CustomUX\SGUIDE\MACH\8671\BIOS
        Extract all the files in update.exe into the current directory. This is
        required since, in some cases, UpdateXpress requires extra files
        above what's included in the update itself. Then delete update.exe.
        i.   In our example, run update.exe –o –d from the
            D:\CustomUX\SGUIDE\MACH\8671\BIOS directory.
        ii.   From the same directory, delete update.exe.

    b. Copy the new update files into the directory.
        i.   In our example, copy *.* from the x235 bios update diskette into
            the D:\CustomUX\SGUIDE\MACH\8671\BIOS directory. (xcopy
            a:*.* -e D:\CustomUX\SGUIDE\MACH\8671\BIOS)
    c. Create a self extracting .zip containing all files called UPDATE.EXE.
        i.   Once all files are copied into the directory, use your favorite
            compression utility to create a self extracting .exe called
            UPDATE.EXE that contains all of the files copied from the diskette.
            Note: make sure to copy all subdirectories into the .exe and
            preserve those subdirectory names.

		Adding Firmware and Driver Packages to UpdateXpress CD Whitepaper
IBM	@server	Written By: Paul Tippett, Tyrone Baird and Peter Donovan
	Page 9 **of** 12	

> ii. Once you've created the UPDATE.EXE file in the D:\CustomUX\SGUIDE\MACH\x235\BIOS directory, delete all the files in the directory except for UPDATE.EXE.

3. Update the appropriate section in the flashit.ini file (refer to section 3.2)
   a. Update the flashit.ini file.
      i. Open D:\CustomUXCD\SGUIDE\INI\FLASHIT.INI into a text editor.
      ii. Locate the appropriate section (in our example, XSERIES_235)
      iii. Modify the appropriate _CD line to reflect the new version of the update. See "Finding the version of a firmware update" (Section 3.3) for more details.
         1. Change:
            SYSTEM_BIOS_CD=25A to
            SYSTEM_BIOS_CD=27A
            Note: When modifying the _CD line for the Remote Supervisor Adapter, you must specify all 6 characters in the build ID, not just the last 3.

            Note: Do not modify the _CD line for the hard disk drive microcode or tape drive microcode updates. These are applied every time UpdateXpress is run. Version checking is done by the updates themselves. Anything that needs updating will be. If nothing needs updating, these utilities will simply exit.

            Tip: If you want an update to be applied no matter what level is currently on the machine, change the _CD line to a very high version (99A). This will cause UpdateXpress to always think the firmware version on the CD is higher than what is on the system and to update it every time.

      iv. Make any required changes to the _EXEC and _APPLY lines.
          Note: In most cases these lines will not change. If you are unsure what modifications to make, leave these lines alone.
      v. Save and close the file

5.3 Upgrading Tape Drive Microcode

The instructions for updating tape drive microcode are very similar to the steps listed in section 5.1 although there are some differences since the tape drive microcode update program is not compressed on the UpdateXpress CD. Use section 5.1 for detailed instructions on adding this update, but note the differences listed below:

A. The Tape Drive update is also found in the [COMMON] section near the top of Flashit.ini instead of being in the individual machine sections.

B. The tape drive microcode update program is not compressed on the UpdateXpress CD. To add a new version, simply delete the DRIVEMIC subdirectory from the SGUIDE\ADAPT\TAPEFW directory and copy in the

new update files. Make sure to preserve the directory structure on the new version of the tape drive update. Do not delete the files in the SGUIDE\ADAPT\TAPEFW directory because UpdateXpress has a few additional files in this directory. If, while copying in the new tape drive update, you are prompted that some files already exist, overwrite them.

C. Like the hard disk drive microcode update, you should not modify the _CD line for the tape drive update.

5.4 Finding Versions for and Upgrading ServeRAID Bios/Firmware

The ServeRAID update program updates some adapters to a different firmware version than others. To find the versions for each adapter, open the FLASHMAN.PRO file on the IBM ServeRaid Bios and Firmware Disk 1. A sample flashman.pro is listed below:

Type:ServeRAID,A:\
.
Unknown Adapter
:?,raid.img,99,1,codeblk.cph,99,2,bootblk.cph,0.00.00,1,EFI:N, , , ,
.
Copperhead Adapter
:ServeRAID,raid.img,7.13.02,1,codeblk.cph,2.25.01,2,bootblk.cph,0.00.00,1, , , ,
.
ServeRAID on planar image (Navajo)
:ServeRAID1C1,raid.img,7.13.02,1,codeblk.nvj,2.88.13,2,bootblk.nvj,0.00.00,1, , , ,
.
Copperhead-Refresh Adapter
:ServeRAID II,raid.img,7.13.02,1,codeblk.rf,2.88.13,2,bootblk.rf,0.00.00,1, , , ,
.
Copperhead-Refresh on planer (Kiowa)
:ServeRAID2C2,raid.img,7.13.02,1,codeblk.rf,2.88.13,2,bootblk.rf,0.00.00,1, , , ,
.
Clarinet Adapter
:ServeRAID-3H,raid.img,7.13.02,1,codeblk.cln,6.10.24,3,bootblk.cln,0.00.00,1, , , ,

The versions highlighted in blue are the firmware versions that get applied to each adapter by the ServeRAID update program. The section near the top of flashit.ini needs to be updated with these versions. The version highlighted in red is the new version of BIOS that gets applied to all adapters. Even though this version is listed separately for each adapter, note that the same version always gets applied to all adapters. Also note that not every one of these versions is updated every time a new ServeRAID firmware update is released, so a lot of these numbers may not change.

In addition, the IBM_SERVERAID_BIOS_CD= line at the top of this section needs to get updated with the new bios version that will be applied. As stated earlier, the same BIOS gets applied to all adapter types, which is why this line is only listed once.

The appropriate section in flashit.ini is listed below, with the firmware versions that need to be updated in blue and the BIOS version in red:

		Adding Firmware and Driver Packages to UpdateXpress CD Whitepaper
IBM	e server	Page 11 of 12
		Written By: Paul Tippett, Tyrone Baird and Peter Donovan

Note that there are two ServeRAID sections in the [COMMON_FIRMWARE] section of flashit.ini. For this example, we'll be modifying the first section located directly under the [COMMON_FIRMWARE] heading. The other section should not need to be modified.

[COMMON_FIRMWARE]
IBM_SERVERAID_BIOS_CD_7.12=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_1=2.25.01
IBM_SERVERAID_FIRMWARE_CD_7.12_2=2.88.13
IBM_SERVERAID_FIRMWARE_CD_7.12_3=2.88.13
IBM_SERVERAID_FIRMWARE_CD_7.12_4=2.88.13
IBM_SERVERAID_FIRMWARE_CD_7.12_5=6.10.24
IBM_SERVERAID_FIRMWARE_CD_7.12_6=6.10.24
IBM_SERVERAID_FIRMWARE_CD_7.12_7=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_8=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_9=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_10=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_11=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_12=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_13=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_14=7.13.02

ADVANCED USERS: If you only use a few types of ServeRAID adapter cards, this list can be trimmed to only contain the specific cards used in your organization.

Directly above this section are comments mapping the FIRMWARE_CD_ numbers listed above to the adapter names in FLASHMAN.PRO. A sample is included below:

;//ServeRAID types returned by a call to hardware detect are as follows:
;//Type 1 = ServeRAID I/Copperhead
;//Type 2 = ServeRAID II/Copperhead Refresh
;//Type 3 = PC Server 330 system board (Navajo) - not supported by UpdateXpress
;//Type 4 = PC Server 5500 system board (KIOWA) - not supported by UpdateXpress
;//Type 5 = ServeRAID 3H- Clarinet
;//Type 6 = ServeRAID 3L- Clarinet Lite
;//Type 7 = ServeRAID 4H- Trombone
;//Type 8 = ServeRAID 4M- Morpheus
;//Type 9 = ServeRAID 4L- Morpheus Lite
;//Type 10 =ServeRAID 4Mx-Neo
;//Type 11 =ServeRAID 4Lx-Neo Lite
;//Type 12 =ServeRAID 5i-Sarasota
;//Type 13 =ServeRAID 6M- Marco
;//Type 14 =ServeRAID 6i-Sebring

Once the above changes are made, follow the instructions in Section 5.1 to create a new update.exe file and copy it into the SGUIDE\MACH\SR7.12\BIOS directory.

Similar to BIOS, each specific machine section in flashit.ini contains an IBM_SERVERAID section That looks like this:

IBM_SERVERRAID_Exec=Z:\SGUIDE\MACH\SR7.12\BIOS\call

IBM_SERVERRAID_Apply=Y:\FIRMWARE\SRAID.BAT/CD:Y:\FIRMWARE\DOSFLASH/AUTOX
PRESS:2
IBM_SERVERRAID_CD=7.12

These lines should not need to be modified, but are explained below.

The _Exec line contains the path to the update.exe file, plus the "call" keyword since we are running a .bat file.
The _Apply line contains the .bat file that runs the update and the necessary switches.
The _CD line contains the section in [COMMON FIRMWARE] to use. In section 5.4, the instructions told you to modify the following section below.

[COMMON_FIRMWARE]
IBM_SERVERAID_BIOS_CD_7.12=7.13.02
IBM_SERVERAID_FIRMWARE_CD_7.12_1=2.25.01

Note the numbers highlighted in red. These numbers must match the number listed on the IBM_SERVERAID_CD line to ensure that the proper versions are found. In UpdateXpress 4.02, the IBM_SERVERAID_CD line for every system points to 7.12 and should not be changed.

6. Create the new UpdateXpress CD.

The CD you create MUST be bootable and must support Joliet extensions. Due to legal concerns, IBM can neither provide nor recommend tools to create bootable CD's or ISO images. You must use your favorite CD producer software. The software you use must support the El-Torito specification for bootable CD's. The name of the diskette image that the UpdateXpress CD uses is D:\CustomUXCD\pcdos.img.

To decrease the size of the ISO image, remove any directories for the machines that your company does not support. For example, if your company does not support any IBM eServer xSeries 345's, you may remove the D:\CustomUXCD\SGUIDE\MACH\8670 directory and all subdirectories.