# IBM / Lenovo System x3650 M4

# **Missing ServeRAID M5110e SAS/SATA Controller**

Updating the Programmable System-on-Chip firmware with the Lenovo ToolsCenter Bootable Media Creator Software





Release 2, 2015-05-25

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### **1** Important

The PSoC code update is mandatory for all System x3650 M4 servers except for those where the system board FRU indicates that the update is not necessary. For additional details refer to Chapter "<u>4 Affected and non-affected System boards</u>".

#### **Parts replacement**

**No** parts are to be replaced for the M5110e disappearing from the x3650 M4 host server.

#### **Additional information**

You cannot apply the Programmable System-on-Chip (PSoC) update in either Linux or Windows operating systems when the OS has been booted off the internal server hard disk drives. During the code update the PSoC update will reset and all drives will disappear for a short period of time. This will cause the operating system to go down.

The only exception would be if the disks drives from which the operating system has booted and is running from are not attached to the M5110e RAID controller.

The only tested Programmable System-on-Chip code update method is via Bootable Media Creator Tool (BoMC). Thus the use of the BoMC environment is mandatory.

**Note:** Using the media created with the Bootable Media Creator tool will always attempt to update the PSoC irrespective to whether the PSoC code is up-to-date or not. It cannot detect the currently installed PSoC code level.

The following tools are also not able to report the currently installed PSoC code level:

- DSA
- FFDC

The currently installed version of the PSoC code can be verified by using the IPMItool for Linux or Windows. For further information refer to Chapter "<u>5 Verifying currently</u> installed PSoC code".

### **Obsoleted confidential tips**

The following two IBM confidential tips do not apply anymore:

- H206209
- H213402

# **2 Affected Servers**

The following servers are affected by this code update:

- IBM System x3650 M4, MT 7915
- Lenovo logoed System x3650 M4, MT 7915

# **3 Preface**

This document explains on how to update the Programmable System-on-Chip – in short PSoC - firmware in order to resolve the missing onboard ServeRAID M5110e SAS/SATA controller after restarting the host server.

This document explains the steps using the Windows based Lenovo ToolsCenter Bootable Media Creator software package – in short BoMC.

Additionally further tips will be discussed where the server shows similar symptoms, that is the ServeRAID M5110e disappears, which are however not related to the PSoC code update.

# 4 Affected and non-affected System boards

The following table lists the replacement part numbers of system boards that are affected by this issue and those that are not affected by this issue.

Affected system board	Not affected system board
00Y8457	00MV221,Vali FRU planar Volterra P0/P2/PSoC (SNB CPU)
00Y8499	00MV220, Vali FRU planar Volterra P2/PSoC (SNB CPU)
00AM209	00MV219, Vali system FRU planar Ref3 (SNB/IVB CPU)

Notes:

- The above table is only for guidance. It <u>does not</u> imply that the affected system board <u>is to</u> be replaced by the non-affected system board!
- The list of affected system boards only reflect those boards which are directly replaced by the boards in the column "Not affected system board"
- All system boards must be upgraded except the ones listed in the column "Not affected system board"

# 5 Verifying installed PSoC code level

### **5.1 Steps to verify the PSoC code level**

Verifying which version of PSoC code level is installed requires at a maximum four steps:

- a) Check what system board installed, see also "4 Affected and non-affected System boards"
- b) I2C write to the MUX chipset on the system board to select the PSoC
- c) I2C write to set PSoC I2C address index to zero
- d) I2C Read command which reads 9 bytes from psoc starting at address zero which allows to determine the current PSoC level installed
- **Note:** Only newer versions of the x3650 M4, 7915, have an I2C MUX chipset onboard. Using the command to select the PSoC via the MUX chipset will lead to an error message that can be safely ignored.

### 5.2 Tools that can be used

There are two tools that can be used for verifying the PSoC code level installed and which system board is in the System x3650, M4:

- a) IPMItool, available via <u>http://sourceforge.net/projects/ipmitool/</u>
- b) IPMIutil, available via http://ipmiutil.sourceforge.net/

### 5.3 Which tool to use

The IPMItool is available only as source code for the Linux platforms. It is part of most mainstream Linux distributions. A windows pre-complied version is not easy to be found.

The IPMIutil is available as source code and precompiled for Linux, Windows, Solaris, FreeBSD, and MacOS.

It does not matter which tool is being used. The result is always the same.

### 5.4 Paramaters that always must be used

The following parameters are always to be used with either the IPMItool or the IPMIutil:

host_ip_addr	IP address of the x3650 M4 server to be checked
imm_user_id	The IMM2 User ID for logging on to the x3650 M4 as administrator
imm_admin_pw	The IMM2 administrator password

#### 5.5 IPMItool

**Note:** The IPMItool is only available in source code format for Linux platforms. It has to be compiled for Windows using Cygwin.

#### 5.5.1 Verifying installed system board FRU

Issue the following command from a command prompt:

```
ipmitool -I lanplus -H <host_ip_addr> -U <imm_user_id> -p <imm_admin_pw>
fru
```

- Notes:
- The above command is to be issued as one command on the command line
- The parameters in the arrow brackets are mandatory.

The output will be a long list of FRUs the IPMItool finds. Quite at the beginning the system board FRU will be displayed:

Administrator: Command Prompt - ipmitool			
C:\>ipmitool -I lanplus	-H <imm ip=""> -U <userid> -P <passw0rd> fru</passw0rd></userid></imm>	<b>^</b>	
FRU Device Description	: Builtin FRU Device (ID 0)		
Chassis Type	: Other		
Chassis Serial	: 06BMXK0		
Chassis Extra	: 8bbe485e9bf911e19866e41f13ec85c2		
Board Mfg	: IBM		
Board Product	: System Board		
Board Serial	: YÕ10UN25A0JW		
Board Part Number	: <u>00D2887</u>		
Board Extra	: 00D2888 Systemboard FRU		
Board Extra	: 1400		
Board Extra	: 0000		
Board Extra	: 5000		
Board Extra	: 10		
Board Extra	: 01024f0100		
Board Extra	: e41f13ec85c2e41f13ec85c3e41f13ec85c4e41f13ec85c50000000000000000000000000000000000	00000	
000000000000000000000000000000000000000			
Board Extra	: 8bbe485e9bf911e19866e41f13ec85c2		
Board Extra	: 02		
Board Extra	: 1111000000000000000000000000000000000		
Board Extra	: 00000000000000		
Board Extra	: 0188		

With the help of the grep utility the output can be reduced significantly by issuing the following command:

ipmitool -I lanplus -H <IMM IP> -U <USERID> -P <PASSWORD> fru | grep "Board Extra"

CN. Adm	Administrator: Command Prompt			
			-	
C:\>i	omitool -I lanplu	s <u>-H <imm< u="">IP&gt; -U <userid> -P <passw0rd> fru   grep "Board Extra"</passw0rd></userid></imm<></u>		
Board	Extra	: 00D2888 Systemboard FRU		
Board	Extra	: 1400		
Board	Extra	: 0000		
Board	Extra	: 5000		
Board	Extra	: 10		
Board	Extra	: 01024f0100		
Board	Extra	: e41f13ec85c2e41f13ec85c3e41f13ec85c4e41f13ec85c50000000000000000000000000000000000	0000	
000000	000000000000000000000000000000000000000			
Board	Extra	: 8bbe485e9bf911e19866e41f13ec85c2		
Board	Extra	: 02		
Board	Extra	: 1111000000000000000000000000000000000		
Board	Extra	: 000000000000000		
Board	Extra	: 0188		
Board	Extra	: 0000		
Board	Extra	: 00004f4d		
Board	Extra	: FOXC		
Board	Extra	: 43X3312ÿÿÿÿÿ		
Board	Extra	: 0200		
Board	Extra	: 00		
Board	Extra	: 0080		
Board	Extra	: 1		
Board	Extra	: 94Y7751		
Board	Extra	: 3600		
Board	Extra	: 00		
Board	Extra	: 7000		
Board	Extra	: 0		
C:\>				

**Note:** A Windows port of the grep utility is available via e.g.

http://unxutils.sourceforge.net/

in the file <u>UnxUpdates.zip</u>.

#### 5.5.2 Selecting the PSoC

Warning! The below command must be executed exactly as shown. Incorrect parameters in the write command can lead to damage to the system board!

An I2C write to the MUX chipset on the system board in order to select the PSoC. This is accomplished with the command:

ipmitool -I lanplus -H <host\_ip\_addr> -U <imm\_user\_id> -p <imm\_admin\_pw>
raw 0x06 0x52 0xfd 0xe2 0 0x04

- **Notes:** The above command is to be issued as one command on the command line
  - The parameters in the arrow brackets are mandatory

If there is no MUX chipset on the system then the IPMItool will issue an error message similar to the one below:



This error message can safely be ignored.

#### 5.5.3 Setting the I2C address index to zero

**Warning!** The below command must be executed exactly as shown. Incorrect parameters in the write command can lead to damage to the system board!

An I2C write to set PSoC I2C address index to zero needs to be issued. This is accomplished with the command:

ipmitool -I lanplus -H <host\_ip\_addr> -U <imm\_user\_id> -p <imm\_admin\_pw>
raw 0x06 0x52 0xfd 0xb0 0 0x00

- **Notes:** The above command is to be issued as one command on the command line
  - The parameters in the arrow brackets are mandatory

#### 5.5.4 I2C read of the first 9 bytes of the PSoC

An I2C Read command has to be issued which reads 9 bytes from psoc starting at address zero. This allows to determine the current PSoC level installed. This is accomplished with the command:

```
ipmitool -I lanplus -H <host_ip_addr> -U <imm_user_id> -p <imm_admin_pw>
raw 0x06 0x52 0xfd 0xb0 0x09
```

- Notes:
- The above command is to be issued as one command on the command line
- The parameters in the arrow brackets are mandatory.

The result is a sequence of hex data of which the last indicates the PSoC code level installed:



#### 5.5.5 Command timing

It is important that the commands for selecting the PSoC, setting the index address to zero and reading the first nine bytes of the PSoC are executed straight after each other *without* delays. A delay during these commands can result in the MUX does not switch the connection off to the PSoC. *It is best to put all commands into a single batch file and execute that batch file:* 



#### 5.5.6 Sample Windows batch file

Below is an example how a windows batch file looks like for executing the above IPMItool commands. This batch file works if the IMM2 Administrator log on credentials - Username and password – have not been changed, else the user name and passwords must be adapted.

```
@Echo off
:Start
Echo Enter imm IP Please
set /P "imm_ip_addr="
Echo on
:init
    ipmitool    -H %imm_ip_addr% -U USERID -P PASSWORD raw 0x06 0x52 0xfd 0xe2 0 0x04
ipmitool    -H %imm_ip_addr% -U USERID -P PASSWORD raw 0x06 0x52 0xfd 0xb0 0 0x00
ipmitool    -H %imm_ip_addr% -U USERID -P PASSWORD raw 0x06 0x52 0xfd 0xb0 0 0x09
```

:end

#### 5.5.7 Interpreting the last hex value

The below table allows to determine to what PSoC code level is installed and if the PSoC requires updating:

Last hex value	Meaning
33	Initial PSoC code release
35	Ivy-Bridge CPU PSoC code release
36	PSoC code level that fixes M5110e disappearing issue

#### 5.6 IPMIutil

#### 5.6.1 Verifying installed system board FRU

Issue the following command from a command prompt:

ipmiutil fru -N <host ip addr> -U <imm user id> -P <imm admin pw>

**Note:** The parameters in the arrow brackets are mandatory.

Administrator: Command Prompt - ipmiutil			
:\>ipmiutil fru -N <host_ip_addr> -U <imm_user_id> -P <imm_admin_pw></imm_admin_pw></imm_user_id></host_ip_addr>			
ipmiutil ver 2.96			
ifru: version 2.96			
Connecting to node host ip addr			
BMC version 4.55, IPMI version 2.0			
Scanning SDR Repository for 292 SDRs			
SDR[00ba] FRU 20 01 0a 01 Power Supply 1			
[PowerSply,20,01] PowerSply FRU Size : 200			
[PowerSply,20,01] Board Mfg DateTime : Mon Apr 23 01:00:00 2012			
[PowerSply,20,01] Board Manufacturer : ACBE			
[PowerSply,20,01] Board Product Name : IBM Designed Device			
[PowerSply,20,01] Board Serial Number : YK121124P1MH			
[PowerSply,20,01] Board Part Number : 43X3311			
[PowerSply,20,01] Board FRU File ID :			
[PowerSply,20,01] Board OEM Field : 43X3312			
SDR[00bb] FRU 20 02 0a 02 Power Supply 2			
FRU(20,2) not present			
SDR[00bc] FRU 20 03 Of 01 DASD Backplane 1			

The output of this command is quite long and the information required is quite at the end of the output:

🐹 Administrator: Comma	nd Prompt - ipmiutil		The second s
[Baseboard,20,00]	Chassis OEM Field	:	8bbe485e9bf911e19866e41f13ec85c2
[Baseboard, 20,00]	Board Mfg DateTime	÷.	Mon May 07 13:00:00 2012
[Baseboard, 20,00]	Board Manufacturer		IBM
[Baseboard, 20,00]	Board Product Name		System Board
[Baseboard, 20,00]	Board Serial Number		Y010UN25A0JW
[Baseboard, 20,00]	Board Part Number		00D2887
[Baseboard,20,00]	Board FRU File ID		<ul> <li>In College and Fig. Sector and the Sector Sector</li> </ul>
[Baseboard,20,00]	Board OEM Field		00D2888 Systemboard FRU
[Baseboard, 20,00]	Product Manufacturer	:	IBM
[Baseboard, 20,00]	Product Name	÷	System x3650 M4
[Baseboard, 20,00]	Product Part Number		791552G
[Baseboard, 20,00]	Product Version		0000
[Baseboard, 20, 00]	Product Serial Num	-	06BMXK0

With the help of the grep utility the output can be reduced significantly by issuing the following command:

ipmiutil fru -N <host\_ip\_addr> -U <imm\_user\_id> -P <imm\_admin\_pw> | grep "Board OEM Field"

ax Administrator: Command Prompt				
C:\>ipmiutil fru -N <host_ip_addr> [PowerSply,20,01] Board OEM Field [HotSwapCt,20,03] Board OEM Field [Baseboard,20,00] Board OEM Field</host_ip_addr>	-U <imm_user_id> -P <imm_admin_pw>   grep "Board OEM Field" : 43X3312 : 94Y7751 : 00D2888 Systemboard FRU</imm_admin_pw></imm_user_id>			
C:\>				

**Note:** A Windows port of the grep utility is available via e.g.

http://unxutils.sourceforge.net/

in the file <u>UnxUpdates.zip</u>.

#### 5.6.2 Selecting the PSoC

**Warning!** The below command must be executed exactly as shown. Incorrect parameters in the write command can lead to damage to the system board!

An I2C write to the MUX chipset on the system board in order to select the PSoC. This is accomplished with the command:

ipmiutil cmd -N <host\_ip\_addr> -U <imm\_user\_id> -P <imm\_admin\_pw> -V 4 -d 0x 06 0x52 0xfd 0xe2 0 0x04

- Notes:
- The above command is to be issued as one command on the command line
- The parameters in the arrow brackets are mandatory

If there is no MUX chipset on the system then the IPMIutil will issue an error message similar to the one below:

```
Administrator: Command Prompt - ipmiutil
C:\>ipmiutil cmd -N <host_ip_addr> -U <imm_user_id> -P <imm_admin_pw> -V 4 -d 0x06 0x52 0xfd 0xe2 0
ipmiutil ver 2.96
icmd ver 2.96
This is a test tool to compose IPMI commands.
Do not use without knowledge of the IPMI specification.
Connecting to node host_ip_addr
-- BMC version 4.55, IPMI version 2.0
ipmi_cmd: ret = 0, ccode 83 NAK on Write - busy
send_icmd ret = 0
ipmiutil cmd, completed successfully
C:\>
```

This error message can safely be ignored.

#### **5.6.3 Setting the I2C address index to zero**

**Warning!** The below command must be executed exactly as shown. Incorrect parameters in the write command can lead to damage to the system board!

An I2C write to set PSoC I2C address index to zero needs to be issued. This is accomplished with the command:

ipmiutil cmd -N <host\_ip\_addr> -U <imm\_user\_id> -p <imm\_admin\_pw> -V 4-d 0x06 0x52 0xfd 0xb0 0

- **Notes:** The above command is to be issued as one command on the command line
  - The parameters in the arrow brackets are mandatory

#### 5.6.4 I2C read of the first 9 bytes of the PSoC

An I2C Read command has to be issued which reads 9 bytes from psoc starting at address zero. This allows to determine the current PSoC level installed. This is accomplished with the command:

ipmiutil -N <host\_ip\_addr> -U <imm\_user\_id> -p <imm\_admin\_pw> -V 4 -d 0x06 0x52 0xfd 0xb0 0x09

- **Notes:** The above command is to be issued as one command on the command line
  - The parameters in the arrow brackets are mandatory

The result is a sequence of hex data of which the last indicates the PSoC code level installed:

```
Administrator: Command Prompt - ipmiutil

C:\>ipmiutil -H <host_ip_addr> -U <imm_user_id> -p <imm_admin_pw> raw 0x06 0x52 0xfd 0xb0 0x09

ipmiutil ver 2.96

This is a test tool to compose IPMI commands.

Do not use without knowledge of the IPMI specification.

Connecting to node host_ip_addr

-- BMC version 4.55, IPMI version 2.0

respData[len=9]: 50 53 6f 43 1e 0a 30 69 36

send_icmd ret = 0

ipmiutil cmd, completed successfully

C:\>
```

#### 5.6.5 Command timing

It is important that the commands for selecting the PSoC, setting the index address to zero and reading the first nine bytes of the PSoC are executed straight after each other *without* delays. A delay during these commands can result in the MUX does not switch the connection off to the PSoC. *It is best to put all commands into a single batch file and execute that batch file:* 

- ipmiutil cmd -N <host\_ip\_addr> -U <imm\_user\_id> -P <imm\_admin\_pw> -V 4 -d 0x 06 0x52 0xfd 0xe2 0 0x04
- ipmiutil cmd -N <host\_ip\_addr> -U <imm\_user\_id> -p <imm\_admin\_pw> -V 4-d 0x06 0x52 0xfd 0xb0 0
- ipmiutil -N <host\_ip\_addr> -U <imm\_user\_id> -p <imm\_admin\_pw> -V 4
   -d 0x06 0x52 0xfd 0xb0 0x09

#### 5.6.6 Sample Windows batch file

Below is an example how a windows batch file looks like for executing the above IPMutil commands. This batch file works, if the IMM2 Administrator log on credentials – Username and password – have not been changed, else the user name and passwords must be adapted.

@Echo off
:Start
Echo Enter imm IP Please
set /P "imm\_ip\_addr="
Echo on
:init
ipmiutil cmd -N %imm\_ip\_addr% -U USERID -P PASSWORD -V 4 -d 0x 06 0x52 0xfd 0xe2 0 0x04
ipmiutil cmd -N %imm\_ip\_addr% -U USERID -p PASSWORD -V 4-d 0x06 0x52 0xfd 0xb0 0
ipmiutil -N %imm\_ip\_addr% -U USERID -p PASSWORD -V 4 -d 0x06 0x52 0xfd 0xb0 0x09

:end

#### 5.6.7 Interpreting the last hex value

The below table allows to determine to what PSoC code level is installed and if the PSoC requires updating:

Last hex value	Meaning
33	Initial PSoC code release
35	Ivy-Bridge CPU PSoC code release
36	PSoC code level that fixes M5110e disappearing issue

### 6 Issue and Code package

After a system restart, the onboard ServeRAID M5110e SAS/SATA Controller may disappear from the Unified Extensible Firmware Interface (UEFI) or in Human Interface Infrastructure (HII) utility on a System x3650 M4, causing access to the local disks to be lost.

For further details refer to Retain tip H213425 per support bulletin MIGR-5096525 available via:

http://www.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5096525

On IBM FixCentral - http://www.ibm.com/support/fixcentral/ - the only code update package available is ibm fw psoc3 m5110e-36 linux 32-64.

SAS	
1. Firmware Update for ServeRAID M5110e PSoC3 +	Dec 4, 2014

ibm fw psoc3 m5110e-36 linux 32-64

Dec 4, 2014

No other operating systems (OS) are supported.

The code package can only be installed by using the Lenovo ToolsCenter Bootable Media Creator software package. The reason for this is that the ServeRAID card must be disconnected from the OS running on the internal disk drives.

# 7 Software needed

In order to update the PSoC firmware of the IBM / Lenovo System x3650 M4 one of the following BoMC software packages is required:

- **BoMC for Windows** •
- **BoMC for Linux**

For the currently available BoMC packages see support document <u>Invo-bomc</u> located at

http://www.ibm.com/support/entry/portal/docdisplay?Indocid=Invo-bomc

The BoMC documentation is available in support document LNVO-BOMCUG located at

http://www.ibm.com/support/entry/portal/docdisplay?Indocid=LNVO-BOMCUG

In later chapters a procedure is discussed for only updating the PSoC firmware.

# 8 Creating the Update ISO image with BoMC

This chapter details how to download all code updates for the IBM / Lenovo System x3650 M4 using the Windows BoMC.

- 1. Launch the BoMC tool, in this case lnvgy\_utl\_bomc\_10.0\_windows\_i386
- 2. Read and accept the Software License Agreement
- 3. Only Code Updates are to be installed



5. Set the correct HTTP Proxy Settings

Confirm Choices

ToolsCenter Bootable Me	dia Creator		lend
✓ Welcome ✓ Media Purpose	Targeted Systems Specify what systems this bootable media should support.		
<ul><li>Acquire Location</li><li>HTTP Proxy</li></ul>	Please select servers:		
Targeted Systems	BladeCenter HS23	7875	
Target Directory	IBM Flex System x280/x480/x880 X6	7903	
Media Format	IBM Flex System x220 Compute Node	7906	
> Unattended Mode	System X iDataPlex dx360 M4	7912	
Confirm Choices	System X iDataPlex dx360 M4	7913	
Progress	System x3550 M4	7914	
Finish	System x3650 M4	7915	

- 7. Select the Target Directory into which the code packages are downloaded by BoMC
- 8. For Media Format it is recommended to create an ISO image file which then can be burned later.

9. It is also possible to directly write to a CD/DVD medium, a USB memory key or into a PXE file that can be transferred to the target server(s). The target media needs to be blank.

Media F	ormat tions for the type of media that you wish to create. For CD and DVD devices, the i ISO.	mage file
Device type CD/DVD OWrite d OWrite to bootable.is	rectly to device Preferre image file	ed method Browse
Other pos Device type CD/DVD O Write d Device type USB O Write d Device type PXE Directory to The PXE files	sible selections, below display examples         Disk:         rectly to device         Disk:         N:         rectly to device         write PXE files to:         write PXE files to:         write paced in the directory that you specify here. After the bootable files are or	reated, you will need
PXE TFTP s Enter the IP here. Note the manually price 9.123.196	e files from this directory to your PXE server. erver address: address of your PXE TFTP server. When the media boots via PXE, it will look at the lat the bootable files will <u>not</u> automatically be copied to this TFTP server; you will n r to using your media. The default value is 9.123.196.61. 61	Browse IP address specified eed to do this
Notes:	<ul> <li>The hardware devices - DVD/CD writer with blat inserted or USB memory key - must be attached prior to launching BoMC as else these media will recognised</li> <li>All downloads for the System x3650 M4 server DVD due to the size of the code packages</li> <li>ISO Images can be mounted remotely to the System value to the Feature on Demand Key for ful Management is installed, the IBM Integrated M Module Advanced Upgrade software feature for presence. See also http://www.redbooks.ibm.com/abstracts/tips08</li> </ul>	ink media ed to the system ill not be will require a /stem x3650 M4 Il remote anagement r remote 50.html, table 22

10.Unattended Mode is not desired as else the PSoC can not be updated
 Note: If the Integrated Management Module Advanced Upgrade software feature has not been installed then either an internal System x3650 M4 DVD drive or USB DVD drive is required

Toolsoenter Dootable Mit	
/ Welcome	Unattended Mode Configuration
' Media Purpose	Helps you to configure your created image able to run in a completely unattended mode. In that case, it will
Acquire Location	upload the log files onto your TFTP server, FTP server, your network file share(NFS/Samba) or your USB drive and shutdown your dients after the firmware update process. If you want to upload the log files onto the
HTTP Proxy	TFTP, FTP server, NFS or Samba server, please make sure the directory has been created and anonymous access granted.
Targeted Systems	
Target Directory	Do not use unattended mode
Media Format	Upload log files to: Server Address:
Unattended Mode	TETD Senior

#### 11.Confirm the selected choices

12.Wait until all code has been downloaded and the ISO image file or media is created as selected

Welcome	Creation Pro	ogress	
Media Purpose	Your bootable media i	s being created.	
Acquire Location			
HTTP Proxy	Acquiring	updates: ibm_fw_imm2_1aoo48h-3.10_anyos_noarch	
Targeted Systems	3,253 of 6	i8,759KB (406KB/Sec)	
Target Directory	Acquiring	2 of 4 package bundle(s)	
rarget Directory	Cancel		
Media Format			
Unattended Mode	Tape	ibm fw tape dds-1.1 linux 32-64	2,518
Confirm Choices	Converged Netwo	rk Adapter brcd fw cna_2.3.0.3_linux_32-64	2,176
Progress	SAS	ibm_fw_exp_6gb-sas-61a6_linux_32-64	2,103 🔽
Finish	SAS	ibm_fw_exp_6gb-2500-60bg.02_linux_32-64	1,828 🔽
FILISI	Converged Netwo	rk Adapter brcd_fw_cna_3.2.4.0.b_linux_32-64	1,779 🔽
	Converged Netwo	rk Adapter brcd_fw_cna_3.2.4.0.c_linux_32-64	1,779 🔽
	SAS	ibm_fw_mpt2sas_1.18.01_linux_32-64	1,750 🔽
	SAS	ibm_fw_mpt3sas_n2215-1.03.01_linux_32-64	1,397 🔽
	SAS	ibm_fw_mpt2sas_n2125-1.18.01_linux_32-64	1,357 🔽
	SAS	ibm_fw_mpt2sas_n2115-1.18.01_linux_32-64	1,343 🔽
	SAS	ibm_fw_psoc3_m5110e-36_linux_32-64	988 🖾 🛛
	Таре	ibm_fw_tape_rd-1.6_linux_32-64	804 🔽 🔝
	Tape	ibm_fw_tape_rd-1.2_linux_32-64	720 🔽 🜉
	•]		

13. Once all has been completed, click the "Finish" button

If an ISO image has been created burn it now.

### 9 Update the System x3650 M4 server

- 1. Boot the System x3650 M4 off the created media, e.g. DVD
- 2. On the Welcome screen click on Updates

ToolsCenter Bootable Med	ia Creator leno
Welcome	Welcome to ToolsCenter
Updates Exit	Lenovo X Tools Center is a collection of server management standalone tools to help Deploy, Configure, Update and Diagnose
	Descriptive name: Bootable Media - Wed Dec 10 10:08:13 2014
	This will do the following
	You can click the "Exit" button to quit, which will reboot the system.
ne media will	indicate for which system the updates are and the update

3. process is initiated by clicking "click here to start update ToolsCenter Bootable Media Creator lenovo

Welcome <b>Updates</b> Exit	Updates Keep your systems up-to-date and running optimally with tools that make it easy to appy the latest system software updates. click here to start update This bootable media supports to update the following machines: • System x3650 M4 machine type 7915

- 4. Accept the Software License Agreement
- 5. The update utility will start checking which code updates are to be applied UpdateXpress System Pack Installer

Update Comparison	Update Recommendation The information below shows which components need updating.
Update Options	
Update Execution Finish	Comparing updates

6. Once the comparison has completed, a list of applicable updates will be displayed. In order to verify the list of updates it is recommended to stop the count down by clicking onto the clock next to "click here to stop"

pdate Comparison	The information below shows which	ndation components need u	pdating.				
odate Options odate Execution nish	ورون 42 seconds remain	ing to navigate to	execution page.		<u>click here t</u>	o stop->®	/
	Name	Severity	New Version	Installed Version	Reboot	Updated ID	Requ
			Ma	chine-Type="7915"			
	IBM uEFI Flash Update	Not Required	1.80 (vve142e)	1.80 (vve142e)	Reboot Requir	e ibm_fw_uefi_vve1	42e-1 None
	IBM Dynamic System Analy	sis Not Required	9.54 (dsytd8g)	9.54 (dsytd8g)	Reboot Requir	e ibm_fw_dsa_dsyte	18g-9 None
	IBM Online SAS/SATA Hard	Dis Not Required			Not Required	ibm_fw_hdd_sas-	1.14.0 None
	ST9146803SS (Disk Slot 0,	Tr	B53E	B53E			
	ServeRAID M5100 Series SA	S/S Not Required			Reboot Requir	e ibm_fw_sraidmr_	5100- None
	۰۰۰۰۰۵ س0412h Firmware		23.22.0-0024	23.22.0-0024			
	IBM DDS tape drive firmwa	re ı Initial Release	1.1 (0000)	Undetected	Not Required	ibm_fw_tape_dds	-1.1_li None
	IBM LTO3/4/5 tape drive fir	mv Critical	1.7 (buildnm)	Undetected	Not Required	ibm_fw_tape_lto-1	1.7_lir None
	IBM RDX drive firmware up	dat Critical	1.6 (0000)	Undetected	Not Required	ibm_fw_tape_rd-1	.6_lin None
	BIOS and Firmware Update	fo Non-Critical	24.2.1-0045	Undetected	Reboot Requir	e ibm_fw_sraidmr_	5200-None
	Firmware Update for Serve	RAJ Initial Release	0.36	Undetected	Reboot Requir	e ibm_fw_psoc3_m	5110€ None
	IBM 6Gb 2500 Series SAS E	xpa Initial Release	60BG	Undetected	Reboot Requir	e ibm_fw_exp_6gb-	2500- None
	IBM 6Gb SAS Expander Bac	kpl Non-Critical	61a6	Undetected	Reboot Requir	e ibm_fw_exp_6gb-	sas-6 None
	Online Broadcom NetXtrem	ne a Suggested	2.4.1c	Undetected	Reboot Requir	e brcm_fw_nic_2.4.	1c_lin None
	4						Þ

- All updates that are recognised automatically and are necessary will be automatically selected, e.g. if the IBM uEFI Flash Update was required there will be a tick in the box left to it
  - The update utility cannot recognise whether the PSoC update has to be applied. Because of this this specific update has to be selected manually as shown in the above and below graphics. If it is not selected it will *not* be applied. This means that the PSoC code update can be applied repeatedly to the same sever
     Firmware Update for ServeRAI Initial Release 0.36 Undetected Rebot Require ibm\_fw\_psoc3\_m5110c None
  - If the count down clock has been stopped, the update has to be initiated manually – else the update utility will commence the update automatically including the PSoC update
- 7. After the update has been completed click on "Finish" and follow any instructions to complete the update process, exit the update media , remove the update media if necessary and reboot the System x3650 M4 server

Pack Installer
Running updates
Successfully applied all updates

## **10 Updating only PSoC firmware with BoMC**

This chapter discusses how to only update the PSoC without updating any other System x3650 M4 code using the BoMC software.

- If any of the below listed packages are not available for download anymore, then please contact your local IBM or Lenovo support centre. They can provide the packages if required.
  - Alternatively create a full System x3650 M4, 7915, update DVD image and copy the files needed for creating the PSoC only update package.

### 10.1 Code packages needed

In order to create the update package – CD / DVD, USB Memory, PXE, ISO image – the following code packages have to be downloaded:

- Bootable Media Creator Software,
- <u>UpdateXpress System Pack Installer</u>
- <u>MCP Common Image</u>
- Firmware Update for the ServeRAID M5110e PSoC3

#### 10.2 Downloading the software

All packages listed in Chapter "<u>10.1 Code packages needed</u>" are available via IBM FixCentral, a direct download link is provided in Chapter "<u>10.1 Code packages</u> <u>needed</u>".

**Note:** It is important that <u>all</u> files are downloaded as else the creation of the update medium and the update itself may not work at all.

Before each download ensure that prequesite and co-requesite fixes are included in the download.

# CAUTION: Do not assume that Fix Central will show you all the prerequisites you need.

Be sure to always click the **More information** link for additional prerequisite and other important fix information. Click <u>here</u> for an explanation of what prerequisites you can expect Fix Central to provide.

Include prerequisites and co-requisite fixes (you can select the ones you need later)

#### **10.2.1 Download the MCP common image**

### Invgy\_utl\_boot\_tools-7.42\_anyos\_x86-64

MCP Common Image

The following files implement this fix.

- Invgy\_utl\_boot\_tools-7.42\_anyos\_x86-64.xml (23.46 KB)
- Invgy\_utl\_boot\_tools-7.42\_anyos\_x86-64.zip (200.26 MB)
- Invgy\_utl\_boot\_tools-7.4\_anyos\_x86-64.chg (253 bytes)
- Invgy\_utl\_boot\_tools-7.4\_anyos\_x86-64.txt (63 bytes)

# 10.2.2 Download the UpdateXpress System Pack Installer Invgy\_utl\_uxspi\_10.0\_anyos\_x86-64

UpdateXpress System Pack Installer

The following files implement this fix.

- Invgy\_utl\_uxspi\_10.0\_anyos\_noarch.chg (9.17 KB)
- Invgy\_utl\_uxspi\_10.0\_anyos\_noarch.txt (63.68 KB)
- Invgy\_utl\_uxspi\_10.0\_anyos\_x86-64.bin (57.37 MB)
- Invgy\_utl\_uxspi\_10.0\_anyos\_x86-64.xml (24.28 KB)

### 10.2.3 Download the Firmware Update for SR M5100e PSoC3

ibm\_fw\_psoc3\_m5110e-36\_linux\_32-64

Firmware Update for ServeRAID M5110e PSoC3

The following files implement this fix.

- ibm\_fw\_psoc3\_m5110e-36\_linux\_32-64.bin (976.51 KB)
- ibm\_fw\_psoc3\_m5110e-36\_linux\_32-64.chg (418 bytes)
- ibm\_fw\_psoc3\_m5110e-36\_linux\_32-64.txt (3.44 KB)
- ibm\_fw\_psoc3\_m5110e-36\_linux\_32-64.xml (8.36 KB)

#### **10.3 Directory structure for downloads**

In order for the BoMC software to create the downloaded code packages need to be placed into a specific directory structure. For example if all code is located in the directory C:\7915PSOC then the downloaded files are to be placed into this directory as follows:

```
C:\7915PSOC

| ibm_fw_psoc3_m5110e-36_linux_32-64.bin

| ibm_fw_psoc3_m5110e-36_linux_32-64.chg

| ibm_fw_psoc3_m5110e-36_linux_32-64.txt

| ibm_fw_psoc3_m5110e-36_linux_32-64.xml

| lnvgy_ut1_boot_tools-7.42_anyos_x86-64.xml

| lnvgy_ut1_boot_tools-7.42_anyos_x86-64.chg

| lnvgy_ut1_boot_tools-7.4_anyos_x86-64.chg

| lnvgy_ut1_boot_tools-7.4_anyos_x86-64.txt

|

\---uxspi

lnvgy_ut1_uxspi_10.0_anyos_noarch.chg

lnvgy_ut1_uxspi_10.0_anyos_noarch.txt

lnvgy_ut1_uxspi_10.0_anyos_x86-64.bin
```

lnvgy utl uxspi 10.0 anyos x86-64.xml

### **10.4 Running BoMC to create the update Media**

For more detailed information see also Chapter "<u>8 Creating the Update ISO image with</u> <u>BoMC</u>".

The only change when creating the bootable media is selecting the directory containing the updates files in the "Aquire Location" section of the BoMC software:

ToolsCenter Bootable Media Cre	ator
ToolsCenter Bootable Mec	lia Creator lenov
<ul><li>✓ Welcome</li><li>✓ Media Purpose</li></ul>	Acquire Location You can choose to acquire updates, tools and bootable image from IBM web site or from local directory.
<ul> <li>Acquire Location</li> <li>Media Format</li> <li>Unattended Mode</li> <li>Confirm Choices</li> <li>Progress</li> </ul>	<ul> <li>Check the IBM web site - Downloads the appropriate updates automatically from the IBM site.</li> <li>UpdateXpress System Packs (UXSP's) - UpdateXpress System Packs contain an integration-tested bundle of online, updateable firmware updates for each System x and BladeCenter server. This is the preferred method to obtain firmware for the server.</li> <li>Latest available individual updates - Check the IBM web site for the latest individual version of each firmware package. This is the preferred method when you wish to install the latest updates or when IBM</li> </ul>
▷ Finish	<ul> <li>Look in a local directory - Specify a directory on the local file system containing specific individual files to include in the bootable media. The directory should have been populated with the required files either in a previous session of this tool, or manually. See <u>here</u> for specific requirements on manually obtaining required files.</li> </ul>
	C:\/915PSUC
Exit	Previous

#### Chose "Do not use unattended mode" in order to be able to update the PSoC:

ToolsCenter Bootable Media Creator		
ToolsCenter Bootable Me	dia Creator leno	vo
<ul> <li>Welcome</li> <li>Media Purpose</li> <li>Acquire Location</li> <li>HTTP Proxy</li> <li>Targeted Systems</li> </ul>	Unattended Mode Configuration Helps you to configure your created image able to run in a completely unattended mode. In that case, it will upload the log files onto your TFTP server, FTP server, your network file share(NFS/Samba) or your USB drive and shutdown your clients after the firmware update process. If you want to upload the log files onto the TFTP, FTP server, NFS or Samba server, please make sure the directory has been created and anonymous access granted.	
<ul> <li>Target Directory</li> <li>Media Format</li> <li>Unattended Mode</li> </ul>	Do not use unattended mode     Use unattended mode     Upload log files to: Server Address:     TFTP Server	

#### **10.5 Performing the PSoC update**

For more detailed information see also chapter "<u>9 Update the System x3650 M4</u> <u>server</u>".

- 1. Boot off the update media
- 2. Click on "Updates"

ToolsCenter Bootable Me	dia Creator lenovo
▶ Welcome Updates Exit	Welcome to ToolsCenter Lenovo X Tools Center is a collection of server management standalone tools to help Deploy, Configure, Update and Diagnose your machines. The wizard will help you manage your system more efficiently. Descriptive name: Bootable Media - Wed Dec 17 13:17:56 2014
	This will do the following <ul> <li>Updates</li> <li>You can click the "Exit" button to quit, which will reboot the system.</li> </ul>

3. The "Updates" window provides some general information and for what systems it can be used. Click on "click here to start update"

Welcome	Updates					
Updates						
Exit	Keep your systems up-to-date and running optimally with tools that make it easy to appy the latest system software updates.					
	This bootable media supports to update the following machines:					
	IBM Flex System x220 Compute Node machine type 7906					
	System X iDataPlex dx360 M4 machine type 7912					
	<ul> <li>System X iDataPlex dx360 M4 machine type 7913</li> </ul>					
	System x3550 M4 machine type 7914					
	System x3650 M4 machine type 7915					
	<ul> <li>Flex System x222 Compute Node machine type 7916</li> </ul>					
	IBM Flex System x440 Compute Node machine type 7917					
	System X iDataPlex dx360 M4 Water Cooled server machine type 7918					
	System X iDataPlex dx360 M4 Water Cooled server machine type 7919					

4. Tick the box left to PSoc Firmware update

upuatexpress system P	ack installi						Active Machine	Type: 791
Update Comparison	Upd a The info	ate Recommen	dation	pdating.				
Update Execution	39 seconds remaining to navigate to execution page				<u>click here to stop-&gt;</u> 麥			
		Name	Severity	New Version	Installed Version	Reboot	Updated ID	Requis
	Machine-Type="7915"							
	1	Firmware Update for ServeR/	AJ Initial Release	0.36	Undetected	Reboot Require	ibm fw psoc3 m5110	None

Note: The update utility cannot recognise whether the PSoC update has to be applied. Because of this, this specific update has to be selected manually as shown in the above and below graphics. If it is not selected it will **not** be applied. This means that the PSoC code update can be applied repeatedly to the same sever Firmware Update for ServeRAI Initial Release 0.36 Undetected Reboot Require ibm\_fw\_psoc3\_m5110c None

- 5. Wait until the update is completed
   UpdateXpress System Pack Installer
   Update Comparison
   Update Execution
   Finish
- 6. Click on "Finish" and follow any instructions to complete the update process, exit the update media , remove the update media if necessary and reboot the System x3650 M4, server

# 11 Updating the PSoC using a USB memory key

The following is a way to update the PSoC manually by using a USB memory key attached to a local laptop computer. A remote session to the System x3650 M4 will be established with this laptop computer.

- **Note:** For remote access to the IMM2 of the System x3650 M4 the Integrated Management Module Standard Upgrade Feature on Demand key must be installed on the target IMM2 of the server.
  - 1. Install formatted USB memory key into your laptop
  - 2. Using BoMC creator generate a local bomc usb image. This can take at least one hour or longer



Once the key is created edit the start.sh file on the USB memory key with the following string:

```
cd /toolscenter/
chmod -R +x * /dev/null 2>/dev/null
dos2unix /toolscenter/bomc.config > /dev/null 2>&1
cp -f /toolscenter/bomc.config /tmp/bomc.config
#disable Crtl+z and Ctrl+c
trap "" 2 20
sh <------ enter sh string here ----->
BOMC_MENU=/toolscenter/menu/show_menu.sh
BOMC_LOG_FILE=/tmp/bomc.log
BOMC_REMOTE_CHECK=/toolscenter/menu/check_remote.sh
```

4. This sh will break out of the complete BoMC image and leave us with a MCP linux read only shell

 If not present on the USB memory key copy ibm\_fw\_psoc3\_m5110e-36\_linux\_32-64.xml and ibm\_fw\_psoc3\_m5110e-36\_linux\_32-64.xml files to USB memory key

Now we are ready to remote boot the key.

1. Remote boot the system via the IMM2, press F2 during post and select boot from device - this is your USB memory key installed in remote laptap



- Select imm remote storage boot option and wait for the linux kernel to load
   Enter ./ibm fw psoc <hit tab> .bin -s
  - **Note:** The tab key will automatically fill in the rest of name, that is autocomplete the name.

4. The "ERROR: Module megaraid\_sas is in use" message can be safely ignored

# **12 Troubleshooting similar issues**

It may be that after applying the PSoC code update the issue either still persists or a different issue may occur.

### **12.1** Issue persists after updating the PSoC code

The ServeRAID M5110 and M5110e HBA can either utilise "Standard" Cache Memory or Flash Cache Memory. Standard Cache Memory uses a battery to protect data stored in the Cache Memory in the event of a power failure. Flash Cache Memory is backed up with a capacitor which is either referred to as SuperCAP, supercapacitor, or CVPM, Cache Vault Power Module.

The M5110e disappearing issue will "persist" if Flash Cache Memory is in use as the charge of the super capacitor (CVPM) will hold the Programmable System-on-Chip (PSOC) in its current state until the supercapacitor is completely discharged, at which point the hang condition will clear and the system can be restarted. See also Retain tip H213425 per support bulletin MIGR-5096525 for further details.

In this case follow the instructions from Retain tip <u>H213255</u> per support bulletin <u>MIGR-5096194</u>:

- Shutdown and power off the x3650 M4 host server
- Remove the AC power from the x3650 M4 host server for at least 10 minutes
- Check the LED on the Flash Cache Memory that it is off (not illuminated). This
  verifies that the Cache Vault Power Module is fully discharged. For further
  information see Chapter "12.1.1 Locating the RAID Flash Cache Memory" below
- Reconnect the AC power to the x3650 M4 host server
- Power up the x3650 M4 server

### 12.1.1 Locating the RAID Flash Cache Memory

The ServeRAID M5110e RAID Cache Memory – both the standard and Flash Cache Memory – is attached to the system board. There can only be one RAID Cache Module attached to the system board at any time.

Peform these steps:

- 1. Open the System x3650 M4 top cover
- 2. Check the below system board connector diagram. The connector into which the RAID Cache is indicated in the below diagram as "RAID upgrade connector"



3. Check the status of the LED on the RAID Flash Cache Memory. If it is illuminated wait until it switches off



### 12.2 RAID Configuration lost with more than 8 HDDs

When more than 8 hard disk drives are installed in a x3650 M4 server then an additional hard disk drive backplane with attached SAS Expander card is used. If the SAS Expander firmware – also referred to backplane firmware – is v61A6 then the previous RAID Configuration may be gone after a system restart. However all disk drives are discovered by the server.

In this case the SAS Expander (backplane) firmware must be updated to at least v61B6 by using one of these methods:

- Bootable Media Creator tool and performing full server update, see also Chapter "<u>9 Update the System x3650 M4 server</u>"
- Using package <u>ibm\_fw\_exp\_6gb-sas-61b6\_linux\_32-64</u>
- Using package <u>ibm\_fw\_exp\_6gb-sas-61b6\_windows\_32-64</u>

For further details refer to Retain tip <u>H213861</u> per support bulletin <u>MIGR-5097170</u>.

### 12.3 RAID Configuration is lost, disk drives are discovered

As a minimum a second hard disk drive backplane with attached SAS Expander needs to be installed in the server.

Check the following code levels:

- ServeRAID M5110e
- SAS Expander Firmware

If the SAS Expander firmware is v61A6, update it to v61B6 and update the firmware of the ServeRAID M5110e to the latest available code level.

### 12.4 Hard disk drives are not detected by host server

Perquisites:

- A second hard disk drive backplane with attached SAS Expander card must be installed in the host server
- The PSoC code update does not cure the issue
- The instructions of Chapter "<u>12.1 Issue persists after updating the PSoC code</u>" have been followed without success
- After removing the second hard disk backplane with the attached SAS Expander the disk drives in slots 0 to 7 are recognised

If the SAS Expander firmware is v61A6 update it to v61B6 and update the firmware of the ServeRAID M5110e to the latest available code level.

### 12.5 If a similar issue still persists

If a similar issue still persists after updating the PSoC and following all other steps in Chapter "<u>12 Troubleshooting similar issues</u>" then contact the IBM / Lenovo support centre for further assistance.

# 13 IBM System x SSR

IBM System x System Service Representatives can perform the PSoC update with the BoMCsft2 tool. This requires that the USB memory key is updated to the latest level.

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