

# Flex Update Best Practice



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# 1. INTRODUCTION

## 1.1 TERMINOLOGIES

CMM – Chassis Management Module

FSP – Flexible Service Processor for Power Systems

IMM2 – Second Generation of Integrated Management Module

I/O Modules – Input/Output Modules, i.e. switches and Pass Thru modules

RSAP – Remote Service Access Point

pDSA – preboot Dynamic System Analysis

UEFI – Unified Extensible Firmware Interface

UXSP – UpdateXpress System Pack

UXSPI – UpdateXpress System Pack Installer

## 1.2 IBM FLEX SYSTEM ENTERPRISE CHASSIS MANAGED BY FLEX SYSTEM MANAGER

This document covers the best practices for updating an IBM Flex System Enterprise Chassis managed by a Flex System Manager.

# 2. UPDATING ALL COMPONENTS IN A CHASSIS WHEN FLEX SYSTEM MANAGER IS PRESENT

## 2.1 PROCEDURE

Updates for a PureFlex offering are tested and released together. Therefore, it is important to update all components in a chassis together as well. Updates should be applied in the following order:

- Flex System Manager
- CMM
- Compute nodes (X-Architecture-based (x86) and Power Systems-based)



- Storage nodes (IBM Flex System V7000)
- I/O modules

**Notes:**

1. Updates can be applied to an active running system, however in general the system will need a reboot for update to take effect.
2. Updates for all components have been tested and released together. It is important that when you update the Flex System Manager that you also update all other components in the chassis.

### 2.1.1 PREREQUISITES

The following prerequisites must be met to update the components in a chassis:

- The chassis and all devices within the chassis must be managed by the IBM Flex System Manager management node to which the updates will be downloaded. Compute nodes must have an operating system installed. The operating system must have a network IP address and the operating system must have been discovered by the IBM Flex System Manager

Note: The firmware update for a Power Systems compute node can be applied even if the operating system has not been discovered by the Flex System Manager..

- I/O modules must have at have an SSH remote service access point (RSAP).
- The I/O modules Flex System Fabric EN4093 10Gb Scalable Switch and Flex System EN2092 1Gb Ethernet Scalable Switch do not support updating from SFTP and require a TFTP server. See section 2.6.2.
- Updating firmware with VMware vSphere 5 (ESXi) using Flex System Manager requires the IBM customized image. Apply the latest patches to the vSphere system. Once you reboot the vSphere 5 system it is **critical** to wait 20 minutes after the system reboots before applying the firmware updates. In particular it is **critical** to apply the following patch :

<http://www-947.ibm.com/support/entry/portal/docdisplay?lnocid=MIGR-5091988&brandind=5000008>

See additional initial setup for details at :

[http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.acc.8731.doc%2Fgetting\\_started.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.acc.8731.doc%2Fgetting_started.html)

### 2.1.2 VERIFYING AN UPDATE COMPLETED SUCCESSFULLY

You can validate that an update completed successfully by verifying that the version in the component's inventory is up to date. The IBM Flex System Manager version is verified from the Plugins Tab on the Home page. Select the



IBM Flex System Manager and approximately half way down the page the installed version is displayed. For example it may be version 1.2.0

You can also verify that an update task itself succeeded. If the update task display is still open select the Jobs Steps tab and verify all steps have completed with Status Complete. See screen shot below:

The screenshot shows the 'Jobs Steps' tab for a job named 'Install Updates - December 1, 2012 1:20:42 PM EST'. The 'Job Instance' is '12/1/12 at 1:20 PM'. The table below lists the steps and their status.

Name	Status	Progress	Start time	Stop time
Downloading updates to "IBM 873LA...	Complete	100%	Dec 1, 2012 1:20:45 PM	Dec 1, 2012 1:20:45 PM
Staging Updates to "r3-c2-ch1-mm.r...	Complete	100%	Dec 1, 2012 1:20:45 PM	Dec 1, 2012 1:23:04 PM
Installing Updates to "r3-c2-ch1-mm...	Complete	100%	Dec 1, 2012 1:23:04 PM	Dec 1, 2012 1:42:42 PM
Collecting Inventory on "r3-c2-ch1-m...	Complete	100%	Dec 1, 2012 1:42:42 PM	Dec 1, 2012 1:52:52 PM
Running Compliance on "r3-c2-ch1-...	Complete	100%	Dec 1, 2012 1:52:52 PM	Dec 1, 2012 1:52:52 PM

You can display previous tasks by selecting the component that was updated on the Chassis Manager page and right clicking "Advanced Properties". In "Applied Activities" tab select the install task for your update, see screen shot below:

The screenshot shows the 'Applied Activities' tab. The table below lists activities applied to the system.

Select	Name	Type
<input type="radio"/>	Data Collection : r3-c2-ch1-mm.rtp.stglabs.ibm.com (Support file list data collector) 12/1/2012 ...	Job Instance
<input type="radio"/>	Data Collection : r3-c2-ch1-mm.rtp.stglabs.ibm.com (Support file list data collector) 12/1/2012 ...	Job Instance
<input type="radio"/>	Data Collection : r3-c2-ch1-mm.rtp.stglabs.ibm.com (Support file list data collector) 12/1/2012 ...	Job Instance
<input type="radio"/>	Data Collection : r3-c2-ch1-mm.rtp.stglabs.ibm.com (Support file list data collector) 12/1/2012 ...	Job Instance
<input type="radio"/>	Data Collection : r3-c2-ch1-mm.rtp.stglabs.ibm.com (Support file list data collector) 12/1/2012 ...	Job Instance
<input type="radio"/>	Install Updates - December 1, 2012 1:20:42 PM EST 12/1/2012 at 1:20 PM	Job Instance
<input type="radio"/>	Update Compliance - December 1, 2012 1:52:51 PM EST 12/1/2012 at 1:52 PM	Job Instance

## 2.2 FLEX SYSTEM MANAGER UPDATE

Before updating the Flex System Management it is suggested to create a backup image. See info center link: [http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.8731.doc/backing\\_up\\_frm.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.8731.doc/backing_up_frm.html)



If the Flex System Manager is connected to the Internet you can use the Flex System Manager to acquire the updates as well as to install them. Proceed to section 2.2.2

### 2.2.1 CHASSIS IS NOT CONNECTED TO THE INTERNET

If the chassis is not connected to the Internet, you will need to download the updates from the IBM FixCentral web site and transfer them to the Flex System Manager file system using SCP or a USB key. The preferred location to copy the updates to is the /home/<user> directory, where <user> is the user id that you use to login to the Flex System Manager. The default is /home/USERID.

The Flex System Manager update can be found at the following location:

[www.ibm.com/support/fixcentral/](http://www.ibm.com/support/fixcentral/)

To obtain the updates, fill in the product fields as shown in the following:



# Fix Central

Fix Central provides fixes and updates for your system's software, hardware, and operating system.

For additional information, click on the following link.

[Getting started with Fix Central](#)

Select product Find product

Select the product below.

When using the keyboard to navigate the page, use the **Alt** and **down arrow** keys to navigate the selection lists.

## Product Group

PureSystems

## Select from PureSystems

PureFlex System

## Select from PureFlex System

Management devices and solutions

## Select from Management devices and solutions

Flex System Manager Node

## Select from Flex System Manager Node

7955

## Operating system

Operating system independent / None

Continue

Select and download the latest Flex System Manager update. Then follow the directions to download the update. After downloading the update to your computer, follow these instructions to copy the update to the IBM Flex System Manager. Make sure that you copy all files that you downloaded. The Flex System Manager update downloaded from IBM may be one or more zip files or separate updates. If the update is downloaded as zip files transfer the zip file updates to the Flex System Manager without unzipping the files.

Instructions for transferring files to the IBM Flex System Manager can be found at:

[http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.director.updates.helps.doc/fqm0\\_tum\\_updates\\_director\\_manual\\_download.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.director.updates.helps.doc/fqm0_tum_updates_director_manual_download.html)



Remember that the computer from which you copy the updates to the IBM Flex System Manager must have network access to the IBM Flex System Manager.

A typical scp command for copying the IBM Flex System Manager update from your laptop is :

```
scp * USERID@<management_node_host_name>:/home/USERID/*
```

Where *management\_node\_host\_name* is the dns name or IP address of the Flex System Manager. If you are using winscp it is good practice to set transfer mode to binary, so that text files are not modified during transfer.

### 2.2.2 APPLYING THE FLEX SYSTEM MANAGER UPDATES

From the IBM Flex System Manager user interface, select the Home, Initial Setup tab. Then click **Check and Update Flex System Manager**

If the Flex System Manager is connected to the Internet it will search for any Flex System Manager updates that are later than the currently installed software and firmware. Click the **Download and Install** to initiate the download and installation of the update.

If you are not connected to the internet connect to the IBM Flex System Manager using an SSH client application, see info center link:

[http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.cmm.doc/cli\\_use\\_start\\_cli.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.cmm.doc/cli_use_start_cli.html)

Follow command line instructions in the readme for Flex System Manager update, these may vary slightly for each release. Here is an example of the IBM Flex System Manager v1.2.0 update instructions:

```
smcli cleanupd -mva
smcli collectinv -p "All Inventory" -i 10.3.0.1,10.3.0.2 -t OperatingSystem
smcli importupd -v /home/USERID/FSMApplianceUpdate-1-2-0-ImportFirst.zip
smcli importupd -v /home/USERID/FSMApplianceUpdate-1-2-0-ImportSecond.zip
smcli installneeded -v -F --installonly
```

As the install task is running, messages are displayed in the console. Wait for them to "Complete" successfully. The Flex System Manager update may take about 20 minutes to. When the update completes, you will need to restart the Flex System Manager. To restart the Flex System Manager perform the following from the cli :

```
Smshtutdown -r -t now
```

If the update completes with error proceed to the see Troubleshooting section in the readme of the IBM Flex System Manager update.

The Flex System Manager may take a further 30 minutes to fully restart.

## 2.3 CMM UPDATE

Use the Flex System Manager to update the CMM. If the Flex System Manager is connected to the Internet proceed to section 2.3.2



### 2.3.1 DOWNLOADING CMM UPDATE FROM THE WEB

The CMM and I/O module updates are located in the PureFlex Chassis section on the IBM FixCentral web site. When downloading the CMM update it is convenient to also download the I/O module updates since they are organized on the same web page. Before you download update files to your workstation, delete (or move) any existing updates from the directory where you will download the files. This will prevent you copying unnecessary files later on when you transfer them to the Flex System Manager.

The CMM updates can be found at <http://www.ibm.com/eserver/support/fixes/> by selecting the settings in the following screen shot:

Select product Find product

Select the product below.

When using the keyboard to navigate the page, use the **Alt** and **down** the selection lists.

**Product Group**  
PureSystems

**Select from PureSystems**  
PureFlex System

**Select from PureFlex System**  
Chassis

**Select from Chassis**  
Enterprise Chassis

**Select from Enterprise Chassis**  
7893

**Operating system**  
Operating system independent / None

**Continue**

1. Select and download the latest CMM and I/O module updates to your laptop.
2. Create a directory on the Flex System Manager file system to accept these updates:
  - a. Use SSH to log in to the Flex System Manager and
  - b. Run the mkdir command to create a directory.
3. Transfer files from your laptop to the Flex System Manager using a Secure Copy application such as scp or winscp. This example assumes you created subdirectory *chassis* in previous step:



```
scp * USERID@<Flex System Manager-address>:/home/USERID/chassis
```

### 2.3.2 IMPORTING THE CMM UPDATE AND UPDATING THE CMM

On the Flex System Manager "Initial Setup" tab select "Update Chassis Components" button and then select the "CMMs - Check and Update Firmware" link.

- If the Flex System Manager is connected to the Internet, select "Check for updates" and click "OK". This will download the latest CMM update from the Internet.
- If the Flex System Manager is not connected to the Internet:
  1. , select "Import updates from file system" and enter the full directory where you copied the CMM update in the "Path:" field.  
**Note:** Enter the directory path only; do not enter a file name.
  2. Click "OK". All updates in the directory will be imported.

The CMM update takes about 30 minutes to complete.

You can verify the update completed successfully by looking in the Task Log Steps and verifying that each step completed with status Complete. See section 2.1.2.

**Note:** If you select the option to *Automatically restart during installation as needed* you might temporarily lose your connection to the Flex System Manager for a few minutes. This is normal.

## 2.4 COMPUTE NODE UPDATE

Use the Flex System Manager to update the firmware for compute nodes, including both X-Architecture based (x86) and Power Systems based compute nodes. The prerequisites for updating compute code can be found at:

[http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.director.updates.helps.doc/fqm0\\_c\\_um\\_platform\\_extensions.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.director.updates.helps.doc/fqm0_c_um_platform_extensions.html)

If the Flex System Manager is connected to the Internet proceed to section 2.4.2.

### 2.4.1 DOWNLOADING COMPUTE NODE UPDATES FROM THE WEB

The compute node updates can be found at <http://www.ibm.com/eserver/support/fixes/> by selecting the settings in the following screen shot:



# Fix Central

Fix Central provides fixes and updates for your system's software, hardware, and operating system.

For additional information, click on the following link:

[Getting started with Fix Central](#)

Select product

Find product

Select the product below.

When using the keyboard to navigate the page, use the **Alt** and **down arrow** keys to navigate the selection lists.

## Product Group

PureSystems

## Select from PureSystems

PureFlex System

## Select from PureFlex System

Compute Node

## Select from Compute Node

x240 Compute Node

## Select from x240 Compute Node

8737

## Operating system

SUSE Linux Enterprise Server 11 x64

Continue

In the above example, the “x240 Compute Node” and “SUSE Linux Enterprise Server 11 x64” are selected . Other compute nodes available at this time are x220, x440 and the POWER Nodes p24L p260and p460.

For X architecture compute nodes (x220, x240 and x44) download the UpdateXpress System Packs (UXSPs) for each of the OSs installed on your compute nodes. In addition you will also need to download the UpdateXpress System Pack Installer (UXSPI) utility for each OS. You can use the hyperlink on the compute node’s update page to navigate to the UXSPs and UXSPI utility, see the following screen shot:



The screenshot displays the Fix Central interface for an x240 Compute Node. The left sidebar contains navigation options: Fix Central, Inventory upload, Supported products, Enhancements, Help, and Feedback. Below the sidebar are sections for 'Change your selection' (Product selector) and 'Filter your content' (Component and And Platform filters). The main content area shows 'Download options' with settings for 'Download method: Download Director' and 'Include requisites: Yes'. The 'Select fixes category view' section displays a list of results, with 'UpdateXpress System Pack' and 'Utility' highlighted. The 'View results' section shows a dropdown menu set to 'Component'.

The steps to download compute node updates can be summarized as follows:

1. Select and download the latest compute node updates to your laptop. For X architecture compute nodes download the UXSP system packs and UXSPI utility for each OS.
2. Create a directory on the Flex System Manager file system to accept these updates:
  - a. Use SSH to log in to the Flex System Manager and
  - b. Run the mkdir command to create a directory.
- 3.

Transfer files from your laptop to the Flex System Manager using a Secure Copy application such as scp or winscp. This example assumes you created subdirectory *compute* in previous step:

```
scp * USERID@<Flex System Manager-address>:/home/USERID/compute
```

Note:

- It is critical to download the UXSPI from the “Utility” section of the previous screen shot. You will need to download the UXSPI version for the OS of the target Compute Node. However, VMware ESXi 4 and vSphere 5 do not require the UXSPI utility.

## 2.4.2 IMPORTING THE COMPUTE NODE UPDATES AND UPDATING THE COMPUTE NODES

### Important considerations when updating compute nodes

- On VMware vSphere 5 systems it is critical to apply the latest patches to the IBM Customized ESXi image. See Prerequisite section 2.1.1 for details. It is also critical to wait 20 minutes after rebooting vSphere 5 before attempting to update firmware on the system.
- If you are running Flex System Manager 1.2 and earlier and you have a Power Systems based compute node or a mix of Power Systems based and X-Architecture based (x86) compute nodes then you will need to ensure that you do not select FSP updates at the same times as Power Systems Mezz updates or any updates for x86 compute nodes.



- If you have Power Systems based p24L compute node and running Flex System Manager v1.2.0 or earlier the above procedure will not update the FSP component. You will need to select each p24L compute node on the chassis manager tab and select Release Management action. If your chassis is connected to the internet, select "Release Management -> Acquire Updates" followed by "Release Management -> Show and Install Updates". If you have already downloaded updates from FixCentral you can proceed directly to "Release Management -> Show and Install Updates" action.

On the Flex System Manager "Initial Setup" tab select "Update Chassis Components" button. Then select the "Compute Nodes - Check and Update Firmware" link. On earlier versions of Flex System Manager you can select "Compute Nodes - Check and Update Firmware" directly from the "Initial Setup" tab.

- If the Flex System Manager is connected to the Internet, select "Check for updates" and click "OK". This will download the latest compute node updates from the Internet.
- If the Flex System Manager is not connected to the Internet:
  1. Select "Import updates from file system" and enter the full directory path where you copied the compute node updates in the "Path:" field. Enter the full path to the directory only; do not enter a file name.
  2. Click "OK". All updates in the directory will be imported.

When you setup the task to apply the updates you are given the choice to reboot the compute node immediately. If you deselect the check box to reboot the compute nodes the updates will take effect on the next reboot. If the check box is selected the compute node will be automatically rebooted after applying the update.

## 2.5 STORAGE NODES (IBM FLEX SYSTEM V7000) UPDATE

Use the IBM Flex System Manager to update the firmware and software for the IBM Flex System V7000 storage node..

Note: If the chassis components are at update levels corresponding to Flex System Manager v1.1.1 or earlier it is suggested that you remove the IBM Flex System V7000 storage node from the chassis and first update all other components in the chassis. Finally re-insert and update the IBM Flex System V7000 storage node.

After you insert the storage node you might need to refresh (F5) the browser. See info center

link:[http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.4939.doc/site\\_qicfgsys\\_FSM.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.4939.doc/site_qicfgsys_FSM.html)

If the IBM Flex System Manager is connected to the Internet proceed to section 2.5.2.

### 2.5.1 DOWNLOADING STORAGE NODE UPDATES FROM THE WEB

The storage node updates can be found at <http://www.ibm.com/eserver/support/fixes/> by selecting the settings in the following screen shot:



Fix Central provides fixes and updates for your system's software, hardware, and operating system.

For additional information, click on the following link:

[Getting started with Fix Central](#)

Select product

Find product

Select the product below.

When using the keyboard to navigate the page, use the **Alt** and **down arrow** keys to navigate the selection lists.

**Product Group**

**Select from PureSystems**

**Select from PureFlex System**

**Select from Storage Node**

**Installed Version**

Transfer the updates to the Flex System Manager.

## 2.5.2 IMPORTING THE STORAGE NODE UPDATES AND UPDATING THE STORAGE NODES

Do not use the Flex System Manager "Initial Setup" tab select "Update Chassis Components" button to update the Storage Nodes. Instead select each storage node on the chassis manager tab and select Release Management action Acquire Updates. If your chassis is connected to the internet select "Check for updates", otherwise select "Import updates from file system" and enter the directory where you transferred the updates.

After you import the updates select action "Release Management" and "Show and Install Updates".



## 2.6 I/O MODULE UPDATE

Use the IBM Flex System Manager to update the I/O modules this includes both switches and Pass Thru modules.

If the IBM Flex System Manager is connected to the Internet proceed to section 2.6.2.

### 2.6.1 DOWNLOADING I/O MODULES UPDATES FROM THE WEB

The I/O module updates can be found at <http://www.ibm.com/eserver/support/fixes/> . The I/O module updates can be downloaded from the same web page as the CMM update. You may already have downloaded them when you downloaded the CMM update (see 2.3.1). If you have not already downloaded the I/O Modules when you downloaded the CMM, then you should do so now. See section 2.3.1.

### 2.6.2 IMPORTING THE I/O MODULE UPDATES AND UPDATING THE I/O MODULES

On the Flex System Manager web interface select the "I/O Modules - Check and Update Firmware" link on the "Initial Setup" tab:

- If the Flex System Manager is connected to the Internet, select "Check for updates" and click "OK". This will download the latest I/O module updates from the Internet.
- If the Flex System Manager is not connected to the Internet:
  1. Select "Import updates from file system" and enter the full directory path where you copied the updates in the "Path:" field. Enter the directory path only; do not enter a file name. This can be the same directory where you copied the CMM update.
  2. Click "OK". All updates in the directory will be imported.

#### **Important Considerations when updating I/O modules**

The following switches require a TFTP server is installed and running on a Compute Node that is managed by the Flex System Manager:

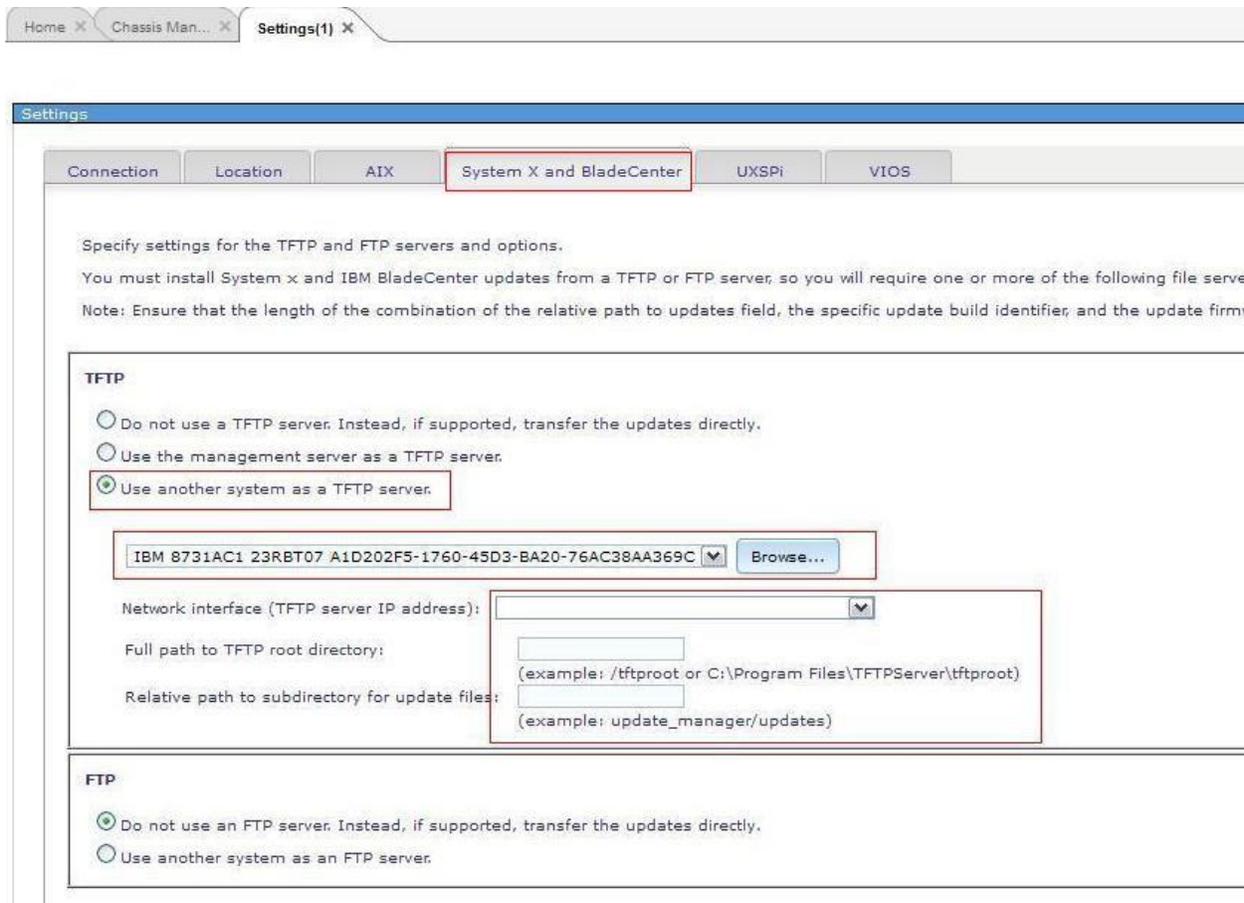
- Flex System Fabric EN4093 10Gb Scalable Switch
- Flex System EN2092 1Gb Ethernet Scalable Switch

For these I/O modules the Flex System Manager must be set up to use another system as a TFTP server. You can configure the TFTP server by entering "Update settings" in the Find field in the Chassis Manager tab and clicking on the Update settings link under Release Management. See screen shot below:





On the **Settings** pane select the **System X and BladeCenter** tab. Then select to **Use another system as a TFTP server** and browse for a managed Compute Node that has a TFTP server installed. See screen shot below:



Note: The above configuration is only needed for EN4093 and EN2092 switches.



Alternatively use the TFTP server on the IBM Flex System Management server, by selecting the **Use management server as a TFTP server**. However, since TFTP is a non secure protocol you will have to lower the security setting on IBM Flex System Management to Legacy Security when using the management server's TFTP server. As soon as I/O modules are updated restore the security setting on the IBM Flex System Management to its prior setting.

See info center for discussion on security settings :

[http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.8731.doc/frm\\_security\\_policies.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.8731.doc/frm_security_policies.html)

## 3. UPDATING ALL COMPONENTS IN A CHASSIS WHEN FLEX SYSTEM MANAGER IS NOT PRESENT

### 3.1 UPDATING ALL COMPONENTS IN A CHASSIS WHEN FLEX SYSTEM MANAGER IS NOT PRESENT

If Flex System Manager is not present in your configuration then use the ToolsCenter tools to update your chassis and the update methods that target the devices directly, such as Storage Nodes and I/O Modules web interfaces.

Go to the Updates section of Toolscenter :

<http://www.ibm.com/systems/support/toolscenter>

## 4. PUREFLEX INFOCENTER LINKS

Information Center documentation related to Flex System and PureFlex products

Initial Setup :

[http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.acc.8731.doc%2Fgetting\\_started.html](http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.acc.8731.doc%2Fgetting_started.html)

Update Considerations for VMware ESXi /vSphere Updates :

[http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.director.updates.helps.doc%2Ffqm0\\_c\\_um\\_considerations\\_for\\_updating\\_vmware-esxi.html&resultof=%22ESXi%22%20%22esxi%22](http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.director.updates.helps.doc%2Ffqm0_c_um_considerations_for_updating_vmware-esxi.html&resultof=%22ESXi%22%20%22esxi%22)

