

Upgrading the firmware on a Brocade Fibre Channel Switch

Introduction

In order to maintain a secure, well-functioning fibre channel fabric over the years you'll need to perform a firmware upgrade now and again. Brocade fibre channel switches are expensive but they do deliver a very solid experience. This experience is also obvious in the firmware upgrade process. We'll walk through this as a guide on how to do this environment.

Have a FTP/SFTP/SCP server in place

If you have some switches in your environment you're probably already running a TFTP or FTP server for upgrading those. For TFTP I use the free but simple and good one provided by [Solarwinds](#). They also offer a free SCP/SFTP solution. For FTP it depends either we have IIS with FTP (and FTPS) set up or we use [FileZilla FTP Server](#) which also offers SFTP and FTPS.

In any case this is not a blog about these solutions. If you're responsible for keeping network gear in tip top shape you should this little piece of infrastructure set up for both downloads and uploads of configurations (backup/restore), firmware and boot code.

If you don't have this, it's about time you set one up sport! A virtual machine will do just fine and we back it up as well as we store our firmware and backups on that VM as well. For mobile scenarios I just keep TFTP & FileZilla Server installed and ready to go on my laptop in a stopped state until I need 'm.

Getting the correct Fabric OS firmware

It's up to your SAN & switch vendors to inform you about support for firmware releases. Some OEMs will publish those on their own support sites some will coordinate with Brocade to deliver them as download for specific models sold and supported by them. Dell does it in this manner. To get to it you select your switch version on the DELL support site as you would normally find support and downloads for any DELL product and under downloads you'll find a link to the Brocade web page for DELL.

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Product Name	Release Date
▼ Fabric Operating System (FOS) 7.X	
▼ Fabric Operating System (FOS) 7.4.x	
▼ Fabric Operating System (FOS) 7.4.0b GA	07-28-2015
Fabric OS v7.4.0b Release Notes v2.0 (pdf, 925.44 KB) Fabric OS v7.4.0b MIBs (gz, 104.86 KB) Fabric OS v7.4.0b md5 Checksum (md5, 1.11 KB) Fabric OS v7.4.0b for Windows (zip, 1.06 GB) Fabric OS v7.4.0b for Linux (gz, 1.06 GB)	
► Fabric Operating System (FOS) 7.4.0a GA	05-29-2015
► Fabric Operating System (FOS) 6.X	
► Network Operating System (NOS)	

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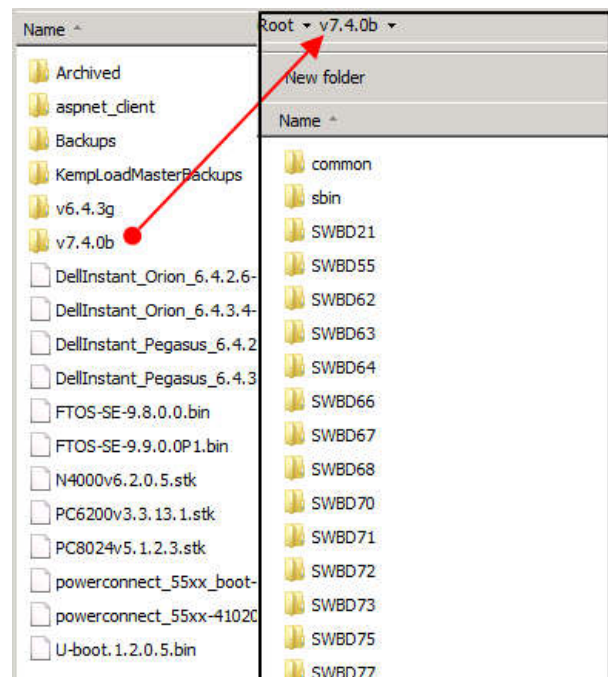
Welcome to DELL Assist

From this page you can access firmware and software downloads and documentation for Brocade SAN product offerings that are qualified by DELL. Check the tabs at the top of the page to navigate between Downloads and Documentation. If you have any issues with the site, please [contact us](#).

Make sure you download the correct firmware for your switch. Read the release notes and make sure you're the hardware you use is supported. Do your homework, go through the [Brocade Fabric OS \(FOS\) 7.x Compatibility Matrix](#). There is no reason to shoot yourself in the foot when this can be avoided. I

always contact DELL Compellent CoPilot support to verify the version is support with the Compellent Storage Center firmware.

When you have downloaded the firmware for your operating system (I'm on Windows) unzip it and place the content of the resulting folder in your FTP root or desired folder. I tend to put the active firmware under the root and archive older one as they get replaced. So that root looks like this. You can copy it there over RDP or via a FTP client. If the FTP server is running your laptop, it's just a local copy.



The upgrade process

A word on upgrading the firmware

If you move from a single major level/version to the next or upgrade within a single major level/version you can do non-disruptive upgrades with a High Availability (HA) reboot meaning that while the switch reloads it will not impact the data flow, the FC ports stay online. Everything keeps running, bar that you lose connectivity to the switch console for a short time.

Some non-disruptive upgrade examples:

V6.3.2e to V6.4.3g

V7.4.0a to v7.4.0b

V7.3.0c to v7.4.0b

Note that this way you can step from an old version to a new one step by step without ever needing downtime. I have always found this a really cool capability.

You can find Brocade's recommendations on what the desired version of a major release is in <https://www.brocade.com/content/dam/common/documents/content-types/target-path-selection-guide/brocade-fos-target-path.pdf>

I tend to way a bit with the latest as the newer ones need some wrinkles taken care of as we can see now switch 7.4.1 which is susceptible to memory leaks.

Some disruptive upgrade examples (FC ports go down):

7.1.2b to 7.4.0a

6.4.3.h to 7.4.0b

Our upgrade here from 7.4.0a to 7.4.0b is non-disruptive as was the upgrade from to 7.3.0c to 7.4.0a. You can jump between version more than one version but it will require a reboot that takes the switch out of action. Not a huge issue if you have (and you should) to redundant fabrics but it can be avoided by moving between versions one at the time. IT takes longer but it's totally non-disruptive which I consider a good thing in production. I reserve disruptive upgrades for green field scenarios or new switches that will be added to the fabric after I'm done upgrading.

Prior to the upgrade

There is no need to run a copy run or write memory on a brocade FC switch. It persists what you do and you have to save and activate your zoning configuration anyway when you configure those (cfsave). All other changes are persisted automatically. So in that regards you should be all good to go.

Make a backup copy of your configuration as is. This gives you a way out if the shit hits the fan and you need to restore to a switch you had to reset or so. Don't forget to do this for the switches in both fabrics, which normally you have in production!

You log on switch with your username and password over telnet or ssh (I use putty or kitty)

MySwitchName:admin> configupload

Hit ENTER. Select the protocol of the backup target server you are using.

Protocol (scp, ftp, sftp, local) [ftp]: ftp

Hit ENTER. Enter the IP address of the FTP server (of the name if you have name resolution set up and working).

Server Name or IP Address [host]: 10.1.1.12

HIT ENTER. Enter the user, here I'm using anonymous.

User Name [user]: anonymous

Hit ENTER. Give the backup file a clear and identifying name.

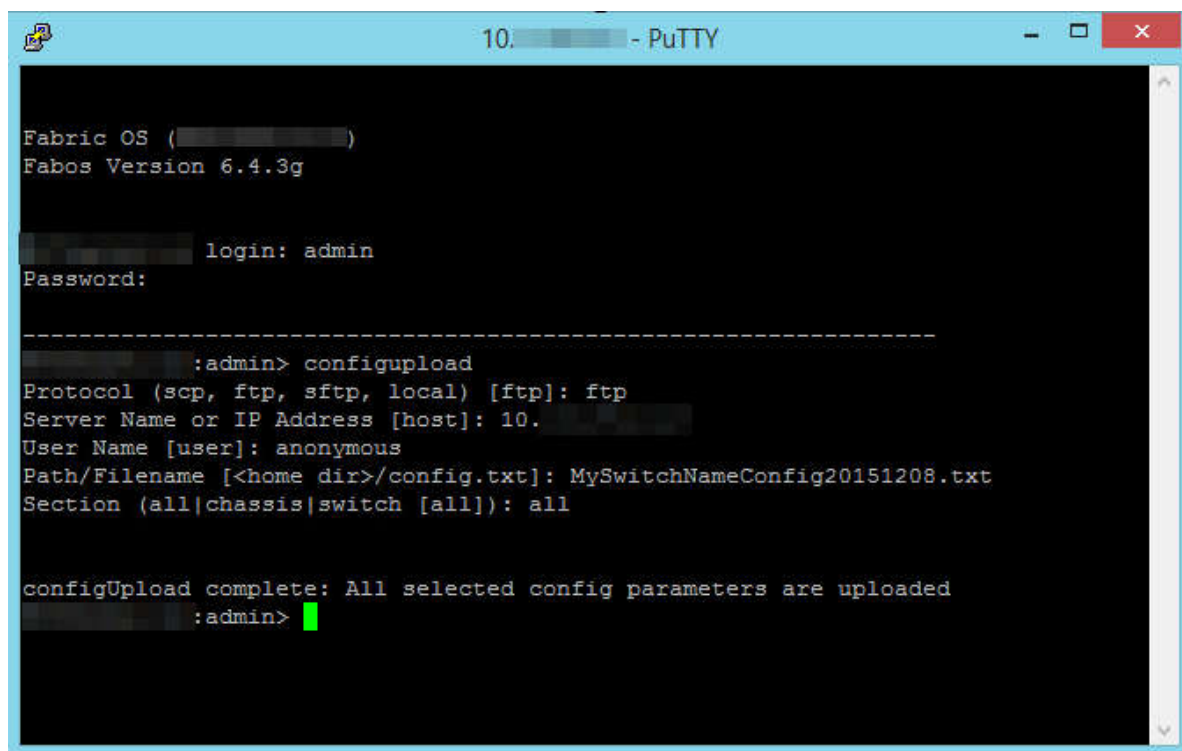
Path/Filename [<home dir>/config.txt]: MySwitchNameConfig20151208.txt

Hit ENTER. Select all (default).

Section (all|chassis|switch [all]): all

configUpload complete: All selected config parameters are uploaded

That's it. You can verify you have a readable backup file on your FTP server now.



```
Fabric OS ( )
Fabos Version 6.4.3g

login: admin
Password:

-----
:admin> configupload
Protocol (scp, ftp, sftp, local) [ftp]: ftp
Server Name or IP Address [host]: 10.1.1.12
User Name [user]: anonymous
Path/Filename [<home dir>/config.txt]: MySwitchNameConfig20151208.txt
Section (all|chassis|switch [all]): all

configUpload complete: All selected config parameters are uploaded
:admin>
```

The Upgrade

A production environment normally has 2 fabrics for redundancy. Each fabric exists out of 1 or more switches. It's wise to start with one fabric and complete the upgrade there. Only after all is proven well there should you move on to the second fabric. To avoid any impact on production I tend plan these early or late in the day also avoiding any backup activity. Depending on your environment you could see some connectivity drops on any FC-IP links (remote SAN replication FC to IP ⇔ IP to FC) but when you work one fabric at the time you can mitigate this during production hours via redundancy.

Log on to first brocade fabric switch with your username and password over telnet or ssh (I use putty or kitty). At the console prompt type

firmwaredownload

This is the command for the non-disruptive upgrade. If you need or want to do a disruptive one, you'll need to use `firmwaredownload -s`.

Hit ENTER. Enter the IP address of the FTP server (of the name if you have name resolution set up and working).

Server Name or IP address: 10.1.1.12

User name: I fill out anonymous as this gives me the best results. Leaving it blank doesn't always work depending on your FTP server.

User Name: anonymous

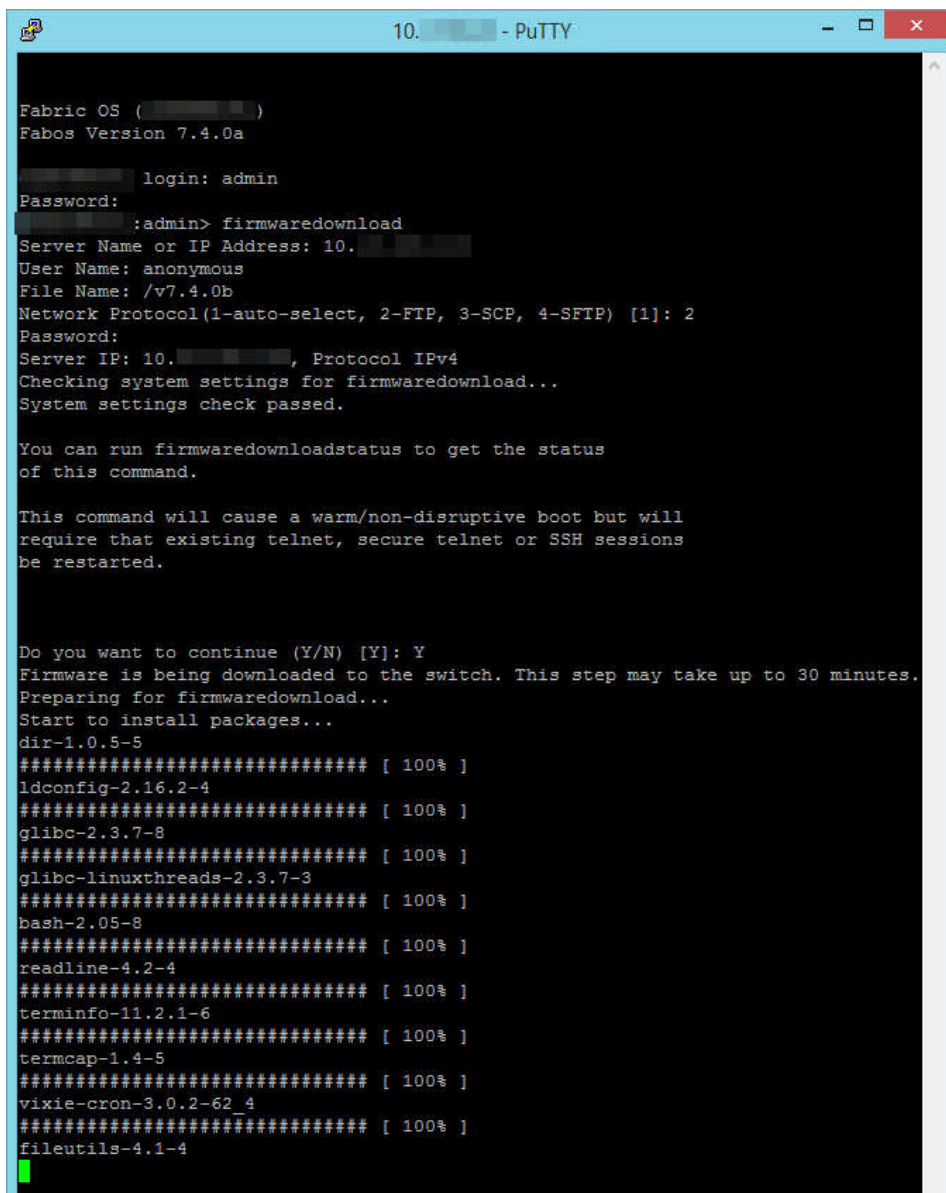
Hit ENTER. Now enter the path to the firmware, I placed the firmware folder in the root of the FTP server so that is.

Path: /v7.4.0b

Hit ENTER. At the password prompt leave the password empty. Anonymous FTP doesn't need one.

Password:

Hit ENTER, the upgrade process preparation starts. After the checks have passed you'll be asked if you want to continue. We enter Y for yes and hit Enter. The firmware download starts and you'll see list of packages being downloaded. Just let it run.



```
10. - PuTTY

Fabric OS ( )
Fabos Version 7.4.0a

login: admin
Password:
:admin> firmwaredownload
Server Name or IP Address: 10.
User Name: anonymous
File Name: /v7.4.0b
Network Protocol(1-auto-select, 2-FTP, 3-SCP, 4-SFTP) [1]: 2
Password:
Server IP: 10., Protocol IPv4
Checking system settings for firmwaredownload...
System settings check passed.

You can run firmwaredownloadstatus to get the status
of this command.

This command will cause a warm/non-disruptive boot but will
require that existing telnet, secure telnet or SSH sessions
be restarted.

Do you want to continue (Y/N) [Y]: Y
Firmware is being downloaded to the switch. This step may take up to 30 minutes.
Preparing for firmwaredownload...
Start to install packages...
dir-1.0.5-5
##### [ 100% ]
ldconfig-2.16.2-4
##### [ 100% ]
glibc-2.3.7-8
##### [ 100% ]
glibc-linuxthreads-2.3.7-3
##### [ 100% ]
bash-2.05-8
##### [ 100% ]
readline-4.2-4
##### [ 100% ]
terminfo-11.2.1-6
##### [ 100% ]
termcap-1.4-5
##### [ 100% ]
vixie-cron-3.0.2-62_4
##### [ 100% ]
fileutils-4.1-4
```


This goes on for a while. At one point you'll see the prom update happening.

```
fabos-man-7.4.0b-13
##### [ 100% ]
fabos-swbd66-7.4.0b-3
##### [ 100% ]
apache-2.4.6-10
##### [ 100% ]
fastcgi-2.3-4
##### [ 100% ]
fabos-webtools-7.4.0b-11
##### [ 100% ]
fabos-webtoolsez-7.4.0b-3
##### [ 100% ]
tz-7.12-6
##### [ 100% ]
mtracer-tool-2.4.20-13
##### [ 100% ]
sysstat-5.0.5-8
##### [ 100% ]
prom-440epx-1.0.11-1
Please avoid powering off the system during prom update.
##### [ 100% ]
ip6v-1.3-8
##### [ 100% ]
awk-3.1.1-6
##### [ 100% ]
ipsec-1.1-1
##### [ 100% ]
Removing unneeded files, please wait ...
Finished removing unneeded files.
```

When it's done it starts removing unneeded files and when done it will inform you that the download is done and the HA rebooting starts. HA stands for high availability. Basically it fails over to the next CP (Control Processor, see http://www.brocade.com/content/html/en/software-upgrade-guide/FOS_740_UPGRADE/GUID-20EC78ED-FA91-4CA6-9044-E6700F4A5DA1.html) while the other one reboots and loads the new firmware. All this happens while data traffic keeps flowing through the switch. Pretty neat.

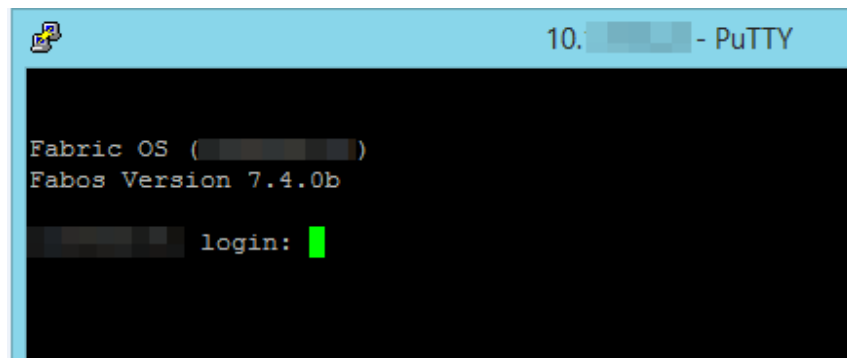
When you keep a continuous ping to the FC switch running during the HA reboot you'll see a short drop in connectivity.

```
##### [ 100% ]
fastcgi-2.3-4
##### [ 100% ]
fabos-webtools-7.4.0b-11
##### [ 100% ]
fabos-webtoolsez-7.4.0b-3
##### [ 100% ]
tz-7.12-6
##### [ 100% ]
mtracer-tool-2.4.20-13
##### [ 100% ]
sysstat-5.0.5-8
##### [ 100% ]
prom-440epx-1.0.11-1
Please avoid powering off the system during prom update.
##### [ 100% ]
ip6v-1.3-8
##### [ 100% ]
awk-3.1.1-6
##### [ 100% ]
ipsec-1.1-1
##### [ 100% ]
Removing unneeded files, please wait ...
Finished removing unneeded files.

All packages have been downloaded successfully.
Firmware has been downloaded to the secondary partition of the switch.
HA Rebooting ...

C:\Users\>ping 10. -t
Pinging with 32 bytes of data:
Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
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Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
Reply from : bytes=32 time=3ms TTL=62
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 10. : bytes=32 time=6ms TTL=62
Reply from 10. : bytes=32 time=3ms TTL=62
Reply from 10. : bytes=32 time=3ms TTL=62
Reply from 10. : bytes=32 time=5ms TTL=62
Reply from 10. : bytes=32 time=5ms TTL=62
Reply from 10. : bytes=32 time=5ms TTL=62
Reply from 10. : bytes=32 time=5ms TTL=62
```

But do realize that since this is a HA reboot the data traffic is not interrupted at all. When you get connectivity back you SSH to switch and verify the reported version, which here is now 7.4.0b.



That's it. Move on to the switch in the same fabric until you're done. But stop there before you move on to your second fabric (failure domain). It pays to go slow with firmware upgrades in an existing environment.

This doesn't just mean waiting a while before installing the very latest firmware to see whether any issues pop up in the forums. It also means you should upgrade one fabric at the time and evaluate the effects. If no problems arise, you can move on with the second fabric. By doing so you will always have a functional fabric even if you need to bring down the other one in order to resolve an issue.

On the other hand, don't leave fabrics unattended for years. Even if you have no functional issues, bugs are getting fixed and perhaps more importantly security issues are addressed as well as browser and Java issues for GUI management. I do wish that the 6.4.x series of the firmware got an update in order for it to work well with Java 8.x.

About the Author



Didier Van Hoya is an IT veteran with over 17 years of expertise in Microsoft technologies, storage, virtualization & networking. He works mainly as a subject matter expert advisor and infrastructure architect in Wintel environments leveraging DELL hardware to build the best possible high performance solutions with great value for money. As Microsoft MVP in Hyper-V, a VEEAM Vanguard, a member of the Microsoft Extended Experts Team in Belgium and a DELL TechCenter Rockstar, he contributes his experience and knowledge to the global community. He's a blogger, writer & public speaker on his areas of expertise.



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