APPLICATION NOTE

# XHub-VIA v1

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ICONOGRAPHY

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 Warning

# What's New?

In the Application Note the icon NEW ! has been added next to the text to highlight information on new and updated features.

Added a condition of AVG erase count of 6000 and above to perform the SSD FW upgrade for the SSD model - M.2 (S42) 3ME3.

Changed download links from BOX to salesforce.

- See section "SSD Firmware Upgrade" on page 8

# 1. Product Overview

The XHub-VIA v1 network switch is at the core of the XNet-VIA network deployment. This network appliance is specifically optimized and pre-configured to seamlessly set up and operate XNet-VIA networks over ethernet.

One unit can support up to 18 servers. Several XHub-VIA v1 units can be added to build larger networks.

Its half rack wide small form factor and shallow depth makes it ideal for usage in mobile production units and outside broadcast environments.

# 2. Default Configuration

The XHub-VIA v1 switch is delivered with the following default settings:

- **Management IP Address:** 192.168.10.4
- **Subnet Mask:** 255.255.255.0
- **Gateway:** 192.168.10.1
- **DNS:** 8.8.8.8
- **Port Speed:**
  - 1/1 - 1/18 = 10000
  - 1/19 - 1/22 = 100000
- **Default Username:** admin
- **Default Password:** admin

# 3. Firmware Upgrade

## 3.1. Management Console

To upgrade the XHub-VIA v1 firmware using the Management Console (= web interface), proceed as follows:

1. Open a web browser.

   The following web browser versions are supported: Firefox 12, Chrome 18, Internet Explorer 8, Safari 5 or higher.

   Make sure that your screen resolution is set to 1024x768 or higher.

2. Enter the IP address or DNS name of the switch.

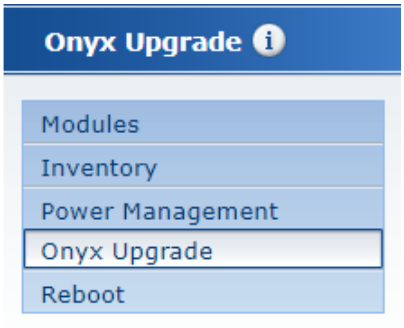
   `https://<switch_IP_address>` or `http://<switch_DNS_name>`

3. Log into the switch.

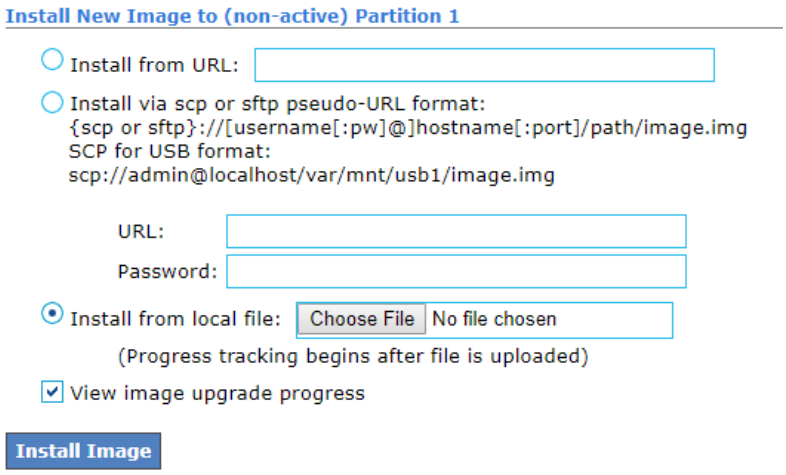
   The Management Console will appear.

4. Open the System tab.

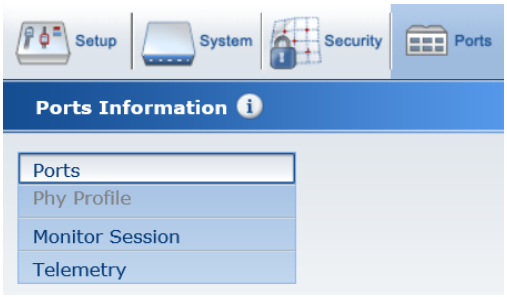

5. Select **Onyx Upgrade**.



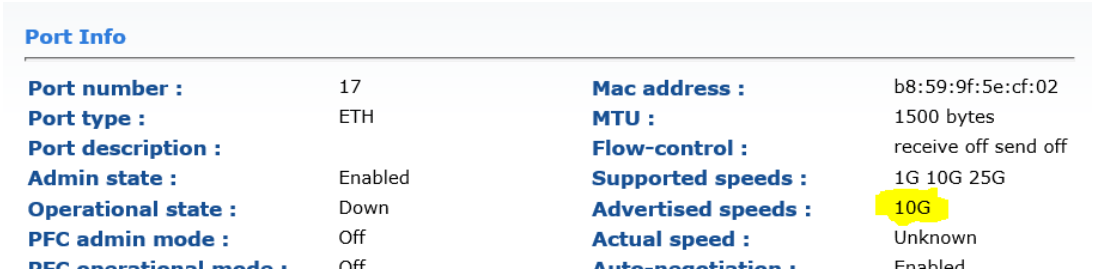
6. In the Install New Image to (Non-Active) Partition 1 area, select the option **Install from Local File**.




7. Browse for and upload the installation file.
8. Click **Install Image**.
9. Reboot your switch once the installation has been completed.
10. Log into the switch.
11. In the Management Console, open the Ports tab.




12. Check that the port speed is:
    - 10G for ports 1-18
    - 100G for ports 19-22



## 3.2. Command Line Interface

To upgrade the XHub-VIA v1 firmware using the command line interface, proceed as follows:

1. Enter Config mode.

```
switch > enable
switch # configure terminal
switch (config) #
```

2. Display the currently available image (`.img` file).

```
switch (config) # show images
Installed images:

Partition 1:
<old_image>

Partition 2:
<old_image>

Last boot partition: 1
Next boot partition: 1

Images available to be installed:
webimage.tbz
<old_image>

Serve image files via HTTP/HTTPS: no

No image install currently in progress.

Boot manager password is set.

Image signing: trusted signature always required
Admin require signed images: yes

Settings for next boot only:
```

```
Fallback reboot on configuration failure: yes (default)
```

3. Delete the image listed under `Images available to be installed` prior to fetching the new image. Use the command `image delete` for this purpose.

```
switch (config) # image delete <old_image>
```

When deleting an image, it is recommended to delete the file, but not the partition, so as to not overload system resources.

4. Fetch the new software image.

```
switch (config) # image fetch scp://<username>:<password>@<ip-
address>/var/www/html/<new_image>

Password (if required): ****** 100.0%
[############################################################]
```

If you want to stock the image on the FTP of the XHub-VIA and launch the installation from this location, proceed as follows:

a. Via SFTP, create an `install` folder in the `home` folder and assign 777 rights (`chmod 777`).

b. Fetch the new software image.

```
switch (config) # image fetch scp://<username>:<password>@<ip-
address>/var/home/install/<new_image>
```

5. Display the available images again and verify that the new image now appears under `Images available to be installed`.

To recover from image corruption (e.g., due to power interruption), there are two installed images on the system. See the commands `image boot next` and `image boot location` for more information.

```
switch (config) # show images

Installed images:


Partition 1:

<old_image>


Partition 2:

<old_image>


Last boot partition: 1

Next boot partition: 1


Images available to be installed:

webimage.tbz
```

```
<new_image>

Serve image files via HTTP/HTTPS: no

No image install currently in progress.

Boot manager password is set.

Image signing: trusted signature always required
Admin require signed images: yes

Settings for next boot only:
Fallback reboot on configuration failure: yes (default)
```

6. Install the new image.

```
switch (config) # image install <new_image>
Step 1 of 4: Verify Image
100.0% [############################################################]
Step 2 of 4: Uncompress Image
100.0% [############################################################]
Step 3 of 4: Create Filesystems
100.0% [############################################################]
Step 4 of 4: Extract Image
100.0% [############################################################]
```

CPU utilization may go up to 100% during image upgrade.

7. Have the new image activate during the next boot.

```
switch (config) # image boot next
```

8. Run `show images` to review your images.

```
switch (config) # show images
Installed images:
Partition 1:
<new_image>
Partition 2:
<old_image>
```

```
Last boot partition: 1
Next boot partition: 1

Images available to be installed:
webimage.tbz
<new_image>

Serve image files via HTTP/HTTPS: no

No image install currently in progress.

Boot manager password is set.

Image signing: trusted signature always required
Admin require signed images: yes

Settings for next boot only:
Fallback reboot on configuration failure: yes (default)
```

9. Save current configuration.

```
switch (config) # configuration write
```

10. Reboot to run the new image.

```
switch (config) # reload
Configuration has been modified; save first? [yes] yes
Configuration changes saved.
Rebooting...
switch (config)#
```

After software reboot, the software upgrade will also automatically upgrade the firmware version.

When performing an upgrade from the WebUI, make sure that the image being upgraded to is not already located in the system (i.e., fetched from the CLI).

# 4. SSD Firmware Upgrade

## Introduction

The following procedure describes the upgrade of Mellanox SSD driver controller's firmware for switches running the version XHub-VIA 1.3.7 and higher.

The following disk types are covered by this procedure:

| Vendor | Model | Firmware Version | Size | Power Cycle Required |
|---|---|---|---|---|
| Virtium | StorFly VSF302XC016G-MLX | 0115-000 | 15.8 GB | No |
| Innodisk | M.2 (S42) 3IE3 | S16425i | 16.0 GB | Yes |
| Innodisk | M.2 (S42) 3IE3 | S19903Mi | 16.0 GB | Yes |
| Innodisk | M.2 (S42) 3ME3 | S15A19 | 16.0 GB | Yes |
| Innodisk | M.2 (S42) 3ME3 | S16425M | 16.0 GB | Yes |
| Innodisk | M.2 (S42) 3ME3 | S19903M | 16.0 GB | Yes |

The procedure will update the above disks to the following target versions:

- StorFly VSF302XC016G-MLX 16GB to version 1210-000
- M.2 (S42) 3IE3 16GB to Version S20728
- M.2 (S42) 3ME3 16GB to Version S20728i

## How to Detect the Disk Model and Firmware Version of the SSD

To read the disk type, perform the below actions.

```
# fae show smart
```

**Output example:**

```
Device Model:             M.2 (S42) 3IE3
************************************************************************
**********************
* Innodisk iSMART V3.9.41 2018/05/25 *
************************************************************************
********************** Model Name: M.2 (S42) 3IE3
FW Version: S16425i
Serial Number: BCA11708040400678 Health: 99.115%
Capacity: 14.914146 GB
P/E Cycle: 20000
Lifespan : 25000 (Years : 68 Months : 6 Days : 0) iAnalyzer: Disable
Write Protect: Disable
```

# How to Upgrade the SSD Firmware Step by Step

## Switches running XHub-VIA Version 1.3.8.2306 or Lower

The following procedure will utilize Mellanox Onyx Dockers' technology.

### Dependencies

- XHub-VIA 1.3.7 and above
- Files needed:

NEW !

  - `nvidia_mlnx_ssd_docker.img.gz` (https://mellanox.my.salesforce.com/sfc/p/500000007heg/a/1T000000t2kg/vmdg0mUhrgfEWU8ISX3PXAZ5E7cij7nkwMwWbPdfy_I)

### Step-by-Step Guide

1. Copy the file `nvidia_mlnx_ssd_docker_img.tgz` to the switch `/var/opt/tms/images/` directory using SFTP from a remote location to the switch or using CLI:

   ```
   # image fetch scp://user:password@<server ip>:<path to nvidia_mlnx_ssd_docker.img.gz>
   ```

2. Enable docker.

   ```
   (config)# no docker shutdown
   ```

3. Create a docker label named shared.

   ```
   (config)# docker label shared
   ```

4. Load the docker image.

   ```
   (config)# docker load nvidia_mlnx_ssd_docker.img.gz
   ```

5. Start a container based on the docker image.

   ```
   (config)# docker start nvidia_mlnx_ssd_docker.img.gz latest ssd now-and-init privileged network label shared cpus 0.4 memory 300
   ```

6. Save the configuration.

   ```
   (config)# configuration write
   ```

7. Verify switch model/Fw version and health status, Save the below command output to provide later to Nvidia Mellanox Technical Support.

   ```
   (config)# docker exec ssd "health"
   ```

NEW !

   If the SSD model is M.2 (S42) 3ME3 and the SSD Avg Erase Count field value is 6000 and above, don't continue to the next step as the SSD FW upgrade can't be performed safely.

   For Innodisk SSDs, the next command will power cycle the switch after applying the new SSD FW. For virtium SSDs, the upgrade does not involve any interruption and can be performed during the normal operation of the switch.

8. Run the SSD FW upgrade command, Save the below command output to provide later to Nvidia Mellanox Technical Support.

```
(config)# docker exec ssd "ssd_upgrade"
```

9. After the switch boots up after step 8, run the following command to verify new firmware version is displayed. save the below command output to provide later to Nvidia Mellanox Technical Support.

   ```
   (config)# docker exec ssd "health"
   ```

10. Remove the docker container.

    ```
    (config)# no docker start ssd
    ```

11. Unload the docker image.

    ```
    (config)# docker remove image nvida_mlnx_ssd latest
    ```

12. Save the configuration.

    ```
    (config)# configuration write
    ```

## Example

```
l-csi-2100-tmp-34 [standalone: master] # show version concise X86_64 3.9.0300
2020-02-26 19:25:24 x86_64

l-csi-2100-tmp-34 [standalone: master] (config) # no docker shutdown

l-csi-2100-tmp-34 [standalone: master] (config) # docker label shared

nvidia_mlnx_ssd latel-csi-2100-tmp-34 [standalone: master] (config) # image
fetch scp://user:password@10.228.128.178:/tmp/nvidia_mlnx_ssd_docker.img.gz
[##################################################################################]

l-csi-2100-tmp-34 [standalone: master] (config) #

l-csi-2100-tmp-34 [standalone: master] (config) # docker load nvidia_mlnx_ssd_
docker.img.gz

4f8e24182800: Loading layer 3.072kB/3.072kB

6ec0e7160d2c: Loading layer 755.2kB/755.2kB

aaf19938abe9: Loading layer 23.04kB/23.04kB

8ebcdc1320ca: Loading layer 1.799MB/1.799MB

fe18a55ee030: Loading layer 80.83MB/80.83MB

3e95865940cd: Loading layer 542.2kB/542.2kB

ee81f3594b12: Loading layer 116.7kB/116.7kB

f69ea0daa085: Loading layer 3.072kB/3.072kB

6a6a8d1d113e: Loading layer 3.072kB/3.072kB

106966c561b7: Loading layer 3.072kB/3.072kB

62aa3f43c88b: Loading layer 3.072kB/3.072kB

8d5034587822: Loading layer 3.072kB/3.072kB

2ec71dee1e79: Loading layer 285.5MB/285.5MB

Loaded image: nvidia_mlnx_ssd:latest

l-csi-2100-tmp-34 [standalone: master] (config) # docker start nvidia_mlnx_ssd
latest ssd now-and-init privileged network label shared cpus 0.4 memory 300

Attempting to start docker container. Please wait (this can take a minute)...

l-csi-2100-tmp-34 [standalone: master] (config) # docker exec ssd health

Running exec_name:[health]

Thu Sep 10 06:40:59 UTC 2020 ================================================

Switch details:

Hostname: l-csi-2100-tmp-34

Switch SN: MT1728X06981

Switch PN: MSN2100-CB2F

SSD Model: M.2 (S42) 3ME3

SSD Size: 16.0GB
```

SSD FW Version: S15A19

SSD Flash Technology: MLC

SSD Avg Erase Count: 1181 ==========

Recommendation: Upgrade SSD FW to version S20728
==========

l-csi-2100-tmp-34 [standalone: master] (config) # **docker exec ssd ssd_upgrade**

Running exec_name:[ssd_upgrade]

Device Model : M.2 (S42) 3ME3

Serial Number : 20160926AA105059102D

User Capacity : 16.0 GB

Firmware Version : S15A19

Device Model : M.2 (S42) 3ME3

Serial Number : 20160926AA105059102D

User Capacity : 16.0 GB

Current Firmware Version : S15A19

Available Firmware Version : S20728

Power Cycle Required : yes

Upgrade Required : yes

Please note: Once SSD FW Update process ends, system will power-cycle automatically and it will take up to 1 minute to access it back. ********** *

Innodisk Microcode Download V2.4.0 2019/12/27 *
**********

Model Name : M.2 (S42) 3ME3

Serial Num : 20160926AA105059102D

FW Version : S15A19

Capacity : 16.013943

MCDL Mode : 7

---

Download Microcode done !!

Model Name : M.2 (S42) 3ME3

Serial Num : 20160926AA105059102D

FW Version : S15A19

SSD FW update completed successfully.

Execute power cycle...

# Power Cycle is performed automatically by the upgrade tool

```
# ssh admin@l-csi-2100-tmp-34

l-csi-2100-tmp-34 [standalone: master] > enable

l-csi-2100-tmp-34 [standalone: master] # conf t

l-csi-2100-tmp-34 [standalone: master] (config) # docker exec ssd health

Running exec_name:[health] Thu Sep 10 07:09:56 UTC 2020
================================================

Switch details:

Hostname: l-csi-2100-tmp-34

Switch SN: MT1728X06981

Switch PN: MSN2100-CB2F

SSD Model: M.2 (S42) 3ME3

SSD Size: 16.0GB

SSD FW Version: S20728

SSD Flash Technology: MLC

SSD Avg Erase Count: 1181 ================================================

Recommendation: No Actions required - SSD FW version is already S20728
================================================

l-csi-2100-tmp-34 [standalone: master] (config) #
```

## Switches running XHub-VIA Version 1.3.9.0914 or Higher

The Following procedure will utilize built-in cli commands available with XHub-VIA 1.3.9.0914 and above.

### Dependencies

- XHub-VIA  version 1.3.9.0914 or higher
- Files needed:

NEW !

  - `mlnx_ssd_fw_package.pkg` ( https://mellanox.my.salesforce.com/sfc/p/500000007heg/a/1T000000t2kb/gyJqN4v1Oi6itYdtAPR4M7RRQ1UhkYjQpUIF3wxzy1o)

### Step-by-Step Guide

1. Save the Switch configuration

   ```
   > enable # config terminal (config)# configuration write
   ```

2. Copy the file `mlnx_ssd_fw_package.pkg` to the switch `/var/opt/tms/images/` directory using SFTP/SCP from a remote location to the switch or using CLI:

   ```
    # image fetch scp://user:password@<server ip>:<path to mlnx_ssd_fw_package.pkg>
   ```

3. Run the Commands to verify switch model, FW version and health, save the below command output to provide later to Nvidia Mellanox Technical Support.

   ```
   (config)# fae show smart
   ```

   ```
   (config)# fae show ssd info
   ```

NEW !

   If the SSD model is M.2 (S42) 3ME3 and the SSD Avg Erase Count field value is 6000 and above, don't continue to the next step as the SSD FW upgrade can't be performed safely.

   For Innodisk SSDs, the next command will power cycle the switch after applying the new SSD FW. For virtium SSDs, the upgrade does not involve any interruption and can be performed during the normal operation of the switch.

4. Upgrade the SSD FW, save the below command output to provide later to Nvidia Mellanox Technical Support.

   - For XHub-VIA 1.3.9.09XX – if the SSD is an Innodisk SSD from the list below, perform the command as listed below (with power-cycle option)
     - M.2 (S42) 3ME3
     - M.2 (S42) 3IE3

     ```
     (config)# fae ssd fwupdate mlnx_ssd_fw_package.pkg power-cycle force
     ```

   - For XHub-VIA 1. 3.9.1xxx

     ```
     (config)# fae ssd fwupdate mlnx_ssd_fw_package.pkg force
     ```

5. After the switch boots up (Innodisk SSD) or finishes the Upgrade (Virtium), verify the SSD FW version and health

   ```
   > enable
   ```

```
# conf t
(config)# fae show ssd info
(config)# fae show smart
```



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