Upgrading SSD Firmware on Mellanox Switches

Rev 1.0

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Document Revision History

Table 1: Document Revision History

Revision	Date	Description
1.0	1 April 2020	Initial version of the document

About This Manual

The following procedure describes the upgrade of Mellanox SSD driver controller's firmware on all supported operating system flavors.

Upgrade use-cases:

- Switches running Cumulus, SONiC, SwitchDev, or ONL
- Switches running Mellanox Onyx version 3.9.0300 and lower
- Switches running Mellanox Onyx version 3.9.0500 or higher

NOTE:
Cumulus 4.1 and higher will include the mlnx_ssd_fw_update tool within the version.

Switches running Mellanox Onyx version 3.8.1xxx (est. availability: July 2020),will auto upgrade the SSD disk and no further action is required.

1 Switches Running Cumulus, SONiC, SwitchDev, or ONL

1.1 Download the Latest Upgrade Tool

Go to the Box Link at https://mellanox.box.com/s/rwej22g8n2utq4953p1u0qwuvllwnasq

Select the file named: mlnx_ssd_fw_update.tgz

1.2 Dependencies

Make sure to have the correct time and date set on the switch before running the procedure, as there is a GPG package signing check that is done and it requires the switch clock to be relatively accurate

The tool requires that the following utilities be installed on the Linux OS:

- smartctl
- sha256sum
- tar
- bash
- gpg
- sed
- hdparm (needed for Virtium disk upgrade)

1.3 Step-by-Step Guide

1. Copy the " mlnx_ssd_fw_update.tgz " file to the switch.
2. Extract the "# tar -zxf mlnx_ssd_fw_update.tgz " file.
3. Upgrade SSD firmware by running the tool: "# sudo ./mlnx_ssd_fw_update.sh -u -y -i mlnx_ssd_fw_package.pkg".

NOTE: A README file is also available inside the above tar package.

2 Switches Running Mellanox Onyx Version 3.9.0300 and Lower

The following procedure will utilize Mellanox Onyx Dockers' technology. In case your Mellanox Onyx version does not support the Dockers technology (this is true for versions 3.6.4006 and lower), upgrade your switches to the latest Software version.

The following disk types are covered by this procedure:

```
Supported SSDs:
    Vendor   |            Model              |    FW ver    |   Size    | Pwr Cyc Req |
=============|===============================|==============|===========|=============|
o Virtium    | StorFly VSF302XC016G-MLX      | 0115-000     | 15.8  GB  |     no      |
o Innodisk   | M.2 (S42) 3IE3                | S16425i      | 16.0  GB  |     yes     |
o Innodisk   | M.2 (S42) 3ME3                | S15A19       | 16.0  GB  |     yes     |
o Innodisk   | M.2 (S42) 3ME3                | S16425M      | 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 S19903Mi
- M.2 (S42) 3ME3 16GB to Version S19903M

2.1 Step-by-Step Guide

1. Download the docker image file "mlnx_ssd_fw_update_docker.tgz" from the box: https://mellanox.box.com/s/s7njaf2jb9sjxpi0671vjhkkdd6r6waw.
2. Copy the file 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
   mlnx_ssd_fw_update_docker.tgz>
   ```

3. Enable docker.

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

4. Create a docker label named shared.

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

5. Load the docker image.

   ```
   (config)# docker load mlnx_ssd_fw_update_docker.tgz
   ```

6. Start a container based on the docker image.

   ```
   (config)# docker start mlnx_ssd_fw_update latest mlnx_ssd now-and-init
   privileged network label shared
   ```

7. Save the configuration.

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

8. Run the upgrade command from the controller.

```
(config)# docker exec mlnx_ssd "./mlnx_ssd_fw_update.sh -i
mlnx_ssd_fw_package.pkg -u -y "
```

9. After the switch boots up after step 8, run the following command to verify new firmware version is displayed.

```
(config)# docker exec mlnx_ssd "./mlnx_ssd_fw_update.sh -q"
```

10. Remove the docker container.

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

11. Unload the docker image.

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

12. Save the configuration.

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

NOTE: For Innodisk SSDs, the upgrade involves a HARD power-cycle performed by the upgrade script.

For virtium, the upgrade does not involve any interruption and can be performed during the normal operation of the switch.

2.2 Example:

```
demo-switch1[standalone: master] > enable
demo-switch1[standalone: master] # conf t
demo-switch1[standalone: master] (config) # docker exec mlnx_ssd
"./mlnx_ssd_fw_update.sh -i mlnx_ssd_fw_package.pkg -u -y "
Running exec_name:[./mlnx_ssd_fw_update.sh -i mlnx_ssd_fw_package.pkg -u -y
]
Device Model : M.2 (S42) 3IE3
Serial Number : BCA11708040400678
Current Firmware Version : S16425i
Available Firmware Version : S19903Mi
User Capacity : 16.0 GB
Power Cycle Require : 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) 3IE3
Serial Num : BCA11708040400678
FW Version : S16425i
Capacity : 16.013943
MCDL Mode : 7
------------------------------------------------------------
Download Microcode done !!
Model Name : M.2 (S42) 3IE3
Serial Num : BCA11708040400678
FW Version : S16425i

<automatic power cycle>
```

3 Switches Running Mellanox Onyx Version 3.9.0500 or Higher

1. Run the following commands:

```
demo-switch1 [switch1: standby] (config) # show version concise
X86_64 3.9.0430-67 2020-03-22 06:08:22 x86_64

demo-switch1 [switch1: standby] (config) #

demo-switch1 [switch1: standby] (config) # fae show ssd info
Device Model : M.2 (S42) 3IE3
Serial Number : BCA11709270170159
Firmware Version : S16425i
User Capacity : 16.0 GB

demo-switch1 [switch1: standby] (config) # fae show ssd package
mlnx_ssd_fw_package_default.pkg
Package Name:/opt/tms/bin/mlnx_ssd_fw_package_default.pkg
description:MLNX SSD firmware update utility to read and write SSD FW.
version:1.2
release_date:15-Mar-2020
Supported SSDs:
Vendor | Model | FW ver | Size | Pwr Cyc Req |
=============|================================|==============|==========|
=============|
o Virtium | StorFly VSF302XC016G-MLX | 0115-000 | 15.8 GB | no |
o Innodisk | M.2 (S42) 3IE3 | S16425i | 16.0 GB | yes |
o Innodisk | M.2 (S42) 3ME3 | S15A19 | 16.0 GB | yes |
o Innodisk | M.2 (S42) 3ME3 | S16425M | 16.0 GB | yes |
```

```
demo-switch1 [switch1: standby] (config) # fae ssd fwupdate
mlnx_ssd_fw_package_default.pkg
Device Model : M.2 (S42) 3IE3
Serial Number : BCA11709270170159
Current Firmware Version : S16425i
Available Firmware Version : S19903Mi
User Capacity : 16.0 GB
Power Cycle Require : 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.
Do you want to continue? [Y/N]Y
************************************************************
* Innodisk Microcode Download V2.4.0 2019/12/27 *
************************************************************
Model Name : M.2 (S42) 3IE3
Serial Num : BCA11709270170159
FW Version : S16425i
Capacity : 16.013943
MCDL Mode : 7
------------------------------------------------------------
Download Microcode done !!
Model Name : M.2 (S42) 3IE3
Serial Num : BCA11709270170159
FW Version : S16425i
```

2. After power cycle, run the following:

```
demo-switch1 [switch1: standby] # fae show ssd info
Device Model : M.2 (S42) 3IE3
Serial Number : BCA11709270170159
Firmware Version : S19903Mi
User Capacity : 16.0 GB
```

```
demo-switch1 [switch1: standby] #
```