



# Linux Driver Installation

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This section describes how to install and test the MLNX\_OFED for Linux package on a single server with a ConnectX-6 Dx adapter card installed.

## Prerequisites

Requirements	Description
Platforms	A server platform with a ConnectX-6 Dx Ethernet adapter card installed.
Required Disk Space for Installation	1GB
Operating System	Linux operating system. For the list of supported operating system distributions and kernels, please refer to the <i>MLNX_OFED Release Notes</i> .
Installer Privileges	The installation requires administrator (root) privileges on the target machine.

## Downloading MLNX\_OFED

1. Verify that the system has a network adapter installed by running lspci command. The below table provides output examples per ConnectX-6 Dx card configuration.

```
# lspci -v | grep Mellanox
86:00.0 Network controller [0207]: Mellanox Technologies MT28908A0 Family
Subsystem: Mellanox Technologies Device 0014
86:00.1 Network controller [0207]: Mellanox Technologies MT28908A0 Family
Subsystem: Mellanox Technologies Device 0014
```

2. Download the ISO image to your host.

The image's name has the format MLNX\_OFED\_LINUX-<ver>-<OS label><CPU arch>.iso.

You can download and install the latest OpenFabrics Enterprise Distribution (OFED) software package available via the NVIDIA web site at [nvidia.com/en-us/networking\\_Products\\_Software\\_InfiniBand\\_Drivers\\_NVIDIA\\_MLNX\\_OFED](https://nvidia.com/en-us/networking_Products_Software_InfiniBand_Drivers_NVIDIA_MLNX_OFED)

- 1.

1. Scroll down to the Download wizard, and click the Download tab.
2. Choose your relevant package depending on your host operating system.
3. Click the desired ISO/tgz package.
4. To obtain the download link, accept the End User License Agreement (EULA).

3. Use the Hash utility to confirm the file integrity of your ISO image. Run the following command and compare the result to the value provided on the download page.

```
SHA256 MLNX_OFED_LINUX-<ver>-<OS label>.iso
```

## Installing MLNX\_OFED

### Installation Script

The installation script, `mlnxofedinstall`, performs the following:

- Discovers the currently installed kernel
- Uninstalls any software stacks that are part of the standard operating system distribution or another vendor's commercial stack
- Installs the MLNX\_OFED\_LINUX binary RPMs (if they are available for the current kernel)
- Identifies the currently installed InfiniBand and Ethernet network adapters and automatically upgrades the firmware

**Note:** To perform a firmware upgrade using customized firmware binaries, a path can be provided to the folder that contains the firmware binary files, by running `--fw-image-dir`. Using this option, the firmware version embedded in the MLNX\_OFED package will be ignored.

### Example:

```
./mlnxofedinstall --fw-image-dir /tmp/my_fw_bin_files
```

### Note

**If the driver detects unsupported cards on the system, it will abort the installation procedure. To avoid this, make sure to add `--skip-unsupported-devices-check` flag during installation.**

## Usage

```
./mnt/mlnxofedinstall [OPTIONS]
```

The installation script removes all previously installed OFED packages and re-installs from scratch. You will be prompted to acknowledge the deletion of the old packages.

### Note

Pre-existing configuration files will be saved with the extension `".conf.rpmsave"`.

- If you need to install OFED on an entire (homogeneous) cluster, a common strategy is to mount the ISO image on one of the cluster nodes and then copy it to a shared file system such as NFS. To install on all the cluster nodes, use cluster-aware tools (such as `pdsh`).
- If your kernel version does not match with any of the offered pre-built RPMs, you can add your kernel version by using the `"mlnx_add_kernel_support.sh"`

script located inside the MLNX\_OFED package.

**(i) Note**

On Redhat and SLES distributions with errata kernel installed there is no need to use the `mlnx_add_kernel_support.sh` script. The regular installation can be performed and weak-updates mechanism will create symbolic links to the MLNX\_OFED kernel modules.

**(i) Note**

If you regenerate kernel modules for a custom kernel (using `--add-kernel-support`), the packages installation will not involve automatic regeneration of the initramfs. In some cases, such as a system with a root filesystem mounted over a ConnectX card, not regenerating the initramfs may even cause the system to fail to reboot.

In such cases, the installer will recommend running the following command to update the initramfs:

```
dracut -f
```

On some OSs, `dracut -f` might result in the following error message which can be safely ignore.

```
libkmod: kmod_module_new_from_path: kmod_module 'mdev' already exists with different path
```

The “`mlnx_add_kernel_support.sh`” script can be executed directly from the

mlnxofedinstall script. For further information, please see '--add-kernel-support' option below.

**Note**

On Ubuntu and Debian distributions drivers installation use Dynamic Kernel Module Support (DKMS) framework. Thus, the drivers' compilation will take place on the host during MLNX\_OFED installation. Therefore, using "mlnx\_add\_kernel\_support.sh" is irrelevant on Ubuntu and Debian distributions.

**Example:** The following command will create a MLNX\_OFED\_LINUX ISO image for RedHat 7.3 under the /tmp directory.

```
# ./MLNX_OFED_LINUX-x.x-x-rhel7.3-x86_64/mlnx_add_kernel_support.sh
-m /tmp/MLNX_OFED_LINUX-x.x-x-rhel7.3-x86_64/ --make-tgz
Note: This program will create MLNX_OFED_LINUX TGZ for rhel7.3 under
/tmp directory.
All Mellanox, OEM, OFED, or Distribution IB packages will be removed.
Do you want to continue?[y/N]:y
See log file /tmp/mlnx_ofed_iso.21642.log

Building OFED RPMs. Please wait...
Removing OFED RPMs...
Created /tmp/MLNX_OFED_LINUX-x.x-x-rhel7.3-x86_64-ext.tgz
```

- o The script adds the following lines to /etc/security/limits.conf for the userspace components such as MPI:
  - \* soft memlock unlimited
  - \* hard memlock unlimited



- These settings set the amount of memory that can be pinned by a userspace application to unlimited. If desired, tune the value unlimited to a specific amount of RAM.

For your machine to be part of the InfiniBand/VPI fabric, a Subnet Manager must be running on one of the fabric nodes. At this point, OFED for Linux has already installed the OpenSM Subnet Manager on your machine.

For the list of installation options, run:

```
./mlnxofedinstall --h
```

## Installation Procedure

This section describes the installation procedure of MLNX\_OFED on NVIDIA adapter cards.

1. Log in to the installation machine as root.
2. Mount the ISO image on your machine.

```
host1# mount -o ro,loop MLNX_OFED_LINUX-<ver>-<OS label>-<CPU arch>.iso /mnt
```

3. Run the installation script.

```
/mnt/mlnxofedinstall
Logs dir: /tmp/MLNX_OFED_LINUX-x.x-x.logs
This program will install the MLNX_OFED_LINUX package on your machine.
Note that all other Mellanox, OEM, OFED, RDMA or Distribution IB
packages will be removed.
Those packages are removed due to conflicts with MLNX_OFED_LINUX, do
not reinstall them.
Starting MLNX_OFED_LINUX-x.x.x installation ...
.....
```

.....

Installation finished successfully.

Attempting to perform Firmware update...

Querying Mellanox devices firmware ...

**(i) Note**

For unattended installation, use the `--force` installation option while running the `MLNX_OFED` installation script:  
`./mnt/mlnxofedinstall --force`

**(i) Note**

`MLNX_OFED` for Ubuntu should be installed with the following flags in `chroot` environment:  
`./mlnxofedinstall --without-dkms --add-kernel-support --kernel <kernel version in chroot> --without-fw-update --force`  
For example:  
`./mlnxofedinstall --without-dkms --add-kernel-support --kernel 3.13.0-85-generic --without-fw-update --force`  
Note that the path to kernel sources (`--kernel-sources`) should be added if the sources are not in their default location.

**(i) Note**

In case your machine has the latest firmware, no firmware update will occur and the installation script will print at the end of installation a message similar to the following:  
Device #1:-----Device Type: ConnectX-XP  
Part Number: MCXXXX-XXXPSID: MT\_<version>PCI Device

Name: 0b:00.0Base MAC: 0000e41d2d5cf810Versions:  
Current AvailableFW XX.XX.XXXXStatus: Up to date

**Note**

In case your machine has an unsupported network adapter device, no firmware update will occur and one of the error messages below will be printed. Please contact your hardware vendor for help with firmware updates.

Error message #1:Device #1:-----Device Type: ConnectX-  
XPart Number: MCXXX-XXXPSID: MT\_<version>PCI Device  
Name: 0b:00.0Base MAC: 0000e41d2d5cf810Versions:  
Current AvailableFW XX.XX.XXXXStatus: No matching image  
found

Error message #2:The firmware for this device is not  
distributed inside NVIDIA driver: 0000:01:00.0 (PSID:  
IBM2150110033)To obtain firmware for this device, please  
contact your HW vendor.

4. **Case A:** If the installation script has performed a firmware update on your network adapter, you need to either restart the driver or reboot your system before the firmware update can take effect. Refer to the table below to find the appropriate action for your specific card.

Action \ Adapter	Driver Restart	Standard Reboot (Soft Reset)	Cold Reboot (Hard Reset)
Standard ConnectX-4/ConnectX-4 Lx or higher	-	+	-
Adapters with Multi-Host Support	-	-	+
Socket Direct Cards	-	-	+

**Case B:** If the installations script has not performed a firmware upgrade on your network adapter, restart the driver by running: `"/etc/init.d/openibd restart"`.

5. (InfiniBand only) Run the `hca_self_test.ofed` utility to verify whether or not the InfiniBand link is up. The utility also checks for and displays additional information such as:

- HCA firmware version
  - Kernel architecture
  - Driver version
  - Number of active HCA ports along with their states
  - Node GUID
- For more details on `hca_self_test.ofed`, see the file `docs/readme_and_user_manual/hca_self_test.readme`.

After installation completion, information about the OFED installation, such as prefix, kernel version, and installation parameters can be retrieved by running the command `/etc/infiniband/info`. Most of the OFED components can be configured or reconfigured after the installation, by modifying the relevant configuration files. See the relevant chapters in this manual for details.

The list of the modules that will be loaded automatically upon boot can be found in the `/etc/infiniband/openib.conf` file.

### **Note**

Installing OFED will replace the RDMA stack and remove existing 3rd party RDMA connectors.

## **Installation Results**

Soft ware	<ul style="list-style-type: none"><li>○ Most of MLNX_OFED packages are installed under the <code>"/usr"</code> directory except for the following packages which are installed under the <code>"/opt"</code></li></ul>
--------------	--

	<p>directory:</p> <ul style="list-style-type: none"> <li>▪ fca and ibutils</li> <li>▪ iproute2 (rdma tool) - installed under /opt/Mellanox/iproute2/sbin/rdma</li> </ul> <ul style="list-style-type: none"> <li>○ The kernel modules are installed under <ul style="list-style-type: none"> <li>▪ /lib/modules/`uname -r`/updates on SLES and Fedora Distributions</li> <li>▪ /lib/modules/`uname -r`/extra/mlnx-ofa_kernel on RHEL and other RedHat like Distributions</li> <li>▪ /lib/modules/`uname -r`/updates/dkms/ on Ubuntu</li> </ul> </li> </ul>
Firm ware	<ul style="list-style-type: none"> <li>○ The firmware of existing network adapter devices will be updated if the following two conditions are fulfilled: <ul style="list-style-type: none"> <li>▪ The installation script is run in default mode; that is, without the option '--without-fw-update'</li> <li>▪ The firmware version of the adapter device is older than the firmware version included with the OFED ISO image</li> </ul> <p><b>Note:</b> If an adapter's Flash was originally programmed with an Expansion ROM image, the automatic firmware update will also burn an Expansion ROM image.</p> </li> <li>○ In case your machine has an unsupported network adapter device, no firmware update will occur and the error message below will be printed.  "The firmware for this device is not distributed inside NVIDIA driver: 0000:01:00.0 (PSID: IBM2150110033)  To obtain firmware for this device, please contact your HW vendor."</li> </ul>

## Installation Logging

While installing MLNX\_OFED, the install log for each selected package will be saved in a separate log file.

The path to the directory containing the log files will be displayed after running the installation script in the following format:

### Example:

```
Logs dir: /tmp/MLNX_OFED_LINUX-4.4-1.0.0.0.IBMM2150110033.logs
```

## Driver Load Upon System Boot

Upon system boot, the NVIDIA drivers will be loaded automatically.

**To prevent the automatic load of the NVIDIA drivers upon system boot:**



1. Add the following lines to the "/etc/modprobe.d/mlnx.conf" file.

```
blacklist mlx5_core
blacklist mlx5_ib
```

2. Set "ONBOOT=no" in the "/etc/infiniband/openib.conf" file.
3. If the modules exist in the initramfs file, they can automatically be loaded by the kernel. To prevent this behavior, update the initramfs using the operating systems' standard tools.**Note:** The process of updating the initramfs will add the blacklists from step 1, and will prevent the kernel from loading the modules automatically.

### **mlnxofedinstall Return Codes**

The table below lists the mlnxofedinstall script return codes and their meanings.

<b>Return Code</b>	<b>Meaning</b>
0	The Installation ended successfully
1	The installation failed
2	No firmware was found for the adapter device
22	Invalid parameter
28	Not enough free space
171	Not applicable to this system configuration. This can occur when the required hardware is not present on the system
172	Prerequisites are not met. For example, missing the required software installed or the hardware is not configured correctly
173	Failed to start the mst driver

Soft ware	<ul style="list-style-type: none"> <li>○ Most of MLNX_OFED packages are installed under the “/usr” directory except for the following packages which are installed under the “/opt” directory: <ul style="list-style-type: none"> <li>▪ fca and ibutils</li> <li>▪ iproute2 (rdma tool) - installed under /opt/Mellanox/iproute2/sbin/rdma</li> </ul> </li> <li>○ The kernel modules are installed under <ul style="list-style-type: none"> <li>▪ /lib/modules/`uname -r`/updates on SLES and Fedora Distributions</li> <li>▪ /lib/modules/`uname -r`/extra/mlnx-ofa_kernel on RHEL and other RedHat like Distributions</li> <li>▪ /lib/modules/`uname -r`/updates/dkms/ on Ubuntu</li> </ul> </li> </ul>
Firm ware	<ul style="list-style-type: none"> <li>○ The firmware of existing network adapter devices will be updated if the following two conditions are fulfilled: <ul style="list-style-type: none"> <li>▪ The installation script is run in default mode; that is, without the option ‘--without-fw-update’</li> <li>▪ The firmware version of the adapter device is older than the firmware version included with the OFED ISO image</li> </ul> <p><b>Note:</b> If an adapter’s Flash was originally programmed with an Expansion ROM image, the automatic firmware update will also burn an Expansion ROM image.</p> </li> <li>○ In case your machine has an unsupported network adapter device, no firmware update will occur and the error message below will be printed.  "The firmware for this device is not distributed inside NVIDIA driver: 0000:01:00.0 (PSID: IBM2150110033)  To obtain firmware for this device, please contact your HW vendor."</li> </ul>

## Installation Logging

While installing MLNX\_OFED, the install log for each selected package will be saved in a separate log file.

The path to the directory containing the log files will be displayed after running the installation script in the following format:

### Example:

```
Logs dir: /tmp/MLNX_OFED_LINUX-4.4-1.0.0.0.IBMM2150110033.logs
```

## Uninstalling MLNX\_OFED

Use the script `/usr/sbin/ofed_uninstall.sh` to uninstall the MLNX\_OFED package. The script is part of the `ofed-scripts` RPM.

## Additional Installation Procedures

### Installing MLNX\_OFED Using YUM

This type of installation is applicable to RedHat/OL and Fedora operating systems.

### Setting up MLNX\_OFED YUM Repository

1. Log into the installation machine as root.
2. Mount the ISO image on your machine and copy its content to a shared location in your network.

```
# mount -o ro,loop MLNX_OFED_LINUX-<ver>-<OS label>-<CPU arch>.iso /mnt
```

3. Download and install NVIDIA's GPG-KEY:  
The key can be downloaded via the following link:  
<http://www.mellanox.com/downloads/ofed/RPM-GPG-KEY-Mellanox>

```
# wget http://www.mellanox.com/downloads/ofed/RPM-GPG-KEY-Mellanox
--2018-01-25 13:52:30-- http://www.mellanox.com/downloads/ofed/RPM-GPG-KEY-Mellanox
Resolving www.mellanox.com... 72.3.194.0
Connecting to www.mellanox.com|72.3.194.0|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1354 (1.3K) [text/plain]
Saving to: ?RPM-GPG-KEY-Mellanox?

100%[=====] 1,354
--.-K/s in 0s
```



2018-01-25 13:52:30 (247 MB/s) - ?RPM-GPG-KEY-Mellanox? saved [1354/1354]

#### 4. Install the key.

```
# sudo rpm --import RPM-GPG-KEY-Mellanox
warning: rpmts_HdrFromFdno: Header V3 DSA/SHA1 Signature, key ID
6224c050: NOKEY
Retrieving key from file:///repos/MLNX_OFED/<MLNX_OFED file>/RPM-GPG-KEY-
Mellanox
Importing GPG key 0x6224C050:
Userid: "Mellanox Technologies (Mellanox Technologies - Signing Key v2)
<support@mellanox.com>"
From : /repos/MLNX_OFED/<MLNX_OFED file>/RPM-GPG-KEY-Mellanox
Is this ok [y/N]:
```

#### 5. Check that the key was successfully imported.

```
# rpm -q gpg-pubkey --qf '%{NAME}-%{VERSION}-%{RELEASE}\t%{SUMMARY}\n' |
grep Mellanox
gpg-pubkey-a9e4b643-520791ba gpg(Mellanox Technologies
<support@mellanox.com>)
```

#### 6. Create a yum repository configuration file called "/etc/yum.repos.d/mlnx\_ofed.repo" with the following content:

```
[mlnx_ofed]
name=MLNX_OFED Repository
baseurl=file:///<path to extracted MLNX_OFED package>/RPMS
enabled=1
gpgkey=file:///<path to the downloaded key RPM-GPG-KEY-Mellanox>
gpgcheck=1
```

#### 7. Check that the repository was successfully added.

```
# yum repolist
```

```
Loaded plugins: product-id, security, subscription-manager
This system is not registered to Red Hat Subscription Management. You
can use subscription-manager to register.
repo id repo name status
mlnx_ofed MLNX_OFED Repository 108
rpmforge RHEL 6Server - RPMforge.net - dag 4,597

repolist: 8,351
```

### Setting up MLNX\_OFED YUM Repository Using --add-kernel-support

1. Log into the installation machine as root.
2. Mount the ISO image on your machine and copy its content to a shared location in your network.

```
# mount -o ro,loop MLNX_OFED_LINUX-<ver>-<OS label>-<CPU arch>.iso
/mnt
```

3. Build the packages with kernel support and create the tarball.

```
# /mnt/mlnx_add_kernel_support.sh --make-tgz <optional --kmp> -k
$(uname -r) -m /mnt/
Note: This program will create MLNX_OFED_LINUX TGZ for rhel7.6 under
/tmp directory.
Do you want to continue?[y/N]:y
See log file /tmp/mlnx_iso.4120_logs/mlnx_ofed_iso.4120.log

Checking if all needed packages are installed...
Building MLNX_OFED_LINUX RPMS . Please wait...
Creating metadata-rpms for 3.10.0-957.21.3.el7.x86_64 ...
WARNING: If you are going to configure this package as a repository, then
please note
WARNING: that it contains unsigned rpms, therefore, you need to disable
the gpgcheck
WARNING: by setting 'gpgcheck=0' in the repository conf file.
```

```
Created /tmp/MLNX_OFED_LINUX-5.2-0.5.5.0-rhel7.6-x86_64-ext.tgz
```

4. Open the tarball.

```
# cd /tmp/  
# tar -xvf /tmp/MLNX_OFED_LINUX-5.2-0.5.5.0-rhel7.6-x86_64-ext.tgz
```

5. Create a YUM repository configuration file called "/etc/yum.repos.d/mlnx\_ofed.repo" with the following content:

```
[mlnx_ofed]  
name=MLNX_OFED Repository  
baseurl=file:///<path to extracted MLNX_OFED package>/RPMS  
enabled=1  
gpgcheck=0
```

6. Check that the repository was successfully added.

```
# yum repolist  
Loaded plugins: product-id, security, subscription-manager  
This system is not registered to Red Hat Subscription Management. You  
can use subscription-manager to register.  
repo id repo name status  
mlnx_ofed MLNX_OFED Repository 108  
rpmforge RHEL 6Server - RPMforge.net - dag 4,597  
  
repolist: 8,351
```

## Installing MLNX\_OFED Using the YUM Tool

After setting up the YUM repository for MLNX\_OFED package, perform the following:

1. View the available package groups by invoking:

```
# yum search mlnx-Ofed-
```

mlnx-ofed-all.noarch : MLNX\_OFED all installer [package](#) (with KMP support)

mlnx-ofed-all-user-only.noarch : MLNX\_OFED all-user-only installer [package](#) (User Space packages only)

mlnx-ofed-basic.noarch : MLNX\_OFED basic installer [package](#) (with KMP support)

mlnx-ofed-basic-user-only.noarch : MLNX\_OFED basic-user-only installer [package](#) (User Space packages only)

mlnx-ofed-bluefield.noarch : MLNX\_OFED bluefield installer [package](#) (with KMP support)

mlnx-ofed-bluefield-user-only.noarch : MLNX\_OFED bluefield-user-only installer [package](#) (User Space packages only)

mlnx-ofed-dpdk.noarch : MLNX\_OFED dpdk installer [package](#) (with KMP support)

mlnx-ofed-dpdk-upstream-libs.noarch : MLNX\_OFED dpdk-upstream-libs installer [package](#) (with KMP support)

mlnx-ofed-dpdk-upstream-libs-user-only.noarch : MLNX\_OFED dpdk-upstream-libs-user-only installer [package](#) (User Space packages only)

mlnx-ofed-dpdk-user-only.noarch : MLNX\_OFED dpdk-user-only installer [package](#) (User Space packages only)

mlnx-ofed-eth-only-user-only.noarch : MLNX\_OFED eth-only-user-only installer [package](#) (User Space packages only)

mlnx-ofed-guest.noarch : MLNX\_OFED guest installer [package](#) (with KMP support)

mlnx-ofed-guest-user-only.noarch : MLNX\_OFED guest-user-only installer [package](#) (User Space packages only)

mlnx-ofed-hpc.noarch : MLNX\_OFED hpc installer [package](#) (with KMP support)

mlnx-ofed-hpc-user-only.noarch : MLNX\_OFED hpc-user-only installer [package](#) (User Space packages only)

mlnx-ofed-hypervisor.noarch : MLNX\_OFED hypervisor installer [package](#) (with KMP support)

mlnx-ofed-hypervisor-user-only.noarch : MLNX\_OFED hypervisor-user-only installer [package](#) (User Space packages only)

mlnx-ofed-kernel-only.noarch : MLNX\_OFED kernel-only installer [package](#) (with KMP support)

mlnx-ofed-vma.noarch : MLNX\_OFED vma installer [package](#) (with KMP support)  
 mlnx-ofed-vma-eth.noarch : MLNX\_OFED vma-eth installer [package](#) (with KMP support)  
 mlnx-ofed-vma-eth-user-only.noarch : MLNX\_OFED vma-eth-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-vma-user-only.noarch : MLNX\_OFED vma-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-vma-vpi.noarch : MLNX\_OFED vma-vpi installer [package](#) (with KMP support)  
 mlnx-ofed-vma-vpi-user-only.noarch : MLNX\_OFED vma-vpi-user-only installer [package](#) (User Space packages only)

where:

mlnx-ofed-all	Installs all available packages in MLNX_OFED
mlnx-ofed-basic	Installs basic packages required for running NVIDIA cards
mlnx-ofed-guest	Installs packages required by guest OS
mlnx-ofed-hpc	Installs packages required for HPC
mlnx-ofed-hypervisor	Installs packages required by hypervisor OS
mlnx-ofed-vma	Installs packages required by VMA
mlnx-ofed-vma-eth	Installs packages required by VMA to work over Ethernet
mlnx-ofed-vma-vpi	Installs packages required by VMA to support VPI
bluefield	Installs packages required for BlueField
dpdk	Installs packages required for DPDK
dpdk-upstream-libs	Installs packages required for DPDK using RDMA-Core
kernel-only	Installs packages required for a non-default kernel

**Note:** MLNX\_OFED provides kernel module RPM packages with KMP support for RHEL and SLES. For other operating systems, kernel module RPM packages

are provided only for the operating system's default kernel. In this case, the group RPM packages have the supported kernel version in their package's name.

### Example:

```
mlnx-ofed-all-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED all installer
package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-basic-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED basic
installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-guest-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED guest
installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-hpc-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED hpc installer
package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-hypervisor-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED
hypervisor installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP
support)
mlnx-ofed-vma-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED vma installer
package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-vma-eth-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED vma-eth
installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-vma-vpi-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED vma-vpi
installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-hypervisor-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED
hypervisor installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP
support)
mlnx-ofed-vma-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED vma installer
package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-vma-eth-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED vma-eth
installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
mlnx-ofed-vma-vpi-3.17.4-301.fc21.x86_64.noarch : MLNX_OFED vma-vpi
installer package for kernel 3.17.4-301.fc21.x86_64 (without KMP support)
```

When using an operating system different than RHEL or SLES, or you have installed a kernel that is not supported by default in MLNX\_OFED, you can use the `mlnx_add_kernel_support.sh` script to build MLNX\_OFED for your kernel.

The script will automatically build the matching group RPM packages for your kernel so that you can still install MLNX\_OFED via yum.

Please note that the resulting MLNX\_OFED repository will contain unsigned RPMs, therefore, you should set 'gpgcheck=0' in the repository configuration file.

## 2. Install the desired group.

```
# yum install mlnx-ufed-all
Loaded plugins: langpacks, product-id, subscription-manager
Resolving Dependencies
--> Running transaction check
---> Package mlnx-ufed-all.noarch 0:3.1-0.1.2 will be installed
--> Processing Dependency: kmod-iser = 1.0-
OFED.3.1.0.1.2.1.g832a737.rhel7u1 for package: mlnx-ufed-all-3.1-0.1.2.noarch
.....
.....
qperf.x86_64 0:0.4.9-9
rds-devel.x86_64 0:2.0.7-1.12
rds-tools.x86_64 0:2.0.7-1.12
sdpnstat.x86_64 0:1.60-26
srptools.x86_64 0:1.0.2-12

Complete!
```

### **Note**

Installing MLNX\_OFED using the “YUM” tool does not automatically update the firmware. To update the firmware to the version included in MLNX\_OFED package, run: # yum install mlnx-fw-updater

## Installing MLNX\_OFED Using apt-get

This type of installation is applicable to Debian and Ubuntu operating systems.

### Setting up MLNX\_OFED apt-get Repository

1. Log into the installation machine as root.
2. Extract the MLNX\_OFED package on a shared location in your network. It can be downloaded from <https://www.nvidia.com/en-us/networking/Products/Software/InfiniBand/Drivers>.
3. Create an apt-get repository configuration file called `"/etc/apt/sources.list.d/mlnx_ofed.list"` with the following content:

```
deb file:./<path to extracted MLNX_OFED package>/DEBS ./
```

4. Download and install NVIDIA's Technologies GPG-KEY.

```
# wget -qO - http://www.mellanox.com/downloads/ofed/RPM-GPG-KEY-Mellanox |  
sudo apt-key add -
```

5. Verify that the key was successfully imported.

```
# apt-key list  
pub 1024D/A9E4B643 2013-08-11  
uid Mellanox Technologies <support@mellanox.com>  
sub 1024g/09FCC269 2013-08-11
```

6. Update the apt-get cache.

```
# sudo apt-get update
```

### Setting up MLNX\_OFED apt-get Repository Using --add-keyring



1. Log into the installation machine as root.
2. Mount the ISO image on your machine and copy its content to a shared location in your network.

```
# mount -o ro,loop MLNX_OFED_LINUX-<ver>-<OS label>-<CPU arch>.iso  
/mnt
```

3. Build the packages with kernel support and create the tarball.

```
# /mnt/mlnx_add_kernel_support.sh --make-tgz <optional --kmp> -k  
$(uname -r) -m /mnt/  
Note: This program will create MLNX_OFED_LINUX TGZ for rhel7.6 under  
/tmp directory.  
Do you want to continue?[y/N]:y  
See log file /tmp/mlnx_iso.4120_logs/mlnx_ofed_iso.4120.log  
  
Checking if all needed packages are installed...  
Building MLNX_OFED_LINUX RPMS . Please wait...  
Creating metadata-rpms for 3.10.0-957.21.3.el7.x86_64 ...  
WARNING: If you are going to configure this package as a repository, then  
please note  
WARNING: that it contains unsigned rpms, therefore, you need to disable  
the gpgcheck  
WARNING: by setting 'gpgcheck=0' in the repository conf file.  
Created /tmp/MLNX_OFED_LINUX-5.2-0.5.5.0-rhel7.6-x86_64-ext.tgz
```

4. Open the tarball.

```
# cd /tmp/  
# tar -xvf /tmp/MLNX_OFED_LINUX-5.2-0.5.5.0-rhel7.6-x86_64-ext.tgz
```

5. Create an apt-get repository configuration file called  
"/etc/apt/sources.list.d/mlnx\_ofed.list" with the following content:

```
deb [trusted=yes] file:./<path to extracted MLNX_OFED package>/DEBS ./
```

6. Update the apt-get cache.

```
# sudo apt-get update
```

## Installing MLNX\_OFED Using the apt-get Tool

After setting up the apt-get repository for MLNX\_OFED package, perform the following:

1. View the available package groups by invoking:

```
# apt-cache search mlnx-ofed-
apt-cache search mlnx-ofed .....
knem-dkms - DKMS support for mlnx-ofed kernel modules
mlnx-ofed-kernel-dkms - DKMS support for mlnx-ofed kernel modules
mlnx-ofed-kernel-utils - Userspace tools to restart and tune mlnx-ofed
kernel modules
mlnx-ofed-vma-vpi - MLNX_OFED vma-vpi installer package (with DKMS
support)
mlnx-ofed-kernel-only - MLNX_OFED kernel-only installer package (with
DKMS support)
mlnx-ofed-bluefield - MLNX_OFED bluefield installer package (with DKMS
support)
mlnx-ofed-hpc-user-only - MLNX_OFED hpc-user-only installer package
(User Space packages only)
mlnx-ofed-dpdk-user-only - MLNX_OFED dpdk-user-only installer package
(User Space packages only)
mlnx-ofed-all-exact - MLNX_OFED all installer package (with DKMS support)
(exact)
mlnx-ofed-all - MLNX_OFED all installer package (with DKMS support)
mlnx-ofed-vma-vpi-user-only - MLNX_OFED vma-vpi-user-only installer
package (User Space packages only)
```

mlnx-ofed-eth-only-user-only - MLNX\_OFED eth-only-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-vma-user-only - MLNX\_OFED vma-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-hpc - MLNX\_OFED hpc installer [package](#) (with DKMS support)  
 mlnx-ofed-bluefield-user-only - MLNX\_OFED bluefield-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-dpdk - MLNX\_OFED dpdk installer [package](#) (with DKMS support)  
 mlnx-ofed-vma-eth-user-only - MLNX\_OFED vma-eth-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-all-user-only - MLNX\_OFED all-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-vma-eth - MLNX\_OFED vma-eth installer [package](#) (with DKMS support)  
 mlnx-ofed-vma - MLNX\_OFED vma installer [package](#) (with DKMS support)  
 mlnx-ofed-dpdk-upstream-libs-user-only - MLNX\_OFED dpdk-upstream-libs-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-basic-user-only - MLNX\_OFED basic-user-only installer [package](#) (User Space packages only)  
 mlnx-ofed-basic-exact - MLNX\_OFED basic installer [package](#) (with DKMS support) (exact)  
 mlnx-ofed-basic - MLNX\_OFED basic installer [package](#) (with DKMS support)  
 mlnx-ofed-dpdk-upstream-libs - MLNX\_OFED dpdk-upstream-libs installer [package](#) (with DKMS support)

where:

mlnx-ofed-all	MLNX_OFED all installer package
mlnx-ofed-basic	MLNX_OFED basic installer package
mlnx-ofed-vma	MLNX_OFED vma installer package
mlnx-ofed-hpc	MLNX_OFED HPC installer package
mlnx-ofed-vma-eth	MLNX_OFED vma-eth installer package
mlnx-ofed-vma-vpi	MLNX_OFED vma-vpi installer package

knem-dkms	MLNX_OFED DKMS support for mlnx-ofed kernel modules
kernel-dkms	MLNX_OFED kernel-dkms installer package
kernel-only	MLNX_OFED kernel-only installer package
bluefield	MLNX_OFED bluefield installer package
mlnx-ofed-all-exact	MLNX_OFED mlnx-ofed-all-exact installer package
dpdk	MLNX_OFED dpdk installer package
mlnx-ofed-basic-exact	MLNX_OFED mlnx-ofed-basic-exact installer package
dpdk-upstream-libs	MLNX_OFED dpdk-upstream-libs installer package

2. Install the desired group.

```
apt-get install '<group name>'
```

**Example:**

```
apt-get install mlnx-ofed-all
```

**Note**

Installing MLNX\_OFED using the “apt-get” tool does not automatically update the firmware. To update the firmware to the version included in MLNX\_OFED package, run: # apt-get install mlnx-fw-updater

## Performance Tuning

Depending on the application of the user's system, it may be necessary to modify the default configuration of network adapters based on the ConnectX® adapters. In case that tuning is required, please refer to the [Performance Tuning Guide for NVIDIA Network Adapters](#).

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