



DOCA-Host Installation and Upgrade

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Storage Installation

The following options are available for installing or upgrading DOCA on host:

Method	Option Name	Description
Installation	DOCA local repo package	This option installs DOCA components
Upgrade	DOCA online repo	This option upgrades DOCA components using online repo from the Internet

Info

Find the relevant DOCA installation files for your host in the [NVIDIA DOCA Downloads](#) page.

Note

This page provides basic instructions for setting up DOCA on a standard system. For device-specific setups, refer to the respective device documentation, as additional steps may be required.

Uninstalling Software from Host

If an older DOCA (or MLNX_OFED) software version is installed on your host, make sure to uninstall it before proceeding with the installation of the new version:

Debian	<pre>\$ for f in \$(dpkg --get-architecture grep -E 'dca flexio dpa-gdbserver dpa-stats dpaeumgmt' awk '{print \$2}'); do echo \$f ; apt remove --purge \$f -y ; done \$ /usr/sbin/ofed_uninstall.sh --force</pre>
--------	--

	<code>\$ sudo apt-get autoremove</code>
RPM-based	<pre> host# for f in \$(rpm -qa grep -i doca) ; do yum -y remove \$f; done host# /usr/sbin/ofed_uninstall.sh --force host# yum autoremove host# yum makecache </pre>

Package and Kernel Module Signing

This section highlights the signing methods used to ensure the authenticity and integrity of the packages and kernel modules.

Package Signing

RPM packages are signed with a GPG key, enabling users to confirm that the packages come from a trusted NVIDIA source and have not been altered.

During installation, package managers automatically fetch and verify the signature while updating their metadata cache.

Info

For more details, see the section on "[Installing Software on Host](#)".

Kernel Module Signing

Kernel drivers are signed using NVIDIA's x.509 public key , allowing users to verify that the drivers originate from a trusted NVIDIA source and have not been tampered with.

To support loading DOCA-HOST drivers on a secure-boot-enabled OS, the NVIDIA x.509 public key should be added to the key database using the following steps:

1. Obtain NVIDIA's public x.509 key :

```
# wget http://www.mellanox.com/downloads/ofed/mlnx_signing_key_pub.der
```

Note

Builds for SLES15 SP4 and SP5 are signed with a newer signing key. The corresponding public key can be downloaded from [this link](#).

2. Import the public key to the MOK list using the `mokutil` utility:

```
# mokutil --import mlnx_signing_key_pub.der
```

Info

Users will be asked to enter and confirm a password for this MOK enrollment request.

3. Reboot the system.

Installing Software on Host

1. Install DOCA local repo package for host:

- For deb-based distributions:

-

1. Download the DOCA host repo from the [NVIDIA DOCA Downloads](#) page.

2. Unpack the deb repo:

```
host# dpkg -i <repo_file>
```

3. Run apt update:

```
host# apt-get update
```

4. If the kernel version on your host is not supported (not shown under section "[Supported Host OS per DOCA-Host Installation Profile](#)"), refer to section "[DOCA Extra Package and doca-kernel-support](#)".

5. Ensure that the kernel headers installed match the version of the currently running kernel.

Info

If the `build` directory exists in under `/lib/modules/$(uname -r)/build`, then the kernel headers are installed.

6. Install any of the profiles supported for your OS and architecture. Refer to "[Supported Host OS per DOCA-Host Installation Profile](#)" (e.g., `doca-all`) for more information.

```
host# apt install -y doca-all
```

7. Update the firmware:

```
host# apt install -y mlnx-fw-updater
```

- For rpm-based distributions:

1. Download the DOCA host repo from the [NVIDIA DOCA Downloads](#) page.

2. Unpack the rpm repo:

```
host# rpm -Uvh <repo_file>.rpm
```

3. For non-SLES systems, run:

```
host# yum makecache
```

4. For SLES systems, run the following to verify the package signing:

```
host# zypper --gpg-auto-import-keys refresh
```

Note

Continue the procedure using `zypper` instead of `yum`.

Info

If the kernel version on your host is not supported (not shown under section "[Supported Host OS per DOCA-Host Installation Profile](#)"), refer to section "[DOCA Extra Package and doca-kernel-support](#)".

5. Install any of the profiles supported for your OS and architecture (e.g., doca-all):

```
host# yum/zypper install -y doca-all
```

6. Update the firmware:

```
host# apt install -y mlnx-fw-updater
```

2. Load the drivers:

```
host# sudo /etc/init.d/openibd restart
```

3. Initialize MST:

```
host# sudo mst restart
```

DOCA Extra Package and doca-kernel-support

If the kernel version on your host is not supported (not shown under section "[Supported Host OS per DOCA-Host Installation Profile](#)"), users may opt to either:

- Switch to a compatible kernel; or
- Install `doca-extra` package and run `doca-kernel-support`

`doca-kernel-support` is a script intended to rebuild kernel modules included with DOCA-host for cases where they are not provided. It builds a single package (i.e., `rpm` or `deb`) that contains a repository of packages (i.e., `dnf` or `apt`).

DOCA-host provides binary builds of kernel modules for some specific kernels. This script rebuilds kernel modules included with DOCA-host for a custom kernel version and creates an RPM or DEB package that holds all of those rebuilt modules for easy install.

Note

`doca-kernel-support` does not support customized or unofficial kernels.

To run `doca-kernel-support`:

1. Run:

```
host# apt/yum install -y doca-extra
```

2. Execute the `doca-kernel-support` script which rebuilds and installs the DOCA-host kernel modules with the running kernel:

```
host# /opt/mellanox/doca/tools/doca-kernel-support
```

The output may end with `rpm` or `deb` with the following general format:

```
doca-kernel-support: Built single package: <doca-kernel-repo>
```

```
doca-kernel-support: Done
```

Output example:

```
doca-kernel-support: Built single package:  
/tmp/DOCA.EuUfkWfV7Z/doca-kernel-repo-2.9.0-  
1.kver.5.14.0.356.el9.x86_64.x86_64.rpm  
doca-kernel-support: Done
```

Note

`doca-kernel-support` does not support customized or unofficial kernels.

3. Install the generated meta-package on the desired DOCA profile:

Info

The examples provided install DOCA kernel repos (RPM/DEB) with `doca-ufed` profile, but other profiles may be installed if they are supported.

- For RPM-based distributions:

```
host# rpm -i <doca-kernel-repo>  
host# dnf makecache  
host# dnf install <doca-userspace-metapackage>
```

```
host# dnf install --disablerepo=doca doca-kernel-  
KERNEL_VERSION      # For all the meta-package, not just this  
single package
```

Example:

```
host# rpm -i /tmp/DOCA.EuUfkWfV7Z/doca-kernel-repo-2.9.0-  
1.kver.5.14.0.356.el9.x86_64.x86_64.rpm  
host# dnf makecache  
host# dnf install doca-ofed-userspace  
host# dnf install --disablerepo=doca doca-kernel-  
5.14.0.356.el9.x86_64.x86_64.noarch
```

- For DEB-based distributions:

```
host# dpkg -i <doca-kernel-repo>  
host# apt update  
host# apt install <doca-profile>
```

Example:

```
host# dpkg -i /tmp/DOCA.J8JYxEmffD/doca-kernel-repo-2.9.0-  
6.4.0.mlnx_2.9.0_amd64.deb  
host# apt update  
host# apt install doca-ofed
```

4. (Optional) Retrieve installed packages and their versions as part of DOCA Host installation:

```
host# /opt/mellanox/doca/tools/doca-info
```

Versions:

- DOCA Base MLNX_OFED_LINUX-24.07-0.5.5.0
- MFT 4.29.0-127

UEFI\ATF versions:

- mst_device: mt41692_pciconf0
 - UEFI Version: 4.7.0-42-g13081ae
 - ATF Version: 4.7.0-25-g5569834

Firmware (Current):

- BlueField-3 32.41.1000

DOCA:

- doca-all 2.8.0-0.0.4
- doca-apsh-config 2.8.0079-1
- doca-bench 2.8.0079-1

...

DOCA Dependencies:

...

- flexio 24.07.2300
- mlnx-dpdk 22.11.0-2407.0.10

OFED:

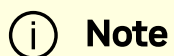
...

- rdma-core 2407mlnx52-1.2407055

...

- ucx 1.17.0-1.2407055

...



If BlueField has a BF-Bundle version older than 2.7.0 installed on it, the UEFI/ATF versions would appear as N/A. If your version is 2.7.0 or higher and still see N/A, then perform driver restart on the host:

```
/etc/init.d/openibd restart
```

Upgrading Software on Host

To update existing DOCA host packages, follow these steps:

1. Install the newer version of the DOCA host repository as detailed in section ["Installing Software on Host"](#).
2. Upgrade the DOCA packages:
 - To upgrade from DOCA version 2.5.x, all DOCA and OFED related packages should be removed . For detailed instructions on how to uninstall these packages, please refer to the uninstall section ["Uninstalling Software from Host"](#).
 - To upgrade from DOCA 2.6.0 and later, use the following command:

- For DEB-based distributions:

```
host# apt install doca-all
```

- For RPM-based distributions:

```
host# yum upgrade doca-all
```

- Before upgrading `mlnx-fw-updater`, make sure to restart MST first:

```
host# mst restart
```

Installation on Community Operating Systems

In the community model, there is shared responsibility between NVIDIA and customers choosing to use community OSs in their environment:

- NVIDIA owns basic validation for the OSs, so that customers know they can expect DOCA to work.
- Customers are responsible for building their own packages and binaries (based on source code and build instructions detailed below), and can also choose to deploy parts of DOCA instead of the whole package

Note

NVIDIA offers support to customers and partners with active Support contracts. However, in some cases, NVIDIA may require customers to collaborate with the open-source community to address issues determined to be caused by community changes that disrupt DOCA functionality.

To install `doca-host-community` on a host, follow these steps:

1. Install the `doca-host-community` repository that includes sources and tools to generate the DOCA community repo:
 - For RPM-based packages:

```
host# rpm -uvh doca-host-repo-community-  
{doca_version}.noarch.rpm
```

Example:

```
host# rpm -uvh doca-host-repo-community-2.9.0-0.2.9.24.10.0.5.2.0.noarch.rpm
```

- For DEB-based packages:

```
host# dpkg -i doca-host_{doca_version}-community_all.deb
```

Example:

```
host# dpkg -i doca-host_2.9.0-100000-24.10-community_all.deb
```

2. Run the build script to generate the `doca-host-community` repository:

```
host# /opt/mellanox/doca/tools/doca-community-build
```

The script output should include a line similar to the following:

- For RPM-based packages:

```
host# doca-community-build: Built single package:  
/tmp/DOCA.Lz1pntWcGM/doca-community-repo-24.10.0.5.2.0-1.kver.4.18.0.477.10.1.el8.8.x86_64.x86_64.rpm
```

- For DEB-based packages:

```
host# doca-community-build: Built single package:  
/tmp/DOCA.gcVyNokLfV/doca-community-repo-24.10-0.5.2.0-
```

```
6.8.0.31.generic_24.10.0.5.2.0_amd64.deb
```

Info

The binary created by the script can be copied to any similar machine with the same kernel. It contains all of the `doca-ofed` profile built packages, with extra meta-package that depends on those packages, installing the meta-package will install all of the built packages.

3. The resulting DOCA community repo should be ready for installation on this host or distributed to any other similar machine with the same distribution and kernel:

- For RPM-based (non-SLES) packages:

```
host# yum install /tmp/DOCA.m6rIcEJNK1/doca-community-  
repo-24.10.0.4.6.0-1.kver.5.14.0.427.13.1.el9.4.x86.64.x86_64.rpm  
host# yum makecache
```

- For SLES RPM-based packages:

```
host# zypper install /tmp/DOCA.m6rIcEJNK1/doca-  
community-repo-24.10.0.4.6.0-  
1.kver.5.14.0.427.13.1.el9.4.x86.64.x86_64.rpm  
host# zypper refresh
```

- For DEB-based packages:

```
host# apt install /tmp/DOCA.gcVyNokLfV/doca-community-  
repo-24.10-0.5.2.0-6.8.0.31.generic_24.10.0.5.2.0_amd64.deb
```

```
host# apt update
```

4. Install `doca-ofed-community` meta-package:

```
host# yum/apt install doca-ofed-community
```

Installing Proprietary Packages

The installation procedure does not install proprietary packages. Those packages are installed upon request.

List of close-source proprietary packages:

- Clusterkit
- DPCP
- hcoll
- sharp
- ibutils2
- opensm

Currently, the only way to install these packages is by using an already-built RPM or DEB file from a similar primary OS.

The following table maps community OSs which are most similar to primary OSs:

Community OS	Most Similar Primary OS
Alma 8.5	RHEL 8.5
Anolis OS 8.4	RHEL 8.5
CentOS Stream 8	RHEL 8
CentOS Stream 9	RHEL 9
EulerOS-V2.0.SP10	EulerOS-V2.0.SP11

Community OS	Most Similar Primary OS
Fedora 35	RHEL 8.5
OpenEuler-20.03.SP1	OpenEuler20 SP3
OpenSUSE 15.3	SLES15 SP3
Photon OS 3.0	RHEL 7.9
UOS-V20-1040d	Debian 10.8

Download and Install MFT and Firmware

- [Download MFT](#)
- [Download firmware](#)

Storage Installation

1. Before installation, search for the required package using your system's package manager:

```
# apt/zypper/dnf/yum search mlnx-nvme
# apt/zypper/dnf/yum search mlnx-nfsrdma
```

2. Once the correct package name is identified, install it using:

```
# apt/zypper/dnf/yum install <full-package-name>
```

Installation examples:

- For SLES:

```
# zypper search mlnx-nvme
```

```
# zypper install mlnx-nvme-kmp-default
```

- For Debian-based systems:

```
# apt search mlnx-nvme  
# apt search mlnx-nfsrdma  
# apt install mlnx-nvme-dkms  
# apt install mlnx-nfsrdma-dkms
```

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