



# **NVIDIA DOCA Installation Guide for Linux**

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[Installing Rivermax Driver](#)

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This guide details the necessary steps to set up NVIDIA DOCA in your Linux environment.

## Introduction

Installation of the NVIDIA® BlueField® DPU software requires following the following step-by-step [procedure](#).

## Supported Platforms

### Supported BlueField DPUs

The following NVIDIA® BlueField® DPUs are supported with DOCA:

NVIDIA SKU	Legacy OPN	PSID	Description
900-9D3B6-00CV-AA0	N/A	MT_0 0000 0088 4	BlueField-3 B3220 P-Series FHHL DPU; 200GbE (default mode) / NDR200 IB; Dual-port QSFP112; PCIe Gen5.0 x16 with x16 PCIe extension option; 16 Arm cores; 32GB on-board DDR; integrated BMC; Crypto Enabled
900-9D3B6-00SV-AA0	N/A	MT_0 0000 0096 5	BlueField-3 B3220 P-Series FHHL DPU; 200GbE (default mode) / NDR200 IB; Dual-port QSFP112; PCIe Gen5.0 x16 with x16 PCIe extension option; 16 Arm cores; 32GB on-board DDR; integrated BMC; Crypto Disabled
900-9D3B6-00CC-AA0	N/A	MT_0 0000 0102 4	BlueField-3 B3210 P-Series FHHL DPU; 100GbE (default mode) / HDR100 IB; Dual-port QSFP112; PCIe Gen5.0 x16 with x16 PCIe extension option; 16 Arm cores; 32GB on-board DDR; integrated BMC; Crypto Enabled
900-9D3B6-00SC-AA0	N/A	MT_0 0000 0102 5	BlueField-3 B3210 P-Series FHHL DPU; 100GbE (default mode) / HDR100 IB; Dual-port QSFP112; PCIe Gen5.0 x16 with x16 PCIe extension option; 16 Arm cores; 32GB on-board DDR; integrated BMC; Crypto Disabled
900-9D219-0086-ST1	MBF2 M516A - CECOT	MT_0 0000 0037 5	BlueField-2 E-Series DPU 100GbE Dual-Port QSFP56; PCIe Gen4 x16; Crypto and Secure Boot Enabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D219-0086-ST0	MBF2 M516A - EECOT	MT_0 0000 0037 6	BlueField-2 E-Series DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; PCIe Gen4 x16; Crypto and Secure Boot Enabled; 16GB on-board DDR; 1GbE OOB management; FHHL

NVIDIA SKU	Legacy OPN	PSID	Description
900-9D219-0056-ST1	MBF2 M516A - EENOT	MT_0 0000 0037 7	BlueField-2 E-Series DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; PCIe Gen4 x16; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D206-0053-SQ0	MBF2 H332A - AENOT	MT_0 0000 0053 9	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; PCIe Gen4 x8; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; HHHH
900-9D206-0063-ST2	MBF2 H332A - AEEOT	MT_0 0000 0054 0	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; PCIe Gen4 x8; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; HHHH
900-9D206-0083-ST3	MBF2 H332A - AECOT	MT_0 0000 0054 1	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; PCIe Gen4 x8; Crypto and Secure Boot Enabled; 16GB on-board DDR; 1GbE OOB management; HHHH
900-9D206-0083-ST1	MBF2 H322A - AECOT	MT_0 0000 0054 2	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; PCIe Gen4 x8; Crypto and Secure Boot Enabled; 8GB on-board DDR; 1GbE OOB management; HHHH
900-9D206-0063-ST1	MBF2 H322A - AEEOT	MT_0 0000 0054 3	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; PCIe Gen4 x8; Crypto Enabled; 8GB on-board DDR; 1GbE OOB management; HHHH
900-9D219-0066-ST0	MBF2 M516A -EEEOT	MT_0 0000 0055 9	BlueField-2 E-Series DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; PCIe Gen4 x16; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D219-0056-SN1	MBF2 M516A - CENOT	MT_0 0000 0056 0	BlueField-2 E-Series DPU 100GbE Dual-Port QSFP56; PCIe Gen4 x16; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D219-0066-ST2	MBF2 M516A - CEEOT	MT_0 0000 0056 1	BlueField-2 E-Series DPU 100GbE Dual-Port QSFP56; PCIe Gen4 x16; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; FHHL

NVIDIA SKU	Legacy OPN	PSID	Description
900-9D219-0006-ST0	MBF2 H516A - CEEOT	MT_0 0000 0070 2	BlueField-2 DPU 100GbE Dual-Port QSFP56; PCIe Gen4 x16; Crypto; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D219-0056-ST2	MBF2 H516A - CENOT	MT_0 0000 0070 3	BlueField-2 DPU 100GbE Dual-Port QSFP56; PCIe Gen4 x16; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D219-0066-ST3	MBF2 H516A -EEEOT	MT_0 0000 0070 4	BlueField-2 DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; PCIe Gen4 x16; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D219-0056-SQ0	MBF2 H516A - EENOT	MT_0 0000 0070 5	BlueField-2 DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; PCIe Gen4 x16; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D250-0038-ST1	MBF2 M345A - HESOT	MT_0 0000 0071 5	BlueField-2 E-Series DPU; 200GbE/HDR single-port QSFP56; PCIe Gen4 x16; Secure Boot Enabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; HHHL
900-9D250-0048-ST1	MBF2 M345A - HECOT	MT_0 0000 0071 6	BlueField-2 E-Series DPU; 200GbE/HDR single-port QSFP56; PCIe Gen4 x16; Secure Boot Enabled; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; HHHL
900-9D218-0073-ST1	MBF2 H512C - AESOT	MT_0 0000 0072 3	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; integrated BMC; PCIe Gen4 x8; Secure Boot Enabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D218-0083-ST2	MBF2 H512C - AECOT	MT_0 0000 0072 4	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; integrated BMC; PCIe Gen4 x8; Secure Boot Enabled; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; FHHL
900-9D208-0086-ST4	MBF2 M516C - EECOT	MT_0 0000 0072 8	BlueField-2 E-Series DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; Tall Bracket; FHHL

NVIDIA SKU	Legacy OPN	PSID	Description
900-9D208-0086-SQ0	MBF2 H516C - CECOT	MT_0 0000 0072 9	BlueField-2 P-Series DPU 100GbE Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; Tall Bracket; FHHL
900-9D208-0076-ST5	MBF2 M516C - CESOT	MT_0 0000 0073 1	BlueField-2 E-Series DPU 100GbE Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; Tall Bracket; FHHL
900-9D208-0076-ST6	MBF2 M516C -EESOT	MT_0 0000 0073 2	BlueField-2 E-Series DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; Tall Bracket; FHHL
900-9D208-0086-ST3	MBF2 M516C - CECOT	MT_0 0000 0073 3	BlueField-2 E-Series DPU 100GbE Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Enabled; 16GB on-board DDR; 1GbE OOB management; Tall Bracket; FHHL
900-9D208-0076-ST2	MBF2 H516C -EESOT	MT_0 0000 0073 7	BlueField-2 P-Series DPU 100GbE/EDR/HDR100 VPI Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; Tall Bracket; FHHL
900-9D208-0076-ST1	MBF2 H516C - CESOT	MT_0 0000 0073 8	BlueField-2 P-Series DPU 100GbE Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management; Tall Bracket; FHHL
900-9D218-0083-ST4	MBF2 H532C - AECOT	MT_0 0000 0076 5	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; integrated BMC; PCIe Gen4 x8; Secure Boot Enabled; Crypto Enabled; 32GB on-board DDR; 1GbE OOB management; FHHL
900-9D218-0073-ST0	MBF2 H532C - AESOT	MT_0 0000 0076 6	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; integrated BMC; PCIe Gen4 x8; Secure Boot Enabled; Crypto Disabled; 32GB on-board DDR; 1GbE OOB management; FHHL
900-9D208-0076-ST3	MBF2 H536C - CESOT	MT_0 0000 0076 7	BlueField-2 P-Series DPU 100GbE Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Disabled; 32GB on-board DDR; 1GbE OOB management; FHHL

NVIDIA SKU	Legacy OPN	PSID	Description
900-9D208-0086-ST2	MBF2 H536C - CECOT	MT_0 0000 0076 8	BlueField-2 P-Series DPU 100GbE Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled; Crypto Enabled; 32GB on-board DDR; 1GbE OOB management; FHHL
900-9D218-0073-ST4	MBF2 H512C - AEUOT	MT_0 0000 0097 2	BlueField-2 P-Series DPU 25GbE Dual-Port SFP56; integrated BMC; PCIe Gen4 x8; Secure Boot Enabled with UEFI disabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management
900-9D208-0076-STA	MBF2 H516C - CEUOT	MT_0 0000 0097 3	BlueField-2 P-Series DPU 100GbE Dual-Port QSFP56; integrated BMC; PCIe Gen4 x16; Secure Boot Enabled with UEFI disabled; Crypto Disabled; 16GB on-board DDR; 1GbE OOB management
900-9D208-0076-STB	MBF2 H536C - CEUOT	MT_0 0000 0100 8	BlueField-2 P-Series DPU 100GbE Dual-Port QSFP56, integrated BMC, PCIe Gen4 x16, Secure Boot Enabled with UEFI Disabled, Crypto Disabled, 32GB on-board DDR, 1GbE OOB management, Tall Bracket, FHHL
P1004/699210040230	N/A	NVDO 0000 0001 5	BlueField-2 A30X, P1004 SKU 205, Generic, GA100, 24GB HBM2e, PCIe passive Dual Slot 230W GEN4, DPU Crypto ON W/ Bkt, 1 Dongle, Black, HF, VCPD
P4028/699140280000	N/A	NVDO 0000 0002 0	ZAM / NAS

## Supported ConnectX NICs

The following NVIDIA® ConnectX® NICs are supported with DOCA on the host:

- [ConnectX-7 devices](#)
- [ConnectX-6 Dx devices](#)
- [ConnectX-6 Lx devices](#)
- [ConnectX-6 devices](#)



## Hardware Prerequisites

This quick start guide assumes that an NVIDIA® BlueField® DPU has been installed in a server according to the instructions detailed in your [DPU's hardware user guide](#).

## DOCA Packages

Device	Component	Version	Description
Host	DOCA SDK	2.5.1	Software development kit package for developing host software
	DOCA Runtime	2.5.1	Runtime libraries required to run DOCA-based software applications on host
	DOCA Tools	2.5.1	Tools for developers and administrators on host
	DOCA Extra	2.5.1	Contains helper scripts (doca-info, doca-kernel-support)
	DOCA OFED	2.5.1	Software stack which operates across all NVIDIA network adapter solutions
	Arm emulated (QEMU) development container	4.5.1	Linux-based BlueField Arm emulated container for developers
Target BlueField DPU (Arm)	BlueField BSP	4.5.1	BlueField image and firmware
	DOCA SDK	2.5.1	Software development kit packages for developing Arm software
	DOCA Runtime	2.5.1	Runtime libraries required to run DOCA-based software applications on Arm
	DOCA Tools	2.5.1	Tools for developers and administrators for Arm target

# Supported Operating System Distributions

The default operating system of the BlueField DPU (Arm) is Ubuntu 22.04.

The supported operating systems on the host machine are the following:

## Note

Only the following generic kernel versions are supported for DOCA local repo package for host installation.

DOCA for Host	Kernel	Arch	doca-all	doca-cx	doca- ofed
CTYunOS3 23.01	5.10	x86	✓	✓	✓
RHEL/CentOS 7.6	3.10	x86	✓	✓	✓
	4.14	aarch64	✓	✓	✓
RHEL/CentOS 8.2	4.18	x86	✓	✓	✓
RHEL / Rocky Linux 8.6	4.18	x86	✓	✓	✓
Ubuntu 18.04	4.15	x86	✓	✓	✓
Ubuntu 20.04	5.4	x86	✓	✓	✓
Ubuntu 22.04	5.15	X86	✓	✓	✓
	5.15	aarch64	✓	✓	✓
Debian 10.8	4.19	x86	✓	✓	✓
Debian 10.13	5.10.135 / 5.4.210	x86	✓	✓	✓
Allinux 3.2	5.10	X86	✓	✓	✓
Oracle Linux 8.7	5.10	x86	✓	✓	✓
RHEL/Rocky Linux 9.1	5.14.0-162.19.1.el9	x86	✓	✓	✓
Debian10.9	4.19.0-16	x86			✓

<b>DOCA for Host</b>	<b>Kernel</b>	<b>Arch</b>	<b>doca- all</b>	<b>doca- cx</b>	<b>doca- ofed</b>
BCLinux 21.10 SP2	4.19.90	x86/aarch64			✓
Kylin 10 SP2	4.19.90	x86/aarch64			✓
openEuler 20.03 SP3	4.19.90	x86/aarch64			✓
openEuler 22.03	5.10.0	x86/aarch64			✓
UOS 20 1040d	4.19.0	x86/aarch64			✓
RHEL/CentOS 7.7	3.10.0-1062.el7	x86			✓
RHEL/CentOS 7.8	3.10.0-1127.el7	x86			✓
RHEL/CentOS 7.9	3.10.0-1160.el7	x86			✓
RHEL/CentOS 8.1	4.18.0-147.el8	x86/aarch64			✓
RHEL/CentOS 8.3	4.18.0-240.el8	x86/aarch64			✓
RHEL/CentOS 8.4	4.18.0-305.el8	x86/aarch64			✓
RHEL/CentOS 8.5	4.18.0-305.el8	x86/aarch64			✓
RHEL/CentOS 8.8	4.18.0-477.10.1.el8_8	x86/aarch64			✓
RHEL/CentOS 8.9	4.18.0-513.5.1.el8_9	x86/aarch64			✓
RHEL/CentOS 9.0	5.14.0-70.46.1.el9_0	x86/aarch64			✓
RHEL/CentOS 9.2	5.14.0-284.11.1.el9_2	x86/aarch64			✓
RHEL/CentOS 9.3	5.14.0-362.8.1.el9_3	x86			✓
sles12sp4		x86 / aarch64			✓
sles12sp5		x86 / aarch64			✓
sles15sp2		x86 / aarch64			✓
sles15sp3		x86 / aarch64			✓
sles15sp4		x86 / aarch64			✓

DOCA for Host	Kernel	Arch	doca-all	doca-cx	doca- ofed
sles15sp5		x86 / aarch64			✓

## BlueField DPU Image Installation

This guide provides the minimal instructions for setting up DOCA on a standard system.

### Installation Files

Device	Component	OS	Arch	Link
Host	<p>These files contain the following components suitable for their respective OS version.</p> <ul style="list-style-type: none"> <li>DOCA SDK v2.5.2</li> <li>DOCA Runtime v2.5.2</li> <li>DOCA Tools v2.5.2</li> <li>DOCA Extra v2.5.2</li> <li>DOCA OFED v2.5.2</li> </ul>	Alinux 3.2	x86	<a href="#">doca-host-repo-alinux32-2.5.2-0.0.6.2.5.2003.1.al8.23.10.3.2.2.0.x86_64.rpm</a>
		BCLinux 21.10 SP2	aarch64	<a href="#">doca-host-repo-bclinux2110sp2-2.5.2-0.0.6.23.10.3.2.2.0.oe1.bclinux.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-bclinux2110sp2-2.5.2-0.0.6.23.10.3.2.2.0.oe1.bclinux.x86_64.rpm</a>
		CTyunOS 2.0	aarch64	<a href="#">doca-host-repo-ctyunos20-2.5.2-0.0.6.23.10.3.2.2.0.ctl2.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-ctyunos20-2.5.2-0.0.6.23.10.3.2.2.0.ctl2.x86_64.rpm</a>
		CTyunOS 23.01	aarch64	<a href="#">doca-host-repo-ctyunos2301-2.5.2-0.0.6.23.10.3.2.2.0.ctl3.aarch64.rpm</a>

Device	Component	OS	Arch	Link
			x86	<a href="#">doca-host-repo-ctyunos2301-2.5.2-0.0.6.2.5.2003.1.ctl3.23.10.3.2.2.0.x86_64.rpm</a>
		Debian 10.13	x86	<a href="#">doca-host-repo-debian1013_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_amd64.deb</a>
		Debian 10.8	x86	<a href="#">doca-host-repo-debian108_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_amd64.deb</a>
		Debian 10.9	x86	<a href="#">doca-host-repo-debian109_2.5.2-0.0.6.23.10.3.2.2.0_amd64.deb</a>
		Debian 12.5	arm64	<a href="#">doca-host-repo-debian125_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_arm64.deb</a>
			x86	<a href="#">doca-host-repo-debian125_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_amd64.deb</a>
		Kylin 1.0	arm64	<a href="#">doca-host-repo-kylin10sp2-2.5.2-0.0.6.23.10.3.2.2.0.ky10.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-kylin10sp2-2.5.2-0.0.6.23.10.3.2.2.0.ky10.x86_64.rpm</a>
		Oracle Linux 7.9	x86	<a href="#">doca-host-repo-ol79-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		Oracle Linux	x86	<a href="#">doca-host-repo-ol84-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.r</a>

Device	Component	OS	Arch	Link
		8.4		<a href="#">pm</a>
		Oracle Linux 8.6	x86	<a href="#">doca-host-repo-ol86-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		Oracle Linux 8.7	x86	<a href="#">doca-host-repo-ol87-2.5.2-0.0.6.25.2003.1.el8.23.10.3.2.2.0.x86_64.rpm</a>
		Oracle Linux 9.0	x86	<a href="#">doca-host-repo-ol90-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		openEuler 20.03 SP3	aarch64	<a href="#">doca-host-repo-openeuler2003sp3-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-openeuler2003sp3-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		openEuler 22.03	aarch64	<a href="#">doca-host-repo-openeuler2203-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-openeuler2203-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 7.2	x86	<a href="#">doca-host-repo-rhel72-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 7.4	x86	<a href="#">doca-host-repo-rhel74-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>

Device	Component	OS	Arch	Link
		RHEL/CentOS 7.6	aarch64	<a href="#">doca-host-repo-rhel76-2.5.2-0.0.6.2.5.2003.1.el7a.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="#">doca-host-repo-rhel76-2.5.2-0.0.6.2.5.2003.1.el7.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 7.7	x86_64	<a href="#">doca-host-repo-rhel77-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 7.8	x86_64	<a href="#">doca-host-repo-rhel78-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 7.9	x86_64	<a href="#">doca-host-repo-rhel79-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 8.0	x86_64	<a href="#">doca-host-repo-rhel80-2.5.2-0.0.6.2.5.2003.1.el8.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 8.1	aarch64	<a href="#">doca-host-repo-rhel81-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="#">doca-host-repo-rhel81-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 8.2	x86_64	<a href="#">doca-host-repo-rhel82-2.5.2-0.0.6.2.5.2003.1.el8.23.10.3.2.2.0.x86_64.rpm</a>

Device	Component	OS	Arch	Link
		RHEL/CentOS 8.3	aarch64	<a href="#">doca-host-repo-rhel83-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="#">doca-host-repo-rhel83-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 8.4	aarch64	<a href="#">doca-host-repo-rhel84-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="#">doca-host-repo-rhel84-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/CentOS 8.5	aarch64	<a href="#">doca-host-repo-rhel85-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="#">doca-host-repo-rhel85-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 8.6	aarch64	<a href="#">doca-host-repo-rhel86-2.5.2-0.0.6.2.5.2003.1.el8.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="#">doca-host-repo-rhel86-2.5.2-0.0.6.2.5.2003.1.el8.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 8.8	aarch64	<a href="#">doca-host-repo-rhel88-2.5.2-0.0.6.2.5.2003.1.el8.23.10.3.2.2.0.aarch64.rpm</a>



Device	Component	OS	Arch	Link
			x86	<a href="#">doca-host-repo-rhel88-2.5.2-0.0.6.2.5.2003.1.el8.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 8.9	aarch64	<a href="#">doca-host-repo-rhel89-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-rhel89-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 8.10	aarch64	<a href="#">doca-host-repo-rhel810-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-rhel810-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 9.0	aarch64	<a href="#">doca-host-repo-rhel90-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-rhel90-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 9.1	aarch64	<a href="#">doca-host-repo-rhel91-2.5.2-0.0.6.2.5.2003.1.el9.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-rhel91-2.5.2-0.0.6.2.5.2003.1.el9.23.10.3.2.2.0.x86_64.rpm</a>

Device	Component	OS	Arch	Link
		RHEL/Rocky 9.2	aarch64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-rhel92-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm">doca-host-repo-rhel92-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-rhel92-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm">doca-host-repo-rhel92-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 9.3	aarch64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-rhel93-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm">doca-host-repo-rhel93-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-rhel93-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm">doca-host-repo-rhel93-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		RHEL/Rocky 9.4	aarch64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-rhel94-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm">doca-host-repo-rhel94-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-rhel94-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm">doca-host-repo-rhel94-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		SLES 12 SP4	aarch64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-sles12sp4-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm">doca-host-repo-sles12sp4-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86_64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-sles12sp4-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm">doca-host-repo-sles12sp4-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		SLES 12 SP5	aarch64	<a href="https://www.redhat.com/en/resources/download/doca-host-repo-sles12sp5-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm">doca-host-repo-sles12sp5-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>

Device	Component	OS	Arch	Link
			x86	<a href="#">doca-host-repo-sles12sp5-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		SLES 15 SP2	aarch64	<a href="#">doca-host-repo-sles15sp2-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-sles15sp2-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		SLES 15 SP3	aarch64	<a href="#">doca-host-repo-sles15sp3-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-sles15sp3-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		SLES 15 SP4	aarch64	<a href="#">doca-host-repo-sles15sp4-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-sles15sp4-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		SLES 15 SP5	aarch64	<a href="#">doca-host-repo-sles15sp5-2.5.2-0.0.6.23.10.3.2.2.0.aarch64.rpm</a>
			x86	<a href="#">doca-host-repo-sles15sp5-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>

Device	Component	OS	Arch	Link
		SLES 15 SP6	x86	<a href="#">doca-host-repo-sles15sp6-2.5.2-0.0.6.23.10.3.2.2.0.x86_64.rpm</a>
		Ubuntu 18.04	x86	<a href="#">doca-host-repo-ubuntu1804_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_amd64.deb</a>
		Ubuntu 20.04	x86	<a href="#">doca-host-repo-ubuntu2004_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_amd64.deb</a>
		Ubuntu 22.04	arm64	<a href="#">doca-host-repo-ubuntu2204_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_arm64.deb</a>
			x86	<a href="#">doca-host-repo-ubuntu2204_2.5.2-0.0.6.2.5.2003.1.23.10.3.2.2.0_amd64.deb</a>
		UOS 201040d	arm64	<a href="#">doca-host-repo-uos201040_2.5.2-0.0.6.23.10.3.2.2.0_arm64.deb</a>
			x86	<a href="#">doca-host-repo-uos201040_2.5.2-0.0.6.23.10.3.2.2.0_amd64.deb</a>
		Target BlueField DPU (Arm)	BlueField Software v 4.5.2	Ubuntu 22.04
DOCA SDK v2.5.2	Ubuntu 22.04		arm64	<a href="#">doca-dpu-repo-ubuntu2204-local_2.5.2003-1.23.10.3.2.2.bf.4.5.2.13183_arm64.deb</a>
DOCA Runtime v2.5.2				
DOCA Tools v2.5.2				

# Uninstalling Software from Host

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

<b>Ubuntu/Debian</b>	<pre>\$ for f in \$( dpkg --list   grep doca   awk '{print \$2}' ); do echo \$f ; apt remove --purge \$f -y ; done \$ ofed_uninstall.sh --force \$ sudo apt-get autoremove</pre>
<b>CentOS/RHEL/Rocky</b>	<pre>host# for f in \$(rpm -qa   grep -i doca ) ; do yum -y remove \$f; done host# ofed_uninstall.sh --force host# yum autoremove host# yum makecache</pre>

Then perform the following steps:

1. Download NVIDIA's RPM-GPG-KEY-Mellanox-SHA256 key:

```
# wget http://www.mellanox.com/downloads/ofed/RPM-GPG-KEY-
Mellanox-SHA256
--2018-01-25 13:52:30--
http://www.mellanox.com/downloads/ofed/RPM-GPG-KEY-Mellanox-
SHA256
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-SHA256?
```

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

2018-01-25 13:52:30 (247 MB/s) - ?RPM-GPG-KEY-Mellanox-
SHA256? saved [1354/1354]
```

2. Install the key:

```
# sudo rpm --import RPM-GPG-KEY-Mellanox-SHA256
warning: rpmts_HdrFromFdno: Header V3 DSA/SHA1 Signature, key
ID 6224c050: NOKEY
Retrieving key from file:///repos/MLNX_OFED//RPM-GPG-KEY-
Mellanox
Importing GPG key 0x6224C050:
  Userid: "Mellanox Technologies (Mellanox Technologies -
  Signing Key v2) "
  From   : /repos/MLNX_OFED//RPM-GPG-KEY-Mellanox-SHA256
Is this ok [y/N]:
```

3. Verify 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 )
```

## Installing Prerequisites on Host for Target DPU

Install `doca-tools` to manage and flash the BlueField DPU.

OS	Procedure
Ubuntu/Debian	<ol style="list-style-type: none"> <li>1. Download the DOCA host repo package from the "<a href="#">Installation Files</a>" section.</li> <li>2. Unpack the deb repo. Run: <pre data-bbox="581 342 1463 548">host# sudo dpkg -i doca-host-repo-ubuntu&lt;version&gt;_amd64.deb</pre> </li> <li>3. Perform apt update. Run: <pre data-bbox="581 590 1463 743">host# sudo apt-get update</pre> </li> <li>4. Run <code>apt install</code> for DOCA Tools: <pre data-bbox="581 793 1463 947">host# sudo apt install doca-tools</pre> </li> </ol>
CentOS/RHEL 7.x	<ol style="list-style-type: none"> <li>1. Download the DOCA host repo package from the "<a href="#">Installation Files</a>" section.</li> <li>2. Unpack the RPM repo. Run: <pre data-bbox="581 1125 1463 1331">host# sudo rpm -Uvh doca-host-repo-rhel&lt;version&gt;.x86_64.rpm</pre> </li> <li>3. Enable new yum repos. Run: <pre data-bbox="581 1373 1463 1526">host# sudo yum makecache</pre> </li> <li>4. Run <code>yum install</code> to install DOCA Tools: <pre data-bbox="581 1577 1463 1730">host# sudo yum install doca-tools</pre> </li> </ol>
CentOS/RHEL 8.x or Rocky 8.6	<ol style="list-style-type: none"> <li>1. Download the DOCA host repo package from the "<a href="#">Installation Files</a>" section.</li> <li>2. Unpack the RPM repo. Run:</li> </ol>

OS	Procedure
	<pre data-bbox="581 212 1463 422">host# sudo rpm -Uvh doca-host-repo- rhel&lt;version&gt;.x86_64.rpm</pre> <p data-bbox="548 422 976 457">3. Enable new dnf repos. Run:</p> <pre data-bbox="581 457 1463 611">host# sudo dnf makecache</pre> <p data-bbox="548 611 1203 667">4. Run <code>dnf install</code> to install DOCA Tools:</p> <pre data-bbox="581 667 1463 821">host# sudo dnf install doca-tools</pre>

**Note**

Skip section "[Installing Software on Host](#)" to proceed without the DOCA local repo package for host.

## Determining DPU Device ID

It is important to learn your DPU's `device-id` for performing some of the software installations or upgrades in this guide.

To determine the device ID of the DPUs on your setup, run:

```
host# mst start  
host# mst status -v
```



Example output:

```
MST modules:
-----
    MST PCI module is not loaded
    MST PCI configuration module loaded
PCI devices:
-----
DEVICE_TYPE          MST                                PCI
RDMA                 NET                                NUMA
BlueField2(rev:1)    /dev/mst/mt41686_pciconf0.1      3b:00.1
mlx5_1               net-ens1f1                        0
BlueField2(rev:1)    /dev/mst/mt41686_pciconf0        3b:00.0
mlx5_0               net-ens1f0                        0
BlueField3(rev:1)    /dev/mst/mt41692_pciconf0.1      e2:00.1
mlx5_1               net-ens7f1np1                    4
BlueField3(rev:1)    /dev/mst/mt41692_pciconf0        e2:00.0
mlx5_0               net-ens7f0np0                    4
```

The device IDs for the BlueField-2 and BlueField-3 DPUs in this example are `/dev/mst/mt41686_pciconf0` and `/dev/mst/mt41692_pciconf0` respectively.

## Installing Software on Host

### Note

Skip this section if you intend to update only the BlueField software (`*.bfb`).

1. Follow the instructions under "[Installing Prerequisites on Host for Target DPU](#)".
2. Install DOCA local repo package for host:

### Info

The following table provides instructions for installing the DOCA host repo on your device depending on your OS and desired profile.

OS	Profile	Device	Instructions
<b>Ubuntu/Debian</b>	<b>doca-all</b>	<b>BlueField</b>	<ol style="list-style-type: none"><li>1. Download the DOCA SDK and DOCA Runtime packages from section "<a href="#">Installation Files</a>" for the host.</li><li>2. Unpack the deb repo. Run:<pre>host# dpkg -i &lt;repo_file&gt;</pre></li><li>3. Perform apt update. Run:<pre>host# apt-get update</pre></li><li>4. If the kernel version on your host is not supported (not shown under "<a href="#">Supported Operating System Distributions</a>"), refer to section "<a href="#">DOCA Extra Package</a>".</li><li>5. Run apt install for DOCA SDK, DOCA runtime, DOCA tools:<pre>host# sudo apt install -y doca-runtime doca-sdk doca-tools</pre></li></ol>

OS	Profile	Device	Instructions
	<b>doca-cx</b>	<b>ConnectX</b>	<ol style="list-style-type: none"> <li>1. Download the DOCA SDK and DOCA Runtime packages from section "<a href="#">Installation Files</a>" for the host.</li> <li>2. Unpack the deb repo. Run: <pre data-bbox="597 380 1463 537">host# dpkg -i &lt;repo_file&gt;</pre> </li> <li>3. Perform apt update. Run: <pre data-bbox="597 579 1463 737">host# apt-get update</pre> </li> <li>4. If the kernel version on your host is not supported (not shown under "<a href="#">Supported Operating System Distributions</a>"), refer to section "<a href="#">DOCA Extra Package</a>".</li> <li>5. Run apt install for DOCA SDK, DOCA runtime, DOCA tools: <pre data-bbox="597 894 1463 1100">host# sudo apt install -y doca-cx-runtime doca-cx-sdk doca-cx-tools</pre> </li> </ol>
	<b>doca-ofd</b>	<b>All</b>	<ol style="list-style-type: none"> <li>1. Download the DOCA SDK and DOCA Runtime packages from section "<a href="#">Installation Files</a>" for the host.</li> <li>2. Unpack the deb repo. Run: <pre data-bbox="597 1241 1463 1446">host# sudo dpkg -i doca-host-repo-ubuntu&lt;version&gt;_amd64.deb</pre> </li> <li>3. Perform apt update. Run: <pre data-bbox="597 1488 1463 1646">host# sudo apt-get update</pre> </li> <li>4. If the kernel version on your host is not supported (not shown under "<a href="#">Supported Operating System Distributions</a>"), refer to section "<a href="#">DOCA Extra Package</a>".</li> <li>5. Install <code>doca-ofd</code>. Run:</li> </ol>

OS	Profile	Device	Instructions
			<pre>host# sudo apt install -y doca-ofed</pre>
<b>Cent OS/RHEL/Alinux/Rocky/Oracl e Linux</b>	<b>doc a-all</b>	<b>Blu eFile Id</b>	<div data-bbox="516 489 1463 751" style="background-color: #ffffcc; padding: 10px;"> <p><b>Note</b> RHEL users need a valid subscription to install packages. See "<a href="#">HowTo Open RedHat Account</a>".</p> </div> <p>1. Install the following software dependencies. Run:</p> <ul style="list-style-type: none"> <li>▪ For RH 8.x, run: <div data-bbox="678 890 1463 1136" style="background-color: #f0f0f0; padding: 10px; margin: 5px 0;"> <pre>host# yum -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm</pre> </div> </li> <li>▪ For Alinux 3.x (Alibaba Cloud Linux), run: <div data-bbox="678 1178 1463 1423" style="background-color: #f0f0f0; padding: 10px; margin: 5px 0;"> <pre>host# yum -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm</pre> </div> </li> <li>▪ For Rocky 8.x, run: <div data-bbox="678 1465 1463 1871" style="background-color: #f0f0f0; padding: 10px; margin: 5px 0;"> <pre>host# sudo dnf makecache host# sudo dnf install epel-release host# sudo dnf install -y yum-utils host# sudo dnf config-manager --enable PowerTools host# sudo dnf clean dbcache</pre> </div> </li> <li>▪ For CentOS 8.x, run:</li> </ul>

OS	Profile	Device	Instructions
			<pre data-bbox="678 254 1463 506"> host# sudo dnf install epel-release host# sudo dnf config-manager --set-enabled PowerTools </pre> <ul style="list-style-type: none"> <li data-bbox="639 512 971 548">■ For CentOS 7.x, run: <pre data-bbox="678 554 1463 1381"> host# sudo yum install -y https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm host# sudo yum-config-manager --add-repo http://mirror.centos.org/centos/7/os/x86_64 host# sudo rpm --import http://mirror.centos.org/centos/7/os/x86_64/RPM-GPG-KEY-CentOS-7 host# sudo yum-config-manager --add-repo http://mirror.centos.org/centos/7/extras/x86_64 host# sudo yum-config-manager --save -- setopt=mirror.centos.org_centos_7_os_x86_64.exclude='pciutils* libnl3*' host# yum makecache </pre> </li> </ul> <p data-bbox="561 1388 1409 1461">2. Download the DOCA SDK and DOCA Runtime packages from section "<a href="#">Installation Files</a>" for the host .</p> <p data-bbox="561 1467 987 1503">3. Unpack the rpm repo. Run:</p> <pre data-bbox="597 1509 1463 1661"> host# rpm -Uvh &lt;repo_file&gt;.rpm </pre> <p data-bbox="561 1667 980 1703">4. Perform yum update. Run:</p> <pre data-bbox="597 1709 1463 1860"> host# sudo yum makecache </pre> <p data-bbox="561 1866 1463 1940">5. If the kernel version on your host is not supported (not shown under "<a href="#">Supported Operating System Distributions</a>"),</p>

OS	Profile	Device	Instructions
			<p>refer to section "<a href="#">DOCA Extra Package</a>".</p> <p>6. Run yum install for DOCA SDK, DOCA runtime, DOCA tools:</p> <pre>host# sudo yum install -y doca-runtime doca-sdk doca-tools</pre>
	<b>doca-cx</b>	<b>ConnextX</b>	<p>1. Install the following software dependencies. Run:</p> <ul style="list-style-type: none"> <li>▪ For RH 8.x, run: <pre>host# yum -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm</pre> </li> <li>▪ For Alinux 3.x (Alibaba Cloud Linux), run: <pre>host# yum -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm</pre> </li> <li>▪ For Rocky 8.x, run: <pre>host# sudo dnf makecache host# sudo dnf install epel-release host# sudo dnf install -y yum-utils host# sudo dnf config-manager --enable PowerTools host# sudo dnf clean dbcache</pre> </li> <li>▪ For CentOS 8.x, run: <pre>host# sudo dnf install epel-release host# sudo dnf config-manager --set-enabled PowerTools</pre> </li> </ul>

OS	Profile	Device	Instructions
			<ul style="list-style-type: none"> <li> <span data-bbox="639 260 971 289">■ For CentOS 7.x, run:</span> <pre data-bbox="678 296 1463 1125" style="background-color: #f0f0f0; padding: 10px;"> host# sudo yum install -y https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm host# sudo yum-config-manager --add-repo http://mirror.centos.org/centos/7/os/x86_64 host# sudo rpm --import http://mirror.centos.org/centos/7/os/x86_64/RPM-GPG-KEY-CentOS-7 host# sudo yum-config-manager --add-repo http://mirror.centos.org/centos/7/extras/x86_64 host# sudo yum-config-manager --save -- setopt=mirror.centos.org_centos_7_os_x86_64.exclude='pciutils* libnl3*' host# yum makecache </pre> </li> <li> <span data-bbox="639 1136 1040 1165">■ For Oracle Linux 8.7, run:</span> <pre data-bbox="678 1171 1463 1371" style="background-color: #f0f0f0; padding: 10px;"> host# yum config-manager --set-enabled ol8_codeready_builder </pre> </li> </ul> <ol style="list-style-type: none"> <li data-bbox="561 1381 1409 1453">2. Download the DOCA SDK and DOCA Runtime packages from section "<a href="#">Installation Files</a>" for the host .</li> <li data-bbox="561 1463 987 1493">3. Unpack the rpm repo. Run: <pre data-bbox="597 1499 1463 1650" style="background-color: #f0f0f0; padding: 10px;"> host# rpm -Uvh &lt;repo_file&gt;.rpm </pre> </li> <li data-bbox="561 1661 980 1690">4. Perform yum update. Run: <pre data-bbox="597 1696 1463 1848" style="background-color: #f0f0f0; padding: 10px;"> host# sudo yum makecache </pre> </li> <li data-bbox="561 1858 1463 1929">5. If the kernel version on your host is not supported (not shown under "<a href="#">Supported Operating System Distributions</a>"),</li> </ol>

OS	Profile	Device	Instructions
			<p>refer to section "<a href="#">DOCA Extra Package</a>".</p> <p>6. Run yum install for DOCA SDK, DOCA runtime, DOCA tools:</p> <pre>host# sudo yum install -y doca-cx-runtime doca-cx-sdk doca-cx-tools</pre>
	<b>doca- ofed</b>	<b>All</b>	<p>1. Download the DOCA SDK and DOCA Runtime packages from section "<a href="#">Installation Files</a>" for the host.</p> <p>2. Unpack the RPM repo. Run:</p> <pre>host# sudo rpm -Uvh doca-host-repo- rhel&lt;version&gt;.x86_64.rpm</pre> <p>3. Install <a href="#">doca-extra</a>. Run:</p> <pre>host# sudo yum/dnf install -y doca-extra</pre> <p>4. If the kernel version on your host is not supported (not shown under "<a href="#">Supported Operating System Distributions</a>"), refer to section "<a href="#">DOCA Extra Package</a>".</p> <p>5. Install <code>doca-ofed</code>. Run:</p> <pre>host# sudo yum install -y doca-ofed</pre>

3. Initialize MST. Run:

```
host# sudo mst start
```

4. Reset the `nvconfig` parameters to their default values:

```
host# sudo mlxconfig -d <device-id> -y reset
```



```
Reset configuration for device <device-id>? (y/n) [n] : y
Applying... Done!
-I- Please reboot machine to load new configurations.
```

**Note**

To learn the DPU's device ID, refer to section "[Determining DPU Device ID](#)".

5. Skip this step if your BlueField DPU is Ethernet only. Please refer to [Supported Platforms](#) to learn your DPU type.

If you have a VPI DPU, the default link type of the ports will be configured to IB. To verify your link type, run:

```
host# sudo mst start
host# sudo mlxconfig -d <device-id> -e q | grep -i link_type
Configurations:                                     Default
Current      Next Boot
*            LINK_TYPE_P1                          IB(1)
ETH(2)       IB(1)
*            LINK_TYPE_P2                          IB(1)
ETH(2)       IB(1)
```

**Note**

If your DPU is Ethernet capable only, then the `sudo mlxconfig -d <device>` command will not provide an output.

If the current link type is set to IB, run the following command to change it to Ethernet:

```
host# sudo mlxconfig -d <device-id> s LINK_TYPE_P1=2  
LINK_TYPE_P2=2
```

6. Verify that RShim is active.

```
host# sudo systemctl status rshim
```

This command is expected to display `active (running)`. If RShim service does not launch automatically, run:

```
host# sudo systemctl enable rshim  
host# sudo systemctl start rshim
```

7. Assign a dynamic IP to `tmfifo_net0` interface (RShim host interface).

### **Note**

Skip this step if you are [installing the DOCA image on multiple DPUs](#).

```
host# ifconfig tmfifo_net0 192.168.100.1 netmask 255.255.255.252 up
```

## DOCA Extra Package

If the kernel version on your host is not supported (not shown under "[Supported Operating System Distributions](#)"), two options are available:

- Switch to a compatible kernel.
- Install `doca-extra` package:

1. Run:

```
host# sudo apt install -y doca-tools doca-extra
```

2. Execute the `doca-kernel-support` script which downloads the appropriate missing packages from your kernel to support DOCA:

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

### **Note**

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

## Installing Software on DPU

Users have two options for installing DOCA on the DPU:

- Upgrading the full DOCA image on the DPU (recommended) – this option overwrites the entire boot partition
- Upgrading DOCA local repo package on the DPU – this option upgrades DOCA components without overwriting the boot partition. Use this option to preserve configurations or files on the DPU itself.

## Installing Full DOCA Image on DPU via Host

### **Warning**

This step overwrites the entire boot partition.

### **Note**

This installation sets up the OVS bridge.

### **Note**

If you are installing DOCA on multiple DPUs, skip to section [Installing Full DOCA Image on Multiple DPUs](#).

## Option 1 – No Pre-defined Password

### **Note**

To set the password in advance, proceed to Option 2.

BFB installation is executed as follows:

```
host# sudo bfb-install --rshim <rshimN> --bfb <image_path.bfb>
```

Where `rshimN` is `rshim0` if you only have one DPU. You may run the following command to verify:

```
host# ls -la /dev/ | grep rshim
```

## Option 2 – Set Pre-defined Password

Ubuntu users can provide a unique password that will be applied at the end of the BlueField software image installation. This password needs to be defined in a `bf.cfg` configuration file.

To set the password for the "ubuntu" user:

1. Create password hash. Run:

```
host# openssl passwd -1  
Password:  
Verifying - Password:  
$1$3B0RIrfX$T1Hry93NFUJzg3Nya00rE1
```

2. Add the password hash in quotes to the `bf.cfg` file:

```
host# sudo vim bf.cfg
```

```
ubuntu_PASSWORD='$1$3B0RlrfX$TIHry93NFUJzg3Nya00rE1'
```

When running the installation command, use the `--config` flag to provide the file containing the password:

```
host# sudo bfb-install --rshim <rshimN> --bfb  
<image_path.bfb> --config bf.cfg
```

### Note

If `--config` is not used, then upon first login to the BlueField device, users will be asked to update their password.

The following is an example of Ubuntu installation assuming the `pv` Linux tool has been installed (to view the installation progress).

```
host# sudo bfb-install --rshim rshim0 --bfb DOCA_<version>-  
aarch64.bfb --config bf.cfg  
Pushing bfb  
1.08GiB 0:00:57 [19.5MiB/s] [      <=>      ]  
Collecting BlueField booting status. Press Ctrl+C to stop...  
INFO[BL2]: start  
INFO[BL2]: DDR POST passed  
INFO[BL2]: UEFI loaded  
INFO[BL31]: start  
INFO[BL31]: runtime  
INFO[UEFI]: eMMC init  
INFO[UEFI]: eMMC probed  
INFO[UEFI]: PCIe enum start  
INFO[UEFI]: PCIe enum end
```

```
INFO[MISC]: Ubuntu installation started
INFO[MISC]: Installation finished
INFO[MISC]: Rebooting...
```

## Installing Full DOCA Image on Multiple DPUs

On a host with multiple DPUs, the BFB image can be installed on all of them using the `multi-bfb-install` script.

```
host# ./multi-bfb-install --bfb <bfb-file> --password <password>
```

This script detects the number of RShim devices and configures them statically.

- For Ubuntu – the script creates a configuration file `/etc/netplan/20-tmfifo.yaml`
- For CentOS/RH 7.6 – the script creates a configuration file `/etc/sysconfig/network-scripts/ifcfg-br_tmfifo`
- For CentOS/RH 8.0 and 8.2 – the script installs the `bridge-utils` package to use the `brctl` command, creates the `tm-br` bridge, and connects all RShim interfaces to it

After the installation is complete, the configuration of the bridge and each RShim interface can be observed using `ifconfig`. The expected result is to see the IP on the `tm-br` bridge configured to `192.168.100.1` with subnet `255.255.255.0`.

### Note

To log into BlueField with `rshim0`, run:

```
ssh ubuntu@192.168.100.2
```

For each RShim after that, add 1 to the fourth octet of the IP address (e.g., `ubuntu@192.168.100.3` for `rshim1`, `ubuntu@192.168.100.4` for `rshim2`, etc).

The script burns a new MAC address to each DPU and configures a new IP, 192.168.100.x, as described earlier.

## Installing DOCA Local Repo Package on DPU

### Note

If you have already [installed BlueField image](#), be aware that the DOCA SDK, Runtime, and Tools are already contained in the BFB, and this installation is not mandatory. If you have not installed the BlueField image and wish to update DOCA Local Repo package, proceed with the following procedure.

### Note

Before installing DOCA on the target DPU, make sure the out-of-band interface (`mgmt`) is connected to the internet.

1. Download the DOCA SDK, DOCA Runtime, and DOCA Tools package from section [Installation Files](#).
2. Copy deb repo package into BlueField. Run:



```
host# sudo scp -r doca-repo-aarch64-ubuntu2204-  
local_<version>_arm64.deb ubuntu@192.168.100.2:/tmp/
```

3. Unpack the deb repo. Run:

```
dpu# sudo dpkg -i doca-dpu-repo-ubuntu2204-  
local_<version>_arm64.deb
```

4. Run apt update.

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

5. Run `apt install` for DOCA Runtime, DOCA Tools, and DOCA SDK:

```
dpu# sudo apt install doca-runtime  
dpu# sudo apt install doca-tools  
dpu# sudo apt install doca-sdk
```

## Upgrading Firmware

### Note

If multiple DPUs are installed, the following steps must be performed on all of them after [BFB installation](#).

To upgrade firmware:

1. SSH to your BlueField device via 192.168.100.2 (preconfigured).

**Note**

If multiple DPUs are installed, the tmfifo IP interface does not have to be 192.168.100.2. The last octate changes and depends on the RShim number.

The default credentials for Ubuntu are as follows:

Username	Password
ubuntu	ubuntu or a unique password that you set in bf.cfg

For example:

```
host# ssh ubuntu@192.168.100.2
Password: <configured-password>
```

2. Upgrade firmware in BlueField DPU. Run:

```
dpu# sudo /opt/mellanox/mlnx-fw-updater/mlnx_fw_updater.pl --
force-fw-update
```

Example output:

```
Device #1:
-----
```

```
Device Type:      BlueField-2
[...]
Versions:        Current      Available
FW               <Old_FW>    <New_FW>
```

3. For the firmware upgrade to take effect:

1. Run the following command on the BlueField DPU and host:

```
dpu# sudo mst start
```

2. Otherwise, trigger reset by running the following:

```
dpu# sudo mlxfwreset -d /dev/mst/mt41686_pciconf0 --sync
1 -y reset
```

If the `mlxfwreset` command fails, perform a [graceful reboot](#) and host power cycle.

### **Note**

The entire DPU will experience reset.

## Post-installation Procedure

1. Restart the driver. Run:

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

```
Unloading HCA driver: [
OK ]
Loading HCA driver and Access Layer: [
OK ]
```

2. Configure the physical function (PF) interfaces.

```
host# sudo ifconfig <interface-1> <network-1/mask> up
host# sudo ifconfig <interface-2> <network-2/mask> up
```

For example:

```
host# sudo ifconfig p2p1 192.168.200.32/24 up
host# sudo ifconfig p2p2 192.168.201.32/24 up
```

Pings between the source and destination should now be operational.

## Upgrading BlueField DPU Using Standard Linux Tools

This dpu-upgrade procedure enables upgrading DOCA components using standard Linux tools (e.g., `apt update` and `yum update`). This process utilizes native package manager repositories to upgrade DPUs without the need for a full installation, and has the following benefits :

- Only updates components that include modifications
  - Configurable – user can select specific components (e.g., UEFI-ATF, NIC-FW)
- Includes upgrade of:
  - DOCA drivers and libraries
  - DOCA reference applications

- BSP (UEFI/ATF) upgrade while maintaining the configuration
- NIC firmware upgrade while maintaining the configuration
- Does not:
  - Impact user binaries
  - Upgrade non-Ubuntu OS kernels
  - Upgrade DPU BMC firmware
- After completion of DPU upgrade:
  - If NIC firmware was not updated, perform DPU Arm reset (software reset / reboot DPU)
  - If NIC firmware was updated, perform firmware reset (`mlxfwreset`) or perform a graceful shutdown and power cycle

OS	Action	Instructions
Ubuntu/ Debian	Remove <code>mlxbf-bootimages</code> package	<pre>&lt;dpu&gt; \$ apt remove --purge mlxbf-bootimages* -y</pre>
	Install the the GPG key	<pre>&lt;dpu&gt; \$ apt update &lt;dpu&gt; \$ apt install gnupg2</pre>
	Export the desired distribution	<p>Export <code>DOCA_REPO</code> with the relevant URL. The following is an example for Ubuntu 22.04:</p> <pre>&lt;dpu&gt; \$ export DOCA_REPO="https://linux.mellanox.com/public/repo/doca/2.5.1/ubuntu22.04/dpu-arm64"</pre> <ul style="list-style-type: none"> <li>• Ubuntu 22.04 – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/ubun">https://linux.mellanox.com/public/repo/doca/2.5.1/ubun</a></li> </ul>

OS	Action	Instructions
		<p><a href="https://linux.mellanox.com/public/repo/doca/2.5.1/ubuntu22.04/dpu-arm64">tu22.04/dpu-arm64</a></p> <ul style="list-style-type: none"> <li>• Ubuntu 20.04 – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/ubuntu20.04/dpu-arm64">https://linux.mellanox.com/public/repo/doca/2.5.1/ubuntu20.04/dpu-arm64</a></li> <li>• Debian 12 – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/debian12/dpu-arm64">https://linux.mellanox.com/public/repo/doca/2.5.1/debian12/dpu-arm64</a></li> </ul>
	Add GPG key to APT trusted keyring	<pre data-bbox="573 541 1463 854">&lt;dpu&gt; \$ curl \$DOCA_REPO/GPG-KEY-Mellanox.pub   gpg --dearmor &gt; /etc/apt/trusted.gpg.d/GPG-KEY-Mellanox.pub</pre>
	Add DOCA online repository	<pre data-bbox="573 871 1463 1184">&lt;dpu&gt; \$ echo "deb [signed-by=/etc/apt/trusted.gpg.d/GPG-KEY-Mellanox.pub] \$DOCA_REPO ./" &gt; /etc/apt/sources.list.d/doca.list</pre>
	Update index	<pre data-bbox="573 1201 1463 1358">&lt;dpu&gt; \$ apt update</pre>
	Upgrade UEFI/ATF firmware	<p data-bbox="573 1381 1463 1415">Run:</p> <pre data-bbox="573 1423 1463 1625">&lt;dpu&gt; \$ apt install mlxbf-bootimages-signed mlxbf-scripts</pre> <p data-bbox="573 1633 1463 1667">Then initiate upgrade for UEFI/ATF firmware:</p> <pre data-bbox="573 1675 1463 1824">&lt;dpu&gt; \$ bfreq</pre>
	Upgrade BlueField DPU NIC firmware	<p data-bbox="573 1850 1463 1883">Run:</p>

OS	Action	Instructions
		<pre data-bbox="574 212 1463 369">&lt;dpu&gt; \$ apt install mlnx-fw-updater-signed</pre> <div data-bbox="574 428 1463 653" style="background-color: #ffffcc; padding: 10px;"> <p><b>Note</b> This immediately starts NIC firmware upgrade.</p> </div> <p data-bbox="574 711 1091 747">To prevent automatic upgrade, run:</p> <pre data-bbox="574 747 1463 905">&lt;dpu&gt; \$ export RUN_FW_UPDATER=no</pre>
	Upgrade system	<pre data-bbox="574 926 1463 1083">&lt;dpu&gt; \$ apt upgrade</pre>
	Apply the new changes, NIC firmware, and UEFI/ATF	<pre data-bbox="574 1104 1463 1314">&lt;dpu&gt; \$ mlxfwreset -d /dev/mst/mt*_pciconf0 -y -l 3 --sync 1 r</pre> <div data-bbox="574 1373 1463 1682" style="background-color: #ffffcc; padding: 10px;"> <p><b>Note</b> If <code>mlxfwreset</code> is not supported, graceful shutdown and host power cycle are required for the NIC firmware upgrade to take effect.</p> </div>
CentOS/RHEL/	Remove <code>mlxbf-bootimages</code> , <code>librerswan</code> , and	<pre data-bbox="574 1766 1463 1934">&lt;dpu&gt; \$ yum -y remove mlxbf-bootimages*</pre>

OS	Action	Instructions
Anolis/Rocky	openvswitch-ipsec packages	<pre data-bbox="573 218 1459 415">&lt;dpu&gt; \$ yum remove libreswan openvswitch-ipsec &lt;dpu&gt; \$ yum makecache</pre>
	Export the desired distribution	<p data-bbox="573 443 1459 527">Export <code>DOCA_REPO</code> with the relevant URL. The following is an example for Rocky Linux 8.6:</p> <pre data-bbox="573 527 1459 779">&lt;dpu&gt; \$ export DOCA_REPO="https://linux.mellanox.com/public/repo/doca/2.5.1/rhel8.6/dpu-arm64/"</pre> <ul data-bbox="573 814 1459 1535" style="list-style-type: none"> <li>• AnolisOS 8.6 – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/anolis8.6/dpu-arm64/">https://linux.mellanox.com/public/repo/doca/2.5.1/anolis8.6/dpu-arm64/</a></li> <li>• OpenEuler 20.03 sp1 – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/openeuler20.03sp1/dpu-arm64/">https://linux.mellanox.com/public/repo/doca/2.5.1/openeuler20.03sp1/dpu-arm64/</a></li> <li>• CentOS 7.6 with 4.19 kernel – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/rhel7.6-4.19/dpu-arm64/">https://linux.mellanox.com/public/repo/doca/2.5.1/rhel7.6-4.19/dpu-arm64/</a></li> <li>• CentOS 7.6 with 5.10 kernel – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/rhel7.6-5.10/dpu-arm64/">https://linux.mellanox.com/public/repo/doca/2.5.1/rhel7.6-5.10/dpu-arm64/</a></li> <li>• CentOS 7.6 with 5.4 kernel – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/rhel7.6/dpu-arm64/">https://linux.mellanox.com/public/repo/doca/2.5.1/rhel7.6/dpu-arm64/</a></li> <li>• Rocky Linux 8.6 – <a href="https://linux.mellanox.com/public/repo/doca/2.5.1/rhel8.6/dpu-arm64/">https://linux.mellanox.com/public/repo/doca/2.5.1/rhel8.6/dpu-arm64/</a></li> </ul>
	Add DOCA online repository	<pre data-bbox="573 1577 1459 1938">echo "[doca] name=DOCA Online Repo baseurl=\$DOCA_REPO enabled=1 gpgcheck=0 priority=10</pre>



OS	Action	Instructions
		<pre>cost=10" &gt; /etc/yum.repos.d/doca.repo</pre> <p>A file is created under <code>/etc/yum.repos.d/doca.repo</code>.</p>
	Update index	<pre>&lt;dpu&gt; \$ yum makecache</pre>
	Upgrade UEFI/ATF firmware	<p>Run:</p> <pre>&lt;dpu&gt; \$ yum install mlxbf-bootimages-signed.aarch64 mlxbf-bfscripts</pre> <p>Then initiate the upgrade for UEFI/ATF firmware:</p> <pre>&lt;dpu&gt; \$ bfred</pre>
	Upgrade BlueField DPU NIC firmware	<p>The following command updates the firmware package and automatically attempts to flash the firmware to the NIC:</p> <pre>&lt;dpu&gt; \$ yum install mlnx-fw-updater-signed.aarch64</pre> <div style="background-color: #ffffcc; padding: 10px; margin-top: 10px;"> <p><b>i Note</b></p> <p>To prevent automatic flashing of the firmware to the NIC, run the following first:</p> <pre>&lt;dpu&gt; \$ export RUN_FW_UPDATER=no</pre> </div>

OS	Action	Instructions
		00000194-6a9d-d115-addd-fb9f21880003 00000194-6a9d-d115-addd-fb9f21880007
	Upgrade system	<dpu> \$ yum upgrade --nobest
	Apply the new changes, NIC firmware, and UEFI/ATF	<pre>&lt;dpu&gt; \$ mlxfwreset -d /dev/mst/mt*_pciconf0 -y -l 3 --sync 1 r</pre> <p><b>Note</b> If <code>mlxfwreset</code> is not supported, a graceful shutdown and host power cycle are required for the NIC firmware upgrade to take effect.</p>

## Building Your Own BFB Installation Image

Users wishing to build their own customized BlueField OS image can use the BFB build environment. Please refer to the bfb-build project in [this GitHub webpage](#) for more information.

### **Note**

For a customized BlueField OS image to boot on the UEFI secure-boot-enabled DPU (default DPU secure boot setting), the OS must be either signed with an existing key in the UEFI DB (e.g., the Microsoft key), or UEFI secure boot must be disabled. Please refer to the "Secure

Boot" page under [NVIDIA BlueField DPU Platform Operating System Documentation](#) for more details.

## Setting Up Build Environment for Developers

For full instructions about setting up a development environment, refer to the [NVIDIA DOCA Developer Guide](#).

## Additional SDKs for DOCA

### Installing CUDA on NVIDIA Converged Accelerator

NVIDIA® CUDA® is a parallel computing platform and programming model developed by NVIDIA for general computing GPUs.

This section details the necessary steps to set up CUDA on your environment. This section assumes that a BFB image has already been installed on your environment.

To install CUDA on your converged accelerator:

1. Download and install the latest NVIDIA Data Center GPU driver.
2. Download and install CUDA

#### **Note**

The CUDA version tested to work with DOCA SDK is 11.8.0.

#### **Note**

Downloading CUDA includes the latest NVIDIA Data Center GPU driver and CUDA toolkit. For more information about CUDA and driver compatibility, refer to the [NVIDIA CUDA Toolkit Release Notes](#).

## Configuring Operation Mode

There are two modes that the NVIDIA Converged Accelerator may operate in:

- Standard mode (default) – the BlueField DPU and the GPU operate separately
- BlueField-X mode – the GPU is exposed to the DPU and is no longer visible on the host

To verify which mode the system is operating in, run:

```
host# sudo mst start
host# sudo mlxconfig -d <device-id> q
PCI_DOWNSTREAM_PORT_OWNER[4]
```

### Note

To learn the DPU's device ID, refer to section "[Determining DPU Device ID](#)".

- Standard mode output:

```
Device #1:
[...]
Configurations:                                Next Boot
          PCI_DOWNSTREAM_PORT_OWNER[4]
          DEVICE_DEFAULT(0)
```

- BlueField-X mode output:

```
Device #1:
```

[...]

Configurations:

PCI\_DOWNSTREAM\_PORT\_OWNER[4]

Next Boot

EMBEDDED\_CPU(15)

To configure BlueField-X mode, run:

```
host# mlxconfig -d <device-id> s PCI_DOWNSTREAM_PORT_OWNER[4]=0xF
```

To configure standard mode, run:

```
host# mlxconfig -d <device-id> s PCI_DOWNSTREAM_PORT_OWNER[4]=0x0
```

### **Note**

To learn the DPU's device ID, refer to section "[Determining DPU Device ID](#)".

[Graceful reboot](#) and power cycle are required for configuration to take effect. To power cycle the host run:

```
host# ipmitool power cycle
```

## Downloading and Installing CUDA Toolkit and Driver

This section details the necessary steps to set up CUDA on your environment. It assumes that a BFB image has already been installed on your environment.

1. Install CUDA by visiting the [CUDA Toolkit Downloads](#) webpage.

**Note**

Select the Linux distribution and version relevant for your environment.

**Note**

This section shows the native compilation option either on x86 or aarch64 hosts.

2. Test that the driver installation completed successfully. Run:

```
dpu# nvidia-smi

Tue Apr  5 13:37:59 2022
+-----+
-----+
| NVIDIA-SMI 510.47.03   Driver Version: 510.47.03   CUDA
Version: 11.8   |
|-----+-----+-----+-----+
-----+
| GPU  Name          Persistence-M| Bus-Id        Disp.A |
Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|      Memory-Usage | GPU-
Util  Compute M. |
|                               |                  |
MIG M. |
|=====+=====+=====+=====+
|   0   NVIDIA BF A10      Off  | 00000000:06:00.0 Off |
0 |
```

```

| 0% 43C P0 N/A / 225W | 0MiB / 23028MiB |
0% Default |
| | |
N/A |
+-----+-----+
-----+
+-----+
-----+
| Processes:
|
| GPU GI CI PID Type Process name
GPU Memory |
| ID ID
Usage |
|=====|
| No running processes found
|
+-----+
-----+

```

3. Verify that the installation completed successfully.

1. Download CUDA samples repo. Run:

```
dpu# git clone https://github.com/NVIDIA/cuda-samples.git
```

2. Build and run vectorAdd CUDA sample. Run:

```
dpu# cd cuda-samples/Samples/0_Introduction/vectorAdd
dpu# make
dpu# ./vectorAdd
```

### **(i) Note**

If the `vectorAdd` sample works as expected, it should output "`Test Passed`".

### **(i) Note**

If it seems that the GPU is slow or stuck, stop execution and run:

```
dpu# sudo setpci -v -d ::0302 800.L=201 #  
CPL_VC0 = 32
```

## **GPUDirect RDMA**

For information on GPUDirect RDMA and more, refer to [DOCA GPUNetIO](#) documentation.

## **Installing Rivermax on DPU**

NVIDIA Rivermax offers a unique IP-based solution for any media and data streaming use case.

This section provides the steps to install Rivermax assuming that a BFB image has already been installed on your environment.

### **Downloading Rivermax Driver**

1. Navigate to the [NVIDIA Rivermax SDK](#) product page.



2. Register to be able to download the driver package using the JOIN button at the top of the page.
3. Download the appropriate driver package according to your BFB under the "Linux" subsection. For example, for Ubuntu 22.04 BFB, download `rivermax_ubuntu2204_<version>.tar.gz`.

## Installing Rivermax Driver

1. Copy the `.tgz` file to the DPU:

```
host# sudo scp -r rivermax_ubuntu2204_<version>.tar.gz  
ubuntu@192.168.100.2:/tmp/
```

2. Extract the Rivermax file:

```
dpu# sudo tar xzf rivermax_ubuntu2204_<version>.tar.gz
```

3. Install the Rivermax driver package:

```
dpu# cd <rivermax-version>/Ubuntu.22.04/deb-dist/aarch64/  
dpu# sudo dpkg -i rivermax_<version>.deb
```

## Installing Rivermax Libraries from DOCA

Rivermax libraries are compatible with DOCA components and can be found inside the `doca-dpu-repo`.

1. Unpack the doca-dpu-repo:

```
dpu# sudo dpkg -i doca-dpu-repo-ubuntu2204-  
local_<version>_arm64.deb
```

2. Run apt update:

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

3. Install the Rivermax libraries:

```
dpu# sudo apt install doca-rmax-libs  
dpu# sudo apt install libdoca-rmax-libs-dev
```

For additional details and guidelines, please visit the [NVIDIA Rivermax SDK](#) product page.

### Info

For questions, comments, and feedback, please contact us at [DOCA-Feedback@exchange.nvidia.com](mailto:DOCA-Feedback@exchange.nvidia.com).

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