



# **DOCA Developer Quick Start Guide**

# Table of contents

[Introduction](#)

---

[Install BlueField Networking Platform](#)

---

[Install DOCA Software Package](#)

---

[Access BlueField](#)

---

[Run Reference DOCA Application](#)

---

[More Information](#)

---

This guide details the basic steps to bring up the NVIDIA DOCA development environment and to build and run the DOCA reference applications provided along with the DOCA software framework package.

## Introduction

NVIDIA DOCA brings together a wide range of powerful APIs, libraries, and frameworks for programming and accelerating modern data center infrastructures. Like NVIDIA® CUDA® for GPUs, DOCA is a consistent and essential resource across all existing and future generations of BlueField DPU and SuperNIC products.

This document is intended for those wishing to develop applications using the DOCA framework.

### Note

Not sure which installation type to use? To expand on different DOCA user types and the relevant installation for each, see [BlueField and DOCA User Types](#).

## Install BlueField Networking Platform

Install the BlueField networking platform into your host according to the installation instructions in the [BlueField's hardware user guide](#). The steps include installing BlueField into the PCIe slot and properly securing it in the chassis. Make sure your host OS is listed under the "[Supported Host OS and Features per DOCA-Host Installation Profile](#)" section.

## Install DOCA Software Package

A detailed step-by-step process for downloading and installing the required development software on both the host and BlueField can be found in the [DOCA Installation Guide for Linux](#).

During installation, you must change the default password, `ubuntu`, to access the NVIDIA® BlueField® networking platform.

## Access BlueField

After a successful installation, on the host, the RShim driver exposes a virtual Ethernet device called `tmfifo_net0`.

1. Configure the host side of the `tmfifo_net0` with a static IP to enable IPv4-based communication to the BlueField OS according to the instructions in section " Virtual Ethernet Interface " of the "[Host-side Interface Configuration](#)" page in the *NVIDIA BlueField DPU BSP* document.
2. Log into BlueField's Ubuntu-based OS by running the following command from the host:

```
host# ssh ubuntu@192.168.100.2
```

Use the BlueField networking platform password you defined during the installation process.

At this stage DOCA is installed on BlueField and the host server.

## Run Reference DOCA Application

DOCA package assets (e.g., references, tools) are located on Bluefield and on the host under `/opt/mellanox/doca/`.

The DOCA package includes a set of reference applications to facilitate developer on-boarding. Please refer to the [DOCA Reference Applications](#) and [DOCA Programming Guide](#) for more information.

To run the [DOCA Secure Channel](#) reference application which demonstrates accelerated and secure message transmission between the host and BlueField over the Comm Channel interface:

1. Run the application as server on the BlueField networking platform using the following command (all parameters are available in the [DOCA Secure Channel Application Guide](#)):

```
#  
/opt/mellanox/doca/applications/secure_channel/bin/doca_secure
```

```
-s 256 -n 10 -p 03:00.0 -r 3b:00.0
```

2. Run the application as client on the host using the following command (all parameters are available in the [DOCA Secure Channel Application Guide](#)):

```
#  
/opt/mellanox/doca/applications/secure_channel/bin/doca_secure  
-s 256 -n 10 -p 3b:00.0
```

## More Information

To learn more about NVIDIA BlueField networking platforms, refer to the [NVIDIA BlueField Hardware Manuals](#).

### Info

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

**Notice**  
This document is provided for information purposes only and shall not be regarded as a warranty of a certain functionality, condition, or quality of a product. NVIDIA Corporation (“NVIDIA”) makes no representations or warranties, expressed or implied, as to the accuracy or completeness of the information contained in this document and assumes no responsibility for any errors contained herein. NVIDIA shall have no liability for the consequences or use of such information or for any infringement of patents or other rights of third parties that may result from its use. This document is not a commitment to develop, release, or deliver any Material (defined below), code, or functionality. NVIDIA reserves the right to make corrections, modifications, enhancements, improvements, and any other changes to this document, at any time without notice. Customer should obtain the latest relevant information before placing orders and should verify that such information is current and complete. NVIDIA products are sold subject to the NVIDIA standard terms and conditions of sale supplied at the time of order acknowledgement, unless otherwise agreed in an individual sales agreement signed by authorized representatives of NVIDIA and customer (“Terms of Sale”). NVIDIA hereby expressly objects to applying any customer general terms and conditions with regards to the purchase of the NVIDIA product referenced in this document. No contractual obligations are formed either directly or indirectly by this document. NVIDIA products are not designed, authorized, or warranted to be suitable for use in medical, military, aircraft, space, or life support equipment, nor in applications where failure or malfunction of the NVIDIA product can reasonably be expected to result in personal injury, death, or property or environmental damage. NVIDIA accepts no liability for inclusion and/or use of NVIDIA products in such equipment or applications and therefore such inclusion and/or use is at customer’s own risk. NVIDIA makes no representation or warranty that products based on this document will be suitable for any specified use. Testing of all parameters of each product is not necessarily performed by NVIDIA. It is customer’s sole responsibility to evaluate and determine the applicability of any information contained in this document, ensure the product is suitable and fit for the application planned by customer, and perform the necessary testing for the application in order to avoid a default of the

application or the product. Weaknesses in customer's product designs may affect the quality and reliability of the NVIDIA product and may result in additional or different conditions and/or requirements beyond those contained in this document. NVIDIA accepts no liability related to any default, damage, costs, or problem which may be based on or attributable to: (i) the use of the NVIDIA product in any manner that is contrary to this document or (ii) customer product designs.

No license, either expressed or implied, is granted under any NVIDIA patent right, copyright, or other NVIDIA intellectual property right under this document. Information published by NVIDIA regarding third-party products or services does not constitute a license from NVIDIA to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property rights of the third party, or a license from NVIDIA under the patents or other intellectual property rights of NVIDIA.

Reproduction of information in this document is permissible only if approved in advance by NVIDIA in writing, reproduced without alteration and in full compliance with all applicable export laws and regulations, and accompanied by all associated conditions, limitations, and notices.

THIS DOCUMENT AND ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS, AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL NVIDIA BE LIABLE FOR ANY DAMAGES, INCLUDING WITHOUT LIMITATION ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES, HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY, ARISING OUT OF ANY USE OF THIS DOCUMENT, EVEN IF NVIDIA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Notwithstanding any damages that customer might incur for any reason whatsoever, NVIDIA's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms of Sale for the product.

**Trademarks**

NVIDIA and the NVIDIA logo are trademarks and/or registered trademarks of NVIDIA Corporation in the U.S. and other countries. Other company and product names may be trademarks of the respective companies with which they are associated.

© Copyright 2025, NVIDIA. PDF Generated on 05/05/2025