



# NVIDIA DOCA

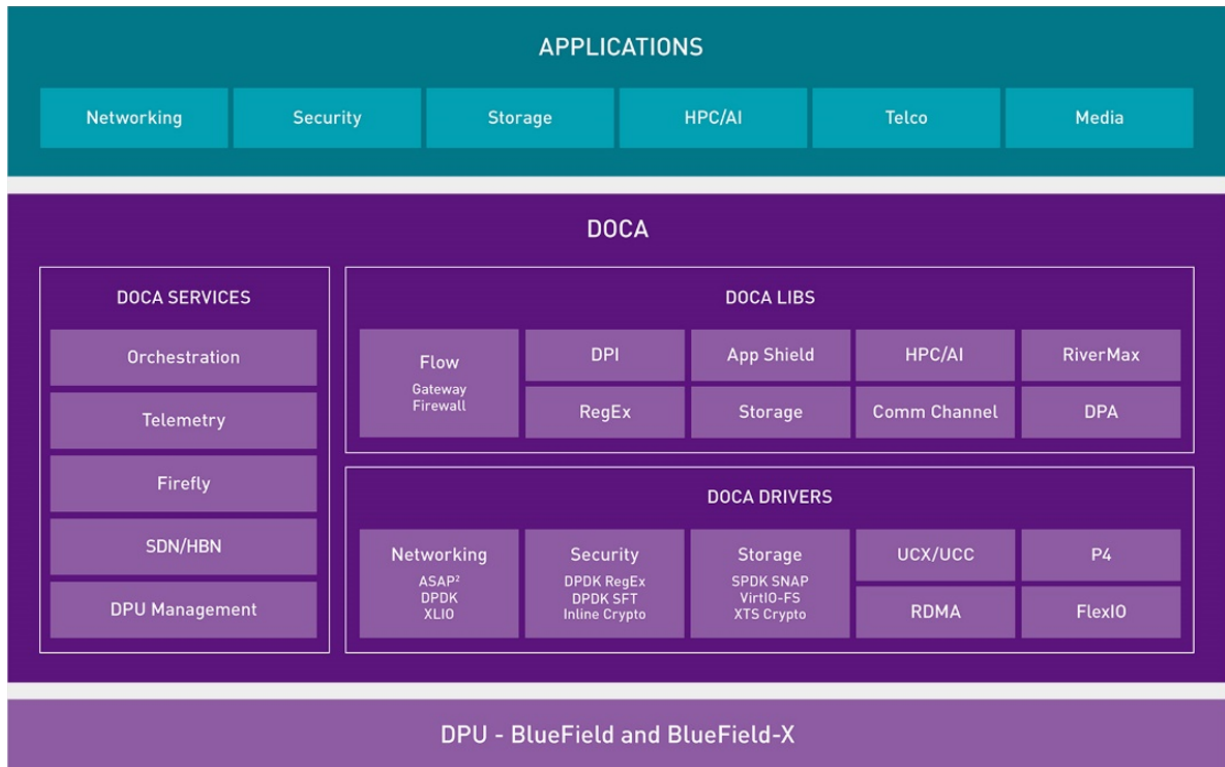
## Overview

# Table of Contents

Chapter 1. Introduction.....	1
Chapter 2. Installation.....	2
Chapter 3. API.....	3
Chapter 4. Samples.....	4
Chapter 5. Applications.....	5
Chapter 6. Tools.....	6
Chapter 7. Services.....	7

# Chapter 1. Introduction

The NVIDIA DOCA™ SDK enables developers to rapidly create applications and services on top of NVIDIA® BlueField® data processing units (DPUs), leveraging industry-standard APIs. With DOCA, developers can deliver breakthrough networking, security, and storage performance by harnessing the power of NVIDIA's DPUs.



This guide walks you through DOCA's developer zone portal which contains all the information about the DOCA toolkit from NVIDIA, providing everything you need to develop DPU-accelerated applications.

---

## Chapter 2. Installation

DOCA contains a runtime and development environment for both the host and as part of a BlueField image for the DPU. The full installation instructions for both can be found in the [NVIDIA DOCA Installation Guide for Linux](#).

Whether DOCA has been installed on the host or on the DPU, one can find the different DOCA components under the `/opt/mellanox/doca` directory. These include the traditional SDK-related components (libraries, header files, etc.) as well as the DOCA samples, applications, tools and more, as described in this document.

---

# Chapter 3. API

The DOCA SDK is built around the different DOCA libraries designed to leverage the capabilities of the DPUs. Under the [Programming Guides section](#), one can find a detailed description of each DOCA library, its goals, and API. These guides document DOCA's API, aiming to help developers wishing to develop DOCA-based programs.

The API References section holds the Doxygen-generated documentation of DOCA's official API. See [NVIDIA DOCA Libraries API Reference Manual](#).

Please note that, as explained in the [NVIDIA DOCA gRPC Infrastructure User Guide](#), some of DOCA's libraries also support a gRPC-based API. More information about these extended programming interfaces can be found in detail in the programming guides of the respective libraries.

---

# Chapter 4. Samples

Samples are simple code snippets for achieving basic DOCA-based tasks using DOCA's libraries. It is recommended to review the samples while going over the programming guide of the DOCA library of interest and learning about its API. The samples are designed to show an example implementation of a single feature of a given DOCA library. As such, the samples of a given library should be treated as a direct extension of the programming guide of that library, aiming to provide code snippets to accompany developers wishing to familiarize themselves with the DOCA API.

For more information about DOCA samples, refer to [NVIDIA DOCA Samples Overview](#).

For a higher-level reference of full DOCA-based programs that make use of multiple DOCA libraries, refer to [Applications](#).

---

# Chapter 5. Applications

Applications are a higher-level reference code than the samples and demonstrate how a full DOCA-based program can be built. In addition to the supplied source code and compilation definitions, the applications are also shipped in their compiled binary form. This is to allow users an out-of-the-box interaction with DOCA-based programs without the hassle of a developer-oriented compilation process.

Many DOCA applications combine the functionality of more than one DOCA library and offer an example implementation for common scenarios of interest to users such as application recognition according to incoming/outgoing traffic, scanning files using the hardware RegEx acceleration, and much more.

For more information about DOCA applications, refer to [NVIDIA DOCA Applications Overview](#).

---

# Chapter 6. Tools

Some of the DOCA libraries are shipped alongside helper tools for both runtime and development. These tools are often an extension to the library's own API and bridge the gap between the library's expected input format and the input available to the users.

An example for one such DOCA tool is the `doca_dpi_compiler`, responsible for converting Suricata-based rules to their matching `.cdo` definition files which are then used by the DOCA DPI library.

For more information about DOCA tools, refer to [NVIDIA DOCA Tools Overview](#).



---

# Chapter 7. Services

DOCA services are containerized DOCA-based programs that provide an end-to-end solution for a given use case. DOCA services are accessible as part of NVIDIA's container catalog (NGC) from which they can be easily deployed directly to the DPU.

For more information about container-based deployment to the DPU, refer to the [NVIDIA DOCA Container Deployment Guide](#).

For more information about DOCA services, refer to the [NVIDIA DOCA Services Overview](#).

## 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 nor any of its direct or indirect subsidiaries and affiliates (collectively: "NVIDIA") make no representations or warranties, expressed or implied, as to the accuracy or completeness of the information contained in this document and assume 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 NON-INFRINGEMENT, 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, the NVIDIA logo, and Mellanox are trademarks and/or registered trademarks of Mellanox Technologies Ltd. and/or NVIDIA Corporation in the U.S. and in other countries. The registered trademark Linux® is used pursuant to a sublicense from the Linux Foundation, the exclusive licensee of Linus Torvalds, owner of the mark on a world-wide basis. Other company and product names may be trademarks of the respective companies with which they are associated.

## Copyright

© 2023 NVIDIA Corporation & affiliates. All rights reserved.