



NVIDIA DOCA Socket Relay

User Guide

Table of Contents

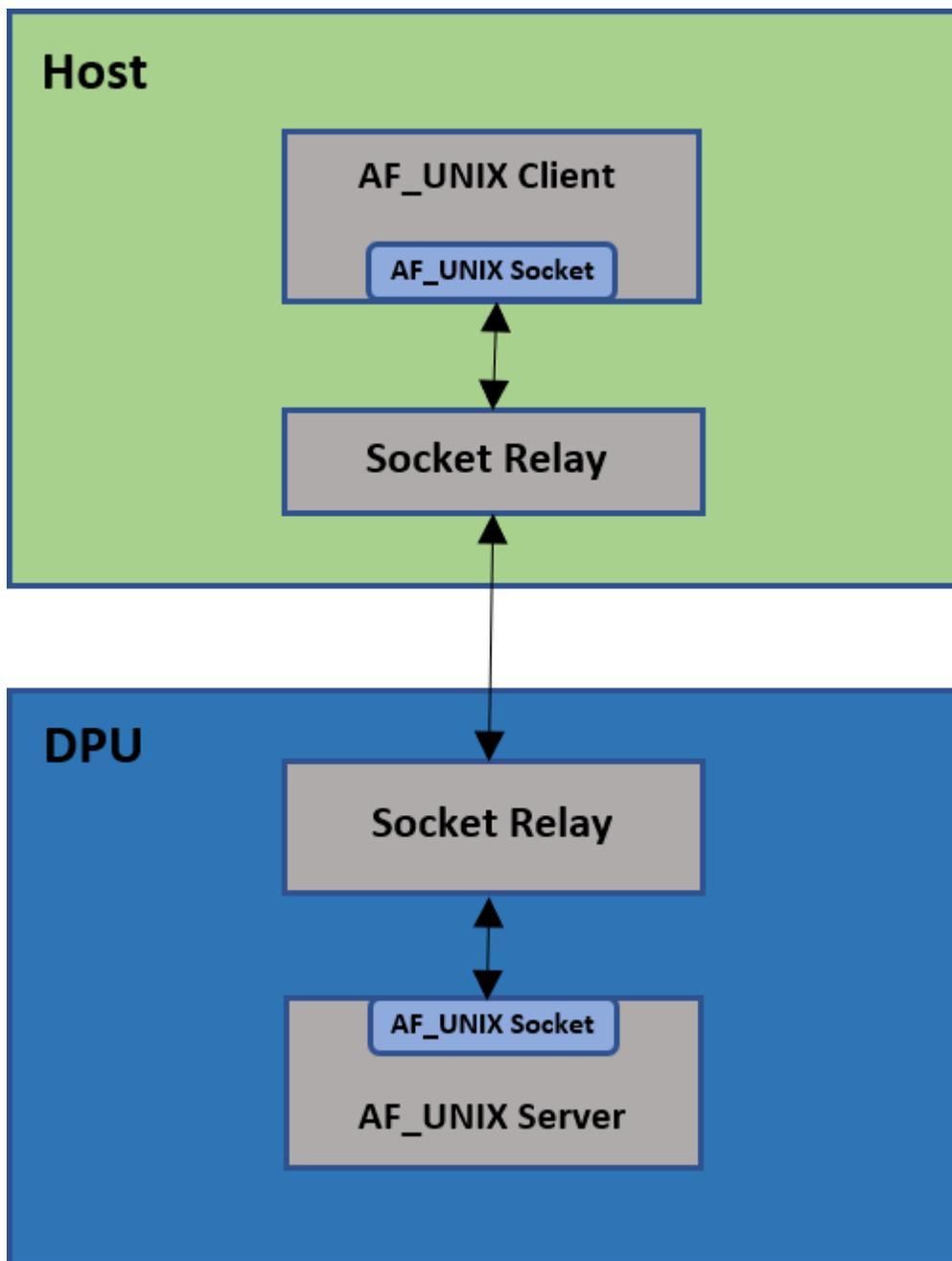
Chapter 1. Introduction.....	1
Chapter 2. Prerequisites.....	4
Chapter 3. Dependencies.....	5
Chapter 4. Execution.....	6
Chapter 5. Arg Parser DOCA Flags.....	7

Chapter 1. Introduction

DOCA Socket Relay allows Unix Domain Socket (AF_UNIX family) server applications to be offloaded to the DPU while communication between the two sides is proxied by [DOCA Comm Channel](#).

Socket relay only supports SOCK_STREAM communication with a limit of 512 AF_UNIX application clients.

The tool is coupled to the client AF_UNIX server application. That is, a socket relay instance should be initiated per AF_UNIX server application.



Socket relay is transparent to the application except for the following TCP flows:

- ▶ Connection termination must be done by the host side application only
- ▶ Once a FIN packet is sent (shutdown system call has been made) by the host side application, data cannot be transferred between the DPU and the host, and the connection must be closed.

The following details the communication flow between the client and server:

- ▶ The AF_UNIX client application connects to the socket relay AF_UNIX server in the same way as in the original flow
- ▶ The AF_UNIX client application sends SOCK_STREAM packets
- ▶ The socket relay (host) AF_UNIX server receives the client application packets, and the Comm Channel client sends them on the channel
- ▶ The socket relay (DPU) Comm Channel server receives the client application packets and the AF_UNIX client sends them to the user's AF_UNIX server application

Chapter 2. Prerequisites

Windows 10 build 17063 is the minimal Windows version to run DOCA Socket Relay on a Windows host.

Chapter 3. Dependencies

NVIDIA® BlueField®-2 firmware version 24.35.1012 or higher.

Chapter 4. Execution

To execute DOCA Socket Relay:

```
Usage: doca_socket_relay [DOCA Flags] [Program Flags]
```

DOCA Flags:

-h, --help	Print a help synopsis
-v, --version	Print program version information
-l, --log-level	<CRITICAL=20, ERROR=30, WARNING=40, INFO=50, DEBUG=60>

Program Flags:

-s, --socket	Unix domain socket path, host side will bind to and DPU connect to
-n, --cc-name	Comm Channel service name
-p, --pci-addr	DOCA Comm Channel device PCI address
-r, --rep-pci	DOCA Comm Channel device representor PCI address (needed only on DPU)

For example (DPU side):

```
doca_socket_relay -s /tmp/sr_server.socket -n cc_channel -p 03:00.0 -r b1:00.0
```

To run doca_socket_relay using a JSON file:

```
doca_socket_relay --json [json_file]
```

For example:

```
doca_socket_relay --json /tmp/doca_socket_relay.json
```

Chapter 5. Arg Parser DOCA Flags

Refer to the [NVIDIA DOCA Arg Parser Programming Guide](#) for more information.

Flag Type	Short Flag	Long Flag/ JSON Key	Description	JSON Content
General flags	l	log-level	Sets the log level for the application: <ul style="list-style-type: none"> ▶ CRITICAL=20 ▶ ERROR=30 ▶ WARNING=40 ▶ INFO=50 ▶ DEBUG=60 	<code>"log-level": 60</code>
	v	version	Print program version information	N/A
	h	help	Print a help synopsis	N/A
Program flags	s	socket	AF_UNIX (SOCK_STREAM) path. On the host, this is the path of the socket relay AF_UNIX server for the client's application to connect to. On the DPU, this is the path of the client AF_UNIX server application.	<code>"socket": "/tmp/uds-server.socket"</code>

 **Note:**
This

Flag Type	Short Flag	Long Flag/ JSON Key	Description	JSON Content
			flag is mandatory.	
	n	cc-name	Comm Channel service name.	<code>"cc-name": sr_channel</code>
			 Note: This flag is mandatory.	
	p	pci-addr	DOCA Comm Channel device PCIe address.	<code>"pci-addr": b1:00.1</code>
			 Note: This flag is mandatory.	
	r	rep-pci	Comm Channel DOCA device representor PCIe address.	<code>"rep-pci": b1:02.2</code>
			 Note: This flag is mandatory only on the DPU.	

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.