



Agilio OvS 2.2 Getting Started Guide

Netronome Intelligent Server Adapters

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Agilio OvS 2.2 Getting Started Guide: Netronome Intelligent Server Adapters

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Revision History

Date	Revision	Description
24 February 2016	000	First DRAFT for Agilio OvS 2.2.
6 April 2016	001	Added description of the experimental Conntrack version of Agilio OvS software bundled with the standard version.

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1. Introduction

1.1 Scope

This document serves as a guide to new users of Netronome's Agilio OvS software and describes the documents that need to be consulted in order to use the software.

1.2 Related Documents

Descriptive Name	Description
Netronome Network Flow Processor: Agilio OvS 2.2 Programmer's Reference Manual	A reference for programming and system design using the Netronome Agilio OvS.
Netronome Network Flow Processor: Agilio OvS 2.2 User's Guide	Provides a general overview of the Agilio OvS software.
Netronome Network Flow Processor: Datasheet	Contains summary information on the Netronome Network Flow Processor NFP including a functional description, signal descriptions, electrical specifications, and mechanical specifications.

1.3 Terminology

Acronym	Description
BDF	Bus/Device/Function
CDP	Customer Development Platform
DPDK	Intel© Dataplane Development Kit
FlowNIC	Netronome FlowNIC PCIe card containing a high performance NFP
GSG	Getting Started Guide
GUI	Graphical User Interface
LTS	Long Term Support
NFD	Netronome Flow Driver
NFP	Netronome Network Flow Processor
NIC	Network Interface Card
OvS	Open vSwitch
OS	Operating System
PCIe	Peripheral Component Interconnect Express

Acronym	Description
PMD	Poll Mode Driver
SDN	Software Defined Networking
SR-IOV	Single Root I/O Virtualization
VF	SR-IOV Virtual Function

2. Installation and Setup

2.1 Supported Platforms

The Agilio OvS software supports the following platforms:

- Netronome Intelligent Server Adapter, optionally including a card to attach the Intelligent Server Adapter to a second PCIe slot.
- Advantech FWA-6522C platform.
- Netronome Customer Development Platform (CDP).

2.2 Host Requirements

The Agilio OvS software is compatible with a wide variety of 64-bit GNU/Linux distributions and is expected to work on many distributions. It has been tested with the specific distributions listed below. Supported Linux kernel versions are:

- RHEL/CentOS 7.1 with kernels 3.10 to 4.2 — only Red Hat (not vanilla) kernels
- Ubuntu 14.04 with kernels 3.13 to 4.2



Note

Unless otherwise noted, newer versions of the systems below are expected to work. Please report any issues with newer versions to support@netronome.com.

2.2.1 Ubuntu 14.04 LTS, 64-bit x86

The following command will install all the required packages for the Agilio OvS software:

```
sudo apt-get install make autoconf automake libtool \  
gcc g++ bison flex hwloc-nox libreadline-dev libpcap-dev dkms libftdi1 libjansson4 \  
libjansson-dev guilt pkg-config libevent-dev ethtool libssl-dev \  
libnl-3-200 libnl-3-dev libnl-genl-3-200 libnl-genl-3-dev psmisc gawk
```

Error messages should be displayed if the packages cannot be installed. Should you nevertheless prefer to manually verify that the packages have been installed, enter

```
dpkg --get-selections
```

and verify that the package names are listed.

2.2.2 RHEL/CentOS 7.1, 64-bit x86

Note: Make sure you install kernel-devel FOR YOUR MATCHING KERNEL. If you have to install both the kernel and kernel-devel packages, then a restart might be required. Commands similar to:

```
rpm -qa | grep kernel
rpm -qa --last | head
```

should help you determine whether kernel and kernel-devel packages match and what you installed last.

Consult your OS guide on how to manage your kernels and whether a restart is required. The rest of the build process assumes kernel and kernel-devel match.

The epel repo must be enabled to install all the required dependencies. This can be disabled again after installation. The following command can be used to enable this repo:

```
yum install epel-release
```

The following packages should be installed:

```
yum install make autoconf automake libtool gcc gcc-c++ libpcap-devel \
readline-devel jansson-devel libevent libevent-devel libtool openssl-devel \
bison flex gawk hwloc gettext texinfo kernel-devel kernel-headers rpm-build \
redhat-rpm-config graphviz python-devel python python-devel tcl-devel \
tk-devel texinfo dkms zip unzip pkgconfig wget patch minicom libusb \
libusb-devel psmisc libnl3-devel libftdi pciutils
```

Error messages should be displayed if the packages cannot be installed. Should you nevertheless prefer to manually verify that the packages have been installed, enter

```
rpm --query --all
```

and verify that the package names are listed.

2.3 Installing Agilio OvS

To automatically install and configure the software, please complete the following steps:

1. All commands should be entered while logged in as root.
2. Transfer the latest software release archive file to the host and extract it. File names follow the pattern `agilio-ovs-2.2r*-yyyy-mm-dd-type.tar.gz`.
3. Change to the extracted directory and enter `make clean_install`. Installation is complete once the following message is displayed on screen:

```
*** Agilio OvS Software 2.2 Installation Complete!
    Build Number: 'build number'
```

4. If the user does not want all the files in the `/opt/netronome` directory to first be removed, the `make install` target should rather be used.

5. After the installation is complete, the user will be requested by means of a message displayed on the console to either power cycle or reboot the host system. Depending on which platform is being used, only one of these tasks will be requested.

**Note**

The `make clean_install` command will remove all the files in the installation directory /`opt/netronome` before commencing with the installation.

2.3.1 Experimental Agilio OvS Contrack Version

The Agilio OvS package includes an experimental Agilio OvS Contrack version. In order to install the Contrack version of the software, the `make install` or `make clean_install` steps described above, should be replaced with `make install_contrack` and `make clean_install_contrack` respectively.

The basic usage for this version of the software is the same as the standard Agilio OvS software version, however not all the features in the standard version is available in the Contrack version. For usage information about the Contrack specific features, please refer to the appropriate User Guide or contact Netronome Support.

**Note**

The Contrack version of the software is in an experimental state which implies that this is not a production version yet. Customers can evaluate this software for deployment planning purposes, however bugs are expected at this stage. Please stay in close synchronization with Netronome support.

2.4 Starting and Stopping the Software

The following commands must be entered as root.

After installation, the software can be started using the following command:

```
/opt/netronome/bin/ovs-ctl start
```

Configuration variables taken into account at startup can be set in the `/etc/netronome.conf` file. Refer to the User's Guide for more information.

The software can be stopped using the following command:

```
/opt/netronome/bin/ovs-ctl stop
```

Refer to the User's Guide and Open vSwitch documentation to configure the system from this point.

2.5 Backing Up and Restoring Configuration Files

To back up the configuration of the software, the following file needs to be preserved if it exists:

- `/etc/netronome.conf`

To restore the configuration from a backup, install the software as described above. Thereafter, replace the `/etc/netronome.conf` file from the backed up version. This file needs to be restored before the software is started.

Currently, there are no considerations to take note of to restore files to different versions of the software. If any particular considerations arise in the future, these will be mentioned in the release notes of the specific software build.

3. Usage Examples

3.1 Open vSwitch Forwarding

This section provides information and an example to fast track the setup of a simple Open vSwitch configuration on the Agilio OvS software. Refer to the User's Guide for more detailed information.

In order to configure this feature, one must:

1. Start the Agilio OvS software.
2. Configure OpenFlow based rules via Open vSwitch (OvS).

One configures OvS by adding the "representative netdev" corresponding to each physical port or VF to the OvS bridge. The representative netdevs are created automatically when the Agilio OvS software starts. The representative netdevs for physical ports are named:

```
sdn_pX
```

where x is a sequential number starting at 0. The representative netdev for VF N on NFP PCIe unit M is named:

```
sdn_vM.N
```

The representative netdevs can be used to obtain statistics and link state of the physical or virtual port it corresponds to. Standard Linux tools such as `ifconfig`, `ip` and `ethtool` can be used for this purpose.

3.1.1 Configuration Example

All commands provided in this example must be entered as root. This example illustrates a simple forwarding configuration where traffic is forwarded from one physical port directly to the other and vice versa. The corresponding representative netdevs are `sdn_p0` and `sdn_p1`. If one wants to use VFs for such an example, the VF needs to be bound to either the Netronome netdev driver or the Netronome DPDK driver. Refer to the User's Guide for more details on using VFs.

Start the Agilio OvS software with the following command:

```
/opt/netronome/bin/ovs-ctl start
```

To configure the bridge and ports in OvS, the following commands can be executed:

```
ovs-vsctl add-br br0 -- set Bridge br0 protocols=OpenFlow13 -- set-fail-mode br0 standalone
ovs-vsctl add-port br0 sdn_p0 -- set Interface sdn_p0 ofport_request=1
ovs-vsctl add-port br0 sdn_p1 -- set Interface sdn_p1 ofport_request=2
ovs-ofctl -O OpenFlow13 add-flow br0 in_port=1,actions=output:2
ovs-ofctl -O OpenFlow13 add-flow br0 in_port=2,actions=output:1
```

This is a very trivial OvS configuration example. Refer to the online OvS documentation for more details on the commands used and the extent of the configuration options available.

4. Uninstalling Agilio OvS Software



Warning

Back up all configuration files, log files, software, or other files you wish to preserve before entering the following commands!

To uninstall Agilio OvS software, and other Netronome supplied software, enter:

```
dpkg --purge nfp-bsp nfp-bsp-dkms  
rm -rI /etc/netronome.conf /opt/netronome
```

Third party software installed during the Agilio OvS installation, e.g. Open vSwitch and libfluid, will still be present in the /usr directory of the system.

Note that it is not required to uninstall Agilio OvS before upgrading to a more recent version. However, when downgrading, it is recommended to uninstall the current version of the Agilio OvS software first.

5. Technical Support

To obtain additional information, or to provide feedback, please email <support@netronome.com> or contact the nearest **Netronome** technical support representative.

5.1 Related Documents

Descriptive Name	Description
Netronome Network Flow Processor: Agilio OvS 2.2 Getting Started Guide	A guide to new users of Netronome's Agilio OvS software.
Netronome Network Flow Processor: Agilio OvS 2.2 Programmer's Reference Manual	A reference for programming and system design using the Agilio OvS software.
Intelligent Server Adapters: Hardware User Manual	Contains summary information on the Netronome Intelligent Server Adapter (ISA) PCIe card including card physical descriptions.
Netronome Network Flow Processor: Datasheet	Contains summary information on the Netronome Network Flow Processor NFP including a functional description, signal descriptions, electrical specifications, and mechanical specifications.
Netronome Network Flow Processor: Databook	Contains detailed reference information on the Netronome Network Flow Processor NFP.
Netronome Network Flow Processor: Development Tools User's Guide	Describes Programmer Studio and the development tools that can be accessed through Programmer Studio.
Netronome Network Flow Processor: Network Flow Assembler System User's Guide	Describes the syntax of the NFP's assembly language, supplies assembler usage information, and lists assembler warnings and errors.
Netronome Network Flow Processor: Microengine Programmer's Reference Manual	A reference for microcode programming of the Netronome Network Flow Processor NFP.
Netronome Network Flow Processor: Network Flow C Compiler User's Guide	Presents information, language structures and extensions to the language specific to the Netronome Network Flow C Compiler for Netronome NFP.
Netronome Network Flow Compiler LibC: Reference Manual	Specifies the subset and the extensions to the language that support the unique features of the Netronome Network Flow Processor NFP product line.
Open vSwitch Software Documentation	Agilio OvS software offers acceleration of Open vSwitch software. Refer to http://openvswitch.org/ for more details on Open vSwitch.
OpenFlow Specification	Open vSwitch (which is accelerated by Agilio OvS software) is an OpenFlow switch implementation. Refer to https://www.opennetworking.org/sdn-

Descriptive Name	Description
	resources/openflow for more details on this specification.
Data Plane Development Kit Documentation	DPDK related documentation is available at http://dpdk.org .