NETRONOME

Network Flow Processor 6xxx:

Debug Server User's Guide

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2018-10-09 03:57:25

docrev: 5e3413e9ca50:161

buildno: 3161

swrev: 0.01

Product code
030-00025-000

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Revision History

Date	Revision	Description
06 August 2014	001	First draft.

Table of Contents

1. Introduction

1.1 Overview

This manual is a User's Guide to the NFP-6xxx Debug Server. Debug Server allows NFP Programmer Studio to connect to a target hardware platform and perform debugging. From a platform point of view, the debug server uses the underlying NFP BSP APIs to connect to the hardware and is considered as an application of those APIs. Please refer to the *NFP-6xxx SDK Development Tools User's Guide* for more information on how to use Programmer Studio for hardware debugging.

1.2 Related Documentation

Descriptive Name	Description
Netronome NFP Board Support Package User's Guide	Contains a high-level description of the hardware for the Customer Development Platform and includes setup and configuration information.
Netronome NFP ARM and PCIe Programmer's Reference Manual	Provides a guide to software running on the NFP ARM and also controlling the NFP via the PCIe bus.
Netronome Network Flow Processor 6xxx: Databook	Contains detailed reference information on the Netronome Network Flow Processor NFP-6xxx.
Netronome Network Flow Processor 6xxx: Microengine Programmer's Reference Manual	Provides a reference for microcode programming of the Netronome Network Flow Processor NFP-6xxx.
Netronome Network Flow Processor 6xxx: Development Tools User's Guide	Reference for NFP network processor development tools.

1.3 Acronyms

Acronym	Description
ARM	ARM Holding plc
BSP	Board Support Package
CDP	Customer Development Platform
CPP	Command/Push/Pull bus
IA	Intel Architecture
NFP	Network Flow Processor
PCIe	PCI Express
RPC	Remote Procedure Call

2. Software Installation and Setup

Debug server provides hardware debugging in cooperation with Netronome Programmer Studio (PS or SDK). It can be installed and executed on an IA host with an NFP device connected via PCIe. A single Programmer Studio instance can connect to the server and the server requires non-interfering control over the hardware, otherwise the results will be undefined. It is also possible to interact with debug server with the client examples and libraries that are packaged with the server.

2.1 Requirements

The current release of Debug Server has following requirements:

- Programmer Studio version 5.1.0 or above. All debugging access to Debug Server occurs from Programmer Studio.
- BSP version 2014-10-01 or above.

2.2 Installation and Running on x86 Host System

To use Debug Server on an x86 host, the server must be built from sources on the system. The NFP BSP must be installed.

Note

Make sure the NFPBSP is in a proper state for builds per the *NFPBSP Getting Started Guide* for the platform. This guide expects the BSP to be installed in the folder `/opt/netronome`

```
# export NETRONOME_DIR=/opt/netronome
# cd ${NETRONOME_DIR}
# tar zxf nfp-sdk-hwdbgsrv-VERSION.tgz
# cd nfp-sdk-hwdbgsrv
# BSPROOT=/opt/netronome
#     NFP_LIBS="${NETRONOME_DIR}/nfp-bsp-release/install" make server-all
```

2.2.1 Running the Debug Server

Separate instances of Debug Server can be run against multiple NFP targets if more than one NFP device is present (one instance per NFP). Use the -n option to select the NFP device to connect to (0 by default). Note that all running Debug Server instances must have their own server TCP port assigned. For example, to run against NFP device 1 in daemon mode on TCP port 20405, the following example shows a session:

```
# ./nfp-sdk-hwdbgsrv -h
usage : ./nfp-sdk-hwdbgsrv [options]
      build version: e159333e254d:60
      build date: Wed Aug  6 11:03:12 UTC 2014
      Where options are:
      -h              - this message
      -v              - print version
      -n [nfp]        - NFP device number (default: 0)
      -p [port]       - specify RPC port (default: 20406)
      -s [srcip]      - specify RPC source IP
      -D              - run as daemon
      -O              - stop MEs on startup
      -m [mes]        - list of MEs to debug
      -l [level]      - set log level (default: 4)
      -f [filename]   - log output to a file
      -S              - log output to syslog
      -A              - always log to stdout
      -P [pidfile]    - specify pidfile name
# ./nfp-sdk-hwdbgsrv -n 1 -D -p 20405
```

The server can be stopped by pressing Control-C or by typing 'q' into the server `stdin` prompt when running in foreground mode. In daemon mode the server can be stopped by using the `kill` command.

2.2.2 Installing and Running the Command-line Client Examples

Debug Server is packaged with client libraries and examples to aid those who may be unable to use Programmer Studio or who wish to develop their own interface to Debug Server. Note that you may need to install `libncurses-dev` and `libjansson-dev` packages on your system. To compile the client libraries and tools:

```
# cd nfp-sdk-hwdbgsrv-VERSION
# make client-all
```

The above step will generate the RPC libraries and command-line examples necessary to interact with Debug Server. An example `dbgcmd` will be compiled, which may be used to debug an ME that has already been loaded.

In order to use `dbgcmd` you must provide both the firmware list-file and elf file as command line arguments. Note that both the elf and the list-list must have been compiled with debug enabled. The following command illustrates how to run `dbgcmd`. Note that in order to direct the RPC libraries to the running Debug Server the environment variable NFP_RPC_URL_DEV0 should be set to the URL of the running server (see example below for URL format).

```
cd ${NETRONOME_DIR}/nfp-bsp-release/client
export NFP_RPC_URL_DEV0=tcp://10.0.0.5:20406
./dbgcmd -m i32.me1 -e test.elf -l test.list
```

The `dbgcmd` example uses vim-style key binding. Type ':h' for help.

3. Change Log

3.1 Initial release

- Initial release.

4. Technical Support

To obtain additional information, or to provide feedback, please use one of the following methods:

- Email <help@netronome.com> or visit https://help.netronome.com
- Email <support@netronome.com> (NFP32xx products)
- Contact the nearest **Netronome** technical support representative.