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Release Notes

SNFv5.3.2.11 Software Release

January 8, 2021

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Summary

The SNFv5.3.2.11 release is an aggregation of individual features, bug fixes, limitations, and some known issues. We recommend that users migrate to this release at their earliest convenience.

SNFv5.3.2.11 (SNF version 5.3.2.11) software now supports ARIA Cybersecurity Solutions Myricom 1G and 10G ARC Series E-Class adapters.

With this release, the functionality and performance that customers expect across IG and 10G adapter hardware in dual-port (2x1GE)/(2x10GE) and quad-port (4x1GE) (4x10GE) formats are offered. The additional functionality and features focus on improved CPU utilization, with the goal of further reducing CPU overhead.

For more information regarding specific functionality, refer to the *SNFv5.3.2.11 User Guide* (version 5.3.2.11).

Software Support Notice

- This release is compatible only with ARC Series E-class adapters (10G-PCIE3-8E-2S) and (10G-PCIE3-8E-4S)

- This release requires Firmware version 2.1.5 or later. See the *SNFv5.3.2.11 User Guide* for details on the various firmware types that are supported. The firmware must match the adapter model and transceiver type.

- Several models of 1G and 10G transceivers are supported. The firmware must match the adapter model and transceiver type. Refer to the *SNFv5.3.2.11 User Guide* for details.

- SNFv5.3.2.11 does *not* support Arista timestamping in this release.

- Linux Support

    o CentOS 8.0 is recommended.

    o CentOS 7.7 is supported.

    o Ubuntu 16 with Linux kernel version 4.4.0-143 and Ubuntu 18 are supported.

    o For non-RPM based Linux distributions, a `.tgz` installation package is provided with support up to Linux kernel version 5.5.

- Windows Support

    o Windows is *not* supported in this release.

For more information on this software release, refer to the *SNFv5.3.2.11 User Guide.*

Benchmarks

Operating Systems:	CentOS Linux release 7.6; Ubuntu 16 with Linux kernel 4.4.0-143; Ubuntu 18
ARIA Network Adapters:	ARC Series E-class adapters (10G-PCIE3-8E-2S) and (10G-PCIE3-8E-4S), Firmware Version 2.1.5 or later.
ARIA Driver:	SNF Release 5.3.2.11 release
Host 1:	i7-4790K Devil's Canyon Processor @ 4.00 GHz (Frequency scaled to 4.20 GHz), 4 cores, 2x8GB DDR3-1333, Asus H97I-PLUS motherboard
Host 2:	i7-4790K Devil's Canyon Processor @ 4.00 GHz (Frequency scaled to 4.20 GHz), 4 cores, 2x8GB DDR3-1333, Asus H97I-PLUS motherboard
PCIe:	Gen 3 (8GT/s) x8, (Gen 3 x16 capable slot)
Topology:	point-to-point (switchless)
Tuning:	Linux: tuned-adm network-latency Hyper-threading disabled CPU C-states disabled CPU Affinity set to specified core

Dual-port adapter: Displaying traffic throughput entering the interface

Command line:

> **Server A:**
> **$ /opt/snf/bin/tests/snf_simple_recv -t -n 50000000**

Output:

```
snf_recv ready to receive
11583584 pkts (695015040B) in 1.000 secs (11583387 pps), Avg Pkt: 60, BW (Gbps):  5.560
14881544 pkts (892892640B) in 1.000 secs (14880845 pps), Avg Pkt: 60, BW (Gbps):  7.143
14881536 pkts (892892160B) in 1.000 secs (14881075 pps), Avg Pkt: 60, BW (Gbps):  7.143
7653336 pkts (459200160B) in 1.000 secs (7653091 pps), Avg Pkt: 60, BW (Gbps):  3.673
59656 pkts (244350976B) in 1.000 secs (59655 pps), Avg Pkt: 4096, BW (Gbps):  1.955
303408 pkts (1242759168B) in 1.000 secs (303403 pps), Avg Pkt: 4096, BW (Gbps):  9.942
303416 pkts (1242791936B) in 1.000 secs (303409 pps), Avg Pkt: 4096, BW (Gbps):  9.942
303376 pkts (1242628096B) in 1.000 secs (303371 pps), Avg Pkt: 4096, BW (Gbps):  9.941


Packets received   in HW:        50000000
Packets reinjected,    app:         0
Packets reflected to netdev:        0
Total bytes received,  app:        7036000000 (6710 MB)
Total bytes received, HW: 7036102400 (6710 MB)
Average Packet Length:    140 bytes
Dropped, NIC overflow:    0
Dropped, ring overflow:   0
Dropped, bad:             0
```

Dual-port: Running the tcpdump tool to capture packets on any port

Command line:

> **Server A:**
>
> `$ sudo yum install -y tcpdump`
>
> `$ export LD_LIBRARY_PATH=/opt/snf/lib`
>
> `$ ldd /usr/sbin/tcpdump | grep libpcap`

Output:

```
libpcap.so.1 => /opt/snf/lib/libpcap.so.1 (0x00007f25d30a4000)
```

Command line:

> $ **sudo tcpdump -D |grep snf**

Output:

```
2.enp1s0f0 (Myricom snf0)
8.enp1s0f0-snf1 (Myricom snf1)
10.enp1s0f0-snf2 (Myricom snf2)
12.enp1s0f0-snf3 (Myricom snf3)
```

Command line:

> `$ sudo tcpdump -i enp1s0f0`

Output:

```
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp1s0, link-type EN10MB (Ethernet), capture size 65535 bytes
21:33:38.084991 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:39.084999 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:40.085015 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:41.085033 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:42.085035 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:43.085062 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:44.085074 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:45.085093 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:46.085093 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:47.085116 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
^C
10 packets captured
10 packets received by filter
0 packets dropped by kernel
```

Quad-port adapter: Displaying throughput for small messages

Command line:

>**Server A:**
>
>**$ /opt/snf/bin/tests/snf_simple_recv -t -n 100000000**

Command line:

>**Server B:**
>
>**$ /opt/snf/bin/tests/snf_pktgen -n 100000000 -s 60**

Output:

```
snf_recv ready to receive
12856360 pkts (771381600B) in 1.000 secs (12856090 pps), Avg Pkt: 60, BW (Gbps):  6.171
14881536 pkts (892892160B) in 1.000 secs (14880777 pps), Avg Pkt: 60, BW (Gbps):  7.143
14881552 pkts (892893120B) in 1.000 secs (14880897 pps), Avg Pkt: 60, BW (Gbps):  7.143
14881536 pkts (892892160B) in 1.000 secs (14880912 pps), Avg Pkt: 60, BW (Gbps):  7.143
14881544 pkts (892892640B) in 1.000 secs (14880978 pps), Avg Pkt: 60, BW (Gbps):  7.143
14881544 pkts (892892640B) in 1.000 secs (14881038 pps), Avg Pkt: 60, BW (Gbps):  7.143

Packets received   in HW:        100000000
Packets reinjected,    app:        0
Packets reflected to netdev:       0
Total bytes received,  app:       6000000000 (5722 MB)
Total bytes received, HW: 6000000000 (5722 MB)
Average Packet Length:    60 bytes
Dropped, NIC overflow:    0
Dropped, ring overflow:   0
Dropped, bad:            0
```

Quad-port adapter: Displaying throughput for large messages

Command lines:

> **Server A:**
>
> **$ /opt/snf/bin/tests/snf_simple_recv -t -n 1000000**
>
> **Server B:**
>
> **$ /opt/snf/bin/tests/snf_pktgen -n 1000000 -s 4096**

Output:

```
snf_recv ready to receive
295160 pkts (1208975360B) in 1.000 secs (295159 pps), Avg Pkt: 4096, BW (Gbps):  9.672
303408 pkts (1242759168B) in 1.000 secs (303398 pps), Avg Pkt: 4096, BW (Gbps):  9.942
303408 pkts (1242759168B) in 1.000 secs (303397 pps), Avg Pkt: 4096, BW (Gbps):  9.942


Packets received   in HW:        1000000
Packets reinjected,    app:        0
Packets reflected to netdev:       0
Total bytes received,  app:        4096000000 (3906 MB)
Total bytes received, HW: 4096000000 (3906 MB)
Average Packet Length:    4096 bytes
Dropped, NIC overflow:    0
Dropped, ring overflow:   0
Dropped, bad:             0
```

Quad-port: Running the tcpdump tool to capture packets on any port

Command line:

> **Server A:**
>
> **$ sudo yum install -y tcpdump**
>
> **$ export LD_LIBRARY_PATH=/opt/snf/lib**
>
> **$ ldd /usr/sbin/tcpdump | grep libpcap**

Output:

```
libpcap.so.1 => /opt/snf/lib/libpcap.so.1 (0x00007f25d30a4000)
```

Command line:

> **$ sudo tcpdump -D |grep snf**

Output:

```
2.enp1s0f0 (Myricom snf0)
8.enp1s0f0-snf1 (Myricom snf1)
10.enp1s0f0-snf2 (Myricom snf2)
12.enp1s0f0-snf3 (Myricom snf3)
```

Command line:

> **$ sudo tcpdump -i enp1s0f0**

Output:

```
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp1s0, link-type EN10MB (Ethernet), capture size 65535 bytes
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21:33:40.085015 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:41.085033 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
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21:33:44.085074 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:45.085093 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:46.085093 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
21:33:47.085116 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
^C
10 packets captured
10 packets received by filter
0 packets dropped by kernel
```

Command line:

Server B:

```
$ /opt/snf/bin/tests/snf_pktgen -n 10
```

New Features and Enhancements

(ID# 283) Added support for CentOS 8.3.

Bug Fixes

None

Limitations

1. (ID# 343) SNF: Port merge combinations: Port merging is only permitted between two ports. You can merge ports 0 & 1, or ports 2 & 3. You cannot merge other port combinations such as ports 1 & 2.

2. NUMA awareness: For best performance, all receive operations should be assigned to the single NUMA zone closest to the PCIe slot where the adapter is installed. Accessing from a socket CPU across QPI to a different NUMA zone may incur higher CPU utilization and dropped packets. The application must insure it runs from the NUMA zone CPUs where the rings/buffers are allocated to ensure no packet drops.

3. (ID# 80) The ARC series E-class adapters only support DAC cables that are three meters in length or less. For cable lengths longer than three meters, we recommend fiber and SFP+ transceivers.

4. (ID# 196) Running the `tcpdump -D` utility to display devices does not display the **snf0** device with **SNF_DEBUG_MASK=0**; however, the **snf0** device can still be referenced and works. If you set **SNF_DEBUG_MASK=3**, no devices are shown, but are still referenced.

5. (ID# 335) The FPGA firmware programmed on the board must match the 10G or 1G transceiver being used. The 1G firmware may work with 10Gb transceivers, but this is neither recommended nor supported. Run `myri_info` tool to verify the firmware type.

6. (ID# 254) The test program **snf/bin/tests/sniffex** is unsupported and will be removed in a future release.

Known Issues

1. (ID# 174) PF_RING port aggregation uses only one CPU and may drop packets.

2. (ID# 147, 153) Arista switch timestamping is not yet supported. There is no support for keyframes or timestamped packets.

3. (ID# 181) `myri_endpoint_info` does not show the physical receive endpoint in use by the current port. It only displays physical endpoints in use by other ports.

4. (ID# 387) You may receive FCS errors from a 1G firmware board when you **Ctrl-C** the receiving application.

5. (ID# 388) The `snf_basic_diags` utility may intermittently fail. The failure is due to a timing issue when using port merging.

6. (ID# 375) If a transmit application (one that invokes the SNF API operation `snf_inject_open()`) is terminated (**Ctrl-C** or kill), a server hang or lockup may occur. An error log in **dmesg** or **/var/log/messages** issues the warning: "`myri_snf WARN: SnifferTX still not flushed after 30 msec`". If the problem persists, reboot the server. If the application needs to terminate the Tx application in an ungraceful manner (`-C` or kill), we recommend your application handle signals and trap on the kill or terminate signal to ensure that the Tx application is shut-down appropriately (invoke `snf_inject_close`) to avoid potential lockup.

7. (ID# 442) Port merging on a four-port adapter with the 1G/10G firmware may result in merge fails for larger-sized packets (over 1500 bytes) with packet drops. An error log in **dmesg** or **/var/log/messages** issues the warning: "`myri_snf WARN: SnifferTX still not flushed after 30 msec`" when the receiver is terminated. If the problem persists, reboot the server.

8. (ID# 444) A segmentation fault may occur when you port merge between multiple adapters in the same server.

9. (ID# 374) `snf_replay -Z -N` (software pacing of playback) assumes microseconds and runs slow. These two flags should not be used together.

Technical Support:

If there are any problems installing or using ARIA Cybersecurity Solutions products, or if any bugs or possible enhancements are noticed, do not hesitate to contact ARIA Technical Support.

Contact Technical Support via the ARIA Customer Portal *
https://www.ariacybersecurity.com/support/downloads/

ARIA website:
https://www.ariacybersecurity.com/network-adapters/

ARIA email support at ARIA_support@ariacybersecurity.com

Before you contact our technical support staff, have the following information available:

- Your name, title, company name, phone number, and email address

- Operating system and version number

- Product name and release version

- Problem description

* Follow the instructions on the ARIA Customer Portal website to register for an ARIA Customer Support account