Release Notes

SNFv5.3.2.7 Software Release
February 21, 2020

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Summary

The SNFv5.3.2.7 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.

SNFv5.3.2.7 (SNF version 5.3.2.7) 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 SNFv5.3.2.7 User Guide (version 5.3.2.7).
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 SNFv5.3.2.7 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 SNFv5.3.2.7 User Guide for details.

- SNFv5.3.2.7 does not support Arista timestamping in this release.

- Linux Support
  - CentOS 8.0 is recommended.
  - CentOS 7.7 is supported.
  - Ubuntu 16 with Linux kernel version 4.4.0-143 and Ubuntu 18 are supported.
  - For non-RPM based Linux distributions, a .tgz installation package is provided with support up to Linux kernel version 5.5.

- Windows Support
  - Windows is not supported in this release.

For more information on this software release, refer to the SNFv5.3.2.7 User Guide.
## Benchmarks

<table>
<thead>
<tr>
<th>Operating Systems:</th>
<th>CentOS Linux release 7.6; Ubuntu 16 with Linux kernel 4.4.0-143; Ubuntu 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARIA Network Adapters:</td>
<td>ARC Series E-class adapters (10G-PCIE3-8E-2S) and (10G-PCIE3-8E-4S), Firmware Version 2.1.5 or later.</td>
</tr>
<tr>
<td>ARIA Driver:</td>
<td>SNF Release 5.3.2.7 release</td>
</tr>
<tr>
<td>Host 1:</td>
<td>i7-4790K Devil's Canyon Processor @ 4.00 GHz (Frequency scaled to 4.20 GHz), 4 cores, 2x8GB DDR3-1333, Asus H97I-PLUS motherboard</td>
</tr>
<tr>
<td>Host 2:</td>
<td>i7-4790K Devil's Canyon Processor @ 4.00 GHz (Frequency scaled to 4.20 GHz), 4 cores, 2x8GB DDR3-1333, Asus H97I-PLUS motherboard</td>
</tr>
<tr>
<td>PCIe:</td>
<td>Gen 3 (8GT/s) x8, (Gen 3 x16 capable slot)</td>
</tr>
<tr>
<td>Topology:</td>
<td>point-to-point (switchless)</td>
</tr>
</tbody>
</table>
| 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
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:

<table>
<thead>
<tr>
<th>Received Packets</th>
<th>Throughput (pps)</th>
<th>Average Packet Length</th>
<th>Total Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>12856360</td>
<td>12856090</td>
<td>60</td>
<td>6000000000</td>
</tr>
<tr>
<td>14881536</td>
<td>14880777</td>
<td>60</td>
<td>6000000000</td>
</tr>
<tr>
<td>14881552</td>
<td>14880897</td>
<td>60</td>
<td>6000000000</td>
</tr>
<tr>
<td>14881536</td>
<td>14880912</td>
<td>60</td>
<td>6000000000</td>
</tr>
<tr>
<td>14881544</td>
<td>14880978</td>
<td>60</td>
<td>6000000000</td>
</tr>
<tr>
<td>14881544</td>
<td>14881038</td>
<td>60</td>
<td>6000000000</td>
</tr>
</tbody>
</table>

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
21:33:38.084991 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
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21:33:40.085015 IP 0.0.0.0.dec-notes > 0.0.0.0.dec-notes: UDP, length 18
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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

Command line:

Server B:

$ /opt/snf/bin/tests/snf_pktgen -n 10
New Features and Enhancements

(ID# 255) Added the Linux Standard Base (LSB) header to the systemctl script myri_start_stop.

Bug Fixes

(ID# 258) Added support for Linux kernel versions up to 5.5.

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/sniff0 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