Myricom Sniffer10G with Myricom ARC Series SmartNIC

*Zero-loss packet processing, minimal CPU overhead,
and open source application support*

Myricom® Sniffer10G technology is a tightly integrated combination of FPGA firmware and software libraries designed to implement pure packet capture, with the flexibility to configure advanced functions so they match application needs and perform efficiently, leaving the vast majority of server cycles available for your application. It powers the Myricom ARC Series of network adapters for packet capture, enabling advanced networking devices and applications without unnecessary costs.

Features and Benefits

- Zero-loss packet capture across the full range of Ethernet packet sizes.

- Complete visibility into what's happening on your network, critical for advanced threat detection and network security.

- Nanosecond scale time stamping at full line rate.

- Ability to load balance packet delivery for up to 32 endpoints (e.g., CPU cores) based on user-defined rules.

- Support for libpcap, WinPcap, and PF_RING libraries and a full set of open source packet capture application tools.

- PPS and 10 MHz daisy chaining for multi-module time synchronization.

- Ability to also use the adapter as a 10G general purpose NIC on port zero. No need for additional NICs, for server application communication, which helps keep costs down.

Pure Packet Capture

Today's network adapters must deliver in three areas of performance for pure packet capture: (1) zero loss, (2) highly accurate timestamping, and (3) essential packet capture functions.

A government study from Sandia National Lab* documents Sniffer10G's zero loss performance across a range of Ethernet packet sizes. This uncompromising quality results from an architecture that bypasses the kernel and sends packets directly into user space, leveraging a 'ring' that can expand to any size. As an application developer, you define ring sizes to rate match with your application.

Along with zero loss, Sniffer10G meets current network requirements by supporting packet capture and timestamping at line rate, up to the maximum possible rate of 14.8 million packets per second on each 10GbE line. The timestamping is also extremely accurate; ARC Series adapters contain high quality clock crystals, and users requiring extraordinary accuracy can connect to an atomic clock.

Sniffer10G also provides essential packet capture functions, including time-based merge, filtering, and load balancing. These functions can all be implemented with flexible application control using the Sniffer10G API or one of the industry standard libraries: libpcap, WinPcap or PF_RING.

Pure Package Capture
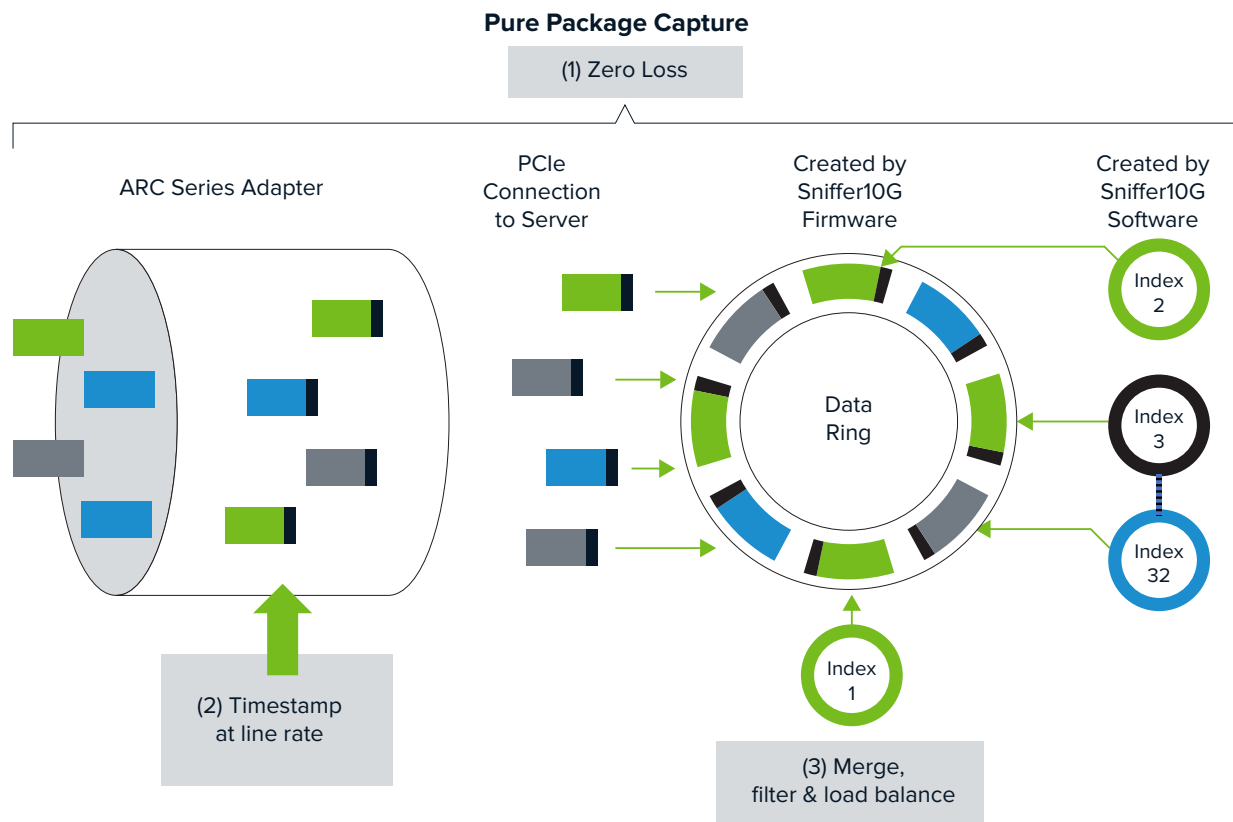
Combining Cost-effectiveness, High Functionality, and Strictly Limited Server Impact

The Myricom ARC Series network adapters are built to deliver extensive application flexibility while leaving the vast majority of server cycles available for your application. This means applications will benefit from full user space access to all incoming packets without requiring intervention from the OS, while packets requested by the Sniffer10G API are optimized to enhance performance. Additionally, a cost-effective design approach balances feature implementation across software and hardware. For example, software has the option of using industry-standard libraries (libpcap, WinPcap, or PF_RING) or the Sniffer10G API.

Flexible Multi-core Application Support

Using its flexible partitioning capability, Sniffer10G can engage all CPU cores in analyzing packets. Incoming TCP and UDP packet flows can be directed to multiple applications simultaneously, with each application controlling one or more cores. The Myricom adapter allows all applications to process the same packets and frees up the packets only when every application has stopped using them. Plus, using technology exclusive to ARIA Cybersecurity Solutions, any application can be supported with its own specific data flow partitioning scheme.

Application developers can partition the packet flow across as many as 32 rings using pre-built rule sets or implement specific user-defined rules with the Sniffer10G API. This API allows developers to address application needs with partitioning models based on virtually any criteria. With this capability, data flows can be balanced across multiple cores so each one analyzes an equal portion of incoming traffic. Developers can leverage user-defined rules from an application compiled to use the standard libpcap library. For applications that require deep packet inspection (DPI), this approach can reduce the processing time constraints under high packet rate loads. Your development team can also access the complete Berkeley Packet Filter (BPF) language, unlike other adapters on the market that limit filters to a specified set of schemes.

Enhanced Timing Features

Sniffer10G's integration with the ARC Series adapter hardware enables further flexibility with a set of advanced timing features, including:

- **Timing synchronization**: PPS and 10 MHz connections are available (not on C-Class) to enhance timestamp accuracy by linking to external oscillators or GPS devices. One version of the ARC adapters offers an enhanced capability supporting ±500 picosecond accuracy.

- **PPS and 10 MHz daisy chaining**: Used for external time synchronization as well as synchronization across multiple modules for some adapters. Daisy chaining offers a straightforward way to enhance timing accuracy for applications with complex configurations.

- **Support for Arista Networks DANZ timestamping**: Arista switches can optionally add timestamps to packet traffic flowing through the switch, using proprietary extensions to the IP standard that Sniffer10G software can decode. This allows applications to use the time packets entered a local network rather than the time they enter the network adapter.

Comprehensive support for common industry software

Sniffer10G is capable of supporting open source packet capture application tools. Some examples of tested applications include:

1. The standard Linux utility Tcpdump
2. Wireshark network protocol analyzer
3. Zeek network intrusion detection system
4. Snort intrusion prevention systems
5. Suricata network intrusion detection and security monitoring
6. PF_RING™ packet capture network socket, ported to run above the Sniffer10G API
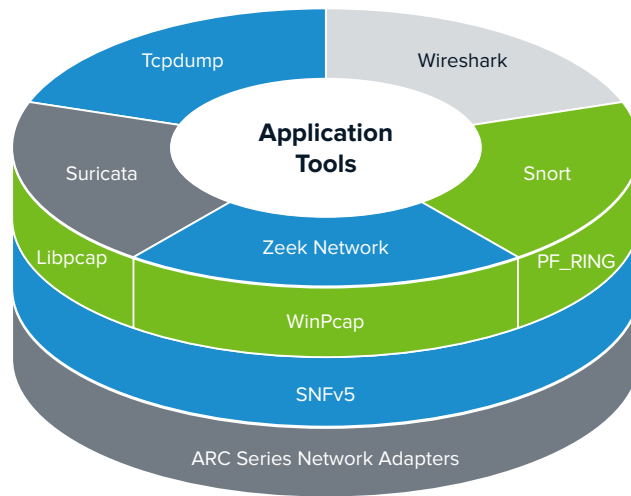
Deployment options that work best for you

Sniffer10G technology powers the Myricom ARC Series network adapters, delivering pure packet capture capability with zero loss, highly accurate timestamping at full line rate speeds and critical application support functions, including time-based merge, filtering, and load balancing. Application developers can use Sniffer10G's unique capabilities to partition a data flow across up to 32 rings based on virtually any criteria.

Two of our ARC Series product classes (our C and E Classes) are designed to offer a selection of features, functions, and capabilities that's right for your objectives.

The Myricom ARC C-Class provides a number of significant benefits and capabilities:

- Scales applications to work on multiple cores using built-in or user-provided algorithms

- No packet drops, even with extreme packet test sequences

- Limited CPU overhead, delivering a CPU "frequency boost"

- Packet replication provides the ability to send the same packets into multiple applications without actually duplicating the packet data

- Creates time stamps on every packet with additional support for Arista switch time stamps

- Works under a libpcap interface, PF_RING, or using the Sniffer10G API

- Plug-ins for many popular open source applications, making the C-Class the most popular network adapter in those open source communities

- Programmable 10G packet generator to the host or to the network

- Replay captured traffic for analysis

- Operate simultaneously as a standard NIC for those applications that do not require packet capture
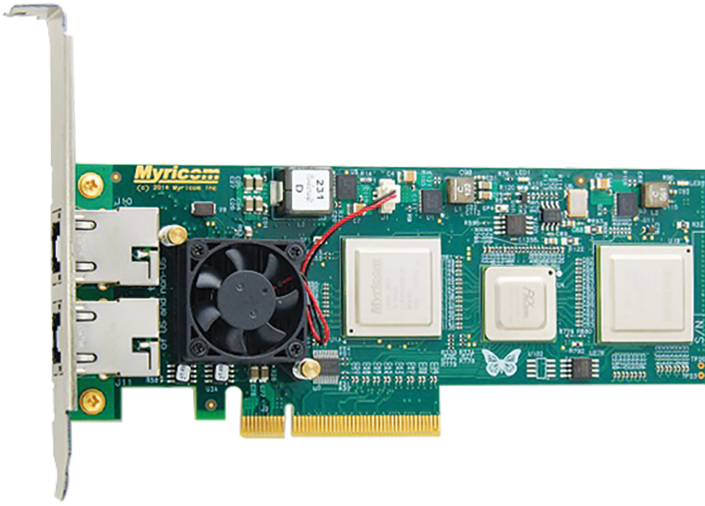
C-Class

Features

- Industry's lowest cost pure packet capture device based upon the proven Myricom LANai ASIC

- Available in low-profile PCIe, and PC/104 form factors

- One or two 10G ports in either SFP+ or 10GBASE-T or XFP or CX4, the broadest range of 10G options on the market
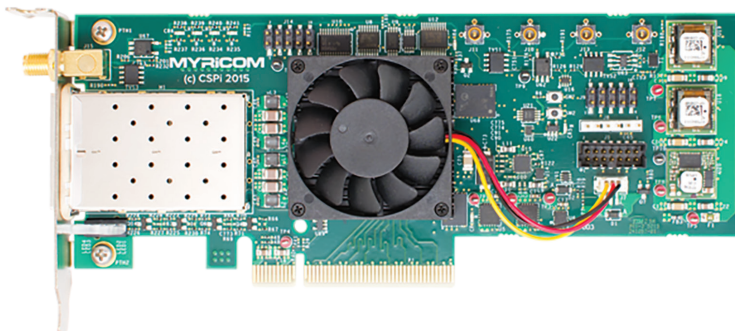
The Myricom ARC E-Class provides all the same functionality found in the C-Class, as well as the following:

- Off-loading for scaling, including parsing capabilities for tunneling protocols like GTP/GRE, as well as port merging

- Extremely accurate timestamps and replay of packet recordings

- Capture and send malformed or bad packets, which is useful for network debugging and test equipment

E-Class

Features

- Very accurate time stamps as well as inputs for 1 PPS and 10 Mhz timing signals

- FPGA to enable a stream of future enhancements

- Two or four 1 G or 10G ports using SFP+ cages (for bandwidths higher than 25Gbit, we recommend using a broker to load balance between ARC adapters)

SPECIFICATIONS

	ARC C	ARC E
Dimensions	2.7" x 6.6"	2.7" x 6.6" (dual) 4.2" x 6.6" (quad)
Bus interface	PCI Express Gen 2, 8 lanes wide (dual port adapters) PCI Express. Gen 1, 8 lanes wide (single port adapters)	PCI Express Gen 3, 8 lanes wide
Form Factor	low-profile PCI Express x8 add-in cards that ship with a standard height faceplate installed; and a low profile faceplate in the box.	Dual port low-profile PCI Express x8 add-in cards that ship with a standard height faceplate installed; and a low profile faceplate in the box. Quad port is full height PCI Express x8 add-in cards.
Electrical power	14.5W - 17.7W, Dual Port Adapters	18 W - dual port adapter 24W - quad port adapter
Cooling Requirements	It is recommended that adapters be installed into servers that provide some air flow over the PCIe slots .Use in an office or computer room environment.	It is recommended that adapters be installed into servers that provide some air flow over the PCIe slots .Use in an office or computer room environment.
Cooling Options	Passive cooling / Active cooling	Active cooling
Operating Temperature	0-55 deg C (100 LFM min)	0-55 deg C (100 LFM min)
Storage Temperature	-40 to 70 deg C	-40 to 70 deg C
Storage Humidity	5% to 90% non-condensing	5% to 90% non-condensing
Processor	LANai ASIC (dual)	FPGA
Hardware Acceleration	N/A	N/A
Memory	2 MB NOR Flash	No user programmable memory
Network Connectivity	2x10 Gb Ethernet, SFP+; 10GBASE-T, XFP, CX4	2x10 GB Ethernet, SFP+; 10GBASE-T
Software Support	Software available for Linux (CentOS, RHEL and Ubuntu) and Windows. Supports libpcap (Linux) and winpcap (Windows) libraries. Software provides support for RSS (receive side scaling), port merging of ethernet packets, pcap replay	Software available for Linux (CentOS, RHEL and Ubuntu) and Windows. Supports libpcap (Linux) and winpcap (Windows) libraries. Software provides support for RSS (receive side scaling), port merging of ethernet packets, pcap replay
SW Version supported	V3 – SNF and ethernet driver	V3 – SNF and ethernet driver
Security	N/A	N/A
Throughput	2x10Gb/s	2x10Gb/s (dual) 4x10Gb/s (quad)
Timestamp (if applicable)	+/- 5 us accuracy	+/- 100 ns accuracy
Regulatory approvals, compliance	TAA, RoHS (Reduction of Hazardous Substances). EMI and EMC, Class A USA, Canada, and Europe.	RoHS (Reduction of Hazardous Substances). EMI and EMC, Class A USA, Canada, and Europe.

SPECIFICATIONS

	ARC C	ARC E
Country of Origin	USA	USA
Warranty	Three year for hardware defects and 90 days for software defects. 90 days of "getting started" telephone and email support, as well as any software upgrades shipped within that window. Refer to the support datasheet for options extending the 90-day window	One year for hardware defects and 90 days for software defects. 90 days of "getting started" telephone and email support, as well as any software upgrades shipped within that window. Refer to the support datasheet for options extending the 90-day window
ORDER DETAILS		
	10G-PCIE2-8C2-2S-SYNC+SNF3 Dual Port, 10Gb/s Ethernet, PCI Express Gen2 x8 timecode-enabled adapter with SFP+ sockets for 10GBase-SR, LR, and LRM modules, Direct Attach Copper and EOE Cables (transceiver, cable not included) with Sniffer10Gv3. 10G-PCIE2-8C2-2S+SNF3 Dual Port, 10Gb/s Ethernet, PCI Express Gen2 x8 adapter with SFP+ sockets for 10GBase-SR, LR, and LRM modules, Direct Attach Copper and EOE Cables (transceiver, cable not included) with Sniffer10Gv3.	10G-PCIE3-8E-2S+SNF Dual SFP+ board using K35 FPGA with SNF license. Full height bracket pre-installed. 10G-PCIE3-8E-4S+SNF Dual SFP+ board using K35 FPGA with SNF license. Full height bracket pre-installed.
Cables and Transceivers	Refer to the Myricom Accessories datasheet for compatible cables and tranceivers.	

* Comparing Ring-buffer–based Packet capture solutions - SAND2015-9378R
Sandia National Laboratory

Contact Us to Schedule a Technical Demonstration or Arrange an Evaluation ✉ **ARIAsales@ariacybersecurity.com**

ABOUT ARIA CYBERSECURITY SOLUTIONS

ARIA Cybersecurity Solutions recognizes that better, stronger, more effective cybersecurity starts with a smarter approach. Our solutions provide new ways to monitor all internal network traffic, while capturing and feeding the right data to existing security tools to improve threat detection and surgically disrupt intrusions. Customers in a range of industries rely on our solutions each and every day to accelerate incident response, automate breach detection, and protect their most critical assets and applications. With a proven track record supporting the Department of Defense and many intelligence agencies in their war on terror, and an award-winning portfolio of security solutions, ARIA Cybersecurity Solutions is committed to leading the way in cybersecurity success.

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