

SmartNICs for Reconfigurable Computing

NAPATECH SOFTWARE SUITE

FAST, EASY INTEGRATION AND ON-THE-FLY CONFIGURATION

Napatech Software Suite provides a well-defined application programming interface as well as support for the well-known, open-source interface libpcap and the Windows variant called WinPcap. This allows programmers to quickly integrate Napatech SmartNICs for network monitoring and security applications into their system.

In addition, Napatech Software Suite provides advanced features for data sharing and merging supporting multi-SmartNIC and multi-application integration.

A common API is provided for all Napatech SmartNICs allowing plug-and-play operation.

An intuitive, easy-to-learn, yet powerful programming language is also provided to allow dynamic, on-the-fly configuration of filtering and intelligent multi-CPU distribution on Napatech SmartNICs.

FEATURE HIGHLIGHTS

- NTAPI: Common API for all Napatech SmartNICs
- Simple programming interface allowing fast integration
- Zero copy transfer of data to host
- Zero copy transfer of data between SmartNICs
- Packet-based interface providing abstraction of hardware details
- Advanced features including:
 - Data merging of port data from multiple SmartNICs into a single data stream
 - Data sharing of captured data between multiple customer applications without the need for replication

NAPATECH-SUPPORTED APPLICATIONS

Napatech Software Suite is ideal for applications that require multiple high-speed ports and SmartNICs. Data merging functionality is provided to support accurate merging of data from multiple ports and SmartNICs into a single stream for analysis.

Data sharing functionality allows multiple applications to be hosted on the same server with data distributed to each application using the Napatech SmartNICs' intelligent flow distribution capabilities.

The ability to support all types of Napatech SmartNICs with a single API allowing OEM vendors to support a range of product variants using a single application development effort.

ONE SOFTWARE SUITE FOR SEAMLESS INTEGRATION AND MIGRATION

Our comprehensive software suite ensures that our SmartNICs are widely compatible and easy to integrate.

From support for all major operating systems, to the common API for all products, we keep your learning curve to a minimum and provide an efficient migration path for next-generation network speeds. This can help you reduce time-to-market for new products, while reducing risk.

Software development tools
Napatech provides a number of command line tools and application example source code to be used by customers for evaluation, prototyping, diagnostics or getting a head start in application software development.

Customer Applications
Our customers can stay ahead of the data growth curve by creating high performance network management and security applications, based on Napatech SmartNICs.

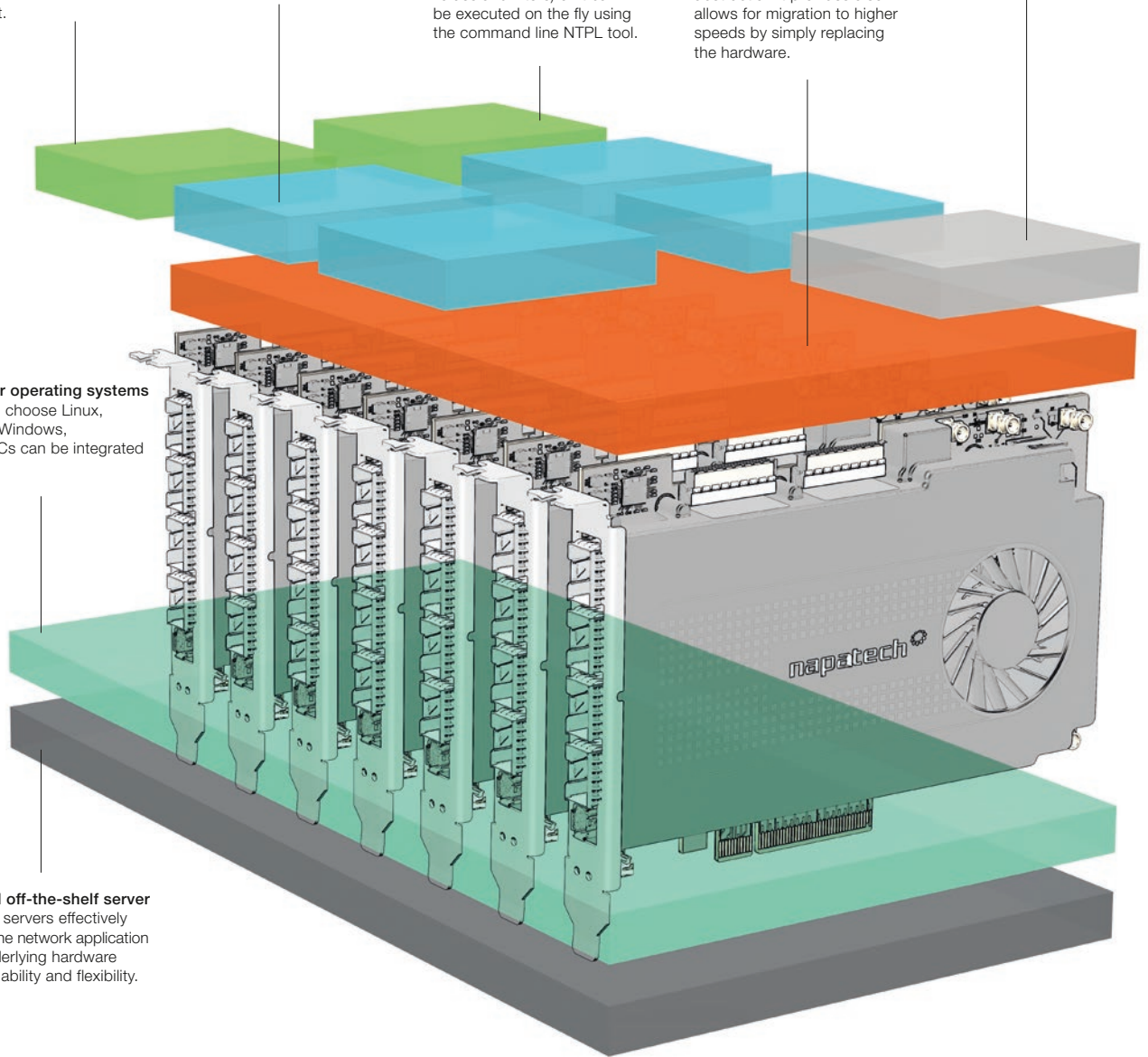
On the fly reconfiguration of features and capabilities
Designed for ease-of-use, the Napatech programming language (NTPL) can be used within application software, in configuration scripts (for hash values and filters) or it can be executed on the fly using the command line NTPL tool.

One interface for quick and easy integration
We provide one application programming interface for all our SmartNICs to reduce integration time for new products. The hardware abstraction it provides also allows for migration to higher speeds by simply replacing the hardware.

3rd party software
A growing range of partners provide value adding applications

For all major operating systems
Whether you choose Linux, FreeBSD or Windows, our SmartNICs can be integrated seamlessly.

Commercial off-the-shelf server
Using COTS servers effectively de-couples the network application from the underlying hardware allowing scalability and flexibility.



APPLICATION PROGRAMMING INTERFACES

PACKET CAPTURE INTERFACES

The libpcap and WinPcap packet capture interfaces are widely used interfaces in open-source applications, such as Wireshark, Ethereal, TCPdump, TCPReplay and more. libpcap is available on Linux and FreeBSD and WinPcap is available on Windows. They provide excellent starting points for development of network monitoring and analysis appliances.

libpcap and WinPcap are supported by the NTAPI interface allowing existing implementations using libpcap or WinPcap to quickly use Napatech SmartNICs. The NTAPI provides additional features that are not available via the libpcap or WinPcap interfaces, but can be configured using the Napatech Programming Language (NTPL).

NAPATECH SOFTWARE SUITE NTAPI

Napatech Software Suite supports the Napatech Application Programming Interface (NTAPI), which is a packet-based interface designed to make programming and integration quicker and easier. While NTAPI is packet-based, it also supports a segment-based mode.

The NTAPI interface provides a hardware abstraction, so programmers do not need to know or manage details of the individual SmartNICs, which in turn reduces the complexity and potential for errors.

The NTAPI interface is thus ideal for system configurations where multiple SmartNICs are used. The SmartNIC ports can be treated individually or can be merged in groups, allowing more efficient data management and distribution.

COMPARING APPLICATION PROGRAMMING INTERFACES

libpcap and WinPcap are widely used interfaces, which makes integration of Napatech SmartNICs quick and easy. However, to fully benefit from the acceleration and off-load features provided by Napatech SmartNICs, it is recommended that the Napatech NTAPI interface is used. In addition, NTAPI provides a simple interface where many of the details are managed by Napatech Software Suite and multi-SmartNIC configurations are easily supported including extra features for data merging of multiple ports and data sharing between multiple host applications.

The following table provides a brief overview of the differences between the interfaces.

Feature	libpcap and WinPcap	libpcap and WinPcap with NTPL	Napatech Software Suite NTAPI
Full line-rate packet capture	✓	✓	✓
Full line-rate packet transmit	✓	✓	✓
Zero copy transfer to host (OS bypass)	✓	✓	✓
Zero copy transfer between SmartNICs			✓
Merging of port data from a single SmartNIC	✓	✓	✓
Merging of port data from multiple SmartNICs	✓	✓	✓*
Data sharing between multiple applications	✓	✓	✓
HW time stamp (4 ns resolution)	✓	✓	✓
Packet classification including tunneling support		✓	✓
Advanced filters		✓	✓
Packet coloring / tagging			✓
Hash key generation			✓
Intelligent multi-CPU distribution		✓	✓
IP fragment handling		✓	✓
Packet slicing		✓	✓
Time synchronization	✓	✓	✓
Statistics			✓

* Best performance

NAPTECH PROGRAMMING LANGUAGE (NTPL) PROGRAMMING LANGUAGE FOR RAPID CONFIGURATION

NTPL is an easy-to-understand text-based configuration language, which abstracts the details of SmartNIC hardware implementation from the application developer allowing faster code development.

The NTPL language can be used for configuration of features on the SmartNIC, such as filters, hash key generation, deduplication and local retransmit.

ON-THE-FLY CONFIGURATION

NTPL is designed for on-the-fly configuration of Napatech SmartNIC features. Commands can be sent using a tool provided by Napatech.

NTPL can also be used to configure filters when using a libpcap interface.

OPERATING SYSTEM SUPPORT

The following operating systems are supported by Napatech Software Suite.

	Versions	Napatech Software Suite
Linux	2.6.18 - 2.6.x 64-bit	✓
	3.0 - 3.19 64-bit	✓
	4.0 - 4.11 64-bit	✓
Windows	Server 2016 64-bit	✓
libpcap	1.6.2 1.7.3 1.8.1	✓
WinPcap	4.1.3	✓
DPDK	17.08	✓

Additional operating system support is constantly added. Contact your sales representative for more information on planned operating system support.

COMPANY PROFILE

Napatech helps companies to reimagine their business by bringing hyperscale computing benefits to IT organizations of every size. We enhance open and standard virtualized servers to boost innovation and release valuable computing resources that improve services and increase revenue. Our reconfigurable computing platform™ is based on a broad set of FPGA software for leading IT compute, network and security applications that are supported on a wide array of FPGA hardware designs.

Additional information is available at www.napatech.com

Napatech. RECONFIGURABLE COMPUTING

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