ALVEO™ U45N NETWORK ACCELERATOR

2x100G Datapaths for Custom Network Functions in the Data Center



OVERVIEW

Hyperscalers, cloud service providers, telecom operators, and enterprises with on-premise data centers are continually seeking to maximize network performance and utilization of existing infrastructure. In virtualized data centers, precious CPU cycles are often consumed on infrastructure management tasks instead of running application and client services. The compute burden becomes even more complex as infrastructure requirements change.

The Alveo U45N network accelerator provides hardware-adaptable acceleration at 2x100G line rate performance for custom datapaths-and networking functions in the data center. By leveraging the Vivado FPGA development flow, rich IP catalog, and "OpenNIC" open source reference design, developers can customize the platform for proprietary protocols, security policies, and new offloads to scale their infrastructure.

HIGHLIGHTS

Line-Rate Performance

- Datapath acceleration at 2x100G line rate
- Deterministic low latency for custom networking stacks

Hardware-Adaptable Acceleration for Custom Datapaths

- Over 1 million LUTs of FPGA fabric to build custom solutions
- Accelerate networking, security, and storage workloads on a single platform

Familiar Development for Hardware Designers

- Vivado™ Design Suite for RTL design and vast catalog of networking IP
- "OpenNIC" open source design with pre-built shell to jump-start development
- Support for network programming languages with Vitis™ Net compiler

KEY APPLICATIONS

INFRASTRUCTURE MANAGEMENT

- Multi-Tenant SDN
- Telemetry

NETWORKING

- Software-Defined Networking
- Virtual Switch (e.g., OVS)
- vRouter
- Load Balancing
- IPSEC

STORAGE

- NVMe-oF, NVMe/TCP
- Ceph
- Compression
- Encryption

SECURITY FEATURES

- Virtual Firewall
- Edge Gateway
- Intrusion Detection Systems (IDS)
- Intrusion Prevention Systems (IPS)

SPECIFICATION

FEATURES	
FPGA Device	• XCU26 device based on 16nm UltraScale+ architecture • 1,030k LUTs • 2,059k registers
On-Board Processor	• Discrete 16-core 64-bit Arm™ Cortex®-A72 at 2.0GHz • 8MB cache
Performance	• 200Gb/s Full Duplex Throughput
Network Interface	• 2x 100G QSFP28 • Direct-attach copper or optical transceiver
Host Interface	• PCIe® Gen4 x8 or Gen3 x16
On-Board Memory	• 2x 4GB x72 DDR4-2666 (to FPGA) • 1x 4GB x72 DDR4-266 (to Arm® Processor)
Form Factor	• Full-height, half-length, • Single slot
Power & Thermal	• Passive cooling • 75W TDP • Operating temperature: 30oC (86o F)
Product Number	• A-U45N-P08G-PQ-G

NEXT STEPS

- Learn more at www.xilinx.com/u45n
- Access OpenNIC open source reference design and resources at https://github.com/xilinx/open-nic
- Learn about Vitis Net to design using network programming languages
- Apply for Early Access program by contacting your sales representative or emailing dc_inquiries@amd.com

DISCLAIMERS

The information contained herein is for informational purposes only and is subject to change without notice. While every precaution has been taken in the preparation of this document, it may contain technical inaccuracies, omissions and typographical errors, and AMD is under no obligation to update or otherwise correct this information. Advanced Micro Devices, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this document, and assumes no liability of any kind, including the implied warranties of noninfringement, merchantability or fitness for purposes, with respect to the operation or use of AMD hardware, software or other products described herein. No license, including implied or arising by estoppel, to any intellectual property rights is granted by this document. Terms and limitations applicable to the purchase or use of AMD's products are as set forth in a signed agreement between the parties or in AMD's Standard Terms and Conditions of Sale.

COPYRIGHT NOTICE

© Copyright 2023 Advanced Micro Devices, Inc. All rights reserved. Xilinx, the Xilinx logo, AMD, the AMD Arrow logo, Alveo, Artix, Kintex, Kria, Spartan, Versal, Vitis, Virtex, Vivado, Zynq, and other designated brands included herein are trademarks of Advanced Micro Devices, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies. AMBA, AMBA Designer, ARM, ARM1176JZ-S, CoreSight, Cortex, and PrimeCell are trademarks of ARM in the EU and other countries. PCIe, and PCI Express are trademarks of PCI-SIG and used under license. PID2100167