

# Synopsys and Mellanox

EZChip, Now Part of Mellanox, Achieves First-Pass Silicon Success for NPS-400 Processor With Synopsys Solutions



“Building our NPS-400 400 Gb/s Network Processor on a new architecture required close collaboration with Synopsys. Synopsys’ high-quality products and expert services helped us to achieve first-pass silicon success.” —Erez Shaizaf, Vice President, Chip Design, Mellanox Technologies

## Business

Mellanox Technologies is a leading supplier of end-to-end Ethernet and InfiniBand intelligent interconnect solutions and services for servers, storage, and hyper-converged infrastructure. Mellanox solutions deliver data faster to applications, thereby increasing data center efficiency and unlocking system performance. Mellanox solutions provide the highest throughput and lowest latency to accelerate application runtime and maximize business results for the enterprise data center, Web 2.0, storage, network security, telecom and financial services markets.

## Challenges

- ▶ Introduce a new network processor architecture to meet stringent power and performance requirements
- ▶ Reduce integration risk with proven solutions
- ▶ Execute on schedule with a geographically diverse, limited in-house staff

## Synopsys Solutions

- ▶ [DesignWare® Interfaces, Processors, Embedded Memories and Logic Libraries](#)
- ▶ [PrimeTime Hyperscale](#) technology for hierarchical engineering change order (ECO) and timing signoff
- ▶ [Lynx Design System](#)
- ▶ [Synopsys Professional Services](#), including DDR and core hardening services

## Benefits

- ▶ Achieved first-pass silicon success for new network processing architecture
- ▶ Accelerated static timing analysis by 4X with smart hierarchical technology to target existing compute resources
- ▶ Met aggressive schedule with help from an experienced support team

*“Synopsys’ silicon-proven solutions enabled fast integration into our NPS-400 networking design, on-schedule tapeout, and first-silicon success.”—Erez Shaizaf, Vice President, Chip Design, Mellanox Technologies*

## Overview

EZChip, now owned by Mellanox, developed a new network processing architecture that merges network processing unit (NPU) performance with CPU flexibility and ease of programmability. The NPS-400 C-programmable packet processor offers 400 Gb/s throughput and supports all seven communication protocol layers with integrated traffic management to enable high-performance intelligent carrier routers, data center network equipment, and accelerate virtualized functions in emerging SDN and NVF networks.

With the explosion of big data, network processing is a highly competitive market segment, making it critical that EZChip achieve their stringent power, performance, area and time-to-market objectives. EZChip required a reliable vendor who could provide the products and services required to minimize their design and integration effort and help meet their design goals. EZChip selected Synopsys due to its portfolio of proven products and expert professional services. “A new architecture for a network processor is not a small idea, and we needed to find the right supplier to help bring it to reality,” said Erez Shaizaf, Vice President of Chip Design, Mellanox. “Working with Synopsys mitigated our design risk, avoided unnecessary complications of coordinating between multiple vendors, and helped us meet our power, performance and area targets.”

## Expert and Responsive Technical Support

With any new complex design, design and integration can be challenging. However, EZChip found Synopsys’ responsive, worldwide technical support and Synopsys Professional Services eased the implementation process and helped them to meet their schedules. “The complete model for Synopsys support is robust and was critical to the success of our project,” said Erez Shaizaf. “The accuracy and completeness of Synopsys’ product documentation, combined with our close collaboration with Synopsys’ ready-to-go support teams, helped ease the integration process. With our engineering teams distributed across multiple time zones, we found that the Lynx Design System provided the infrastructure we needed to manage our entire design process. We will consider Synopsys for future projects with the confidence that Synopsys will continue to meet our design and support requirements.”

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