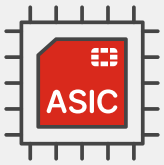
WHITE PAPER

The Benefits of Combining Custom ASICs with the Power of FortiOS

Executive Summary

In the fast-evolving cybersecurity landscape, organizations face increasing challenges from AI-led threats, new attack vectors, and a lack of resources to combat these risks effectively. Fortinet addresses these challenges by combining custom ASICs and the FortiOS operating system. Fortinet security processing units (SPUs), network processors, and content processors work in tandem with FortiOS to enhance speed, security, and energy efficiency. This synergy boosts the ability of FortiOS to deliver fast packet processing, cryptographic acceleration, and efficient content inspection while reducing power consumption.

By leveraging purpose-built hardware, Fortinet custom **application-specific integrated circuits** (ASICs) outperform traditional general-purpose processors and provide a performance advantage, reducing complexity, lowering costs, and enabling scalability. FortiOS ensures seamless integration across the entire network, cloud, and IoT environments, offering robust protection through unified management and a holistic approach. As a result, Fortinet's platform improves security performance and contributes to sustainability efforts by optimizing power efficiency and reducing the carbon footprint of large-scale deployments.



Scalability and performance: Fortinet custom ASICs deliver 17x faster firewall performance compared to leading standard CPUs, 3.5x faster next-generation firewall (NGFW) performance compared to leading standard CPUs to handle higher levels of traffic inspection to detect and block threats, and 32x faster encryption to protect sensitive data and secure virtual private networks.[1]

Power efficiency: Fortinet ASICs consume up to 90% less power than general-purpose CPUs, significantly lowering operational and total cost of ownership costs and contributing to sustainability goals.

Introduction

Cyberthreats are constantly evolving, increasing in scale and sophistication. Security teams face growing pressure to defend against these advanced threats while dealing with resource constraints. In this high-stakes environment, organizations require cybersecurity solutions that defend against today's AI-led cyberattacks and offer high-speed processing to keep up with modern threat dynamics.

Fortinet custom ASICs, such as the SPU and network processor unit, are designed to increase speed, scale, and efficiency. These specialized hardware components, developed specifically for Fortinet security solutions, play a pivotal role in enhancing the performance and price advantages of Fortinet products. Combined with the power of FortiOS, the Fortinet operating system, these custom ASICs deliver an unparalleled cybersecurity solution that balances performance, sustainability, and security.

Custom ASICs: Fortinet's Performance Differentiator

Fortinet custom ASICs are key components driving the company's leadership in the cybersecurity space. These processors, purpose-built for Fortinet devices, are designed to maximize performance, reduce latency, and minimize energy consumption. Notable models include:

- **FortiSP5:** A high-performance, energy-efficient System-on-a-Chip (SoC) that integrates network and content processing with two ARM CPUs. The SP5 powers the FortiGate 200G firewall model.
- **Network Processor NP7:** A specialized network processor that delivers ultra-high performance for firewalls, especially in large enterprises and hyperscale data centers. The NP7 enhances throughput for critical network functions.
- **Content Processor CP9:** Optimized for handling content-intensive tasks, such as deep packet inspection, SSL/TLS decryption, and threat intelligence, the CP9 improves system efficiency by offloading processing tasks from the main CPU.

FortiOS: The Unified Powerhouse

FortiOS is the backbone of the Fortinet Security Fabric. It consolidates security operations, offers holistic visibility, and simplifies the management of security policies across complex environments. Whether protecting cloud, hybrid, or IoT ecosystems, FortiOS enables streamlined management and enhanced protection.

Enhanced security features in FortiOS 7.6

The latest version, FortiOS 7.6, is optimized to work in synergy with Fortinet custom ASICs, delivering a range of advanced security features:

- **AI-powered threat detection:** FortiOS 7.6 leverages custom ASICs to accelerate AI-based threat detection, enabling the system to rapidly identify and block sophisticated threats, including ransomware and zero-day attacks.
- **Cloud security:** With integrated sandboxing and web security, FortiOS 7.6 ensures faster threat analysis and web filtering, both powered by Fortinet ASICs.
- **IoT security:** Device profiling and anomaly detection are enhanced by custom ASICs, protecting connected devices from unauthorized access.
- **Data loss prevention (DLP):** The FortiOS 7.6 DLP features are optimized for speed and accuracy, reducing latency while improving sensitive data detection through accelerated content processing.

Efficiency, Sustainability, and Scalability

Fortinet custom ASICs are designed for performance, efficiency, and sustainability. By reducing energy consumption, these processors minimize the environmental impact of network and data center operations. This power efficiency translates into lower operational costs and a reduced carbon footprint.

- **Power efficiency:** Fortinet ASICs are far more energy-efficient than traditional general-purpose processors.
- **Scalability:** Offloading computational tasks to custom ASICs allows FortiOS to handle larger workloads, scale more efficiently, and support expanding networks without performance degradation.

Conclusion

The combination of Fortinet custom ASICs and FortiOS creates a powerful and efficient cybersecurity solution that meets the modern demands of performance, scalability, and sustainability. By integrating specialized hardware with a unified operating system, Fortinet delivers higher performance, advanced security features, and cost efficiencies that benefit organizations of all sizes. As businesses continue to face increasingly sophisticated threats, Fortinet's approach ensures they have the tools and resources to secure their infrastructure effectively while contributing to a more sustainable IT environment.

[1] Security Brief Australia, "Fortinet announces latest breakthrough in ASIC tech," Feb 2023.

[2] Fortinet, "Don't Sacrifice Security for Performance: Discover Fortinet's Custom ASIC," Sept 26, 2024.

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