Solution Brief

# Bloombase Delivers AI-Powered Threat Detection and PQC Encryption

## Bloombase StoreSafe Storage Firewall, powered by Intel® Xeon® 6 processors, offers high-performance security for enterprise storage; tests show cryptographic read/write I/O advantages over previous-generation CPU

Today's enterprise data storage environment is defined by unprecedented complexity and scale, creating significant challenges for protection of data-at-rest against cyber-attacks and data leakage.

Organizations are contending with growth in data distributed across cloud platforms, managed service providers, and on-premises systems, making consistent and comprehensive security increasingly difficult to achieve.

The tools that protect these storage platforms need CPU performance to scale to process ever greater amounts of data coming from flash storage and ultra-high-speed networking. Adding to this uptick in data flow is the surge in AI. More data is generated and processed using AI, rapidly expanding in size to every enterprise and demanding new data protection techniques that are often overly complex and valuable to organizations. AI is also used by adversaries to devise attacks and threats to an enterprise's valuable assets.

"Harvest now, decrypt later" is a real data-theft tactic that counts on the emergence of crypto-relevant quantum computers (CRQC) to decipher encrypted information using encryption standards in use today.

These converging trends underscore the urgent need for a fundamentally new approach to safeguarding data—one that is agile, resilient, and built to address both today's cyber-threats and tomorrow's unknown attacks.

It is for these enterprises that Bloombase, an Intel® Industry Solutions Builders Partner, has created Bloombase StoreSafe Intelligent Storage Firewall. Bloombase has integrated and tested the software on servers powered by Intel® Xeon® 6 processors to demonstrate performance advantages over previous generation CPUs in mitigating the risks of malware, ransomware and data breach.

### Introducing Bloombase StoreSafe Intelligent Storage Firewall

Bloombase StoreSafe Intelligent Storage Firewall delivers AI-powered threat detection and response (TDR), continuous sensitive data protection, and application-transparent post-quantum cryptography (PQC) encryption security. The firewall supports all of the Federal Information Processing Standard (FIPS) PQC standards including FIPS 203, FIPS 204 and FIPS 205.

The storage firewall software is an agentless, turnkey encryption solution (see Figure 1) for a wide range of datacenter technologies and IT infrastructures. It is designed for high-speed, low-latency storage systems and services from edge computing, physical and virtual data centers, through hyperconverged infrastructure (HCI) and composable disaggregated infrastructure (CDI), to hyperscalers and the cloud, enabling organizations to lock down their crown-jewel data with state-of-the-art encryption.

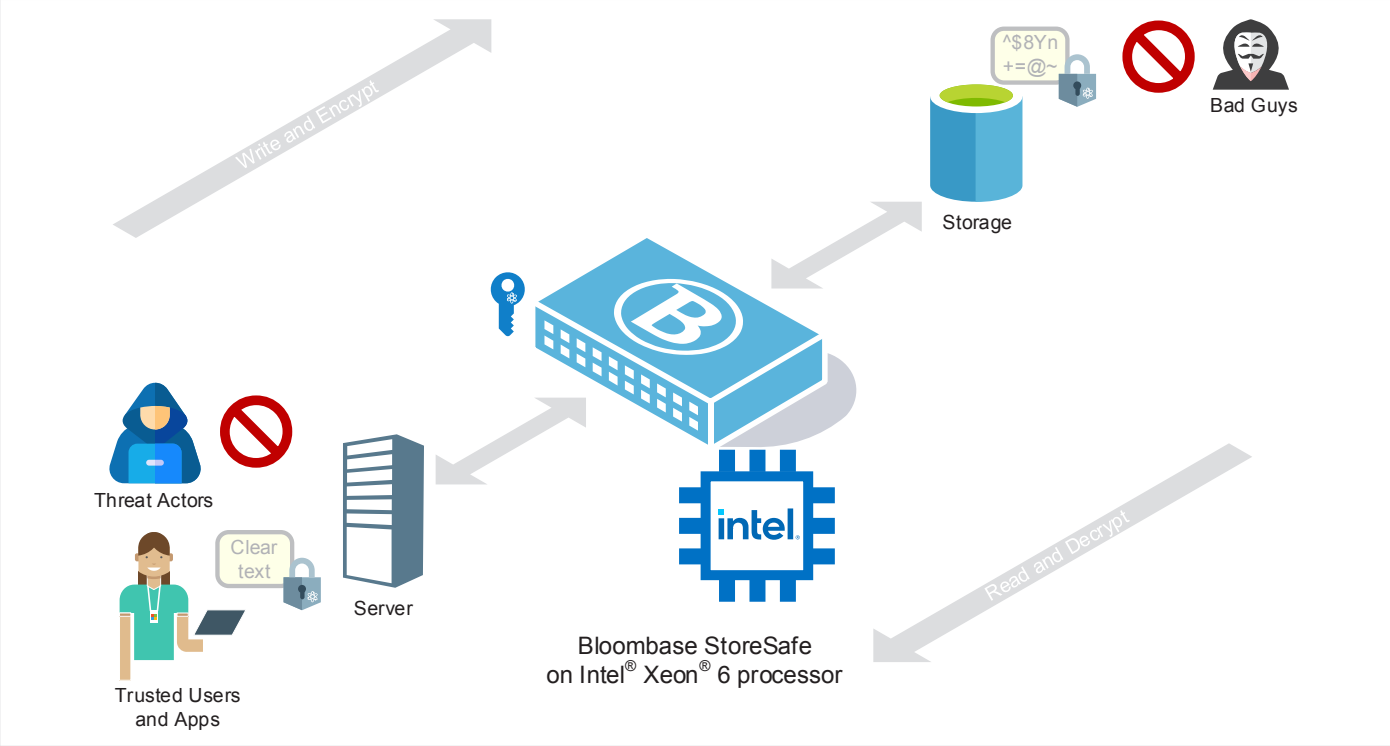


**Figure 1.** Data flow through the Bloombase StoreSafe Intelligent Storage Firewall.

Bloombase StoreSafe Intelligent Storage Firewall operates at the storage networking layer, eliminating the need to modify the business logic of client software applications or retrofit the storage infrastructure with encryption hardware. Organizations can ensure that their Bloombase StoreSafe-protected information is secret and safe and be able to meet information confidentiality and regulatory compliance requirements immediately and cost-effectively.

Bloombase StoreSafe Intelligent Storage Firewall is optimized for servers powered by Intel Xeon 6 processors to deliver high-bandwidth, low-latency protection for all software applications and data services in either traditional IT or next-generation data center environments.

This Bloombase software running on Intel CPUs allows customers to meet stringent data privacy regulations and offers adaptable deployment options within their own data centers or via third-party cloud providers, ensuring data availability, security, and privacy for data owners and users across all sectors.

The Bloombase StoreSafe Intelligent Storage Firewall can run on cloud infrastructure, bare metal servers and cloud-native containers.

## Popular Bloombase StoreSafe Intelligent Storage Firewall use cases:

- Protecting big data repositories, data warehouses and data lakes for Fortune 500-sized organizations
- Securing customer data, patient data, payment data, and personal data for banks and financial services firms, healthcare, retail and e-commerce, transportation and utilities, government and public sector
- Protection of vector databases, retrieval-augmented generation (RAG) data, AI training data, AI models, and AI-generated data for AI application and AI-as-a-Service providers
- Safeguarding research data, trade secrets, intellectual properties, inventions and top secret information for research institutions, oil and gas, chemical and pharmaceutical, aerospace and defense

## Intel® Xeon® 6 Processor with P-cores: Driving High Read / Write Cycles

Bloombase StoreSafe is now supporting servers based on the Intel Xeon 6 processor with P-cores, to deliver the performance needed to accommodate increased storage I/O.

The Intel Xeon 6 processor marks a major advancement in Intel's data center processor portfolio, featuring different core types to address diverse workload requirements. The Intel Xeon 6 processor, built on the performance-core (P-core) architecture, targets high-performance computing and latency-sensitive network applications for HPC, AI and cloud environments.

The growing popularity of all flash memory storage devices and the use of the high-speed Non-Volatile Memory Express (NVMe) protocol that uses the PCI Express (PCIe) bus to connect these flash drives to the CPU. The result of this memory architecture has been a greater data flow; single storage drives that can push out hundreds of gigabits of data – consuming the capacity of multiple network interface cards.

The Intel Xeon 6 processor with P-cores delivers significant improvements in instructions per cycle (IPC), memory bandwidth, and power efficiency. These capabilities are crucial for sustaining high throughput and deterministic performance in firewall environments where low-latency packet processing is essential.

The Intel Xeon 6 processor with P-cores supports configurations with up to 128 cores per socket. The performance and large core count of Intel Xeon 6 can handle the compute-intensive Bloombase threat detection and encryption workloads and still have cores available for other tasks.

## CPU Has Built-In Security Accelerators

The CPU delivers robust single-thread and multi-thread performance critical for deep packet inspection, TLS decryption, and session handling at line rate. The processor includes support for Intel® Advanced Vector Extensions 512 (Intel® AVX-512) and Intel® Advanced Matrix Extensions (Intel® AMX) for accelerating AI-based threat detection and pattern recognition algorithms.

The Bloombase StoreSafe Intelligent Storage Firewall makes use of Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) to provide fast and secure data encryption and decryption. Intel AES-NI acceleration is beneficial to a wide range of cryptographic applications, for example: applications that perform bulk encryption/decryption, authentication, random number generation, and authenticated encryption. Intel Xeon 6 processors also integrate Intel® QuickAssist Technology (Intel® QAT) accelerators to process cryptographic and data compression algorithms.

With support for up to 504 MB of L3 cache and up to 12 channels of DDR5 memory, the Intel Xeon 6 processor with P-cores offers the memory bandwidth and cache capacity needed to maintain stateful firewall tables and session caches with minimal latency. PCIe 5.0 and CXL 2.0 support provide high-speed I/O for multi-port network interface cards, enabling rapid ingress and egress of network storage traffic.

## Bloombase StoreSafe Tested on Intel Xeon 6 Processor-Based Servers

To demonstrate the performance increases of using Intel Xeon 6 processors, Bloombase engineers tested Bloombase StoreSafe 4.0 on an Intel Tiber AI cloud instance powered by an Intel Xeon 6 processor with P-cores compared to an Intel Tiber AI cloud instance powered by 5th Gen Intel Xeon Scalable processor[i].

The tests measured write I/O throughput, read I/O throughput and CPU loading and the results of the tests can be seen in Figure 2. The overall result is an increase in throughput with a more efficient use of CPU resources. The use of the Intel Xeon 6 processor enables the delivery of significantly faster data services with real-time cryptography while also bolstering overall secure computing capabilities within the storage infrastructure.

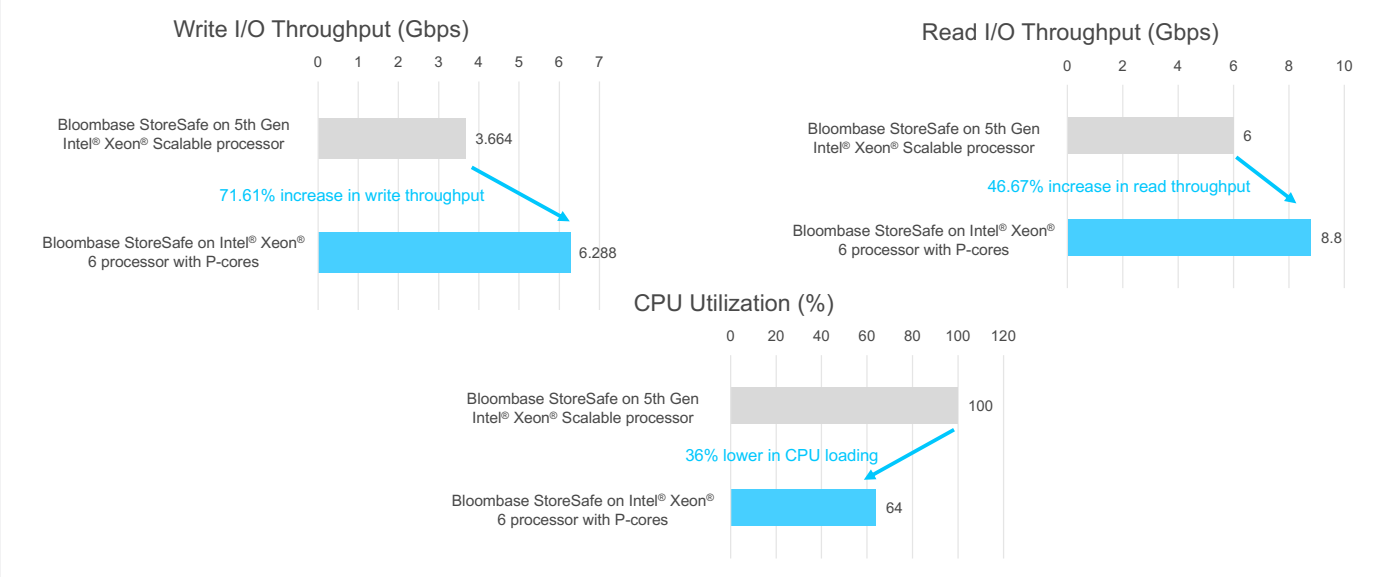


**Figure 2.** Results compare read and write performance and CPU utilization for servers powered by Intel® Xeon® 6 processor and 5th Gen Intel® Xeon® Scalable processors.

## Conclusion

High-speed storage systems and scalable cloud storage services are on the front line of many enterprise computing initiatives which makes them prime targets for hackers looking to steal data. Enterprises need advanced security tools that have the performance capability to keep up with flash storage with the latest NVMe protocols. Bloombase has developed its Bloombase StoreSafe Intelligent Storage Firewall that offers the features needed for protecting the crown-jewel data managed by enterprise storage systems and turned to the Intel Xeon 6 processor with P-cores to power the encryption and threat detection services provided by the software. Combined, Bloombase and Intel have developed a storage firewall system that can keep up with the fastest all-flash storage systems and cloud storage services and has the flexibility and feature set to secure data-at-rest against cyber-threats of today and beyond.

## Learn More

Bloombase Homepage

Bloombase StoreSafe Intelligent Storage Firewall

Intel® Xeon® 6 processors

Intel® Xeon® Scalable processors

Intel® Advanced Encryption Standard New Instructions (AES-NI)

Intel® Industry Solutions Builders

[i] **Intel Xeon 6 processor SUT**: Intel Tiber AI Cloud environment with dual-socket compute instances powered by 120-core Intel Xeon 6979-P- processor. Total DDR5 memory was 768 GB; Intel® Hyper-Threading Technology enabled; Intel® Turbo Boost Technology 2.0 enabled.

3TB of application storage; Software: OS was Ubuntu 24.04 LTS; kernel was 6.8.0-49-generic. Benchmark tools: ioping, fio, iometer. Workload software: Bloombase 4.0. Test conducted by Bloombase in November 2024.

**5th Gen Intel Xeon Scalable processor SUT**: Intel Tiber AI Cloud environment with dual-socket compute instances powered by 60-core Intel Xeon Platinum 8581V Processor. Total DDR5 memory was 1 TB; Intel® Hyper-Threading Technology enabled; Intel® Turbo Boost Technology 2.0 enabled.

4TB of application storage. Software: OS was Ubuntu 24.04 LTS; kernel was 6.5.0-9-generic.

Benchmark tools: ioping, fio, iometer. Workload software: Bloombase 4.0. Test conducted by Bloombase in November 2024.

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