VergeIO ioOptimize:
Revolutionizing IT Infrastructure Efficiency and Sustainability

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Organizations are continually searching for ways to extend the life of their hardware, adopt new technologies, and reduce operational costs. However, achieving these goals is increasingly difficult due to the limitations imposed by traditional software licensing models, aging hardware, and the need to stay competitive with the latest infrastructure advancements.

VergeIO's **ioOptimize** is an integrated feature of VergeOS that leverages machine learning (ML) and narrow artificial intelligence (AI) to address these challenges. It allows companies to optimize the use of old and new hardware while maintaining consistent performance and lowering costs. This white paper details how ioOptimize extends hardware lifespan, accelerates the adoption of new hardware innovations, and simplifies infrastructure management, all while supporting sustainability goals.

The Challenges of Legacy IT Infrastructure

Aging Hardware

As IT budgets remain flat or even shrink, many organizations operate on aging hardware. Older servers often exhibit performance degradation, higher maintenance costs, and decreased reliability. Replacing this hardware can be costly, but continuing to use it can lead to reduced system stability and increased downtime.

Power-Efficient Hardware Integration

Adopting power-efficient, high-performance servers, such as quad-processor models with hundreds of cores, enables organizations to reduce power and cooling requirements. However, integrating these systems into existing infrastructure can be difficult due to compatibility issues with older hardware. This forces organizations to refresh all their servers simultaneously even though the older servers bought and paid for still have serviceable life.

Legacy Licensing Models

Traditional per-core licensing models create financial barriers to infrastructure optimization. These licensing models often penalize customers for adopting newer, denser servers, making the cost of software licenses more than double that of the hardware itself.

Introducing VergeIO's ioOptimize

ioOptimize is a feature of VergeOS designed to address the above challenges by improving hardware utilization, extending server life, and enabling the seamless integration of new technologies. By leveraging machine learning (ML) and narrow AI, ioOptimize automatically monitors and manages hardware resources, dynamically reallocating workloads and ensuring optimal performance across the entire infrastructure.

Key Capabilities:

What is ioOptimize?: ioOptimize is a service that leverages machine learning and narrow AI to boost server flexibility and longevity.

- **ioOptimize's Value:** It also extends the lifespan of servers, allowing our customers to use a mix of new and old hardware seamlessly.
- **Automated Scale-Down Feature:** With VergeOS 4.13, we're introducing an automated "scale-down" feature that helps customers reduce their server count, saving on power, cooling, and space requirements. This feature empowers them to transition to fewer, more powerful servers and fully utilize our licensing.
- **TCO and Sustainability:** ioOptimize helps lower the total cost of ownership by reducing power consumption, cooling needs, and data center footprints. This aligns with growing customer demand for sustainability and cost savings.
- **Unique Licensing:** Our per-server licensing model stands out from the competition. This allows customers to adopt high-performance, dense hardware without the penalties of traditional per-core or per-CPU licensing models.

Safely Extending Hardware Longevity

Many organizations struggle to balance the use of legacy hardware with the demands of modern applications. With ioOptimize and VergeOS's efficiency, customers can extend the lifespan of aging hardware while maintaining performance and operational stability.

YEAR 1   YEAR 3   YEAR 5
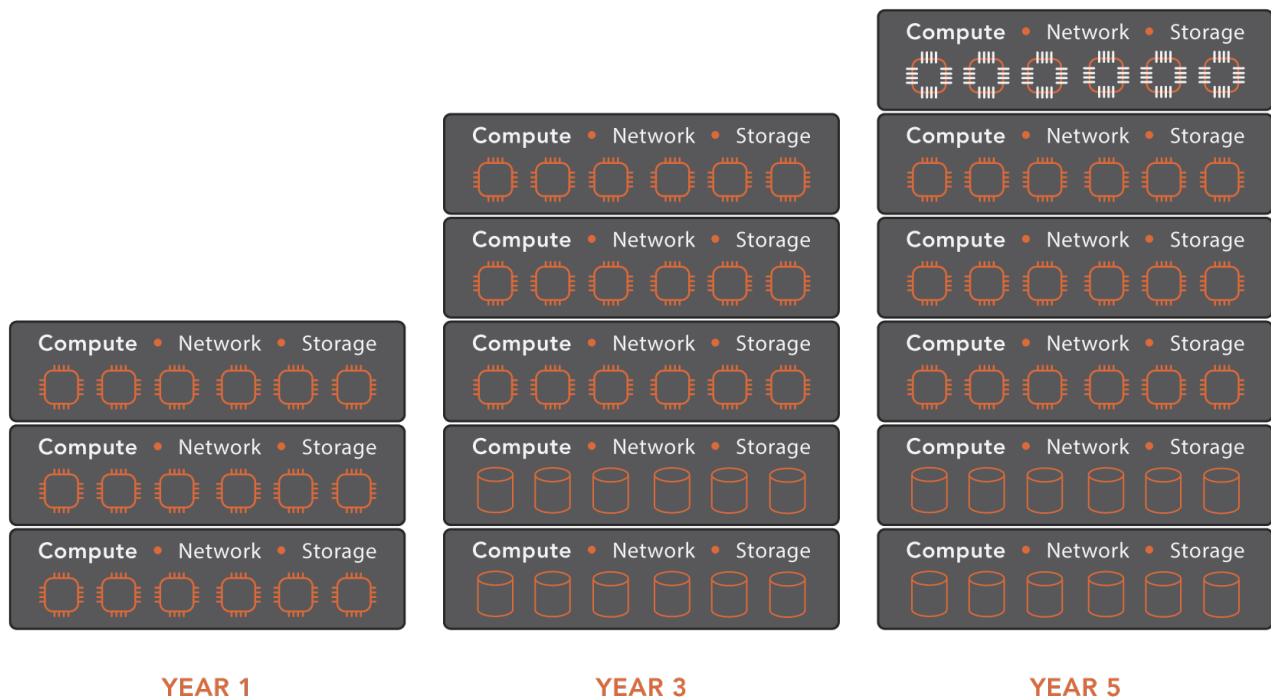
Leveraging Multiple Generations of Hardware

ioOptimize allows VergeOS to support various CPU architectures, storage media, and networking technologies. Organizations can mix older and newer hardware in the same virtual environment, allowing older server nodes to operate alongside brand-new ones.

This ability to mix generations of servers is critical for companies that want to reduce capital expenditures while maximizing the value of their existing hardware investments. By continuously monitoring hardware health and balancing workloads across available resources, ioOptimize ensures that older servers can continue to provide value without disrupting overall performance.

ioOptimize's AI-driven workload orchestration guarantees system stability by monitoring hardware health in real-time. When a server fails, the system automatically migrates virtual machines (VMs) to the most optimal nodes with minimal latency, maintaining uptime and preventing performance degradation.

By dynamically reallocating resources across the infrastructure, ioOptimize eliminates the risk of performance bottlenecks caused by aging servers, enhancing overall operational uptime.

Accelerated Hardware Innovation Adoption

In today's fast-moving IT landscape, adopting new hardware innovations quickly and efficiently is essential to staying competitive. ioOptimize accelerates hardware deployment by eliminating manual configuration and automatically optimizing new hardware components.

Unlike traditional systems that require hard-coded updates, ioOptimize's machine learning algorithms recognize new hardware capabilities and adjust system operations accordingly. For example, when a customer upgrades from dual-port 10GBe network interfaces to quad-port 25GB interfaces, ioOptimize automatically detects the increased throughput and configures the connections for maximum efficiency. VergeIO customers continually state that adding additional servers to an existing VergeOS environment is faster and less disruptive than completing the same task with solutions like VMware and Nutanix.

SCALE VERTICAL

EDGE   SERVER ROOM   DATA CENTER   ENTERPRISE

SCALE SMALL   SCALE LARGE
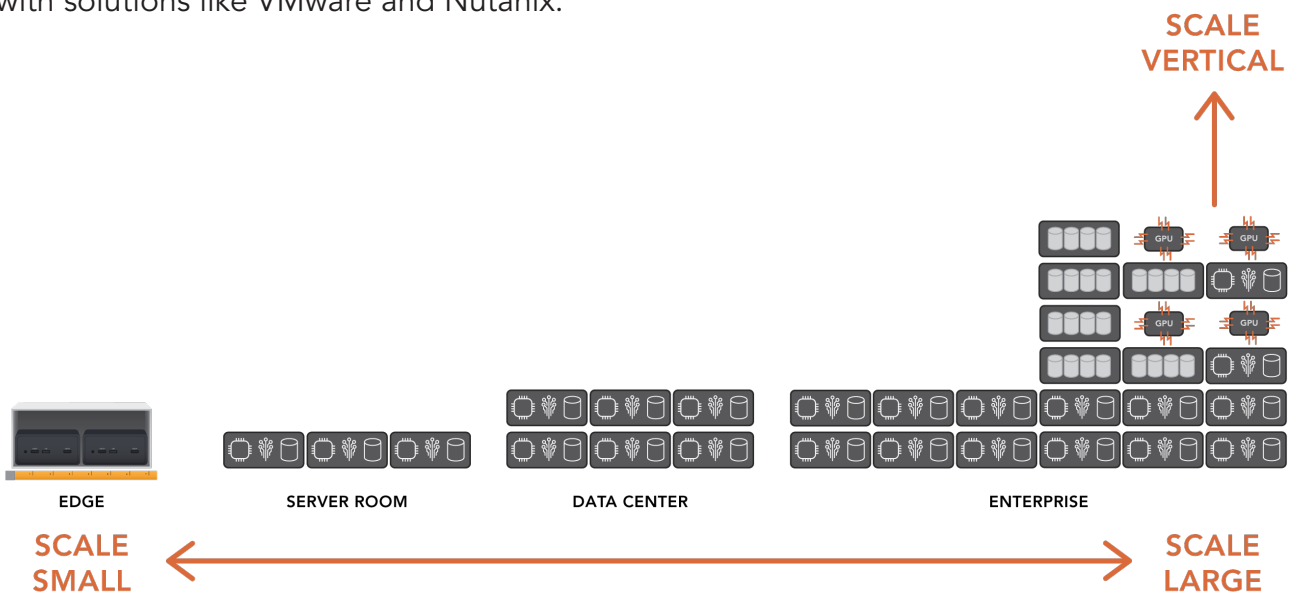
This real-time adaptation process ensures that new hardware is fully integrated into the system, optimizing data throughput and communication paths without manual tuning.

By leveraging the full capabilities of new network, compute, and storage hardware, ioOptimize allows VergeOS environments to take immediate advantage of innovations. This reduces hardware integration timeframes, enabling companies to deploy the latest technologies faster than their competitors.

Automated Scale-Down: Reducing Power, Cooling, and Hardware Footprint

As organizations adopt fewer high-density servers, reducing their overall server footprint becomes increasingly essential. ioOptimize's automated scale-down feature simplifies this process, enabling companies to decommission older servers while increasing overall capacity.

For example, quad-processor servers with hundreds of cores offer greater performance and efficiency per rack unit than older dual-processor models. An organization running 12 dual-processor servers can upgrade to 8 quad-processor servers, significantly increasing computational density while reducing hardware footprint. ioOptimize automates this transition by seamlessly migrating VMs and associated data from older servers to newer, more powerful ones. This process minimizes administrative overhead, reduces power consumption, and cuts cooling costs, allowing organizations to streamline their infrastructure without sacrificing performance.
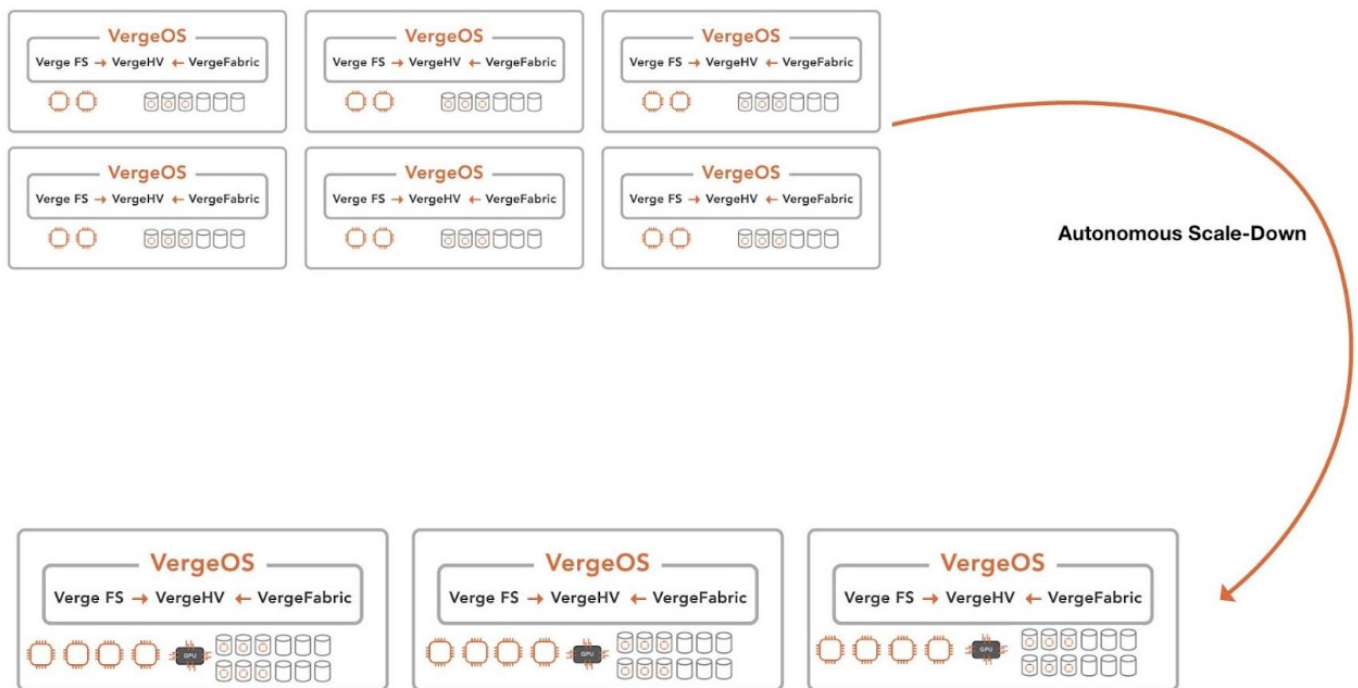
Overcoming the Challenges of Legacy Per-Core Licensing Models

Traditional per-core licensing models significantly hinder the adoption of more efficient, dense hardware. These models often make deploying high-performance, high-density servers prohibitively expensive, penalizing organizations for using more powerful hardware.

VergeIO's **per-server licensing** model breaks away from these restrictive practices. With per-server licensing, customers can deploy the most potent, energy-efficient servers without being penalized for their performance capabilities. This enables organizations to build more efficient, sustainable data centers while controlling software costs.

As Marc Staimer, CEO of DragonSlayer Consulting, explained:

> *"Many software vendors hold back progress with their restrictive licensing models, which can more than double the cost of adopting efficient hardware. VergeIO's per-server approach is a rare exception, helping IT professionals shrink their footprint and achieve their sustainability goals."*

ioOptimize and Sustainability

Beyond its operational and financial benefits, ioOptimize is an essential tool for organizations seeking to align their IT operations with sustainability goals. By enabling fewer, more powerful servers, ioOptimize, and the VergeIO licensing model help organizations reduce their energy consumption and cooling requirements, lowering their carbon footprint.
Fewer servers result in lower power consumption and reduced cooling needs. With ioOptimize, companies can deploy highly dense hardware configurations that drastically reduce the number of servers in their data centers. This helps organizations achieve their sustainability goals and leads to significant cost savings.

Conclusion

VergeIO's **ioOptimize** is transforming the way organizations manage their IT infrastructure. By extending hardware lifecycles, accelerating the adoption of new technologies, and reducing the server footprint, ioOptimize helps organizations achieve operational and sustainability goals. With VergeIO's per-server licensing model, organizations can build more efficient data centers without being penalized by legacy software licensing models. By leveraging the power of machine learning and AI, ioOptimize optimizes infrastructure performance, lowers the total cost of ownership, and enables companies to reduce their environmental impact.