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# Improve IaaS Flexibility with HCI and Intel® Technology

## Hyperconverged infrastructure (HCI) enables SysEleven to provide customers with reliable public and private cloud solutions

### At a Glance:

- Estimated reduction of total cost of ownership (TCO) for shared storage by 75 percent over five years[1]
- Increased hardware flexibility to handle a wide range of use cases
- Excellent scalability, with the ability to add nodes with no downtime

**SysEleven**

**75%**

REDUCTION OF TOTAL COST OF OWNERSHIP FOR SHARED STORAGE[3]

Germany-based SysEleven is a proven industry leader in providing reliable yet flexible infrastructure as a service (IaaS) in the public cloud, with a private cloud option. To meet its widely varying customer needs, the company requires a very flexible hardware design. For those customers developing microservices using container technology, SysEleven also offers Kubernetes (k8s) orchestration running on managed infrastructure—which requires affordable high-performance shared storage.
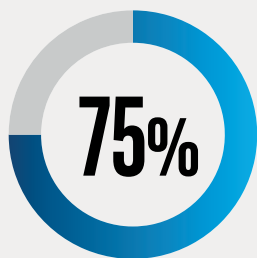
### Challenge

To meet growing customer demand for container orchestration and management, SysEleven needed to design IaaS based on an OpenStack cloud environment, that would serve as the base infrastructure for customers' managed Kubernetes clusters. The company wanted to create a hyperconverged hardware design, where compute and storage are combined in a single server and could run as a private cloud or in a hyperscaler environment in the background. In a Kubernetes environment, virtual instances typically need access to multiple volumes. In order to fulfill this requirement, SysEleven needed a new, high-performance central shared storage system.

### Solution

For its OpenStack cloud and the MetaKube managed Kubernetes service, SysEleven has combined a just-right mix of various Intel® Xeon® Scalable processors that provide the reliability and high performance customers expect. For the Kubernetes cluster shared storage, SysEleven chose a software-defined, all-flash design using a combination of two varieties of Intel® 3D NAND SSDs. The choice of Intel® technologies for building out SysEleven's services was based on total cost of ownership (TCO) calculations and performance benchmarks conducted by SysEleven engineers.

### Results

The new all-flash shared storage system is expected to reduce storage TCO by 75 percent, compared to a proprietary storage system[2]. This significant cost saving results from focusing on non-use-case-specific hardware and high-performance Intel® components. Also, the ability to combine compute and storage into a single, hyperconverged infrastructure is highly cost efficient, but more importantly can handle a broad variety of use cases in one bare metal design. The solution is eminently scalable; SysEleven can easily add nodes to a cluster on the fly, with no downtime.

## One Infrastructure for Many Needs

Although the adoption of containerization technology is expanding[4], deploying and managing containers can represent a significant challenge. One of SysEleven's goals is to provide Kubernetes cluster orchestration and management for its customers. But because some customers run in SysEleven's OpenStack cloud, with or without Kubernetes orchestration, some run on hyperscaler infrastructure with SysEleven's Kubernetes orchestration, and others prefer on-premises deployment, SysEleven's internal compute and storage resources must be flexible. In addition, SysEleven has received many requests for shared storage driven by a strong demand on Kubernetes orchestrated virtual environments. To accelerate business, SysEleven needed to provide flexible, reliable and high-performance compute and cost-efficient shared storage.

## Combining Hyperconverged Infrastructure with Affordable Shared Storage

SysEleven did not want to create several hardware designs for its customers' various deployment scenarios. Instead, SysEleven chose to integrate several processors into the same bare metal infrastructure. For its IaaS based on an OpenStack Cloud environment, the base infrastructure for managed Kubernetes clusters is a hyperconverged hardware setup. Servers are primarily two-socket, equipped with Intel® Xeon® Gold 6240 processors and four Intel® SSD DC P4610 Series (92 TB). In 2019, SysEleven deployed 28 of these nodes. For customers using SysEleven's IaaS as a virtual private server system, nodes use the Intel® Xeon® Gold 6140 processor.

A regular SysEleven customer setup consists of a network with multiple worker nodes with direct mounts of several different storage types. With a Kubernetes orchestration many "Pods" are running on one worker node. In order to support data storage in such an environment storage with the "read/write many" capability is mandatory. Instead of going with an expensive proprietary shared storage solution, SysEleven elected to use software-defined storage to combine two different commodity, all-flash storage types in one solution: 50 Intel® SSD DC P4610 Series and 300 Intel® SSD DC P4500 Series—saving up to 75 percent on TCO[5]. While setting up the software-defined orchestration for two storage types was a bit tricky, it is seamless for SysEleven's customers. SysEleven's managed Kubernetes can mount these shares in Kubernetes Pods.

Offering hyperconverged infrastructure for IaaS combined with all-flash, affordable shared storage is a differentiator for SysEleven and meets an important customer need. SysEleven has deployed 20 nodes (equipped with Intel® Xeon® Silver 4214 processors) of this new offering.

> "Our customers request the performance advantage of Intel® technology-based CPUs, and the operation of Intel-based virtual structures in a homogeneous data center environment is very efficient."

—**Jens Plogsties,**
  Head of Infrastructure, SysEleven

## Building a Path to Success Together

SysEleven recognizes that having a great relationship with customers is important to everyone's success—a philosophy that Intel holds dearly as well. Intel engineers worked closely with SysEleven engineers to evaluate which Intel technologies would meet SysEleven's use case needs and to create a test scenario. The two sets of engineers were in direct contact and conducted benchmarking together. Combining SysEleven's IaaS and Kubernetes orchestration and management expertise with Intel's high-quality products and support led to the creation of a unique IaaS solution that will help accelerate SysEleven's business for years to come. And, as Intel brings more innovations to market, the future looks bright for further collaboration between the two companies.

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### Spotlight on SysEleven

For the last 12 years, SysEleven has delivered reliable, efficient and secure infrastructure as a service (IaaS) and has been a member of the Cloud Native Computing Foundation since 2018. It is also a member of the Linux Foundation. With more than 100 employees SysEleven provides a premium technology stack that involves managed cloud services, an OpenStack-based public cloud, Kubernetes as a service and carrier services—everything exclusively operated in German data centers. For more information, visit www.syseleven.de.

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### Learn More

You may find the following resources helpful:

- SysEleven home page
- 2nd generation Intel® Xeon® Scalable processors
- Intel® 3D NAND SSDs

Find the solution that is right for your organization. Contact your Intel representative or visit **intel.com/csp**

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[1] Cost savings as estimated by SysEleven as of February 1, 2020. The new all-flash shared storage system replaces multiple proprietary storage systems that are no longer supported by the OEM. SysEleven's decision to invest in a software-defined storage solution based on commodity Intel® hardware was based on both price and performance, estimating a 75% reduction in total cost of ownership (TCO) over five years, compared to an all-flash updated version of the previous storage solution (including support and license costs).

[2] See endnote 1.

[3] See endnote 1.

[4] https://thenewstack.io/add-it-up-enterprise-adoption-of-kubernetes-is-growing/

[5] See endnote 1.

Performance results are based on testing as of the date set forth in the configurations and may not reflect all publicly available security updates. See configuration disclosure for details. No product or component can be absolutely secure.

Intel does not control or audit third-party benchmark data. You should review this content, consult other sources, and confirm whether referenced data are accurate.

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