

CASE STUDY

Service Providers
Data Center



Extending the Cloud to Small and Medium Sized Businesses

Some small and medium sized businesses are wary of the cloud, but that could change thanks to IONOS' affordable private cloud service. Powered by 2nd generation Intel® Xeon® Scalable processors, it uses proven VMware software

IONOS
CLOUD

Small and medium sized companies sometimes hesitate to adopt the cloud, put off by the high price of some hyperscale private cloud offerings and the perceived risk of using shared infrastructure, however well it is secured. IONOS created a private cloud service, using 2nd generation Intel® Xeon® Scalable processors to give customers a spectrum of price and performance options to choose from. The solution is based on VMware, so the customer's IT team can use its existing tools and experience, rather than learning a new technology stack.

Challenge

- Bring affordable private cloud to small and medium sized businesses (SMBs) who have not used the cloud before.
- Lower the barrier to entry, by adopting tools that will be familiar to the customer already.
- Provide powerful performance, so that customers experience the cloud at its best.

Solution

- IONOS' private cloud service is based on the VMware software stack that many SMBs use in their on-premise data centers.
- The solution is provided as pay-per-use with a low entry price, to make it accessible to SMBs.
- The 2nd generation Intel Xeon Scalable processor family enables IONOS to offer a range of performance options, so customers can right-size their investment to their application requirements.
- Intel® SSDs provide reliable storage and accelerate the cache for faster storage access.

Results

- With the launch of the new service, IONOS will be able to bring more SMBs into the cloud, and help them to scale their compute capability more effectively.
- In the longer term, IONOS expects customers to gain confidence and begin to adopt public cloud for even greater flexibility.

Providing a first step into the cloud

For SMBs, it can be difficult to take the first steps into the cloud. Many companies perceive the security risk to be higher when using shared infrastructure, even if the platform incorporates the latest security features. Additionally, the public cloud uses technologies that may be unfamiliar to the IT team, which raises an additional barrier to entry. Nevertheless, there are considerable advantages to using the cloud: it provides far greater flexibility and scalability than in-house IT.

That's why IONOS decided to launch a new private cloud service based on the VMware software stack. While there were already large companies offering similar services, IONOS saw an opportunity to offer something more affordable for SMBs. "VMware is widely used in the SMB segment, so we adopted it partly to build trust, and also because the IT staff in these companies know the tools and can seamlessly continue using them, making the transition from on-prem to cloud as easy as possible," said Alexander Vierschrodt, Head of Commercial Management Cloud, IONOS. IONOS planned to assume responsibility for managing the VMware stack and hardware, while customers would have the ability to manage an unlimited number of virtual machines (VMs) (see Figure 1).

The plan was to provide a turn-key solution with flexible pay-per-use licensing. Using the new service, SMBs would rent dedicated hardware, and use a fully virtualized pay-as-you-go infrastructure on top.

Three main use cases were identified:

- Peak workloads, where customers would spill over into the cloud when they had exhausted in-house capacity. In some cases, this would be for short-run projects, such as an artificial intelligence (AI) application which might only run for a few months, and wouldn't justify investing in new hardware in-house.
- Projects requiring a dedicated cluster, which would be slow to set up in-house because of the lead-time in acquiring and setting up the hardware. "Usually, you choose a dedicated cluster if you really need to rely on the performance. Even if you book high-performance public cloud, you nearly always have to share the compute power with other customers on the same blade. Our new service would guarantee exclusive use of 100 percent of the resources," said Vierschrodt.
- Non-critical workloads, which customers would be more willing to deploy into the cloud as their first experiments. Examples might include second backup locations, or workloads that are not time-critical such as batch data analysis.

Customer experience was crucial for this first taste of the cloud, so IONOS needed a portfolio of hardware options that offered powerful performance at a range of price points to help keep services affordable.

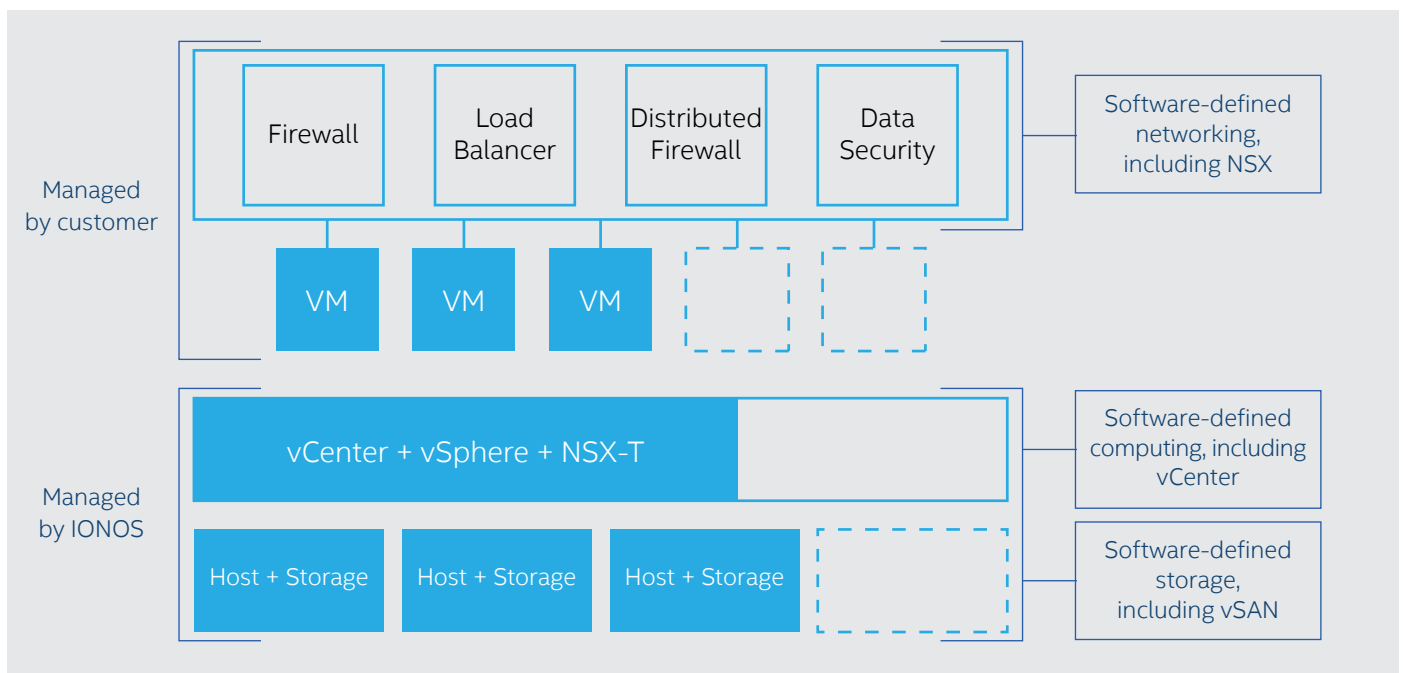


Figure 1. Customers manage the virtual machines (VMs), while IONOS manages the VMware software solutions and the hardware stack.

Solution Details

IONOS chose the 2nd generation Intel Xeon Scalable processor family to power its new private cloud service. The company was able to draw on its experience offering the Intel® Xeon® Gold 6210U processor in a dedicated server model since that processor's launch. In the future, IONOS plans to offer 2nd generation Intel Xeon Scalable processors in other dedicated server models too.

“We chose the 2nd generation Intel Xeon Scalable processor family because we wanted to offer customers the benefits of the latest technology,” said Vierschrodt. “Especially since this solution is likely to be the first step into the cloud, we do not want to disappoint them. We want to deliver exceptional performance that will convince customers to switch from their well-known on-prem solution to a cloud offering. The 2nd generation is a significant step forward from the previous generation. For our customers, the most important thing was the higher core count, which enables them to support more virtual machines within their dedicated server footprint.”

For the private cloud service, IONOS offers three configurations, enabling SMBs to choose an appropriate balance between price and performance for their applications. “We wanted to offer our customers a solution that fits their needs well, and not force them to use something that might be too big or too small for their requirements,” said Vierschrodt. As shown in Figure 2, the configurations range from a single Intel® Xeon® Silver processor with 48 GB of RAM, to a two-socket server based on the Intel® Xeon® Gold 6230 processor with 192 GB of memory.

Storage is based on the Intel® SSD DC P4510 Series, which uses non-volatile memory express (NVMe). This SSD series is optimized for cloud infrastructures and offers outstanding quality, reliability and advanced manageability to minimize service disruptions.

Technical Components of Solution

- **2nd generation Intel® Xeon® Scalable processors.** The latest generation of Intel Xeon Scalable processors incorporates built-in artificial intelligence (AI) acceleration, extends the core count to a maximum of 56 cores per socket, and provides consistent breakthrough performance.
- **Intel® SSD DC P4510 Series.** This SSD is a 3D NAND drive delivering highly efficient storage for cloud infrastructures. IONOS is using it for bulk storage in its private cloud implementation.
- **Intel® Optane™ SSDs.** These SSDs provide breakthrough performance, and are used in IONOS' private cloud for a cache that accelerates storage performance.

In front of the NVMe SSDs, IONOS is using Intel® Optane™ SSDs as a caching device to accelerate input/output operations. Intel Optane SSDs help to eliminate data center storage bottlenecks, accelerating applications and reducing transaction costs for latency-sensitive workloads. The 100 GB Intel® Optane™ SSD DC P4801X is used for caching on the Silver-48 configuration, and the 375 GB Intel® Optane™ SSD DC P4800X is used for the two more powerful configurations. Storage is local to each server, but VMware vSAN (virtual storage area network) combines the local storage of all nodes into one storage entity, providing both the speed of local storage with the high availability of a storage area network.

Configuration name	Silver-48	Gold-96	DualGold-192
Processor	Intel® Xeon® Silver 4214 processor	Intel® Xeon® Gold 6210 processor	2 x Intel® Xeon® Gold 6230 processors
Cores/Threads	12/24	20/40	40/80
RAM	48 GB	96 GB	192 GB
Storage capacity on NVMe SSDs	1000 GB	2000 GB	4000 GB

Figure 2. IONOS offered a range of configurations for its new private cloud service, all based on the 2nd generation Intel® Xeon® Scalable family.

The minimum cluster size is three servers to ensure high availability, and customers can flexibly scale their resources up or down (to the minimum) as required, using the IONOS Cloud panel interface. Customers can also upgrade to more powerful configurations if they need more storage or memory.

The private cloud solution uses a hyper-converged infrastructure, as shown in Figure 3, with fully virtualized compute, storage and networking. VMware vSphere is used to manage the resource pools of compute, storage and memory that sit on the dedicated bare metal hosts. VMware ESXi is the hypervisor, and VMware NSX-T is used for network virtualization and management.

IONOS is providing software for backup and disaster recovery, with plans to offer additional applications later.

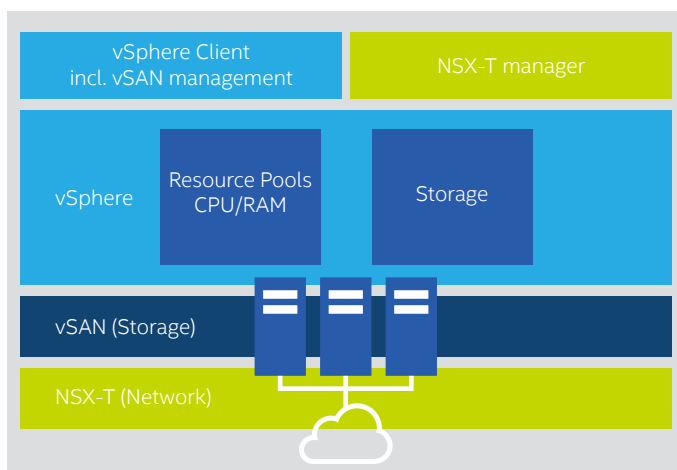


Figure 3. The solution is based on a hyper-converged infrastructure, managed using VMware software solutions.

Intel Works Closely with Cloud Service Providers

IONOS enjoys a close relationship with Intel. Intel has given IONOS prerelease product samples, and has helped IONOS run tests to identify the right server configurations for the private cloud service. The IONOS engineering team is able to call on Intel's experts for guidance in getting optimized performance from Intel® technologies.

Because IONOS was using both Intel Optane SSDs and Intel DC NAND SSDs, the company had to switch from legacy BIOS to EFI BIOS. Intel worked with IONOS to develop, test and resolve a bug within the network stack in EFI. Although EFI supported Intel NVMe SSDs without resolving this network issue, it would not have been possible to achieve this project without these changes.

Intel and IONOS engage in co-marketing activities, and IONOS is a member of the Intel® Cloud Insider Program, which provides a focal point for the cloud ecosystem.

IONOS is on the board of advisors for the Intel® Cloud Insider Program. This board is one of the ways that Intel receives feedback from cloud service providers (CSPs) and other companies about its product roadmap, and any opportunities customers have identified to improve products.

Business Results

IONOS is now poised to launch its new service, which will enable it to extend its reach to SMBs who have not yet ventured into the cloud. Because the solution is based on Intel technologies that deliver a great customer experience, IONOS is confident that the new private cloud service will provide a stepping stone towards the public cloud, helping SMBs to gain the confidence they need to unlock even more flexibility.

Spotlight on IONOS

IONOS is a leading provider of cloud infrastructure, cloud services, and hosting with more than eight million customer contracts. The product portfolio offers everything that companies need to be successful in the cloud: from domains to classic websites and do-it-yourself solutions, from online marketing tools to full-fledged servers and infrastructure-as-a-service (IaaS) solutions. The portfolio is aimed at freelancers, small businesses, and consumers as well as enterprise customers with complex IT requirements.

IONOS was created in 2018 from the merger of 1&1 and IaaS provider ProfitBricks. IONOS is part of the listed United Internet AG (ISIN DE0005089031). The IONOS brand family includes STRATO, Arsys, Fasthosts, home.pl, InterNetX, SEDO, United Domains and World4You.
www.ionos.com

Lessons Learned

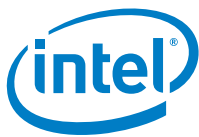
IONOS' experience with this project highlights three key lessons for other cloud service providers (CSPs):

- The 2nd generation Intel Xeon Scalable processor family provides a range of processor options, which CSPs can use to enable customers to right-size their bare metal platform to their requirements.
- The increased core count on the 2nd generation Intel Xeon Scalable processor enables customers to run more virtual machines (VMs) within their dedicated resource footprint.
- Intel Optane SSDs can be used to accelerate the cache to help optimize performance.

Learn More

- 2nd generation Intel® Xeon® Scalable processors
- Intel® SSD DC P4510 Series
- Intel® Optane™ SSD DC P4800X Series
- Intel® Cloud Insider Program

Find the solution that is right for your organization.
Contact your Intel representative or visit [intel.com/csp](https://www.intel.com/csp)



Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No product or component can be absolutely secure. Check with your system manufacturer or retailer or learn more at [intel.com](https://www.intel.com).

Intel, the Intel logo, and other Intel Marks are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

*Other names and brands may be claimed as the property of others.