



Building with the right blocks

D&D Distribution develops custom storage solutions powered by Intel® technology



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*Kris De Smet,
Technical Manager,
D&D Distribution*

Challenges

- **Building blocks.** D&D Distribution specializes in building storage solutions from scratch, using the right components to meet each customer’s needs.
- **Modular ambitions.** It wanted to create a next-generation modular storage solution with new levels of flexibility, availability, and scalability.

Solutions

- **Compact and powerful.** D&D built a small modular server platform, designed to scale and adapt to each customer’s needs.
- **Intel relationship.** Having worked with Intel for many years, D&D included Intel® Xeon® processors in its new solution.
- **Innovative software.** Open-E® storage software offers an easy-to-use storage management interface for the new platform.

Technology Results

- **Flexible foundation.** Customers can add components to enhance the platform’s capabilities, or to scale up, depending on their own environment.
- **No single point of failure.** Each server is managed independently, meaning that if one fails, the rest can keep going, thereby minimizing downtime for end users.
- **Strong availability.** Active/active failover ensures additional availability, performance and reliability across the platform.
- **Small but mighty.** Compact and customizable server racks means the solution can be easily installed and moved about, even for customers without a data center.

Business Value

- **Multiple customers.** The solution has already been deployed across a range of customer projects and in collaboration with a number of resellers.
- **Future planning.** D&D, Intel and Open-E share a vision of the future data center and plan to launch new solutions over time, starting with a cloud storage solution that’s ready for big data and the Internet of Things.

A tailor-made approach

Belgium-based D&D Distribution is not a typical IT solution provider. “We build every solution from the ground up,” explains Kris De Smet, technical manager at D&D. “Every organization has its own priorities and challenges, depending on its size, budget, business needs, and scope. We believe that the best way to deliver the ideal IT platform each time is to go back to the components available and combine the most appropriate elements to create a custom solution. Whatever the customer’s situation, we believe this is the best way to deliver the performance, redundancy, and availability they need and expect.”

D&D Distribution offers this build-to-order approach to its reseller collaborators, who can use their own deep understanding of their customers’ requirements to help ensure that the solutions delivered will drive the most value for users. Each reseller has its own approach, meaning that D&D must be flexible not only in terms of the technology at its disposal, but also in how it is delivered. “Sometimes, our job is simply to build the right combination of hardware and software,” explains De Smet. “However, we may also offer support with marketing, pre-sales, implementation, or ongoing management of solutions for our resellers.”

In 2004, D&D Distribution launched its own range of servers and storage devices under the brand name Pointer Systems*. The diverse range of devices available under this brand was

specifically developed to enable D&D’s customers to benefit from solutions that are tailor-made for them, while delivering consistent and reliable quality.

The right storage components

One of D&D’s areas of specialism is data storage. As with any of its other solutions, the company makes sure that it stays abreast of technology developments to ensure that it assesses any new hardware or software and includes it in its toolbox if appropriate.

“We’ve worked with Intel for a long time and use Intel® technologies like the Intel Xeon processor E3 and E5 families and Intel® Solid-State Drives (Intel® SSDs) as core building blocks in our storage solutions,” says De Smet. “We had also made extensive use of the Intel® Modular Server before it was retired.” When this solution reached end of life, D&D set itself the goal of developing a new, next-generation modular storage solution that would give even its smaller customers the capability to store their ever-growing data volumes in the most effective way possible.

The organization also works closely with Open-E, a data storage software and operating system provider, and it wanted to include Open-E in the development of its new modular solution.

The team at Open-E regularly tests its software on any new Intel technology-based hardware to ensure the software can be optimized for any hardware combination that D&D may develop for its resellers. “We have a great three-way



Storage solution provider delivers customer environments with Intel® technology

collaboration model, where we work with engineers from Intel and Open-E to ensure all the technologies work seamlessly together to deliver the best performance and availability," De Smet continues. "This way, we can be confident that when we come to design a new solution for a reseller's end customer, it's going to be robust and long-lasting."

De Smet and his team worked with Intel and Open-E to build a small rack of 15-20 server units, powered by Intel Xeon processors and running Open-E software. Resellers can add capacity, memory, connectivity and other elements to this foundation, depending on the specific needs of each customer. This means the solution can be easily tailored for any environment.

New advantages

The new modular storage solution that D&D Distribution developed has, according to De Smet, a number of advantages, not least its flexibility. "Being able to add more components as needed means it's easy to adapt the platform to suit the performance or growth needs of a given customer environment," says De Smet. "Our resellers and their customers aren't restricted at all by the solution's structure."

Furthermore, the modular design means there is no single point of failure in the platform. "Some other modular solutions have all their components on one firmware and management module," De Smet continues. "While this can make daily management of the platform simpler, it also means that if even one small element fails, the whole platform could be offline for up to an hour while it is fixed. By making each component independent of the others, we've ensured that if there's a failure in one element, the rest will keep running as usual." This availability is ensured using an active/active failover model, which reroutes any data intended for a failed node to another node or combination of nodes and is controlled by the cross-platform Open-E software.

Many customers of the resellers that D&D works with are small to medium sized, so it was also important that the solution be compact. "Typically the end customer doesn't have acres of data center space available," says De Smet. "They may only have a small server room, or may need to keep their IT equipment in an office environment. Either way, they need something that's not too large or unwieldy, so they can easily move it around when they need to. This is why we focused on making the modular solution compact enough to fit on a single rack yet with

the compute performance to support demanding applications and data volumes."

Widespread adoption

In the 18 months since the combined solution was first developed with Open-E and Intel, D&D Distribution has deployed it with a number of resellers to a wide range of end customers.

For example, ATS wanted a solution with both fast and slower bulk storage, combined in one system, with full redundancy at both the hardware and software levels. It also demanded easy upgrade possibilities for future expansion.

The customer had implemented several modular storage solutions in the past, but it had run into difficulties such as the fact that neither the storage subsystem nor the management system of the solution was redundant. This meant that if one of those elements failed, everything went down. At the same time, any planned or unplanned maintenance (for example, due to firmware updates) impacted all components. Each of its six servers had to be shut down first, resulting in more unwanted downtime.

In seeking an alternative solution, ATS wanted to retain the modularity so that it could choose the most appropriate hardware components and have strong redundancy and scalability. However, it did not have the resource or budget to move its infrastructure to a data center.

D&D therefore created a solution for ATS, based on its new modular storage solution with Intel and Open-E. The solution included:

- Intel® Compute Modules HNS2600WP used as Microsoft Hyper-V* front-end servers, with up to four servers in one 2U chassis
- Dual 10 Gb Ethernet switches
- Intel® Server System R2224GZ4GC4 servers running Open-E Data Storage Software* v7 for fast HDD/SSD storage, combined with SSD caching
- Intel® Storage System JBOD 2000 family for bulk storage
- An uninterruptible power supply to provide electricity to the whole system in case of an external power outage

The fast HDD/SSD storage was included to create a highly available and redundant active/active iSCSI SAN environment for virtualization, while the bulk storage provided NAS shares with built-in replication of backup data over WAN to a second location.

By using this setup, D&D ensured that there was no longer any single point of failure and that upgrades or maintenance plans could be done without facing downtime. According to its internal tests, D&D estimates that this could potentially ensure ATS receives up to 99.99 percent complete system uptime.

Lessons learned

Every organization wants its IT resources to be tailored to its own needs, but lack of budget or expertise can make this difficult. By creating a build-to-order model that combines the appropriate components for any given environment, D&D Distribution enables its resellers to give their end customers this flexibility. The versatility of Intel® technologies to work with a wide range of storage hardware and software makes it a key ingredient in D&D's portfolio when developing its customers' solutions.

Another customer, CB-IT, used this same setup to host its own cloud solution, called CloudWorx*, which is based on the VMware vSphere* ESXi virtualization platform. Finally, JFK Computer Systems and Electro-Line, a provider of quality IT solutions and customized IT support, are using the solution to set up flexible Hyper-V clusters for all kind of workloads. They are using the fast storage for different kinds of database applications, while the bulk storage provides customers with access to file and print services, Microsoft Office applications and less resource-heavy applications.

Into the cloud

"We're in agreement with Open-E and Intel that as big data and the Internet of Things become part of everyday business, the need for robust cloud storage will be ever more important," says De Smet. "For this reason, we're continuing to work together to develop new solutions and investigate new technologies."

The latest milestone in this journey is the launch of a new cloud storage solution that runs the Linux-based ZFS* file system with Intel Xeon processor-powered servers and Open-E software. "This latest innovation means that we're able to offer a future-ready storage option for those who want to take advantage of big data and the Internet of Things," De Smet concludes. "Indeed, Schoenen Torfs has shown interest in the solution through one of our resellers, and we're already in negotiations with another, DNA Systems, to deliver the next-generation ZFS-based storage solution to more than 80 Game-mania stores in the Benelux region."

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