

# ClearPointe Clears the Way to the Cloud

July 2016

## Nilfisk Customer Case Study

The Nilfisk Group is a global company headquartered in Denmark, with production facilities in Europe, Asia, and the Americas, and total net sales of EUR 970 million in 2015. With 5,500 employees, Nilfisk produces and sells commercial cleaning and other products under a range of brand names, including Nilfisk and Viper.

The company has a datacenter in Copenhagen, Denmark, where IT management for the entire organization resides. Another datacenter is in Shanghai, and one is in Minnesota. IT management in Copenhagen has determined that Nilfisk's strategic IT infrastructure direction is to eliminate local, onsite datacenters and move to hosted solutions, and eventually to full cloud infrastructure. Leading the way, the Copenhagen team worked for five years with a leading European service provider to complete its migration to a hosted solution as a first step towards a fully cloud-based solution. Following this, Copenhagen's IT management team mandated a move to hosted IT infrastructure for Nilfisk's local datacenters in the US and Asia.

### Situation

When the Nilfisk team in Minnesota was about to move its offices from one location to another, IT management in Denmark required that US IT infrastructure be migrated to a hosted solution. Carsten Lausen, the head of IT Infrastructure, Management, and Development at Nilfisk in Minnesota, recalled, "IT management in Copenhagen said, 'You can't bring the server room with you. Make sure the server room is run by a third-party hosted cloud provider.' That was my challenge."

Headquarters encouraged Lausen to work with the same provider that the team in Europe used, so he explored that direction. Although Denmark's provider has a large presence in Europe, Lausen found that, in the US, his options with that provider were limited for several reasons.

First, Lausen explained that in the US, Nilfisk is "a Microsoft house. We use a lot of Microsoft software. It fits our needs and demands, and the price is absolutely fair. So we primarily wanted to look at solutions where we could interact with vendors who could give us Microsoft solutions." However, Lausen continued, Denmark's European hosting provider of choice, "was running everything in VMware and Linux environments, and that does *not* connect well with our infrastructure. We use Hyper-V, and we prefer the Hyper-V option so that, even in a hosted environment, we would be able to take servers from the hoster's datacenter and do work in our on-premises environment and then push that work back to the datacenter."

The second consideration was cost. Lausen emphasized, “*Plus*, the finances didn’t make sense for us: It was extremely expensive to go with the European provider.”

The third factor was the ability to choose the location of the hosted datacenter. Lausen said, “Denmark forced me to look into their provider, but that company only has a US datacenter out in California. I was not super happy with the location in California due to latency issues. So I found a locally run datacenter, and then we looked into different cloud vendors and cloud solutions.”

This process led Lausen to talk to ClearPointe, which was working on a separate project for Nilfisk US. Lausen noted, “All those small things were the important things that ended up pointing us in the direction of ClearPointe. The straw that broke the camel’s back was the combination of Linux, VMware, and price. ClearPointe was very strong from the price perspective.”

To understand just how significant not only the price difference, but also the services provided are, it’s necessary to examine the ClearPointe solution in detail.

### The ClearPointe Solution

At Lausen’s request, ClearPointe architected a Microsoft private cloud solution that enabled Nilfisk to migrate to a vendor-neutral datacenter. ClearPointe’s approach offered Nilfisk significant cost savings over the expense of the European solution. Lausen reported that, “The initial quote we got from ClearPointe was \$11,000 per month. The European vendor quoted \$90,000 per month. We’re now paying ClearPointe \$15,000 per month because we added more services to the agreement and they are monitoring more systems for us than originally quoted.”

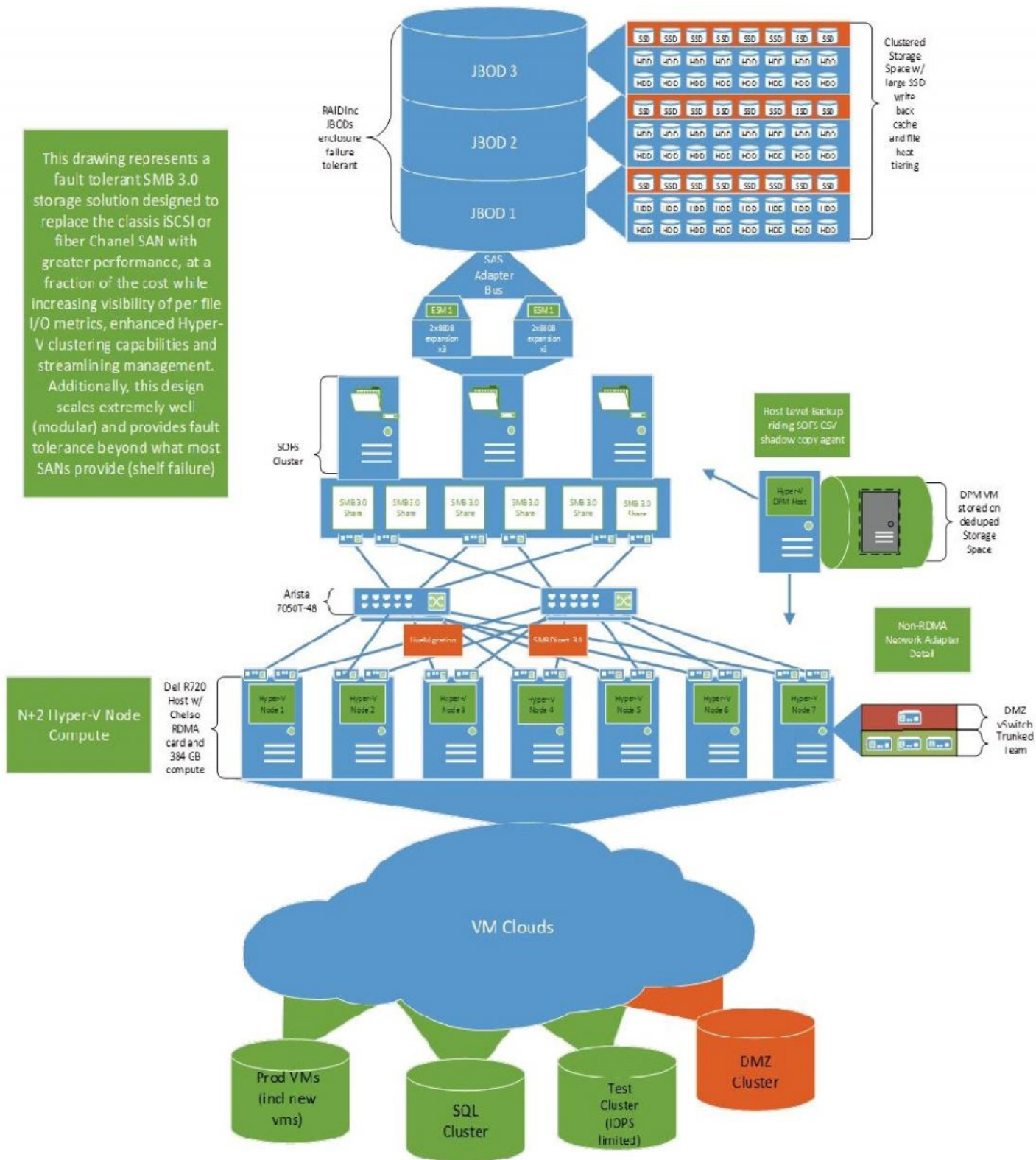
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Figure 1 shows the architecture that ClearPointe developed for Nilfisk. To satisfy Nilfisk’s strategic goals, the ClearPointe solution delivers simple, default Hyper-V-to-Hyper-V virtual machine migration paths. Microsoft System Center Data Protection Manager (DPM) physical instances, as well as private- and public-cloud virtual DPM instances, provide backup and restore support. System Center also manages disaster site recovery failover to a Microsoft Azure virtual private network.

Figure 1: ClearPointe architecture developed for Nilfisk



To support Nilfisk's high-demand Microsoft SQL Server virtual machine workloads, ClearPointe drew on its own experience with a SAN-replacement storage solution based on Windows Server 2012 R2 Storage Spaces technology. As ClearPointe's own NOC solution demonstrates, Storage Spaces for the private cloud is optimized for high performance and takes advantage of the most modern techniques of software-defined storage.

In Nilfisk's case, because Hyper-V in Windows Server 2012 R2 can allocate more cores and RAM to each SQL Server virtual server than those servers currently have on a physical cluster, the only way SQL Server could be storage-bound would be if the virtualization plant could not provide sufficient raw IOPS throughput to keep up with fully utilized cores and memory. Addressing this, Storage Spaces specifically has a tiered storage feature that will use the SSD drives in each storage shelf to dramatically accelerate data access. In this tiered storage solution, the most frequently accessed data is moved from spinning (Tier 2) to solid state (Tier 1) disks within each shelf in 1 MB chunks. Additionally, the SSDs act as write-back cache for the spinning drives in Tier 2, which means that even writes to turning drives produce SSD-level performance.

Demonstrating the effectiveness of this solution, ClearPointe used the Iometer test to validate IOPS of over 300,000 write IOPS (8K IO), 500,000 (4K IO) and over 750,000 write IOPS with 2K IO in this plant configuration. Nilfisk was able to compare this with a turning-storage SAN, which is typically 50,000-100,000 write IOPS for very fast SANs with many spindles. ClearPointe was able to predict that their solution in the new virtualization plant would deliver superior core, memory, and storage resources over the current Nilfisk SQL Server Cluster nodes on physical servers.

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Once Nilfisk and ClearPointe deployed the private cloud, a rapid migration of virtual machine workloads began. Using a combination of online migration and removable media transfer, each necessary virtual machine and group of virtual machines were brought online in the new stack.

The solution provides excellent local backup services for virtual machines, and the solution enables easy addition of disaster recovery. The Azure Site Recovery (ASR) service enables seamless disaster recovery to the Azure public cloud at very low cost.

### **The Best Solution, Fastest Implementation, Lowest Cost**

Nilfisk and Lausen could not be more satisfied with the ClearPointe hosted solution. Lausen explains, "We are now hosted in a professional datacenter where they're working 24/7. Before this move, we were doing everything ourselves, and we are just three guys in the local US team running the US datacenter. Now there is way more professional service, way better monitoring. ClearPointe is monitoring all the most critical systems 24/7. It's just a better solution."

The benefits of the new system go well beyond the advantages of having mature, skilled IT support. Lausen also pointed out that huge performance gains are now part of everyday business for the end users: “We got all the hardware upgraded, so it’s also a faster solution that our users can enjoy every day. We have an ERP system, like most other companies. When the ERP system is running special reports, it used to take 12 to 14 hours. Now it’s run in 1.5 hours. Big improvements in speed!”

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Lausen emphasizes just how impactful his partnership with ClearPointe has been: “We did the entire project in just five months, and that is because we had ClearPointe as a partner. It’s huge to realize that it took five to six years to do this in Copenhagen with a different partner. I also want to acknowledge my team. I had a really strong team that was very dedicated. We worked every weekend for a half year.”

The enormous success of the project has affected Lausen’s career and the direction of his team, as well. Lausen says, “It has had an impact on the team in a really funny way: Nilfisk actually eliminated my position! We did very well, and now that ClearPointe is doing all this work for us, I’m not needed. This is the conclusion that IT management came to. They like me and what I do, so they’ve created a new department around me. We’re going to be a group of cloud architects. I’m ready for a new challenge so I’m happy they pushed me into a new role.”

In addition, the ClearPointe solution has had a huge impact for Nilfisk’s plans worldwide. The company is planning to move from private cloud, then to hybrid cloud, and finally to full-out cloud infrastructure in the next three to five years. As Nilfisk prepares to roll out a fully cloud-based solution to its global locations, both Lausen and ClearPointe will be leading the charge. “Because I proved we could do it, and we did it in such a timely correct, dedicated way, with good quality, Nilfisk trusts that I can run the next step forward: moving Nilfisk to the cloud. It will start in the US, but it will definitely be a global project.”

### Advice to Others

When asked what advice Lausen would give to other organizations he replied, “Talk to ClearPointe. No doubt about it. They are knowledgeable, they are good at what they do. They sat down, gave us all the prices, did the project, and delivered in a timely manner. Everything was spot on. The quality is there. The speed is better than expected: ClearPointe was a little conservative in predicting the speed, but they did kind of say between the lines that it would be faster than what you have today. Actually, it’s an incredible performance improvement.”

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*“A partner like ClearPointe can smooth the way.” –Carsten Lausen*

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In general, Lausen advised, “If somebody has all their services on-premises and they want to move to the cloud, it’s really a good drill to move it to another datacenter first. This is because you have to start to think about how to move the data while at the same time keeping your service level agreements and

at the same time maintaining the service windows. It rocks the boat and it's a long process to move a datacenter. But a partner like ClearPointe can smooth the way."

## ClearPointe: Focus on Transformation, not Migration

Organizations are devoting large amounts of money and time to moving to the benefits the cloud offers—whether a private cloud, hybrid cloud, or public cloud, or all of these. As Nilfisk's Lausen emphasized, organizations can hugely benefit from working with an experienced partner such as ClearPointe.

But Lausen is not alone in reaching this conclusion. The IDG Enterprise Cloud Computing survey report found that "respondents say they want vendors' assistance in selling the benefits of cloud to internal stakeholders. Whether choosing public or private cloud, they want help proving their investments will lower TCO, enable business continuity, and replace on-premises legacy systems."

And vendors such as ClearPointe can help ensure that companies are getting the best solution at the lowest cost because ClearPointe is not pushing any particular technology or solution. ClearPointe has deep cloud experience from running network operations centers themselves and for other large organizations. John Joyner, Microsoft MVP for Cloud and Datacenter Management and Senior Director,

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Technology at ClearPointe puts it this way, "Migration of business computing from infrastructure to platform-based services is necessary to stay competitive in a global economy. ClearPointe has a unique vision and business model that incents us to take the strategic view, guiding our customers' IT journeys without lost investment following a long term roadmap to the lowest costs and highest agility."

ClearPointe's world-class NOC offers enterprise-level monitoring and management as a service to organizations around the world. ClearPointe draws on staff who are experts at streamlining and optimizing networks that are reliable and easy to manage over the long term.

In today's cloud-hungry environment, ClearPointe is a proven leader in developing cloud-based solutions. Since the earliest days of cloud technology, ClearPointe has been incorporating the best and most effective aspects of cloud into its own infrastructure and passing along that experience to benefit its clients. ClearPointe knows what works and how to get there.

According to the *IDG Enterprise 2015 Cloud Computing* survey report, "the average company plans to dedicate one quarter of its IT budget to cloud computing." With so much money—and the success of the organization—on the line, enterprise IT needs to be sure that the organization can quickly, efficiently, and successfully deploy a tailor-made cloud solution without breaking the budget. The key can be to work with a solution provider that has no other agenda than to help customers deploy and manage a modern, secure, scalable, and cost-effective IT environment. Such a partner empowers the organization to focus its resources on innovation.



## ClearPointe Expertise

ClearPointe is a leader in managed services and private-, hybrid-, and public cloud-based solutions with vast vendor-agnostic experience and expertise across enterprise technologies, industries and applications. ClearPointe makes it a priority to deliver performance, security, scalability, and manageability—not to mention unmatched return on investment (ROI). As examples from ClearPointe implementations—both internal and customer solutions—show, ClearPointe’s track record proves that “the best solution money can buy” does not have to be the most expensive or time-draining solution.

ClearPointe is a systems integration consultant and managed IT services provider for companies worldwide. Because ClearPointe experts bring experience working with the leading enterprise platforms, they can architect, deploy, manage, and advise clients about Microsoft, VMware, and Linux private cloud solutions, as well as leverage public cloud platforms including Microsoft Azure, Amazon Web Services and Rackspace.

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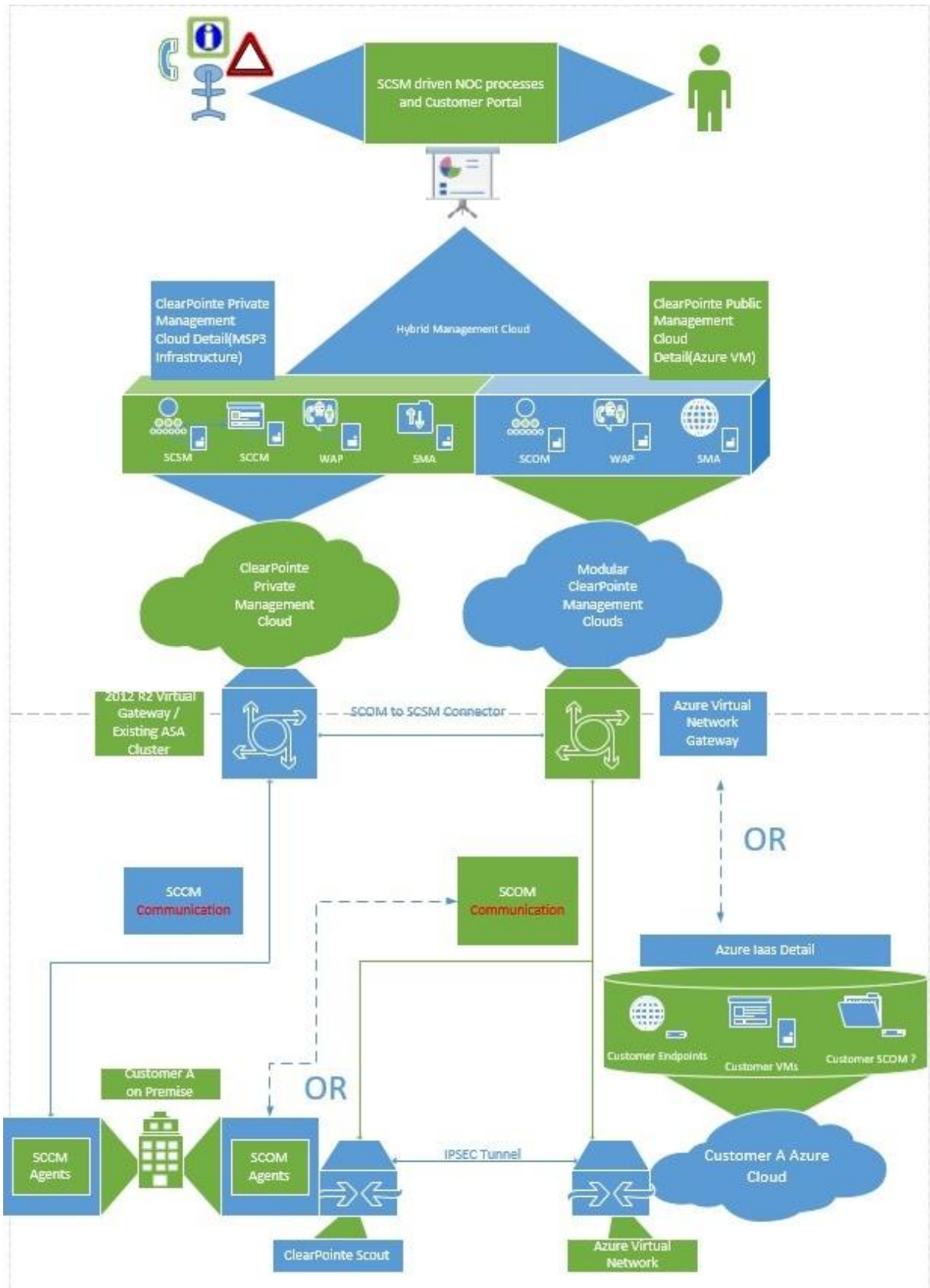
As ClearPointe’s Bush Williams notes, “We staff systems architects and network analysts who can identify customer pain points and find a solution that is appropriate to the customer’s specific needs. We focus on the customer, not on pushing any agenda: We don’t sell software or hardware, just efficient and cost-effective solutions at the right time.” Customers realize that a ClearPointe tailor-made solution makes sense because it combines a choice of platforms to work with their specific environment and needs, with on-premises, private-cloud, public-cloud, and hybrid implementations, and incredibly fast deployment.

## Lifecycle Management

ClearPointe bases its services on proven expertise in the full extent of IT lifecycle management in the largest, most complex datacenters: ClearPointe runs its own Network Operations Center (NOC), based in Arkansas, and operates its hybrid management cloud from Texas and Microsoft Azure. The company’s 24/7 NOC provides managed services for a multitude of different environments and configurations.

ClearPointe’s monitoring and remediation services start at the network edge with internet services up/down availability ingress to internal switching with port specific statistics and performance trending (regardless of switch infrastructure vendor), to virtualization hosts (Hyper-V and VMware) that support applications, to server chassis and core applications (e.g., Microsoft Active Directory, SQL Server, Exchange) that support such applications. As customers begin to embrace the cloud, they can also take advantage of such offerings as Microsoft Office 365, Microsoft Azure, and Amazon Web Services (AWS). Additionally, ClearPointe offers private/hybrid cloud design, implementation and monitoring services that culminate all of their learnings from the multitude of environments managed into a best of breed solution designed to meet the customer’s needs. Figure 2 briefly summarizes the services ClearPointe offers.

Figure 2: ClearPointe Services Summary





## Internal Cost Reduction Paves the Way to Customers Benefits

Budget constraints are a universal reality, and ClearPointe itself faced those constraints when the company's hybrid-cloud NOC was experiencing performance issues related to its storage area network (SAN). ClearPointe's modern monitoring solution for customers includes a distributed System Center Operations Manager and Service Management Automation infrastructure that works with Microsoft Azure: Azure Virtual Machines run individual customers' instances of Operations Manager, and Microsoft System Center 2012 R2 Service Manager is used with ClearPointe's proprietary systems to coordinate and manage the many of Operations Manager instances.

To give managed-services customers excellent performance, ClearPointe needed not only improved SAN performance, but also an overall storage solution that would provide cost effective performance and scalability. A new SAN would solve the performance issues, but the cost was prohibitive. With a budget of \$300,000 for new storage infrastructure, ClearPointe was not in a position to pay \$370,000 for a new SAN, plus additional tens of thousands of dollars for supporting network and backup equipment.

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But with sure instincts based on knowledge of where technology is headed, the ClearPointe team decided to test a very different direction: software defined storage (SDS). As Daniel Weissenborn, Enterprise Architect for ClearPointe, notes, “The software-defined datacenter is the way IT is going. It's less about standalone servers, and more about software-defined infrastructure and private/hybrid cloud. We think of hardware as a pool of resources we can abstract in many ways through software.”

The new solution was based on innovations that were introduced in—and included in the price of—Windows Server 2012 R2, in particular:

- Storage Spaces, which enables pools of storage that are virtualized over physical disks on commodity servers (as opposed to dedicated SAN storage) and therefore offer much faster performance
- Storage Tiering, which enables a combination of fast solid-state drives (SSDs) and inexpensive, high-capacity hard disk drives (HDDs) to form one storage solution. By allowing frequently used data to be moved to SSDs while maintaining less frequently used data on HDDs, Storage Tiering
- Hyper-V over Server Message Block 3.0 (SMB3) protocol, by means of which, a Hyper-V host can store virtual machine configuration files, virtual hard drives, and snapshots in file shares

Figure 3 shows a diagram of Clear Pointe's Windows Server 2012 R2 software-defined storage infrastructure, which includes:

- Three 4U RAID Inc. enclosures with 60 storage drive bays in each for fault tolerance
- 7,200-RPM HDDs mixed with high-speed SSDs, to implement storage tiering
- Two Dell PowerEdge R720 2U rack server chassis housing a set of industry standard scale-out file services servers as a means of accessing the scalable and flexible storage pool

- Two additional Dell R720s as Hyper-V servers, housing virtual machines that use the storage on the scale-out file server. These virtual machines are rolled into the Service Manager installation for production NOC use
- Chelsio Remote Direct Memory Access (RDMA)-capable network interface cards (NICs), over which all elements communicate by using Hyper-V over SMB3
- A Dell PowerEdge R620 rack server attached to a half-populated RAID Inc. EBOD (90 TB raw) at the ClearPointe's primary datacenter as a means of rolling up backup solutions
- A secondary Dell PowerEdge R620 with the same half-populated EBOD in Little Rock, which serves as an offsite sync for backups in the management cloud. This Little Rock sync takes data and pushes it up to Azure to meet compliance requirements for Statement on Standards for Attestation Engagements (SSAE-16). Additionally, the half-populated disk chassis gives ClearPointe backup scalability.
- Windows PowerShell command line interface and scripting for managing the Storage Spaces infrastructure—an inexpensive alternative to costly, proprietary SAN management (in terms of human resource consumption)

### Savings and efficiency

A SAN solution would have cost six times what the Windows Server 2012 R2 Storage Spaces implementation cost. Instead of potentially investing \$370,000 in a new SAN, ClearPointe was able to spend just \$60,000 for storage hardware with Storage Spaces. And storage tiering would have added tens of thousands of dollars more cost. In addition, storage performance increased by a factor of ten, and storage scalability was greatly increased. Storage Spaces has eliminated 20 to 30 hours of SAN troubleshooting and management work each month, and storage infrastructure redundancy has doubled.

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ClearPointe's approach to solving its own performance issues resulted in a solution that saved the company time, money, and staff. But more important, the solution is benefitting customers by providing even better service. A very important aspect of this experience—and all of ClearPointe's experience running its largescale datacenters—is that ClearPointe is able to apply the lessons learned as it serves customers.

**Figure 3: Clear Pointe's Windows Server 2012 R2 software-defined storage infrastructure**

