



Stairway to Hybrid

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Many IT architects who resisted the rush to the public cloud now find themselves adopting hyperconverged infrastructure, or HCI, as their first step toward hybrid cloud. Here's why fast-growing Azure Stack HCI is emerging as the preferred choice – and why more decision makers are choosing DataON to deliver the platform.

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Executive Summary

Executives increasingly demand that IT deliver on a pair of seemingly contradictory tasks. The first is to modernize the datacenter so mushrooming data stores are more accessible and integral. And the second? Slash capital expenditures and operating costs.

The two objectives may sound mutually exclusive, but they're not – provided you think outside the box. Specifically, more IT architects are delivering on both mandates by adopting hyper converged infrastructure, or HCI, a decade-old, cloud-era concept that extends software-defined capabilities beyond the confines of a single system.

HCI platforms effectively virtualize compute, storage and networking to improve efficiency in the datacenter. And because individual systems are so densely packed with storage and compute, HCI is also an attractive option for remote offices and, increasingly, at the edge. And because the platform takes care of mating and managing all the hardware resources, it can greatly reduce administrative headaches.

Traditionally, HCI has been attractive more to SMB than large governments and enterprises, primarily because smaller organizations don't have resources to deploy more complex alternatives. But an expanding menu of compelling HCI platform choices is now attracting organizations of all sizes and has become the de-facto standard for infrastructure refresh.



One increasingly popular option is Microsoft's Azure Stack HCI, a low-cost, streamlined new OS tailored specifically for hyperconvergence. Azure Stack HCI brings to the party datacenter and public cloud administration tools and features that are just as compelling for companies that are modernizing on-premises deployments – with a someday goal of leveraging the cloud for load balancing – as they are for organizations looking to repatriate some data and workloads from the cloud.

And in mid-2021, the company added Azure Kubernetes Service (AKS) to Azure Stack HCI, giving IT managers the ability to host Windows and Linux containers in their own datacenters.

At about the same time, the underlying hardware also got a big boost in features and performance. Intel is now shipping the 3rd Gen Xeon® Scalable datacenter platform, which opens up a host of systemwide bottlenecks. In addition to a significant increase in raw computing performance and a wider selection of core counts per socket, the new platform also provides:

- Up to 1.6 times better memory bandwidth,
- Twice the maximum throughput with PCIe Gen 4, which will relieve bottlenecks for NVMe storage as well as networking, and
- Cryptographic acceleration, which offloads taxing security workloads.

And for those who decide that Azure Stack HCI on Intel's 3rd Gen Xeon® Scalable is the platform for their path to modernization, DataON is emerging as a preferred provider, according to in-depth research from FeibusTech. As part of that research, FeibusTech conducted interviews with multiple DataON /Intel/Microsoft customers – as well as the three providers themselves.

Among the findings:

- Customers generally appreciate how closely DataON works with them to ensure they get the best, most cost-effective solution for their needs,
- DataON enjoys a closer relationship with Intel and Microsoft than its comparatively small size might dictate, primarily because it exclusively delivers Azure Stack HCI-on-Intel® Xeon® Scalable platforms, and
- DataON listens to its customers. And because Intel and Microsoft listen to DataON, small and mid-sized businesses enjoy a channel into the industry juggernauts that they otherwise wouldn't have.

And all enterprises benefit from DataON service and expertise, which is focused only on the one platform – so the company's efforts aren't diluted by supporting competing platforms.

Analysis

Background

Inertia can be a powerful force in the datacenter. IT decisionmakers' risk-reward calculations typically skew decisions in favor of incremental improvements over more dramatic options, like forklift upgrades and giant leaps into the cloud.

IT architects who watched from the sidelines as their peers chased visions of digital transformation into the public cloud now feel vindicated, as many of their counterparts are repatriating some data and workloads from the cloud. That's giving the slow-and-steady crowd more ammunition in their fight to continue taking small steps toward modernization.

At the same time, though, the call to modernize from inside their own organizations has simply become too loud to ignore. The explosion in the volume of data has been aggravated by the growth of stored data types as well as the number of employees who want access to the data in their quest to make better, more informed decisions.

Increasingly, IT decisionmakers are responding. They're taking steps to modernize their organizations' infrastructures. But they're still not going to the cloud. Rather, they're

looking for ways to take small steps that will help their on-premises datacenters and co-located facilities handle existing loads more efficiently.

“You can’t force the enterprise to go to the cloud,” said Howard Lo, a DataON vice president and a member of Intel’s Channel Advisory Board. “It doesn’t work that way. The pendulum will only swing so fast. So, you’ve got to offer them baby steps.”

For many of them, HCI is emerging as a critical next step on IT decisionmakers’ modernization path. HCI relieves the pressure to forecast compute, storage and networking demands for each task hosted on every server. That’s because HCI architecture virtualizes all on-premises assets, with the entire pool of hardware resources allocated and managed from a single control plane. Which means that IT can now set up virtual machines for each workload based on the entire pool of available resources. That’s far more efficient than devoting discrete hardware resources to individual tasks.

And as they plan, many IT architects see HCI as a logical bridge to the future. They anticipate that HCI’s cloud-like efficiency will prepare their organization for adding the public cloud to their stable of resources, extending load-balancing options beyond the walls of their datacenters.

In that sense, HCI is emerging as the preferred first step toward hybrid cloud.

“It’s interesting to me how many people I run across that will not set up a big presence in the public cloud,” said Benjamin Clements, President of Strategic Online Systems Inc., a CIO advisory and disaster recovery provider in Germantown, Tenn. “They’re saying, ‘I can’t pass the buck to somebody else. I need to control exactly where my data goes.’”

“Airlines, hospitals, banks, attorneys – they’re all saying that they’re willing to put apps in the public cloud. But they won’t put their data there.”

Interestingly, many companies approaching HCI from the other direction – that is, those that are repatriating data and workloads from the cloud – also see HCI as a cornerstone of their developing hybrid cloud strategies.



(Re) enter Microsoft

Some market watchers that keep tabs on the HCI arena view Microsoft as a newcomer with negligible share in this decade-old segment. But their perceptions are about to change.

Certainly, the new Azure Stack HCI operating system is starting to build market momentum. The OS was just announced in late 2020, and Microsoft is still adding core features to the package. In May 2021, for example, the company added Kubernetes containerization, a critical must-have modernization component – particularly for hybrid cloud implementers who are repatriating workloads.

Even if Kubernetes isn't a priority for those developing hybrid cloud from the datacenter, the capability will be critical for them at some point, because much of the latest software innovations for analyzing and manipulating data are cloud-native, container-based packages.

But while Kubernetes may be new for on-premises Microsoft implementations, it isn't new for Microsoft. As one of the world's leading public cloud providers, Microsoft leaned into Kubernetes early for scaling and distributing workloads. It was one of the first companies to join the Kubernetes community seven years ago, helping to flesh out Linux support. And in 2016, Microsoft unveiled Windows Server support for Kubernetes. Windows Server support for Hyper-V, the company's hypervisor, has been available since 2008.



Hypervisors, of course, make up one of the three core pillars of HCI, along with storage and network virtualization. And Microsoft has included all three in the pervasive Windows Server bundle for years. Hyper-V has been used by some licensees since before Nutanix pioneered HCI as a discrete segment.

But because enterprise licenses for Windows Server don't take into account which services IT customers use, market watchers have had no way to quantify how many licensees deploy HCI via the Windows Server platform.

Given that Windows Server is a dominant OS in the datacenter, it's not farfetched to assume that the HCI components already serve a significant – and growing – share of the market. One indicator is that by some estimates, Hyper-V is the second most deployed hypervisor after VMware. And Microsoft's own telemetry data suggests that Storage Spaces Direct – Microsoft's storage virtualization platform – is quite popular as well.

Now that Hyper-V, Storage Spaces Direct and software-defined networking components like Hyper-V Virtual Switch and Software Load Balancing are all bundled into Azure Stack HCI, industry watchers finally can track a Microsoft HCI operating system tailored specifically for hyperconverged environments. There still won't be a way to monitor HCI implementations via Windows Server. But at least now there will be a floor.

Azure Stack HCI: to the Datacenter and Beyond

The addition of Kubernetes to Azure Stack HCI lets organizations tap the latest container-based applications in the private cloud. But while running cloud-native software on-premises is an important next step after virtualization, there's still more to do before organizations can realize the full promise of hybrid cloud.

True hybrid cloud is about storing data and running workloads anywhere – whether that's on-premises, in the public cloud, at remote offices or at the edge. And Azure Arc services, which extends the Azure Resource Manager model to owned and co-located assets, gives IT architects the control plane they need to manage all those resources.

“With the integration of Azure Arc and the control plane in Azure, customers can now monitor clusters anywhere – in the cloud, at their headquarters in, say, Tulsa, Oklahoma, and their satellite in Dallas, Texas,” said Claude Lorenson, Senior Product Marketing Manager for Cloud and Enterprise at Microsoft. “That’s very difficult to do with the traditional model.”

And to extend the anything-anywhere concept, Microsoft continues to add Azure capabilities to Azure Stack HCI. This fall, for example, Microsoft is integrating GPU support for machine learning and artificial intelligence.

“This whole concept of software-defined permeates everything Microsoft is doing,” said Clements of Strategic Online Systems. “So going to the next version doesn’t have to be a lift-and-shift. It can become a migration – even potentially an in-place migration where your systems don’t have to be replaced.”

DataON already has customers that are conducting early trials with Azure Percept, Microsoft’s Azure edge platform. Those customers are collecting high-bandwidth data streams from vision systems to do everything from enhancing asset security to improving patient health at nursing homes. For those trials, DataON customers are leveraging Nvidia GPUs to build their models.

Here-and-Now Benefits

For some IT architects, the primary driver of Azure Stack HCI adoption isn’t some lofty vision for the future. They’re more concerned with cost, efficiency and performance on-premises today. That’s particularly true for SMBs with modest performance and accessibility needs.

Some say that performance, simplicity and cost drew them to Microsoft's virtualization features long before Azure Stack HCI arrived on the scene. Adam Morris at DEC said his company moved to Microsoft's Hyper-V from VMware because performance was so much better. And because his Windows Server license was already paid for, running Hyper-V was basically free.

And then they got another performance kick moving to Azure Stack HCI from Windows Server 2016.



"We weren't sure if we're going to notice any performance increase, but we did," said Morris, who ran the same Hyper-V virtual machines in Azure Stack HCI and Windows Server 2012 R2 for comparison. "There was quite a bit of difference. It was noticeably faster" on the streamlined Azure Stack HCI. Morris said he especially noticed a performance benefit while running SQL Server, something others also pointed out.

Many SMB IT architects say that Azure Stack HCI's software-defined networking capabilities open the door for virtualizing smaller deployments because they can now connect nodes without the need for expensive high-speed switches.

"So far, we've been very happy with our HCI deployment," said Paul Maune, a systems architect at Bradley Arant Boult Cummings LLP, a 550-attorney law firm with 10 offices stretching across the Southeast from Washington, DC, to Texas. "We have 24 – soon to be 26 – DataON nodes running as Hyper-V hosts, which allows us to run everything fast in a smaller physical footprint.

“With the legacy SAN storage we had before this, we had an issue where our cluster volumes on legacy Hyper-V servers – not hyperconverged – would sometimes offline themselves briefly because of the high I/O level,” Maune continued. “That doesn’t happen anymore. We’re running more than 500 VMs, but they’re not stressing the environment.

“And no one complains. I like it when no one complains.”

3rd Gen Intel® Xeon® Scalable: Capable Foundation

Intel datacenter platforms have always been known for their robustness. As well, the company has been a leader in hardware security as well as overall system development.

In recent years, however, Intel’s Xeon® Scalable processor lineup has been challenged – not only by its own manufacturing issues but by energized competitors as well. Of late, the raw performance of AMD’s EPYC-series processors have garnered more attention from IT architects.

But there’s more to performance than processor horsepower. There are system-level and TCO issues to consider as well.

“You have raw performance on the EPYC side, which is nice,” said Kenji Chapman, a systems engineer with the King County Library System in Seattle. “But Intel definitely offers a lot of very fine-tuned, workload-specific instruction sets that take a lot of engineering and work to get done. AMD hasn’t had the resources for that, and it would be very hard to catch up in those areas.”

To achieve raw performance, AMD crammed lots of high-speed, dual-threaded cores – up to 64 cores, or 128 threads – into a single socket. While that can be appealing from a simplicity point of view, dual-socket Xeon® Scalable systems often perform better on HCI workloads because they are able spread system bottlenecks over two chokepoints instead of one, customers said.

DataON customers also say that Intel’s dual-socket implementations are far ahead of AMD’s from a latency perspective, which can play a big role in real-world performance. From a cost perspective, AMD charges a premium for its highest-performing parts. And when you consider that Azure Stack HCI costs \$10 per core per month, the subscription can get pricey on EPYC systems.

As well, customers point out that Intel enjoys wider industry support for processor features and instruction sets. Microsoft, for example, first implemented Intel’s hardware root-of-trust in Azure Stack HCI. Customers also appreciate the new Vector AES feature in Intel’s

3rd Gen Xeon® Scalable, which leverages AVX512 encryption engine to accelerate regular AES workloads up to 40 percent.

DataON Delivers

DataON has always delivered Microsoft platforms on Intel hardware – and has always distinguished itself from the crowd with quality knowledge, service and support. And over the years, that’s gotten the attention of partners and customers alike.

“Many of our early Azure Stack HCI customer case studies are with DataON as a partner,” said Microsoft’s Lorensen. “Despite their size, DataON is one of our go-to partners. Their understanding of the product is second to none. And they respond to our customers very, very quickly.”

 **Azure Stack HCI | Catalog**

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To underscore the point, Lorensen pointed to the Azure Stack HCI validated hardware catalog. In it, you'll find that Microsoft has signed off on integrated systems from three vendors for now: two Fortune 200 companies, and DataON.

Customers value DataON for those same qualities. They like that DataON listens to them, no matter their size. And because Intel and Microsoft listen to DataON, smaller customers have a feedback channel that they otherwise wouldn't have.

Chapman, the systems engineer for the King County public library, said whenever he contacts DataON for support, he always gets folks who have intimate knowledge of the platform – something that's not always true with the top-tier OEMs.

"With the big suppliers, you might get a good tech. Or you might get the new guy," he said. "With DataON, I always know that we'll get taken care of. That's something that you expect every company to do, but DataON goes out of their way to do so. I just appreciate their support."

DEC's Morris agreed. "I love that I can get on the phone and talk to DataON. I like putting a face to a company." He said that DataON helped him settle on a configuration that cost a little less – and also had fewer cores, so Microsoft charged him less for his Azure Stack HCI subscription as well.

And now, with Azure Stack HCI on 3rd Gen Xeon® Scalable systems from Intel, DataON has added software and premium support service to its portfolio.

As for the software, DataON includes MUST – short for Management Utility Software Tool – a monitoring and management tool that is a native extension of Microsoft's pervasive Windows Admin Center. The software provides IT administrators with a simplified yet detailed look at both Azure Stack HCI and Windows Server environments through a single pane of glass. Customers say that has been instrumental as they transition from their legacy SAN deployments to HCI.

DataON also includes MUST Pro with its Integrated Systems. MUST Pro updates software, drivers and firmware in the background. That's normally an important, time-saving feature. But it's even more important with Azure Stack HCI, customers said, because the platform performs noticeably better when everything is up to date.

The large platform providers have similar software offerings to MUST. But their packages provide the same service for all the platforms they offer, not just Azure Stack HCI. That can make it more complicated for the OEMs to keep their utility up to date, which could mean that vulnerability patches and performance improvements will take longer to proliferate.

Conclusions

Systems architects who resisted the rush to the public cloud are now finding that they can no longer put off modernization. Demands on their hardware resources are blossoming. At the same time, the cost of keeping up with those demands the old-fashioned way is also mushrooming. So the only way to adapt is to modernize by adopting a more cloud-like approach.

Increasingly, the way to do that is with hyperconverged infrastructure, or HCI. HCI virtualizes compute, storage and networking in a way that:

- Delivers the performance today's businesses need,
- Scales in an easier, more cost-effective manner, and
- Simplifies setup, monitoring and management.

Microsoft's Azure Stack HCI on Intel's 3rd Gen Xeon® Scalable is emerging as the preferred HCI platform because it is flexible enough to help companies straddle legacy and modernization. That makes it much easier to take baby steps toward modernization without ripping out everything and starting again. Or, for that matter, jumping headlong into the cloud.

And for those who have decided on the Azure Stack HCI-on-Intel path, DataON is a preferred provider, primarily because DataON focuses exclusively on this platform. That has helped DataON develop expertise that is "second to none."

The expertise translated into developing platform expertise ahead of rivals, which put it first in line for early development projects. And that, in turn, has made DataON a favorite of Microsoft's, which points customers looking for recommendations to DataON.

DataON listens to its customers. And Intel and Microsoft listen to DataON. Taken together, that comforts potential customers that might otherwise hesitate to build their digital infrastructure around a comparatively small supplier. And it comforts existing customers, which already know they've made the right choice.

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