The Benefits of a Cloud Integrated Hyper-converged Architecture

by George Crump, Lead Analyst

Hyper-converged architectures (HCA) consolidate compute, storage and networking onto a single server and then through software, aggregate these servers, creating a shared pool of resources. These resources can then be allocated to virtual machines (VMs) based on their performance and capacity demands. The goal is to simplify the purchasing, implementation and operation of the data center by consolidating or converging it. The logical next step for HCA is to extend its capabilities to the cloud allowing data centers of all sizes to achieve greater flexibility and resilience from disaster.

The Benefits of a Hyper-converged Architecture

There are numerous benefits to a HCA. First, resources are now pooled together so they can be allocated to applications dynamically. This pooling also enables a self-service provisioning aspect to HCAs that allows IT administration to be delegated, easing up the burden on IT. In addition some HCA architectures have the ability to automatically shift the pooled resources to respond to the demands of applications. But this dynamic shifting should also be off-set by I/O Control or quality of service (QoS) so that performance reserves are kept available for mission critical applications. QoS is an important capability and enables IT to virtualize these mission critical workloads knowing that they will get the performance they require no matter what other applications are placing demands on the infrastructure.

The key benefit of an HCA though is its inherent simplicity. This is especially true if the architecture is delivered in a turnkey fashion that includes hardware and software, allowing the architecture to be scaled out as easily as adding additional bricks to a stack of Lego blocks. The result is a quicker time to value, since implementation is far simpler, and thanks to the integration there are fewer components to manage. The end result is a reduced total cost of ownership that allows the business to more rapidly extract value from their IT investments.

HCA allows an organization to deliver IT services in the same way that large public cloud providers do, essentially creating a private cloud. It is curious then that one benefit that is often absent from many HCAs is the ability to connect to a public cloud. While an IT professional could manually create this connection, doing so requires time, expertise and additional hardware and software, essentially violating the turnkey and integrated nature of HCAs. What is needed is a cloud integrated HCA, where the connection to a public cloud provider is integrated, automated and made functional as easily and as rapidly as the HCA itself.

While establishing an integration between a vendor's HCA and the public cloud is no trivial task, it seems odd that more HCA vendors have not provided this capability since its benefits are so obvious. These vendors seem to be concerned about competing with the public cloud

instead of complementing it. An integration may limit the investment into a vendor's HCA to only what they need and frees the customer's data from a single entity. HCA vendors that do integrate with the cloud must have confidence in the quality of their solution to stand on its own when compared to the public cloud alternative.

What is a Public Cloud Integrated Hyper-Converged Appliance?

A cloud integrated HCA means that at the point of implementation the HCA automatically connects to a public cloud provider via the organizations credentials to allow movement of data and applications. There should be no additional software or hardware to be installed, and it should run within the HCA construct. It also needs to run the same VMs and applications without modification or conversion.

Four Benefits of a Public Cloud Integrated HCA

1 - Integrated Disaster Recovery

The most obvious use case of a cloud integrated HCA is its use as a disaster recovery platform offering protection from major disasters like hurricanes, floods, fires or earthquakes and minor disasters like corruption of the application's data, and a failure of the server or its storage. There are other services that can provide protection from these events, like disaster recovery as a service (DRaaS) or replication tools, but they are often limited by how quickly they can re-start applications and what performance of the VM will be like in its recovered state.

Time to restart an application can be almost instantaneous in the case of the cloud integrated HCA. Because most cloud providers only charge when CPU is actually used, "warm VMs" can be positioned and continuously updated at the public cloud provider via the integration at almost no cost to the data center. Starting an application in the cloud then merely requires starting the VM. Since it has ready access to live data, the VM does not need to be created and no data has to be recovered.

Performance of the VM is also a concern with solutions like DRaaS, and as a result they often tend to limit the number of VMs that can start at a given point in time. Because of the massive scale of public cloud providers they can easily support the entire application workload for even a large data center and still provide adequate performance for the entire environment while not impacting the performance of their other customers.

The other key advantage of using a public cloud integrated HCA for DR is that the process itself is integrated into the existing solution set. There is no need to install and monitor a separate solution stack in order to achieve DR protection.

2 - Test and Dev-Ops

The second major benefit to a cloud integrated HCA is the ability to use the integration to enable flexible test and development of applications. Production data can again be easily replicated to the cloud and then tested or developed on. The cloud is an ideal location for test-dev/ops. Instead of buying servers, the processing power can be rented. The environment can be rapidly and cost effectively scaled both up and down depending on where the application is in the test-dev/ops process.

3 - Application Life Cycle Management

Another benefit of cloud-based dev/ops is that the application can be developed in the cloud, then seamlessly migrated into the on premises HCA infrastructure when it is ready for production rollout. This, again, allows development to occur in the cloud but when time comes to control both user experience and to secure data assets the application is run on-premises. Finally when the time comes to sunset the application, it and its data can be archived into the cloud for long term retention. The application can be archived to the cloud in a ready state so that data access can still be seamless, but costs are lowered since the provider only charges for compute as it is used.

4 - Cloud Bursting

A final use case of a cloud integrated HCA is for situations where the on premises design won't support a sudden peak in application demand. If a peak occurs that will stress the available resources of the HCA the application can be moved to the cloud and then instantiated there.

This capability provides great value not only for unexpected spikes in workload but also *expected* seasonal spikes. Most data centers build for the 'worst case' application performance demand but if that 'worse case' only occurs two or three times a year this means that those compute and storage resources go under-utilized the rest of the year. A cloud bursting strategy allows for the data center to design for the norm and leverage the cloud for the peaks.

The problem with cloud bursting has again been that the movement back and forth has been so complex that most data centers don't take advantage of it. The advantage of a cloud integrated HCA is that the process is now seamless and can be easily taken advantage of.

Conclusion

HCAs have greatly reduced the time required to implement and operate virtual architectures, allowing them to deliver a much higher and more rapid return on investment. They are essentially the data center's private cloud. Leveraging the public cloud seems like a logical next step for these data centers, but that connection is complicated and introduces additional components to be managed. By integrating the public cloud into the HCA's private cloud, data centers can take full advantage of the public cloud's resources without detracting from the HCA's operational simplicity.

Sponsored by Gridstore

About Gridstore HCA

Gridstore has developed an all-flash hyper-converged architecture designed specifically for Microsoft workloads. Gridstore's Hyper-Converged Infrastructure v3.5 now supports Azure Pack, enabling deployment of Cloud-in-a-Box easily and cost-effectively. Windows Azure Pack provides a multi-tenant, self-service cloud interface that works with Windows Server and System Center, to deliver self-service provisioning, and easy movement of workloads to the Azure public cloud.