Why Pivot3 earned the *Recommended* Ranking in DCIG's Evaluation of Hyperconverged Infrastructure Appliances

Charley McMaster, DCIG Senior Analyst

Pivot3

Hyperconverged Infrastructure Appliances Tackle Data Center Pain Points

Hyperconverged infrastructure appliances (HCI) are taking the data center by storm. These pre-integrated solutions unite—or converge—as much of the data center infrastructure as possible into a scale-out cluster, managed as a single entity by a single application. HCI reduces capital and operational costs through rapid deployment, non-disruptive granular scalability and simplified virtualization-centric management. Rapid deployment enables quick time-to-value. Granular scalability and simplified management yield ongoing benefits in agility and IT staff efficiency.

HCI solutions are easy to expand. The most common physical instantiation of—and unit of scaling for—hyperconverged infrastructure is a 1U–2U rack-mountable appliance containing 1–4 cluster nodes. Simply install a new node, or multi-node appliance, and the system detects and aggregates the new resources. HCI eliminates the time-consuming work of integrating and testing disparate technologies and enables IT teams to quickly and incrementally increase performance and/or storage resources to meet evolving business demands.

DCIG Ranks Pivot3 Acuity X-Series as *Recommended*

Pivot3's Acuity X-Series enables enterprise workload consolidation by integrating NVMe flash and rich QoS technology from its 2016 acquisition of NexGen. Acuity scales to 12 hybrid or 16 all-flash nodes—and up to 516.8 TB of raw all-flash capacity—per virtual Performance Group (vPG). Pivot3 uses erasure coding to stripe data across all SSDs/HDDs in a vPG, and supports unlimited vPGs per cluster.

- **Intelligent Quality of Service.** Acuity X-Series prioritization engine functions like thin provisioning for performance, operating on three metrics: IOPS, throughput and latency.

  It achieves consistent, predictable performance through a simple assignment of workloads to pre-defined QoS policies. When resource contention occurs, the system ensures that critical workloads meet SLAs by automatically scaling back less critical applications.

- **Superior Fault Tolerance.** Pivot3's patented erasure coding enables each vPG to survive simultaneous controller node and drive failures. These results are superior to traditional replication.

> *"Pivot3's patented erasure coding for data protection provides impressive fault tolerance and storage efficiency."*
>
> — Charley McMaster, *DCIG Senior Analyst*

- **Superior Data Efficiency.** Another benefit of Pivot3's erasure coding is storage efficiency that is superior to traditional RAID or replication approaches, achieving up to 94% storage efficiency.

- **Integration with Existing Infrastructure.** Pivot3 is one of the few hyperconverged systems that can present its HCI storage as an iSCSI target to both virtual and physical servers, just like a traditional SAN. This enables Pivot3 to integrate with existing servers and accelerate even non-virtualized data center workloads.

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Overall Rankings

RANKING	PRODUCT
RECOMMENDED	Pivot3 Acuity X-Series *
	Dell EMC VxRail Series
	Dell EMC XC6320-6
	HPE SimpliVity OmniCube CN-5400
	HPE SimpliVity OmniCube CN-3400
	HPE SimpliVity OmniCube CN-2400
	Nutanix NX-8000 Series
	Nutanix NX-6000 Series
	Nutanix NX-3000 Series
	Nutanix NX-1000 Series
EXCELLENT	Pivot3 HCI Blades *
	Pivot3 HCI All-Flash *
	Pivot3 HCI Hybrid *
	Dell EMC XC730 Series
	Dell EMC XC630-10
	HPE Hyper Converged 380 VMware Platform System Standard
	HPE Hyper Converged 250 for VMware Platform System Standard
	HPE Hyper Converged 250 for Microsoft Cloud Platform System Standard
	HPE SimpliVity OmniCube CN-1400
	HPE SimpliVity OmniStack **
	Lenovo HX7510
	Lenovo HX5510
	Lenovo HX3000 Series
	Lenovo HX2710-E

* The licensing provider is listed at the beginning of each ranking category in which its products are included. One should not draw any negative inferences about any other products included in that ranking.

** OmniStack utilizes Cisco UCS, Dell EMC PowerEdge, HPE, Huawei, or Lenovo servers

Hyperconverged Infrastructure Delivers Business Value

HCI solutions provide bottom line value by reducing capital and operational expenses. These factors make HCI solutions appealing to many organizations:

- **Simplified management.** HCI solutions provide a framework to manage servers, networking and storage without the need for multiple IT specialists, specialized training or separate administration tools. HCI systems in remote or branch offices can be administered centrally, ensuring consistent protection of corporate data.

- **Easy expansion.** HCI solutions minimize or even eliminate painful data migrations and legacy rip-and-replace methods of growth. Compute and capacity is expanded by simply adding a new appliance or node to the existing configuration.

- **Customized resource scaling.** Several vendors now offer capacity- or performance-optimized nodes, allowing organizations to target upgrades to address the constrained resource.

- **Infrastructure savings.** Traditional data center solutions may require a half rack or even a full rack of equipment, including: servers, storage array and networking. Today, some HCI appliances provide a four-node solution utilizing only two rack units. Power, cooling and space consolidation yields bottom-line savings.

- **Simplified disaster recovery and high-availability solutions.** HCI solutions provide fundamental disaster recovery and high-availability functionality, reducing the need for third party products.

DCIG Observations:

Recommended

Products earning the *Recommended* ranking include the Pivot3 Acuity X-Series, Dell EMC VxRail Series, Dell EMC XC6320-6, HPE SimpliVity OmniCube CN-5400, CN-3400 and CN-2400, Nutanix NX-8000, NX-6000, NX-3000 and NX-1000 Series. These products are generally distinguished from products ranked *Excellent* by the following characteristics:

- 70% of the *Recommended* products scale to at least 64 nodes in a cluster compared to 46% of products ranked Excellent

- Average 25 TB/RU (terabyte per rack unit) of raw all-flash capacity, more than 2.5X the average of Excellent products

Pivot3's Acuity X-Series enables enterprise workload consolidation by integrating NVMe flash and rich QoS technology from its 2016 acquisition of NexGen. Acuity scales to 12 hybrid or 16 all-flash nodes—and up to 516.8 TB of raw all-flash capacity—per virtual Performance Group (vPG). Pivot3 supports unlimited vPGs per cluster.

Pivot3's patented erasure coding technology utilizes storage capacity much more efficiently than traditional RAID and replication technologies, delivering storage efficiency of up to 94%. Optional vGPU cards enhance VDI performance and consolidation ratios.

The Dell EMC VxRail Series consists of five different platforms designed to address different use cases. The VxRail products utilize VMware virtualization technologies including Virtual SAN. Four of the five platforms are available as hybrid or all-flash configurations. The largest all-flash platform scales to 2.9 PB in a 64-node maximum scale-out configuration. Each 1U or 2U appliance contains one or four nodes. The VxRail Series offers erasure coding, deduplication and compression data services on the all-flash configurations. With VSAN 6.2, the product now provides stretch clustering, allowing nodes to be in separate physical locations.

The Dell EMC XC6320-6 is 2U, four-node appliance powered by Nutanix software. Dell EMC positions the XC6320 for high-density compute and storage environments, service providers and private cloud deployments. Each all-flash node consists dual Xeon processors and 6 x 3.8 TB SSD drives giving the appliance a maximum raw all-flash capacity of 91.2 TB. The Dell EMC XC6320-6 offers REST API for automated management and supports multiple hypervisors including Nutanix Acropolis Hypervisor (AHV), VMware ESXi and Microsoft Hyper-V.

Simplivity was acquired by HPE in February 2017. The HPE SimpliVity OmniCube CN-5400, CN-3400 and CN-2400 have a maximum raw storage capacity of 25.6 TB, 21.6 TB and 10.4 TB per hybrid appliance, and 22.4 TB, 10.6 and 8 TB in all-flash configurations. The OmniCube scales to eight appliances for a maximum all-flash capacity of 179.2 TB. The latest OmniStack software release builds on existing data protection capabilities by adding support for multi-node stretch clustering and SQL Server application-aware backups. SimpliVity appliances utilize OmniStack Accelerator Cards to offload and accelerate deduplication and compression operations.

The Nutanix NX-8000, NX-6000, NX-3000, and NX-1000 models all earned the Recommended ranking in this year's Buyer's Guide. Nutanix claims unlimited scaling. A 64-node NX-8000 cluster provides almost 3 PB of raw all-flash capacity. Nutanix products support multiple hypervisors including VMware ESXi, Microsoft Hyper-V and its own KVM-based Acropolis hypervisor. The latest release of the Nutanix AOS now includes native file services through AFS (Acropolis File Services), the Prism self-service portal and ESXi management within Prism.

DCIG Observations:

Excellent

The fourteen (14) products that achieved an *Excellent* ranking are Pivot3 HCI Blades, All-Flash and Hybrid products, Dell EMC XC730 Series and XC630-10, HPE Hyper Converged 380 VMware Platform System Standard, 250 for Microsoft Cloud Platform System Standard and 250 for VMware Platform System Standard, HPE SimpliVity CN-1400 and OmniStack, Lenovo HX7510, HX5510, HX3000 Series and HX2710-E.

Pivot3 HCI Blades, HCI All-Flash and HCI Hybrid models have similar management and operational characteristics as the *Recommended* Acuity X-Series, with the exception of NVMe flash and QoS support. The HCI Blade chassis utilizes 16 half-width blades for a compute-dense HCI solution supporting up to 51.2 TB of raw all-flash capacity. The HCI Flash scales to nearly 500 TB, while the HCI Hybrid scales to over 1.5 PB of raw capacity.

The Dell EMC XC730 Series and XC630-10 share many similarities with their XC6320-6 sibling. These appliances fill a spectrum of use-cases including VDI, storage-heavy workloads and performance-intensive transactional workloads. The Dell EMC XC systems run Nutanix software and provide broad hypervisor support including VMware ESXi, Microsoft Hyper-V and Acropolis. These products offer all-flash or hybrid configurations, the largest providing 60 TB raw capacity per node.

HPE Hyper Converged 380 and 250 products are available in hybrid and all flash configurations. The HC380 is available in three workload configurations: Virtualization, CloudSystem and VDI. An available GPU card enhances VDI performance. It supports up to 40.2 TB of usable all-flash capacity per node, and scales to 16 nodes. The HC250 supports 32 VMware ESXi nodes or 16 Microsoft Hyper-V nodes. HPE HC250 provides VM and application-consistent snapshots and synchronous replication for multi-site high availability. It provides 38.4 TB of raw all-flash capacity per node, or 38.4 TB in a 4-node appliance.

HPE SimpliVity OmniCube CN-1400 is the entry level model of the series. Like its larger OmniCube siblings, the CN-1400 is powered by the OmniStack operating software. The CN-1400 is available in a hybrid configuration with an effective capacity of 6 TB per node.

The HPE SimpliVity OmniStack operating system is packaged with servers from several vendors including HPE, Cisco, Dell EMC and Lenovo. This option benefits organizations where getting a new vendor approved would add many months to the acquisition process. The OmniStack OS provides an enhanced optimization engine identifying VM locations for workload balancing, and stretched clustering that enables deployments to span multiple locations.

Lenovo HX7510, HX5510, HX3000 Series and HX2710-E utilize Lenovo hardware and the Nutanix OS. The HX7510 is a 2U, single-node appliance positioned for high-performance enterprise databases and applications. A 64-node cluster scales to nearly 3 PB of raw storage capacity. The Lenovo HX Series supports Microsoft Hyper-V, VMware ESXi, and the built-in Nutanix Acropolis hypervisor. Existing Lenovo customers can leverage XClarity, Lenovo's hardware systems management application.

Inclusion and Exclusion Criteria

The inclusion and exclusion of specific products in this Bulletin is based on the follow criteria:

- Must be available (orderable) as a single SKU and includes its own hardware and software

- Must be marketed as a hyperconverged appliance

- Must support at least one hypervisor (XEN, Hyper-V, VMware, KVM, etc)

- Must provide compute and storage in the same infrastructure solution (i.e. the appliance can host multiple virtual machines and use local direct attached storage as the storage layer)

- Must not require an external storage appliance (i.e. SAN/NAS)

- Must cluster/federate nodes together

- Must support a centralized management and reporting structure

- Must provide data protection features

- There must be sufficient information available to DCIG to make meaningful decisions. DCIG makes a good faith effort to reach out and obtain information from as many storage providers as possible. However, products may be excluded because of a lack of sufficient reliable data

- Must be formally announced and/or generally available for purchase as of April 28, 2017

Ultimately, it is the professional judgment of the analysts working on each DCIG Bulletin whether or not a particular model meets the inclusion criteria.

Disclosures

Over the last few years the general trend in the US has been for both large and boutique analyst firms to receive some or all of their revenue from vendors.

DCIG is no different in this respect as it also receives payment for the different services it performs for vendors. The services that DCIG provides include blogging, battle cards, competitive advantage reports, customer validations, product reviews, executive white papers, white papers and special reports.

In the interest of transparency, a number of the vendors included in this Bulletin are or have been DCIG clients. This is not to imply that their products were given preferential treatment. All it means is that DCIG had more knowledge of their products so that DCIG could *consider* their product for inclusion in this Bulletin.

In that vein, there are a number of important facts to keep in mind when considering the information contained in this Bulletin and its merit.

- No vendor paid DCIG any fee to research this topic or arrive at pre-determined conclusions

- DCIG did not guarantee any vendor that its product would be included in this Bulletin

- DCIG did not imply or guarantee that a specific product would receive a preferential ranking before or after completion of research

- All research was based upon publicly available information, information provided by the vendor, and/or the expertise of those evaluating the information

- No negative inferences should be drawn against any vendor or product not covered in this Bulletin

- It is a misuse of this Bulletin to compare products included in it against products not included

- This Bulletin reflects DCIG's independent research and opinion, though the content on page one was developed specifically for the vendor licensing this Bulletin

Because of the number of features analyzed and weighed, there was no way for DCIG to accurately predict at the outset how individual products would end up ranking. DCIG wants to emphasize that no vendor was privy to how DCIG weighed individual features. In every case the vendor only found out the rankings of its product(s) after the analysis was complete.

The Six-Step Process Used to Rank the Hyperconverged Infrastructure Appliances

1. *DCIG established which features would be evaluated and which ones would not.* Prior to selecting the features which would be evaluated, DCIG quantified, then "normalized" the list of available features such that a common name for each feature was established. In cases where a feature could not be objectively defined or understood, it was excluded from consideration.

2. *DCIG developed a survey to capture the feature data and completed a survey for each vendor's product(s). DCIG then sent the survey(s) to each vendor for verification. Each vendor was invited to review their data and respond with any corrections or edits to the DCIG-completed survey(s).* In every case, every vendor had the opportunity to review and respond to any DCIG-completed survey.

3. *DCIG identified a list of products that met the DCIG definition for an "Hyperconverged Infrastructure Appliance" based on the inclusion/exclusion criteria.*

4. *DCIG weighted each feature to establish a scoring rubric.* The weighting of each feature was done by a team of DCIG research analysts. The weightings were used to reflect if a feature was supported and potentially how useful and/or important the feature was to end users.

5. *Features were scored based on the information gathered from the surveys.* Features were marked as either *"supported"* or *"unsupported/undetermined"* and then scored accordingly. Rankings were finalized after any updates from vendors had been entered and the review period expired.

6. *Products were ranked using standard scoring techniques.* One of the goals of this Bulletin is to establish clear lines of differentiation with conclusions that are arrived at objectively. To accomplish this goal, the mean score for all products was first determined and then the standard deviation. DCIG developed an overall ranking for each product based on where that product's overall score fit into standard deviation ranges.

The full set of products and feature data may be accessed in the DCIG Competitive Intelligence Portal available through DCIG's website: **www.dcig.com**. ∎

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