Cool Vendors in Cloud Computing

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Initiatives: Cloud Computing

Innovation in cloud computing continues to accelerate at a rapid pace in cloud infrastructure and platform services. CIOs should assess these Cool Vendors, who are disrupting the cloud market with their innovative approach in enabling operationalization of cloud-native platforms.

Overview

Key Findings

- The innovation among cloud providers is moving up the stack around cloud-native platform services. Databases, integration and application platform services, orchestration and management tools, and large hyperscale providers are increasingly offering distributed cloud services across on-premises, edge and even other cloud provider environments.

- While there is growing interest in developing applications using cloud-native platforms, lack of operational know-how and inability to hire the right talent continue to be significant bottlenecks in the path to production.

- Scaling cloud-native efforts across distributed locations needs effective security, observability, integration, automation, centralized management and governance that often exceeds the capacity and skills of IT teams.

Recommendations

As a CIO building a cloud computing strategy, you should:

- Create a scalable framework for cloud operations through standardized toolchains, repeatable processes and a collaborative DevOps approach.

- Assess the vendors outlined in this research on their tight integration with cloud-native platforms and their ability to deliver against your business SLAs across resiliency, security, performance and costs.

- Proactively manage startup relationships by conducting regular quarterly meetings and by providing action-oriented feedback to vendors on product quality, features, quality of support and the business benefits achieved thus far.
Strategic Planning Assumption(s)

By 2025, more than 85% of global organizations will be running containerized applications in production, which is a significant increase from less than 35% in 2019.

More than 50% of global enterprises will have deployed serverless function platform as a service (fPaaS) by 2025, up from less than 20% today.

Analysis

This research does not constitute an exhaustive list of vendors in any given technology area, but rather is designed to highlight interesting, new and innovative vendors, products and services. Gartner disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

What You Need to Know

The adoption and interest in public cloud continues unabated as a majority of customers pursue a “cloud first” policy for onboarding new workloads. Past efforts at building private clouds in enterprises have met with limited success due to lack of tooling maturity, automation gaps, lack of scale and inability to innovate at the speed and scale of hyperscale providers. Gartner believes that in the future, cloud services will be more distributed beyond centralized cloud regions to different physical locations such as the data center and the edge. CIOs will increasingly leverage cloud-native platform services such as containers and serverless functions to modernize and build new applications. These cloud-native platform services will enable adoption of newer application architectures such as microservices and a continuous integration and delivery pipeline for agile software development and delivery. Figure 1 illustrates the new technologies enabling a cloud-native ecosystem.

Figure 1: Cloud-Native Ecosystem
To fully reap the value of these new technologies, organizations need to pursue a DevOps approach to how they plan, build and run workloads. The vendors identified in this research have built products to solve customers’ challenges in accelerating scaling of cloud environments and in enabling adoption and operationalization of cloud-native platforms.

Opsani

Redwood City, California (https://www.opsani.com)

Analysis by Craig Lowery

Why Cool: As container adoption accelerates, the number of companies going to market with container management solutions has also increased. Opsani is numbered among them but stands out with its approach to application performance and cost optimization using machine learning (ML) techniques to autoscale containers and tune the software running in them. When its entire suite of capabilities are used, Opsani claims it can more than double performance while cutting more than half the cost of a container-based cloud-native application.

Opsani’s hybrid cloud architecture consists of a software as a service (SaaS) linked with a local container or virtual machine (VM) running the Opsani agent, dubbed “Servo.” Servo functions as an adjunct to the other containers, VMs and services comprising the application to be tuned. Servo takes measurements from the application environment in both horizontal and vertical dimensions. It supports containers running under Kubernetes or in native public cloud container platforms (Amazon Web Services [AWS], Microsoft Azure and Google Cloud Platform [GCP]).
Horizontally, the agent collects metrics for all the containers associated with the application. Vertically, the agent collects metrics about the container cluster, the containers and the runtime environments in the containers (such as the Java Virtual Machine). Servo’s measurement service provides plug-ins for Prometheus, New Relic, Wavefront, Datadog and Splunk-SignalFx, among others. Information drawn from these sources is passed back to the SaaS in the public cloud for analysis using ML models that then make optimization recommendations.

The recommendations are then sent back to Servo, which implements them throughout the application by adjusting configurations in Kubernetes or the native public cloud platform. Typical recommendations include resizing a container, reconfiguring the autoscaler or reconfiguring the Java Virtual Machines in containers. Servo also interacts with Jenkins, GitHub and other continuous integration/continuous delivery (CI/CD) for checking in recommended configurations into customers’ repositories.

Opsani serves use cases in both production and development environments. It is designed to run continuously, making adjustments automatically and incrementally over time. For customers concerned about allowing such a tool free rein in a production context, Opsani’s canary mode constrains it to optimize a limited set of production containers (canaries) to validate proposed optimizations before broader deployment. In test environments, a synthetic load generator modeling different performance workloads stresses an application under test, and Opsani is used to find an optimal configuration that can then be propagated to a production environment.

**Challenges:** Opsani’s approach to performance management and optimization is an instance of autoremediation. Autoremediation has been slow to gain acceptance except in well-understood, specific use cases. As new technology that is in development, Opsani is evolving quickly and lacks long-term validation. Some customers may not trust it to make autonomous decisions, especially in critical production environments. Opsani may not be able to deliver the dramatic cost savings and scalability it promises when its autonomy is limited. However, this challenge is not specific to Opsani. This is a market acceptance barrier that nearly all ML-based recommendation products face.Opsani is a SaaS-delivered solution. Some enterprises may still be reluctant to adopt SaaS as a critical management component because it is perceived to offer less control than a self-managed solution.

**Who Should Care:** Opsani’s solution does not depend on developers making changes in their work habits or best practices. Any container-based application can be optimized though applications that exhibit more variance in resource utilization and load may see higher returns. CIOs are most likely to purchase this product because it can be deployed across teams unobtrusively and synergized with a container-native strategy. It delivers performance improvements while reducing overall costs, the latter of which may motivate CFOs to be enthusiastic supporters of its adoption.

**Pensando**

Milpitas, California (https://www.pensando.io)
**Analysis by Sid Nag**

**Why Cool:** As the performance and efficiency gains of x86 have slowed over time, new technologies such as dedicated accelerators based on new technologies have found a role for specialized workloads such as graphics processing units for artificial intelligence (AI) and ML. Pensando has developed a new breed of AI and ML accelerators offering specialized offloaded performance and services, particularly for things like network functions. These new platforms such as AWS’ Nitro Cards and Pensando’s Distributed Services Platform will solve complex workload needs from a performance demand standpoint.

The Pensando platform gives any public cloud provider the ability to compete with established players such as Microsoft Azure and AWS that have similar capabilities. Additionally, it allows enterprises to build scalable infrastructure that accelerate the disaggregation of compute, networking and storage to drive efficiency and management at large scale — thereby emulating the operations of a hyperscaler. The Pensando platform is available in a modular form, unlike the same capabilities from AWS Nitro System and Azure, which are proprietary in nature.

The explosion of data generated by applications in and out of the data center has enterprises choose between scale-up capacity with a traditional IT architecture or move-more workloads to public clouds. Either approach means IT staff often end up spending more time managing complexity and infrastructure than they do innovating for the business. Pensando has created a third option that overcomes the constraints of the other two, with the first secure, programmable, edge-accelerated platform that directly addresses the generational shift occurring as data pushes to the edge of the cloud.

The core of the Pensando platform is a custom P4 programmable system on a chip, Capri. Capri is optimized to execute a software-stack-delivering cloud, compute, network, storage and security service at cloud scale with minimal latency, jitter and very low power requirements (about 30W at 100 gigabytes). Capri is easily installed in any standard server via the Pensando Distributed Services Card (DSC).

The Pensando DSC replaces the standard network interface card in any server, providing software-defined services at the server edge, eliminating an assortment of discrete appliances throughout the data center and simplifying IT operations. The Pensando DSC additionally enables pervasive network visibility using its hardware bidirectional flow-streaming and traffic-mirroring capabilities.

In addition, the Pensando Policy and Services Manager (PSM) delivers central life cycle management, enterprise-grade security and unmatched visibility at every level of the software stack.

The Pensando platform integrates with third-party tools such as compute orchestration platforms (VMware vCenter, Kubernetes, Red Hat OpenShift, OpenStack, etc.), security information and event management, and analytics applications (Splunk, Pico-Corvil, ExtraHop, etc.), ITOps platforms (ServiceNow, Infoblox, BlueCat, etc.). This simplifies operations, facilitates the deployment of the
The Pensando platform is available as a standard factory-supported option on a broad range of Hewlett Packard Enterprise (HPE) infrastructure platforms. This includes select HPE ProLiant, HPE Apollo and HPE Edgeline Converged Edge Systems servers in addition to availability through HPE GreenLake, HPE’s market-leading as-a-service platform. The Pensando DSC is an enabling technology that powers the NetApp AFF A400 platform.

Challenges:

- Pensando is early in the market, and it remains to be seen how the market reacts to a solution of this nature.
- Pensando provides a revolutionary technology that may have issues being compatible with existing deployments.
- While Pensando’s founders have an excellent track record, CIOs may reconsider investing in a solution from a disruptive startup company.
- Pensando will have to establish deep relationships in the public cloud provider market and invest to ensure its products can compete effectively with AWS and Microsoft Azure.
- The Pensando model represents a significant change for enterprise organizations and its breadth of services means there will be multiple decision makers in the purchase cycle.
- The strong go-to-market relationship with HPE that has made this a standard server option and the ability to deploy the various services over time should help in terms of adoption. Additional hardware OEMs and strong relationships with other software providers will be key to success.

Who Should Care:

- Cloud architects and infrastructure and operations (I&O) leaders who are looking for high-performance throughput solutions for their specialized workloads running in on-premises data centers and hybrid, distributed and public cloud provider service offerings

RackN

Austin, Texas  (https://rackn.com)

Analysis by Sid Nag and Arun Chandrasekaran

Why Cool: RackN allows customers to manage their infrastructure with cloudlike APIs and infrastructure as code (IaC) control plane but without requiring a cloud IaaS provider or SaaS management plane.
RackN does not take a multicloud SaaS provider approach, unlike other players such as Google Anthos in this space. It deploys self-managed software from inside the customer premises and edge data centers at the level of bare metal and then outbound to the cloud. Its product, Digital Rebar, provides IaaS APIs and infrastructure-as-code automation for both vendor-agnostic environments and multicloud adoption models. They are also able to combine management of commodity servers and VMware, Windows, Linux and Kubernetes environments.

This approach helps clients who have adopted a multivendor hybrid approach. By embracing the heterogeneous nature of infrastructure with reusable workflows and integration, RackN can enable customers to preserve vendor and automation products but modernize it with integrations for IaC tools like Red Hat Ansible and HashiCorp Terraform. Enterprise customers can use Digital Rebar to deliver completely autonomous infrastructure from delivery of bare metal to fully enabled clusters including built-in security features like RBAC, SSO, secure boot, certificate injection and standardized firmware updates.

In their latest version, RackN has enhanced the Digital Rebar Infrastructure as code components. This includes a feature that allows standard workflows to dynamically jump between machine and platform contexts, allowing operators to create and then manage multicloud instances from the self-managed platform. They have also introduced pooling APIs that enable end-user self-management by tools like Terraform and an enhanced distributed site management capability that allows single-pane-of-glass control of remote sites without compromising autonomy.

**Challenges:**

- RackN targets companies that are seeking self-management and do not want to rely on a provider’s native tooling or SaaS platform. In a world where SaaS is the default delivery approach, the RackN choice of delivering its products as self-managed software could be challenging for those customers who prefer a SaaS-based platform approach.

- RackN’s approach ensures customers’ autonomy and network integrity; it also means that customers need to install their platform and learn how to operate it. This extra step may pose a challenge.

- While RackN appears to have streamlined the out-of-the-box self-service experience, it remains to be seen how this “back to the future” model scales.

**Who Should Care:**

- Cloud architects and I&O leaders who manage internal infrastructure and are looking to leverage proven cloudlike CI/CD and IaC best practices in their IT systems should consider this vendor.

- Enterprise architects in highly regulated industries looking to modernize their infrastructure provisioning and automation processes should consider this vendor.
Serverless
San Francisco, California (https://serverless.com)

Analysis by Raj Bala

Why Cool: Serverless is the name of a company whose employees are the primary contributors to an open-source framework of the same name. Serverless has also come to describe a broad category of fully managed services with functions as a service (FaaS) offerings, namely AWS Lambda, being the most emblematic of the entire market. Serverless provides the application framework for developers and teams building on those fully managed services.

Serverless, the framework, acts as a deployment wrapper around other popular web programming frameworks such as React and the Express framework designed for Node.js, a server-side JavaScript runtime. Typically, to deploy a web application, developers would need to provision servers, deploy application and web servers and configure them appropriately. As a deployment wrapper, the Serverless framework removes all the heavy lifting of deploying applications since it automatically maps constructs defined in application code to services in the public cloud. Further, the Serverless framework specializes in deploying to cloud services that autoscale and never charge while idle, enabling developers to deliver applications with very low operational cost.

Most enterprises will find that serverless applications need to be part of a CI/CD process that involves automated testing before deployment. Serverless conveniently offers developer services such as CI/CD tooling in addition to a serverless application monitoring service.

Challenges: Cloud providers such as AWS and Microsoft act as both partners and competitors to developers such as Serverless. AWS offers the serverless application model, which is an extension to its Cloud Formation provisioning service. The serverless application model doesn't employ the same experience as the Serverless framework, but some enterprises may find this experience sufficient. The cloud providers also have their own CI/CD and application monitoring tooling that is integrated in their suite of offerings unlike a third-party could possibly offer.

The Serverless framework also doesn't support all cloud providers equally well. As is expected, the framework supports providers in order of their customer demand, which is mostly focused on AWS. There may be insurmountable functionality gaps with other providers related to language runtime, framework and overall functionality.

The Serverless framework also does not support all programming languages equally well, either. Python, for example, is not as well-supported as JavaScript, which is what Serverless is written in. Other language-specific serverless frameworks (such as Chalice and Zappa for Python) may be a better fit when the Serverless framework doesn't support languages particularly well.

Who Should Care: DevOps teams attempting to reduce the operational burden of managing cloud infrastructure such as servers should consider the Serverless framework. I&O teams requiring...
automation of infrastructure can use Serverless to programmatically interact with cloud providers’ infrastructures.

Volterra
Santa Clara, California (https://www.volterra.io)

Analysis by Arun Chandrasekaran and Sid Nag

Why Cool: Volterra provides a unified platform for deploying, orchestrating, securing and scaling workloads across hybrid and multicloud environments. They seek to address the enterprise pain point of architecting and operating a do-it-yourself (DIY) stack for cloud-native workloads through an integrated stack and simplified SaaS platform that supports on-premises, public cloud and edge-based deployments. While the adoption of containers and Kubernetes is on the rise, operating those workloads in production requires a steep learning curve and integrating several open-source or commercial tools together, a problem that Volterra is focused on solving.

Volterra has two flagship products. VoltMesh is a SaaS offering for connecting, securing and monitoring applications deployed across multiple cloud providers and edge sites. VoltMesh uses a distributed proxy architecture to enable a mesh network across the WAN with global load balancing, traffic management and embedded application security capabilities such as web application firewall (WAF), distributed denial of service, encryption and vulnerability mitigation. VoltStack is an integrated solution that includes VoltMesh and includes capabilities such as identity and secrets management, multitenancy, observability, storage and an integrated Kubernetes orchestration engine with a common management plane. VoltStack helps customers bring Kubernetes workloads to production in a faster, resilient and secure manner. VoltStack customers can run these workloads on-premises, in the public cloud or in edge environments, either on VMs or bare-metal OSs. While VoltStack is primarily a software offering certified to run on off-the-shelf third-party hardware, Volterra does offer it in an appliance form factor for industrial and telco edge sites. Volterra’s disaggregated product strategy enables customers to consume its product in a modular fashion as they do not need to buy the entire stack on Day 1. Moreover, it opens the door for supporting other Kubernetes distributions in the future should customers decide to head down that path.

Deploying and managing distributed apps that run on Kubernetes is challenging for most IT organizations and the unified, but modular, approach that Volterra brings can enable platform teams to be agile, robust and cost-effective in their operations.

Challenges:

- Volterra is trying to sell a full stack solution in a market that is characterized by several best-of-breed solutions across the various product categories. While they do offer a modular approach to consuming their products, the fact that they position themselves as a full stack solution creates a higher barrier to entry in the enterprise and potential competition with several point product solutions.
The Kubernetes ecosystem is characterized by a plethora of open-source projects and DIY approaches. It isn't an easy task convincing those teams of the value proposition of a proprietary and commercially supported approach.

Large platform providers such as AWS, Microsoft, Google Cloud, IBM’s Red Hat and VMware have comparable capabilities across several capabilities that Volterra offers and are formidable competitors to this young startup.

Who Should Care:

- Platform engineering and site reliability engineering teams looking to enhance security and performance and reduce operational complexity of their containerized workloads across hybrid or multicloud environments should consider Volterra in their shortlist.
- I&O teams looking to support their platform teams and developers for cloud-native workloads should shortlist Volterra to ease their operational burden and be compliant with business SLAs.

Evidence

All vendors profiled in this research — Opsani, RackN, Pensando, Serverless and Volterra — were selected based on Gartner inquiries with these vendors and other end-user clients during the course of the year.

Recommended by the Authors

‘Distributed Cloud’ Fixes What ‘Hybrid Cloud’ Breaks
CTO’s Guide to Containers and Kubernetes — Answering the Top 10 FAQs
A CIO’s Guide to Serverless Computing
Top 10 Trends in PaaS and Platform Innovation, 2020

Recommended For You

Consulting Providers Must Invest in Asset-Based Managed Services to Capture Strategy Consulting Opportunities
Effective Communication Is Critical to Successful Cost Optimization Efforts
Toolkit: Use Gartner’s Customized IBM Passport Advantage Software RFQ Template to Negotiate the Optimal Deal
CFOs in Transition — Accelerating Time to Impact
Benchmarking the Location of Finance Middle-Office Activities