Containers Rise to the Challenges of Hybrid IT

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PREPARED FOR

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EXECUTIVE SUMMARY

In today's hybrid IT environment where workloads are deployed across various cloud infrastructures, as well as in traditional IT environments, containers are one solution to the problem of getting software to run reliably when migrating from one environment to another. As self-contained runtime environments, containers comprise an application and all its dependencies, configuration files and libraries.

Because they are small, containers start up almost instantly, in seconds compared to several minutes or more for typical virtual machines (VMs). Faster startup times contribute to less downtime, a boon for organizations seeking to leverage a public cloud service to handle peak-load transaction volumes. In a case like this, faster boot and restart times can directly reduce costs.

Another aspect of the growing popularity of containers is their potential to mitigate the frequent conflicts that arise between development and operations teams. Containers do so by separating the areas of responsibility for each: developers focus on the applications, and operations on infrastructure.

451 Research believes application containers to be the primary use case in the enterprise for popular container software. This OpenStack/container synergy centers on the speed and efficiency gained by development teams. This is especially true in OpenStack private cloud environments, which assist in scaling out the use of containers. We believe that popular container software can have complementary effects on the broader OpenStack market. OpenStack and containers are further aligned in that OpenStack is the clear leader in open source clouds.

Below are case studies from two different kinds of organizations that have already benefited significantly from containers in terms of enhanced security, greater operational efficiency and more rapid development of cloud-aware applications.

Case Study: Major IT Vendor Embraces OpenStack and Containers

For this company – one of the world's largest OpenStack users – the move to OpenStack technology and practices didn't come from a top-down mandate, from developers or even from IT. Rather, it came from both end-user and customer demands. Specifically, the company sought to resolve problems related to packaging, microservices and access to hardware with its OpenStack strategy. The company cites several key motivators for its aggressive move into OpenStack, including a general OpenStack mandate, the ability to program via APIs and improved operational efficiency.

With its nearly 74,000 employees globally and $50bn in annual revenue, the company has set the tone for the way networking is done in organizations of all sizes. And with its roughly 10,000 cores and virtual CPUs in its OpenStack operations, along with 400 OpenStack-dedicated employees, the company is continuously pushing the envelope for this leading open source cloud computing platform. The most common use cases and workloads leveraging OpenStack at the company include R&D, application development, networking services and systems management.

Currently, the company is using containers in active production mode, and it is doing so by running containers separately from VMs. 451 research indicates that while containers offer the benefit of typically being much more lightweight than VMs, the reality is that most enterprises today are running containers on top of or inside VMs. This sacrifices some of the benefits of containers, including speed, simplicity and efficiency. However, in return, those running containers integrated with VMs get the benefits of their VM management, tooling and processes, all of which offer the benefit of increased security.

But as mentioned, the company is pushing the envelope in both OpenStack and container deployments, as evidenced by its running containers entirely separate from VMs. The company further believes it is critical that platform-as-a-service (PaaS) offerings include infrastructure-as-a-service (IaaS) management capabilities; however, the company does not deem it critical that IaaS have built-in integration with PaaS. The company is also operating a container infrastructure platform in conjunction with its OpenStack services to run its huge environment.

Case Study: Financial Services Firm Seeks Operational Efficiency

With the ambitious goal of putting roughly 30% of its development in containers within 12 months, this company is on the leading edge of container deployment aimed at smoothing out the often-rocky application-development process. As a leading provider of analytics software and tools to manage risk, fight fraud, and optimize compliance and regulatory practices, this firm counts 95% of the largest US financial institutions as its clients.

The company made the move to OpenStack cloud platforms more than two years ago, the result of an engineering decision seeking cost benefits and greater operational efficiency while avoiding vendor lock-in of non-open-source cloud platform alternatives. Today, the most common use cases and workloads deployed to OpenStack at the company include R&D, application development, big-data services and industry-specific applications.

At the time the engineering team was considering the use of containers at the company, team members were wrestling with the problem of trying to build applications that are cloud-aware and can scale horizontally without relying on underlying infrastructure to do so. In other words, this problem seemed tailor-made for a fix using containers and their ability to move from one environment to another in a highly seamless manner.

To boost the effectiveness of its OpenStack container initiatives, the company also uses a software-defined storage platform, a container infrastructure program and a hybrid cloud management tool.

The company runs its containers on top of its VMs. Although it loses some of the potential benefits of containers, it gains greater confidence in areas such as multi-tenant security. This is in keeping with our expectations that VMs will continue to persist in the enterprise for at least the next two to three years, in this case as a host for the company's containers. The company believes it is critical that IaaS has built-in integration with PaaS to leverage various integrations and support so the two can be centrally managed.

Conclusion

In summary, 451 Research believes there is beneficial synergy between OpenStack and containers. Popular container software, for example, nicely complements OpenStack. Containers and OpenStack are further in step because OpenStack is the clear leader in open source cloud platforms, while containers are tightly aligned with open source development.

This relationship and synergy will come under competitive pressure from emerging container management software. But at least for the near-term, containers will continue to be a key element of the OpenStack ecosystem.