Containers and Cloud: Exploring the OpenStack Opportunity with LivePerson

Introduction

As more mainstream companies become software development organizations in their own right, containers are an attractive technology to help speed the development and deployment of applications. Many IT organizations and infrastructure teams are being asked to support containers for their developers, but the best way to deliver containers and tie them into enterprise systems has not been clear. There's also been confusion about whether container orchestration systems are competitive or complementary with cloud platforms like OpenStack. OpenStack is viewed by many people as a platform for virtual machines (VMs), and nothing more. But many users are now running container orchestration engines on on top of both bare metal and virtualized infrastructure, all managed by OpenStack.

LivePerson is one such organization who wanted to orchestrate containerized apps while relying on its existing OpenStack powered infrastructure. With a sizeable OpenStack footprint orchestrating VMs across multiple datacenters, its team recognized the opportunity behind combining OpenStack and containers. LivePerson has successfully built a containerized infrastructure using OpenStack and put over 150 microservices into production.

If you've ever engaged with a sales or support rep through a chat window on a website, there's a good chance you were using the LivePerson real-time chat platform. Recently, to support its software developers, boost time to deployment, better leverage public cloud, and increase hardware utilization, LivePerson chose Kubernetes to orchestrate Docker containers on its OpenStack private cloud.

Why OpenStack for containers?

Here's a look into why LivePerson chose containers on OpenStack.

The OpenStack community continues to demonstrate that containers fit well into the OpenStack ecosystem. OpenStack provides a programmable, pluggable data center infrastructure, using open APIs, that helps organizations secure and manage their IT. As new innovations emerge, like containers, the OpenStack community develops ways to plug the new innovations into OpenStack. By doing so, OpenStack serves as a connecting point for any relevant technology, delivering monitoring, management, orchestration, and self-service provisioning.

Today, OpenStack has the capability to deploy containers as first-class resources, within a VM or bare metal. When you deploy containers on OpenStack, you can take advantage of existing services like enhanced security, tenant isolation, built-in load balancing, and a self-service catalog to streamline containerized application management and deployment. In addition, OpenStack can support a wide range of container toolsets, including Kubernetes, Docker Swarm, and Mesos.

Containers were the most robust technology available to take LivePerson's existing microservices to the next level. Together with Google's new open source containers orchestration tool - Kubernetes, LivePerson could take advantage of containers and drive several key advantages beyond deployment with minimal complexity.

OpenStack gave LivePerson the perfect framework for exploring and implementing containers within its enterprise. Docker and Kubernetes fit seamlessly with OpenStack, giving them the perfect opportunity to drive a shift toward better business value.

"A few years ago Openstack made all the difference for us and enabled the company to succeed with its transition to microservices. Now Openstack, together with Kubernetes and Docker will enable us to take the next step in speed of delivery, uptime and a hybrid cloud approach."
Koby Holzer, Cloud Engineering Director, LivePerson

Supports multiple orchestration tools including Docker Swarm, Kubernetes and Mesos

Enables you to run containers in virtual machines or directly on bare metal

Integrates your containers environment with important enterprise systems rather than creating a new silo

"Having OpenStack-powered infrastructure makes the most sense for us and has given us the fastest path to production to deploy Kubernetes clusters using Puppet on OpenStack VMs. It's kind of like having a one stop shop for all of our use cases - bare metal, instances and containers."
Koby Holzer, Cloud Engineering Director, LivePerson

Background

LivePerson is an early OpenStack adopter, starting with the Essex release 2012 for production and now standardizing on Kilo. It has seven global data centers with over 20,000 virtual cores. Several years ago, it migrated from a single monolithic service, running mainly on VMware, combined with physical servers running Sun Solaris and Microsoft Windows, to over 150 microservices running on Linux within OpenStack.

But recently, LivePerson needed to make another shift because its team had two problems that couldn't be addressed with conventional approaches.

1. **Deployment** - with thousands of deployments a year, the existing pipeline clogged/became bottlenecked. It needed a way to build a new pipeline that was the same across all datacenters, starting from Continuous improvement to quality assurance, from staging to alpha, and finally all the way to production. It had to create a full continuous delivery model, end to end. Their goal was to be able to shift from thousands of deployments each year, to many thousands -- with no apparent impediments to future growth.

2. **Public cloud** - LivePerson had attempted to utilize public cloud to cope with spikes in demand as well as ongoing business growth, but had some unusual constraints that impeded its progress. The team was trying to find a way to have the same development and production pipeline across public and private, as well as coming up with a way to orchestrate across both environments.

Ultimately, its team aims to give a real PaaS service to their software developers, from the first line of code to a running service in production.

How did they do it?

Leveraging their OpenStack powered infrastructure, LivePerson deployed Kubernetes clusters, using Puppet, on large VMs, and the team is busy migrating its microservices to the new clusters. Some services are already in production, and over the next few quarters, LivePerson intends to have all its containerized services in production.

What have the benefits been?

So far, LivePerson has had great results with Docker and Kubernetes on OpenStack.

1. Focusing on the continuous integration and delivery pipeline, its team has seen significant advantages in time to deployment, giving its developers a fast and smooth pipeline to production. Implementing a new service went from taking a few days to a few minutes. To upgrade existing services, it went from a few hours to a few seconds.

2. Kubernetes made all the difference in its ability to grow toward hybrid cloud. With Kubernetes its team can have the same pipeline and technology, using private and public without added complexity. Orchestrating the services, making them mobile across different infrastructures is exactly what LivePerson looked for. Eventually, many microservices will run in containers on its private cloud and multiple public clouds.

3. Though it's still early, LivePerson thinks that containers are also going to make a significant difference in hardware utilization, giving the company more room to adapt and grow without additional physical infrastructure.

In short, for LivePerson, containers on OpenStack have been a success. To explore the possibilities, visit us at www.openstack.org/containers.

LIVEPERSON