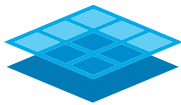


WHITE PAPER

Open Source-as-a-Service

How to make cloud infrastructure easy

Indeed, software is truly changing the world. If you think about taxi companies, gaming companies, retailers, everybody is reinventing themselves with software. Open source, in particular, is playing a big part in this transformation of our world. Many of the modern, innovative services use underlying Open source frameworks. This has enabled them to develop features quickly, innovate faster and deliver great user experiences. In this white paper, we discuss how Open source-as-a-Service is a new model of consuming Open source software.



PLATFORM9

Why Open Source Software?

WHITE PAPER:
Open Source
as a Service

There was a very seminal paper in the late 1990s titled “Cathedral and the Bazaar” by Eric Raymond, as he collaborated with Linus Torvalds. It was his observation on Open source systems v/s proprietary systems. The cathedral in this case alludes to a proprietary software model and the bazaar is the Open source model. Eric formulated a law that has come to be known as Linus’ law- “Given enough eyeballs, all software bugs are shallow”. There are so many more people looking out for issues while developing, testing and using popular Open source software. The community involvement makes it easy to find and resolve bugs and problems in a timely manner. A lot of evidence has built up over the last decade or so that this really affects security vulnerabilities; the community can jump in and fix issues faster. This reduces the costs of software development and ownership, and enables faster time-to-value.

The Open source dynamics are playing out in various industries and there is a massive rise in innovative and exciting capabilities being brought to market by Open source software. In the world of cloud infrastructure platforms, there is a similar trend with the emergence of Open source alternatives to the dominant solution from VMware. Open source software, like OpenStack and Kubernetes, are predominantly being used for new cloud infrastructure projects.

Open source software for DevOps

For DevOps teams, in particular, there are a plethora of exciting and popular Open source tools like Vagrant, Packer, Jenkins, Puppet, Chef, Ansible etc. Big Data is predominantly led by Open source systems like Hadoop. Docker is a very popular solution for containerized applications and micro-services. OpenStack and Kubernetes represent the fundamental blocks for IT infrastructure solutions that have risen due to the need for open APIs and frameworks for cloud-native apps. Kubernetes is a continuation of the philosophy of operating at a higher-level of abstraction for application development, by managing software deployment instead of managing infrastructure plumbing.

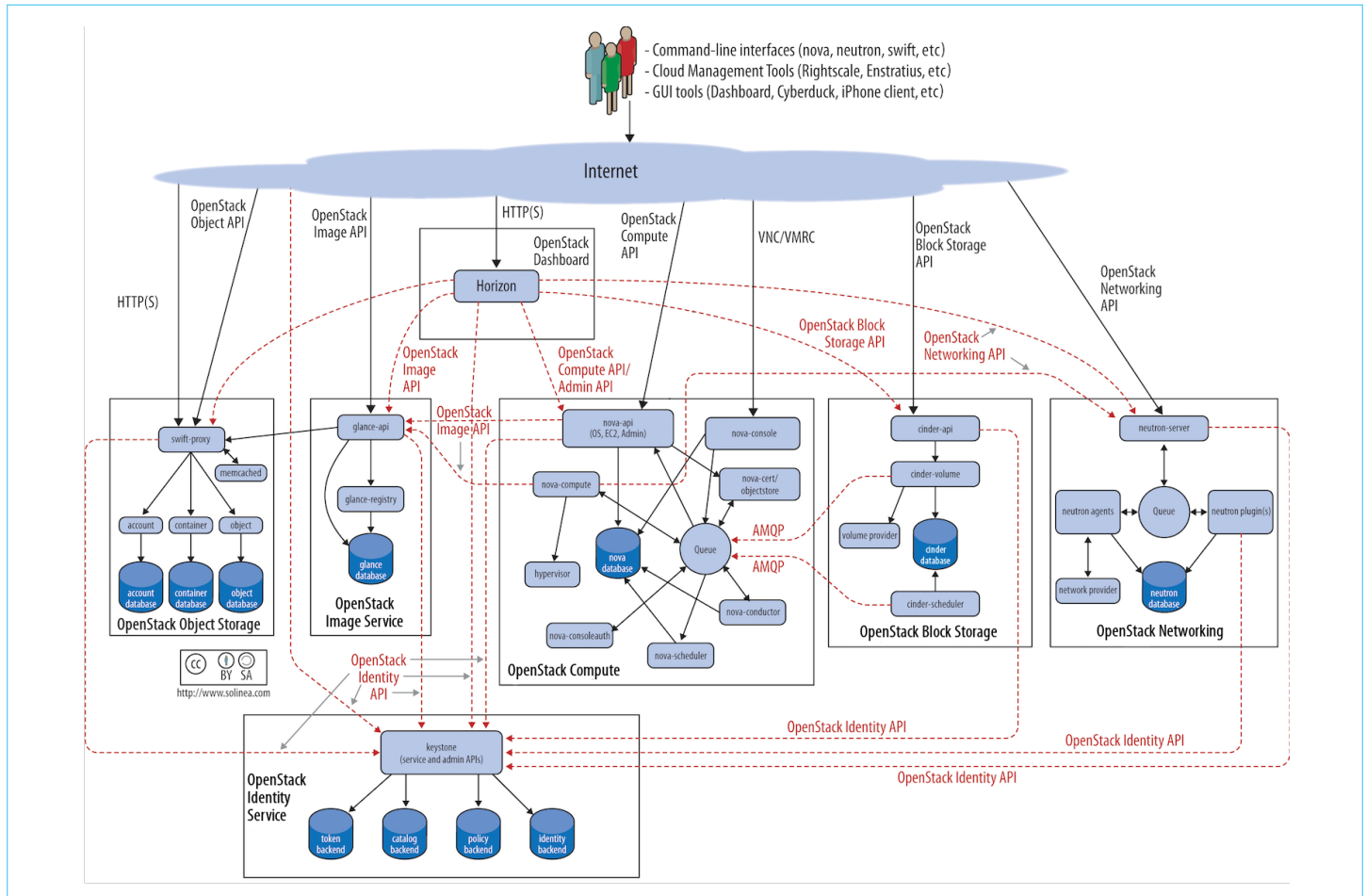
Open Source Consumption Experience

Traditionally, the first consumption model comes down from the origin of Open source which was a do-it-yourself community. It was enthusiasts rallying around Linux in the 1990s. This introduced a class of users called the trained operators who had the skills to run Linux. In turn, that led to the support subscription model by Red Hat, where Open source enthusiasts and IT teams could get support from a vendor that provided more curated software and updates. It was an enhancement but not a fundamental shift from the DIY model since it still relied heavily on a set of operators who are experts in that stack.

However, it gets exponentially more complex when moving from a single node software like Linux to managing a complex framework like OpenStack with its many component projects and moving parts. The DIY model or subscription model does not extend to a complex system such as OpenStack. OpenStack has, in particular, been much maligned for the complexity of deploying it in production-ready enterprise IT environments.

Complexity of OpenStack Architecture

See the architecture diagram below which involves just the top 5 projects in OpenStack- Keystone, Nova, Glance, Cinder and Neutron. There are lots of interdependencies; each service has to be deployed, secured, updated and wired up to work with other components. This interdependency multiplies the points-of-failure. Deploying this architecture at scale in production, and troubleshooting potential issues, is not for the faint-of-heart. This is an example of the higher complexity in managing the deployment of distributed systems.



Inter-dependencies of OpenStack projects makes them difficult to deploy at scale.
Credit: <http://docs.openstack.org/admin-guide/common/get-started-logical-architecture.html>

There are different types of Open source projects out there. DevOps-friendly Open source projects can be classified in two simple ways: "Single-node systems" and "Complex Distributed Systems".

Single-node systems such as Vagrant, Jenkins, Docker, mongoDB are comparatively simpler to install and run. Since there aren't many moving parts, these tools are easier to deploy and use.

Complex distributed systems, on the other hand, like Hadoop, OpenStack and Kubernetes, have many moving parts and are fairly complex frameworks to package and run at scale. There are lots of variable to cause things to go wrong e.g. time drift, misconfiguration, and securing components. This is not a problem of these specific frameworks, but is caused by the inherent nature of distributed systems and the path complexity involved. This makes it very likely that teams will run into performance and stability issues when using these systems.

Clearly, there is a lot of goodness and value to Open source, and it represents the future of software due to its lower cost and faster innovation. However, what is needed now is a way to solve the hardest problems associated with distributed complex systems, and unlock the true benefits of Open source. There's got to be a better way to leverage the goodness of Open source while avoiding the difficulties enterprise face in deploying these systems.

Ideal Open Source Consumption Experience

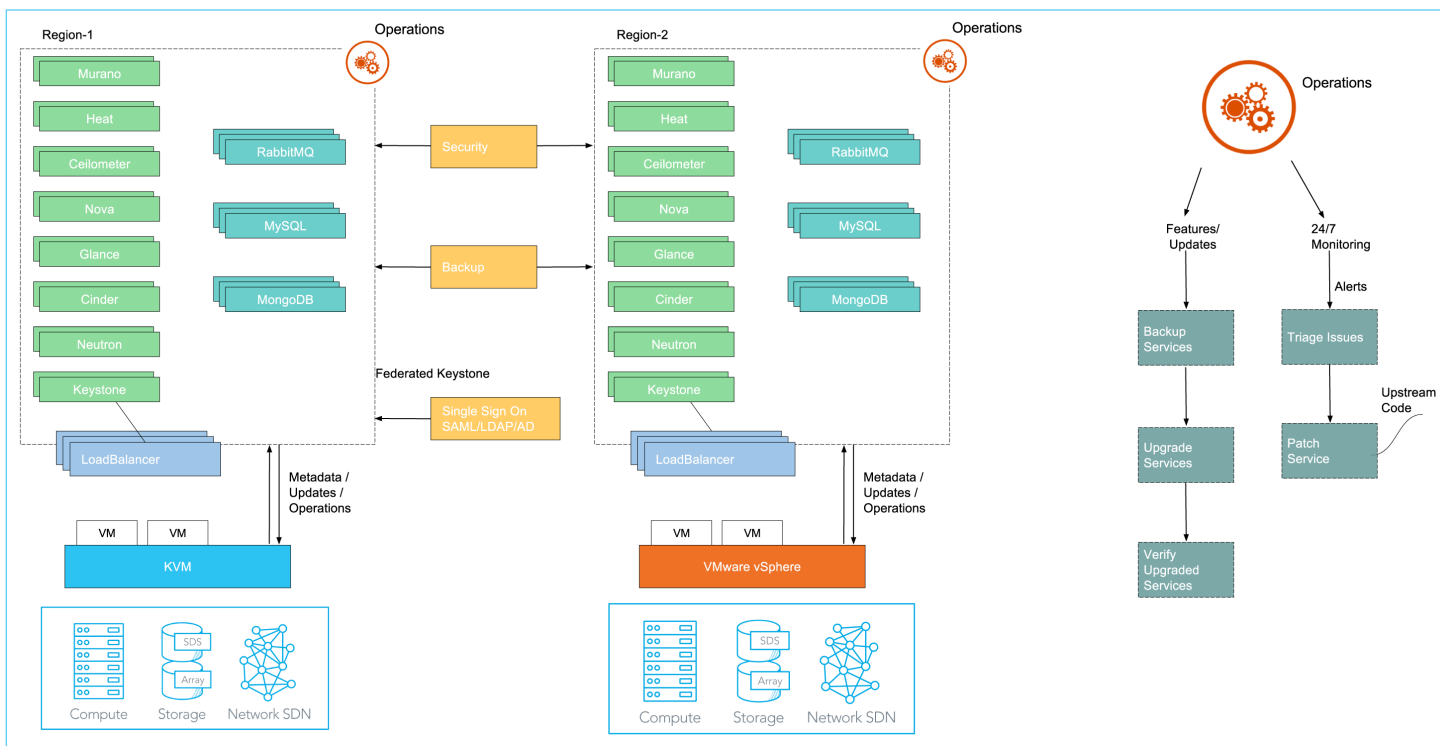
For inspiration, look at the way Amazon Web Services (AWS) provides new services. They provide fully managed services, such as EC2, S3 and EBS, that are easy to setup and scale. With a few clicks in the AWS console, customers can begin using these services and focus on solving their specific IT and business problems. Wouldn't it be nice to see a consumption experience like AWS and apply this to Open source? This combination will give the freedom of choice, and all the advantages that come with Open source, without the difficulty of setting it up. An ideal solution like this will solve two problems - manageability and full integration with enterprise systems.

Manageability would involve considerations like how to deploy, configure high availability, provide SLAs for uptime and reliability, monitor, troubleshoot, deploy patches and upgrades to new versions.

Full integration would involve working with existing compute/storage/network IT platforms, working across different regions of capacity, connecting to enterprise SSO systems like AD/LDAP, and working across multiple private and public clouds.

Enterprise Deployment of OpenStack in Production

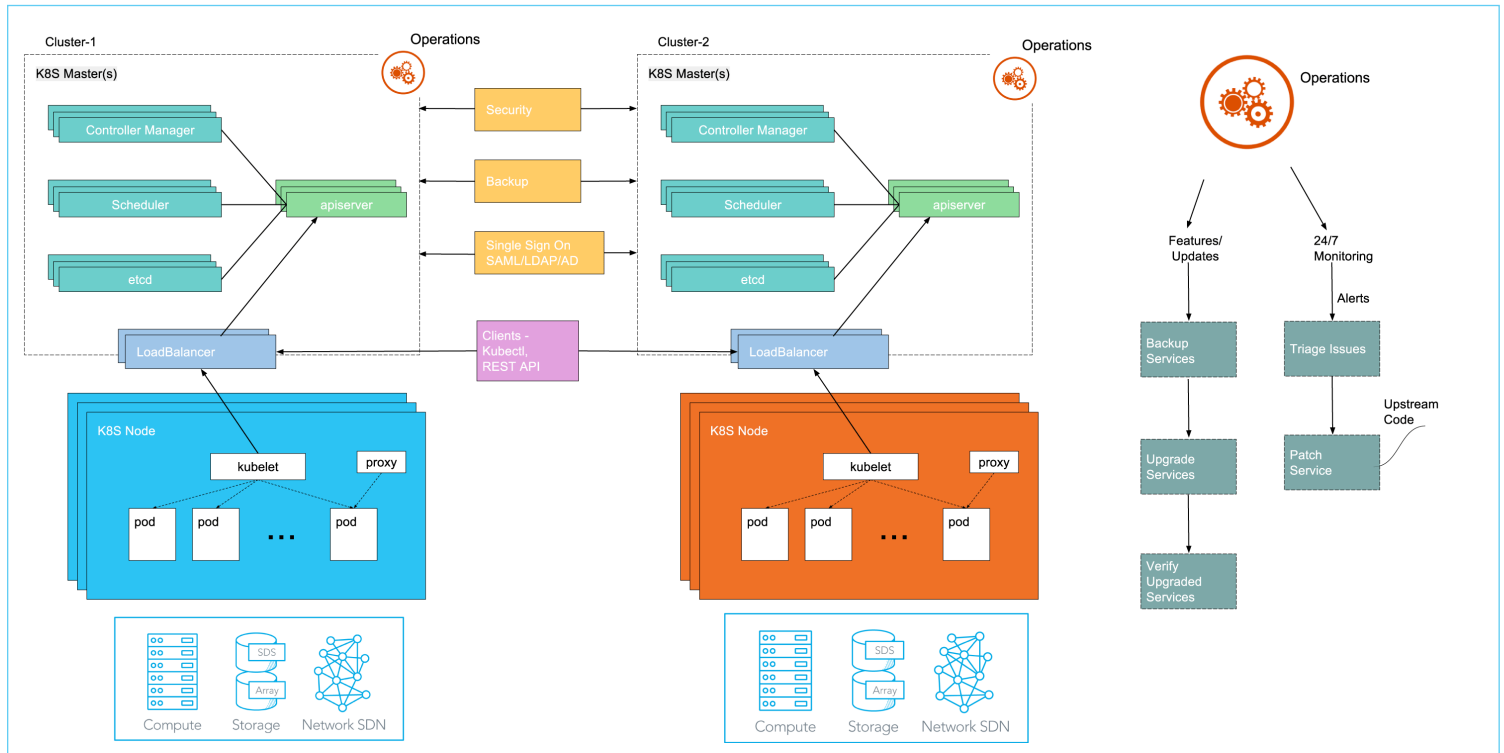
The figure below shows OpenStack services running in a highly available configuration in two regions. Each region has a different hypervisor: KVM v/s VMware. In addition, both regions need to be configured for security, backup and Single Sign On services. While configuring all this is a huge effort in itself, it still doesn't take care of day 2 activities like monitoring, patches and updates. Deploying OpenStack in an enterprise-ready configuration is a significant effort.



Multi-region, highly available OpenStack environments are difficult to setup and manage.

Enterprise Deployment of Kubernetes in Production

The figure below shows Kubernetes clusters in a multi-master configuration. Each cluster runs the Master node services in a highly available manner. Similar to the OpenStack example above, both clusters have to be configured for security, backup and Single Sign On services. In a production environment, the clusters will have to be continuously monitored for health and performance, and updated regularly with patches and new versions of Kubernetes.

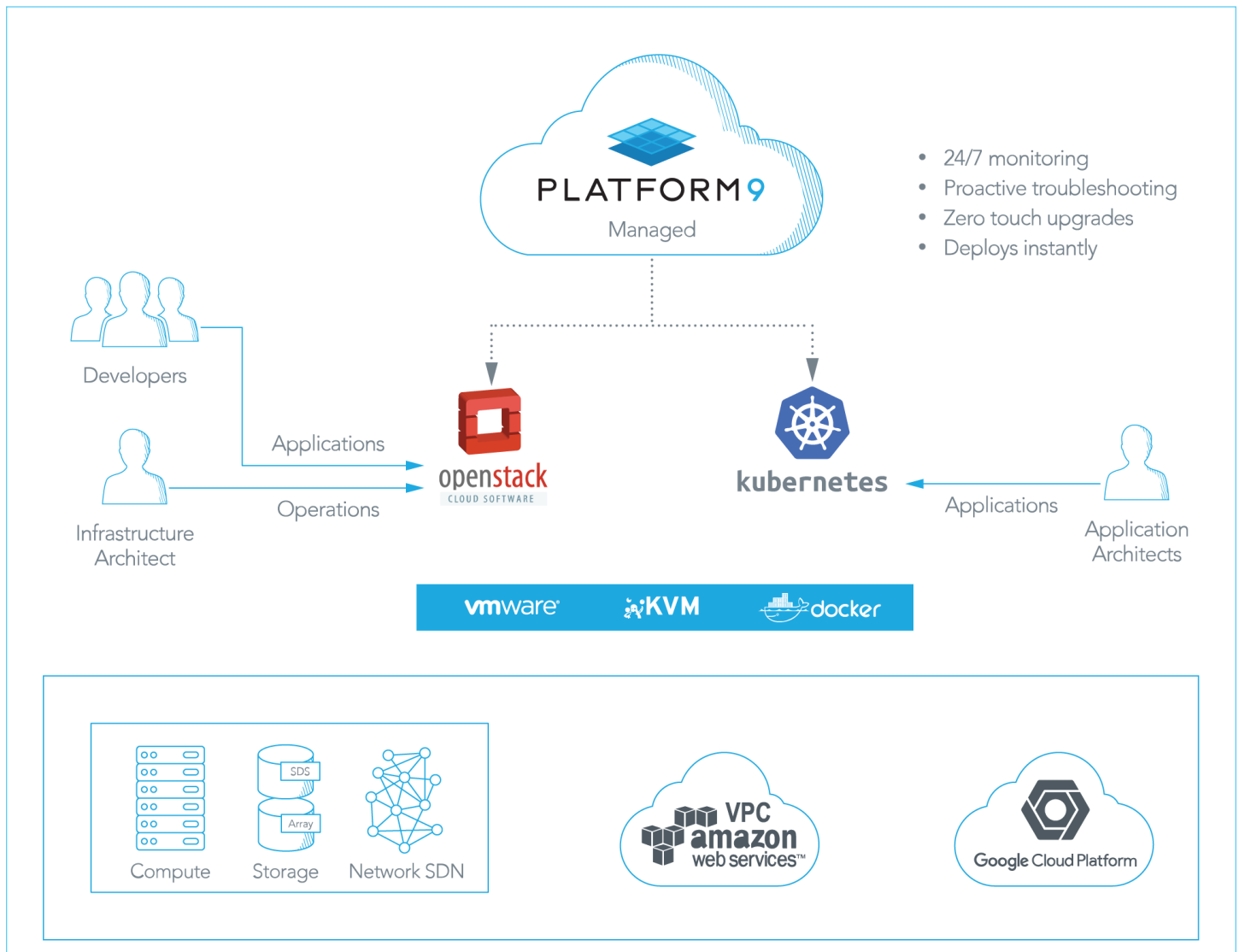


Highly available Kubernetes clusters across availability zones are complex to deploy and manage.

From the diagrams above, it is clear that installing these platforms to include high-availability, security, backup, SSO across regions, setting up monitoring and upgrades is a very complex process.

Fully Managed Service for Open Source Frameworks

In order to have an AWS-like consumption experience, there're a lot of underlying tooling and operations that have to be set up. This is exactly what Platform9 provides as a managed service for Open source frameworks. We deliver Open source-as-a-Service to fill the missing pieces in consuming Open source: manageability and full integration. This model is faster to deploy, makes it easier to start consuming Open source, and delivers on the value prop of using leading Open source frameworks that are fundamental to cloud infrastructure. Customers can use physical machines or virtual environments on VMware, KVM or Docker, and even a mix of private and public clouds. Without having to spend time and resources to setup and configure, enterprises can be up and running on OpenStack or Kubernetes in minutes instead of weeks.



Fully Managed 'Open source-as-a-Service'

Conclusion

Open source software is where a lot of innovation is happening for cloud infrastructure and DevOps products. While these Open source software platforms are very powerful solutions, there's a lot of effort required to set them up in an enterprise-ready configuration, so that DevOps teams can consume them easily. This is where Open source-as-a-Service provides the best way to consume Open source software to their maximum potential, without being burdened by the underlying tasks to deploy, monitor and upgrade. This brings an AWS-like consumption experience to Open source software, with the added choice and flexibility of using these on top of private or hybrid cloud infrastructure.

About Platform9

Platform9 is a Silicon Valley startup building a business offering Open source-as-a-Service to enterprise customers. Currently, we offer two very popular projects, OpenStack and Kubernetes, as managed services. Since we function on a software-as-a-Service model, our solutions are very easy to deploy. Unlike other vendors, it doesn't require dozens of engineers to get these complex framework deployed in an enterprise-ready configuration. This extreme ease of use, coupled with production-ready SLAs, gives our customers:

- Production-ready environments in minutes, not months.
- Zero-touch upgrades and bug fixes, ongoing monitoring and troubleshooting
- Functionality right out of the box. No need to hire a team of experts. Platform9 "just works"

See how easy it is to deploy open source frameworks for your cloud infrastructure. [Start a Free Trial.](#)