



Whitepaper:  
OpenStack and Beyond Built on ProphetStor Federator



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The Promise of Cloud as a business enabler is well documented, the technologies and approaches to cloud are now also starting to take shape. Hybrid is a must, on-premises will shrink but is unlikely to disappear. Private cloud either on-premises or hosted will be a key feature of the datacenter and various levels of public cloud and dedicated cloud providers that will all feature in an aggregated datacenter.

The benefits in terms of cost, scalability, elasticity and flexibility are numerous, but underpinning your applications, cloud infrastructure and SaaS offerings are the data themselves, and having a storage platform that meets a cloud scale infrastructure is sometimes overlooked.

An important cloud stack that is starting to be increasingly rolled out into the corporate and service provider space is OpenStack. OpenStack is already being used to build public clouds, hosted private clouds and on-premises private clouds across the region.

As an open source cloud platform OpenStack there are many reasons why companies are trusting their business applications into this architecture. It's widely supported with companies like IBM, HPE, RedHat, Suse, Dell, Rackspace and Cisco to name a few all supporting OpenStack Clouds. It's the only cloud platform that actually allows mixed server hypervisors to co-exist.

Most importantly, OpenStack offers the choice of the vendors avoiding hardware technology lock-in and by association cost effectiveness by enabling enterprise grade capability built on commodity components.

OpenStack has not been as quickly adopted into corporates as clouds built on platforms like VMware. This has been due to issues such as security and very importantly being able to serve enterprise class storage in a way commensurate with a cloud based platform.

Federator from ProphetStor is a genuine enabler for OpenStack based cloud environments. It not only adds enterprise-class security for your data, but also enables flexible scale-out fast performing storage to complement the cloud environment that can be built across multiple storage vendor offerings.

## Selecting Your Storage for Cloud is Critical



Traditional approaches to storage are not able to meet the scalability demands of cloud environment. A software based approach is key. ProphetStor Federator has some clear advantages when it comes to building a storage infrastructure for cloud. Federator abstracts storage enabling it to be managed, monitored and configured via software. This in turn enables storage to be managed and allocated and shared in a way that meets the demand of cloud. In the case of OpenStack, Federator integrates with the storage service (Cinder) to deliver and manage storage that is served to the application. Critical is that this same management layer can be used to abstract Cinder and also many other storage hardware platforms, so that your storage can be managed across multiple clouds and on-premises datacenters as well.

## Some key terms that matter in OpenStack Storage

Cinder and Ceph – If you are a hardened “storage guy” you will know what these are, for everyone else it may not be so obvious.

In the OpenStack world these are key components of building a storage infrastructure. Cinder is the method by which storage in its most basic form (blocks) is presented to an OpenStack environment. Cinder effectively enables storage to connect to applications running in OpenStack.

Cinder is effective in doing that, but does not cater for the finer features required in enterprise storage like snapshots or data protection.

Ceph is another open source project that enables scale out enterprise class storage to be constructed using commodity hardware. Ceph groups machines together into clusters pooling processing, memory and storage from each node that makes up the cluster. Adding nodes is simple and as you do so performance and capacity increases incrementally.

Both Cinder and Ceph can be considered as the foundation or building blocks of a robust storage infrastructure for OpenStack – however, to make that foundation enterprise class AND cloud ready, it needs a software defined approach with an integrated Software Defined Storage product like Federator from ProphetStor.

## OpenStack will almost never exist in isolation.

From a storage perspective it is also important to acknowledge that OpenStack is unlikely to exist in isolation. It is likely to coexist with legacy environments, public cloud or private hosted clouds built on other platforms.

Having purpose integrated storage for OpenStack is great, but given the reality of the modern datacenter, doing this in isolation will mean that you have a flexible scalable pool of storage that is tied to OpenStack alone. This will mean inefficient use of your storage infrastructure.

One of the great points about a truly software defined approach like that the Federator approach is that storage can be shared and provisioned across environments, more than that different storage architectures can be shared in this way.

The federator approach ensures enterprise class integration in the OpenStack world and even more importantly it extends to reach to all storage platforms on all infrastructures.

## Where Does That RESTful API fit in?



When ProphetStor discuss integration with OpenStack and all other platforms they refer to their RESTful API. This API is an absolutely critical feature for an SDS solution. Its importance is not restricted to OpenStack, but with this platform being open source the RESTful API is even more important in this space.

RESTful API is an architecture that has been referred to as the language of the web. It breaks tasks into small modules that developers can apply to storage related tasks very cleanly. As an architecture that was developed to utilise web technology, RESTful APIs are well suited to cloud architectures of which OpenStack is a key example.

Bottom line is that the comprehensive RESTful API is key to Federators ability to manage almost any storage vendor's product, it also enables ISV's, cloud and managed service providers to integrate Federator into their own architectures. It is also the way that basic storage commands can be communicated to physical storage devices in an OpenStack environment.

When it comes to OpenStack cloud based storage, it is all about automation, without this RESTful API, the required automation cannot exist.

## The Federator OpenStack Advantage

So what exactly does Federator do over and above Ceph and Cinder.

It's important to remember that Federator is an enterprise wide virtualized layer for your storage, it will serve all storage platforms into Cinder and is not just restricted to Ceph. This give flexibility and options for Scale-up Storage as well as Scale-out.

Having the might of Federator to provision all and any storage between OpenStack and other platforms creates the flexibility in Storage that is needed to support the software defined datacenter.

If we drill into Cinder we find a robust basic platform that facilitates linking storage and hence data to applications in an OpenStack cloud, Federator impressively adds functions that make this truly enterprise class. Federator adds a comprehensive layer of storage management and data services including replication, snapshot, pooling and increased data integrity through verification and self-healing technologies.

When drilling into Ceph we see that once again Federator takes an excellent clustered storage platform and builds enterprise class functionality on top. Federator facilitates key actionable features like classification and provisioning of storage based on available IOPS, Automated Deployment and easy configuration and management of block storage devices which are defined and created specifically by the Federator Storage Hypervisor (Flexvisor).

It doesn't end there. Federator adds other important enterprise class enhancements to Ceph. Other Key enhancements include reducing latency by using RDMA and iSER, increased performance by adding SSD and NMVe as journey devices. Addition of enterprise expected features such as RAID, Compression and Snapshots.

In the next release of Federator, ProphetStor will take these enhancements even further adding functions such as highlighting low performance drives to ensure that SLA's are met by the lowest performing drive in a Ceph node (i.e. accommodating the lowest common denominator) as well as identification and prediction of disk failure.

These features combine to add cast iron enterprise storage stability in a flexible scalable platform. Federator is a fill to an important gap in the OpenStack landscape, essentially bolstering the Storage layer to make OpenStack a more credible choice for business application being run by corporate IT.

## Why does your business need Federator

ProphetStor Federator is the layer that will enable storage to match the demands and elasticity of datacenters built on a hybrid cloud model.

The demands of the Business on IT are different today than at any other time. Gartner are calling it the “Enterprise Driven Data Center”. By this they mean that lines of business are driving decisions in the datacenter more than IT themselves. The business expects to launch new ideas and new routes to market and do so in days or weeks rather than months of years, they expect IT to be able to expand and accommodate on demand.

Business also demands performance, Federator enables OpenStack to support IOPS provisioning which is critical of providing the right speed of storage to the right task to deliver guaranteed Quality of Service to meet SLAs.

The fundamentals of cloud allow this. There are many options for building cloud and OpenStack which one that is gaining excellent traction, especially in Asia. The challenge is ensuring that the underlying storage supports the computing platforms above are as scalable, efficient and flexible. Elasticity at the compute layer without corresponding elasticity of resource at the storage layer will ultimately put significant limitations on IT to be as agile as the business demands.

Quite Simply Federator provides the answer.



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