## **Cloud in a Rack**

Enterprises Embrace the Cloud

Traditionally, a typical medium to large organization runs tens or even hundreds of applications on the same number of individual physical servers connected to a legacy storage infrastructure. However, the rapid growth of business data in the midst of heavy budget cuts forces enterprises around the world to reevaluate their operational efficiency and cost structure in order to stay competitive or just to survive. As a result, most companies are exploring alternative solutions to consolidate their IT infrastructure using the cloud. For instance, according to a recent study published by [HIMSS Analytics](http://www.himssanalytics.org/home/index.aspx)1, 83% of healthcare organizations are using cloud-based applications today. In fact, the cloud computing market in the health care sector is expected to grow to $5.4 billion by 2017, estimated by [Markets and Markets](http://www.marketsandmarkets.com/).

Although the cloud offers many decisive advantages over the old-school IT practices, moving applications and data into the cloud poses enough challenges even for the largest organizations. To meet the most demanding system management and budget requirements of the hospitals, a viable solution must:

* Observe the blueprint of a **software-defined** datacenter
* Scale out with **commodity hardware**
* Adopt open source computing platforms
* Offer seamless data and application migration services to bridge the legacy IT systems
* Provide an enterprise-grade private cloud environment for mission critical workloads.

[**Download**](http://www.prophetstor.com/?page_id=5709&customize_changeset_uuid=73068fe9-ba57-4c5e-96a4-ea98ee4e8814&customize_messenger_channel=preview-0)Intel® Solutions Reference Architecture.

Solution

From a feature-set point of view, integrated turnkey solutions such as Vblock from VCE are very attractive propositions, but the costs associated with these offerings are often prohibitively high. ProphetStor’s cloud-in-a-rack solution, on the other hand, leverages the industry-leading open source cloud computing platform OpenStack and integrates it with our state-of-the-art software-defined-storage [Federator® SDS](http://www.prophetstor.com/product-federator) to offer organizations a complete package of software-defined datacenter with a host of sophisticated [data services](http://www.prophetstor.com/federator-sds), in a very cost-effective fashion.

* [**Text Hover**](http://www.prophetstor.com/solution-cloud-in-a-rack/)

This solution architecture consists of a complete and self-sufficient cloud environment that allows the option to connect to a heterogeneous legacy storage systems while scaling out linearly with commodity hardware for future growth.

**Key Features / Benefits**

* Turnkey solution to create a complete cloud environment in a rack
* Automated, integrated system that deploys OpenStack and Federator SDS (storage controller and hypervisor) on commodity hardware over PXE
* Self-service provisioning for both virtual machines and storage through GUI dashboards
* Supports both legacy and commodity storage systems
* Feature-rich, enterprise-grade data services including data mover, data migration, traffic modeling, elastic resource control, and disaster recovery
* Cost efficient
  + Initial hardware and software acquisition
  + Deployment
  + Management and maintenance

Hardware Configuration

The fundamental architecture of this solution is based on a single rack design. Each rack represents a self-sufficient cloud platform complete with all necessary compute, networking and storage resources. Scaling can be accomplished by either adding more nodes to an existing rack, or adding more racks sharing the same architecture.

* [**Text Hover**](http://www.prophetstor.com/solution-cloud-in-a-rack/)

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### 10GbE Switch

* 48 10Gigabit SFP+ ports supporting 10GbE or 1GbE
* 4 QSFP+ each supporting 40GbE

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### OpenStack Horizon and Nova Servers

* Intel Xeon E5-2620 v2 × 2
* DDR3 RDIMM 16G × 4
* 500G 2.5″ 7200RPM HDD × 2
* 10G single NIC × 1

### OpenStack Cinder and Neutron Servers

* Intel Xeon E5-2620 v2 ×1
* DDR3 RDIMM 16G × 1
* 500G 2.5″ 7200RPM HDD × 2
* 10G single NIC × 1

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### Federator SDS Deployment and Controller Servers

* Intel Xeon E5-2620 v2 × 1
* DDR3 RDIMM 16G × 1
* 500G 2.5″ 7200RPM HDD × 2
* 10G single NIC × 1

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### Federator SDS and Storage Servers

* Intel Xeon E5-2620 v2 × 1
* DDR3 RDIMM 16G × 1
* 4TB 3.5″ HDD × 8
* 10G single NIC × 1

Network Topology

It is important to note that all deployment and management networks are separated from the VM and storage network such that control-plane events do not interfere with data-plane activities, and vice versa.

* [**Text Hover**](http://www.prophetstor.com/solution-cloud-in-a-rack/)

Easy Insertion and Future Proof

Despite the fact that the vast majority of organizations are embracing the cloud technologies due to tightening budgets and the pressure to offer higher quality patient services, the transition into cloud is not always easy. ProphetStor’s cloud-in-a-rack offers a modular solution to introduce cloud computing into existing legacy IT environment, **one rack at a time**. As future needs grow, compute and storage resources can be scaled independently using different rack configurations. Federator SDS provides all necessary tools to enable seamless data migration from legacy storage systems to the new software-defined cloud environment.

* [**Text Hover**](http://www.prophetstor.com/solution-cloud-in-a-rack/)

Conclusion

Private clouds built on elastic virtual infrastructures are increasingly appealing to the medium to large organizations. By leveraging open source cloud platforms and cutting edge software-defined storage technologies to consolidate workloads run at individual physical servers and legacy storage arrays, enterprises can significantly reduce IT management cost while improving service level and customer satisfaction at the same time. However, introducing a private cloud into an existing legacy IT environment is a daunting challenge, which represents a major hurdle for companies to adopt the latest cloud technologies, even if it is evident that, going forward, cloud is the only viable solution for their business to stay competitive.

ProphetStor’s **Cloud-in-a-Rack** solution solves this challenge with a fully integrated platform that combines compute, networking, and storage resources in a stand-alone unit. With its modular approach and fully automated deployment service, this solution can be quickly and easily introduced into any existing IT environment. Thanks to Federator SDS, both new scale-out storage and existing legacy arrays can be managed from a single-pane-of-glass dashboard. Workloads can be migrated to the new cloud environment using Federator’s suite of data services, one application at a time. As a result, organizations can find a comfortable pace, and the budget, to start building its private cloud infrastructure without imposing any limitation on future growth potentials.

1 [2014 HIMSS Analytics Cloud Survey](http://www.himssanalytics.org/research/AssetDetail.aspx?pubid=82160&tid=127) recently published by [HIMSS Analytics](http://www.himssanalytics.org/home/index.aspx)