

# OnApp Storage

The fast, scalable, integrated SAN for your cloud

**OnApp Storage is a distributed SAN for OnApp Cloud. It turns your existing cloud infrastructure into an extremely scalable and resilient storage system.**

## Designed for cloud providers

Traditional SANs don't fit the performance, resilience and cost characteristics you need to run a profitable cloud business.

OnApp Storage is designed for cloud providers. You can build a high-performance SAN in your existing cloud infrastructure, using commodity disks in your hypervisor servers. OnApp Storage pools the capacity of those disks to create an enterprise-class SAN with close to raw disk performance.

## Built for cloud environments

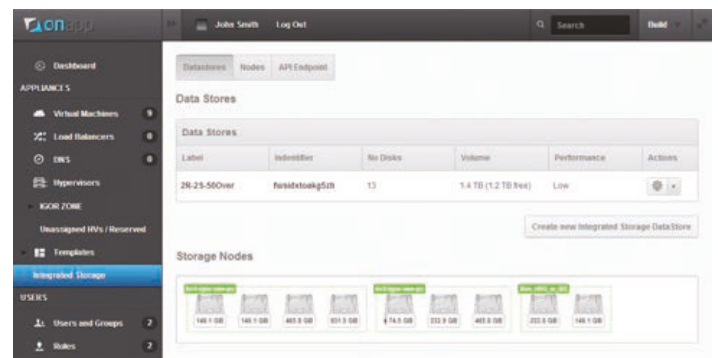
OnApp Storage is optimized for cloud workloads, and gives you intuitive control of striping, redundancy, storage overcommitting and pricing.

Our unique VM-aware technology optimizes throughput, by ensuring that data resides on the same server as the application that needs it, while patent-pending smart disk technology maximizes resilience by removing the need for a central storage controller.

## Use commodity hardware

With OnApp Storage, there is no vendor lock-in with supported disk types or custom network backplanes: you can use off-the-shelf hypervisor servers, disks and Ethernet components.

You can use SATA, SAS or SSD devices, and get exceptional performance even in a 1Gbit network environment.



Create flexible storage tiers from disks in your cloud

## Full cloud integration

OnApp Storage is fully integrated with OnApp Cloud: you can provision storage and manage billing for multiple tiers of storage, just as you would with a traditional SAN.

You can use OnApp Storage instead of, or alongside, a traditional/centralized SAN array.

## Designed for cloud providers

OnApp Storage is designed for cloud providers who have always struggled to find the right balance of performance, resilience and cost with traditional, centralized SANs.

### How your distributed SAN works

Instead of hooking your cloud up to a traditional centralized SAN, you populate your hypervisor servers with additional physical disk drives, and turn them into a distributed SAN using the OnApp Control Panel.

There can be many different types of storage connected to your hypervisor servers.

OnApp Storage categorizes these drives as low, medium or high performance.

The different drives are then announced and made available through a multicast channel, local to a single Control Panel system and divided by Hypervisor Zones. Hypervisor Zones help to separate the storage channels for different types of underlying hypervisor (Xen, KVM).

### Building your distributed SAN

Setting up your SAN is easy. First you choose which hypervisors (and their disks) you want to include, using the OnApp Control Panel.

Next, you create one or more virtual datastores containing disks of similar performance distributed across multiple hypervisors. Each datastore can have its own policies for striping, redundancy and overcommit.

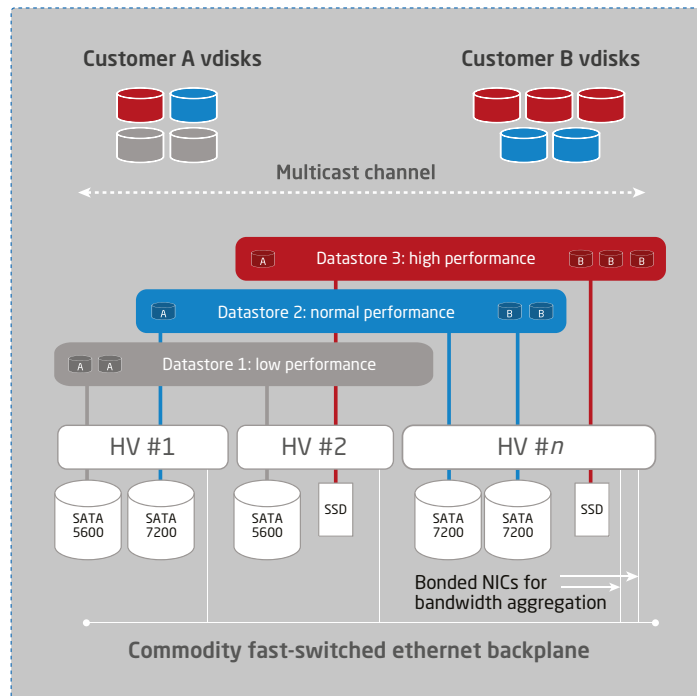
When a customer sets up a virtual machine, they can choose from the datastores you have created to provision their VM with storage - for example, a high-performance datastore based on SSDs, or a highly resilient datastore with multiple copies, each associated with a billing plan.

### Highly scalable

With OnApp Storage you can add additional storage capacity when you need it, without having to rebuild the whole SAN. Scaling your SAN is as simple as adding more disks to your hypervisors, and/or adding more hypervisors to your cloud.

This makes OnApp Storage particularly suitable for cloud service providers because the number of hypervisors scales naturally with the number of customers you have.

It's easy to ensure your cloud storage keeps pace with the overall growth of your cloud.



## Highlight features & technology

**OnApp Storage has the performance and resilience you need to run a successful global cloud business.**

### VM-aware technology boosts performance

OnApp Storage features our VM-aware technology, which optimizes storage throughput for virtual machines in your cloud.

VM-aware technology means the system knows which physical disk, on which hypervisor, holds a copy of data belonging to a specific virtual machine.

OnApp Storage uses this information to store VM data close to the VM that needs it: a copy is always held locally to the virtual machine whenever possible, on a disk in the same hypervisor.

This contributes to OnApp Storage's high throughput for cloud workloads.

### Cloud Boot saves set-up time

With Cloud Boot, your OnApp Cloud (and your distributed SAN) can discover and install hypervisors automatically. Instead of installing each hypervisor manually, you can deploy an image and install your hypervisors immediately from that image.

The OnApp Control Panel manages NIC IP address assignment for hypervisors, and you can pre-assign SSH keys for each hypervisor to speed cloud deployment, as well as accelerating the deployment of your OnApp Storage distributed SAN.

Cloud Boot works with Xen and KVM hypervisors and backup servers.

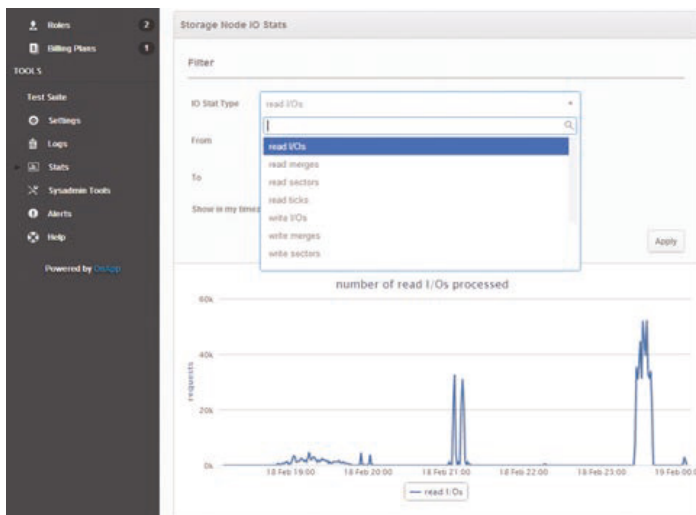
### Smart disks increase resilience

OnApp Storage features our patent-pending smart disk technology.

OnApp Storage knows which physical disks hold copies of data for a specific virtual machine. It uses that information to rebuild VM data if a problem occurs with any of the physical copies.

With smart disk technology, each physical disk in your distributed SAN is a self-managing, self-discovering and self-contained unit. It can make decisions about data synchronization and load balancing without depending on a central controller. With no central controller there is no single point of failure.

Smart disk technology also means disks are hot-pluggable. You can move disks between hypervisors and preserve the integrity of the data they hold.



OnApp Storage includes a range of monitoring and reporting tools

## Datstore management

OnApp Storage lets you set up virtual datstores with different price, performance and resilience characteristics. These datstores are used to provision storage (vdisks) to your customers' VMs.

- You can configure datstores with up to 4 redundant copies and 4 stripes per vdisk, and a range of overcommit percentages
- Adding and removing distributed SAN datstores is handled through the OnApp control panel, just like datstores based on traditional SANs

## vdisk management

OnApp Storage makes it easy to manage virtual disks:

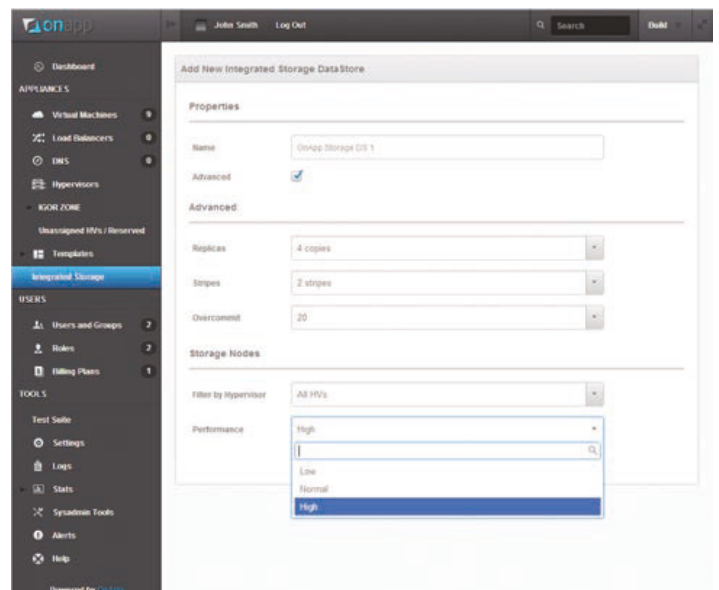
- Create, delete and resize vdisks
- Create and delete vdisk snapshots
- Repair vdisk membership (repair to an existing out-of-sync member, or to a new member)
- Migrate vdisk membership content (move content to a new member in the same datstore) without impacting VMs

Managing vdisks takes place in the OnApp Control Panel, in much the same way as virtual disks provisioned from traditional SANs.

## Physical drive management

You manage various aspects of physical disks too:

- Physical disks can be configured during hypervisor initialization, or afterwards
- OnApp Storage auto-detects drive performance (this can also be set manually)
- Physical disks can easily be formatted, assigned and unassigned to datstores



Each datstore can have its own policies for striping, replication & storage overcommit

## Reporting

OnApp Storage includes reports on key metrics, including:

- Statistics for each virtual disk on a specific hypervisor, for the duration of that vdisk's existence - filtered by date
- Statistics on each physical drive in your distributed SAN - filtered by date

## Hardware requirements

- > **OnApp Controller Server:** Dual or Quad Core 2Ghz+, 8GB+ RAM, 100GB RAID 1, 2 x Gbit NIC
- > **Hypervisor Servers:** 8GB+ RAM\*, Quad Core 2Ghz+, 30GB HDD (any commodity SATA or SSD drives), 4 x Gbit NIC

\* A small amount of hypervisor RAM is required by OnApp Storage, which cannot be assigned to VMs.

More information:

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