



VIRTUNET SYSTEMS VIRTUCACHE HOST BASED SOFTWARE FOR VMWARE TO ACCELERATE STORAGE PERFORMANCE OF ANY SAN BASED STORAGE APPLIANCE

VirtuCache is software for vSphere that clusters together in-host SSDs and/or RAM installed across VMware hosts in a VMware cluster and then automatically caches frequently and recently used data (both reads and writes) from any SAN based storage appliance to this clustered pool of host based caching media. Subsequently, by automatically serving more and more data from in-host caching media, VirtuCache substantially improves storage performance of vSphere hosts and all the VMs running on the hosts, thus improving the performance of applications running within VMs and increasing the VM density on the hosts, without requiring an expensive upgrade to SSD based storage appliances.

High Performance

Host Side Caching is one of the highest performing storage architectures on the market, and in this category of software, VirtuCache is the highest performing. Below are the reasons for both:

1. The **cache media is right on the motherboard** of the VMware physical server and it is connected to the host CPU via high speed PCIe bus (when caching to PCIe/NVME SSDs) or memory bus (when caching to host RAM). In comparison, cache media in a storage array is lower performing because it is behind the storage network and storage controller of the array.
2. **No equal when caching to host RAM:** If VirtuCache is configured to cache to in-host SSDs the storage performance is comparable to an All-Flash array. When VirtuCache is configured to cache to host RAM, then there is no equally high performing architecture currently on the market, since neither hyper-converged appliances nor storage arrays use large amounts of RAM in the IO path. And RAM is the highest performing storage media currently.
3. **Caching writes as well:** VirtuCache is higher performing than other host side caching software because we cache both reads and writes versus all our competition who cache only reads.

Ease of Use

1. **No VM or host reboot, and no storage reconfiguration** required.
2. **Seamless**
 - a. VirtuCache is seamless to the customer's existing server-storage architecture, in the sense that end users and applications running within VMs do not realize that data is being read from and written to the in-VMware host caching media, instead of the backend storage appliance.
 - b. Seamless **support for all advanced VMware features** - vMotion, High Availability, Snapshots (and snapshot based backup software), DRS, Linked Clones, Storage vMotion, Instant Clones, Stretched SAN Cluster, AppVolumes, vGPU, Replication, and all VDI and server virtualization features in vSphere are supported without requiring any configuration.
3. Caching policy can be set at the Datastore or VM level.
4. VirtuCache is **fully automatic and requires zero ongoing administration**. Cache capacity is dynamically allocated to VMs, and blocks are dynamically cached from storage appliance, all without any user intervention.

Data Protection

- Read Cache: All frequently and recently accessed data is cached. When a host fails or VM moves, the read cache is invalidated. There is no data loss since these reads are always in the backend storage.
- Write Cache: All recent writes are cached. These cached writes are asynchronously synced with the backend storage appliance, so all the cached writes ultimately make their way to the backend appliance.
- **Replicating Write Cache:** Since writes are written to only the local cache media without synchronously writing to backend storage, at any point in time, there will be writes in the in-host cache that are not yet in the backend storage, and hence the write cache needs to be protected against host failure. VirtuCache does this by making two copies of writes across two hosts in the same ESXi cluster. In case of **host failure, mirrored writes from the peer host are immediately synced with the backend storage appliance.**

System Specifications

- Supports all ESXi versions.
- Can cache data *to* any SSD (SATA, SAS, PCIe or NVME); any amount of host RAM; and persistent Memory.
- Can cache data *from* any networked block based storage - iSCSI, FC, FCoE, and shared SAS.

