

Samsung AutoCache

(HP server only)

Using Flash Devices to Remove I/O
Bottlenecks for Greater VM Density
and Efficiency



Greater VM Density, Efficiency and Performance

AutoCache™ is the only I/O caching solution designed specifically to increase VM density and accelerate business-critical applications in virtualized servers. This solution is incredibly easy to deploy and maintain, by virtue of being totally transparent to system resources and fully integrated with native management infrastructure for the hypervisor. Depending on the workload, AutoCache can increase VM density by two to three times with absolutely no impact on IT operations; it requires no guest OS agents and no changes to current storage processes such as backup, snapshot or replication services. AutoCache also improves VM efficiency and performance while maximizing system resource usage, enabling customers to reclaim idle CPUs to support more business applications. AutoCache provides maximum immediate performance benefits by utilizing high-performance Solid State Drive.

Intelligent Use of Flash Devices in Virtualized Servers

AutoCache attaches inside standard hypervisors (e.g., VMware™ ESXi), where it inspects all I/O from all virtual machines and places hot I/O into a SSD with NVMe, SATA, or SAS interface. Embedded intelligence supplies hot reads back to the VMs that request them, without requiring any sysadmin effort to modify the deployed storage or VM infrastructure. AutoCache creates a universal cache for all VMs that adapts automatically to the changing workloads of the environment, shifting cache resources on the fly to VMs that most need them, as defined by a set of sophisticated, concurrently

running algorithms. For example, even as AutoCache is supplying hot reads to a business-critical application on one VM, it can also prevent backup I/O from another VM from evicting other hot data from the cache, thus preserving valuable flash resources. And finally, AutoCache supports any data store, whether connected by block protocols or network file system (NFS).

Pre-warming for vMotion and fast load caching

AutoCache's innovative vMotion™ event detection feature pre-warms cached data from the source host to the destination host, thereby giving vMotion a head start on making critical data available faster. AutoCache also has a unique "fast load" feature that fills the cache with more data, faster. This speeds cache warming on initial deployment and enables the cache to build much faster upon reboot.

Cost-effective use of leading-edge flash technology

AutoCache optimizes performance by leveraging the latest solid state technologies from Samsung and other vendors. AutoCache has the intelligence to unleash the performance of flash by efficiently managing the I/O blender that virtualized servers create.

Absolutely no impact on IT operations

This product was specifically designed to make life easier for system administrators, yet it drastically improves the efficiency of your virtualized environment. Reports run quicker, VM density is improved, business-critical apps run faster,

Accelerate your business-critical applications with greater VM density

everything runs better. AutoCache requires no agents for guest OSs, supports all high-availability (HA) configurations and advanced features such as vMotion and is integrated into existing management interface workflow such as VMware's vSphere® client or vCenter™ server. The default setting works automatically, but you also have the option to manage your environment by policy or exception. This is why AutoCache is the only solution that can claim that it has absolutely no impact on IT operations; simply install with a single VIB without rebooting your host and within minutes you get improved performance so you can add more VMs.

Simplifying Management in Virtualized Servers

AutoCache is managed within the standard VMware vSphere client or vCenter server framework; just point and click on the AutoCache tab.

Role-based Administration

AutoCache's vCenter plug-in supports role-based administration, which allows administrators to create specific access rights through an easy-to-use interface. This function is particularly important to enterprises and cloud service providers (CSPs) that need to track specific usage of storage resources. CSPs and enterprise administrators can create vCenter accounts for their customers or corporate departments. They also have the flexibility to grant varying degrees of AutoCache rights on a user basis rather than a machine basis, enabling users to control the caching for their individual VMs. Administrators and their users can modify both host- and VM-level cache settings giving them the flexibility to assign different system, VM and AutoCache access privileges. AutoCache also collects usage data over a month and the previous month's data may be exported for billing purposes.

Analytics

AutoCache provides extensive analytics to quantify performance gains through intuitive yet powerful multilayered reporting, offering insight into resource utilization, I/O workloads and cache benefits. Reporting is available per host, per cached device and per guest virtual machine. Both real-time and historical data are presented in the management interface.

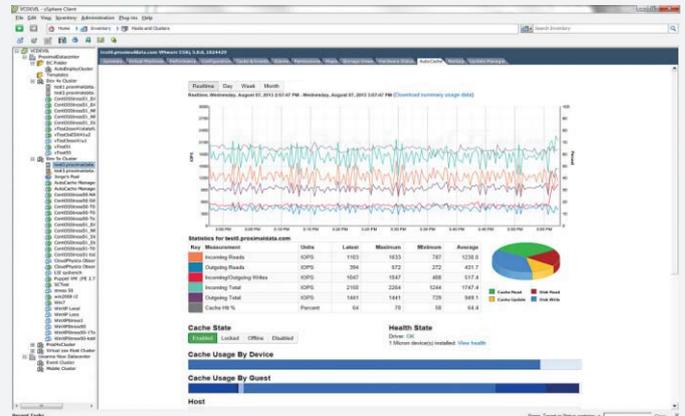


Figure 1. AutoCache graphical user interface (GUI) and performance monitor

AutoCache Fast Virtual Cache Benefits

- 2x–3x greater VM density, depending on workload
- Incredibly easy to deploy
- Increases VM efficiency and performance
- Accelerates business-critical application performance
- Fast load caching speeds cache warming on boot
- Seamless integration with VMware, vSphere and vCenter
- Cache pre-warm feature avoids performance disruption during vMotion
- Supports block and NFS data storage
- vCenter role-based administration for enterprises and cloud service providers
- Works with leading NVMe and legacy SSD (SATA/SAS) vendors' solutions
- No agents for guest OSs
- No impact on IT infrastructure

Greater VM performance with higher throughput and lower latency

Product Features

Hypervisor support	VMware ESXi 5.5
Advanced feature support	All VMware value-added features such as VAAI, vMotion, HA, DRS and DPM
Supported guest operating systems	All, requiring absolutely no guest OS agent
Compatible SSDs*	Leading enterprise SSD products with SATA, SAS or NVMe interface
Compatible Servers	HP DL360/DL380 Gen 9
Supported storage protocols	Any DAS or SAN, including Block (Fibre Channel and iSCSI) and File (NFS)
I/O cache type	Read cache with write through and write around
Caching algorithms	Multiple adaptive algorithms that self-tune to workload
I/O caching attach point	Hypervisor (not guest OS)
CPU overhead	Negligible
RAM overhead	Less than 1/1400th of flash cache capacity
Management	VMware vCenter plug-in and vSphere virtual appliance, vCenter role-based administration
Realistic minimum guidelines	Six CPU cores, each with 2 GB RAM; disk data store >10x cache device

(Note: There is no absolute minimum per se.)

**Additional flash device support is being added regularly; please visit <http://www.samsung.com> for details.*

Legal and additional information

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For more information

For more information about Samsung AutoCache, visit www.samsung.com/semiconductor.

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