

# V-locity<sup>®</sup>

## I/O Reduction Software

### Overview

V-locity<sup>®</sup> (version 6) is I/O reduction software that solves the performance penalty of increasingly smaller, fractured and random I/O patterns, delivering 50-300% faster application performance in virtual, physical, and/or cloud environments. Organizations seeking more than 300% performance on existing systems need only add more server-side DRAM.

Virtual environments suffer from two big I/O inefficiencies that unnecessarily tax workloads, stealing bandwidth from VM (virtual machine) to storage, resulting in sluggish system performance regardless of the storage media being used—whether SSD (solid-state drive) or HDD (hard disk drive).



### I/O Inefficiencies

The first I/O tax is small, fractured I/O, generated by the Windows OS due to free space allocation inefficiencies. Since the Windows OS lacks file size intelligence, it simply looks for the next available allocation at the logical disk layer when writing files instead of managing free space properly and choosing the BEST available allocation. The result is a single file that is broken down and fractured into multiple pieces at multiple logical disk addresses. The reason this is bad for performance is because every address at the logical disk layer (i.e., every piece of the file) requires its own dedicated I/O operation to process as either a read or write. So, instead of processing a single 32K file with a single I/O operation, the OS may break the file down into eight 4K chunks, resulting in eight fractured I/O to process a file that could have otherwise been processed with a single I/O. That is a lot of I/O overhead, not just for the server but, more importantly, the backend storage device populated with flash or spindles.

Not only does this Windows I/O tax mean systems have to work harder and take longer to process any given workload with a high percentage of small, fractured I/O, it also further exacerbates the second I/O tax in a virtual environment—the “I/O blender” effect. Disparate VMs on a single host send down otherwise sequential I/O traffic to the hypervisor where those I/O streams are “blended,” resulting in a severely random I/O pattern that is sent out to storage, further penalizing storage performance. It is bad enough for systems that are taxed with the I/O overhead of small, fractured I/O, but even worse when all those I/O streams are mixed together and randomized. As much as flash may perform well with random reads, it chokes on random writes due to additional cycles—reading, erasing, and rewriting blocks in order to write data to flash memory.

Whereas organizations typically mask the problem of these I/O inefficiencies by overbuying expensive hardware with more flash or spindles, these I/O inefficiencies can be easily cured by V-locity for 50-300% faster application performance on existing systems. Not only does this approach protect the CapEx investment made into the existing hardware infrastructure, it solves performance bottlenecks without any disruption and ensures organizations get the most out of any future storage system investment with SSD or HDD.

V-locity is the only way to optimize I/O performance by solving these aforementioned I/O taxes in a virtual environment with a two-part approach, consisting of two very different engines to optimize reads and writes:

## V-locity: Automated Read and Write I/O Optimization

### IntelliWrite®: V-locity's Write I/O Optimization Technology

IntelliWrite prevents small, fractured I/O and sequentializes I/O streams by understanding when the Windows OS is about to break a file into pieces.

IntelliWrite provides Windows with file size intelligence to help it choose the best available allocation at the logical disk layer instead of next available allocation that would likely result in multiple, fractured I/O to process the file as a write or subsequent read. By providing file size intelligence to Windows, the OS is capable of making much smarter decisions when writing files, so files are written (and read) in a clean, contiguous, sequential state. This increases I/O density and prevents I/O fracturing so systems can reclaim degraded throughput and process more data in less time. With fewer I/O being mixed and randomized at the hypervisor for every GB of data, IntelliWrite additionally helps to combat the ill-effects of the "I/O blender" effect.

### IntelliMemory®: V-locity's Read I/O Optimization Engine

IntelliMemory is a server-side DRAM read caching engine that leverages available DRAM to target I/O that penalizes storage performance the most—small, random I/O. IntelliMemory's behavioral analytics engine makes the best use of DRAM for caching by collecting usage data and I/O characteristics across a wide range of data points. By servicing I/O at the top of the technology stack from the fastest storage media possible, organizations reduce latency and further reduce the amount of I/O to storage, complementing the I/O reduction from IntelliWrite.

Administrators who are concerned with allocating precious DRAM for caching purposes need not be concerned. IntelliMemory is a dynamic cache that leverages available DRAM and throttles according to the need of the application so there is never an issue of resource contention or memory starvation. Whereas organizations typically experience 50-300% faster application performance from a mere 4GB of memory per VM, organizations looking for the fastest performance possible should consider adding more DRAM for caching purposes before installing dedicated PCIe cards or SSDs for caching.

V-locity is transparent, "set-and-forget" software that operates with near zero overhead, utilizing only idle, available resources. V-locity is a very lightweight file system driver and performs all optimizations at the OS level, which means V-locity is both hypervisor and storage agnostic. V-locity is

compatible with any system that is compatible with Windows and improves the efficiency of all VMware ESX/ESXi, Hyper-V, and Xen platforms.

## Target Applications

V-locity is most commonly used to address an organization's most I/O intensive applications as its effectiveness scales with workload intensity. This typically means applications running on top of SQL/Oracle/SAP, ERP, EMR (electronic medical records), OLTP, Business Intelligence, CRM, Exchange, SharePoint, file servers, and backup. Whether it's a client facing applications whereby users are complaining about sluggish performance or a back office batch job that is taking too long to complete, V-locity improves business efficiency without disruption.

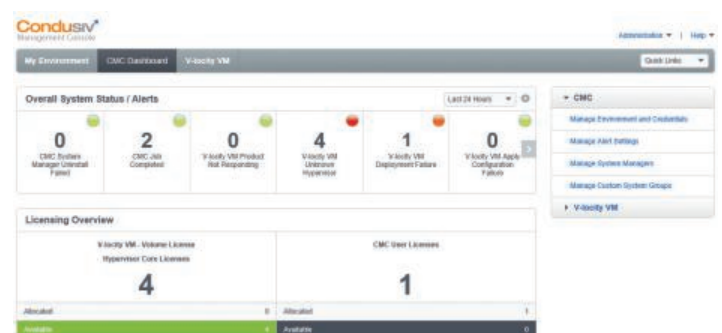
V-locity is proven to dramatically improve SQL, Oracle, Exchange, VDI, backup, EHR/EMR (like MEDITECH), CRM (Salesforce), web servers, Business Intelligence (BI) applications, file servers, and more.

## V-locity's Benefit Analyzer

V-locity is bundled with "proof of performance" benchmark software that provides a before-and-after performance comparison during initial deployment. All key metrics needed to establish a "proof of concept" are report-ready, showing metrics based on real-world use:

- I/Os per second
- I/O per GB
- KB per I/O
- Response time
- Workload comparisons

The Benefit Analyzer tool is Iometer-verified. Although administrators can run their own tests, the Benefit Analyzer provides an easy way to validate performance and understand the nature of I/O for a given application workload.



V-locity Management Console: system status and alerts overview

## V-locity Management Console: Seamless Deployment and Management

V-locity comes bundled with the V-locity Management Console (VMC), enabling seamless deployment and centralized management of V-locity on-premises in a virtual or physical environment—or even in the cloud.

- Fast, non-disruptive deployment of V-locity even in the most complex environments
- Support for various license models (perpetual, enterprise site licenses, or subscription-based)
- Easy license and asset management across a wide range of environments and locations
- Ongoing performance validation

VMC leverages I/O performance monitoring to give administrators visibility into key I/O metrics to explain workload behavior across different applications—greatly reducing the burden of troubleshooting and tuning for performance.

### Configuration Management

V-locity provides central command and control to install, configure, and manage V-locity products for mid-size to large-scale deployments. Administrators can choose presets or configure read and write I/O optimization and create admin-defined exclusions if necessary. Admins can also configure reporting and alerts by recent activity or workload, schedule ad-hoc reporting by VM or groups of VMs, and receive email alerts by VM or groups of VMs.

### Performance Management

V-locity reports on I/O performance from VM to storage and back and provides before/after performance reports to validate V-locity ROI. With this level of visibility, V-locity enables administrators to quickly validate application performance; identify and solve I/O performance problems; ensure that applications, VMs, servers, and storage are running at peak performance; proactively manage application SLAs with email alerts set to customized performance thresholds; and access reports on an ongoing basis to measure the value of V-locity.

## A TOOLKIT OF

## Performance Acceleration Technologies

V-locity contains a toolkit of technologies to accelerate your applications from VM or physical server to storage:

### IntelliWrite<sup>®</sup>

A write I/O optimization technology that automatically prevents split I/Os from being generated when a file is typically broken into pieces before write.

### IntelliMemory<sup>®</sup>

A read I/O optimization technology that intelligently caches active data from read requests using available server memory.

### Benefit Analyzer

An embedded performance benchmarking tool that provides before-and-after performance comparisons,

enabling IT to measure workloads and performance to quantify V-locity benefits in their real-world environment before purchase commitment.

### InvisiTasking<sup>®</sup>

An intelligent monitoring technology that allows all the V-locity “background” operations within the server to run with zero resource impact on current production.

### CogniSAN<sup>®</sup> and V-Aware<sup>®</sup>

These technologies are extensions to InvisiTasking that ensure optimizations occur using only available resources. As a result, V-locity avoids creating additional I/O that might interfere with workloads on the storage media being executed by other systems. This is Ideal for SANs or hypervisor-managed storage, where multiple VMs have the VDDs on the same physical disk or drive.

## V-locity Benefits

- 50–300% faster application performance —with no additional hardware
- Latency and throughput dramatically improved
- True “set and forget” management
- Compatible with all SAN/NAS systems
- Easily deploy to the largest virtual, physical or cloud environments in just five clicks
- Before-and-after performance reporting to validate performance gains from V-locity
- Enterprise-wide visibility into I/O performance health from the operating system to storage

## Supported Platforms and Configurations

V-locity installs on all Windows virtual machines and supports Windows 7, Windows 8, Windows 8.1, Windows Server 2008 R2 and Windows Server 2012/R2

### Supported Clustered Configurations for Virtual Environments:

Active/Passive Hypervisors, Active/Active Hypervisors, Active/Passive VMs

### Supported Clustered Configurations for Physical Environments:

Active/Passive

**Required Cache Size:** 3GB of physical memory per VM or physical server

**Recommended Minimum Cache Size:** 4GB of physical memory per VM or physical server

**Maximum Cache Size:** 128GB per VM or physical server

## Management Console

V-locity Management Console UI supports IE 9, IE 10

VMC master node installs on physical servers and VMs and supports Windows Server 2012 64 bit, Windows Server 2008 R2, 64 bit

## About Conduktiv

Conduktiv Technologies is the world leader in software-only storage performance solutions for virtual and physical server environments, enabling systems to process more data in less time for faster application performance.

## More Information

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