

Topic

This technical note details the Windows and Macintosh system requirements for the Volocity Product range.

Please note that these recommendations refer to the most recent version of Volocity. If you are not able to run the most recent version, you may need to renew your Software Maintenance Agreement. To do this, please contact sma@perkinelmer.com to receive a quotation.

Discussion

The specification required for a computer depends on the type of Volocity configuration it is to run. This document first looks at recommended computer specifications. We then look at requirements for different Volocity configurations. Finally, we examine the minimum computer specifications.

Volocity supports five platforms:

- Microsoft Windows XP for 32-bit processors
- Microsoft Windows XP Professional x64 Edition for 64-bit processors
- Microsoft Windows 7 for 32-bit processors
- Microsoft Windows 7 Professional x64 for 64-bit processors
- Apple Mac OS X on Intel processors

Volocity has almost exactly the same features on all platforms; however 64-bit operating systems allow users to work with very large datasets without receiving “out of memory” errors, and would be our primary recommendation.

Volocity Acquisition users should check the Volocity Supported Hardware List to ensure that their chosen hardware is supported on their chosen platform. Driver availability on different platforms changes regularly and the Volocity Supported Hardware List will be updated as drivers are released and pass testing.

The Volocity Supported Hardware list can be found here:

http://www.cellularimaging.com/support/technical_notes/detail.php?id=417

Microsoft Windows Vista for 32-bit or 64-bit processors is not recommended. Further information on Volocity and Windows Vista can be found here:

http://www.cellularimaging.com/support/technical_notes/detail.php?id=433

Recommended Specification

This is our recommended system for each platform. Specifications from manufacturers change regularly so an exact configuration cannot be described. Please read this complete document and use the information it contains, together with material available from your vendor, to configure your system.

Microsoft Windows (64-bit)

<i>Processor</i>	Quad core Intel Xeon 5550 2.66 GHz or better (e.g. Lenovo D20)
<i>Operating System</i>	Windows 7 Professional x64
<i>Graphics</i>	ATI Radeon HD 5000 series/ NVIDIA GeForce 280 series or better, single card
<i>RAM</i>	16 GB
<i>Hard Disk</i>	Dual 500GB SATA drives configured as RAID-0
<i>Other</i>	Free USB port for hardware key

Processor

The new quad core processors from Intel support the Intel 64-bit instruction set (EM64T) and offer excellent performance. For users with a more constrained budget, a single core 2 duo processor would be a good choice. The Dell Precision T3400 is an example of such a system.

Operating System

Windows 7 Professional x64 is the 64 bit version of Windows 7. It supports large amounts of RAM (more than 4GB) and massive address spaces for applications – this allows Volocity to handle larger datasets more easily. Windows 7 x64 is strongly recommended for all Volocity applications however Volocity Acquisition users must check in the Volocity Supported Hardware List that 64-bit drivers are available.

Graphics

Purchase the fastest, high performance gaming graphics card, with at least 1GB video memory, currently available. From ATI the Radeon series are recommended, the NVIDIA equivalent is the GeForce series. Please ensure your system will provide sufficient power and cooling for this card. Consult your vendor for more information. Quadro and FireGL cards are expensive and generally give poor performance with Volocity – these cards should be avoided. Multiple graphics cards do not offer benefits to applications such as Volocity.

Volocity 5.0 and higher require a graphics card which supports OpenGL 2.0 or above, for instance ATI X1600, NVidia GeForce 6000 series or newer.

RAM

Windows x64 supports more than 4 GB of RAM – we would recommend 16 GB for users working with larger datasets.

Hard Disk

Dual SATA drives configured as RAID-0 are an inexpensive choice and offer excellent performance. If the cost of two 500 GB drives is prohibitive we would recommend two smaller drives (2 x 250GB for instance) rather than a single 500 GB drive – dual drives will be quicker when used in a RAID-0 configuration.

Microsoft Windows (32-bit)

<i>Processor</i>	Intel Core 2 Quad W3520 or better (e.g. Lenovo D20)
<i>Operating System</i>	Windows 7 Professional
<i>Graphics</i>	ATI Radeon HD 5000 series/ NVIDIA GeForce 280 series or better, single card
<i>RAM</i>	4 GB
<i>Hard Disk</i>	Dual 500GB SATA drives configured as RAID-0
<i>Other</i>	Free USB port for hardware key

Processor

The new quad core processors from Intel offer excellent performance. For users with a more constrained budget, a single core 2 duo processor would be a good choice. The Dell Precision T3400 is an example of such a system.

Operating System

Windows 7 is a standard choice for workstation-class PCs.

Graphics

Purchase the fastest, high performance gaming graphics card, with at least 1GB video memory, currently available. From ATI the Radeon series are recommended, the NVidia equivalent is the GeForce series. Please ensure your system will provide sufficient power and cooling for this card. Consult your vendor for more information. Quadro and FireGL cards are expensive and generally give poor performance with Volocity – these cards should be avoided. Multiple graphics cards do not offer benefits to applications such as Volocity.

Volocity 5.0 and higher require a graphics card which supports OpenGL 2.0 or above, for instance ATI X1600, NVidia GeForce 6000 series or newer.

RAM

4GB of RAM matches the maximum “address space” available to Volocity. Adding more RAM than this on a 32-bit system is unlikely to improve performance.

Note: Some motherboards will only allow 3 GB of memory to be used with Windows XP 32-bit – check with your vendor.

Hard Disk

Dual SATA drives configured as RAID-0 are an inexpensive choice and offer excellent performance. If the cost of two 500 GB drives is prohibitive we would recommend two smaller drives (2 x 250 GB for instance) rather than a single 500 GB drive – dual drives will be quicker when used in a RAID-0 configuration.

Apple Macintosh (Intel)

<i>Processor</i>	2.66GHz Quad-Core Intel Xeon “Nehalem” or better(Velocity 4.0 and higher run natively on Intel processors)
<i>Operating System</i>	Mac OS 10.5.8 or higher. For Lion (Mac OS X 10.7), version 10.7.1 or higher is required.
<i>Graphics</i>	ATI Radeon HD 5000 series or better, single card
<i>RAM</i>	6GB
<i>Hard disk</i>	Dual 500GB SATA drives configured as RAID-0
<i>Other</i>	Free USB port for hardware key

Processor

Velocity is a “Universal” application, which will run natively on both PowerPC and Intel processors. Velocity will make use of multiple processors or cores to speed up calculations.

Operating System

Mac OS X 10.7.1 currently comes as standard with all new Macintosh computers.

Graphics

Purchase the fastest single graphics card available with the Mac Pro with at least 1GB video memory for use with Velocity Visualization. Velocity already uses the graphics card close to optimally and therefore there is no benefit to configuring a system with multiple graphics cards. Velocity 5.0 and higher requires a graphics card which supports OpenGL 2.0 or above, for instance ATI X1600, NVidia GeForce 6000 series or newer. Quadro cards do not perform well with Velocity and should be avoided.

RAM

4GB of RAM matches the maximum “address space” available to Velocity. Adding more RAM than this on a 32-bit system is unlikely to improve performance.

Hard Disk

Dual SATA drives configured as RAID-0 are an inexpensive choice and offer excellent performance. If the cost of the 500GB drives is prohibitive we would recommend two smaller drives (2 x 250GB for instance) rather than a single 500GB drive – dual drives will be quicker when used in a RAID-0 configuration.

Apple Macintosh (PowerPC)

We no longer recommend using PowerPC Macs with Velocity – the Intel Macs offer substantially better performance.

Performance Considerations

Different Volocity products use the computer hardware in different ways. This section describes the computer components that are most heavily used by each Volocity product.

Volocity Visualization

<i>Processor</i>	Visualization is processor intensive and requires fast CPUs. Visualization will take advantage of multiple CPUs if they are available.
<i>Operating System</i>	For large datasets it is possible to exceed the limitations of 32-bit platforms, which will result in “out of memory” errors. Windows x64 is strongly recommended. On the Mac, Mac OS X 10.5.8 or higher is required.
<i>Graphics</i>	<p>A fast graphics card is the primary requirement for Volocity Visualization .</p> <p>Volocity 5.0 and higher require a graphics card which supports OpenGL 2.0 or above, for instance ATI X1600, NVidia GeForce 6000 series or newer.</p> <p>SLI: Volocity already uses the graphics card close to optimally and therefore does not benefit from systems with two graphics cards.</p> <p>With Windows systems it is often impossible to buy a system with a recommended graphics card. Windows workstations are often supplied with “workstation” graphics cards such as the NVidia Quadro range and the ATI FireGL range. These workstation cards are expensive and do not perform well with Volocity Visualization. In this circumstance we recommend that users purchase the cheapest possible graphics card with the system and then replace it with a recommended card.</p>
<i>RAM</i>	Visualization is memory intensive. Sufficient RAM is required to prevent the computer “paging” to disk. Paging will greatly reduce the speed of rendering.
<i>Hard Disk</i>	A fast disk system (e.g. dual SATA drives configured as RAID-0) will improve performance when working with larger datasets.

Volocity Restoration

<i>Processor</i>	Restoration is processor intensive and requires fast CPUs. Restoration will take advantage of multiple CPUs if they are available.
<i>Operating System</i>	For large datasets it is possible to exceed the limitations of 32-bit platforms, which will result in “out of memory” errors. Windows x64 is strongly recommended. On the Mac, Mac OS X 10.5.8 or higher is required.
<i>Graphics</i>	Restoration does not make use of the graphics card.
<i>RAM</i>	Restoration is memory intensive. Sufficient RAM is required to prevent the computer “paging” to disk. Paging will greatly reduce the speed of restoration.
<i>Hard Disk</i>	A fast disk system (e.g. dual SATA drives configured as RAID-0) will improve performance when working with larger datasets.

Volocity Quantitation

<i>Processor</i>	Quantitation is processor intensive and requires fast CPUs. Quantitation will take advantage of multiple CPUs if they are available.
<i>Operating System</i>	For large datasets it is possible to exceed the limitations of 32-bit platforms, which will result in “out of memory” errors. Windows x64 is strongly recommended. On the Mac, Mac OS X 10.5.8 or higher is required.
<i>Graphics</i>	Quantitation does not make use of the graphics card.
<i>RAM</i>	Quantitation is not particularly memory intensive, however sufficient RAM is required to prevent the computer “paging” to disk. Paging will greatly reduce the speed of Quantitation.
<i>Hard Disk</i>	A fast disk system (e.g. dual SATA drives configured as RAID-0) will improve performance when working with larger datasets.

Volocity Acquisition

<i>Processor</i>	Acquisition is processor intensive and requires fast CPUs. Acquisition will take advantage of multiple CPUs if they are available.
<i>Operating System</i>	On the PC, Windows 7 x64 edition is currently recommended for acquisition particularly if using Visualization, Quantitation and/or Restoration on the same system. Check the Volocity Supported Hardware List for driver availability. On the Mac, Mac OS X 10.5.8 or higher is required.
<i>Graphics</i>	Acquisition does not make use of the graphics card.
<i>RAM</i>	Acquisition is not particularly memory intensive; data is acquired directly to disk.
<i>Hard Disk</i>	A fast disk system (e.g. dual SATA drives configured as RAID-0) is important for acquisition. The disk system must be able to keep up with the camera. A SATA RAID-0 system will be able to keep up with all current cameras.

Note: Volocity Acquisition requires drivers for camera and microscope hardware. Not all hardware manufacturers will support all platforms. Check the Volocity Supported Hardware List for more information.

Note: Volocity Acquisition hardware may require free PCI slots, PCI-X slots, PCI Express slots or FireWire ports – check that your computer has the ports and expansion slots that you will need.

Note: Some microscope hardware requires free serial (RS232 or COM) ports to connect to the computer. Not all computers come with serial ports – in this case a USB to Serial adapter such as the EasySync USB-RS232 Adapter (www.easysync.co.uk) will be required.

Minimum Specification

This is the minimum specification required for Volocity to run. Volocity Visualization, Quantitation, Restoration and Acquisition may require a higher specification for acceptable performance.

Microsoft Windows (64-bit)

<i>Processor</i>	AMD64 or Intel-EM64T
<i>Operating System</i>	Windows XP Professional x64 Edition SP2 Windows 7 x64
<i>Graphics</i>	Graphics card must support OpenGL 2.0 or above, for instance ATI X1600, NVidia GeForce 6000 series or newer
<i>RAM</i>	1 GB minimum
<i>Free hard disc space</i>	200 MB for installation

Microsoft Windows (32-bit)

<i>Processor</i>	Intel Pentium 3 or AMD Athlon XP Processor or better Intel Pentium, Intel Pentium 2 or AMD K6/K6-2 CPUs of any speed are not supported.
<i>Operating System</i>	Windows XP with Service Pack 3 Windows 7 Windows 98, ME and NT4 are not supported.
<i>Graphics</i>	Graphics card must support OpenGL 2.0 or above, for instance ATI X1600, NVidia GeForce 6000 series or newer
<i>RAM</i>	1 GB minimum
<i>Free hard disc space</i>	200 MB for installation

Apple Macintosh

<i>Processor</i>	Macintosh G5 2.0 GHz Intel Core Duo (Volocity 4.0 and higher run natively on Intel processors)
<i>Operating System</i>	Mac OS 10.5.8 or higher. For Lion (Mac OS X 10.7), version 10.7.1 or higher is required.
<i>Graphics</i>	Graphics card must support OpenGL 2.0 or above, for instance ATI X1600, NVidia GeForce 6000 series or newer
<i>RAM</i>	1 GB minimum
<i>Free hard disc space</i>	200 MB for installation