

Business white paper

HP and Bentley

MicroStation V8i (SELECTseries3)



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Introduction

The purpose of this document is to provide information that will aid in selection of HP Workstations for running Bentley MicroStation V8i (SELECTseries3). A performance study was completed with a MicroStation V8i (SELECTseries3) benchmark provided by Bentley. Detailed results are provided for CPU rating, Graphics rating and I/O rating. The benchmark was run on HP Z820, HP Z220 and HP Z1 workstations running Windows 7 Professional 64-bit. Recommended configurations are provided for the HP Workstations. Tips are also provided for running the solutions at ultimate performance.

What type of application is MicroStation V8i (SELECTseries3)?

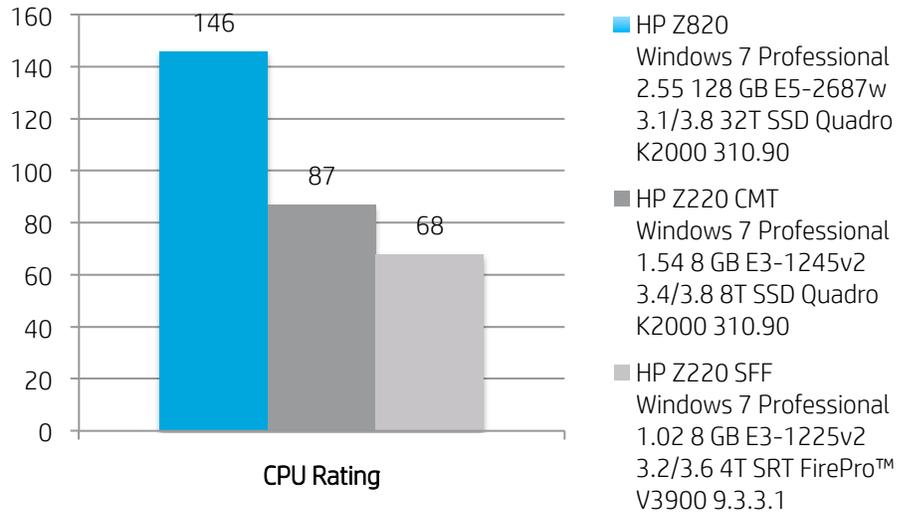
MicroStation is an information-modeling environment explicitly for the architecture, engineering, construction, and operation of all infrastructure types. The solution provides immersive interaction with 3D models and 2D designs. The solution enables performance simulation of designs, including lifelike rendering and compelling animations. If your operating system is Windows 7 Professional 64-bit with a DirectX 11 capable graphics card, then MicroStation (SELECTseries3) will use DirectX 11. For most configurations DirectX 11 display is significantly faster, especially for edges, transparency, and shadows. MicroStation is a 32-bit application. Visualization uses the Luxology rendering engine (64-bit application on 64-bit operating system) for lifelike rendering. The rendering engine runs in parallel and can utilize all existing processor cores.

How does the HP Workstation family (HP Z1, HP Z220, HP Z420, HP Z620, HP Z820 and HP EliteBook) provide ultimate MicroStation performance?

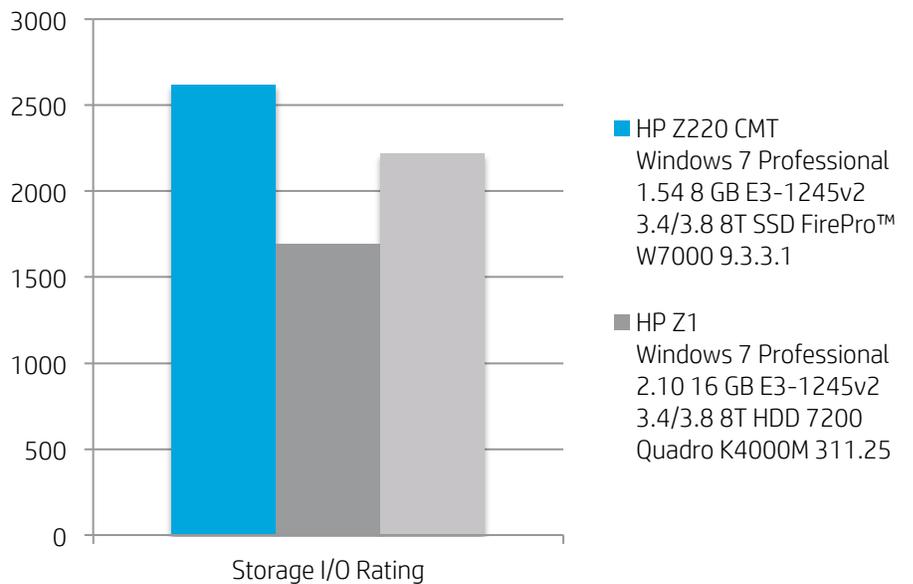
- **Compute** performance
 - HP Z420, HP Z620 and HP Z820 workstations utilize the Intel® Xeon® processor E5-XXXX family and the Intel® C602 chipset.
 - HP Z220 workstations utilize the Intel® Xeon® processor E3-XXXXv2 family or Intel® Core™ i7-XXXX or Core™ i5-XXXX or Core™ i3 processor and the Intel® C216 chipset.
 - HP Z1 workstation utilize the Intel® Xeon® processor E3-XXXXv2 family or Core™ i5-XXXX or Core™ i3 processor and the Intel® C206 chipset.

- HP EliteBook 8470w, HP EliteBook 8570w and HP EliteBook 8770w Mobile workstations utilize the 3rd Generation Intel® Core™ i7 processor or 3rd Generation Intel® Core™ i5 processor and the Intel® QM77 chipset.
- **Memory** bandwidth and latency. The HP Z620 and HP Z820 have Dual QPI links in parallel with up to 8GT/s.
- **Memory** speed 1600MHz
- **Memory** design
 - HP Z1 and HP Z220 supports unbuffered DIMMS and non-ECC unbuffered DIMMS
 - 4 DIMM sockets, 2 channels, 2 DIMMs per channel
 - HP Z420 supports unbuffered DIMMs (UDIMM)
 - 8 DIMM sockets, 4 channels, 2 DIMMs per channel
 - HP Z620 supports unbuffered DIMMS (UDIMM) and registered DIMMS (RDIMM)
 - 12 DIMM sockets, 4 channels
 - 2 DIMMs per channel - CPU0 – 8 sockets
 - 1 DIMM per channel - CPU1 – 4 sockets
 - HP Z820 supports unbuffered DIMMs (UDIMM), registered DIMMS (RDIMM) and load-reduced DIMMS 1333Mhz (LRDIMM)
 - Mixing UDIMM / RDIMM / LRDIMM is not permitted
 - 16 DIMM sockets, 4 channels
 - 2 DIMMS per channel – CPU0 – 8 sockets
 - 2 DIMMS per channel – CPU1 – 8 sockets
 - HP EliteBook 8470 Mobile workstation support DDR3 SDRAM, 1600MHz
 - Dual-core processors support 2 memory slots, 2 channels
 - HP EliteBook 8570w and HP EliteBook 8770w Mobile workstations support DDR3 SDRAM, 1600 MHz
 - Dual-core processors support 2 memory slots, 2 channels
 - Quad-core processors support 4 memory slots, 2 channels, 2 DIMMS per channel
- **Storage I/O** performance
 - PCI-Express 3.0
 - 6 Gb/s SATA and SAS ports
 - DMA bandwidth
 - 6 Gb/s hard drives (HDD) and 6 Gb/s solid state drives (SSD)
 - Storage volumes can be configured with RAID 0 for speed or RAID 1 for resilience
 - USB 3.0 ports

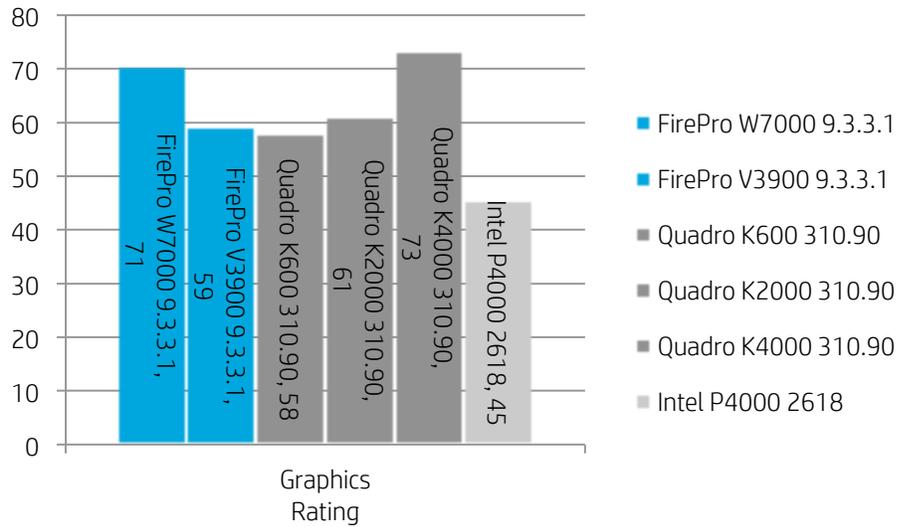
What MicroStation V8i (SELECTseries3) CPU Rating did HP measure?



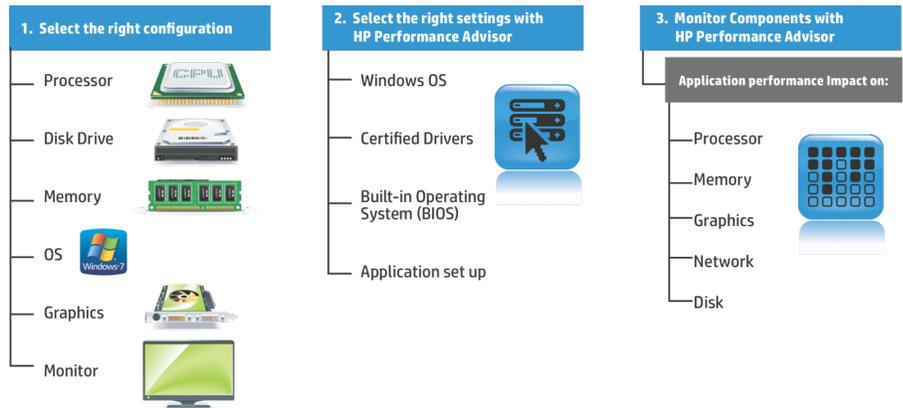
What MicroStation V8i (SELECTseries3) I/O Rating did HP measure?



What MicroStation V8i (SELECTseries3) Graphics Rating did HP measure?



How to manage your desktop for MicroStation



HP MicroStation Recommendations for running MicroStation V8i (SELECTseries3)

- HP Workstation Recommendations for running MicroStation V8i (SELECTseries3)
 - 2D Design Drafting - HP Z220 with Windows 7 Professional 64-bit, Intel Xeon E3-1230v2 4-Core 3.3/3.7 tb, 16GB memory, 256GB SATA SSD, NVIDIA Quadro K600 or AMD FirePro™ V3900
 - 3D Design Modeling - HP Z220 with Windows 7 Professional 64-bit, Intel Xeon E3-1280v2 4-Core 3.6/4.0 tb, 16GB memory, 512GB SATA SSD, NVIDIA Quadro K2000 or AMD FirePro™ V3900
 - Advanced Design Visualization Rendering – HP Z620 with Windows 7 Professional 64-bit, 2x Xeon E5-2643 4-Core 3.3/3.5 tb, 32GB memory, 512GB SATA SSD, NVIDIA Quadro K2000 or AMD FirePro™ W7000
 - Education - HP Z1 with Windows 7 Professional 64-bit, Intel Xeon E3-1245v2 4-Core 3.4/3.8 tb, 16GB memory, 512GB SATA SSD, NVIDIA Quadro 1000M or Intel HD Graphics P4000
 - Construction/Field – HP 8470w with Windows 7 Professional 64-bit, Intel Core i7-3820QM 4-Core 2.7/3.7 tb, 16GB memory, 256GB SATA SSD, AMD FirePro™ M2000
 - Mobile Design – HP 8570w with Windows 7 Professional 64-bit, Intel Core i7-3820QM 4-Core 2.7/3.7 tb, 16GB memory, 256GB SATA SSD, NVIDIA K1000M or AMD FirePro™ M4000
- Memory sizing/selection is critical. For best performance, use same total memory size on each channel. Use same total size on each CPU.
- Windows 7 Professional 64-bit Service Pack 1. 32-bit programs like MicroStation will have full 4 GB memory access and beyond on Windows 64-bit.
- Windows 7 Professional 64-bit uses physical memory for dynamic buffer cache when available. The buffer cache prevents Disk I/O transactions. Memory is much faster than disk I/O. Additional memory for the OS is necessary.
- HP workstations have 6 Gb/s and 3 Gb/s disk I/O ports. The 6 Gb/s I/O ports are recommended for 6 Gb/s devices
- 3 Gb/s devices will negotiate 3 Gb/s protocol when plugged into 6 Gb/s ports

Tips for running Bentley MicroStation V8i (SELECTseries3)

communities.bentley.com/products/microstation/w/microstation__wiki/selectsupport-technotes-and-faqs.aspx

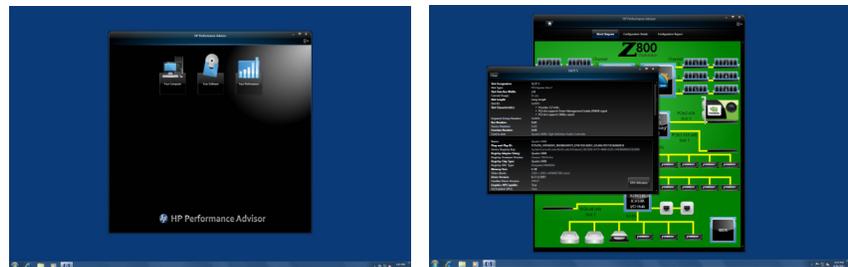
- **Operating System**

Operating System / Setting	Default	Recommend
Windows 7 Professional 64-bit		Service Pack 1
Control Panel/Power Options	Balanced	High Performance

- **System BIOS**

BIOS Setting	Default	Recommend
Power/OS Power Management/Runtime Power Management	Enable	Enable
Power/OS Power Management/Idle Power Savings	Extended	Normal
Power/OS Power Management/Turbo Mode	Enable	Enable
Advanced/Device Options/Hyper-Threading	Enable	Enable
Advanced/Bus Options/NUMA (HP Z620 and HP Z820 Dual processor)	Enable	Enable

HP Performance Advisor can be used to install graphics drivers, select BIOS settings and help characterize MicroStation memory usage. Download from hp.com/go/hpperformanceadvisor



Additional resources

hp.com/go/whitepapers

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