



# Resource Guide: Workstation Productivity

## Contents

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**Beyond the Desktop: Workstation Productivity .....2**  
*Find out how to get the highest productivity possible from high performance applications that require more power than traditional desktop computers*

**Top IT Considerations for Mobile Workstations .....4**  
*Discover the top IT considerations for organization that require mobile workstations designed to provide a balance of performance and portability*

**Maximum Management and Control with Virtualized Workstations .....6**  
*Explore the benefits of virtualization to ensure the greatest possible management and control of high performance workstations for the most demanding workloads and applications*

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## **Beyond the Desktop: Workstation Productivity**

*Find out how to get the highest productivity possible from high performance applications that require more power than traditional desktop computers*

Desktop computers have come a long way in terms of value and performance for the average user but more advanced applications now require even more in terms of processing, graphics, memory and storage. The following is a brief overview of the differences between standard desktops and workstations as well as the implications for overall performance and productivity as compiled from the editorial resources of CNET, TechRepublic and ZDNet.com.

### **Think Inside the Box**

A lot of people tend to think of desktop computers and computer workstation as one and the same but that isn't always the case in terms of power and performance. In fact, many of today's most demanding workloads and applications for industries such as engineering, entertainment, finance, manufacturing, and science actually require much higher functionality than what traditional desktops have to offer. From computer assisted design (CAD) and 3D modeling to audio/video editing and digital content creation, today's professional-grade computer workstations offer tremendous value for much greater efficiency and productivity.

The reasons are really very simple; greater computer and graphics processing, more memory, and massive amounts of storage. While desktops are still perfectly fine for standard applications such as many of those that are now such a large part of the typical workplace, customized software designed for professional and industrial applications require optimized hardware combinations that are specifically intended for these more demanding environments:

#### **Processing**

*Desktop PCs typically offer single core processors while workstations generally come with multi core processors (dual, quad, and many) that literally multiply the amount of raw processing power that can be achieved from a single computer chip. The result is greater processing power which provides faster computations and a better overall experience for even the most demanding workloads.*

#### **Graphics**

*Workstations performance very much depends on professional-grade graphics and video cards that offer dedicated memory up to 1GB to produce rich 2D and 3D visualizations and faster rendering by reducing the amount of demand that is generally placed on random access memory (RAM). Very few desktops without dedicated graphics memory offer the same level of performance or user experience.*

#### **Memory**

*RAM is quite often the bottleneck in desktop computers and greatly limits their ability to process vast sums of information generated by computer and graphics processing. Workstations, on the other hand, generally come with anywhere from 4 Gigabytes (GB) to as much as 192GB of memory which eliminates information bottlenecks and improves the systems ability to process more information more quickly.*

#### **Storage**

*With so much performance built-in to a single system designed specifically for more demanding professional and industrial applications, special considerations must also be given to storage. In addition to providing 500GB to 1 Terabyte (TB) of on-board storage capability,*

*typical workstations also provide nearly limitless expandability via many different types of external storage options.*

### **Additional Considerations**

Of course, making sure that all of these components work well together depends a great deal on how well their optimized based on application manufacturers' performance benchmarks and specifications. Another important factor is the operating system (OS). Both Windows and Linux now offer 32-Bit and 64-Bit versions with 64-Bit generally preferred for its ability to basically handle twice as much information in the same amount of time. While desktops are often able to run 64-Bit operating systems with increased memory (minimum 4GB), workstations with optimized hardware based on the above parameters offer more reliable efficiency and performance for a wide range of more demanding workloads and applications.

### **Summary**

Without a doubt, high performance workstations offer tremendous benefits for greater productivity versus traditional desktop PCs which are designed for less demanding office and communication applications. More advanced applications intended for professional and industrial applications require an optimized combination of hardware that provides greater computational power, faster graphics rendering and visualizations, additional memory for speed and reliability, and enough storage to maintain content and system integrity. By choosing a system designed for the more demanding workloads of professional and industrial applications, organizations with such needs are practically guaranteed to improve their efficiency and productivity as well as their bottom line.

## Top IT Considerations for Mobile Workstations

*Discover the top IT considerations for organizations that require mobile workstations designed to provide a balance of performance and portability*

High performance workstations come in all shapes and sizes but the increasing demands of an increasingly mobile workforce are placing even greater demands on the need for mobile workstation solutions. The following provides a brief overview of the top IT considerations for mobile workstations as compiled from the editorial resources of CNET, TechRepublic, and ZDNet.com.

### **Price, Performance, and Portability**

The workplace has no boundaries and IT administrators are increasingly challenged to support a wide range of mobile computing solutions. The same is true for highly specialized applications designed for advanced, professional, and industrial environments. Fortunately, leading manufacturers now offer a wide range of mobile workstations that offer a considerable balance of performance and portability for everything from telecommuting to remote and field-based situations. In all cases, the objective is to ensure that remote workers have the tools they need and remain productive regardless of their location:

#### **Price and Performance**

*IT professionals face an ever growing amount of pressure to do more with less, which makes it tempting to try and get by with less expensive notebook computers for mobile workers. However, today's more demanding applications for a wide range of advanced, professional, and industrial applications require much more powerful mobile workstations.*

*Fortunately, many extremely powerful mobile workstations are now available with optimized processors, dedicated graphics, memory, and storage at prices just slightly above the cost of a standard notebook computer (often as low as \$1,200.00). Furthermore, based on the benefits of increased productivity for mobile workers who need these sorts of resources in the field or simply want to work from home, the potential for a rapid return on investment (ROI) is actually quite high.*

#### **Support and Reliability**

*Increased productivity is practically impossible without reliability and this is especially true of mobile workstation solutions. Time is money and people who depend on high performance workstations for a wide range of applications cannot do their jobs with unreliable solutions. Mobile workstations must be able to withstand the additional punishment inherent with any mobile solution. Ruggedized workstations are certainly an option, but the most important consideration is the record and reputation of the manufacturer.*

*Also, when something does go wrong, administrators need to be able to fix the problem fast, often online or on the telephone. Again, this is where the manufacturer can make all the difference since remote workers must often turn to them as a single source of support for hardware, software, and/or specialized applications. Today, the leading manufacturers offer independent software vendor (ISV) certifications which allow them to troubleshoot many of the most common problems with third party solutions. And finally, in the event of a catastrophic failure, be sure to have a good warranty (2-3 years, based on the average expected lifecycle of most mobile workstations). Finally, whenever possible, also have a backup in case it's ever needed.*

### **Management and Security**

*In addition to running the specialized applications they're specifically designed to run, many mobile workstations will also likely double as the primary computer for other more common types of office and communication applications such as word processing and email. As such, they'll require the same sort of management and security that you'd expect for a typical notebook computer. However, due to the nature and value of the unique information created on a mobile workstation (i.e. CAD models, video projects, etc.), backing up the system is extremely important. Generally speaking, it's also a good idea to carry additional external storage (1TB is typically less than \$200.00).*

*The real concern for IT professionals is probably security. Any type of mobile solution is more exposed to loss, theft, and unauthorized access. Protecting proprietary information is paramount, especially in the case of anything close to intellectual property. In addition to simple password protection, mobile workstations almost inevitably require more stringent security solutions such as finger print readers, electronic card readers, and/or data encryption. Physical locks and cables are certainly appropriate as well for remote work sites or anyplace where the workstation is exposed to more than just a few trusted people. Remember, however, that it's less about protecting the computer and more about protecting the highly information that's inside it.*

### **Summary**

Protecting the productivity of a growing mobile workforce is just one of the rising concerns for IT professionals. Many must now consider high performance mobile workstations for users who require computers that are able to handle more advanced, professional, and industrial applications that require additional considerations for things such as storage, backup, and security. However, in many cases, mobile workstations are comparably priced to more expensive notebook computers and offer a tremendous number of additional benefits in terms of higher productivity, which should lead to a better and faster ROI.

## Maximum Management and Control with Virtualized Workstations

*Explore the benefits of virtualization to ensure the greatest possible management and control of high performance workstations for the most demanding workloads and applications*

Virtualization is one of the single most important trends in modern computing and many view it as an invaluable innovation for decreasing costs and increasing efficiency. The following is a broad overview of the most important implications of virtualization for high performance workstations in terms of management and control as compiled from the editorial resources of CNET, TechRepublic, and ZDNet.com.

### The Power of Virtualization

Virtualization allows a single piece of hardware to operate as more than one computer by allowing multiple instances of applications, services and even operating systems to run simultaneously. The primary value proposition for virtualization is in fact less hardware, which has far reaching benefits for greater efficiency and lower costs in terms of not only hardware but also management, support, and power consumption. For many IT professionals, virtualization also provides a higher degree of control since they have ready access to virtual machines (VMs) which are physically hosted within a consolidated data center and can thus be more easily managed, updated, configured, and optimized for maximum performance. Scalability is also much simpler because adding a new VM doesn't necessarily require additional hardware but rather simply provisioning of existing and often excess resources.

### Virtualized Workstations

Virtualization is particularly useful for high performance workstations which are specifically designed for more complex and demanding workloads that require additional computer and graphics processing, memory, and storage. Although necessary for the types of applications they're running, workstations may also sit idle or be under utilized. Virtualization can vastly increase workstation utilization by allowing organizations to customize a single rack mounted unit that actually hosts several "virtual" workstations that can then be individually customized based on the individual user requirements. Each VM can even run its own operating system (OS) so that, for instance, those who still require a 32-Bit OS for their particular applications can still have it without impacting those who require or prefer a 64-Bit OS for their own applications.

### Virtual Machines and Versatile Access

Having so many virtual workstations consolidated in a single location has even greater benefits beyond just performance, management, control, and versatility. Rather than providing multiple workstation users with their own individual desktop, mobile, or perhaps even rack mounted workstations, each user is actually given access to the resources they need on their own virtual machine (VM) that's hosted with many other VMs on a single or perhaps few high performance workstations in the data center. Access is then provided via local networking or a virtual private network (VPN), which provides even greater benefits for productivity since workers can then have access to the resources they need from home, on the road, and remote locations without having to take an actual physical workstation with them. All they really need is an optimized notebook or desktop computer with network or VPN access.

### Final Considerations

Physical hardware is still the foundation of any virtualized workstation solution due to the high demands of many advanced, professional, and industrial applications running on either 32-Bit or 64-Bit versions of the Linux and/or Windows operating systems. Although there certainly are exceptions, these sorts of high performance solutions require a minimum of the following: 1) dual, multi-core processors; 2) multiple graphics cards with up to 4GB of dedicated graphics memory; 3) up to 192GB of random access memory, or RAM, and; 4) minimum 2 Terabytes (TB) of internal storage with the option of additional internal and external storage as needed. Once you have the proper hardware in place in a secure environment, the only think left is virtualization software, many versions of which are now offered by a wide variety of vendors