How to select the right workstation
6 things to know before configuring a workstation

1 **Your workstation configuration should reflect the type of work that you do most often**

The first step toward maximizing workstation performance and productivity is determining exactly what type of work you will be using your workstation for. Selecting the optimal component configuration for the specific work you do most often is paramount to maximizing your productivity and achieving more for every dollar you spend.

Dividing work tasks into two distinct usage models, computational and interactive, will help determine the optimal component configuration for your workstation:
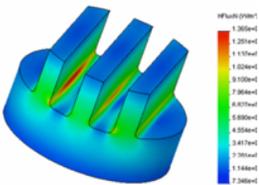

Figure 1: Computational task

Understanding computational tasks

Computational tasks can be characterized as large, complex jobs that the user sets up and then runs to analyze a data model. These jobs typically involve little user interaction and extended, high utilization of all the system's available resources. Examples of computation tasks include rendering frames of video, integrated finite element analysis, or running a heat flux simulation (as represented in Figure 1).

Figure 2: Interactive task

Understanding interactive tasks

Interactive tasks, on the other hand, involve much heavier user interaction. They can be characterized by sporadic peaks of high system component utilization, separated by idle periods where the user is thinking about the next interaction. Examples of interactive tasks include rotating an engine model, or animating a complex, fully rigged model in a 3D modeling program (as represented in Figure 2).

Once you have determined what type of work you will be using your workstation for most often, you can begin appropriately configuring workstation components, like CPU, graphics, memory and storage, to maximize performance.

2 **What to consider when choosing a CPU**

When choosing a CPU, first think about how much time is spent in computational workloads, where all available cores will be driven for long durations at high utilization. A good rule of thumb is the more time spent in these computational usage types, the more of your workstation budget should be spent on maximizing CPU core count. If more time will be spent completing interactive tasks, however, more of your workstation budget should be used to increase the maximum CPU frequency.

3 Choosing the right graphics

Graphics cards are all about speed. The higher your frames per second in an application, the more fluid your interactions with the data model, and the more productive you can be. Finding the right graphics solution for a workstation depends on the desired frames per second in the applications you will use most often. As a general rule of thumb, look for a card that is capable of delivering more than 30 frames per second in the most important applications for your usage model.

4 Get the right kind and right amount of memory

For computational workloads, you will almost always want to maximize the amount of memory bandwidth available to the processing cores. For example, if given the choice about whether to populate eight DIMMs of an 8 GB capacity each, or four DIMMs of a 16 GB capacity each, choose the option that populates more DIMM slots.

Dell Precision tower and rack workstations featuring Intel® Xeon™ processors are equipped with Dell™ Reliable Memory Technology (RMT) when purchasing Error Correcting Code (ECC) memory. RMT uses the ECC data to identify specific locations in memory modules where errors are occurring, if they occur. RMT can identify an error at a particular memory bit location, and automatically quarantine that location in memory to ensure that a healthy location is used for subsequent reads and writes.

Choosing the right frequency is also important, and varies depending on the workload. In applications requiring maximum memory bandwidth, populating all available DIMM slots with the highest-frequency memory is important.

Lastly, when the integrity of data used in individual computations is paramount to the end result, Error Checking & Correction (ECC) memory should be used.

5 Determining the right storage

There are a wide variety of storage performance considerations that depend completely on your usage model. Is the data on your network or stored locally? If on your network, how frequently are updates committed to the network resources? If stored locally, how much capacity is required? Determining the right storage components for your usage model is a complex task, but an important one in maximizing performance for your given workload.

Different types of storage drives, i.e. Solid State Drives (SSDs), SATA and serial-attached-SCSI Drives and Hybrid Drives, provide different benefits for different situations. For example, an interactive usage model, in which you open and save a wide variety of file sizes, requires greater performance. This is where SSDs, SAS drives and RAID arrays begin to play a more important role. If a single SSD provides the capacity needs required for both your office productivity and interactive workstation usages, this option will be the best performing short of a multi-drive RAID.

6 Independent Software Vendor (ISV) certifications matters

Workstation certification addresses today's vast and complex software environment through many hours of testing and carefully documenting which configurations of a system are determined to be compatible and optimal for the applications you need. With software certification, you can be confident before purchasing or upgrading that a specific workstation has been certified by the software vendor of your desired application. View our list of approved vendors at Dell.com/ISV

Find the right workstation to achieve peak performance and get more for your dollar.

Optimizing performance for a particular usage model can be achieved by first identifying the factors that are most important to that usage: CPU, graphics, memory and storage. Configure your workstation to effectively accommodate the tasks that you perform most often.

Combine the right configuration selections with application certification and the new Dell Performance Optimizer 2.0, available exclusively on new Dell Precision tower and rack workstations with Intel® Xeon™ processors, to boost productivity, maximize performance and ensure that you have the best possible experience at any price.

To learn more about selecting the right workstations, visit Dell.com/precision