WHITE PAPER

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Workstations for Software Development

Windows based Intel workstations are being used extensively for software development. This paper provides a brief overview of the reasons why these workstations are so attractive to software developers.

For more information about Compaq Workstation product offerings, refer to www.compaq.com/products/workstations.

Recommended configurations of Compaq Workstations for software developers can be found at http://www.compaq.com/products/workstations/recommended/softdev.html.

NOTICE

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Introduction

Software development is a labor intensive and time consuming process. Code is written, built, and then debugged in a very interactive process, requiring the manipulation and display of large files.

Many developers have found that workstations help them reduce the time it takes to develop an application. This paper reviews the main features of a workstation, and how each of these features can improve the productivity of a software developer.

Key Workstation Features

The performance of a workstation is dependent on many different factors. The main hardware components in a workstation are:

- Graphics
- Hard drives
- Memory
- Processor(s)

While the hardware components are important, it's also critical that all these components work together effectively and reliably. This requires extensive engineering and system certification testing.

Finally, the workstation needs to be tested and certified to support the operating system that developers need, including Windows NT Workstation, Windows 2000 Professional, Windows NT Server, Windows 2000 Server, and Linux.

Graphics

Compaq Workstation 2D graphics controllers provide two important features that software developers need. First, they provide fast scrolling of text displays. Second, they provide high refresh rates at high screen resolutions.

Fast scrolling is important when editing large source files. The developer can quickly move through the file, reducing the time needed to make edits. Fast scrolling also means that the developer can include more detailed trace statements into the program while debugging without slowing the execution of the program

High refresh rates at high screen resolutions are important for flicker free viewing on the large monitors that software developers use.

For users that need a very large amount of viewing area, Compaq Workstations also support graphics controllers that can drive multiple high resolution monitors. This allows the developer to view more content simultaneously.

Hard Drives

Compaq Workstations include SCSI controllers and high rotational speed (10,000 rpm) hard drives. These controllers and drives provide three major benefits.

First, it takes less time to load large applications and data files because of their high data transfer rate.

Second, software build times are shorter. Software builds require access to many files spread across the drive, including operating system files, library files, source code files, object files and executable files. The short seek times and high data transfer rates of the SCSI controller and drive are the reason for the shorter build times. This performance advantage is even larger if two or more drives are used because SCSI controllers and drives can queue up reads and writes, not stalling the processor or other drives while waiting for an I/O operation to complete.

Finally, a SCSI controller and drive can maintain high throughput even when reading or writing multiple large files simultaneously; for example, a user opening a large application while copying a large file over the network.

Memory

Compaq Workstations provide large amounts of Error Correction Code (ECC) memory.

ECC memory corrects most memory errors on the fly, ensuring that data is not corrupted. If an error cannot be corrected, the system generates an error. Without ECC memory, it is impossible to know if an intermittent failure is due to a programming mistake or a transient memory error.

Compaq workstations support large amounts of memory, up to 4 GB of main memory on the Professional Workstation line. Large memory configurations allow more data to be stored in high speed memory, improving the performance of the application by reducing the need to read and write information to the hard drive.

Multi-processor Support

Compaq supports the fastest processors available, and also provides multi-processor support on its Professional Workstation line. This provides four major benefits.

First, the faster processor results in shorter build times.

Second, a developer on a multi-processor workstation can use one processor to complete a build while utilizing the other processor to perform a second task, such as editing software.

If the software being developed is targeted to run on a multi-processor server, a third benefit is that the developer can use the workstation to do initial multi-processor testing before moving the application to a server for final testing.

Finally, as the system gets older, the low cost addition of a second processor can extend the useful life of the workstation.

System Certification

The proceeding sections have discussed the various hardware components that make up a workstation. Each provides specific user benefits that are easy to measure. An equally important feature of a Compaq Workstation is that the entire system has been engineered and tested to ensure that it will reliably support all the recommended configurations. The three main areas that are closely examined are device drivers, cooling and power.

As shown above, Compaq Workstations support a wide variety of high performance components. Each component and its associated driver is subjected to extensive testing to ensure maximum performance and reliability. When a problem is found with a component or driver, Compaq works with the vendor to help them correct the problem before the component is certified with the workstation.

For high reliability, the workstation must provide adequate cooling for all components under all conditions. A Compaq Workstation can contain multiple 10,000 rpm SCSI drives, a large amount of memory, and a high performance graphics card. Each component provides a lot of performance, but can also generate a lot of heat. Compaq Workstations are engineered and tested with worst case configurations to ensure that they will run cool under all conditions.

Besides creating a lot of heat, many of these components also draw a lot of power at start-up and during steady state running. Compaq Workstation power supplies are engineered and tested with worst case configurations to ensure a stable supply of power under all circumstances.

Operating System Support

Today, Windows NT Workstation is the most common workstation operating system. However, it does not meet the requirements of all software developers. Therefore, Compaq Workstations are tested and certified to run Windows NT Server and Linux in addition to Windows NT Workstation.

Many developers run Windows NT Server on their workstation so they can develop a server-based application in the same software environment in which it will be deployed. It also allows them to perform initial testing on their workstation before moving the application to a server for final testing. A multi-processor Compaq Professional Workstation with 4 GB of ECC memory and multiple high-speed SCSI hard drives is a cost-effective way for a developer to test large server applications right on his/her desktop. It also reduces the testing demands on the development server.

Compaq Workstations have been supporting each version of Windows 2000 Professional and Windows 2000 Server beta software as it has become available. Compaq will provide support for the production versions of this software as soon as it is released.

As Linux gains popularity, more developers are requesting Linux support. Compaq provides systems and support to key Linux distributors for certification.

Summary

Compaq Workstations are engineered and tested to provide the capabilities that software developers require:

- Fast 2D graphics for scrolling through large source code files and program output
- High rotation speed SCSI drives with quick seek times for shorter build times
- Support for multiple SCSI drives for storage of large amounts of data with no loss in performance
- ECC memory to eliminate data corruption
- Large memory capability to reduce build times
- Support for the fastest processors to reduce build times
- Multi-processor support to speed up simultaneous editing and builds
- Multi-processor support for testing of server based applications
- Support for all major operating systems
- Testing and certification of the system to insure reliable performance in any supported hardware configuration

Compaq provides two different workstation product lines to meet the needs of different software developers in the most cost-effective manner. The Deskpro Workstation line provides workstations performance at an affordable price for users that only require one Pentium III processor. The Professional Workstation line provides multi-processor support for both Pentium III and Pentium III Xeon processors. The Professional Workstation line also supports up to 4 GB of main memory.

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