

Clustered Computing with ClearCube Pentium 4 Blades

Rapid development of operating system software has created a new segment in desktop computing. Computers can be assimilated in a variety of processor configurations to provide immense computing power at a minimal cost. These powerful clustering capabilities are made possible through software running on today's operating systems including Windows and Linux.

The market for powerful scientific computing continues to grow. Markets such as Life Sciences, CAD/CAM, financial modeling, simulations, pharmaceutical and military modeling rely on clusters of computers to generate the computing cycles required for their high-end needs. ClearCube's Blades provide the densest P4 solution available on the market and can run not only Windows applications, but Linux-based clustering software as well – all without any special modifications.

P4 clusters are clearly price-advantaged over other server level products in the market. But cost is not their only advantage. High-end scientific calculations heavily exercise the floating-point calculation capabilities of a processor. The P4 processor is much improved over the P3 processors in the use of floating point calculations. Clustering P4 computers in a compact, flexible and managed architecture creates the ultimate solution for many compute-intensive applications.

Life Sciences, for instance, are filled with highly demanding computing problems. The pace of change in the field is extremely fast, with major shifts in strategy and discoveries happening on a monthly/quarterly basis. It is imperative that any computing solution targeting this market be able to scale to increase computational power on the fly and adapt to changing projects and priorities by re-purposing the computing power. The solution must be manageable and comprised of industry standard equipment to create operational efficiencies and retain a low cost advantage. These same requirements apply equally to financial modeling, CAD/CAM, military simulations, semiconductor modeling and other compute-intensive applications.

Since the platform is clustered, there is no physical limit to the number of CPUs that are added to the computing platform. And re-purposing can be done on the fly by simply reallocating individual P4 processor blades to other tasks – whether the task is research/computational or administrative.

The key software technology used to enable clustering blades is already used today in clustered PC applications. A whole community of scientists and engineers have developed solutions based on the Linux operating system to do clustering. The most common solution built on Linux is called Beowulf (www.beowulf.org). Some scientists and engineers have also used Windows operating systems as a basis for their clusters (see ClearCube Case Study on Petersen Lithography online at <http://www.clearcube.com/casestudies/commercial/>).

ClearCube's dense blade architecture can give any clustering software a highly dense and powerful hardware platform on which to run. With 112 fully powered Pentium 4 systems (up to 3.06 GHz each) in a single 42U high rack, today's ClearCube solution can provide unprecedented computing density and value.



112 ClearCube P4 Blades