The Need for High Performance Computing on Wall Street

In today's market, financial institutions need to complete highly complex calculations with increased accuracy, make better business decisions based on timely information, reduce business risk and create and deploy new and more complex financial instruments in a more manageable manner. The main technical challenge is to achieve a higher level of operational efficiency. This challenge has prompted the need for what is now referred to as high-performance computing, or HPC. HPC's new roadmap using industry standard solutions has begun transforming the science of parallel high-performance computing into an everyday business application, transparent to the user.

Clustering to Create More Powerful and Reliable Systems

For several years, technology companies have been promoting aggregated computing power as the next step in the evolution of computers. The term "utility computing" is generally used to describe the availability of computing resources on demand. "Grid computing" is the collaborative use of geographically distributed computers, available over a network. Those computers are independently administered machines with separate administrative domains.

Clusters, on the other hand, are machines set up to be a single system giving users the ability to manage a large set of machines, update programs and configurations at a single point. Along with the "cluster," these approaches bring intensive computing power to a broad set of computational problems which is a perfect fit to meet the demands of financial firms.

As a leading innovator of Linux-based clustering technologies, Penguin Computing has transformed the concept of clustering. A privately held firm headquartered in San Francisco, Penguin is an expert in leveraging open-standards technology.

The Scyld Beowulf Platform

In 2003, Penguin Computing acquired Scyld Software, developer of the industry leading Linux clustering software, Scyld Beowulf™. Scyld Beowulf Linux Clustering Software is a fully integrated software platform for high performance computing. Commercially developed and supported, Scyld Beowulf is a standards-based Linux distribution for improved ease of deployment and manageability of a Linux cluster. A full HPC software toolset is integrated to ensure that Scyld Beowulf provides a powerful and working system, out of the box.

The Beowulf Cluster was conceived specifically to enable HPC applications to utilize commercial off-the-shelf compute resources, costing only a fraction of traditional supercomputers. Penguin Computing and Scyld enable customers to leverage the power of the commodity cluster market by providing SMP-like ease of use features in a Linux cluster environment.

Scyld Software™, understands that compute intensive applications require scalable and robust environments. While Linux clusters provide compelling value for HPC, deploying and managing these systems can be very complex for system administrators. Assembling all of the software components, integrating them and keeping everything up-to-date across the cluster is a significant and ongoing investment. Submitting and managing jobs can be extremely time consuming for end users. Scyld Beowulf was designed specifically to address these issues with the following features:

- Single Point of Management
  The Scyld Beowulf master node functions as a single point of installation, administration, security and monitoring, regardless of the number of compute nodes in a cluster. The installation procedure is as simple as a standard desktop Linux installation. Installation is required only on the master node. Scyld Beowulf assumes full control of the compute nodes from provisioning to security to monitoring and compute nodes may be added or removed without rebooting the entire cluster. Scyld Beowulf's single point of management eliminates cluster complexity, providing extreme ease of deployment and manageability.

- Unified Process Space
  Scyld Beowulf gives users an SMP-like experience for submitting and managing jobs. By providing a single process ID space for the entire cluster on the master node, the cluster acts like one computer. Once users log in to the master node, Scyld Beowulf seamlessly distributes applications across the cluster with processes migrated to compute nodes at execution time. All processes running on the compute nodes are fully visible and manageable from the master node using standard Linux tools.

- Integrated & Flexible Tool Set
  The Scyld Beowulf solution provides a complete HPC software tool set, bundled and pre-tested for compatibility. Tools include parallel libraries, a cluster file system, and popular compilers. This integrated tool set provides a complete environment for users to run a wide variety of custom and commercial applications.

Scyld Beowulf was designed to be an easy to use, standards-based software platform for Linux clustering. Scyld Beowulf is commercially developed, tested and supported, so one can reduce the risk and decrease the long term costs versus building a clustering solution or trying to adapt cluster management systems focused on hardware monitoring and control.

"Penguin Computing and Scyld enable customers to leverage the power of the commodity cluster market by providing SMP-like ease of use features in a Linux Cluster environment," explains Richard Reichgut, Regional Sales Director. "This technology is a computing necessity for Wall Street - as faster time to market is essential today."

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