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Case Study

GENCO

Department of Defense Builds a Highly Available, Scalable Linux Cluster with PolyServe

The Challenge

- Replace UNIX server with Linux cluster
- Improve availability and performance
- Manage cluster cost-effectively
- Allow non-disruptive expansion

The Solution

- Clustered Intel-based servers
- Storage Area Network
- Cluster File System

Results

- Saved 75% on server capital expenditures and on-going server maintenance expenditures
- Same cost of on-going systems management
- Non-disruptive expansion of server and storage capacity
- High availability of server and storage resources

This Department of Defense project concentrates on data/text retrieval. Due to the sensitive nature of the project, application details cannot be divulged.

Genco Engineering Services has over 22 years experience working in the secure environment for the Department of Defense. Genco's expertise includes: System architecture and implementation, performance tuning, troubleshooting, network design, SAN/RAID design and management, growth planning, tape backup/archive management, application development, system administration.

THE CHALLENGE

The Department of Defense (DoD) needs large amounts of highly available compute capacity accessing massive volumes of shared data to support its mission. Rather than embracing the approach of deploying expensive UNIX servers, the DoD wanted a price-performant cluster of Linux servers where each server in the cluster can simultaneously read and write to large volumes of shared data on a storage area network (SAN). The Linux cluster had to possess the following characteristics to successfully replace the UNIX server options:

- No single point of failure
- Shared file system
- High performance
- Expandable

The Linux cluster also had to be easily configured and managed so the cluster could not only act as a single large UNIX server but be as easily managed as a single large UNIX server. Mark Rizzo, President of Genco Engineering Services – a DoD contractor – led the systems integration effort.

Genco found a hardware vendor that could successfully provide all of the hardware components in the cluster but struggled to find the cluster file system product that caused the hardware component to act and be managed as a unified system. The first two file system products that were evaluated failed to meet expectations. The first product contained a blatant single-point of failure and was cumbersome to configure and manage, while the second product corrupted the file system and destroyed over 300 gigabytes of data.

"With PolyServe Matrix Server , we were able to save large amounts of money for our client while building a highly available, highly scalable cluster. Matrix Server installed quickly, and cluster configuration and management is as easy as managing a single, large UNIX server."

Mark Rizzo
President, Genco

THE SOLUTION

PolyServe's Matrix Server was the third cluster file system tested. Matrix Server installed easily, possessed an intuitive graphical user interface for centralized cluster configuration, and most importantly - offered seamless, highly scalable file system performance using standard Linux (ext3) system calls. Matrix Server also eliminated single points of failure with its server fail-over and Multi-Path I/O capabilities and additional servers and storage can be migrated into the cluster without affecting existing members of the cluster.

RESULTS

Mark Rizzo noted that, "With PolyServe Matrix Server, we were able to save large amounts of money for our client while building a highly available, highly scalable cluster. Matrix Server installed quickly, and cluster configuration and management is as easy as managing a single large UNIX server." With a fully functional and reliable cluster in place, Genco is building larger configurations for the Department of Defense. The next phase of the project is a cluster of servers concurrently accessing a ten to twenty terabyte file system.

CONFIGURATION

The data center recently upgraded the PolyServe NAS Cluster solution to be the storage platform supporting the entire 1,000-node HPC cluster. The file-serving cluster now consists of PolyServe NAS Cluster software, Red Hat Enterprise Linux 2.1, nine dual-processor Dell PowerEdge 2650 servers with 2 GB of memory each, connected to a storage area network (SAN) consisting of six 10 TB Nexsan infiniSAN ATAbeast storage subsystems (60 TB storage capacity total).

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