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MFG Systems' Offers an Innovative, High Availability Solution for ThermoLabSystems LIMS users

Challenge

A business unit of a major Chemical company is implementing Thermo Lab Systems SampleManager™ software, a laboratory information management system (LIMS). Users of the system are disbursed globally throughout the company's various manufacturing sites. Thermo Lab Systems LIMS is implemented according to a series of guidelines within the organization.

In order to fully benefit from this new system, the business unit realized that high availability was crucial to gaining user-acceptance of this new, sophisticated application, and as acceptance was achieved, the application would be mission-critical. In addition, a large number of external applications, including SAP, would be interfaced to Thermo Lab Systems LIMS. It was imperative that the infrastructure, architecture and support personnel were established to meet these requirements. System downtime must be as close to zero as possible. The server environment needed to be as robust as possible.

Sample Manager runs in three-tier architecture. Thin-client software is installed on each user's workstation. The SampleManager Application Server is installed on the middle-tier server. The application server maintains persistent connections to the Oracle database.

In an effort to maximize availability, this Chemical company purchased Windows2000 Advanced Server cluster architecture. The cluster is comprised of two identical Dell servers with dual CPUs and 4 GB RAM total. Shared between the two nodes are three NTFS-formatted, RAID-5 disk arrays.

However, through the traditional configuration and installation, the application architecture will not exploit the high availability features of the cluster.

- Users could not connect to a single LIMS server. Users needed to know there were two servers to which they could connect. Managing when users should connect to which node was a challenge.
- The middle-tier application server was not able to 'failover' to the second node in the event of a hardware failure.
- Oracle was not configured to 'failover' to a second node in the event of a hardware failure.

Also, if the Oracle database was shutdown, the middle-tier application server had to be manually restarted.

The business unit of this major Chemical company initially worked with the LIMS vendor for installation of the software. However, the vendor indicated that the software was not cluster-aware, and therefore would not be able to take advantage of the Windows clustering capabilities.

Solution

The Chemical company contacted MFG Systems for a solution. MFG Systems was chosen for its proven track record providing Oracle solutions and support services to other systems within the organization.

“Like the cavalry coming to the rescue, MFG Systems saved the day for us! MFG Systems came up with a solution and installed it in a couple of days.”

—Manufacturing Quality System Leader

Working closely with the systems administration and LIMS support staff at the company, MFG configured a high-availability solution that exceeded the LIMS users and support staff expectations.

MFG Systems installed and configured Oracle FailSafe, Oracle Corporation's cluster-aware software for instance 'failover'. The database was configured to transparently 'failover' from the primary node to the secondary node at the time of instance failure or to intentionally 'failover' for database/software maintenance.

The LIMS application server also was installed on the same cluster. The application server was configured to run on the database's backup node. This allowed load-balancing for the LIMS users by separating the Oracle database resource utilization from the application server resource utilization.

In the event of hardware failure, the application server and database server will temporarily run on the same node. Users' connections are minimally interrupted, and each user simply reconnects to the virtual LIMS server. The environment is fully available within 30 seconds of a complete loss of one of the nodes.

Outcome

This high-availability architecture allows the company's LIMS users many benefits in comparison to a traditional single-server configuration.

No additional software purchase was required - Oracle FailSafe is packaged with Oracle RDBMS software. Fail-over of the application server was accomplished using native functionality in the Windows2000 Advanced Server cluster administrator.

Seamless 'failover' between nodes - Proper configuration of Oracle Failsafe, including establishing appropriate dependencies between the application server and Oracle, and enlisting the service management capabilities of Windows2000 cluster management, ensures seamless, dependable 'failover' between each node in the cluster.

Minimal user interruption - Automatic reconnect of the Application server persistent connections to the database, and the 'failover' solution enables users to simply reconnect to the LIMS application in the event of a disaster. Disasters happen 'behind the scenes'.

Users connect to a single location - By utilizing virtual server configuration in Windows2000 Advanced Server, users do not have to keep track of which application server is available for connection. Users simply connect to a single, virtual server.

Software maintenance may be performed with no downtime to users - A true benefit to the two-node architecture is the ability to perform software maintenance of the LIMS application server without disrupting the users. By temporarily moving both the application server and database server to the same node, the second node is freely available for maintenance.

Greater resilience to hardware failure - In traditional single server architecture, the loss of a CPU or operating system disk can disable the entire server. Within our high-availability solution, hardware loss will initiate a 'failover'. The failed node can be repaired without impacting the productivity of the users.

Each node manages processes independently ensuring better use of hardware CPU and memory - The Oracle database instance uses one node of the cluster as its primary node. The other node acts as the primary server for the LIMS application server. During normal day-to-day operations, the business unit's users are able to eliminate resource contention and exploit the full capabilities of the hardware architecture of each node in the cluster.

Contact MFG for help with your LIMS Systems

Contact us toll free at 1-877-DIAL-MFG (1-877-324-5634), or e-mail sales@mfgsys.com. MFG Systems is online at www.mfgsys.com.