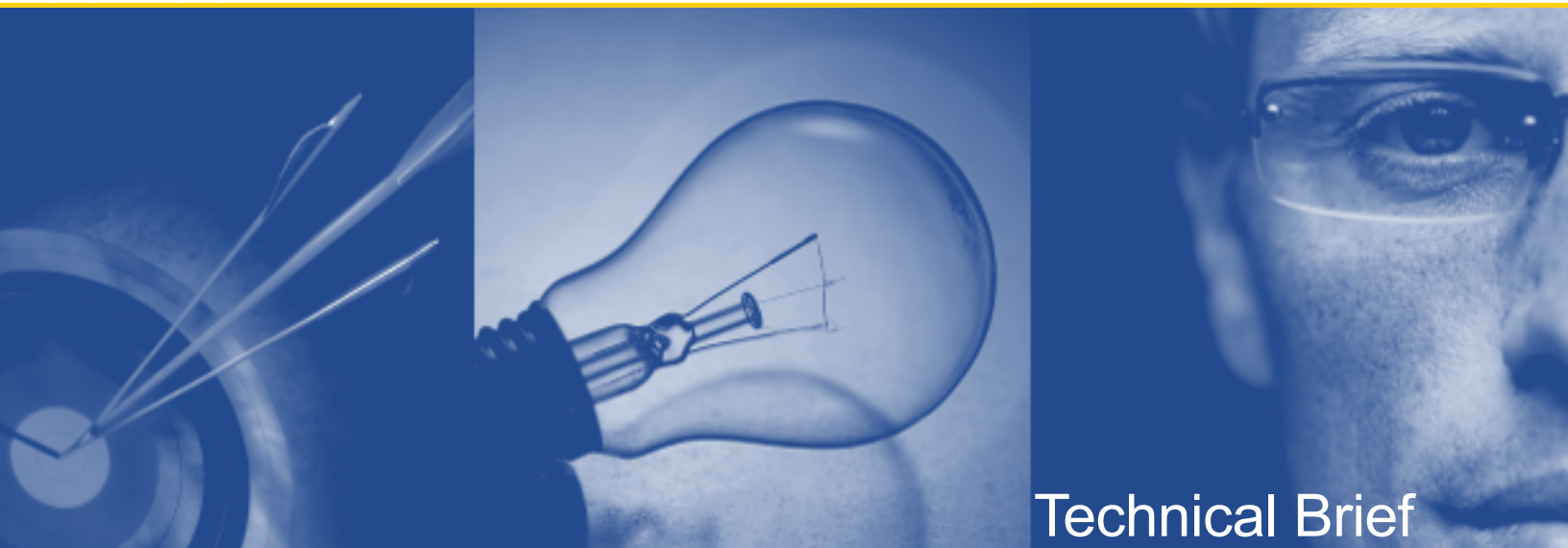


Quest on Quest

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Technical Brief

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INTRODUCTION

Quest Software develops and markets innovative products that help organizations manage their applications, databases, and Windows infrastructure. As a premier systems management vendor, Quest employs many of the best systems management experts in the world. This makes managing IS at Quest interesting. First, we have access to a large number of wonderful products and the experts who helped create them. Second, as Quest's resident customer, we have a unique opportunity to influence product direction. Finally, because we are Quest, we hold ourselves to the highest standards for IT performance, availability, and productivity. This paper describes how we use our own products to help us meet our high standards.

QUEST INFORMATION SERVICES

Quest Information Services supports:

- Over 2900 employees at over 65 locations worldwide
- Approximately 7000 computers in its production domains
- A heterogeneous infrastructure that includes, among other things, Windows, AIX, HP-UX, Linux, Oracle, SQL-Server and Exchange Server
- Oracle Financials
- Siebel
- Clarify (Amdocs)
- A home-grown HR application
- A variety of customer-facing Web applications including the Quest e-Store and the Quest SupportLink site.

AUTOMATED PROVISIONING

Like all organizations its size, Quest is challenged by the need to create, modify, and terminate user accounts in a timely and consistent manner. Every time an employee is hired, fired, or given a new role, there are a multitude of tasks that must be performed – accounts must be created or terminated, mailboxes must be created or reassigned, SMTP aliases must be generated, distribution list membership must be updated, directory information must be updated, access to applications must be granted or revoked, and so on.

Manual provisioning processes are expensive and error-prone. User errors, poor communications, lack of training, and the mistaken assignment of inappropriate access rights can derail a manual provisioning process, sometimes with disastrous consequences. The failure to assign the appropriate privileges or the failure to immediately deactivate or modify privileges when an employee is terminated or changes jobs makes systems and applications vulnerable to unauthorized access with the potential for theft or damage. Moreover, the lack of internal controls that prevent or detect such security breaches is an important Sarbanes-Oxley control deficiency.

ActiveRoles Server has allowed Quest to completely automate user provisioning, re-provisioning, and de-provisioning, taking human error out of the equation while improving IS efficiency and security. ActiveRoles Server's rule-based policies ensure that every administrator action is consistent with Quest's security standards. Moreover, its role-based delegation of administrative privileges allows us to provide different levels of access to administrators, help-desk personnel, and even end-users without the risk of unauthorized modification of Active Directory objects.

Quest uses ActiveRoles Server's Quick Connect capability to integrate with the Quest HR system. Quick Connect allows us to synchronize Active Directory with the HR database every 10 minutes – or immediately in the case of an urgent termination. From there, ActiveRoles Server does all of the heavy lifting. When a new hire is created in the HR system, ActiveRoles Server maps appropriate HR data to Active Directory attributes and executes the rules we defined for creating new user accounts and mailboxes. When an employee is terminated, a similar process is used to disable the employee's user accounts.

We have also extended our automated provisioning processes beyond that which has traditionally been the domain of Active Directory. With Quest's Vintela Authentication Services, we are able to extend Active Directory authentication to UNIX and Linux. This enables us to manage UNIX and Linux user accounts as standard Active Directory accounts. Moreover, we were able to easily customize Quick Connect to automate the creation and termination of our Oracle Financials user accounts. This allows us to address an important Sarbanes-Oxley issue with ActiveRoles Server.

Quest on Quest

We also customized Quick Connect to assist with additional business processes related to employee hiring and termination. For example, when a new hire is processed, an e-mail is sent to the helpdesk initiating hardware deployment; another e-mail is sent to the hiring manager confirming the start date and prompting follow through on a number of approval workflow processes; and finally, a third e-mail is sent welcoming the new employee to Quest and providing useful new hire information.

ActiveRoles Server has delivered the following benefits to Quest IS:

- We have freed up IT headcount that was once dedicated to account provisioning.
- The time taken to process a new hire ticket has gone from being measured in hours, or even days, to less than ten minutes.
- All re-provisioning and de-provisioning of accounts happens in minutes. Sensitive terminations can be properly processed in almost real-time. The automation of these processes has increased our system security and provided the appropriate controls for Sarbanes-Oxley compliance.
- The data in our exchange address book is 100 percent in sync with the data in a custom-built HR system that is not Active Directory aware.

DYNAMIC GROUP MEMBERSHIP

We have configured Quick Connect to synchronize over 14 additional data fields (e.g., cost centers, department codes, and geographic regions) including some that do not map directly to Active Directory attributes. Values that do not map directly onto Active Directory attributes are held in ActiveRoles Server virtual attributes, eliminating the need to extend the Active Directory schema. ActiveRoles Server allows us to define dynamic groups whose membership is based on queries of Active Directory attributes or ActiveRoles Server virtual attributes. For instance, Office.AMER.US.AlisoViejo is a dynamic group of all Quest users whose office is equal to 'Aliso Viejo.' If the attribute in the dynamic group membership query changes, users are automatically added or removed. Since this data is synchronized with the HR database as often as every 10 minutes, membership in the dynamic group is always accurate.

USER SELF-SERVICE

In addition to fully automating the provisioning and de-provisioning processes at Quest, ActiveRoles Server further reduces helpdesk costs by enabling users to perform some of their own routine directory maintenance tasks. Using ActiveRoles Server's self-administration capability, we now allow our end-users to login to a website to change mobile phone numbers, home numbers, and notes fields. Exposing this capability through ActiveRoles Server's Web interface has lowered the number of helpdesk calls we get because users can change their own data any time they want.

We have also implemented Quest's Password Manager to allow our users to securely reset their own passwords. Proper security measures and Sarbanes-Oxley compliance require that passwords meet certain standards of complexity and that they are changed on a regular basis. Of course, this means that users are more likely to forget their passwords, thereby creating a burden on the helpdesk. In some organizations, as much as 40 percent of all helpdesk activity is related to password management.

Quest uses Password Manager to ease the burden of supporting higher standards of password management by allowing users to securely reset their own passwords. Password Manager authenticates the user by asking questions from the user's profile that are easy for the user to remember but which other users will not know or be able to guess. Once authenticated, the user can supply a new password as long as it meets the standards established by Quest IS. Password manager supports and enforces a wide range of password policies. It also records a complete audit trail of all password maintenance activities, and it can be configured to generate alerts when appropriate password events occur.

ACCESS AUDIT

Quest periodically reviews user access privileges to ensure that they conform to Quest policies. This important component of our access and identity management strategy is typically required by Sarbanes-Oxley. Quest Reporter helps with this review by automatically discovering and reporting all Active Directory users and the resources to which they have access. With this information, we are able to ensure that inappropriate users do not have access to sensitive resources. Quest IS also uses Reporter for a variety of ad hoc reporting needs that come up during normal operations.

In addition to reviewing privileges on a monthly basis, Quest IS proactively monitors all access-related activity. Good security practice and Sarbanes-Oxley compliance require that we review all access to sensitive information, all access by highly-privileged administrators and users, and all abnormal or suspicious access-related events, such as repeated failed login attempts.

We use Quest's InTrust for Active Directory to monitor all changes to Active Directory. InTrust for Active Directory provides complete information related to important changes, including who made the change and the before and after values. This helps administrators troubleshoot Active Directory problems and reverse any problematic changes. It also helps us meet our compliance requirements by enabling us to audit Active Directory changes for compliance to our security policies.

We also use Quest's InTrust for Windows to audit access to important file shares. InTrust for Windows securely collects event logs from appropriate servers and stores them in a highly compressed repository. It also provides real time alerting and reporting of significant events. We use InTrust to audit changes to permissions on sensitive shares as well as unusual or suspicious events, such as repeated login failures and other security anomalies. InTrust also helps with routine operational tasks. For instance, we use it to alert us to expired service accounts so that we can quickly restore the service that uses those accounts.

ENSURING THE AVAILABILITY OF ACTIVE DIRECTORY

The availability of Active Directory is an important issue for Quest. We use Quest's Spotlight on Active Directory to monitor the health of Active Directory across the enterprise. Spotlight on Active Directory provides a set of tests that analyze core Active Directory processes to ensure that they are working properly. The tests can be scheduled to run at regular intervals and generate notifications when they fail. In the event that a problem occurs, Spotlight's diagnostic console greatly simplifies the tasks of identifying and examining the problematic domain controller subsystem.

We also use Quest's Recovery Manager for Active Directory to help us quickly recover from accidental deletions of directory objects and from directory corruption due to hardware or software failure. Recovery Manager provides a centralized and automated backup with a granular restore capability. With Recovery Manager, we only need to restore the deleted or corrupted objects. When we have needed the product, it has worked flawlessly and has delivered enormous value.

MANAGING EXCHANGE PERFORMANCE & AVAILABILITY

Like most companies, Quest's business is dependent on the availability and proper functioning of our e-mail system. Apart from its importance for employee communication and collaboration, e-mail is a critical tool for Quest sales and support staff. Much of the communication between Quest sales representatives and existing or potential customers is handled through e-mail. Also, much of our customer support is handled through e-mail. Our customers depend upon us to address their issues in a timely manner, and e-mail system failures can result in significant delays.

Spotlight on Exchange provides the coverage we need for Exchange diagnostics and resolution. We use Spotlight's graphical representation of our Exchange topology to quickly and accurately assess the health of our Exchange environment. Spotlight on Exchange helps us monitor key indicators, such as network availability, SMTP queue status and size, performance counters, and other data items. Spotlight can also be configured to generate alerts when important thresholds are exceeded. We have found the queue diagnostics to be especially useful. With visibility to the buildup in the queues, we are able to take action to clear or eliminate the queues before legitimate e-mail is impacted.

Spotlight on Exchange includes simple, yet powerful, tests that ensure that the key parts of Exchange are running properly, including internal/external message delivery, OWA access, mailbox logon, and information store responsiveness. Quest runs a single instance of Spotlight on Exchange to send test messages every 15 minutes from one of the central mailbox servers to a mailbox on each of the other 26 mailbox servers in the organization. If a test message fails to reach its desired target within a specific timeframe, Spotlight issues an alert and notifies the appropriate people. Based on the test results Spotlight provides, Quest can determine message delivery times and adjust thresholds to improve system performance.

Another product that plays a critical role in Exchange management at Quest is MessageStats. Quest MessageStats provides comprehensive reporting of usage, traffic, volume, capacity, uptime, inventory, and other important Exchange metrics. From an IT operations perspective, these reports are invaluable for identifying trends and performing capacity planning. They also provide the critical information needed for architectural discussions concerning the distribution or consolidation of Exchange servers.

MessageStats provides reports that are valuable to other parts of the business. The ability to flag messages sent to or from specific domains or which have certain words or phrases in the subject line enables us to identify messages that fail to comply with our internal e-mail policies. We routinely audit e-mail to and from our competitors. E-mail volume reports also provide managers with a measure of the e-mail activity of their employees. This is helpful in some areas, such as Sales, where e-mail activity could potentially be tied to performance.

Another important part of our Exchange management toolbox is Quest's Recovery Manager for Exchange. Recovery Manager allows us to retrieve individual items from Exchange backups for particular mailboxes, public folders, and message stores. It supports fast searches based on sender, recipient, date, subject, message keyword, or attachment keyword. This product is valuable not only for its granular restore of Exchange messages when something gets accidentally deleted, but its comprehensive e-mail search and discovery mechanism is also valuable when our HR or legal department needs to produce e-mails that exist only on Exchange backups. In all of these cases, Recovery Manager saves us enormous time and money by eliminating the need to set up recovery servers to restore Exchange backups.

MANAGING ORACLE AND SQL-SERVER

One of our most important database tools is Quest's Toad. Toad provides functionality for building and executing queries; creating and managing database objects; developing, debugging, and tuning SQL; and simplifying routine DBA tasks, such as importing and exporting data, comparing schemas, and updating statistics. Toad is used extensively by our DBAs, application developers, and data analysts. One feature that is especially useful to our DBAs is the ease with which it helps us identify and release Oracle deadlocks. Toad's session browser enables our DBAs to quickly view all locking sessions and easily identify the offending locks. Toad saves us many person-hours each week by simplifying and automating routine database development and administration tasks.

Another database tool is Quest's LiteSpeed for SQL-Server. LiteSpeed combines the quick backup and compression of SQL-Server data with a fast object-level restore. LiteSpeed is so quick and easy to use that we use it for a variety of database management tasks, including moving data from production to test and staging databases, and fast ad hoc backup of critical data in preparation for potentially harmful operations. The speed, high-performance compression technology, and ease of use make LiteSpeed an invaluable tool for SQL-Server. LiteSpeed has allowed us to reduce the size of our production backup window while dramatically reducing the amount of storage required for the backup files. We are looking forward to implementing the new version for Oracle which is planned to be available this year.

We use Quest's Foglight products to monitor our critical database instances. Foglight monitors all important services and resources as well as key performance metrics. When deeper diagnostic information is required, we use the Quest Spotlight products. Spotlight on Oracle and Spotlight on SQL-Server allow us to quickly determine whether a database performance problem is related to a specific user action, a resource-intensive SQL transaction, an I/O bottleneck, a lock wait, or a variety of other performance-related issues.

Our DBAs also use Quest's Space Manager with LiveReorg. In addition to providing tools to help us collect space usage data, to troubleshoot space-related problems, and to plan for future space requirements, Space Manager's LiveReorg component allows us to re-org Oracle databases without taking them offline.

Finally, we make extensive use of Quest's SharePlex fault-tolerant replication solution for Oracle. We use SharePlex to create a database failover environment for our Siebel and Clarify applications. We also use it to maintain reporting instances of our Clarify and Oracle Financials databases. This has allowed us to reduce the load on our OLTP systems, thereby keeping performance high without incurring the cost usually associated with hardware upgrades for systems stressed by heavy report and query use.

APPLICATION PERFORMANCE & AVAILABILITY

Quest runs several important applications that are critical to the operation of our business. When these applications go down or experience significant problems, Quest suffers lost productivity and revenue opportunities. Consequently, we use Quest application management products to help us maintain high levels of application availability and performance.

Consider our Siebel application. Siebel automates many of the processes at the very heart of our business. At Quest, Siebel is used to manage the sales process from original lead through completed order. Moreover, the data provided by Siebel is critical to our sales pipeline management and forecasting as well as our marketing campaign analysis and evaluation.

Siebel downtime or performance degradation has important consequences for our business. First, poor performance or lack of availability has a negative impact on salesperson productivity. With sales, lost productivity translates directly to lost revenue. The less time sales people spend working with Siebel, the more time they have for engaging potential customers. Moreover, if there is significant pain associated with using the Siebel application, the sales people are more likely to take short-cuts or avoid using the application altogether. This results in lower quality data for analysis and planning. We have been able to address these issues with Quest's Foglight and Spotlight products.

We use Foglight Experience Monitor to monitor actual user response times. Foglight Experience Monitor utilizes non-invasive, zero-impact technology for monitoring the performance of the system as experienced by our end-users. With Foglight Experience Monitor, we are able to:

- Generate alerts when response-time SLAs are violated
- Review trend data to identify problems before they become critical
- Review performance metrics related to individual users, user sessions, user locations, application transactions, web servers, and web sites.

Foglight Experience Monitor helps us quickly diagnose many performance problems. When we receive an alert or when a user complains about a performance problem, we are able to review the sessions related to the problem and identify which components of the transaction are resulting in greater than expected delays. We can also quickly determine whether the problem is related to certain servers or offices. In one case, we were able to isolate a performance problem to the users in a particular office. Further investigation showed that the problem was related to a bandwidth issue that was subsequently resolved by our telecommunications provider. Having the data in hand made it much easier to engage our own networking staff and to work with our telecommunications vendor.

We also use the Foglight Cartridges for Siebel, Oracle, and AIX. This allows us to monitor exceptions and comprehensive performance metrics across the whole application technology stack. In this way, we are able to monitor the overall health of the application, databases, web servers, application servers, and operating systems. Often, we are able to identify and correct problems before they impact end-users. When end-users do experience performance problems, the Foglight console allows us to drill down into any of these components to assist in rapid diagnosis of the problem. A quick review of the console, for instance, could tell us that an application performance problem is related to problems in a particular instance of the Oracle database. From there, we can drill down into the Oracle instance to see key database metrics including wait statistics, lock contention, table space usage, and other important performance and resource statistics. If necessary, we can then use Spotlight on Oracle to provide deeper diagnostic information. With Spotlight, we can determine whether the problem is related to a specific user, SQL transaction, I/O bottleneck, lock wait, or to some other cause.

ACQUISITION INTEGRATION

In addition to helping us in the day-to-day management of our IS infrastructure, Quest products have also played an important role in the integration of Quest's acquisitions. Over the last few years, Quest has made a number of significant acquisitions requiring the integration of numerous geographic locations, IT infrastructures, and new employees. Quest's comprehensive offerings for NT, Active Directory, NDS, and Exchange migrations have played a key role in most of these integration and consolidation projects. These products are invaluable in helping us plan and execute successful migrations to our standard IT infrastructure.

One product that has been valuable for acquisition integration, as well as other consolidation projects, is Quest's Storage Consolidator for Windows. Storage Consolidator automates the online migration of data and printers with their security settings intact, while updating end-user desktops and profiles to ensure that mapped drives, printer connections, desktop shortcuts, and hyperlinks continue to function after the move so as to minimize the impact on critical business activities.

Another product that has been helpful during the integration of acquisitions is Quest's Collaboration Services for Exchange. This product has enabled us to integrate messaging and calendaring in a very short time with Global Address List (GAL) and free/busy synchronization. In one of our acquisitions, our new users were able to obtain e-mail addresses and schedule meetings with their new coworkers within 24 hours of our finalizing the acquisition.

SUMMARY

Quest IS supports a fast-growing, dynamic business that demands the highest level of service from its IT organization. The use of our own products is an important component of maintaining this high level of service. Whether we are integrating new acquisitions, automating provisioning, auditing access, managing Exchange, tuning our databases, or ensuring the availability of our mission critical applications, Quest products play a key role in maintaining the highest levels of performance, availability, and productivity of our IT infrastructure and staff.

ABOUT THE AUTHOR

Carol Fawcett is Quest Software's Vice President of Global Information Services. In the 25 years Carol has spent in the IT industry, she has led numerous IT initiatives, including:

- The selection and implementation of key enterprise business applications
- The identification and implementation of improvements to global IT infrastructure and IT operations
- The implementation and management of professional IT outsourcing arrangements.

In addition, Carol has extensive experience with financial, manufacturing, CRM, HR/Payroll, marketing and sales force automation applications. She has also participated in successful ISO900x and Sarbanes-Oxley certification programs. Carol holds a bachelor's degree in Management Information Systems from National University in San Diego, California.

ABOUT QUEST SOFTWARE, INC.

Quest Software, Inc. delivers innovative products that help organizations get more performance and productivity from their applications, databases and Windows infrastructure. Through a deep expertise in IT operations and a continued focus on what works best, Quest helps more than 18,000 customers worldwide meet higher expectations for enterprise IT. Quest's Windows Management solutions simplify, automate and secure Active Directory, Exchange and Windows, as well as integrate Unix and Linux into the managed environment. Quest Software can be found in offices around the globe and at www.quest.com.

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