

## Functional and Stress Testing of a Data Backup Application

"A big 'Thank You' to everyone for the great team effort you made. We are very pleased you succeeded to take over my program and make so many improvements in it. It was important to emphasize the good work that was done. Again, thank you."

Frank van der Hesselink  
R&D Manager

### Customer

The customer is an IT company that specializes in backup services for file systems and servers (MS SQL and Microsoft Exchange). The company's ambition is to provide fast, complete, and safe ways to save and restore information.

<b>Company</b>	<i>Software Development Provider</i>
<b>Country</b>	<i>The Netherlands</i>
<b>Business Domain</b>	<i>Functional Testing, Usability Testing, Stress Testing, Database Testing and GUI Testing</i>
<b>Services Used</b>	<i>Complex Testing</i>
<b>Cooperation Model</b>	<i>QA Outsourcing for a Development Company</i>
<b>Duration</b>	<i>3 years</i>
<b>Efforts</b>	<i>60 man-hours per month</i>

### Project

The online backup software is a data backup and restoration system. The system is a Windows/Linux application that allows the client to back up files and e-mail messages on Microsoft Exchange servers and restore lost data.

A1QA was recommended to the customer for independent project testing. The company personnel, the remote development team and A1QA cooperated on the project.

### Challenge

The customer needed a product with the following capabilities:

- Backup and recovery of the file system
- Backup and recovery of e-mail messages on Microsoft Exchange servers
- Backup of MS SQL, Oracle and DB2 databases
- Backup and recovery of net resources on both Windows and Linux platforms
- Backup and recovery services on Linux-based systems

### Solution

The testing process started simultaneously with the development. The first task was to carefully study the project specification and to test the project prototype. Our objective was to uncover and eliminate many potential defects at the very beginning of the project development and reduce the project stabilization time.

To ensure seamless functioning of the customer's product, A1QA conducted:

- Functional testing
- Usability testing
- Stress testing (e-mailing of more than 1000 letters and checking the server and backup program functionality)
- Database testing (database structure, scalability, operational speed on different data volumes, data integrity)
- GUI testing

Within a short period of time A1QA testing experts managed to do the following:

- Tested the new functionality on Windows XP, Windows 2000, Windows NT and Linux.
- Tested the project documentation (the functional specification and use case documents).

- Created test documentation (test scenarios).

While the product was under development, A1QA offered an automated solution, which proved to be very helpful for testing in different environments. The solution included two constituents:

1. Build machine
2. Automated minimal acceptance test

Every time a build was delivered for testing, the build machine generated builds for different operating systems and then ran automated scripts for the minimal acceptance test in all virtual environments. This allowed performing regression testing automatically without any human involvement. A1QA engineers started manual tests only after automated tests were successfully completed.

## Cooperation with a remote development team

A well-organized cooperation model with the development team allowed producing a high-quality product in a short time span. To foster communication, we used various communication channels: e-mail, phone calls and Internet voice and paging software.

The developers provided two builds every week. After each build was tested, we uploaded detailed reports on the tests performed and their results. The customer was also provided with weekly progress reports.

## Technologies used

**Automation tool:** Squish

**Defect tracking system:** Rational ClearQuest (including Rational ClearQuest Web)

**DB tools:** MS SQL Server, MySQL database connector

**OS emulation software:** VMWare

**Other tools:** Email AutoSender

To effectively test the product, A1QA testing experts created a product testing environment including:

1. A separate domain
2. An Exchange server with Outlook support in the new domain
3. A program that we developed for sending a set number of e-mail messages with an option to configure the size of messages and attachments
4. Web access to Microsoft Exchange servers
5. Several virtual OS images: Windows XP (English, French, Russian, etc. for localization testing), Windows 2000, Windows NT and Linux

## Success

- The customer received a high-quality product.
- The automated approach offered by A1QA helped reduce the duration of the stabilization period. All uncovered defects were fixed by the developers on the go, and the customer received a high-quality product.
- Several programs were incorporated into one system, which simplified and facilitated data backup and recovery.
- A1QA usability experts contributed greatly to development of a user-friendly GUI.
- The project was transparent and easy to control since the customer had web access to the system where all defects were stored and was immediately notified about new defects. Also, the customer could upload any recommendations into the same system and track the project quality and progress.
- The customer cooperates closely with A1QA on each new version of the product. For every new product feature, A1QA offers a unique complex testing approach.
- The customer engaged A1QA to test the product on an ongoing basis.