



To succeed in business it is necessary to make others see things as you see them.

## Security Testing & Load Testing for Online Document Management system

### Abstract

The client is a leading provider of online technical documentation solutions in UK, they wanted to protect their documents from theft and provide a trusted environment along with enhancements included improvement in the existing features as well as addition of new features. Their requirements were met with performance testing for 50 concurrent users, security testing for Documents Upload, Download and major functionalities of the application, effective automation with different test scenarios which helped them reduce overall cost of testing.



## Client Profile

The client is a leading provider of online technical documentation solutions in UK for a wide range of building services.

## Business Need

The client was initially approached by the company to take care of their online Documentations, protect their documents from theft and provide a trusted environment for conducting secure business through web.

The Application has been introduced in market since 2003 and is continuously being enhanced to meet specific client requirements. Enhancements included improvement in the existing features as well as addition of new features. Since the client was a first-time outsourcer, the first main concern around security & quality.

The modifications/enhancements/additions required the client to continuously test the application. Client was looking for an offshore test partner who can:

- Understand the current application in limited time period
- Customer faced difficulty to schedule, assign, and track the testing tasks for the technicians
- Test Plans & Test Reports were lying in network shared folders and access control was very hard
- Managing audits performed every quarter was becoming a nightmare
- User and User group utilize role-based security with option to change access on the fly by logging in to the application
- The assignment involved conducting a Security testing of the application within a short time of 35 to 40 hours.

For Security testing, the client's main concern was to identify vulnerabilities clearly and accurately, with a minimum of false positives and protect their customer's confidential building documents information.

## Challenges

The Main challenges faced were:

- To find out the key scenarios for the performance testing such that it covers the whole application.
- Change in the proposed testing tool (Open STA/WAPT, Acunetix Vulnerability) because of limitations with the developed application and tool compatibility
- To find out and propose a tool that overcomes the limitations
- Close communication with client required as the product was being tested rapidly in accordance with the end user requirements
- Team management in very effective way to lead the way through to client's expectations up to the mark
- To add more value to the result findings, a team of experienced project managers went through the report and reviewed it for strategic analysis. The report was then presented according to the specified client template.

# Case Study

For automated testing, the client's main concern was to check whether 50 concurrent users logging into the application does not crash the application. The scenarios had to be identified such that it covered whole of the application.

Also areas of concern were to check the robustness, speed, fault tolerance, security, cost criteria and extensibility.

Client wanted to have following things done during testing:

## Security Testing:

- Broken access control
- Mandatory access control
- Invalidated input
- Broken Authentication & Session management
- Cross site scripting (XSS) flaws
- Trusted path
- Buffer overflows
- SQL Injection
- Improper error handling
- Insecure storage
- Directory Traversal Attacks
- File inclusion Attacks
- Authentication Attacks
- Code Execution attacks
- Google Hacking Database

## Performance Testing:

- Perform the Performance testing with 50 concurrent users so that the application does not crash.
- Identify the Key scenarios.
- Create the scripts and run the scripts.
- Analyze the results

## Gateway's Solution

## Benefits

- Performance Testing was done for 50 concurrent users
  - ✓ Performance testing was carried out on the application using the Open STA. The area of concern was to check that the application does not crash with 50 concurrent users.
- Security Testing was done for Documents Upload, Download and major functionalities of the application
  - ✓ Security testing was carried out on the application using Acunetix Vulnerability tool.
  - ✓ The other concern was to check that the document should not be visible or downloaded/Uploaded by users other than the privileged users and should not be able to access certain links in the application if the user does not have enough privileges.
- Effective automation with different test scenarios which was time consuming in manual testing
  - ✓ Performance testing & Security testing was done using the automated testing tool. Different test scenarios were identified which covered all the critical areas in the application. This could be time consuming, had it been done manually.



Software applications are backbones of business hence quality becomes one of the key differentiators in success or failure of the software. Gateway's independent software testing services ensures faster delivery of quality software, with less risk, at lower costs.

Gateway was chosen as an ideal partner to implement effective offshore Quality Assurance for the product and carry out the complete Performance and Security testing of the application by doing manual research & automation testing. Gateway team had to ensure that the overall quality of deliverables is achieved within the agreed timeline. Gateway setup a 3-member team comprising of 1 project manager, 2 automation test engineers.

#### **Security Testing:**

Security testing attempts to verify that protection mechanisms built into a system will, in fact, protect it from improper penetration. During Security testing, password cracking, unauthorized entry into the software, network security are all taken into consideration.

#### **Security Testing Approach:**

- Identifies the resources needed to conduct the Security test
- Explains the security test execution process
- Presents the Security test schedule

Gateway QA team had to guarantee the product quality at each release with regression testing, Unit testing & Code Review of existing and new functionalities.

After the completion of the functionality testing at the last leg of system testing security testing was done. First the application was checked with Acunetix vulnerability testing tool. Then the application was subjected to different penetration testing methodologies.

- Overall reduction in cost of testing
  - ✓ Regression testing was carried out using the old test cases. Other than the implementation to a new platform which involved setup of required hardware infrastructure, the team did not foresee any major costs to the current project.

### **Technology**

#### **Client Software:**

Platform: Windows  
XP/2003/2000

Browser Versions: IE 06

Report Printer: ActiveX Control

#### **Server Software:**

Operating System: Windows  
Server 2003 R2

Frame work: Dot Net 2.0

Report: Crystal Report

Indexing System: MS indexing  
service

Database: MS SQL- 2005



A proper communication channel was established between the client and its Development team to ensure that no gaps are left during the final testing. Weekly summary calls were made to ensure that Gateway team is in line with the development team and Client's expectations.

The test automation Security testing was achieved using Acunetix Vulnerability tool and respective technology add-ins. Application access was given by client on Gateway's local test environment.

#### **Performance Testing:**

Performance testing of a Web site is basically the process of understanding how the Web application and its operating environment respond at various user load levels. In general, we want to measure the Response Time, Throughput, and Utilization of the Web site while simulating attempts by virtual users to simultaneously access the site. One of the main objectives of performance testing is to maintain a Web site with low response time, high throughput, and low utilization.

The test automation Performance testing was achieved by using Open STA (Open System Testing Architecture) and respective technology add-ins. This was the Open Source tool, downloaded through internet and installed at Gateway's local test environment.

#### **Major Challenges in the Execution:**

- The team was responsible for Performance testing, Security testing and final approval by the client
- Knowledge transfer of the application as concrete requirement documents were not available.
- Communication and close track of all communication between the Client and their Development team regarding the Change requests and schedule changes.
- Selection of the Module(s) and scenarios to be included for automation testing The team was responsible for Performance testing, Security testing and final approval by the client

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