

# Development of End to End Triage Automation Workflow Tool for Testing

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**Abstract:** Automation work flow which automates, to at least some degree, a process or processes. It can be process and requires a series of steps to be automated via software. Steps of the process do not require human intervention. Bug triage is a process where tracker issues are screened and prioritised. Auto triage helps in triaging the build without manual effort.

**Keywords:** Automation testing, Automation workflow, Bug triage, Triaging.

## I. INTRODUCTION

When a product is developed, it is very important that the product is tested for the correct functionality it has been developed for, before it can be sold to customers or clients. Thus, the role of testing in the software development process is very important. It should not happen that, when a customer is using the software there should not be defect or a bug. Automation Testing is a method where we use testing tools and reduce the need of manual or human efforts. Automated testing is used by software engineer to save time and resources. Test automation is the process of writing a computer program to do testing otherwise which had to be done manually. Once tests have been automated, they can be run quickly and repeatedly [1]. This can be a cost-effective method for testing of software product that have a long maintenance life. Test automation offers a possibility to perform these types of testing effectively [2].

Test automation follows many approaches; some of them are [3]:

- 1) Graphical user interface testing: In this a testing framework generates user interface events such as keystrokes and mouse clicks.
- 2) Code-driven testing: Here the classes, modules or libraries are tested with a variety of input arguments to validate that the results that are obtained are correct.
- 3) API driven testing: This testing framework uses a programming interface to the application to validate the behavior under test.

## II. NEED OF AUTOMATION TESTING

Executing the test cases will also help us understand what portion of the functionality is implemented. The set of the automated test suite can form a regression test suite. Automating also reduces the time in finding the problems at an earlier stage and solving them. Manual testing is a time consuming process and error prone, automation testing helps to overcome this draw back. Running the tests frequently increases confidence in the application.

Companies not only need to test software adequately, but also it is required to test quickly and thoroughly. To accomplish this goal, automated testing is required.

## III. BUG TRIAGE

The Bug Triage meeting should be facilitated by QA lead and this meeting should be conducted in testing phase of the SDLC. The frequency of the meeting is varying from projects to projects and it is to be decided based on the how many bugs are logged by the testers.

The aim is to take action on most important or critical bugs first and not concentrated much to fix non-important bugs first. Triage in software development requires three parties be present. Test facilitates a bug triage with a bug tracking system and reads the description of the bug to everyone, product generally asks some clarifying questions, and testing and development go back and forth the importance and impact of their point of view.

There will be understanding on the severity and priority, or "actionable priority", of the bug or defect, and the defect is marked as Triaged. Consistent triage meetings are important to ensuring a clear product backlog and reducing the need for meetings to talk about priorities.

Triaging a bug involves making sure the bug has enough information for the developers and makes sense, bug is filed in the correct place, bug has sensible "Severity" and "Priority" fields. Priority is Business; Severity is Technical Triages, will give the Priority of the fix based on the business perspective.

Priority and Severity gives the excellent metrics to identify overall health of the Project. Severity is customer-focused while priority is business-focused. Assigning Severity for a bug is straightforward. Using some general guidelines about the project, testers will assign Severity but while assigning a priority is much more juggling act.

#### A. Bug triage Meeting:

When the new defect is logged by tester then every defect should be triaged in the Bug Triage meeting. In this meeting bugs are discussed among meeting attendees and assigned in the defect is category like bugs to fix now, bugs to fix later, and bugs we'll never fix.

### IV. AUTOMATION TOOL

Automated tool is important for many projects in order to automatically run the key functionality, tests and produce required result without human intervention.

#### A. End to End Testing

Term "End to End testing" is defined as a testing method which determines whether the performance of application is as per the requirement or not. The purpose of performing end-to-end testing is to identify system dependencies and to ensure that the data integrity is maintained between various system components and systems. The entire application is tested for critical functionalities such as communicating with the other systems, interfaces, database, network, and other applications. The areas of intervention cover the full QA chain: from test methodology and process to design and execution via testing management, automation and tools. The course of action can vary from professional services to turn-key projects, and even an innovative Test-as-a-Service (TaaS) approach.

#### B. Bug Tracking Tools

A bug tracking system or defect tracking system is a software application that keeps track of reported software bugs in software development projects. It may be regarded as a type of issue tracking system. A bug tracking system is usually a necessary component of a good software development infrastructure, and consistent use of a bug or issue tracking system is considered one of the "hallmarks of a good software team". Typically bug tracking systems are integrated with other software project management applications.

### V. EXISTING TRIAGE TOOL

The CERT Triage Tools can be used to assist software vendors and analysts in identifying the impact of defects discovered through techniques such as fuzz testing and prioritizing their coordination in the software development process. The CERT Triage Tools include a GNU Debugger (GDB) extension called "exploitable" that classifies Linux application bugs by severity and a wrapper script for batch execution. CERT Triage Tools project has been transitioned to the GDB 'exploitable' plugin project on GitHub. In the course vulnerability discovery work in developing the CERT Basic Fuzzing Framework. The CERT Triage Tools were developed to serve purposes on the Linux platform. It is compatible with 32-bit or 62-bit Linux platform. It helps in collecting, analysing, and validating the emerge vulnerabilities to common computing platforms. It broadly notifies

operators of vulnerabilities as well as provide mitigation and remediation guidance.

### VI. PROPOSED TRIAGE AUTOMATION

The Automation Tool is used by triage engineers to report the results of tests. It was originally intended to replace the handoff emails between different teams. web application running on an Apache web server, built primarily with PERL to render the HTML to the user's browser. The data is stored in a MYSQL database. A cron runs every day to pick the build from the database which invokes the database server and web server for the logs. The tool processes the logs and capture the bug/defected information and triage the bugs. Tool also sends all this information in the form of mail to the respected triage engineers.

The tool is built with various CGI's along with common JavaScript libraries including jQuery and dojo.

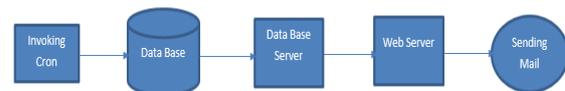


Fig. 1: Proposed Triage Automation Flow

### VII. TRIAGE AUTOMATION ADVANTAGES

**Reliable:** Automation perform precisely the same operations each time they are run, thereby eliminating human error.

**Better Quality Tool:** Because you can run more tests results in less time with fewer resources.

**Fast:** Automated Tools run tests significantly faster than human users.

**Cost Reduction:** As the number of resources for manual test are reduced.

**Greater consistency and repeatability:** People have tendency to do the same task in a slightly different way even when they think they are repeating something exactly. A tool will exactly reproduce what it did before, so each time it is run the result is consistent.

**Ease of access to information:** Information presented visually is much easier for the human mind to understand and interpret. Special purpose tools give these features directly for the information they process and form the table with all the required data.

**Objective assessment:** If a person calculates a value from the software or incident reports, by mistake they may omit something, or their own one-sided preconceived judgments or convictions may lead them to interpret that data incorrectly. Using a tool means that subjective preconceived notion is removed and the assessment is more repeatable and consistently calculated.

**A. Some of the Major benefits involves**

- 1) Test automation enables one to achieve detailed product testing with significant reduction in test cycle time.
- 2) The efficiency of automated testing incorporated into product lifecycle can generate sustainable time and money savings.
- 3) Automated testing increases the significance and accuracy of testing and results in greater test coverage.
- 4) Rapid validation of software changes with each new release of application is possible.
- 5) Comprehensive: you can build a suite of tests that covers every feature in your application.

**B. Some of the Disadvantages involves**

- 1) More initial developer time for a given feature.
- 2) Increase tooling needs (test runners, frameworks, etc.).
- 3) Complex analysis required when a failed test is encountered.
- 4) Debugging the test script is major issue. If any error is present in the test script, sometimes it may lead to deadly consequences.
- 5) Automated checks keep failing due to issues other than genuine bugs, they can raise false alarms.

**VIII. CONCLUSION**

The Automation tool helps in running many projects without the human intervention. There by minimizing the manual effort. It also helps in running much functionality with the scenario. It mainly used by the triage engineers to report the results of tests which was intended to replace the handoff emails between the teams. This Automation reduces the automation cost and reduces the time consuming.

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