UNIT IV

Performance Testing: Factors Governing Performance Testing – Methodology for Performance Testing – Tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing– Best Practices in Regression Testing.

TEXT BOOK: “SOFTWARE TESTING Principles and Practices”-Srinivasan Desikan & Gopalswamy Ramesh, 2006, Pearson Education

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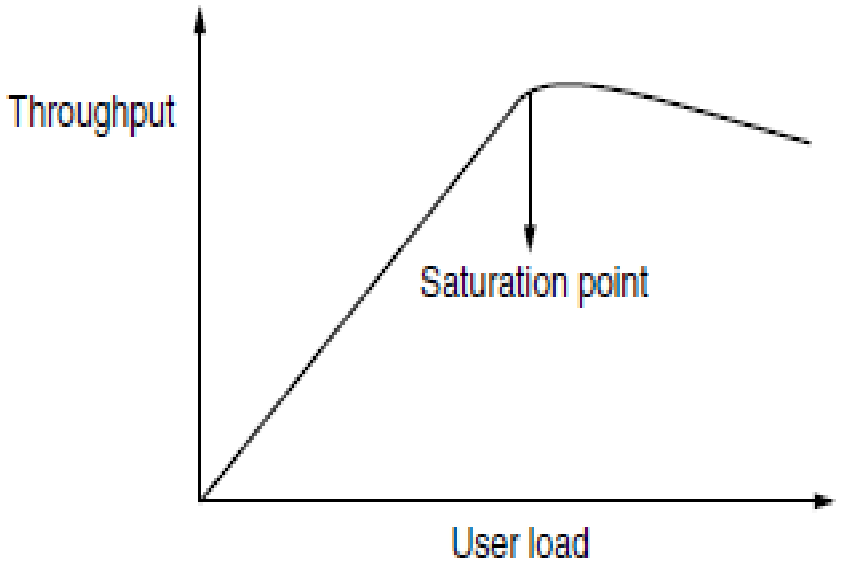
Performance Testing

- Factors Governing Performance Testing
- Methodology for Performance Testing
- Tools for Performance Testing
- Process for Performance Testing
- Challenges.

FACTORS GOVERNING PERFORMANCE TESTING

- There are many factors that govern performance testing.
- It is critical to understand the definition and purpose of these factors prior to understanding the methodology for performance testing and for analyzing the results.

Throughput of a system at various load conditions.



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The testing performed to evaluate the response time, throughput, and utilization of the system, to execute its required functions in comparison with different versions of the same product(s) or a different competitive product(s) is called performance testing.

METHODOLOGY FOR PERFORMANCE TESTING

- Performance testing is complex and expensive due to large resource requirements and the time it takes.
- Hence, it requires careful planning and a robust methodology.
- Performance testing is ambiguous because of the different people who are performing the various roles having different expectations.

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A methodology for performance testing involves the following steps.

- Collecting requirements
- Writing test cases
- Automating performance test cases
- Executing performance test cases
- Analyzing performance test results
- Performance tuning
- Performance benchmarking
- Recommending right configuration for the customers (Capacity Planning)

TOOLS FOR PERFORMANCE TESTING

- There are two types of tools that can be used for performance testing—functional performance tools and load tools.
- Functional performance tools help in recording and playing back the transactions and obtaining performance numbers. This test generally involves very few machines.

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- Load testing tools simulate the load condition for performance testing without having to keep that many users or machines.
- The load testing tools simplify the complexities involved in creating the load and without such load tools it may be impossible to perform these kinds of tests.

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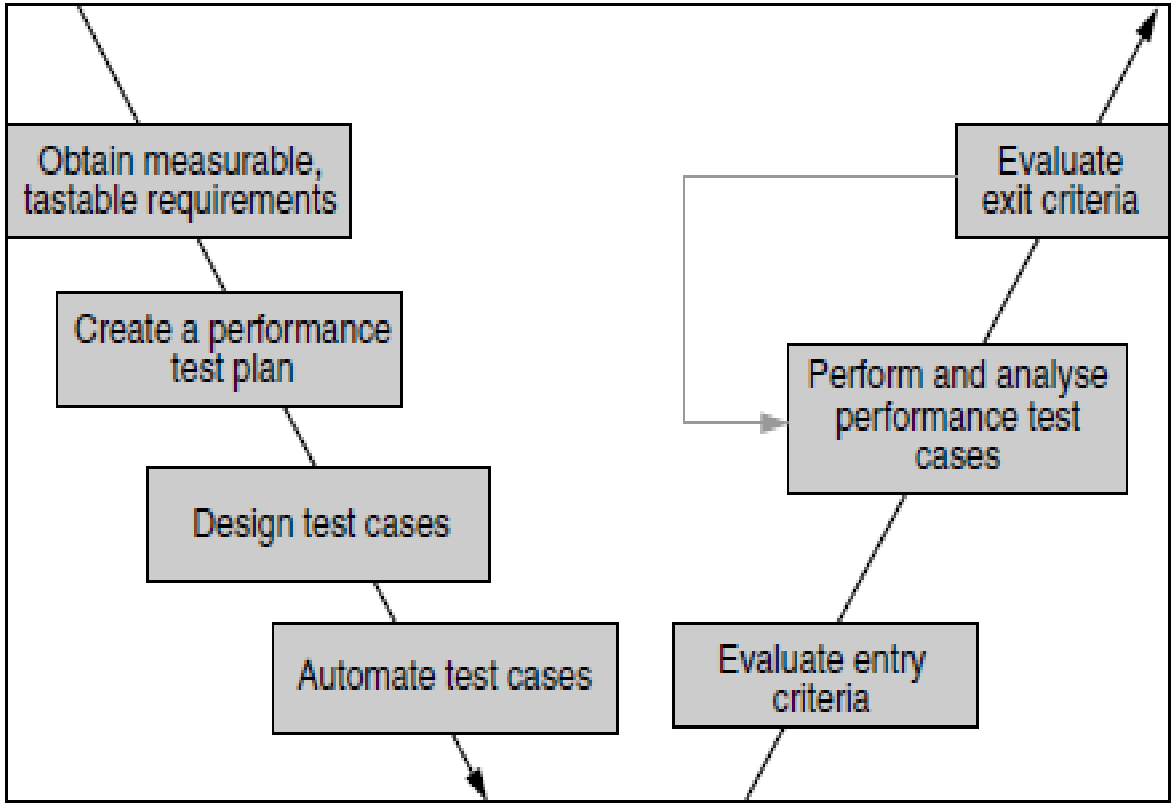
We list below some popular performance tools:

- Functional performance tools
  - Win Runner from Mercury
  - QA Partner from Compuware
  - Silk test from Segue
- Load testing tools
  - Load Runner from Mercury
  - QA Load from Compuware
  - Silk Performer from Segue

PROCESS FOR PERFORMANCE TESTING

- Performance testing follows the same process as any other testing type.
- The only difference is in getting more details and analysis.
- A major challenge involved in performance testing is getting the right process so that the effort can be minimized.

PROCESS FOR PERFORMANCE TESTING



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- The next step in the performance testing process is to create a performance test plan. This test plan needs to have the following details.
- Resource requirements
- Test bed (simulated and real life), test-lab setup
- Responsibilities

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- Setting up product traces, audits, and traces (external and internal)
- Entry and exit criteria
- Each of the process steps for the performance tests described above are critical because of the factors involved (that is, cost, effort, time, and effectiveness).
- Hence, keeping a strong process for performance testing provides a high return on investment.

CHALLENGES

- Performance testing is not a very well understood topic in the testing community.
- There are several interpretations of performance testing.
- Some organizations separate performance testing and load testing and conduct them at different phases of testing.
- While it may be successful in some situations, sometimes separating these two causes complications.
- The availability of skills is a major problem facing performance testing

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- Performance testing requires a large number and amount of resources such as hardware, software, effort, time, tools, and people
- Selecting the right tool for the performance testing is another challenge
- Interfacing with different teams that include a set of customers is yet another challenge in performance testing.
- Lack of seriousness on performance tests by the management and development team is another challenge.

Regression Testing

- What is Regression Testing?
- Types of Regression Testing
- When to do Regression Testing ?
- How to do Regression Testing?
- Best Practices in Regression Testing

Regression Testing

- Regression testing is done to ensure that enhancements or defect fixes made to the software works properly and does not affect the existing functionality.
- Regression testing follows *selective re-testing* technique

TYPES OF REGRESSION TESTING

- There are two types of regression testing in practice.
- Regular regression testing
- Final regression testing

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- A *regular regression testing* is done between test cycles to ensure that the defect fixes that are done and the functionality that were working with the earlier test cycles continue to work.
- A regular regression testing can use more than one product build for the test cases to be executed.

- A “final regression testing” is done to validate the final build before release.
- The CM engineer delivers the final build with the media and other contents exactly as it would go to the customer.
- The final regression test cycle is conducted for a specific period of duration, which is mutually agreed upon between the development and testing teams.
- This is called the *“cook time”* for regression testing.

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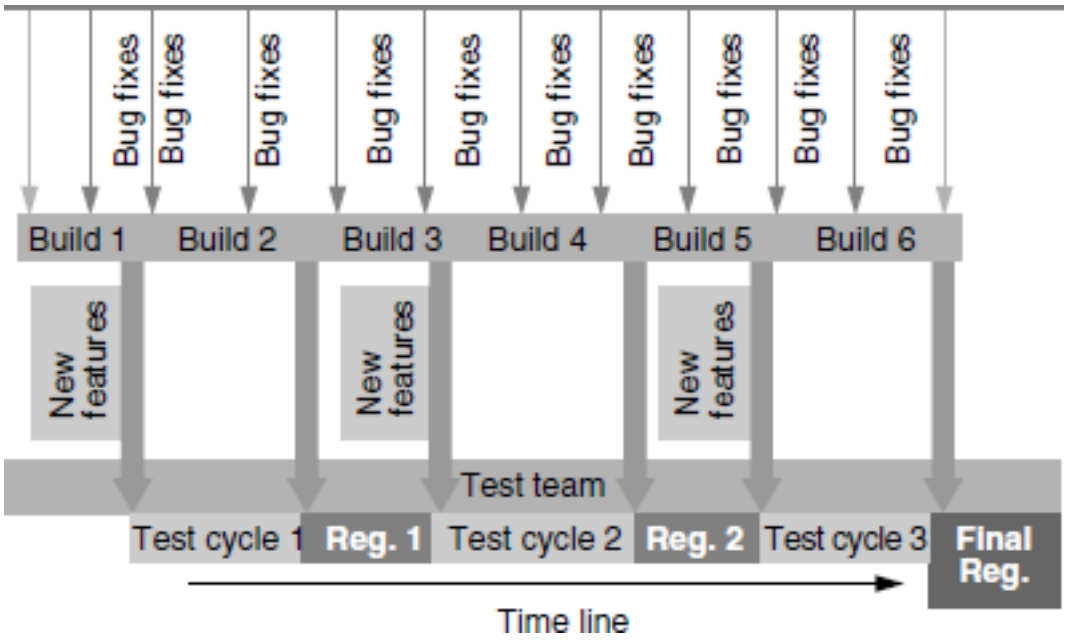

Regression testing—types.

WHEN TO DO REGRESSION TESTING?

- Whenever changes happen to software, regression testing is done to ensure that these do not adversely affect adversely the existing functionality.
- A regular regression testing can use multiple builds for the test cases to be executed.
- However, an unchanged build is highly recommended for final regression testing.
- The test cases that failed due to the defects should be included for future regression testing.

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- It is necessary to perform regression testing when
- A reasonable amount of initial testing is already carried out.
- A good number of defects have been fixed.
- Defect fixes that can produce side-effects are taken care of.
- Regression testing can be performed irrespective of which test phase the product is in.

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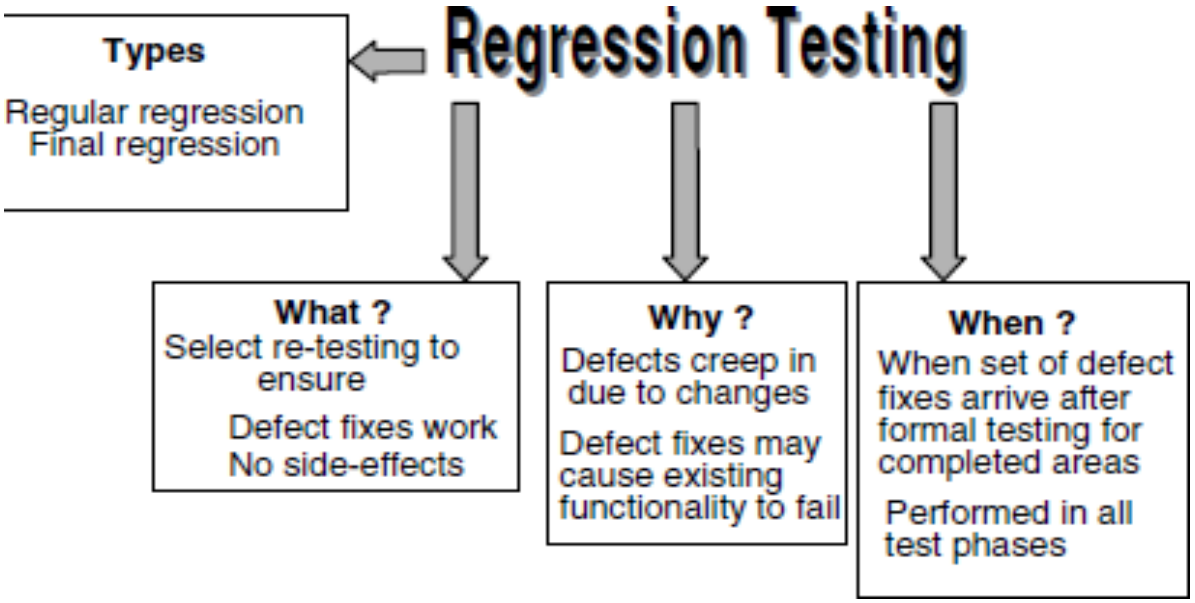
Regression Testing
Types
Regular regression
Final regression
What ?
Select re-testing to ensure
Defect fixes work
No side-effects
Why ?
Defects creep in due to changes
Defect fixes may cause existing functionality to fail
When ?
When set of defect fixes arrive after formal testing for completed areas
Performed in all test phases

HOW TO DO REGRESSION TESTING?

- The failure of regression can only be found very late in the cycle or found by the customers.
- Having a well-defined methodology for regression can prevent such costly misses.

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- There are several methodologies for regression testing that are used by different organizations.
- Performing an initial “Smoke” or “Sanity” test
- Understanding the criteria for selecting the test cases
- Classifying the test cases into different priorities
- A methodology for selecting test cases
- Resetting the test cases for test execution
- Concluding the results of a regression cycle

BEST PRACTICES IN REGRESSION TESTING

- Regression methodology can be applied when
- We need to assess the quality of product between test cycles (both planned and need based);
- We are doing a major release of a product, have executed all test cycles, and are planning a regression test cycle for defect fixes; and
- We are doing a minor release of a product (support packs, patches, and so on) having only defect fixes, and we can plan for regression test cycles to take care of those defect fixes.

- Regression can be used for all types of releases.
- Mapping defect identifiers with test cases improves regression Quality.
- Create and execute regression test bed daily.
- Ask your best test engineer to select the test cases.
- Detect defects, and protect your product from defects and defect fixes.