Testing Fundamentals

Session Objective

- ✓ Testing Life cycle
- ✓ Testing Types
- ✓ Testing Techniques
- ✓ Automation Testing
- ✓ Performance Testing

Testing Life cycle

Software Testing Life cycle Contd...

•**Software Testing Life Cycle (STLC)** is a sequence of specific activities conducted during the testing process to ensure software quality goals are met

• In the STLC process, each activity is carried out in a planned and systematic way.

• Each phase has different goals and deliverables.

Software Testing Life cycle

Contd...

Software Testing Life cycle Contd...

- ✓ **Requirement Analysis** – When the SRD is ready and shared with the stakeholders, the testing team starts high level analysis concerning the AUT (Application under Test).
- ✓ **Test Planning** – Test Team plans the strategy and approach.
- ✓ **Test Case Designing** – Develop the test cases based on scope and criteria.
- ✓ **Test Environment Setup** – When integrated environment is ready to validate the product.
- ✓ **Test Execution** – Real-time validation of product and finding bugs.
- ✓ **Test Closure** – Once testing is completed, matrix, reports, results are documented.

Software Testing Life cycle

Principles of Testing

(i) All the test should meet the customer requirements

(ii) To make our software testing should be performed by a third party

(iii) Exhaustive testing is not possible. As we need the optimal amount of testing based on the risk assessment of the application.

(iv) All the test to be conducted should be planned before implementing it

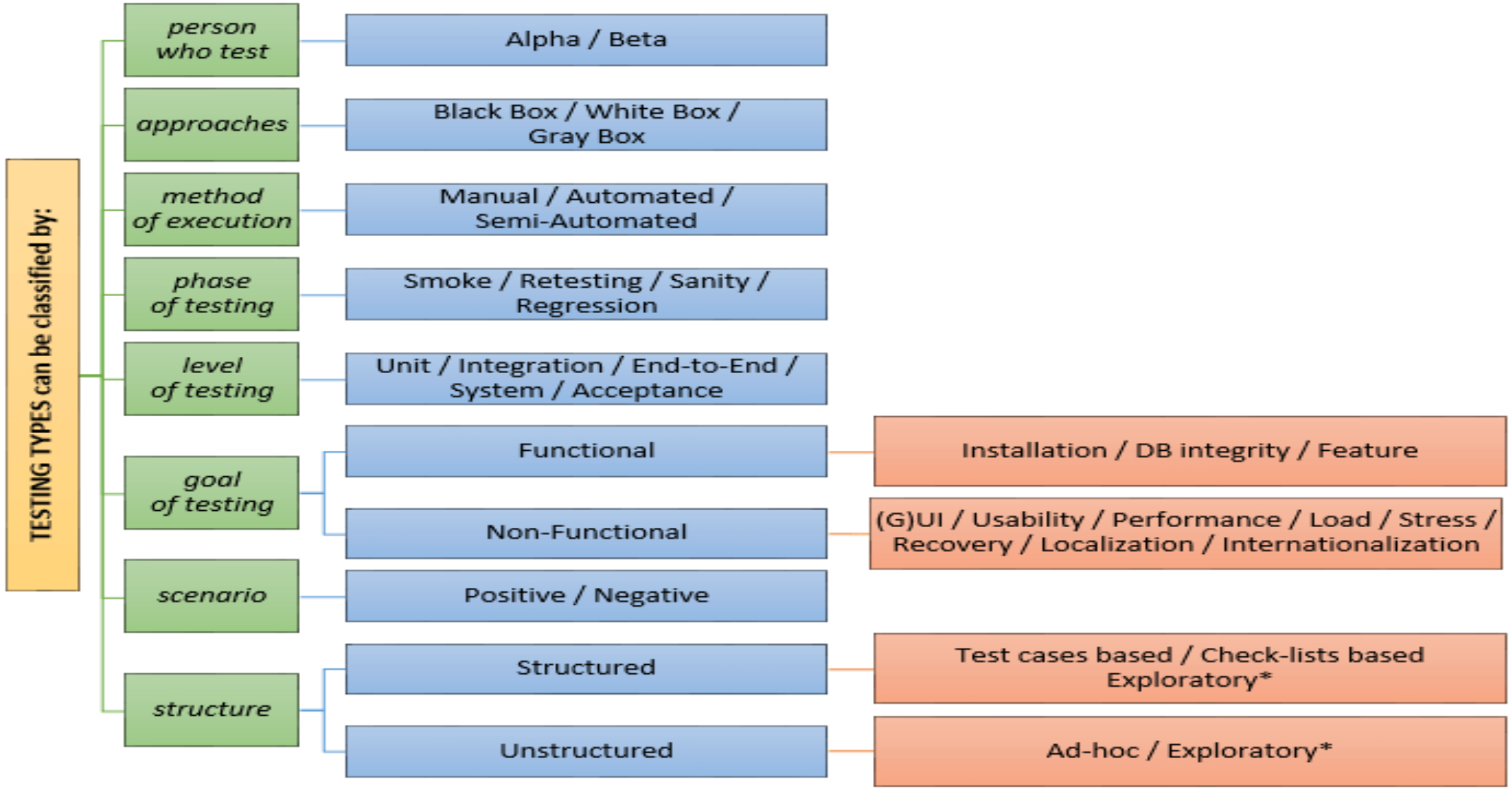
(v) It follows the Pareto rule(80/20 rule) which states that 80% of errors come from 20% of program components.

(vi) Start testing with small parts and extend it to large parts.

Testing Types

Testing Types

Contd...



Testing Types

Contd...

Functional Testing types

- ❑ Unit Testing
- ❑ Integration Testing
- ❑ System Testing
- ❑ Sanity Testing
- ❑ Smoke Testing
- ❑ Interface Testing
- ❑ Regression Testing
- ❑ Beta/Acceptance Testing

Testing Types

Contd...

Non-functional Testing types

- ❑ Performance Testing
- ❑ Load Testing
- ❑ Stress Testing
- ❑ Volume Testing
- ❑ Security Testing
- ❑ Compatibility Testing
- ❑ Install Testing
- ❑ Recovery Testing
- ❑ Reliability Testing
- ❑ Usability Testing
- ❑ Compliance Testing
- ❑ Localization Testing

Testing Types

Testing Techniques

Testing Techniques Contd...

Alpha Testing

The objective of this testing is to identify all possible issues or defects before releasing it into the market or to the user.

- Alpha Testing is carried out at the end of the software development phase but before the Beta Testing.

Beta Testing

- Beta Testing is performed in **the Real Environment** before releasing the product to the market for the actual end-users.
- Beta Testing is carried out to ensure that there are no major failures in the software or product, and it satisfies the business requirements from an end-user perspective.

Testing Techniques Contd...

Black Box Testing

- Internal system design is not considered in this type of testing. Tests are based on the requirements and functionality.

White Box Testing

- White Box Testing is based on the knowledge about the internal logic of an application's code.

- It is also known as Glass box Testing. Internal software and code working should be known for performing this type of testing.

Testing Techniques Contd...

System Testing

- The entire system is tested as per the requirements.
- It is a Black-box type Testing that is based on overall requirement specifications.

Unit Testing

- Testing an individual software component or module is termed as Unit Testing.
- It is typically done by the programmer and not by testers, as it requires detailed knowledge of the internal program design and code.

Testing Techniques Contd...

End-to-End Testing

- This testing involves a complete application environment in a situation that simulate real-world use, such as interacting with a database, using network communications, or interacting with other hardware, applications, or systems if appropriate.

Compatibility Testing

- It is a testing type in which it validates how software behaves and runs in a different environment, web servers, hardware, and network environment.

- Compatibility testing ensures that software can run on a different configuration, different database, different browsers, and their versions. Compatibility testing is performed by the testing team.

Testing Techniques Contd...

Acceptance Testing

- An Acceptance Test is performed by the client and verifies whether the end to end the flow of the system is as per the business requirements or not and if it is as per the needs of the end-user.
- Client accepts the software only when all the features and functionalities work as expected.
- It is the last phase of the testing, after which the software goes into production.
- This is also called User Acceptance Testing (UAT).

Testing Techniques

Functional Testing

- This type of testing ignores the internal parts and focuses only on the output to check if it is as per the requirement or not.

- It is a Black-box type testing.

Non-Functional Testing

- Non-Functional Testing involves testing of non-functional requirements such as Load Testing, Stress Testing, Security, Volume, Recovery Testing, etc.

- It should not take more time to load any page or system and should sustain during peak load.

Automation Testing

Automation Testing Contd...

Automation Testing

Automation Testing or Test Automation is a software testing technique that performs using special automated testing software tools to execute a test case suite.

- Automation testing is a Software testing technique to test and compare the actual outcome with the expected outcome.

- This can be achieved by writing test scripts or using any automation testing tool.

- Test automation is used to automate repetitive tasks and other testing tasks which are difficult to perform manually.

Automation Testing Contd...

Manual Testing

- Manual testing requires physical time and effort to ensure the software code meets the requirement

- This involves checking log files, external services and the database for errors.

Automation Testing

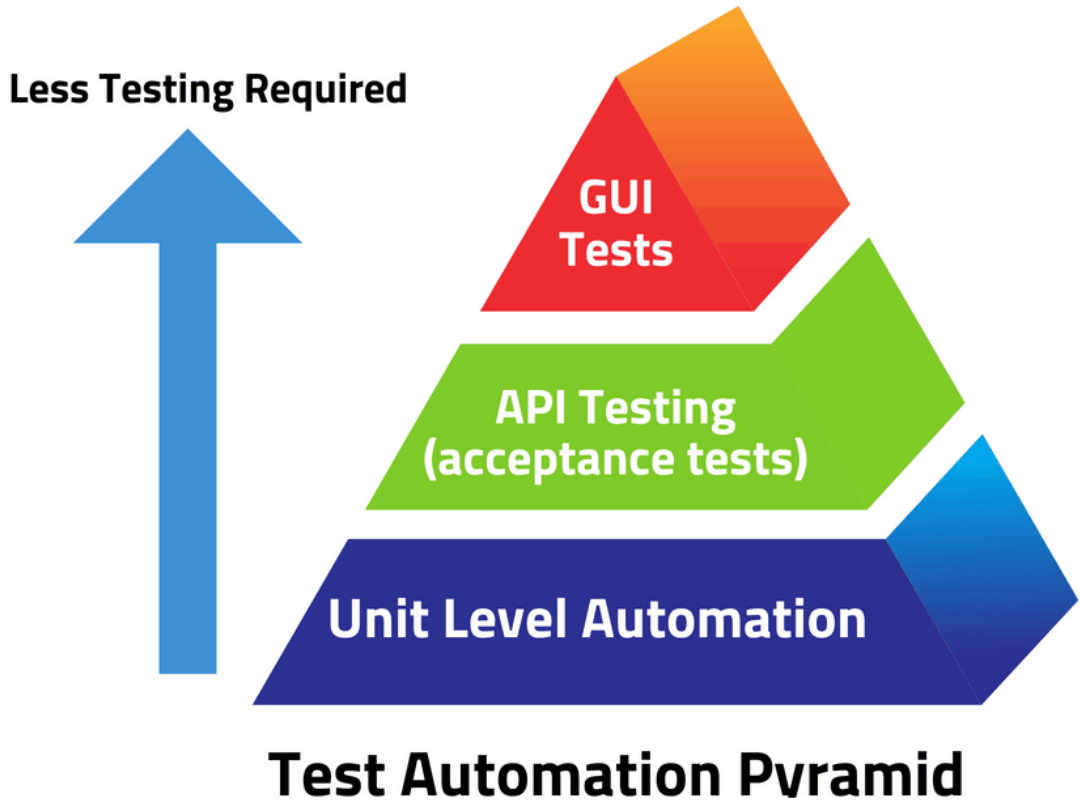
Contd...

The test automation performs testing at three different levels

1.Unit Level Automation

2.API Testing

3.User Interface



Automation Testing Contd...

Why Automation Testing?

Test automation has many benefits for app testing cycles. Also, it is less time-consuming.

Advantage of Automation Testing:

- ✓ **Running Tests** :
  Test can be started from anywhere and anytime.

- ✓ **Fewer Human Resources**:
  Test automation engineer will write scripts to automate the tests.

- ✓ **Reusability**:
  The scripts are reusable and new scripts is not required every time

Automation Testing

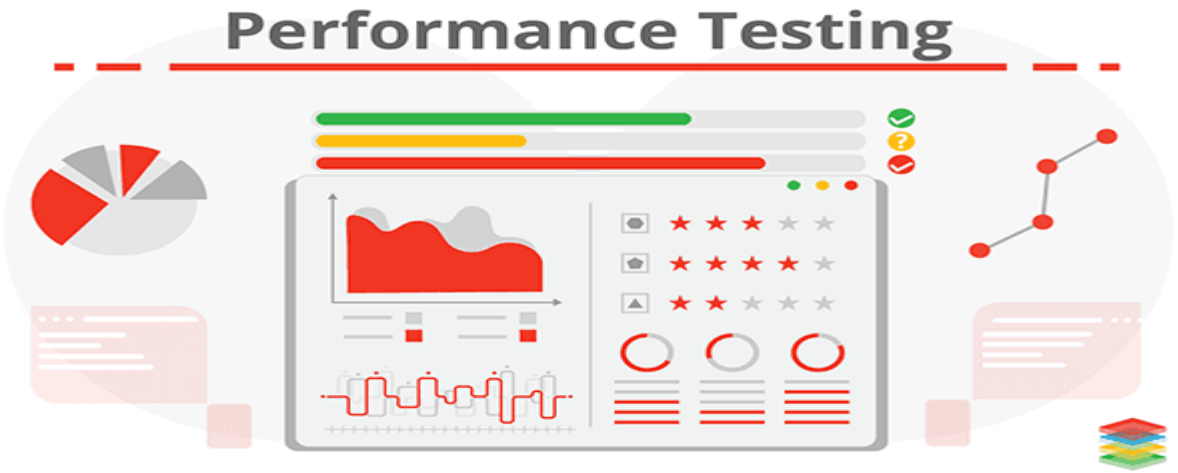
- ✓ **Bugs:**
  Automation helps to find bugs in the early stages of software development, reducing expenses and working hours to fix these problems as well.

- ✓ **Reliability:**
  Automated testing is more reliable and way quicker when running boring repetitive standardized tests which can not be skipped but may cause errors when manually tested.

Performance Testing

Performance Testing Contd...

- Performance Testing is a software testing process used for testing the speed, response time, stability, reliability, scalability and resource usage of a software application under workload.
- The main purpose of performance testing is to identify and eliminate the performance bottlenecks in the software application.
- It is a subset of performance engineering and known as “Perf Testing”.



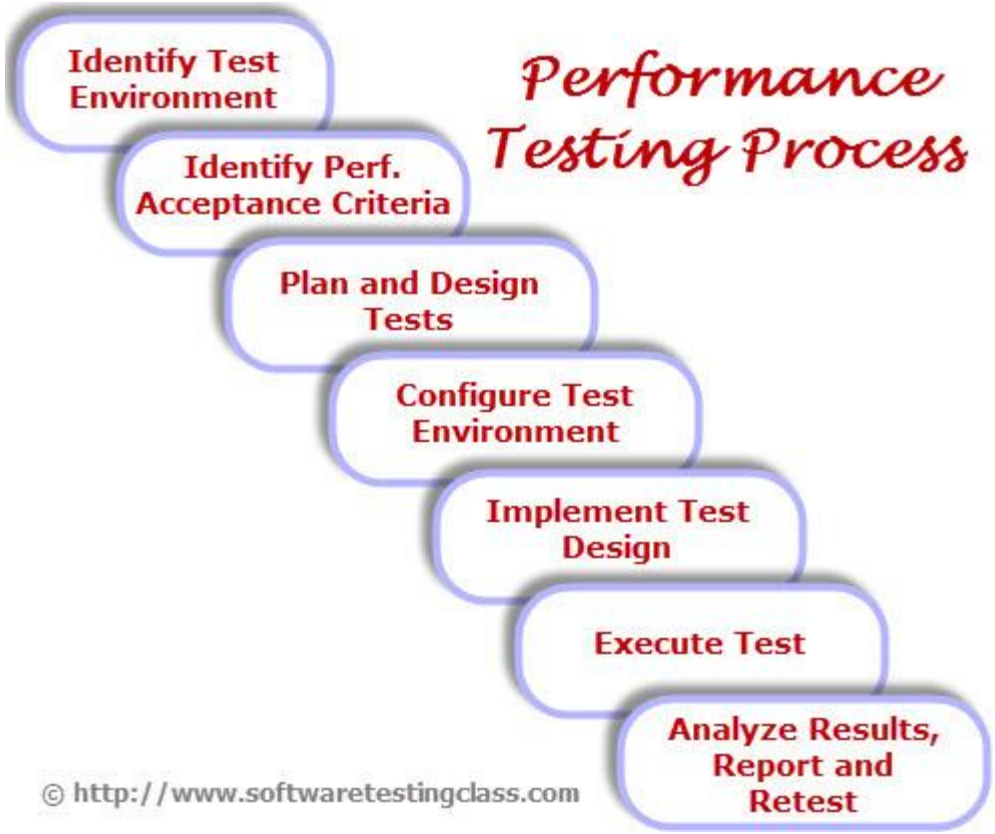
Performance Testing Contd...

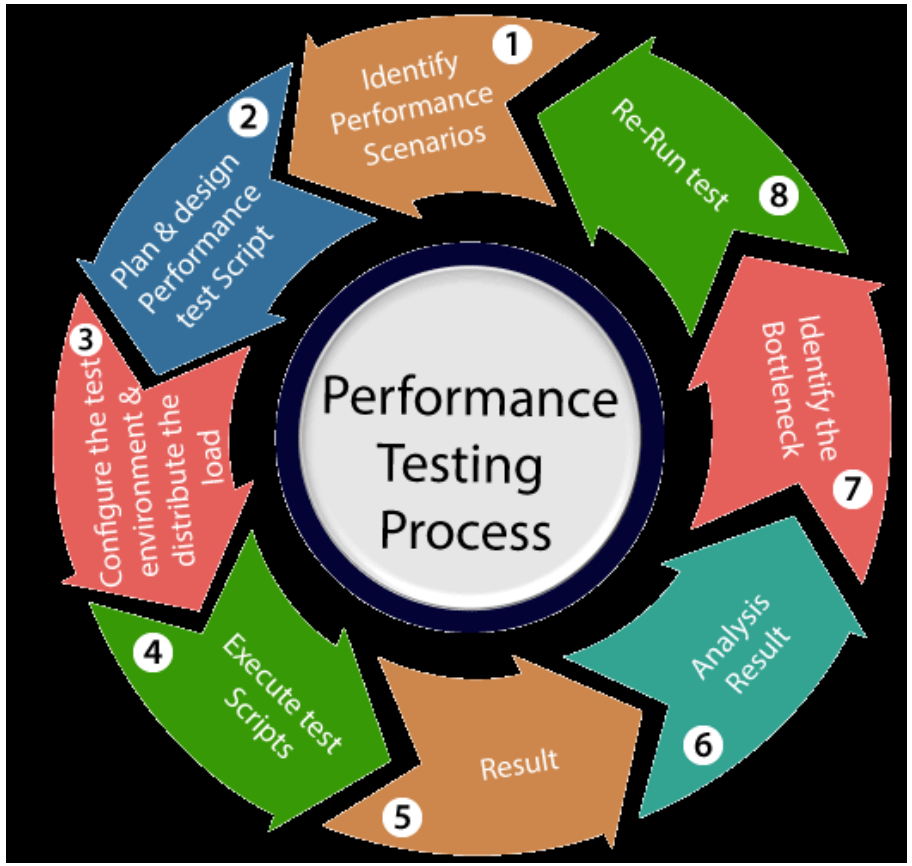
The focus of Performance Testing is checking a software program's

- **Speed** - Determines whether the application responds quickly
- **Scalability** - Determines maximum user load the software application can handle.
- **Stability** - Determines if the application is stable under varying loads

What is Lorem Ipsum?

Performance Testing Process





Performance Testing Contd...

Types of Performance Testing

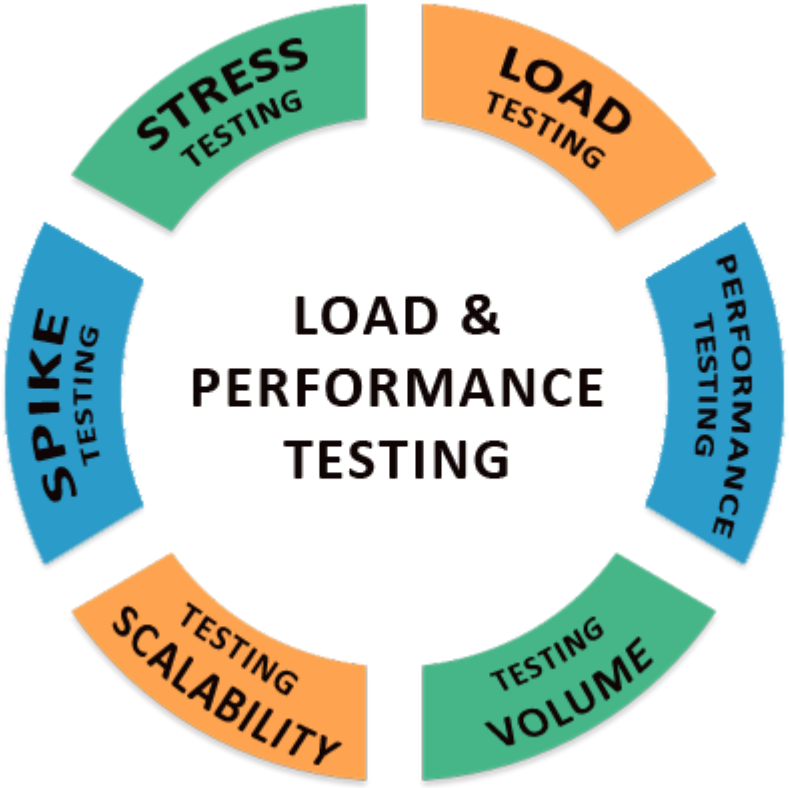
- ✓ Load testing
  checks the application's ability to perform under anticipated user loads. The objective is to identify performance bottlenecks before the software application goes live.

- ✓ Stress testing
  involves testing an application under extreme workloads to see how it handles high traffic or data processing. The objective is to identify the breaking point of an application.

- ✓ Endurance testing
  is done to make sure the software can handle the expected load over a long period of time.

Performance Testing Contd...

- ✓ Spike testing
  tests the software's reaction to sudden large spikes in the load generated by users.



Performance Testing Contd...

- ✓ Volume testing
  Under Volume Testing large no. of. Data is populated in a database and the overall software system's behavior is monitored. The objective is to check software application's performance under varying database volumes.

- ✓ Scalability testing
  The objective of scalability testing is to determine the software application's effectiveness in "scaling up" to support an increase in user load. It helps plan capacity addition to your software system.

Performance Testing

Need for Performance Testing

Performance testing is important for the following reason,

- ❑ According to Dunn & Bradstreet, 59% of Fortune 500 companies experience an estimated 1.6 hours of downtime every week
- ❑ Only a 5-minute downtime of Google.com (19-Aug-13) is estimated to cost the search giant as much as $545,000.
- ❑ It's estimated that companies lost sales worth $1100 per second due to a recent Amazon Web Service Outage.

Thank you

Innovative Services

Passionate Employees

Delighted Customers