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Software Testing
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=> The Process of verifying and validation application functionalities is called as Software Testing.

=> Software Testing will happen in multiple stages

1) Unit Testing
2) System Integration Testing (SIT)
3) User Acceptance Testing

Unit Testing : Testing individual components of the application.

Note: Developers will perform unit testing by using Junit.

SIT : Testing team will perform system integration testing.

Note: Identified bugs will be reported using JIRA.

UAT : User acceptance testing. client or client side team will test our application before delivery (acceptance testing).

Note: Based on UAT client will decide GO or No-GO.

=> Go means it is green signal from client to deploy in production.

=> No-GO means client identified some issues in UAT hence production deployment got cancelled.

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What is Performance Testing ?
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=> It is used to test stability and responsiveness of the application.

1) how many users can access our application at a time

2) For 100 users what is avg response time ?

3) For 1000 users what is avg response time ?
...

4) For 1 lakh users what is avg response time ?

5) What is bottleneck / failure point of our application

Note: To implement performance testing we will use tools.

a) JMETER (open source)

b) HP Load Runner (licensed)

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JMETER
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-> JMETER is a free & open source software given by Apache Organization.

-> JMETER is used for performance testing.

-> Performance testing means the process of verifying stability & responsiveness of the application.

-> How our application is responding for different work loads we can verify using JMETER.

-> Using JMETER we can create virtual users to test our application performance.

-> JMETER is a java based desktop application.

-> Using JMETER we can test performance of any web application.

Note: Before giving project delivery to client we need to submit performance testing report.

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JMETER Setup
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1) Download JMETER software

URL : https://dlcdn.apache.org//jmeter/binaries/apache-jmeter-5.6.3.zip

2) Extract JMETER zip file

3) Go to JMETER bin folder and run "jmeter.bat" file  (it will open JMETER tool)

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Creating Test Plan
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1) Right Click on Test plan

                        - Add Threads
                        - Add Thread Group
                        - Enter Thread/users count

2) Right Click on Thread Group   (For sampler)

                        - Add Sampler
                                - Http Request
                                - Add Server IP, Port Number, URL Pattern

3) Right Click on Thread Group (For Listerns)

                        - Add Listener
                                - Add View Results Tree
                                - Add Summary Report

4) Save the test and run the test (filename.jmx)

5) Verify the results (we can change thread group count and we can test it).


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JMETER Best Practise
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-> Create the TEST in GUI mode and run the test in CLI mode.

   Ex:  jmeter -n -t test-plan.jmx -l test-results.jtl

-> After test execution complete we can import JTL file into JMETER summary report to see the test
results.

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Root causes for performance issue
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1) System Resources Very Low

2) Network issue

3) Database Query Execution taking more time

4) Unwanted loops and conditions in code

Note: Industry Standard Avg response time for a request is 3 secs.