The artifact is mainly going to cover about the performance testing, let’s understand what that is all about. This test helps the business to understand the stability and reliability of the application upon stringent circumstances.

**1.       What is performance testing: -** To define in laymen terms, Performance test is conducted to mainly observe the behavior of application which is hosted on a server upon some adequate load.

The goal is not to validate the functional flow and identify the bugs in that manner, rather to test a maturity attained application under critical load, volume, stress conditions to verify the set benchmark parameters are satisfied before the application goes live.

**2.       Types of performance Testing:** - In levels of testing this test is classified under the non-functional testing, given the nature of the test. This is again categorized into various types of testing which are listed below

**         Load testing**

**         Stress testing**

**         Volume testing**

**         Soak testing**

**         Endurance testing**

**         Spike testing**

**         Scalability test**

**         Disaster and recovery testing**

**Load testing: -** this test determines the application behavior under certain load. When we say load we can consider couple of illustrations as number of user hits per second or the number of transactions. Goal is to verify how the application performance when there is a load on the server.

**Stress testing: -** unlike the above test, this is done by injecting the load higher than the threshold to see the behavior of the application, this can tell us the breakeven point of an application also the frequency of getting down.

**Volume testing: -** This test is also called as flood testing as we are going to inject too much of data into the application to see, how the queue or any other interface is withstanding the inflow

**Endurance testing: -** This testing is done by subjecting the application to a nominal load but to make it operate for quite longer than its usage in the field. This test gives the reliability of the application as we are considering the time that the application lasts before it sees failure.

**Spike testing: -** This test is performed by applying a significant steep of raise load on the application to see the withstanding nature of an application

**Scalability testing:-** This testing is done to verify how the application behaving when the load is kept increasing by adding lot of user data volume.

**3.       Why is performance testing needed**

Given the capabilities of functional testing , performance test is more useful to understand the reliability parameters. The intention of the test is not just to find the defects but more about examining the application behavior under load. the spec is defined in such a way that it mainly denotes following

* How many concurrent users can login to the application?
* How many transactions should the application be processing upon peak load?
* How much minimum the response time must be of?

There are a few other parameters which are gathered as part of non-functional requirements (NFR) gathering and tested accordingly.

Has there been no functional testing we would be able to understand the capacity, flexibility and the critical parameters of an application under load and there are great chances that we fail in field due to the improper understanding of the bench mark parameters

**4.       Entry & Exit criteria**

Like every other type of tests, performance test is also defines its own entry and exit criteria.

**Entry criteria:-** This imperatively defines, when the application is eligible to undergo performance test. Following are the key pre-requisites to define entry criteria

* Functional testing must have been thoroughly conducted
* Application must be stable
* No major showstoppers must have been in open state
* When a dedicated NFT environment is made available

**Exit criteria:-** This defines how and when to tear down the test, the following activities must be completed to give a proper sign-off from performance test perspective

* Application must have been tested with all the NFR requirements .
* No major defects or customer use cases are to be in failing state
* All the test results should be properly analyzed
* Reports and results must be published to all stakeholders for sign-off

**5.        Test strategy:-** Like all types and levels of testing, performance testing is having its own game plan, literally that is the bible of the test, it must contain the details of all the details related to the test from nook to the corner. Below explained key things are part of test strategy

* Tool identification
* Environment readiness
* Scope defining
* Risk assessment
* Results analysis and report preparation

**Tool identification:-** This is essential in the business, right choice of tool will help in managing the cost as well as the hassle free test conduction. Proper analysis must be done before we go for a selection that best suites the assignment.

* Whether or not it’s an open source tool or licensed
* The tool that is selected should support the any test activity w/ minimal configuration
* Tool should help us in generating the best reporting mechanism
* Tool must have got decent community to get any solution for the problem being faced

To insist on the first point, tool need not be freeware all the time, it’s completely a business call considering the high-end features that a licensed tool offers, no possibility for any breaches. If at all the test engineer identifies that the same can be accomplished by going with any other alternative tool that is available for free and supports the operation equally with a licensed one, then the choice of open source one is desired as that way we can save the cost that is incurred. Below are some tools list

**Performance test tools: –**

* Jmeter (open source)
* Load runner (licensed)
* Silk performer
* Neo load
* IBM RPT (rationale performance test)

**Application performance management tools:-**

* App Dynamic
* Wily-introscope
* Perf mon
* N-mon

**Environment Readiness:-**  This is one of the major considerations as far as the performance test is concerned. Unless and otherwise there is an isolated environment for NFT testing we can deem the test results and the application critical parameters (response time, think time,throughput..etc). So, dedicated environment is highly recommended as the tasks more or related to

* Insert a huge number of transactions in DB through API hit
* Perform concurrent login scenario
* Observe the response time while navigating between the pages

The environment must be maintained properly and should be highly stable

**Scope defining: -** This is nothing but the process of coming up with a well-documented test plan. This phase essentially includes the identification of the non-functional requirements such as stated below

* How much load on each scenario,
* How many hours to conduct a test,
* How many rounds of testing is needed
* Identification whole scenarios needed to test
* Calling out the Infrastructure that would be needed to test

**Risk assessment:-** It is quite obvious that on a certain tasks, there are one or multiple hurdles seen down the line. We should foresee them during the initial discussions about the planning and proactively calling them out to all stakeholders will help come up with a stringent plan, that way we can reduce the negative impact on the business.

This concept is to learn the impact on business if at all

* a particular scenario is not tested
* going live with the presence a defect that may occur at customer sight
* Can’t test a particular scenario due to the unavailability of the infrastructure in the lower environments
* Testing a feature by taking some deviation

**Results analysis and report preparation:-** For any test results are key as they are adequate outcome of the effort that is being spent. Once the test is done after analyzed the results internally within the team, a decent report in an easily understandable way to be shared to all stakeholders. We have tools which captures results of a test run, we can fairly extract from them.

After completion of test, all sign-off documents such as test completion reports must be shared to the business stakeholders and get the proper sign-off. This activity officially tears down the test and the application can go live with enormous confidence.

**Conclusion:-** Given the fact that every test has its own purpose and can’t be avoided , same is applicable to performance test as well. Without this test we can’t quite predict the customer experience and the way it serves the customer. While the functional test deems the application behaves intended as per design , performance test defines the endurance of that intended behavior under various critical circumstances.

Hope this is a good read, summarizes the agenda into a note that can deciphered easily

Happy learning!!! More we know more we grow ☺