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Why Performance Testing

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Abstract:
This paper introduces Benefits of performance testing in organizations. To understand the importance, it is very necessary to know what Performance is testing, why it should be or when it should be performed.
Performance testing means to validate the applications/ systems reliability, scalability, stability. If testing is not performed properly then it can produce catastrophic results.
Keywords: Performance Testing, HP Load runner, Load testing, Stress Testing

I. Introduction

Testing is very important part of any organization. If application deploys before testing it could be the reason of loss in the business or users get frustrated.
It is used to find bugs and errors. For business point of view it is very important in every organization as well as in real life. To save money and time testing should be automated. Performance Testing is used to check how fast the system can perform under specific workload.
Performance testing is needed in applications specifically in web applications to verify response time, throughput, disk usage, memory utilization.
It is an emerging computer science practice, and organizations are using it in their systems prior to design and coding phase.
Let's take a real life example of Indian Railways IRCTC, it offers railways E-Booking for all over India. Generally, (during Tatkal) heavy load occurs on the site, which results in slow speed, bad response time etc. Users get frustrated and try to move on better website. Neither internet nor terminals are expensive; Users time is much more expensive and important. To stand in market, the performance of application should be tested.

Types of Performance Testing

Performance testing usually includes four types. They are:
A) Load Testing
B) Stress Testing
C) Soak Testing
D) Spike Testing

Setting Performance Goals

Performance testing can serve different purposes.

- Systems performance criteria should be meet.
- Can check two releases of the system who performs better.
- And can measure what parts of the system or workload causes the system to perform badly.

Goals of the performance testing, totally depends upon the technology of the system and purpose. Such as,

a) Concurrency/Throughput
b) Server Response Time
c) Render Response Time

II. LOAD TESTING

To measure and compare the behaviour of the application for maximum limit of concurrent users for a set of transactions.

For Example: In IRCTC, maximum 1000 users can login or do transactions simultaneously. To check the system with 1000 concurrent users using any tool like HP Load Runner is load testing.
As in IRCTC, around 10.00a.m the no. of users gradually increases and it limit to maximum users. Even page load time is too high. It could be one of the reasons to switch on to another website.

A) Load Testing Goals

The main goal of performance testing is to validate and verify the system behaviour after providing specified workload.
On providing the workload, the performance tester has to check for stack overflow, any memory leak in the system after providing the load, to check the database server for buffer overflow as well.
Application should be tested on maximum load as well as with empty or zero loads.

III STRESS TESTING

To observe, how the system behaves under stress or (after obtaining the maximum limit) of no. of. Concurrent users or limit of the system.

For Example: In IRCTC, if there is a maximum limit of 1000 users to work simultaneously, then if more than 1000 users do transactions or CPU utilization becomes more than 90 percent due to stress. At times it results in failure of transactions such unexpected closing of logged in session. To understand behaviour of the system whether it is behaving as expected or abnormally with conditions such as system crash or DB failure, Disk failure stress test is performed.

A) Stress Testing Goals

Main goal of stress testing is to check the systems robustness in terms of computing the ability of a computer system to cope with errors during workload. The system should be able to withstand the workload for some time without any system failure, memory leak.
Because for an online business to be successful it has to be available at a click of a button—without long wait times, delays, errors, or service interruptions.
Similar tools used for Load Testing can also be used for Stress Testing.

IV PERFORMANCE TESTING TOOLS

Performance testing is possible with the various tools such as HP Load Runner, IBM Rational Perfomance tester, Apache Jmeter, Silk-performer. But in the Organizations HP Load Runner is the most popular and user friendly.

So, we are using HP Load Runner to test the load, reasons behind is that it is one of the best tools, compromises of lots of protocols and it supports almost all the technologies as compared to other tools.

HP LOAD RUNNER

HP Load Runner is an automated performance and testing product from Hewlett-Packard for examining system behavior and performance, while generating actual load.

HP Load runner consists of three components such as:

a). Virtual user generator – It captures end-user business process and creates an automated performance testing script also known as a vuser script.

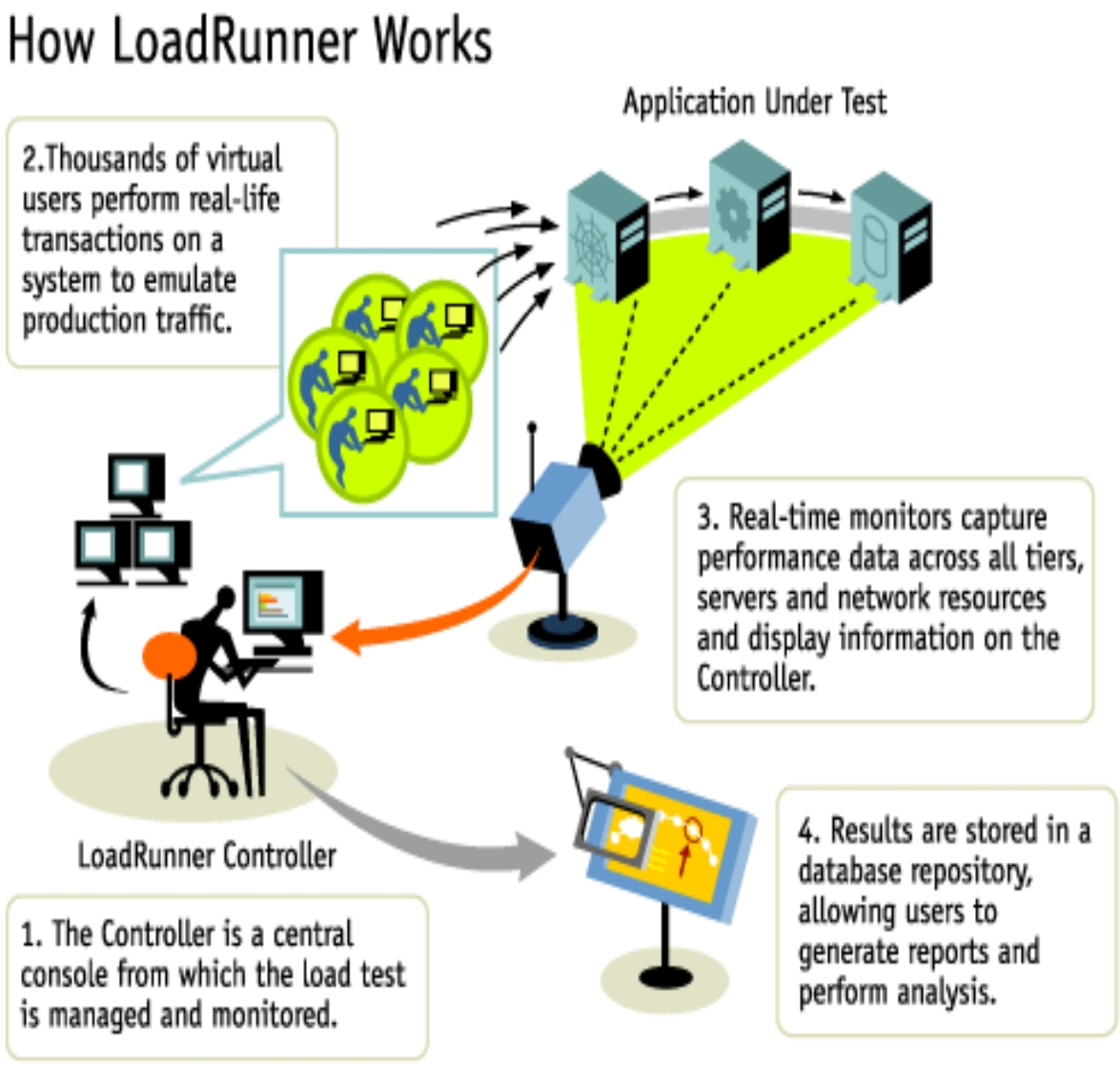
b). Controller – It organizes, driver, manages and monitors the load test**.**

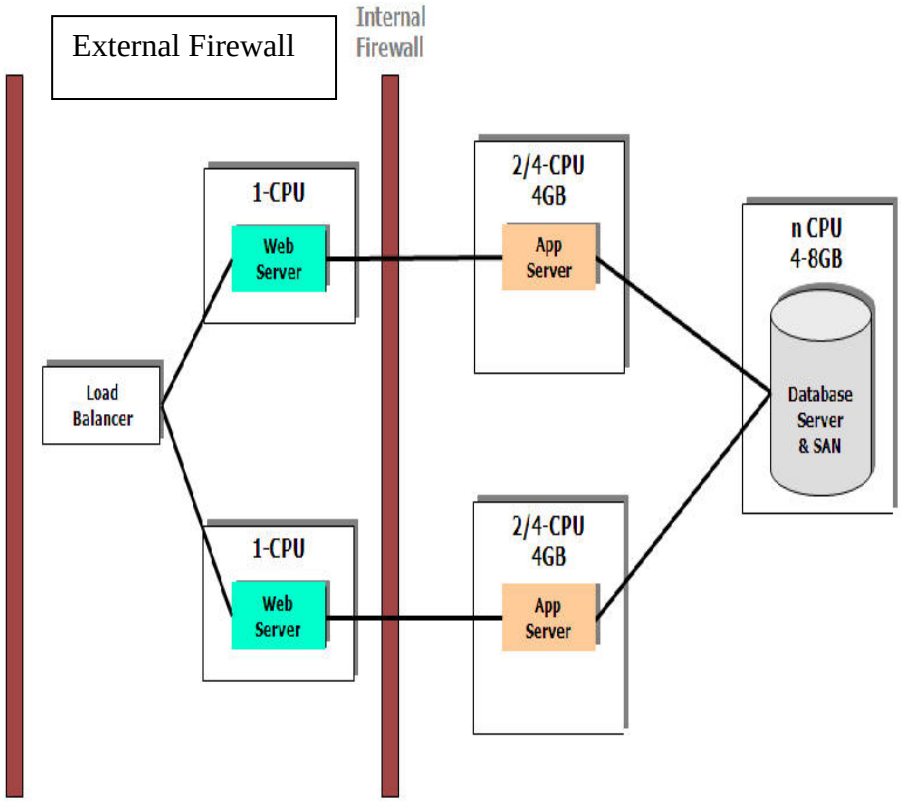
c). Load Runner Agent – It's installed on the remote machines and connected to the controller such that to execute test for various geographical area.

d). Analysis – It's used to generate the result report after execution of the test.

Using HP Load Runner for load testing, we try to simulate actual users with virtual users. We prepare a scenario for the applications according to application requirement.

Then script is run using load generator and analysis is prepared to measure expected outcome with actual outcome

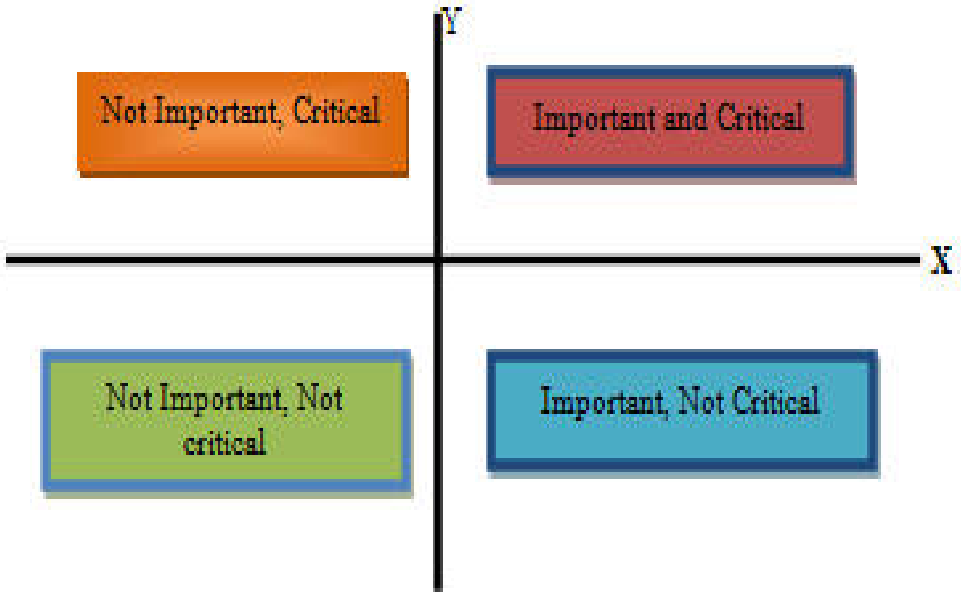




V HOW TO DECIDE WHAT TO BE TESTED

As business requirements grow, pressure on IT organizations increases to deliver more products with Quality in less time and with minimum resources. To meet the deadline we have to test the product in minimum time. For this, priorties should be set properly what to test first according to business application requirements.For web applications, business critical transactions should be given weightage and should be tested first.

We can follow the below graph to decide priority:



V I BENEFITS OF PERFORMANCE TESTING

1.) To verify application behavior under normal and abnormal workload.

2.)How many concurrent users website can sustain?

3.)To check whether Content of websitesare available at a click of a button—without long wait times, delays, errors, orservice interruptions.

4.).Data should not be corrupted or mismatched,or to check common hardware requirements without any failure.

5.) To validate scalability, reliability and stability of the system under stress or workload

VII CONCLUSION

Performance Testing is the necessity of the applications to prevent ortanizations from business loss. As people know how to drive a car,but driving the car efficiently or on the right track in a dense fog or in a sloopy area that is called actual and safe driving.Similiarly,To efficiently and effectively test the application within the given time comes with the knowledge or correleating with the real –life.

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