Performance testing

Testing which is to measure the performance of the web application.

You are determining the responsiveness, stability and reliability of the application.

Process of running a specific business use cases to emulate real time customer behaviour at various load levels.

You take the measurement of site performance for various paramaters .

Responsiveness – How responsiveness the application is to client request. Clicking on the link etc becomes a request . Time taken to give out the response .

Throughput – Request per sec./ Hits per sec./Transaction- How much work is done in how much unit of time.

If a web app receives 50 requests per second, but can only handle 30 transactions per second, the other 20 requests end up waiting in a queue. When presenting **performance** test results, **throughput performance**is often expressed as transactions per second, or TPS.

Reliable – Every time the user comes up , he should not be shown with error page

Scalable – you should want your website to handle additional workload without adversely affecting the performance of the system. You can add resources – memory , CPU ,processor .

We do performance testing

* To find the source of performance problems – why is the application slow? To evaluate bottle neck.
* Why is it not able to take so many request per day.
* To evaluate system performance against perforrmance criteria – Criteria can be as per industry standards or internal guidelines. You can check if the system is ready to go to production. This is also one of the criteria.

Technical Jargons

Functional Testing/Regression Testing – Check application against functional requirements – functionality of module

Non functional testing – Performance testing

Load testing – we give realistic loads . You donot go beyond the max no of load this called load testing.

Ramp Up – Max no of users accessing the web application is 100 . We will not increase the load to 100 at once. We increase to 10,20,30,40 …100 in some pattern (10 10.. in 1 min ). You introduce the users to the system. Donot overload the system at once.

Ramp down – when the test has ended , you want the users to come out of system - 5 users to come out in every 5 min.

Users/Threads – with performance testing you have to keep on increasing the load. If you want to do it manually, u need many real time users , those many machines . This is not possible. They are prone to errors . They will not hit the button at the same time. It will not give proper results .

Therefore, it creates virtual users and will fire the command , Users/Threads are virtual users created by the tool to generate load.

Business process: Flow of application

1. User Login
2. Will select ticket and book it.
3. Check itinerary and sign out

Business process/Use case – set of steps you want to consider for performance measurement of the system.

You want to measure the time taken to book a ticket from source to destination .

What are the flows that is very critical to business . That will be business process.

Performance Testing tools

Load runner

Silk perfomance

RPT – Rational performance test (IBM)

Open source

Jmeter

Open STA

Web Load

Load UI(Paid tool)

**Performance testing requirements**

We need to have certain requirements against which we do performance testing.

* We need to identify requirements before we start performance testing.
* We need to interact with client on regular basis to meet expectation of customer.
* Or we need to interact with business unit
* What is expected response time / what is throughput expected (how many transactions per day)
* Need to check mostly used functionality amongst end users
* Processor intensive which is loaded all the time.
* What is the technology in which application is built on? GUI? NON GUI? SAP?
* Will you increase the no of users in the future? (Scalability ) Present load 200 ..Future 500?

**Performance testing life cycle.**

* **Identify the envt - physical test envt / prod envt - Hardware / Sofware / Network**
* Automation tools - > load runner / jmeter
* What are the resources that you are going to use?
* **Need to identify performance acceptance criteria – the application is now tested**

Users point of view - Response time is between so and so limit.

Business point of view - Throughput – 1000 transactions per day

System performance point of view - resource utilization , CPU Utilization is between so and so limit.

* **Plan and design a test**

Identify key scenarios – business process

Identify test data

Variability among different users.- >Manager role user , employee role user -> flow could be different for each various level of users

**Configure your test envt – tools ready , resources ready**

**Implement the test design – you are going to create the script**

**Execute the test**

**Monitor the test against various measurement (Responsiveness, Throughput, CPU utilization)**

**You have all the results - > depending on the result , you have to retest** .

**Performance Test Plan**

Step 3

**Load Modelling –**

Usage Modelling. You are preparing a load profile. When you are load testing your web application, it should be reproducible.

It should simulate the load as accurately as possible. You have to determine the actual load. You need to come out with load pattern.

To determine work load , there may be various questions that may be asked –

* What are the possible set of actions that are performed by the users
* What is the duration for which test need to be executed
* Based on this what is the load that I need to set for this execution.

IRCTC - 10 min - 5000 USERS - you will have to execute the load for 10 min. You need to create a real time scenario.

* We also need to get the distribution of users on activities .In this session of 1 hr , what kind of users are doing which activity.

Some may be 80 % browsing, some 15 % adding items to cart , some 5 % may be adding payment details

The information that you require to load model

* Key scenario
* What are user activities , user pattern,
* Think time
* Scenario distribution
* Average time user spends – average session time
* Peak time
* What are total concurrent no of users

**Scripting** - > you do the scripting -> whatever workload you have come up with

**Benchmarking** - > comparing your results with expected /baseline results - > where improvement is required.

**Loading the test** - > doing ramp up we load

**Report generation and analysis –** to come up with conclusion if measurement criteria is met . You identify the bottleneck

**Bottleneck –** is something that degrades the performance of application but doesn’t stop the application from working

**Recommedation and implementation of same –** CPU is overloaded .(above 90 % ) – you comeup with recommendation , you want to add some more processor