

# Stability Testing in Software Testing



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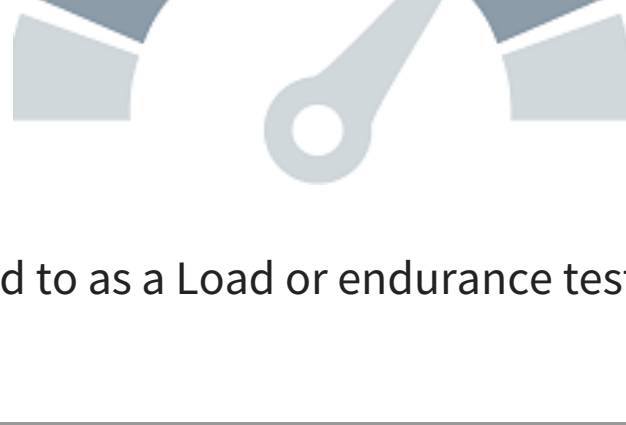
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## Stability Testing

**Stability Testing** is a type of non functional software testing performed to measure efficiency and ability of a software application to continuously function over a long period of time. The purpose of Stability testing is checking if the software application crashes or fails over normal use at any point of time by exercising its full range of use.

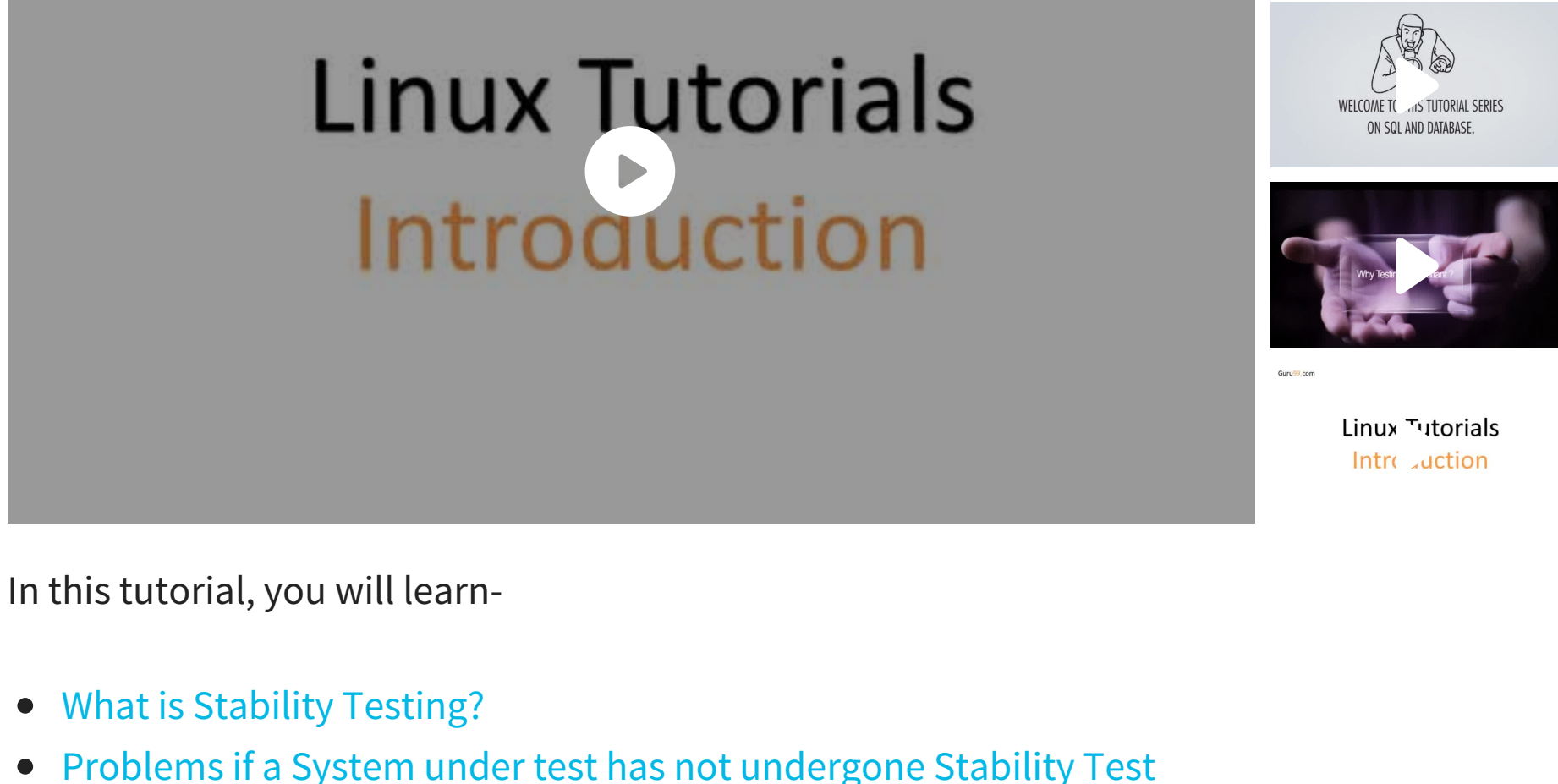
Stability Testing is done to check the efficiency of a developed product beyond normal operational capacity, often to a breakpoint. There is greater significance is on error handling, software reliability, robustness and scalability of a product under heavy load rather than checking the system behavior under normal circumstances.

Stability testing assesses stability problems. This testing is primarily intended to stress the software component to the maximum. It is a Non-Functional Technique.



Stability testing is also referred to as a Load or endurance testing.

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In this tutorial, you will learn-

- [What is Stability Testing?](#)
- [Problems if a System under test has not undergone Stability Test](#)
- [Why do Stability Testing](#)
- [How to do Stability Testing](#)
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## Problems if a System under test has not undergone

### Stability Test

For an application under test where a large number of users are introduced and applications that have to run for months without restarting, a number of problems are likely to occur:

The possible error can be faced,

- the system slows down
- the system encounters functionality problems
- the system shows wired behavior
- the system crashes altogether

In Software Engineering, **Stability Testing** typically involves exercising the system with heavy users (virtual) and measuring the performance parameters to verify whether the system can support the anticipated load.

## Why do Stability Testing

This kind of testing helps users to understand the ways the system will work in real-life situations.

Hence, Stability Testing allows you to check,

- Provide confidence in the stability of your system under test.
- Ensure that your system can handle large programs.
- Monitor the effectiveness of your system.
- Test system stability under stress.

It plays an important role in product development as it is used to determine the limitations of a software product under test before it is released or the areas of more improvement before the product goes live or at Production.

A very common example of Stability testing technique is

**Online Shopping Portals:** Stability testing will check how the website will behave when -

- High Amount of data entered at peak time
- Number of hits at a certain specific time
- Page load issue at the same time
- Behavior of system
- Responsiveness of the system and many more come under **Stability Testing**

### Another example

A CPU test is a popular form of stability test under [Performance Testing](#) technique. This test checks for processor stability and also monitors its performance as the processor's workload is increased.

## How to do Stability Testing

- To determine the scope and objective of the testing, we must ensure that the Application Server(s) do not crash during the Load Test executions.
- To determine the Business issues, verify the system performance and load as per end user perspective.
- To assign the different Responsibilities and Roles like -Creating Test plan, [Test Case](#) design, Test case review, Test execution, etc.
- To ensure the Test deliverables within the specified time
- To ensure proper [Load Testing](#) tools and experience team is present for the same.
- To measure the risk and cost involves in the testing. This will determine the cost of each execution in terms of CPU utilization and memory.
- Determine the [Defect](#) tracking and reporting and there proper mapping with the requirements.

## Test Case for Stability Testing for CPU Performance

- To verify the Upper limit of the system.
- How system crashes or recovers.
- A total number of transactions completed per request.
- Whether or not transaction response stays steady or increases over time.
- How the system behaves under heavy load.
- Its response and behavior under heavy load.

## Test Reports for Stability Testing

Several statistics are gathered and measured during test executions; these numbers are analyzed in order to generate a report and to identify possible performance problems.

Examples of statistics collected under test are:

- **Transaction Response Times:** The average time is taken to perform transactions during the test. This statistic will evaluate whether the performance of the server is within the acceptable minimum and maximum transaction performance time periods defined for the system.  
This information will evaluate the time taken in processing the request by the web server and sent to the application server, which in most of the cases will make a request to a database server.
- **Hits Per Second:** The number of hits made on the server by users. This statistics benefits to determine the number of load users generate, with respect to a number of hits.
- **Throughput:** The amount of throughput on the Web server during the test which is measured in bytes. Throughput means the amount of data that the users received from the server at any given time. This statistic helps to evaluate the amount of load that users generate.
- **Transaction per second:** These are the total number of completed transactions (both successful and failed) performed during a test. This statistic helps to check the actual transaction load on the system.
- **CPU:** CPU percentage utilization spent during a test.
- **Memory:** Memory usage during a test.
- **Disk:** utilization of disk spaces spent during a test.

By the time, you can now easily identify that –

**Stability Testing** comes under Performance Testing –a technique that is performed to check some of the quality attributes of Software like stability, reliability, and availability.

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This testing is used to determine how fast a system or sub-system performs under a particular workload.

Performance Testing has many types and stability testing is one of them.

- **Stress testing:** It is a testing type which checks the robustness of the system beyond the system capacity.
- **Spike testing:** It is used to check the behavior of a system by increasing a load of a system instantly. The objective is to check at which point the system will be having performance issues, or it will pass.
- **Scalability testing:** It is used to check the capabilities of a system. How effective the system will going to behave in growing needs, change in size and change in volume.
- **Volume testing:** It is a non-functional testing technique where software under test is subjected to a huge volume of data, and the behavior of a system is checked and verified accordingly.
- **Load or Stability testing:** (already discussed above)

Some of the tools for Performance Testing are as –

- WebLOAD
- [LoadRunner](#)
- [Apache JMeter](#)
- NeoLoad
- CloudTest
- Loadstorm
- LoadUI
- WAPT
- LoadImpact
- Loadster
- Httperf
- OpenSTA
- Performance Tester
- Testing Anywhere

### Conclusion:

Stability testing is a non-functional process of testing the behavior of the application by applying maximum load. It is performed to find out the scalability of the system in a given environment.

*This article is contributed by Vaibhav Chitransh*

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