What is Soak Testing? Definition and Examples

testbytes.net/blog/soak-testing

Software systems are subjected to heavy loads continuously. Google Search is an apt example of such scenarios. But what if such software breaks after a certain time of bearing heavy loads? It can affect large masses of people and can even break their trust in the software. Hence it is very important to ensure that such heavy load software are aggressively tested. To test software for heavy load for over a continuous time, we require soak testing.

What is Soak Testing?

Soak Testing is a type of performance testing where the software under load is tested to validate that it can endure heavy loads for the extended period.

Why Should You Perform a Soak Test?

Soak testing is very important and is conducted to recognize and augment possible issues like memory leaks, resource leaks, or deprivation that can happen over time due to constant heavy load over the system.

It is very essential to reduce performance errors and system errors from the system. Soak testing loads the system with a heavy load for a continuous period, hence determining its ability to sustain heavy loads for a long period. This type of testing is important for a website that bears a heavy load for a continuous time frame. Some of such websites are search engines, social media sites, etc.

The main Objectives of Soak Testing are:

- One of the main objectives of soak testing is to validate software behavior when subjected to heavy loads for a continuous long time.
- Another main objective is to predict system failure during heavy load conditions.
- Soak testing also validates the performance of the system.
- It also validates the system is dependable and steady.

When is Soak Testing done?

Soak testing is a complicated job and is very time-consuming. Hence it should be carried out in a particular time so that no other testing activities are disturbed and the complete software testing process goes on smoothly.

1. Soak testing is better to be conducted after load testing. Before the build is installed, and it is gone through a series of load tests at high traffic levels. After the accomplishment of load testing, a round of soak testing is done.
2. Soak testing requires a lot of time to be executed, sometimes the soak tests last for full day and night. Hence soak testing should be performed at a time, when it does not hinder any other testing activity. The weekends are the best times for conducting soak testing, as the testers can execute the soak testing test cases and can let it execute over the weekend.

Concerns in Soak Testing

Soak testing is a time-consuming process; hence keeping in mind the duration of executing its test cases and amount of test data, few considerations has to be taken before executing soak testing. Here are a few considerations for executing soak testing:

- How long do you have to execute soak testing, is one major question when considering soak testing. It is very important to decide what time frame you will consider for soak testing. The execution time of soak testing is generally decided by the availability of the system for conducting soak testing and delivery deadlines.
- It should be very well considered that each application can execute without any interruptions during the execution of soak testing.
- It should include all the scenarios decided during the requirement phase based on customer's requirements.
- The maintenance window time is a major aspect in determining the scope of soak testing.

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What are the failures that are detected by Soak Testing?

The soak testing is very important, it helps in validating software for bearing heavy load for continuously long periods. The soak testing helps in the detection of issues like:

Memory Leaks:

Soak testing helps in the detection of some of the major issues which can even lead to the system crash. It helps in the detection of serious memory leaks which can not only crash the application or the software but can also crash the complete operating system in which the application runs.

Layer Connections Failure:

There is a very close connection between the layers of the software or the system, and defect or failure in these connections can lead to an interruption in the complete module. Soak testing helps us detects any such failures of connections between the layers of the system.

Database Connections Failure:

Under some situations, soak testing can also detect database connection failures. These failures can result in crashing of the complete system, and hence detection of such failures is very important, soak testing assists us in the detection of such Database Connections Failure

Response Time Degradation:

One of the major issues that heavy loads can lead to is losing the efficiency of the system by increasing the response time. Soak testing helps in the detection of such response time degradations, hence giving the developers a chance to fix this issue to make the

system free from any Response Time Degradation issues.

Soak Testing Strategy

Strategy plays a very important in software testing. it is equally important in soak testing as well. It is very important to strategize your soak testing efforts before actually executing the soak testing:

Testing Environment:

Setting up of testing environment is one major phase of software testing. It helps analyse the software, hardware, operating system, and database on which the tests have to be performed. In soak testing also creating up of test environment is very important and plays a major role.

Test Scenarios:

Soak testing is a very wide process. It is also very time consuming, hence it becomes very important to plan, analyse, and conclude the <u>test scenarios</u> before executing soak testing test cases. The development team also play a major role in determining test scenarios by letting the testing team know the amount of load that can be adhered on the system.

Test Estimation:

Soak testing as discussed earlier is extensive testing. It requires long hours to execute soak testing test cases. Though, this duration of execution may vary according to the scope of the system and participation of the development team, clients, and more.

Risk Analysis:

The probable risks and issues are analysed to conduct soak testing.

Soak testing tools

The list of tools that can execute is pretty long. Mainly the tools used for load testing are also used for soak testing by setting up the load and durations field in the test tools.

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Some of the automated testing tools that can assist in soak testing are LoadUI, Apache JMeter, Appvance IQ, WebLOAD, and various plugins on <u>Jenkins</u> and <u>GitHub</u>.

Advantages of Soak Testing

Soak testing is very important and has many added advantage in delivering a defect-free system:

- It ensures that capabilities of the software system.

- Soak testing helps in finding defects that cannot be detected by the performance testing
- It helps in making the software system more robust by detecting the defects that can be induced in the software due to continuous heavy load conditions.
- It validates the sustainability of software system over a time period.
- The soak testing results are used to improve the client-side infrastructure and hardware.

Disadvantages of Soak Testing

Soak testing has many advantages, but as every coin has two sides, soak testing tools has many advantages and few disadvantages. Though these disadvantages do not affect the soak testing test results but are essential to be considered before executing soak testing.

- Soak testing is a very time-consuming process and can even take a couple of days and nights to execute it. Such a long process can result in delayed product delivery and hence executing soak testing or not has to be decided based on the time limitations of the project.
- Running soak testing manually is a very bad idea as soak testing is a time-consuming task and also requires a large amount of data. Doing it manually can result in wrong test results and hence it is must to execute soak testing using the automated tools.
- It is very important to detach live environment from the test environment while executing the soak testing, as any anomaly in executing the soak testing can corrupt the complete live environment resulting in data loss or data corruption permanently.
- Determining the extent of soak testing to be performed is very difficult. You can hardly get an idea of how much soak testing has to be performed to give the best results.

Examples of Soak Testing

Search engines are an apt example for soak testing. Search engines are continuously used by millions of people around the world. Search bars keep lying idle for few on their mobile handsets, for few they have some search typed over but are left unattended and few are rigorously searching for information over search engines. These search engines are a must to be tested for soak testing.

The Banking software is continuously tested for load for around 70 hrs to 150 hrs. They are induced with large data and are uninterruptedly tested for long hours.

Similarly, there are many other applications and software that experience heavy loads for long hours. Executing soak testing for them is very important to ensure the utmost safety of the system. Some of this software are social media sites, gaming sites, etc.

Conclusion

Soak testing is a type of performance testing that validate that software can tolerate heavy loads continuously for long durations. Although it is very time consuming and requires a large amount of data, it is very important to execute soak testing to ensure the high-end performance of the software system.