

VOLUME TESTING

Volume testing, which helps us to check the behavior of an application by inserting a massive volume of the load in terms of data.

And we also learn about its process, why we need to perform the volume testing, the objective of volume testing, multiple examples, various attributes of volume Testing, advantages, and disadvantages.

Introduction of Volume Testing

Volume testing comes under [software testing](#). It helps us to check the behavior of an application by inserting a massive volume of the load in terms of data is known as **volume testing**.

In volume testing, we will concentrate on the number of data rates than the number of users. It is also called **Flood testing**.

It is executed to analyze the effect on the system's response time and behavior when the volume of data is enhancing in the database. In this testing, a massive volume of information is acted upon by the software.

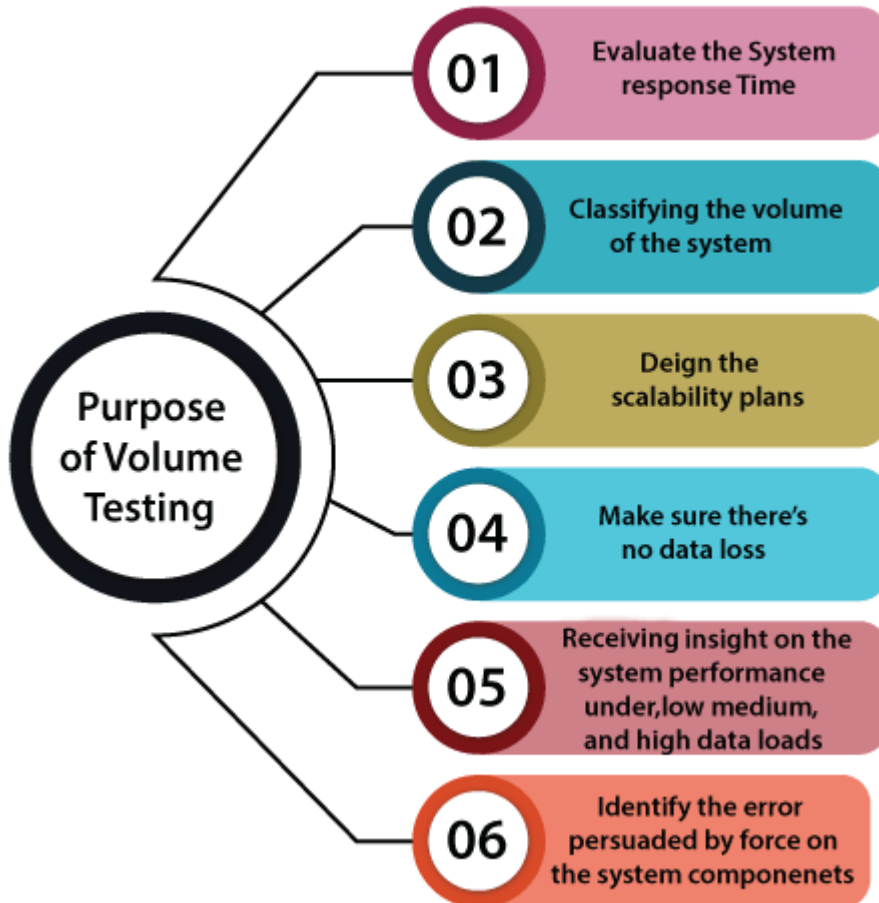
It is required to certify that the system is not at risk of overflow or data security issues.

Note: Volume is a capacity while Load is a quantity, i.e., load testing means no. of users, and volume testing implies the amount of data.

PURPOSE OF VOLUME TESTING

The initial objective of implementing the **volume testing** is to discover system performance with collective volumes of data in the database.

Let see some other objectives of performing volume testing:



- **Evaluate the system response time**

We can evaluate the system response time as we know that the Volume testing is productive, and it helps the **organization** executives to confirm that software performance is not interrupted.

- **Classifying the volume of the system**

If we identify the system's volume, it helps us to simplifies the scalability development which is very useful while preparing the contingency plans.

And the Volume testing gives understandings to developers, which helps them forecast how much data the system can proceed with without any failure.

Design the scalability plans

We can easily design the scalability plans by performing volume testing. As we learn that the volume tests help business executives understand if we enhance the size or accumulating more components to support the system.

- **Make sure there's no data loss**

In software testing, only through volume testing the project team can guarantee that there is no data loss as the burden on the system grows and the database's size.

- **Receiving insights on the system performance under low, medium, and high data loads**

The next objective of implementing the volume testing is to measure the system's performance under **low and medium** loads to ensure it works. And the risk of data loss is expanded under high data loads.

- **Identifying the errors persuaded by force on the system components**

The purpose of doing the volume testing is to find issues that only display when the **data load upsurges, higher response time, system failure, or security activities.**

FEATURES OF VOLUME TESTING

It contains various features that are essential while executing the volume testing:

In the development stage, only a small amount of data is tested.

- The software's execution is weakening with the passing time as there is a vast amount of data over time.
- While performing the volume testing, we make sure that there is no data loss because if we lose any data, we might miss some vital information.

- Mostly, a test data generator creates the test data, which needs to be logically accurate.
- To analysis the performance of the system, we can use the test data.
- The application's response time is tested during the volume testing and whether the system responds within a fixed time or not.
- In volume testing, we also test that the data is stored appropriately or not because if the information is not stored correctly, then it is restored accordingly in the proper place.

WHY DO WE NEED THE VOLUME TESTING?

Before we understand the need for volume testing, we will see one example of volume testing.

Suppose there is an **e-commerce web application**, which is generally used by 1000 end-users. And during the sale or festive season, on the web application, around 40-50k users try to access the web application.

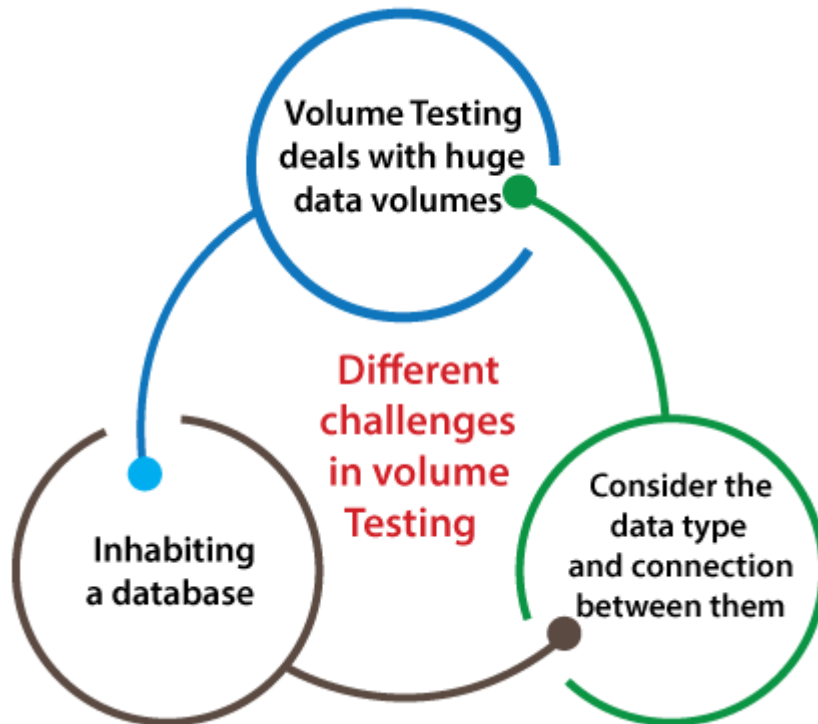
And the application will crash, or the data could not load successfully, which cause problems for the customers.

To overcome such real-time conditions, we need to perform one round of volume testing. The below aspects will help us to understand the importance of Volume testing:

- The volume testing will help us detect any data loss when the volume of the database upsurges to a specific limit.
- The execution of volume testing is essential to identify the problems in the early stages of testing, which could increase the volume of data in the database.
- The volume testing can quickly identify many system performance issues before managing the customer.

WHAT ARE THE DIFFERENT CHALLENGES IN VOLUME TESTING?

There are few things we always keep remember while executing the volume testing because all the initial thoughts in volume testing need to deal with data.



- **Volume testing deals with huge data volumes.**

As compared to other categories of **performance testing**, volume testing deals with huge data volumes.

To handle a considerable amount of data it requires extensive data sets with a comprehensive team of test engineers. The programmer also has to deal with managing the data that bumped as an outcome of regular testing meetings.

- **INHABITING A DATABASE**

It is the most commonly faced challenge during the volume testing because we are dealing with the relational databases, which contain a robust structure and lots of adjacent tables.

And the tester needs to gather various fields, both the required elective ones that contain large binary files, to make sure the high quality of test data.

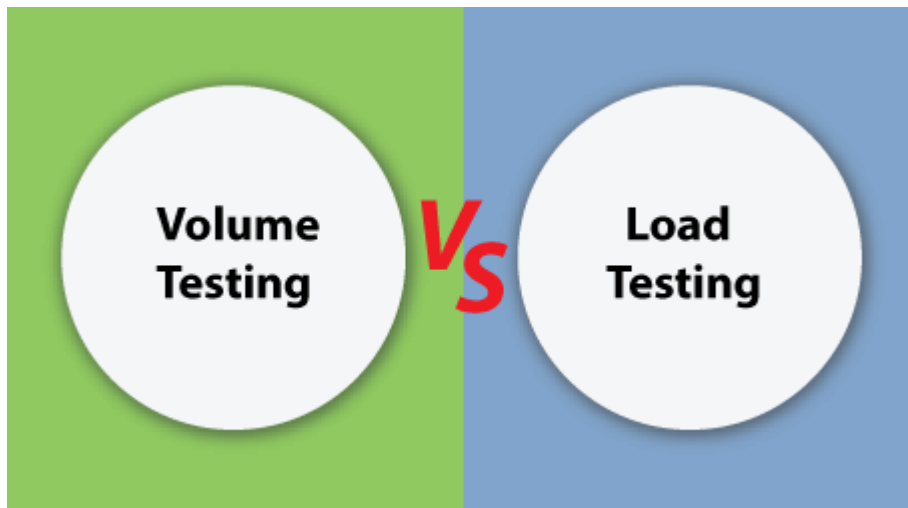
- **REVIEW THE DATA TYPES AND CONNECTIONS BETWEEN THEM.**

For the testing beginner, it is tough to learn the connections between them, the differences between the types, and how the software reacts.

The test professionals have to deal with an extensive range of data valid, invalid, absent, boundary, or wrong during the volume testing.

Difference between Volume Testing and Load Testing

In the below table, we have listed some of the vital distinction between volume testing and load testing:



| S.NO. | Volume testing | Load testing |
|-------|--|--|
| 1. | It helps us to check the behavior of an application by inserting a massive volume of the load in terms of data is known as volume testing. | Load testing is testing where we check an application's performance by applying some load, which is either less than or equal to the desired load. |
| 2. | Volume testing tests the system both under regular and irregular circumstances. | Load testing tests the system under normal circumstances. |
| 3. | Its analysis the system's response time. | Its analysis the system's performance. |

| | | |
|----|---|--|
| 4. | It mainly emphasis verifying the system's capacity. | The load testing emphasis on verifies the stability of the software. |
| 5. | It makes the system capacity of real-world use. | It makes the system capable according to end-users. |
| 6. | It helps us to save the maintenance cost of the system. | It doesn't save maintenance cost of the system. |

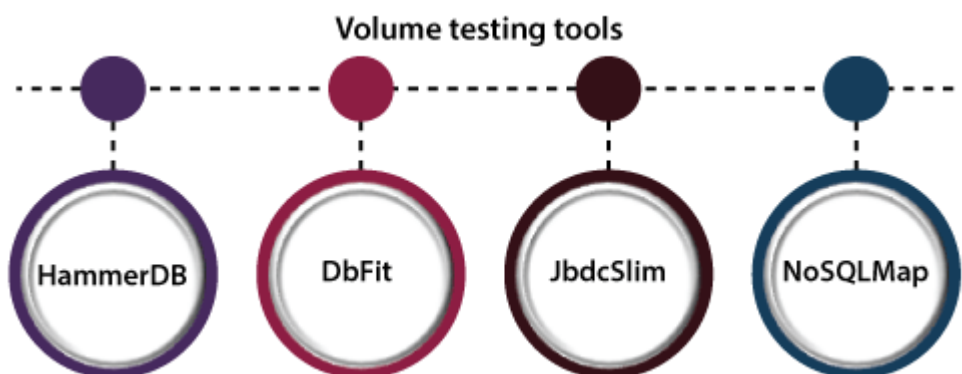
Volume testing tools

As we know that the automation testing is a time-saving process and also provides the precise outcome as compared to manual testing.

The primary advantage of using the volume testing tools is that we can execute the tests at night, and because of that, the team members or the other teams won't be affected by the data volume of the Database.

Let see a few open-source tools compatible for volume testing:

- **HammerDB**
- **DbFit**
- **JdbcSlim**
- **NoSQLMap**



HammerDb

It is an **open-source** tool and a database benchmarking application to the global database industry. It is used to automate, multi-threaded, and also allows run-time scripting.

FEATURES OF HammerDB

Following are the commonly used features of HammerDB:

- It is a fully transparent enterprise rating software with no virtual user restrictions.
- It can be used by all of the top technology companies.
- It is fully supported for various databases such as Oracle, MYSQL, SQL Server, PostgreSQL, etc.
- It allows expert level support.
- It provides complete and comprehensive documentation.
- It is fully functional and supported for **Linux** and **Windows** platforms.

DbFit

The DbFit is an **open-source tool** that supports the test-driven development. The DbFit tests can be used as existing executable documentation of our system behavior.

FEATURES OF DbFit

Some of the commonly used features of DbFit are as follows:

- It enables Agile practices such as **Test-Driven Development, refactoring**.
- It supports several database types such as SQL Server, Oracle, etc.
- It helps us to enhance the quality, design, and maintainability of our product.

- It gives readable and understandable syntax, which improves communication with non-technical people.
- It provides online documentation with examples.

JdbcSlim

Another volume testing tool is **JdbcSlim**, where the database statements and queries are easily integrated into **Slim FitNesse** testing. It mainly emphasis keeping the configuration, test data, and SQL commands distinctly.

FEATURES OF JdbcSlim

Following are the commonly used features of JdbcSlim:

- The JdbcSlim framework can be used by Developers, Testers, and Business Users who know SQL language.
- It supports all databases for which a JDBC driver
- It is also making sure that the requirements are written independent of the execution and easy to understand by the users.

NoSQLMap

The **NoSQLMap** is an open-source **Python** tool, which is designed to automatically insert outbreaks and disrupt the Database configurations to evaluate the threat.

ADVANTAGES OF VOLUME TESTING

Some benefits of volume testing are as follows:

- It helps save maintenance costs that are spent on application improvement.
- It works only for the MongoDB database.
- It helps in the early detection of bottlenecks.

- It supports a quicker start for scalability plans.
- The volume testing makes sure that the system is capable of real-world usage.

DISADVANTAGES OF VOLUME TESTING

Following are the disadvantages of volume testing:

- By using the volume testing, it not possible to make the precise division of memory used in the real world.
- A skilled database performance testing team is essential to obtain the Volume testing that would become an extra expense of the project.
- The individual copy of the real environment is difficult and complicated.
- It takes a lot of time to execute the thorough volume testing, which covers all the test scenarios, creating scripts, and executing those scripts, which could delay the application's release time.

SUMMARY

Volume testing is used to analyze the system performance for high data loads. It is a type of **non-functional testing**.

The volume testing is executed manually as well as with the help of some automation tools to check the system performance.

The volume testing is very important, which is relatively complicated with its challenges. Before implementing it, we need a complete knowledge of a particular concept along with the database languages.

If any test beginner tries to perform the volume testing, they need to use some tool and perform some test case, which will help us understand the concept of volume testing before using it in real-time.

