A Study on Performance Testing Based on Web Application

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Abstract— Performance testing can be done by speed of a computer, network, software program, device or web application. It can be used to measuring the response time, throughput and resource utilization of the server by the system functions. The number of users hitting the application will be large and the site might not behave as it does for a single user the user might experience various issues while it was concurrently used the user could be face the various issues like internal server error, timed out error, application crash and slowness of the application. For example : when there was a big sale announced for snapdeal. The number of users hitting the application on that particular day is huge 100% higher than the usual users. Performance testing was the solution that could have prevented them from this situation. If they had planned for a proactive performance testing with the anticipated load they could have avoided this failure on their big day sale.

Keywords— Client Response Time, Server Response Time, Testing the Performance.

I. INTRODUCTION

End - End Web Application Architecture Web Server

Web server could be used on web application testing and it can be consists of low capacity computers that send a requests from the client to server and receive the response from server to client.

Application Server

Application server could be used on three tier applications having one or more medium capacity computers that receive user requests from the web server and send them back to the web server.

Database Server

Database server is used on Database testing and it can be having high capacity computer with manages the database access to help the user data requests.

Network Devices

The network devices are used to support and connect the other components. Such as the network devices are network card, network interface adapter, hub, routers and firewall etc.

In this research work, we conducted on performance testing based on web application. The two websites are

tested and compared. HotelIngh and Tefconpesttech websites are performing in this dissertation. It can be used to measure the different metrics like throughput, response time and resource utilization of the server.

To compare those sites, the tefconpesttech site performance is best. These two websites are helps to gather their own information from their sites. The system can be used as single point or single component. It can be worked as on single users only.

II. RELATED WORK

In [1] a new method of performance evaluation and performance measurements is processed with OWD (One-Way-Delay) meter and RTT (Round-Trip-Time) meter. In [2] paper describes the performance evolution with web browser. It can be measure the network characteristic of traditional and multimedia applications. In [3] a traffic model and performance evolution of web browsers developed the benchmark tool WAGON. In [4], measure and mitigate the web performance bottlenecks in home networks. In [5] analyze the http content caching at the location SGW in wireless network.

In [6] cache ability can be analyzed in access network with HACKSAW. In [7] explains the pitfalls in HTTP traffic measurement and analysis. HTTP content size and type could be used. In [8] concept of analyze and testing the web application performance. Testing could be conducted on software applications, system resources and databases. In [9] examine to research the performance testing and improvement strategy in web application. Also analyze and research the types and indicators and testing methods of the web. In [10] a method of web performance testing tools and challenges could be analyzed.

III. METHODOLOGY

Performance testing methodology of a web application consists of the following:

To Identify the Test Environment

In the test environment should be thorough understanding at the outset enables are more efficient. The test design and planning helps to identify challenges.

To Identify the Performance Acceptance Criteria

It can be used to identify the response time, throughput, resource-goals and constraints. Response time is a user concern, throughput is a business concern and resource use is a system concern. It also identify the project success criteria and it may not be captured the goals and constraints.

Plan and Design Tests

Plan and design tests could be used to identifying the key scenarios, define test data, to simulate the variability and other things to be calculated. This will be used for one or more models of system usage to be executed, implemented and analyzed.

To Configure the Test Environment

The test will be done for the following things are to be prepare test environment, tools and components. The test environment is ensured for resource monitoring.

Implement the Test Design

The script will be generated by this testing and it could be implemented.

Execute the Test

Monitor the tests. To validates the test and test data. Execute the test for analysis during the test environment.

Analyze the Results, Tune and Reset

Consolidate and analyzed the data it could be share the data results. It can make a tuning change and reset

User Response Time=Server Response Time + Client Rendering (Loading) Time

Server Response Time

Server side testing plays a major role to ensure the performance of application. Most of the business complex logic and code resides at server-side.

Time taken by the request to reach the server and the time taken by the server to send the response back to the client. This had been calculated in this work.

Client Rendering Time

Most of the efforts spent on optimizing server side code to reduce the response time. As a result, we have very good response time on the server side the end-user experience could be very disappointing.

There are various client side performance tools are used like google page speed, yslow, dynatrace, ajax tools analyzes the content of a web page.

Time taken to display the whole content in the page since it receives the response from the server as shown in figure 1.
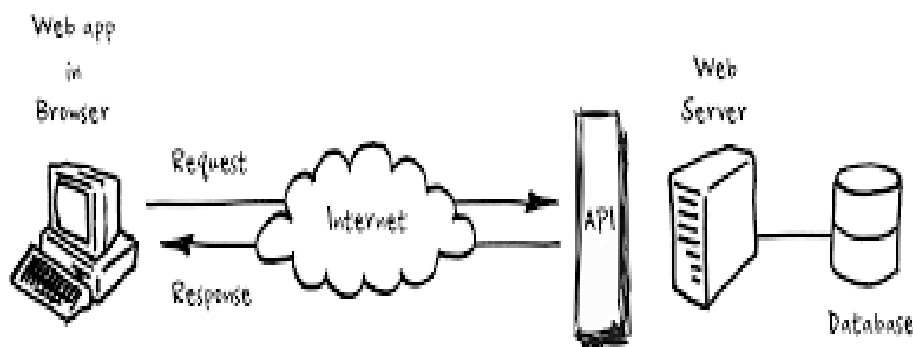

Fig.1: Time taken from the web browser

IV.   RESULTS AND DISCUSSION

In this paper, we tested the two websites performance and the results are shown in following figures.

Transactions:

6 Transactions were performed
Click to view transactions and their durations.

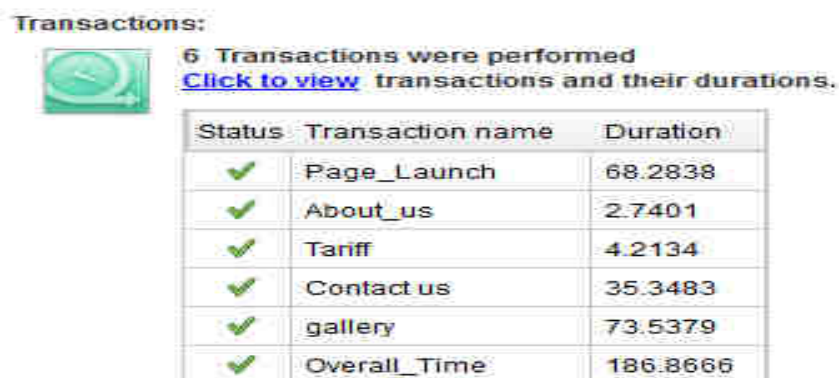| Status	Transaction name	Duration
✔	Page_Launch	68.2838
✔	About_us	2.7401
✔	Tariff	4.2134
✔	Contact us	35.3483
✔	gallery	73.5379
✔	Overall_Time	186.8666

Fig.2: HotelIngh Response Time

Transactions:

6 Transactions were performed
Click to view transactions and their durations.

Status	Transaction name	Duration
✔	Page_Launch	11.6334
✔	About	2.3516
✔	Services	2.2715
✔	Products	8.3312
✔	Contact us	7.8062
✔	Overall_Time	35.1267

Fig.3: Tefconpesttech Response Time

Content breakdown by domain (First View)

Domain	Requests
www.hotelngh.com	55
maps.google.com	4
fonts.gstatic.com	3
csi.gstatic.com	1
maps.googleapis.com	1
fonts.googleapis.com	1

Domain	Bytes
www.hotelngh.com	6,147,326
maps.google.com	114,886
fonts.gstatic.com	49,155
fonts.googleapis.com	1,811
maps.googleapis.com	412
csi.gstatic.com	312
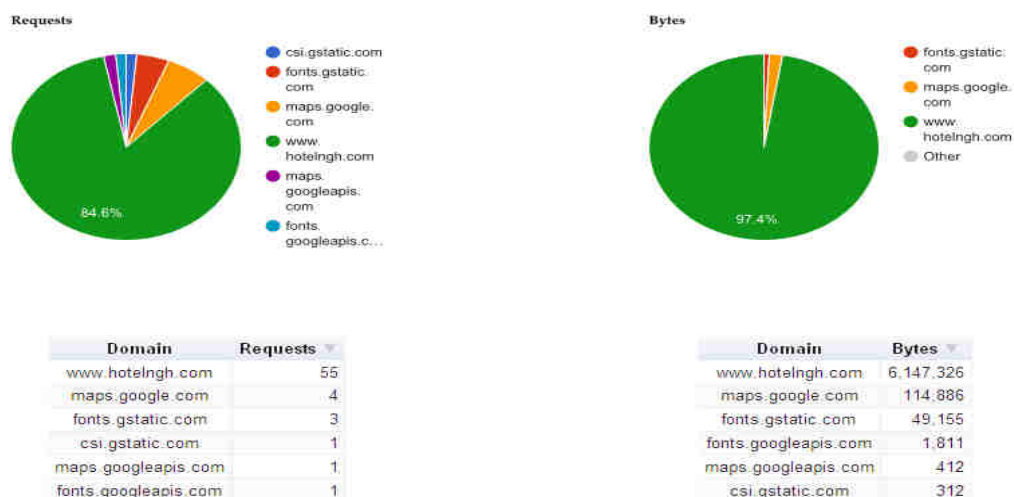
Fig.4: HotelIngh Snapshots

Content breakdown by domain (Repeat View)
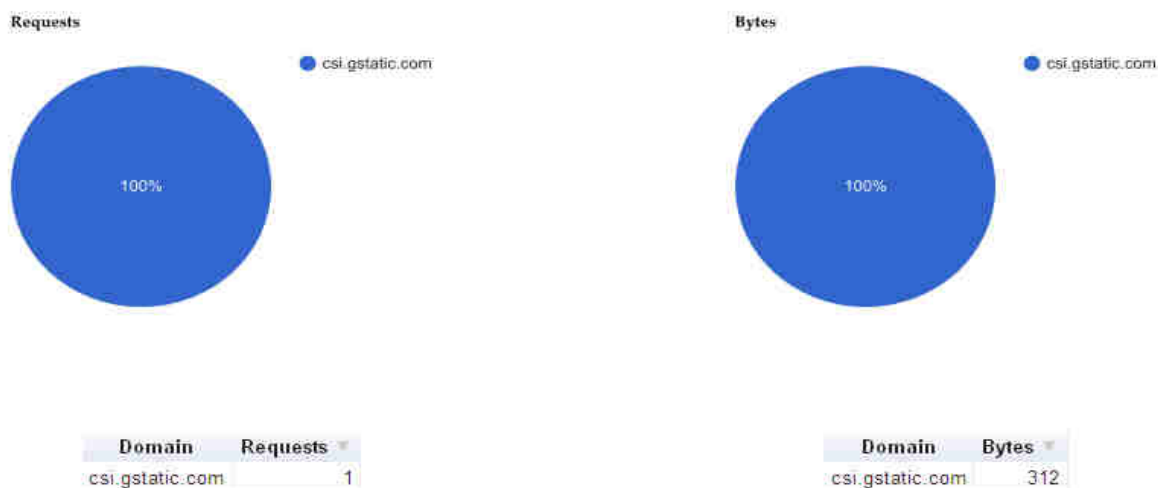
Domain	Requests
csi.gstatic.com	1

Domain	Bytes
csi.gstatic.com	312

Content breakdown by domain (Repeat View)

Domain	Requests
www.tefconpesttech.com	4
api.flickr.com	1

Domain	Bytes
www.tefconpesttech.com	338,836
api.flickr.com	2,894

Content breakdown by domain (First View)

Domain	Requests
www.tefconpesttech.com	64
farm4.staticflickr.com	7
farm3.staticflickr.com	5
api.flickr.com	1

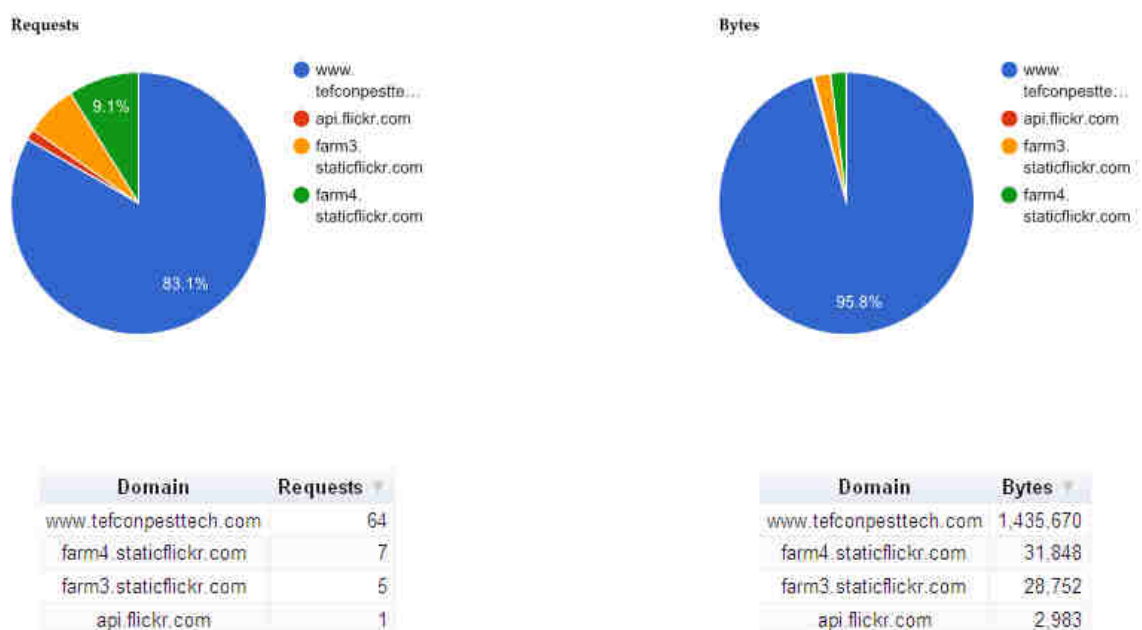| Domain	Bytes
www.tefconpesttech.com	1,435,670
farm4.staticflickr.com	31,848
farm3.staticflickr.com	28,752
api.flickr.com	2,983
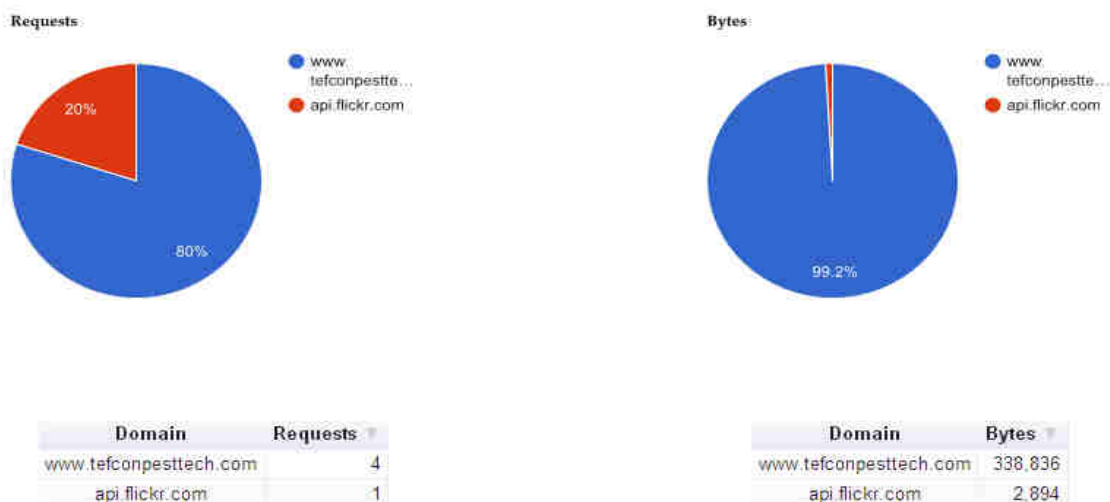
Fig.5: Tefconpesttech Snapshots

V.   CONCLUSION

The tests conducted conclude that the normal sites which were hosted on web as performance degradation. Hence going forward, it becomes mandatory for all the applications which will be hosted in web needs to be tested for performance.

In order to ensure the uses gets the response of the site in the standard SLA time which will reduce the wait time of the customer and increase business and revenue for the stake holders. Performance test also confirms the load supported by the Application and the server's capacity can also be evaluated by this test. The site owners can avoid confusions like customers get disappointed by the sites performance which will impact the business.

As a future work we are planning to run the script in controller with more number of users which will help us in identifying more bottlenecks. When the same test is conducted for multiple users, the response time and the resource utilization will vary according to the load we are generating so we are planning to capture the performance things by pumping load to the applications.

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