Supergeo Technologies Inc.
staff@supergeotek.com | www.supergeotek.com

SuperGIS Server
Stress Testing Report

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Preface

SuperGIS Server is the map server software that allows enterprises to publish dynamic maps and spatial data to the Internet. SuperGIS Server has the high-scalable architecture, complete GIS objects, and extensive support for OGC standards and spatial database, and provides the more diversified web page templates; therefore, SuperGIS Server can satisfy the enterprises needing to publish, display and share the spatial data on their intranet or the Internet. Thus, the competitiveness and efficiency of the enterprises can be strengthened.

Also, SuperGIS Server supports many client applications. The client users can use the services published by SuperGIS Server easily through SuperGIS Desktop, SuperPad and the various common browsers, such as Internet Explorer, Firefox, Chrome, Safari, and Opera, etc.

The purpose of the report is to provide the efficiency of the current system, by testing; we can know the maximum limit that can be handled by the system within a particular period, and get the number of optimal connection for each server. The result can be taken to evaluate the system deployment in GIS projects and guarantee the performance of GIS web services.

Testing Environment

(1) Testing tools: The Apache JMeter™, which is open source software, a 100% pure Java application designed to analyze and measure the performance of a variety of web applications.

(2) System Deployment

The stress test will be conducted in two different OS environment, and one server adopts Windows Server 2012 Datacenter, and another applies Windows Server 2016 Datacenter as the operating system for the website server. The client computer uses Windows 10 Professional. About the specs of the machines, Please see the chart below.

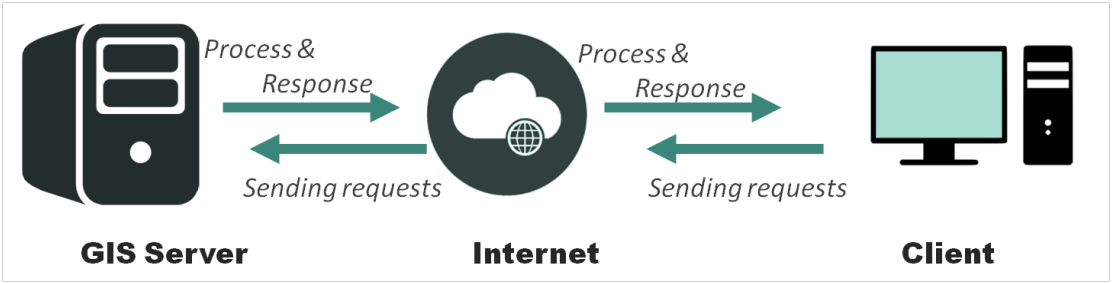

Figure1. System Deployment

Table1. Spec of machines

Client	**Server 1**	**Server 2**
		
Windows 10 Professional	Windows Server 2016 Datacenter	Windows Server 2012 Datacenter
Intel(R) Core(TM)2 Quad CPU Q8200 2.33 GHz	Intel(R) Core i5-4570 3.2 GHz (Dual processors)	Intel(R) Core i5-4570 3.2 GHz (Dual processors)
4 GB RAM	8 GB RAM	8.0 GB RAM
100Mbps LAN	100Mbps LAN	100Mbps LAN

Procedure of Website Performance Testing

This Stress testing will simulate the behavior of browsing the web application via Chrome and record the number of stable connection and the number of maximum response in unit time. This result will be the reference as GIS system deployment.

During the Stress testing, the tester will write down the testing script, and adjust the client parameters such as the number of users to understand the efficiency of SuperGIS Server 3.3 in different using circumstances.

In order to know the efficiency of each service, this test summarizes four circumstances, including Cache Service, Map Service, Feature Service and Geo-processing Service, and the details are described below:

A. Cache Service：

This circumstance tests the efficiency of cache service by accessing a huge amount of tile within a period. The default tile size is 256 * 256, and we assume the screen size of the client might close to 1440 * 990. Therefore, to display the full map view on the screen of client side, the GIS Server will need to process (1140/256)*(900/256) ≒ 24 requests. The tester will continuously send requests till the GIS server reaches the limit.

B. Map Service：

The map service will render the map in time according to the current extent of browsing. The test data applies the administrative area of Indonesia which contains 66187 features. The geometry of features is complicated, and the spatial pattern is diverse, and thus it is selected as test data. During the Stress testing, the GIS server will render the map and response to the client side. The tester will continuously send requests till the GIS server reaches the limit.

C. Feature Service：

The feature service allows users to edit, identify the feature. This circumstance simulates the identify behavior. Each identify movement will send one request. The tester will continuously send requests till the GIS server reaches the limit. The result will provide the efficiency of attribute query.

D. Geo-Processing Service：

Users can publish their own analyze processing onto the server, and this circumstance simulates a general geoprocessing: route planning between two or more locations. Every route planning sends a request. The tester will continuously send requests till the GIS server reaches the limit.

Result

GIS Server I (Server 2012)

	Cache Service	Map Service	Feature Service	Geo-Processing Service
Number of stable connection (per second)	168	4	27	24
Maximum respond (per second)	5808	700	5000	500

GIS Server II (Server 2016)

	Cache Service	Map Service	Feature Service	Geo-Processing Service
Number of stable services((Per second)	156	5	33	22

Limited Service(Per second)	5592	500	5000	500

** Number of stable services represents the number of finishing the movement, including rendering map, query attribute and analyze after getting requests from client side within a specific time. The number of limited services is the maximum number of clients that server can respond within the unit time, GIS Server will not be able to respond beyond the limit.

Conclusion

This stress test is to understand the number of stable services and maximum service . According to the result, if service provider would like to accelerate the efficiency of rendering, it is suggested to apply cache service.

Basically, there is no user number limit on the 4 types of services(Cache, Map, Feature and geoprocessing) provided by SuperGIS Server; the performance of the websites depends on the loading of the website server. Therefore, the performance test report contains the test results of the 4 types of services and provides the suggestions to enable the users who would like to establish the related website services to refer to the associated data provided by us to evaluate and adjust the server environment they need.