Essbase GridBased Retrieval Load Testing using Apache Jmeter

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Note: Feel free to use the attached scripts/amend/improve as necessary.

Inspiration : Chapter 4: Essbase Performance and Load Testing-- by Tim German from the "Developing Essbase Applications: Hybrid Techniques and Practices" book

Objective

This document provides an example and steps to simulate a load test of Spreadsheet retrievals for Essbase using Apache Jmeter and the Essbase Japi.

The Use Case assumes that the Tester would like to simulate multiple users retrieving Essbase Data with the Excel-Addin retrieval or Smart view based ones. The Sample.Basic Database has been used to demo the load test.

The steps have been executed for an Essbase Server hosted on a Linux box, with the Jmeter Tests being executed from a Windows box. In case you have an Essbase server on an Windows environment, You could still use the same steps, except for some of the shell scripts (which could also be executed using Unix-Like Utility tools for Dos).

Flow

The flow can be summarized roughly as below.

- User does an retrieval of data from configuring the Query Log Mode.
- This generates a query log file (.qlg) which is subsequently parsed via shell scripts to generate a grid file containing the co-ordinates (X,Y) for all members involved in the retrieval query.
- The grid file is then used in an Java - Application (executed via Jmeter) to submit retrieval requests to the Essbase Server via the japi.

Inventory of Files included

DataQuery.java	Data retrieval Java source file based on the DataQuery.java provided as part of the sample examples
DataQuery.class	Java class for the above app (compiled with Jdk 1.8)
log2grid.sh	Shell script to convert .qlg files to gridfiles , which are used by the java app
log2grid.awk	Awk script as a helper to the log2grid.sh
Basic00001.qlg	Sample Query Log generated by Spreadsheet retrieval
SampleBasic.jmx	Sample Jmeter Test script for spinning of retrievals
readme.pdf	This file itself
Basic.cfg	Configuration file for Query Logging for Sample.Basic database

Prepare Environment

Software

- Download Jmeter from jmeter.apache.org
- Download Java RunTime or JDK from the Oracle site (In case you are unable to use the class file provided, you can compile according to your environment using the source file DataQuery.java, in which case you will require the jdk to compile)
- Get a copy of the ess_japi.jar from your Hyperion environment (Should be available under the MiddleWare Home)

Prepare Folders

Linux (Used purely for executing shell scripts. Alternates like Cygwin/unixdos tools can be used)

- On a linux server, create a folder for the gridfiles (e.g. /u01/gridfiles)
- Copy log2grid.sh and log2grid.awk to the /u01/gridfiles

Windows

- Install Jmeter (e.g. under c:\ApacheJmeter3.0)
- Install Java, if not available (e.g. c:\jdk)

- Create a folder jmetertest (e.g. c:\jmetertest) with 4 subfolders jmx, gridfiles ,jlib and jlib\dataquery)
- Copy ess_japi.jar to c:\jmetertest\jlib & the DataQuery.class to c:\jmetertest\jlib\dataquery
- Copy SampleBasic.jmx to c:\jmetertest\jmx

Verify APS availability

- Test that the Analytic Provider Services are running and the jsapi url is reachable

http://YourAnalyticProviderServicesServer:port/aps/jsapi

It should give something akin to the below lines

Hyperion Provider Services

Hyperion Provider Services - Release Version xxxxx

Enable Query Logging in Essbase

Turn on the Essbase Application Query Logging for Sample Basic

- Navigate to your app directory (E.g. <MWHome...>/app/Sample/Basic) and create a Basic.cfg file with the below contents. Change the LOGPATH as per your environment

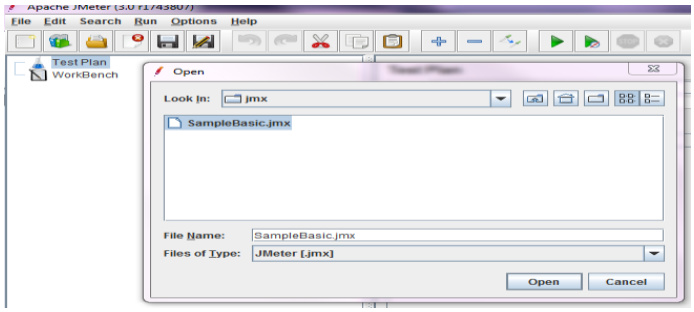
```
QUERYLOG [Year]
QUERYLOG [Measures]
QUERYLOG [Product]
QUERYLOG [Market]
QUERYLOG [Scenario]
QUERYLOG [Years]
QUERYLOG LOGPATH /MW_HOME..../app/Sample/Basic/
QUERYLOG LOGFORMAT CLUSTER
QUERYLOG LOGFILESIZE 1024
QUERYLOG TOTALLOGFILESIZE 1024
QUERYLOG ON
```

- Restart Sample application (unload/load)
- Use the below Excel grid example to do a single retrieval

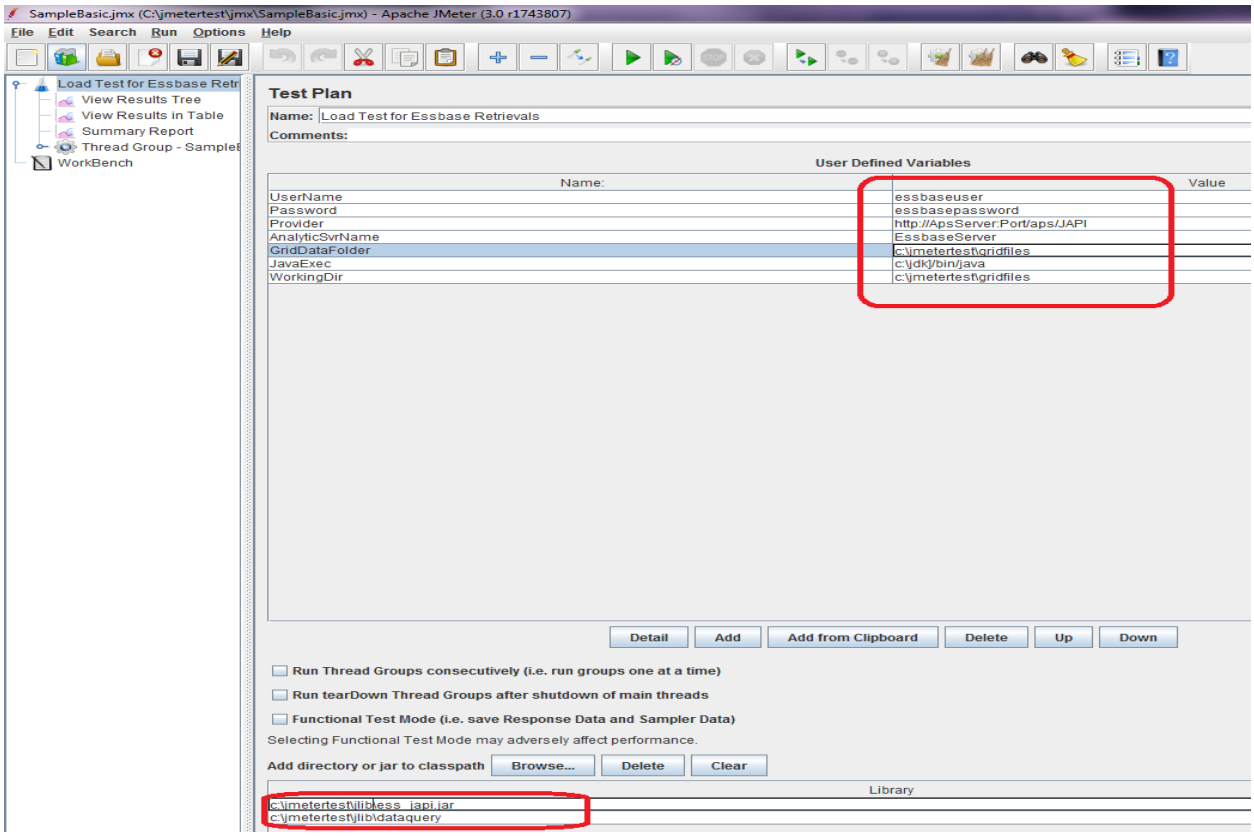
	Years							
					Sales			
			Actual			Budget	Budget	Budget
		Jan	Feb	Mar	Qtr1	Qtr2	Qtr3	Qtr4
East	Colas	2127	2061	2126	5870	6760	7300	5570
	Root Beer	1853	1966	1907	5460	5650	5600	5780
	Fruit Soda	1213	1272	1250	3880	4150	4350	3850
California	Root Beer	1252	1292	1343	3680	4070	4380	3790
	Cream Soda	876	887	894	2280	2470	2700	2150
Oregon	Root Beer	611	612	588	1690	1540	1450	1590
	Cream Soda	190	181	190	460	440	490	650
Washington	Root Beer	380	382	387	1050	1110	1190	960
	Cream Soda	395	419	391	1040	930	880	1110
Utah	Root Beer	349	338	349	930	870	890	1140
	Cream Soda	312	317	332	800	1020	1120	930

Nevada	Root Beer	131	135	129	350	380	410	340
	Cream Soda	829	898	932	2310	2860	3110	2730
West	Root Beer	2723	2759	2796	7700	7970	8320	7820
	Cream Soda	2602	2702	2739	6890	7720	8300	7570

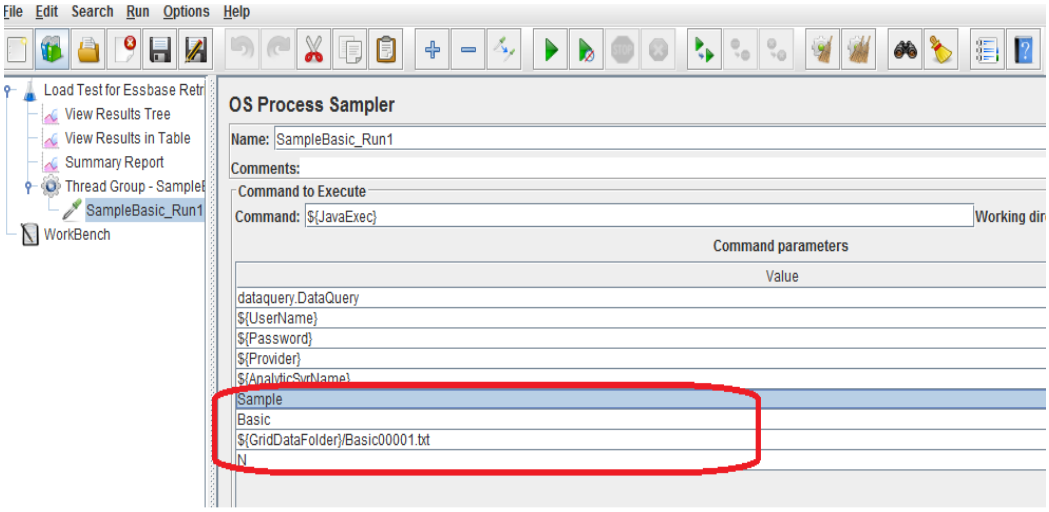
- Unload/Stop the Sample application to flush out the log
- You will find a Basic00001.qlg file in the ../app/Sample/Basic folder or at the LOGPATH you have defined in the Basic.cfg file
- Copy the Basic00001.qlg file to the /u01/gridfiles
- Run the gridparser script as follows
    - cd /u01/gridfiles
    - ./log2grid.sh Basic00001.qlg Sample Basic
        - The parameters are self-explanatory
        - The script will create the Basic00001.txt in the /u01/gridfiles/output folder
- Copy the /u01/gridfiles/output/Basic00001.txt to the c:\jmetertest\gridfiles folder
- Launch Jmeter using the c:\ApacheJmeter3.0\bin\jmeter.bat
- Do a "file open" and open the c:\jmetertest\jmx\SampleBasic.jmx



- Click on the "Load Test for Essbase Retrievals" and change the values as per your environment


SampleBasic.jmx (C:\jmetertest\jmx\SampleBasic.jmx) - Apache JMeter (3.0 r1743807)
File Edit Search Run Options Help
Load Test for Essbase Retr
View Results Tree
View Results in Table
Summary Report
Thread Group - Sample
WorkBench
Test Plan
Name: Load Test for Essbase Retrievals
Comments:
User Defined Variables
Name:
Value
UserName
essbaseuser
Password
essbasepassword
Provider
http://ApsServer:Port/aps/JAPI
AnalyticSvrName
EssbaseServer
GridDataFolder
c:\jmetertest\gridfiles
JavaExec
c:\jdk\bin\java
WorkingDir
c:\jmetertest\gridfiles
Detail
Add
Add from Clipboard
Delete
Up
Down
Run Thread Groups consecutively (i.e. run groups one at a time)
Run tearDown Thread Groups after shutdown of main threads
Functional Test Mode (i.e. save Response Data and Sampler Data)
Selecting Functional Test Mode may adversely affect performance.
Add directory or jar to classpath
Browse...
Delete
Clear
Library
c:\jmetertest\jlibless_japi.jar
c:\jmetertest\jlib\dataquery

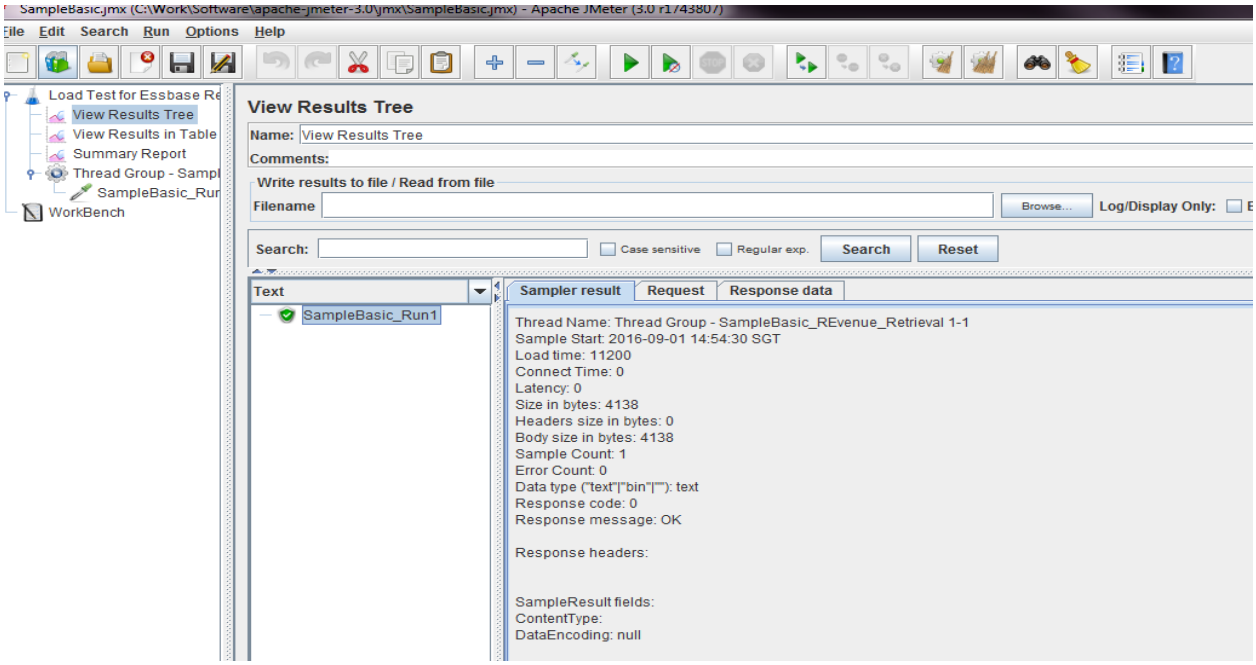
- Click on the "SampleBasic_Run1" and change the values as per your environment



Where

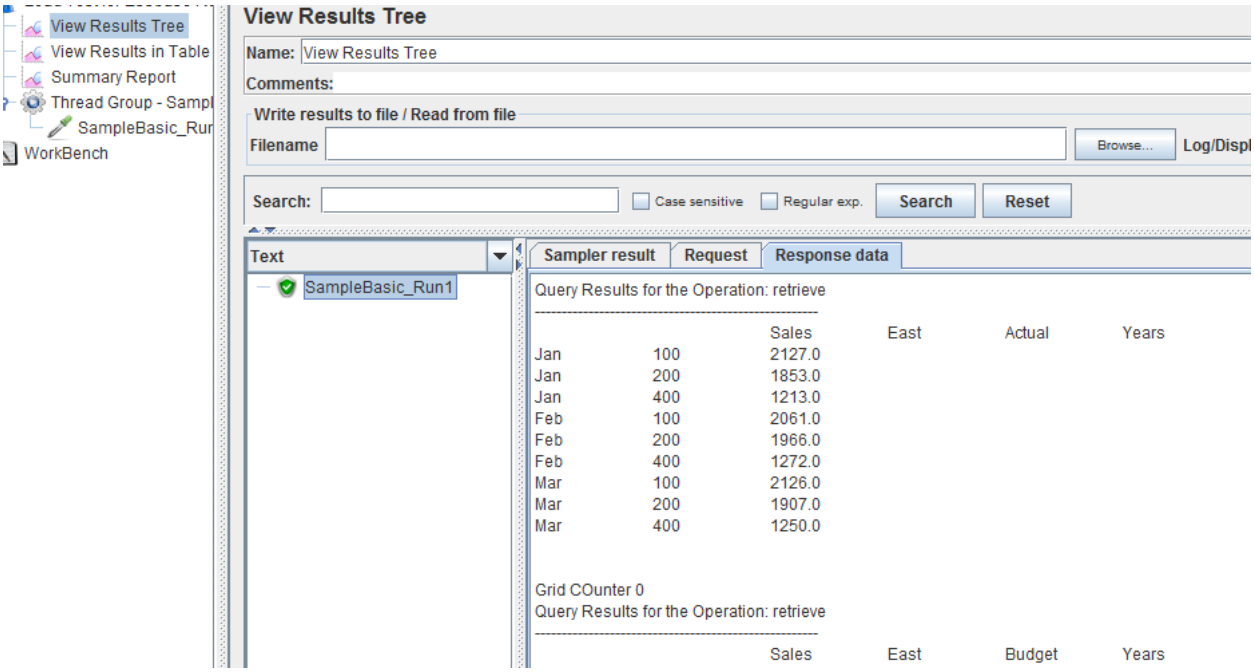
Sample	: App Name
Basic	: DB Name
Basic00001.txt	: Filename
N	: Display Parameter: Use Y in case you want to see the results of the Retrieval in the Response tab of Jmeter

- Stop the Sample Application in order to have a clean start
- Delete the ../app/Sample/Basic/Basic00001.qlg file from the Essbase server so that the run of the previous info is not present
- Run the Jmeter Test



In case you have set the display parameter to Y, you can check the results in the response data

N : Use Y in case you want to see the results of the Retrieval in the Response data tab of View Results Tree Node



Ensuring that the Test files are correct.

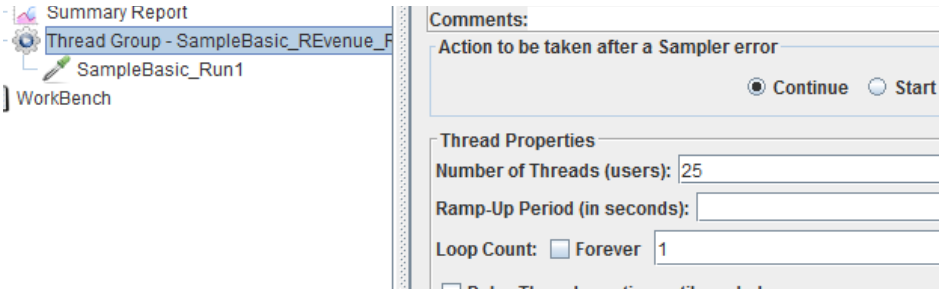
- Shutdown the Sample application
- Do a diff between the qlg files generated by the original Spreadsheet retrieve and the one generated by the JMeter run

E.g.
diff ../app/Sample/Basic/Basic00001.qlg /u01/gridfiles/Basic00001.qlg

Where ../app/Sample/Basic/Basic00001.qlg represents the latest log file generated by the Jmeter run and the /u01/gridfiles/Basic00001.qlg represents the previous one generated by the Spreadsheet retrieval.
The differences displayed between the 2 files should be only the elapsed times/datetimestamps /non critical ones.
If all other lines are identical between the 2 files, it implies that the c:\jmetertest\gridfiles\Basic00001.txt file can be used to do all subsequent runs.

You are now ready to start a load test

Run a 25 Concurrent User Test



View the results