

Essbase GridBased Retrieval Load Testing using Apache Jmeter

Sanjay Ganvkar, Sep 2016

Note: Feel free to use the attached scripts/amend/improve as necessary. Sanjay.ganvkar@gmail.com

[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
```

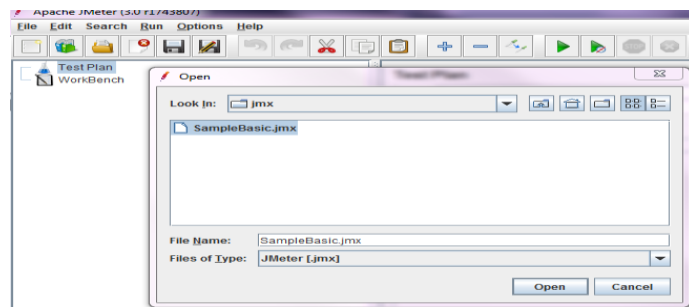
- Restart Sample application (unload/load)
- Use the below Excel grid example to do a single retrieval

	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

Essbase GridBased Retrieval Load Testing using Apache Jmeter

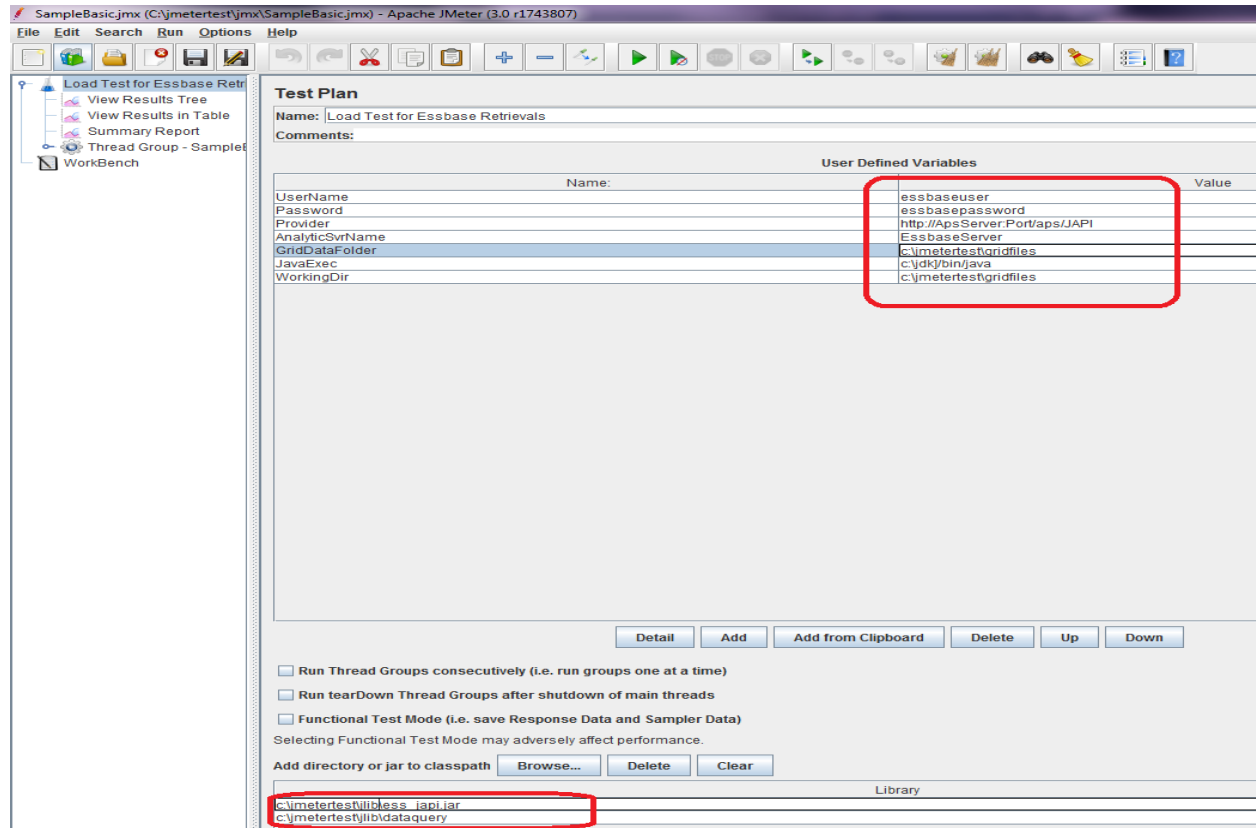
Nevada	Root Beer	131	135	129	350	380	410	340
	Cream Soda	829	898	932	2310	2860	3110	2730
West	Root Beer	2723	2759	2796	7700	7970	8320	7820
	Cream Soda	2602	2702	2739	6890	7720	8300	7570

- 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



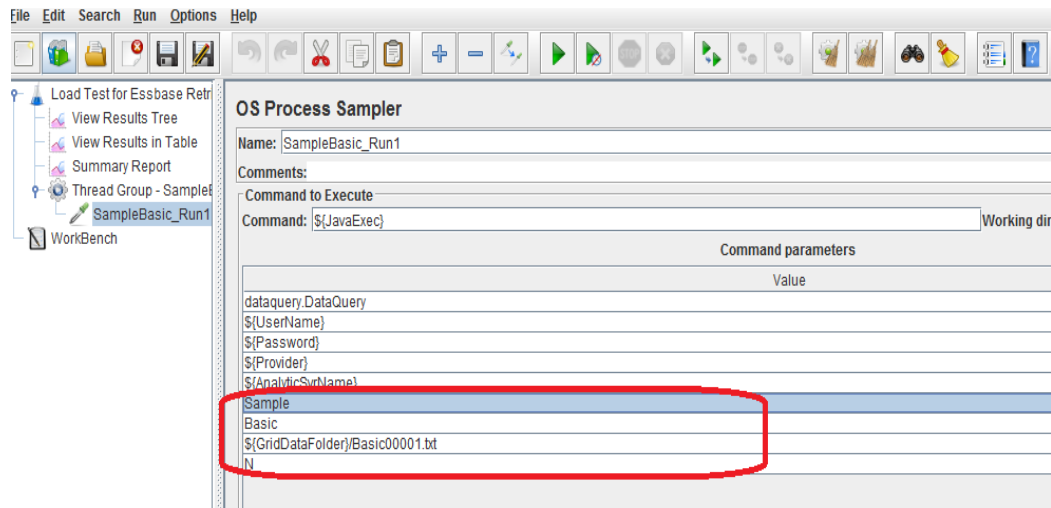
- Click on the "Load Test for Essbase Retrievals" and change the values as per your environment

Essbase GridBased Retrieval Load Testing using Apache Jmeter



Essbase GridBased Retrieval Load Testing using Apache Jmeter

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



Where

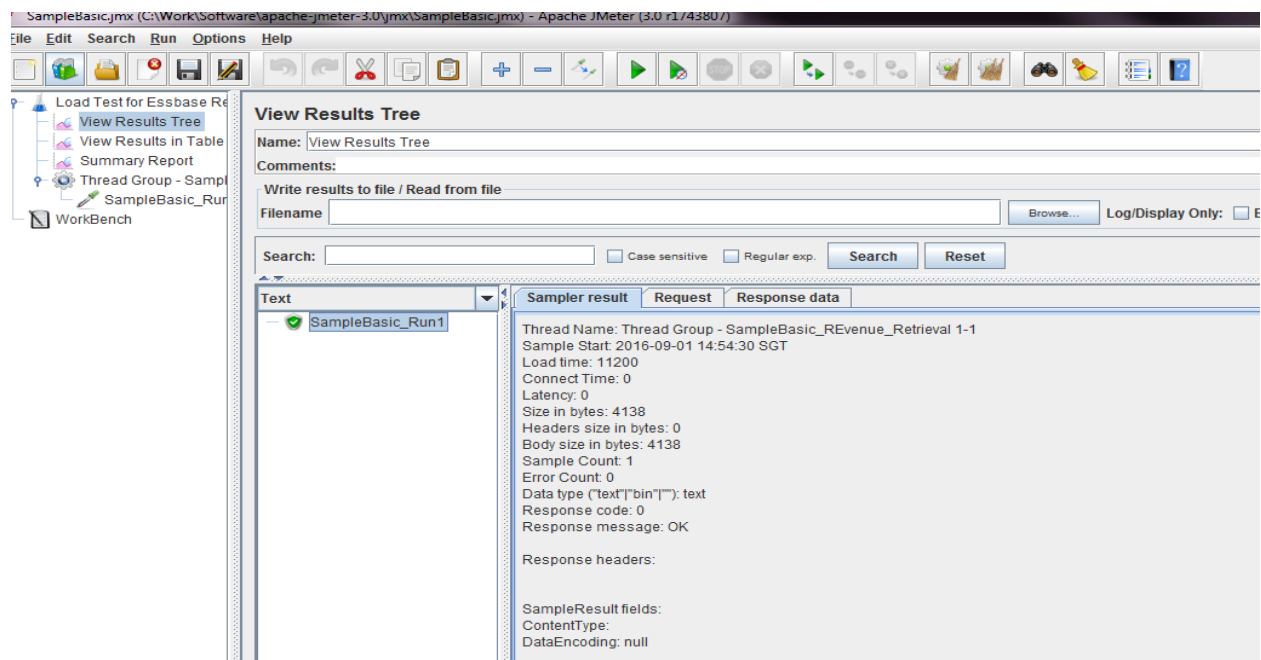
Sample : App Name

Basic : DB Name

Basic00001.txt : Filename

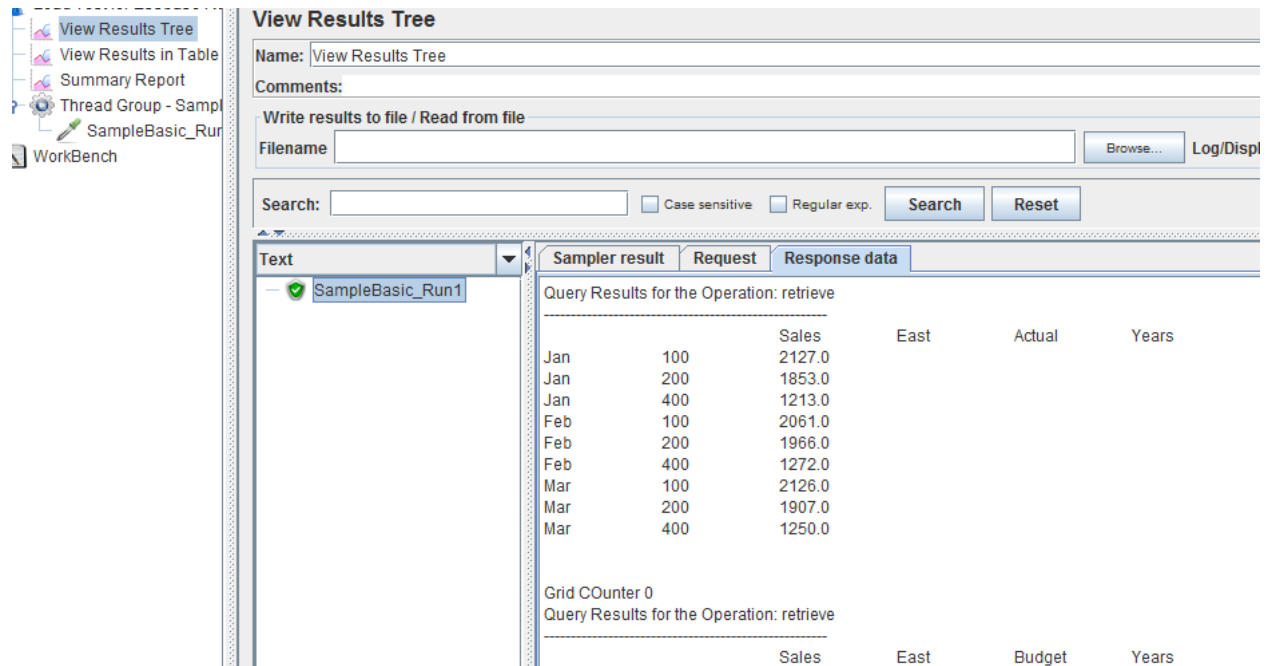
N : Display Parameter: Use Y in case you want to see the results of the Retrieval in the Response tab of Jmeter

- 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

Summary Report
Thread Group - SampleBasic_REvenue_F
SampleBasic_Run1
WorkBench

Comments:
Action to be taken after a Sampler error
☒ Continue ☐ Start

Thread Properties
Number of Threads (users): 25
Ramp-Up Period (in seconds):
Loop Count: ☐ Forever 1

View the results

Load Test for Essbase Retrieval
View Results Tree
View Results in Table
Summary Report
Thread Group - SampleBasic_Run1
WorkBench

View Results in Table
Name: View Results in Table
Comments:
Write results to file / Read from file
Filename

Sample #	Start Time	Thread Name	Label	Sample Time(ms)	Status	Bytes
1	19:45:40.202	Thread Group - Sa...	SampleBasic_Run1	10342	✓	
2	19:45:40.199	Thread Group - Sa...	SampleBasic_Run1	10359	✓	
3	19:45:40.200	Thread Group - Sa...	SampleBasic_Run1	10350	✓	
4	19:45:40.203	Thread Group - Sa...	SampleBasic_Run1	10348	✓	
5	19:45:40.200	Thread Group - Sa...	SampleBasic_Run1	10348	✓	
6	19:45:40.202	Thread Group - Sa...	SampleBasic_Run1	10340	✓	
7	19:45:40.202	Thread Group - Sa...	SampleBasic_Run1	10341	✓	
8	19:45:40.198	Thread Group - Sa...	SampleBasic_Run1	10343	✓	
9	19:45:40.200	Thread Group - Sa...	SampleBasic_Run1	10337	✓	
10	19:45:40.200	Thread Group - Sa...	SampleBasic_Run1	10257	✓	
11	19:45:40.200	Thread Group - Sa...	SampleBasic_Run1	10252	✓	
12	19:45:40.201	Thread Group - Sa...	SampleBasic_Run1	10350	✓	
13	19:45:40.198	Thread Group - Sa...	SampleBasic_Run1	10249	✓	
14	19:45:40.202	Thread Group - Sa...	SampleBasic_Run1	10355	✓	
15	19:45:40.201	Thread Group - Sa...	SampleBasic_Run1	10549	✓	
16	19:45:40.201	Thread Group - Sa...	SampleBasic_Run1	10567	✓	
17	19:45:40.201	Thread Group - Sa...	SampleBasic_Run1	10567	✓	
18	19:45:40.201	Thread Group - Sa...	SampleBasic_Run1	10570	✓	
19	19:45:40.201	Thread Group - Sa...	SampleBasic_Run1	10579	✓	
20	19:45:40.203	Thread Group - Sa...	SampleBasic_Run1	10578	✓	
21	19:45:40.198	Thread Group - Sa...	SampleBasic_Run1	10562	✓	
22	19:45:40.202	Thread Group - Sa...	SampleBasic_Run1	10590	✓	
23	19:45:40.202	Thread Group - Sa...	SampleBasic_Run1	10778	✓	
24	19:45:40.203	Thread Group - Sa...	SampleBasic_Run1	10789	✓	
25	19:45:40.201	Thread Group - Sa...	SampleBasic_Run1	11464	✓	

Load Test for Essbase Retrieval
View Results Tree
View Results in Table
Summary Report
Thread Group - SampleBasic_Run1
WorkBench

Summary Report
Name: Summary Report
Comments:
Write results to file / Read from file
Filename

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput
SampleBasic_R...	25	10487	10249	11464	250.78	0.00%	2
TOTAL	25	10487	10249	11464	250.78	0.00%	2