SC Result Analyzer

This document provides guidelines of using the SC Result Analyzer to conduct analysis on results produced by the Qlik Scalability Tools for QlikView and Qlik Sense.

NOTE *Parts of the Qlik Scalability Tools package are unsupported by Qlik, so use it at your own discretion.*

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Introduction

The SC Result Analyzer is a package of QlikView applications that can be used for analyzing both QlikView and Qlik Sense performance test results. It is part of the Qlik Scalability Tools.

In the root folder of the SC Result Analyzer there are a Demo test result folder, three QlikView applications, and one ZIP archive file, named as below.

- DemoTest
- QVD Generator.qvw
- ServerMetaFetcher.qvw
- SC_Results - DemoTest.qvw
- FolderTemplate.zip

Quick Start

This section shows a recommended flow of analyzing performance test results with SC Result Analyzer. The steps described in this section are brief and can be used as a check list if you are already familiar with such analysis. Otherwise, please read the whole document for more detailed information about the steps.

1. Extract the folder structure from *FolderTemplate.zip* and rename it to suit your need. This will be your <Test Root> folder.
2. Copy needed log files from their original places and put them into the correct locations under the <Test Root> folder structure.
3. Collect information of all Qlik machines that were involved in the test using the *ServerMetaFetcher.qvw* and save it to the file called *ServerInfo.xml.* Copy it to the <Test Root> folder.
4. Generate QVDs using the *QVD Generator.qvw.*
5. Edit *TestLogMeta.txt* to connect the test logs with the performance counters logs, also rename and group the tests as you wish.
6. Create a copy of the analyzer application *SC_Results - DemoTest.qvw* and rename it. Input the path of your <Test Root> folder. Load the QVDs into the analyzer application.
7. Before you start doing analysis, use the charts "Failed Clicks" and "Assertions, Actions" to verify that the tests seem to be successful completed, i.e. there is no failed request. If there is failed request, it has to be investigated first.
8. Once the tests are verified being completed successfully, you can use suitable charts and views in the application to conduct your analysis. There are some commonly used charts though for the basic information. E.g. Check the table "TestLog files, Details" for an overview of the KPIs of the selected tests. Use the charts "Response time" and "Throughput" to follow their changes along the time. Use the "CPU, ###" and "RAM, ###" charts to check the resource consumption of different Qlik services along the time, etc. You can also switch between different views, e.g. from Relative time to Calendar time slot, etc.
9. If needed you can generate a report via "Reports" -> "Scalability Center Report"

Prepare for analysis

This section will explain the steps that you need to go through before you can view the test results in the analyzer application.

Set up the folder structure

In order to enable the QVD Generator to find and handle the different files, the following folder structure is required.

- <Test Root>
  - Archived Logs
  - EventLogs
  - Exerciser
  - JMeterLogs
  - QVD
    - CalendarQVD
    - EventLogQVD
    - ExerciserQVD
    - JMeterQVD
    - LogsQVD
      - ArchivedLogsQVD
    - PerformanceCounterQVD
    - SessionLogQVD
    - UsedQVWsQVD
  - ServerLogs
  - SessionLogs

The folder structure can be extracted from the archive file *FolderTemplate.zip*, which can be found in the root folder of the SC Result Analyzer.

Collect machine information

Open the *ServerMetaFetcher.qvw* and enable Macro. Add all IP addresses or machine names, for all machines used in the testing, to the table. Click the "*Fetch Properties*"-button. Check the details table to ensure that everything is collected. Make sure that the WorkingSet-limits are set according to the settings *in QMC->Engine->Central Engine->Advanced* for the machines, as these are by default set to min 70 and max 90 in the Analyzer and not read from the server.

Click the "*Export ServerInfo*"-button. This will save an xml file, called *ServerInfo.xml*, adjacent to *ServerMetaFetcher.qvw*.

If you're not authorized to fetch data from the server you can manually enter the values in the "*Required fields*" or "*Details*"-table before exporting. The details table can also be used for manual editing. Make sure the total memory you entered is in bytes.

Collect log files

To be able to read in the result of one or more tests you need several types of files:

- **Test log files**: SC Result Analyzer can be used together with the QlikView or Qlik Sense Scalability Tools. Depending on which tool you were using, copy the test log files either to the "*Exerciser*" *(for Qlik Sense tool)* or "*JMeterLogs*" *(for QlikView tool)* folder.
- **Performance Counters logs:** Copy Performance Counters log files from all Qlik server machines involved in the test, to the "*ServerLogs*" folder.
- **ServerInfo.xml**: Generated by the *ServerMetaFetcher.qvw*. Copy and place it under *<Test Root>* folder and it will be used for all tests.
- **Qlik logs** (optional):
    - If you are testing against QlikView deployment, copy related Events logs and Sessions logs correspondingly to the *"EventLogs"* and *"SessionLogs"* folders under *<Test Root>* folder.
    - If you are testing against Qlik Sense multi-node deployment, restart all Qlik services after the test and wait for some minutes so that all logs are rotated and synced to the central node. And then go to central node and copy everything under "*C:\ProgramData\Qlik\Sense\Repository\Archived Logs*" into "*<Test Root>\Archived*" *Logs* folder.

Generate QVDs

To be able to load the data, it is first extracted from the log files and put into QVD files.

All files log files under the same <Test Root> folder and subfolders will be available for analysis. When all files are placed in their respective folder, open the *QVD Generator.qvw*. This qvw-file could be placed at the parent folder level of the <Test Root> folder.

Type the name or the absolute path of the <Test Root> folder into the input field *Folder name*. This will be used as the starting point for the relative path used in the *QVD Generator.qvw*.

Select the closest city of where the test was conducted from the input box of time zone. This option allows you to convert time stamps into your local time, useful if you intend to display charts with absolute time stamps. If not, this setting does not matter.
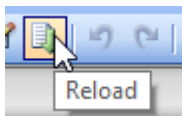
Now **reload the document** to create QVDs for all logs. The QVD files will be created under respective subfolders of the *QVD* folder. You can add more files if you have run more tests and compare them as you want. Whenever you add new log files to the <Test Root> folder, you need to reload the *QVD Generator.qvw* application, attempt to create QVDs from them.

Under some situation you might want to move some of the log files and/or recreate some of the QVDs. You could use the two objects at the bottom of the *QVD Generator.qvw* to do so. Use them with care and read the help text carefully first.

Edit Meta-data

Before we can start a correct analysis work, the analyzer application needs to know what log files belong to which specific test, and what are the connections between them. This information cannot be figured out with certainty by the analyzer application simply based on the provided log files, therefore we might need to manually input it.

Click on the "*Edit Meta-data in Notepad*" button in the *QVD Generator.qvw*. This will open a CSV formatted text file called *TestLogMeta.txt* existing under the folder < Test Root >.

Connect test logs with performance counters logs

Since the load client doesn't know which Qlik-machines were used for handling the requests, the analysis tool can't connect CPU and RAM usage per test log automatically. We need to edit the *TestLogMeta.txt* file to make the connection between a test and Qlik-machines. Enter the Windows machine names of Qlik machines to each test log entry in the file. As it is a text file in CSV format, put the machine names of QVS/Engine in the field called "QVS", and put the machine name of QvWS/IIS/Proxy in the field called "WebServer". If there are multiple QVS/Engines involved in the test, put their names in the same filed but separated with semicolons (;).

Save the *TestLogMeta.txt* file. And optionally you can reload the *QVD Generator.qvw* to view the same information in QlikView.

Grouping

If more than one instance of the load client was used during the test in order to generate enough virtual users, you can use the grouping functionality to group the test log files. This will make it possible to view the values as one test. Open the *TestLogMeta.txt* file and enter a same group name in the field "*TestGroupName*" in each test log entry that belong together, to group those logs. This field can be also used to rename the test log entry with a shorter and more descriptive test name.

Save the *TestLogMeta.txt* file. And optionally you can reload the *QVD Generator.qvw* to view the same information in QlikView.

Use the analyzer application

This section will give you an overview of the analyzer application. The application itself should be quite self-explanatory, so you are encouraged to explore it with common senses while using it.

Inside the package there is a QlikView document named "*SC_Results - DemoTest.qvw*". This is set of test results data, which can be used by the users for familiarizing themselves with the Analyzer. Feel free to play with it first if you wish.

Read in QVDs

Create a copy of the analyzer application file *"SC_Results - DemoTest.qvw"* and rename and open it. Go to the sheet called *"Folder Settings"* and enter the path of your <Test Root>. **Reload the application**. This application will read all QVDs presented in the different folders.
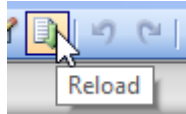
The results will be presented either as in calendar TimeSlot, or as in RelativeTime, for all machines/tests in the selected time frame.

Calendar TimeSlot vs RelativeTime

You can choose to either display data as functions of relative time, i.e. starting from zero and counting upwards by minute, or using the original time stamps. To adjust this setting, find the list located to the right side of all of the sheets, named either TimeSlot or RelativeTime and press the cycle button to change between time modes.

The calendar TimeSlot is based on the timestamps of the entries in the test log files. Every timestamp is truncated to the minute it occurred, to set the granularity of the calendar time in analysis to the minute level. This is an important component for many of the keys in the Analyzer application.

Every timestamp will also belong to a relative minute named RelativeTime. This is a group where the first 60 seconds of a test, regardless at what time it occurred, is relative minute zero and so on. This means that one RelativeTime with a high probability will have entries that belong to two TimeSlots, and vice versa. This is why charts might show slightly different values if the same data is visualized in calendar- or relative-time.

Note that RelativeTime will only show values from the test log files and not the performance counter values unless the *TestLogMeta.csv* contains the correct machine names used for the test. The *TestLogMeta.csv* can be edited or recreated at any time, and after that a reload of the analyzer-application is needed.

Layout and Components

The analyzer application contains a set of sheets and objects to assist your analysis of the test results. You have seen the sheet *"Folder Settings".* There are also other sheets named *"Main"*, *"Extra"*, *"Logs"*, and *"PrintObjects"*. Major analysis work could be conducted with the *Main"*, *"Extra"*, and *"Logs"* sheets. The last sheet *"PrintObjects"* contains altogether all the key charts side-by-side. We use those charts to generate Scalability Center Reports.

Figure: Overview of the analyzer-application

The first 3 sheets share the same layout, as shown in the figure above.

- Area 1 can be used for making primary selections in time, test, and test settings.
- In area 2 you will find objects that will present you the detailed information of the tests and machines you've selected, and help you to do further analysis.
- Area 3 will keep extra information if available. You can use them by double clicking on them, and close them using the small "-" button on the top-right corner of the yellow pane.

Switches for Different Views

There are several **cyclic buttons** that allow you to analyze your tests from different views. They mostly reside in the list boxes in the Area 1 and 2. An example of such a button is the yellow circular arrow in the screenshot below.
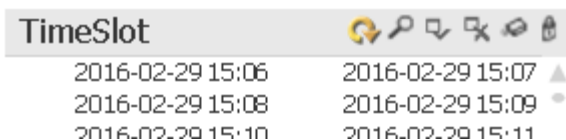
In the list box labeled with "*View Charts by*" you will find all the available tests. Click the cyclic button to switch between the test log names and test group names if available. Then you can select the tests or test groups you want to analyze from the list box.

On the right side of list box "*View Charts by*" there is another list box that allows you to select the time slots, either in relative-time or calendar-time. By clicking the cyclic button you can switch between them. Note that charts might show slightly different values if the same data is visualized in calendar- or relative-time.

Above the time slot list box, there is a list box named "Machines" that allows you to select the involved test machines based on either machine names or Qlik service names.

There is another useful switch existing in "CPU, ###" and "RAM, ###" charts in the sheet *Main*. If you have test results from a multimode Qlik deployment, and you have properly linked the test logs and performance counters logs together with the *TestLogMeda.txt* file, then you can use this cyclic switch to view CPU and RAM consumption in either per Qlik machine or the whole cluster.

Sheets

Sheet *Main*

Most of the basic investigations for your test analysis can be done in the sheet *Main*.

Before starting your analysis, it is recommended to verify that the test execution(s) were successfully completed. Charts like "*Failed clicks*" and "*Assertions, Actions*" can help you with that. If there has been a significant amount of failures of any kind, further analysis is needed in order to identify whether the original source of failures is from the script, the load client or the target system. From the table "*Assertions, Actions*", you can also see when and under which action the error occurred.

Once verified the test execution is successful, then you can use other charts to visualize the test results you selected. Don't forget to use the cyclic switches to change the views so you can have different perspective about the same measurement.

Table "*Test log files, Details*" will give you a good overview about important KPIs of the tests.

Charts "*Throughput*", "*Response time*" and "*Sessions*" help you to visually investigate tests throughout their execution time.

If the performance counter logs are provided and correctly connected to the tests via *TestLogMeta.txt* file, the charts at the lower part of the sheet will show you the average CPU and RAM usage based on selected time span for the specific Qlik service on all relevant machines.

Lines will become thicker and darker when you group more than one instance in the test.

In the table "*Actions, avg Response time*" you can find the average response time of each action of the selected tests or test groups.

Sheet *Extra*

You can find more useful charts for your analysis from this sheet.

Sheet *Logs*

If you have appended QlikView or/and Qlik Sense logs they will be visualized in this sheet. You can look for warnings and other useful information from here.

Sheet *Folder Settings*

As introduced before, user needs to set the path to access the QVD files of the test on this sheet. There is also a button on this sheet to open the *TestLogMeta.txt* file, so that you can edit it. You need to reload the analyzer application after the edit to get in the change.

Sheet *PrintObjects*

The objects on this sheet are used to generate the Scalability Center Report. You can create that report by selecting from the menu bar "Reports" -> "Scalability Center Report".

You can also use this sheet to compare different measurements side-by-side. It will be even more useful if you have set the "Point of Interest" in the time. (You can do it from the Input Box on the right side of this sheet.)

Sheet QlikSense Benchmarking Results

This sheet presents results for Benchmarking test execution and it should not be used for other test results. The results from test execution can be compared to results provided by Scalability Center which can be downloaded from community page (). The table "*Server Information*" presents information about tested server(s). The charts are presenting key metrics for four benchmarking tests, which are also presented in table "*Test Log files, Details*".

Generating a Report

For sharing or archiving, it is possible to create a report from the charts and information as currently presented in the SC Result Analyzer document (including adjustments caused by any selections).

To generate a report, click the menu option "Reports" -> "Scalability Center Report". This will present the possibility of viewing a print preview to see what the report will look like, or to print the report. If you would prefer the report as a document, you can change the printer to a PDF printer. The print button will then act as an export button for exporting the report to a PDF document.

Definitions

In this section we list some common definitions we used, in order to help you understand the analyzer application better.

Response time: the average response time for all individual actions grouped by the dimensions in the visualization, measured in milliseconds.

Throughput: the average number of clicks performed per minute.

Sessions: the aggregated number of completed "Open document"-actions performed.

CPU: the CPU utilization consumed by specific Qlik-service in % of the total capacity of the machine.

RAM: the amount of memory, measured in GB, requested by specific Qlik-service during the test.