May 2023

EspressChart 7.0 benchmarks

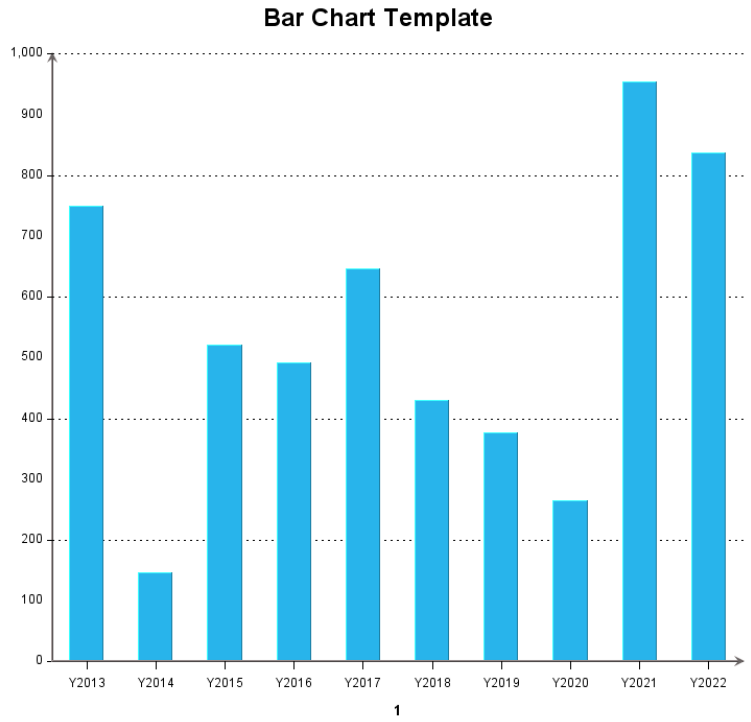
Multi-threaded export of 10,0000 bar charts

We want to export 10,000 charts. All charts use the same template but each chart has data for a different customer. The charts are parameterized, you can set the customer ID via a parameter. We are exporting the charts using Quadbase EspressChart API, the export application is multi-threaded.

Test parameters and results

Export API	EspressChart 7.0u13
CPU	Intel i7 13700K
Nr. of threads	24 threads
Export format	PNG
Export resolution	793 x 700 px
Database	MySQL 8
Nr. of charts	10 000 charts
Chart type	Bar chart
Export time	**32.29 seconds**
Average time per 1 chart	**0.003 seconds/chart**

Exported chart example



Export format	PNG
Export resolution	793 x 700 px

EspressChart 7.0 vs. Competition - Line chart

We are comparing EspressChart 7.0 API and Competition API. We created similar-looking line chart templates that are using the same data from the same database. Charts in both products were parameterized. We exported 1,000 and 10,000 charts from each product in a single-threaded benchmark.

Test details

Export API	EspressChart 7.0u13	Competition
CPU	AMD 5950X	AMD 5950X
Export format	PNG	PNG
Export resolution	793 x 1122 px	793 x 1122 px
Database	MySQL 8	MySQL 8
Chart type	Line chart	Line chart

Test results for 1,000 charts

Export API	EspressChart 7.0u13	Competition
Nr. of charts	1,000	1,000
Export time	**45.58 seconds**	82.34 seconds

Test results for 10,000 charts

Export API	EspressChart 7.0u13	Competition
Nr. of charts	10,000	10,000
Export time	**452 seconds**	812 seconds

EspressChart 7.0 vs. Competition - Bar chart

We are comparing EspressChart 7.0 API and Competition API. We created similar-looking bar chart templates that are using the same data from the same database. Charts in both products were parameterized. We exported 1,000 and 10,000 charts from each product in a single-threaded benchmark.

Test details

Export API	EspressChart 7.0u13	Competition
CPU	AMD 5950X	AMD 5950X
Export format	PNG	PNG
Export resolution	793 x 1122 px	793 x 1122 px
Database	MySQL 8	MySQL 8
Chart type	Bar chart	Bar chart

Test results for 1,000 charts

Export API	EspressChart 7.0u13	Competition
Nr. of charts	1,000	1,000
Export time	**39.9 seconds**	80.1 seconds

Test results for 10,000 charts

Export API	EspressChart 7.0u13	Competition
Nr. of charts	10,000	10,000
Export time	**395 seconds**	787 seconds

EspressChart 7.0 vs. Competition - Pie chart

We are comparing EspressChart 7.0 API and Competition API. We created similar-looking pie chart templates that are using the same data from the same database. Charts in both products were parameterized. We exported 1,000 and 10,000 charts from each product in a single-threaded benchmark.

Test details

Export API	**EspressChart 7.0u13**	**Competition**
CPU	AMD 5950X	AMD 5950X
Export format	PNG	PNG
Export resolution	793 x 1122 px	793 x 1122 px
Database	MySQL 8	MySQL 8
Chart type	Pie chart	Pie chart

Test results for 1,000 charts

Export API	**EspressChart 7.0u13**	**Competition**
Nr. of charts	1,000	1,000
Export time	**47.6 seconds**	80.7 seconds

Test results for 10,000 charts

Export API	**EspressChart 7.0u13**	**Competition**
Nr. of charts	10,000	10,000
Export time	**472 seconds**	800 seconds

EspressChart export using the EspressManager

EspressChart API can be used either as a standalone API (without connecting to any local or remote servers) or you can use the API as a client that will connect to the EspressChart server (running the EspressManager) and do the work there. With EspressChart EspressManager server, you gain several advantages like connection pooling that keeps your database connections open as long as they are being used by clients.

This can improve the speed of export slightly even when both the server and the client are running on the same machine as the database (i.e. with a very low latency).

Test details

EspressChart API	Standalone API	With EspressManager
CPU	AMD 5950X	AMD 5950X
Export format	PNG	PNG
Export resolution	793 x 1122 px	793 x 1122 px
Database	MySQL 8	MySQL 8

Test results for bar chart

EspressChart API	Standalone API	With EspressManager
Chart type	Bar chart	Bar chart
Nr. of charts	10,000	10,000
Export time	419 seconds	**395 seconds (-5.8 %)**

Test results for line chart

EspressChart API	Standalone API	With EspressManager
Chart type	Line chart	Line chart
Nr. of charts	10,000	10,000
Export time	473 seconds	**452 seconds (-4.4%)**

Test results for pie chart

EspressChart API	Standalone API	With EspressManager
Chart type	Pie chart	Pie chart
Nr. of charts	10,000	10,000
Export time	491 seconds	**472 seconds (-3.9 %)**

Summary

EspressManager’s connection pooling provides slight but consistent and noticeable improvements when running thousands of database queries.

EspressChart performance with varying number of data points

In this benchmark, we have created a Scatter chart template that takes one parameter. The parameter determines the number of chart points that will be loaded from our MySQL 8 database.
Please note that the charts with over 1,000 data points are hard to read. We did this to measure performance only, you'd create a better looking chart in real life.

Test details

CPU	Intel i7 13700K
Export format	PNG
Export resolution	1200 x 1000 pixels
Database	MySQL 8
Chart type	Scatter chart

Test results

Data points	Seconds to export
10	0.073
100	0.69
1,000	0.163
10,000	1.4
20,000	3.9
30,000	8.34
40,000	14.4
50,000	29

Summary

You can use as many data points as makes sense to display. The number of data points is not limited by our software, it's only limited by your hardware. As you can see, the chart with 10,000 points is full of data points but it took only 1.4 seconds to export.