

Appendix 1: Elapsed Time for Time Series Charts, Regular Charts and D3 Charts

Goal

These timings illustrate the loading performance based on the number of rows. In this test, the nature of the data and the number of columns were the same. The only variable was the date range.

Factors

The graph's performance can be influenced by:

- The number of rows being processed.
- The number of columns.
- The frequency of the data.
- ADX query optimization (using query parameters, materialized queries, etc.)
- ADX Hot Store vs Cold Store. Hot Store duration needs to be at least the maximum data range required on the TS Chart. This is one of the factors that improve query performance.
- If relevant, where, and how aggregation is processed.

ADX Hot Store	90 days
Browser	Edge
Data scanned 90 days	1.39 GB
Data scanned 60 days	1.11 GB
Data scanned 30 days	640 MB

Resource Configuration

ADX Data
Version 1.92

Save Discard Delete Logs

Database
Database
showcase

Table
PumpTelemetryData
☐ Specify ADX Query

Primary Key Column
Timestamp

Columns To Return
Timestamp x MotorCurrent x PumpSuctionHead x InletPressure x DischargePressure x FlowRate x DEBearTemp x NDEBearTemp x DEBearVibration x NDEBearVibration x MotorFanSpeed x

☐ Ignore TimeZone Info from DateTime values?
By default, DateTime values are assumed to be in UTC. If this option is ticked, timezone will be ignored and the app will not convert the values to local timezone.

Timeseries Settings
☒ Is Timeseries Data?

Timestamp Column
Timestamp
☒ Use Timeseries Aggregation?

Aggregation Parameters
Please make sure at least one of the return columns is of numeric data type. Aggregation is applied to numeric columns only. Grouping will be applied on the remaining return columns.
Maximum Record Count
10000

Aggregation Type
Average

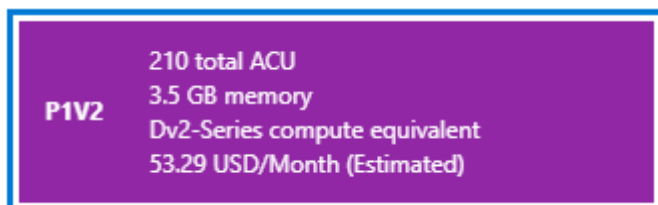
Figure 1 - ADX Connector Configuration

XMPro Environment consists of 4 components.

- Subscription Manager (SM)
- Data Stream Designer (DS)
- Application Designer (AD) V4.1.13.3 using the XMPro ADX Connector V1.92
- Stream Host (SH)

SM, DS, and AD each require Application Services and SQL databases.

SM, DS, AD and SH app service plans are configured at P1V2



SQL Databases are configured as Standard service Tier and DTU's 50 with Data Max size set to 100GB

Service and compute tier

Select from the available tiers based on the needs of your workload. The vCore model provides a wide range of configuration controls and offers Hyperscale and Serverless to automatically scale your database based on your workload needs. Alternately, the DTU model provides set price/performance packages to choose from for easy configuration. [Learn more](#)

Service tier: Standard (For workloads with typical performance requirements)

[Compare service tiers](#)

DTUs: Compare DTU options

DTUs slider: 50

Data max size (GB): 100

ADX Cluster

- Engine type – V3
- Compute Specifications – Dev (No SLA)_Standard_E2a_v4

Developer Tier

Use the Developer tier to develop and test applications. The developer tier does not offer an SLA and should not be used for applications in production.

Instance	vCPU(s)	Storage	Support SLA	Pay as you go	1 year reserved'	3 year reserved'
D11 v2	2	80 GB	None	\$135.05/month	\$64.3349/month ~52% savings	\$42.559/month ~68% savings
E2a v4	2	30 GB	None	\$91.98/month	\$54.0857/month ~41% savings	\$34.5801/month ~62% savings

ADX Database

- Retention Period – Unlimited
- Cache Period – 90 days
- Database kind – Read-Write
- Shared with others – No
- Relationship – None

Response Times – Single Chart versus Multiple Charts on a page

The 'single' vs 'multiple' timings seek to illustrate the compounding effect of adding multiple charts to a single App Page.

Single Time Series Chart

Aggregation Size 10,000
Aggregation Type Any

* Notice the 'No. of Records after Aggregation' column. Irrespective of the count of records in ADX for the specified duration, ADX connector is applying dynamic aggregation to limit the rows to the Aggregation Size specified which is 10,000 in this case.

Duration (Days)	No. of Records before Aggregation	No. of Records after Aggregation
90	11,024,694	8,488
60	8,876,316	9,985
30	5,043,638	9,961
7	1,181,126	9,915
1	168,928	9,599

Query Exec Time (In ADX Explorer Stats)	Rendering (sec)	Total Time (sec)
3.59	2.41	6
3.05	1.95	5
2.50	2.50	5
1.95	2.05	4
1.81	2.19	4
Average Time to render	3	5

Four Time Series Charts

* Average Query Exec Time is average of execution time of 4 queries that get executed, 1 for each chart. Queries are triggered asynchronously.

No. of Records after Aggregation
33,952
39,940
39,844
39,660
38,396

Average Query Exec Time (In ADX Explorer Stats) *	Rendering (sec)	Total Time (sec)
5.76	10.24	16
3.73	9.27	13
1.76	9.24	11
0.56	7.44	8
1.81	5.19	7
Average Time to render	9	11

Single Time Series Chart

Aggregation Size 50,000
Aggregation Type Any

Duration (Days)	No. of Records before Aggregation	No. of Records after Aggregation
90	11,024,694	42,310
60	8,876,316	49,794
30	5,043,638	49,772
7	1,181,126	46,523
1	168,928	43,192

Query Exec Time (In ADX Explorer Stats)	Rendering (sec)	Total Time (sec)
4.47	5.53	10
4.11	5.89	10
3.55	6.45	10
2.87	6.13	9
2.67	6.33	9
Average Time to render	7	10

Single Regular Chart

Aggregation Size 10,000
Aggregation Type Any

Duration (Days)	No. of Records before Aggregation	No. of Records after Aggregation
90	11,024,694	8,488
60	8,876,316	9,985
30	5,043,638	9,961
7	1,181,126	9,915
1	168,928	9,599

Query Exec Time (In ADX Explorer Stats)	Rendering (sec)	Total Time (sec)
3.59	7.47	11
3.05	6.98	10
2.50	7.53	10
1.95	8.11	10
1.81	7.25	9
Average Time to render	8	10

Four Regular Charts

* Average Query Exec Time is average of execution time of 4 queries that get executed, 1 for each chart. Queries are triggered asynchronously.

No. of Records after Aggregation
33,952
39,940
39,844
39,660
38,396

Average Query Exec Time (In ADX Explorer Stats) *	Rendering (sec)	Total Time (sec)
5.46	18.54	24
4.72	21.28	26
2.83	23.17	26
0.97	24.03	25
0.35	23.65	24
Average Time to render	23	25

Single Regular Chart

Aggregation Size 50,000
Aggregation Type Any

Duration (Days)	No. of Records before Aggregation	No. of Records after Aggregation
90	11,024,694	42,310
60	8,876,316	49,794
30	5,043,638	49,772
7	1,181,126	46,523
1	168,928	43,192

Query Exec Time (In ADX Explorer Stats)	Rendering (sec)	Total Time (sec)
4.38	45.62	50
4.30	42.70	47
3.39	43.61	47
2.90	43.10	46
2.63	40.37	43
Average Time to render	44	47

Single D3 Chart

Aggregation Size 10,000
Aggregation Type Any

Duration (Days)	No. of Records before Aggregation	No. of Records after Aggregation
90	11,024,694	8,488
60	8,876,316	9,985
30	5,043,638	9,961
7	1,181,126	9,915
1	168,928	9,599

Query Exec Time (In ADX Explorer Stats)	Rendering (sec)	Total Time (sec)
3.58	3.42	7
3.06	3.94	7
2.50	3.50	6
1.92	3.08	5
1.78	3.22	5
Average Time to render	4	6

Four D3 Charts

* Average Query Exec Time is average of execution time of 4 queries that get executed, 1 for each chart. Queries are triggered asynchronously.

No. of Records after Aggregation
33,952
39,940
39,844
39,660
38,396

Average Query Exec Time (In ADX Explorer Stats) *	Rendering (sec)	Total Time (sec)
5.94	9.06	15
3.43	12.57	16
2.83	9.20	12
0.97	10.74	12
0.35	10.11	11
Average Time to render	11	14

Single D3 Chart

Aggregation Size 50,000
Aggregation Type Any

Duration (Days)	No. of Records before Aggregation	No. of Records after Aggregation
90	11,024,694	42,310
60	8,876,316	49,794
30	5,043,638	49,772
7	1,181,126	46,523
1	168,928	43,192

Query Exec Time (In ADX Explorer Stats)	Rendering (sec)	Total Time (sec)
4.42	14.58	19
4.13	12.87	17
3.40	13.60	17
2.83	13.17	16
2.63	13.37	16
Average Time to render	14	17