The Impact of GPUs for Geovisualization for Government

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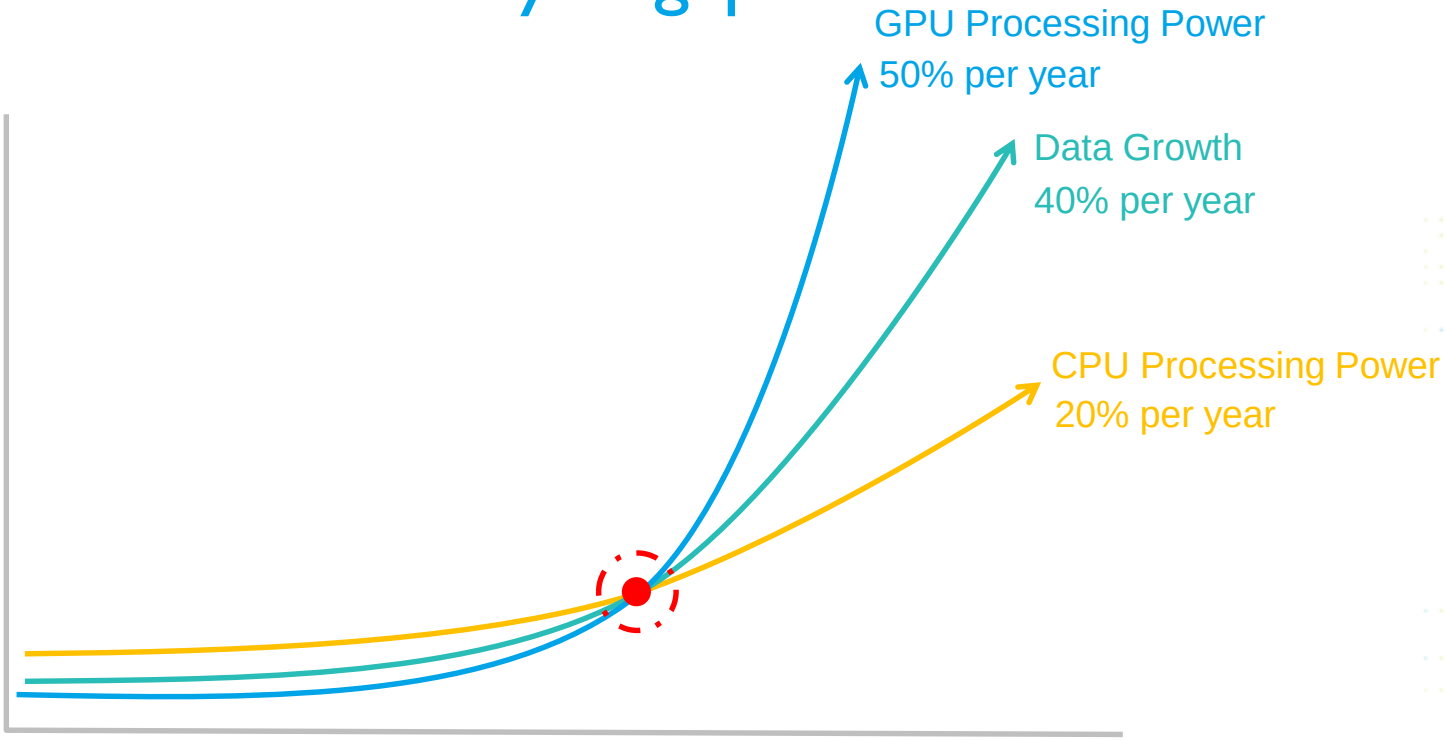
GPUs close the analytic gap

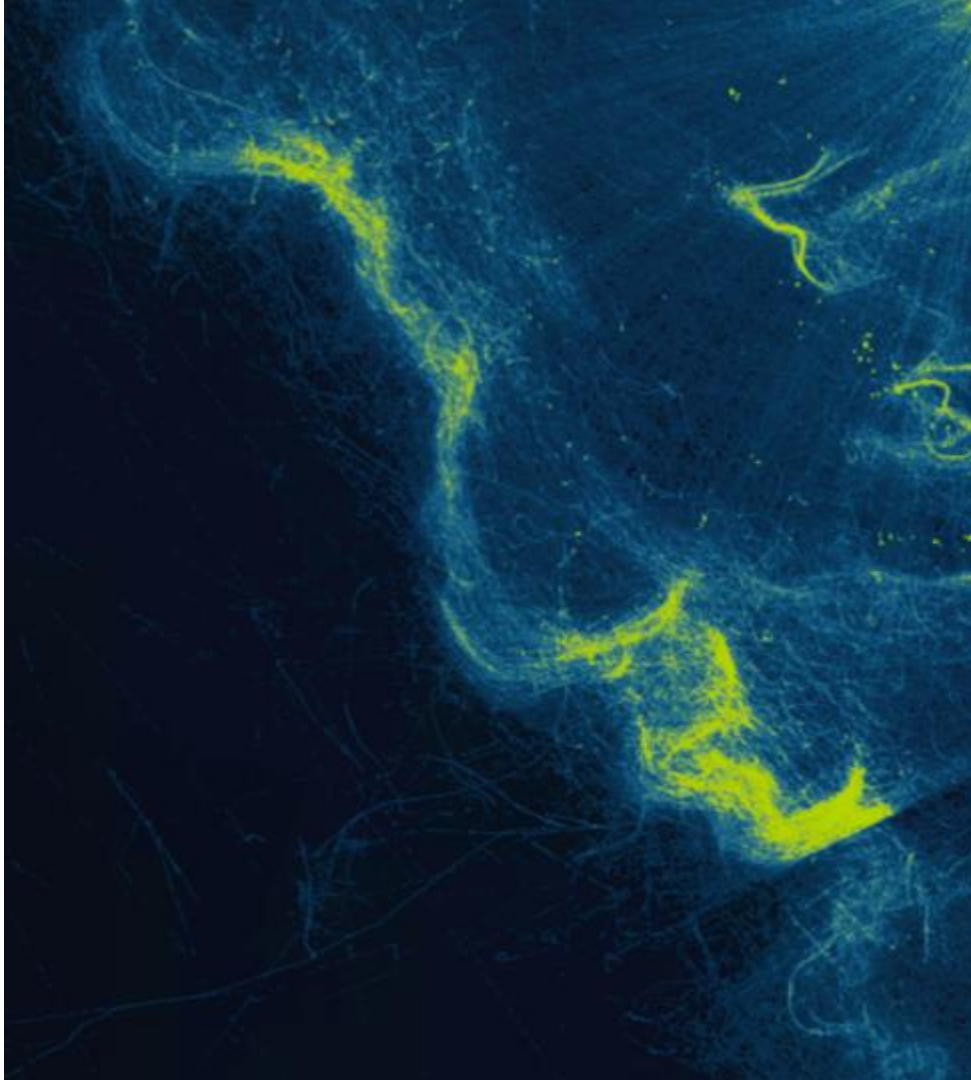


MapD Core

The fastest
analytic database,
architected on GPUs

MapD Immerse

A visualization client,
accelerating interaction
with billion-row datasets

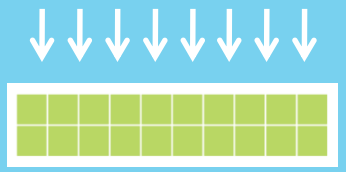


DEMO

GPU speed: core density and parallel processing

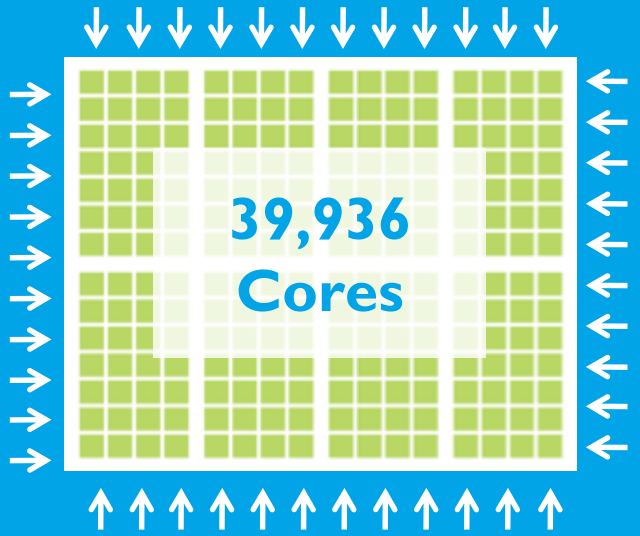
CPU Processing

(Traditional)



20 Cores

GPU Processing



MapD queries are orders of magnitude faster

Blogger Mark Litwintschik benchmarked MapD on a billion-row taxi data set and found it to be **up to 12,500x faster than the fastest CPU databases**

Query 1	Query 2	Query 3	Query 4	Setup
0.021	0.053	0.165	0.51	MapD & 8 Nvidia Pascal Titan Xs
0.027	0.083	0.163	0.891	MapD & 8 Nvidia Tesla K80s
0.028	0.2	0.237	0.578	MapD & 4-node g2.8xlarge cluster
0.034	0.061	0.178	0.498	MapD & 2-node p2.8xlarge cluster
0.036	0.131	0.439	0.964	MapD & 4 Nvidia Titan Xs
0.051	0.146	0.047	0.794	kdb+/q & 4 Intel Xeon Phi 7210 CPUs
0.762	2.472	4.131	6.041	BrytlytDB & 2-node p2.16xlarge cluster
1.034	3.058	5.354	12.748	ClickHouse, Intel Core i5 4670K
1.56	1.25	2.25	2.97	Redshift, 6-node ds2.8xlarge cluster
2	2	1	3	BigQuery
4	4	10	21	Presto, 50-node n1-standard-4 cluster
6.41	6.19	6.09	6.63	Amazon Athena
8.1	18.18	n/a	n/a	Elasticsearch (heavily tuned)
10.19	8.134	19.624	85.942	Spark 2.1, 11 x m3.xlarge cluster w/ HDFS
11	10	21	31	Presto, 10-node n1-standard-4 cluster
14.389	32.148	33.448	67.312	Vertica, Intel Core i5 4670K
34.48	63.3	n/a	n/a	Elasticsearch (lightly tuned)
35	39	64	81	Presto, 5-node m3.xlarge cluster w/ HDFS
43	45	27	44	Presto, 50-node m3.xlarge cluster w/ S3
152	175	235	368	PostgreSQL 9.5 & cstore_fdw
264	313	620	961	Spark 1.6, 5-node m3.xlarge cluster w/ S3

Source: http://tech.marksblogg.com/benchmarks.html

MapD Core: Comparative Query Acceleration*

System	Query 1	Query 2	Query 3	Query 4
BrytlytDB & 2-node p2.16xlarge cluster	36x	47x	25x	12x
ClickHouse, Intel Core i5 4670K	49x	58x	32x	25x
Redshift, 6-node ds2.8xlarge cluster	74x	24x	14x	6x
BigQuery	95x	38x	6x	6x
Presto, 50-node n1-standard-4 cluster	190x	75x	61x	41x
Amazon Athena	305x	117x	37x	13x
Elasticsearch (heavily tuned)	386x	343x	n/a	n/a
Spark 2.1, 11 x m3.xlarge cluster w/ HDFS	485x	153x	119x	169x
Presto, 10-node n1-standard-4 cluster	524x	189x	127x	61x
Vertica, Intel Core i5 4670K	685x	607x	203x	132x
Elasticsearch (lightly tuned)	1,642x	1,194x	n/a	n/a
Presto, 5-node m3.xlarge cluster w/ HDFS	1,667x	735x	388x	159x
Presto, 50-node m3.xlarge cluster w/ S3	2,048x	849x	164x	86x
PostgreSQL 9.5 & cstore_fdw	7,238x	3,302x	1,424x	722x
Spark 1.6, 5-node m3.xlarge cluster w/ S3	12,571x	5,906x	3,758x	1,884x

**All speed comparisons are to the "MapD & 8 NVIDIA Pascal Titan Xs" benchmark*

Common use cases

Powering analytics beyond the limits of CPUs

FINANCIAL SERVICES

Trading model acceleration
Loss prevention
Fraud anomaly detection

TELECOMMUNICATIONS

Network optimization
Know your customer
NOC/SOC monitoring

FEDERAL

Geospatial intelligence (GEOINT)
Cyber security
Disaster command center

ENERGY

Well log analytics
Smart meter analytics
Field service management

TRANSPORTATION

Real-time fleet monitoring
Incentive-based insurance
Smart cities

ADTECH

Segmentation analytics
Ad pricing and placement
Behavioral insights

About MapD

Investors

$25 million Series B in March 2017

Customers, Team and Community

- May 2017 – MapD Core open sourced
- April 2017 – MapD 3.0 with distributed core and HA
- Founding member of GPU Open Analytics Initiative (GOAI)
- Available on AWS, Azure and GCP public cloud platforms


Q & A