Kx Technology

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March 2nd 2016

TCO

- Hardware

- Software

- Operational

Data Platforms Map
June 2015

451 Research

Non-relational zone

Relational zone

Grid/cache zone

KX SYSTEMS

Know Your Hardware

Hardware - Memory

- 1TB RAM is now "commodity"
- Multi TB RAM already here
- In-Memory Compression
- Transactional Memory

Hardware - Storage

- NVDIMM

- NVME/Flash SSD/HDD

- SAN/NAS/DAS

- Hyper-Converged

- Compression

Hardware - Parallelism

- Multi-Core

- Vector Instructions

- Multi-Machine

- Distributed/Parallel File Systems

IoT

- Time-Series
  - Structured/Semi-Structured
- Analytics at the Edge
  - Small Footprint
  - ARM/Intel Quark
- Streams
- Micro batches

About Kx

- Offices in North America, Europe & Asia

- Part of First Derivatives Group

- Large user community

- Finance, Energy/Utilities, Oil/Gas, Pharmaceuticals, Software and Telco

- Widely adopted in financial services for over two decades

US Equity/Index Options
Daily Quote Counts (Billions)
Through 2-Oct-2015

Nanex
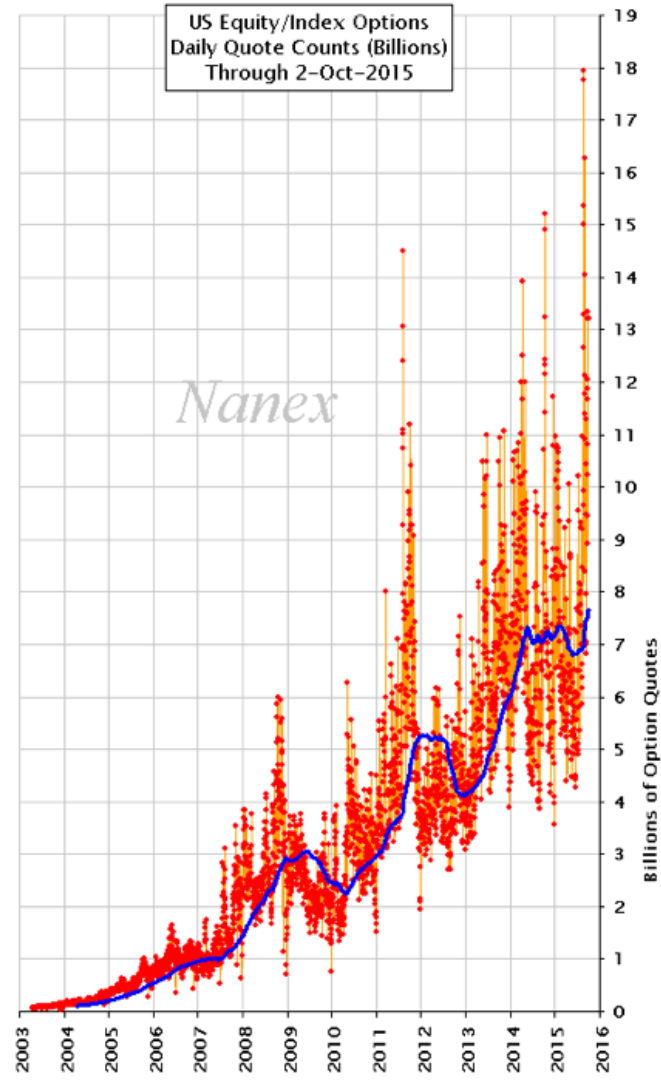
Streaming, Real-Time and Historical Data

DevOps Borat @DEVOPS_BORAT   18h
Small Data is when is fit in RAM. Big Data is when is crash because
is not fit in RAM.
Expand

kdb+

- Integrated Database and Programming System

- 32 bit free version

- 64 bit licensed version

Features

- Standard OS and Hardware

- In-Database Analytics

- Compression

- Parallelism

- Columnar/Relational/Key-Value

APIs

- Language Support: C#, C++, Java, JavaScript, R etc.
- Community Language Support: Python, Scala, NodeJS, PHP, Erlang etc.
- Interfaces: ODBC, JDBC, HTTP & WebSockets

Sample Architecture
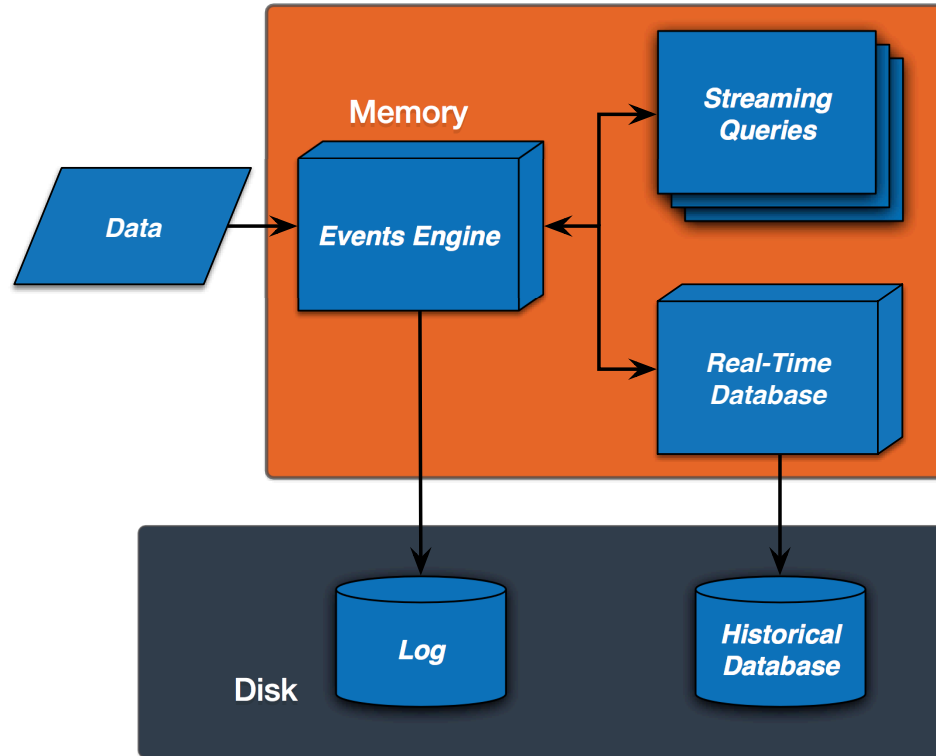
q programming language

- SQL (with extensions)
- Vector/Array Operations
- Native Time-Series Support
- Functional Language Features

Sample q query

```
select open: first price, high: max price, low:
min price, close: last price from trade where
date = 2013.05.01, sym = `AAPL
```

open	high	low	close
83.85	85.9	83.28	85.45

Parallelism in q

Serial:

```
calcEvent each eventTypes
```

Parallel:

```
calcEvent peach eventTypes
```

Time-Series Analysis

- Native Temporal Data Types
- High-Precision (ns)
- Temporal Arithmetic
- Asof Join/Bi-Temporal Joins
- Join Time-Series On-The-Fly

Time-Series Analysis cont'd

```
select count i by userAgent,5 xbar time.minute from
events where date within (.z.D - 7;.z.D),
eventType=`login


aj[`time; select time,price from trade where
date=last date,sym=`MSFT; select time,bid,ask from
quote where date=last date,sym=`MSFT]
```

q v Hive ETL comparison

```
q:
`product_dtl set ("ISFS"; enlist ",") 0: `input.txt;


Hive:

create table product_dtl ( product_id: int, product-name:
string, product_price: float, product_category: string)
rows format delimited fields terminated by ',' ;

describe product_dtl;

load data local inpath 'input.txt' into table product_dtl;

Hive —f /home/cloudera/sample.sql
```

STAC Benchmarks

Items involving Kx Systems

Kx Systems

Search reports related to this vendor...

SUT ID: KDB141211 | STAC-M3

Kx Systems kdb+ 3.2 with Intel SSD DC P3700 on Lenovo System x3850 X6

Post date: Thursday, January 22, 2015 - 08:31

Read more

Filter by :

☐ Domain

SUT ID: KDB140603 | STAC-M3

STAC-M3 / kdb+ 3.1 with HGST FlashMAX II on IBM x3750 M4

Post date: Thursday, June 26, 2014 - 23:27

Read more

SUT ID: KDB140522 | STAC-M3

STAC-M3 Kx Systems kdb+ 3.1 with Intel SSD DC P3700 on IBM

Demo
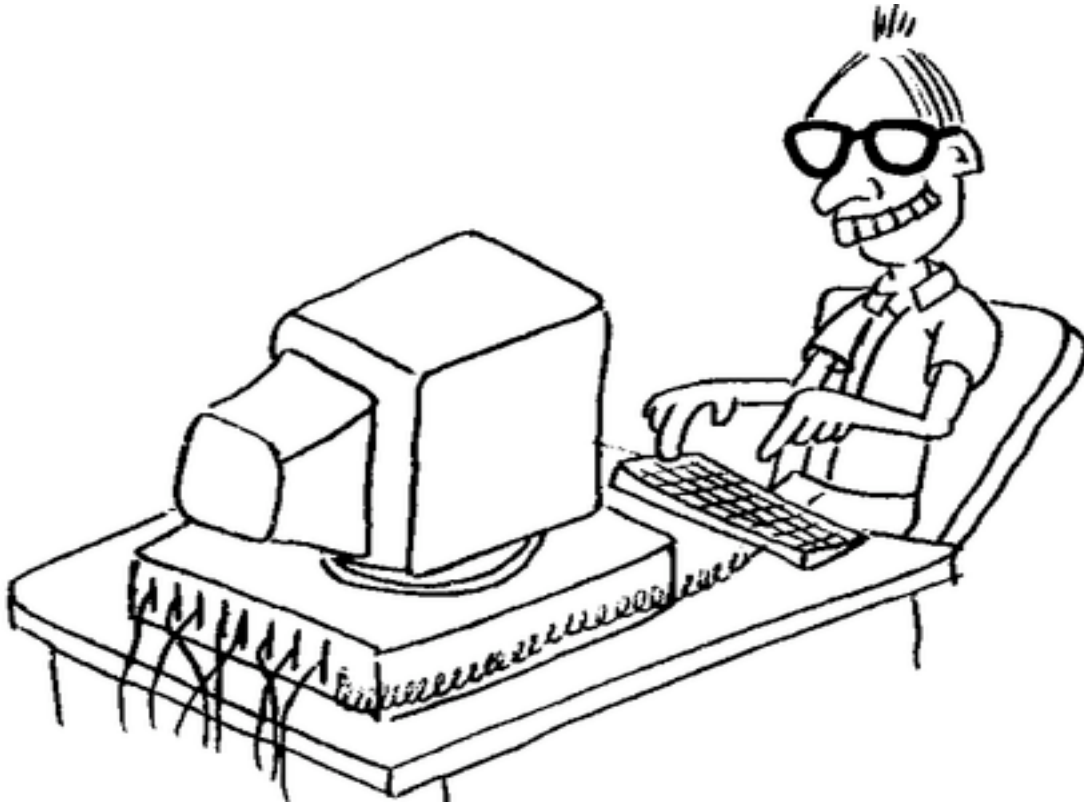
Summary

- Big Fast Data
  - Scalability
  - High Throughput/Low Latency
- IoT
  - Time-Series
  - Small Footprint
- Lower TCO
  - Efficient Software
  - Less Hardware

Resources – Wiki Page

Page **Discussion**   **Read** **View source** **View history** | compression | **Go** | **Search** |

Main Page

Welcome to the Kx wiki. See About for an overview of the wiki and how to edit the pages.

It is a good idea to familiarise yourself with how the search function works. The default operation when inputing search strings and pressing enter is to run the "Go" function as opposed to the "Search" function.

Wiki Pages:

- **Show Me:** gets you started and shows the performance and language of kdb+
- **Tutorials:** tutorials on using kdb+
- **Reference:** an online kdb+ reference
- **Cookbooks:** a collection of how-to guides on kdb+
- **Articles:** a collection of articles and useful links
- **Contrib:** guides to the contrib area of the code repository

Other Links:

- **Code repository:** the Kx community subversion repository
- **Kdb+ utilities:** a versioned mirror of the kx.com/q directory
- **Kx Home:** Kx website

Navigation

Reference
Cookbooks
Articles
Try It Out
Tutorials
Contrib
Code repository
Recent changes
Random page

Toolbox

What links here
Related changes
Special pages

Resources – Kx Community

Resources – Forum & Google Group

Resources – Github

Kx user contributions on **GitHub**

| Documentation | Kx Community | Free kdb+ |

▶ **Subscribe here** to the Kx Community newsletter.
▶ **Email us** if you would like to list your Kx-related GitHub code.

exxeleron **/enterprise-components** exxeleron enterprise components for kdb+, a brand of DEVnet	**CharlesSkelton** **/studio** studio for kdb+	**geocar** **/qnode** kdb+ client for NodeJS	**psaris** **/qtips** Nick Psaris' Q Tips code
yang-guo threads, qml, conn, timer, qp	**exxeleron** **/qPython** DEVnet's interprocess communication between Python and kdb+	**enlnt** **/pyq** Python interface to the Q language	**AffinitySystems** **/qprof** q code profiler
AquaQAnalytics **/mongoo** AquaQ Analytics' C shared lib along with associated q functions to allow push/pull access to mongoDB from within kdb+	**zholos** **/qml** math library for kdb+	**openfin** **/fin-hypergrid/q** OpenFin q subsection	**geocar** **/qphp** kdb+ client for PHP

Resources – Q For Mortals
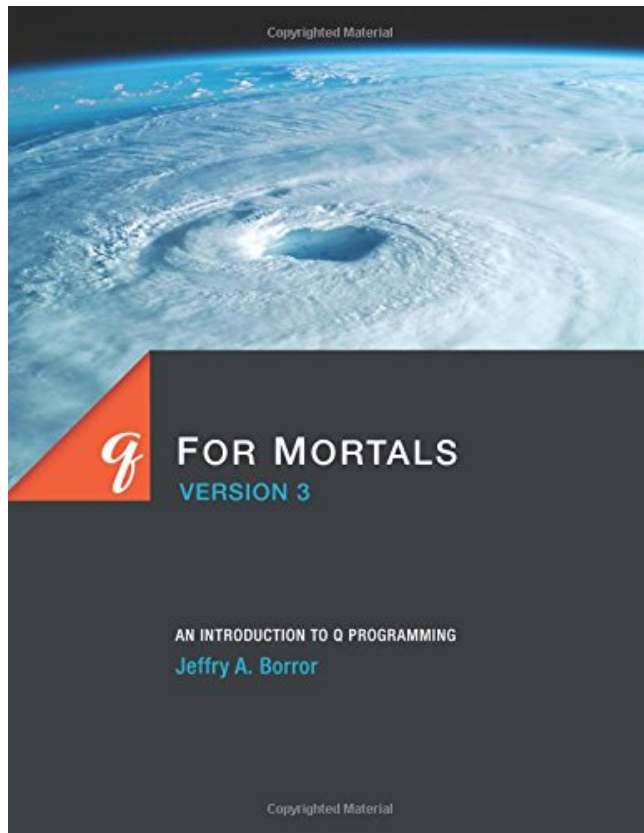
Resources – Q Tips
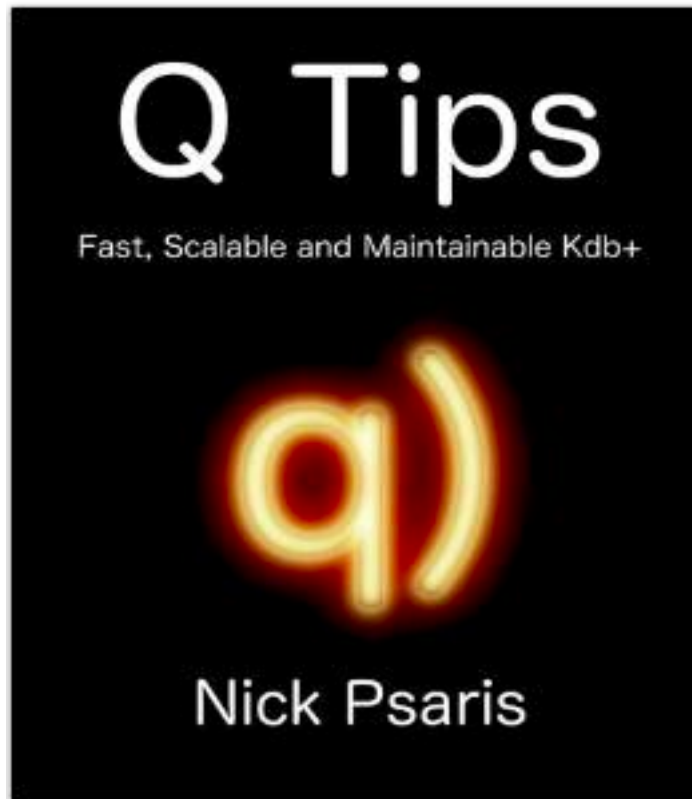
Resources – Free 32-bit download

Resources – Kx Community Meetups

Resources – FD Lecture Series

Appendix

- [Kx Wiki](#)
- [Kx Community](#)
- [Google Group](#)
- [Kx Github](#)
- [Q For Mortals](#)
- [Q Tips](#)
- [STAC benchmarks](#)
- [Free version](#)
- [Kx Meetups](#)
- [FD Lecture Series](#)

Image Sources

- navalarchitecture.tumblr.com

- discardingimages.tumblr.com

- xkcd.com

- despair.com