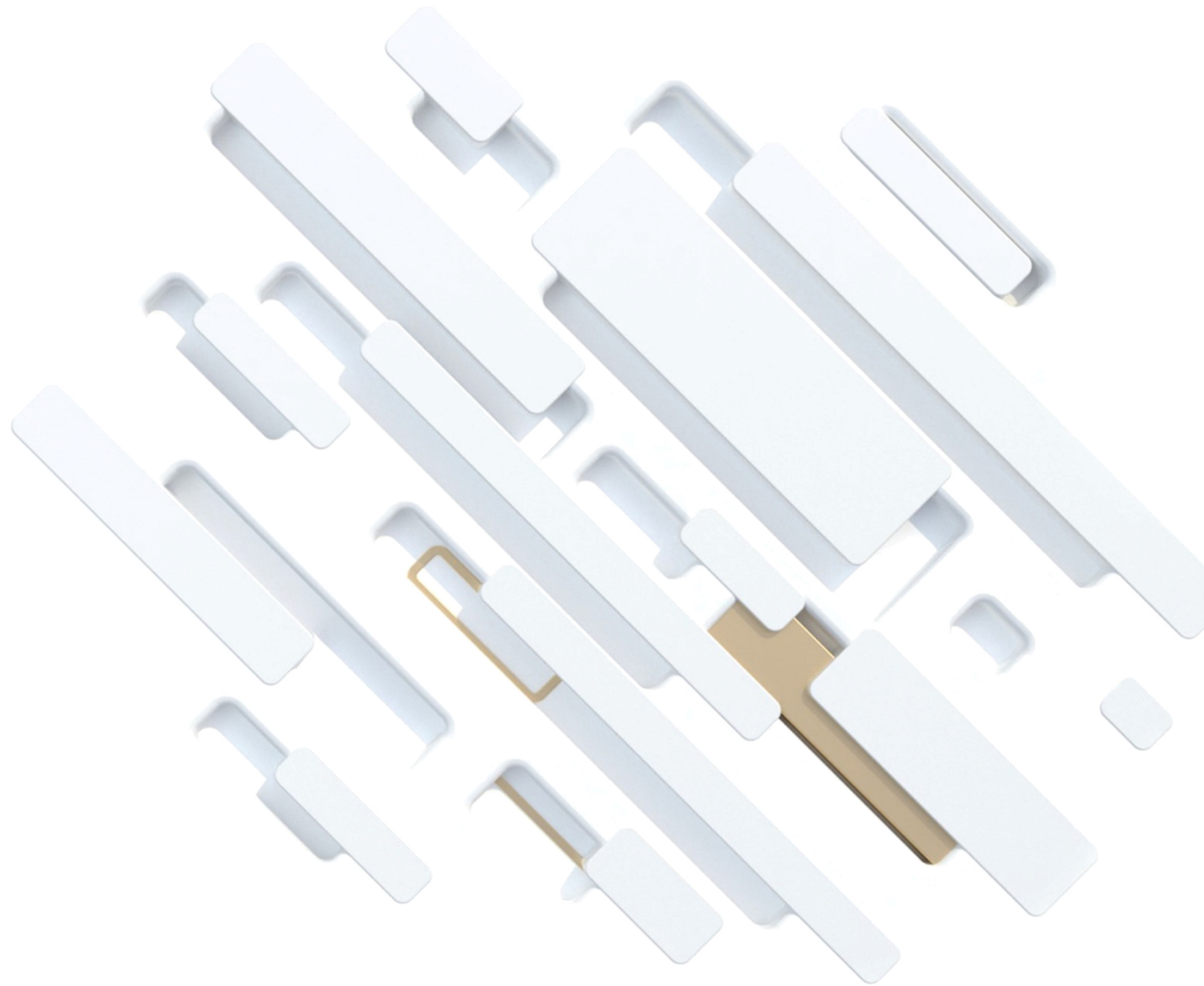WEKA

WekaFS™ For Financial Analytics

Barbara Murphy

VP of Marketing

Weka is an Enterprise POSIX Parallel File System

Introducing WekaFS – the Weka File System	Problems solved With WekaFS
Scalable NVMe-based, high-performance storage • Shared file system with the cache coherency of DAS and SAN • Effortlessly presents petascale data set to applications • Fully saturates compute resources for great efficiency • Seamlessly handles large and small files • Fully cloud enabled for hybrid or public cloud deployments	Faster wall clock time Simpler to manage at scale No performance tuning required Lowers the overall cost of infrastructure Ability to run more on-demand models
Integrated object-based data lake with seamless movement of data between hot and cold data	Best cost for multi-petabyte data sets Data is always available to the applications Models can source far more market indicators

IO500

This is the official list from 🌐 Supercomputing 2019. The list shows the best result for a given combination of system/institution/filesystem.
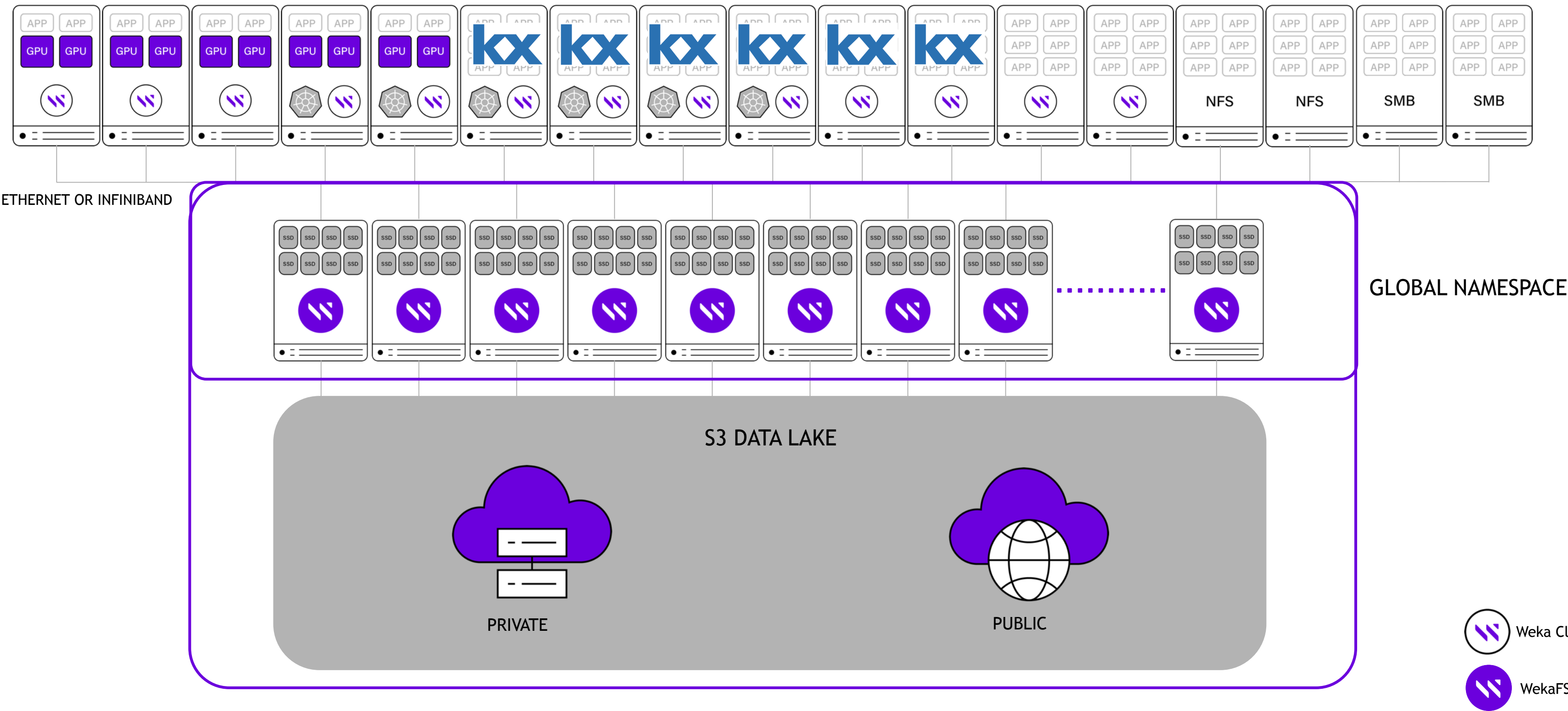
Please see also the 10 node challenge ranked list.

https://www.vi4io.org/std/io500/start

IO^{500}

#	list id	institution	system	storage vendor	filesystem type	client nodes	client total procs	data	score	bw GiB/s	md kIOP/s
1	sc19	WekaIO	WekaIO on AWS	WekaIO	WekaIO Matrix	345	8625	zip	938.95	174.74	5045.33
2	sc19	Intel	Wolf	Intel	DAOS	26	728	zip	933.64	183.36	4753.79
3	sc19	National Supercomputing Center in Changsha	Tianhe-2E	National University of Defense Technology	Lustre	480	5280	zip	453.68	209.43	982.78
4	sc19	NVIDIA	DGX-2H SuperPOD	DDN	Lustre	10	400	zip	249.50	86.97	715.76
5	sc19	University of Cambridge	Data Accelerator	Dell EMC	Lustre	128	2048	zip	229.45	131.25	401.13
6	sc19	CEA	Tera-1000	DDN	Lustre	128	4096	zip	210.26	81.01	545.74

#1 on Overall Score
#1 on Metadata

WEKA

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The Weka File System in a Production Environment

ETHERNET OR INFINIBAND

GLOBAL NAMESPACE

S3 DATA LAKE

PRIVATE

PUBLIC

Weka Client

WekaFS

Customer Success

Quantitative Trader

Problem: Needed DAS performance but kept burning out local server NVMe drives
With Weka File System - 3x Faster than DAS and scales effortlessly

Quantitative Trader

Problem: Wanted to move market analysis with kdb+ to AWS but no solution was performant
WekaFS on AWS provides higher performance than on-premises with easy dev-test environment

Major Bank

Problem: Have a single scale-up expensive Kx kdb+ server with everyone waiting in queue
Weka File System enables scale-out of kdb+ time series analysis

WEKA

HPE + Weka Solution (KDB200401): Key products

- STAC-M3™ Packs for kdb+ Rev 3.0 Antuco * Kanaga, Compatibility Rev E

- kdb+ 3.6 running in distributed mode

- 14 x HPE ProLiant XL170r Gen10 database servers

- 18 x HPE ProLiant XL170r Gen10 storage cluster servers

- WekaIO WekaFS Storage Software Release v3.6.2

- Mellanox SB7790 36-port Non-blocking Externally-managed EDR 100Gb/s InfiniBand Switch

* Full STAC® Report report at: SUT ID KDB200401
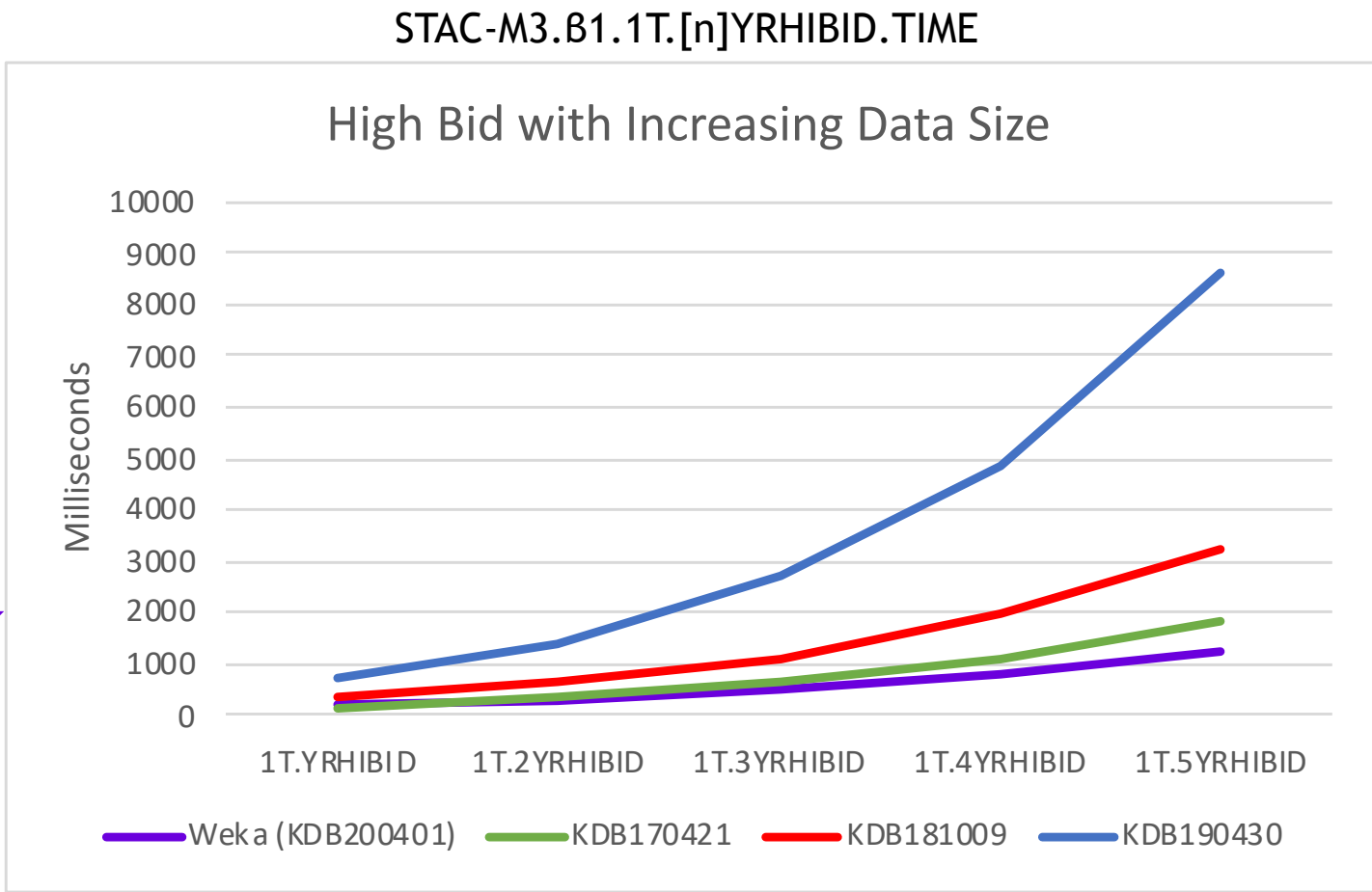
Record Performance for Read Intensive Benchmarks

- Outperformed all publicly disclosed results in **11 of 24** Kanaga mean-response time (MRT) benchmarks:

  - **100-user 12-day VWAB:** all 5 benchmark years (STAC-M3.ß1.100T.YR[n].VWAB-12D-HO.TIME)

  - **50-user 12-day VWAB:** benchmark years 4 and 5 (STAC-M3.ß1.50T.YR4VWAB-12D-HO.TIME and STAC-M3.ß1.50T.YR5VWAB-12D-HO.TIME).

  - **Multi-year high bid:** all 4 multi-year spans (STAC-M3.ß1.1T.[n]YRHIBID.TIME)

- Outperformed all publicly disclosed results in **5 of 5** Kanaga throughput benchmarks
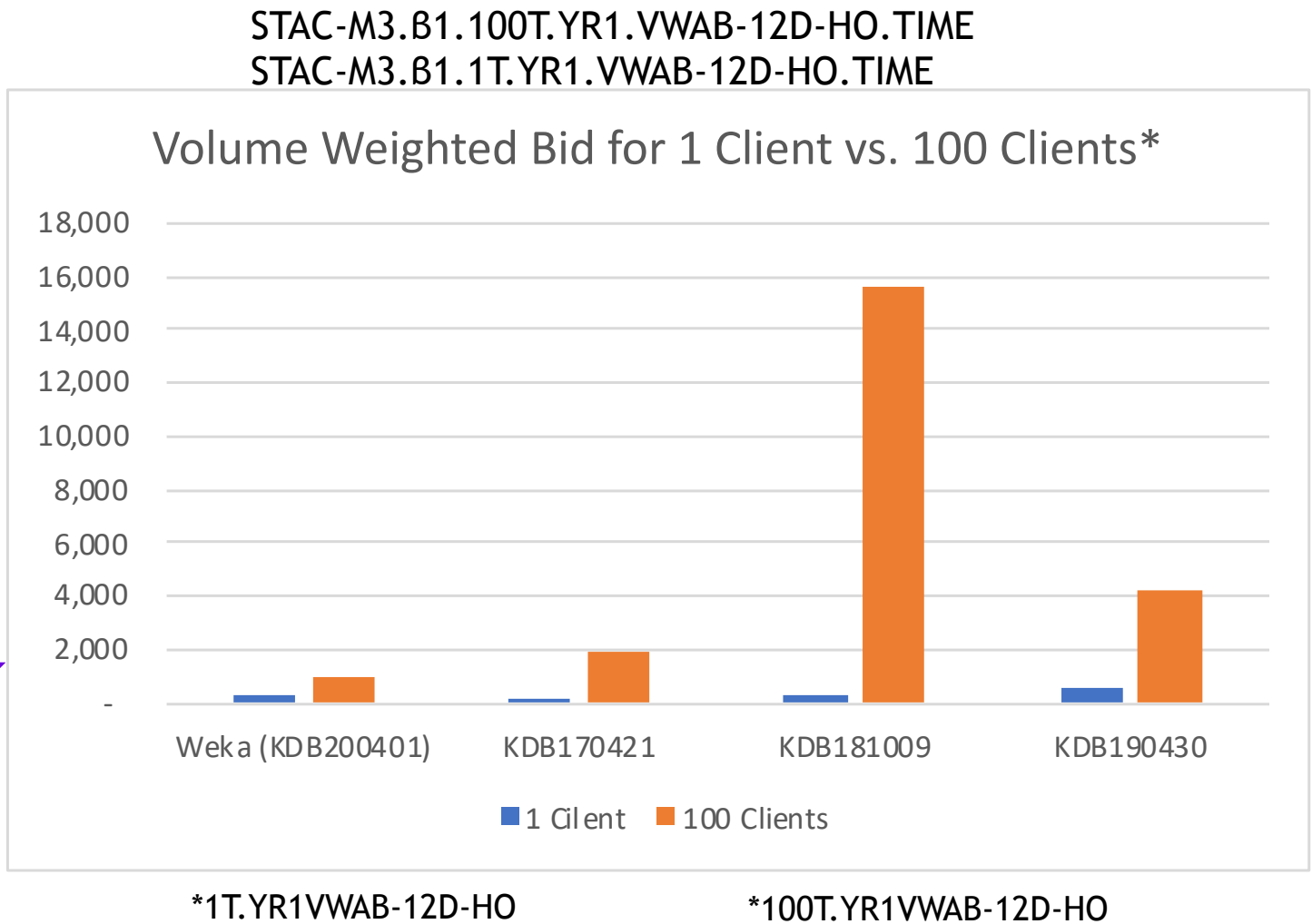
  - STAC-M3.ß1.1T.*.BPS

Compared to other solutions

- Versus a kdb+ solution involving an all-flash NAS and 4 database nodes (SUT ID KDB190430):
  - was faster in all **24 Kanaga MRT benchmarks**; and
  - was faster in 15 of 17 MRT Antuco benchmarks, including:
    - 8.8x speedup in 100-user interval stats (STAC-M3.ß1.100T.STATS-UI.TIME)
    - 4.5x speedup in 10-user aggregate stats (STAC-M3.ß1.10T.STATS-AGG.TIME)

- Versus a kdb+ solution involving a single server with direct-attached Intel Optane and 3D-NAND Flash SSD (SUT ID KDB181009):
  - was faster in **19 of 24 Kanaga MRT benchmarks**, including:
    - 20.3x speedup in STAC-M3.ß1.100T.YR2VWAB-12D-HO.TIME; and
  - was faster in 4 of 17 MRT Antuco benchmarks.

- Versus a kdb+ solution involving a Fibre Channel-connected flash array and 4 database nodes (SUT ID KDB170421):
  - was faster in **12 of 24 Kanaga MRT benchmarks**; and
  - was faster in 3 of 17 Antuco MRT benchmarks.

WEKA

Record-Breaking Performance on STAC-M3

STAC-M3.ß1.100T.YR1.VWAB-12D-HO.TIME
STAC-M3.ß1.1T.YR1.VWAB-12D-HO.TIME

STAC-M3.ß1.1T.[n]YRHIBID.TIME

High Bid with Increasing Data Size

Lower is better

Milliseconds

10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0

1T.YRHIBID 1T.2YRHIBID 1T.3YRHIBID 1T.4YRHIBID 1T.5YRHIBID

—— Weka (KDB200401) —— KDB170421 —— KDB181009 —— KDB190430

Volume Weighted Bid for 1 Client vs. 100 Clients*

Lower is better

18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
-

Weka (KDB200401) KDB170421 KDB181009 KDB190430

■ 1 Client ■ 100 Clients

*1T.YR1VWAB-12D-HO   *100T.YR1VWAB-12D-HO

WekaFS gives users the ability to scale to high concurrency for small and large data

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