

Software-Defined Servers

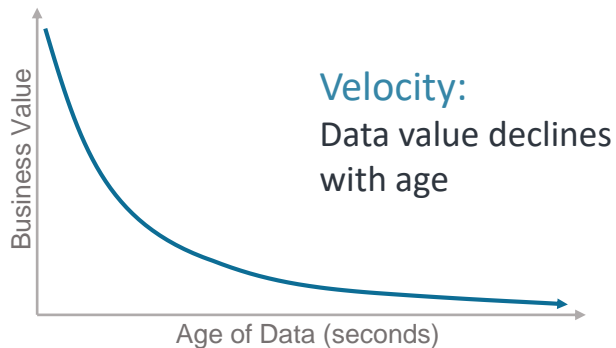
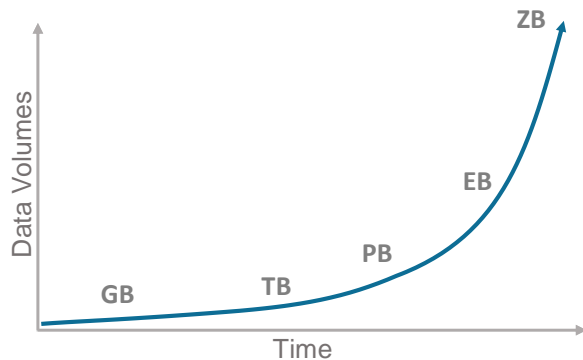
A Game Changer for Financial Analytics

Dr. Ike Nassi
Founder & CTO
TidalScale, Inc.

TidalScale

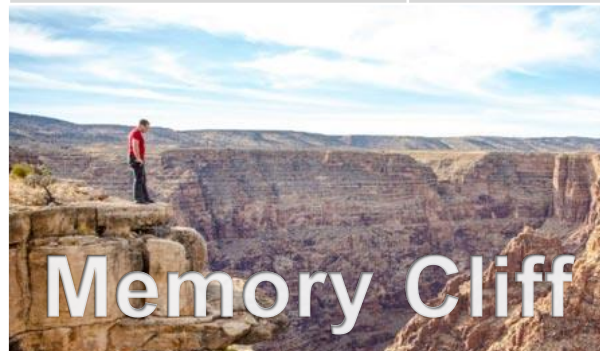
The Problem

Variety & Volume: Data growing at 62% CAGR



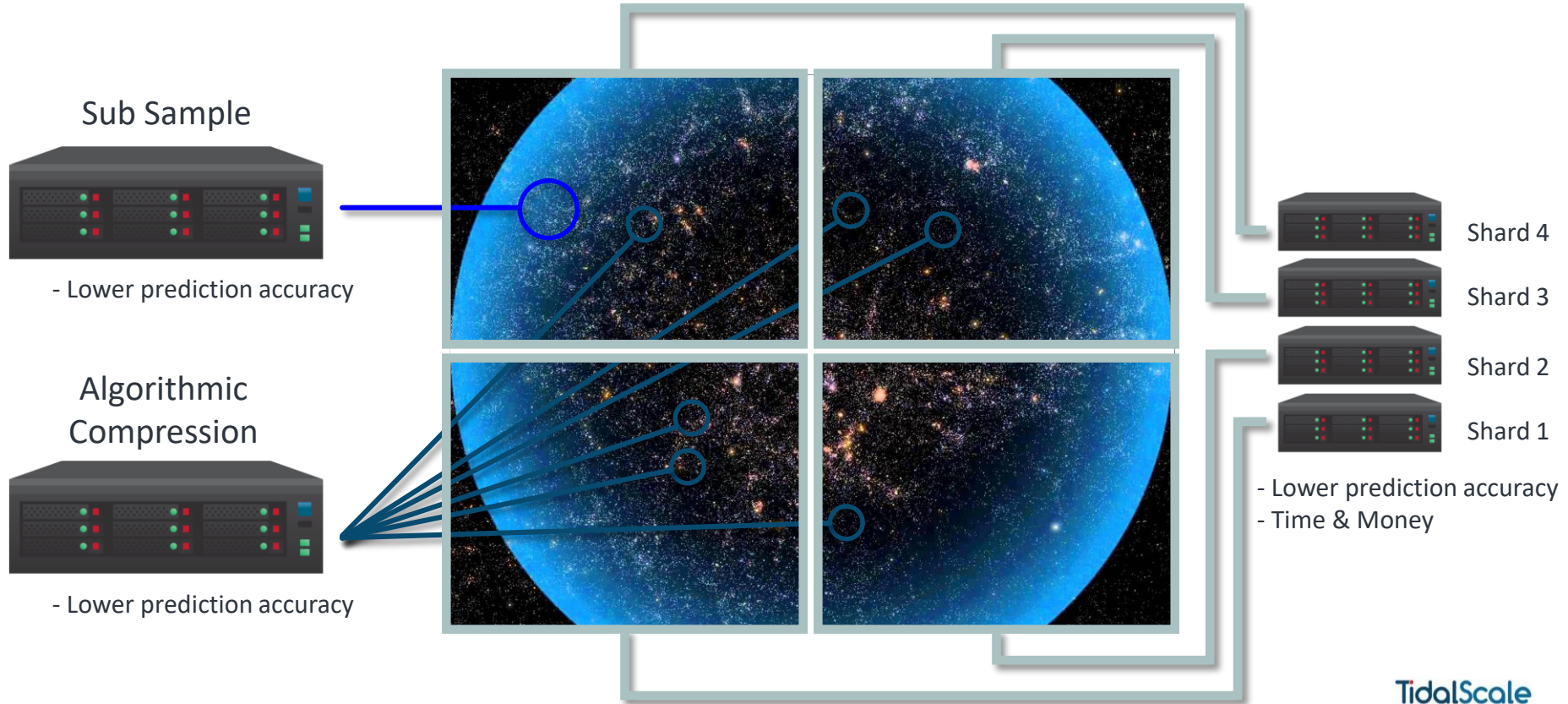
In-Memory Computing is Key

Operation	Processing Latency
L1-L3 Cache	1-13 ns
DRAM	50 ns

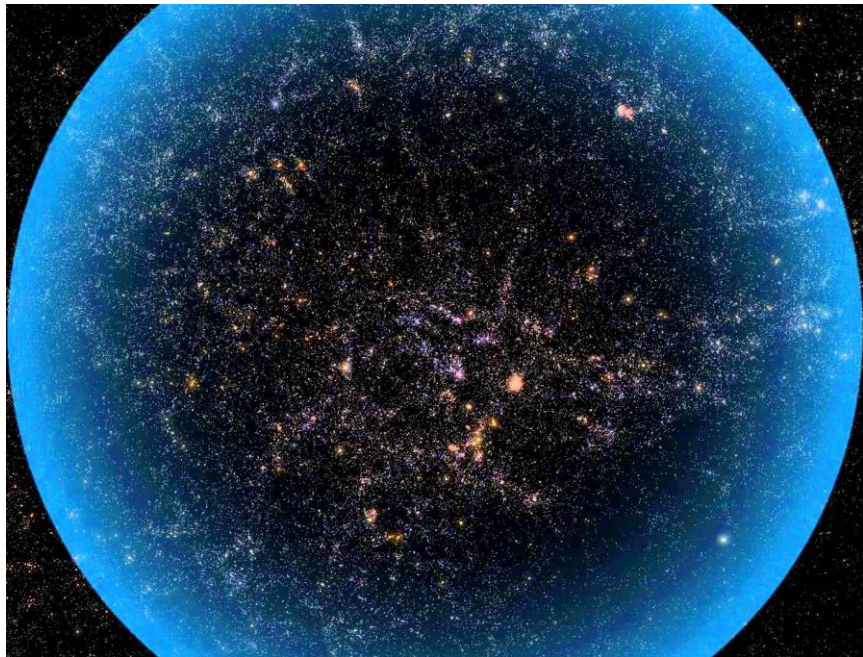


NVMe Flash	150 μ s
Flash Array	1 ms
Hard Drive	5 ms
TCP packet retransmit	2 s

Current Approaches



What If Servers were Software-Defined?

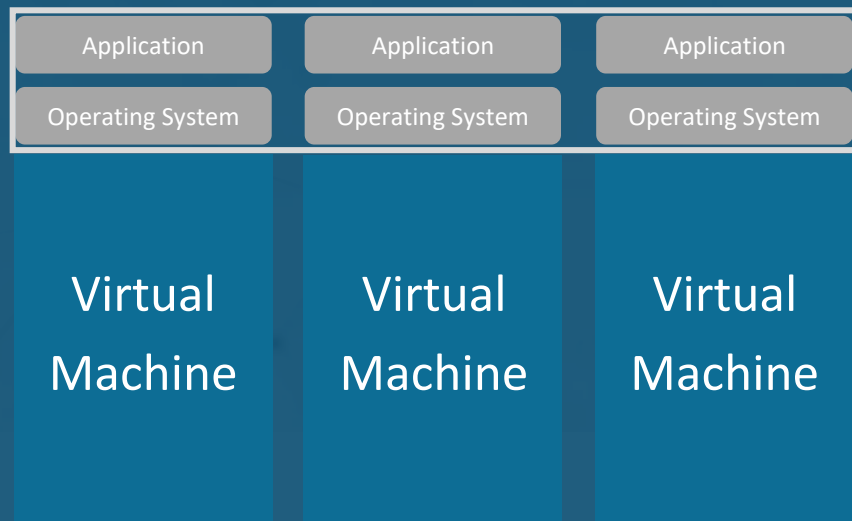


- In-memory performance at scale
- As many cores as needed
- Self optimizing
- Everything just works
- Uses standard hardware

TidalScale
Software-Defined Servers

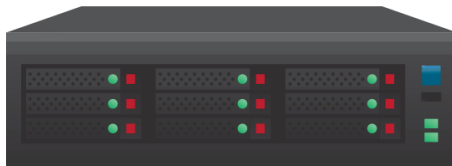
Traditional Virtualization

Virtual



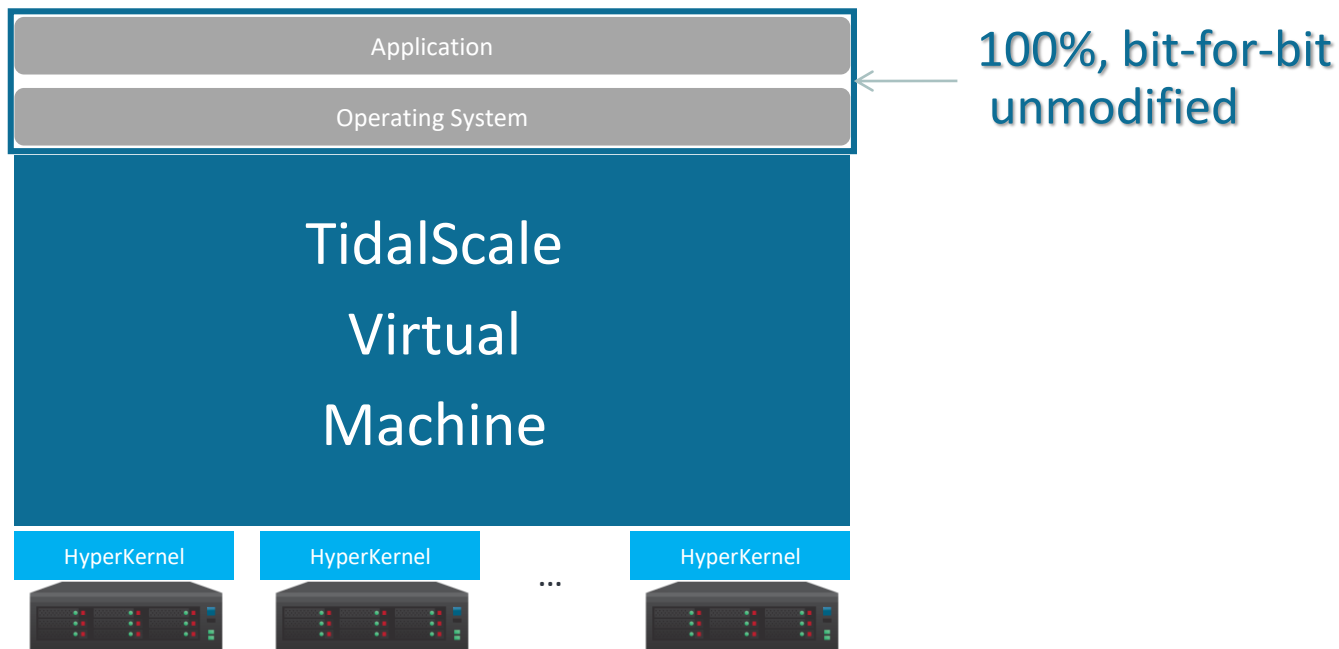
100%, bit-for-bit
unmodified

Physical



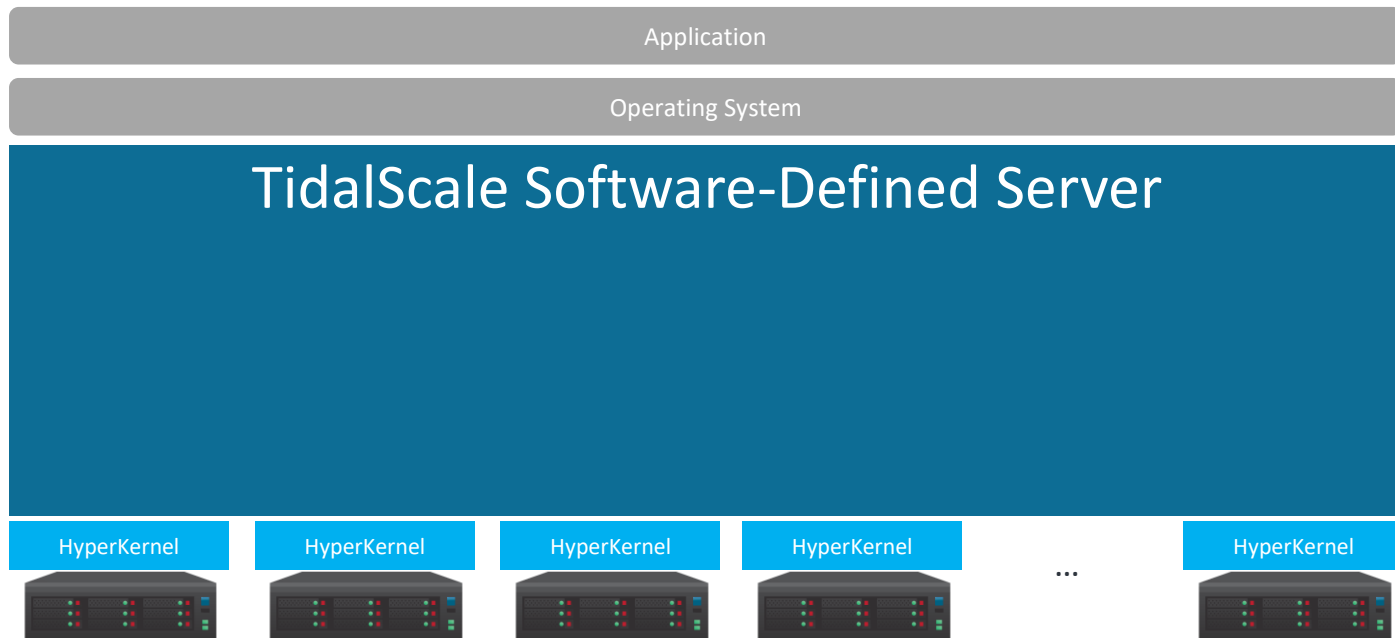
Multiple virtual machines share a
single physical server

TidalScale: Software-Defined Servers



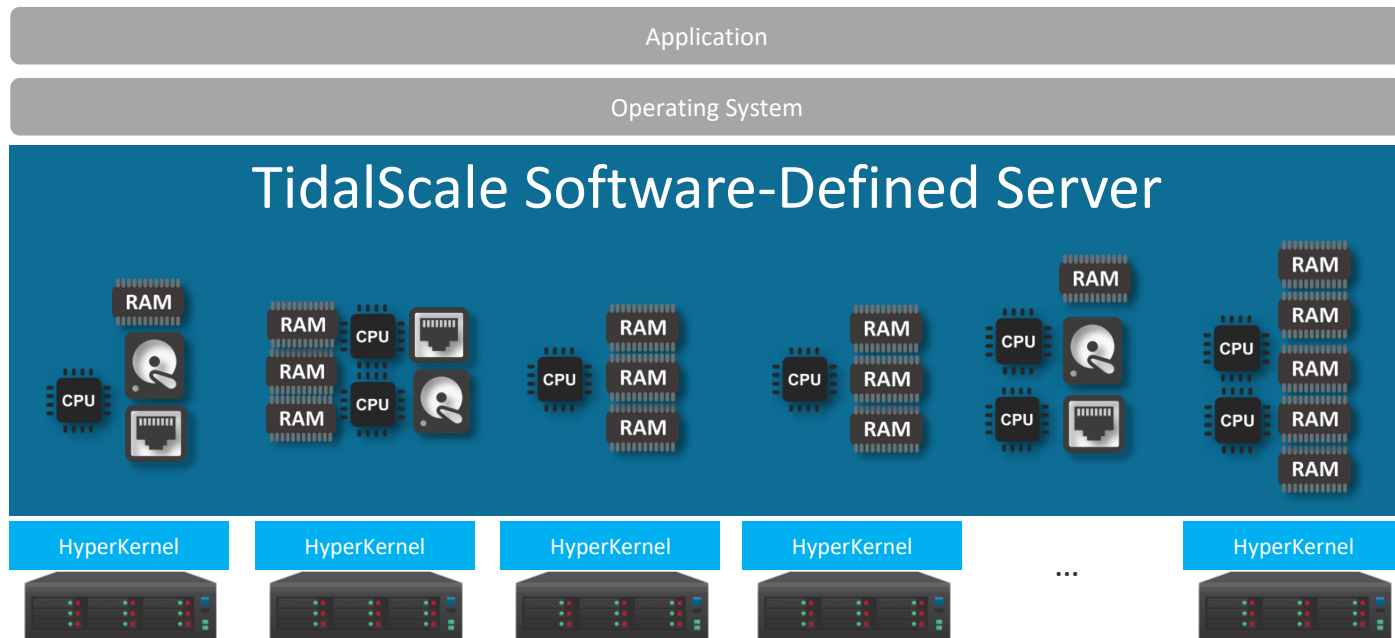
Single virtual machine spans multiple physical servers

Seamless Scalability



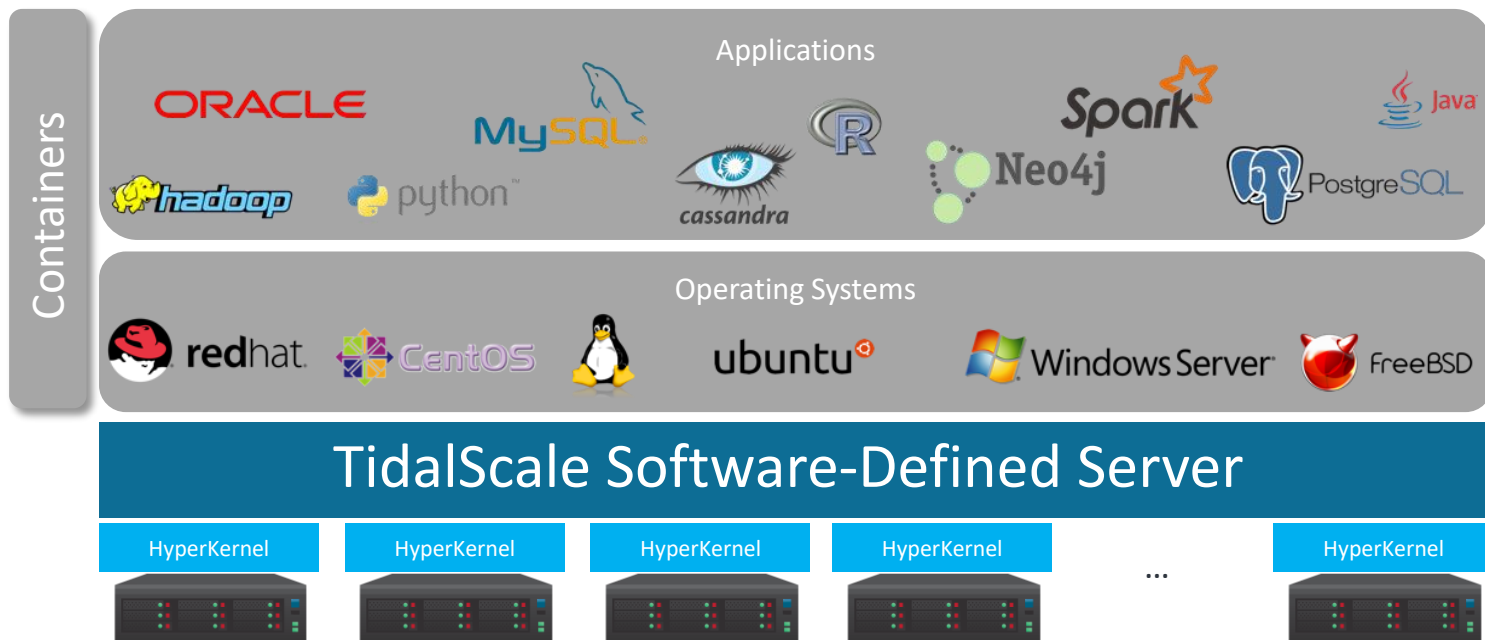
Flexible – Scales Up or Down Quickly

Machine Learning Driven Self-Optimization



Uses patented machine learning to transparently align resources

100% Compatible

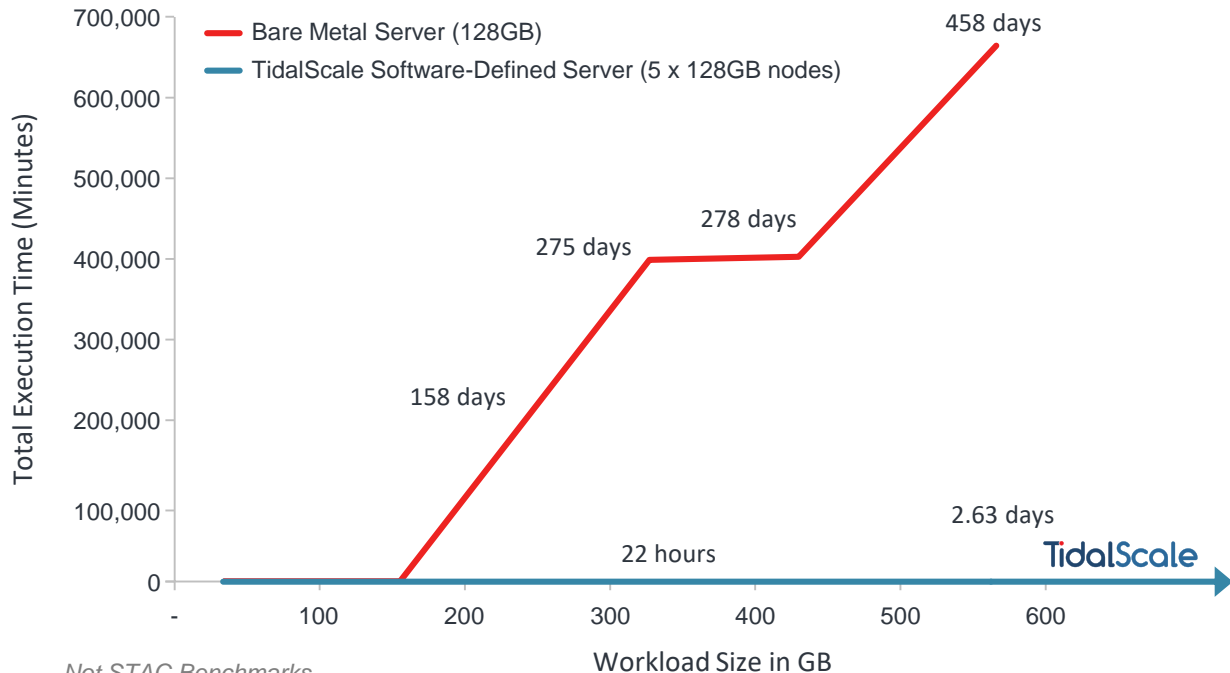


If it runs, it runs on a TidalScale Software-Defined Server

Benchmark: Open Source R on TidalScale

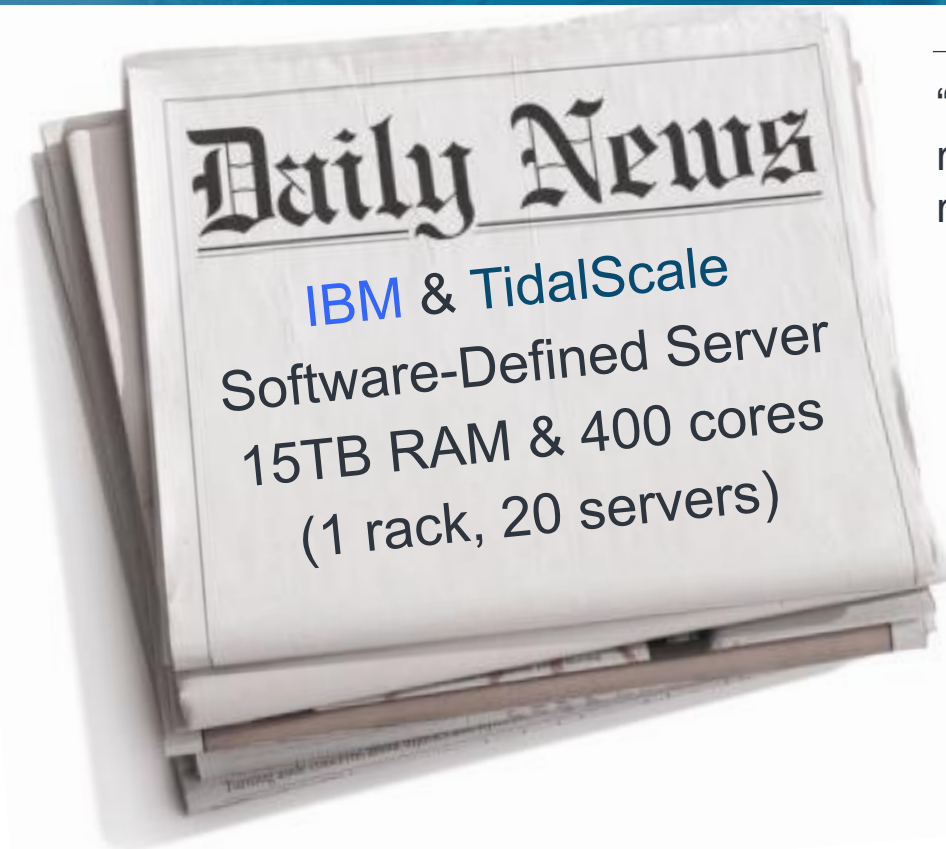
https://github.com/TidalScale/R_benchmark_test

Open Source R Performance Comparisons



- Version: **Revolution R Open 8.0.3** with pryr, dplyr, mgcv, rpart, randomForest, FNN, Matrix, doparallel & foreach
- Data: **CMS Public Use Dataset**
- In-memory footprints: **32GB-680GB**
- Operations timed:
 - Load
 - Join
 - GAM linear regression
 - GLM linear regression
 - Decision Tree
 - Random Forest (fixed seed)
 - K Nearest Neighbors

Tomorrow's Servers Today: A Game-Changer



“Software-defined Servers make it easy to run memory-intensive applications like data mining, machine learning and simulation.”

Marc Jones, Director &
Distinguished Engineer, IBM





“This is the way all servers will be built in the future.”

Gordon Bell

Industry legend & 1st outside investor in TidalScale

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