



**TidalScale**<sup>TM</sup>  
Software-Defined Servers

# Maximale Agilität mit Software-Defined-Servern von TidalScale

Robert Meiners (Team Lead PreSales, MTI Technology GmbH)

8. Juni 2020

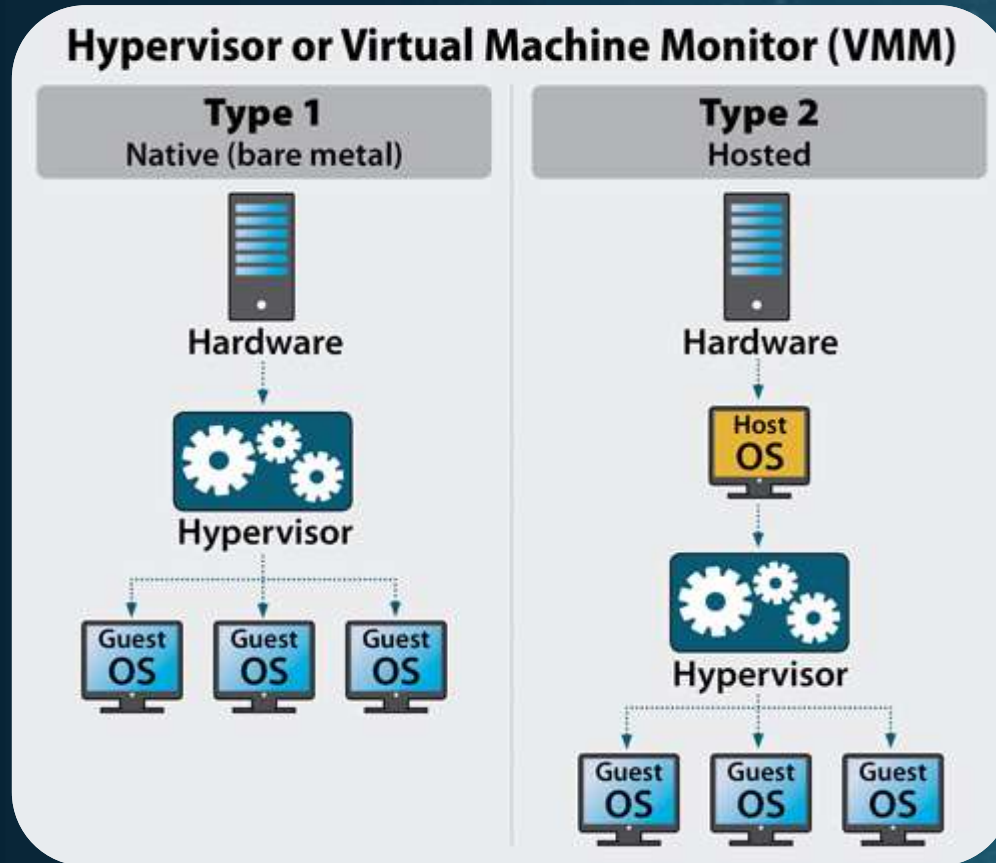


**Dip.-Inf. Robert Meiners**  
**Presales Manager Deutschland**  
**rmeiners@MTI.com**

- **EMC Certified Architect**
- **AWS Technical Professional**
- **VMWare Certified Professional**
- **Microsoft Cloud Architect**

**rmeiners@mti.com**

# Konzepte der klassischen Virtualisierung



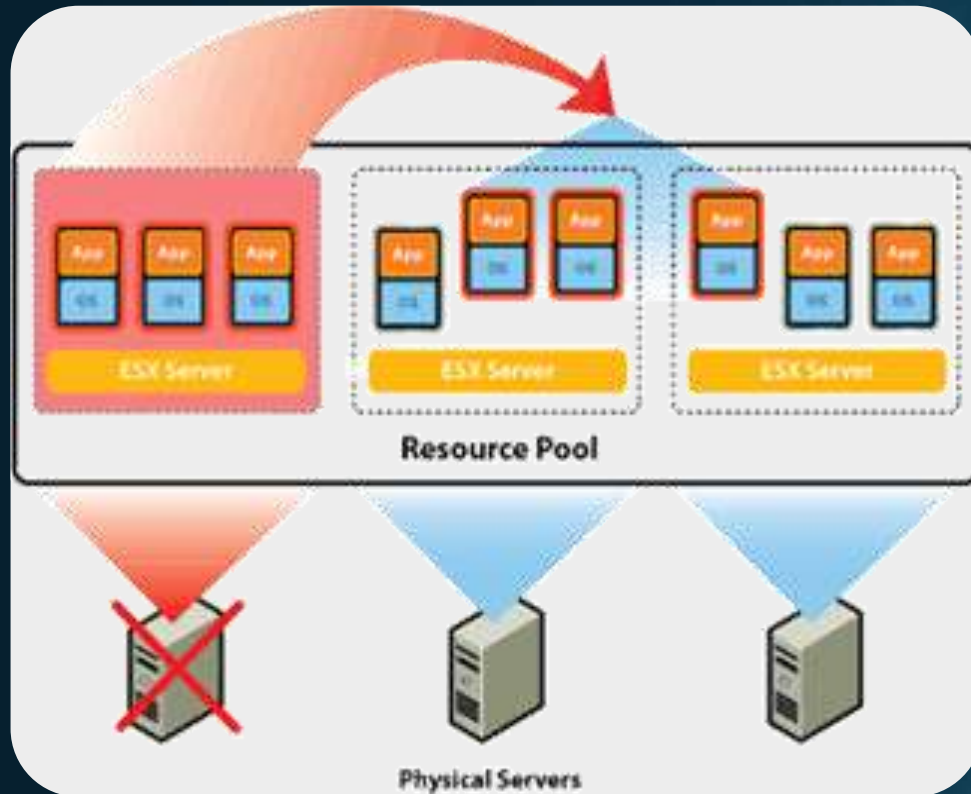
## Traditionelle Virtualisierung

Teile große Hardware in kleine Teile auf.

Erstellt kleinere VM's in Minuten  
Keine Änderung des OS oder der Anwendungen

Spezialisiert auf zunehmende Server Virtualisierung  
Für "Small Data" optimiert

# Konzept der Hochverfügbarkeit

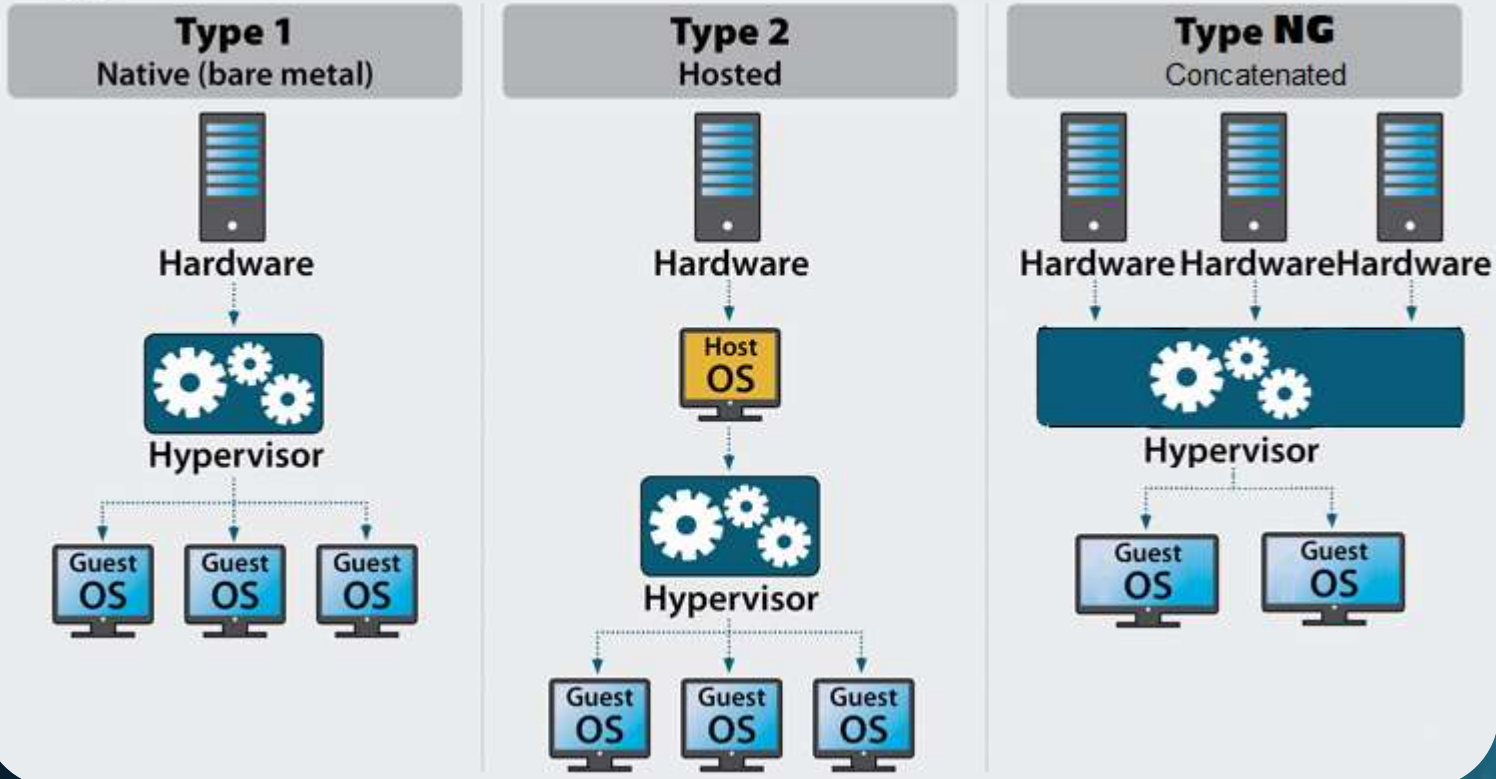


Bei klassischer Hochverfügbarkeit in der Virtualisierung müssen auf den anderen Systemen ausreichend Reserven bestehen. Nach einem Ausfall, wird dann dort die VM komplett neu gestartet.:

- ✓ Ausfälle werden nach kurzer Zeit abgefangen.
- ✓ Wiederherstellung nach Beeinträchtigung
- ✓ Kann nachträglich angepasst werden.

# Konzept der Virtualisierung der nächsten Generation

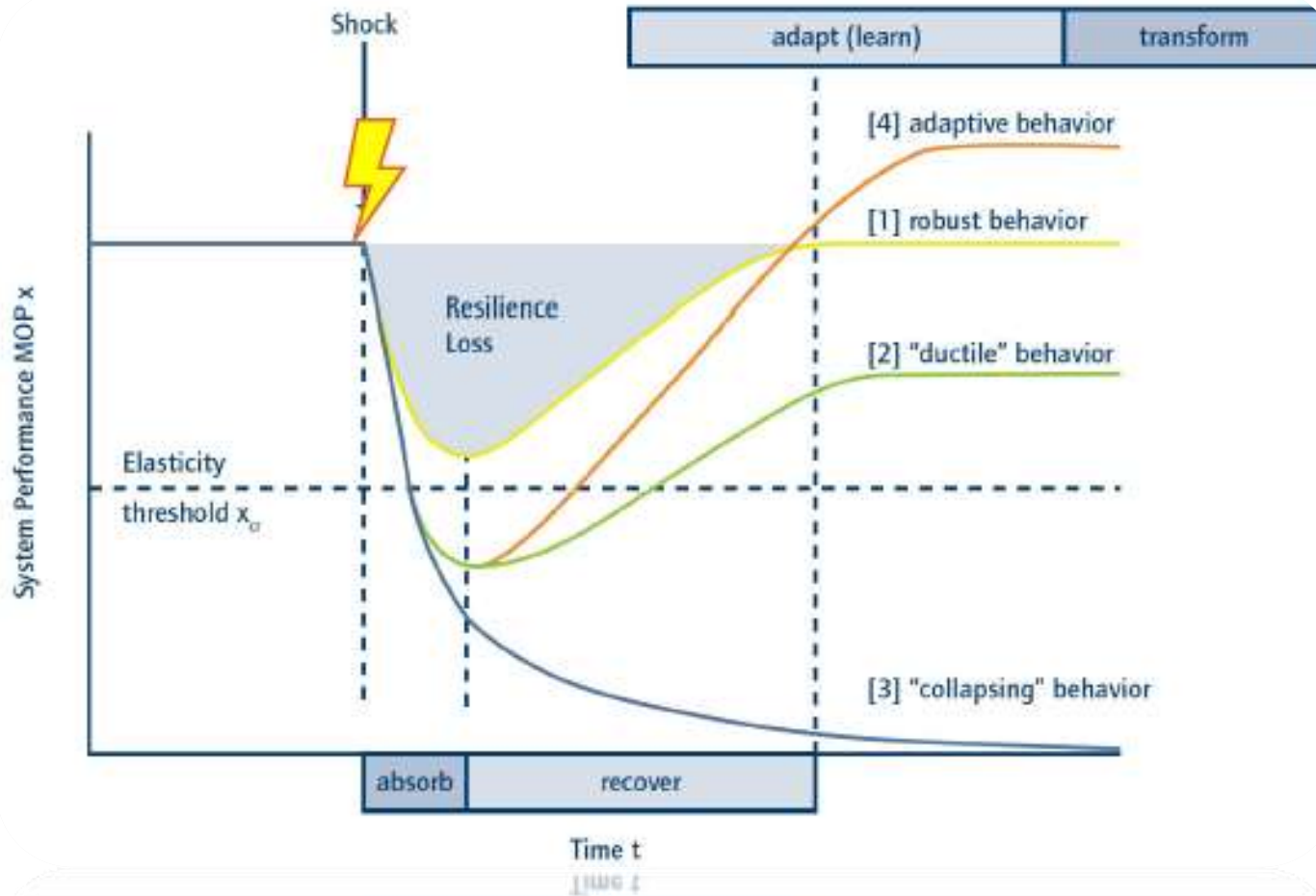
## Hypervisor or Virtual Machine Monitor (VMM)



## Zusammenfassende Virtualisierung

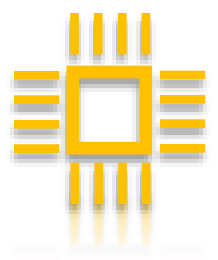
Bahnbrechende inverse Hypervisor Technologie  
Fast mehrere Server zu einer großen Plattform zusammen  
Erstellt VM's die größer als die Hardware sind.  
Ohne Änderungen am OS oder der Anwendung  
Ausgelegt als Scale-out Konzept  
Perfekt für "Big Data"  
Verringert den Wartungsaufwand  
Selbstoptimierend  
Ausfallsicher

# Konzept der Resilienz



Resilienz ist die Fähigkeit eines Systems, sich schnell und effektiv flexibel an folgende Situationen anzupassen:

- ✓ Kritischen Situationen zu widerstehen (2)
- ✓ Stresssituationen zu absorbieren (3)
- ✓ Selbstheilung nach Beeinträchtigung (1)
- ✓ Lernen und anpassen zur besseren Vorbereitung (4)



**Programmable**



**Modular**



**Intelligent**

**Gartner IT  
Infrastructure,  
Operations & Cloud  
Strategies Conference**

Strategies Conference



**Programmable**



**Modular**



**Intelligent**

## You Must

Enable programmable infrastructure by prioritizing software-driven technologies versus rigid proprietary appliances

## You Must

Place a lot of smaller bets on emerging technologies and vendors versus placing one bet on single one

## You Must

Invest in infrastructure automation and orchestration tools and enable path to AI-driven operations



# A Game-Changer for the Data Center

## Fast

In-memory performance

Machine learning optimized

## Flexible

Massively Scalable

Build-as-you-grow

Infinitely Configurable

Cloud or On-premise

## Easy

Deploy in Minutes

No data sharding

Simple to manage

## Proven Technologies

Cost-effective x86 servers

Ethernet interconnect

Red Hat & SUSE Certified

Unmodified applications

Software-  
Defined Server

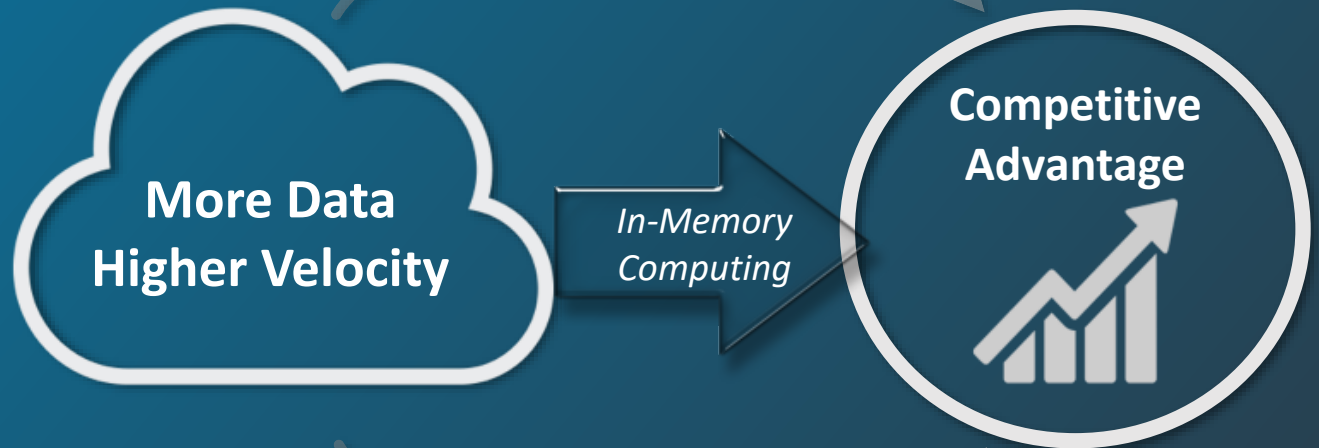
# Customer's Challenge – Turn Data Into Competitive Edge

*Expensive Hardware - Limited Scalability*

Our Initial Focus:  
Big Enterprise  
Applications



ORACLE DATABASE      SAP HANA      Microsoft SQL Server

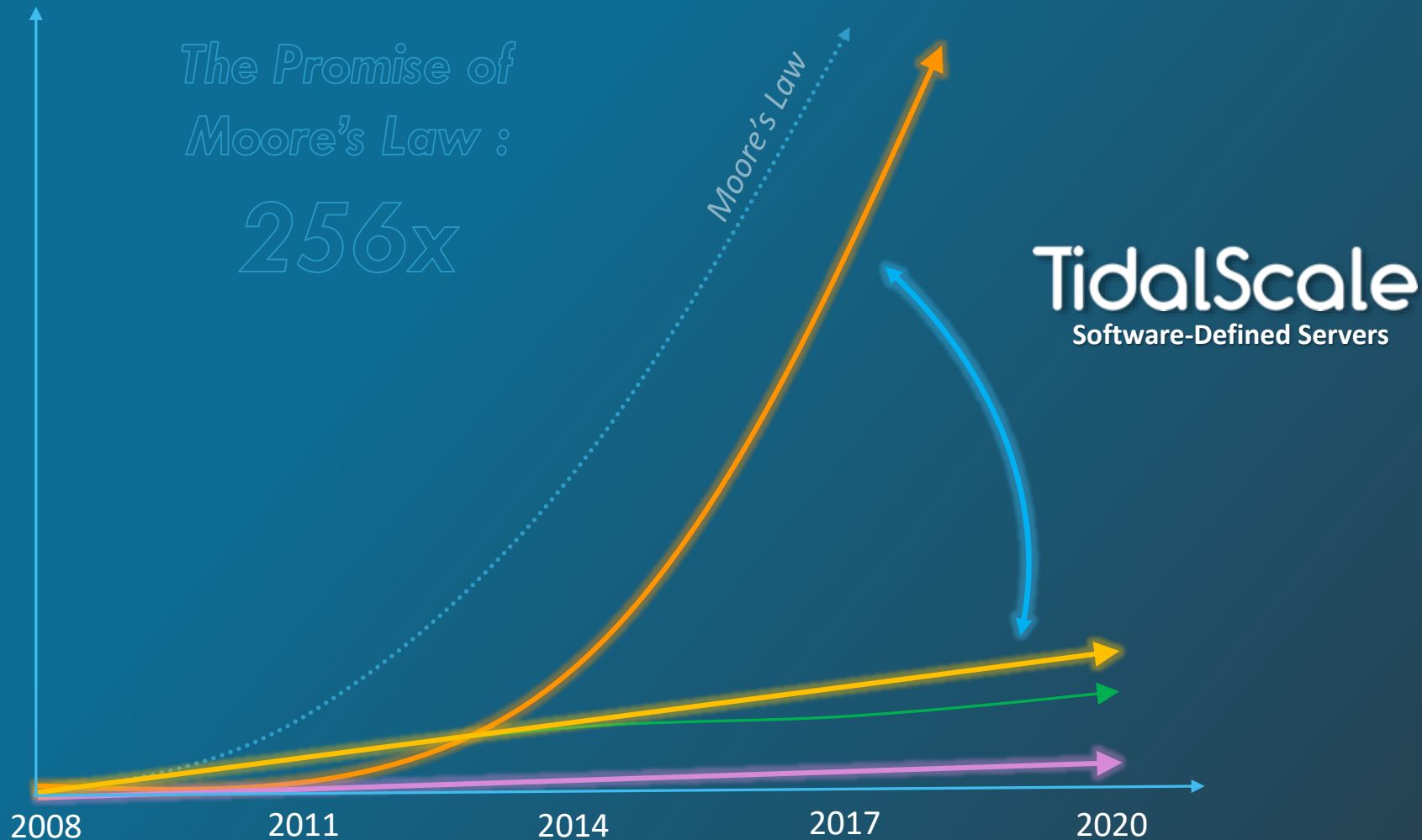


*Re-write Software - Partition Data*



mongoDB      APACHE Spark

# Your Data is Growing. Is your Server?



**100x**

Data Growth

**7x**

Memory Capacity Per Core

**5x**

CPU Core Performance<sup>(2)</sup>

**2x**

Memory Bandwidth Per Core

**TidalScale**

(1) Spec.org: SpecInt\_rate® 2006

(2) Spec.org: SpecInt® 2006

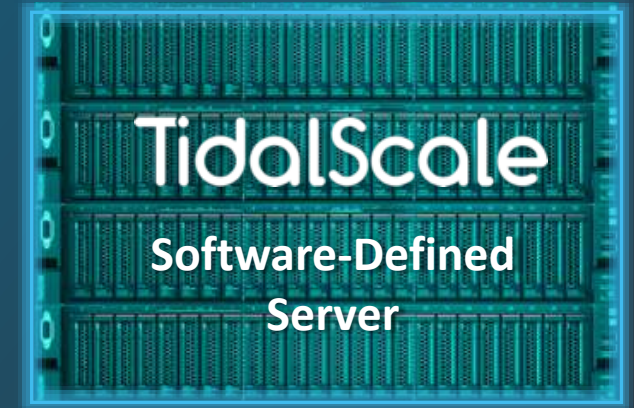
# Deploy Faster with Agility



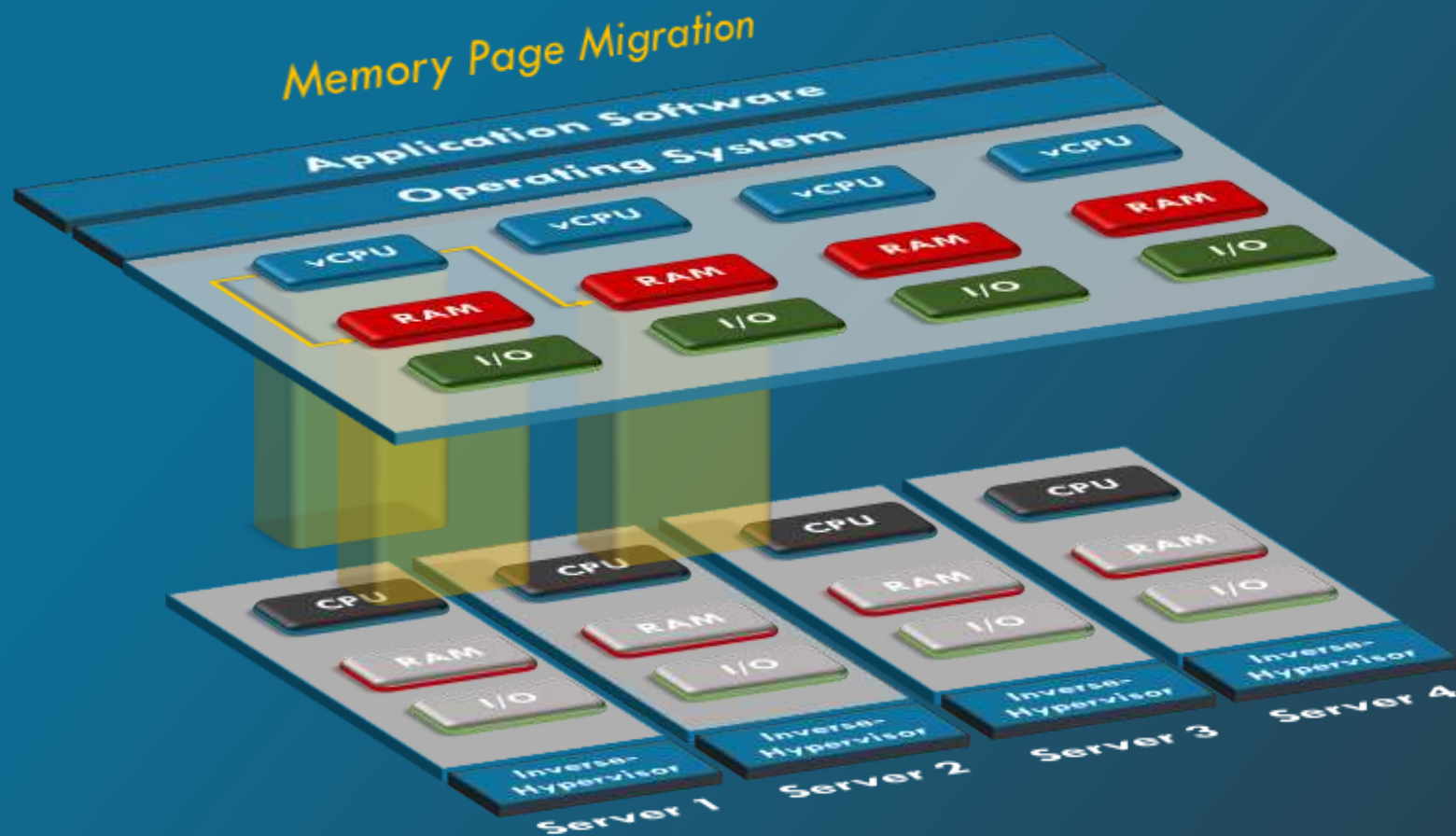
- Eliminate complex sizing exercises
- Agility to adjust to changing requirements
- Lower CapEx and OpEx costs

**25x** faster deployment

# Under the Hood...



# The Magic... Real-Time Machine Learning



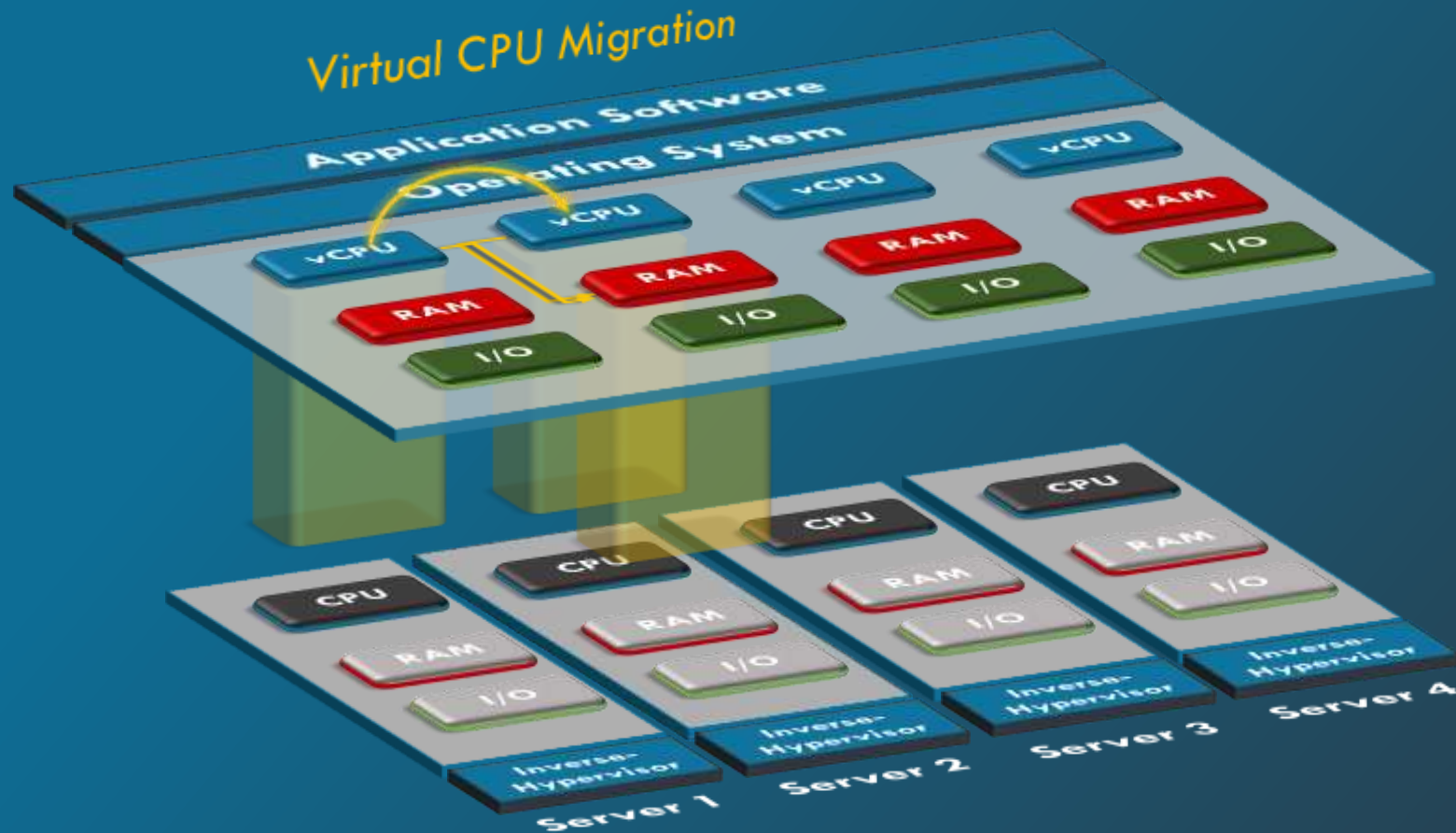
## Patented Technology

Transparently migrates vCPUs and memory

Dynamically load balances

Self-optimizing

# World's First Use of ML Below the Application



## *Patented Technology*

Transparently migrates vCPUs  
and memory

Dynamically load balances

Self-optimizing

# WaveRunner<sup>®</sup> Orchestration Software

*Configure & Deploy Systems in Minutes*



Allocate resources



Configure & manage



Monitor system performance & health



Open API for integration



TidalScale



# In-Memory Computing is Critical

Memory & Storage	Processing Latency	In Human Terms
L3 Cache	13 ns	<b>15 minutes</b>
DRAM	50 ns	<b>1 hour</b>
NVMe FLASH	100 $\mu$ s	<b>3 months</b>
ALL FLASH Array	1 ms	<b>2 years</b>



# Use Case: SAP HANA

## In-Memory Database



### The Opportunity

- HANA requires all data in-memory
- Data sets are growing quickly – 20, 40, 70TB...

### Massively scalable

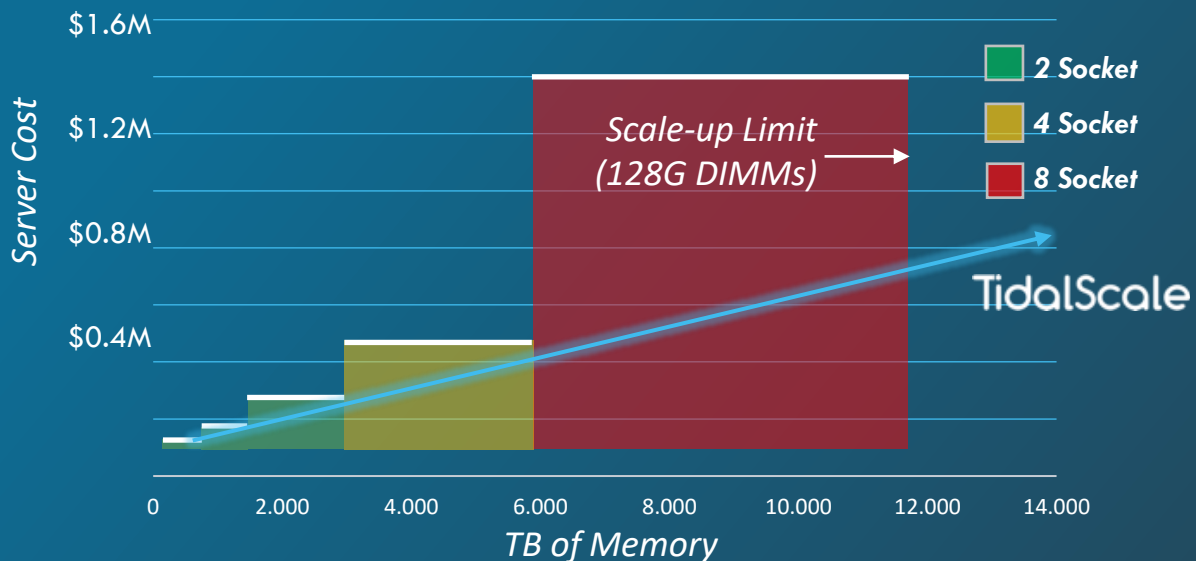
Scale beyond scale-up limits without the cost and complexity of scale-out

### Build-as-you-grow

Maximize NPV with distributed CapEx. Avoid the high cost of underestimating future needs

### Cost-effective hardware

Commodity servers  
Standard Ethernet networking



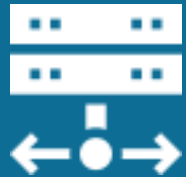
TidalScale

# SAP Use Case: Overview of TidalScale HANA Enablers



## Create Servers with Large Memory Sizes

HANA cannot be “partially cached” in memory, creating the need for systems with extraordinarily large memory footprints in order to place the entire database into memory



## Avoid Scale-out

SAP’s current scale-out solution is manual, technically and financially wasteful, and avoided by the SAP community (and SAP) unless no other solution is applicable



## Sizing Made Easy

SAP Sizing is “acceptable” for existing SAP data, but ”just a guess” for non-SAP data, leading to servers that don’t match the workload.



## Reconfigurable

Adapt to changing business needs and/or provide High Availability and Disaster Recovery

# SAP Landscapes - Hardware Requirements



**Production**



**Quality Assurance**



**Development**



**Test / Sandbox**



**High Availability**



**Disaster Recovery**

	Production	Quality Assurance	Development	Test / Sandbox	High Availability	Disaster Recovery
<b>Size</b>	Current peak need +4-5 years of growth	Production or larger	Minimal to Production	Same as Production	Same as Production	Same as Production
<b>Users</b>	End-Users	All Testers & Some Developers	All Developers	A handful of Developers & Testers	No users 99% of time	No users 99.99% of time
<b>Performance</b>	Highest	Good	Minimal	Minimal	Minimal	Minimal
<b>Availability</b>	Highest	Good	Good	Good	High	High
<b>TidalScale Fit</b>	Yes	Yes	Yes	Yes	Yes	Yes

TidalScale



# SAP Reference: \$35B Manufacturer – S/4HANA (OLTP)

## Current Hardware



### HPE Superdome X

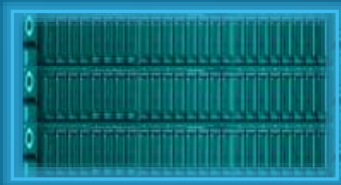
48 cores  
1.5 TB RAM

### Total Cost (MSRP):

\$1,440,000

## TidalScale

Software-Defined Server



VS

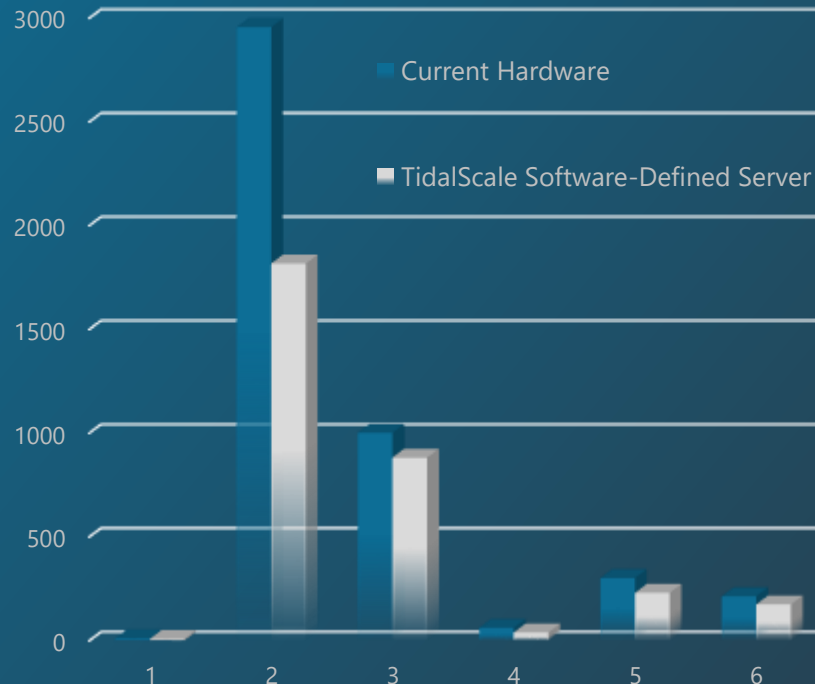
### 3x HPE DL360

48 cores  
2.3 GB RAM

### Total Cost (MSRP):

\$336,500

## Test Results (seconds)



## Test Details:

SAP S/4HANA

Full Production data (1.5TB)  
6 most frequently executed jobs

## Performance:

TidalScale performed **44% faster** than current Superdome X

## Savings:

TidalScale provided **76% CapEx Savings** and additional OpEx Savings

TidalScale

# SAP Reference: \$10B Manufacturer – HANA (OLAP)

## Current Hardware



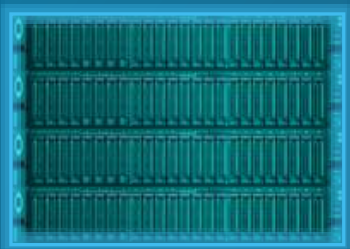
### Cisco B460-M4

60 cores  
1 TB RAM

VS

## TidalScale

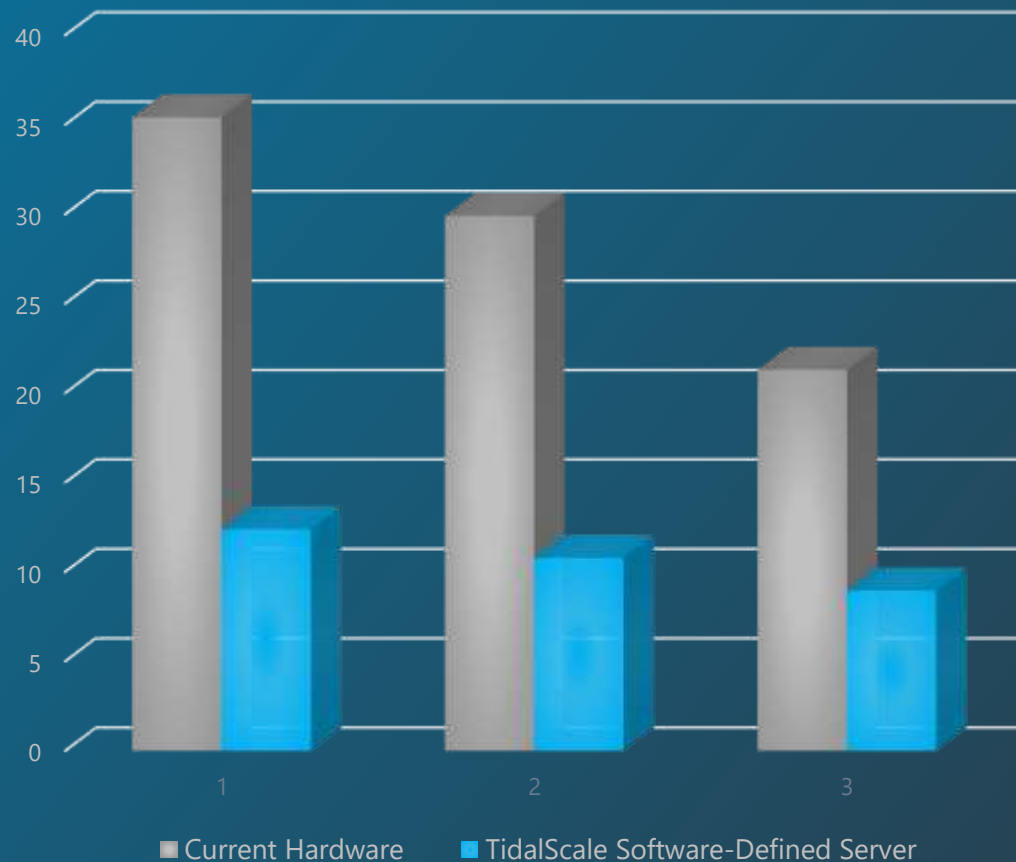
Software-Defined Server



### 4x Cisco C240-M4

80 cores  
1 TB RAM

## Test Results (seconds)



## Test Details:

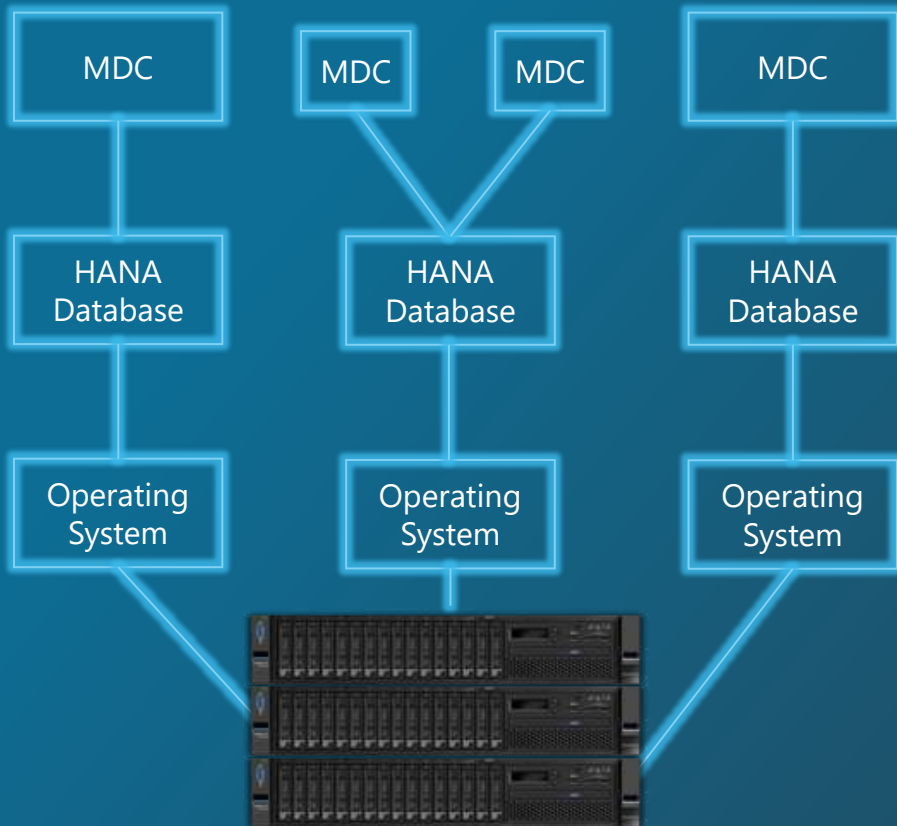
SAP HANA (Database – Analytics)  
600GB (customer Production data)  
Most frequently executed  
queries/jobs ran with  
**177% faster results!**

## Infrastructure Costs:

TidalScale yields  
**53% cost savings**  
when compared to  
traditional servers!

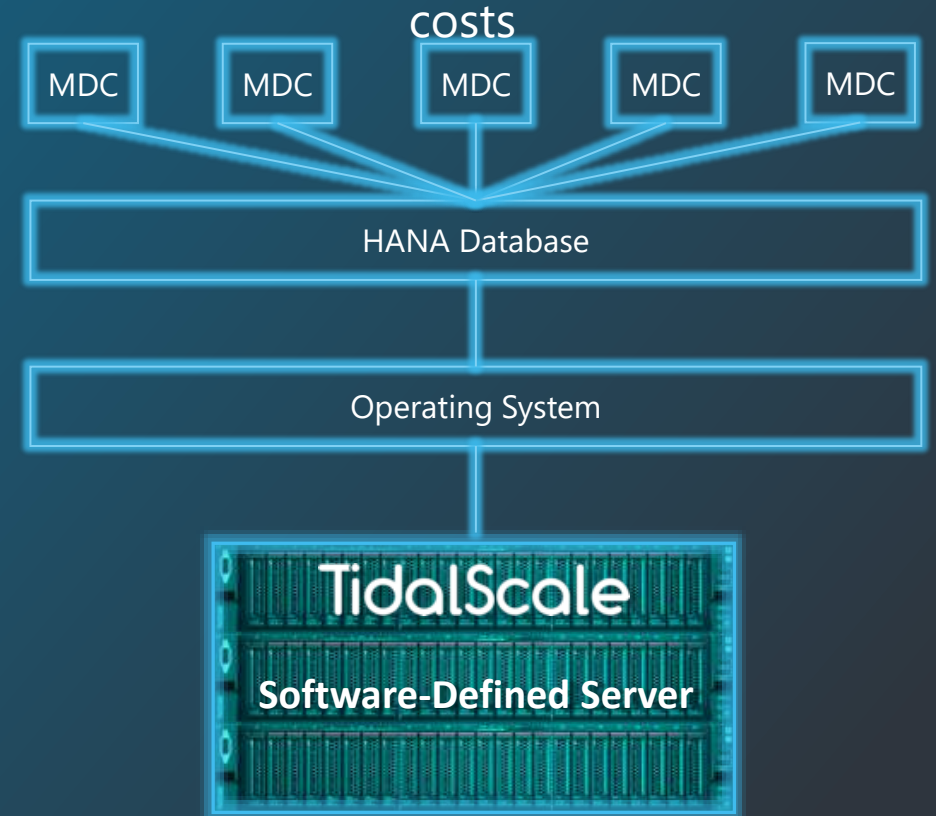
# SAP use Case: HANA Server Consolidation

Traditional Clouds require the parallel operation of multiple identical components, increasing deployment, operation, and financial costs for each incremental workload



MDC = Multitenant Database Container

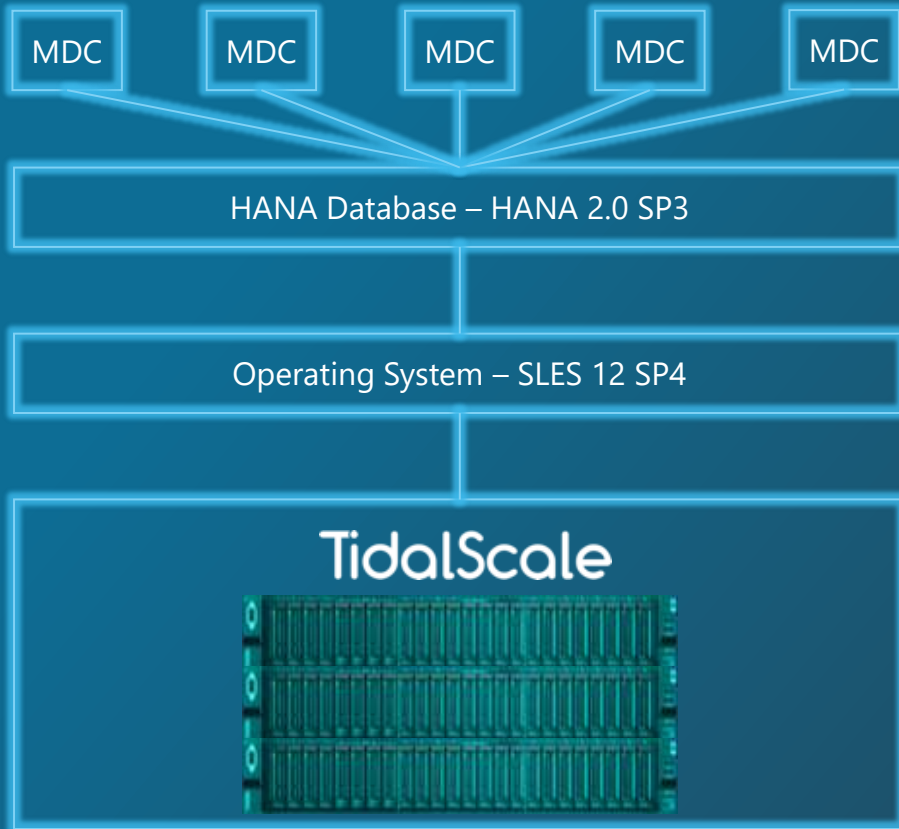
TidalScale allows for the aggregation of resources, allowing for a drastic reduction in identical components for faster workload deployment and lower operating costs



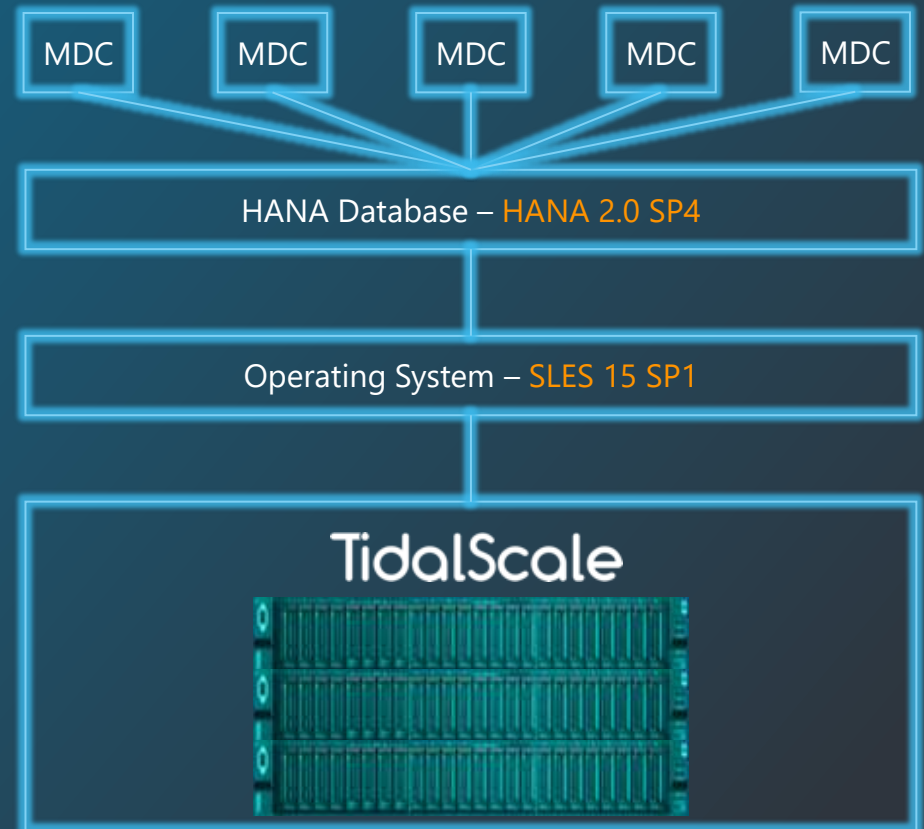
TidalScale

# SAP use Case: Sliding Upgrade

Traditionally, upgrading a server is done all at once, in-place with a lengthy restore as the backout option. Or, additional hardware is required in order to create a new landscape...



...or you can simply reallocate hardware from one Software-Defined Server to another and upgrade individual HANA MDCs with ease.



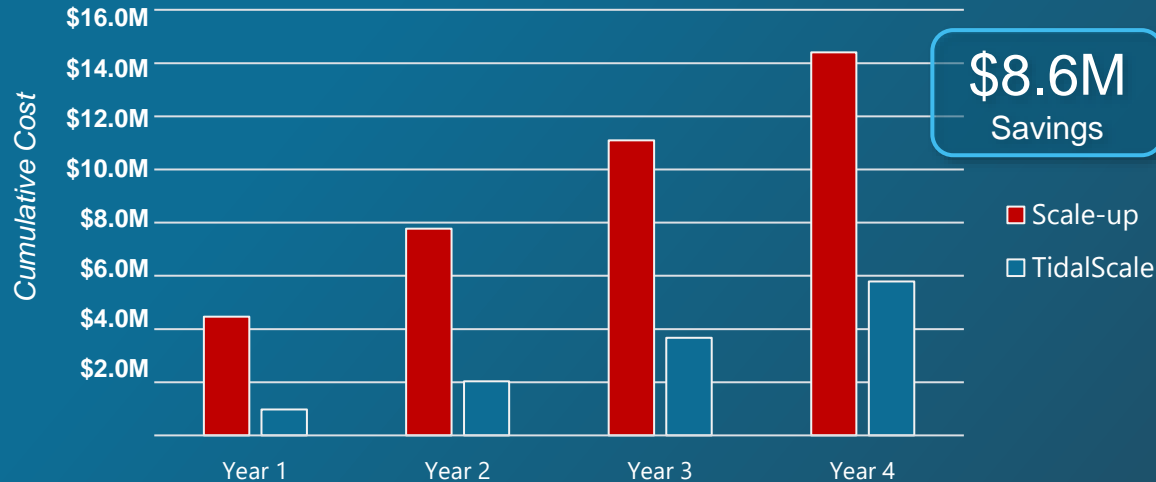
TidalScale



# TidalScale for Oracle Database

## The Opportunity

- Optimizing the server to the workload
- A “future proof” server drives up costs



*“TidalScale’s value proposition for Oracle Database practically sells itself...”*  
– Fortune 50 company



## In-Memory Performance

Up to 20X faster performance for your Oracle Database workload



## Lower Costs

Reduce Oracle licensing costs and avoid proprietary engineered systems



## Massively Scalable

Scale to fit your increasing needs so your system is always sized to your workload



## Agility

Maximize NPV with distributed CapEx, avoid the high cost of underestimating future needs

# Oracle AWR Report Analysis and TidalScale Sizing



## Generate AWR Report

Create one or more Automated Workload Repository (AWR) reports to gather performance statistics for your database.



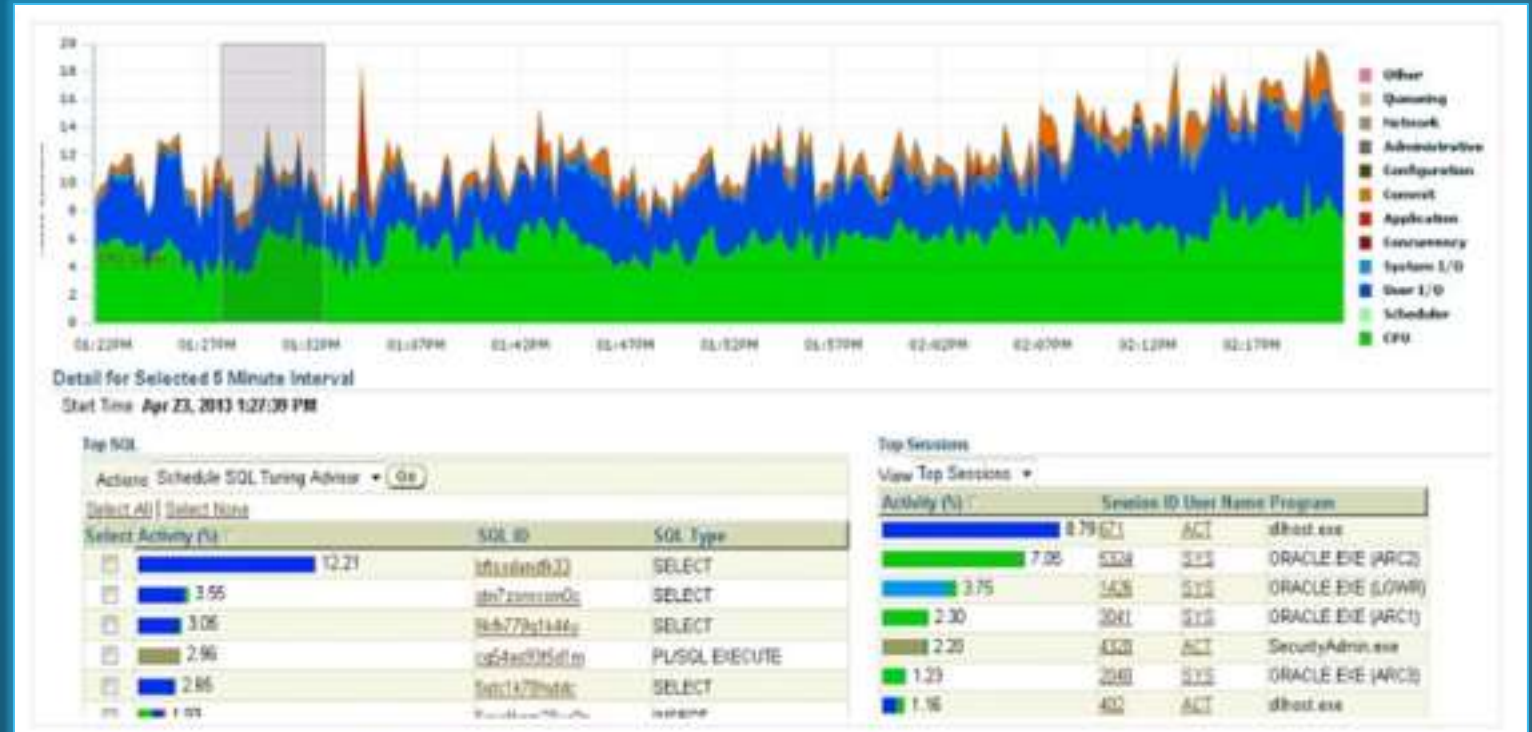
## Identify “Hot” Tables

Examine the AWR report to identify those tables (and other objects) that would benefit from residing in memory



## Scale your SGA/PGA

Create your software-defined server and set your SGA/PGA buffers large enough to accommodate the entirety of the “hot” tables in RAM.



Repeat these steps every 1-3 months to resize your software-defined server to match your “Hot” tables

**TWICE** the performance at HALF the cost

TidalScale

# Use Case: Oracle Database Servers

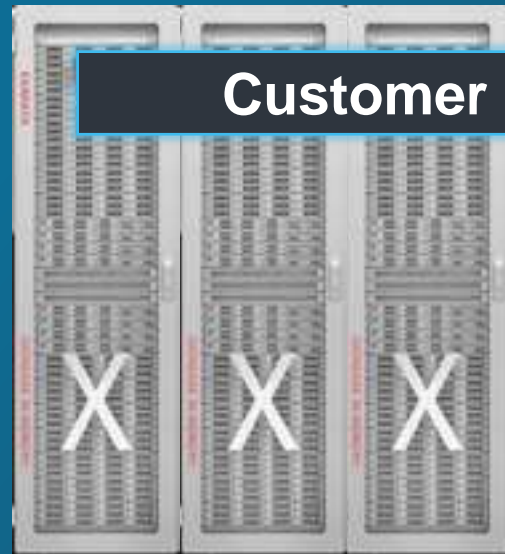
Global 50 Financial Services Company

ORACLE®

EXADATA

## Exadata Proprietary Appliance

- Proprietary solution
- 576 CPU Cores @ 2.4Ghz
- 12 kVA power requirement
- Proprietary storage required
- 3 full proprietary racks



## TidalScale Software-Defined Server

- Use existing commodity 2-socket x86 servers (or purchase)
- 144 CPU Cores @ 3.9Ghz
- .78 - 1.41 kVA power requirement
- Use existing commodity storage (or purchase new)
- 1/3 of a standard rack

**Customer Requirement: 3x 6TB Servers (18TB total RAM)**



+



Existing Storage Solution

3- Year Total Cost of Ownership:

**\$20.9M**

3- Year Total Cost of Ownership:

**\$9.8M**

TidalScale

# TidalScale 3.0 Performance

Oracle 18c: Star Schema Benchmark, Scale Factor 1500

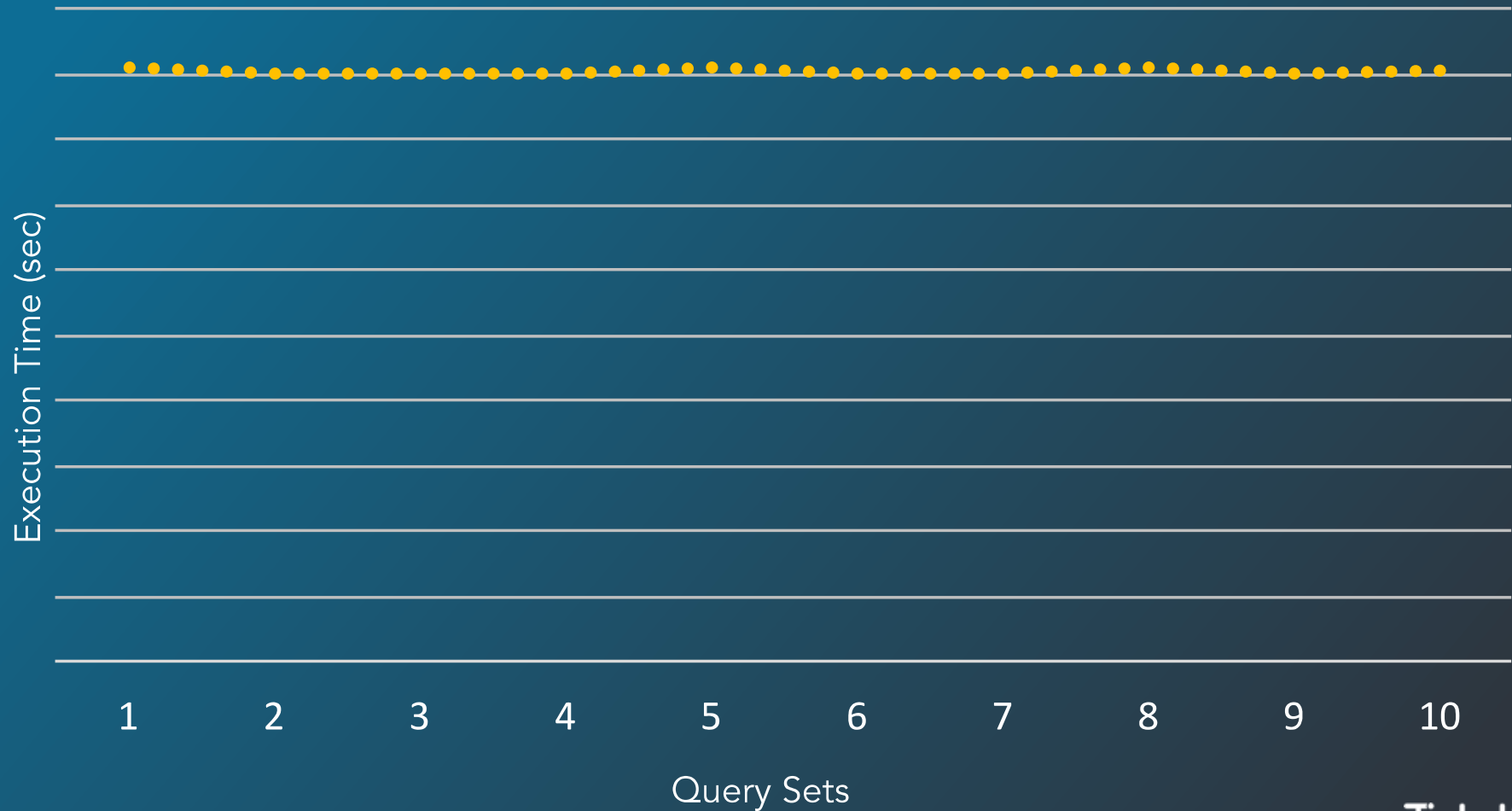


Dell R840

Quad Socket  
48 Cores 768GB

TidalScale

2 x Dual Socket  
24 Cores 1536GB



TidalScale

# TidalScale 3.0 Performance

Oracle 18c: Star Schema Benchmark, Scale Factor 1500



Dell R840

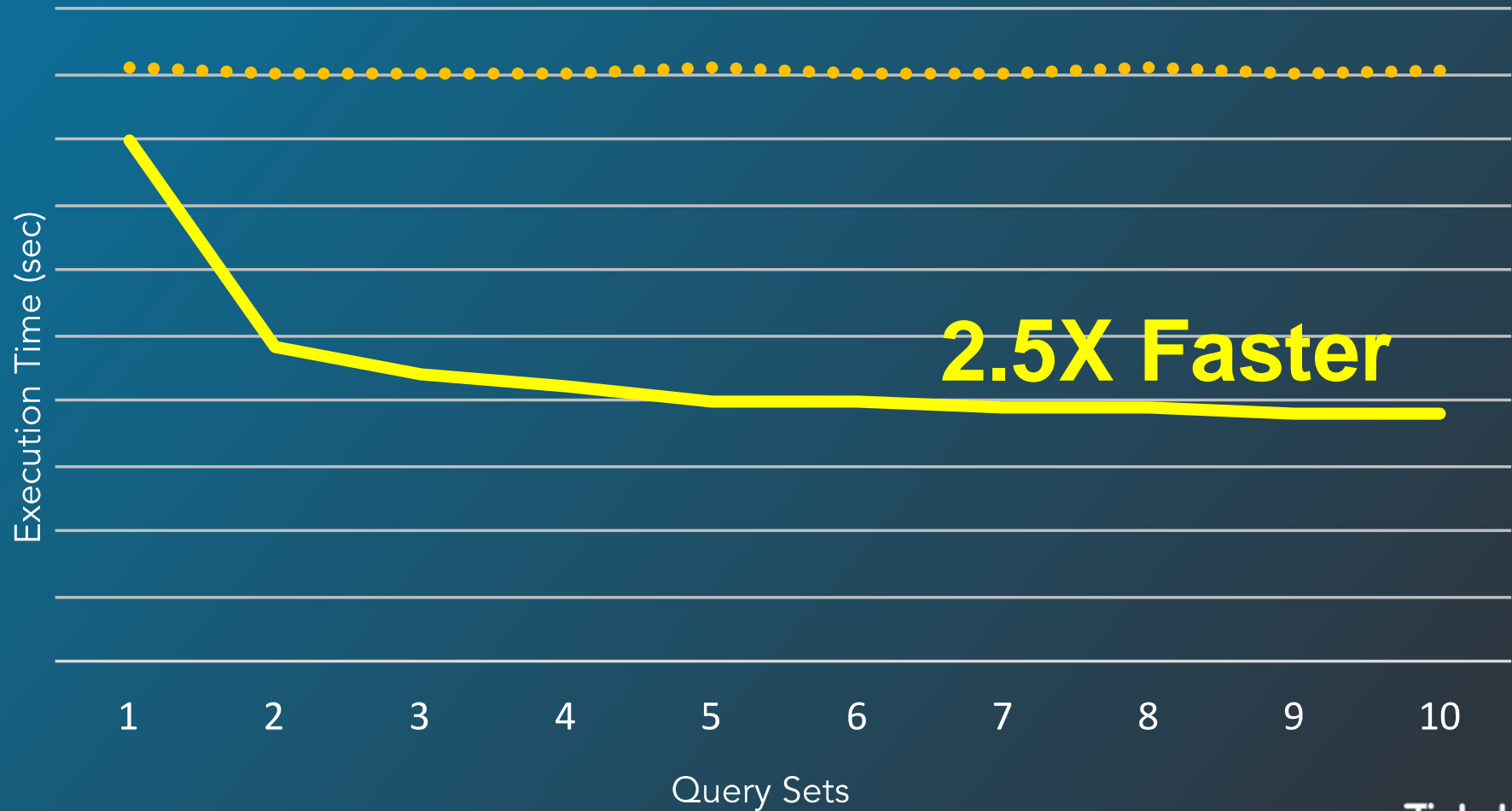
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TidalScale

2 x Dual Socket  
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With Oracle "In-Memory"



TidalScale

# TidalScale 3.0 Performance

Oracle 18c: Star Schema Benchmark, Scale Factor 1500



## Dell R840

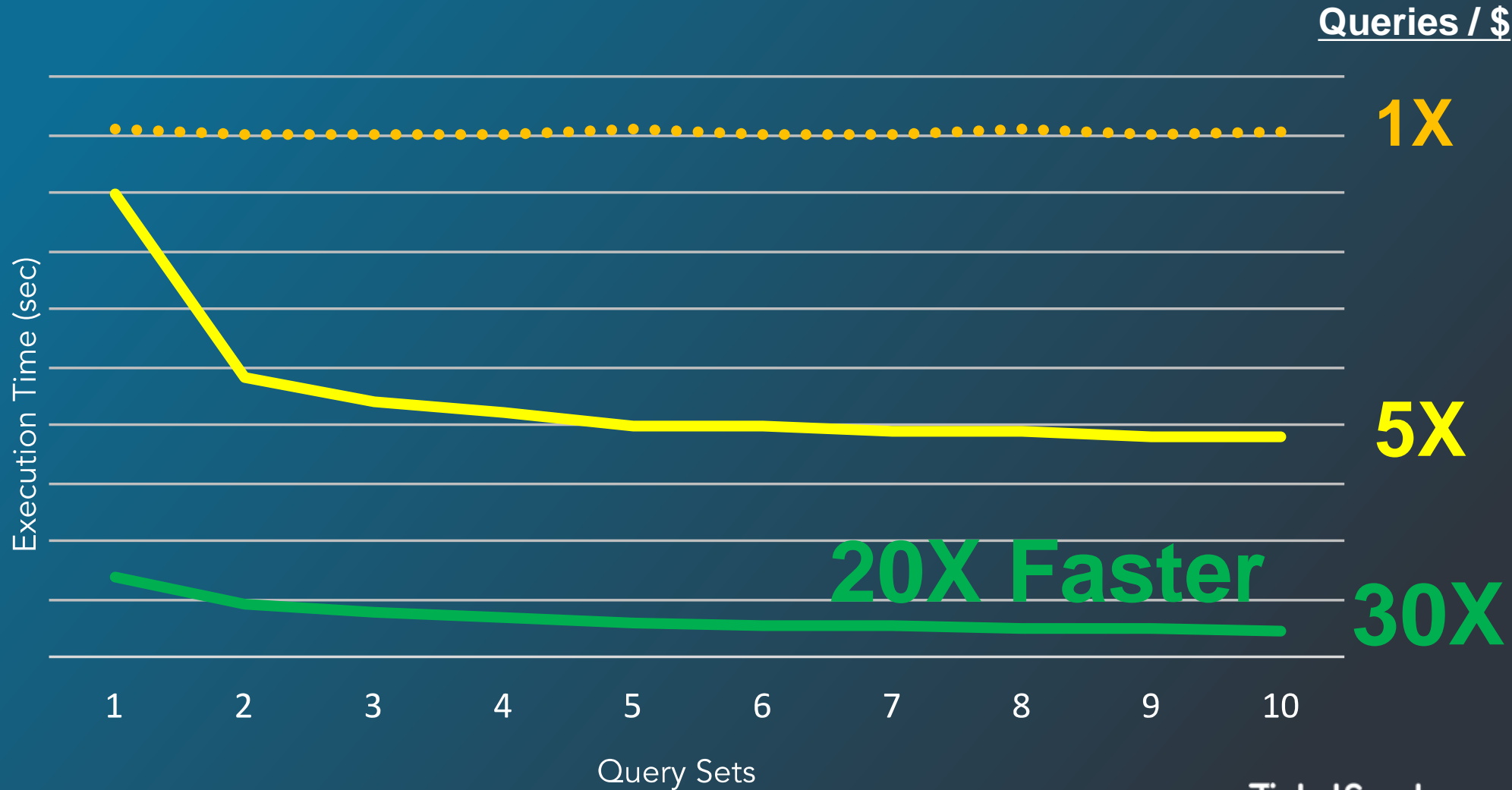
Quad Socket  
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2 x Dual Socket  
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With Oracle "In-Memory"



TidalScale

# TidalScale 3.0 Performance

Oracle 18c: Star Schema Benchmark, Scale Factor 1500

## Quad Socket

Bare Metal

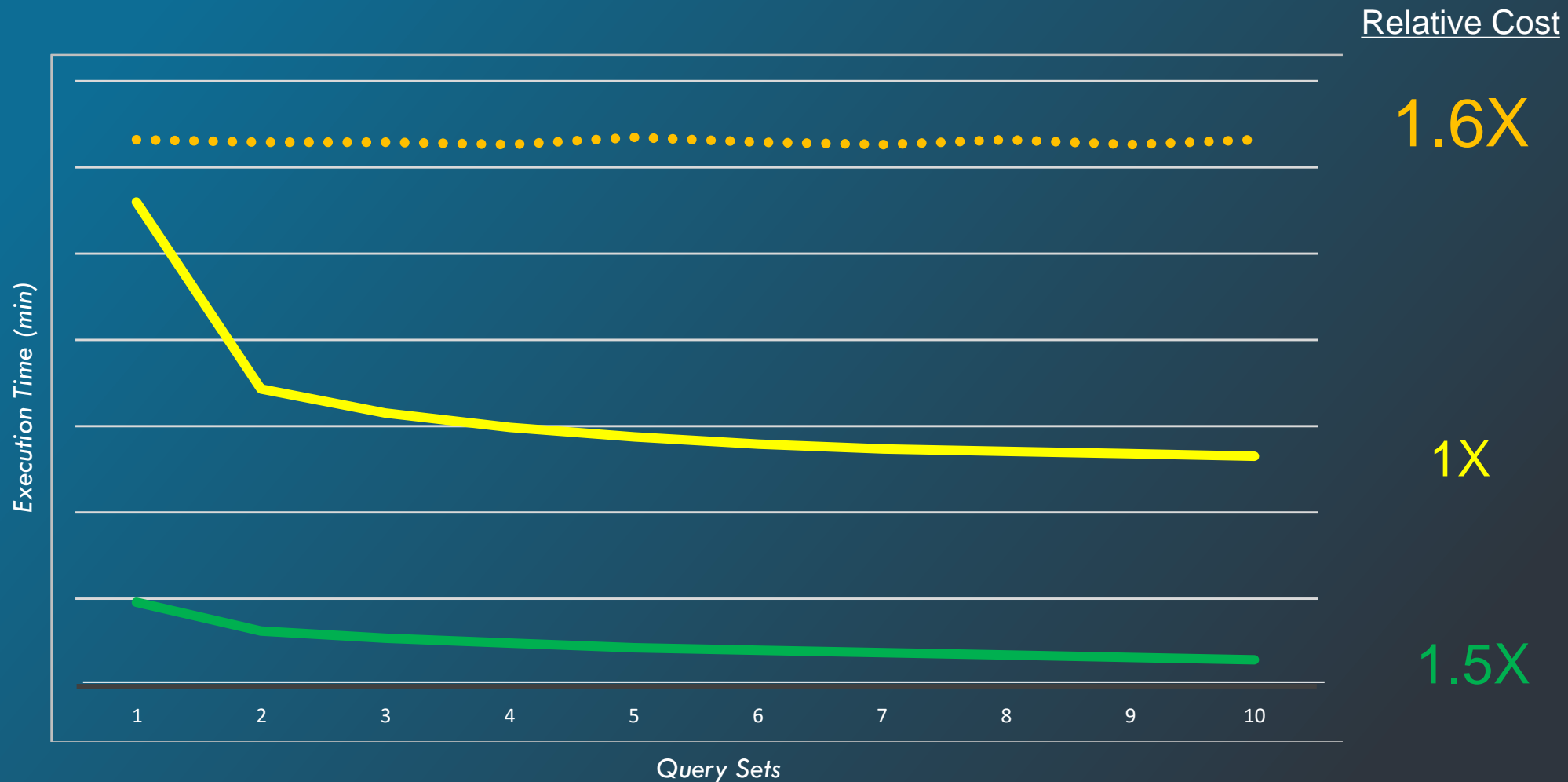
Quad socket, Intel V5  
48 cores, 768GB, 4 NVMe

## TidalScale

2xDual Socket, Intel V4  
24 Cores, 1.5TB, SATA SSD

## TidalScale

2xDual Socket, Intel V4  
24 Cores, 1.5TB, SATA SSD  
With Oracle "In-Memory"



TidalScale

# TidalScale - A Better Value

Oracle 18c: Star Schema Benchmark, Scale Factor 1500

## Quad Socket

Bare Metal

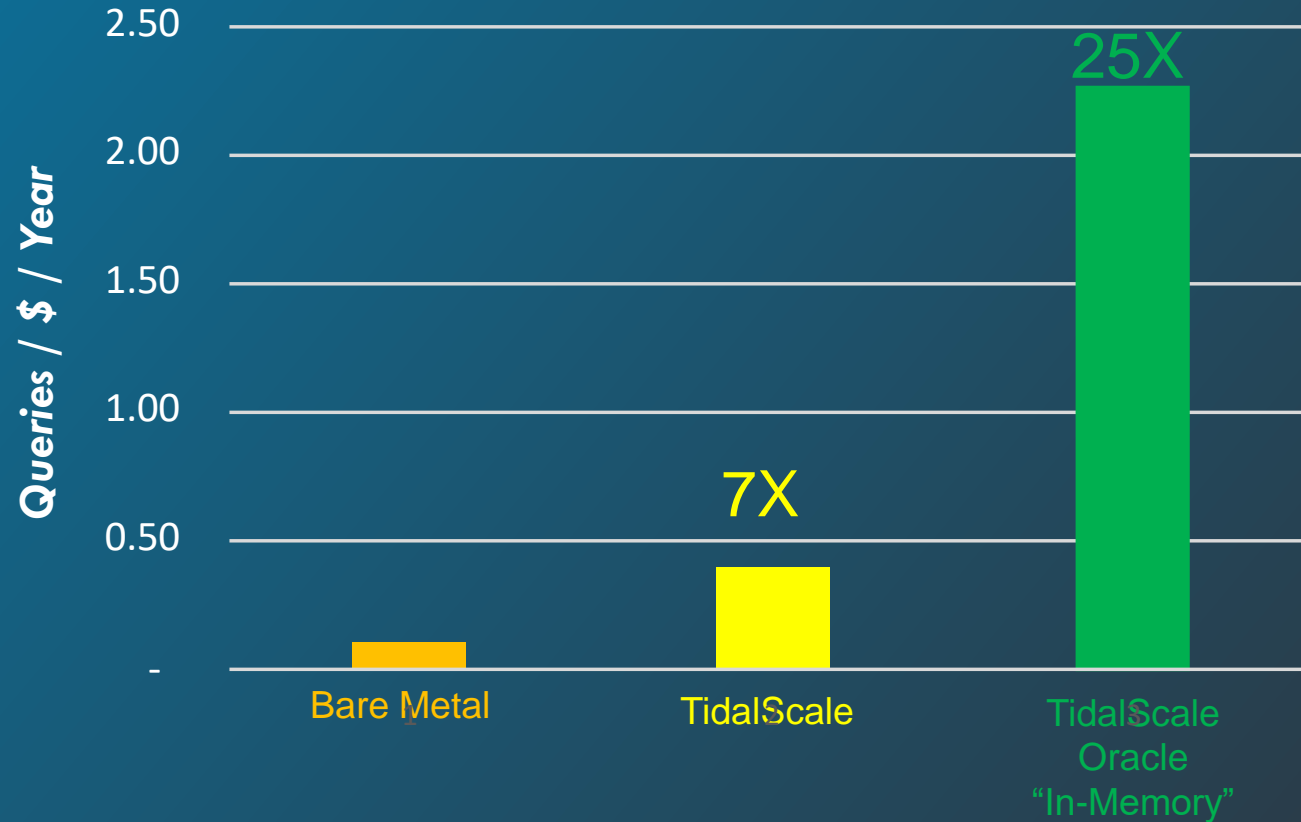
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2xDual Socket, Intel V4  
24 Cores, 1.5TB, SATA SSD  
With Oracle "In-Memory"





# The Future of Servers is Software-Defined

## Auto-Sizing & Thin Provisioning

*Provision Compute on Demand*



When application needs increase, resources are hot-added, invisible to

the user / application  
IT Optimal utilization

MTI Beispiel aus Kundenprojekt:

**ACTIONS  
SPEAK  
LOUDER  
THAN  
WORDS.®**

**ACTIONS  
SPEAK  
LOUDER  
THAN  
WORDS.®**

# SAP HANA 6N-Cluster Kalkulation VMware

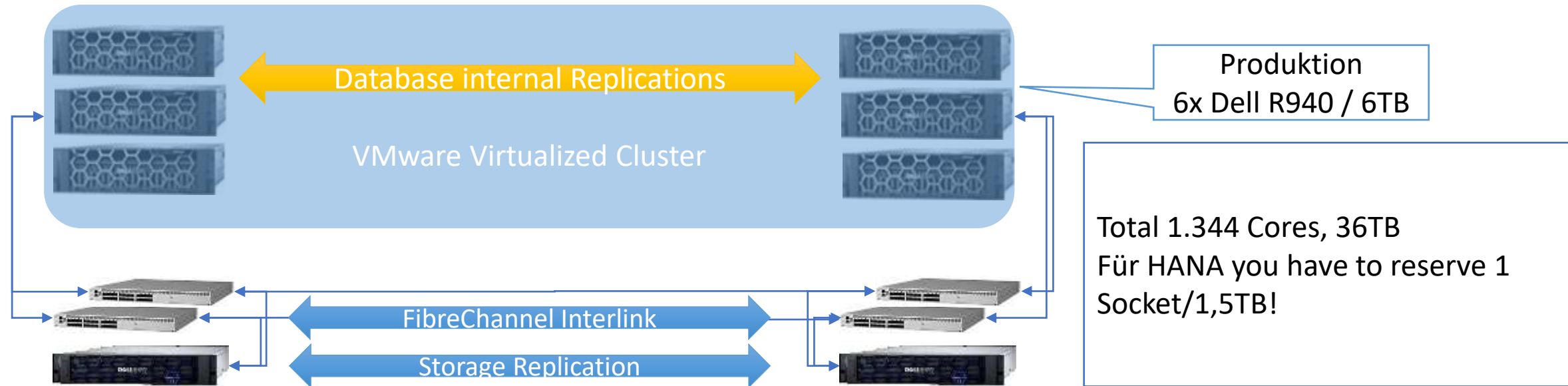


Durch VMware virtualisiert:

- Failover Availability von System zu System
- Einfach Bedienung wie gewohnt
- Teilweise Migration über bestehende Umgebung.
- Die HANA-Systeme sind limitiert auf <6TB

## MTI Pricing Example - SAP HANA Cluster - 6 Server

6x R940 Server inkl. 4x Intel® Xeon® Platinum 8280M, 6.144 GB RAM (48*128 GB), 5 Years ProSupport Plus and 4Hr Mission Critical	1.200.000,00
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# Ressourcen Zuweisung mit trad. Hypervisor

Insgesamte Cluster Kapazität  
336C / 36TB

56C / 6TB

56C / 6TB

DB 3,5TB

~~DB 3,5TB~~

56C / 6TB

56C / 6TB

DB 3,5TB

Res. 3,5TB

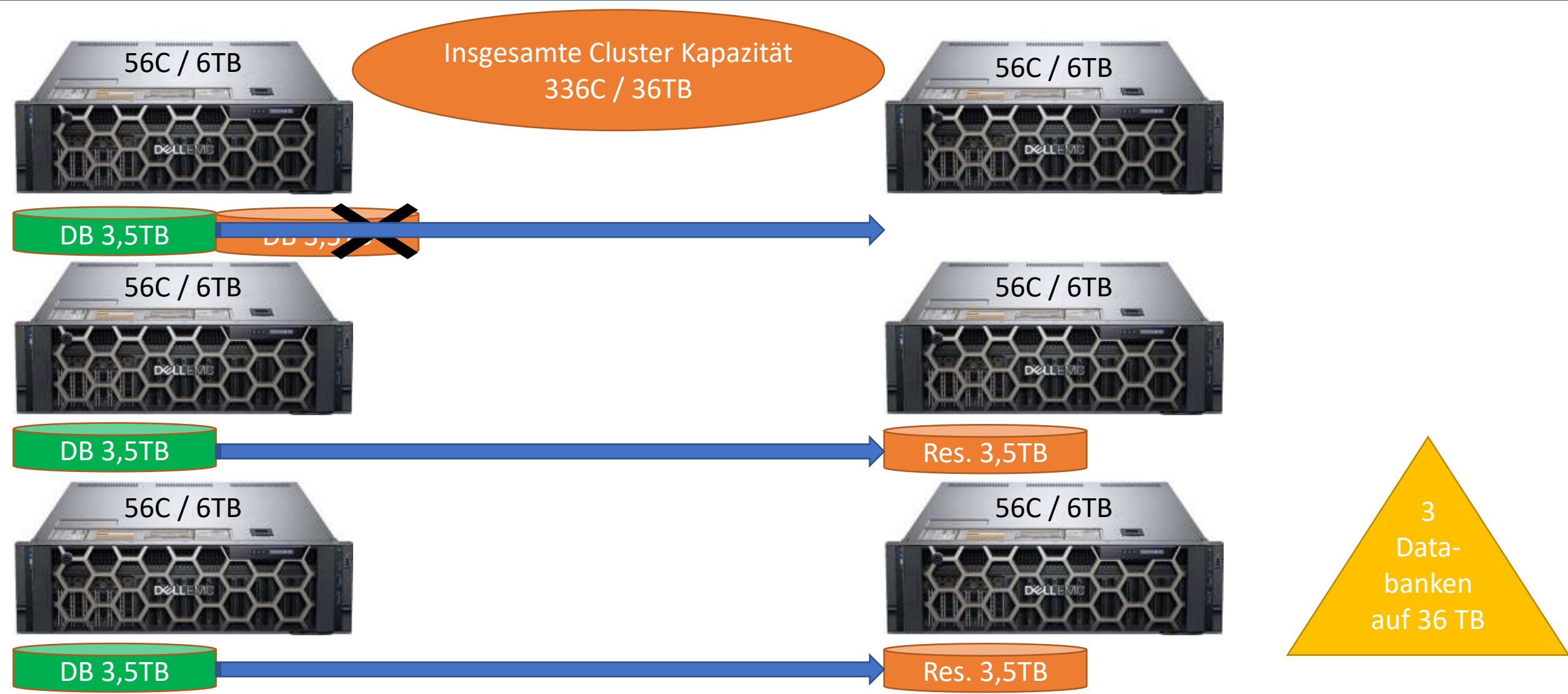
56C / 6TB

56C / 6TB

DB 3,5TB

Res. 3,5TB

3  
Data-  
banken  
auf 36 TB



# Ressourcen Zuweisung mit Tidalscale



## MTI Pricing Example - SAP HANA Cluster - TidalScale 18 TB

6 x R640 Server inkl. 2x Intel® Xeon® Platinum 8260M, 3TB GB RAM  
5 Years ProSupport Plus and 4Hr Mission Critical

460.000,00

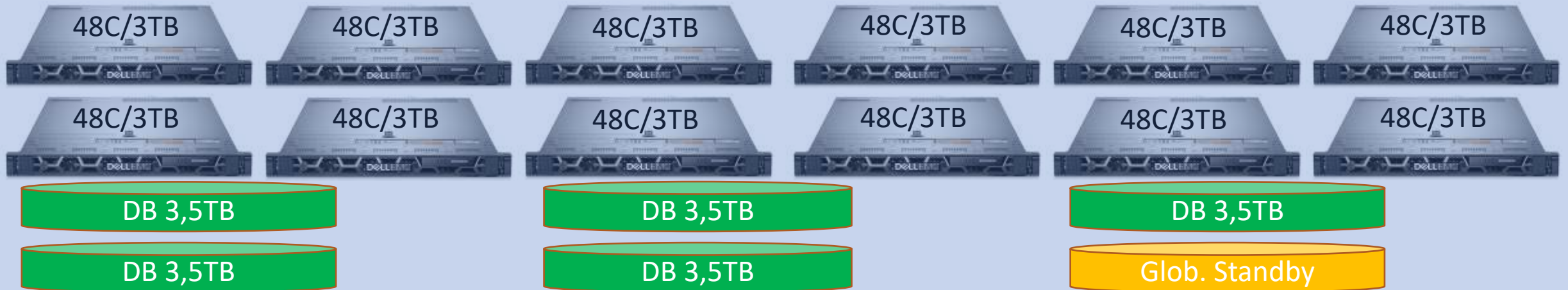
3  
Datenbanken  
auf 18 TB

Als verteilter Cluster ist TS nicht abhängig von einer festen Socket/RAM Zuweisung. Dies macht es wesentlich effizienter.

# Ressourcen Scale-Out mit Tidalscale



## Tidalscale Cluster 576C / 36TB



### MTI Pricing Example - SAP HANA Cluster - TidalScale 36 TB

12 x R640 Server inkl. 2x Intel® Xeon® Platinum 8260M, 3TB GB RAM  
5 Years ProSupport Plus and 4Hr Mission Critical

920.000,00

**5 Databases  
on 36 TB**

Als verteilter Cluster ist TS nicht abhängig von einer festen Socket/RAM Zuweisung. Dies macht es wesentlich effizienter. und skalierbar.

# Ressource Scale-Out mit Tidalscale



1<sup>st</sup> Tidalscale Cluster 288C / 18TB



2<sup>nd</sup> Tidalscale Cluster 288C / 18TB



**5 Databases  
on 2 x 18 TB**

Als verteilter Cluster ist TS nicht abhängig von einer festen Socket/RAM Zuweisung. Dies macht es wesentlich effizienter, skalierbar und verfügbar.

# SAP HANA Concept mit TidalScale



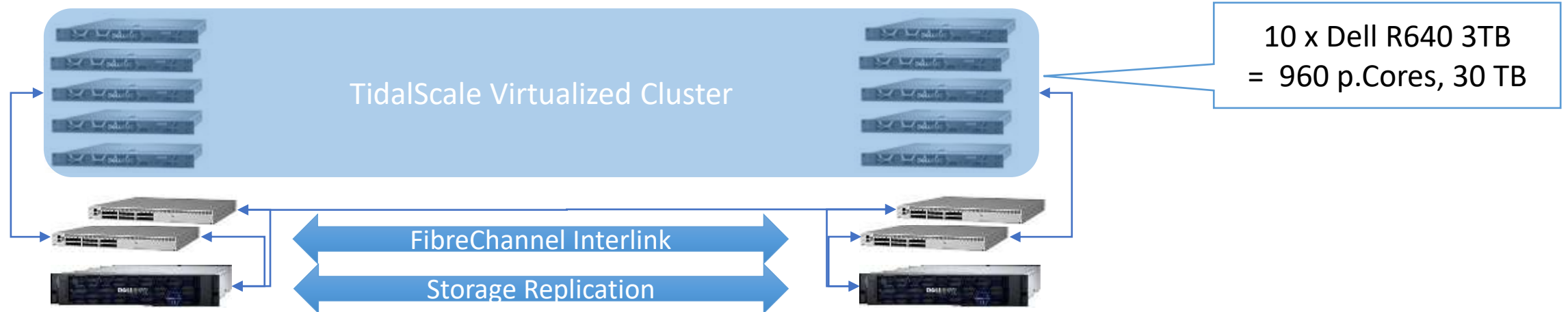
For the Linux based SAP systems:

- ✓ Higher flexibility
- ✓ Higher reliability / availability
- ✓ Higher efficiency
- ✓ Uninterruptable maintenance
- ✓ Granular scalability for the future

## MTI Pricing Example - SAP HANA Cluster - TidalScale 30 TB

10 x R640 Server inkl. 2x Intel® Xeon® Platinum 8260M, 3TB GB RAM  
5 Years ProSupport Plus and 4Hr Mission Critical

770.000,00





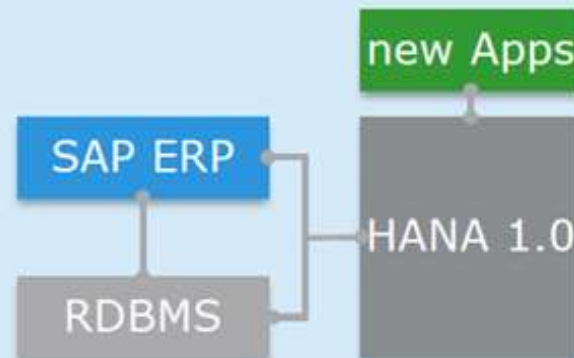
# SAP Deployment Models

## New Business Warehouse Scenario

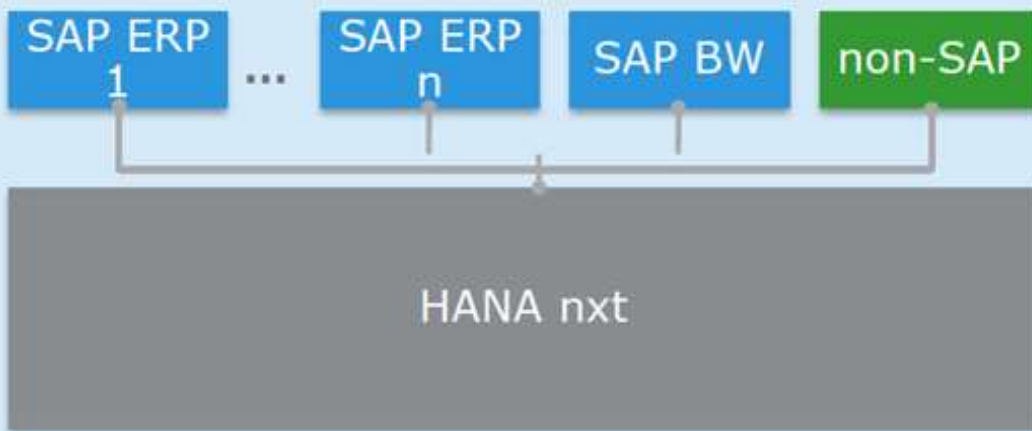
BW was first SAP application running 100% on HANA



## Side-by-side Scenario



- SAP ERP running on a traditional RDBMS.
- Vertical applications adapted for HANA accelerated by underlying HANA instance
- New apps developed on HANA



## One Data Source

- SAP HANA only persistence layer for SAP Business Suite
- SAP Business Suite optimized for in-memory computing

# Ressource Scale-Out mit Tidalscale



Tidalscale Cluster 576C / 36TB



Als verteilter Cluster ist TS nicht abhängig von einer festen Socket/RAM Zuweisung. Dies macht es wesentlich effizienter, skalierbar verfügbar und anpassbar.

# Ressource Scale-Out mit Tidalscale



Tidalscale Cluster 576C / 36TB



**Keine  
Notwendigkeit  
für teurere 8  
Sockel Systeme!**

Als verteilter Cluster ist TS nicht abhängig von einer festen Socket/RAM Zuweisung. Dies macht es wesentlich effizienter, skalierbar verfügbar und anpassbar.

# Zusammenfassung der Vorteile



**Höhere Leistung**



**Zertifizierte Hardware von MTI**



**Günstigere Anschaffung**



**Projekt und Installation durch MTI**



**Skalierbarkeit nach Bedarf**



**Zentraler Ansprechpartner MTI**



**Dynamische Hochverfügbarkeit**



**Managed Service 24x7 durch MTI**



**Einfache und intelligente Verwaltung**

# MTI Service

- Erster europäischer Partner
- 24/7 Service Leistung
- Service Angebot nach Maß

MTI Managed Service Value To Your Business	Fully Managed		Monitor + Analyse		Monitor	
	9 x 5	or 24 x 7	9 x 5	or 24 x 7	9 x 5	or 24 x 7
Priority Service-Desk	✓	✓	✓	✓	✓	✓
Single Point of Contact to get Resolutions	✓	✓	✓	✓	✓	✓
Optimised Productivity	✓	✓	✓	✓	✓	✓
Business Health Reporting	✓	✓	✓	✓	✓	✓
Business Health Checks	✓	✓	✓	✓	✓	✓
Incident Alerting	✓	✓	✓	✓	✓	✓
Incident Investigation	✓	✓	✓	✓	✓	✓
Incident Management	✓	✓	✓	✓	✓	✓
Update Management	✓	✓	✓	✓	✓	✓
Performance Trending	✓	✓	✓	✓	✓	✓
Capacity Monitoring	✓	✓	✓	✓	✓	✓
Capacity Management	✓	✓	✓	✓	✓	✓
Customer Portal Access	✓	✓	✓	✓	✓	✓
Continual Service Improvement	✓	✓	✓	✓	✓	✓
Peace of Mind	✓	✓	✓	✓	✓	✓
Lower Total Cost of Ownership	✓	✓	✓	✓	✓	✓
Reduced Business Risks	✓	✓	✓	✓	✓	✓

# TidalScale™

## Software-Defined Servers



[https://de.mti.com/wp-content/uploads/2017/12/MTI\\_Managed-Services\\_IMS.pdf](https://de.mti.com/wp-content/uploads/2017/12/MTI_Managed-Services_IMS.pdf)

# Wo passt die Lösung?



Sie haben große Datenbanken?

Sie planen gerade eine Neuanschaffung für Ihre Datenbanken?

Sie wollen Ihr SAP System auf HANA migrieren?

Ihre SAP HANA Datenbank sprengt die Systemkapazitäten oder Leistung ist unzureichend?

Sie verwalten multiple Mandanten zentral?

Sie wollen die Verfügbarkeit erhöhen und die Wartung vereinfachen?

Sie möchten Ihre Lizenzkosten für Oracle senken?



**Vielen Dank für Ihre Aufmerksamkeit!**

**Gerne beantworten wir jetzt Ihre Fragen.**

# MTI Webinare – die nächsten Termine im Überblick



- Informationen und Anmeldung unter <https://de.mti.com/webinars/>

18.05.2020

*Dell EMC*

*PowerStore kompakt – was ist wirklich neu?*



25.05.2020

*Huawei*

*OceanStor Dorado V6 - KI-unterstützter Speicher*



02.06.2020

*(Dienstags!)*

*Zadara*

*Enterprise Data Storage pay-as-you-grow*



08.06.2020

*Tidalscale*

*Software Defined Database Server*



15.06.2020

**Quantum**

Was das Darknet mit Ihrem Backup zu tun hat



22.06.2020

**SEP**

Enterprise Backup auch für den Mittelstand







**Bleiben Sie gesund! Bis nächste Woche.**

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