Oracle Hardware

Performance at its best

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Agenda

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Oracle Database Appliance X7-2S/M/HA

Es gibt noch deutlich mehr, nicht nur Exadata

Oracle Appliance X8-2

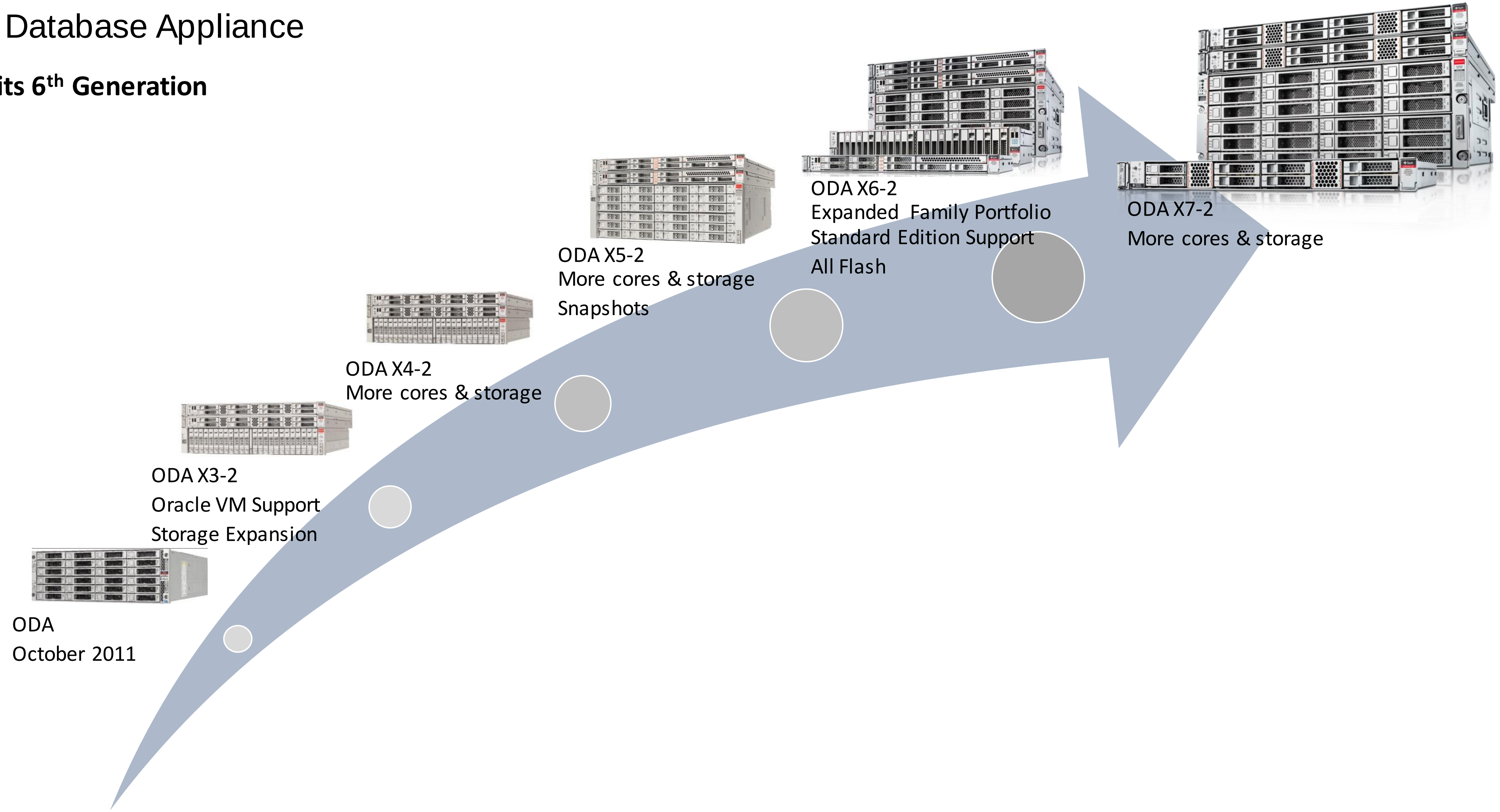
Die kostengünstige Alternative zu "herkömmlicher" Hardware

Oracle Database Appliance X7-2S/M/HA

Die Oracle Database Appliance X7-2 im Überblick

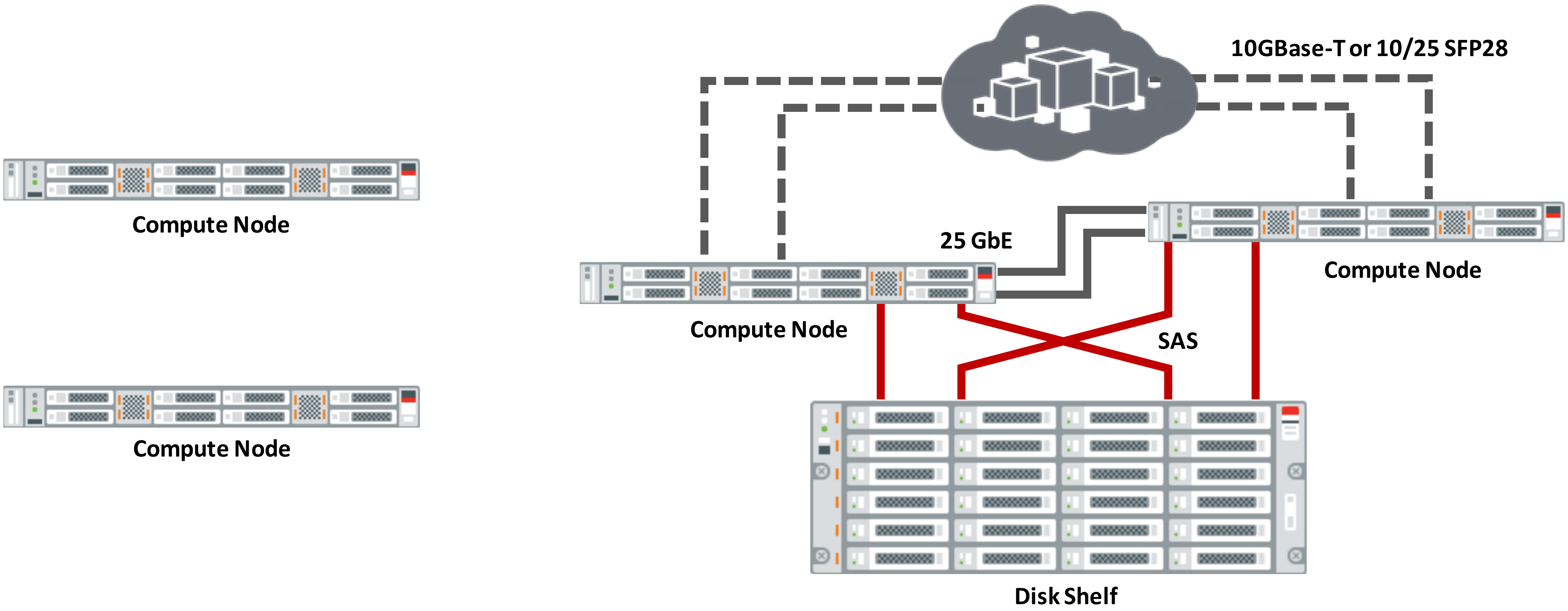
Oracle Database Appliance

Now in its 6th Generation



Die Oracle Database Appliance X7-2 im Überblick

Single Node and Clustered Platform Choices

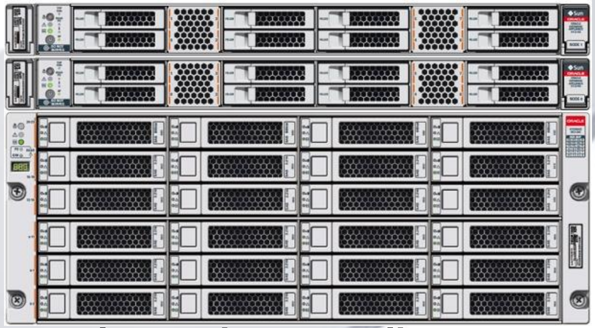


Die Oracle Database Appliance X7-2 im Überblick

PERFORMANCE
HIGHER

Oracle Database Appliance X7-2S
Single-instance
SE/SE1/SE2 or EE
Virtualization
10 Cores
12.8 TB Data Storage (Raw)

Oracle Database Appliance X7-2M
Single-instance
SE/SE1/SE2 or EE
Virtualization
36 Cores
Up to 51.2 TB Data Storage (Raw)

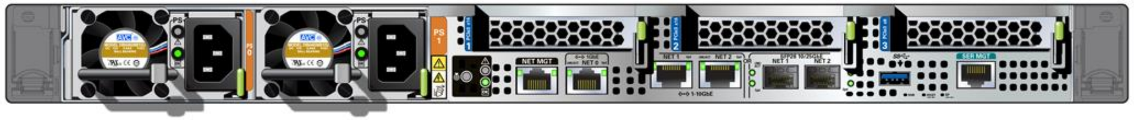


Oracle Database Appliance X7-2-HA
RAC, RAC One, SI
SE/SE1/SE2 or EE
Virtualization
72 Cores
Up to 128TB SSD or
300 TB HDD Data Storage (Raw)

CAPACITY
HIGHER

ODA X7-2S - Small Hardware Configuration

Component	Details
Database	Single Instance SE/EE
Deployment Option	Bare Metal w/ optional KVM support
CPU	1 x 10 Core Intel® Xeon® Silver 4114 processor 2.2 GHz
Memory	192 GB (6 x 32 GB) expandable to 384 GB
Flash Storage (Raw)	12.8 TB NVMe (2 x 6.4 TB NVMe)
Boot Disk	2 x 480 GB M.2 SATA SSD
Network	2 x 10 GbE ports (RJ45) or 2 x 10/25 GbE ports (SFP28)

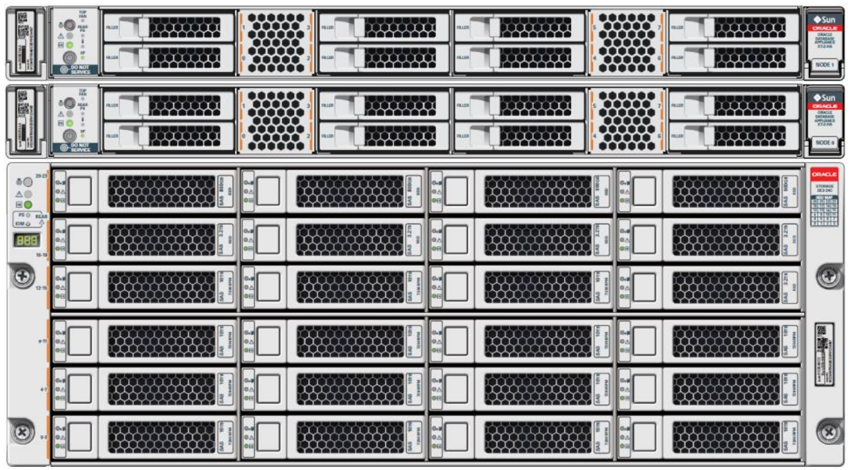


ODA X7-2M – Medium Hardware Configuration

Component	Details
Database	Single Instance SE/EE
Deployment Option	Bare Metal w/ optional KVM support
CPU	2 x 18 core Intel® Xeon® Gold 6140 Processors 2.3 GHz
Memory	384 GB (12 x 32 GB) expandable to 768 GB
Flash Storage (Raw)	12.8 TB NVMe (2 x 6.4 TB NVMe) expandable to 51.2 TB
Boot Disk	2 x 480 GB M.2 SATA SSD
Network	2 x 10 GbE ports (RJ45) or 2 x 10/25 GbE ports (SFP28)

ODA X7-2-HA – High Availability Configuration

Component		Details
Database		Single Instance and RAC SE/EE
Deployment Option		Bare Metal or OVM based VP
Base System		2 x Servers and 1 x Storage Shelf
Each Server	CPU	2 x 18 core Intel® Xeon® Gold 6140 Processors 2.3 GHz
	Memory	384 GB (12 x 32 GB) expandable to 768 GB
	Boot Drive	2 x 480 GB M.2 SATA SSD
	Public Network	2 x 10 GbE ports (RJ45) or 2 x 10/25 GbE ports (SFP28)
	Interconnect	25 GbE
SSD Storage (Raw) - REDO		3.2 TB SSD (4 x 800 GB)
SSD Storage (Raw) - FLASH/DATA		16 TB SSD (5 x 3.2 GB)



Storage Expansion Options
Expandable to 2 x Storage Shelves
High Performance Configuration: 5 Pack of 3.2 TB SSD (16 TB), expandable up to 64 TB per shelf (Raw)
High Capacity Configuration: 15 Pack of 10 TB HDD (150 TB) per shelf (Raw)

Standard Edition Versions and Features Supported on ODA

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Edition	Database Version	RAC	RAC One	Notes	Supported ODA Model Deployments
SE	11.2.0.4	Yes	Yes	• Can run on 4 Sockets with SE license • SE2 restrictions apply if used with an SE2 license	• X7-2S/M Single Instance • X7-2-HA Bare Metal - RAC and Single Instance • X7-2-HA VP – RAC and Single Instance
SE1	11.2.0.4	No	No		• X7-2S/M Single Instance • X7-2-HA Bare Metal - Single Instance • X7-2-HA VP – Single Instance
SE2	12.1.0.2, 12.2.0.1 18.x	Yes	Yes	• RAC is limited to 1 socket server and can only run on ODA Virtualized Platform	• X7-2-S/M Single Instance • X7-2-HA Bare Metal - Single Instance • X7-2-HA VP – RAC, RAC One and Single Instance

Virtualization on Oracle Database Appliance

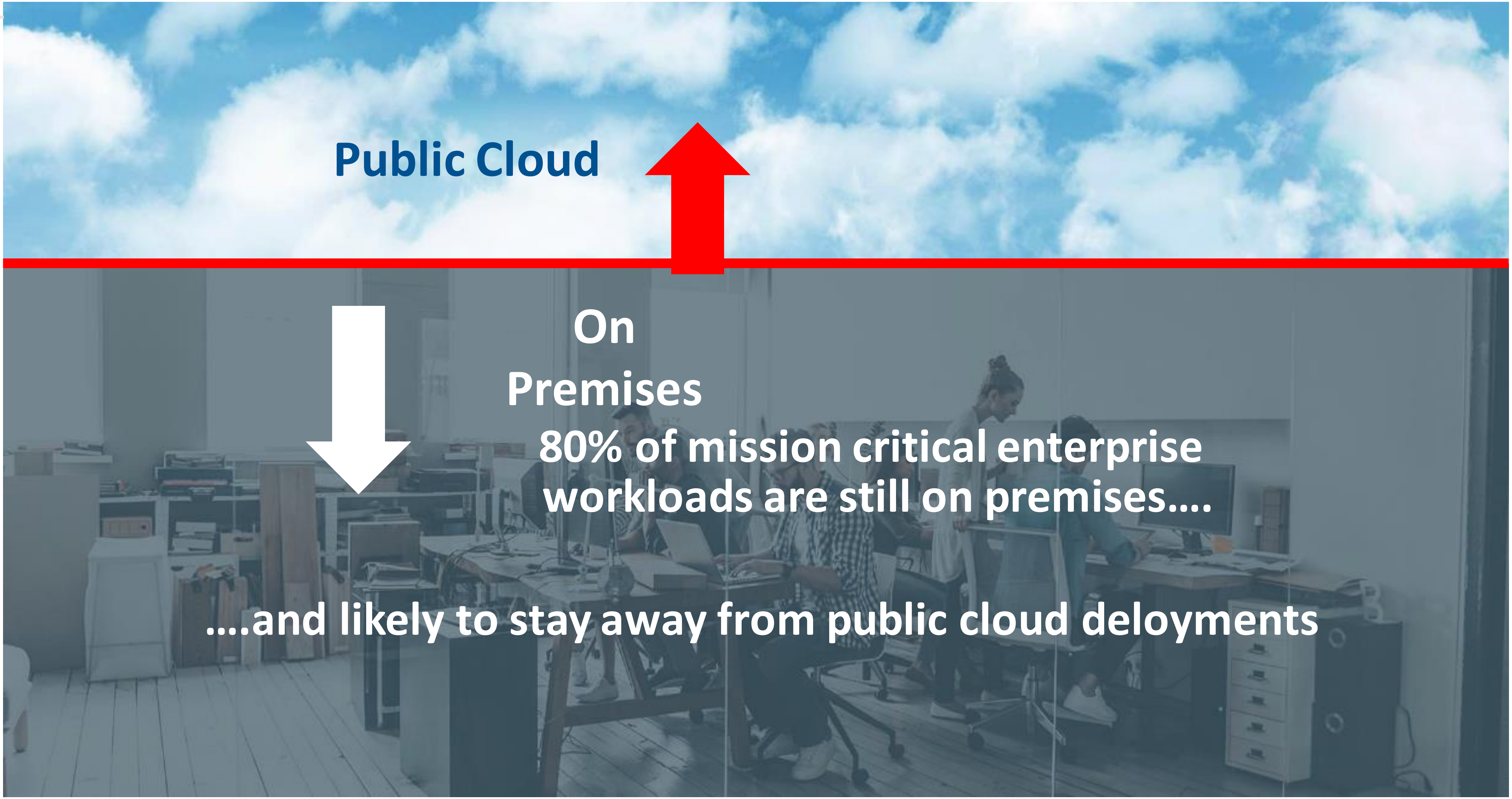
X7-2-HA supports OVM based Virtualized Platform

- OVM based image provides Oracle VM hypervisor with integrated VM provisioning and management using command line (oakcli)

X7-2S/M support KVM virtualization

- Requires native Linux commands to provision and manage workloads
- Does not support databases or Windows OS in VMs
- **Does not qualify as a hard partition for licensing purposes**

Oracle Appliance X8-2


Public Cloud
On
Premises
80% of mission critical enterprise workloads are still on premises....
....and likely to stay away from public cloud deloyments

Oracle Offers The Most Complete And Integrated Infrastructure For All Application Deployment Models

Oracle Cloud Infrastructure

- Subscription-based Services
- Runs in Oracle Cloud
- Managed by Oracle

Cloud@Customer

- Subscription-based Systems
- Behind Your Firewall
- Managed by Oracle

On-Premises Infrastructure

- Hardware & Software
- In Your Datacenter
- Managed by You

Secure Hardware Components in Oracle's x86 Servers

Intel® Xeon® Processors

- Enhancements and extensions for symmetric cryptography –Intel® AES-NI
- SMM External Call Trap Architecture to protect against privilege escalation attack
- Special instructions for asymmetric crypto algorithms
- High quality entropy source

Trusted Platform Module

- Secure generation of cryptographic keys
- Random number generator
- Creates an unforgettable hash key summary of hardware and software configuration
- Encrypts data in a way that can only be decrypted with the TPM device

ORACLE ILOM

Integrated Lights Out Manager

- Service processor that ensures out-of-box security
- Enforces role based access to all management functions
- Validates image signing of new ILOM and BIOS firmware before it is applied
- Audits and logs all configuration changes

Oracle’s x86 Systems Roadmap – CY’19 and Beyond

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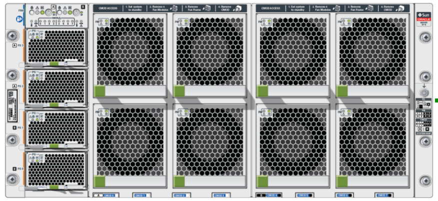
Skylake-SP Based Servers



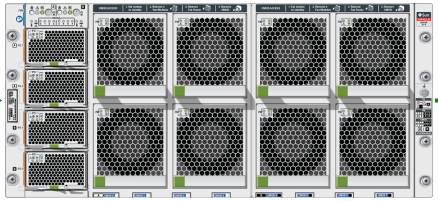
Oracle Server X7-8
Dual Four Socket
Single Eight Socket

Oracle Server X7-2L

Oracle Server X7-2

EOL in Q2CY19

Cascade Lake-SP Based Servers



Oracle Server X8-8
Dual Four Socket
Single Eight Socket

Oracle Server X8-2L

Oracle Server X8-2

GA in Q2CY19

Cooper Lake/
Ice Lake

X9-2
X9-2L

CY20

Sapphire Rapids

X10-*

CY21

Oracle's Latest x86 Servers

Oracle Server X8-2

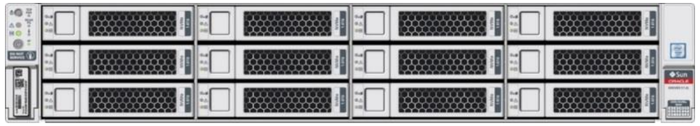
1U Chassis

Two-Socket Server (Up to 48 Cores)

24x DDR4 DIMMs (Up to 1.5 TB)

4x external PCIe slots

8x NVMe SSDs (Up to 51.2 TB)



Oracle Server X8-2L

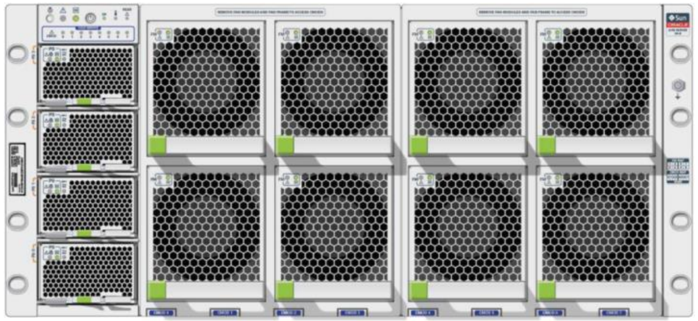
2U Chassis

Two-Socket Server (Up to 48 Cores)

24x DDR4 DIMMs (Up to 1.5 TB)

11x external PCIe slots

12x NVMe SSDs (Up to 76.8 TB)



Oracle Server X8-8

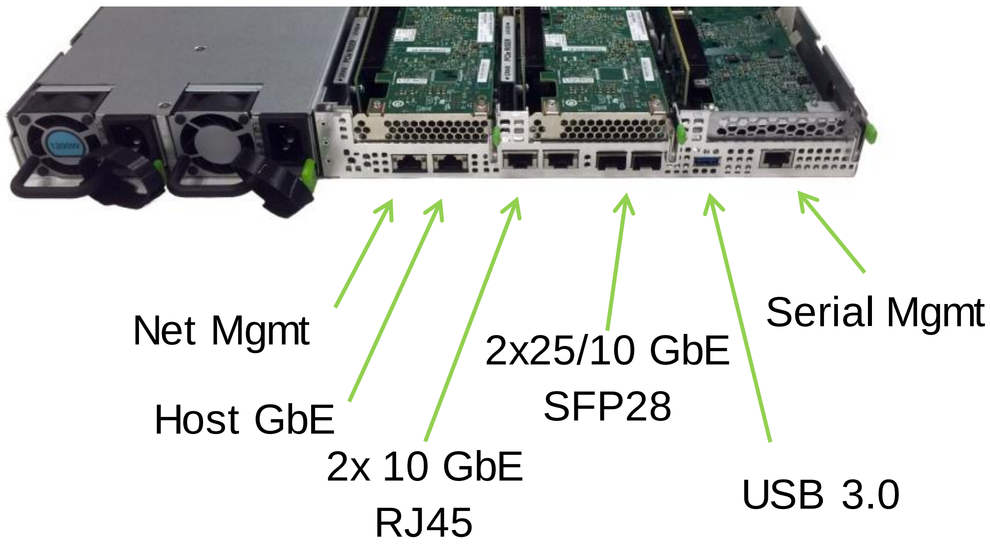
5U Chassis

2x Four-Socket Servers or
1x Eight-Socket Server
(Up to 192 Cores)

96x DDR4 DIMMs (Up to 6 TB)

16x external PCIe slots

Oracle Server X8-2



1RU Chassis

Up to 2x CPU sockets

Up to 24x DDR4 DIMMs

3+1 PCIe Slots: External (2 x16, 1x x8) & Internal-only 1x x8 for HBA

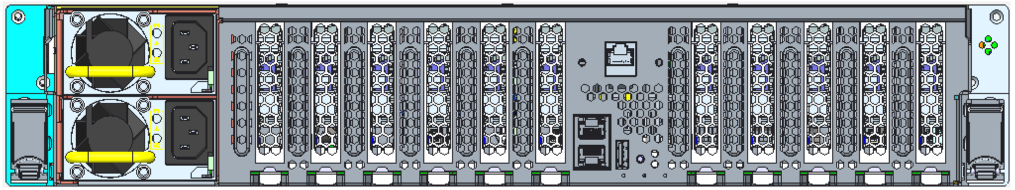
NVMe connectors on Motherboard to support 8x NVMe SFF

2x (10GbE RJ45 or 10/25GbE SFP28), 1x GbE

Mgmt (SP) Serial + GbE, USB-3.0 External rear I/O, USB-3.0 Internal

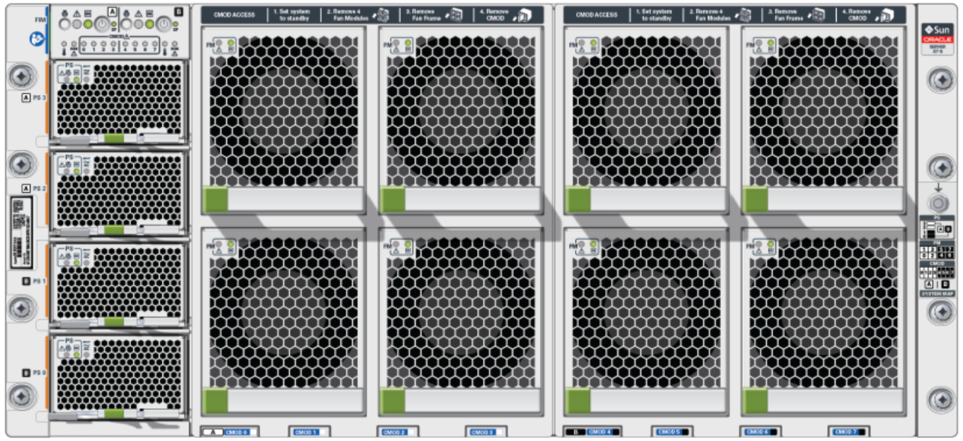
2x M.2 SSDs (internal)

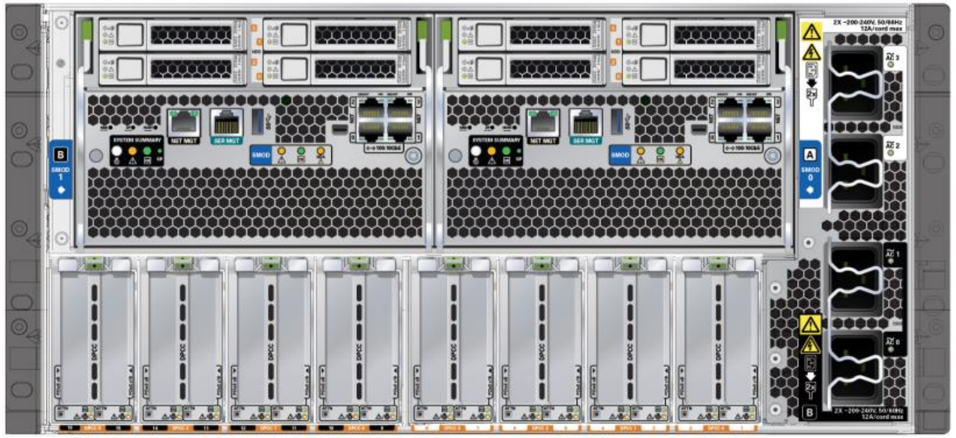
Oracle Server X8-2L



- 2RU Chassis, redundant hot-plug Fans & PSUs
- Up to 2x CPU sockets
- Up to 24x DDR4 DIMMs
- 11x external PCIe Slots (1x x16, 10x x8)
- 1x GbE, Mgmt (SP) Serial + GbE, USB-3.0 External rear I/O, 1x internal USB-3.0
- 2x M.2 boot SSDs (internal)
- Single disk backplane supporting 12x SAS or 12x NVMe (6.4 TB per NVMe SSD) with individual power on/off controls

Oracle Server X8-8

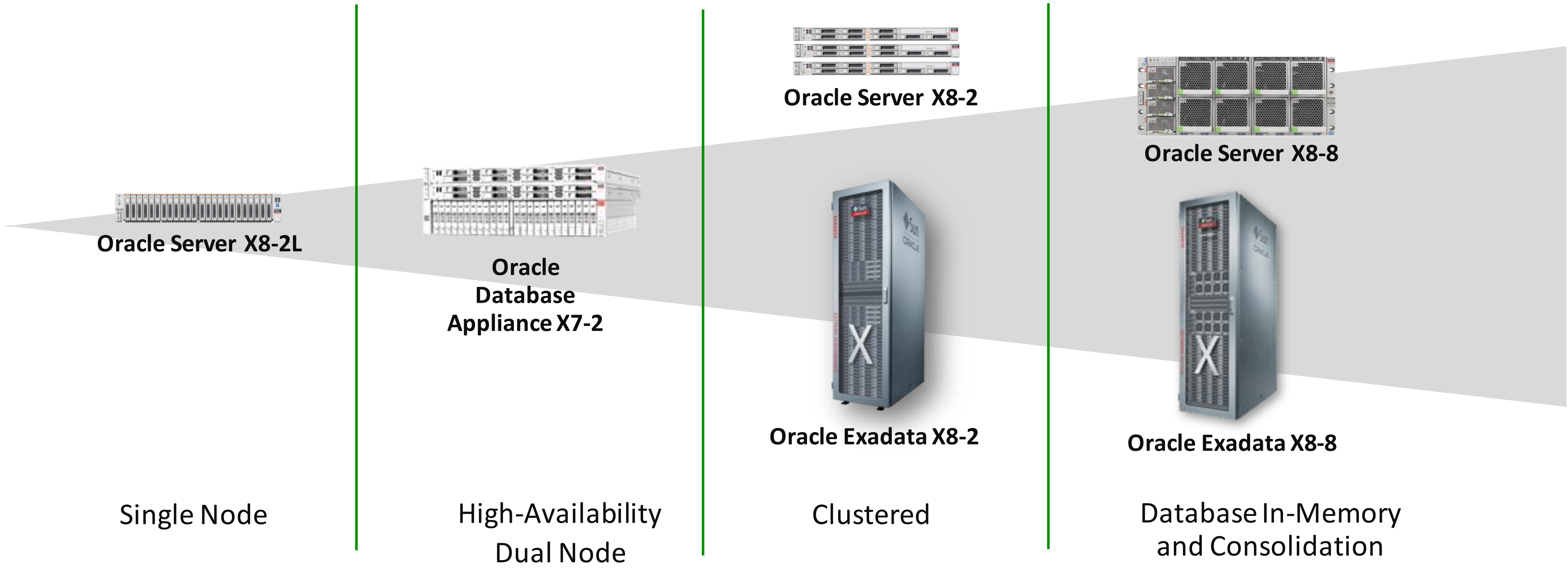




- 5RU Chassis, redundant hot-plug Fans & PSUs
- Single Solution operates as either 8-Socket system or dual independent 4-Socket systems
- Support up to 8x CPUs
- Support up to 12x DDR4 DIMMs per CPU (up to 6TB)
- 16x rear PCIe slots (8x (x8 + x16) slots)
- Total of 8xSFF (2x sets of 4x SFF)
- Total of 8x10GE (2x sets of 4x 10GBaseT)
- 2x sets of [Mgmt (SP) Serial + GbE, USB-3.0 External rear I/O, 1x USB internal]

Es gibt noch deutlich mehr, nicht nur Exadata

Oracle’s x86 Servers for Secure Oracle Database



On-Prem General Purpose Enterprise

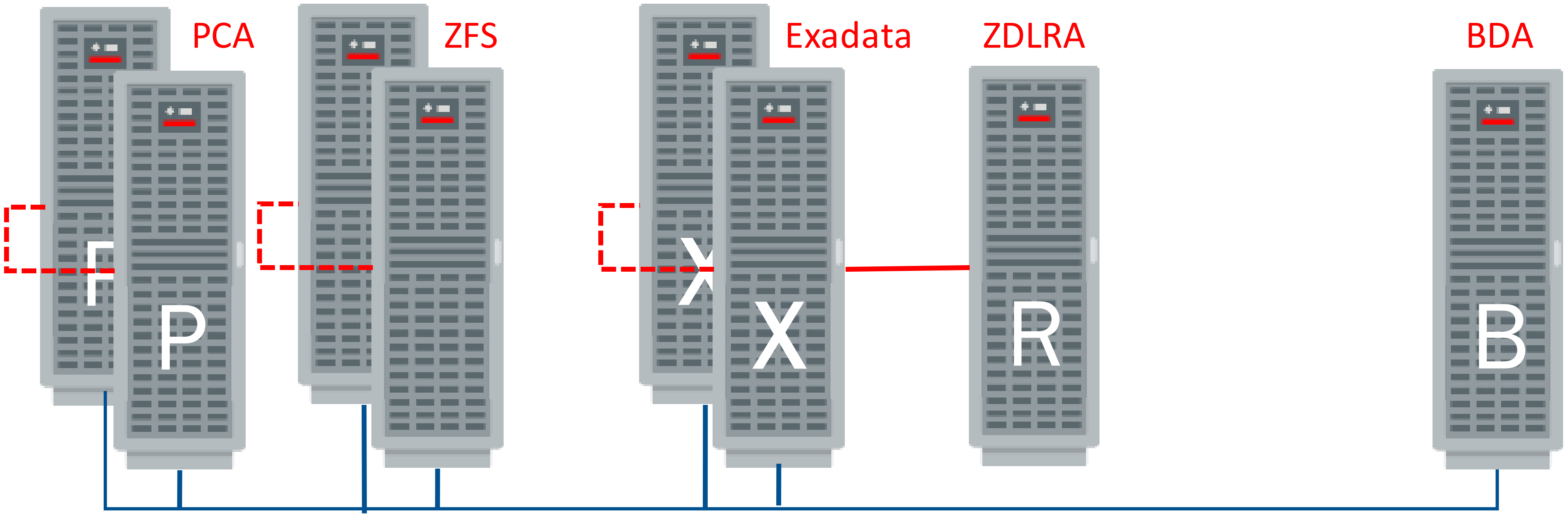
The Engineered Data Center

General Purpose Apps & Shared Storage
App Consolidation
Apps as Service

Databases
DBaaS
OLTP, Warehouse
DB Consolidation

Database Protection
Database Back Up
Database Recovery

Big Data Analytics
Hadoop/NoSQL
Unstructured Data

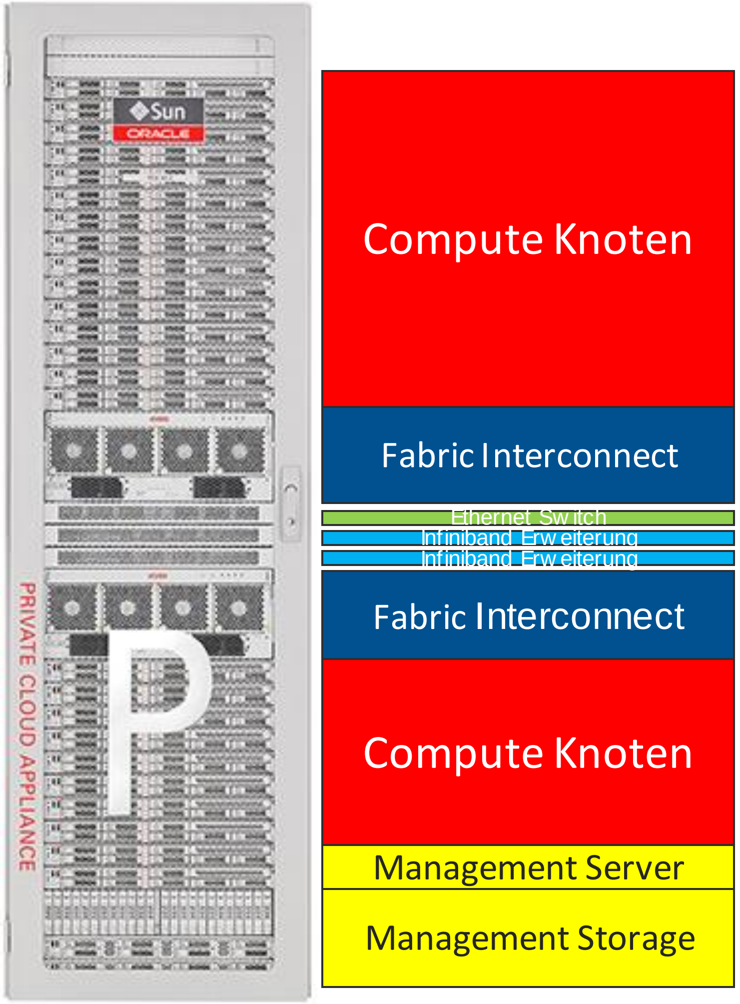


Private Cloud Appliance

- Converged System
- „Cloud in a Box“
- Stellt Server und Netzwerk zur Verfügung
  - Storage ist drin – sollte aber nur für administrative Zwecke genutzt werden
  - Auf den internen Storage kann nicht von extern zugegriffen werden
  - Externen Storage hinzunehmen
    - ZFSSA
    - Beliebiges SAN
- Netzwerk ist virtualisiert
  - Infiniband

Private Cloud Appliance

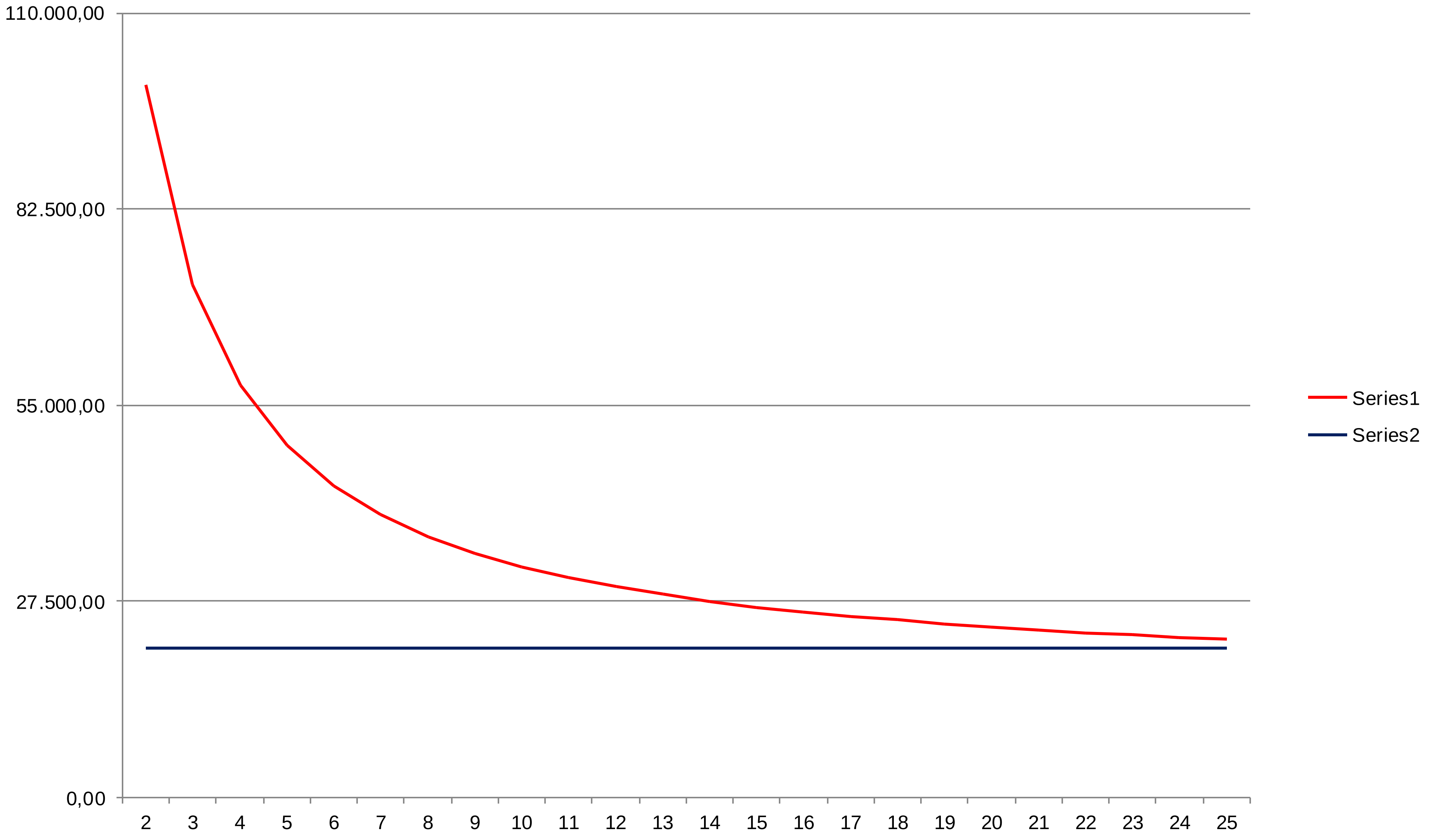
- Compute Infrastruktur
  - X8-2 Server als Rechenknechte
  - 2 x Xeon Platinium 24-Core 2.1GHz
  - 384/768 oder 1,5TB RAM pro Knoten
  - 2 x 1.2 TB Disks pro Server
  - 2 - 25 Rechenknoten
  - Supported mit Linux, Solaris, Windows
  - Windows-Lizenzen sind selber beizustellen
  - Gilt auch für RHEL und SLES
- Netzwerk Infrastruktur
  - High Speed Low Latency zwischen allen Komponenten
  - Fertig vorkonfigurierte Infiniband-Fabric
  - Ports zu LAN und Storage Netzwerk



Vergleich Server/PCA zu einzelnen Server (384GB)

Konfiguration	Anzahl Server	Listenpreis	Preis pro Server		Server X8-2	
PCA mit Compute Knoten a 384GB	2	200.081,00	100.040,50		2 x 24 Core CPU	20.869,96
PCA mit Compute Knoten a 384GB	3	215.556,00	71.852,00		384 GB RAM	
PCA mit Compute Knoten a 384GB	4	231.031,00	57.757,75		2 x 1.2TB Disk	
PCA mit Compute Knoten a 384GB	5	246.506,00	49.301,20		Infinibandadapter	
PCA mit Compute Knoten a 384GB	6	261.981,00	43.663,50			
PCA mit Compute Knoten a 384GB	7	277.456,00	39.636,57			
PCA mit Compute Knoten a 384GB	8	292.931,00	36.616,38			
PCA mit Compute Knoten a 384GB	9	308.406,00	34.267,33			
PCA mit Compute Knoten a 384GB	10	323.881,00	32.388,10			
PCA mit Compute Knoten a 384GB	11	339.356,00	30.850,55			
PCA mit Compute Knoten a 384GB	12	354.831,00	29.569,25			
PCA mit Compute Knoten a 384GB	13	370.306,00	28.485,08			
PCA mit Compute Knoten a 384GB	14	385.781,00	27.555,79			
PCA mit Compute Knoten a 384GB	15	401.256,00	26.750,40			
PCA mit Compute Knoten a 384GB	16	416.731,00	26.045,69			
PCA mit Compute Knoten a 384GB	17	432.206,00	25.423,88			
PCA mit Compute Knoten a 384GB	18	447.681,00	24.871,17			
PCA mit Compute Knoten a 384GB	19	463.156,00	24.376,63			
PCA mit Compute Knoten a 384GB	20	478.631,00	23.931,55			
PCA mit Compute Knoten a 384GB	21	494.106,00	23.528,86			
PCA mit Compute Knoten a 384GB	22	509.581,00	23.162,77			
PCA mit Compute Knoten a 384GB	23	525.056,00	22.828,52			
PCA mit Compute Knoten a 384GB	24	540.531,00	22.522,13			
PCA mit Compute Knoten a 384GB	25	556.006,00	22.240,24			

Preis pro Server



Exadata Database Machine

- Oracles erste Datenbankmaschine
  - Intelligenter Storage (Storagezellen)
  - Schnelles Netzwerk (Infiniband)
  - Optimierter Softwarestack

- Alles „aus einer Hand“
  - SPOC im Servicefall

- Als High Capacity Variante mit Festplatten

- Als High Performance Variante nur mit Flash Disks

Für jede Größe etwas dabei

- Start mit 2 DB Servern und 3 Storage Zellen
- Ältere Maschinen können mit aktuellen Servern aufgerüstet werden
- Lizenzen für Storagezellen erforderlich (1 Lizenz pro Disk)
- Capacity – on – Demand für Datenbankserver

Oracle DB Systeme

Exadata

Oracle Database Appliance

Private Cloud Appliance

Maximale Performance

Einfachste Bedienung

Virtualisierung bei geringen Lizenzkosten

Oracle SPARC M8 Prozessor

- Achte Generation von Oracle SPARC Prozessoren
  - 32 Cores
  - Bis zu 8 Threads pro Core
  - 64 MB L3 Cache
  - 128 KB L2 Data Cache pro Core, 256 KB L2 Instruction Cache pro Core
  - 16 KB L1 Data Cache pro Core, 32 KB L1 Instruction Cache pro Core
- Sehr hohe Memory Bandbreite (185 GB/s)
- Sehr hohe I/O Bandbreite (145 GB/s)
- Extrem hohe Taktfrequenz (5.06 GHz)
- Software in Silicon V2

Software in Silicon v2

SQL in Silicon

Neue Generation vom DAX für Data Analytics Beschleunigung.

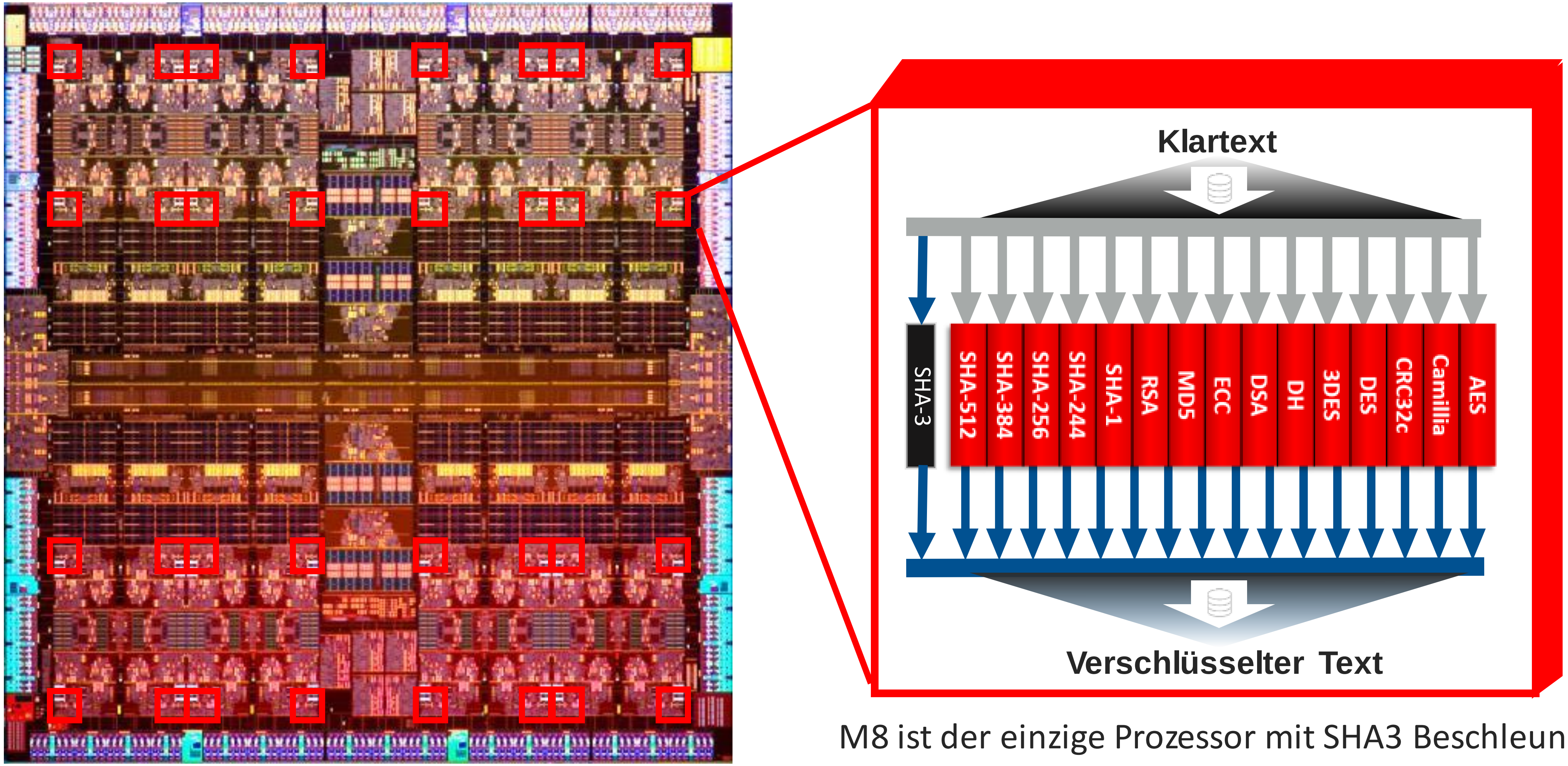
HW-Implementierung von Oracle NUMBERS für schnelleres OLTP

Security in Silicon

Silicon Secured Memory zum Schutz vor Datenstrukturen im RAM.

On-the-fly Verschlüsselung jetzt mit Unterstützung von SHA3.

Datenverschlüsselung in Hardware



M8 ist der einzige Prozessor mit SHA3 Beschleunigung

SPARC T8-1 Server

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- 2U Chassis, passt in ein 900mm tiefes Rack
- Ein SPARC M8 Prozessor
- Bis zu 1 TB RAM
    - 8 oder 16 Dimms a 16GB, 32GB, 64GB
- Acht 2,5‘‘ hot-pluggable Drive Bays
    - Bis zu 8 SAS HDDs/SSDs
    - Bis zu 4 NVMe SSDs
    - Mischen von SAS und NVMe Laufwerken supported
- 1 Onboard SAS3 HBA (HW RAID 0,1,10,1E)
- Eine optionale NVMe Switch-Karte (factory-installed)
- Vier 10GBase-T Ports
- 6 PCIe 3.0 Steckplätze mit je 8 Lanes oder 4 PCIe 3.0 Steckplätze, davon 2 mit 16 und 2 mit 8 Lanes
- Vier hot-pluggable Lüfter
- Zwei 1200W hot-pluggable Netzteile (1+1 Redundanz)

SPARC T8-2 Server

- 3U Chassis, passt in ein 900mm tiefes Rack
- Zwei SPARC M8 Prozessor
- Bis zu 2 TB RAM
  - 16 oder 32 Dimms a 16GB, 32GB, 64GB
- Sechs 2,5‘‘ hot-pluggable Drive Bays
  - Bis zu 6 SAS HDDs/SSDs
  - Bis zu 4 NVMe SSDs
  - Mischen von SAS und NVMe Laufwerken supported
- 1 Onboard SAS3 HBA (HW RAID 0,1,10,1E)
- Ein oder zwei optionale NVMe Switch-Karte (factory-installed)
- Vier 10GBase-T Ports
- 8 PCIe 3.0 Steckplätze, davon 4 mit 16 und 4 mit 8 Lanes
- Sechs hot-pluggable Lüfter
- Zwei 2000W hot-pluggable Netzteile (1+1 Redundanz)

SPARC T8-4 Server

- 5U Chassis, passt in ein 1000mm tiefes Rack
- Zwei oder vier SPARC M8 Prozessor
- Bis zu 4 TB RAM
  - Halb oder vollbestückte Dimm-Slots pro CPU Board a 32GB, 64GB
- Acht 2,5‘‘ hot-pluggable Drive Bays
  - Bis zu 8 SAS HDDs/SSDs und/oder NVMe SSDs
    (NVMe derzeit noch nicht supported)
  - Mischen von SAS und NVMe Laufwerken supported
- Zwei Onboard SAS3 HBA (HW RAID 0,1,10,1E)
- Zwei optionale NVMe Switch-Karten
  - Bisher noch nicht supported!
- Vier 10GBase-T Ports
- 16 low-profile PCIe 3.0 Steckplätze, davon 8 mit 16 und 8 mit 8 Lanes
- Fünf hot-pluggable Lüftermodule
- Vier 3000W hot-pluggable Netzteile (N+N Redundanz)

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Die kostengünstige Alternative zu "herkömmlicher" Hardware

Fragen?

merlin.zwo

Wir kümmern uns!

merlin.zwo InfoDesign GmbH & Co. KG

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