



# Cloud leadership: Delivering epic cloud value and performance

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# AMD computing powers the daily lives of billions




Cloud,  
Enterprise  
& HPC



5G & Comms  
Infrastructure



Artificial  
Intelligence



Adaptable  
Intelligent  
Systems



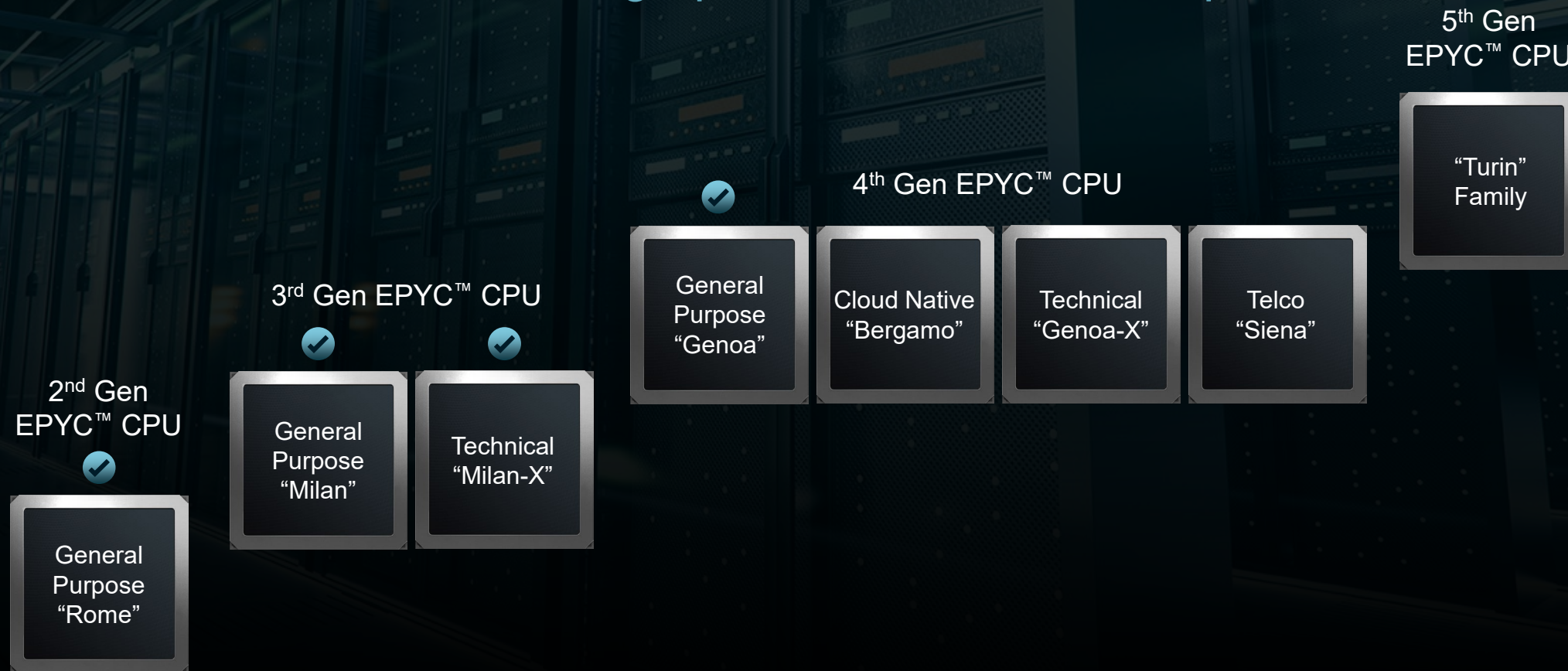
Gaming,  
Simulation &  
Visualization



Smarter  
Client Devices

# AMD Data Center CPU Roadmap

## Sustained High-performance Leadership



2019

2024



# THE BEST GETS BETTER

## 300+ WORLD RECORDS AND COUNTING

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### DATABASES & ANALYTICS

Structured data and analytics  
Unstructured data and analytics



### HCI/SDI/CLOUD

Cloud and Virtualization  
Integer Performance  
Cloud/VM/Integer Efficiency



### Enterprise

ERP Business Apps  
Java® Based Performance  
Energy Efficiency



### HPC

High Performance Computing Apps  
Floating Point Performance  
Floating Point Energy Efficiency

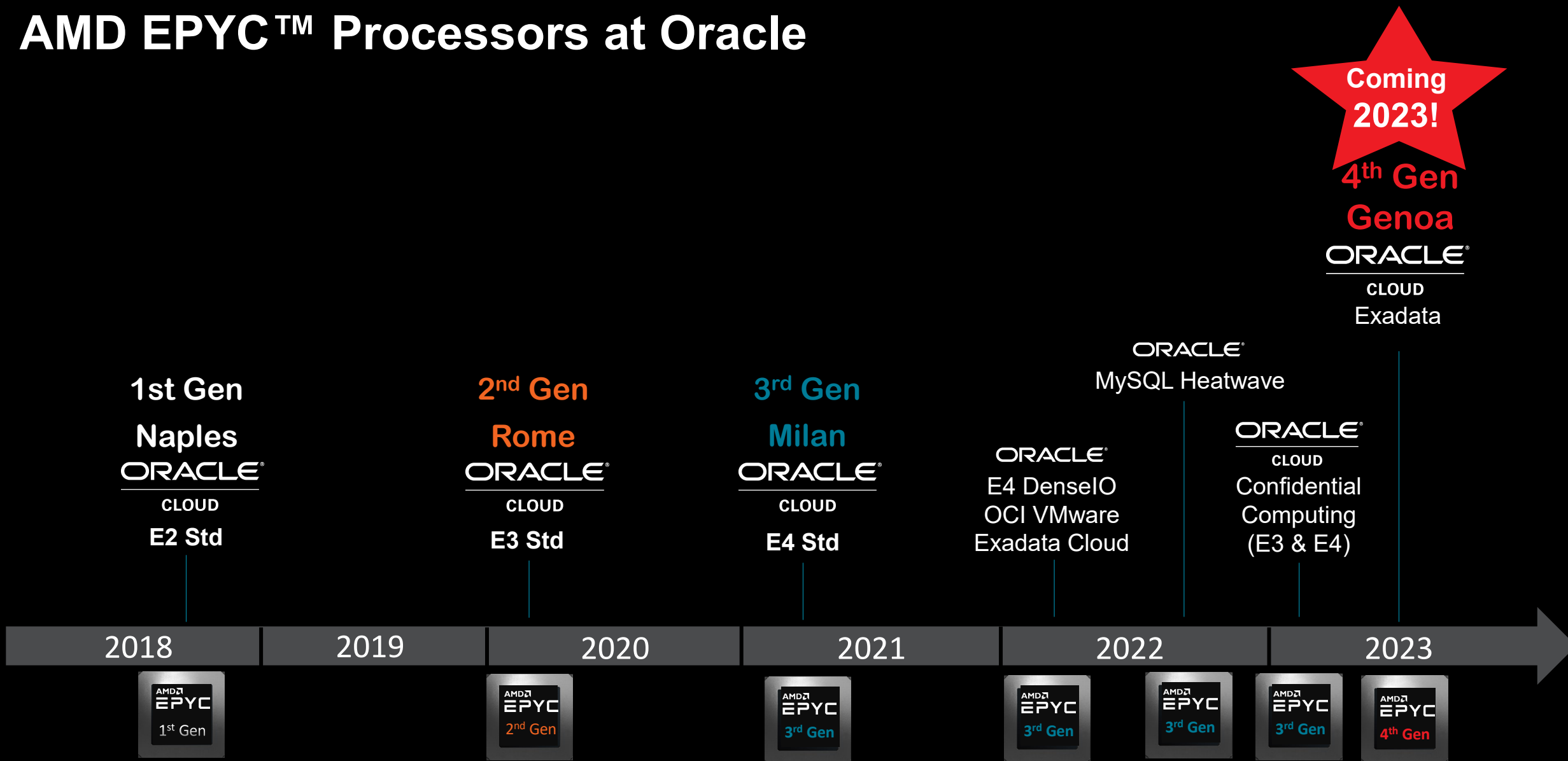


# Accelerating Enterprise Value with AMD EPYC™ CPU BASED OCI VM's

**OUTSTANDING x86 PRICE/PERFORMANCE**

**INDUSTRY'S MOST FLEXIBLE, EASY TO USE INSTANCES**

# AMD EPYC™ Processors at Oracle

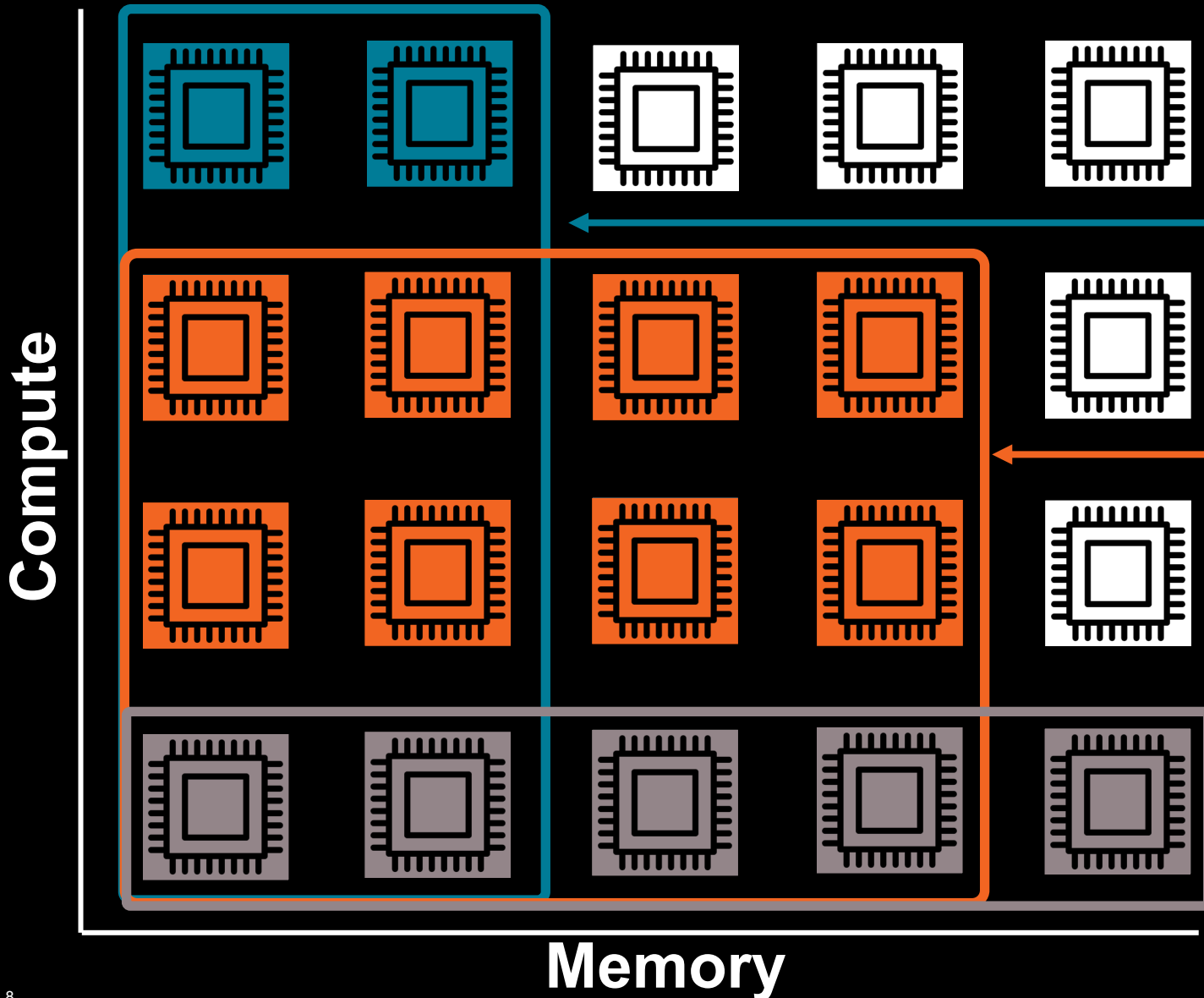


4th Gen  
Genoa

ORACLE®  
CLOUD  
Exadata

Sources:  
[Oracle and AMD announcement video](#)  
[Oracle 3rd Gen EPYC Based VMs - Launch blog](#)

# Flexible Shapes Unlock Elastic and Efficient Compute



## Competitors Fixed Shapes:

Provide fixed number of compute and memory resources, you pay for all

**Media encoding workloads are compute intensive**

With fixed shapes you may waste money on memory you don't need

**Web server workloads require balanced compute and memory**

But you may pay for extra compute and memory resources with fixed shapes

**In-memory database workloads are memory intensive**

You may have to waste budget on extra compute

## Bottom Line:

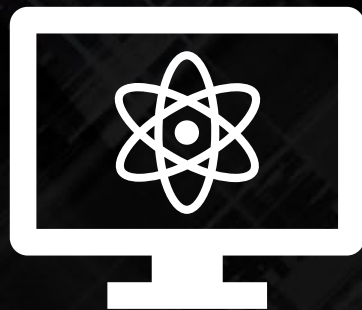
With OCI's flexible shapes you only pay for the resources you need



ORACLE + AMD 

2022 Launches

# Accelerate Storage Optimized Workloads on 3<sup>rd</sup> Gen AMD EPYC™ CPU Based OCI Instances



E4 DenseIO Virtual Machines and BM DenseIO  
Powered by 3<sup>rd</sup> Gen EPYC™ CPUs

Helps accelerate database and big data analytics with 50% better price/perf vs. previous gen\*

Significant network throughput, memory, and core advancements vs. previous gen\*

Available worldwide

Large and fast SQL databases

Streaming, real-time analytics

Large transactional databases

Distributed NoSQL databases

Distributed file systems

\*Sources:

[Announcing E4 DenseIO instances with twice the performance for database and analytics workloads \(oracle.com\)](https://www.oracle.com/announcements/announcing-e4-denseio-instances-with-twice-the-performance-for-database-and-analytics-workloads/)

# OCI's AMD Based E4 DenseIO Compute Instances

## *Storage optimized compute instances*

- **Low latency, high IOPs, TLC based NVMe SSDs**
- **60% better CPU performance than DenseIO2 at lower cost**
- **Increased scale with 2.5X cores, 2.5X memory and 2X network compared to DenseIO2**

World-class performance for workloads that need **low latency storage**:

- Large Databases
- File services
- Bigdata and Data processing
- Transaction optimized workloads
- Oracle Cloud VMWare vSAN solution

Oracle Cloud VMWare Service : *"With the new E4 Dense shape, Oracle Cloud VMware Solution can now provide customers with industry leading VM deployment options per SDDC host, for high cpu or high memory use cases. With over 2.5x the Memory and CPUs per host than competing offerings"*

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Shape	OCPU	Memory	Storage	Network
E4 DenseIO	128	2048 GB	54.4 TB NVMe	2x50 Gbps



**TIM Brasil selects Oracle and Microsoft to migrate all of its datacenter workloads to the cloud**

"We are undergoing an important cloud transformation to improve our environmental, social, and governance practices. Using a multi cloud strategy, we are the first carrier in Brazil to move 100% of our workloads to the cloud. It includes moving our customer billing system, our CRM and VMware workloads to Oracle Cloud Infrastructure."

**Pietro Labriola**  
CEO, Tim Brasil

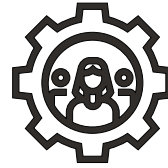
# Oracle Cloud VMware Solution

*The ideal platform for...*



## Control

Modernize without compromising existing software, processes and policies



## Predictability

Built for custom enterprise workloads, retain some talent and IT operational processes



## Security

Dedicated isolated vSphere environment, with zero-trust, and built in encryption

*Delivers the same native VMware experience in the cloud with security, predictability and full administrative control*

# Oracle Cloud VMware Solution Shapes Powered by AMD EPYC™ CPUs

E4.32 AMD	E4.64 AMD	E4.128 AMD
32 Cores 2 TB RAM 54.4 TB NVMe	64 Cores 2 TB RAM 54.4 TB NVMe	128 Cores 2 TB RAM 54.4 TB NVMe
New Workload	New Workload	New Workload
VDI	VDI	VDI
Small Workload		Massive Workload
Memory Hungry +++	Memory Hungry ++	Memory Hungry +
Storage Hungry +++	Storage Hungry	DC Exit

[Announcing the Oracle Cloud VMware Solution spring release](#)

# Everything, Everywhere, with Simple Pricing

ORACLE

AMD

vmware®



**41 Oracle Cloud Regions + 8 planned**

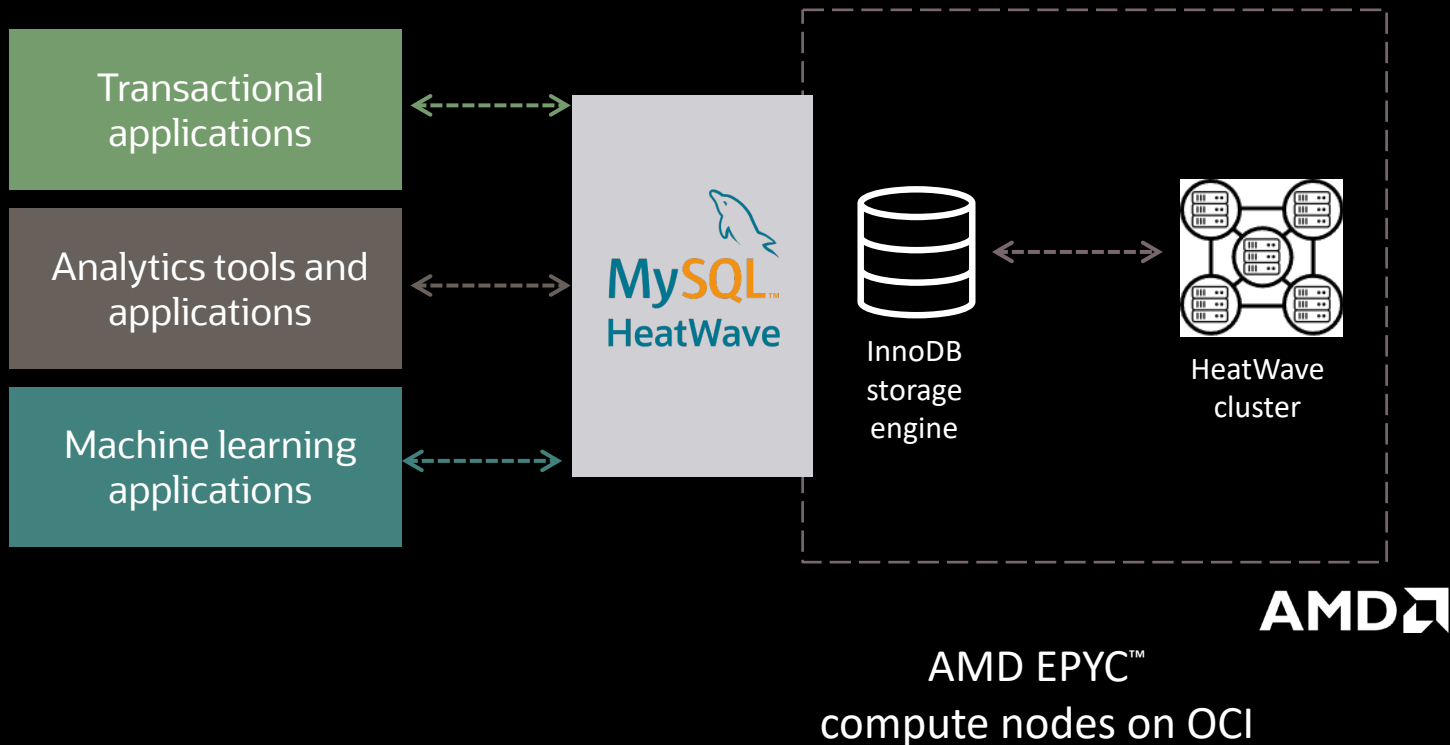
**12 Interconnect for Azure regions**

Support for all workload types, at the same price, anywhere around the world

■ Commercial   ■ Commercial Planned   ■ Government  
□ Sovereign Planned   ■ Interconnect for Azure

Source: Oracle

# MySQL HeatWave – One database is better than many



One service for OTLP, OLAP, & ML

No ETL duplication

Unmatched performance, at a fraction of the cost

Real-time analytics






Improved security

Applications work without changes

# ORACLE CLOUD IAAS OFFERINGS POWERED BY AMD EPYC CPU'S







**E3-standard**  
Flexible options  
with 2<sup>nd</sup> Gen EPYC CPUs

**NEW!**

Flexible VM 	Confidential 
Burstable 	
Preemptible 	
Bare Metal 	

**E4-standard**  
Exceptional price/perf with 3<sup>rd</sup> Gen EPYC CPUs

**NEW!**

Flexible VM 	Confidential 
Burstable 	E4 DenseIO 
Preemptible 	
Bare Metal 	

## Notes:

- A burstable instance is a virtual machine (VM) instance that provides a baseline level of CPU performance with the ability to burst to a higher level to support occasional spikes in usage.
- Preemptible instances are the same as a standard instances, with one exception: If compute capacity is needed elsewhere, OCI can terminate preemptible instances after a short notice period. They are designed for running interruptible workloads at half the cost.



# Q1CY23 - OCI Launches AMD EPYC Based Confidential Compute

## Enhanced Security

## OCI Confidential Computing

Advanced security to protect your data, included for free

- Protects data-in-use by encrypting it in memory with enhanced isolation using AMD Secure Encrypted Virtualization (SEV)
  - Data in memory isolated via encryption keys
  - No code change required for onboarding
  - Minimal performance impact across most workloads
  - Available at low or no cost to eliminate security tradeoffs

## Workloads

- Enterprise workloads that process sensitive or confidential data requiring extra security protection for data-in-use.
- Workloads that leverage AMD shapes (E3 and E4)

Source: Oracle

## Create compute instance

Availability domain

AD 1 yTes:US-ASHBURN-AD-1	AD 2 yTes:US-ASHBURN-AD-2
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[Show advanced options](#)

## Security

Shielded instance

Confidential computing ⓘ

Shielded instances harden the firmware security on bare metal hosts and virtual machines (VMs) to defend against malicious boot level software.

Confidential computing is hardware technology in CPUs that encrypts data in-use while being processed and protects against these threats.

## Image and shape

A shape is a template that determines the number of CPUs, amount of memory, and other resources allocated to an instance. The image is the operating system that runs on top of the shape.

Image

ORACLE Linux  
Oracle Linux 8  
Image build: 2022.08.08-0

Shape

AMD  
VM.Standard.E4.Flex  
Virtual machine, 1 core OCPU, 16 GB memory, 1 Gbps network bandwidth

Source: Oracle

## Step 1:

### Create an Instance

## Step 2:

### Toggle “on” Confidential Compute

## Step 3:

### Choose Image and Shape

# Confidential Compute Targets



## Financial Services

- ▲ Financial and credit records
- ▲ Secure credit card and bank transactions
- ▲ Anti-money laundering
- ▲ Credit risk assessment & qualification from combined bank records
- ▲ Capital markets
- ▲ Crypto and GSIB
- ▲ Fraud analytics



## Government

- ▲ Privacy preserving digital transformation
- ▲ Protecting IP
- ▲ Protecting classified data
- ▲ Medical data
- ▲ Critical infrastructure
- ▲ Ensuring compliance
- ▲ Judicial proceedings and case management
- ▲ Safeguarding vulnerable population protection



## Healthcare & Life Sciences

- ▲ Protecting patient data
- ▲ HMO medical records
- ▲ Drug development
- ▲ Insurance fraud, waste, and abuse prevention
- ▲ Disease diagnostics

**AMD** 