



together we advance_data center computing

AMD and HPE Virtualization Sales Guide

February 2023

Get Started



CURRENT MARKET DISRUPTERS

Virtualization is a ubiquitous workload for which AMD has clear leadership and a strong value proposition.

Currently, there are several key market disrupters that are causing IT decision makers to be open to new solutions, including those with AMD processors.



VMWARE® VSPHERE®

- ▲ VMware announced end of support (EOS) for vSphere 6.5 and 6.7 and stated that vSphere 8.0 won't support CPUs listed as EOS or end of life (EOL).
- ▲ Many customers are foregoing the upgrade to VMware vSphere 7.0, choosing to migrate directly to vSphere 8.0.
- ▲ Upgrading is nontrivial. Testing and certification is needed to ensure compatibility with infrastructure and applications.
- ▲ **Opportunity:** Many customers will choose to upgrade or refresh their server infrastructure when upgrading software. Many will define "open windows" for new hardware and software testing/certification. These are ideal times to introduce AMD EPYC™ processor-based solutions and get them into the test/evaluation/certification cycle.



TECHNOLOGY TRANSITIONS

- ▲ Older infrastructure can be more costly to maintain and may not be able to keep pace with increasing business demands.
- ▲ Aging servers may experience higher failure rates that can result in unplanned downtime and increased maintenance cost.
- ▲ There are costs associated with doing nothing. Older servers have fewer cores, result in more servers, space, and energy use.
- ▲ Older servers may be unable to handle the latest security risks.
- ▲ **Opportunity:** Identify old (3-5 year old) servers and talk about how they increase costs. Emphasize that refreshing older servers with newer servers with AMD EPYC processors can help reduce energy consumption, thereby reducing OpEx and helping meet sustainability goals.



EXPANDING DEMANDS

- ▲ IT needs to deploy new workloads, including AI/ML and database analytics to tap into data and improve operations, better understand customers, automate operations, etc.
- ▲ **Opportunity:** Many companies don't have enough infrastructure capacity to implement additional workloads. IT decision makers are looking for new hardware that can handle the load. AMD EPYC processor-based servers are ideal for these customers.
- ▲ Containers now are used in production. VMware, Nutanix, Microsoft, and Red Hat products allow IT staff to manage VMs and containers in the same cluster for greater flexibility and oversight.
- ▲ **Opportunity:** High core counts support more containers per server. Fewer servers support savings on CapEx and OpEx.



EFFICIENCY AND SAVINGS

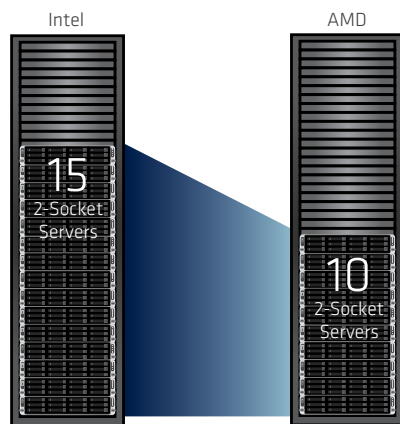
- ▲ Increasing power and cooling costs are taxing IT budgets.
- ▲ Many businesses have initiatives to make IT more sustainable.
- ▲ Key goals include maximizing the computing performance delivered per watt of energy consumed, and reducing energy use and greenhouse gas (GHG) emissions.
- ▲ **Opportunity:** AMD EPYC processors power the most energy-efficient x86 servers in the market, delivering exceptional performance and helping reduce energy consumption. ^{EPYC-028} High core counts support more VMs, containers, and VDI instances per server.

WHY AMD EPYC

Our flexible architecture delivers leadership up and down the stack, with outstanding performance and power savings across all core counts.

- ▲ **Containers and microservices:** supports fast response time with a high core-to-container count ratio
- ▲ **Desktop virtualization:** delivers improved user experiences with a system accelerated by up to 96 cores per CPU and sizable GPU capacity
- ▲ **In-memory databases:** offers large memory size and I/O for massive amounts of NVMe™ storage for persistent storage

- ▲ **Hyperconverged infrastructure (HCI):** provides leadership performance and value for virtualized IT
- ▲ **Big data:** offers large memory space, large I/O capacity with direct-to-disk capability
- ▲ **Software-defined storage:** delivers high bandwidth for latency-sensitive storage environments and a consistent feature set regardless of CPU core count



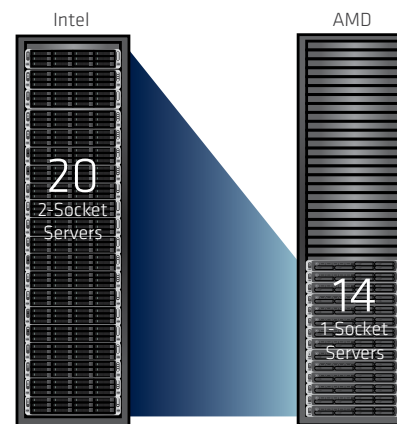
Up to **33%** Fewer servers

Up to **32%** Less power

Up to **41%** Lower 3-year server TCO

Up to **28** Acres of US forest annually of equivalent carbon sequestration [MLNTCO-021](#)

Numbers are estimates. TCO based on the hardware and related OpEx to support the 1200 VMs in this analysis.



Up to **43%** Lower hardware TCO

Up to **61%** Lower hardware and virtualization costs

Up to **30%** Fewer servers

Cost per virtual machine

AMD EPYC \$991

Intel Xeon \$1902

Up to **48%** Estimated 1-year lower cost per VM

Up to **48%** Estimated 1-year TCO savings

Estimated first year TCO/VM to deliver 320 virtual machines.
1 core, 8 GB of memory per VM. 2P Intel Xeon 6334 vs. 1P AMD EPYC 7443. [MLNTCO-011](#)

OVERVIEW

HPE ProLiant Gen10 Plus servers with AMD EPYC™ 7003 Series processors with AMD 3D V-Cache™ technology deliver faster time to results for targeted workloads. The new processors triple the available L3 cache delivering significant performance uplifts for high-value technical computing solutions.

DL325 Gen10 Plus V2

Cost-optimized server designed for virtual desktop infrastructure (VDI) deployments

DL345 Gen10 Plus

Large storage capacity server designed for database workloads

HPE vSAN Ready Nodes

Distributed shared data stores for virtualization, data management, and data warehousing workloads

DL365 Gen10 Plus

Performance-optimized server designed for VDI deployments

DL385 Gen10 Plus V2

High-capacity, high-performance server designed for big data analytics and AI/ML workloads

HPE SimpliVity

Intelligent hyperconverged infrastructure optimized for edge, VDI, and general virtualized workloads

SEE SIDE-BY-SIDE DETAILED SPECIFICATIONS [➔](#)



FEATURE	HPE PROLIANT DL325 GEN 10 PLUS V2 SERVER	HPE PROLIANT DL345 GEN 10 PLUS SERVER	HPE PROLIANT DL365 GEN 10 PLUS SERVER	HPE PROLIANT DL385 GEN 10 PLUS V2 SERVER
Form factor	1 rack unit (RU)	2 RU	1 RU	2 RU
Processors	1-socket server AMD EPYC™ 7003 series AMD EPYC 7003 Series with AMD 3D V-Cache™ Technology	1-socket server AMD EPYC 7003 series AMD EPYC 7002 series	2-socket server AMD EPYC 7003 and 7002 series AMD EPYC 7003 Series with AMD 3D V-Cache Technology	2-socket server AMD EPYC 7003 series AMD EPYC 7003 Series with AMD 3D V-Cache Technology
Storage	Front: 4LFF SAS/SATA, 8 +2 SFF SAS/SATA, 8 +2 SFF NVMe x4 PCIe® Gen 4 Rear: None	Front: 12 LFF HDD/SSD; SAS/SATA, 24 SFF HDD SSD; SAS/SATA, 24 SFF NVMe x4 PCIe Gen4, 24 SFF NVMe x1 PCIe Gen4 Rear: 2 SFF SAS/SATA x4 NVMe	Front: 8 +2 SFF SAS/SATA, 8 +2 SFF NVMe x4 PCIe Gen4 Rear: None	Front: 12 LFF SAS/SATA, 24 SFF SAS/SATA, 24 SFF NVMe x4 PCIe Gen 4, 24 SFF NVMe x1 PCIe Gen4 Mid Tray: 8 SFF SAS/SATA/NVMe x4 PCIe Gen4, 4 LFF SAS/SATA Rear: 4 SFF SAS/SATA
I/O	Up to 3 x16 PCIe Gen4, x8 PCIe Gen4 OCP3 slot, x8 AROC	Up to 4 PCIe Gen4 slots, 2 x16 PCIe Gen4 on Primary; x16 PCIe Gen4 or 2 x8 PCIe Gen4 on Secondary, x8 PCIe Gen4 OCP3 slot, x8 AROC	Up to 3 x16 PCIe Gen4, Riser option with tinker support-2 x16 and 1 x8, x8 PCIe Gen4 OCP3 slot, x8 AROC	8 total PCIe Gen4 slots, x8 PCIe Gen4 OCP3 slot, x8 AROC, up to 6 x16 PCIe Gen4
GPU support	2x single wide	Up to 3x single wide	2x single wide	8x single wide or 3x double wide
Chassis	Short depth (<25.5")	28" (SFF), 29.5" (LFF)	29.21"	28" (SFF), 29.5" (LFF)
Category	Cost-optimized server	Large storage capacity server	Performance-optimized server	Performance and capacity server
Target workloads	Virtual desktop infrastructure (VDI)	Databases	VDI	AI/ML and big data analytics



VIRTUAL MACHINE MIGRATION

Migrating virtual machines is a straightforward and easy task. Both AMD and VMware tools help simplify and accelerate the process.

Step 1: Identify processors. Select the AMD EPYC™ processors that are best suited to existing virtual machine deployments and workloads. Be sure to identify comparable processors and consider factors that affect TCO.

Step 2: Download the VMware Architecture Migration Tool. Install and configure the software for the migration session.

Step 3: Identify and tag virtual machines. Create a list of the virtual machines to be migrated to the new platform. Tag the virtual machines as 'readyToMigrate' so they can take part in the migration and future rollback processes.

Step 3: Execute the migration. The virtual machines are shut down and migrated from the old cluster to the new cluster. Once the migration is complete, a status summary appears.

Step 4: Validate the migration result. Check that the virtual machines were migrated to the correct target platform. Note that virtual machines can be rolled back from the migrated cluster at any point in time after a migration operation is complete.

AMD and VMware provide the tools that simplify the migration of virtual machines to HPE servers with AMD processors, from selecting a processor to performing and validating the migration.

The [AMD EPYC Processor Selector Tool](#) makes it easy to compare Intel Xeon Scalable processors to comparable AMD EPYC processors. Users simply select "1P EPYC" or "2P EPYC" as the basis of comparison, then choose the Intel Scalable generation and processor, and the metric for comparison. The tool shows the comparable AMD EPYC processors for the Intel processor selected based on the indicated metric.

The [AMD EPYC™ Server Virtualization and Greenhouse Gas Emissions TCO Estimation Tool](#) helps quantify the potential value AMD EPYC CPUs can deliver for data centers. Users input virtual machine requirements and environment factors and the Intel Xeon processor to be used for the comparison. The tool outputs estimated cost savings for hardware and software acquisition, virtualization licenses, power, and server administration.

The [AMD EPYC Bare Metal and Greenhouse Gas Emissions TCO Estimation Tool](#) helps identify the potential greenhouse gas (GHG) emissions and TCO savings AMD EPYC CPUs can deliver for server environments. Users can compare by hardware specification (core, server, or rack count), performance, or IT budget for 3, 4, or 5 year time frames.

The [VMware Architecture Migration Tool](#) provides an easy-to-use, automated process for migrating virtual machines between clusters within a VMware vCenter® deployment. The clusters can use different processor architectures. See the [Quick Start Guide](#) for detailed instructions on performing the migration.

The [VMware Architecture Migration Tool Repository](#) is the place to start to obtain the scripts needed for virtual machine migration.

CONVERSATIONS AND QUESTIONS

Questions for identifying candidates:

- ▲ Do you use virtualization solutions in your data center today?
- ▲ Are your servers underutilized? (Utilization of less than 50%.)
- ▲ Is your IT infrastructure more than four years old?
- ▲ Are you reaching on-premises space, power, or cooling limitations?
- ▲ Do you have concerns about data security?
- ▲ Is it difficult to find and keep specialized IT talent?
- ▲ Do you need more flexibility and scalability to meet dynamic environments?

Do I have to pay more for VMware licenses with AMD?

VMware modified its licensing model in April 2020, to align its products to industry-standard pricing models. This change does not favor or penalize AMD or Intel.

- ▲ 1-socket server with a 32-core (or less) CPU: one VMware license
- ▲ 2-socket server with two 32-core (or less) CPUs: two VMware licenses
- ▲ 1-socket server with a CPU with more than 32 cores: two VMware licenses
- ▲ 2-socket server with CPUs with more than 32 cores: four VMware licenses

Use the [AMD Virtualization TCO Estimation Tool](#) to discover potential savings.

Can I operate in a mixed environment (AMD and Intel)?

OSVs and ISVs often recommend using homogeneous clusters. Many groups deploy multiple clusters, each supporting specific workloads or customers. Older clusters are replaced over time, for a planned mixed environment and an ordered transition to AMD EPYC. Use the [VMware Architecture and Migration Tool](#) and contact vendors and ISVs for their recommendations and support for mixed environments.

What workloads can I run on a virtualized or HCI deployment?

Almost any workload can run. Top workloads: business intelligence, big data, analytics, productivity applications, virtual desktop infrastructure (VDI), AI/ML, data warehousing, relational databases, and container orchestrators.

HANDLING OBJECTIONS

Switching costs are huge. I need to refactor/rewrite my apps to run on AMD.

- ▲ AMD and Intel processors have x-86 architectures and instruction sets. Most workloads and applications just work.
- ▲ AMD has deep technical relationships with an ecosystem of OEMs, ODMs, IHVs, OSVs, and ISVs. Early access to roadmaps, silicon, testing, and validation helps ensure that solutions solve problems and deliver great experiences out of the box.
- ▲ The cost savings associated with deploying AMD EPYC processor-based servers may be significant for customers. See our [estimation tools](#) for potential savings.

AMD has too many cores. Deploying AMD solutions would increase my “blast radius” (failure domain) beyond our comfort level.

Every customer has its own comfort level how many virtual machines and containers should run on a single node or server. Their “failure domain” may differ by workload or physical server location.

AMD EPYC processors are extremely scalable (up to 192 cores per server) and offer performance and performance/watt leadership across the entire stack and failure domain.

I need 2-socket servers for redundancy.

Two-socket servers do not offer hardware failover capability. If one CPU fails, the entire server fails. Buying a 1-socket server often requires purchasing a 2-socket server with only one populated socket. In this case, the PCIe® lanes and memory sockets attached to the empty socket do not function. AMD offers “no compromise” 1-socket servers that scale from 8 to 96 cores per socket, up to 4 TB DDR4 memory, and up to 128 PCIe 4.0 lanes.

Migrating to major VMware vSphere releases is too hard.

AMD can work with you and your technical staff to map out your migration. Our [VMware Architecture Migration Tool](#) provides an easy and automated process to cold migrate machines between clusters of different architecture types within the same vCenter.

GUIDES

- ▲ [VMware PowerCLI™ Installation](#)
- ▲ [VMware Architecture Migration Tool Quick Start Guide](#)

DOCUMENTS

- ▲ [AMD EPYC Tech Docs and White Papers](#)
- ▲ [Addressing Sustainability in the Financial Services Industry \(Solution Brief\)](#)
- ▲ [AMD EPYC Processor Workload Solutions Overview - Virtual IT and HCI](#)
- ▲ [Emirates NBD Bank \(Case Study\)](#)
- ▲ [HPE ProLiant DL345 Gen10 Plus Takes Two World Records on the VMmark 3.1.1 Benchmark \(Performance Brief\)](#)
- ▲ [Modern Infrastructure for Digital Healthcare \(Solution Brief\)](#)
- ▲ [New World Record for the HPE ProLiant DL385 Gen10 Plus v2 \(Performance Brief\)](#)
- ▲ [Protect, Detect, Recover with HPE ProLiant Gen10 Plus and AMD EPYC Technology for Secure Virtualization \(Solution Brief\)](#)
- ▲ [Reinvent the Way You Work with Virtualized Healthcare \(Solution Brief\)](#)

PRESENTATIONS

- ▲ [AMD EPYC CPU Virtual IT and HCI Executive Brief](#)

SALES TOOLS

- ▲ [5 Reasons Why AMD EPYC CPUs Matter for HCI](#)
- ▲ [AMD EPYC HCI and Virtualized Computing \(Battlecard\)](#)
- ▲ [AMD EPYC Processor Workload \(Quick Reference Guide\)](#)
- ▲ [AMD EPYC Processors for Virtualized Infrastructure Workloads \(Positioning Guide\)](#)
- ▲ [Hyperconverged Infrastructure Infographic](#)

TOOLS

- ▲ [AMD EPYC™ Processor Selector Tool](#)
- ▲ [AMD EPYC Bare Metal and Greenhouse Gas Emissions TCO Estimation Tool](#)
- ▲ [AMD EPYC Server Virtualization TCO Tool](#)
- ▲ [VMware Architecture Migration Tool](#)
- ▲ [VMware Architecture Migration Tool Repository](#)

WEB CONTENT

- ▲ [AMD EPYC Energy Efficiency](#)
- ▲ [AMD EPYC Processors Demo Hub](#)
- ▲ [AMD Solutions for Hyperconverged Infrastructure and Virtualization](#)
- ▲ [HPE and AMD: Better Together](#)

MISCELLANEOUS

- ▲ [Advancing the United Nations Sustainable Development Goals](#)
- ▲ [Can You Easily Migrate VMs from Intel Hardware to AMD Hardware?](#)
- ▲ [Chemist Warehouse Turns to Hewlett Packard Enterprise to Transform Its Data Center with New Hyperconverged and VDI Solutions \(Press Release\)](#)
- ▲ [HPE Extends Supply Chain Security by Adding AMD EPYC Processors \(Blog\)](#)
- ▲ [HPE Servers and AMD EPYC Provide an Answer to the New Normal of Work \(YouTube Video\)](#)
- ▲ [Reduce Complications of SDS Through HPE Solutions with AMD and VMware \(Solution Brief\)](#)



together we advance_data center computing

The information contained herein is for informational purposes only and is subject to change without notice. While every precaution has been taken in the preparation of this document, it may contain technical inaccuracies, omissions and typographical errors, and AMD is under no obligation to update or otherwise correct this information. Advanced Micro Devices, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this document, and assumes no liability of any kind, including the implied warranties of noninfringement, merchantability or fitness for particular purposes, with respect to the operation or use of AMD hardware, software or other products described herein. No license, including implied or arising by estoppel, to any intellectual property rights is granted by this document. Terms and limitations applicable to the purchase or use of AMD's products are as set forth in a signed agreement between the parties or in AMD's Standard Terms and Conditions of Sale.

Timelines, roadmaps, and/or product release dates shown in these slides are plans only and subject to change. "Rome", "Milan", "Genoa", "Zen", "Zen2", "Zen3", and "Zen4" are codenames for AMD architectures, and are not product names.

©2023 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, EPYC, Infinity Fabric, and combinations thereof are trademarks of Advanced Micro Devices, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies. PCIe is a registered trademark of PCI-SIG Corporation. Oracle is a registered mark of Oracle and/or its affiliates. SPEC®, SPECrate®, and SPECpower® are registered trademarks of Standard Performance Evaluation Corporation. Learn more at spec.org. More information about SPEC® is available at <http://www.spec.org>. VMmark, VMware vCenter, VMware Horizon, VMware vSAN, and VMware vSphere are either trademarks or registered trademarks of VMware in the US or other countries.

LE-85501-00 02/23