## AMD EPYC™ 7002 Series Processors and Nutanix Bring Exceptional Performance and Scalability for Hyperconverged Infrastructure

**AMD EPYC**

APRIL 2020

## AMD EPYC™ processors for Hyperconverged Infrastructure (HCI)

AMD EPYC™ 7002 Series Processors provide a leadership throughput computing foundation for Nutanix HCI. Together AMD and Nutanix have fully tested solutions demonstrating excellent workload performance, which helps to lower risk and reduce implementation costs for customers.

## Standards-Based Architecture

Continuing AMD's commitment to industry standards, AMD EPYC™ 7002 Series processors offer you a choice in x86 architecture. x86 compatibility means you can run most popular applications on AMD EPYC processors.

## Exceptional Scalability

Scaling is critical to HCI applications. AMD EPYC 7002 Series processors provide high bandwidth between nodes with support for PCIe Gen 4 enabled network devices. Within a node, taking advantage of up to 64 cores per socket, the AMD EPYC 7002 series delivers exceptional performance and scalability for Nutanix customers.

## Nutanix Acropolis

Nutanix Acropolis™ software converges compute and storage to provide cloud-like infrastructure that can run applications at scale. Nutanix Acropolis HCI Software (AOS 5.17) is slated to be supported and available by May 2020 on AMD EYPC processors on select HPE ProLiant systems. Please contact your Nutanix and/or HPE sales representative for more information. Nutanix HCI with other EPYC based OEM server vendors is targeted for 2H 2020 availability.

**NUTANIX**™

## Nutanix Enterprise Cloud Solutions Powered by AMD EPYC™ Deliver Performance, Scalability, Flexibility and Cost-Efficiency

The AMD EPYC™ processor is ideally suited for hyperconverged infrastructure (HCI) providing top performance for virtualized enterprise workloads typical with private cloud deployments. With high core counts per socket coupled with an impressive number of I/O channels for native connectivity to storage, EPYC System-on-Chip (SoC) performance scales well across cores helping minimize application performance variation. Designed from the ground up for a new generation of solutions, AMD EPYC implements a philosophy of choice without restriction. Choose the number of cores and sockets that meet your needs without sacrificing key features like memory and I/O.

| 7 nm | PCIe® Gen 4 | DDR4 3200 |
|---|---|---|
| **64** Cores per socket | **128** PCIe® Gen 4 lanes per socket | **8** Memory channels per socket |
| World's first 7 nm x86 CPU  Twice the performance per socket than previous generation. | World's first PCI Gen 4[1] capable x86 CPU  Doubles the bandwidth of the previous generation. | World's first x86 architecture with DRR4 3200[1]  Up to 4 TB of memory capacity per socket. |

The second generation of the AMD EPYC™ processor extends AMD's innovation leadership for Data Center and Cloud. Built with leading-edge 7nm technology, the AMD EPYC™ SoC offers a consistent set of features across a range of choices from 8 to 64 cores, including 128 lanes of PCIe® Gen 4[2] and 8 memory channels with access to up to 4 TB of high-speed memory.

## AMD EPYC™ 7002 for Hyperconverged Infrastructure

Traditional data center infrastructure involves separate collections of compute servers and storage arrays connected through a networking fabric. Each component is managed individually, and a typical data center has a mix of vendors providing compute, storage, and networking equipment.

Nutanix HCI software tightly integrates storage, networking, and compute resources into a powerful software-defined virtualized single-managed pool. Integrating (or hyperconverging) storage, networking, and

compute resources into a single infrastructure building block avoids having to manually stitch together separate discrete computing devices.

Software-defined storage is a key element of HCI. It eliminates the need for dedicated storage hardware, connected over storage area networks (SANs).  Nutanix HCI does this by virtualizing the storage layer in software, enabling the provisioning, aggregation and management of data storage across multiple HCI nodes using a standard ethernet network. Similarly, software-defined servers, often referred to as virtual machines (VMs), are also integrated on these HCI nodes.  To be most effective, applications and its data are localized together on each Nutanix-based HCI node.  This data locality avoids network hops to other nodes and speeds performance.  Doing so requires that the on-board storage in each HCI node is capable of high-speed I/O, have high memory bandwidth, and a large amount of memory capacity. The AMD EPYC SoC's architecture meets these needs by providing 128 native-connect PCIe lanes, 8 memory channels, and support for up to 4TB of memory per socket

The EPYC processor's innovative architecture translates to terrific performance cost-effectively. Storage-intensive workloads can utilize the plentiful I/O bandwidth with the right number of cores (avoiding overpaying for unneeded power), while compute-intensive workloads can make use of fully loaded core counts, dual sockets and plenty of memory.

 AMD and Nutanix have an ongoing collaboration to create reference architectures with exceptional performance while helping to lower risk and reduce implementation costs for customers.

## AMD EPYC™ 7002 and Nutanix Enterprise Cloud Deliver Great Value

Memory bandwidth is a critical factor in maximizing performance of Hyperconverged Infrastructure workloads. AMD EPYC server processors' exceptional memory bandwidth helps ensure that you get the most out of your system, optimizing execution time and overall utilization of your deployment.

Many virtualization workloads require you to balance performance versus per-core license costs to manage your overall cost. AMD EPYC processors offer a consistent set of features across the product line, allowing you to optimize the number of cores required for your workloads without sacrificing features, memory channels, memory capacity, or I/O lanes. Regardless of the number of physical cores per socket, you will have access to 8 channels of memory per processor across all EPYC server processors.

As workloads demand more processor cores, communication between processor cores becomes critical to efficiently solving complex problems. As cluster sizes increase, the communication requirements between nodes rise quickly and can limit scaling at large node counts. AMD and Nutanix have collaborated to offer solutions for virtualized workloads, enabling exceptional performance and low implementation costs.

AMD EPYC processors provide flexibility by offering cost-effective infrastructure solutions to public and private clouds with high core counts, large numbers of VMs, exceptional I/O, and outstanding memory throughput. Nutanix Enterprise Cloud offers the foundational Acropolis OS (AOS) software with AHV hypervisor consisting of a 100% software-defined stack that integrates compute, virtualization, storage, networking, and security to power any application, at scale.

Nutanix offers a complete solution for delivering infrastructure services:

- Native virtualization with Nutanix AHV hypervisor, and additional support of VMware® ESXi hypervisor.
- Platform services includes VM and container-based storage, and native block, file and object-based storage.
- Enterprise storage capabilities including performance acceleration and storage optimization technologies, data protection and recovery features.

## Nutanix Enterprise Cloud Use-Cases

Powered by AMD EPYC processors, Nutanix software unifies private, public, and distributed clouds, and empowers IT to deliver applications and use cases that power their businesses as listed below:

### Databases and Enterprise Applications

Deploy and scale critical workloads, such as Microsoft® SQL, Oracle® and SAP® business applications.

## Virtual Desktop Infrastructure (VDI)

Make VDI a success by delivering excellent user performance and scalability without burdensome operational and capital costs.

## Cloud

Deliver an efficient private and hybrid cloud with Nutanix Calm™, VMware, Microsoft or OpenStack® based solutions.

## File & Object Storage and Analytics/AI/ML

Data sets and analytics easily scale as your needs grow, enabling better understanding of your customers and operational trends to run your organization.

## Data Protection

Full remote replication plus back up VMs and data to your local systems, to a remote site or to the cloud.

## Messaging, Collaboration and Unified Communications (UC)

Proven deployments for Microsoft Exchange, collaboration tools such as SharePoint® and major UC vendors, including Avaya®, Cisco®, and Microsoft.

## Development & Test

Engineering and QA get their own efficient high-performance VMs with access to private copies of production databases and data.

# AMD EPYC™ 7002 Advantages for Nutanix Enterprise Cloud Software

AMD EPYC™ 7002 processors deliver significant advantages for Nutanix Enterprise Cloud Solutions, including:

- Bringing industry-leading core counts to Nutanix HCI solutions: the AMD EPYC SoC offers industry leading core counts in an x86-architecture server processor with versatile configurations, large memory capacity, and exceptional I/O providing the flexibility to match workloads needs to optimize performance.
- Outstanding value in a single processor system: AMD EPYC™ offers excellent performance in a single socket HCI system with no compromise on I/O, memory and CPU performance, particularly useful for edge computing applications.
- Consistency in private and public clouds: the AMD EPYC processor offers a consistent x86 code standard for private, public and hybrid cloud configurations.
- Reduce risk when deploying HCI solutions: AMD and Nutanix collaborate to create fully tested solutions with reference designs and performance information.
- Joint efforts benefit the customer: AMD and Nutanix plan to work together on an ongoing basis to benefit joint customers, protecting their investment by working to maintain compatibility.

**AMD**

# Conclusion

Together, AMD and Nutanix empower the development of fast, accurate and high performance workloads on cost-effective HCI clustered systems. Versatility and agility are among the most important requirements in modern datacenters. The AMD EPYC system-on-a-chip (SoC) enables organizations to deploy systems that meet today's needs while positioning themselves for tomorrow's requirements.

The Nutanix HCI solution with AMD 2nd Generation EPYC processors offers freedom of choice for datacenter customers by providing the ability to right size their AMD x86 CPUs – choose the core counts the application needs without sacrificing other processor features like I/O and memory bandwidth.

Together, empower the development of modern data applications that implement solutions to a diverse set of business problems with high-performance processing and cost-effective solutions that are precisely sized for current needs and easily scalable as the business grows.

## References

- AMD's EPYC line of processors:  https://www.amd.com/en/products/epyc-server
- Nutanix solution: http://www.nutanix.com *

**AMD EPYC**