



# AMD EPYC™ PROCESSORS FOR YOUR DATA CENTER. EPIC FOR THE PLANET.

Meet your application performance demands with fewer physical servers than competitive solutions, enabling environmental and cost efficiencies.

## BASED ON A 1,200 VM SCENARIO



Intel® Xeon® 8380 processor-based servers

AMD EPYC™ 7713 processor-based servers

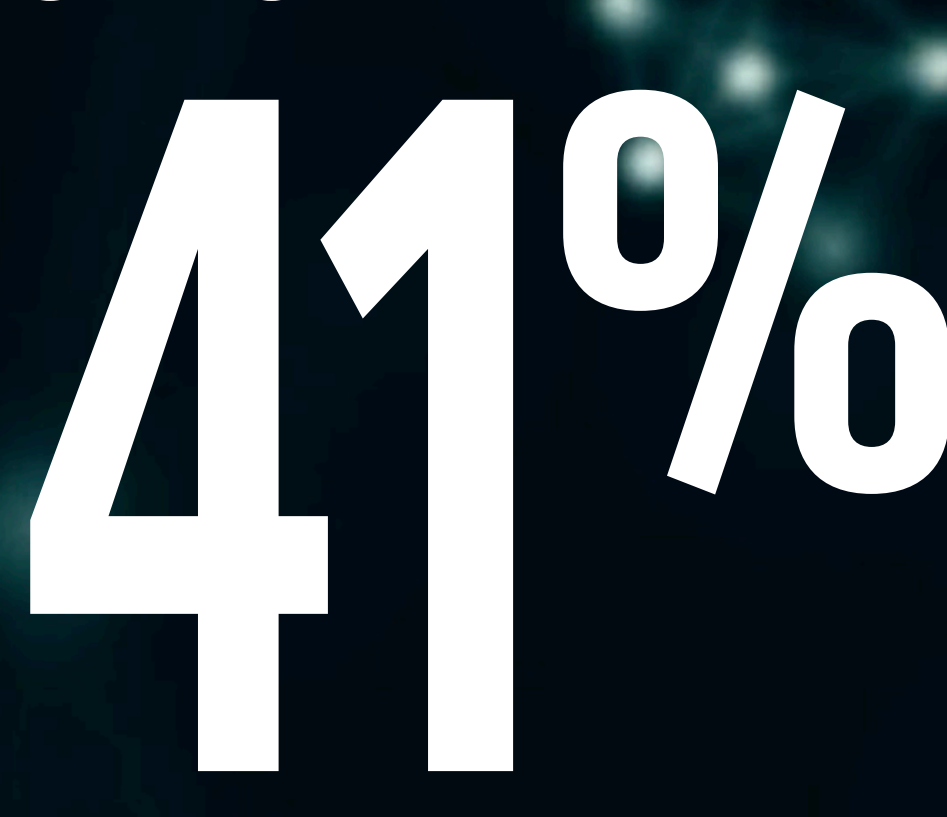
## WITH EPYC™

UP TO



Fewer servers required

UP TO



Lower TCO over a three-year period\*

ESTIMATED



Less energy consumed

## ENVIRONMENTAL IMPACT



Saves an estimated 70 metric tons of CO2e



Equivalent to 28 acres of U.S. forest every year!

## AMD EPYC™ PROCESSORS

Exceptional energy-efficient performance

LEARN MORE



\*Hardware only

MLNTCO-021: This scenario contains many assumptions and estimates and, while based on AMD internal research and best approximations, should be considered an example for information purposes only, and not used as a basis for decision making over actual testing. The AMD EPYC™ SERVER VIRTUALIZATION and GREENHOUSE GAS EMISSIONS TCO ESTIMATION TOOL tool compares the 2P AMD EPYC™ and the 2P Intel® Xeon® server solutions required to deliver 1200 total virtual machines (VM), requiring 1 core and 8GB of memory per VM. The analysis includes both hardware and virtualization software components. Hardware costs (CPU + memory + storage + chassis): The 2P AMD 64 core EPYC™ 7713 processor used in this solution analysis provides 128 total cores per server, each processor cost \$7060 and the server uses 32 x 32GB DIMMs to achieve the minimum required memory footprint, in a 1RU server chassis that cost \$2200, and requires 1 server racks. The AMD solution has a total estimated hardware acquisition cost of \$217880. The 40 core Intel Xeon Platinum. 8380 processor used in this solution analysis provides 80 total cores per server. Each processor cost \$8666 and the server uses 16 x 64GB DIMMs to achieve the minimum required memory footprint, in a 2RU server chassis that cost \$2500 and requires 2 server racks. The Intel solution has a total estimated hardware acquisition cost of \$390060.

OPERATING COSTS: The core assumptions for this analysis are as follows: Cost of power @ \$0.12 with kwatts (kW) of power to each rack and a PUE (power usage effectiveness) of 1.7 and a server rack size of 42RU. Each server has 1 hard drives drawing 3 watts each. Server Admin annual salary is \$85000 managing 30 physical servers with a physical burden rate of 30%. The VM Admin salary is \$85000, with a burden rate of 30% and managing 400 VMs.

AMD has estimated OpEx costs as follows: a hardware admin cost of \$110500, a real estate cost of \$19440, and a power cost of \$40208.4, for a total estimated 3-year TCO cost (hardware cost and operating expense) of \$388028 with AMD. Estimated OpEx costs for Intel are: hardware admin cost of \$165750, real estate cost of \$38880, and power cost of \$58704.

HARDWARE TCO: This is the CapEx and OpEx directly associated with the hardware. The AMD EPYC™ 7713 solution requires 10 - 2P servers with a CapEx of \$217880 with a total estimated 3-year TCO cost (CapEx plus OpEx) of \$388028. The Intel Platinum. 8380 processor requires 15 - 2P servers with a CapEx of \$390060 with a total estimated 3-year TCO cost (CapEx plus OpEx) of \$653394. The AMD solution has an estimated 41% lower hardware TCO for this virtualization solution, 1 - (\$388028 - \$653394) = 41%, than the Intel solution.

VIRTUALIZATION TCO: Analysis is based on the following estimates: 3-year Virtualization (hardware, operating, and software cost) for the Intel solution is \$2005974 and \$1621248 for the AMD solution. This means that the AMD solution is ~19% less expensive over three years. 1 - (\$1621248 - \$2005974) = 19%. The EPYC solution 1st year TCO is \$844816 and the Intel 1st year TCO is \$1167418. The AMD solution 1st year TCO per VM of \$704.01 where the Intel 1st yr. solution is \$972.85. The AMD 1st year TCO per VM is \$268.83, or ~28% lower than Intel. The 1st year TCO per VM is calculated by taking the 1-year TCO (hardware, software, and 1st year OpEx) and dividing it by the total number of VMs. The virtualization software used in this analysis is VMware with a VMware® vSphere Enterprise Plus w/ Production support license. This analysis uses license pricing of \$5968 per Socket + Core with 3-year support. More information on VMware software can be found @ https://store-us.vmware.com/vmware-vsphere-enterprise-plus-284281000.html. For 1200 VMs with 1 core(s) per VM, and 8 GB of memory per VM, the Intel Platinum. 8380 processor requires 15 servers, and 60 licenses. The AMD EPYC™ 7713 solution requires 10 servers and 40 licenses. The AMD solution requires 33% fewer servers than the Intel solution.

The AMD server and virtualization software license cost are \$456600, and the Intel cost are \$748140. Hardware and virtualization cost are ~\$291540 or ~39% Lower w/ AMD.

AMD EPYC™ 7713 powered servers save ~154132.2kWh of electricity for the 3 years of this analysis. Leveraging this data, using the Country / Region specific electricity factors from the '2020 Grid Electricity Emissions Factors v1.4 - September 2020', and the United States Environmental Protection Agency 'Greenhouse Gas Equivalencies Calculator', the AMD EPYC powered server saves ~69.86 Metric Tons of CO2 equivalents. This results in the following estimated savings based on United States data.

Greenhouse Gas Emissions Avoided of one of the following:

15 USA Passenger Cars Not Driven for 1 year; or,

5 USA Passenger Cars Not Driven Annually; or,

173382 Miles Driven by Avg Passenger Car; or,

or CO2 Emissions Avoided from:

7894 Gallons of Gasoline Not Used; or,

77261 Pounds of Coal Not Burned in USA; or,

9 USA Homes' Electricity Use for 1 year; or,

3 USA Homes' Electricity Use Annually; or,

or Carbon Sequestered equivalent to:

1153 Tree Seedlings Grown for 10 years in USA; or,

84 Acres of USA Forests in 1 year; or,

27.94 Acres of USA Forests Annually.

The 2020 Grid Electricity Emissions Factors v1.4 - September 2020 data used in this analysis can be found in https://www.carbonfootprint.com/docs/2020\_09\_emissions\_fac-tors\_sources\_for\_2020\_electricity\_v14.pdf and the US EPA Greenhouse Gas Equivalencies Calculator can be found at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Virtualization software pricing sourced online as of 09/14/2021. Third party names are for informational purposes only and may be trademarks of their respective owners. All pricing is in USD.

AMD CPU pricing based on 1KU price as of January 2022. Intel® Xeon® Scalable CPU data and pricing from https://ark.intel.com as of January 2022. All pricing is in USD.

Results generated by: AMD EPYC™ SERVER VIRTUALIZATION and GREENHOUSE GAS EMISSIONS TCO ESTIMATION TOOL - v10.13

© 2022 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, EPYC, and combinations thereof, are trademarks of Advanced Micro Devices, Inc.