ENDNOTES / CLAIMS

1 GD-177: AMD Infinity Guard security features on EPYC™ processors must be enabled by server OEMs and/or Cloud Service Providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinity-guard.

2 EPYC-022: For a complete list of world records see http://amd.com/worldrecords

3 MLNX-001A: EDA RTL Simulation comparison based on AMD internal testing completed on 9/20/2021 measuring the average time to complete a test case simulation. comparing: 1x 16C EPYC™ 7373X with AMD 3D V-Cache Technology versus 1x 16C AMD EPYC™ 73F3 on the same AMD "Daytona" reference platform. Results may vary based on factors including silicon version, hardware and software configuration and driver versions.

4 MLNX-002C: ANSYS® CFX® 2022.1 comparison based on AMD internal testing as of 2/14/2022 measuring the time to run the cfx_10, cfx_50, cfx_100, cfx_lmans, and cfx_pump test case simulations. CFX_10 is the max result.
Configurations: 2x 64C AMD EPYC™ 7773X with AMD 3D V-Cache™ versus 2x 64C AMD EPYC 7763 on the same AMD
"Daytona" reference platform. Results may vary based on factors including silicon version, hardware and software configuration and driver versions.

5 MLNX-005A: ANSYS® Mechanical® 2021.1 comparison based on AMD internal testing as of 09/27/2021 measuring the core solver rating for the Release 19.0 R2 test case simulations. Configurations: 2x 32C AMD EPYC 7573X with AMD 3D V-Cache Technology ("Milan-X") versus 2x 32C EPYC 75F3 on the same AMD "Daytona" reference platform. Results may vary based on factors including silicon version, hardware and software configuration and driver versions. CG1 is the max result.

6 MLNX-006C: ANSYS® LS-DYNA® 2021.1 comparison based on AMD internal testing as of 09/27/2021 measuring the time to run the 3Cars, Car2Car, odb10m-short, and Neon test case simulations. Configurations: 2x 64C AMD EPYC 7773X with AMD 3D V-Cache Technology ("Milan-X") versus 2x 64C AMD EPYC 7763 on the same AMD "Daytona" reference platform. Results may vary based on factors including silicon version, hardware and software configuration and driver versions. 3cars is the max result.

7 Processor compatibility with EPYC 7003 powered platforms may require a BIOS update.

8 MLNX-12: EPYC™ 7003 Processors with AMD 3D V-Cache have 768MB of L3 Cache, while EPYC 7003 processors without AMD 3D V-Cache have up to 256MB.

9 EPYC-026: EPYC-026: Based on calculated areal density and based on bump pitch between AMD hybrid bond AMD 3D V-Cache stacked technology compared to AMD 2D chiplet technology and Intel 3D stacked micro-bump technology.

10 MLNX-003C: ANSYS® Fluent® 2021.1 comparison based on AMD internal testing as of 09/27/2021 measuring the core solver rating for the Release 19 R1 test case simulations.

Configurations: 2x 64C AMD EPYC 7773X with AMD 3D V-Cache Technology ("Milan-X") versus 2x 64C AMD EPYC 7763 on the same AMD "Daytona" reference platform. Results may vary based on factors including silicon version, hardware and software configuration and driver versions. Pump2 is the max result.

11 Max boost for AMD EPYC processors is the maximum frequency achievable by any single core on the processor under normal operating conditions for server systems. EPYC-18

12 MLNTCO-001: 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™ AMD 3D V-Cache™ VALUE ANALYSIS & GHG TOOL compares the selected AMD EPYC™ and Intel® Xeon® CPU based server solutions required to deliver a TOTAL_PERFORMANCE of 4600 jobs per day with Ansys® cfx-50 using the performance scores in this analysis for Intel Xeon and AMD EPYC CPU based servers. This estimation reflects a 3-year time frame.
This analysis compares a 2P AMD EPYC_7573X powered server with a Ansys® cfx-50 jobs per day of 484.67; to a 2P Intel Platinum_8362 based server with a Ansys® cfx-50 jobs per day of 239.51.
A server powered by the EPYC_7573X can deliver up to 102% more jobs per day than the Platinum_8362 based server.
Both AMD EPYC and Intel based servers use the same cost for the following elements of the analysis: server chassis size of 2RU at a cost of $2500 per chassis; internal storage $380; physical servers managed per admin: 30; fully burdened cost per admin
$110500; server rack size of 42; space allowance per rack of 27 sq feet; monthly cost of data center space $20 per sq foot; cost per kW for power $0.12; power drop per rack of 12kW; and a PUE (power usage effectiveness) of 1.7.
The AMD EPYC powered solution is estimated to take 10 total 2P EPYC_7573X powered servers at a hardware only acquisition cost of $19564 per server, which includes $5590 per CPU, total system memory of 1024GB, which is 16GB of memory / core and a total system memory cost of $5504; internal storage cost of $380. The total estimated AMD EPYC hardware acquisition cost for this solution is $195640. Each server draws ~754kWhr per month. For the 3 years of this analysis the: EPYC total solution power cost is ~$55406 which includes the PUE factor; the total admin cost is ~$110499, and the total real estate cost is ~$19440 using 1 rack(s). The total 3-year TCO estimate for the EPYC solution is $370802.
The Intel based solution is estimated to take 20 total 2P Platinum_8362 powered servers at a hardware only acquisition cost of $20080 per server, which includes $5828 per CPU, total system memory of 1024GB, which is 16GB of memory / core and a total system memory cost of $5504; internal storage cost of $380. The total estimated Intel hardware acquisition cost for this solution is $401600. Each server draws ~743kWhr per month. For the 3 years of this analysis the: Intel total solution power cost is ~$109203 which includes the PUE factor; the total admin cost is ~$221001, and the total real estate cost is ~$38880 using 2 rack(s). The total 3-year TCO estimate for the Intel solution is $750318.
AMD EPYC powered servers have a $379516 or 51% lower 3-year TCO.
Delivering a minimum score of 4600 for Ansys® cfx-50 produces the following estimated results: the EPYC_7573X solution requires 50% fewer servers; takes 50% less RU space; 49% less power.

AMD EPYC_7573X powered servers save ~448315 kWh 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 ~203.19 Metric Tons of CO2 equivalents. This results in the following estimated savings based on United States data, for any one of the following:
Greenhouse Gas Emissions Avoided:

44 USA Passenger Cars Not Driven for 1 year; or
15 USA Passenger Cars Not Driven Annually; or
510604 Miles Driven by Avg Passenger Car; or

or CO2 Emissions Avoided from:

22960 Gallons of Gasoline Not Used; or
224520 Pounds of Coal Not Burned in USA; or
37 USA Homes' Electricity Use for 1 year; or
12 USA Homes' Electricity Use Annually; or

or Carbon Sequestered equivalent to:

3353 Tree Seedlings Grown for 10 years in USA; or
244 Acres of USA Forests in 1 year; or
81.27 Acres of USA Forests Annually.

The 2020 Grid Electricity Emissions Factors v1.4 – September 2020 data used in this analysis can be found at
https://www.carbonfootprint.com/docs/2020_09_emissions_factors_sources_for_2020_electricity_v14.pdf and
the US EPA Greenhouse Gas Equivalencies Calculator used in this analysis can be found at
https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.
Pricing per CPU is 1kU pricing for AMD and Intel published pricing at https://ark.intel.com/, January 2022. All pricing is in USD. All performance numbers are based on AMD internal testing, February 2022. AMD tests were run with pre-production B1 CPUs on AMD reference platforms. Intel tests were run on production platforms. Product and company names are for informational purposes only and may be trademarks of their respective owners.
Results generated by the: AMD EPYC™ AMD 3D V-Cache™ VALUE ANALYSIS & GHG TOOL: v3.10

13 GD-204: "Technical Computing" or "Technical Computing Workloads" as defined by AMD can include: electronic design automation, computational fluid dynamics, finite element analysis, seismic tomography, weather forecasting, quantum mechanics, climate research, molecular modeling, or similar workloads.

14 MLNX-032: World's highest performance x86 CPU for technical computing comparison based on AMD internal testing as of 2/14/2022 measuring the score, rating or jobs/day for each of estimated SPECrate®2017_fp_base, Ansys Fluent, Altair Radioss and Ansys LS-Dyna application test case simulations average speedup on 2P servers running 32-core EPYC 7573X to 2P servers running 32-core Intel Xeon Platinum 8362 for per-core performance leadership and on 2P servers running top-of-stack 64-core EPYC 7773X to 2P servers running top-of-stack 40-core Intel Xeon Platinum 8380 for density performance leadership. "Technical Computing"

or “Technical Computing Workloads” as defined by AMD can include: electronic design automation, computational fluid dynamics, finite element analysis, seismic tomography, weather forecasting, quantum mechanics, climate research, molecular modeling, or similar workloads. Results may vary based on factors including silicon version, hardware and software configuration and driver versions. SPEC®, SPECrate® and SPEC CPU® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information.

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