AMPERE™

Ampere™ Altra™ Processor

Datacenter Efficiency

Cloud computing requirements have dramatically diverged from legacy enterprise requirements

Shift to containers and microservices	Growth in Edge data centers	Demand for density and power efficiency	Increased capabilities of ML and AI	Customized heterogenous infrastructures

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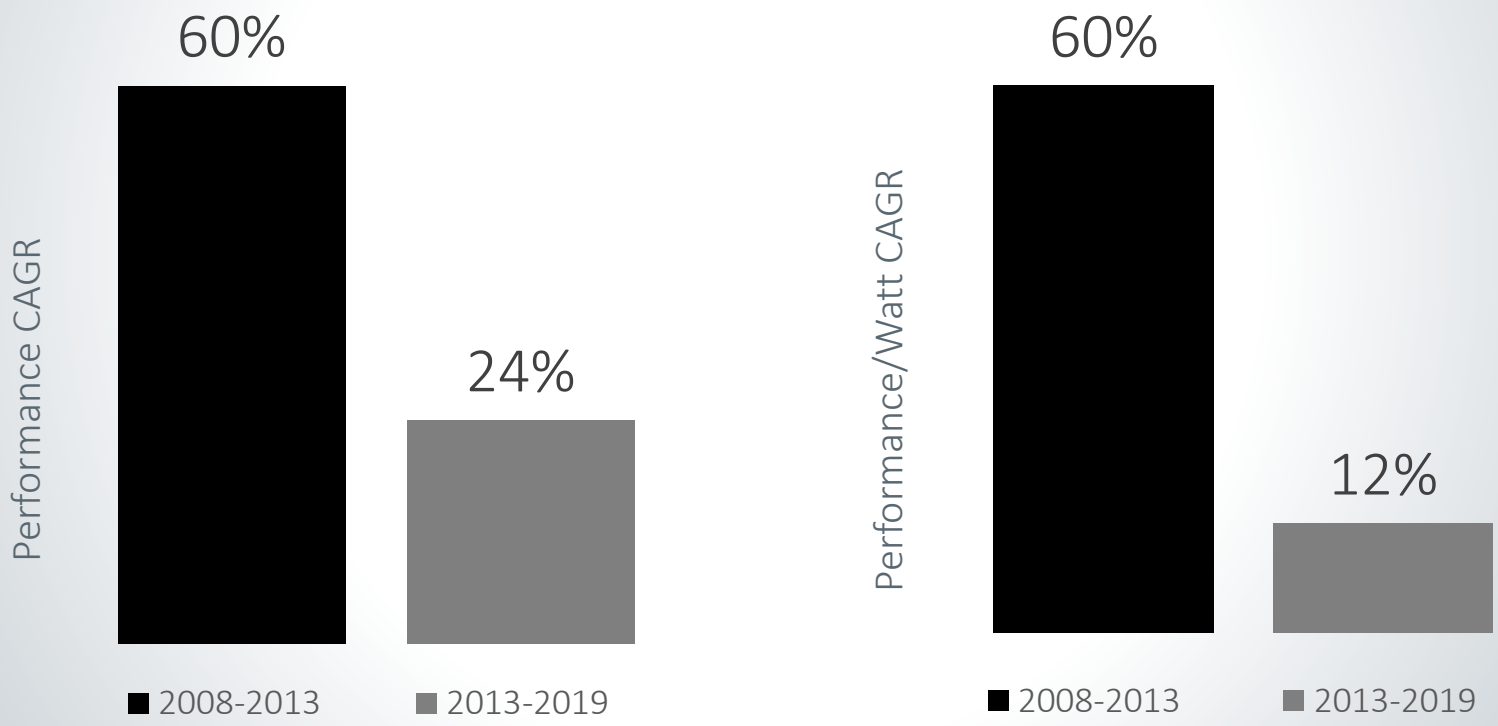
Current solutions do not meet Cloud needs

Performance and Power Efficiency CAGR have slowed



Refer to end notes for details

The Cloud needs High Performance and Power Efficient Processors

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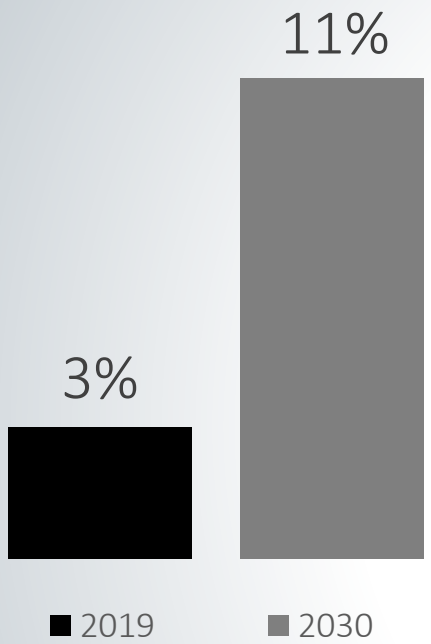
Power Consumption and Sustainability are critical global issues



Data center power consumption as percentage of worldwide energy consumption continues to grow

Data center contribution to worldwide greenhouse gas emissions already equals that of the airline industry

Power Efficient processors are required for the Cloud

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The requirements for the modern Cloud

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Ampere™ Altra™ processor complex

80 64-bit Arm CPU cores @ 3.0 GHz Turbo

- 4-Wide superscalar aggressive out-of-order execution
- Single threaded cores for performance and security isolation

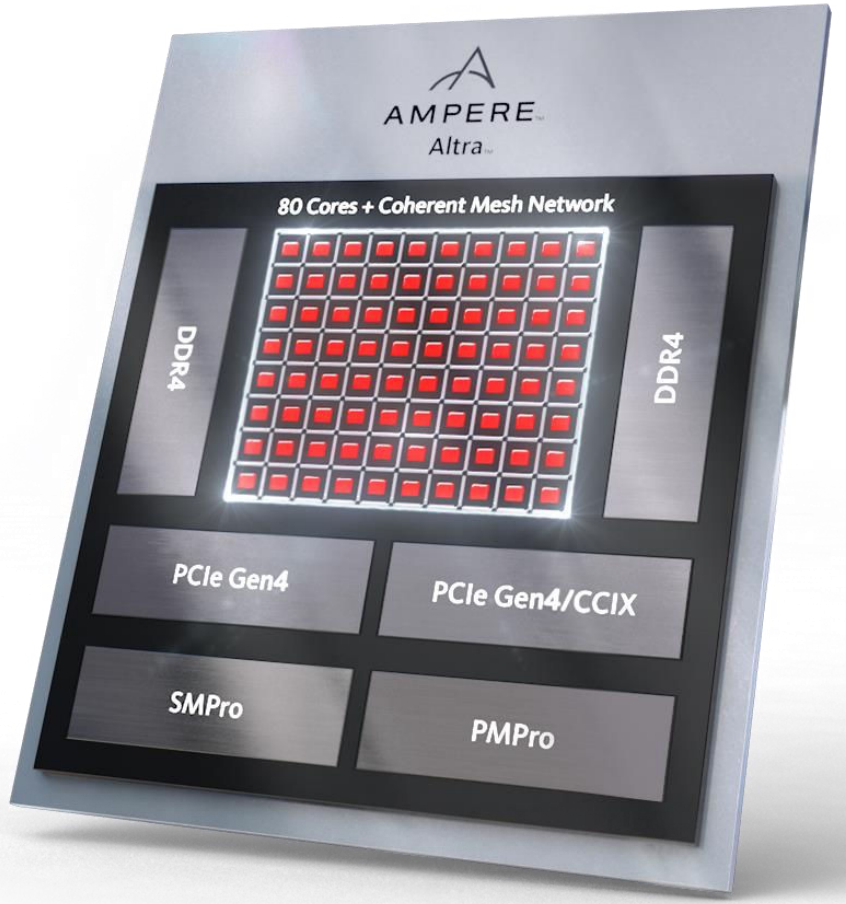
Arm v8.2+ features

Large Cache, all with ECC Protection

- 64 KB L1 I/D-cache per core
- 1 MB L2 cache per core
- 32 MB system level cache

2x 128-bit SIMD Units

int8 and fp16 for ML Inference performance



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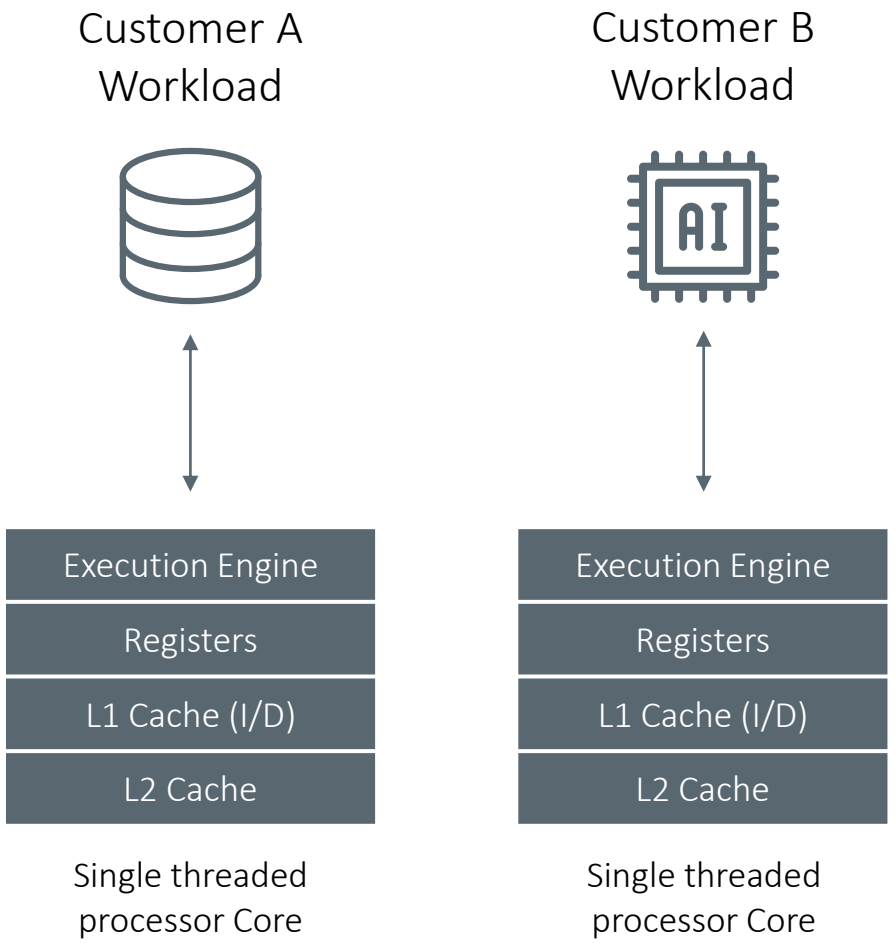
Processor cores built to reduce “noisy neighbor” effects

Dedicated resources per core for:

- Excellent customer isolation
- Lower vulnerability to side channel attacks
- Consistent, predictable performance



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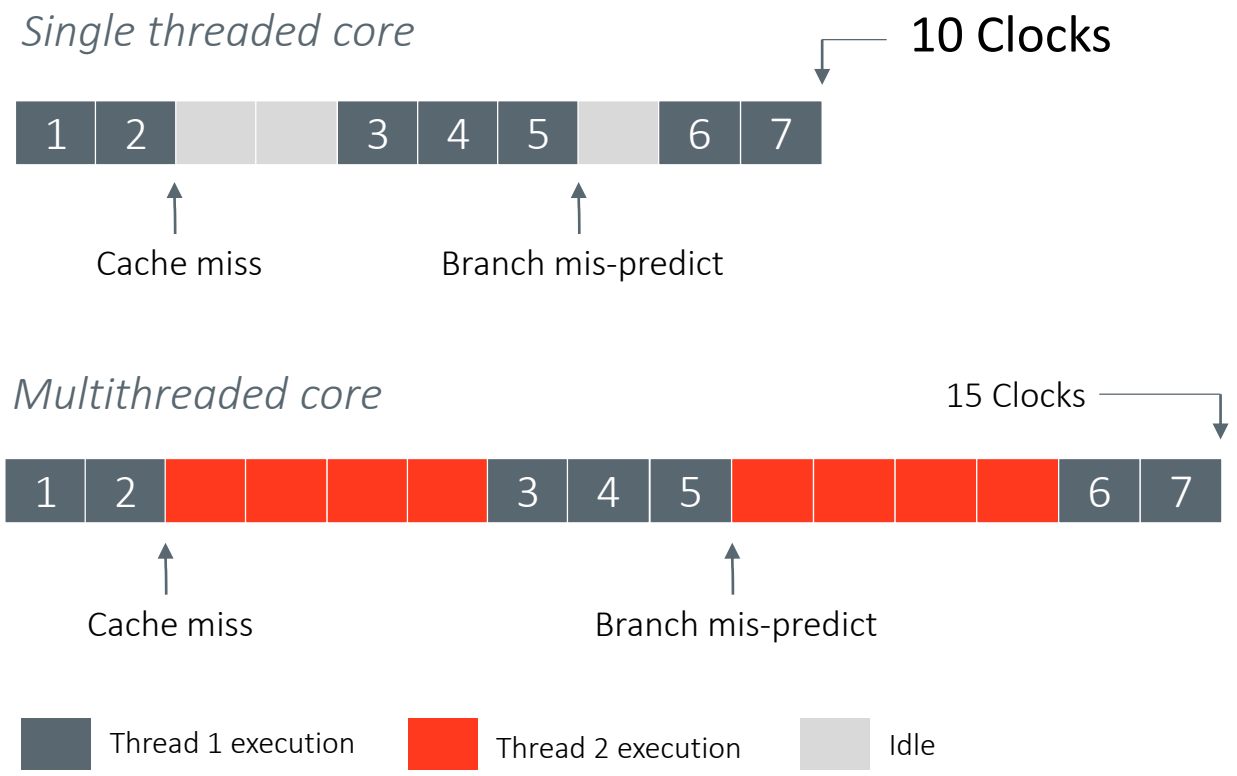
Processor built from the ground up for the Cloud

Single threaded cores deliver for the cloud specific needs:

- Consistent predictable performance
- No *noisy neighbor* issues within core
- No resource contention within core

Instruction Execution Illustration



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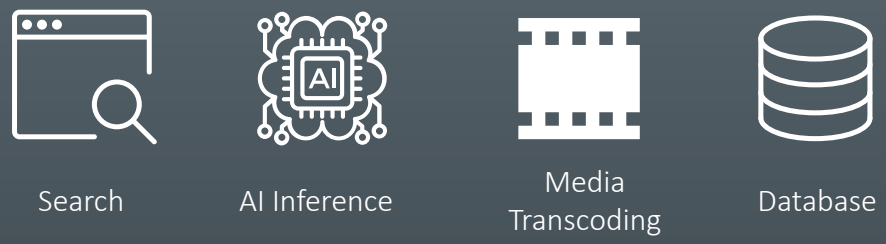
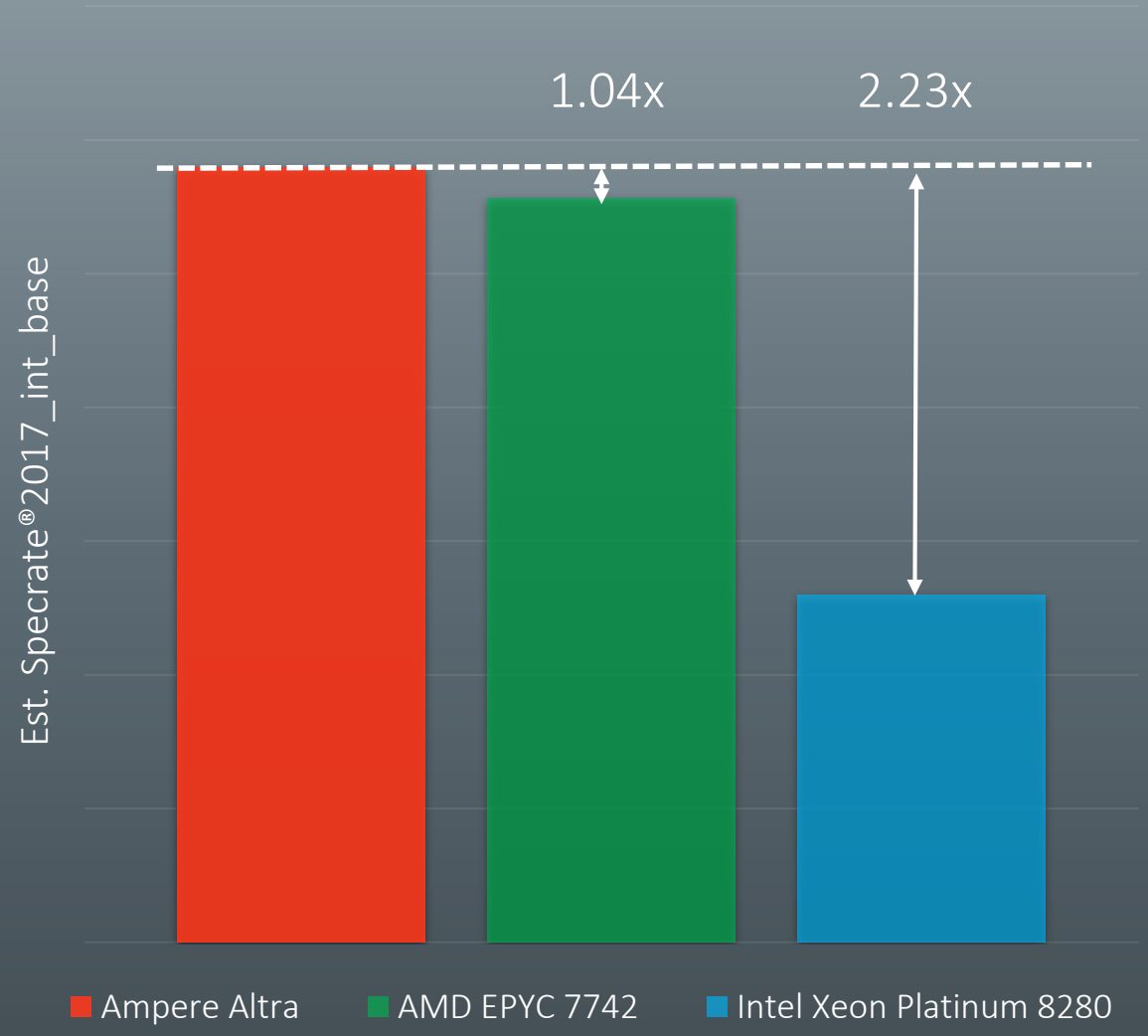
Leadership Performance

Run Cloud workloads fastest on the Ampere™ Altra™ Processor:

- High Performance for Cloud Native workloads
- Predictable virtual machine and container performance





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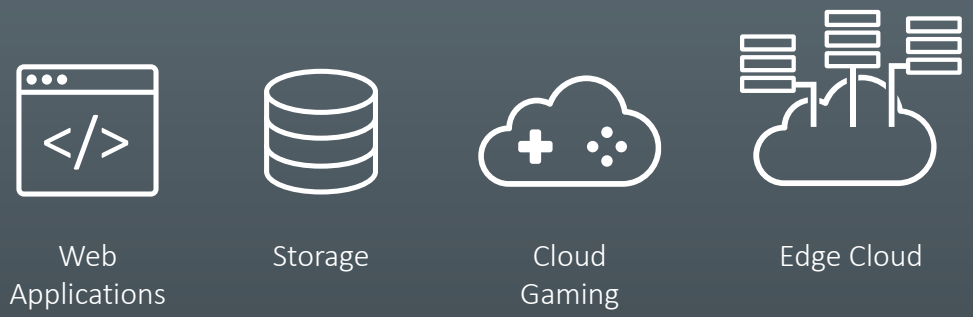
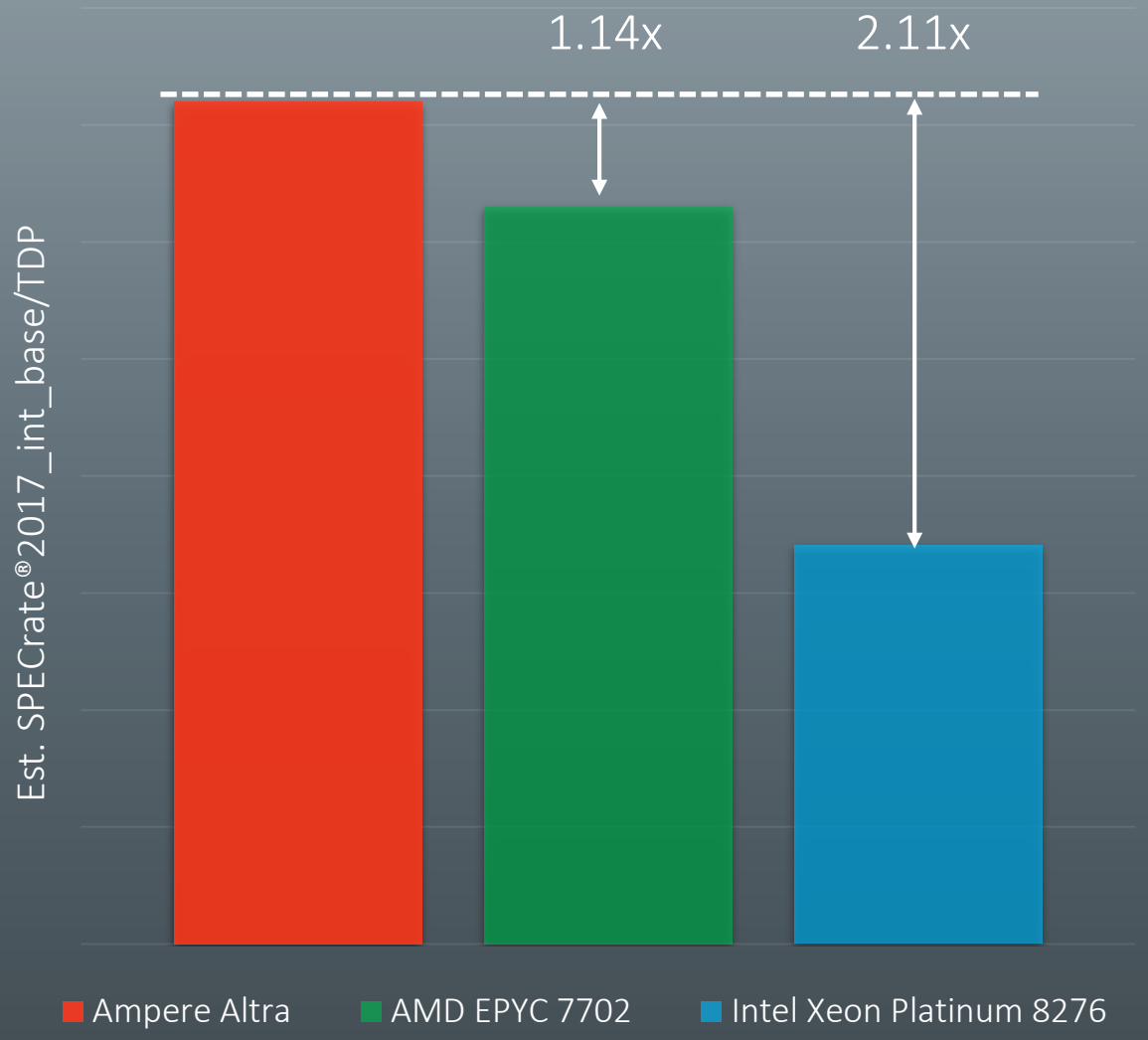
Leadership Power Efficiency

Run Cloud workloads on the most power efficient Ampere™ Altra™ Processor:

- Scalability from Hyperscale to Edge
- Maximize data-center capacity within the same power envelope





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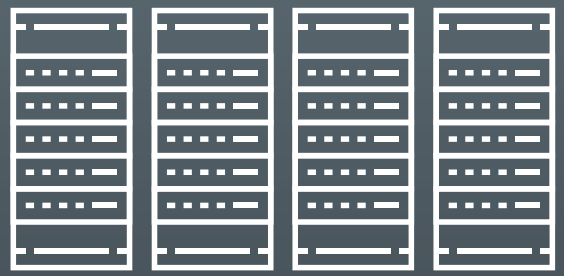
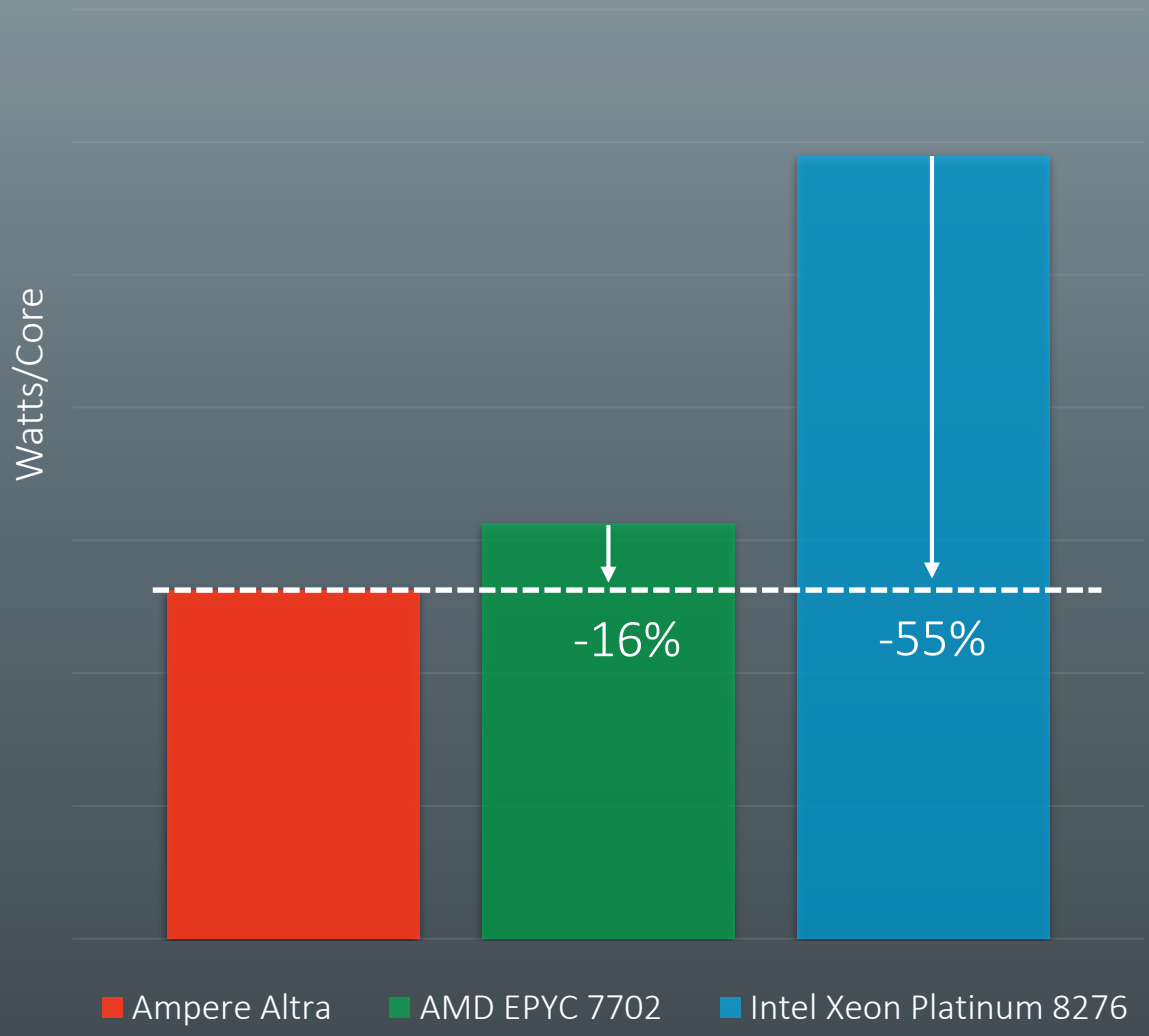
Leadership Scalability

Run Cloud workloads on the densest racks with the Ampere™ Altra™ Processor:

- 3500+ cores per Rack[1]
- 11,000+ Est. SPECrate® 2017_int_base per Rack[1]





[1]Rack Config: 42U w/ 12.5kw rack power

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Extreme density for maximum rack capacity

Ampere™ Altra™

Core Density per Rack[1]

38% higher than AMD EPYC 7702

173% higher than Intel Xeon Platinum 8276

Performance per Rack[2]

13% higher than AMD EPYC 7702

120% higher than Intel Xeon Platinum 8276

[1]Rack Config: 42U w/ 12.5kw rack power
[2] Est. SPECrate®2017_int_base

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End Notes