

DELL EMC POWEREDGE | AMD EPYC

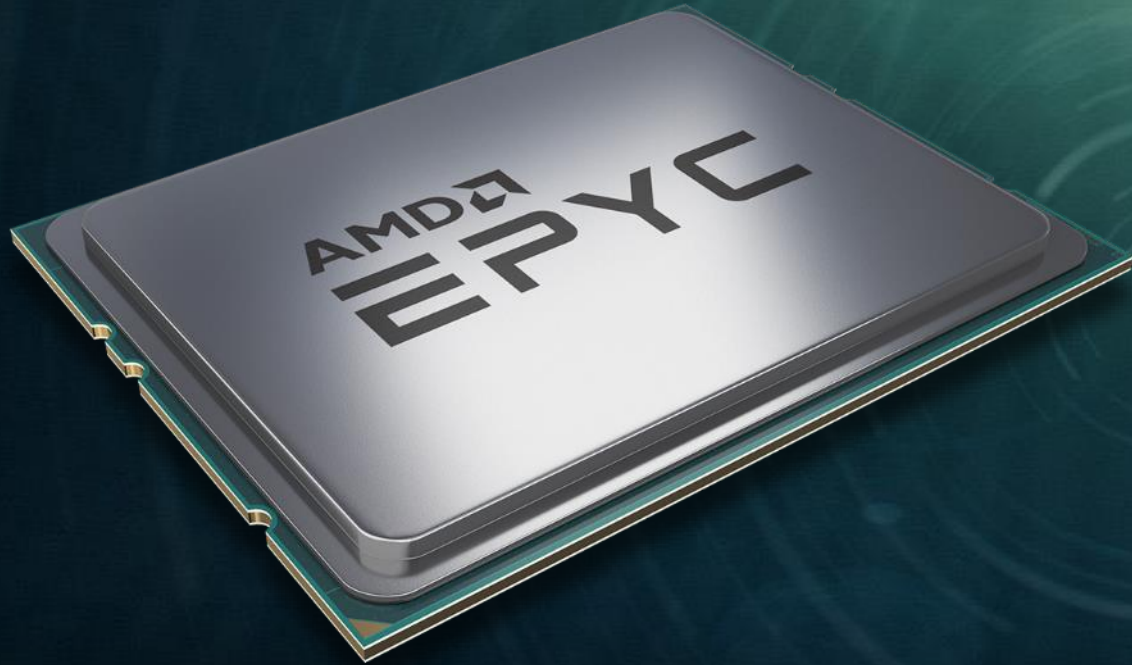
PowerEdge is EPYC Channel

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AMD RUSSIA | FAE

COMPETITION RETURNS TO THE DATACENTER



- PowerEdge 14G
- X86 architecture
- Performance
- Security, Simplicity, Value
- Field resources

OUTSTANDING PERFORMANCE DRIVES BUSINESS AGILITY

32 24, 16, 8
cores per socket

Wide range of cores
without sacrificing features



128 PCIe Gen 3 lanes
in a single CPU

Largest I/O
capacity



8 Memory channels
per CPU

Industry leading memory
bandwidth



2TB RAM per
socket

Richest
memory density





VIRTUALIZATION & VDI

- Higher core count to enable dense user base
- Large memory capacity for more VMs
- HW encrypted multi-tenant security
- Massive I/O for scale-out environments



SW-DEFINED STORAGE

- Direct SATA & NVMe Support
- High parallelism for low latency
- More memory for larger cache
- Memory encryption for data security

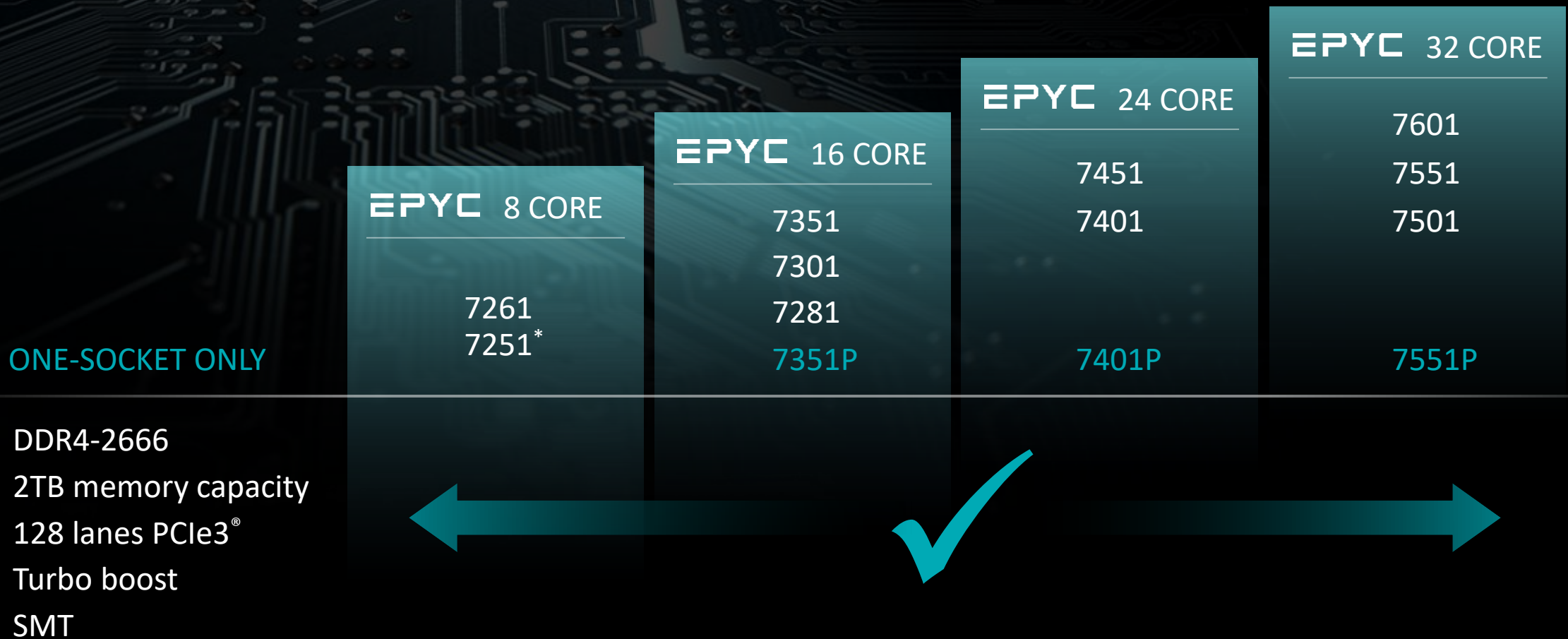


HPC

- CPU optimized for GPU acceleration
- Massive I/O for cluster connectivity
- memory capacity for large datasets
- Massive I/O bandwidth for NVMe drives

THE POWER OF SIMPLICITY

FEATURE CONSISTENCY AND SIMPLIFIED PRODUCT STACK



* The AMD EPYC 7251 has DDR4-2400 memory speed

AMD EPYC STRENGTHS



Feature Set Leadership



Core Density
Memory Channels
Memory Capacity

IO capability
Consistency

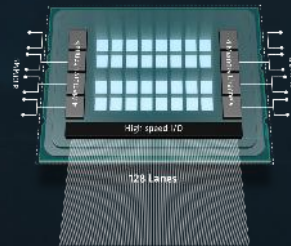
Leadership Dual Socket



Core Scalability
VM Density
Memory Bandwidth

Performance
Perf/\$

No Compromise Single Socket



Disruptive value prop
IO Expansion
TCO Impact

Memory Footprint
Perf/\$

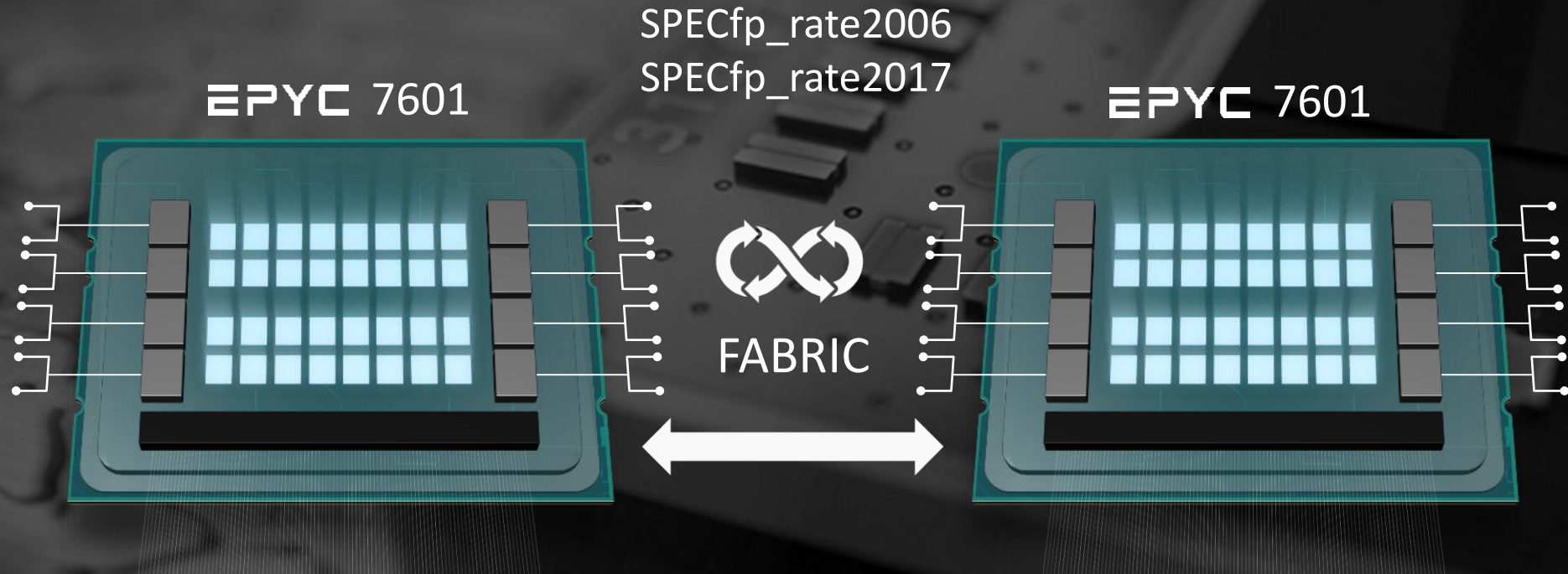
Security



Secure Root-of-Trust
AMD Secure Memory Encryption (SME)

AMD Secure Encrypted Virtualization (SEV)

WORLD RECORD BENCHMARKS!



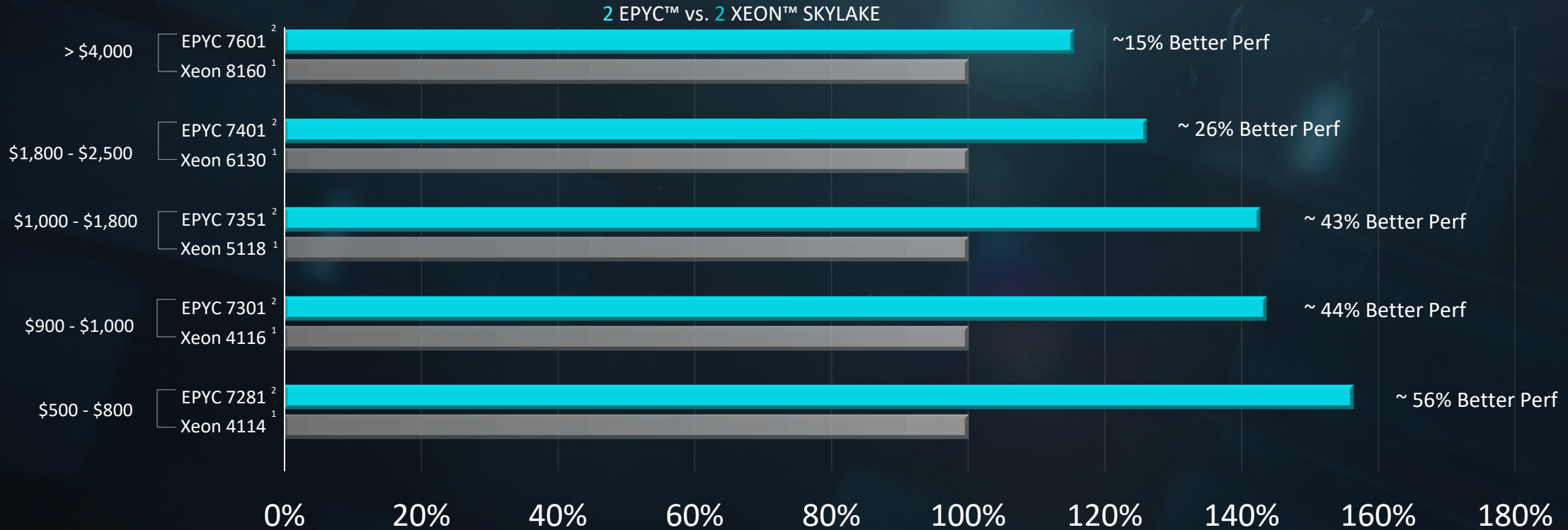
14% More Cores ¹

33% More Memory Bandwidth ²
2.6x More Memory Capacity ³

UP TO 2.6x More Performance / \$ ⁴

Feature and perf/\$ comparison to 2 Intel Xeon Platinum 8180.
Perf/\$ based on published prices and published SPECfp_rate2016 scores on spec.org
See Endnotes

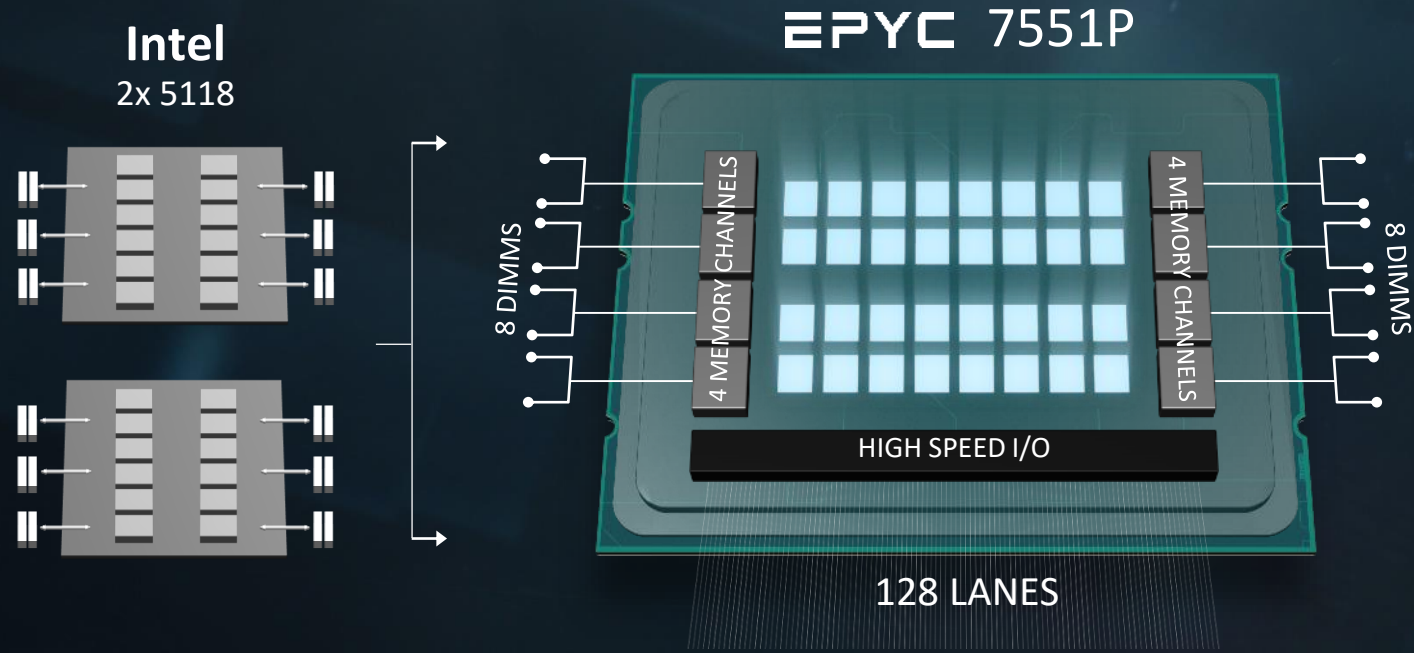
PERFORMANCE IN THE HEART OF THE MARKET



Scores are estimates based on SPECint®_rate_base2017

See endnotes for 1 and 2 details. Pricing ranges based on Intel recommended customer pricing per ark.intel.com Oct 2017; AMD 1Ku pricing June 2017

NO-COMPROMISE 1-SOCKET SERVER



11%
More Performance

20%
Less Power Draw

33% More
Cores

33% More Memory
Capacity

~37% More
Performance / \$

1P1U R6415

| | |
|-----------|---|
| Workloads | <ul style="list-style-type: none"> Distributed core/edge computing Dense virtualization Web tech / CSP |
| Storage | Up to 10 NVMe (Native) Rich mix of other storage configs |
| IO | 2 slots: x16 LP or x16 FH |

1P2U R7415

| | |
|-----------|---|
| Workloads | <ul style="list-style-type: none"> Software defined storage Scale up / scale out BI Analytics VSAN ready node |
| Storage | Up to 24 NVMe Rich mix of other storage configs |
| IO | 4 slots: 1 x8 LP + 3 x16 (1LP/2FH); 1 DW GPU |

2P2U R7425

| | |
|-----------|--|
| Workloads | <ul style="list-style-type: none"> HPC / CFD Database High-end Virtualization |
| Storage | Up to 24 NVMe Rich mix of other storage configs |
| IO | 5-7 slots, with up 3 DW GPUs |



▶ “Edge Computing”



“Software Defined Storage”



“HPC” & Virtualization
Monster

The industry’s best and most complete AMD EPYC platforms

EPYC POWEREDGE SINGLE SOCKET SERVER

OPTIMIZED WITHOUT COMPROMISE



HPE DL380 G10



\$11,543

2 x 4110 (16 Total Cores)
128GB Memory
8x480GB SATA

PowerEdge R7415



\$9,393

1 x 7351P (16 Total Cores)
128GB Memory
8x480GB SATA

Two socket Performance and Features

- Same Core Count
- Like Performance
- Same Memory Footprint
- Same Storage Footprint

**Nearly 20% Lower
System price point**

EPYC POWEREDGE TWO SOCKET SERVER

SCALE UP FOR EXTREME PERFORMANCE



HPE DL380 G10



\$13,188

2 x 5118 (24 Total Cores)
128GB Memory
8x480GB SATA

PowerEdge R7425



\$14,599

2 x 7351 (32 Total Cores)
256GB Memory
8x480GB SATA

33% MORE Cores

2X Memory Capacity

2X Memory BW

40+% MORE

Performance

~10% MORE Cost

EPYC BASED POWEREDGE



Dell EMC PowerEdge Servers Powered by AMD EPYC™ Processors

DELL EMC PowerEdge line-up makes full use of UNIQUE EPYC™ Processor Design

DELL EMC POWEREDGE R7425

14%

MORE CORES*

33%

MORE MEMORY BANDWIDTH*

25%

SUPERIOR HPC/CFD PERFORMANCE*

SCALE-UP PERFORMANCE FOR EXTREME COMPUTING WORKLOADS

- OPTIMIZED FOR: HPC, VDI, DATA ANALYTICS, AND SCALE-UP SOFTWARE DEFINED DEPLOYMENTS
- UP TO 64 CORES/128 THREADS
- UP TO 4TB MEMORY
- SUPPORT FOR UP TO 3 DOUBLE-WIDE CPUS
- RICH STORAGE WITH UP TO 24 NVME DRIVES

DELL EMC POWEREDGE R7415

14%

MORE CORES*

33%

MORE MEMORY*

20%

SUPERIOR vSAN TCO*

NO COMPROMISE SCALE-UP EFFICIENCY

- CORE DENSITY AND I/O CAPABILITY DRIVE DISRUPTIVE TCO FOR SOFTWARE DEFINED STORAGE OR ANALYTICS
- UP TO 32 CORES AND 64 THREADS
- UP TO 2TB MEMORY
- RICH STORAGE WITH UP TO 24 NVME DRIVES

DELL EMC POWEREDGE R6415

14%

MORE CORES*

33%

MORE MEMORY BANDWIDTH*

1U

FOR DENSE VIRTUALIZATION

SINGLE SOCKET FOR LOWER TCO

- IDEAL FOR DENSE VIRTUALIZATION AND SCALE-OUT SOFTWARE DEFINED STORAGE
- SPECIALLY TUNED FOR EDGE COMPUTING
- UP TO 32 CORES/64 THREADS
- UP TO 2 TB OF MEMORY
- RICH STORAGE WITH UP TO 10 NVME DRIVES

LEADERSHIP TWO SOCKET | THE POWER OF ONE SOCKET

| MORE CORES | MORE MEMORY CAPACITY AND BANDWIDTH | MORE COMPUTE PERFORMANCE | HARDWARE ENCRYPTED MEMORY | MASSIVE I/O FOR SCALE OUT ENVIRONMENTS |
|---------------------------|--|--|---|--|
| UP TO 32 CORES PER SOCKET | UP TO 2 TB OF MEMORY AND 8 MEMORY CHANNELS | SPEC® BENCHMARKS*: SPECFP®_RATE2006 SPECRATE®2017_FP | PROTECT AGAINST A CLASS OF MEMORY ATTACKS | 128 PCI® LANES |

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Cassandra

UP TO 50 THROUGH THIS IS

INTEL Xeon E5-2680 v4

\$70,000

TOTAL TCO

MORE MEMORY

UP TO 26 PERFORM THIS IS

INTEL Xeon E5-2680 v4

\$17,292

3 YEAR TCO

MORE CORES

UP TO 37 TCO PER THIS IS

INTEL Xeon E5-2680 v4

\$435

3 YEAR TCO

MORE CORES

UP TO 65 PERFORM THIS IS

INTEL Xeon E5-2680 v4

\$87

TOTAL T

MORE CORES

ANSYS Fluent

Linux VIRT

Why 1P

Hadoop

vSAN

AMPR

AMPR is a Magna Global Partner. The Magna Group Partner Program is a global program of choosing the right technology for each customer's unique needs and goals.

MAPR

MAPR is a Magna Global Partner. The Magna Group Partner Program is a global program of choosing the right technology for each customer's unique needs and goals.

BETTER PERFORMANCE HALF THE LICENSING COST THIS IS EPYC

| | 100 | 500 | 1000 |
|-----------------------|----------|-----------|-----------|
| INTEL Xeon E5-2680 v4 | \$44,084 | \$332,404 | \$646,807 |
| AMD EPYC 7002 | \$44,084 | \$332,404 | \$646,807 |
| EPYC PERCENT SAVINGS | 34% | 63% | 62% |

\$646,807 62% COST SAVINGS*

1P AMD EPYC vSAN POWERED SERVER SAVINGS VS. A 2P INTEL Xeon E5-2680 v4 SERVER

VMWARE vSAN READYNODE SOLUTIONS

For vSAN ReadyNode solutions, the 1P AMD EPYC vSAN powered server delivers 62% cost savings vs. a 2P Intel Xeon E5-2680 v4 server. Each ReadyNode includes the full vSAN software license, 100GB of storage, 100GB of RAM, and 100GB of network bandwidth.

https://www.vmware.com/resources/compatibility/details/#server_hardware

INNOVATIVE SECURITY

Secure Memory Encryption (SME) and Secure Encrypted Virtualization (SEV) protect data in memory and on disk. All with one piece of hardware.

NO-COMPROMISE 1P

Up to 32 cores, 2 TB of memory and 8 memory channels. All with one piece of hardware.

REDEFINING ECONOMICS

AMD EPYC vSAN powered servers are a game-changer. With up to 62% cost savings vs. the Intel Xeon E5-2680 v4 server, redefining vSAN economics.

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VMWARE VSAN SINGLE SOCKET



EQUIVALENT 2-SOCKET THROUGHPUT WITH SIGNIFICANT LICENSE SAVINGS

3x Dell EMC PowerEdge R7415
w/ 2x NVMe (cache) + 6x SATA (capacity)



10 GbE Switch

Simplified Architecture

SoC approach allows for direct multi-protocol connection – lower latency

Two Socket Performance

Comparable throughput (400MB/s) to two socket E5-2698 v4 system

License Optimized

VMware vSphere and vSAN licensing savings of \$7,610 per node for single-socket servers

END-CUSTOMERS WORKLOAD WINS



Tencent Cloud



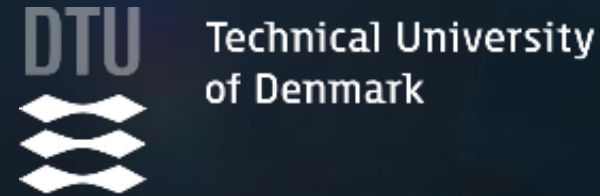
Technical University of Denmark



DENSE VIRTUALIZATION

*HIGH-PERFORMANCE
COMPUTING , ANALYTICS & SDS*

END CUSTOMER MOMENTUM IN EMEA



Working on: City of Zurich, Verne Global, Bosch, Online, Hetzner, et al.

CUSTOMER CASE: SPINVFX



Making a quality Sci-Fi show is always a hell if you are a visual effects designer – you'll need CGI effects almost in every detail to make things look like it's a real space. DELL PowerEdge R7425 w/dual EPYC 7501 reduced rendering times by up to 50% at SPINVFX cluster, so we could enjoy new seasons of "The Expanse" – hours after hours of heavy-FX scenes rendered with quality at the short period of time.



CUSTOMER CASE: PACKET



“A single-socket AMD EPYC-based system allows us to give our clients more bang for their buck...”

Jacob Smith SVP, Engagement

As a leading bare metal cloud for developers, Packet prides itself on offering its clients the very latest and best in hardware technology. That’s why Packet was excited to add AMD EPYC-based servers, Dell PowerEdge R6415 to its offerings—and to create a new class of service based on this platform.



“Naples”

- “Zen”
- 14nm

“Rome”

- “Zen 2”
- 7nm

“Milan”

- “Zen 3”
- 7nm+



Continuous Innovation



Performance Leadership



- DELL | AMD Landing Page: www.dell.com/en-gb/servers/amd-servers.htm
- AMD EPYC Selector Tool: <https://www.amd.com/en/processors/epyc-cpu-selector>
- EPYC TCO Tool: <https://www.amd.com/EPYC-tcotool>

DELL EMC SEARCH LOGIN MENU

| | | |
|--|---|---|
|  PowerEdge R6415 Single Socket / 1U <ul style="list-style-type: none">• Distributed edge / core computing• Dense virtualization• Web tech / CSP |  PowerEdge R7415 Single Socket / 2U <ul style="list-style-type: none">• Software defined storage• VSAN ready nodes• Scale up / scale out• BI analytics |  PowerEdge R7425 Dual Socket / 2U <ul style="list-style-type: none">• HPC• Heavy virtualization• Database• CFD |
|--|---|---|

AMD EPYC™ Processor Selector Tool

→ [Your EPYC™ Choice Is One Click Away](#) ←

| | | |
|---|---|--|
|  AMD EPYC DELIVERS EXCELLENT PERFORMANCE FOR HPC WORKLOADS |  AMD, Dell EMC, and VMware Are First to Publish TPCx-V Results for Virtualized Database Workloads |  Dell EMC PowerEdge R7415 AMD EPYC VMware vSAN Mixed Workloads Performance |
|---|---|--|

Processor to Processor Compare

Processor to Processor Compare

Price

SPECrates

Calculator

| Processor | 2P Cores | 2P Price | 2P SPECrates 2017_Int_Base | 2P SPECrates 2017_FP_Base |
|-----------------------------------|----------|----------|----------------------------|---------------------------|
| Intel Scalable (SP) CPU 4114 * | 20 | \$1,388 | 95.5 | 108 |

2 Intel Processors comparing with 1P EPYC 2P EPYC

Comparing by show less Price

| | Processor | 1P Cores | 1P Price | 1P SPECrates 2017_Int_Base | 1P SPECrates 2017_FP_Base |
|---|-----------|----------|----------|----------------------------|---------------------------|
| 1 | 7401P | 24 | \$1,075 | 116 | 117 |
| 2 | 7351P | 16 | \$750 | 84.4 | 95.2 |
| 3 | 1P 7281 | 16 | \$650 | 76.7 | 88.3 |

DELL EMC | AMD – TARGET CUSTOMERS & CALL TO ACTION

PowerEdge | AMD Solutions are ideal for customers looking at:

- ▲ Reducing TCO/Power draw through PowerEdge | AMD EPYC 1P platforms (applicable to ALL customers currently buying rack servers with 2 x Xeon 4000/5000/low 6000 series);
- ▲ Optimize costs of all per-Socket licensing: VSphere, VSAN, Oracle...;
- ▲ increase the number of NVMe drives and lower the TCO of SDS solutions (HPE has no equivalent to R7415);
- ▲ Lower the cost of a single virtual desktop, in VDI environments;
- ▲ Use high-memory configurations without sku limitations, in both 1 or 2-sockets

AMD 

EPYC

Any Questions ?