A balanced architecture with enhanced cores, memory, I/O, and security is a better choice for software-defined infrastructure.

TRANSITION FROM PHYSICAL TO VIRTUAL

The drive to virtualization and cloud computing has propelled a paradigm shift from physical to virtual infrastructure. Now storage is virtualized along with computing. Software-defined storage can be file, block, or object-based. Tenants, clients and applications can spin up dedicated storage without the expense and delay of configuring physical devices.

SOFTWARE-DEFINED INFRASTRUCTURE CHALLENGES

Different software-defined infrastructure (SDI) has different requirements:

- SERVER VIRTUALIZATION needs more resource density—more cores, more memory, more I/O.
- SOFTWARE-DEFINED STORAGE needs less computing power but requires high-speed networking and highly parallel access to disk storage.
- SECURE MULTITENANCY is essential to isolate multiple tenants, clients, and applications.
- DATACENTER FLEXIBILITY is limited by processors with feature sets dependent on number of cores.

WHY AMD EPYC FOR SDI?

AMD EPYC™ processors address SDI challenges with a product line that delivers the appropriate balance of compute, memory & I/O resources and consistent feature enhancements across the entire product stack. As a result, the AMD EPYC product line supports a wide range of SDI needs:

COMPUTING FLEXIBILITY
- Up to 32 cores for more virtual machine capability per socket
- Scale down to 8 cores and help reduce cost
- Consistent memory capacity, I/O, and security features across the AMD EPYC™ 7000 Series family

MORE MEMORY CAPACITY
- Support more richly configured virtual machines
- Less paging latency
- Better user experience.
- Support larger in-memory databases, caches, and indexes

MORE I/O
- Up to 128 lanes of PCIe™ bandwidth
- Connect to very high-bandwidth network interfaces, hard disk drives, and high-speed NVMe drives.
- Linear scaling from 1 to 16 NVMe drives

MORE DRIVES
- Built-in interfaces support NVMe drives and SATA disks with no need for PCIe switches or HBAs

EMBEDDED SECURITY PROCESSOR
- Hardware encryption acceleration delivers protection through whole-memory encryption
- Can decrypt disk data within a hardware-encrypted buffer to limit exposure of unencrypted data
- Protect against a class of memory-based attacks
**PROVEN AMD EPYC ADVANTAGES**

Service providers and enterprise datacenters can achieve the following benefits with AMD EPYC.

Compare an AMD EPYC 7601 CPUs to an Intel Xeon Platinum 8180 CPU and you get:

- 14% **MORE CORES**
- 33% **MORE MEMORY BANDWIDTH**
- 33% **MORE I/O BANDWIDTH**

Compare two AMD EPYC 7601 CPUs to two Intel Xeon Gold 5118 CPUs and you get:

- **UP TO 90% MORE PERFORMANCE PER DOLLAR**

AMD EPYC-based servers deliver increased I/O throughput and linear scaling useful in software-defined storage environments:

- **MORE THAN 9 MILLION READ IOPS**
- **MORE THAN 7 MILLION WRITE IOPS**

**WHY AMD**

We understand the needs for software-defined infrastructure, and whether you are building software-defined storage appliances, virtualized environments, or hyperconverged systems, we offer the CPU and I/O performance, flexibility and security that you need.

For more information visit [amd.com/EPYC](http://amd.com/EPYC).

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**FOOTNOTES**

1. AMD EPYC 7601 processor includes up to 32 CPU cores versus the Xeon Platinum 8180 processor with 28 CPU cores. NAP-43
2. AMD EPYC 7601 processor supports up to 8 channels of DDR4-2667, versus the Xeon Platinum 8180 processor at 6 channels of DDR4-2667. NAP-42
3. AMD EPYC 7601 processor supports 128 lanes of PCIe bandwidth directly connected to the CPU, versus the Xeon Platinum 8180 processor with 96 lanes
4. Based on SPECint®_rate2006 scores published on [www.spec.org](http://www.spec.org) as of October 25, 2017. 2 x EPYC 7601 CPU ($4,200 per processor at AMD 1ku pricing) in Sugon A620-G30, Ubuntu 17.04, x86 Open64 v4.5.2.1 Compiler Suite, 512 GB PC4-2666V-R memory running at 2400, 1 TB SATA 7200RPM has a peak score of 2400 (base score 2150); versus 2P Xeon Platinum 8180 ($10,009 per processor per [ark.intel.com](http://ark.intel.com))-based Cisco UCS C240 M5 system with SUSE Linux Enterprise Server 12 SP2, ICC 17.0.3.191, 384GB PC4-2666V-R memory, 1x600GB SAS 10000RPM score of 3010 (base score 2890). SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. See [www.spec.org](http://www.spec.org) for more information. NAP-48
5. 1 x EPYC 7601 CPU in HPE Cloudline CL3150, Ubuntu 17.04 4.10 kernel (Scheduler changed to NOOP, CPU governor set to performance), 256 GB (8 x 32GB 2Rx4 PC4-2666) memory, 24 x Samsung pm1725a NVMe drives (with only 16 enabled): FIO v2.16 (4 Jobs per drive, IO Depth of 32, 4K block size) Average Read IOPs 9,178,000 on 100% Read Test (Average BW 35.85 GB/s); FIO (4 jobs per drive, IO depth of 10, 4K block size) Average Write IOPs 7,111,000 on 100% Write Test (Average BW 27.78 GB/s) Each run was done for 30 seconds with a 10 second ramp up using 16 NVMe drives. NAP-24
6. AMD EPYC processor offers up to 128GB LRDIMM in 2 DIMM per channel config, so up to 256GB/channel x 8 channels = 2,048 TB/processor, versus the Xeon E5-2699A v4 processor at 128GB LRDIMM in 3 DIMM per channel config, so up to 384GB/channel x 4 channels = 1.54 TB/processor. NAP-04