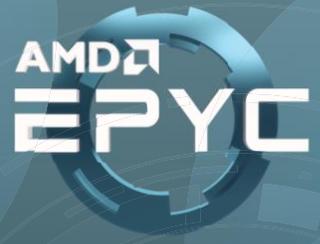# Use AMD EPYC SoCs to Consolidate Virtual Desktops from Dual Processor to Lower Power Single Processor Systems

Transition from Dual to Single Processor

VMware Horizon® 7.6 combined with VMware vSAN® and a single AMD EPYC™ 7601 SoC enables you to run as many virtual desktops per node as a legacy dual processor server.

Upgrade and consolidate

Customers upgrading from Windows 7 will find that a single AMD EPYC 7601 powered server can run the same virtual desktops that their legacy Intel Xeon e5-2687 dual processor powered servers do, even after upgrading to Windows 10.

More Desktops per processor

AMD EPYC processors enabled 121 virtual desktops per processor with the AMD EPYC 7601 processor offering class-leading density[1,4] at low TCO.

AMD EPYC™ Delivers Exceptional Hyperconverged Performance on LoginVSI™

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When upgrading a virtual desktop infrastructure, TCO is of the highest concern. Older dual processor servers due for refresh have to be replaced with newer models. But new dual processor servers can come with a high price tag, use more electricity, and generate more heat than single processor systems.

Previously, single processor systems could not be counted on to support the VDI workloads of dual processor systems. Until now. Servers powered by a single AMD EPYC 7601 processor, with its high core count, high memory bandwidth, and high number of virtual desktops per processor in a hyper-converged system[4], proves to be an excellent choice for deploying virtual desktops in a hyperconverged environment.

Processor	Desktop OS	Virtual Desktops per Node	Virtual Desktops per Processor
1 x AMD EPYC 7601	Windows® 10 2016 LTSB	121	**121**
2 x Intel Xeon e5-2687, 3 GHz 10-core[2]	Windows® 7 Enterprise	121	61

Table 1: LoginVSI "Knowledgeworker" test of Windows 10 vs. Windows 7 desktops

A single processor server with the AMD EPYC 7601 enables you to run as many virtual desktops per node as a legacy dual processor server and requires less power[3] and cooling per server, all while upgrading from Windows 7 to Windows 10. See Table 1.

Tested with LoginVSI

LoginVSI is the industry standard virtual desktop load-testing tool. With the LoginVSI benchmark you can model the performance, scalability and availability of typical virtual desktop environments based on their synthetic user technology. LoginVSI uses Microsoft® Office and other knowledge worker applications to determine response times.

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Test Configurations

We configured four single socket servers with AMD
EPYC 7601 processors with 64 threads per server
(Figure 2). We added 512 GB of memory in a high-
throughput, single-DIMM-per-channel configuration.
The storage configuration used VMware vSAN
software with 8 SATA SSD disks in two disk groups per
server. Each capacity disk was 891 GB, for a total of
20.96 TB of high-speed storage. Each cache disk was
450 Gb SATA SSD. vSAN deduplication, compression,
and checksum were disabled. 25-Gbps switches
connected the servers.

The virtual desktops ran Microsoft Windows 10 LTSB
2016 with 2 vCPUs with 2304 MB of memory allocated
and 40 GB of vDisk each. This configuration represents
a typical hyperconverged architecture.

Figure 2: Benchmark Configuration

We compared our system to a similarly configured vSAN
architecture designed to support virtual desktops during
testing. The configuration of the reference system, used to represent a configuration three or
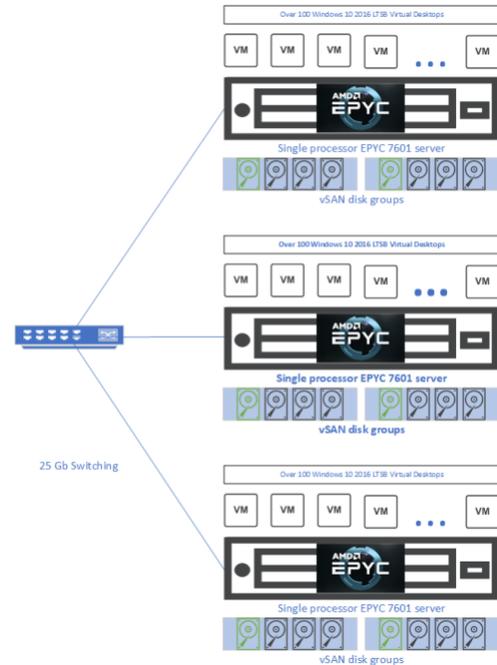more years old and due for consolidation, is detailed in Table 2.

PROPERTY	SPECIFICATION
Server	8 x rack server
CPU	2 sockets, Intel® Xeon® e5-2687 CPUs CPU
RAM	512GB
Network adapter	2 x Intel 10 Gigabit SFI/SFP
Storage adapter	2 x 12Gbps SAS PCI Express®
Disks	SSD: 2 x 800GB class-D 6Gbps SAS drive as cache SSD SSD: 8 x 400GB class-D 6Gbps SAS drive as capacity SSD

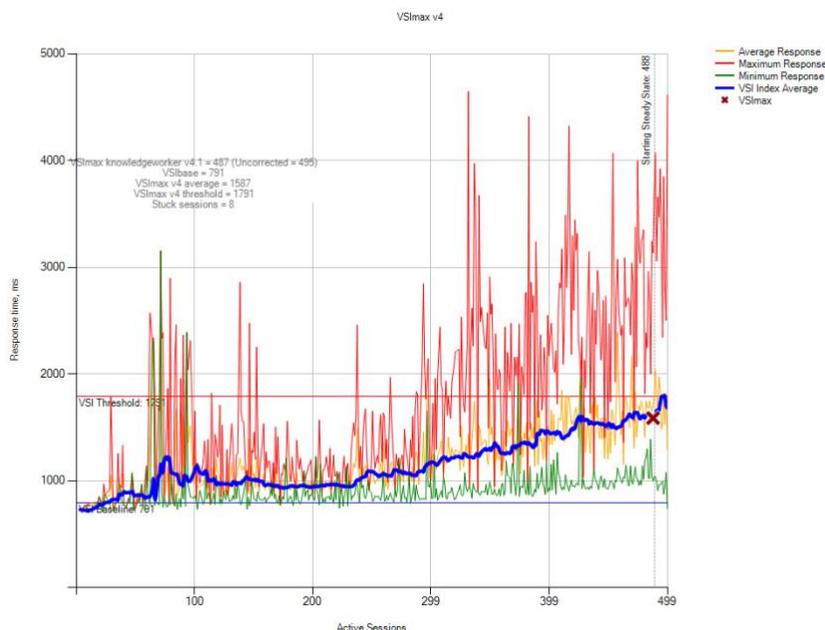**Table 2**: Reference System for Intel CPU testing

Figure 3: LoginVSI test results

Confidently Virtualize Your Desktops

Our AMD internal Login VSI testing (Figure 3) shows that the single processor AMD EPYC 7601 server running VMware vSAN and VMware Horizon 7.6 can deliver the same virtual desktop density as a dual processor server with legacy Xeon processors[2] (Table 1). This means customers can reduce power and cooling costs while upgrading to Windows 10 and replacing older VDI servers. AMD EPYC combined with VMware vSAN can save on capital expense, deployment, power and cooling.

Innovation is Becoming Ever More Important

Innovation is the reason for these outstanding results. As the once automatic leaps in processor performance become increasingly elusive, innovation becomes even more important. The AMD EPYC 7601 system on chip (SoC) delivers 32 cores of CPU performance. The ability to package more cores in a comprehensive system on chip becomes essential to delivering superior performance at a reasonable cost. It is part of AMD's strategy of delivering a better balance of resources for better real-world application performance. The AMD EPYC SoC delivers best-in class number of cores, memory capacity and bandwidth[1], and massive I/O capacity - all essential elements of virtual desktop environments.

FOOTNOTES

1. Best-in-class based on industry-standard pin-based (LGA) X86 processors .
2. VMware Horizon 7 on VMware vSAN 6.6 All-Flash results, Table 2 and Figs. 9 and 14
   https://storagehub.vmware.com/export_to_pdf/vmware-horizon-7-on-vmware-virtual-san-6-2-all-flash
3. EPYC 7601 TDP 180W vs. Intel Xeon E5-2687 TDP 160W X 2 processors.
   https://ark.intel.com/content/www/us/en/ark/products/81909/intel-xeon-processor-e5-2687w-v3-25m-cache-3-10-ghz.html
4. Based on results found on the LoginVSI Benchmark Reports site:
   https://www.loginvsi.com/resources/benchmark-reports