The right processor for VDI
VMware Horizon® 7.9 combined with VMware® vSAN™ and a dual AMD EPYC™ 7542 SoC enables you to run more virtual desktops per node than legacy dual processor servers.

High performance at high density
Our testing reveals that the average response time at full load only differs from response time at minimal load by ~0.1 seconds. This means at high load or low, end users get a productive and comfortable user experience.

More Virtual Desktops per Processor
AMD internal Login VSI testing shows that an AMD EPYC processor-based four node cluster supports ~980 desktops. Thus, each server powered by dual AMD EPYC 7542 processors, can deliver 245 virtual desktops offering class-leading density12 at low TCO.

### AMD EPYC™ Delivers Exceptional Hyperconverged Performance on Login VSI™

Upgrading a virtual desktop infrastructure frequently requires replacing older dual processor powered servers due for refresh with newer models. This can have a huge impact on the Total Cost of Operations (TCO).

Now, you can help reduce TCO with servers powered by AMD EPYC 7542 processors. With their high core count and ample memory bandwidth, AMD EPYC 7542 powered servers support a large number of VDI workloads, proving them to be an excellent choice for deploying virtual desktops in a hyperconverged environment.

<table>
<thead>
<tr>
<th>Processor</th>
<th>Desktop OS</th>
<th>Virtual Desktops Per Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x AMD EPYC™ 7542</td>
<td>Windows® 10 Enterprise 64 bit</td>
<td>~245</td>
</tr>
<tr>
<td>2 x Intel Xeon Gold 6138, 2GHz, 20-Core²</td>
<td>Windows® 10 Enterprise 64 bit</td>
<td>150</td>
</tr>
</tbody>
</table>

Table 1: Login VSI “Knowledgeworker” test of Windows 10 desktops

Dual-socket servers with AMD EPYC 7542 processors enable you to run far more virtual desktops per node than a comparable legacy dual processor server configuration, while supporting Windows 10. See Table 1.

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

We configured four dual socket servers with AMD EPYC 7542 processors with 128 threads per server (Figure 1). We added 1TB of memory in a high-throughput, dual-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 1.6 TB, for a total of 23.29 TB of high-speed storage. Each cache disk was 1.6 TB SATA SSD. vSAN deduplication and compression were disabled, and checksum was enabled. 25-Gbps switches connected the servers.

The virtual desktops ran Microsoft Windows 10 Enterprise 64 with 2 vCPUs, each with 4096 MB of memory allocated and 60 GB of vDisk. This configuration represents a typical hyperconverged architecture.

We compared our system to a similarly configured vSAN architecture designed to support virtual desktops. See Table 2 for configuration details.

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>AMD EPYC 7542</th>
<th>REFERENCE SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server</td>
<td>4 x Dual Socket Server</td>
<td>3 x rack server</td>
</tr>
<tr>
<td>CPU</td>
<td>2 sockets, EPYC 7542 CPUs</td>
<td>2 sockets, Intel® Xeon® Gold 6138 CPUs</td>
</tr>
<tr>
<td>RAM</td>
<td>1 TB</td>
<td>768 GB</td>
</tr>
<tr>
<td>Network adapter</td>
<td>Broadcom® NetExtreme 25 GB</td>
<td>4 x Intel X710 rNDC</td>
</tr>
<tr>
<td>Storage adapter</td>
<td>Dell® PERC H745P</td>
<td>2 x 12 Gbps SAS PCI Express®</td>
</tr>
<tr>
<td>Disks</td>
<td>SSD: 2 x 1.6 TB SATA cache SSD</td>
<td>SSD: 2 x 960GB cache SSD</td>
</tr>
<tr>
<td></td>
<td>SSD: 6 x 1.6 TB SATA cache SSD</td>
<td>SSD: 4 x 1.8TB capacity HDD</td>
</tr>
</tbody>
</table>

Figure 1 Benchmark Configuration
Confidently Virtualize Your Desktops

AMD internal Login VSI testing (Figure 2) shows that the AMD EPYC processor-based four node cluster supports 979 desktops. Thus, each server, powered by dual AMD EPYC 7542 processors running VMware vSAN and VMware Horizon® 7.9 can deliver ~245 virtual desktops, considerably higher density than the dual processor server with legacy Xeon processors that only deliver ~75 virtual desktops per processor\(^2\) (Table 1). This means customers supporting Windows 10 when replacing older VDI servers can experience much better response times and higher density.

![Figure 2: AMD EPYC 7542 2P Server 4-Node Cluster Login VSI Test Results](image)

Also, the response time as measured by VSImax Average at 1108 ms is only 94 ms greater than the base response time of 1014 ms. This shows that the system response time is only minimally impacted at maximum load levels. We can safely conclude that the system can scale beyond our current threshold limits.

Innovation is Becoming Ever More Important

Continuous innovation enables the AMD EPYC 7542 system on chip (SoC) to deliver 32 cores of CPU performance. The ability to package more cores in a comprehensive SoC is 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 core count, 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.

**DISCLAIMER**

The information contained herein is for informational purposes only and is subject to change without notice. While every precaution has been taken in the preparation of this document, it may contain technical inaccuracies, omissions and typographical errors, and AMD is under no obligation to update or otherwise correct this information. Advanced Micro Devices, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this document, and assumes no liability of any kind, including the implied warranties of noninfringement, merchantability or fitness for particular purposes, with respect to the operation or use of AMD hardware, software or other products described herein. No license, including implied or arising by estoppel, to any intellectual property rights is granted by this document. Terms and limitations applicable to the purchase or use of AMD’s products are as set forth in a signed agreement between the parties or in AMD's Standard Terms and Conditions of Sale. GD-18

Login VSI bears no responsibility for this publication in any way and cannot be held liable for any damages following from or related to any information in this publication or any conclusions that may be drawn from it.

©2019 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD logo, EPYC, and combinations thereof are trademarks of Advanced Micro Devices, Inc. Login VSI™ is a trademark of Login VSI, Inc. and Login VSI, B.V. PCIe and PCI Express are registered trademarks of PCI-SIG Corporation. VMware vSAN and VMware Horizon are trademarks or registered trademarks of VMware in the US or other countries. Windows is a registered trademark of Microsoft Corporation in the US and other jurisdictions.