



Executive summary



**GREATER MEMORY FOOTPRINT:**  
SUPPORT 2X THE  
VDI USERS\*



**MORE COST-EFFICIENT:**  
PAY 51% LESS PER  
VDI USER\*



**COMPARABLE DESKTOP  
RESPONSE TIME  
VS. DRAM-ONLY SOLUTION\***

## Increase your virtual desktop density with Intel Optane persistent memory

Now that many businesses around the world have transitioned to remote work environments, virtual desktop infrastructure (VDI) is playing a bigger role in the IT landscape. If your business is considering server clusters with traditional DRAM memory technology to host VDI sessions, you should know that for the same price, servers with Intel® Optane™ persistent memory could double the number of VDI users you can support.

At Principled Technologies, we tested two configurations of a four-node Lenovo® ThinkSystem™ SR650 VMware® vSAN™ cluster powered by Intel® Xeon® Gold 6240R processors. The servers in one configuration used 768 GB of traditional DRAM each, while the servers in the other configuration each used a mix of 384 GB of DRAM and 1.5 TB of Intel Optane persistent memory. We configured these clusters so that they differed in price by less than two percent to demonstrate the user density available for roughly the same budget.

In our tests, the configuration with Intel Optane persistent memory supported twice as many virtual users as the DRAM-only configuration and made better use of its compute resources. This would enable you to host more users on fewer servers.

Based on performance testing and publicly available cost information, we determined that the Intel Optane persistent memory-based configuration would save a business up to 51 percent of three-year, per-user costs compared to a DRAM-only configuration, making it more cost-effective. The cluster with Intel Optane persistent memory also provided nearly identical response time to the DRAM-only solution when supporting the same number of users and comparable response time when supporting twice as many users.



Lenovo ThinkSystem SR650

\*Lenovo ThinkSystem SR650 server cluster with 1.5 TB of Intel Optane persistent memory compared to a cluster of the same servers with 768 GB of traditional DRAM.

## How we tested

We ran a Login VSI workload on a four-node VMware vSAN™ cluster of Lenovo ThinkSystem SR650 servers in two configurations. One configuration had 768 GB of traditional DRAM, while the other had 1.5 TB of Intel Optane persistent memory and 384 GB of DRAM. For more details, [read our full report](#).

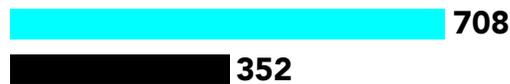
## Support higher user density

The four-node VMware vSAN cluster with Intel Optane persistent memory supported 708 total users (or 2.01 times the users supported by the DRAM-only cluster) due to its higher memory footprint. This configuration would enable you to host more users on fewer servers.



### MAX NUMBER OF VDI USERS PER FOUR-NODE CLUSTER

Higher is better



## Achieve comparable desktop response time

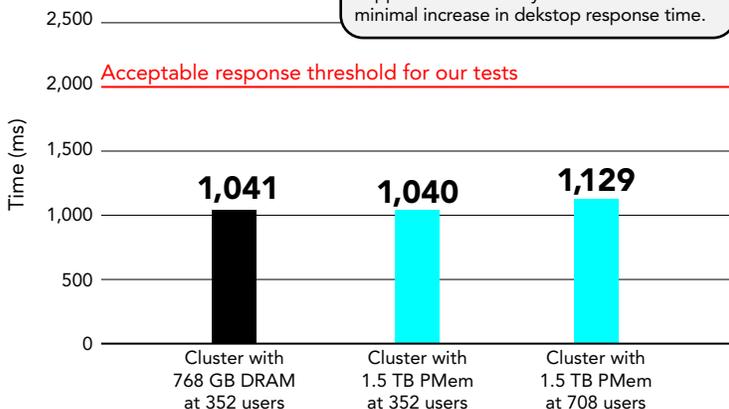
The Intel Optane persistent memory-based cluster we tested was just as responsive as the DRAM-only cluster when both clusters were supporting 352 VDI users (the maximum we could support on the DRAM-only cluster), and still had a comparable response time when supporting twice the number of users as the DRAM-only solution.



### DESKTOP RESPONSE TIMES

Lower is better

Support twice as many users with PMem with minimal increase in desktop response time.



## Get a more cost-effective VDI solution

The graph below compares the cost per VDI user for each of the solutions we tested. We based this analysis on publicly available information—for more details, [read our full report](#). The two clusters had a similar price, with just a 1.6 percent difference between them. However, because the Intel Optane persistent memory-based cluster supported twice the user density, it was about twice as cost-effective as the DRAM-only cluster on a per-user level.



### COST PER VDI USER

AT MAXIMUM CLUSTER USER DENSITY

Lower is better



## Conclusion

VDI is playing an increasingly important role for businesses around the world. To give your virtual desktop users a good experience, you need a server solution that can handle their demands. In our tests, Intel Optane persistent memory supported twice as many simultaneous users as a similarly priced solution that used DRAM only.

Four-node Lenovo ThinkSystem SR650 VMware vSAN cluster with 1.5 TB of Intel persistent memory and 384 GB of DRAM per node

Four-node Lenovo ThinkSystem SR650 VMware vSAN cluster with 768 GB of DRAM per node

Read the report at <http://facts.pt/ADMMVck>



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