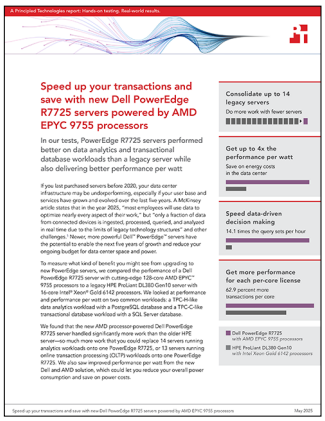

The science behind the report:

Speed up your transactions and save with new Dell PowerEdge R7725 servers powered by AMD EPYC 9755 processors

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report Speed up your transactions and save with new Dell PowerEdge R7725 servers powered by AMD EPYC 9755 processors.

We concluded our hands-on testing on July 3, 2024 for TPROC-H, and March 14, 2025 for TPROC-C. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on July 3, 2024 for TPROC-H, and March 14, 2025 for TPROC-C, or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to http://facts.pt/calculating-and-highlighting-wins. Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Results of our TPROC-H testing.

	Dell™ PowerEdge™ R7725	HPE ProLiant DL380 Gen10
Number of VMs	50	6
Time-to-complete all VMs (seconds)	259	441
Average power usage (watts)	1,511	438
Total number of query sets in an hour (projected)	694.98	48.98
Performance per watt	0.46	0.11

Table 2: Results of our TPROC-C testing.

	Dell PowerEdge R7725	HPE ProLiant DL380 Gen10
Number of VMs	50	6
Transactions per minute (TPM)	38,741,414	2,971,158
Average power usage (watts)	1,641	531
Performance per watt	23,608.42	5,595.40

Figures 1 and 2 show the average processor utilization for each server during the TPROC-H tests. Note that the time (in seconds) differs because the servers completed query sets at different times.

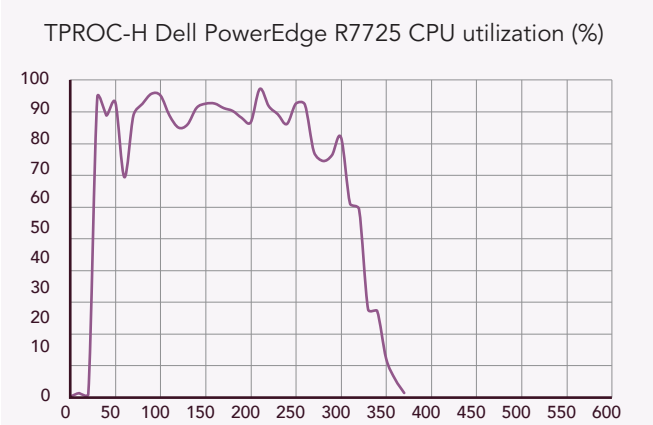

Figure 1: CPU utilization for the Dell PowerEdge R7625 server over the course of the TPROC-H test. Source: Principled Technologies.

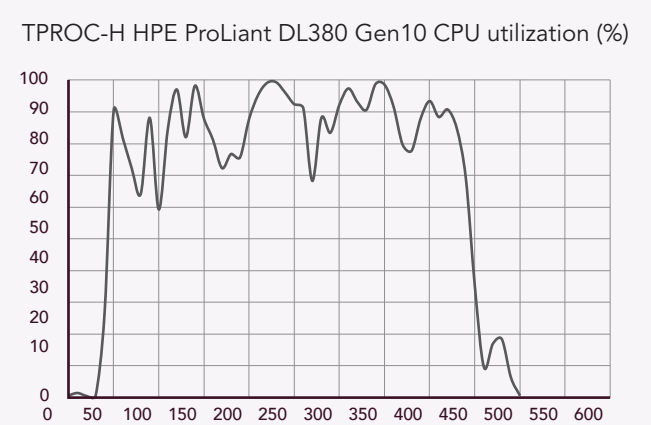

Figure 2: CPU utilization for the HPE ProLiant DL380 Gen10 server over the course of the TPROC-H test. Source: Principled Technologies.

Figures 3 and 2 show the average processor utilization for each server during the TPROC-C tests. Note that the time (in seconds) differs because the servers completed query sets at different times.

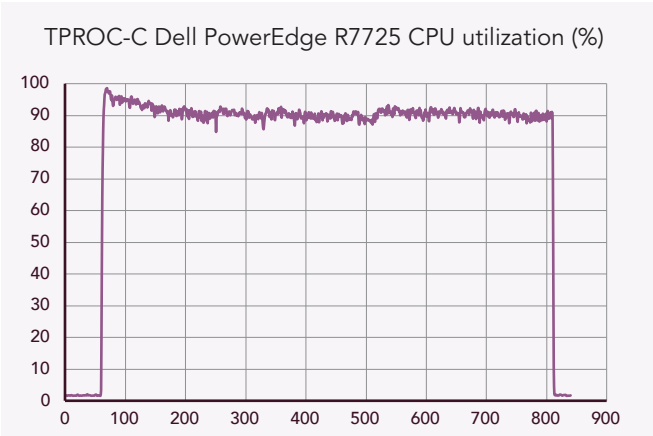

Figure 3: CPU utilization for the Dell PowerEdge R7625 server over the course of the TPROC-C test. Source: Principled Technologies.

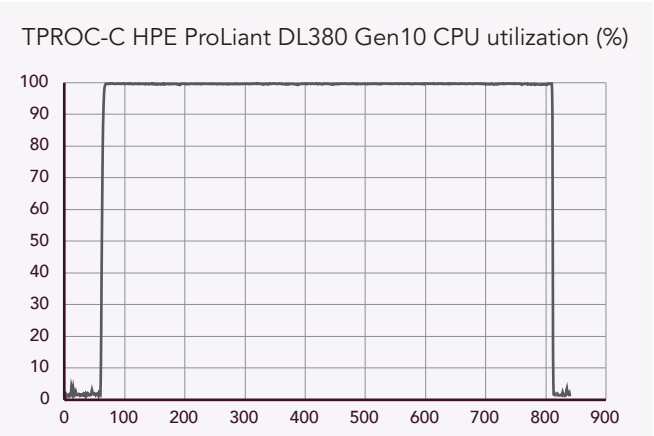

Figure 4: CPU utilization for the HPE ProLiant DL380 Gen10 server over the course of the TPROC-C test. Source: Principled Technologies.

System configuration information

TPROC-H test systems

Table 3: Detailed information on the systems we tested for the TPROC-H workload.

Server configuration information	Dell PowerEdge R7725	HPE ProLiant DL380 Gen10
BIOS name and version	Dell 1.0.1	HPE U30 v3.10
Non-default BIOS settings	System Profile set to Performance	Static High Performance Mode, Maximum Performance
Operating system name and version/build number	VMware® ESXi™ 8.0.2 23305546 Dell Customized	VMware ESXi 8.0.2 23305546 HPE Customized
Date of last OS updates/patches applied	July 3, 2024	July 3, 2024
Power management policy	System Profile set to Performance	Maximum Performance
Number of processors	2	2
Vendor and model	AMD EPYC™ 9755	Intel® Xeon® Gold 6142
Core count (per processor)	128	16
Core frequency (GHz)	2.7	2.60
Stepping	1	1
Memory module(s)		
Total memory in system (GB)	256	256
Number of memory modules	12	12
Vendor and model	Micron 18ASF2G72PDZ-2G6D1	Micron 18ASF2G72PDZ-2G6D1
Size (GB)	16	16
Type	PC4-25600	PC4-25600
Speed (MHz)	2,666	2,666
Speed running in the server (MHz)	2,666	2,666
Storage controller		
Vendor and model	N/A	HPE Smart Array P408i-a SR Gen10
Cache size (GB)	N/A	2 GB
Firmware version	N/A	6.52
Local storage		
Number of drives	8	8
Drive vendor and model	Dell NVMe™ PM1745	HPE VK000960GWCFF
Drive size (GB)	3.2 TB	960 GB
Drive information (speed, interface, type)	PCIe® SSD NVMe	6Gbps SATA SSD

Server configuration information	Dell PowerEdge R7725	HPE ProLiant DL380 Gen10
Network adapter #1		
Vendor and model	Broadcom NetXtreme® Gigabit Ethernet (BCM57508)	HPE Ethernet 1Gb 4-port 331i Adapter
Number and type of ports	2x 100Gb	4x 1Gb
Driver version	226.0.145.4	20.18.31
Network adapter #2		
Vendor and model	N/A	Intel 25GbE 2P XXV710 Adapter
Number and type of ports	N/A	2x25GbE
Driver version	N/A	20.5.13
Power supplies		
Vendor and model	LITEON 01PDMHA00	HP 5WBXUV2LL492TL
Number of power supplies	2	2
Wattage of each (W)	1,500	800

TPROC-C test systems

Table 4: Detailed information on the systems we tested for the TPROC-C workload.

Server configuration information	Dell PowerEdge R7725	HPE ProLiant DL380 Gen10
BIOS name and version	Dell 1.0.6	HPE U30 v3.10
Non-default BIOS settings	System Profile set to Performance	Static High Performance Mode, Maximum Performance
Operating system name and version/build number	VMware® ESXi™ 8.0.3 24022510 Dell Customized	VMware ESXi 8.0.3 24022510 HPE Customized
Date of last OS updates/patches applied	March 14, 2025	March 14, 2025
Power management policy	System Profile set to Performance	Maximum Performance
Processor		
Number of processors	2	2
Vendor and model	AMD EPYC 9755	Intel Xeon Gold 6142
Core count (per processor)	128	16
Core frequency (GHz)	2.7	2.60
Stepping	1	1
Memory module(s)		
Total memory in system (GB)	3,072	256
Number of memory modules	24	12
Vendor and model	Micron® MTC40F2047S1RC64BBX	Micron 18ASF2G72PDZ-2G6D1
Size (GB)	128	16

Server configuration information	Dell PowerEdge R7725	HPE ProLiant DL380 Gen10
Type	PC5-51200	PC4-25600
Speed (MHz)	6,400	2,666
Speed running in the server (MHz)	6,400	2,666
Storage controller		
Vendor and model	N/A	HPE Smart Array P408i-a SR Gen10
Cache size	N/A	2 GB
Firmware version	N/A	6.52
Local storage #1		
Number of drives	8	8
Drive vendor and model	Dell NVMe™ PM1745	HPE VK000960GWCFF
Drive size	3.2 TB	960 GB
Drive information (speed, interface, type)	N/A	6Gbps SATA SSD
Local storage #2		
Number of drives	N/A	8
Drive vendor and model	N/A	Intel P4600
Drive size	N/A	1.6 TB
Drive information (speed, interface, type)	N/A	PCIe NVMe
Network adapter #1		
Vendor and model	Broadcom NetXtreme® Gigabit Ethernet (BCM57508)	HPE Ethernet 1Gb 4-port 331i Adapter
Number and type of ports	2x 100Gb	4x 1Gb
Driver version	232.0.154.0	20.18.31
Network adapter #2		
Vendor and model	N/A	Intel 25GbE 2P XXV710 Adapter
Number and type of ports	N/A	2x 25GbE
Driver version	N/A	20.5.13
Power supplies		
Vendor and model	LITEON 01PDMHA00	HP 5WBXUV2LL492TL
Number of power supplies	2	2
Wattage of each (W)	1,500	800

About our testing

Our testing compared the following dual-socket solutions:

- Dell PowerEdge R7725 with AMD EPYC 9755 128-core processors and 3TB DDR5 memory
- HPE ProLiant DL380 Gen10 with Intel Xeon Gold 6142 16-core processors and 256GB DDR4 memory

We used VMware vSphere 8.0 as our hypervisor. We created 6 and 50 VMs on the HPE and Dell, respectively, with 10 vCPU each. We sized the memory on each VM to use most of the memory on the host, leaving a few GB for hypervisor overhead. We installed Ubuntu 22.04 and PostgreSQL 16 on our TPROC-H VMs. We installed Windows Server 2025 and SQL Server 2022 on our TPROC-C VMs. We ran the HammerDB 4.11 TPROC-H workload and recorded the time it took to complete all the query sets. We then ran the HammerDB 4.12 TPROC-C workload and recorded the average transactions per minute.

How we tested

Installing VMware vSphere 8

1. Boot to the VMware vSphere 8 installation media.
2. To continue, press Enter.
3. To accept the license agreement, press F11.
4. Select the OS installation location.
5. Select a language, and create the root password.
6. To install, press F11.

Creating the base VM

1. Use a web browser to connect and log into the vSphere instance.
2. Right-click the host, and click New VM.
3. Assign the VM the following properties:
   - 10 vCPU
   - 40 GB of memory on HPE, 60 GB of memory on Dell
4. Reserve all guest memory:
   - 100GB VMDK
     - Thick-provisioned
     - VMware Paravirtual controller
5. For TPROC-C testing, add the following drives:
   - 100GB VMDK for SQL Server data
     - Thick-provisioned
     - VMware Paravirtual controller
   - 80GB VMDK for SQL Server logs
     - Thick-provisioned
     - VMware Paravirtual controller
6. Click Finish.

Configuring TPROC-H

Installing Ubuntu 22.04

1. Boot the VM to the Ubuntu Server 22.04 LTS installation media.
2. When prompted, select Install Ubuntu.
3. Select the desired language, and click Done.
4. Choose a keyboard layout, and click Done.
5. At the Network Connections screen, click Done.
6. At the Configure Proxy screen, click Done.
7. At the Configure Ubuntu Archive Mirror screen, click Done.
8. Select Use an entire disk, and click Done.

9. Click Continue.
10. Enter user account details, and click Done.
11. Enable OpenSSH Server install, and click Done.
12. At the installation summary screen, click Done.
13. When the installation finishes, unmount the installation media, and reboot the VM.

Configuring the OS

1. Boot the VM to the operating system, and log in with the configured user.
2. Update the system:

```
apt update -y
```

3. Upgrade the system:

```
apt upgrade -y
```

4. Install tuned and apply the PostgreSQL profile:

```
apt install -y tuned
tuned-adm profile postgresql
```

Installing and configuring PostgreSQL

1. Install PostgreSQL 16:

```
apt install -y postgresql
```

2. Edit /etc/postgresql/16/main/postgresql.conf to the following:

```
max_parallel_workers = 8
```

3. Restart the service:

```
systemctl restart postgresql
```

Installing HammerDB 4.11 and building the database

1. On a separate Linux VM, download and extract the HammerDB files:

```
wget https://github.com/TPC-Council/HammerDB/releases/download/v4.11/HammerDB-4.11-Linux.tar.gz
tar -zxf HammerDB*
```

2. Navigate to the HammerDB-4.11 folder, and run the pg_tproch_build.tcl script from the Scripts section:

```
cd HammerDB-4.11
./hammerdbcli auto pg_tproch_build.tcl
```

Backing up and restoring the database

1. On the target VM, stop the PostgreSQL service:

```
systemctl stop postgresql
```

2. Create an archive of the data folder:

```
sudo tar -cf- /var/lib/postgresql/16/main | pigz -9 -c > backup.tar.gz
```

3. Restore the database from the backup before every test run:

```
systemctl stop postgresql
rm -rf /var/lib/postgresql/16/main
tar -zxf backup.tar.gz -C /
systemctl start postgresql
```

Running the test

1. Use the steps above to restore a fresh copy of the database.
2. Shut down the VMs, reboot the host, start the VMs, and allow them to idle for 5 minutes.
3. Navigate to the HammerDB folder, and run the test script from the Scripts section:

```
cd HammerDB-4.11
./hammerdbcli auto pg_tproch_run.tcl
```

4. Complete steps 1 through 3 three times, and record the median score.

Configuring TPROC-C

Installing Windows Server 2025

1. Boot the VM to the Windows Server 2025 installation media.
2. Press any key to boot from the virtual CD.
3. At the Select language settings screen, click Next.
4. At the Select keyboard settings screen, click Next.
5. At the Select Image screen, select Windows Server 2025 Datacenter Evaluation (Desktop Experience), and click Next.
6. At the Applicable notices and license terms, click Accept.
7. At the Select location screen, select the base VMDK, and click Next.
8. Click Install.
9. After the install finishes and the VM reboots, enter and reenter a password, and click Finish.

Disabling Windows Firewall

1. In the Windows Search bar, type Firewall.
2. Click Windows Defender Firewall with Advanced Security.
3. Under Public Profile, click Windows Defender Firewall Properties.
4. On the Domain profile, under Firewall State, click the drop-down menu, and select Off.
5. Click Private profile, and under Firewall State, click the drop-down menu, and select Off.
6. Click Public profile, and under Firewall State, click the drop-down menu, and select Off.
7. Click OK.

Enabling Remote Desktop

1. From Server Manager, click Local Server.
2. On the Local Server properties page, click Disabled next to Remote Desktop.
3. In the System Properties menu that appears, select Allow remote connections to this computer.
4. Click OK on the warning that appears.
5. To exit, click OK.

Running Windows Update

1. In the Windows Search bar in the lower left, type Update, and click Check for updates.
2. Click Check for Updates.
3. Click Install All.

Installing MS SQL Server 2022

1. Attach the installation media ISO for SQL Server 2022 to the VM.
2. Double-click the Setup application.
3. In the left pane, click Installation.
4. Click New SQL Server stand-alone installation or add features to an existing installation.
5. Select Evaluation, and Click Next.
6. Click the checkbox to accept the license terms, and click Next.
7. Click Use Microsoft Update to check for updates, and click Next.
8. On the Install Rules page, click Next.
9. Check the boxes for the following features, and click Next:
   - Database Engine Services
   - Full-Text and Semantic Extractions for Search
10. Leave the Default instance, and click Next.
11. Leave the default Service Accounts, and click Next.
12. On the Server Configuration tab, choose Mixed Mode, and enter and confirm a Password for the SQL Server system administrator (sa) account.
13. Click Add Current User to Specify the SQL Server administrators.
14. In Data Directories, change the Data root directory to the database volume.
15. Choose the log volume for the User database log directory.
16. If you plan to have a locally stored backup, change the Backup directory to point to it.
17. Click Next.
18. At the Error and usage reporting screen, click Next.
19. At the Installation Configuration Rules screen, check that there are no failures or relevant warnings, and click Next.
20. At the Ready to Install screen, click Install.
21. Close the installation window.
22. Download and install SQL Server Management Studio.

Installing HammerDB 4.12 and building the database

1. On a separate Linux VM, download and extract the HammerDB files:

```
wget https://github.com/TPC-Council/HammerDB/releases/download/v4.12/HammerDB-4.12-Linux.tar.gz
tar -zxf HammerDB*
```

2. Navigate to the HammerDB-4.12 folder, and run the mssql_tprocc_build.tcl script from the Scripts section:

```
cd HammerDB-4.12
./hammerdbcli auto mssql_tprocc_build.tcl
```

Backing up the database

1. Open SQL Server Management Studio.
2. Right-click the tpcc database, and click Tasks→Back up….
3. Choose a location to store the backup, and click OK.

Restoring the database

1. Open SQL Server Management Studio.
2. Right-click the tpcc database, and click Tasks→Restore….
3. Choose the backup file created earlier, and click OK.

Running the test

1. Use the steps above to restore a fresh copy of the database.
2. Shut down the VMs, reboot the host, start the VMs, and allow them to idle for 5 minutes.
3. Navigate to the HammerDB folder, and run the test script from the Scripts section:

```
cd HammerDB-4.12
./hammerdbcli auto mssql_tprocc_run.tcl
```

4. Complete steps 1 through 3 three times, and record the median score.

Scripts

pg_tproch_build.tcl

```
dbset db pg
dbset bm TPC-H
diset connection pg_host <IP_ADDRESS>
diset connection pg_port 5432
diset connection pg_sslmode prefer
diset tpch pg_scale_fact 10
diset tpch pg_num_tpch_threads 4
diset tpch pg_tpch_superuser postgres
diset tpch pg_tpch_superuserpass <PASSWORD>
diset tpch pg_tpch_defaultdbase postgres
diset tpch pg_tpch_user postgres
diset tpch pg_tpch_pass <PASSWORD>
diset tpch pg_tpch_dbase tpch
diset tpch pg_tpch_tspace pg_default
buildschema
```

pg_tproch_run.tcl

```
#!/bin/tclsh
dbset db pg
dbset bm TPC-H
diset connection pg_host <IP_ADDRESS>
diset connection pg_port 5432
diset connection pg_sslmode prefer
diset tpch pg_scale_fact 10
diset tpch pg_tpch_user postgres
diset tpch pg_tpch_pass <PASSWORD>
diset tpch pg_tpch_dbase tpch
diset tpch pg_total_querysets 1
diset tpch pg_degree_of_parallel 8
loadscript
vuset vu 3
vucreate
vurun
```

mssql_tprocc_build.tcl

```
puts "SETTING CONFIGURATION"
dbset db mssqls
dbset bm TPC-C
diset connection mssqls_tcp false
diset connection mssqls_port 1433
diset connection mssqls_azure false
diset connection mssqls_encrypt_connection true
diset connection mssqls_trust_server_cert true
diset connection mssqls_authentication sql
diset connection mssqls_server <IP_ADDRESS>
diset connection mssqls_linux_server <IP_ADDRESS>
diset connection mssqls_uid sa
diset connection mssqls_pass <PASSWORD>
diset connection mssqls_linux_authent sql
diset connection mssqls_linux_odbc {ODBC Driver 18 for SQL Server}
diset tpcc mssqls_use_bcp false
diset tpcc mssqls_count_ware 200
diset tpcc mssqls_num_vu 10
diset tpcc mssqls_dbase tpcc
puts "SCHEMA BUILD STARTED"
buildschema
puts "SCHEMA BUILD COMPLETED"
```

mssql_tprocc_run.tcl

```
dbset db mssqls
dbset bm TPC-C
diset connection mssqls_linux_server <IP_ADDRESS>
diset connection mssqls_server <IP_ADDRESS>
diset connection mssqls_linux_authent sql
diset connection mssqls_authentication sql
diset connection mssqls_uid sa
diset connection mssqls_pass <PASSWORD>
diset connection mssqls_tcp true
diset connection mssqls_port 1433
diset tpcc mssqls_count_ware 200
diset tpcc mssqls_use_bcp false
diset tpcc mssqls_total_iterations 1000000000
diset tpcc mssqls_driver timed
diset tpcc mssqls_rampup 10
diset tpcc mssqls_duration 15
diset tpcc mssqls_allwarehouse true
loadscript
puts "TEST STARTED"
vuset vu 36
vuset logtotemp 1
vucreate
tcstart
tcstatus
set jobid [ vurun ]
vudestroy
tcstop
puts "TEST COMPLETE"
```

Read the report at https://facts.pt/tyhADCe ▶

This project was commissioned by Dell Technologies.