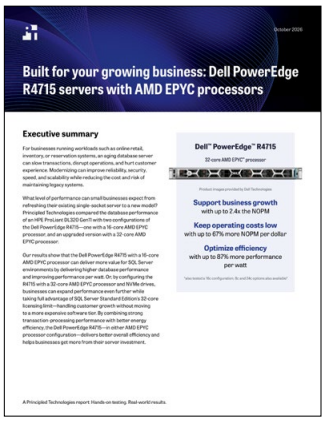


The science behind the report:

Built for your growing business: Dell PowerEdge R4715 servers with AMD EPYC 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 Built for your growing business: Dell PowerEdge R4715 servers with AMD EPYC processors.

We concluded our hands-on testing on August 13, 2026. 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 August 10, 2026 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 https://facts.pt/calculating-and-highlighting-wins. Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Detailed results for the three configurations from our HammerDB testing. Source: PT.

Configuration	HPE ProLiant DL320 Gen11	Dell™ PowerEdge™ R4715 (16-core)	Dell PowerEdge R4715 (32-core)
Processor	Intel® Xeon® Gold 5416S (16 cores)	AMD EPYC™ 9135 (16 cores)	AMD EPYC 9335 (32 cores)
Storage	SATA SSD	SATA SSD	NVMe™ SSD
Virtual users	192	192	256
NOPM (median run)	1,548,181	1,992,362	3,825,788
Power (W)	323.5	332.7	426.9
NOPM per watt	4,786	5,988	8,961
Avg CPU utilization	99.7%	99.5%	98.2%

Table 2: Pricing data and NOPM per dollar, sourced from discounted quotes from an HPE reseller and from Dell on September 8, 2026. Pricing, taxes, and fees will vary. Source: PT.

Configuration	HPE ProLiant DL320 Gen11	Dell PowerEdge R4715 (32-core)
Cost	$92,581.05	$136,753.99
NOPM	1,548,181	3,825,788
NOPM/$	16.72	27.97
More NOPM/$	N/A	67.2%

System configuration information

Table 3: Detailed configuration information for the servers under test.

System configuration information	HPE ProLiant DL320 Gen11	Dell PowerEdge R4715 (16-core, SATA)	Dell PowerEdge R4715 (32-core, NVMe)
BIOS name and version	U63 v2.94	Dell 1.7.7	Dell 1.7.7
Non-default BIOS settings	Workload Profile – Transactional Application Processing	System Profile – Performance Optimized	System Profile – Performance Optimized
Operating system name and version/build number	Microsoft Windows Server 2025 Standard Evaluation 10.0.26100 (build 26100.33158)	Microsoft Windows Server 2025 Standard Evaluation 10.0.26100 (build 26100.33158)	Microsoft Windows Server 2025 Standard Evaluation 10.0.26100 (build 26100.33158)
Date of last OS updates/ patches applied	07/27/2026	07/27/2026	07/27/2026
Power management policy	High performance	High performance	High performance
Processor			
Number of processors	1	1	1
Vendor and model	Intel Xeon Gold 5416S	AMD EPYC 9135	AMD EPYC 9335
Core count (per processor)	16	16	32
Core frequency (GHz)	2.00	3.65	3.00
Stepping	8	1	1
Logical processors (SMT/ Hyper-Threading)	32 (enabled)	32 (enabled)	64 (enabled)
Memory module(s)			
Total memory in system (GB)	256	384	384
Number of memory modules	8	12	12
Vendor and model	Samsung® M321R4GA3PB0-CWMCH	Samsung M321R4GA3EB2-CCPKF	Samsung M321R4GA3EB2-CCPKF
Size (GB)	32	32	32
Type	DDR5	DDR5	DDR5
Speed (MHz)	5,600	6,400	6,400
Speed running in the server (MHz)	4,400	5,200	5,200
Storage controller (data path)			
Vendor and model	Embedded SATA AHCI controller	Dell PERC H965i Front (drives presented as Non-RAID pass-through)	None in the data path (CPU-attached NVMe, direct PCIe); PERC H965i Front installed with no drives attached
Cache size (GB)	N/A	8 (not in the data path for Non-RAID drives)	N/A
Firmware version	N/A	8.14.0.0.18-14	N/A

System configuration information	HPE ProLiant DL320 Gen11	Dell PowerEdge R4715 (16-core, SATA)	Dell PowerEdge R4715 (32-core, NVMe)
Local storage (OS)			
Number of drives	2	2	2
Drive vendor and model	HPE VR000480KXLXF on NS204i-u Gen11 Boot Controller	Dell BOSS-N1: Dell EC NVMe ISE 7450 RI M.2	Dell BOSS-N1: Dell EC NVMe ISE 7450 RI M.2
Drive size (GB)	480	480	480
Drive information (speed, interface, type)	NVMe M.2 SSD	NVMe M.2 SSD	NVMe M.2 SSD
Data disks			
Number of drives	8	8	8
Drive vendor and model	Samsung MZ7L31T9HELAAD3 (PM893a)	Samsung MZ7L31T9HELAAD3 (PM893a)	Samsung (Dell DC NVMe PM9D3a RI U.2 1.92TB)
Drive size (TB)	1.92	1.92	1.92
Drive firmware	HL51	HL51	1.0.1
Drive information (speed, interface, type)	6Gb SATA, SSD	6Gb SATA, SSD	NVMe U.2, SSD
Network adapter (data)			
Vendor and model	Intel Ethernet Server Adapter X520-2 (82599ES)	Intel Ethernet Server Adapter X520-2 (82599ES)	Intel Ethernet Server Adapter X520-2 (82599ES)
Number and type of ports	2 x 10GbE SFP+	2 x 10GbE SFP+	2 x 10GbE SFP+
Network adapter (management)			
Vendor and model	Broadcom® BCM5720 (LOM)	Broadcom BCM57412 (OCP)	Broadcom BCM57412 (OCP)
Number and type of ports	2 x 1GbE	4 x 10GBASE-T (linked at 1GbE)	4 x 10GBASE-T (linked at 1GbE)
Management controller			
Vendor and firmware version	HPE iLO 6 v1.77	Dell iDRAC 1.30.30.50	Dell iDRAC 1.30.30.50
Cooling fans			
Number of cooling fans	7	16	16
Power supplies			
Number of power supplies	2	2	2
Vendor and model	Delta (HPE P38995-B21)	Lite-On (Dell 1100W RDNT)	Lite-On (Dell 1100W RDNT)
Wattage of each (W)	800	1,100	1,100
Software versions			
Database software	Microsoft SQL Server 2025 Standard Developer Edition 17.0.4065.4 (CU7, KB5096981)	Microsoft SQL Server 2025 Standard Developer Edition 17.0.4065.4 (CU7, KB5096981)	Microsoft SQL Server 2025 Standard Developer Edition 17.0.4065.4 (CU7, KB5096981)
Benchmark software (client system)	HammerDB CLI v6.0	HammerDB CLI v6.0	HammerDB CLI v6.0
Database client driver (client system)	Microsoft ODBC Driver 18 for SQL Server 18.6.2.1	Microsoft ODBC Driver 18 for SQL Server 18.6.2.1	Microsoft ODBC Driver 18 for SQL Server 18.6.2.1
Power measurement tool	ipmitool 1.8.19	ipmitool 1.8.19	ipmitool 1.8.19

How we tested

Testing with TPROC-C

We compared the online transaction processing (OLTP) performance of three server configurations using the HammerDB 6.0 TPROC-C workload: an HPE ProLiant DL320 Gen11 server powered by one Intel Xeon Gold 5416S processor with SATA SSD storage, a Dell PowerEdge R4715 server powered by one AMD EPYC 9135 processor with SATA SSD storage, and the same Dell PowerEdge R4715 server powered by one AMD EPYC 9335 processor with NVMe SSD storage. Each system under test (SUT) ran Microsoft SQL Server 2025 Standard Developer Edition on bare-metal Microsoft Windows Server 2025 Standard Evaluation, with two mirrored Storage Spaces volumes hosting the database data and log files. A HammerDB client ran on a separate Dell PowerEdge R640 server connected to each SUT over a dedicated 10GbE network. We used a 2,000-warehouse database and tested with 192 virtual users on the 16-core configurations and 256 virtual users on the 32-core configuration. While running the TPROC-C workload, we captured power consumption by using IPMI to measure the system power from each system's baseboard management controller (BMC). We ran each test three times and report the median run.

Table 4: Benchmark parameters

	HPE ProLiant DL320 Gen11	Dell PowerEdge R4715 (16-core, SATA)	Dell PowerEdge R4715 (32-core, NVMe)
Tested by	Principled Technologies	Principled Technologies	Principled Technologies
Test date	08/13/2026	08/10/2026	08/13/2026
Workload & version	HammerDB v6.0 TPROC-C	HammerDB v6.0 TPROC-C	HammerDB v6.0 TPROC-C
Workload-specific parameters	2,000 warehouses; 192 virtual users; Use All Warehouses disabled	2,000 warehouses; 192 virtual users; Use All Warehouses disabled	2,000 warehouses; 256 virtual users; Use All Warehouses disabled
Ramp-up / test duration	10 minutes / 20 minutes	10 minutes / 20 minutes	10 minutes / 20 minutes
Iterations and result choice	3 runs, median	3 runs, median	3 runs, median

Setting up the systems under test

Installing Windows Server 2025

1. Boot the server from the Windows Server 2025 installation media.
2. When the system prompts you to boot from DVD, press any key.
3. When the installation screen appears, leave language, time/currency format, and input method as default, and click Next.
4. Click Install now.
5. Select Windows Server 2025 Standard Evaluation (Desktop Experience), and click Next.
6. Check I accept the license terms, and click Next.
7. Click Custom: Install Windows only (advanced).
8. Select Drive 0 Unallocated Space, and click Next. This starts Windows automatically, and Windows will restart automatically after completing.
9. When the Settings page appears, fill in the Password and Reenter Password fields with the same password. Log in with the password you set up previously.
10. Complete steps 1 through 9 on the other systems under test and on the client system.

Configuring Windows Server

1. Open Server Manager, and click Local Server.
2. Disable Windows Defender Firewall on Domain network, Private network, and Public network.
3. Change the time zone to your local time zone.
4. Set the system clock to synchronize with your NTP server. We used a local NTP server.
5. Change the name of your server, and when prompted, reboot.
6. Open Server Manager again, and click Local Server.
7. Click to run updates.
8. Run updates, rebooting when prompted, until the server shows no new updates to install.
9. Pause Windows updates so that none install during testing.
10. In Power Options, set the power plan to High performance.

Creating the data and log volumes

On the Dell PowerEdge R4715 with SATA storage, we first converted the eight drives to Non-RAID in the PERC BIOS so Windows received them as pass-through disks. On the NVMe configuration, the drives are CPU-attached and require no controller configuration.

1. On the Dell SATA configuration only: boot into System Setup, open Device Settings, select the PERC H965i controller, and convert all eight physical disks to Non-RAID. Reboot.
2. In Settings, open Manage Storage Spaces.
3. Click Add.
4. Enter a name for the storage pool, and select the six data disks.
5. Click Create, and click Yes to confirm.
6. Enter a name for the storage space, the default maximum size, and choose a resiliency. We used Two-way mirror.
7. Click Create, and click Yes to confirm.
8. Enter a name for the volume label, assign drive letter D for the data volume, and click Next.
9. Select the file system and allocation size, and click Next. We used NTFS and 64K allocation size.
10. Verify that the settings are correct, and click Format.
11. Repeat steps 2 through 10 to create the log volume: select the remaining two disks for the pool, choose Two-way mirror, assign drive letter L, and format NTFS with 64K allocation size.
12. Create the directories D:\data, D:\tempdb, and L:\log.

Installing Microsoft SQL Server 2025

1. Download the SQL Server 2025 installation media from Microsoft, and run the installer.
2. In the left pane, click Installation.
3. Click New SQL Server stand-alone installation or add features to an existing installation.
4. Specify Standard Developer as the edition you are installing, and click Next.
5. Accept the license terms, and click Next.
6. Click Use Microsoft Update to check for updates, and click Next.
7. To install the setup support files, click Install.
8. If the installer doesn't display any failures, click Next.
9. At the Setup Role screen, choose SQL Server Feature Installation, and click Next.
10. At the Feature Selection screen, select Database Engine Services and Full-Text and Semantic Extractions for Search.
11. Click Next.
12. At the Instance Configuration screen, leave the instance default selection, and click Next.
13. At the Server Configuration screen, accept the defaults, and click Next.
14. At the Database Engine Configuration screen, select Mixed Mode authentication. For the system administrator account, enter and confirm a password.
15. Click Add Current User. This may take several seconds.
16. Click Data Directories. Set the user database directory to D:\data, the user database log directory to L:\log, and the backup directory to C:\backup.
17. Click TempDB. Change the number of files to eight, the initial file size to 1,024 MB, and the initial size of the log to 1,024 MB. Set the tempdb data and log directories to D:\tempdb.
18. Click MaxDOP, and set Max Degree of Parallelism to 8.
19. Click Next.
20. At the Ready to Install screen, verify the summary, and click Install.
21. Once the installation finishes, apply the latest cumulative update (we used CU7, KB5096981, build 17.0.4065.4).

Configuring Windows policies

1. In the Start menu, click Run. In the Open box, type gpedit.msc.
2. On the Local Group Policy Editor console, expand Computer Configuration, and expand Windows Settings.
3. Expand Security Settings, and expand Local Policies.
4. Select the User Rights Assignment folder.
5. In the details pane, double-click Lock pages in memory.
6. In the dialog box for Local Security Setting - Lock pages in memory, click Add User or Group.
7. In the dialog box for Select Users, Service Accounts, or Groups, select the SQL Server Service account, and click OK.
8. In the details pane, double-click Perform volume maintenance tasks.
9. In the dialog box for Local Security Setting - Perform volume maintenance tasks, click Add User or Group.
10. In the dialog box for Select Users, Service Accounts, or Groups, select the SQL Server Service account, and click OK.
11. For these settings to take effect, restart the SQL Server Service.

Configuring SQL Server global options

1. Open SQL Server Configuration Manager, expand SQL Server Network Configuration, and click Protocols for MSSQLSERVER. Enable TCP/IP, and in the TCP/IP properties, set the IPAll TCP port to 1433.
2. Still in SQL Server Configuration Manager, right-click the SQL Server (MSSQLSERVER) service, click Properties, and on the Startup Parameters tab add -T652.
3. Connect to the instance with a SQL query tool, and run the following commands. Use 235712 for max server memory on the HPE server and 262144 on the Dell server:

```
EXEC sp_configure 'show advanced options', 1; RECONFIGURE;
EXEC sp_configure 'max server memory (MB)', 262144; RECONFIGURE;
EXEC sp_configure 'network packet size (B)', 8192; RECONFIGURE;
```

4. Verify max degree of parallelism is 8 (set during installation).
5. Restart the SQL Server service.

Creating and pre-sizing the TPROC-C database

1. On the SUT, connect to the instance with a SQL query tool, and run the following query:

```
CREATE DATABASE [tpcc] ON PRIMARY (NAME='tpcc', FILENAME='D:\data\tpcc.mdf',
SIZE=36864MB, FILEGROWTH=0),
(NAME='tpcc2', FILENAME='D:\data\tpcc2.ndf', SIZE=36864MB, FILEGROWTH=0),
(NAME='tpcc3', FILENAME='D:\data\tpcc3.ndf', SIZE=36864MB, FILEGROWTH=0),
(NAME='tpcc4', FILENAME='D:\data\tpcc4.ndf', SIZE=36864MB, FILEGROWTH=0),
(NAME='tpcc5', FILENAME='D:\data\tpcc5.ndf', SIZE=36864MB, FILEGROWTH=0),
(NAME='tpcc6', FILENAME='D:\data\tpcc6.ndf', SIZE=36864MB, FILEGROWTH=0),
(NAME='tpcc7', FILENAME='D:\data\tpcc7.ndf', SIZE=36864MB, FILEGROWTH=0),
(NAME='tpcc8', FILENAME='D:\data\tpcc8.ndf', SIZE=36864MB, FILEGROWTH=0)
LOG ON (NAME='tpcc_log', FILENAME='L:\log\tpcc_log.ldf', SIZE=98304MB, FILEGROWTH=0);
```

2. Once finished, run the following command to set the recovery model:

```
ALTER DATABASE tpcc SET RECOVERY SIMPLE;
```

Setting up the client

Installing ODBC Driver 18 for SQL Server

1. In the browser of your choice, navigate to https://learn.microsoft.com/en-us/sql/connect/odbc/download-odbc-driver-for-sql-server.
2. Click the download link for Microsoft ODBC Driver 18 for SQL Server (x64).
3. Double-click the downloaded file, and follow the prompts in the wizard to install.

Installing HammerDB on the client system

1. Download the latest version of HammerDB from www.hammerdb.com/download.html. We used version 6.0.
2. Double-click the .EXE file, choose English, and click OK.
3. Click Yes.
4. Click Next.
5. Choose a destination location, and click Next.
6. Click Next.
7. Click Finish.

Loading the TPROC-C schema

1. Open HammerDB, and click Options, then Benchmark.
2. Choose MSSQL Server and TPROC-C.
3. Expand SQL Server, TPROC-C, and Schema Build.
4. Double-click Options.
5. In the SQL Server field, input the IP address of the SUT.
6. Change the ODBC Driver to ODBC Driver 18 for SQL Server, choose SQL Server Authentication, and enter the password you chose during SQL Server setup.
7. Select 2,000 warehouses and 32 virtual users.
8. Click OK.
9. Double-click Build.

Configuring SQL Server database options

1. On the SUT, run the following command:

```
ALTER DATABASE tpcc SET TARGET_RECOVERY_TIME = 600 SECONDS;
```

2. Verify delayed durability is Disabled (the default).

Backing up the database

1. On the SUT, run the following command to store a backup on the internal boot volume:

```
BACKUP DATABASE tpcc TO DISK='C:\backup\tpcc_wh2000.bak';
```

Measuring server power

We captured power from a management system that had network access to each server's BMC. IPMI over LAN is disabled by default on both platforms, so we enabled it before we began testing.

1. On the management system, install ipmitool.
2. On the Dell server, log into the iDRAC web interface, and go to iDRAC Settings, then Connectivity. Under IPMI Settings, set Enable IPMI Over LAN to Enabled, and click Apply.
3. On the HPE server, log into the iLO web interface, and go to Security, then Access Settings. Click the edit icon for Network, and select IPMI/DCMI over LAN.
4. On the management system, start a power log that runs the following command against each BMC every 5 seconds and appends each reading, with a timestamp, to a CSV file:

```
ipmitool -I lanplus -H <BMC IP address> -U <user name> -P <password> dcmi power reading
```

Performing the TPROC-C test

1. Log into the client system, and open a command prompt.
2. Navigate to the HammerDB directory:

```
cd "C:\Program Files\HammerDB-6.0"
```

3. To capture CPU, RAM, disk, and network performance counters, start a custom Perfmon data collector set.
4. Begin capturing power from the SUT's BMC as described in the Measuring server power section.
5. Use hammerdbcli to run the hammerdb-settings.tcl script found in the Scripts we used in testing section below:

```
hammerdbcli auto hammerdb-settings.tcl
```

6. When the run finishes, stop Perfmon and the power capture.
7. Save the HammerDB results text file, Perfmon output, and power samples.
8. To drop and restore the database, run the Restore-db.sql script found in the Scripts we used in testing section below, and reboot the system under test.
9. Complete the test two more times. We report the median run results.

Scripts we used in testing

```
hammerdb-settings.tcl
dbset db mssqls
dbset bm TPC-C
diset connection mssqls_server {172.16.0.22}
diset connection mssqls_authentication sql
diset connection mssqls_uid {sa}
diset connection mssqls_pass {********}
diset connection mssqls_tcp true
diset connection mssqls_port 1433
diset connection mssqls_odbc_driver {ODBC Driver 18 for SQL Server}
diset connection mssqls_encrypt_connection true
diset connection mssqls_trust_server_cert true
diset tpcc mssqls_dbase {tpcc}
diset tpcc mssqls_count_ware 2000
diset tpcc mssqls_total_iterations 1000000000
diset tpcc mssqls_driver timed
diset tpcc mssqls_rampup 10
diset tpcc mssqls_duration 20
diset tpcc mssqls_allwarehouse false
print dict
loadscript
puts "TEST STARTED"
vuset vu 192
vuset logtotemp 1
vucreate
tcstart
tcstatus
set jobid [ vurun ]
vudestroy
tcstop
puts "TEST COMPLETE"
```

This script shows the settings for the Dell PowerEdge R4715 16-core configuration. For each configuration, we set mssqls_server to the IP address of that system under test, and for the 32-core configuration, we set vuset vu to 256.

```
Restore-db.sql
IF DB_ID(N'tpcc') IS NOT NULL
BEGIN
    ALTER DATABASE [tpcc] SET SINGLE_USER WITH ROLLBACK IMMEDIATE;
    DROP DATABASE [tpcc];
END
GO
RESTORE DATABASE [tpcc] FROM DISK = N'C:\backup\tpcc_wh2000.bak' WITH FILE = 1,
 MOVE N'tpcc'     TO N'D:\data\tpcc.mdf',
 MOVE N'tpcc2'    TO N'D:\data\tpcc2.ndf',
 MOVE N'tpcc3'    TO N'D:\data\tpcc3.ndf',
 MOVE N'tpcc4'    TO N'D:\data\tpcc4.ndf',
 MOVE N'tpcc5'    TO N'D:\data\tpcc5.ndf',
 MOVE N'tpcc6'    TO N'D:\data\tpcc6.ndf',
 MOVE N'tpcc7'    TO N'D:\data\tpcc7.ndf',
 MOVE N'tpcc8'    TO N'D:\data\tpcc8.ndf',
 MOVE N'tpcc_log' TO N'L:\log\tpcc_log.ldf',
 REPLACE, NOUNLOAD
GO
ALTER DATABASE [tpcc] SET TARGET_RECOVERY_TIME = 600 SECONDS;
GO
```

This project was commissioned by Dell Technologies

Read the report ▶

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How we created this report

A PT team, which includes the contributors we've listed and others, created this report and performed the technical work behind it. We used AI to complete firmware updates, generate scripts, draft some initial sections of text, and proofread this report.

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