Save up to $2.8M per new server over five years by consolidating with new Supermicro H14 Hyper Dual Processor servers powered by AMD EPYC™ 9475F processors

Moving from 5-year-old Supermicro Ultra DP servers to a new Supermicro H14 Hyper DP server featuring AMD EPYC 9475F processors can help organizations reduce their 5-year TCO by getting stronger database performance in a smaller footprint

When transactional database applications—such as online storefronts, reservation systems, or banking services—are the backbone of your business, maintaining high-performing server infrastructure is vital to meeting user demands and keeping customers happy. If it's been a few years since you've invested in new systems, it's time to investigate the possible performance and cost benefits of consolidating those systems onto fewer new servers. New technology strengthens performance to meet user demands into the future—and it can reduce your operating costs over time.

To determine the performance and cost benefits of migrating to newer technology, Principled Technologies compared the transactional database performance of two server solutions: a five-year-old Supermicro Ultra DP server with previous-generation AMD EPYC 7532 processors and a new Supermicro H14 Hyper DP server with 5th Generation AMD EPYC™ 9475F processors.

Reduce IT costs by up to $2.8 million per new server

with up to 61.8% lower TCO over 5 years*

Get up to 3.78x the database performance

and consolidate older servers onto fewer new servers**

Improve energy efficiency and cut costs

with up to 65.1% better performance per watt**

*Comparing 5-year TCO of 4x Supermicro Ultra DP servers with previous-generation AMD EPYC 7532 processors vs. 1x new Supermicro H14 Hyper DP server featuring AMD EPYC 9475F processors
**Comparing 1x new Supermicro H14 Hyper DP server featuring AMD EPYC 9475F processors vs. 1x legacy Supermicro Ultra DP server with previous-generation AMD EPYC 7532 processors

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We found that the Supermicro H14 Hyper DP server made a strong choice for businesses looking to improve their IT outlook over the next several years. A single Supermicro H14 Hyper DP with two AMD EPYC 9475F processors was able to handle 3.78 times the database transactions of the legacy servers, which means it would take four legacy servers to match the work of one new H14 Hyper DP. By our calculations of the five-year total cost of ownership (TCO) for continuing to operate four legacy servers vs. moving to a single Supermicro H14 Hyper DP, consolidating could cut costs by an impressive 61.8 percent—over $2.8 million in savings. This is possible because by supporting fewer servers, businesses save on ongoing server costs in software licensing, power utilization, rack and data center space, and maintenance. By consolidating, you can open up rack space and power consumption to embark on or expand upon AI infrastructure, propelling your business into the future.

The hidden costs of aging hardware and the benefits of consolidation

When business is going well and your existing servers continue to run your database apps, it may be easy to overlook the possibilities that investing in new hardware could afford your IT department. But as servers age, their performance may not be up to the ever-increasing needs of your business' database applications, which is the opposite of what a thriving business requires. Older servers are also likely to suffer decreases in functionality due to hardware and software incompatibilities, and start to physically break down—which can tie up your IT staff with expensive maintenance tasks. Even at its former best, legacy hardware can't compete with the unmatched performance of new technology, which offers higher-performing CPUs and other updated server components that weren't available five years ago.

An attractive solution that addresses these challenges is consolidating multiple older servers onto fewer, more powerful new systems. By shrinking your existing server footprint via consolidation, your business can save on operating costs over the next several years. Areas where you might realize savings through server consolidation include:

- **Licensing:** Reduce costs for software with per-core licenses (e.g., VMware® vSphere®, Windows Server, and SQL Server), because fewer servers mean fewer cores to license.
- **Power:** Modern technology includes power-efficient features that older servers lack, and running fewer servers saves power in both active and idle states. This also reduces power costs related to server cooling. Admins can also use the data center power they save to expand support for new workloads, such as GPU-supported artificial intelligence (AI).
- **Space:** Consolidating servers frees rack and floor space, maximizing the computing productivity of existing footprints without incurring additional rack or expansion costs. Organizations supporting larger data center configurations will see greater gains from data center rack consolidation.
- **Maintenance:** Fewer servers are easier to manage and maintain for IT staff. Plus, new technology typically breaks less, freeing IT resources for innovation while lowering labor costs.

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Moving on from your aging servers and reaping the benefits of consolidation can help you set up your IT department for success in all these areas while allowing you to continue serving your growing customer demand.

How we tested

We compared the transactional database performance of two servers:

- Five-year-old Supermicro Ultra DP server (model number AS -2124US-TNRP) with AMD EPYC 7532 processors (previously codenamed "Rome")
- New Supermicro H14 Hyper DP server (model number AS -2126HS-TN) with AMD EPYC 9475F processors (previously codenamed "Turin")

To measure transactional database performance, we used the HammerDB TPROC-C workload to determine the maximum online transaction processing (OLTP) workload each server could support. During our tests, we also measured CPU and power utilization to ensure we taxed the systems appropriately and to compare energy efficiency. We pushed both servers to at least 80 percent CPU core utilization, at which point the legacy system experience a performance bottleneck due to its older SATA-based storage.

Using our median HammerDB results, we calculated a consolidation ratio, determining how many older servers it would take to equal the work of a single new H14 Hyper DP. Using this ratio, we calculated the expected five-year costs for licensing, power, space, and maintenance for the near-equivalent-performing solutions. For our test results and details of our TCO assumptions and calculations, continue reading.

To learn more about the servers we tested and see our step-by-step test methodology, read the science behind the report.

About AMD EPYC 9475F processors

Part of the AMD EPYC 9005 Series, the AMD EPYC 9475F processor features 48 cores, 96 threads, a base clock speed of 3.65GHz, and max boost clock speed of up to 4.8GHz. It supports AMD Infinity Guard and AMD Infinity Architecture, with target workloads that include analytics, VDI, VM density, application development, and more.

According to AMD, these 5th Gen AMD EPYC processors are "Purpose built to accelerate data center, cloud, and AI workloads; the AMD EPYC 9005 series of processors are driving new levels of enterprise computing performance."[2]

To learn more about AMD EPYC 9475F processors and how they could help accelerate your workloads, visit https://www.amd.com/en/products/processors/server/epyc/9005-series/amd-epyc-9475f.html.

About the workload we used: HammerDB

HammerDB is an open-source benchmarking tool that you can use to test the performance of many leading databases. The benchmark tool includes two built-in workloads derived from industry standards: a transactional (TPROC-C) workload and an analytics (TPROC-H) workload. We chose the TPROC-C (TPC-C-like) workload to demonstrate the online transaction processing performance capabilities of each instance, reporting results in new orders per minute (NOPM). TPROC-C runs a transaction processing workload that simulates an ecommerce business with five types of transactions: receiving a customer order, recording a payment, delivering an order, checking an order's status, and checking stock in inventory.[3] Note that our test results do not represent official TPC results and are not comparable to official TPC-audited results.

To learn more about HammerDB, visit https://www.hammerdb.com/.

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Our findings: Significantly lower your 5-year TCO by consolidating servers on a new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors

Our test results show that the high-performing Supermicro H14 Hyper DP server with AMD EPYC 9475F processors requires four legacy Supermicro Ultra DP servers to match its database performance.

Figure 1 shows the 5-year TCO we calculated for both these near-equivalent-performing solutions. We estimate that consolidating four older servers onto a single H14 Hyper DP server with AMD EPYC 9475F processors could save organizations up to $2.8 million in operating costs over five years, a 61.8 percent reduction.

5-year TCO for equivalent performance

US Dollars (million) | Lower is better

$4,680,938

$1,783,690

1x Supermicro H14 Hyper DP server with AMD EPYC 9475F processors

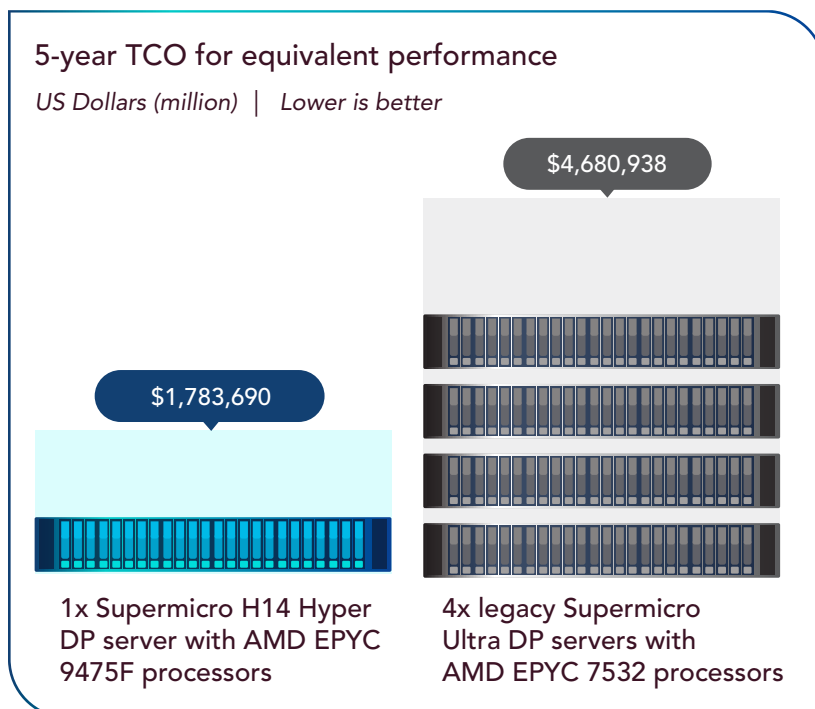4x legacy Supermicro Ultra DP servers with AMD EPYC 7532 processors

Figure 1: TCO, in USD, for solutions with near-equivalent database performance: four legacy Supermicro Ultra DP servers and a single new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors. Lower numbers are better. Source: Principled Technologies.

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Table 1 breaks down our 5-year cost calculations for both solutions. For further details, including the specific assumptions we made to arrive at these calculations, see the science behind the report. Note: As with any TCO estimate, your cost savings will vary depending on several factors.

Table 1: 5-year TCO comparison summary for equivalent-performing legacy solutions and the new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors. Lower costs are better. Source: Principled Technologies.

5-year TCO summary for upgrade to the Supermicro H14 Hyper DP		
	Legacy Supermicro Ultra DP server with AMD EPYC 7532 processors	Supermicro H14 Hyper DP server with AMD EPYC 9475F processors
Number of systems required for equivalent performance	4	1
Purchase price	$0 (existing)	$30,000
Licensing	$4,641,004	$1,740,376
Power	$11,955	$6,319
Data center space	$1,904	$476
Maintenance	$26,073	$6,518
5-year TCO	$4,680,938	$1,783,690

Licensing costs include several software suites that are licensed per physical core: VMware vSphere Standard, SQL Server 2022 Enterprise Edition, and Windows Server 2022 Datacenter Edition. Though the H14 Hyper DP has more cores per server (96), the four legacy servers for equivalent performance require licensing for a total 256 cores, which causes a significant licensing cost compared to consolidating onto a single server.
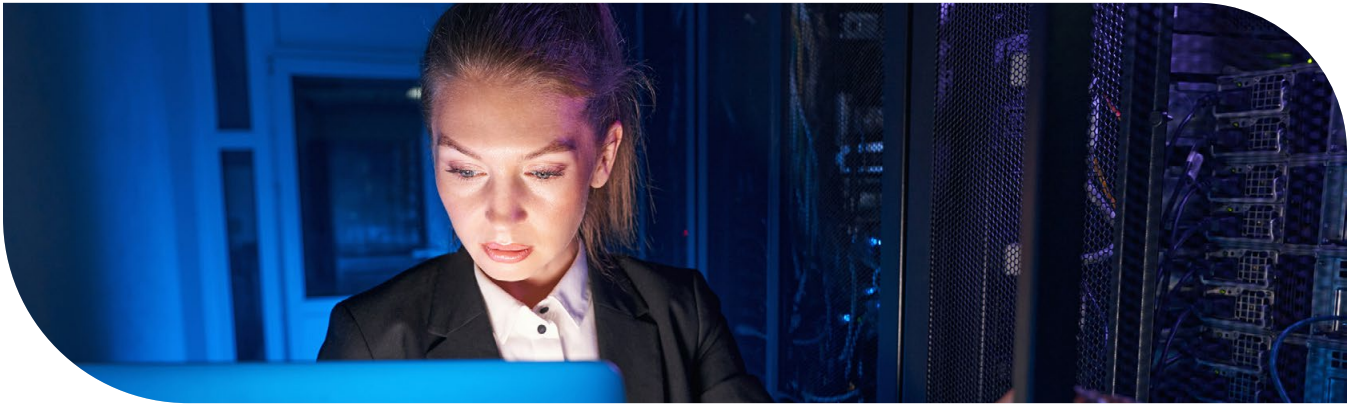
To calculate the costs of **power consumption**, we used the active and idle wattage we measured in our testing, and calculated 5 years of power using the average energy cost in the US as of November 2024: $0.1701 per kWh. Again, the costs for the legacy solution were significantly higher, because a single new H14 Hyper DP uses just 42.5 % of the power used by four legacy servers.

To determine **space savings**, we compared data center footprint cost by rack, adjusted to consolidation ratio and rack space required. Because the legacy solution takes up 8U of space versus the 2U of rack space for the Supermicro H14 Hyper DP, rack space would cost four times as much. These data center costs include any data-center-level cooling infrastructure.

Maintenance (administration) costs we use in our calculation include the assumption that a single IT admin is responsible for 100 servers, and divide the number of servers for the H14 Hyper DP solution (1) and legacy Ultra DP solution (4) to arrive at the number of admins needed. We then multiplied this number by an average salary of $100,580 for a network and computer systems administrator to determine labor costs/admin burden.[4]

Bigger deployments mean bigger savings through consolidating

While we estimate that consolidating four legacy servers onto one Supermicro H14 Hyper DP server could save an organization as much as $2.8 million over 5 years, organizations with larger data centers would see even bigger savings through consolidation. What if you have 20 legacy servers you're looking to consolidate? Extrapolating from our TCO calculations, continuing to run those 20 servers would cost approximately $23,404,690 over the next five years. Purchasing five new H14 Hyper DP servers to consolidate the 20 legacy servers would cost $8,918,453. This means that organizations consolidating 20 servers could save over $14.4 million over the next 5 years should they choose to refresh their data center with Supermicro H14 Hyper DP servers with AMD EPYC 9475F processors.

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Database testing results

In a one-to-one comparison, the new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors delivered 3.78 times the new orders per minute (NOPM) of the legacy Supermicro Ultra DP with AMD EPYC 7532 processors (see Figure 2). By offering significantly stronger transactional database performance, the new H14 Hyper DP is poised to help support your growing business by supporting many more users.

Transactional database performance

New orders per minute (NOPM) │ Higher is better

Supermicro H14 Hyper DP server with AMD EPYC 9475F processors

7,260,166

Legacy Supermicro Ultra DP server with AMD EPYC 7532 processors

1,915,613

Figure 2: Transactional database performance, in new orders per minute, using the HammerDB TPROC-C workload for a single legacy Supermicro Ultra DP server and a single new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors. Higher numbers are better. Source: Principled Technologies.

The performance improvement of the Supermicro H14 Hyper DP server offers another possibility: server consolidation. As Figure 3 shows, you would need four legacy Supermicro Ultra DP servers (because it is only possible to purchase whole servers) to match the performance of a single Supermicro H14 Hyper DP server with AMD EPYC 9475F processors. A consolidation ratio of ~4:1 helps your admins reclaim rack and data center space that they can then use to support new, demanding projects such as AI.

Consolidation ratio: number of servers required to do the same work

Number of servers │ Lower is better

Supermicro H14 Hyper DP server with AMD EPYC 9475F processors

1

Legacy Supermicro Ultra DP servers with AMD EPYC 7532 processors

4

Figure 3: Consolidation ratio based on HammerDB performance. The new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors handled 3.78x the database transactions of the older server, which means four legacy servers would be required to meet the performance of a single new one. Source: Principled Technologies.

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During our tests, we also captured power utilization while active and idle on both servers. As Figure 4 shows, the Supermicro H14 Hyper DP server with AMD EPYC 9475F processors had significantly greater power efficiency than the legacy server, offering 65.2 percent better performance per watt. We took the NOPM each server achieved and divided it by watts consumed to arrive at this statistic.

Power efficiency

New orders per minute (NOPM) per watt | Higher is better

Supermicro H14 Hyper DP server with AMD EPYC 9475F processors

6,172.65

Legacy Supermicro Ultra DP server with AMD EPYC 7532 processors

3,738.25

Figure 4: Power efficiency, in NOPM per watt, for a single legacy Supermicro Ultra DP server and a single new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors. Higher numbers are better. Source: Principled Technologies.

During our database testing, we captured the active power usage of both servers. Figure 5 compares the power consumption of the new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors vs. the estimated power usage for four legacy Supermicro Ultra DP servers. The new H14 Hyper DP consumed just 42.5% of the power used by four legacy servers.

This significant reduction in power consumption reduces power costs. Admins can also choose to redistribute power consumption to power-hungry workloads such as AI, which frequently rely on GPUs that consume significant energy.

Power consumption (equivalent performance solutions)

Watts-active | Lower is better

Supermicro H14 Hyper DP server with AMD EPYC 9475F processors

1,176

Legacy Supermicro Ultra DP servers with AMD EPYC 7532 processors

2,048

Figure 5: Power usage, in watts, for a new Supermicro H14 Hyper DP server with AMD EPYC 9475F processors vs. estimated power usage for four legacy Supermicro Ultra DP servers based on readings during our HammerDB testing. Lower numbers are better. Source: Principled Technologies.

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Conclusion

Continuing to run your transactional database workloads on five-year-old servers is costing you more than you think. By refreshing your currently deployed five-year-old servers, you could support more user demand as your business grows and reap all the benefits of moving to newer technology, including consolidation. In our database performance comparison and related TCO calculations, we found that consolidating your older Supermicro Ultra DP servers onto fewer Supermicro H14 Hyper DP servers with AMD EPYC 9475F processors could save your organization as much as $2.8 million—a 61.8 percent reduction in costs—over five years.

The H14 Hyper DP did 3.78 times the work of the legacy server, which means it would take four legacy servers to reach the performance of the new H14 Hyper DP, allowing your business to consolidate servers and save in licensing, power, rack space, and maintenance costs. As our results show, refreshing your legacy hardware with Supermicro H14 Hyper DP servers with AMD EPYC 9475F processors can keep your organization on the path to success by helping you make the most of your IT budget and giving you more resources to support AI infrastructure or other demanding IT projects.

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1. Supermicro, "H14 Hyper Systems," accessed February 19, 2025, https://www.supermicro.com/datasheet/h14/datasheet_H14_Hyper.pdf.

2. AMD, "5th Generation AMD EPYC™ Processors," accessed February 13, 2025, https://www.amd.com/en/products/processors/server/epyc/9005-series.html.

3. HammerDB, "Understanding the TPROC-C workload derived from TPC-C," accessed February 14, 2025, https://www.hammerdb.com/docs/ch03s05.html.

4. Average for network and computer systems administrator, BLS May 2023, https://www.bls.gov/oes/current/oes_nat.htm.

Read the science behind this report at https://facts.pt/kq87N66 ▶

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This project was commissioned by Supermicro.

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