Solution Brief

intel.

Exceptional Compute, Enhanced AI, and Analytics

Intel® Server D50DNP Family
Featuring 4/5th Gen Intel® Xeon® Scalable Processors or the Intel® Xeon® CPU Max Series

Exceptional HPC performance starts here

### Where is the most important place to boost performance in an HPC platform? Everywhere.

If you need to accelerate your HPC workloads, the Intel® Server D50DNP Family is the right platform for you. The Intel® Server D50DNP Family is the highest-performing HPC platform from Intel, significantly raising the bar for responsiveness to maximize your HPC and AI possibilities. And you can customize your HPC cluster with purpose-built modules to fit your specific needs.

Powered by 4/5th Gen Intel® Xeon® Scalable processors or the Intel® Xeon® CPU Max Series, the Intel® Server D50DNP Family delivers exceptional compute performance, and enhanced AI and in-memory analytics acceleration built into the processor.

But improved performance doesn't stop at the processor. You get a 1.5x memory bandwidth increase versus previous generation processors,1 as well as a 2x I/O bandwidth increase with PCIe 5.0 (compared to PCIe 4.0) to speed data to the processor,2 across the platform, and throughout your HPC infrastructure. A choice of two accelerator modules enables you to pack incredible GPU and accelerator density into a small form factor. The feature-rich, highly scalable modules ensure you can adapt your cluster to meet the specific requirements of your workloads.

Dedicated modules address your specific HPC and AI needs

- **Compute module:** High-performance compute modules, available in air-cooled or liquid-cooled options, include two high-speed processors in a 1U, half-width form factor. The liquid-cooled option helps you maximize compute density while enhancing cooling efficiency versus previous liquid-cooled designs, improving overall data center energy efficiency.

- **Management module:** This 2U, half-width module with additional slots and storage can be used for lightweight management of a full rack, or can be used as a 2-socket, air-cooled, high-TDP compute module.

- **Intel® Data Center GPU Max Series accelerator module:** You can integrate up to four Intel® Data Center GPU Max Series accelerators into a 1U, liquid-cooled module (up to eight per 2U chassis) for incredible performance density.

- **PCIe 5.0 accelerator module:** Up to two high-speed CPUs and four full-height, full-length, double-width PCIe 5.0 accelerators per air-cooled, 2U accelerator module deliver ultra-dense performance for HPC and AI workloads.
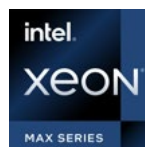
Compute

Intel® Data Center GPU Max Series Accelerator

PCIe Accelerator

Management
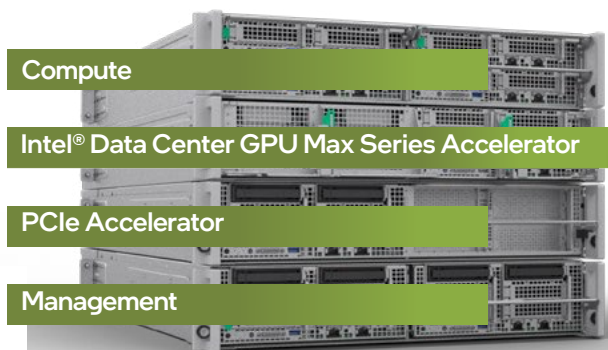
Intel® Server D50DNP Family features

- **Choose from two powerful processors for each 2-socket module:**

4/5th Gen Intel® Xeon® Scalable processors
Up to 60(4th Gen)/64(5th Gen) cores per processor, and 120(4th Gen)/128(5th Gen) cores per module.

Intel® Xeon® CPU Max Series
- Delivers breakthrough memory bandwidth (1TB/sec) with on-chip, High Bandwidth Memory (HBM2e) for memory-intensive workloads.
- Up to 56 cores per processor, and 112 cores per module.

- **Extraordinary scalability and highly configurable versatility:** You can deploy and adapt the Intel® Server D50DNP Family to meet your ever-changing needs. Compute, management, and accelerator modules enable you to easily scale cluster resources to fit workload demands.

- **Accelerate HPC and AI workloads:** Advanced, next-generation AI and in-memory analytics accelerators are built into the processor to speed HPC workloads.

- **Speed data transfer between processors:** Three Intel® Ultra Path Interconnects (Intel® UPI) 2.0 links per socket accelerate data transfer between processors.

- **High memory bandwidth:** Up to 4800(4th Gen) / 5600(5th Gen) MT/s per channel throughput for DDR5 memory provides 1.5x memory bandwidth versus DDR4 memory.1

- **High-speed networking and I/O:** Accelerate network throughput between modules with high-speed networking, including support for 400Gbps network cards.

- **Silicon-hardened security:** Advanced features built into the CPU accelerate encryption, provide continuous protection against advanced threats, and help ensure platforms boot in a known, trusted state.

Highly integrated, high-density compute solution

The Intel® Server D50DNP Family can be configured to support a wide range of memory and I/O options. Solutions are configured using 4/5th Gen Intel® Xeon® Scalable processors or Intel® Xeon® CPU Max Series, Intel® Server D50DNP Modules, and the Intel® Server Chassis FC2000 v2 Family. The Intel® Server Chassis FC2000 v2 Family allows flexible configuration of different functionality compute modules in a single chassis, further extending the benefits of the Intel® Server D50DNP Family.

Intel® Server D50DNP Family Modules				
Component	**1U, half-width compute module**	**2U, half-width management module**	**1U, full-width Intel GPU accelerator module**	**2U, full-width PCIe accelerator module**
CPU	Two 4/5th Gen Intel® Xeon® Scalable processors or Intel® Xeon® CPU Max Series ▪ Up to 270W for air-cooled ▪ Up to 350W for liquid-cooled	Two 4/5th Gen Intel® Xeon® Scalable processors or Intel® Xeon® CPU Max Series up to 350W	Two 4/5th Gen Intel® Xeon® Scalable processors or Intel® Xeon® CPU Max Series up to 350W	Two 4/5th Gen Intel® Xeon® Scalable processors or Intel® Xeon® CPU Max Series up to 350W
Cooling options	Air or Liquid	Air	Liquid	Air
Configurations	2U/4N air-cooled or liquid-cooled	2U/2N air-cooled	2U/2N liquid-cooled	2U/1N air-cooled
Max memory capacity per socket	DRAM: 1 DIMM per channel; 8 DIMMs slots per socket @ 4800(4th Gen)/5600(5th Gen) MT/s	DRAM: 1 DIMM per channel; 8 DIMMs slots per socket @ 4800(4th Gen)/5600(5th Gen) MT/s	DRAM: 1 DIMM per channel; 8 DIMMs slots per socket @ 4800(4th Gen)/5600(5th Gen) MT/s	DRAM: 1 DIMM per channel; 8 DIMMs slots per socket @ 4800(4th Gen)/5600(5th Gen) MT/s
Networking capabilities	Supports up to 400Gbps network cards	Supports up to 400Gbps network cards	Supports up to 400Gbps network cards	Supports up to 400Gbps network cards
Built-in networking capabilities	▪ 10GBASE-T RJ45 shared data/management NIC ▪ 1000BASE-T RJ45 dedicated management NIC	▪ 10GBASE-T RJ45 shared data/management NIC ▪ 1000BASE-T RJ45 dedicated management NIC	▪ 10GBASE-T RJ45 shared data/management NIC ▪ 1000BASE-T RJ45 dedicated management NIC	▪ 10GBASE-T RJ45 shared data/management NIC ▪ 1000BASE-T RJ45 dedicated management NIC
I/O throughput	PCIe 5.0 at 32 GT/s transfer rate	PCIe 5.0 at 32 GT/s transfer rate	PCIe 5.0 at 32 GT/s transfer rate	PCIe 5.0 at 32 GT/s transfer rate
Hot-swap storage	None	Two U.2 2.5" NVMe SSDs	None	Two U.2 2.5" NVMe SSDs
Fixed storage	Maximum of two NVMe/SATA M.2 slots per module	Maximum of two NVMe/SATA M.2 slots per module	Maximum of two NVMe/SATA M.2 slots per module	Maximum of two NVMe/SATA M.2 slots per module

A key member of the Intel® Server portfolio

The Intel Data Center Solutions Group has created a portfolio of Intel® Servers to handle all your data center and workload requirements—from versatile platforms to run a wide, diverse range of workloads, to purpose-built platforms for specialized needs.

Intel® Servers are built from the ground up with platform-wide innovation, including unique processor-based performance and security features, fast memory bandwidth and I/O to speed data to and from the processors, high-performance and low latency networking, and more. There is an Intel® Server for every data center and workload need—and each server comes with Intel's world-class service and support.[3]

Intel® Servers can be configured to order to meet your specific needs. You can learn more about systems in this portfolio by visiting:
https://orderconfigurator.mitacmct.com

Deploy with ease and confidence

The Intel® Server D50DNP Family delivers advanced data center features and Intel's proven global support and service, as well as excellent documentation to minimize deployment time and maximize server uptime. Like all Intel® Servers, they come complete with Intel's highly rated, comprehensive services and support package, delivering differentiating value to every stage of the server lifecycle, from pre-purchase and deployment to operations, management, and support.

Plus, Intel's extensive knowledge base simplifies and accelerates troubleshooting to maximize uptime and availability. In addition, Intel® Servers provide consistent, enterprise-grade server management across all platforms to simplify deployment, monitoring, updating, and debugging, and enterprise RAS features help ensure high reliability for mission-critical workloads.

The consistent interface, tools, and utilities simplify and accelerate all stages of the server lifecycle—from build and customize to deployment, multi-server management, and single-server debug and maintenance.

You can take advantage of Intel's 3-year warranty (optional 5-year) and global technical support. In addition, Intel's manufacturing leadership helps ensure customers can depend on a high-quality, highly reliable infrastructure. Intel's multi-year commitment to each Intel® Server—including spare components and modules—helps ensure long-term supply continuity and confidence.

Reduce risk of counterfeit parts with Intel® Transparent Supply Chain

Counterfeit electronic parts are a growing security concern across all organizations. These concerns have increased as supply chains have become more complex, multi-layered, and global.

Current supply chain practices start with trusting the source, but processes are limited for screening out counterfeit components, particularly for products containing many subsystems.

Intel® Transparent Supply Chain helps partners and customers verify the authenticity and firmware version of servers and their components through a set of tools, policies, and procedures. These verification steps, implemented on the factory floor at server manufacturers, enable enterprises to verify the authenticity and firmware version of systems and their components when systems arrive at their site.

This industry-leading approach helps:

- Provide component-level traceability and visibility
- Detect tampering of components and configuration state between stops
- Deliver fleet-level insights across suppliers

These and other safeguards increase assurance and trust that the Intel servers you're purchasing and deploying are free of counterfeit components that could compromise your business or customers.

For ease of deployment, all Intel® Servers are fully integrated systems with options of configure-to-order CPU, memory, networking, and more.

Additional resources:

For more information on Intel® Server Products visit:
https://datacentersolutions.mitacmct.com/

For more information on the Intel® Server D50DNP Family, visit: https://datacentersolutions.mitacmct.com/Intel-Server-D50DNP-Family

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