Solution Brief

intel XEON®

Exceptional Compute, Enhanced AI, and Analytics Intel® Server M50FCP Family

Featuring 4/5th Gen Intel® Xeon® Scalable Processors

Mainstream Data-intensive and I/O-bound Workloads Have Met Their Match

Many modern data center workloads—such as cloud, AI, data analytics, networking/5G, and storage—are more data-intensive. The Intel® Server M50FCP Family's outstanding compute performance, and high-speed I/O and memory throughput excel at running those demanding workloads.

Featuring 4/5th Gen Intel® Xeon® Scalable processors—with purpose- designed accelerators built in,[1] and platform-wide features that   speed data to those processors—the Intel® Server M50FCP Family   is an excellent companion platform to our Intel® Server M50CYP Family, meeting all your mainstream needs.

Innovative, hardware-enhanced security features help better protect your data, applications, and platforms. These servers provide two choices for taking advantage of Confidential Computing to protect data in-use —Intel® Software Guard Extensions (Intel® SGX) and Intel® Trust Domain Extensions (Intel® TDX).

Intel's world-class service and support[2] help ensure you get the expertise and answers you need—from choosing and purchasing your server, through deployment and operations.

Designed for Data-Intensive Workloads

With powerful compute, built-in accelerators, and high-speed I/O and memory bandwidth, the Intel® Server System M50FCP Family is an ideal choice for your data-intensive mainstream workloads.

Enterprise and Cloud Workloads

- Cloud
- AI
- Data Analytics
- Networking/5G
- Storage

Intel® Server M50FCP Family Features

- **High-performance compute:** Each module includes two 4th Gen Intel® Xeon® Scalable processors with up to 60 cores per processor (up to 120 cores per server) or two 5th Gen Intel® Xeon® Scalable processors with up to 64 cores per processor (up to 128 cores per server) to deliver outstanding performance in a dense form factor.

- **Next generation Intel® Deep Learning Boost (Intel® DL Boost) with Intel® Advanced Matrix Extensions (Intel® AMX):** New, advanced features versus previous generation processors further accelerate AI training and inferencing.

- **New built-in accelerators for data-intensive workloads:**
  - Intel® Dynamic Load Balancer (Intel® DLB)
  - Next Generation Intel® QuickAssist Technology (Intel® QAT)
  - Intel® Data Streaming Accelerator (Intel® DSA)
  - Intel® In-memory Analytics Accelerator (Intel® IAA)

- **Accelerated I/O between processors:** Three Intel® Ultra Path Interconnects (Intel® UPI) 2.0 links per socket accelerate I/O between processors.

- **High memory bandwidth:** Up to 4800 MT/s per channel for 4th Gen Intel® Xeon® Scalable processors and up to 5600 MT/s per channel for 5th Gen Intel® Xeon® Scalable processors throughput increases CPU utilization. In addition, support for DDR5 memory provides 1.5x memory bandwidth versus DDR4 memory, speeding data (up to 4800 MT/s per channel).[3]
- **High-speed networking and I/O:** Accelerate network throughput between nodes with high-speed networking, including support for 400Gbps network cards.
- **Silicon-hardened security:** Advanced features built into the CPU accelerate encryption, enable Confidential Computing to protect data during active processing, provide continuous protection against advanced threats, and help ensure platforms boot in a known-trusted state.

Unleash the Power of Confidential Computing

For decades, sensitive data was encrypted to protect it when transmitted or stored. But data was still exposed and vulnerable during active processing.

4/5th Gen Intel® Xeon® Scalable processors close that gap, offering two Confidential Computing choices to protect data in-use: Intel® SGX and Intel® TDX.

Intel® SGX is the most tested, researched, and battle-tested data center Trusted Execution Environment, with the smallest available attack surface. It enables you to place sensitive data and code in isolated, secure, processor-enforced enclaves to help protect sensitive data even if a system's software layers become compromised.

Intel® TDX offers easy-to-implement protection for virtualized workloads, enabling rapid deployment at scale for cloud workloads, while keeping cloud service providers outside the trust boundary.

Confidential computing enables organizations to discover insights not possible before when sensitive data was siloed, and to move sensitive workloads to the cloud with confidence.

Generational Acceleration Across the Platform

The Intel® Server M50FCP Family can be configured to support a wide range of mainstream needs, including 1U and 2U options.

Features	1U Description	2U Description
Supported CPUs	4/5th Gen Intel® Xeon® Scalable processors – Up to 350W TDP Based on 1U with 4 x 2.5" thermal modeling	4/5th Gen Intel® Xeon® Scalable processors – Up to 350W TDP
Chassis	1U, 30" depth	2U, 30" depth
Power Supply	1300/1600	1300/1600/2100
Onboard Ethernet	1 x OCP v3 slot (module sold separately)	
PCIe Slots	2x low-profile x16 PCIe 5.0 and 1x low-profile x8 PCIe 5.0	Up to 6 FH & 2 HH PCIe 5.0 (x32 riser 1, x32 riser 2, x16 riser 3)
Storage	4 or 12 x 2.5" SSD	8, 16, or 24 x 2.5" SSD 12 x 3.5" HDD (also supports 2.5" SSD) plus 2 internal 2.5" SSD above PSU
Manageability and Security	Intel BMC and TPM supporting Redfish and Secure Boot, TXT 2.0, PFR 3.0, PMD 3.0, VROC 8.0, OOB Management, Open BMC	
Support	Intel 24 x 7 Support with Advance Warranty Replacement	
Intel® Optane™ PMem	Not supported	
Memory	32x DDR5 RDIMMs, 2DPC, 16 channels per system	
Memory Speed	4800 MT/s (RDIMM, 1DPC), 4th Gen Intel® Xeon® Scalable processors 5600 MT/s (RDIMM, 1DPC), 5th Gen Intel® Xeon® Scalable processors	
Onboard Storage	Dual M.2 SATA/PCIe 80/110mm connectors	

A Key Member of the Intel® Server System Family 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 for running a 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.[2]

Intel® Servers can be configured to order to meet your specific needs. You can learn more about systems in the portfolio by visiting www.intel.com/serverproducts.

Deploy with Ease and Confidence

The Intel® Server M50FCP 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® Server Systems 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 that 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.

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

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.

Intel® Server Board M50FCP Family	
Board Specifications	**Details**
Server Board	Intel® Server Board M50FCP2SBSTD

Processor Support	▪ Dual Socket E LGA4677
	
	▪ Supported 4/5th Gen Intel® Xeon® Scalable processor family SKUs:
	
	   - Intel® Xeon® Platinum 8xxx processor
	
	   - Intel® Xeon® Gold 6xxx processor
	
	   - Intel® Xeon® Gold 5xxx processor
	
	   - Intel® Xeon® Silver 4xxx processor
	
	   - Intel® Xeon® Bronze 3xxx processor
	
	   - Does not support processors with SKU ending in Q.
	
	▪ Intel® UPI links: three @ 16 GT/s (Platinum and Gold families) or two @ 16 GT/s (Silver family)
	
	▪ Intel® Xeon® Bronze processors are used in single processor configurations only
	
	Note: Previous generations of Intel® Xeon® processors are not supported

Chipset	▪ Intel® C741 Chipset platform controller hub (PCH)

Memory Support	▪ 32 DIMM slots
	
	   - 16 DIMM slots per processor, 8 memory channels per processor
	
	   - 2 memory slots per channel
	
	   - All DDR5 RDIMMs must support ECC
	
	▪ Registered SDRAM DDR5 DIMMs (RDIMM, 3DS-RDIMM, and 9x4 RDIMM)
	
	▪ Memory capacity: 4 TB DDR5 memory per processor (8 TB per 2S system)
	
	▪ Up to 5600 MT/s at one RDIMM per channel (processor SKU dependent)
	
	▪ Up to 4400 MT/s at two RDIMMs per channel (processor SKU dependent)
	
	▪ DDR5 standard voltage of 1.1 V

Open Compute Project (OCP) Module Support (Onboard Network Support Options)	See Tested Hardware and Operating System List (THOL) for current list of validated OCP modules

PCIe NVMe Support	▪ Support for up to 18 PCIe NVMe Interconnects
	
	   - 16 onboard MCIO connectors, eight per processor
	
	   - Two M.2 NVMe/SATA connectors
	
	▪ Additional NVMe support through select riser card options (See Riser Support)
	
	▪ Intel® Volume Management Device (Intel® VMD) 3.0 support
	
	   - Intel® Virtual RAID on CPU 8.0 (Intel® VROC 8.0) support using one of the three types of VROC keys (available as an Intel accessory option)

Onboard SATA Support	▪ 10 x SATA III ports (6 Gb/s, 3 Gb/s, and 1.5 Gb/s transfer rates supported)
	
	   - Two M.2 connectors: SATA / PCIe
	
	   - Two 4-port miniSAS HD (SFF-8643) connectors

USB Support	▪ One USB 3.0 and two USB 2.0 connectors at the rear edge of the board ▪ Internal 26-pin connector for optional one USB 3.0 port and one USB 2.0 port front panel support
Serial Support	▪ One external RJ-45 Serial Port A connector on the back edge of the server board

Server Management	• Integrated Baseboard Management Controller (BMC) based on ASPEED AST2600* Advanced PCIe Graphics and Remote Management Processor and OpenBMC standard
	• Intelligent Platform Management Interface (IPMI) 2.0 compliant
	• Support for Intel® Data Center Manager (Intel® DCM)
	• Support for Intel® Server Debug and Provisioning Tool (Intel® SDP Tool)
	• Redfish* compliant
	• Support for Intel Server Management Software
	• 1000BASE-T Ethernet port (RJ45) dedicated to server management
	• Light Guided Diagnostics
Security Support	• Intel® Platform Firmware Resilience (Intel® PFR) technology with an I2C interface
	• Intel® Software Guard Extensions (Intel® SGX)
	• Converged Intel® Boot Guard and Trusted Execution Technology (Intel® TXT)
	• Intel® Total Memory Encryption–Multi-Key (Intel® TME-MK)
	• Trusted platform module 2.0
BIOS	Unified Extensible Firmware Interface (UEFI)-based BIOS (legacy boot not supported)

Intel® Server System M50FCP1UR and M50FCP2UR		
Server Specifications	**1U Details**	**2U Details**
Chassis Type	1U rack mount chassis	2U rack mount chassis
System Fans	Unified Extensible Firmware Interface (UEFI)-based BIOS (legacy boot not supported)	Unified Extensible Firmware Interface (UEFI)-based BIOS (legacy boot not supported)
Power Supply Options*	• AC 1,300 W Titanium • AC 1,600 W Titanium	• AC 1,300 W Titanium • AC 1,600 W Titanium • AC 2,100W Platinum
Riser Support*	Concurrent support for up to four riser cards, including one PCIe Interposer riser card, with support for up to three PCIe add-in cards	Concurrent support for up to three riser cards with support for up to eight PCIe add-in cards
Front Drive Bay Options*	• 4 x 2.5" SAS/SATA/NVMe hot swap drive bays • 12 x 2.5" SAS/SATA/NVMe hot swap drive bays	• 8 x 2.5" SAS/SATA/NVMe hot swap drive bays • 16 x 2.5" SAS/SATA/NVMe hot swap drive bays • 24 x 2.5" SAS/SATA/NVMe hot swap drive bays • 12 x 3.5" SAS/SATA hot swap drive bays (supports up to 4 NVMe drives)
Supported Rack Mount Kit Accessory Options	• CYPHALFEXTRAIL–Value rack mount rail kit • CYPFULLEXTRAIL–Premium rail kit with cable management arm (CMA) support • AXXCMA2–Cable Management Arm (supports CYPFULLEXTRAIL only)	
*For more information on specific configurations, see the Intel® Server System M50FCP Configuration Guide or visit ARK.intel.com		

Additional Resources

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

For more information on the Intel® Server M50FCP Family,
visit: https://datacentersolutions.mitacmct.com/Intel-Server-M50FCP-Family

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