Intel

Intel Xeon Gold 5415+ Processor (PK8071305118701)

Datasheet

Product Overview

- The Intel Xeon Gold 5415+ is a 4th Gen Intel Xeon Scalable processor designed for high-frequency enterprise, network, edge, and general-purpose server workloads.
- It provides 8 cores and 16 threads, with a 2.90 GHz base frequency, up to 4.10 GHz Intel Turbo Boost frequency, 22.5 MB cache, and a 150 W TDP.
- Built on Intel 7 process technology, the processor supports two-socket scalability, eight DDR5 memory channels, and up to 4 TB of memory.
- The processor supports DDR5-4400 memory with ECC and provides 80 PCI Express 5.0 lanes for network adapters, storage, and accelerator connectivity.
- Intel AMX, Intel DL Boost, AVX-512, two AVX-512 FMA units, and one default device each for QAT, DLB, DSA, and IAA support AI, data-plane, and analytics workloads.
- Hardware security features include Intel SGX with Intel SPS, Total Memory Encryption, Boot Guard, Control-Flow Enforcement Technology, and Intel virtualization technologies.

Product Highlights

- **8-Core High-Frequency Compute:** 8 cores and 16 threads provide responsive processing for enterprise, network, edge, and general-purpose server workloads.
- **2.90 to 4.10 GHz Frequency Range:** The processor combines a 2.90 GHz base frequency with up to 4.10 GHz Intel Turbo Boost frequency for high per-core performance.
- **DDR5 and PCIe 5.0 Expansion:** Eight DDR5-4400 memory channels and 80 PCIe 5.0 lanes support high-throughput memory and I/O designs in two-socket servers.
- **AI and Data Acceleration:** Intel AMX, Intel DL Boost, QAT, DLB, DSA, and IAA support selected AI, cryptography, load-balancing, data-movement, and analytics workloads.

Detailed Features



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Component	Specification
Processor	Intel Xeon Gold 5415+, 8 cores / 16 threads
Ordering Information	PK8071305118701, FC-LGA16A Tray, Spec Code SRMGC
Frequency and Cache	2.90 GHz base, up to 4.10 GHz turbo, 22.5 MB cache
Memory	Up to 4 TB DDR5-4400, 8 channels, ECC supported
Power and Expansion	150 W TDP, 2S scalability, PCIe 5.0 with 80 lanes, 16 GT/s UPI, 3 UPI links

High-Frequency Server Compute

The 5415+ combines 8 physical cores with 16 threads and a 150 W TDP. Its 2.90 GHz base and up to 4.10 GHz turbo frequencies suit workloads that prioritize per-core responsiveness.

Two-Socket Platform Support

Intel specifies 2S scalability, 16 GT/s UPI, and three UPI links. This supports multi-socket server platforms that need additional compute capacity and inter-socket bandwidth.

Responsive Frequency and Cache Profile

The 2.90 GHz base frequency can reach up to 4.10 GHz with Intel Turbo Boost Technology 2.0. A 22.5 MB cache helps keep frequently accessed data close to the cores.

PCIe 5.0 Expansion

Eighty PCIe 5.0 lanes provide direct expansion capacity for Ethernet adapters, storage controllers, accelerators, and other high-bandwidth server devices.

High-Capacity ECC Memory

The processor supports up to 4 TB of DDR5-4400 memory across eight channels, with ECC support for server-class reliability. This gives two-socket systems room for virtualized network functions, caches, analytics, and service containers.

PCIe 5.0 I/O for Data-Plane Devices

Eighty PCIe 5.0 lanes provide direct expansion capacity for Ethernet adapters, storage controllers, accelerators, and other high-bandwidth devices. The lane budget helps designers build balanced I/O around a processor socket.

Acceleration for AI and Data Movement

Intel AMX and DL Boost support selected AI and inference workloads, while one default device each for QAT, DLB, DSA, and IAA supports cryptography, load balancing, data movement, and analytics operations.

Security and Virtualization Foundation

The processor includes Intel SGX with Intel SPS, Total Memory Encryption, Boot Guard, Control-Flow Enforcement Technology, AES instructions, VT-x, VT-d, and Extended Page Tables. These capabilities help protect workloads and support virtualized server platforms.

Technical Specifications

Product Specifications

Feature	Value
User SKU	INTL-5415+
Intel ordering code	PK8071305118701
Intel Spec Code	SRMGC
Processor model	Intel Xeon Gold 5415+ Processor
Product collection	4th Gen Intel Xeon Scalable Processors
Code name	Products formerly Sapphire Rapids
Vertical segment	Server
Processor number	5415+
Lithography	Intel 7
Marketing status	Launched
Launch date	Q1 2023
Embedded Options Available	Yes
Total cores	8
Total threads	16

Feature	Value
Processor base frequency	2.90 GHz
Max turbo frequency	4.10 GHz
Cache	22.5 MB
Intel UPI speed	16 GT/s
Max UPI links	3
TDP	150 W
Scalability	2S
Sockets supported	FCLGA4677
Package carrier	E1B
Package size	77.5 mm x 56.5 mm
DTS max	99 °C
TCASE	78 °C
Max memory size	4 TB
Memory types	Up to DDR5-4400 MT/s 1DPC and 2DPC
Max memory channels	8
ECC memory supported	Yes
PCI Express revision	5
Max PCI Express lanes	80
Intel DL Boost	Yes
Intel QuickAssist Technology	1 default device
Intel Dynamic Load Balancer	1 default device
Intel Data Streaming Accelerator	1 default device
Intel In-memory Analytics Accelerator	1 default device
Intel Advanced Matrix Extensions	Yes
Intel Speed Select Technology - Core Power	Yes
Intel Speed Select Technology - Turbo Frequency	Yes
Intel Speed Select Technology - Base Frequency	Yes
High Priority Cores	2
High Priority Core Frequency	3.10 GHz
Low Priority Cores	6

Feature	Value
Intel Resource Director Technology	Yes
Intel Speed Shift Technology	Yes
Intel Turbo Boost Technology	2.0
Intel Hyper-Threading Technology	Yes
Instruction set extensions	Intel AMX, Intel SSE4.2, Intel AVX, Intel AVX2, Intel AVX-512
AVX-512 FMA units	2
Intel SGX	Yes with Intel SPS
Default maximum SGX EPC size	128 GB
Intel Total Memory Encryption	Yes
Intel AES New Instructions	Yes
Intel QuickAssist Software Acceleration	Yes
Intel Control-Flow Enforcement Technology	Yes
Intel Trusted Execution Technology	Yes
Intel Boot Guard	Yes
Intel Platform Firmware Resilience	Yes
Intel Run Sure Technology	Yes
Intel Virtualization Technology	VT-x, VT-d, and VT-x with EPT
Shipping media	Tray
Stepping	S3

Product Comparison

Feature	Intel Xeon Gold 5415+ / PK8071305118701	Intel Xeon Gold 5412U / PK8071305120401	Intel Xeon Gold 5418N / PK8071305121701
Processor family	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable
Network or edge positioning	High-frequency general-purpose processor	Single-socket general-purpose processor	N-series, two-socket processor
Total cores	8	24	24
Total threads	16	48	48
Processor base frequency	2.90 GHz	2.10 GHz	1.80 GHz
Max turbo frequency	4.10 GHz	3.90 GHz	3.80 GHz
Cache	22.5 MB	45 MB	45 MB
TDP	150 W	185 W	165 W
Scalability	2S	1S Only	2S
Max memory size	4 TB	4 TB	4 TB
Memory channels	8	8	8
Memory support	DDR5-4400 1DPC and 2DPC	DDR5-4400 1DPC and 2DPC	DDR5-4000 1DPC and 2DPC
ECC memory	Yes	Yes	Yes
PCI Express	5, 80 lanes	5, 80 lanes	5, 80 lanes
Default accelerator devices	QAT: 1; DLB: 1; DSA: 1; IAA: 1	DSA: 1	QAT: 2; DLB: 2; DSA: 1
Intel AMX	Yes	Listed in instruction set extensions	Yes
Intel DL Boost	Yes	Yes	Yes
Best-fit role	High-frequency two-socket enterprise and server compute	Single-socket enterprise, network, and edge server	Two-socket network and edge server

Accessories

Category	Accessories
Included Accessories	- Intel Xeon Gold 5415+ processor - Tray shipping media
Optional Accessories	- FCLGA4677-compatible server board and CPU heatsink solution - DDR5 ECC memory and PCIe 5.0 network or storage adapters

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