Intel

Intel Xeon Gold 5411N Processor (PK8071305121801)

Datasheet

Product Overview

- The Intel Xeon Gold 5411N is a 4th Gen Intel Xeon Scalable processor designed for network, edge, communications, and server workloads.
- It provides 24 cores and 48 threads, with a 1.90 GHz base frequency, up to 3.90 GHz Intel Turbo Boost frequency, 45 MB cache, and a 165 W TDP.
- Built on Intel 7 process technology, the processor supports a single-socket platform, 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 DL Boost, AVX-512, two AVX-512 FMA units, two default QAT devices, two DLB devices, and one DSA device support data-plane and communications 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

- **24-Core Network-Optimized Compute:** 24 cores and 48 threads provide parallel processing capacity for communications servers, edge nodes, and consolidated network functions.
- **1.90 to 3.90 GHz Frequency Range:** The processor combines a 1.90 GHz base frequency with up to 3.90 GHz Intel Turbo Boost frequency for responsive burst 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 single-socket servers.
- **Network and Security Acceleration:** Intel DL Boost, QAT, DLB, DSA, SGX with Intel SPS, TME, Boot Guard, and VT-d support communications and protected workloads.

Detailed Features



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Component	Specification
Processor	Intel Xeon Gold 5411N, 24 cores / 48 threads
Ordering Information	PK8071305121801, FC-LGA16A Tray, Spec Code SRMGY
Frequency and Cache	1.90 GHz base, up to 3.90 GHz turbo, 45 MB cache
Memory	Up to 4 TB DDR5-4400, 8 channels, ECC supported
Power and Expansion	165 W TDP, 1S Only, PCIe 5.0 with 80 lanes

Balanced Edge-Server Compute

The 5411N combines 24 physical cores with 48 threads and a 165 W TDP. This balance is suitable for edge servers and communications appliances that need parallel compute for network services within a controlled thermal and power envelope.

Network-Optimized 4th Gen Xeon Design

As an N-series 4th Gen Intel Xeon Scalable processor, the 5411N is positioned for communications, network functions, and edge infrastructure. Intel DL Boost and AVX-512 help accelerate selected machine-learning and data-plane workloads.

Responsive Frequency and Cache Profile

The 1.90 GHz base frequency can reach up to 3.90 GHz with Intel Turbo Boost Technology 2.0. A 45 MB cache helps keep frequently accessed data close to the cores, supporting responsive control-plane and service workloads.

Single-Socket Platform Efficiency

The processor is specified for 1S Only scalability and uses the FCLGA4677 socket. A single-socket design can simplify platform topology and reduce system complexity in compact edge, security, storage, and network-function deployments.

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 single-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 single processor socket.

Acceleration for Communications Workloads

Intel QAT provides two default devices, DLB provides two, and DSA provides one for supported cryptography, load-balancing, and data-movement operations. Intel DL Boost and AVX-512 support selected inference 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-5411N
Intel ordering code	PK8071305121801
Intel Spec Code	SRMGY
Processor model	Intel Xeon Gold 5411N Processor
Product collection	4th Gen Intel Xeon Scalable Processors
Code name	Products formerly Sapphire Rapids
Vertical segment	Server
Processor number	5411N
Lithography	Intel 7
Marketing status	Launched
Launch date	Q1 2023
Embedded Options Available	Yes
Total cores	24
Total threads	48

Feature	Value
Processor base frequency	1.90 GHz
Max turbo frequency	3.90 GHz
Cache	45 MB
TDP	165 W
SST-PP 5411N(0)	24 active cores, 1.9 GHz base, 165 W
SST-PP 5411N(1)	24 active cores, 1.9 GHz base, 165 W
SST-PP 5411N(2)	24 active cores, 2.1 GHz base, 165 W
Scalability	1S Only
Sockets supported	FCLGA4677
Package carrier	E1B
Package size	77.5 mm x 56.5 mm
DTS max	95 °C
TCASE	84 °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	2 default devices
Intel Dynamic Load Balancer	2 default devices
Intel Data Streaming Accelerator	1 default device
Intel Speed Select Technology - Core Power	Yes
Intel Speed Select Technology - Turbo Frequency	Yes
Intel Speed Select Technology - Performance Profile	Yes
Intel Speed Select Technology - Base Frequency	Yes
Intel Resource Director Technology	Yes
Intel Speed Shift Technology	Yes
Intel Turbo Boost Technology	2.0

Feature	Value
Intel Hyper-Threading Technology	Yes
Instruction set extensions	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	U1

Product Comparison

Feature	Intel Xeon Gold 5411N / PK8071305121801	Intel Xeon Gold 5418N / PK8071305121701	Intel Xeon Gold 5415+ / PK8071305118701
Processor family	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable
Network or edge positioning	N-series, single-socket processor	N-series, two-socket processor	General-purpose Sapphire Rapids processor
Total cores	24	24	8
Total threads	48	48	16
Processor base frequency	1.90 GHz	1.80 GHz	2.90 GHz
Max turbo frequency	3.90 GHz	3.80 GHz	4.10 GHz
Cache	45 MB	45 MB	22.5 MB
TDP	165 W	165 W	150 W
Scalability	1S Only	2S	2S
Max memory size	4 TB	4 TB	4 TB
Memory channels	8	8	8
Memory support	DDR5-4400 1DPC and 2DPC	DDR5-4000 1DPC and 2DPC	DDR5-4400 1DPC and 2DPC
ECC memory	Yes	Yes	Yes
PCI Express	5, 80 lanes	5, 80 lanes	5, 80 lanes
Default accelerator devices	QAT: 2; DLB: 2; DSA: 1	QAT: 2; DLB: 2; DSA: 1	QAT: 1; DLB: 1; DSA: 1; IAA: 1
Intel AMX	Listed in instruction set extensions	Yes	Yes
Intel DL Boost	Yes	Yes	Yes
Best-fit role	Single-socket network and edge server	Two-socket network and edge server	High-frequency general-purpose server

Accessories

Category	Accessories
Included Accessories	- Intel Xeon Gold 5411N 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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[2] Intel. (2026). Intel Xeon Gold 5411N Processor Ordering and Spec Information. https://www.intel.com/content/www/us/en/products/sku/232393/intel-xeon-gold-5411n-processor-45m-cache-1-90-ghz/ordering.html

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