Intel

Intel Xeon Gold 6428N Processor (PK8071305121901)

Datasheet

Product Overview

- The Intel Xeon Gold 6428N is a 4th Gen Intel Xeon Scalable processor designed for network, edge, enterprise, and general-purpose server platforms.
- It provides 32 cores and 64 threads, with a 1.80 GHz base frequency, up to 3.80 GHz Intel Turbo Boost frequency, 60 MB cache, and a 185 W TDP.
- Built on Intel 7 process technology, the processor supports 2S scalability and up to 4 TB of ECC memory.
- It supports DDR5-4000 at 1DPC and 2DPC, with eight memory channels and 80 PCI Express 5.0 lanes for network adapters, storage, and accelerators.
- Intel AMX, Intel DL Boost, two default QAT devices, two default DLB devices, and one default DSA device support selected AI, analytics, security, and data-movement 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

- **32-Core Network and Edge Compute:** 32 cores and 64 threads provide parallel processing capacity for network infrastructure, edge computing, enterprise servers, and demanding general-purpose workloads.
- **1.80 to 3.80 GHz Frequency Range:** The processor combines a 1.80 GHz base frequency with up to 3.80 GHz Intel Turbo Boost frequency for responsive server performance.
- **DDR5-4000 and PCIe 5.0 I/O:** DDR5-4000 at both 1DPC and 2DPC, eight memory channels, and 80 PCIe 5.0 lanes support high-throughput server designs.
- **Integrated Workload Acceleration:** Intel AMX and DL Boost support selected AI and inference workloads, while QAT, DLB, and DSA devices support security, load-balancing, and data-movement operations.

Detailed Features



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Component	Specification
Processor	Intel Xeon Gold 6428N, 32 cores / 64 threads
Ordering Information	PK8071305121901, FC-LGA16A Tray, Spec Code SRMGZ
Frequency and Cache	1.80 GHz base, up to 3.80 GHz turbo, 60 MB cache
Memory	Up to 4 TB ECC memory, DDR5-4000 1DPC and 2DPC, 8 channels

Component	Specification
Power and Expansion	185 W TDP, 2S scalability, PCIe 5.0 with 80 lanes, 16 GT/s UPI, 3 UPI links

32-Core Network and Edge Compute

The 6428N combines 32 physical cores with 64 threads, a 1.80 GHz base frequency, and up to 3.80 GHz turbo frequency. Its profile suits network infrastructure, edge computing, enterprise servers, virtualization, and general-purpose workloads.

2S Platform Support

Intel specifies 2S scalability, 16 GT/s UPI, and three UPI links. This supports server platforms designed for dual-socket compute capacity and inter-socket bandwidth.

Speed Select Performance Profiles

Intel documents three SST-PP configurations: 32 active cores at 1.8 GHz and 185 W, 32 active cores at 1.7 GHz and 185 W, and 32 active cores at 1.8 GHz and 185 W.

PCIe 5.0 I/O Expansion

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

DDR5-4000 ECC Memory

The processor supports up to 4 TB of ECC memory across eight channels, with DDR5-4000 at both 1DPC and 2DPC. This supports high-capacity server systems with different DIMM population requirements.

High-Bandwidth PCIe 5.0 Connectivity

Eighty PCIe 5.0 lanes provide direct expansion capacity for Ethernet adapters, storage controllers, accelerators, and other high-bandwidth devices. The lane budget supports balanced I/O across a dual-socket platform.

Acceleration for AI, Security, and Data Movement

Intel AMX and DL Boost support selected AI and inference workloads. Two default QAT devices, two default DLB devices, and one default DSA device extend acceleration for security, load balancing, and data movement.

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-6428N
Intel ordering code	PK8071305121901
Intel Spec Code	SRMGZ
Processor model	Intel Xeon Gold 6428N Processor
Product collection	4th Gen Intel Xeon Scalable Processors
Code name	Products formerly Sapphire Rapids
Vertical segment	Server
Processor number	6428N
Lithography	Intel 7
Marketing status	Launched
Launch date	Q1 2023
Embedded Options Available	Yes
Use conditions	Server/Enterprise

Feature	Value
Total cores	32
Total threads	64
Processor base frequency	1.80 GHz
Max turbo frequency	3.80 GHz
Cache	60 MB
Intel UPI speed	16 GT/s
Max UPI links	3
TDP	185 W
Intel DL Boost	Yes
SST-PP 6428N(0)	32 active cores, 1.8 GHz base, 185 W
SST-PP 6428N(1)	32 active cores, 1.7 GHz base, 185 W
SST-PP 6428N(2)	32 active cores, 1.8 GHz base, 185 W
Scalability	2S
Memory types	Up to DDR5-4000 MT/s 1DPC and 2DPC
Max memory size	4 TB
Max memory channels	8
ECC memory supported	Yes
PCI Express revision	5.0
Max PCI Express lanes	80
Sockets supported	FCLGA4677
Package carrier	E1B
Package size	77.5 mm x 56.5 mm
DTS max	95 °C
TCASE	85 °C
Intel On Demand Activation Model	No
Intel QuickAssist Technology	2 default devices
Intel Dynamic Load Balancer	2 default devices
Intel Data Streaming Accelerator	1 default device
Intel Advanced Matrix Extensions	Yes
Intel Speed Select Technology - Core Power	Yes

Feature	Value
Intel Speed Select Technology - Turbo Frequency	Yes
Intel Speed Select Technology - Base Frequency	Yes
Intel Speed Select Technology - Performance Profile	Yes
High Priority Cores	12
High Priority Core Frequency	1.90 GHz
Low Priority Cores	20
Low Priority Core Frequency	1.50 GHz
Intel Resource Director Technology	Yes
Intel Speed Shift Technology	Yes
Intel Turbo Boost Technology	2.0
Intel Hyper-Threading Technology	Yes
Intel Transactional Synchronization Extensions	Yes
Intel 64	Yes
Instruction set extensions	Intel AMX, Intel SSE4.2, Intel AVX, Intel AVX2, Intel AVX-512
AVX-512 FMA units	2
Intel QuickAssist Software Acceleration	Yes
Intel Control-Flow Enforcement Technology	Yes
Intel Total Memory Encryption	Yes
Intel AES New Instructions	Yes
Intel Software Guard Extensions	Yes with Intel SPS
Default maximum SGX EPC size	512 GB
Intel Trusted Execution Technology	Yes
Intel OS Guard	Yes
Execute Disable Bit	Yes
Intel Boot Guard	Yes
Intel Platform Firmware Resilience	Yes
Intel Run Sure Technology	Yes
Mode-based Execute Control	Yes
Intel Crypto Acceleration	Yes
Intel Virtualization Technology	VT-x, VT-d, and VT-x with EPT

Feature	Value
Shipping media	Tray
Stepping	S3

Product Comparison

Feature	Intel Xeon Gold 6428N / PK8071305121901	Intel Xeon Gold 6426Y	Intel Xeon Gold 6430
Processor family	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable
Positioning in this comparison	32-core two-socket network and edge processor	16-core high-frequency two-socket processor	32-core two-socket enterprise processor
Total cores	32	16	32
Total threads	64	32	64
Processor base frequency	1.80 GHz	2.50 GHz	2.10 GHz
Max turbo frequency	3.80 GHz	4.10 GHz	3.40 GHz
Cache	60 MB	37.5 MB	60 MB
TDP	185 W	185 W	270 W
Scalability	2S	2S	2S
Intel UPI	16 GT/s; 3 links	16 GT/s; 3 links	16 GT/s; 3 links
Max memory size	4 TB	4 TB	4 TB
Memory channels	8	8	8
Memory support	DDR5-4000 1DPC and 2DPC	DDR5-4800 1DPC; DDR5-4400 2DPC	DDR5-4400 1DPC and 2DPC
ECC memory	Yes	Yes	Yes
PCI Express	5, 80 lanes	5, 80 lanes	5.0, 80 lanes
Default accelerator devices	QAT: 2; DLB: 2; DSA: 1	DSA: 1	DSA: 1
Intel AMX	Yes	Yes	Yes
Intel DL Boost	Yes	Yes	Yes
Best-fit role	Two-socket network, edge, and infrastructure server	High-frequency two-socket enterprise and cloud compute	High-capacity two-socket enterprise and cloud server

Accessories

Category	Accessories
Included Accessories	- Intel Xeon Gold 6428N 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

Support & Warranty

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References

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[2] Intel. (2026). Intel Xeon Gold 6428N Processor Ordering and Spec Information. https://www.intel.com/content/www/us/en/products/sku/232394/intel-xeon-gold-6428n-processor-60m-cache-1-80-ghz/ordering.html