

Intel
Intel Xeon Gold 6433N
Processor
(PK8071305451100)
Datasheet

Product Overview

- The Intel Xeon Gold 6433N is a 4th Gen Intel Xeon Scalable processor for network, edge, communications, and server workloads.
- It delivers 32 cores and 64 threads, with a 2.00 GHz base frequency, up to 3.60 GHz Intel Turbo Boost frequency, 60 MB cache, and a 205 W TDP.
- Built on Intel 7 process technology, the processor is designed for single-socket platforms and supports eight DDR5 memory channels with ECC support.
- DDR5-4400 memory and 64 PCI Express 4.0 lanes provide bandwidth for network adapters, storage, accelerators, and other platform I/O.
- Intel DL Boost, Intel vRAN Boost, AVX-512, two AVX-512 FMA units, and one default Intel DSA device support selected data-plane and communications workloads.
- Security and platform features include Intel SGX with Intel SPS, Total Memory Encryption, Boot Guard, Control-Flow Enforcement Technology, and Intel virtualization technologies.

Product Highlights

- **32-Core Edge Compute:** 32 cores and 64 threads provide high parallel processing capacity for communications servers, edge nodes, virtualized network functions, and service workloads.
- **2.00 to 3.60 GHz Frequency Range:** The processor combines a 2.00 GHz base frequency with up to 3.60 GHz Intel Turbo Boost frequency for responsive burst performance.
- **DDR5-4400 and PCIe 4.0 Expansion:** Eight DDR5-4400 memory channels and 64 PCIe 4.0 lanes support high-throughput memory and I/O designs in single-socket servers.
- **vRAN and Security Acceleration:** Intel vRAN Boost, Intel DL Boost, SGX with Intel SPS, Total Memory Encryption, Boot Guard, and VT-d support communications and protected workloads.

Detailed Features



Intel Xeon Gold 6433N Processor (PK8071305451100)

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Component	Specification
Processor	Intel Xeon Gold 6433N, 32 cores / 64 threads
Ordering Information	PK8071305451100, FC-LGA16A Tray, Spec Code SRN2B
Frequency and Cache	2.00 GHz base, up to 3.60 GHz turbo, 60 MB cache
Memory	Up to 4 TB DDR5-4400, 8 channels, ECC supported
Power and Expansion	205 W TDP, 1S, PCIe 4.0 with 64 lanes



32-Core Edge-Server Compute

The 6433N combines 32 physical cores with 64 threads and a 205 W TDP. This gives network and edge servers substantial parallel compute capacity for virtualized network functions, analytics, security services, and consolidated infrastructure workloads.

Network-Optimized N-Series Design

As an N-series 4th Gen Intel Xeon Scalable processor, the 6433N is positioned for communications, 5G, vRAN, NFV, and edge infrastructure. Intel vRAN Boost and Intel DL Boost help accelerate selected network and machine-learning workloads.

Frequency and Cache Balance

The 2.00 GHz base frequency can reach up to 3.60 GHz with Intel Turbo Boost Technology 2.0. A 60 MB cache helps keep frequently accessed data close to the cores, supporting responsive control-plane and service processing.

Single-Socket Platform Efficiency

The processor is specified for 1S scalability and uses the FCLGA4677 socket. A single-socket design can simplify topology and reduce platform 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. The memory capacity gives single-socket systems room for virtualized network functions, caches, analytics, and service containers.

PCIe 4.0 I/O for Data-Plane Devices

Sixty-four PCIe 4.0 lanes provide expansion capacity for Ethernet adapters, storage controllers, accelerators, and other high-bandwidth devices. The lane budget helps designers build balanced I/O around one processor socket.

Acceleration for Communications Workloads

Intel vRAN Boost targets virtualized radio access network processing, while Intel DSA provides one default device for data movement. Intel DL Boost and AVX-512 support selected inference, packet-processing, 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-6433N
Intel ordering code	PK8071305451100
Intel Spec Code	SRN2B
Processor model	Intel Xeon Gold 6433N Processor
Product collection	4th Gen Intel Xeon Scalable Processors
Code name	Products formerly Sapphire Rapids Edge Enhanced
Vertical segment	Server
Processor number	6433N
Lithography	Intel 7
Marketing status	Launched
Launch date	Q3 2023
Total cores	32
Total threads	64



Feature	Value
Processor base frequency	2.00 GHz
Max turbo frequency	3.60 GHz
Cache	60 MB
TDP	205 W
Scalability	1S only
Sockets supported	FCLGA4677
Package carrier	E1B
Package size	77.5 mm x 56.5 mm
DTS max	96 °C
TCASE	85 °C
Max memory size	4 TB
Memory types	DDR5-4400
Maximum memory speed	4400 MHz
Max memory channels	8
ECC memory supported	Yes
Intel Optane persistent memory	No
PCI Express revision	4.0
Max PCI Express lanes	64
Intel DL Boost	Yes
Intel vRAN Boost	Yes
Intel On Demand Activation Model	No
Intel QuickAssist Technology	0 default devices
Intel Dynamic Load Balancer	0 default devices
Intel Data Streaming Accelerator	1 default device
Intel In-memory Analytics Accelerator	0 default devices
Intel Advanced Matrix Extensions	No
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	No



Feature	Value
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 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 SGX	Yes with Intel SPS
Intel Trusted Execution Technology	Yes
Execute Disable Bit	Yes
Intel OS Guard	Yes
Intel Boot Guard	Yes
Intel Run Sure Technology	Yes
Mode-based Execute Control	Yes
Intel Platform Firmware Resilience	Yes
Default maximum SGX EPC size	128 GB
Intel Crypto Acceleration	Yes
Intel Virtualization Technology	VT-x, VT-d, and VT-x with EPT
Shipping media	Tray
Stepping	L0



Product Comparison

Feature	Intel Xeon Gold 6433N / PK8071305451100	Intel Xeon Gold 6423N / PK8071305451300	Intel Xeon Gold 6403N / PK8071305451400
Processor family	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable
Network or edge positioning	N-series Edge Enhanced	N-series Edge Enhanced	N-series Edge Enhanced
Total cores	32	28	24
Total threads	64	56	48
Processor base frequency	2.00 GHz	2.00 GHz	1.90 GHz
Max turbo frequency	3.60 GHz	3.60 GHz	3.60 GHz
Cache	60 MB	52.5 MB	45 MB
TDP	205 W	195 W	185 W
Scalability	1S only	1S only	1S only
Max memory size	4 TB	4 TB	4 TB
Memory channels	8	8	8
Memory support	DDR5-4400	DDR5-4400	DDR5-4000
ECC memory	Yes	Yes	Yes
PCI Express	4.0, 64 lanes	4.0, 64 lanes	4.0, 64 lanes
Intel DL Boost	Yes	Yes	Yes
Intel vRAN Boost	Yes	Yes	Yes
AMX	No	No	No
Best-fit role	Maximum-core-count single-socket network and edge server	Higher-capacity single-socket network and edge server	Balanced single-socket network and edge server

Accessories



Category	Accessories
Included Accessories	- Intel Xeon Gold 6433N processor (tray shipping media)
Optional Accessories	- FCLGA4677-compatible server board and CPU cooling solution - DDR5 ECC memory and PCIe 4.0 network or storage adapters



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