Intel

Intel Xeon Gold 6414U Processor (PK8071305072001)

Datasheet

Product Overview

- The Intel Xeon Gold 6414U is a 4th Gen Intel Xeon Scalable processor designed for single-socket enterprise, cloud, and general-purpose server platforms.
- It provides 32 cores and 64 threads, with a 2.00 GHz base frequency, up to 3.40 GHz Intel Turbo Boost frequency, 60 MB cache, and a 250 W TDP.
- Built on Intel 7 process technology, the processor supports up to 4 TB of ECC memory and a single-socket platform design.
- It supports DDR5-4800 at 1DPC or DDR5-4400 at 2DPC, with eight memory channels and 80 PCI Express 5.0 lanes for network adapters, storage, and accelerators.
- Intel AMX, Intel DL Boost, one default DSA device, and AVX-512 support selected AI, analytics, data-movement, and compute 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 Single-Socket Compute:** 32 cores and 64 threads provide parallel processing capacity for enterprise servers, cloud infrastructure, virtualization, and demanding general-purpose workloads.
- **2.00 to 3.40 GHz Frequency Range:** The processor combines a 2.00 GHz base frequency with up to 3.40 GHz Intel Turbo Boost frequency for responsive server performance.
- **High-Speed Memory and PCIe 5.0:** DDR5-4800 at 1DPC, DDR5-4400 at 2DPC, and 80 PCIe 5.0 lanes support high-throughput single-socket server designs.
- **AI and Data-Movement Acceleration:** Intel AMX, Intel DL Boost, and one default Intel DSA device support selected AI, inference, analytics, and data-movement workloads.

Detailed Features



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Component	Specification
Processor	Intel Xeon Gold 6414U, 32 cores / 64 threads
Ordering Information	PK8071305072001, FC-LGA16A Tray, Spec Code SRM73
Frequency and Cache	2.00 GHz base, up to 3.40 GHz turbo, 60 MB cache
Memory	Up to 4 TB ECC memory, DDR5-4800 1DPC or DDR5-4400 2DPC, 8 channels
Power and Expansion	250 W TDP, 1S only, PCIe 5.0 with 80 lanes, FCLGA4677 socket

High-Density Single-Socket Compute

The 6414U combines 32 physical cores with 64 threads, a 2.00 GHz base frequency, and a 250 W TDP. Its compute profile suits enterprise servers, cloud infrastructure, virtualization, and data-intensive workloads.

Single-Socket Platform Support

Intel specifies 1S Only scalability for the 6414U. This supports server platforms that need high core density without multi-socket interconnect requirements.

Speed Select Core Profiles

Intel documents Speed Select Core Power and Turbo Frequency support, together with high-priority and low-priority core groups. The 6414U lists 12 high-priority cores at 2.10 GHz and 20 low-priority cores at 1.60 GHz.

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.

Flexible ECC Memory Speeds

The processor supports up to 4 TB of ECC memory across eight channels, with DDR5-4800 at 1DPC and DDR5-4400 at 2DPC. This supports high-capacity single-socket 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 helps balance I/O around one processor socket.

Acceleration for AI and Data Movement

Intel AMX and DL Boost support selected AI and inference workloads, while one default DSA device supports data movement operations. The processor also provides AVX-512 instructions and two AVX-512 FMA units.

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-6414U
Intel ordering code	PK8071305072001
Intel Spec Code	SRM73
Processor model	Intel Xeon Gold 6414U Processor
Product collection	4th Gen Intel Xeon Scalable Processors
Code name	Products formerly Sapphire Rapids
Vertical segment	Server
Processor number	6414U
Lithography	Intel 7
Marketing status	Launched
Launch date	Q1 2023
Supply status	Active
Embedded Options Available	Yes
Use conditions	Server/Enterprise

Feature	Value
Total cores	32
Total threads	64
Processor base frequency	2.00 GHz
Max turbo frequency	3.40 GHz
Cache	60 MB
Intel UPI speed	0 GT/s
Max UPI links	0
TDP	250 W
Intel DL Boost	Yes
Scalability	1S Only
Memory types	Up to DDR5-4800 MT/s 1DPC; up to DDR5-4400 MT/s 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	E1A
Package size	77.5 mm x 56.5 mm
DTS max	93 °C
TCASE	76 °C
Intel On Demand Activation Model	No
Intel Data Streaming 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	12
High Priority Core Frequency	2.10 GHz
Low Priority Cores	20

Feature	Value
Low Priority Core Frequency	1.60 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	128 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
Shipping media	Tray
Stepping	E5

Product Comparison

Feature	Intel Xeon Gold 6414U / PK8071305072001	Intel Xeon Gold 6416H / PK8071305121101	Intel Xeon Gold 6430 / PK8071305072902
Processor family	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable	4th Gen Intel Xeon Scalable
Positioning in this comparison	32-core single-socket processor	18-core high-frequency multi-socket processor	32-core two-socket enterprise processor
Total cores	32	18	32
Total threads	64	36	64
Processor base frequency	2.00 GHz	2.20 GHz	2.10 GHz
Max turbo frequency	3.40 GHz	4.20 GHz	3.40 GHz
Cache	60 MB	45 MB	60 MB
TDP	250 W	165 W	270 W
Scalability	1S Only	S4S	2S
Intel UPI	0 GT/s; 0 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	DDR5-4800 1DPC; DDR5-4400 2DPC	DDR5-4800 1DPC; DDR5-4400 2DPC	DDR5-4400 1DPC and 2DPC
ECC memory	Yes	Yes	Yes
PCI Express	5.0, 80 lanes	5, 80 lanes	5.0, 80 lanes
Default accelerator devices	DSA: 1	DSA: 1; IAA: 1	DSA: 1
Intel AMX	Yes	Yes	Yes
Intel DL Boost	Yes	Yes	Yes
Best-fit role	High-density single-socket enterprise and cloud server	High-frequency multi-socket server compute	High-capacity two-socket enterprise and cloud server

Accessories

Category	Accessories
Included Accessories	- Intel Xeon Gold 6414U 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 6414U Processor Ordering and Spec Information. https://www.intel.com/content/www/us/en/products/sku/231731/intel-xeon-gold-6414u-processor-60m-cache-2-00-ghz/ordering.html