Product Brief

Intel Atom® Processors x7000C Series for Networking

Strengthen Network and Security Appliances with Value-Driven Compute

Get to market fast to deliver more network control, packet processing, crypto traffic and network security AI, and platform hardening with the Intel Atom® processors x7000C Series.

Deliver high value and efficient compute for SD-WAN and uCPE network appliances and embedded board solutions with the Intel Atom® processors x7000C Series, featuring up to eight Efficient-cores (E-cores) and Intel® Ethernet, Wi-Fi, Bluetooth, and 5G connectivity platform solutions. Intel® security features help harden your network security infrastructure, while Communication use conditions[1] drive high uptime and reliability, and Intel® Deep Learning Boost (Intel® DL Boost) supports AI-enhanced zero-day threat detection. Speed your time to market with a modular development kit and extend the value of deployments with long-life availability.[2]

What's new

- Up to eight cores with Intel® Turbo Boost Technology[3] improve packet processing performance
- Deep learning inference capabilities, including Intel® Deep Learning Boost (Intel® DL Boost), Intel® Advanced Vector Extensions 2 (Intel® AVX2) with INT8 support, and OpenVINO™ toolkit (validation to be completed in 2024) support
- LPDDR5, DDR5, and DDR4 memory with support for In-Band Error Correction Code (IBECC) memory enhance multitasking for network and security applications
- Efficient 9W–25W processor base power supports fanless designs[4]
- Ready-to-ship modular development kit accelerates network edge software development

Process more packets with up to eight cores in a network edge appliance

Scale network and security appliance performance to match business requirements with the Intel Atom processors x7000C Series. Up to eight cores with Intel® Turbo Boost Technology,[3] up to 2.4 GHz processor base frequency, and LPDDR5/DDR5/DDR4 memory help process more packets for data-intensive network security workloads. The power-efficient base power of 9W–25W supports compact, fanless designs[4] in space-constrained areas, making it easier to deploy network security wherever you need it.

Create a foundation for growth with fast, more-secure edge networks

The Intel Atom processors x7000C Series is tailored for network and network security edge use cases, with key features designed to enhance control plane application and packet processing. Intel security features help harden your edge platform, while new Instruction Set improves the performance of AI for malware detection, URL filtering, and Unified Threat Management (UTM) in remote branch office networks. Communication use conditions[1] help ensure high uptime, and Data Plane Development Kit (DPDK) with discrete Intel Ethernet gives you more control over network traffic flow.

Speed up software development and extend edge investments

The Intel Atom processors x7000C Series helps solution providers drive tremendous value from network and edge deployments. Intel® connectivity technologies for Ethernet, Wi-Fi, Bluetooth, and 5G platform solutions along with the Intel-supported, ready-to-ship modular development kit help cut down development and testing time for edge appliance software, so providers can get to market fast. Once deployed, the Intel Atom processors x7000C Series also features long-life availability[2] to help businesses maximize the value of their investments, with longer durations between upgrades and refreshes, especially for equipment in remote locations.

Intel Atom® processors x7000C Series

Up to **3.23x** faster OpenSSL AES-128-GCM algorithm performance[5]

Up to **2.41x** faster VPP IPSec AES-128-GCM algorithm performance[5]

Up to **2.00x** faster Snort performance[5]

Up to **1.88x** faster DPDK-L3FWD performance[5]

vs. Intel Atom® processors C3000 Series

Performance varies by use, configuration, and other factors. Learn more at intel.com/PerformanceIndex: Intel Atom® processors. Results may vary.

Key features

Performance and operational efficiency

- Intel® 7 process node
- Up to eight cores with 2.4 GHz processor base frequency and Intel Turbo Boost Technology[3]
- 9W–25W processor base power
- Soldered-down BGA package

Memory and I/O

- LPDDR5 4800 MT/s, DDR5 4800 MT/s, or DDR4 3200 MT/s
- Support for In-Band Error Correction Code (IBECC) memory
- Up to 9x PCIe 3.0 lanes

AI capabilities

- Intel Deep Learning Boost (Intel DL Boost)
- Intel® AVX2 with INT8 support

Flexible deployments

- Support for Data Plane Development Kit (DPDK)-enabled discrete Intel Ethernet acceleration
- Ready-to-ship modular development kit

Longevity, investment, and value

- Long-life availability of up to 10 years[2]
- Embedded and Communication use conditions at Commercial Temperature[1]

Security capabilities

- Intel® Boot Guard
- Intel® Platform Firmware Resilience
- Intel® Platform Trust Technology
- Intel® AES-NI, Intel AVX2 cryptographic acceleration

Software and OS support

- OpenVINO™ toolkit
- Intel® oneAPI support
- Linux OS
- Upstreamed kernel and user mode changes to respective open source projects
- DPDK and KVM hypervisor for software-defined network

Use cases

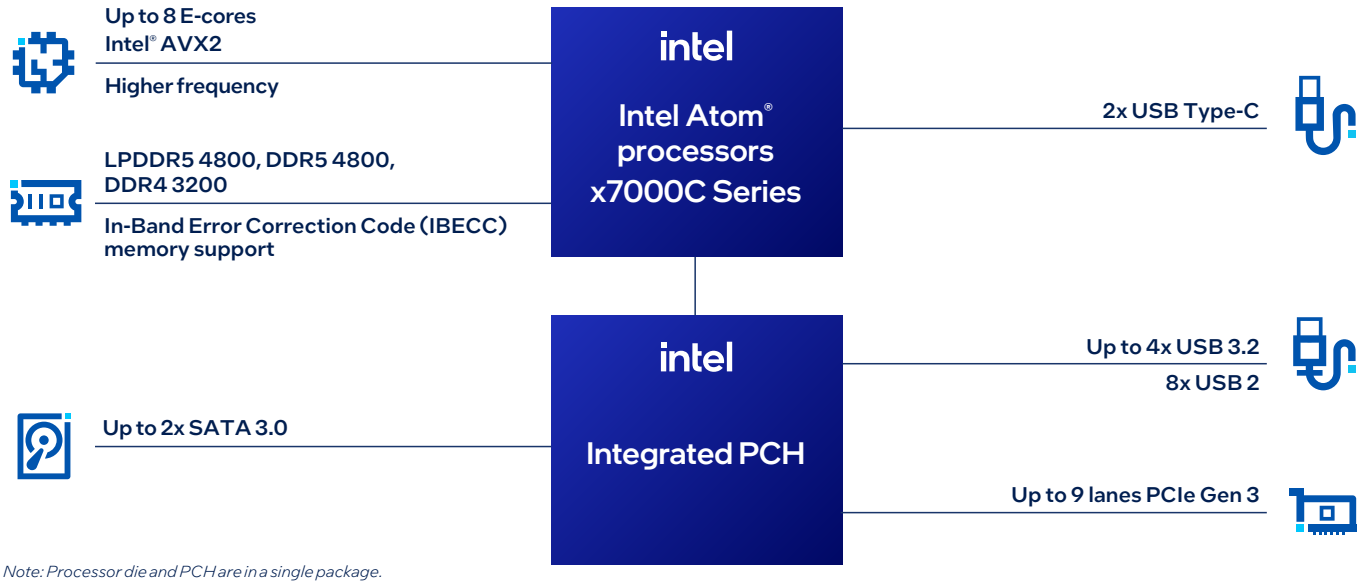
ENTERPRISE NETWORKING AND TELECOMMUNICATIONS

Accelerate packet processing and data encryption and enhance security for edge networking appliances using new deep learning inference capabilities. Technology providers also benefit from development kits and connectivity technologies so they can bring their solutions to market fast.

Applications: SD-WAN, Universal Customer Premises Equipment (uCPE), Secure Access Service Edge (SASE) gateway, edge network and security appliances

- Boost packet processing speed with up to eight cores, LPDDR5/DDR5/DDR4 memory, and Intel Turbo Boost Technology.[3]
- Utilize built-in deep learning inference capabilities and Intel AVX2 for advanced network and security use cases.
- Harden network edge platforms with Intel Boot Guard, Intel Platform Firmware Resilience, and Intel Platform Trust Technology below-the-OS protection.
- Accelerate time to market with Intel connectivity technologies for Ethernet, Wi-Fi, Bluetooth, 5G, and the ready-to-ship modular development kit.
- Maintain high uptime with communication use conditions.[1]
- Extend the value of investments with long-life availability.[2]

Processor block diagram



Note: Processor die and PCH are in a single package.

Software overview

CATEGORY	OPERATING SYSTEMS/SDKs/ BOOT LOADERS	IMPLEMENTATION	DISTRIBUTION AND SUPPORT
Operating systems[a]	Ubuntu[b], RHEL[b], WR Linux[b]	Canonical Ltd., Red Hat, and Wind River Systems	Distributed and supported by commercial Linux vendors; Intel provides the preproduction overlays for Ubuntu and upstream kernel drivers
Hypervisors	KVM[b]	KVM	KVM open source community
	Real-Time Hypervisor	Real-Time Systems GmbH	Real-Time Systems GmbH
Boot Firmware[c]	UEFI/BIOS and Intel® FSP	Intel	Intel® BIOS Vendors (IBV)
	Slim Bootloader and Intel FSP	Intel	Bootloader ecosystem and SBL community
SDKs	Intel® oneAPI (Base and IoT Toolkits)	Intel	Intel
	OpenVINO™ toolkit (validation to be completed in 2024)	Intel	Intel

a. *Not all features are supported in all operating systems.*
b. *Supported by Intel via the upstreaming to open source community. Adoption into individual Linux distributions/hypervisors is dependent upon the OS/HV vendors.*
c. *Legacy boot is not supported. Customers should work with their BIOS vendors for enabling/validating legacy BIOS features.*

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SKU	Use Condition	Temperature	TDP	CPU			GPU	Intel® TCC	TSN GbE
				Core Count	Processor Base Frequency	Max Turbo Frequency			
Intel Atom® processor x7203C	Embedded and Communication	Commercial Temperature	9	2	2.0 GHz	3.2 GHz	N/A	Yes	Yes
Intel Atom® processor x7405C			12	4	2.2 GHz	3.4 GHz		Yes	Yes
Intel Atom® processor x7809C			25	8	2.4 GHz	3.6 GHz		Yes	Yes

Note: The Intel Atom® processor x7809C will require an active cooling solution.

Unlock next-gen performance with versatile configurations for value-driven networking appliances.

Learn more about Intel Atom® processors x7000C Series at intel.com/atomx7000c.

Notices and disclaimers

1. Communication use conditions of up to 10 years, up to 100 percent active, no turbo, Commercial Temperature.
2. Intel does not commit or guarantee product availability or software support by way of road map guidance. Intel reserves the right to change road maps or discontinue products, software, and software support services through standard EOL/PDN processes. Contact your Intel account rep for additional information.
3. Intel® Turbo Boost Technology is available only when it is used as an embedded use condition.
4. For select SKUs only.
5. Performance varies by use, configuration, and other factors. Learn more at intel.com/PerformanceIndex: Intel Atom® processors. Results may vary.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Your costs and results may vary. Intel® technologies may require enabled hardware, software, or service activation.

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