

Intel® Server System M70KLP Family

Featuring 3rd Generation Intel® Xeon® Scalable Processors (with 6 UPI)

Redefining 2U Performance, Density and TCO

An Upper-End Mainstream Server for Scale-Out or Scale-Up Workloads

Intel® Server System M70KLP Family sets a new standard for 2U, upper-end mainstream servers by combining extraordinary density and versatility for both scale-up or scale-out workloads.

Its high compute and memory capacity make it ideal to maximize consolidation for VM and container workloads to reduce sprawl and TCO.

And, it's a great scale-up server choice for compute-intensive or memory-bound workloads, delivering outstanding performance, scalability and TCO for your more demanding needs.

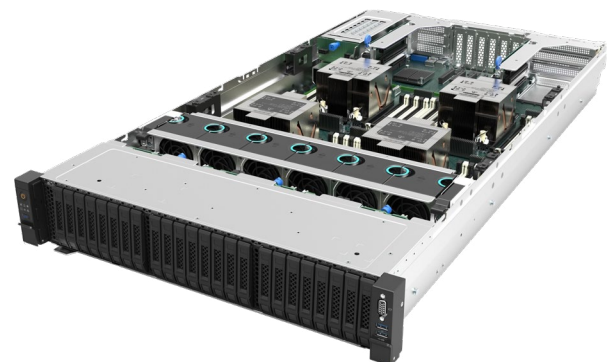
More workloads. Less sprawl. Lower operating costs. The Intel® Server System M70KLP Family's unique blend of 4-socket density—with 2-socket versatility—makes it an ideal choice for data centers that need to do more with less.

Innovation across the Platform

3rd Generation Intel Xeon Scalable processors and other Intel innovations integrated into the Intel Server System M70KLP Family deliver workload-optimized performance with built-in AI acceleration, and improved memory and I/O throughput versus prior generation processors.

- **Boost your compute performance:** Up to 28 cores per processor and up to 112 cores per 2U server delivering outstanding multi-socket core count density and performance.
- **2x Intel® Ultra Path Interconnects (Intel® UPI):** Double the inter-CPU bandwidth for I/O-intensive workloads versus previous generation. (A feature of 3rd Generation Intel® Xeon® Scalable processors with 6 UPI)
- **Breakthrough memory capacity:** Up to 15 TB of memory capacity per server (when utilizing Intel® Optane™ persistent memory 200 series in App Direct mode with supported software) maximizes workload consolidation and enables larger datasets for in-memory databases.
- **Enhanced Intel® Deep Learning Boost with VNNI and new BF16 (A feature of 3rd Generation Intel® Xeon® Scalable processors with 6 UPI):** Accelerates both AI inferencing and training on versatile, general-purpose

- CPUs, delivering up to 1.93x more AI training performance versus the previous generation.¹
- **Intel® Speed Select Technology:** Selectively boosts performance on cores running higher-priority workloads to help meet SLAs, while improving utilization and TCO.²
- **Increased DDR4 memory speed and capacity:** Memory subsystem enhancements include support for 48 DIMMs running up to DDR4-3200 MT/s. Includes DIMM capacities ranging from 16 GB up to 128 GB.
- **Supports Intel® Optane™ persistent memory 200 series:** Extend system memory capacity versus DRAM-only servers. Delivers an average of 25% higher memory bandwidth compared to the first generation.³
- **Supports Intel® Optane™ SSDs and Intel® 3D NAND SSDs:** Intel Optane SSDs deliver a breakthrough storage performance, while Intel 3D NAND SSDs provide high-density storage capacity.
- **High-speed networking:** Support for 100 Gb Ethernet with the Intel® Ethernet 800 Series. These network interface cards feature Application Device Queue, a technology that enables application-specific, uncontended, smooth-flowing traffic because there is no sharing of traffic from other applications on those queues.
- **Maximize uptime:** Enterprise RAS features help ensure high availability and reliability for mission-critical workloads.
- **Hardware-enhanced security:** Help protect against malicious exploits and accelerate data encryption with built-in security features, while maintaining workload integrity with reduced performance overhead.⁴



4-Socket, 2U Server with High Compute, Memory and Storage Capacity

3rd Generation Intel® Xeon® Scalable processors (with 6 UPI)

- Up to 28 cores per processor
- 4 Sockets, for up to 112 cores per server
- 6 Intel® UPI for increased CPU I/O throughput, 2x from previous generation

Intel® Optane™ persistent memory 200 series support

Up to 15 TB memory

- 3 TB of DRAM, plus 12 TB of Intel® Optane™ persistent memory 200 series when using App Direct Mode
- 12 DDR4 DIMMs per socket; 48 DIMMs total

1x OCP3.0, 1x 1GB, Dedicated Management Port

24 x 2.5" SAS/SATA/NVMe hot-swappable drives (front access)

2x M.2 SATA SSDs (internal)

Up to 12 PCIe Gen 3 slots

A Key Member of the Intel® Server System Family Portfolio

The Intel Datacenter Solutions Group (DSG) has created a portfolio of Intel Server Systems to handle all your data center and workload requirements. Combined, these servers can run everything from entry-level tasks to your most compute-intensive and data-centric workloads.

Intel® Server Systems can be configured to order to meet your specific needs. You can learn more about these systems in the portfolio by visiting: www.intel.com/servers.

Enterprise-Class Server Management

Intel Server Systems provide consistent, enterprise-grade server management across all platforms to simplify deployment, monitoring, updating and debugging.

The consistent interface, tools and utilities simplify and accelerate all stages of the server lifecycle—from build and

Reduce Risk of Counterfeit Parts with Intel® Transparent Supply Chain

Counterfeit electronic parts are a growing security concern across all organizations. These concerns have grown as supply chains have become increasingly complex, multi-layered and global.

Current supply chain practices start with trusting the source, but processes are limited for screening out counterfeit components, particularly for products containing many subsystems.

Intel® Transparent Supply Chain helps partners and customers verify the authenticity and firmware version of servers and their components, through a set of tools, policies, and

Purpose-Built to Handle a Variety of Enterprise and Cloud Requirements

With revolutionary 4-socket performance, scalability and TCO advantages, the Intel® Server System M70KLP Family is an ideal choice for compute-intensive and data-intensive workloads for enterprise and cloud requirements.

Cloud

- Analytics
- VM/container consolidation
- Distributed, web scale, in-memory data caching

Analytics

- Big Data (e.g., Apache Spark)
- Ingest applications

In-Memory Database

- SAP HANA
- Distributed, web scale, in-memory data caching

Scale-Up

- High-performance relational databases
- NoSQL databases
- HPC
- Electronic Design Automation

customize, to deployment, to multi-server management, and to single server debug and maintenance.

Deploy with Confidence with Intel Quality, Reliability, Service and Support

Intel servers aren't just packed with innovation—they all come with Intel's highly rated, comprehensive services and support package, delivering differentiating value to every stage of the server lifecycle—from pre-purchase and deployment to operations, management and support.

You can take advantage of Intel's proven support and service, including a 3-year warranty (optional 5-year) and global technical support.

Intel® Server Systems are also easy to deploy and operate, with comprehensive documentation for integration, configuration and management. All Intel Server Systems are fully integrated systems with options of configure-to-order CPU, memory, storage, and more.

procedures. These verification steps, implemented on the factory floor at server manufacturers, enable enterprises to verify the authenticity and firmware version of systems and their components when systems arrive at their site.

This industry-leading approach helps

- Provide component-level traceability and visibility
- Detect tampering of components and configuration state between stops
- Deliver fleet-level insights across suppliers

These and other safeguards combine to increase assurance and trust that the Intel servers you're purchasing and deploying are free of counterfeit components that could compromise your business or customers.

System Options	Standard System - No GPU Support	System with GPU Support
Chassis Form Factor	2U, rack-mount	
Chassis Dimensions	841 mm x 435 mm x 87 mm	
Processor Support	<p>Up to four 3rd Generation Intel® Xeon® Scalable processor family Platinum 83xx H or HL and Gold 63xx H or HL, including:</p> <ul style="list-style-type: none"> Intel® Xeon® Platinum 8380HL Processor (28 core, 38.5M Cache, 2.90 GHz) Intel® Xeon® Platinum 8380H Processor (28 core, 38.5M Cache, 2.90 GHz) Intel® Xeon® Platinum 8376HL Processor (28 core, 38.5M Cache, 2.60 GHz) Intel® Xeon® Platinum 8376H Processor (28 core, 38.5M Cache, 2.60 GHz) Intel® Xeon® Platinum 8360HL Processor (24 core, 33M Cache, 3.00 GHz) Intel® Xeon® Platinum 8360H Processor (24 core, 33M Cache, 3.00 GHz) Intel® Xeon® Platinum 8356H Processor (8 core, 35.75M Cache, 3.90 GHz) Intel® Xeon® Platinum 8354H Processor (18 core, 24.75M Cache, 3.10 GHz) Intel® Xeon® Platinum 8353H Processor (18 core, 24.75M Cache, 2.50 GHz) Intel® Xeon® Gold 6348H Processor (24 core, 33M Cache, 2.30 GHz) Intel® Xeon® Gold 6330H Processor (24 core, 33M Cache, 2.00 GHz)* Intel® Xeon® Gold 6328HL Processor (16 core, 22M Cache, 2.80 GHz)* Intel® Xeon® Gold 6328H Processor (16 core, 22M Cache, 2.80 GHz)* <ul style="list-style-type: none"> • 4x Socket P+ (4189 pin) processor sockets • Up to 28 Cores per processor / Up to 112 Cores per system • 6x UPI links per processor • UPI Speeds up to 10.4GT/s <p>Maximum supported processor TDP: ≤ 250W</p> <p>* Supports Intel® Speed Select Technology</p>	
Chipset	Intel® C621 Chipset	
Memory Support	<p>Up to 48 DIMMs (12 DIMMs per processor socket)</p> <ul style="list-style-type: none"> • 6 memory channels per processor • 2 DIMM slots per memory channel <p>DDR4 – RDIMM, RDIMM-3DS, LRDIMM, LRDIMM-3DS</p> <p>Memory Speeds in MT/s :</p> <ul style="list-style-type: none"> • Platinum 83xx: 3200 2DPC • Gold 63xx: 2933 2DPC <p>Intel® Optane™ persistent memory 200 Series (App Direct Mode Only)</p>	
PCIe Add-in Card Support Options	Support for up to 12x PCIe Gen 3 Add-in Cards	Support for up to 10x PCIe Gen 3 Add-in Cards
Network Support Options	<p>OCP 3.0 Add-in Card accessory options:</p> <ul style="list-style-type: none"> • Ethernet Network Adapter X710-DA4 for OCP 3.0 • Ethernet Network Adapter X710-DA2 for OCP 3.0 • Ethernet Network Adapter X710-T4L for OCP 3.0 • Ethernet Network Adapter E810-XXVDA4 for OCP 3.0 • Ethernet Network Adapter E810-XXVDA2 for OCP 3.0 	
Front Access Drive Bay support	<p>8, 16, or 24 Hot Swap Drive Bays</p> <ul style="list-style-type: none"> • 2.5" SSDs • SAS, SATA, NVMe 	<p>8 Hot Swap Drive Bays</p> <ul style="list-style-type: none"> • 2.5" SSDs • SAS, SATA, NVMe

System Options	Standard System - No GPU Support	System with GPU Support
Internal M.2 SSD support	Up to 2x internal mount M.2 SATA SSDs <ul style="list-style-type: none"> • 2280 & 22110 form factors supported 	Up to 2x internal mount M.2 SATA SSDs <ul style="list-style-type: none"> • 2280 & 22110 form factors supported
Rear Panel Features	<ul style="list-style-type: none"> • 1x Rear Access OCP Add-in Card bay • 2x USB 3.0 ports • 1x VGA Connector • 1x RJ45 Dedicated Management Port • 1x Serial Port interface connector • 1x BMC Serial Port interface connector • 1x UID Button/LED • 1x System Reset Button • 1x Rear Access Dual Power Supply Module Bay 	
Front Panel Features	Left Control Panel Features <ul style="list-style-type: none"> • System Power Button/LED • UID Button/LED • Various system feature/status LEDs Right Control Panel Features <ul style="list-style-type: none"> • VGA Connector • 1x USB 3.0 Connector • 1x USB 2.0 Connector 	
Power Supply Options	<ul style="list-style-type: none"> • Up to 2x 2000W CPRS power supply modules • 1+1 Redundancy (hot swappable) 	
Cooling	<ul style="list-style-type: none"> • 6x 60x60x56mm System Fans with support for fan redundancy • One Fan per installed Power Supply • 4x 2U CPU Heat Sinks • Standard air duct 	<ul style="list-style-type: none"> • 6x 60x60x56mm System Fans with support for fan redundancy • One Fan per installed Power Supply • 4x 1U CPU Heat Sinks • GPGPU supported air duct
Management Support	<ul style="list-style-type: none"> • 1x Dedicated RJ45 1 Gb Management Port • IPMI 2.0 • Red Fish 	
Serviceability Features	Tool-less (Removal and Installation) <ul style="list-style-type: none"> • Top Cover • Power Supply – hot swappable in 1:1 redundant configuration • System Fans • OCP Module 	
Operating Ambient Temperature Support	10°C – 35° C ambient temperature	
Security	<ul style="list-style-type: none"> • TPM 2.0 Accessory Add-in Option (rest of the world) - Note: In China only, TPM not supported • Intel® Platform Firmware Resilience (Intel® PFR) • Converged Boot Guard and Intel® Trusted Execution Technology (Intel® TXT) 	
Rack Mount Kit	Tool-less installation	



1) Up to 1.93x higher AI training performance with 3rd Gen Intel® Xeon® Scalable processor supporting Intel® DL Boost with BF16 vs. prior generation on ResNet50 throughput for image classification – New: 1-node, 4x 3rd Gen Intel® Xeon® Platinum 8380H processor (pre-production 28C, 250W) on Intel Reference Platform (Cooper City) with 384 GB (24 slots / 16GB / 3200) total memory, ucode 0x700001b, HT on, Turbo on, with Ubuntu 20.04 LTS, Linux 5.4.0-26,28,29-generic, Intel 800GB SSD OS Drive, ResNet-50 v 1.5 Throughput, <https://github.com/Intel-tensorflow/tensorflow-bf16/base>, commit#828738642760358b388d8f615ded0c213f10c99a, Modelzoo: [https://github.com/IntelAI/models/-b v1.6.1](https://github.com/IntelAI/models/-b-v1.6.1), Imagenet dataset, oneDNN 1.4, BF16, BS=512, test by Intel on 5/18/2020. Baseline: 1-node, 4x Intel® Xeon® Platinum 8280 processor on Intel Reference Platform (Lightning Ridge) with 768 GB (24 slots / 32GB / 2933) total memory, ucode 0x4002f00, HT on, Turbo on, with Ubuntu 20.04 LTS, Linux 5.4.0-26,28,29-generic, Intel 800GB SSD OS Drive, ResNet-50 v 1.5 Throughput, <https://github.com/Intel-tensorflow/tensorflow-bf16/base>, commit#828738642760358b388d8f615ded0c213f10c99a, Modelzoo: [https://github.com/IntelAI/models/-b v1.6.1](https://github.com/IntelAI/models/-b-v1.6.1), Imagenet dataset, oneDNN 1.4, FP32, BS=512, test by Intel on 5/18/2020.

2) Available on specific SKUs

3) Average of 25% higher memory bandwidth vs prior gen: New: 1-node, 1x Intel® Xeon® pre-production CPX6 28C @ 2.9GHz processor on Cooper City with Single PMem module config (6x32GB DRAM; 1x{128GB,256GB,512GB} Intel® Optane™ PMem 200 series module at 15W), ucode pre-production running Fedora 29 kernel 5.1.18-200.fc29.x86_64, and MLC ver 3.8 with App-Direct. Source: 2020ww18_CPX_BPS_BG. Tested by Intel, on 31 Mar 2020. Baseline: 1-node, 1x Intel® Xeon® 8280L 28C @ 2.7GHz processor on Neon City with Single PMem module config (6x32GB DRAM; 1x{128GB,256GB,512GB} Intel® Optane™ PMem 100 series module at 15W) ucode Rev: 04002F00 running Fedora 29 kernel 5.1.18-200.fc29.x86_64, and MLC ver 3.8 with App-Direct. Source: 2020ww18_CPX_BPS_DI. Tested by Intel, on 27 Apr 2020.

4) No product or component can be absolutely secure.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software, or service activation. Performance varies depending on system configuration. Your costs and results may vary. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.

Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit intel.com/performance.

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