New Supermicro X14 Systems

The Industry's Broadest Range of Workload-Optimized Servers
Powered by Intel® Xeon® 6 Processors

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July 31, 2024

Before we Begin – Intel® Xeon® 6 Naming

Codenames and AP/SP naming should not be used post-launch

Sierra Forest = E-cores
Granite Rapids = P-cores
AP = 6900 series
SP = 6700 series

SFR-SP	→	Intel Xeon 6700 series with E-cores
SFR-AP	→	Intel Xeon 6900 series with E-cores
GNR-SP	→	Intel Xeon 6700 series with P-cores
GNR-AP	→	Intel Xeon 6900 series with P-cores

Introducing Supermicro X14

✓ The industry's broadest portfolio of workload-optimized systems

✓ Flexible hybrid platform for performance and efficiency

✓ Proven platforms over several generations

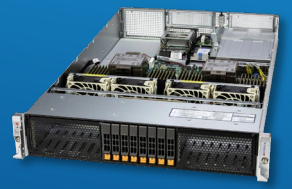
✓ Now available with Intel Xeon 6700 series processors with E-cores

Supermicro Efficiency-Optimized Systems Now Available

Optimized for **Intel® Xeon® 6700 series processors with E-cores**

Rackmount

Range of systems optimized for flexibility and performance. Ideal for cloud-scale data center deployments



Hyper

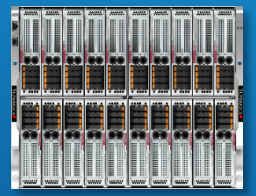
CloudDC with DC-MHS

WIO

Petascale Storage

Multi-Node

High-density and efficiency resource-saving architectures with shared components



SuperBlade®

BigTwin®

GrandTwin®

Edge

Compact and short-depth form factors designed for maximum performance and efficiency at the intelligent edge

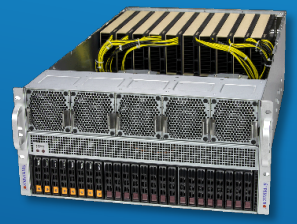
Hyper-E

Telco/Edge

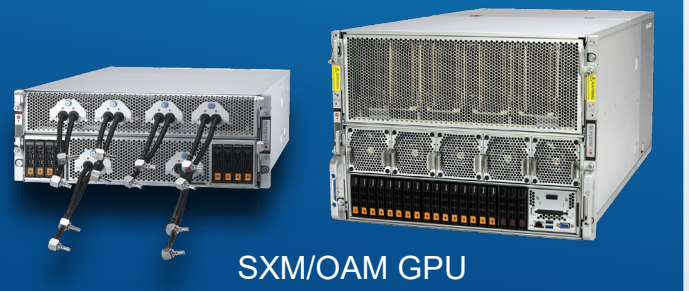
Supermicro Performance-Optimized Systems Coming Soon

AI-Optimized

Flagship high-performance OAM/SXM and PCIe systems for large-scale AI training, HPC, simulation, and 3D media



PCIe GPU



SXM/OAM GPU

Rackmount

Optimized for flexibility and performance. Ideal for rack-scale HPC deployments

Hyper

Multi-Node

High performance, high density, resource-saving architectures with shared components

SuperBlade®

FlexTwin

Intel's Xeon Roadmap

Beyond '5 nodes in 4 years'

Accelerated Roadmap

Intel Xeon 6 to be delivered only 6 months after 5th Gen Xeon

P-Core & E-Core

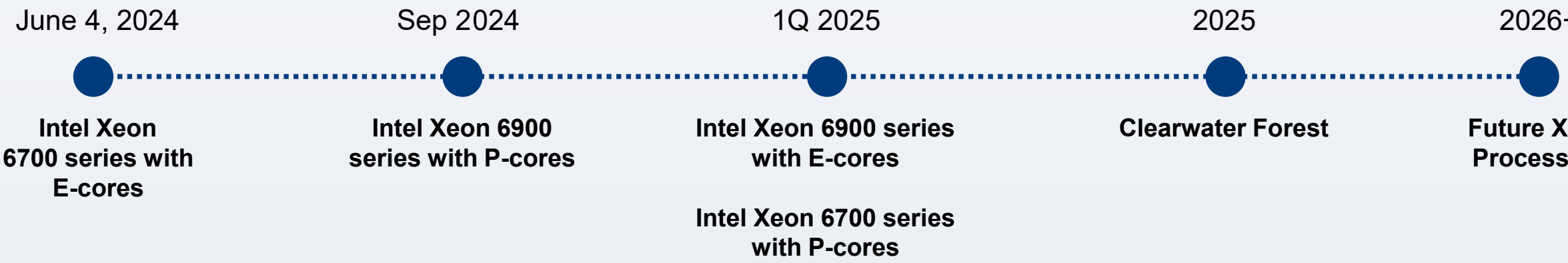
Performance-per-core and performance-per-watt optimized processors for better workload matching

Staggered Release

Intel Xeon 6 will see 4 distinct CPU models released over 9 months

Manufacturing Advantage

Intel is now planning beyond its '5 nodes in 4 years' strategy and will continue to 14A and beyond



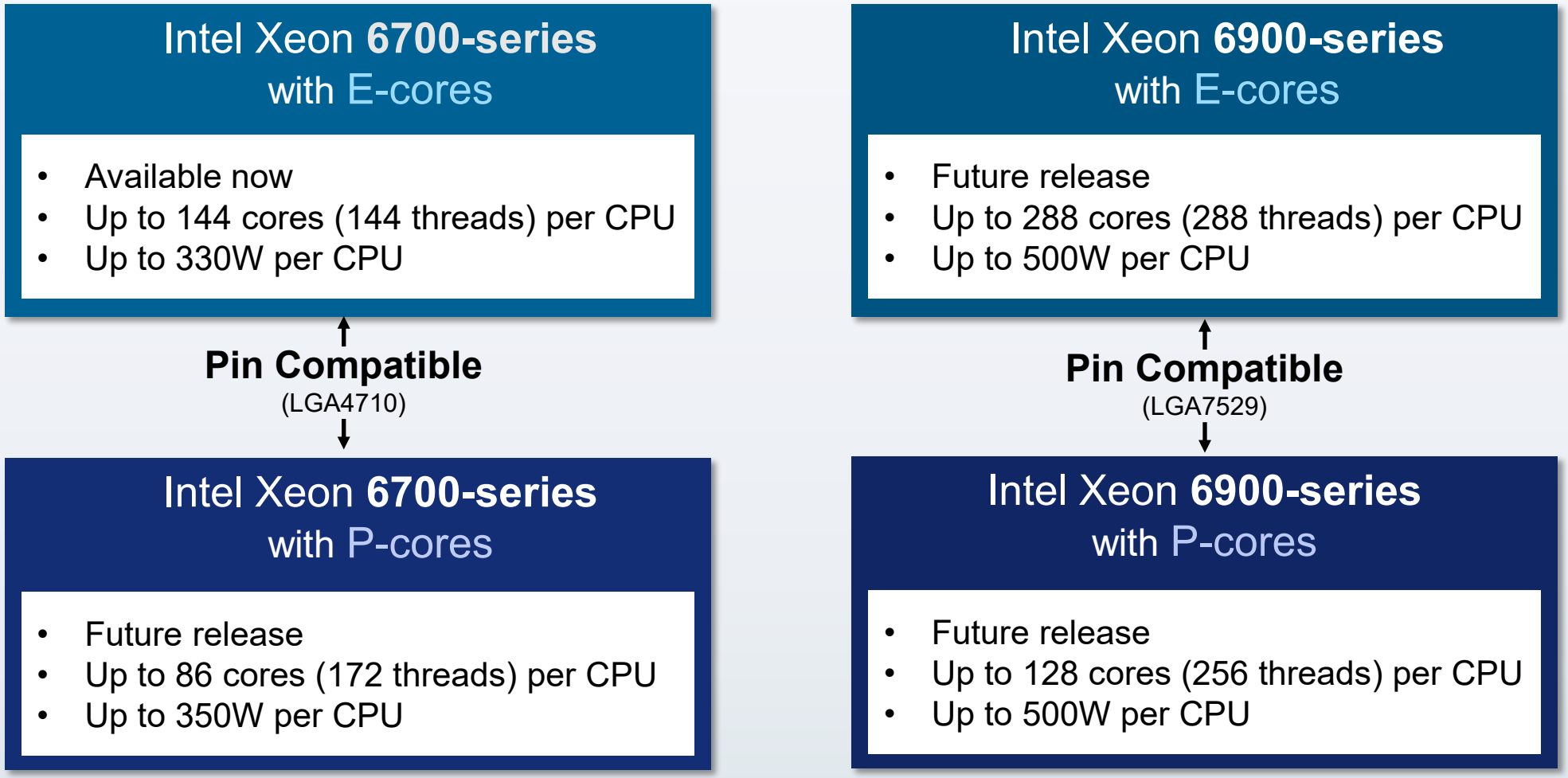
Supermicro X14

Intel 3

Intel 18A (1.8nm)

Intel 14A (1.4nm)

Four categories of workload-optimized processors



Intel® Xeon® 6700 series Processors with E-cores

- Optimized for performance-per-watt
- High core density – Up to 144 cores per CPU now, and up to 288 cores per CPU in the future
- Single thread per core
- Ideal workloads which benefit from a larger number of less powerful cores to run more simultaneous instances at once and using less power
  - Cloud-native CDN
  - Network microservices
  - Cloud-native applications (eg: Kubernetes)
  - Application DevOps
  - Unstructured databases and scale-out analytics

Rack-Level Performance	Performance-Per-Watt
up to **3.2x** vs 2nd Gen Intel Xeon[1]	up to **2.6x** vs 2nd Gen Intel Xeon[1]

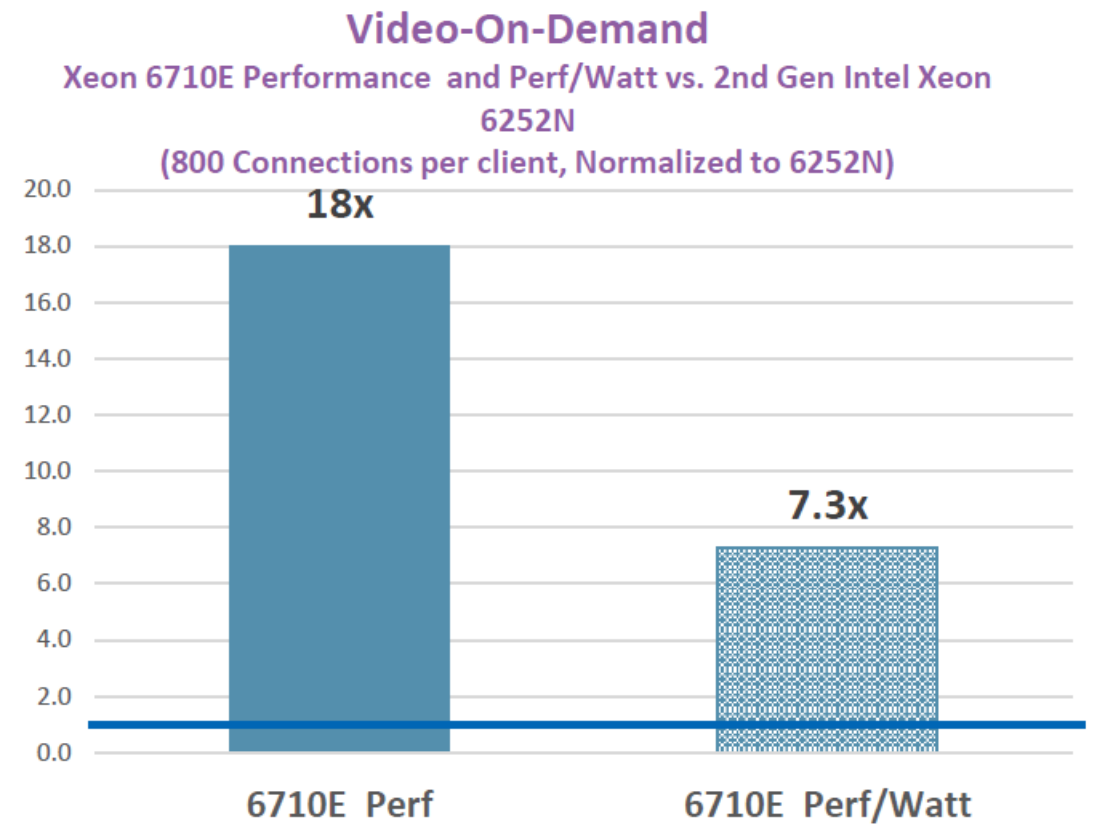
[1] Media transcode workloads vs 2nd Gen Intel Xeon Scalable processors. See [7T1] at intel.com/processorclaims: Intel® Xeon® 6. Results may vary.

X14 - Up to 18x Performance for CDN VoD Workloads

Content Delivery Networks are key to delivering pre-recorded and live streaming video.

- High speed networking
- Fanout of DRAM and high-performance storage sized to the sets of content and users.

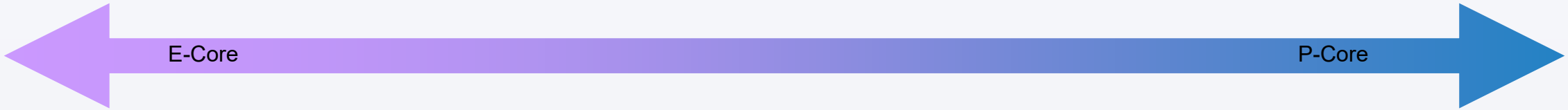
Initial results only; Comprehensive benchmarking of X14 family systems coming soon.



X14 UP Hyper vs X11 UP WIO

Supermicro X14 SYS-212H-TN with Intel Xeon 6 6710E vs Supermicro X11 SYS-1019P-WTR with Intel Xeon Gold 6252N. Please see notes for full system configuration.

Workload Optimization on Intel Xeon 6



Web and Microservices	Networking	Database and Analytics	Edge	Infrastructure and Storage	HPC	AI
Cloud-native Consumer Digital Services Application DevOps	Network Microservices (NFV) Cloud-native CDN	Unstructured Databases Scale-out Analytics				

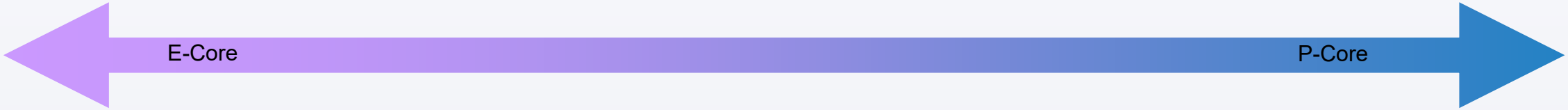
Intel Xeon 6 Processors with E-cores

5G Core CDN Media & Gaming	CRM, ERP Big Data In-memory Analytics	Edge Analytics Video	HCI Virtualization Storage	CAE Modeling & Simulation	Generative AI Deep Learning Machine Learning Inference/Training

Intel Xeon 6 Processors with P-cores

General guidance only. E-core and P-core are expected to have applicability in all categories, depending on specific workload.

Workload Optimization on Intel Xeon 6

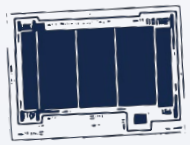


High-Density and Scale-Out	General-Purpose Compute	Compute-Intensive AI
E-core	P-core	P-core
Consumer digital services	Infrastructure (HCI, VDI)	Deep learning
Unstructured databases	Storage	Machine learning
Network microservices (NFV)	Database & Analytics (CRM, ERP)	HPC
Application DevOps	Networking & edge	Media & gaming

What's New in Supermicro X14

New Intel® Xeon® 6 Processors

Workload-optimized & pin compatible between E-core and future P-core CPUs

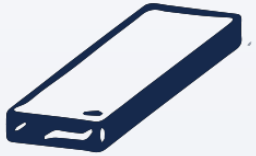


Up to 288 cores per node

Increased computing density

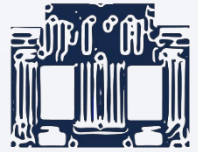
Up to DDR5-6400 and CXL 2.0

Faster memory bandwidth. New capabilities to extend capacity



EDSFF E1.S and E3.S NVMe drives

supported on more families
High throughput, higher density



Data Center Modular Hardware System

DC-MHS Reduces complexity and simplifies maintenance

Upgrading to X14

Customers currently running X12 or earlier platforms will see **significant** performance advantages when upgrading to X14

	X12	X14	Benefit
CPU	3rd Gen Intel Xeon	Intel Xeon 6	
Memory	DDR4-3200	DDR5-6400 MRDIMM 8800	2x memory bandwidth 2.7x memory bandwidth
PCIe	PCIe 4.0	PCIe 5.0	2x throughput increase
Storage	U.2	E1.S, E3.S	Increased density, throughput and better thermals
Cores/socket	Up to 40	Up to 288	7.2x increase
CXL	-	CXL 2.0 (all device types)	Increased shared memory pool

Memory Support on X14

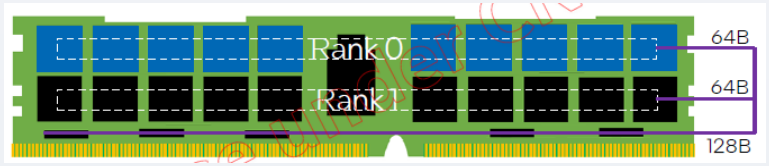
- Enables simultaneous operation of two ranks by utilizing the data buffer assembled onto the MRDIMM.
- Allows transmission of 128 bytes of data to CPU at once, compared with 64 bytes fetched in conventional DRAM module
- 23% memory bandwidth increase when running 1 DPC vs 2 DPC on standard DIMMs

Memory Bandwidth

up to

2.7x

with MRDIMM vs 3rd Gen Xeon[1]

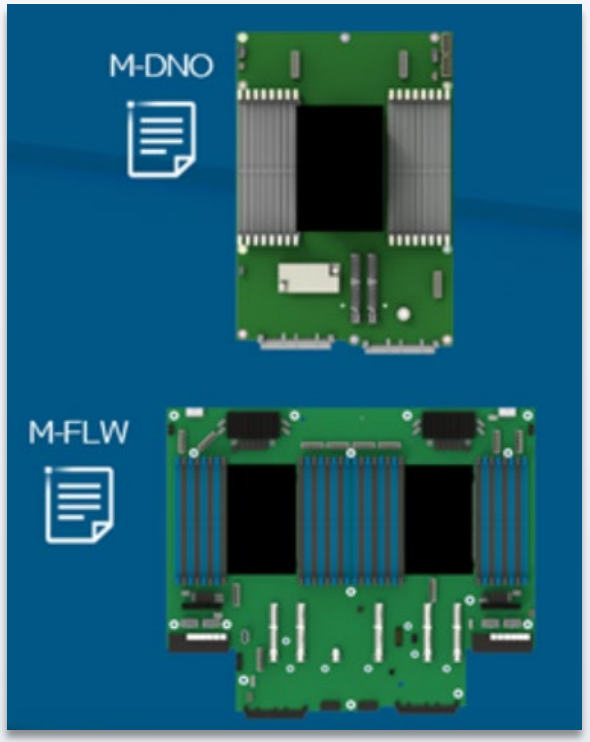


Xeon 6700 series					Xeon 6900 series			
	Max DIMM Count/Socket	Memory Channels	Memory Speed (1 DPC)	Memory Speed (2 DPC)	Max DIMM Count/Socket	Memory Channels	Memory Speed (1 DPC)	Memory Speed (2 DPC)
E-core	16	8	6400	5200	12	12	6400	-
P-core	16	8	6400 8000 (MR)	5200	12	12	6400 8800 (MR)	-

[1] Compared to 3rd Gen Intel Xeon Scalable Processors. Based on architectural projections as of August 21, 2023 relative to prior generation. Your results may vary.

Data Center Modular Hardware System (DC-MHS)

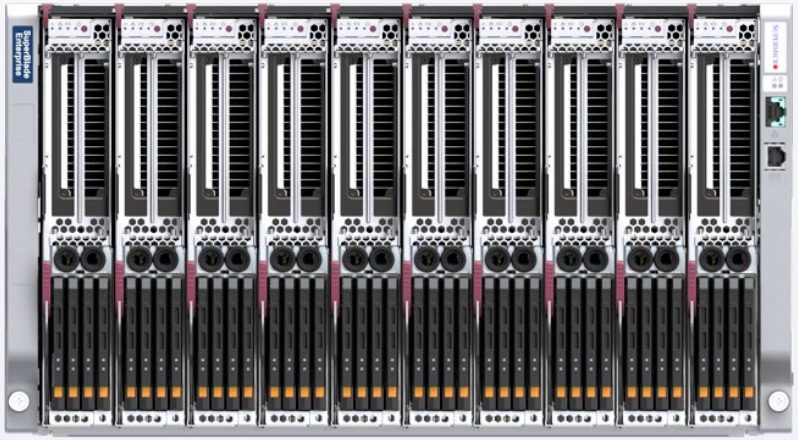
- Developed by the Open Compute Project (OCP)
- Supermicro X14 systems with DC-MHS are ideal for large CSPs & hyperscalers with multi-vendor hardware platforms
- Provides consistent interfaces and form factors among modular building blocks for large-scale data centers
- Host Processor Module (HPM) - Similar to motherboards, but without BMC/Security. Standardized form-factors and supporting ingredients to allow interoperability of HPMs and platforms.
- Datacenter-ready Secure Control Module (DC-SCM) – Enables common management and security infrastructure across platforms
- Supported on X14 CloudDC and Petascale All-Flash family systems



Host Processor Modules

X14 Features Wider EDSFF Drive Support

- Industry-standard family of specifications designed specifically for solid-state drives
- Density and throughput improvements over U.2
- Common compliant connector optimized for PCIe
- Forward compatibility with future PCIe generations
- Efficient thermal design to facilitate higher drive bay density



Supermicro X14 with E3.S

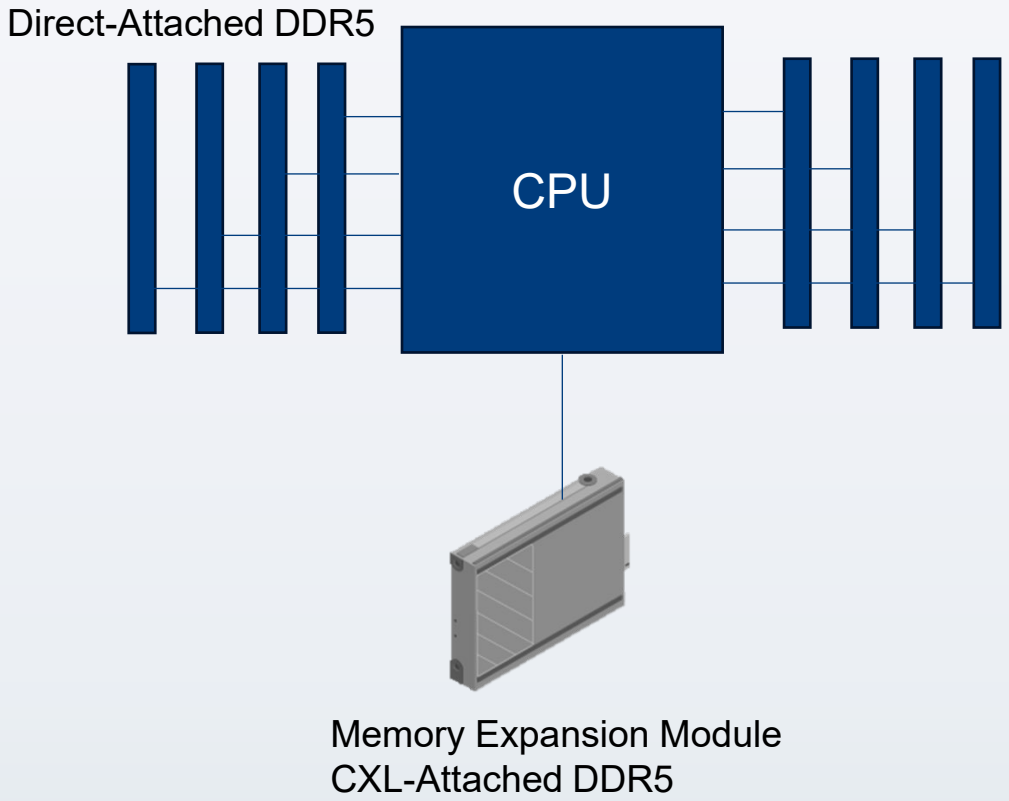
Supermicro X14 with E1.S

X14 EDSFF Support

	SuperBlade®	BigTwin®	GrandTwin®	Petascale®
E1.S	✓		✓	
E3.S	✓	✓		✓

Compute Express Link 2.0 (CXL) Memory Expansion

- High bandwidth and low latency protocol built on the PCI Express physical and electrical interface
- CXL 2.0 supports Type 3 CXL devices for memory expansion
- Memory expansion modules in E3 and CEM add-in card form factors
- Ideal for boosting performance, scaling up memory capacity, or balancing memory bandwidth to CPU cores



Subject to change without notice

X14 DP/MP 6700 series (SP) Product Portfolio

Rackmounts

Hyper

SYS-122H-TN
1U: DP, 32 DIMM, 8-12 NVMe, 3 PCIe slots, AIOM

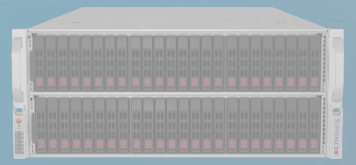
SYS-222H-TN
2U: DP, 32 DIMM, 8-24 NVMe, 4-8 PCIe slots, 1-2 AIOM

MP Systems

SYS-242H-NR
2U: 4P-Compute, 64 DIMM, 8 NVMe, 6 PCIe, 2 AIOM

SYS-242B-NR
2U: 4P-Storage, 64 DIMM, 24 NVMe, 6 PCIe, 2 AIOM

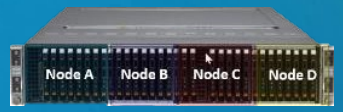
Coming Soon



SYS-442B-NR
4U: 4P-Max I/O, 64 DIMM, 24 NVMe/48 SAS, 6 PCIe, 2 AIOM

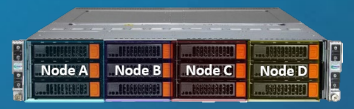
Twin Servers

BigTwin



SYS-222BT-HER
2U 4-node: DP, 16 DIMM, 8 E3.S, 2 PCIe slots, AIOM (per node)

SYS-222BT-HNR(*HNC8R/HC9)
2U 4-node: DP, 16 DIMM, 6 NVMe/SAS*, 2 PCIe slots AIOM (per node)



SYS-622BT-HNC8R
2U 4-node: DP, 16 DIMM, 3 3.5”, 2 PCIe slots AIOM (per node)

SYS-222BT-DNR
2U 2-node: DP, 16 DIMM, 12 NVMe, 3 PCIe slots AIOM (per node)

SYS-622BT-DNC8R
2U 2-node: DP, 16 DIMM, 6 3.5” NVMe/SAS, 3 PCIe slots AIOM (per node)

Edge & Telco Blade Servers

SuperBlade

SBI-422B-1NE14
8U 20-node: DP, 16 DIMM, 4 E1.S, 2 AIOM (per node)

SBI-622B-1NE34 / 1NE38
6U 10-node: DP,32 DIMM, 4 or 8 E3.S, up to 2 GPUs or network cards

Hyper-E

SYS-222HE-TN
2U: DP, Short-depth 22.6”, 32 DIMM, 6 NVMe, 4-8 PCIe slots, 1-2 AIOM

SYS-222HE-FTN
2U: DP, FIO Short-depth 22.6”, 32 DIMM, 6 NVMe, 4-8 PCIe slots, 1-2 AIOM

DC-MHS (M-FLW)

CloudDC

SYS-122C-TN
1U: DP, 32 DIMM, 8-12 NVMe, 3 PCIe slots, 2 AIOM, DC-SCM

SYS-222C-TN
2U: DP, 32 DIMM, 8-24 NVMe, 6 PCIe slots, 2 AIOM, DC-SCM

Petascale All-Flash

SSG-122B-NE316R
1U: DP, 32 DIMM, 16 E3.S, 2 AIOM, DC-SCM

SSG-222B-NE3X24R
2U: DP, 32 DIMM, 32 E3.S, 2 AIOM, DC-SCM

Subject to change without notice

X14 UP 6700 series (SP) Product Portfolio

Rackmounts

Hyper

SYS-112H-TN
1U: UP, 16 DIMM, 8-12 NVMe, 3 PCIe slots, AIOM

SYS-212H-TN
2U: UP, 16 DIMM, 8-24 NVMe, 4-8 PCIe slots, AIOM

WIO

SYS-112B-WR
1U: UP, 8 DIMM, 10 2.5”, 3 PCIe slots, 2x1G

SYS-512B-WR
1U: UP, 8 DIMM, 4 3.5”, 3 PCIe slots, 2x1G

SYS-522B-WR
2U: UP, 8 DIMM, 8 3.5”, 4 PCIe slots, 2x1G

Twin Servers

Grand Twin

SYS-212GT-HNF
2U: UP, 16 DIMM,
option1: 8 E1.S
Option2: 4 E1.S + 1 PCIe
Option3: 4 NVMe
Option4: 2 NVMe + 1 AIOM

SYS-212GT-HNR
1U: UP, 16 DIMM, 6 NVMe, 2 AIOM

Edge & Telco

SYS-E403-14B-FRN2T
1U: UP, Compact, 8 DIMM, 3 PCIe slots

SYS-112B-FWTR
1U: UP, FIO Short Depth, UP, 8 DIMM

SYS-212B-FN2T
2U: UP, Short Depth, UP, 8 DIMM

Blade Servers

SuperBlade

SBI-612B-1NE34 / 5NE34
6U 10-node: UP, 16 DIMM, 4 E3.S,
up to 4 GPUs or network cards

SBI-612B-1C2N
6U 10-node: UP, 16 DIMM, 2 U.2 NVMe,
Up to 2 GPUs or network cards

DC-MHS (M-SDNO)

CloudDC

SYS-112C-TN
1U: UP, 16 DIMM, 8-12 NVMe, 2 PCIe slots,
AIOM, DC-SCM

X14 for Cloud Data Center

Powered by Intel® Xeon® 6700 series Processors with E-cores

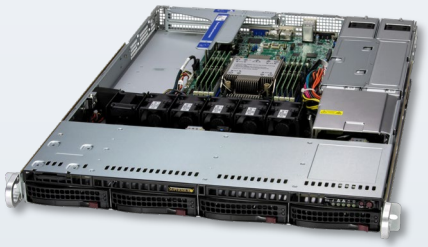
Supermicro X14 Rackmount

Hyper

Best-in-class Performance and Flexibility Rackmount Server

CloudDC with DC-MHS

All-in-one Rackmount Platform for Cloud Data Centers



WIO

Flexible Performance and Efficiency for Enterprise Applications

- **Cloud Computing**
- **Scale-out Cloud Services**
- **Scale-out Data Analytics**

1. **Full range of 1U/2U** rackmounts supporting the latest Intel Xeon 6 processors in dual socket and single socket configurations

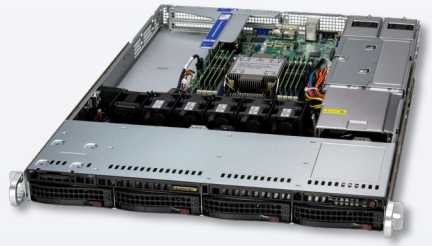
2. **Highly configurable** with vast PCIe expansion slots, hybrid storage and network flexibility

3. **New DC-MHS compliant servers** for data centers adopting multi-vendor hardware & software interoperability

X14 for Cloud Data Centers

Powered by Intel® Xeon® 6700 series Processors with E-cores

Supermicro X14 Rackmount

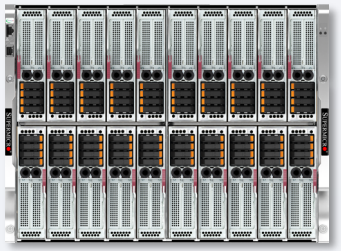


	X14 Hyper	X14 CloudDC	X14 WIO
Positioning	Flagship Enterprise	CSP/Scale-out	Entry-level, Efficiency
Segments	HPC, Enterprise, Cloud Service Providers, Storage, Virtualization, Networking	Cloud Service Providers, Hyperscale Data Centers, Enterprise	Virtualization, Cloud Computing, Data Center
Sockets	2/1	2/1	1
DIMMs	32/16	32/16	8
PCIe	Up to 3 slots (1U) Up to 8 slots (2U)	Up to 3 slots (1U) Up to 6 slots (2U)	Up to 3 slots (1U) Up to 4 slots (2U)
Drives	Up to 24 hot-swap 2.5"	Up to 24 hot-swap 2.5"	10 hot-swap 2.5“/8 hot-swap 3.5"
Key Feature	Maximum I/O flexibility	DC-MHS	UP platform

X14 for High-Density Cloud

Powered by Intel® Xeon® 6700 series Processors with E-cores

Supermicro X14 Multi-node



SuperBlade®

Highest Density Multi-Node Architecture for Cloud Applications

BigTwin®

Industry-leading Multi-node Architecture

GrandTwin®

Multi-Node Architecture Optimized for Single-Processor Performance

- **Cloud Computing**
- **Content Delivery Networks**
- **Scale-out Object Storage**

1. **Maximum core density** up to 34,560 CPU cores per rack
2. **Shared power and cooling** for PUE as low as 1.05
3. **High throughput and density for** E1.S and E3.S NVMe storage (up to 32 drives in 2U)

X14 for Cloud Data Centers

Powered by Intel® Xeon® 6700 series Processors with E-cores

Supermicro X14 Multi-Node

	X14 SuperBlade®	X14 BigTwin®	X14 GrandTwin
Positioning	Maximum core density	Award winning multi-node	Single-processor optimized
Segments	Hybrid/Private Cloud, Financial Services, CDN, vSAN, Cloud Computing	CDN, Cloud Computing, Hybrid Cloud CaaS, Big Data Analysis, Scale-out Storage	Cloud Gaming, Multi-purpose CDN, High-availability Cache Cluster, Mission-Critical Web Applications
Nodes in 48U rack	120	96	96
Sockets (node)	2/1	2	1
DIMMs (node)	32/16	16	16
PCIe (node)	Up to 4 slots	Up to 3 slots (2-node) Up to 2 slots (4-node)	Up to 1 slot (optional)
Drives (node)	Up to 8 hot-swap E3.S NVMe Up to 4 hot-swap E1.S/2.5″ NVMe	Up to 12 hot-swap 2.5″ NVMe/SAS Up to 6 hot-swap 3.5″ NVMe/SAS Up to 8 hot-swap E3.S NVMe	Up to 8 hot-swap E1.S NVMe Up to 6 hot-swap 2.5″ NVMe
Key Feature	Up to 20 nodes in 8U	Up to 8% more efficient than 1U rackmounts	Maximum memory density, front I/O

X14 for Edge and Telco

Powered by Intel® Xeon® 6700 series Processors with E-cores

Supermicro X14 Edge/Telco

- **Edge AI**
- **Telco**

Hyper-E

Best-in-class Performance and Flexibility for Edge Data Centers

Front I/O Short Depth

Compact server for the intelligent Edge

1. **Up to 3 GPUs** in a short-depth form factor

2. **2.5x** core count increase at the edge with improved performance per watt

3. **Edge and Telco Optimized** features including DC Power, NEBS compliance, rackmount and wall mount options

X14 for High Performance Storage

Powered by Intel® Xeon® 6700 series Processors with E-cores

Supermicro X14 Petascale All-Flash

- **NVMe over fabrics**
- **In-memory computing**
- **Data-intensive AI/HPC**

2U Petascale

Maximum density 2U configuration up to 32 E3.S drives with optional CXL 2.0 bays

1U Petascale

Up to 16 E3.S drives

1. **Up to 1.92PB** of NVMe flash storage in 2U
2. **Up to 2TB** additional DDR memory via optional CXL 2.0 expansion bays
3. **Symmetrical DP architecture** minimizes data paths to reduce latency

Rack Plug-and-Play Deployment at Scale

Leading Rack Manufacturing Capacity

Plug & Play Rack Integration Services

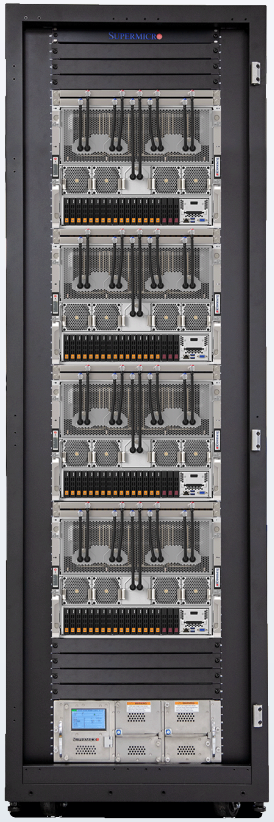
1. Consultation
2. Design
3. Assembly
4. Testing
5. Deployment
6. Support

X14 Full Portfolio of Liquid Cooling Solutions

Liquid Cooled Rack Configurations

High Density Compute Rack

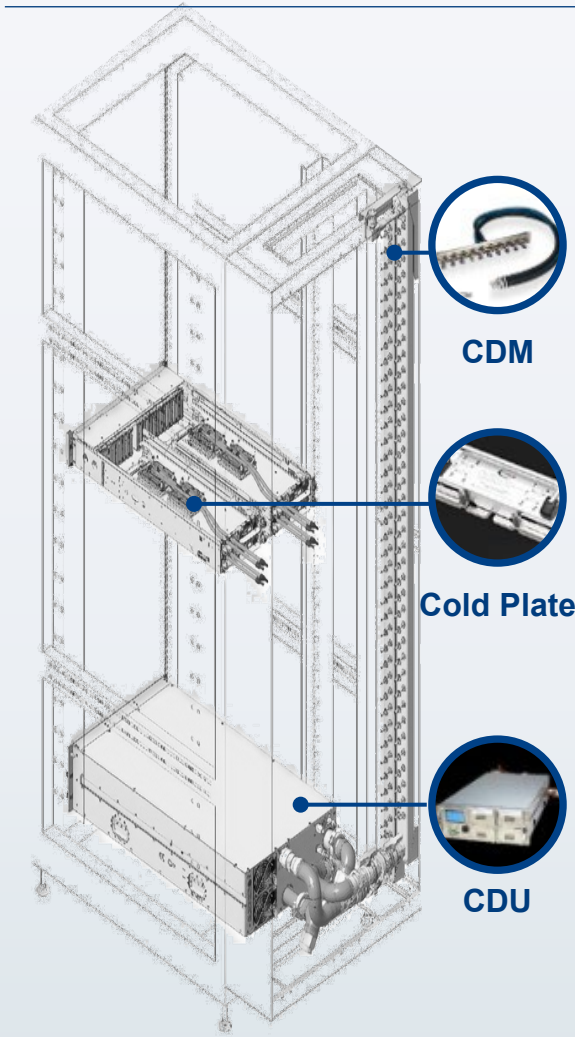
Multi-Node



GPU System

High Density GPU System

Components



Cooling Tower

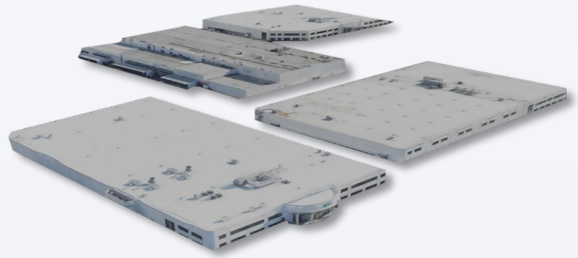
Why Supermicro X14

Most Powerful, Flexible, and Efficient Platform Ever

- Cloud-optimized architectures
- Intel Xeon 6 with E-cores
- Higher performance-per-watt

Rack-scale Solutions

- Complete integration services
- Validation up to L12
- In-house developed liquid cooling



Industry-Leading Time-to-Deployment

- Leading server production capacity
- Silicon Valley production facility

Rack-Level Performance	Performance-Per-Watt	Large Language Models
up to **3.2x** vs 2nd Gen Intel Xeon[1]	up to **2.6x** vs 2nd Gen Intel Xeon[1]	up to **2.6x** Better throughput vs 4th Gen Intel Xeon[2]

[1] Media transcode workloads vs 2nd Gen Intel Xeon Scalable processors. See [7T1] at intel.com/processorclaims: Intel® Xeon® 6. Results may vary.
[2] 1-node, 2 x 4th Gen Intel Xeon Platinum 8480+ processors vs 2 x future-gen Intel Xeon processor, codenamed Granite Rapids. See supermicro.com/x14 for more details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