

# NeXtScale System – M5

Next-generation dense platform provides superior building-block approach for hyperscale computing

## Scale, flexible, simple

Data and computing requirements continue to grow at an ever-increasing pace, posing serious challenges for space-constrained data centers. Today's organizations must perform a larger number and greater variety of functions without increasing budgets. In addition, data centers demand even higher performance, but at lower capital expense and lower operating cost.

NeXtScale™ System addresses these challenges by delivering dense performance across a variety of functions—from compute, IO, storage, and acceleration—in more cost- and energy-efficient ways than ever before. NeXtScale now provides even greater performance, efficiency, and flexibility with a choice of air-cooled or water-cooled offerings.

Choose the air-cooled NeXtScale to enable the broadest selection of server functions for a variety of workloads. Or choose the water-cooled version to create a “green” data center with energy efficient performance and lower total cost of ownership (TCO). This simple, yet powerful system can handle applications ranging from technical computing, to grid deployments, to analytics workloads, to large-scale cloud, high performance computing, and virtualization infrastructures.

## Building on a strong foundation

Extending the System x® family to a larger range of users, the space-saving NeXtScale System comprises powerful compute, storage, and GPU/Phi servers and an energy-efficient, low-cost 12-bay chassis.



## NeXtScale nx360 M5 Server— Air Cooled

This 1U tall, half-wide air cooled compute node supports a broad range of server functions, such as compute, storage/RAID, Infiniband, Ethernet, and interface to NeXtScale Native Expansion trays. The M5 version features several new enhancements for even greater performance, density and flexibility.

- Intel Xeon E5-2600 v3 processors (up to 18 core), enable as much as 432 cores per 6U chassis to deliver maximum performance at extreme density.
- 16 DIMM slots support faster 2133 MHz DDR4 memory, enabling up to 512 GB per node using 32 GB DIMMs.
- Two optional front hot-swap 2.5-inch SAS hard disk drives are supported, in addition to the HDDs in the rear cage, enabling simultaneous use of four 2.5-inch HDDs. Alternatively, customers still have the choice to use the front PCIe slot.
- A new onboard RAID slot frees up the front PCI slots for greater configuration flexibility.
- New x16 ML2 slots support InfiniBand and Ethernet adapters for increased flexibility.



NeXtScale System nx360 M5

## NeXtScale Storage Native Expansion (NeX) Tray

This 1U tall 1/2 wide storage tray provides up to seven additional 3.5-inch HDDs that can easily be attached to the nx360 M5 compute node (air cooled) to create a 2U tall, 1/2 wide storage server.

## NeXtScale PCIe Native Expansion (NeX) Tray

The PCIe NeX is a 1U tall, 1/2 wide PCIe tray that easily attaches to the nx360 M5 compute node. This allows you to attach additional PCIe adapters, such as graphics processing units (GPU) and Intel Xeon Phi Coprocessors.



NeXtScale System PCI Native Expansion Tray

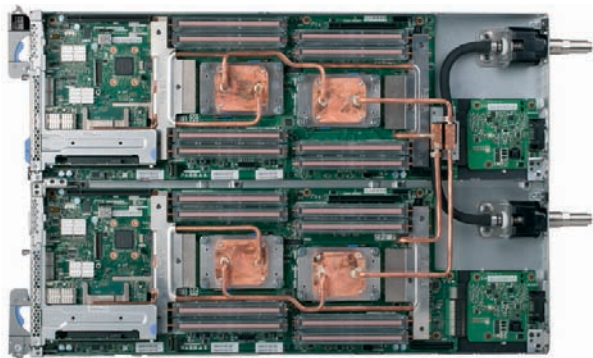
## NeXtScale System with Water Cool Technology

NeXtScale System with Water Cool Technology, a new addition to the System x family, uses an innovative direct water-cooling design to more efficiently cool system components such as processors, memory and I/O cards. Instead of using fans, water is delivered directly to the server and circulated throughout the system through cooling tubes, supporting water inlet temperatures up to 45 degrees Celsius. This makes expensive water chillers unnecessary and reduces total cost of ownership (TCO), while significantly improving energy efficiency in the data center, making for a greener environment. It also drives ongoing operational cost savings that result in quick payback of initial investment and continued savings for lower TCO. This is particularly essential in geographies with high electricity costs or high cost of floor space.

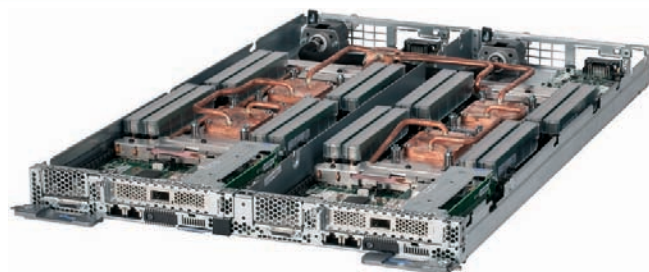
Some key benefits of NeXtScale with Water Cool Technology include:

- 40 percent energy efficiency advantage and 10 percent power advantage over air-cooled systems
- 80 percent less noise due to no fans
- >85 percent of heat can be recovered from the system and can be used for other purposes such as heating other buildings and facilities
- Makes PUE of 1.1 possible for data centers (compared to typical PUE of 1.4 for air-cooled data centers)

The NeXtScale System with Water Cool Technology comprises powerful compute nodes, along with unique chassis and manifolds with an innovative water-cooled design.



Water Cooling Technology more efficiently cools system components such as processors, memory, and I/O cards.



The nx360 M5 WCT delivers innovative Water Cool Technology to drive even greater energy efficiency and performance into the data center.

## NeXtScale nx360 M5 WCT Compute Tray

This 1U full-wide compute tray includes two half-wide server nodes that are cooled by innovative Water Cool Technology (WCT) to drive even greater energy efficiency and performance into the data center. It supports the following platform features:

- Intel Xeon E5-2600 v3 processors (up to 18 cores) are allowed to run in Turbo mode continuously due to efficient Water Cool Technology, enabling the highest possible compute performance.
- 16 DIMM slots support faster 2133 MHz DDR4 memory, enabling up to 512 GB per node using 32 GB DIMMs.
- New x16 ML2 slots support InfiniBand and Ethernet adapters for increased flexibility.

## NeXtScale n1200 Enclosure

The NeXtScale n1200 Enclosure is an efficient, 6U, 12-bay chassis for air cooled solutions. No chassis-level management is required, due to no built-in networking or switching capabilities. Designed to provide shared, high-efficiency power and cooling for housed servers, the n1200 enclosure scales with your business needs. Adding compute, storage, or acceleration capability is as simple as adding specific nodes to the chassis, without any contention for resources. With up to 84 compute servers per rack, this chassis doubles the density of typical racks.

The NeXtScale n1200 WCT Enclosure utilizes Water Cool Technology to cool six full-wide nx360 M5 WCT compute trays, each housing two high-performance compute nodes, for a total of 12 servers per 6U chassis. Uniquely designed for water cooling, this chassis requires no internal fans. It connects to water manifolds that manage inlet and outlet water flows directly to each compute node.



NeXtScale n1200 Enclosure

## Why System x

System x is the leading provider of x86 systems for the data center. The portfolio includes rack, tower, blade, dense and converged systems, and supports enterprise class performance, reliability and security. System x also offers a full range of networking, storage, software and solutions, and comprehensive services supporting business needs throughout the IT lifecycle.

## Specifications - M5 Air and Water-Cooled Nodes

<b>Cooling</b>	Air Cooled	Water Cool Technology
<b>Form factor/height</b>	Half-wide 1U	Full-wide 1U tray including two half-wide compute nodes
<b>Processor</b>	Two Intel Xeon E5-2600 v3 series (4 core to 18 core)	
<b>Memory</b>	16 DDR4 LP, 512 GB maximum with 32 GB LP LRDIMM	
<b>Chassis support</b>	NeXtScale n1200 Enclosure	NeXtScale n1200 WCT Enclosure
<b>Local storage</b>	Choice of one 3.5-inch hard disk drive (HDD), two 2.5-inch HDDs/solid-state drives (SSDs) (simple swap), or four 1.8-inch SSDs. Optional two front hot-swap 2.5-inch HDDs.	No local storage
<b>Storage Native Expansion (NEX) Tray</b>	7x 3.5-inch SAS/SATA HDDs	No Storage NEX support
<b>Internal RAID*</b>	Onboard SATA controller with RAID options	No Raid support
<b>PCIe RAID*</b>	ServeRAID M1200 series adapter	No PCIe Raid support
<b>USB ports</b>	One internal USB key	One internal USB key per 1/2 wide server
<b>Ethernet</b>	Two built-in 1 Gigabit Ethernet (GbE) ports standard	2x built in 1GbE standard per 1/2 wide server
<b>Input/output</b>	Two ML2 ports for InfiniBand FDR or 10 GbE*, two 10 GbE* one PCIe (x16 PCI Express 3.0)*	2x FDR InfiniBand ports per 1/2 wide server
<b>PCIe native Expansion (NEX) Tray</b>	2 x16 Full Height Full Length and 1 Half Length x8	No PCIe NEX support
<b>Power management</b>	Rack-level power capping and management via Extreme Cloud Administration Toolkit (xCAT)	
<b>Systems management</b>	1x shared port with 1GbE per 1/2 wide server	
<b>Operating Systems supported</b>	SUSE Linux Enterprise Server, Red Hat Enterprise Linux	
<b>Limited warranty</b>	3-year customer replaceable unit and onsite limited warranty, next business day 9x5, service upgrades available	

## Specifications - n1200 Enclosure

	NeXtScale n1200 Enclosure	NeXtScale n1200 WCT Enclosure
<b>Cooling</b>	Air Cooled	Water Cool Technology
<b>Form factor</b>	6U NeXtScale, standard rack	6U NeXtScale, standard rack
<b>Bays</b>	12 half-wide bays (air cooled)	6 full-wide bays (water cooled) – supports two nodes/bays
<b>Power supply</b>	Six hot-swappable, non-redundant, N+N or N+1 redundant 80 PLUS® Platinum, high energy efficiency, 900 W and 1300 W	
<b>Fans*</b>	10 hot-swappable	No fans
<b>Controller</b>	One fan and power controller	

\* Air-cooled version only.

## Options

16 GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000  
CL15 2133MHz LP RDIMM  
95Y4821

Add more TruDDR4 Memory to help improve the performance of your workloads

6 TB 7.2K 6Gbps NL SATA 3.5" 512e HDD for  
NextScale System  
00FN183

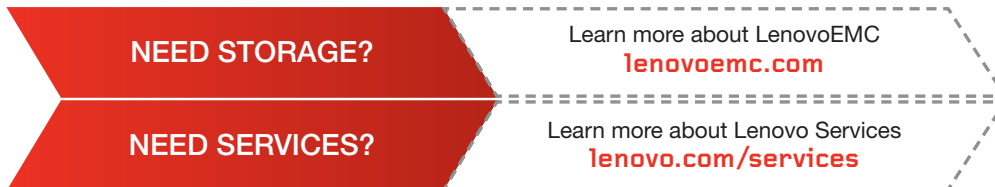
Optimize storage with high density and low cost per GB hard drives

Mellanox ConnectX-3 Pro ML2 2x40GbE/FDR VPI  
Adapter  
00FP650

QDR/FDR Infiniband & 10/40G Ethernet for High Performance Computing

## For more information

To learn more about the NeXtScale System – M5, contact your Lenovo Business Partner or visit [lenovo.com/thinkserver](http://lenovo.com/thinkserver)



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