

## Portfolio Guide

# Lenovo Portfolio for the Data Center



## **Transform your IT Infrastructure into a growth engine for your business**

The IT industry is continually evolving. Today's innovations in cloud, big data, analytics and mobile solutions require IT organizations to remain agile and efficient to drive business growth. Even greater levels of optimization and efficiencies will be required of the next-generation data center to create competitive advantage.

Most organizations have increasing server and storage needs, but typically, resources and budgets aren't keeping pace with the escalating IT demand. We're here to help. Lenovo offers open server, storage, networking and management platforms that run the best operating systems and applications without surprises – with industry-leading security, reliability, and record-setting performance. Most importantly, Lenovo provides these products and solutions at the most competitive prices in the industry.

Let us handle the basics of your IT infrastructure so you can focus on your business – investing in the opportunities that impact your future growth and competitive success.

## Why Lenovo for your data center?

**Reduce the cost of your IT** – At our core, Lenovo builds computing machines, but we create value for you not by cutting quality, or by reducing features and functionality that you want. Instead we provide price leadership with innovation that matters. We bend down the cost curve of IT throughout its lifecycle, so you can reinvest the savings in your own business priorities.

**Increase agility** – Lenovo provides open products built on industry standards, so it's easier for you to deploy solutions and integrate into your existing environment. For example, our management software integrates with the VMware and Microsoft consoles you already use.

Lenovo also delivers the best solutions for your needs by leveraging best-of-breed partners, giving you choice and freedom and protecting you from vendor lock-in.

**Gain competitive advantage** – You can rest assured that Lenovo takes the quality, reliability and security of the products we sell very seriously. Unplanned downtime is costly to your business. For the third year in a row, Lenovo servers were rated the most reliable x86 servers in the world according to the latest ITIC 2015-2016 Global Server Hardware and OS Reliability Survey. Security breaches can be catastrophic to your business. Lenovo goes beyond the norm, designing and building servers with the most transparent, auditable and secure supply chain in the server industry.

By providing the strongest foundation of performance, reliability and security in the industry, Lenovo delivers an end-to-end portfolio of compute, storage and networking capabilities that seamlessly integrate and interoperate with your environment, and are optimized to lower your costs.

Let us show you how.

## The Lenovo Rack Server Portfolio

### BALANCED DESIGN. BUILT FOR BUSINESS.

Lenovo rack systems feature innovative hardware, software and services that solve customer challenges today and deliver an evolutionary fit-for-purpose, modular design approach to address tomorrow's challenges. These servers capitalize on best-in-class, industry-standard technologies coupled with differentiated Lenovo innovations to provide the greatest possible flexibility in x86 servers.

Key advantages of deploying Lenovo rack servers include:

- Highly scalable, modular designs to grow with your business
- Industry-leading resilience to save hours of costly unscheduled downtime
- Expansive storage capacity and flexible storage configurations for optimized workloads
- Fast flash technologies for lower latencies, quicker response times and smarter data management in real-time

For cloud deployments, database, or virtualization workloads, trust Lenovo racks for world-class performance, power-efficient designs and extensive standard features at an affordable price.



Lenovo System x3850 X6



## The Lenovo Rack Server Portfolio

Lenovo Models	System x3650 M5	System x3550 M5
Form Factor	Rack/2U	Rack/1U
Processor	Up to two Intel® Xeon® Processors E5-2600 v4 series (22-core) up to 145W	Up to two Intel® Xeon® Processors E5-2600 V4 series (22-core) up to 145W
Memory (std/max)	24 DIMM slots, maximum 1.5TB with 64GB TruDDR4 2400 MHz RDIMMs, LRDIMM	24 DIMM slots, maximum 1.5TB with 64GB TruDDR4 2400 MHz RDIMMs, LRDIMM
Expansion slots	Up to eight PCIe 3.0 slots	Up to three PCIe 3.0 slots
Maximum internal storage	Up to 120TB	Up to 46TB
Network interface	Quad-port GbE with additional port GbE for dedicated remote management	Quad-port GbE with additional port GbE for dedicated remote management
Power supply (std/max)	Redundant 550W/750W/900W/1500W AC 80 PLUS® Platinum, or redundant 750W/1300W AC 80 PLUS® Titanium	Redundant 550/750W/900W/1500W AC 80 PLUS® Platinum, or redundant 750W AC 80 PLUS® Titanium
RAID support	RAID -0, -1, -10 with optional RAID-5, upgrade	RAID -0, -1, -10 with optional RAID-5, upgrade
OS support (Available for purchase)	Microsoft Windows Server 2012/2008 R2, Windows Server 2012, SUSE Linux Enterprise Server, RedHat Enterprise Linux Server, VMware ESXi	Microsoft Windows Server 2012/2008 R2, Windows Server 2012, SUSE Linux Enterprise Server, RedHat Enterprise Linux Server, VMware ESXi

## The Lenovo Rack Server Portfolio

Lenovo Models	ThinkServer RD650*	ThinkServer RD550*
Form Factor	Rack/2U	Rack/1U
Processor	Up to two Intel® Xeon® Processors E5-2600 v4 series (22-core), up to 145W	Up to two Intel® Xeon® Processors E5-2600 v4 series (22-core), up to 145W
Memory (std/max)	24DIMM slots, maximum 1.5TB with DDR4 2400 MHz RDIMMs, LRDIMM	24DIMM slots, maximum 1.5TB with DDR4 2400 MHz RDIMMs, LRDIMM
Expansion slots	Up to eight PCIe 3.0 slots	Up to three PCIe 3.0 slots
Maximum internal storage	Up to 100TB; Optional AnyBay available for PCIe SSD support	Up to 36TB; Optional AnyBay available for PCIe SSD support
Network interface	One AnyFabric slot for selectable NIC with additional dedicated management port	Up to two AnyFabric slots for selectable NICs with additional dedicated management port
Power supply (std/max)	550W/750W/1100W/1600 Platinum, redundant PSU 750W Titanium, Redundant PSU, HVDC supported	550W/750W/1100W Platinum, Redundant PSU 750W Titanium, Redundant PSU, HVDC supported
RAID support	1x AnyRAID; SW RAID-0, -1, -10, optional RAID-5 upgrade HW RAID-0, -1, -10, -5, -50, -6, -60	1x AnyRAID; SW RAID-0, -1, -10, optional RAID-5 upgrade HW RAID-0, -1, -10, -5, -50, -6, -60
OS support (Available for purchase)	Microsoft Windows Server 2012/2012 R2, Windows Server Storage 2012/2012 R2 Standard, Windows Multipoint Server 2012 SUSE Linux Enterprise Red Hat Enterprise Linux VMware ESXi	Microsoft Windows Server 2012/2012 R2, Windows Server Storage 2012/2012 R2 Standard, Windows Multipoint Server 2012 SUSE Linux Enterprise Red Hat Enterprise Linux VMware ESXi

\*Avail in limited Geographies

## The Lenovo Rack Server Portfolio

Lenovo Models	ThinkServer RD450	ThinkServer RD350
Form Factor	Rack/2U	Rack/1U
Processor	Up to two Intel® Xeon® Processors E5-2600 v4 series (14-core) up to 105W	Up to two Intel® Xeon® Processors E5-2600 V4 series (14-core) up to 105W
Memory (std/max)	16DIMM slots, maximum 1TB with DDR4 2400 MHz RDIMMs, LRDIMM	16DIMM slots, maximum 1TB with DDR4 2400 MHz RDIMMs, LRDIMM
Expansion slots	Up to six PCIe 3.0 slots	Up to two PCIe 3.0 slots
Maximum internal storage	Up to 64TB	Up to 32TB
Network interface	Dual-port GbE with additional port GbE for dedicated remote management	Dual-port GbE with additional port GbE for dedicated remote management
Power supply (std/max)	Redundant 450W 80 PLUS® Gold, or redundant 550W/750W/1100W 80 PLUS® Platinum, or redundant 750W 80 PLUS® Titanium	Redundant 450W 80 PLUS® Gold, or redundant 550/750 W 80 PLUS® Platinum, or redundant 750W 80 PLUS® Titanium
RAID support	2.5" : Optional AnyRAID; RAID -0, -1, -5, -6, -10, -50, -60 3.5" : Integrated RAID -0, -1, -10 with optional RAID-5 upgrade; Optional RAID -0, -1, -5, -6, -10, -50, -60	Integrated RAID -0, -1, -10 with optional RAID-5 upgrade; Optional RAID -0, -1, -5, -6, -10, -50, -60
OS support (Available for purchase)	Microsoft Windows Server 2012/2008 R2, Windows Server 2012, SUSE Linux Enterprise Server, RedHat Enterprise Linux Server, VMware ESXi	Microsoft Windows Server 2012/2008 R2, Windows Server 2012, SUSE Linux Enterprise Server, RedHat Enterprise Linux Server, VMware ESXi

## The Lenovo Rack Server Portfolio

Lenovo Models	System x3250 M6	System x3250 M5	ThinkServer RS140
Form Factor	Rack/1U	Rack/1U	Rack/1U
Processor	Intel® Xeon® Processor E3-1200 v5 series or Core i3 or Pentium or Celeron up to 2133MHz	Intel® Xeon® Processor E3-1200 v3 series or Core i3 or Pentium up to 1600MHz, or Celeron up to 1333MHz	Up to one Intel® Xeon® Processor E3-1200 v3 series, core i3, Pentium, or Celeron up to 1600MHz
Memory (std/max)	4DIMM slots, maximum 64GB TruDDR4 ECC 2133MHz UDIMMs	4DIMM slots, maximum 32GB DDR3 ECC 1600MHz UDIMMs	4DIMM slots, maximum 32GB with DDR3 1600MHz UDIMMs
Expansion slots	One PCIe 3.0 and one PCIe 3.0 slot dedicated for ServerRAID M1210	One PCIe 3.0 and one PCIe 3.0 slot dedicated for ServerRAIDH1110	One PCIe 3.0 slot
Maximum internal storage	Up to 24TB	Up to 24TB	Up to 12TB
Network interface	Dual-port GbE	Dual-port GbE with additional dual-port GbE via FoD	Dual-port GbE with additional port GbE for dedicated remote management
Power supply (std/max)	Single 300W fixed or up to two redundant hot swap 460W high efficiency	300W fixed or redundant, redundant 460W high efficiency	300W fixed 80 PLUS® Gold
RAID support	Optional RAID -0,-1,-5, -6, -10, -50, -60	Optional RAID -0,-1,-5, -6, -10, -50, -60	Integrated RAID -0, -1, -5, -10; Optional RAID500 adapter -0, -1, -10; RAID-5 with upgrade key; Optional RAID700 adapter -0, -1, -10, -5, -6
OS support (Available for purchase)	Microsoft Windows Server 2012 R2, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware vSphere/ESXi (certified); Ubuntu (tested)	Microsoft Windows Server 2012/2008 R2, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware vSphere/ESXi	Microsoft Windows Server 2012/2008 R2, Windows Server 2012, Windows Small Business Server 2011, Novel SUSE Linux Enterprise Server, Red Hat Enterprise Linux Server, VMware ESXi



## The Lenovo Rack Server Portfolio

Lenovo Models	System x3750 M4	System x3850 X6	System x3950 X6
Form Factor	Rack/2U	Rack/4U	Rack/8U
Processor	Up to four Intel® Xeon® Processors E5-4600 v2 series (12-core) up to 1866MHz	Up to four Intel® Xeon® Processors E7-4800/8800 v3 series families up to 3.2GHz, up to 1600MHz memory access (DDR3), and up to 1866MHz (DDR4), 18 cores per processor	Up to eight Intel® Xeon® Processors E7-8800 v3 series families up to 3.2GHz, up to 1800MHz (DDR4) memory access, 18 cores per processor
Memory (std/max)	48 DIMM slots, maximum 1.5TB with DDR3 32GB LRDIMMs	Up to 6TB, 96DIMM slots supporting 64GB LRDIMMs	Up to 12TB, 192 x 64GB LRDIMMs
Expansion slots	Up to eight PCIe slots; five PCIe standard with an additional three PCIe slots with expansion riser	Up to 11 PCIe; Gen3 (up to 11), Gen 2 (up to 2), up to five x16 slots; up to six full-length, full-height	Up to 22 PCIe; Gen3 (up to 22), Gen 2 (up to 4), up to ten x16 slots; up to 12 full-length, full-height
Maximum internal storage	19.2TB of 2.5-inch hot-swap SAS/SATA or up to 25.6TB 1.8-inch eXFlash SSDs	Up to 9.6TB (8 x 2.5-inch SAS/SATA HDDs) or up to 12.8TB (8 x 2.5-inch SSDs) or 6.4TB (16 x 1.8-inch eXFlash SSDs)	Up to 19.2TB, 16 x 2.5-inch SAS/SATA hard disk drives (HDDs) or up to 25.6TB, 16 x 2.5-inch SSDs or 12.8TB, 32 x 1.8-inch eXFlash SSDs
Network interface	Mezzanine LOM gives choice of quad 1GbE or dual 10GbE adapters, 8 PCIe slots	One ML2 Socket; ML2 card choices include: 4 x 1GbE copper or 2 x 10GbE SFP+ or 2 x 10GbE 10BaseT; Dedicated 1GbE on-board management port	Two ML2 Sockets; ML2 card choices include: 4 x 1GbE copper or 2 x 10GbE SFP+ or 2 x 10GbE 10BaseT; Two dedicated 1GbE onboard management ports
Power supply (std/max)	750W, 900W or 1400W redundant power	Up to four common 1400W or 900W AC or 4 x 750W DC	Up to eight common 1400W or 900W AC or 8 x 750W DC
RAID support	ServeRAID-M5210e RAID on motherboard, with Gen3 SAS controller. RAID-0, -1, -10 (standard) with -5, -50 and -6, -60 upgrades	RAID-0, -1, optional RAID-5, -6, -50, -60	RAID-0, -1, -10, optional RAID-5, -6, -50, -60
OS support (Available for purchase)	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware vSphere	Microsoft Windows Server, Red Hat Enterprise Linux Server, SUSE Linux Enterprise Server, VMware vSphere Hypervisor	Microsoft Windows Server, SUSE Linux Enterprise Server, Red Hat Enterprise Linux Server, VMware vSphere Hypervisor

## The Lenovo Tower Server Portfolio

**WORKLOAD HUNGRY. BUDGET FRIENDLY.**

Lenovo single-socket and dual-socket tower servers provide the balance of performance, reliability, scalability and easy-to-use tools in a compact design to help meet general business requirements.

Key advantages of Lenovo tower servers include:

- Innovation and performance at entry-level prices
- Compact design compatible for your environment
- Reliable, easy-to-manage and safe, with industry-leading security innovation built in

Lenovo tower servers are ideal to handle behind-the-scenes IT tasks for small-and-medium-sized organizations – from schools deploying virtual desktop sessions or blackboard applications, to retail deployments, to distributed environments like banks with multiple locations.



ThinkServer TD350



## The Lenovo Tower Server Portfolio

Lenovo Models	System x3500 M5	ThinkServer TD350	System x3100 M5
Form Factor	Tower, 5U rack mountable	Tower, 4U rack mountable	Tower, 4U or 5U rack mountable
Processor	Up to two Intel® Xeon® Processors E5-2600 v3 series (18-core) up to 2133MHz	Up to two Intel® Xeon® Processors E5-2600 v4 series (20 core), up to 2400MHz	Intel® Xeon® Processor E3-1200 v3 series (4-core) or Core i3 (2-core) or Pentium (2-core) up to 1600MHz, or Celeron (2-core) up to 1333MHz
Memory (std/max)	Up to 24 DIMM slots, up to 1.5TB with 64GB TruDDR4 Memory LRDIMMs	16DIMM slots, maximum 1TB with DDR4 2400MHz RDIMM	4DIMM slots, maximum 32GB DDR3 ECC 1600MHz UDIMMs
Expansion slots	Up to seven PCIe 3.0 slots	Up to seven PCIe 3.0 slots	Two PCIe 3.0 and two PCIe 2.0 slots
Maximum internal storage	Up to 123TB	Up to 120TB; M.2 SSD and SD card options available	Up to 24TB
Network interface	Quad-port Gigabit Ethernet and single-port IMM2 standard; optional 10GbE PCIe adapters	Dual-port GbE with dedicated management port	Dual-port GbE
Power supply (std/max)	1/2 hot-swap redundant 550/750/900/1500W AC, 80 PLUS Platinum or 750W 80 PLUS Titanium	550W/750W/1100W Platinum, redundant PSU, 750W Titanium, redundant PSU, HVDC supported	300W fixed 80 PLUS® Bronze or 350W fixed (4U models); or 430W redundant 80 PLUS® Silver
RAID support	Up to two 12Gbps hardware RAID adapters -0, -1, -10 with RAID-5, -50, -6, -60 upgrades	Optional AnyRAID; Optional RAID -0, -1, -5, -6, -10, -50, -60	Integrated RAID -0, -1, -10; Optional RAID -0, -1, -5, -6, -10, -50, -60
OS support (Available for purchase)	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise, VMware vSphere - (optional USB Key or SD Media Adapter)	Microsoft Windows Server 2012 R2, Windows Server 2012, Windows Small Business Server 2011, Novel SUSE Linux Enterprise Server, Red Hat Enterprise Linux Server, VMware ESXi, Citrix XenServer	Microsoft Windows Server 2012/2008 R2, Red Hat Enterprise Linux, SUSE Linux, VMware ESX

## The Lenovo Tower Server Portfolio

Lenovo Models	ThinkServer TS440	ThinkServer TS140
Form Factor	Tower, 5U rack mountable via conversion tray	Tower, 4U rack mountable via conversion tray
Processor	Intel® Xeon® Processor E3-1200 v3 series (4-core) or Core i3 (2-core) or Pentium (2-core) up to 1600MHz, or Celeron (2-core) up to 1333MHz	Intel® Xeon® Processor E3-1200 v3 series (4-core) or Core i3 (2-core) or Pentium (2-core) up to 1600MHz, or Celeron (2-core) up to 1333MHz
Memory (std/max)	4DIMM slots, maximum 32GB DDR3 ECC 1600MHz UDIMMs	4DIMM slots, maximum 32GB DDR3 ECC 1600MHz UDIMMs
Expansion slots	One PCIe 3.0, two PCIe 2.0, and one PCI slots	One PCIe 3.0, two PCIe 2.0, and one PCI slots
Maximum internal storage	Up to 32TB	Up to 16TB
Network interface	<ul style="list-style-type: none"> <li>•Integrated 1 port 1Gb NIC</li> <li>•1Gbe1 port/2 port/4 port add-in NIC</li> </ul>	<ul style="list-style-type: none"> <li>•Integrated 1 port 1Gb NIC</li> <li>•1Gbe 1 port/2 port/4 port add-in NIC</li> </ul>
Power supply (std/max)	450W fixed 80 PLUS® Platinum PSU; or 450W redundant 80 PLUS® Gold PSU	280W fixed 80 PLUS® Bronze PSU; or 450W fixed 80 PLUS® Platinum PSU
RAID support	Integrated RAID -0, -1,-5, -10; Add in entry RAID -0, -1, -10 and Optional RAID -5 key; Add in advanced RAID -0, -1, -5, -6, -10, -50	Integrated RAID -0, -1, -5, -10
OS support (Available for purchase)	Microsoft Windows 7 and Windows 8, Microsoft Windows Server 2012/2008 R2, Red Hat Enterprise Linux, SUSE Linux, VMware ESXi	Microsoft Windows 7 and Windows 8, Microsoft Windows Server 2012/2008 R2

## The Lenovo Tower Server Portfolio

Lenovo Models	ThinkServer TS450 (available in AP, PRC only)	ThinkServer TS150 (available in AP, PRC only)
Form Factor	Tower, 5U rack mountable via conversion tray	Tower, 4U rack mountable via conversion tray
Processor	Intel® Xeon® Processor E3-1200 v5 series or Core i3 or Pentium or Celeron (4-core) up to 2133MHz,	Intel® Xeon® Processor E3-1200 v5 series or Core i3 or Pentium or Celeron (4-core) up to 2133MHz
Memory (std/max)	4DIMM slots, maximum 64GB DDR4 ECC 2133MHz UDIMMs	4DIMM slots, maximum 64GB DDR4 ECC 2133MHz UDIMMs
Expansion slots	Four PCIe 3.0 slots	Four PCIe 3.0 slots
Maximum internal storage	Up to 48TB	Up to 24TB
Network interface	<ul style="list-style-type: none"> <li>• Integrated 1- Port 1Gbe</li> <li>• 1-port / 2-port / 4-port 1Gbe and 2-port 10Gbe add in NIC</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated 1- Port 1Gbe</li> <li>• 1-port , 2-port and 4-port 1Gbe add in NIC</li> </ul>
Power supply (std/max)	450W fixed 80 PLUS® Platinum PSU; or 450W redundant 80 PLUS® Gold PSU	280W fixed 80 PLUS® Bronze PSU; or 450W fixed 80 PLUS® Platinum PSU
RAID support	Integrated RAID -0, -1,-5, -10; Add in entry RAID -0, -1, -10 and Optional RAID -5 key; Add in advanced RAID -0, -1, -5, -6, -10, -50	Integrated RAID -0, -1, -5, -10; Add in entry RAID -0, -1, -10 and Optional RAID -5 key;
OS support (Available for purchase)	Microsoft Windows 7 and Windows 8.1, Microsoft Windows Server 2012 R2, Red Hat Enterprise Linux, VMware ESXi	Microsoft Windows 7 and Windows 8.1, Microsoft Windows Server 2012 R2, Red Hat Enterprise Linux, VMware ESXi

## The Lenovo Flex System Portfolio

### THE NEXT GENERATION OF BLADE SERVER TECHNOLOGY.

Flex System is a new category of Converged Infrastructure and next-generation blade platform. Flex System simplifies infrastructure deployment via integration. It is built on a robust enterprise chassis with integrated compute and networking, with Lenovo XClarity management and several storage choices.

Key advantages of deploying Flex System-based infrastructure include:

- Save money by consolidating workloads to an efficient, space and energy-saving infrastructure
- Optimized for virtualization: Run the same workloads on fewer blades than HP
- Easily upgrade to future technologies – no rip and replace
- Lenovo XClarity reduces the time and steps required for common administrative tasks

Flex System is targeted for major enterprise applications like virtualization, cloud, database and analytics and has clients across major industries – banking/finance, education, government, telecom and manufacturing.

Flex System helps reduce cost, increase agility and improve efficiency.



Flex System



## The Lenovo Flex System Portfolio

Lenovo Models	Flex System x240 M5	Flex System x440	Flex System x480/x880 X6
Form Factor	Scalable to two Intel® Xeon® Processors E7-2800 v2 series up to 2.8GHz, up to 1600MHz memory access, 15 cores per processor	Scalable to four Intel® Xeon® E5-4600 v2 family processors up to 3.3GHz, up to 1600MHz memory access, and up to 12 cores per processor	Scalable to eight Intel® Xeon® E7-8800 (x880) or four E7-4800 (x480) v3 family processors up to 3.2GHz, up to 2133MHz memory access, 18 cores per processor
Processor	Half-wide compute node. Up to 14 per chassis	Full-wide compute node. Up to 7 per chassis	Full-wide 2X high (x480) up to 3 per chassis, or 4X high (x880) 1 per chassis
L3 Cache (max)	Up to 45MB/Processor	Up to 30MB/Processor	Up to 45MB/Processor
Memory (std/max)	Up to 1.5TB, 24 DIMM slots supporting 4/8/16/32/64GB DDR4 DIMMs (RDIMM, LR-DIMM)	Up to 1.5TB, 48 DIMM slots supporting 8/16/32GB DDR3 DIMMs (RDIMM, LR-DIMM)	x880 – up to 12TB,192DIMM x480-up to 6TB 96 DIMM Supporting 4/8/16/32/64GB DDR3 (RDIMM,LR-DIMM)
Expansion slots	Optional PCIe Expansion Node Gen 3 with up to 2 x16 slots or up to 2 x8 slots	Up to 4 PCIe Gen 3; up to 4 x16 slots; up to 4 x8 slots	x880 – up to 16 PCIe Gen 3; up to 8 x16 slots; up to 8 x8 slots. x480- up to 8 PCIe Gen 3; up to 4 8 x16 slots up to 4 8 x8
Drive bays (total/hot-swap)	Two 2.5-inch SAS/SATA/SSD/PCIe hot-swap drives, or four 1.8-inch SSDs with upgrade option	Two 2.5-inch SAS/SATA/SSD hot-swap drives, or eight 1.8-inch SSDs with upgrade option	Eight (x880) or four (x480) 2.5-inch SAS/SATA/SSD/PCIe hot-swap or sixteen (x880) or eight (x480) 1.8-inch SSDs w/ upgrade opt. Up 24 eXFlash DIMMs on both x880 & x480
Maximum internal storage	Up to 4TB (2x 2.5 inch PCIe NVMe 2.0TB drives) or, up to 3.2TB (2 x 2.5-inch SAS/SATA/SSD 1.6TB drives) or up to 3.2TB (4 x 1.8-inch SSD 800GB drives).	Up to 6.4TB (8x 1.8-inch SATA SSD 800GB drives) or up to 3.2TB (2 x 2.5-inch SAS/SATA/SSD 1.6TB drives)	x880 – Up to 12.8TB (16x 1.8-inch SAS/SATA 800GB drives, or 8x 2.5-inch 1.6TB drives); x480 – half of x880 capacities Up to 9.4TB (24x 400GB eXFlash DIMMs) on both
Network interface	LOMless. 2 PCIe Mezzanine card slots supporting 1/10/40Gb Ethernet, Fibre Channel or Infiniband adapters	LOMless. 4 PCIe Mezzanine card slots supporting 1/10/40Gb Ethernet, Fibre Channel or Infiniband adapters	LOMless.16 (x880) or 8 (x480) PCIe Mezzanine card slots supporting 1/10/40Gb Ethernet, Fibre Channel or Infiniband adapters
RAID support	RAID -0, -1, Optional 5	RAID -0, -1, Opt. -5, -6, -10, -50	RAID -0, -1, Optional -5
OS support (Available for purchase)	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware vSphere		
Target Workloads	Virtualization, Cloud	High-end Virtualization, Midrange Database	Mission Critical, Analytics, Big Data

## The Lenovo NeXtScale System Portfolio

### EXTREME SCALABILITY. ENHANCED PERFORMANCE.

The NeXtScale System is an ultra-dense, scale-out platform with an innovative approach to maximum usable density. Optimized to handle high-performance, clustered workloads that demand flexibility, NeXtScale System helps to deliver insight faster. This simple, yet powerful, system can handle applications ranging from technical computing, to grid deployments, to analytics workloads, to large-scale cloud and virtualization infrastructures.

Key advantages of deploying NeXtScale System include:

- Cost-optimized “Essentials Only” platform that delivers the compute power that’s needed and nothing else
- Extreme density with reduced power and cooling costs – without sacrificing performance
- Flexible mix-and-match configurations and simple architecture mean a single platform for all workload requirements whether dense compute, dense storage, or extreme acceleration via GPUs or co-processors is needed

As data and computing requirements continue to grow at an ever-increasing pace, posing serious challenges for space-constrained data centers, NeXtScale addresses workload 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. Designed with industry-standard, off-the-shelf components, this general-purpose platform enables users to create a flexible, mix-and-match offering with compute, storage, and acceleration via graphics processing unit (GPU) or Intel® Xeon® Phi coprocessor. NeXtScale System provides the scale, flexibility and simplicity to help clients solve problems faster.



NeXtScale System





## The Lenovo NeXtScale System Portfolio

### NeXtScale System M5 Compute Node

Form Factor/height	Half-wide 1U
Processor	Two Intel® Xeon® Processors E5-2600 v4 series (up to 22 core)
Memory (std/max)	16 DDR4 LP, 1024GB maximum with 64GB LP LRDIMM
Chassis support	NeXtScale n1200 Enclosure
Local storage	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.
Storage Native Expansion (NeX) Tray	7x 3.5-inch SAS/SATA HDDs
Internal RAID	Onboard SATA controller with RAID options
USB Ports	One internal USB key
Input/Output	Two ML2 ports for InfiniBand FDR or 10GbE, two 10GbE one PCIe (x16 PCI Express 3.0)
Systems Management	1x shared port with 1GbE per 1/2 wide server
OS support (Available for purchase)	SUSE Linux Enterprise Server, Red Hat Enterprise Linux, Microsoft Windows Server, VMware

## Lenovo Storage

As data needs grow, you need a company you can count on to provide feature-rich, flexible products which are optimized for your business. IT budgets are not growing at the same pace as storage needs, so it is important for Lenovo to provide customers with enterprise-class features they need at prices they want. This includes features like storage tiering, thin provisioning, and data encryption all in an easy to use interface.

Along with affordable high-end features, we strive to ensure our products are non-disruptive into any environment. Our customers can choose which architecture, protocols and vendors are right for them. Lenovo offers a variety of SAN, DAS, NAS and tape offerings to fit any of your storage needs. This flexibility we offer our customers is unique for IT manufacturers.

Finally, our customers can count on us to be with them every step of the way. Not only do we understand the need for great products at affordable prices, we know the importance of developing a growing relationship with our customers, enabling them to grow their IT along with the natural growth of their business.

Lenovo's storage portfolio is growing stronger all the time, not only do we offer a wide range of IT products as a whole, but our storage portfolio has something for just about everyone. In our SAN portfolio, we offer two product lines: Lenovo Storage and IBM Storwize.

### Lenovo Storage S2200 and S3200

These are extraordinary products focused on simplicity, speed, scalability and availability. The intuitive management interface to these products automates complex configurations and operations so customers will not need additional IT resource to manage them. Additionally, they are designed to deploy into a wide variety of environments without disrupting normal business operations. Within the management interface are the enterprise-class features customers want and need, like: Intelligent Real-time Tiering, thin provisioning, SSD read cache, virtual snapshots, rapid RAID rebuild and virtual storage pooling. All of these features combined at entry-level price points make this product very attractive.



## The Lenovo Storage S Series Portfolio

S Series Models	S2200	S3200
Max Drives	96	192
Enclosures	2U24 and 2U12	2U24 and 2U12
Max Enclosures	1 + 3	1 + 7
Controllers	Single/Dual	Single/Dual
Cache	12GB	12GB
Host Ports Connectivity	2 per controller: 6/12Gb SAS, 1/10Gb iSCSI, 8Gb FC, Single Connectivity	4 per controller: 6/12Gb SAS, 1/10Gb iSCSI, 8/16Gb FC Hybrid Connectivity
SSD Support / Caching	Base	Base
Intelligent Real-Time Tiering	Base HDD Optional (HDD+SSD)	Base HDD Optional (HDD+SSD)
Lenovo SAN Manager	Standard	Standard
Snapshot	Base 64 Optional 256 Optional 512	Base 128 Optional 512 Optional 1024
Asynchronous Replication	Optional	Optional
Thin Provisioning	Standard	Standard
Rapid RAID Rebuild	Standard	Standard
Synchronous Caching	Standard	Standard

## Lenovo Storage



### IBM Storwize V3700, V5000, and V7000

Enterprise-class SAN appliances are extremely easy to use and provide excellent management for all type and sizes of data centers. The Storwize family of products offers Real-time compression, data virtualization, hyper-swap, and extreme scalability. The simple fact is that infrastructure matters. The right infrastructure allows organizations to shift spending and invest in projects that improve business results. The infrastructure must ensure the most value from data with the least effort and the greatest flexibility.

### Lenovo Storage N4610 and N3310

The Lenovo Storage N4610 and N3310 are Microsoft Windows Storage Server NAS appliances. These powerful devices work seamlessly in Microsoft Server environments providing features like clustering, deduplication and virtual storage pooling. Features like these, which are typically found in high-end systems, are available at the edge of the network. They are ideal for small to medium businesses who need shared storage for database applications, backup targets, and file sharing. These NAS devices seamlessly fit into your existing environment.

### Lenovo Storage Fibre Channel Switch Portfolio

The new line of Lenovo-branded Fibre Channel switches, based on a partnership with Brocade, rounds out the portfolio. Combining Lenovo servers and Lenovo storage with Lenovo Fibre Channel SAN switches provides customers a complete, innovative and affordable end-to-end solution to address dynamic business needs. Lenovo is now a one-stop shop for everything in the data center.



## The Lenovo Storage V Series Portfolio

Features	V3500	V3700	V5000	V7000
Connectivity (Standard)	6Gb SAS 1Gb iSCSI	6Gb SAS 1Gb iSCSI	6Gb SAS 1Gb iSCSI	8Gb FC 16Gb FC 1Gb iSCSI
Connectivity (Optional)	8GbFC 6Gb SAS 1Gb iSCSI	8GbFC 6Gb SAS 1Gb iSCSI 10Gb iSCSI / FCoE	8Gb FC 6Gb SAS 10Gb iSCSI / FCoE	1Gb iSCSI 10Gb iSCSI / FCoE
Cache (per controller)	8GB	8GB	16GB	32 or 64 GB
Max. capacity (per system)	96 drives (up to 3 expansions)	240 drives (up to 9 expansions)	480 drives (up to 19 expansions)	504 (up to 20 expansions)
Capacity (per clustered system)	--	--	Up to 960 drives	Up to 1,056 drives
Internal Virtualization	Yes	Yes	Yes	Yes
Thin Prov.	Yes	Yes	Yes	Yes
Data Migration	Yes	Yes	Yes	Yes
FlashCopy	Yes	Yes	Yes	Yes
Remote Mirroring	Yes	Yes	Yes	Yes
Easy Tier	Yes	Yes	Yes	Yes
Encryption	--	--	Yes	Yes
System Clustering	--	--	Yes (2-way)	Yes (4-way)
External Virtualization	--	--	Yes	Yes
Real-time Compression	--	--	--	Yes

## The Lenovo Storage N Series Portfolio

Features	N3310	N4610
Chassis	1U Rack	2U Rack
CPU	Intel Xeon E5-2603v3 2.5GHz	Intel Xeon E5-2603v3 2.5GHz
Memory	8GB	8GB
HDD	4 x 3.5" Base	12 x 3.5" (front) and 2 x 2.5" (rear) Base
Expansion	E1024 (24 x 2.5") or E1012 (12 x 3.5") up to 8	E1024 (24 x 2.5") or E1012 (12 x 3.5") up to 8
RAID	LSI 110i_RAID 5	LSI RAID720ix
HD supported	SAS, SATA, SSD	SAS, SATA, SSD
PSU	1 PSU 550W Optional second	1 PSU 550W Optional second
Onboard NIC	2 x 1Gb (10Gb options)	4 x 1Gb (10Gb options)
Out of band mgmt	1x 1Gb port onboard	1x 1Gb port onboard
Warranty	3 Year	3 year
Operating System	Windows Storage Server preloaded and preconfigured	Windows Storage Server preloaded and preconfigured
Deduplication	Standard	Standard
Compression	Standard	Standard

## The Lenovo Storage Fibre Channel Switch Portfolio

Features	Lenovo B300	Lenovo B6505	Lenovo B6510
Total bandwidth	192Gbps	384Gbps	768 Gbps
Total line-rate ports	24 Ports	24 Ports	48 Ports
Supported Port speed	8, 4, or 2 Gbps	16, 8, 4, or 2 Gbps	16, 10, 8, 4, or 2 Gbps
Full Fabric / Access Gateway (NPIV)	Optional / Included	Included / Included	Included / Included
Frame-based ISL trunking	64 Gbps frame-based	128 Gbps frame-based	128 Gbps frame-based
Diagnostic Ports	Not Available	Included	Included
In-Flight Encryption and Compression	Not Available	Not Available	2 ports @ 16 Gb 4 ports @ 8 Gb
10 Gbps Native Fibre Channel	Not Available	Not Available	Optional
Forward Error Correction (FEC)	Not Available	Included	Included
Buffer Credit Loss Recovery	Included	Included	Included
Integrated Routing	Not Available	Not Available	Optional
Virtual Fabrics	Not Available	Not Available	Included

## Introducing Lenovo Networking

**FAST AND AGILE NETWORKING FOR IT EFFICIENCY.**

RackSwitch (Top of Rack) switches deliver speed and intelligence to the edge of your network, where it's closer to your business and your users. These switches offer low latency and low power use.

Flex System Embedded Switches provide on-demand scalability and flexible port mapping for dynamic configuration of active ports in these industry-standard ports, which offer simple interoperability with existing networks:

- Reduced CAPEX – less expensive than most competitive alternatives
- Reduced OPEX – designed to use a fraction of the power of most competitors
- Increased performance with low latency products



RackSwitch



Flex System Switch





## The Lenovo Networking Portfolio

### RackSwitch

Lenovo Models	G7028	G7052	G8052
<b>MTM</b>	R2F:7159BAX (HVEC)/ 7159-HCP (XCC)	R2F:7159CAX (HVEC)/ 7159-HCT (XCC)	R2F:7159G52 (HVEC) / 7159-HC1 (XCC)
<b>Ports</b>	24 x 1GbE RJ-45 4 x 10GbE SFP+	48 x 1GbE RJ-45 4 x 10GbE SFP+	48 x 1GbE RJ-45 4 x 10GbE SFP+
<b>Max. bidirect thru-put</b>	128 Gbps	176 Gbps	176 Gbps
<b>Latency</b>	3.3 us	3.1 us	1.8 us
<b>Virtualization / SDN</b>			VMready, OpenFlow
<b>Availability</b>	Layer 2 Failover, Option Ext. redundant power	Layer 2 Failover, Option Ext. redundant power	vLAG, Hot-swap redundant power/fans
<b>Other</b>			Stacking
<b>Power</b>	45W	76W	130W

## The Lenovo Networking Portfolio

### RackSwitch

Lenovo Models	G8124E	G8264	G8264CS
<b>MTM</b>	R2F:7159BR6 (HVEC) / 7159-HC9 (XCC)	R2F:7159G64 (HVEC) / 7159-HC3 (XCC)	R2F:7159DRX (HVEC) / 7159-HCK (XCC)
<b>Ports</b>	24 x 10GbE SFP+	48 x 10GbE SFP+ 4 x 40GbE QSFP+	36 x 10GbE SFP+ 12 Omni (10GbE/8GB FC) 4 x 40GbE QSFP+
<b>Max. bidirect thru-put</b>	480 Gbps	1,280 Gbps	1,280 Gbps
<b>Latency</b>	0.57 us	0.88 us	Varies based on Config.
<b>Virtualization / SDN</b>	VMready	VMready, Virtual Fabric, OpenFlow	VMready, Virtual Fabric
<b>Availability</b>	vLAG, redundant power & fans	vLAG, Hot-swap redundant power/fans	vLAG, Hot-swap redundant power/fans
<b>Other</b>	DCB/CEE	DCB/CEE	DCB/CEE/FCoE, FC ports
<b>Power</b>	115-168W	275W	330W

## The Lenovo Networking Portfolio

### RackSwitch

Lenovo Models	G8272	G8296	G8332
<b>MTM</b>	R2F:7159CRW (HVEC) / 7159-HCW (XCC)	R2F:7159GR6 (HVEC) / 7159-HC6 (XCC)	R2F:7159BRX (HVEC) / 7159-HDE (XCC)
<b>Ports</b>	48 x 10GbE SFP+ 6 x 40GbE QSFP+	86 x 10GbE SFP+ 10 x 40GbE QSFP+	32 x 40GbE QSFP+
<b>Max. bidirect thru-put</b>	1,440 Gbps	2,560 Gbps	2,560 Gbps
<b>Latency</b>	0.6 us	0.6 us	0.6 us
<b>Virtualization</b>	VMready, Virtual Fabric, OpenFlow, VXLAN	VMready, Virtual Fabric, OpenFlow, VXLAN	VMready, Virtual Fabric, OpenFlow, VXLAN
<b>Availability</b>	vLAG, Hot-swap redundant power/fans	vLAG, Hot-swap redundant power/fans	vLAG, Hot-swap redundant power/fans
<b>Other</b>	DCB/CEE	DCB/CEE	DCB/CEE
<b>Power</b>	123W	210W	270W

## The Lenovo Networking Portfolio

### Flex System Switch

Lenovo Models	EN2092 1GbE Scalable Switch	SI4091 System InterconnectModule	SI4093 System InterconnectModule
Base Configuration Ports	14 x 1GbE internal 10 x 1GbE RJ-45 external	14 x 10GbE internal 10 x 10GbE SFP+ external	14 x 10GbE internal 10 x 10GbE SFP+ external
Switch Upgrade 1 Ports	28 x 1GbE internal 20 x 1GbE RJ-45 external	N/A	28 x 10GbE internal 10 x 10GbE SFP+ external 2 x 40GbE QSFP+ external
Switch Upgrade 2 Ports	4 x 10GbE SFP+ external	N/A	42 x 10GbE internal 14 x 10GbE external 2 x 40GbE QSFP+ external
Max bidirectional throughput	176 Gbps	480 Gbps	1,280 Gbps
Cloud Ready	VMready, Switch Partitioning	N/A	VMready, Switch Partitioning, UFP
Flexibility & Scalability	FPM, FoD	N/A	FPM, FoD, FSIF
Converged	Not Applicable	DCB, CEE, FCoE transit	DCB, CEE, FCoE transit
Recommended for:	Performance, virtualization.	Lowest cost end host mode, simple management.	Low-cost end host mode, simple management, 10/40GbE scalability, performance.

## The Lenovo Networking Portfolio

### Flex System Switch

Lenovo Models	EN4093R 10GbE Scalable Switch	CN4093 10GbE Converged Switch	Brocade 10Gb Ethernet Switch EN4023
Base Configuration Ports	14 x 10GbE internal 10 x 10GbE SFP+ external	14 x 10GbE internal 2 x 10GbE SFP+ external 6 x Omni Port external	Base Switch provides 24 dynamic 10Gb ports
Switch Upgrade 1 Ports	28 x 10GbE internal 10 x 10GbE SFP+external 2 x 40GbE QSFP+ external	Turns on additional 14 x 10GbE internal and 2 x 40GbE external	14 additional dynamic 10Gb ports And 2x40GbE
Switch Upgrade 2 Ports	42 x 10GbE internal 14 x 10GbE external 2 x 40GbE QSFP+ external	Turns on additional 14 x 10GbE internal and 6 x Omni Port external	FC support 8/16Gb
Max bidirectional throughput	1,280 Gbps	1,280 Gbps	1,280 Gbps
Cloud Ready	VMready, Switch Partitioning, UFP, OpenFlow	VMready, Switch Partitioning, UFP	AMPP, OpenFlow, VXLAN Support
Flexibility & Scalability	FPM, FoD, stacking	FPM, FoD, stacking	Automated DPOD, Stacking
Converged	DCB, CEE, FCoE transit	DCB, CEE, FCoE break out 8Gb FC	DCB, CEE, FCoE break out 16Gb FC
Recommended for:	Performance, virtualization.	Direct FCoE connectivity, FC to external F SAN or in-chassis storage node.	Direct FCoE connectivity, FC to external F SAN or in-chassis storage node.

## Lenovo Services

Supporting the full life cycle of your investment, Lenovo Services are the perfect complement to Lenovo's world-class enterprise products: ThinkServer, System x, IBM OEM storage, and Lenovo storage and networking offerings.

As the trusted services provider for thousands of companies around the world, we have the expertise and experience to help with everything from solutions architecture to implementation, integration, and migration, to proactive management services.

Lenovo Services guarantee you a superior service experience, and are delivered through Lenovo service professionals and our network of Lenovo Authorized Service Providers.

Investing in Lenovo Services guarantees genuine Lenovo quality parts, reliable and consistent service, and access to our global remote and field support teams. Our services and support are delivered by highly skilled, experienced and certified technicians.

Flexible services offerings have been designed to meet a wide range of requirements, from basic hardware installation to around-the-clock remote monitoring of your Lenovo enterprise systems.

All Lenovo enterprise systems are covered by a base warranty of one to three years, including parts and labor. We offer a wide range of flexible upgrades and extensions with options for around-the-clock coverage, rapid response, and data protection. Your Lenovo sales representative or authorized Lenovo Business Partner can help determine the exact offerings available for the Lenovo systems you choose.

An investment in Lenovo Enterprise Systems provides high performance, complete solutions to meet every need—for simple application workloads to the most complex processing and infrastructure requirements.

Protect your investment with Lenovo Services to maximize availability, and minimize surprises.

## Lenovo Services



### Solutions Services

Tackle your most complex challenges with help from Lenovo Services professionals experienced in technology solutions.

- Remote Technical Consulting
- Data Center Services
  - power and cooling
- Proof of Technology Lab
- Proof of Concept
- Solution Design & Architecture
- Assessments
- Training



### Implementation Services

Let the Lenovo experts deploy your equipment and keep it running so that you can focus on the business.

- Factory Integration
- Hardware Installation
- Health Checks
- Deployment
  - Implementation
  - Configuration
  - Integration
  - Migration



### Technology Services

Protect your technology investment with services that support all of your operational requirements.

- Warranty Service Upgrades
- Post Warranty Services
- YourDrive YourData
- Technical Support Services
  - Enterprise HW Support Preferred Access
  - Enterprise SW Support
- Managed Services

## For more information

To learn more about Lenovo, the Lenovo Server Portfolio, Lenovo Storage and Lenovo Enterprise Services, contact your Lenovo representative or Business Partner, or visit [lenovo.com/systems](http://lenovo.com/systems) and [lenovopress.com](http://lenovopress.com)

The Lenovo logo is a vertical red rectangle with the word "Lenovo" written in white, sans-serif font, oriented vertically from bottom to top. A small "TM" trademark symbol is located at the top right of the word.

© 2016 Lenovo. All rights reserved.

**Availability:** Offers, prices, specifications and availability may change without notice. Lenovo is not responsible for photographic or typographic errors.

**Warranty:** For a copy of applicable warranties, write to: Warranty Information, 500 Park Offices Drive, RTP, NC, 27709, Attn: Dept. ZPYA/B600. Lenovo makes no representation or warranty regarding third-party products or services. **Trademarks:** Lenovo, the Lenovo logo, BladeCenter, Flex System, iDataPlex, NeXtScale, ThinkServer and System x are trademarks or registered trademarks of Lenovo. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, the Intel logo, Xeon and Xeon Inside are registered trademarks of Intel Corporation in the U.S. and other countries. Other company, product, and service names may be trademarks or service marks of others. Visit [www.lenovo.com/lenovo/us/en/safecomp.html](http://www.lenovo.com/lenovo/us/en/safecomp.html) periodically for the latest information on safe and effective computing.