

**ThinkStation**

*Personal Systems Reference  
Lenovo® ThinkStation® Workstations  
2008 to present - withdrawn*

*August 2011 - Version 404*



ThinkStation S10 (left)  
ThinkStation S20 (right)

**lenovo.com**



Lenovo ThinkStation E20  
with Intel HD Graphics



Lenovo ThinkStation E20  
with ThinkVision® L2440p (4420HB2)



Lenovo ThinkStation E20



Lenovo ThinkStation E20



Lenovo ThinkStation Graphics Card Option  
NVIDIA® Quadro® NVS 295 (45K1669)



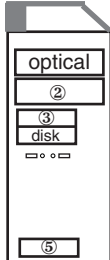
Lenovo ThinkStation Graphics Card Option  
NVIDIA Quadro NVS 450 (57Y4398)

# ThinkStation® E20 (4222) - TopSeller (Windows 7) - withdrawn

Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	1394 adptr	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date
4222-35U	4x5	G6950	2.80	2	1x2GB	1333MHz	No	1x250GB <sup>2</sup>	3.5"	No	DVD±RW	No	FX380	ES50	Pro64	No	Feb 10
4222-36U	4x5	i3-530	2.93	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	No	FX380	ES50	Pro64	No	Feb 10
4222-37U	4x5	i5-650	3.20	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	No	FX580	ES50	Pro64	No	Feb 10

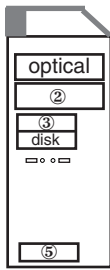
- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **These small and medium business (SMB) models are part of the US TopSeller™ Program**
- **These models have a 3-year limited warranty<sup>1</sup>**
- **These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	<p><b>Intel Pentium® Processor G6950</b> with dual-core, Intel 64, Virtualization Technology, integrated 1066MHz dual-channel DDR3 memory controller, and 3MB cache or <b>Intel Core™ i3 Processor i3-530</b> with dual-core, Intel 64, Hyper-Threading Technology, Virtualization Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache or <b>Intel Core i5 Processor i5-650</b> with dual-core, Intel 64, Hyper-Threading Technology, Turbo Boost Technology, Virtualization Technology, TXT, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache</p> <p>Processor in LGA1156 socket, up to one processor</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Recessed power button</li> </ul>																
Memory	<p><b>2GB or 4GB</b> std, 8GB max*, <b>UDIMM, PC3-10600 1333MHz DDR3**</b>, <b>Non-ECC***</b>, four 240-pin DIMM sockets</p> <p>* Maximum memory is 16GB for ECC models and 8GB for Non-ECC models</p> <p>** System automatically clocks down for processors with 1066MHz DDR3 memory controller</p> <p>*** ECC and non-ECC DIMMs cannot be mixed</p>	<p>Bay ① 5.25", 1.6" high, access, std optical</p> <p>Bay ② 5.25", 1.6" high, access, open</p> <p>Bay ③ 3.5", 1" high, access, media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p>																
Graphics	<p><i>Some:</i> <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 580</b>, PCIe x16 adapter, 512MB, two DisplayPort™, one dual-link DVI-I***, 40W</p> <p>*** Only two display connectors are active at a time</p>	<p>Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)</p> <p>Slot 2: half-length, full-height, PCIe 2.0 x1</p> <p>Slot 3: half-length, full-height, 32-bit PCI 2.3</p> <p>Slot 4: half-length, full-height, 32-bit PCI 2.3</p>																
Media reader	25-in-1 media reader, internal USB 2.0		<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> <p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified</p> <p>RoHS-compliant</p> <p>ENERGY STAR® 5.0-compliant</p> <p>EPEAT™ Gold rating</p>															
SATA disk(s)	<b>250GB or 500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"																	
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive																	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals																	
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMC® SCH5147 Super I/O																	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)																	
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in)																	
IEEE 1394 adptr	None																	
Audio	High Definition (HD) Audio, Realtek® ALC662 codec																	
Speaker	Internal speaker for business audio																	
Ethernet	One gigabit ethernet on planar, Intel 82578DM																	
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant																	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo																	
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo																	
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified																	
Cooling	4 fans (power supply, CPU, rear, front)																	
Rack mount	Rack shelf support																	
<b>Preloaded operating system<sup>20</sup></b>			<p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>															
<p>- Genuine Windows® 7 Professional 64</p> <p><b>Preloaded applications<sup>5</sup></b> (only some listed)</p> <ul style="list-style-type: none"> <li>• Rescue and Recovery™</li> <li>• ThinkVantage Toolbox</li> <li>• Norton™ Internet Security (30 days of virus definitions)</li> <li>• Adobe® Reader®</li> <li>• Adobe Flash® Player</li> <li>• Microsoft Office 2010 preloaded; purchase product key to activate</li> <li>• Corel DVD MovieFactory® (DVD±RW)</li> </ul>	<p><b>Accessories</b></p> <table border="0"> <tr><td>1GB PC3-10600 DDR3 Non-ECC UDIMM</td><td>57Y4389</td></tr> <tr><td>2GB PC3-10600 DDR3 Non-ECC UDIMM</td><td>57Y4390</td></tr> <tr><td>250GB SATA 3.0Gb/s Disk (7200 rpm)</td><td>41N3015</td></tr> <tr><td>500GB SATA 3.0Gb/s Disk (7200 rpm)</td><td>43R1990</td></tr> <tr><td>1TB SATA 3.0Gb/s Disk (7200 rpm)</td><td>45J7918</td></tr> <tr><td>Blu-ray™ Burner SATA 1.5Gb/s</td><td>45K1675</td></tr> <tr><td>NVIDIA Quadro 256MB NVS 295</td><td>45K1669</td></tr> <tr><td>NVIDIA Quadro 512MB NVS 450</td><td>57Y4398</td></tr> </table> <p>More accessories on O-Cad sheet</p> <p>Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a></p>	1GB PC3-10600 DDR3 Non-ECC UDIMM		57Y4389	2GB PC3-10600 DDR3 Non-ECC UDIMM	57Y4390	250GB SATA 3.0Gb/s Disk (7200 rpm)	41N3015	500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918	Blu-ray™ Burner SATA 1.5Gb/s	45K1675	NVIDIA Quadro 256MB NVS 295	45K1669	NVIDIA Quadro 512MB NVS 450	57Y4398
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NVIDIA Quadro 256MB NVS 295	45K1669																	
NVIDIA Quadro 512MB NVS 450	57Y4398																	

See footnotes for important warranty information  
 US models announced January 19, 2010  
 US models withdrawn effective October 2010 or February, August 2011

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date
4222-66U	4x5	i3-530	2.93	2	1x2GB	1333MHz	No	1x250GB <sup>2</sup>	3.5"	No	DVD±RW	No	Intel HD	ES50	Pro64	No	Aug 10
4222-67U	4x5	i3-540	3.06	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	No	FX580	ES50	Pro64	No	Aug 10
4222-68U	4x5	i5-650	3.20	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	No	FX1800	ES50	Pro64	No	Aug 10
4222-69U	4x5	i5-660	3.33	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	No	Intel HD	ES50	Pro64	No	Aug 10

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- **These small and medium business (SMB) models are part of the US TopSeller™ Program**
- **These models have a 3-year limited warranty<sup>1</sup>**
- **These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)**

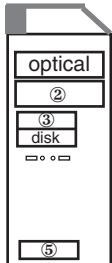
Processor	<p><b>Intel Core™ i3 Processor i3-530 or i3-540 with dual-core,</b> Intel 64, Hyper-Threading Technology, Virtualization Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache or</p> <p><b>Intel Core i5 Processor i5-650 or i5-660 with dual-core,</b> Intel 64, Hyper-Threading Technology, Turbo Boost Technology, Virtualization Technology, TXT, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Recessed power button</li> </ul>	
Implementation	Processor in LGA1156 socket, up to one processor		
Memory	<b>2GB or 4GB</b> std, 8GB max, <b>UDIMM, PC3-10600 1333MHz DDR3, Non-ECC</b> , four 240-pin DIMM sockets		
Graphics	<p><i>Some:</i> <b>Intel HD Graphics</b> in processor, one analog VGA DB-15 connector and one DisplayPort™ connector on rear, supports dual independent display</p> <p><i>Some:</i> <b>NVIDIA® Quadro® FX 580</b>, PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I*, 40W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I*, 59W</p> <p>* Only two display connectors are active at a time</p>	<p>Bay ① 5.25", 1.6" high, access, std optical</p> <p>Bay ② 5.25", 1.6" high, access, open</p> <p>Bay ③ 3.5", 1" high, access, open (media reader)</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p> <p>Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)</p> <p>Slot 2: half-length, full-height, PCIe 2.0 x1</p> <p>Slot 3: half-length, full-height, 32-bit PCI 2.3</p> <p>Slot 4: half-length, full-height, 32-bit PCI 2.3</p>	
Media reader	None		
SATA disk(s)	<b>250GB or 500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, <b>SMSC® SCH5147 Super I/O</b>		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in)		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Realtek® ALC662 codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Intel 82578DM		
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant		<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo		
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo		
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified		
Cooling	4 fans (power supply, CPU, rear, front)		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® 7 Professional 64	1GB PC3-10600 DDR3 Non-ECC UDIMM 57Y4389		
	2GB PC3-10600 DDR3 Non-ECC UDIMM 57Y4390		
	250GB SATA 3.0Gb/s Disk (7200 rpm) 41N3015		
	500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990		
	1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918		
	Blu-ray™ Burner SATA 1.5Gb/s 45K1675		
	NVIDIA Quadro 256MB NVS 295 45K1669		
	NVIDIA Quadro 512MB NVS 450 57Y4398		
	More accessories on O-CAD sheet		
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
<b>Preloaded applications<sup>5</sup></b> (only some listed)			
• Rescue and Recovery™			
• ThinkVantage Toolbox			
• Norton™ Internet Security (30 days of virus definitions)			
• Adobe® Reader®			
• Adobe Flash® Player			
• Microsoft Office 2010 preloaded; purchase product key to activate			
• Corel DVD MovieFactory® (DVD±RW)			
			<p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>• <b>Onsite service upgrade options (in eligible locations)<sup>7</sup></b></li> <li>• <b>Post warranty maintenance services</b></li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>

See footnotes for important warranty information  
 US models announced August 3, 2010  
 US models withdrawn effective October 2010 or January, February, August 2011

# ThinkStation® E20 (4222) - TopSeller (Windows 7) - Oct 2010 - withdrawn Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk Pre-conf size	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date
4222-81U	4x5	i5-650	3.20	2	1x2GB	1333MHz	No	1x250GB <sup>2</sup>	3.5"	No	DVD±RW	Media	Intel HD	ES50	Pro64	No	Oct 10

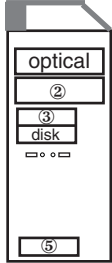
- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **This small and medium business (SMB) model is part of the US TopSeller™ Program**
- **This model has a 3-year limited warranty<sup>1</sup>**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	<b>Intel Core™ i5 Processor i5-650</b> with dual-core, Intel 64, Hyper-Threading Technology, Turbo Boost Technology, Virtualization Technology, TXT, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache	<b>Tower</b>	<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Recessed power button</li> </ul>																
Implementation	Processor in LGA1156 socket, up to one processor																		
Memory	<b>2GB</b> std, 8GB max, <b>UDIMM, PC3-10600 1333MHz DDR3, Non-ECC</b> , four 240-pin DIMM sockets	Bay ① 5.25", 1.6" high, access,	std optical																
Graphics	<b>Intel HD Graphics</b> in processor, one analog VGA DB-15 connector and one DisplayPort™ connector on rear, supports dual independent display	Bay ② 5.25", 1.6" high, access,	open																
Media reader	25-in-1 media reader, internal USB 2.0	Bay ③ 3.5", 1" high, access,	media reader																
SATA disk(s)	<b>250GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"	Bay ④ 3.5", 1" high, internal,	std disk																
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	Bay ⑤ 3.5", 1" high, internal,	opt disk																
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals	Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)																	
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O	Slot 2: half-length, full-height, PCIe 2.0 x1																	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)	Slot 3: half-length, full-height, 32-bit PCI 2.3																	
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in), one analog VGA DB-15 connector, one DisplayPort connector	Slot 4: half-length, full-height, 32-bit PCI 2.3																	
IEEE 1394 adptr	None	<b>SECURITY</b>																	
Audio	High Definition (HD) Audio, Realtek® ALC662 codec	<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>																	
Speaker	Internal speaker for business audio	Supports ThinkVantage® technologies																	
Ethernet	One gigabit ethernet on planar, Intel 82578DM	GREENGUARD® certified																	
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant	RoHS-compliant																	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo	ENERGY STAR® 5.0-compliant																	
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo	EPEAT™ Gold rating																	
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified	<b>LIMITED WARRANTY<sup>1</sup></b>																	
Cooling	4 fans (power supply, CPU, rear, front)	<ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>																	
Rack mount	Rack shelf support	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>																	
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See footnotes for important warranty information  
 US model announced October 12, 2010  
 US model withdrawn effective August 2011

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date
4222-93U	4x5	i3-550	3.20	2	2x2GB	1333MHz	No	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	FX380	ES50	Pro64	No	Nov 10
4222-94U	4x5	i3-550	3.20	2	1x2GB	1333MHz	No	1x250GB	3.5"	No	DVD±RW	Media	Intel HD	ES50	Pro64	No	Nov 10
4222-95U	4x5	i3-550	3.20	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	Media	600	ES50	Pro64	No	Nov 10
4222-96U	4x5	i5-650	3.20	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	Media	600	ES50	Pro64	No	Nov 10
4222-97U	4x5	i5-650	3.20	2	2x2GB	1333MHz	No	1x500GB	3.5"	No	DVD±RW	Media	2000	ES50	Pro64	No	Nov 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **These small and medium business (SMB) models are part of the US TopSeller™ Program**
- **These models have a 3-year limited warranty<sup>1</sup>**
- **These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)**

<p><b>Processor</b></p> <p><b>Intel Core™ i3 Processor i3-550 with dual-core,</b> Intel 64, Hyper-Threading Technology, Virtualization Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache or</p> <p><b>Intel Core i5 Processor i5-650 with dual-core,</b> Intel 64, Hyper-Threading Technology, Turbo Boost Technology, Virtualization Technology, TXT, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache</p> <p><b>Implementation</b> Processor in LGA1156 socket, up to one processor</p> <p><b>Memory</b> <b>2GB or 4GB</b> std, 8GB max, <b>UDIMM, PC3-10600 1333MHz DDR3, Non-ECC</b>, four 240-pin DIMM sockets</p> <p><b>Graphics</b></p> <p><i>Some:</i> <b>Intel HD Graphics</b> in processor, one analog VGA DB-15 connector and one DisplayPort™ connector on rear, supports dual independent display</p> <p><i>Some:</i> <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>NVIDIA Quadro 600</b>, PCIe x16 adapter, 1GB, one DisplayPort, one dual-link DVI-I, 40W</p> <p><i>Some:</i> <b>NVIDIA Quadro 2000</b>, PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I*, 62W</p> <p>* Only two display connectors are active at a time</p> <p><b>Media reader</b> 25-in-1 media reader, internal USB 2.0</p> <p><b>SATA disk(s)</b> <b>250GB or 500GB</b>, SATA 3.0Gb/s, 7200 rpm, 3.5"</p> <p><b>SATA DVD±RW</b> Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive</p> <p><b>SATA controller</b> Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals</p> <p><b>Chipset</b> <b>Intel 3450 Chipset</b>, Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O</p> <p><b>Front ports</b> Two USB 2.0, microphone (3.5mm), headphone (3.5mm)</p> <p><b>Rear ports</b> Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in)</p> <p><i>Intel HD model(s):</i> one analog VGA DB-15 connector, one DisplayPort connector</p> <p><b>IEEE 1394 adptr</b> None</p> <p><b>Audio</b> High Definition (HD) Audio, Realtek® ALC662 codec</p> <p><b>Speaker</b> Internal speaker for business audio</p> <p><b>Ethernet</b> One gigabit ethernet on planar, Intel 82578DM</p> <p><b>Security chip</b> STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant</p> <p><b>Keyboard</b> Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo</p> <p><b>Mouse</b> Optical Wheel Mouse (USB connector), black, Lenovo logo</p> <p><b>Power supply</b> 280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified</p> <p><b>Cooling</b> 4 fans (power supply, CPU, rear, front)</p> <p><b>Rack mount</b> Rack shelf support</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Recessed power button</li> </ul>  <p>Bay ① 5.25", 1.6" high, access, std optical</p> <p>Bay ② 5.25", 1.6" high, access, open</p> <p>Bay ③ 3.5", 1" high, access, media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p> <p>Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)</p> <p>Slot 2: half-length, full-height, PCIe 2.0 x1</p> <p>Slot 3: half-length, full-height, 32-bit PCI 2.3</p> <p>Slot 4: half-length, full-height, 32-bit PCI 2.3</p>																
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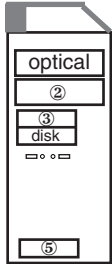
See footnotes for important warranty information  
 US models announced November 2, 2010  
 US models withdrawn effective August 2011

# ThinkStation® E20 (4220) - Windows 7 - withdrawn

Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	1394 adptr	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global (G) GMP (P)	Avail date
4220-34U	4x5	i3-530	2.93	2	2x2GB	1333MHz		1x500GB <sup>2</sup>	3.5"	No	DVD±RW	No	FX380	ES50	Pro64	No	Feb 10
4220-35U	4x5	G6950	2.80	2	1x2GB	1333MHz		1x500GB	3.5"	No	DVD±RW	No	FX380	ES50	Pro64	No	Feb 10
4220-36U	4x5	X3430	2.40	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	No	FX580	ES50	Pro64	No	Feb 10
4220-37U	4x5	X3440	2.53	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	No	FX1800	ES50	Pro64	No	Feb 10

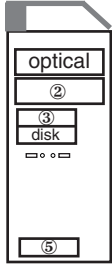
- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **These models have a 3-year limited warranty<sup>1</sup>**
- **These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	<p><b>Intel Pentium® Processor G6950</b> with dual-core, Intel 64, Virtualization Technology, integrated 1066MHz dual-channel DDR3 memory controller, and 3MB cache or <b>Intel Core™ i3 Processor i3-530</b> with dual-core, Intel 64, Hyper-Threading Technology, Virtualization Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache or <b>Intel Xeon® Processor X3430</b> with quad-core, Intel 64, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor X3440</b> with quad-core, Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 8MB cache</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Soft touch front icons</li> <li>• Recessed power button</li> </ul>	
Implementation	Processor in LGA1156 socket, up to one processor	<p>Bay ① 5.25", 1.6" high, access, std optical</p> <p>Bay ② 5.25", 1.6" high, access, open</p> <p>Bay ③ 3.5", 1" high, access, media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p>	
Memory	<p><b>2GB</b> or <b>4GB</b> std, <b>PC3-10600 1333MHz DDR3*, UDIMM</b>, four 240-pin DIMM sockets</p> <p><b>34U/35U:</b> 8GB max**, <b>Non-ECC***</b></p> <p><b>36U/37U:</b> 16GB max, <b>ECC</b></p> <p>* System automatically clocks down for processors with 1066MHz DDR3 memory controller</p> <p>** Max memory is 16GB for ECC models and 8GB for Non-ECC models</p> <p>*** ECC and non-ECC DIMMs cannot be mixed</p>	<p>Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)</p> <p>Slot 2: half-length, full-height, PCIe 2.0 x1</p> <p>Slot 3: half-length, full-height, 32-bit PCI 2.3</p> <p>Slot 4: half-length, full-height, 32-bit PCI 2.3</p>	
Graphics	<p><i>Some:</i> <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 580</b>, PCIe x16 adapter, 512MB, two DisplayPort™, one dual-link DVI-I***, 40W</p> <p><i>Some:</i> <b>NVIDIA® Quadro® FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I***, 59W</p> <p>*** Only two display connectors are active at a time</p>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	25-in-1 media reader, internal USB 2.0	<p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified</p> <p>RoHS-compliant</p> <p>ENERGY STAR® 5.0-compliant</p> <p>EPEAT™ Gold rating</p>	
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	<p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>↪ <b>3-year parts and labor</b></li> <li>↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↪ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>• <b>Onsite service upgrade options (in eligible locations)<sup>7</sup></b></li> <li>• <b>Post warranty maintenance services</b></li> <li>↪ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in)		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Realtek® ALC662 codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Intel 82578DM		
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo		
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo		
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified		
Cooling	4 fans (power supply, CPU, rear, front)		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 Non-ECC UDIMM 57Y4390		
<b>Preloaded applications<sup>5</sup></b> (only some listed)	4GB PC3-10600 DDR3 ECC UDIMM 57Y4138		
• Rescue and Recovery™	1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918		
• Microsoft Office 2010 preloaded; purchase product key to activate	More accessories on O-CAD sheet		
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		

See footnotes for important warranty information  
 US models announced January 19, 2010  
 US models withdrawn effective October 2010 or February, August 2011

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date
4220-82U	4x5	X3440	2.53	4	2x2GB	1333MHz	ECC	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	FX580	ES50	Pro64	Global	Aug 10
4220-83U	4x5	X3440	2.53	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	FX1800	ES50	Pro64	Global	Aug 10
4220-84U	4x5	X3470	2.93	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	FX1800	ES50	Pro64	Global	Aug 10
4220-85U	4x5	i5-650	3.20	2	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	FX580	ES50	Pro64	Global	Aug 10
4220-86U	4x5	i5-650	3.20	2	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	FX1800	ES50	Pro64	Global	Aug 10
4220-87U	4x5	i5-670	3.46	2	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	FX1800	ES50	Pro64	Global	Aug 10
4220-88U	4x5	i5-650	3.20	2	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	Intel HD	ES50	Pro64	Global	Aug 10

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- **These models have a 3-year limited warranty<sup>1</sup>**
- **These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	<b>Intel Core™ i5 Processor i5-650 or i5-670 with dual-core,</b> Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache or <b>Intel Xeon® Processor X3440 or X3470 with quad-core,</b> Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 8MB cache	<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> <li>• Recessed power button</li> </ul> 
Implementation	Processor in LGA1156 socket, up to one processor	
Memory	<b>4GB</b> std, 16GB max, <b>PC3-10600 1333MHz DDR3*, UDIMM, ECC</b> four 240-pin DIMM sockets	Bay ① 5.25", 1.6" high, access, std optical Bay ② 5.25", 1.6" high, access, open Bay ③ 3.5", 1" high, access, media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk
Graphics	Some: <b>Intel HD Graphics</b> in processor, one analog VGA DB-15 connector and one DisplayPort connector on rear, supports dual independent display Some: <b>NVIDIA® Quadro® FX 580</b> , PCIe x16 adapter, 512MB, two DisplayPort™, one dual-link DVI-I*, 40W Some: <b>NVIDIA Quadro FX 1800</b> , PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I*, 59W *** Only two display connectors are active at a time	Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max) Slot 2: half-length, full-height, PCIe 2.0 x1 Slot 3: half-length, full-height, 32-bit PCI 2.3 Slot 4: half-length, full-height, 32-bit PCI 2.3
Media reader	25-in-1 media reader, internal USB 2.0	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"	
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals	
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O	Supports ThinkVantage® technologies
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)	<b>GREENGUARD® certified</b> RoHS-compliant ENERGY STAR® 5.0-compliant EPEAT™ Gold rating
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in) <i>Intel HD model(s):</i> one analog VGA DB-15 connector, one DisplayPort connector	
IEEE 1394 adptr	None	<b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>↪ <b>3-year parts and labor</b></li> <li>↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↪ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>↪ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>
Audio	High Definition (HD) Audio, Realtek® ALC662 codec	
Speaker	Internal speaker for business audio	
Ethernet	One gigabit ethernet on planar, Intel 82578DM	
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo	
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo	
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified	
Cooling	4 fans (power supply, CPU, rear, front)	
Rack mount	Rack shelf support	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 ECC UDIMM 43R2033	
	4GB PC3-10600 DDR3 ECC UDIMM 57Y4138	
	250GB SATA 3.0Gb/s Disk (7200 rpm) 41N3015	
	500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990	
	1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918	
	Blu-ray™ Burner SATA 1.5Gb/s 45K1675	
	NVIDIA Quadro 256MB NVS 295 45K1669	
	NVIDIA Quadro 512MB NVS 450 57Y4398	
	More accessories on O-CAD sheet	
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	
<b>Preloaded applications<sup>5</sup> (only some listed)</b>		
• Rescue and Recovery™		
• ThinkVantage Toolbox		
• Norton™ Internet Security (30 days of virus definitions)		
• Adobe® Reader®		
• Adobe Flash® Player		
• Microsoft Office 2010 preloaded; purchase product key to activate		
• Corel® Burn.Now™ (DVD±RW)		
• Corel DVD MovieFactory® (DVD±RW)		

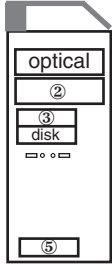
See footnotes for important warranty information  
 US models announced August 3, 2010  
 US models withdrawn effective January, February, or August 2011

# ThinkStation® E20 (4220) - Windows 7 (October 2010) - withdrawn

Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR	Win7 preload	Global	Avail date
4220-91U	4x5	i5-680	3.60	2	2x2GB	1333MHz	ECC	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	Intel HD	ES50	Pro64	None	Oct 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **This model has a 3-year limited warranty<sup>1</sup>**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	<b>Intel Core™ i5 Processor i5-680 with dual-core,</b> Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache		<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> <li>• Recessed power button</li> </ul> 
Implementation	Processor in LGA1156 socket, up to one processor		
Memory	<b>4GB</b> std, 16GB max, <b>PC3-10600 1333MHz DDR3, UDIMM, ECC,</b> four 240-pin DIMM sockets		
Graphics	<b>Intel HD Graphics</b> in processor, one analog VGA DB-15 connector and one DisplayPort™ connector on rear, supports dual independent display		
Media reader	25-in-1 media reader, internal USB 2.0		
SATA disk(s)	<b>500GB,</b> SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel 3450 Chipset,</b> Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in), one analog VGA DB-15 connector, one DisplayPort connector		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Realtek® ALC662 codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Intel 82578DM		
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo		
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo		
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified		
Cooling	4 fans (power supply, CPU, rear, front)		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 ECC UDIMM	43R2033	
	4GB PC3-10600 DDR3 ECC UDIMM	57Y4138	
	250GB SATA 3.0Gb/s Disk (7200 rpm)	41N3015	
	500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990	
	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918	
	Blu-ray™ Burner SATA 1.5Gb/s	45K1675	
	NVIDIA Quadro 256MB NVS 295	45K1669	
	NVIDIA Quadro 512MB NVS 450	57Y4398	
	More accessories on O-CAD sheet		
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
<b>Preloaded applications<sup>5</sup></b> (only some listed)			
• Rescue and Recovery™			
• ThinkVantage Toolbox			
• Norton™ Internet Security (30 days of virus definitions)			
• Adobe® Reader®			
• Adobe Flash® Player			
• Microsoft Office 2010 preloaded; purchase product key to activate			
• Corel® Burn.Now™ (DVD±RW)			
• Corel DVD MovieFactory® (DVD±RW)			
	Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)		
	Slot 2: half-length, full-height, PCIe 2.0 x1		
	Slot 3: half-length, full-height, 32-bit PCI 2.3		
	Slot 4: half-length, full-height, 32-bit PCI 2.3		
	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>		
	Supports ThinkVantage® technologies		
	GREENGUARD® certified RoHS-compliant ENERGY STAR® 5.0-compliant EPEAT™ Gold rating		
	<b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>↔ <b>3-year parts and labor</b></li> <li>↔ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↔ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>↔ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>		

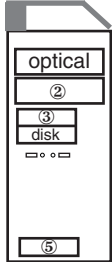
See footnotes for important warranty information  
 US model announced October 12, 2010  
 US model withdrawn effective August 2011

# ThinkStation® E20 (4220) - Windows 7 (November 2010) - withdrawn

Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date
4220-A3U 4x5		i3-550	3.20	2	2x2GB	1333MHz	ECC	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	FX380	ES50	Pro64		Nov 10
4220-A4U 4x5		X3430	2.40	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	600	ES50	Pro64		Nov 10
4220-A5U 4x5		X3440	2.53	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	2000	ES50	Pro64	Global	Nov 10
4220-A6U 4x5		X3440	2.53	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	600	ES50	Pro64	Global	Nov 10
4220-A7U 4x5		X3470	2.93	4	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	2000	ES50	Pro64	Global	Nov 10
4220-A8U 4x5		i5-650	3.20	2	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	600	ES50	Pro64	Global	Nov 10
4220-A9U 4x5		i5-650	3.20	2	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	2000	ES50	Pro64	Global	Nov 10
4220-B1U 4x5		i5-670	3.46	2	2x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	Media	2000	ES50	Pro64	Global	Nov 10

- These models have a 3-year limited warranty<sup>1</sup>
- These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)

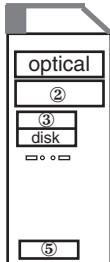
Processor	<p><b>Intel Core™ i3 Processor i3-550</b> with dual-core, Intel 64, Hyper-Threading Technology, Virtualization Technology, integrated 1333MHz dual-channel DDR3 memory controller, 4MB cache or</p> <p><b>Intel Core i5 Processor i5-650</b> or <b>i5-670</b> with dual-core, Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache or</p> <p><b>Intel Xeon® Processor X3430</b> with quad-core, Intel 64, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 8MB cache or</p> <p><b>Intel Xeon Processor X3440</b> or <b>X3470</b> with quad-core, Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 8MB cache</p> <p>Processor in LGA1156 socket, up to one processor</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> <li>• Recessed power button</li> </ul>	
Implementation	Processor in LGA1156 socket, up to one processor	<p>Bay ① 5.25", 1.6" high, access, std optical</p> <p>Bay ② 5.25", 1.6" high, access, open</p> <p>Bay ③ 3.5", 1" high, access, media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p>	
Memory	<b>4GB</b> std, 16GB max, <b>PC3-10600 1333MHz DDR3, UDIMM, ECC</b> four 240-pin DIMM sockets	<p>Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max)</p> <p>Slot 2: half-length, full-height, PCIe 2.0 x1</p> <p>Slot 3: half-length, full-height, 32-bit PCI 2.3</p> <p>Slot 4: half-length, full-height, 32-bit PCI 2.3</p>	
Graphics	<p>Some: <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p>Some: <b>NVIDIA Quadro 600</b>, PCIe x16 adapter, 1GB, one DisplayPort™, one dual-link DVI-I, 40W</p> <p>Some: <b>NVIDIA Quadro 2000</b>, PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I*, 62W</p> <p>* Only two display connectors are active at a time</p>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	25-in-1 media reader, internal USB 2.0	<p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified</p> <p>RoHS-compliant</p> <p>ENERGY STAR® 5.0-compliant</p> <p>EPEAT™ Gold rating</p> <p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>➤ 3-year parts and labor</li> <li>➤ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>➤ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>➤ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in) <i>Intel HD model(s):</i> one analog VGA DB-15 connector, one DisplayPort connector		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Realtek® ALC662 codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Intel 82578DM		
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo		
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo		
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified		
Cooling	4 fans (power supply, CPU, rear, front)		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 ECC UDIMM 43R2033		
	4GB PC3-10600 DDR3 ECC UDIMM 57Y4138		
	250GB SATA 3.0Gb/s Disk (7200 rpm) 41N3015		
	500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990		
	1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918		
	Blu-ray™ Burner SATA 1.5Gb/s 45K1675		
	NVIDIA Quadro 256MB NVS 295 45K1669		
	NVIDIA Quadro 512MB NVS 450 57Y4398		
	More accessories on O-CAD sheet		
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
<b>Preloaded applications<sup>5</sup></b> (only some listed)			
• Rescue and Recovery™			
• ThinkVantage Toolbox			
• Norton™ Internet Security (30 days of virus definitions)			
• Adobe® Reader®			
• Adobe Flash® Player			
• Microsoft Office 2010 preloaded; purchase product key to activate			
• Corel® Burn.Now™ (DVD±RW)			
• Corel DVD MovieFactory® (DVD±RW)			

See footnotes for important warranty information  
 US models announced November 2, 2010  
 US models withdrawn effective January or August 2011

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 (CAD5-2) August 2011

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	1394 adptr	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global (G) GMP (P)	Avail date
4215-11U	4x5	i5-660	3.33	2	2x2GB	1333MHz	ECC	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	1394	FX1800	ES50	Pro64	G P	Feb 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **This small and medium business (SMB) model is part of the US TopSeller™ Program**
- **This model is part of the Global Models Plus (GMP) program with limited onsite service<sup>3</sup> 3-year limited warranty**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	<b>Intel Core™ i5 Processor i5-660</b> with dual-core, Intel 64, Hyper-Threading Technology, Turbo Boost Technology, Virtualization Technology, TXT, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache	<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Recessed power button</li> </ul> 
Implementation	Processor in LGA1156 socket, up to one processor	
Memory	<b>4GB</b> std, 16GB max*, <b>UDIMM, PC3-10600 1333MHz DDR3, ECC**</b> , four 240-pin DIMM sockets * Max memory is 16GB for ECC models and 8GB for Non-ECC models ** ECC and non-ECC DIMMs cannot be mixed	Bay ① 5.25", 1.6" high, access, std optical Bay ② 5.25", 1.6" high, access, open Bay ③ 3.5", 1" high, access, open (media reader) Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk
Graphics	<b>NVIDIA® Quadro® FX 1800</b> , PCIe x16 adapter, 768MB, two DisplayPort™, one dual-link DVI-I**, 59W ** Only two display connectors are active at a time	Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max) Slot 2: half-length, full-height, PCIe 2.0 x1 Slot 3: half-length, full-height, 32-bit PCI 2.3 Slot 4: half-length, full-height, 32-bit PCI 2.3
Media reader	None	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"	
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals	
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, <b>SMSC® SCH5147 Super I/O</b>	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in)	
IEEE 1394 adptr	FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports in rear	
Audio	High Definition (HD) Audio, Realtek® ALC662 codec	
Speaker	Internal speaker for business audio	
Ethernet	One gigabit ethernet on planar, Intel 82578DM	
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo	
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo	
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified	
Cooling	4 fans (power supply, CPU, rear, front)	
Rack mount	Rack shelf support	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 ECC UDIMM 43R2033	
	4GB PC3-10600 DDR3 ECC UDIMM 57Y4138	
<b>Preloaded applications<sup>5</sup> (only some listed)</b>	250GB SATA 3.0Gb/s Disk (7200 rpm) 41N3015	
• Rescue and Recovery™	500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990	
• ThinkVantage Toolbox	1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918	
• Norton™ Internet Security (30 days of virus definitions)	Blu-ray™ Burner SATA 1.5Gb/s 45K1675	
• Adobe® Reader®	NVIDIA Quadro 256MB NVS 295 45K1669	
• Adobe Flash® Player	NVIDIA Quadro 512MB NVS 450 57Y4398	
• Microsoft Office 2010 preloaded; purchase product key to activate	NVIDIA Quadro 256MB FX 380 45K1670	
• Corel® Burn.Now™ (DVD±RW)	More accessories on O-CAD sheet	
• Corel DVD MovieFactory® (DVD±RW)	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	

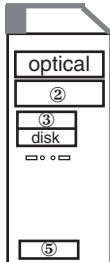
See footnotes for important warranty information  
 US model announced January 19, 2010  
 US model withdrawn effective February 2011

# ThinkStation® E20 (4220) - Windows XP - withdrawn

Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	SATA optical	1394 adptr	Graphics adapter(s)	ENERGY STAR 5.0	Preload	Global	Avail date
4220-65U	4x5	X3450	2.66	4	1x2GB	1333MHz	ECC	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	1394	FX580	ES50	XP Pro	No	May 10
4220-66U	4x5	i5-650	3.20	2	1x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	1394	FX380	ES50	XP Pro	No	May 10
4220-67U	4x5	i5-670	3.46	2	1x2GB	1333MHz	ECC	1x500GB	3.5"	No	DVD±RW	1394	FX1800	ES50	XP Pro	No	May 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **These models have a 3-year limited warranty<sup>1</sup>**

Processor	<b>Intel Core™ i5 Processor i5-650 or i5-670 with dual-core,</b> Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache or <b>Intel Xeon® Processor X3450 with quad-core,</b> Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 8MB cache		<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> <li>• Recessed power button</li> </ul> 
Implementation	Processor in LGA1156 socket, up to one processor		
Memory	<b>2GB</b> std, 16GB max, <b>PC3-10600 1333MHz DDR3, UDIMM, ECC</b> four 240-pin DIMM sockets		Bay ① 5.25", 1.6" high, access, std optical Bay ② 5.25", 1.6" high, access, open Bay ③ 3.5", 1" high, access, open (media reader) Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk  Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max) Slot 2: half-length, full-height, PCIe 2.0 x1 Slot 3: half-length, full-height, 32-bit PCI 2.3 Slot 4: half-length, full-height, 32-bit PCI 2.3
Graphics	Some: <b>NVIDIA® Quadro® FX 380,</b> PCI Express® (PCIe) x16 adapter, 256MB, two dual-link DVI-I, 35W Some: <b>NVIDIA Quadro FX 580,</b> PCIe x16 adapter, 512MB, two DisplayPort™, one dual-link DVI-I*, 40W Some: <b>NVIDIA® Quadro® FX 1800,</b> PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I*, 59W * Only two display connectors are active at a time		
Media reader	None		<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>
SATA disk(s)	<b>500GB,</b> SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel 3450 Chipset,</b> Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in)		
IEEE 1394 adptr	FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		
Audio	High Definition (HD) Audio, Realtek® ALC662 codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Intel 82578DM		
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo		
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo		
Power supply	280 watts with variable speed fan, autosenesing, 85% PSU, 80 PLUS® Bronze qualified		
Cooling	4 fans (power supply, CPU, rear, front)		
Rack mount	Rack shelf support		
Preloaded operating system <sup>20</sup>	<b>Accessories</b> 2GB PC3-10600 DDR3 ECC UDIMM 43R2033 4GB PC3-10600 DDR3 ECC UDIMM 57Y4138 250GB SATA 3.0Gb/s Disk (7200 rpm) 41N3015 500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990 1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918 Blu-ray™ Burner SATA 1.5Gb/s 45K1675 NVIDIA Quadro 256MB NVS 295 45K1669 NVIDIA Quadro 512MB NVS 450 57Y4398 NVIDIA Quadro 256MB FX 380 45K1670 NVIDIA Quadro 512MB FX 580 45K1671 More accessories on O-CAD sheet  Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
Preloaded applications <sup>5</sup> (only some listed)	<ul style="list-style-type: none"> <li>• Rescue and Recovery™</li> <li>• ThinkVantage Toolbox</li> <li>• Norton™ Internet Security (30 days of virus definitions)</li> <li>• Adobe® Reader®</li> <li>• Adobe Flash® Player</li> <li>• Microsoft® Office 2007 Trial (60-day)</li> <li>• Corel® Burn.Now™ (DVD±RW)</li> <li>• Corel DVD MovieFactory® (DVD±RW)</li> </ul>		

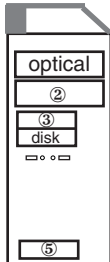
See footnotes for important warranty information  
 US models announced May 4, 2010  
 US models withdrawn effective October 2010

# ThinkStation® E20 (4222) - TopSeller (Windows XP) - withdrawn

Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	ECC memory	Disk(s)	Disk size	Pre-conf RAID	Diskette or Media reader	1394 adptr	Graphics adapter(s)	ENERGY STAR 5.0	Preload	Global	Avail date
4222-56U	4x5	G6950	2.80	2	1x2GB	1333MHz	No	1x250GB <sup>2</sup>	3.5"	No	Media	No	FX380	ES50	XP Pro	No	Mar 10
4222-65U	4x5	i5-650	3.20	2	1x2GB	1333MHz	No	1x250GB	3.5"	No		No		ES50	XP Pro	No	Jun 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **True workstation-level performance at incredibly low price point**
- **High Reliability with Independent Software Vendors (ISV) certified applications and ECC memory support**
- **These small and medium business (SMB) models are part of the US TopSeller™ Program**
- **These models have a 3-year limited warranty<sup>1</sup>**

Processor	<b>Intel Pentium® Processor G6950</b> with dual-core, Intel 64, Virtualization Technology, integrated 1066MHz dual-channel DDR3 memory controller, and 3MB cache or <b>Intel Core™ i5 Processor i5-650</b> with dual-core, Intel 64, Hyper-Threading Technology, Virtualization Technology, TXT, Turbo Boost Technology, integrated 1333MHz dual-channel DDR3 memory controller, and 4MB cache	<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 17.0"D x 16.7"H (with handle)</li> <li>• 175mm W x 431mm D x 425mm H</li> <li>• 24.7 lb (11.2kg) max configuration</li> <li>• 32-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Recessed power button</li> </ul> 
Implementation	Processor in LGA1156 socket, up to one processor	
Memory	<b>2GB</b> std, 8GB max*, <b>UDIMM, PC3-10600 1333MHz DDR3**</b> , <b>Non-ECC***</b> , four 240-pin DIMM sockets * Maximum memory is 16GB for ECC models and 8GB for Non-ECC models ** System automatically clocks down for processors with 1066MHz DDR3 memory controller *** ECC and non-ECC DIMMs cannot be mixed	Bay ① 5.25", 1.6" high, access, std optical Bay ② 5.25", 1.6" high, access, open Bay ③ 3.5", 1" high, access, std or opt media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk
Graphics	<i>Some:</i> <b>NVIDIA® Quadro® FX 380</b> , PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W	Slot 1: half-length, full-height, PCIe 2.0 x16 (75w max) Slot 2: half-length, full-height, PCIe 2.0 x1 Slot 3: half-length, full-height, 32-bit PCI 2.3 Slot 4: half-length, full-height, 32-bit PCI 2.3
Media reader	<i>Some:</i> 25-in-1 media reader, internal USB 2.0	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>
SATA disk(s)	<b>250GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"	
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in chipset, RAID 0, 1 support, two SATA connectors for disks, two SATA connectors for opticals	
Chipset	<b>Intel 3450 Chipset</b> , Platform Controller Hub (PCH) for PCI, ethernet, and USB, SMSC® SCH5147 Super I/O	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)	
Rear ports	Six USB 2.0, serial (9-pin), ethernet (RJ-45), three analog audio ports (line-in, line-out, mic-in)	
IEEE 1394 adptr	None	
Audio	High Definition (HD) Audio, Realtek® ALC662 codec	
Speaker	Internal speaker for business audio	
Ethernet	One gigabit ethernet on planar, Intel 82578DM	
Security chip	STMicroelectronics ST19NP18 Trusted Platform Module (TPM), TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black, Lenovo® logo	
Mouse	Optical Wheel Mouse (USB connector), black, Lenovo logo	
Power supply	280 watts with variable speed fan, autosensing, 85% PSU, 80 PLUS® Bronze qualified	
Cooling	4 fans (power supply, CPU, rear, front)	
Rack mount	Rack shelf support	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	Supports ThinkVantage® technologies
- Genuine Windows® XP Professional 32-bit (preinstalled via downgrade rights in Windows 7 Professional 64-bit)	1GB PC3-10600 DDR3 Non-ECC UDIMM 57Y4389 2GB PC3-10600 DDR3 Non-ECC UDIMM 57Y4390 250GB SATA 3.0Gb/s Disk (7200 rpm) 41N3015 500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990 1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918 Blu-ray™ Burner SATA 1.5Gb/s 45K1675 NVIDIA Quadro 256MB NVS 295 45K1669 NVIDIA Quadro 512MB NVS 450 57Y4398 NVIDIA Quadro 256MB FX 380 45K1670 NVIDIA Quadro 512MB FX 580 45K1671	GREENGUARD® certified RoHS-compliant ENERGY STAR® 5.0-compliant
<b>Preloaded applications<sup>5</sup></b> (only some listed)	More accessories on O-CAD sheet Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	<b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>
• Rescue and Recovery™		
• ThinkVantage Toolbox		
• Norton™ Internet Security 2009 (30 days of virus definitions)		
• Adobe® Reader®		
• Adobe Flash® Player		
• Microsoft® Office 2007 Trial (60-day)		
• Corel® Burn.Now™ (DVD±RW)		
• Corel DVD MovieFactory® (DVD±RW)		

See footnotes for important warranty information  
 US models announced March 23 or June 15, 2010  
 US models withdrawn effective September 2010

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 (CAD1-4) October 2010

Partial list of accessories supported on ThinkStation E20

**Memory**<sup>63</sup>

1GB PC3-10600 DDR3 Non-ECC UDIMM	57Y4389	ann 01/12/10
1GB PC3-10600 DDR3 Non-ECC (25-Pack)	57Y4419	ann 01/12/10
2GB PC3-10600 DDR3 Non-ECC UDIMM	57Y4390	ann 01/12/10
2GB PC3-10600 DDR3 Non-ECC (25-Pack)	57Y4420	ann 01/12/10
2GB PC3-10600 DDR3 ECC UDIMM	43R2033	ann 03/31/09
4GB PC3-10600 DDR3 ECC UDIMM	57Y4138	ann 08/04/09

<sup>63</sup> Mixing of ECC and non-ECC DIMMs is not supported

More information on memory and processor configuration, operation and limitation, please visit:

[www.lenovo.com/support/thinkstationaccessories](http://www.lenovo.com/support/thinkstationaccessories)

**Optical**

DVD-ROM DL SATA1.5Gb/s 16X-48X Max <sup>4</sup>	41N5618	ann 09/26/06
Super Multi-Burner DL DVD±RW SATA1.5Gb/s	41N5620	ann 09/26/06
Blu-ray™ Burner SATA1.5Gb/s	45K1675	ann 03/31/09

**Storage**

250GB SATA 3.0Gb/s Disk (7200 rpm)	41N3015	ann 01/24/06
500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990	ann 11/06/07
1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918	ann 08/19/08
300GB SATA 3.0Gb/s Disk (10000 rpm) 2.5"	43R2031	ann 03/31/09

**Removable storage**

USB 2.0 Portable 320GB Hard Disk	45K1689	ann 03/17/09
USB 2.0 Portable 500GB Hard Disk	45K1690	ann 05/26/09
USB 2.0 Portable Secure 320GB Hard Disk	43R2019	ann 11/18/08
Lenovo® Slim USB Portable DVD Burner	0A33988	ann 06/14/11

**Keyboard**

Preferred Pro USB Keyboard	73P5220	ann 06/21/05
Enhanced Performance USB Keyboard	73P2620	ann 03/23/04
Lenovo USB Fingerprint Keyboard	73P4730	ann 02/22/05
Lenovo USB Smartcard Keyboard	51J0155	ann 03/24/09
Ultraslim Wireless Keyboard and Mouse <sup>52</sup>	57Y4700	ann 09/15/09

More information at [www.lenovo.com/support/keyboards](http://www.lenovo.com/support/keyboards)

**Mouse**

Lenovo Optical Mouse (USB)	06P4069	ann 05/21/03
Lenovo ScrollPoint® Mouse (USB, Optical)	31P7405	ann 08/27/02
Lenovo Laser Mouse (USB)	41U3074	ann 01/23/07
Lenovo Wireless Laser Mouse - Black <sup>52</sup>	45K1696	ann 11/25/08
Lenovo Wireless Laser Mouse - Red/Black <sup>52</sup>	51J0198	ann 11/25/08

<sup>52</sup> Wireless via 2.4GHz technology using a micro-size USB receiver.

More information at [www.lenovo.com/support/mice](http://www.lenovo.com/support/mice)

**Monitors**

Lenovo D186 Wide 18.5" Monitor	2580AB1	ann 01/12/10
ThinkVision® L1711p 17" Monitor	5047HB2	ann 10/20/09
ThinkVision L1900p 19" Monitor	4431HE1	ann 11/11/08
ThinkVision L1951p Wide 19" Monitor	2448HB6	ann 10/20/09
ThinkVision L2250p Wide 22" Monitor	2572HB6	ann 10/20/09
ThinkVision L2251p Wide 22" Monitor	2572HD6	ann 10/20/09
ThinkVision L2251x Wide 22" Monitor	2578HB6	ann 10/20/09
ThinkVision L2321x Wide 23" Monitor	4014HB6	ann 06/10/10
ThinkVision L2440p Wide 24" Monitor	4420HB2	ann 09/17/08

More information at [www.lenovo.com/support/monitors](http://www.lenovo.com/support/monitors)

**Monitor accessories**<sup>46</sup>

ThinkVision USB Soundbar	40Y7616	ann 08/23/05
ThinkVision Soundbar	45K1263	ann 09/16/08
Kensington® MicroSaver® Cable Lock	73P2582	ann 12/29/03
Kensington Twin Head Cable Lock	45K1620	ann 09/30/08

<sup>46</sup> Compatible on selected Lenovo and ThinkVision monitors.

More information at [www.lenovo.com/support/monitoraccessories](http://www.lenovo.com/support/monitoraccessories)

**Graphics**

DisplayPort to Single-link DVI-D Cable <sup>50</sup>	45J7915	ann 08/05/08
NVIDIA® Quadro® 256MB NVS 295	45K1669	ann 04/21/09
NVIDIA Quadro 512MB NVS 300 DMS59 <sup>65</sup>	0A36528	ann 04/26/11
NVIDIA Quadro 512MB NVS 450	57Y4398	ann 01/19/10
NVIDIA Quadro 512MB 400	0A36535	ann 06/28/11
NVIDIA Quadro 1GB 600	0A36183	ann 10/26/10
NVIDIA Quadro 1GB 2000	57Y4479	ann 10/26/10

<sup>50</sup> Attaches to selected DisplayPort graphics cards.

<sup>65</sup> Contains DMS59 to dual-DVI cable and DMS59 to dual-VGA cable.

More information at [www.lenovo.com/support/graphiccards](http://www.lenovo.com/support/graphiccards)

**Security**

Kensington MicroSaver Cable Lock	73P2582	ann 12/29/03
Kensington Twin Head Cable Lock	45K1620	ann 09/30/08
Lenovo Security Cable Lock	57Y4303	ann 08/24/10
USB Gemplus GemPC Smart Card Reader	41N3040	ann 02/21/06

For more information on accessories:

[www.lenovo.com/accessories](http://www.lenovo.com/accessories)

Purchase Lenovo accessories

[www.lenovo.com/support/accessories](http://www.lenovo.com/support/accessories)

Product specifications on Lenovo Support

[www.lenovo.com/accessoriesguide](http://www.lenovo.com/accessoriesguide)

Option Compatibility Matrix (OCM) and accessory brochures

[www.lenovoquickpick.com](http://www.lenovoquickpick.com)

An Options Compatibility Configurator for Lenovo systems

Name	Type-model	Slot x bay	Processor	GHz	Cores	Mem-ory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Vista preload	Workhorse Global	Avail date
S10	6423-26U	5x6	E6750	2.66	2	2GB	1 x 250GB <sup>2</sup> SATA		DVD±RW	1 x FX370	1394		None	Bus64	No	Jan 08
S10	6423-27U	5x6	E6850	3.00	2	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6423-28U	5x6	E6850	3.00	2	2GB	1 x 146GB SAS		DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6423-29U	5x6	E6850	3.00	2	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700	1394	X-Fi	None	Bus64	No	Jan 08
S10	6423-31U	5x6	Q6600	2.40	4	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700	1394	X-Fi	None	Bus64	No	Jan 08
S10	6423-32U	5x6	Q6700	2.66	4	2GB	2 x 160GB SATA	1	DVD±RW	2 x NVS290			None	Bus64	No	Jan 08

- High performance workstation with premium graphics for specialized professionals
- Environmentally friendly, cool, and quiet with rock solid engineering
- These small and medium business (SMB) models are part of the US TopSeller™ Program

Processor	<b>Intel® Core™ 2 Duo Processor E6750 or E6850 with dual-core,</b> 1333MHz system bus, and 4MB L2 cache or <b>Intel Core 2 Quad Processor Q6600 or Q6700 with quad-core,</b> 1066MHz system bus, and 8MB L2 cache Processor uses FC-LGA6 package, one LGA775 socket		<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 16.8"H (without handle)</li> <li>• 175mm W x 483mm D x 426mm H</li> <li>• 36 lb (16.4kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation	Processor uses FC-LGA6 package, one LGA775 socket			
Memory	<b>2GB</b> std, 8GB max, <b>PC3-8500 1066MHZ DDR3, ECC,</b> dual-channel capable, four 240-pin DIMM sockets; <i>Non-italics:</i> standard memory in two sockets; two sockets available		Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 3.5", 1" high, external, std media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, std or opt disk Bay ⑥ 3.5", 1" high, internal, std or opt disk	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU <i>Some:</i> <b>NVIDIA® Quadro® NVS 290,</b> PCIe x16 adapter, 256MB, two single-link DVI-I via DMS-59 dongle, 21W <i>Some:</i> <b>NVIDIA Quadro FX 370,</b> PCIe x16 adapter, 256MB, one single-link and 1 dual-link DVI, dual DVI-I or dual VGA, 25W <i>Some:</i> <b>NVIDIA Quadro FX 1700,</b> PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W		Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe x4 (x16 mechanical) Slot 5: half-length, full-height, 32-bit PCI 2.3	
Media reader	9-in-1 media reader, internal USB 2.0			
SATA disk(s)	<i>Some:</i> <b>160GB</b> or <b>250GB</b> , SATA 3.0Gb/s, 7200 rpm			
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH9R			
SATA connectors	Six SATA connectors on planar			
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive			
SAS disk	<i>Some:</i> <b>146GB</b> , Serial Attached SCSI, 3.0Gb/s, 15000 rpm			
SAS controller	<i>Some:</i> <b>LSI™ LSI SAS3041E-R</b> PCIe x4 adapter, 4-port, 3.0Gb/s, RAID <sup>®</sup> 0, 1, 1E			
Chipset	<b>Intel X38 Express Chipset,</b> Intel I/O Controller Hub 9 RAID (ICH9R) for RAID 0, 1, 5 support, <b>SMSC® SCH5027D</b> Super I/O			
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Chassis intrusion switch</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Rear ports	Eight USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), five analog audio ports (line-in, microphone-in, front-out, rear-out, center/sub-out), optical S/PDIF digital out <i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear High Definition (HD) Audio, Analog Devices AD1988A codec; <i>Some:</i> Creative Sound Blaster® X-Fi, PCI adapter, high-end sound adapter			
IEEE 1394 adptr	None			
Audio	None			
Speaker	Internal speaker for business audio			
Ethernet	Dual gigabit ethernet on planar, <b>Broadcom® BCM5754</b> and <b>BCM5755</b> , 2 x PCIe x1			
Security chip	Integrated in ethernet controller <b>BCM5755</b> , TCG 1.2-compliant			
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black			
Mouse	Optical Wheel Mouse (USB connector), black			
Power supply	650 watts with 120mm bottom-mounted variable speed fan, universal			
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])			
Rack mount	Rack shelf support			
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>			
- Microsoft® Windows® Vista® Business Edition (64-bit)	1GB PC3-8500 DDR3 ECC UDIMM	41U5251		
	2GB PC3-8500 DDR3 ECC UDIMM	41U5252		
<b>Preloaded applications<sup>5</sup></b>	500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990		
• Rescue and Recovery™	750GB SATA 3.0Gb/s Disk (7200 rpm)	43R1991		
• Client Security Solution™	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918		
• ThinkVantage Productivity Center	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s	41N5620		
• ThinkVantage System Update	USB 2.0 Lenovo Multimedia Headset	40Y8518		
• System Migration Assistant	USB 2.0 Lenovo Webcam	40Y8519		
• Norton Internet Security™ (90 days of virus definitions)	USB 2.0 Ultra Secure Memory Key 8GB	45J5918		
• PC-Doctor™ (diagnostics)	USB 2.0 Portable Secure 320GB Hard Disk	43R2019		
• Adobe® Reader	ThinkVision® L1700p 17" Monitor	9417HE2		
• Microsoft Office 2007 Trial (60-day)	ThinkVision L1940p Wide 19" Monitor	4424HB6		
• Sonic RecordNow and Drive Letter Access (DVD±RW)	ThinkVision L2240p Wide 22" Monitor	4422HB6		
• Corel® WinDVD® (DVD±RW)	ThinkVision L2440x Wide 24" Monitor	4421HB2		
	Wireless Kbd & Opt Wheel Mouse (via USB)	73P4067		
	Laser Tilt Wheel Mouse (USB, PS/2)	41U3074		
	Kensington® Cable Lock from Lenovo	73P2582		
	NVIDIA® Quadro® 512MB FX 570	45J7917		
	NVIDIA Quadro 512MB FX 1700	43R1767		
	NVIDIA Quadro 512MB FX 3700	43R1768		
	NVIDIA Quadro 768MB FX 4600	43R1769		
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>			
	Supports ThinkVantage® technologies			
	RoHS-compliant			
	<b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>↔ 3-year parts and labor</li> <li>↔ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>↔ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>↔ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>			

See footnotes for important warranty information  
 US models announced December 18, 2007  
 US models withdrawn effective June 2009

# ThinkStation® S10 (6423) - TopSeller (April 2008) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Mem-ory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Preload	Workhorse Global	Avail date
S10	6423-33U	5x6	E6850	3.00	2	2GB	1 x 250GB <sup>2</sup> SATA		DVD±RW	1 x NVS290			None	XP Pro	No	Apr 08
S10	6423-34U	5x6	E6850	3.00	2	2GB	1 x 250GB SATA		DVD±RW	1 x FX370			None	XP Pro	No	Apr 08
S10	6423-35U	5x6	E6850	3.00	2	2GB	1 x 250GB SATA		DVD±RW	1 x FX1700			None	XP Pro	No	Apr 08
S10	6423-36U	5x6	QX6850	3.00	4	2GB	1 x 250GB SATA		DVD±RW	1 x FX4600			None	XP Pro	No	Apr 08
S10	6423-37U	5x6	E6850	3.00	2	2GB	1 x 250GB SATA		BD burner	1 x FX1700			None	XP Pro	No	Apr 08
S10	6423-38U	5x6	QX6850	3.00	4	2GB	1 x 250GB SATA		BD burner	1 x FX4600			None	XP Pro	No	Apr 08
S10	6423-49U	5x6	E6750	2.66	2	2GB	1 x 250GB SATA		DVD±RW	1 x FX370	1394		None	Bus32	No	Apr 08
S10	6423-51U	5x6	E6850	3.00	2	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700			None	Bus32	No	Apr 08
S10	6423-52U	5x6	E6850	3.00	2	2GB	1 x 146GB SAS		DVD±RW	1 x FX1700			None	Bus32	No	Apr 08
S10	6423-53U	5x6	E6850	3.00	2	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700		X-Fi	None	Bus32	No	Apr 08
S10	6423-54U	5x6	Q6600	2.40	4	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700		X-Fi	None	Bus32	No	Apr 08
S10	6423-55U	5x6	Q6700	2.66	4	2GB	2 x 160GB SATA	1	DVD±RW	2 x NVS290			None	Bus32	No	Apr 08

- High performance workstation with premium graphics for specialized professionals
- Environmentally friendly, cool, and quiet with rock solid engineering
- These small and medium business (SMB) models are part of the US TopSeller™ Program

Processor	Intel® Core™ 2 Duo Processor E6750 or E6850 with dual-core, 1333MHz system bus, and 4MB L2 cache or Intel Core 2 Quad Processor Q6600 or Q6700 with quad-core, 1066MHz system bus, and 8MB L2 cache or Intel Core 2 Extreme Processor QX6850 with quad-core, 1333MHz system bus, and 8MB L2 cache	<b>Tower</b>	
Implementation	Processor uses FC-LGA6 package, one LGA775 socket	<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 16.8"H (without handle)</li> <li>• 175mm W x 483mm D x 426mm H</li> <li>• 36 lb (16.4kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Memory	2GB std, 8GB max, PC3-8500 1066MHz DDR3, ECC, dual-channel capable, four 240-pin DIMM sockets; <i>Non-italics</i> : standard memory in two sockets; two sockets available	<ul style="list-style-type: none"> <li>• Bay ① 5.25", 1.6" high, external, std optical</li> <li>• Bay ② 5.25", 1.6" high, external, open</li> <li>• Bay ③ 3.5", 1" high, external, std media reader</li> <li>• Bay ④ 3.5", 1" high, internal, std disk</li> <li>• Bay ⑤ 3.5", 1" high, internal, std or opt disk</li> <li>• Bay ⑥ 3.5", 1" high, internal, std or opt disk</li> </ul>	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU <i>Some: NVIDIA® Quadro® NVS 290</i> , PCIe x16 adapter, 256MB, two single-link DVI via DMS-59 with dual DVI-I dongle, 21W <i>Some: NVIDIA Quadro FX 370</i> , PCIe x16 adapter, 256MB, one single-link and 1 dual-link DVI, dual DVI-I or dual VGA, 25W <i>Some: NVIDIA Quadro FX 1700</i> , PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W <i>Some: NVIDIA Quadro FX 4600</i> , PCIe x16 adapter, 768MB, two slot width, 2 dual-link DVI, dual DVI-I or dual VGA, 134W	<ul style="list-style-type: none"> <li>• Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 3: full-length, full-height, 32-bit PCI 2.3</li> <li>• Slot 4: full-length, full-height, PCIe x4 (x16 mechanical)</li> <li>• Slot 5: half-length, full-height, 32-bit PCI 2.3</li> </ul>	
Media reader	9-in-1 media reader, internal USB 2.0		
SATA disk(s)	<i>Some: 160GB or 250GB</i> , SATA 3.0Gb/s, 7200 rpm		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH9R		
SATA connectors	Six SATA connectors on planar		
SATA DVD±RW	<i>Some: Super Multi-Burner DL DVD±RW SATA 1.5Gb/s</i>		
SATA BD burner	<i>Some: Blu-ray™ Burner / HD-DVD Player SATA 1.5Gb/s</i>		
SAS disk	<i>Some: 146GB</i> , Serial Attached SCSI, 3.0Gb/s, 15000 rpm		
SAS controller	<i>Some: LSI™ LSISAS3041E-R</i> PCIe x4 adapter, 4-port, 3.0Gb/s, RAID® 0, 1, 1E		
Chipset	Intel X38 Express Chipset, Intel I/O Controller Hub 9 RAID (ICH9R) for RAID 0, 1, 5 support, SMC® SCH5027D Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		
Rear ports	Eight USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), five analog audio ports (line-in, microphone-in, front-out, rear-out, center/sub-out), optical S/PDIF digital out		
IEEE 1394 adptr	<i>Some: FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear</i>		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec; <i>Some: Creative Sound Blaster® X-Fi</i> , PCI adapter, high-end sound adapter		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5754 and BCM5755, 2 x PCIe x1		
Security chip	Integrated in ethernet controller BCM5755, TCG 1.2-compliant	<b>Security</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Chassis intrusion switch</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	650 watts with 120mm bottom-mounted variable speed fan, universal, 80 PLUS®		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Microsoft® Windows® XP Professional	1GB PC3-8500 DDR3 ECC UDIMM	41U5251	
- Microsoft® Windows® Vista® Business Edition (32-bit)	2GB PC3-8500 DDR3 ECC UDIMM	41U5252	
◆ Vista models: Vista Premium logo	750GB SATA 3.0Gb/s Disk (7200 rpm)	43R1991	
<b>Preloaded applications<sup>5</sup></b> (all OSes; only some listed)	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918	
• Rescue and Recovery™	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s	41N5620	
• ThinkVantage Productivity Center	USB 2.0 Ultra Secure Memory Key 8GB	45J5918	
• ThinkVantage System Update	USB 2.0 Portable Secure 320GB Hard Disk	43R2019	
• Norton Internet Security™ (90 days of virus definitions)	ThinkVision® L2240p Wide 22" Monitor	4422HB6	
• Sonic RecordNow and Drive Letter Access (DVD±RW)	ThinkVision L2440p Wide 24" Monitor	4420HB2	
• Corel® WinDVD® (DVD±RW)	NVIDIA® Quadro® 512MB FX 1700	43R1767	
	NVIDIA Quadro 512MB FX 3700	43R1768	
	NVIDIA Quadro 768MB FX 4600	43R1769	
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
		Supports ThinkVantage® technologies	
		RoHS-compliant	
		<b>Limited Warranty<sup>1</sup></b>	
		↔ 3-year parts and labor	
		↔ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts <sup>3</sup> , 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)	
		↔ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a>	
		• Onsite service upgrade options (in eligible locations) <sup>7</sup>	
		↔ 24 hour x 7 day <sup>14</sup> toll-free support during the warranty period <sup>1</sup> via 800-426-7378	

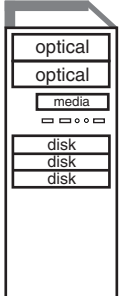
See footnotes for important warranty information  
 US models announced April 15, 2008  
 US models withdrawn effective June 2009

# ThinkStation® S10 (6423) - TopSeller (August 2008) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Mem-ory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0 Preload	Workhorse Global	Avail date	
S10	6423-56U	5x6	Q9550	2.83	4	2GB	2 x 250GB <sup>2</sup> SATA	None	DVD±RW	1 x FX3700		None	None	Bus32	No	Aug 08
S10	6423-57U	5x6	Q9450	2.66	4	2GB	1 x 250GB SATA	None	DVD±RW	1 x FX570		None	None	Bus32	No	Aug 08
S10	6423-58U	5x6	E8200	2.66	2	2GB	1 x 250GB SATA	None	DVD±RW	1 x NVS290	1394	None	None	Bus64	No	Aug 08
S10	6423-59U	5x6	E8400	3.00	2	2GB	1 x 250GB SATA	None	DVD±RW	1 x FX370		None	None	Bus64	No	Aug 08
S10	6423-61U	5x6	E8500	3.16	2	4GB	1 x 146GB SAS	None	DVD±RW	1 x FX1700		None	None	Bus64	No	Aug 08
S10	6423-67U	5x6	Q9450	2.66	4	2GB	1 x 250GB SATA	None	DVD±RW	1 x FX570		None	None	Bus64	No	Aug 08
S10	6423-68U	5x6	Q9450	2.66	4	4GB	1 x 250GB SATA	None	DVD±RW	1 x FX1700		None	None	Bus64	No	Aug 08
S10	6423-69U	5x6	Q9550	2.83	4	4GB	1 x 500GB SATA	None	DVD±RW	1 x FX3700		None	None	Bus64	No	Aug 08
S10	6423-72U	5x6	QX9650	3.00	4	4GB	1 x 500GB SATA	None	DVD±RW	1 x FX3700		None	None	Bus64	No	Aug 08
S10	6423-H1U	5x6	Q9550	2.83	4	4GB	1 x 500GB SATA	None	DVD±RW	None		None	None	Bus64	No	Sep 08
S10	6423-H2U	5x6	E8400	3.00	2	2GB	1 x 250GB SATA	None	DVD±RW	None		None	None	Bus64	No	Sep 08
S10	6423-H3U	5x6	Q9550	2.83	4	4GB	1 x 146GB SAS	None	DVD±RW	None		None	None	Bus64	No	Sep 08
S10	6423-H4U	5x6	E8400	3.00	2	2GB	1 x 146GB SAS	None	DVD±RW	None		None	None	Bus64	No	Sep 08

• These small and medium business (SMB) models are part of the US TopSeller™ Program

Processor	Intel® Core™ 2 Duo Processor E8200, E8400, or E8500 with dual-core, 1333MHz system bus, and 6MB L2 cache or Intel Core 2 Quad Processor Q9450 or Q9550 with quad-core, 1333MHz system bus, and 12MB L2 cache or Intel Core 2 Extreme Processor QX9650 with quad-core, 1333MHz system bus, and 12MB L2 cache	<b>Tower</b> <ul style="list-style-type: none"> <li>Raven black color; metal case</li> <li>6.9"W x 19.0"D x 16.8"H (without handle)</li> <li>175mm W x 483mm D x 426mm H</li> <li>36 lb (16.4kg) max configuration</li> <li>31-liter</li> <li>Removable handle on top front</li> <li>Toolless side cover removal</li> <li>Toolless disk and optical drive removal</li> <li>Toolless adapter retention</li> <li>Illuminated front icons</li> <li>Rack shelf support</li> </ul> 
Implementation	Processor uses FC-LGA6 package, one LGA775 socket	
Memory	2GB or 4GB std, 8GB max, PC3-8500 1066MHz DDR3, ECC, dual-channel capable, four 240-pin DIMM sockets; <i>Italics:</i> standard memory in four sockets; no sockets available <i>Non-italics:</i> standard memory in two sockets; two sockets available	Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 3.5", 1" high, external, std media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, std or opt disk Bay ⑥ 3.5", 1" high, internal, std or opt disk  Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe x4 (x16 mechanical) Slot 5: half-length, full-height, 32-bit PCI 2.3
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76W to 150W adapters use auxiliary power connector from PSU <i>Some:</i> NVIDIA® Quadro® NVS 290, PCIe x16 adapter, 256MB, two single-link DVI-I via DMS-59 dongle, 21W <i>Some:</i> NVIDIA Quadro FX 370, PCIe x16 adapter, 256MB, one single-link and 1 dual-link DVI, dual DVI-I or dual VGA, 25W <i>Some:</i> NVIDIA Quadro FX 570, PCIe 2.0 x16 adapter, 256MB, two dual-link DVI, dual DVI-I or dual VGA, 38W <i>Some:</i> NVIDIA Quadro FX 1700, PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W <i>Some:</i> NVIDIA Quadro FX 3700, PCIe 2.0 x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, 78W	
Media reader	9-in-1 media reader, internal USB 2.0	
SATA disk(s)	<i>Some:</i> 250GB or 500GB, SATA 3.0Gb/s, 7200 rpm	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH9R	
SATA connectors	Six SATA connectors on planar	
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s	
SAS disk	<i>Some:</i> 146GB, Serial Attached SCSI, 3.0Gb/s, 15000 rpm	
SAS controller	<i>Some:</i> LSI™ LSISAS3041E-R PCIe x4 adapter, 4-port, 3.0Gb/s, RAID® 0, 1, 1E	
Chipset	Intel X38 Express Chipset, Intel I/O Controller Hub 9 RAID (ICH9R) for RAID 0, 1, 5 support, SMSC® SCH5027D Super I/O	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)	
Rear ports	Eight USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), five analog audio ports (line-in, microphone-in, front-out, rear-out, center/sub-out), optical S/PDIF digital out	
IEEE 1394 adptr	<i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear	
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec;	
Speaker	Internal speaker for business audio	
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5754 and BCM5755, 2 x PCIe x1	
Security chip	Integrated in ethernet controller BCM5755, TCG 1.2-compliant	<b>Security</b> <ul style="list-style-type: none"> <li>Security chip (see information on left)</li> <li>Side cover lock (ships with two identical keys)</li> <li>Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>Chassis intrusion switch</li> <li>Power-on password</li> <li>Administrator password</li> <li>Boot sequence control</li> <li>Boot without keyboard, mouse, diskette</li> <li>Serial port I/O control</li> <li>USB port disablement (front or all)</li> </ul>
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	
Mouse	Optical Wheel Mouse (USB connector), black	
Power supply	650 watts with 120mm bottom-mounted variable speed fan, universal	
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI >75W graphics), opt front [SAS])	
Rack mount	Rack shelf support	
Preloaded operating system <sup>20</sup>	<ul style="list-style-type: none"> <li>Genuine Windows® Vista® Business 32</li> <li>Genuine Windows Vista Business 64</li> <li>Vista Premium logo</li> </ul>	
Preloaded applications <sup>5</sup> (all OSes; only some listed)	<ul style="list-style-type: none"> <li>Rescue and Recovery™</li> <li>ThinkVantage Productivity Center</li> <li>ThinkVantage System Update</li> <li>Norton Internet Security™</li> <li>Sonic RecordNow and Drive Letter Access (DVD±RW)</li> <li>Corel® WinDVD® (DVD±RW)</li> </ul>	<b>Accessories</b> <ul style="list-style-type: none"> <li>1GB PC3-8500 DDR3 ECC UDIMM 41U5251</li> <li>2GB PC3-8500 DDR3 ECC UDIMM 41U5252</li> <li>750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991</li> <li>1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918</li> <li>Super Multi-Burner DL DVD±RW SATA 1.5Gb/s 41N5620</li> <li>USB 2.0 Ultra Secure Memory Key 8GB 45J5918</li> <li>USB 2.0 Portable Secure 320GB Hard Disk 43R2019</li> <li>ThinkVision® L2240p Wide 22" Monitor 4422HB6</li> <li>ThinkVision L2440p Wide 24" Monitor 4420HB2</li> <li>NVIDIA® Quadro® 512MB FX 1700 43R1767</li> <li>NVIDIA Quadro 512MB FX 3700 43R1768</li> <li>NVIDIA Quadro 768MB FX 4600 43R1769</li> </ul> Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>
		Supports ThinkVantage® technologies  RoHS-compliant  <b>Limited Warranty<sup>1</sup></b> <ul style="list-style-type: none"> <li>3-year parts and labor</li> <li>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>

See footnotes for important warranty information  
 US models announced September 30, 2008 or August 19, 2008  
 US models withdrawn effective June 2009

# ThinkStation® S10 (6483) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Mem-ory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Vista preload	Workhorse Global	Avail date
S10	6483-22U	5x6	Q6700	2.66	4	2GB	1 x 250GB <sup>2</sup> SATA		DVD±RW	1 x FX4600			None	Bus64	No	Jan 08
S10	6483-23U	5x6	E6850	3.00	2	2GB	1 x 146GB SAS		DVD±RW	1 x FX4600			None	Bus64	No	Jan 08
S10	6483-24U	5x6	QX6850	3.00	4	2GB	1 x 146GB SAS		DVD±RW	1 x FX4600	1394	X-Fi	None	Bus64	No	Jan 08
S10	6483-33U	5x6	QX6850	3.00	4	<b>4GB</b>	1 x 146GB SAS		DVD±RW	1 x FX4600	1394	X-Fi	None	Bus64	No	Jan 08
S10	6483-25U	5x6	Q6700	2.66	4	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6483-26U	5x6	E6850	3.00	2	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6483-27U	5x6	Q6600	2.40	4	2GB	1 x 146GB SAS		DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6483-29U	5x6	Q6700	2.66	4	<b>4GB</b>	2 x 250GB SATA		DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6483-31U	5x6	E6850	3.00	2	2GB	2 x 250GB SATA	1	DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6483-32U	5x6	E6850	3.00	2	2GB	3 x 250GB SATA	5	DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6483-19U	5x6	E6850	3.00	2	2GB	1 x 250GB SATA		DVD±RW	1 x FX1700			None	Bus64	No	Jan 08
S10	6483-21U	5x6	QX6800	2.93	4	<b>4GB</b>	2 x 500GB SATA	0	BD burner	2 x FX4600		X-Fi	None	Bus64	No	Jan 08

- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**

Processor	<p><b>Intel® Core™ 2 Duo Processor E6850</b> with dual-core, 1333MHz system bus, and 4MB L2 cache or</p> <p><b>Intel Core 2 Quad Processor Q6600 or Q6700</b> with quad-core, 1066MHz system bus, and 8MB L2 cache or</p> <p><b>Intel Core 2 Extreme Processor QX6800</b> with quad-core, 1066MHz system bus, and 8MB L2 cache or</p> <p><b>Intel Core 2 Extreme Processor QX6850</b> with quad-core, 1333MHz system bus, and 8MB L2 cache</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 16.8"H (without handle)</li> <li>• 175mm W x 483mm D x 426mm H</li> <li>• 36 lb (16.4kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation	Processor uses FC-LGA6 package, one LGA775 socket		
Memory	<p><b>2GB</b> or <b>4GB</b> std, 8GB max, <b>PC3-8500 1066MHz DDR3, ECC</b>, dual-channel capable, four 240-pin DIMM sockets;</p> <p><i>Italics:</i> standard memory in four sockets; no sockets available</p> <p><i>Non-italics:</i> standard memory in two sockets; two sockets available</p>		
Graphics	<p>Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU</p> <p><i>Some:</i> <b>NVIDIA® Quadro® FX 1700</b>, PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 4600</b>, PCIe x16 adapter, 768MB, two slot width, 2 dual-link DVI, dual DVI-I or dual VGA, 134W</p>	<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 3.5", 1" high, external, std media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, std or opt disk</p> <p>Bay ⑥ 3.5", 1" high, internal, std or opt disk</p>	
Media reader	9-in-1 media reader, internal USB 2.0		
SATA disk(s)	<i>Some:</i> <b>250GB</b> or <b>500GB</b> , SATA 3.0Gb/s, 7200 rpm		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH9R		
SATA connectors	Six SATA connectors on planar		
SATA DVD±RW	<i>Some:</i> Super Multi-Burner DL DVD±RW SATA 1.5Gb/s		
SATA BD burner	<i>Some:</i> Blu-ray™ Burner / HD-DVD Player SATA 1.5Gb/s		
SAS disk	<i>Some:</i> <b>146GB</b> , Serial Attached SCSI, 3.0Gb/s, 15000 rpm		
SAS controller	<i>Some:</i> LSI™ LSISAS3041E-R PCIe x4 adapter, 4-port, 3.0Gb/s, RAID® 0, 1, 1E		
Chipset	<b>Intel X38 Express Chipset</b> , Intel I/O Controller Hub 9 RAID (ICH9R) for RAID 0, 1, 5 support, SMC® SCH5027D Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		
Rear ports	Eight USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), five analog audio ports (line-in, microphone-in, front-out, rear-out, center/sub-out), optical S/PDIF digital out		
IEEE 1394 adptr	<i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec; <i>Some:</i> Creative Sound Blaster® X-Fi, PCI adapter, high-end sound adapter		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5754 and BCM5755, 2 x PCIe x1		
Security chip	Integrated in ethernet controller BCM5755, TCG 1.2-compliant		
Keyboard	<i>Model 21U:</i> Lenovo USB Fingerprint Keyboard (USB connector), black <i>Others:</i> Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	650 watts with 120mm bottom-mounted variable speed fan, universal		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		

<p><b>Preloaded operating system<sup>20</sup></b></p> <ul style="list-style-type: none"> <li>- Microsoft® Windows® Vista® Business Edition (64-bit)</li> <li>◇ Vista Premium logo</li> </ul> <p><b>Preloaded applications<sup>5</sup></b> (only some listed)</p> <ul style="list-style-type: none"> <li>• Rescue and Recovery™</li> <li>• Client Security Solution™</li> <li>• ThinkVantage Fingerprint Software (fingerprint keyboard model)</li> <li>• System Migration Assistant</li> <li>• Norton Internet Security™</li> <li>• PC-Doctor™ (diagnostics)</li> <li>• Microsoft Office 2007 Trial (60-day)</li> <li>• Sonic RecordNow and Drive Letter Access (DVD±RW)</li> <li>• Corel® WinDVD® (DVD±RW, Blu-ray)</li> <li>• Ulead® DVD MovieFactory (Blu-ray)</li> </ul>	<p><b>Accessories</b></p> <ul style="list-style-type: none"> <li>1GB PC3-8500 DDR3 ECC UDIMM 41U5251</li> <li>2GB PC3-8500 DDR3 ECC UDIMM 41U5252</li> <li>1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918</li> <li>750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991</li> <li>Super Multi-Burner DL DVD±RW SATA 1.5Gb/s 41N5620</li> <li>USB 2.0 Lenovo Webcam 40Y8519</li> <li>USB 2.0 Ultra Secure Memory Key 8GB 45J5918</li> <li>USB 2.0 Portable Secure 320GB Hard Disk 43R2019</li> <li>ThinkVision® L2240p Wide 22" Monitor 4422HB6</li> <li>ThinkVision L2440x Wide 24" Monitor 4421HB2</li> <li>Wireless Kbd &amp; Opt Wheel Mouse (via USB) 73P4067</li> <li>Laser Tilt Wheel Mouse (USB, PS/2) 41U3074</li> <li>NVIDIA® Quadro® 512MB FX 570 45J7917</li> <li>NVIDIA Quadro 512MB FX 1700 43R1767</li> <li>NVIDIA Quadro 512MB FX 3700 43R1768</li> <li>Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a></li> </ul>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Chassis intrusion switch</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	<p>Supports ThinkVantage® technologies</p> <p>RoHS-compliant</p> <p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>• <b>Onsite service upgrade options (in eligible locations)<sup>7</sup></b></li> <li>• <b>Post warranty maintenance services</b></li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>
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See footnotes for important warranty information  
 US models announced December 18, 2007  
 US models withdrawn effective June 2009

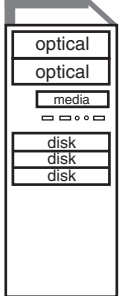
Type-Name	Slot x model	Processor	GHz	Cores	Mem-ory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Preload	Workhorse Global	Avail date
S10	6483-34U	5x6 E6850	3.00	2	2GB	1 x 250GB <sup>2</sup> SATA		DVD±RW	1 x NVS290	None	None	None	XP Pro	No	Apr 08
S10	6483-35U	5x6 E6850	3.00	2	2GB	1 x 250GB SATA		DVD±RW	1 x FX370	None	None	None	XP Pro	No	Apr 08
S10	6483-36U	5x6 E6850	3.00	2	2GB	1 x 250GB SATA		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
S10	6483-37U	5x6 QX6850	3.00	4	2GB	1 x 250GB SATA		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
S10	6483-38U	5x6 QX6850	3.00	4	2GB	1 x 250GB SATA		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
S10	6483-39U	5x6 E6850	3.00	2	2GB	1 x 146GB SAS		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
S10	6483-41U	5x6 QX6850	3.00	4	2GB	1 x 146GB SAS		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
S10	6483-42U	5x6 QX6850	3.00	4	2GB	1 x 146GB SAS		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
S10	6483-43U	5x6 E6850	3.00	2	2GB	2 x 250GB SATA	1	DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
S10	6483-44U	5x6 QX6850	3.00	4	2GB	2 x 250GB SATA	1	DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
S10	6483-45U	5x6 QX6850	3.00	4	2GB	2 x 250GB SATA	1	DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
S10	6483-46U	5x6 E6850	3.00	2	2GB	1 x 250GB SATA		BD burner	1 x FX1700	None	None	None	XP Pro	No	Apr 08
S10	6483-47U	5x6 QX6850	3.00	4	2GB	1 x 250GB SATA		BD burner	1 x FX4600	None	None	None	XP Pro	No	Apr 08
S10	6483-92U	5x6 E6850	3.00	2	2GB	1 x 250GB SATA		DVD±RW	1 x FX1700	None	None	None	Bus32	No	Apr 08
S10	6483-93U	5x6 Q6700	2.66	4	2GB	1 x 250GB SATA		DVD±RW	1 x FX4600	None	None	None	Bus32	No	Apr 08
S10	6483-94U	5x6 E6850	3.00	2	2GB	2 x 250GB SATA		DVD±RW	1 x FX1700	None	None	None	Bus32	No	Apr 08
S10	6483-95U	5x6 E6850	3.00	2	2GB	2 x 250GB SATA	1	DVD±RW	1 x FX1700	None	None	None	Bus32	No	Apr 08
S10	6483-96U	5x6 E6850	3.00	2	2GB	3 x 250GB SATA	5	DVD±RW	1 x FX1700	None	None	None	Bus32	No	Apr 08

- High performance workstation with premium graphics for specialized professionals
- Environmentally friendly, cool, and quiet with rock solid engineering

Processor	Intel® Core™ 2 Duo Processor E6850 with dual-core, 1333MHz system bus, and 4MB L2 cache or Intel Core 2 Quad Processor Q6700 with quad-core, 1066MHz system bus, and 8MB L2 cache or Intel Core 2 Extreme Processor QX6850 with quad-core, 1333MHz system bus, and 8MB L2 cache	<b>Tower</b>	
Implementation	Processor uses FC-LGA6 package, one LGA775 socket	<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 16.8"H (without handle)</li> <li>• 175mm W x 483mm D x 426mm H</li> <li>• 36 lb (16.4kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Memory	2GB std, 8GB max, PC3-8500 1066MHz DDR3, ECC, dual-channel capable, four 240-pin DIMM sockets; <i>Non-italics</i> : standard memory in two sockets; two sockets available	<ul style="list-style-type: none"> <li>Bay ① 5.25", 1.6" high, external, std optical</li> <li>Bay ② 5.25", 1.6" high, external, open</li> <li>Bay ③ 3.5", 1" high, external, std media reader</li> <li>Bay ④ 3.5", 1" high, internal, std disk</li> <li>Bay ⑤ 3.5", 1" high, internal, std or opt disk</li> <li>Bay ⑥ 3.5", 1" high, internal, std or opt disk</li> </ul>	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU <i>Some: NVIDIA® Quadro® NVS 290, PCIe x16 adapter, 256MB, two single-link DVI-I via DMS-59 dongle, 21W</i> <i>Some: NVIDIA Quadro FX 370, PCIe x16 adapter, 256MB, one single-link and 1 dual-link DVI, dual DVI-I or dual VGA, 25W</i> <i>Some: NVIDIA Quadro FX 1700, PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W</i> <i>Some: NVIDIA Quadro FX 4600, PCIe x16 adapter, 768MB, two slot width, 2 dual-link DVI, dual DVI-I or dual VGA, 134W</i>	<ul style="list-style-type: none"> <li>Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>Slot 3: full-length, full-height, 32-bit PCI 2.3</li> <li>Slot 4: full-length, full-height, PCIe x4 (x16 mechanical)</li> <li>Slot 5: half-length, full-height, 32-bit PCI 2.3</li> </ul>	
Media reader	9-in-1 media reader, internal USB 2.0		
SATA disk(s)	<i>Some: 250GB, SATA 3.0Gb/s, 7200 rpm</i>		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH9R		
SATA connectors	Six SATA connectors on planar		
SATA DVD±RW	<i>Some: Super Multi-Burner DL DVD±RW SATA 1.5Gb/s</i>		
SATA BD burner	<i>Some: Blu-ray™ Burner / HD-DVD Player SATA 1.5Gb/s</i>		
SAS disk	<i>Some: 146GB, Serial Attached SCSI, 3.0Gb/s, 15000 rpm</i>		
SAS controller	<i>Some: LSI™ LSISAS3041E-R PCIe x4 adapter, 4-port, 3.0Gb/s, RAID® 0, 1, 1E</i>		
Chipset	Intel X38 Express Chipset, Intel I/O Controller Hub 9 RAID (ICH9R) for RAID 0, 1, 5 support, SMSC® SCH5027D Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		
Rear ports	Eight USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), five analog audio ports (line-in, microphone-in, front-out, rear-out, center/sub-out), optical S/PDIF digital out		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec;		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5754 and BCM5755, 2 x PCIe x1		
Security chip	Integrated in ethernet controller BCM5755, TCG 1.2-compliant	<b>Security</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Chassis intrusion switch</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	650 watts with 120mm bottom-mounted variable speed fan, universal		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b> - Microsoft® Windows® XP Professional - Microsoft Windows Vista® Business Edition (32-bit) ♦ Vista models: Vista Premium logo			
<b>Preloaded applications<sup>5</sup></b> (all OSes; only some listed) <ul style="list-style-type: none"> <li>• Rescue and Recovery™</li> <li>• ThinkVantage System Update</li> <li>• Sonic RecordNow and Drive Letter Access (DVD±RW)</li> <li>• Corel® WinDVD® (DVD±RW, Blu-ray)</li> <li>• Ulead® DVD MovieFactory (Blu-ray)</li> </ul>		<b>Accessories</b> <ul style="list-style-type: none"> <li>1GB PC3-8500 DDR3 ECC UDIMM 41U5251</li> <li>2GB PC3-8500 DDR3 ECC UDIMM 41U5252</li> <li>750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991</li> <li>1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918</li> <li>USB 2.0 Ultra Secure Memory Key 8GB 45J5918</li> <li>USB 2.0 Portable Secure 320GB Hard Disk 43R2019</li> <li>ThinkVision® L2440p Wide 24" Monitor 4420HB2</li> <li>NVIDIA® Quadro® 512MB FX 570 45J7917</li> <li>NVIDIA Quadro 512MB FX 1700 43R1767</li> <li>NVIDIA Quadro 512MB FX 3700 43R1768</li> </ul> Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	
		Supports ThinkVantage® technologies	
		RoHS-compliant	
		<b>Limited Warranty<sup>1</sup></b> <ul style="list-style-type: none"> <li>↔ 3-year parts and labor</li> <li>↔ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>↔ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>↔ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup></li> </ul>	

See footnotes for important warranty information  
 US models announced April 15, 2008  
 US models withdrawn effective June 2009

Name	Type-model	Slot x bay	Processor	GHz	Cores	Mem-ory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Preload	Workhorse Global	Avail date
S10	6483-A1U	5x6	Q9450	2.66	4	2GB	1 x 250GB SATA	None	DVD±RW	1 x FX3700		None	None	Bus64	No	Aug 08
S10	6483-A2U	5x6	Q9450	2.66	4	2GB	1 x 250GB SATA	None	DVD±RW	1 x FX570		None	None	Bus64	No	Aug 08
S10	6483-A3U	5x6	Q9550	2.83	4	2GB	1 x 250GB SATA	None	DVD±RW	1 x FX570		None	None	Bus64	No	Aug 08
S10	6483-A4U	5x6	Q9550	2.83	4	2GB	1 x 250GB SATA	None	DVD±RW	1 x FX3700		None	None	Bus64	No	Aug 08
S10	6483-B2U	5x6	Q9450	2.66	4	4GB	1 x 146GB SAS	None	DVD±RW	1 x FX1700	1394	None	None	Bus64	No	Aug 08
S10	6483-B3U	5x6	Q9550	2.83	4	4GB	2 x 250GB SATA	None	DVD±RW	1 x FX1700		None	None	Bus64	No	Aug 08
S10	6483-B4U	5x6	Q9550	2.83	4	4GB	1 x 146GB SAS	None	DVD±RW	1 x FX3700		None	None	Bus64	No	Aug 08
S10	6483-B5U	5x6	QX9650	3.00	4	4GB	2 x 250GB SATA	None	DVD±RW	1 x FX1700		None	None	Bus64	No	Aug 08
S10	6483-B8U	5x6	E8200	2.66	2	2GB	1 x 160GB SATA	None	DVD	1 x FX570	1394	None	None	Bus64	No	Aug 08
S10	6483-B9U	5x6	E8200	2.66	2	2GB	1 x 160GB SATA	None	DVD	1 x FX3700	1394	None	None	Bus64	No	Aug 08
S10	6483-C1U	5x6	E8400	3.00	2	2GB	2 x 250GB SATA	None	DVD±RW	1 x FX1700		None	None	Bus64	No	Aug 08
S10	6483-C2U	5x6	E8500	3.16	2	4GB	2 x 250GB SATA	None	DVD±RW	1 x FX3700		None	None	Bus64	No	Aug 08
S10	6483-E1U	5x6	QX9650	3.00	4	4GB	2 x 500GB SATA	None	DVD±RW	1 x FX1700		None	None	Bus64	No	Aug 08
S10	6483-E2U	5x6	QX9650	3.00	4	4GB	2 x 500GB SATA	None	DVD±RW	1 x FX3700		None	None	Bus64	No	Aug 08

Processor	Intel® Core™ 2 Duo Processor E8200, E8400, or E8500 with dual-core, 1333MHz system bus, and 6MB L2 cache or Intel Core 2 Quad Processor Q9450 or Q9550 with quad-core, 1333MHz system bus, and 12MB L2 cache or Intel Core 2 Extreme Processor QX9650 with quad-core, 1333MHz system bus, and 12MB L2 cache	<b>Tower</b> <ul style="list-style-type: none"> <li>Raven black color; metal case</li> <li>6.9"W x 19.0"D x 16.8"H (without handle)</li> <li>175mm W x 483mm D x 426mm H</li> <li>36 lb (16.4kg) max configuration</li> <li>31-liter</li> <li>Removable handle on top front</li> <li>Toolless side cover removal</li> <li>Toolless disk and optical drive removal</li> <li>Toolless adapter retention</li> <li>Illuminated front icons</li> <li>Rack shelf support</li> </ul> 
Implementation	Processor uses FC-LGA6 package, one LGA775 socket	
Memory	2GB or 4GB std, 8GB max, PC3-8500 1066MHz DDR3, ECC, dual-channel capable, four 240-pin DIMM sockets; <i>Italics:</i> standard memory in four sockets; no sockets available <i>Non-italics:</i> standard memory in two sockets; two sockets available	Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 3.5", 1" high, external, std media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, std or opt disk Bay ⑥ 3.5", 1" high, internal, std or opt disk
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU <i>Some:</i> NVIDIA® Quadro® FX 570, PCIe 2.0 x16 adapter, 256MB, two dual-link DVI, dual DVI-I or dual VGA, 38W <i>Some:</i> NVIDIA Quadro FX 1700, PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W <i>Some:</i> NVIDIA Quadro FX 3700, PCIe 2.0 x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, 78W	Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe x4 (x16 mechanical) Slot 5: half-length, full-height, 32-bit PCI 2.3
Media reader	9-in-1 media reader, internal USB 2.0	<b>Security</b> <ul style="list-style-type: none"> <li>Security chip (see information on left)</li> <li>Side cover lock (ships with two identical keys)</li> <li>Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>Chassis intrusion switch</li> <li>Power-on password</li> <li>Administrator password</li> <li>Boot sequence control</li> <li>Boot without keyboard, mouse, diskette</li> <li>Serial port I/O control</li> <li>USB port disablement (front or all)</li> </ul>
SATA disk(s)	<i>Some:</i> 160GB, 250GB, or 500GB, SATA 3.0Gb/s, 7200 rpm	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH9R	
SATA connectors	Six SATA connectors on planar	
SATA DVD	<i>Some:</i> DVD-ROM DL SATA1.5Gb/s 16X-48X Max <sup>4</sup>	
SATA DVD±RW	<i>Some:</i> Super Multi-Burner DL DVD±RW SATA 1.5Gb/s	
SAS disk	<i>Some:</i> 146GB, Serial Attached SCSI, 3.0Gb/s, 15000 rpm	
SAS controller	<i>Some:</i> LSI™ LSISAS3041E-R PCIe x4 adapter, 4-port, 3.0Gb/s, RAID® 0, 1, 1E	
Chipset	Intel X38 Express Chipset, Intel I/O Controller Hub 9 RAID (ICH9R) for RAID 0, 1, 5 support, SMSC® SCH5027D Super I/O	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)	
Rear ports	Eight USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), five analog audio ports (line-in, microphone-in, front-out, rear-out, center/sub-out), optical S/PDIF digital out	
IEEE 1394 adptr	<i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear	
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec;	
Speaker	Internal speaker for business audio	
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5754 and BCM5755, 2 x PCIe x1	
Security chip	Integrated in ethernet controller BCM5755, TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	
Mouse	Optical Wheel Mouse (USB connector), black	
Power supply	650 watts with 120mm bottom-mounted variable speed fan, universal	
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])	
Rack mount	Rack shelf support	
Preloaded operating system <sup>20</sup>	- Genuine Windows® Vista® Business 64 ♦ Vista Premium logo	Supports ThinkVantage® technologies
Preloaded applications <sup>5</sup>	<ul style="list-style-type: none"> <li>Rescue and Recovery™</li> <li>Client Security Solution™</li> <li>ThinkVantage Productivity Center</li> <li>ThinkVantage System Update</li> <li>System Migration Assistant</li> <li>Norton Internet Security™ (90 days of virus definitions)</li> <li>PC-Doctor™ (diagnostics)</li> <li>Adobe® Reader</li> <li>Microsoft® Office 2007 Trial (60-day)</li> <li>Sonic RecordNow and Drive Letter Access (DVD±RW)</li> <li>Corel® WinDVD® (DVD±RW)</li> </ul>	RoHS-compliant
Accessories	1GB PC3-8500 DDR3 ECC UDIMM 41U5251 2GB PC3-8500 DDR3 ECC UDIMM 41U5252 750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991 1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918 146GB SAS 3.0Gb/s Disk (15000 rpm) 43R1993 300GB SAS 3.0Gb/s Disk (15000 rpm) 43R1994 Super Multi-Burner DL DVD±RW SATA 1.5Gb/s 41N5620 USB 2.0 Ultra Secure Memory Key 8GB 45J5918 USB 2.0 Portable Secure 320GB Hard Disk 43R2019 ThinkVision® L1940p Wide 19" Monitor 4424HB6 ThinkVision L2240p Wide 22" Monitor 4422HB6 ThinkVision L2440x Wide 24" Monitor 4421HB2 NVIDIA® Quadro® 512MB FX 1700 43R1767 NVIDIA Quadro 512MB FX 3700 43R1768 NVIDIA Quadro 768MB FX 4600 43R1769 Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	<b>Limited Warranty<sup>1</sup></b> <ul style="list-style-type: none"> <li>3-year parts and labor</li> <li>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>

See footnotes for important warranty information  
 US models announced August 19, 2008  
 US models withdrawn effective June 2009

# ThinkStation



Lenovo ThinkStation D10



Lenovo ThinkStation S10 (left)  
Lenovo ThinkStation D10 (right)



Lenovo ThinkStation D10



Lenovo ThinkStation D10



ThinkStation Rail Kit (43R1964)



Lenovo ThinkStation D10

# ThinkStation® D10 (6427) - TopSeller - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor(s)	GHz	Memory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Preload	Avail date
D10	6427-27U	7x9	1 x E5430	2.66	2 x 1GB	2 x 250GB	SATA	DVD±RW	1 x FX1700	None	None	None	Bus64	Mar 08
D10	6427-28U	7x9	2 x E5430	2.66	4 x 1GB	2 x 250GB	SATA	DVD±RW	1 x FX1700	None	X-Fi	None	Bus64	Mar 08
D10	6427-34U	7x9	2 x E5430	2.66	4 x 1GB	2 x 250GB	SATA	DVD±RW, BD burner	1 x FX4600	None	X-Fi	None	Bus64	Mar 08
D10	6427-29U	7x9	2 x E5440	2.83	2 x 2GB	2 x 146GB	SAS	DVD±RW	1 x FX1700	None	X-Fi	None	Bus64	Mar 08
D10	6427-31U	7x9	2 x E5430	2.66	4 x 1GB	2 x 250GB	SATA	DVD±RW	1 x FX1700	None	None	None	Bus64	Mar 08
D10	6427-32U	7x9	2 x E5430	2.66	2 x 2GB	2 x 146GB	SAS	1 DVD±RW	1 x FX1700	None	None	None	Bus64	Mar 08
D10	6427-33U	7x9	2 x E5430	2.66	2 x 1GB	2 x 250GB	SATA	1 DVD±RW	2 x NVS290	None	None	None	Bus64	Mar 08
D10	6427-73U	7x9	1 x E5430	2.66	2 x 1GB	1 x 250GB	SATA	DVD±RW	1 x FX1700	None	None	None	XP Pro	Apr 08
D10	6427-35U	7x9	1 x E5440	2.83	2 x 1GB	1 x 250GB	SATA	DVD±RW	1 x FX1700	None	None	None	XP Pro	Apr 08
D10	6427-36U	7x9	2 x E5430	2.66	2 x 1GB	1 x 250GB	SATA	DVD±RW	1 x FX4600	None	None	None	XP Pro	Apr 08
D10	6427-37U	7x9	2 x E5440	2.83	2 x 1GB	1 x 250GB	SATA	DVD±RW	1 x FX4600	None	None	None	XP Pro	Apr 08

- High performance workstation with premium graphics for specialized professionals
- Environmentally friendly, cool, and quiet with rock solid engineering
- These small and medium business (SMB) models are part of the US TopSeller™ Program

Processor(s)	One or two processors, Intel® Xeon® processor E5430 or E5440 with quad-core, 1333MHz system bus, and 12MB L2 cache	<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 17.1"H (without handle)</li> <li>• 210mm W x 602mm D x 434mm H</li> <li>• 65 lb (29.5kg) max configuration</li> <li>• 49-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Implementation	Processor uses FC-LGA6 package, two LGA771 sockets		
Memory	2GB or 4GB std, 64GB max, PC2-5300 667MHz DDR2, ECC, fully buffered, 4-channel capable, eight 240-pin DIMM sockets; Non-italics: standard memory in two or four sockets; six or four sockets available	Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 5.25", 1.6" high, external, open Bay ④ 3.5", 1" high, external, std media reader Bay ⑤ 3.5", 1" high, internal, std disk Bay ⑥ 3.5", 1" high, internal, std disk Bay ⑦ 3.5", 1" high, internal, std or opt disk Bay ⑧ 3.5", 1" high, internal, std or opt disk Bay ⑨ 3.5", 1" high, internal, opt disk	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU Some: NVIDIA® Quadro® NVS 290, PCIe x16 adapter, 256MB, two single-link DVI-I via DMS-59 dongle, 21W Some: NVIDIA Quadro FX 1700, PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W Some: NVIDIA Quadro FX 4600, PCIe x16 adapter, 768MB, two slot width, 2 dual-link DVI, dual DVI-I or dual VGA, 134W	Slot 1: half-length, full-height, PCIe x4 (x8 mechanical) Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, PCIe x4 (x8 mechanical) Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, 64-bit PCI-X Slot 6: full-length, full-height, 64-bit PCI-X Slot 7: full-length, full-height, 32-bit PCI 2.3	
Media reader	9-in-1 media reader, internal USB 2.0		
SATA disk(s)	Some: 250GB, SATA 3.0Gb/s, 7200 rpm		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in 6321ESB		
SATA connectors	Five SATA connectors on planar		
SATA DVD±RW	Some: Super Multi-Burner DL DVD±RW SATA 1.5Gb/s		
SATA BD burner	Some: Blu-ray™ Burner / HD-DVD Player SATA 1.5Gb/s		
SAS disk	Some: 146GB, Serial Attached SCSI, 3.0Gb/s, 15000 rpm		
SAS controller	LSI™ LSISAS1068E chipset, 5 connectors, 3.0Gb/s, RAID® 0, 1, 1E		
Chipset	Intel 5400A Chipset, Intel 6321ESB I/O Controller Hub for RAID 0, 1, 5, 10 support, Winbond® W83627EHG Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		
Rear ports	Four USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, side-out, rear-out, center/sub-out), RCA-type coaxial digital in, RCA-type coaxial digital out		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Realtek® ALC888 codec; Some: Creative Sound Blaster® X-Fi, PCI adapter, high-end sound adapter		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Intel® 82563EB, proprietary Intel bus		
Security chip	Winbond WPCT200 SafeKeeper™ Trusted Platform Module, TCG 1.2-compliant		<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> Supports ThinkVantage® technologies
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	1000 watts with 120mm bottom-mounted variable speed fan, universal		
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		
Preloaded operating system <sup>20</sup>	- Genuine Windows® XP Professional (preinstalled via downgrade rights in Windows Vista® Business) - Genuine Windows Vista® Business 64 ♦ Vista models: Vista Premium logo	<b>Accessories</b> 2GB PC2-5300 DDR2 ECC FB-DIMM 43R1772 4GB PC2-5300 DDR2 ECC FB-DIMM 43R1773 500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990 750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991 1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918 146GB SAS 3.0Gb/s Disk (15000 rpm) 43R1993 300GB SAS 3.0Gb/s Disk (15000 rpm) 43R1994 ThinkStation Rail Kit 43R1964 USB 2.0 Ultra Secure Memory Key 8GB 45J5918 USB 2.0 Portable Secure 320GB Hard Disk 43R2019 ThinkVision® L2440p Wide 24" Monitor 4420HB2 NVIDIA Quadro 512MB FX 570 45J7917 NVIDIA Quadro 512MB FX 3700 43R1768	
Preloaded applications <sup>5</sup> (all OSes; only some listed)	• Rescue and Recovery™ • Client Security Solution™ • System Migration Assistant • Norton Internet Security™ (90 days of virus definitions) • PC-Doctor™ (diagnostics) • Microsoft® Office 2007 Trial (60-day) • Sonic RecordNow and Drive Letter Access (DVD±RW) • Corel® WinDVD® (DVD±RW, Blu-ray) • Ulead® DVD MovieFactory (Blu-ray)	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	<b>LIMITED WARRANTY<sup>1</sup></b> ⇨ 3-year parts and labor ⇨ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts <sup>3</sup> , 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time) ⇨ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a> ⇨ 24x7 <sup>14</sup> toll-free support for warranty issues during the warranty period <sup>1</sup> via 800-426-7378

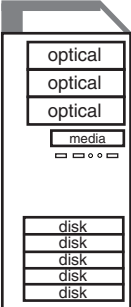
See footnotes for important warranty information  
 US models announced March 11 or April 15, 2008  
 US models withdrawn effective June 2009 or February 2010

# ThinkStation® D10 (6427) - TopSeller (August 2008) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor(s)	GHz	Memory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adpdr	Sound adpdr	ENERGY STAR 5.0	Preload	Avail date
D10	6427-74U	7x9	2 x E5440	2.83	2 x 1GB	1 x 250GB SATA	None	DVD±RW	1 x FX3700	None	None	None	Bus64	Aug 08
D10	6427-88U	7x9	1 x E5450	3.00	2 x 2GB	1 x 146GB SAS	None	DVD±RW	1 x FX3700	None	None	None	Bus64	Aug 08
D10	6427-89U	7x9	2 x E5440	2.83	2 x 1GB	1 x 250GB SATA	None	DVD±RW	1 x FX570	None	None	None	Bus64	Aug 08
D10	6427-91U	7x9	1 x E5450	3.00	2 x 2GB	1 x 146GB SAS	None	DVD±RW	1 x FX570	None	None	None	Bus64	Aug 08
D10	6427-H5U	7x9	1 x E5440	2.83	2 x 2GB	1 x 500GB SATA	None	DVD±RW	None	None	None	None	Bus64	Sep 08
D10	6427-H6U	7x9	1 x E5420	2.50	2 x 2GB	1 x 500GB SATA	None	DVD±RW	None	None	None	None	Bus64	Sep 08
D10	6427-H7U	7x9	1 x E5440	2.83	4 x 2GB	1 x 146GB SAS	None	DVD±RW	None	None	None	None	Bus64	Sep 08
D10	6427-H8U	7x9	1 x E5420	2.50	4 x 2GB	1 x 146GB SAS	None	DVD±RW	None	None	None	None	Bus64	Sep 08

- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **These small and medium business (SMB) models are part of the US TopSeller™ Program**

Processor(s)	One or two processors, <b>Intel® Xeon® processor E5420, E5440, or E5450</b> with <b>quad-core</b> , 1333MHz system bus, and 12MB L2 cache	<b>Tower</b>	
Implementation	Processor uses FC-LGA6 package, two LGA771 sockets		
Memory	<b>2GB, 4GB, or 8GB</b> std, 64GB max, <b>PC2-5300 667MHz DDR2, ECC</b> , fully buffered, 4-channel capable, eight 240-pin DIMM sockets; <i>Non-italics:</i> standard memory in two or four sockets; six or four sockets available	<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 17.1"H (without handle)</li> <li>• 210mm W x 602mm D x 434mm H</li> <li>• 65 lb (29.5kg) max configuration</li> <li>• 49-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76W to 150W adapters use auxiliary power connector from PSU <i>Some:</i> <b>NVIDIA® Quadro® FX 570</b> , PCIe 2.0 x16 adapter, 256MB, two dual-link DVI, dual DVI-I or dual VGA, 38W <i>Some:</i> <b>NVIDIA Quadro FX 3700</b> , PCIe 2.0 x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, 78W	<ul style="list-style-type: none"> <li>Bay ① 5.25", 1.6" high, external, std optical</li> <li>Bay ② 5.25", 1.6" high, external, open</li> <li>Bay ③ 5.25", 1.6" high, external, open</li> <li>Bay ④ 3.5", 1" high, external, std media reader</li> <li>Bay ⑤ 3.5", 1" high, internal, std disk</li> <li>Bay ⑥ 3.5", 1" high, internal, std disk</li> <li>Bay ⑦ 3.5", 1" high, internal, std or opt disk</li> <li>Bay ⑧ 3.5", 1" high, internal, std or opt disk</li> <li>Bay ⑨ 3.5", 1" high, internal, opt disk</li> </ul>	
Media reader	9-in-1 media reader, internal USB 2.0	Slot 1: half-length, full-height, PCIe x4 (x8 mechanical)	
SATA disk(s)	<i>Some:</i> <b>250GB or 500GB</b> , SATA 3.0Gb/s, 7200 rpm	Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in 6321ESB	Slot 3: full-length, full-height, PCIe x4 (x8 mechanical)	
SATA connectors	Five SATA connectors on planar	Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)	
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s	Slot 5: full-length, full-height, 64-bit PCI-X	
SAS disk	<i>Some:</i> <b>146GB</b> , Serial Attached SCSI, 3.0Gb/s, 15000 rpm	Slot 6: full-length, full-height, 64-bit PCI-X	
SAS controller	LSI™ LSI1068E chipset, 5 connectors, 3.0Gb/s, RAID® 0, 1, 1E	Slot 7: full-length, full-height, 32-bit PCI 2.3	
Chipset	<b>Intel 5400A Chipset</b> , Intel 6321ESB I/O Controller Hub for RAID 0, 1, 5, 10 support, Winbond® W83627EHG Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		
Rear ports	Four USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, side-out, rear-out, center/sub-out), RCA-type coaxial digital in, RCA-type coaxial digital out		
IEEE 1394 adpdr	None		
Audio	High Definition (HD) Audio, Realtek® ALC888 codec;		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Intel® 82563EB, proprietary Intel bus		
Security chip	Winbond WPCT200 SafeKeeper™ Trusted Platform Module, TCG 1.2-compliant	<b>SECURITY</b>	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Mouse	Optical Wheel Mouse (USB connector), black	Supports ThinkVantage® technologies	
Power supply	1000 watts with 120mm bottom-mounted variable speed fan, universal	RoHS-compliant	
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® Vista® Business 64	2GB PC2-5300 DDR2 ECC FB-DIMM	43R1772	
◇ Vista Premium logo	4GB PC2-5300 DDR2 ECC FB-DIMM	43R1773	
<b>Preloaded applications<sup>5</sup></b>	500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990	
• Rescue and Recovery™	750GB SATA 3.0Gb/s Disk (7200 rpm)	43R1991	
• Client Security Solution™	146GB SAS 3.0Gb/s Disk (15000 rpm)	43R1993	
• ThinkVantage Productivity Center	300GB SAS 3.0Gb/s Disk (15000 rpm)	43R1994	
• ThinkVantage System Update	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s	41N5620	
• System Migration Assistant	ThinkStation Rail Kit	43R1964	
• Norton Internet Security™	USB 2.0 Ultra Secure Memory Key 8GB	45J5918	
(90 days of virus definitions)	USB 2.0 Portable Secure 320GB Hard Disk	43R2019	
• PC-Doctor™ (diagnostics)	Lenovo USB Fingerprint Keyboard	73P4730	
• Adobe® Reader	NVIDIA Quadro 512MB FX 570	45J7917	
• Microsoft® Office 2007 Trial (60-day)	NVIDIA Quadro 512MB FX 3700	43R1768	
• Sonic RecordNow and Drive Letter Access (DVD±RW)	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
• Corel® WinDVD® (DVD±RW)			
		<b>LIMITED WARRANTY<sup>1</sup></b>	
		<ul style="list-style-type: none"> <li>⇨ 3-year parts and labor</li> <li>⇨ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇨ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	

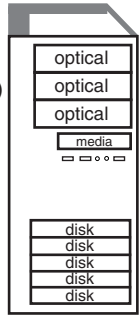
See footnotes for important warranty information  
US models announced August 19 or September 30, 2008  
US models withdrawn effective February 2010

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(BARC11-3) February 2010

# ThinkStation® D10 (6493) - withdrawn

Name	Type-model	Slot x bay	Processor(s)	GHz	Memory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Vista prelod	Workhorse Global	Availability date
D10	6493-19U	7x9	1 x E5430	2.66	2 x 1GB	2 x 250GB <sup>2</sup>	SATA	DVD±RW	1 x FX1700	None	None	None	Bus64	No	Mar 08
D10	6493-21U	7x9	1 x E5440	2.83	2 x 2GB	2 x 146GB	SAS	DVD±RW	1 x FX4600	None	None	None	Bus64	No	Mar 08
D10	6493-22U	7x9	2 x X5460	3.16	2 x 2GB	2 x 146GB	SAS	DVD±RW	1 x FX4600	None	None	None	Bus64	No	Mar 08
D10	6493-23U	7x9	1 x E5430	2.66	4 x 1GB	2 x 250GB	SATA	DVD±RW	1 x FX1700	None	X-Fi	None	Bus64	No	Mar 08
D10	6493-25U	7x9	1 x E5420	2.50	2 x 1GB	2 x 250GB	SATA	DVD±RW	1 x FX1700	None	None	None	Bus64	No	Mar 08
D10	6493-26U	7x9	2 x X5460	3.16	4 x 2GB	2 x 146GB	SAS	1 DVD±RW	1 x FX4600	None	None	None	Bus64	No	Mar 08
D10	6493-33U	7x9	2 x X5460	3.16	8 x 2GB	3 x 146GB	SAS	1E DVD±RW	1 x FX4600	None	None	None	Bus64	No	Mar 08
D10	6493-27U	7x9	2 x X5460	3.16	2 x 1GB	2 x 250GB	SATA	1 DVD±RW	2 x NVS290	None	None	None	Bus64	No	Mar 08
D10	6493-31U	7x9	2 x E5440	2.83	2 x 2GB	2 x 146GB	SAS	1 DVD±RW	1 x FX4600	None	X-Fi	None	Bus64	No	Mar 08
D10	6493-32U	7x9	2 x E5440	2.83	2 x 2GB	3 x 146GB	SAS	1E DVD±RW	1 x FX4600	None	X-Fi	None	Bus64	No	Mar 08
D10	6493-17U	7x9	2 x E5405	2.00	4 x 1GB	2 x 500GB	SATA	DVD±RW	1 x FX1700	None	None	None	Bus64	No	Mar 08
D10	6493-18U	7x9	2 x E5440	2.83	8 x 2GB	4 x 146GB	SAS	0 BD burner	2 x FX4600	None	X-Fi	None	Bus64	No	Mar 08

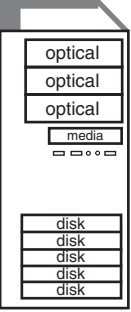
- High performance workstation with premium graphics for specialized professionals
- Environmentally friendly, cool, and quiet with rock solid engineering

Processor	One or two processors, <b>Intel® Xeon® processor E5405, E5420, E5430, E5440, or X5460</b> with <b>quad-core</b> , 1333MHz system bus, and 12MB L2 cache	<b>Tower</b>	
Implementation	Processor uses FC-LGA6 package, two LGA771 sockets		
Memory	<b>2GB, 4GB, 8GB or 16GB</b> std, 64GB max, <b>PC2-5300 667MHz DDR2, ECC</b> , fully buffered, 4-channel capable, eight 240-pin DIMM sockets; <i>Italics:</i> standard memory in eight sockets; no sockets available; <i>Non-italics:</i> standard memory in two or four sockets; six or four sockets available	<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 17.1"H (without handle)</li> <li>• 210mm W x 602mm D x 434mm H</li> <li>• 65 lb (29.5kg) max configuration</li> <li>• 49-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU <i>Some:</i> <b>NVIDIA® Quadro® NVS 290</b> , PCIe x16 adapter, 256MB, two single-link DVI-I via DMS-59 dongle, 21W <i>Some:</i> <b>NVIDIA Quadro FX 1700</b> , PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W <i>Some:</i> <b>NVIDIA Quadro FX 4600</b> , PCIe x16 adapter, 768MB, two slot width, 2 dual-link DVI, dual DVI-I or dual VGA, 134W	<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 5.25", 1.6" high, external, open</p> <p>Bay ④ 3.5", 1" high, external, std media reader</p> <p>Bay ⑤ 3.5", 1" high, internal, std disk</p> <p>Bay ⑥ 3.5", 1" high, internal, std disk</p> <p>Bay ⑦ 3.5", 1" high, internal, std or opt disk</p> <p>Bay ⑧ 3.5", 1" high, internal, std or opt disk</p> <p>Bay ⑨ 3.5", 1" high, internal, opt disk</p> <p>Slot 1: half-length, full-height, PCIe x4 (x8 mechanical)</p> <p>Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 3: full-length, full-height, PCIe x4 (x8 mechanical)</p> <p>Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 5: full-length, full-height, 64-bit PCI-X</p> <p>Slot 6: full-length, full-height, 64-bit PCI-X</p> <p>Slot 7: full-length, full-height, 32-bit PCI 2.3</p>	
Media reader	9-in-1 media reader, internal USB 2.0		
SATA disk(s)	<i>Some:</i> <b>250GB or 500GB</b> , SATA 3.0Gb/s, 7200 rpm		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in 6321ESB		
SATA connectors	Five SATA connectors on planar		
SATA DVD±RW	<i>Some:</i> Super Multi-Burner DL DVD±RW SATA 1.5Gb/s		
SATA BD burner	<i>Some:</i> Blu-ray™ Burner, SATA 1.5Gb/s HD-DVD Player		
SAS disk	<i>Some:</i> <b>146GB</b> , Serial Attached SCSI, 3.0Gb/s, 15000 rpm		
SAS controller	LSI™ LSISAS1068E chipset, 5 connectors, 3.0Gb/s, RAID <sup>®</sup> 0, 1, 1E		
Chipset	<b>Intel 5400A Chipset</b> , Intel 6321ESB I/O Controller Hub for RAID 0, 1, 5, 10 support, Winbond® W83627EHG Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		
Rear ports	Four USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, side-out, rear-out, center/sub-out), RCA-type coaxial digital in, RCA-type coaxial digital out		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Realtek® ALC888 codec; <i>Some:</i> Creative Sound Blaster® X-Fi, PCI adapter, high-end sound adapter		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Intel® 82563EB, proprietary Intel bus		
Security chip	Winbond WPCT200 SafeKeeper™ Trusted Platform Module, TCG 1.2-compliant		
Keyboard	<i>Model 18U:</i> Lenovo USB Fingerprint Keyboard (USB connector), black Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	1000 watts with 120mm bottom-mounted variable speed fan, universal		
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		
<b>Preloaded operating system<sup>20</sup></b>	- Genuine Windows® Vista® Business 64 ◇ Vista Premium logo		
<b>Preloaded applications<sup>5</sup></b> (only some listed)	<ul style="list-style-type: none"> <li>• Rescue and Recovery™</li> <li>• ThinkVantage System Update</li> <li>• ThinkVantage Fingerprint Software (fingerprint keyboard model)</li> <li>• Norton Internet Security™ (90 days of virus definitions)</li> <li>• PC-Doctor™ (diagnostics)</li> <li>• Microsoft® Office 2007 Trial (60-day)</li> <li>• Sonic RecordNow and Drive Letter Access (DVD±RW)</li> <li>• Corel® WinDVD® (DVD±RW, Blu-ray)</li> <li>• Ulead® DVD MovieFactory (Blu-ray)</li> </ul>		
<b>Accessories</b>	<ul style="list-style-type: none"> <li>2GB PC2-5300 DDR2 ECC FB-DIMM 43R1772</li> <li>4GB PC2-5300 DDR2 ECC FB-DIMM 43R1773</li> <li>750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991</li> <li>146GB SAS 3.0Gb/s Disk (15000 rpm) 43R1993</li> <li>300GB SAS 3.0Gb/s Disk (15000 rpm) 43R1994</li> <li>ThinkStation Rail Kit 43R1964</li> <li>USB 2.0 Ultra Secure Memory Key 8GB 45J5918</li> <li>USB 2.0 Portable Secure 320GB Hard Disk 43R2019</li> <li>ThinkVision® L2440p Wide 24" Monitor 4420HB2</li> <li>NVIDIA Quadro 512MB FX 3700 43R1768</li> <li>Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a></li> </ul>		
			<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>
			Supports ThinkVantage® technologies
			RoHS-compliant
			<b>LIMITED WARRANTY<sup>1</sup></b>
			<ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>

See footnotes for important warranty information  
 US models announced March 11, 2008  
 US models withdrawn effective June 2009 or February 2010

Name	Type-model	Slot x bay	Processor(s)	GHz	Memory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Vista preload	Workhorse Global	Avail date
D10	6493-34U	7x9	1 x E5430	2.66	2 x 1GB	1 x 250GB <sup>2</sup> SATA		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
D10	6493-39U	7x9	1 x E5430	2.66	2 x 1GB	1 x 146GB SAS		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
D10	6493-35U	7x9	1 x E5450	3.00	2 x 1GB	1 x 250GB SATA		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
D10	6493-41U	7x9	1 x E5450	3.00	2 x 1GB	1 x 146GB SAS		DVD±RW	1 x FX1700	None	None	None	XP Pro	No	Apr 08
D10	6493-36U	7x9	1 x X5460	3.16	2 x 1GB	2 x 250GB SATA		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-42U	7x9	1 x X5460	3.16	2 x 1GB	2 x 146GB SAS		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-45U	7x9	1 x X5460	3.16	2 x 1GB	4 x 250GB SATA	5	DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-37U	7x9	2 x E5450	3.00	2 x 1GB	2 x 250GB SATA		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-43U	7x9	2 x E5450	3.00	2 x 1GB	2 x 146GB SAS		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-46U	7x9	2 x E5450	3.00	2 x 1GB	4 x 250GB SATA	5	DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-38U	7x9	2 x X5460	3.16	2 x 1GB	2 x 250GB SATA		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-44U	7x9	2 x X5460	3.16	2 x 1GB	2 x 146GB SAS		DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08
D10	6493-47U	7x9	2 x X5460	3.16	2 x 1GB	4 x 250GB SATA	5	DVD±RW	1 x FX4600	None	None	None	XP Pro	No	Apr 08

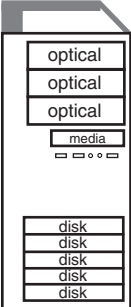
- High performance workstation with premium graphics for specialized professionals
- Environmentally friendly, cool, and quiet with rock solid engineering

Processor	One or two processors, Intel® Xeon® processor E5430, E5450, or X5460 with quad-core, 1333MHz system bus, and 12MB L2 cache	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 17.1"H (without handle)</li> <li>• 210mm W x 602mm D x 434mm H</li> <li>• 65 lb (29.5kg) max configuration</li> <li>• 49-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul> 
Implementation	Processor uses FC-LGA6 package, two LGA771 sockets	
Memory	<b>2GB</b> std, 64GB max, <b>PC2-5300 667MHz DDR2, ECC</b> , fully buffered, 4-channel capable, eight 240-pin DIMM sockets; <i>Non-italics:</i> standard memory in two sockets; six sockets available	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU <i>Some:</i> <b>NVIDIA® Quadro® FX 1700</b> , PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W <i>Some:</i> <b>NVIDIA Quadro FX 4600</b> , PCIe x16 adapter, 768MB, two slot width, 2 dual-link DVI, dual DVI-I or dual VGA, 134W	
Media reader	9-in-1 media reader, internal USB 2.0	
SATA disk(s)	<i>Some:</i> <b>250GB</b> , SATA 3.0Gb/s, 7200 rpm	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in 6321ESB	
SATA connectors	Five SATA connectors on planar	
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	
SATA Blu-ray	None	
SAS disk	<i>Some:</i> <b>146GB</b> , Serial Attached SCSI, 3.0Gb/s, 15000 rpm	
SAS controller	LSI™ LSI5AS1068E chipset, 5 connectors, 3.0Gb/s, RAID® 0, 1, 1E	
Chipset	<b>Intel 5400A Chipset</b> , Intel 6321ESB I/O Controller Hub for RAID 0, 1, 5, 10 support, Winbond® W83627EHG Super I/O	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)	
Rear ports	Four USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, side-out, rear-out, center/sub-out), RCA-type coaxial digital in, RCA-type coaxial digital out	
IEEE 1394 adptr	None	
Audio	High Definition (HD) Audio, Realtek® ALC888 codec;	
Speaker	Internal speaker for business audio	
Ethernet	Dual gigabit ethernet on planar, Intel® 82563EB, proprietary Intel bus	
Security chip	Winbond WPCT200 SafeKeeper™ Trusted Platform Module, TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	
Mouse	Optical Wheel Mouse (USB connector), black	
Power supply	1000 watts with 120mm bottom-mounted variable speed fan, universal	
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)	
Rack mount	Rack shelf support or optional sliding rack mount rail kit support	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> <p>Supports ThinkVantage® technologies</p> <p>RoHS-compliant</p> <p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>↪ 3-year parts and labor</li> <li>↪ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>↪ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>↪ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>
- Genuine Windows® XP Professional (preinstalled via downgrade rights in Windows Vista® Business)	2GB PC2-5300 DDR2 ECC FB-DIMM 43R1772	
<b>Preloaded applications<sup>5</sup></b>	4GB PC2-5300 DDR2 ECC FB-DIMM 43R1773	
• Rescue and Recovery™	750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991	
• Client Security Solution™	146GB SAS 3.0Gb/s Disk (15000 rpm) 43R1993	
• ThinkVantage Productivity Center	300GB SAS 3.0Gb/s Disk (15000 rpm) 43R1994	
• System Migration Assistant	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s 41N5620	
• Norton Internet Security™ (90 days of virus definitions)	ThinkStation Rail Kit 43R1964	
• PC-Doctor™ (diagnostics)	USB 2.0 Ultra Secure Memory Key 8GB 45J5918	
• Windows Live™ Toolbar	USB 2.0 Portable Secure 320GB Hard Disk 43R2019	
• Sonic RecordNow and Drive Letter Access (DVD±RW)	Kensington Microsaver Cable Lock 73P2582	
• Corel® WinDVD® (DVD±RW)	Lenovo USB Fingerprint Keyboard 73P4730	
	NVIDIA Quadro 512MB FX 570 45J7917	
	NVIDIA Quadro 512MB FX 3700 43R1768	
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	

See footnotes for important warranty information  
 US models announced April 22, 2008  
 US models withdrawn effective February 2010

Name	Type-model	Slot x bay	Processor(s)	GHz	Memory	Disk(s)	RAID	SATA optical	Graphics adapter(s)	1394 adptr	Sound adptr	ENERGY STAR 5.0	Preload	Avail date	
D10	6493-73U	7x9	2 x E5450	3.00	4 x 1GB	2 x 250GB	SATA	None	DVD±RW	1 x FX3700	None	None	None	Bus64	Aug 08
D10	6493-A2U	7x9	2 x E5450	3.00	4 x 1GB	2 x 250GB	SATA	None	DVD±RW	1 x FX1700	None	None	None	Bus64	Aug 08

- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **These small and medium business (SMB) models are part of the US TopSeller™ Program**

Processor(s)	Two processors, <b>Intel® Xeon® processor E5450</b> with <b>quad-core</b> , 1333MHz system bus, and 12MB L2 cache		<b>Tower</b>
Implementation	Processor uses FC-LGA6 package, two LGA771 sockets		
Memory	<b>4GB</b> std, 64GB max, <b>PC2-5300 667MHz DDR2</b> , <b>ECC</b> , fully buffered, 4-channel capable, eight 240-pin DIMM sockets; <i>Non-italics:</i> standard memory in two or four sockets; six or four sockets available		<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 17.1"H (without handle)</li> <li>• 210mm W x 602mm D x 434mm H</li> <li>• 65 lb (29.5kg) max configuration</li> <li>• 49-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul> 
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * 76 to 150W adapters use auxiliary power connector from PSU <i>Some:</i> <b>NVIDIA® Quadro® FX 1700</b> , PCIe x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, HDTV out, 42W <i>Some:</i> <b>NVIDIA Quadro FX 3700</b> , PCIe 2.0 x16 adapter, 512MB, two dual-link DVI, dual DVI-I or dual VGA, 78W		
Media reader	9-in-1 media reader, internal USB 2.0		
SATA disk(s)	<b>250GB</b> , SATA 3.0Gb/s, 7200 rpm		
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in 6321ESB		
SATA connectors	Five SATA connectors on planar		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s		
SAS disk	None		
SAS controller	LSI™ LSISAS1068E chipset, 5 connectors, 3.0Gb/s, RAID® 0, 1, 1E		
Chipset	<b>Intel 5400A Chipset</b> , Intel 6321ESB I/O Controller Hub for RAID 0, 1, 5, 10 support, Winbond® W83627EHG Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394)		
Rear ports	Four USB 2.0, serial (9-pin), keyboard (PS/2), mouse (PS/2), two ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, side-out, rear-out, center/sub-out), RCA-type coaxial digital in, RCA-type coaxial digital out		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Realtek® ALC888 codec;		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Intel® 82563EB, proprietary Intel bus		
Security chip	Winbond WPCT200 SafeKeeper™ Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	1000 watts with 120mm bottom-mounted variable speed fan, universal		
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® Vista® Business 64	2GB PC2-5300 DDR2 ECC FB-DIMM	43R1772	
◇ Vista Premium logo	4GB PC2-5300 DDR2 ECC FB-DIMM	43R1773	
<b>Preloaded applications<sup>5</sup></b>	500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990	
• Rescue and Recovery™	750GB SATA 3.0Gb/s Disk (7200 rpm)	43R1991	
• Client Security Solution™	146GB SAS 3.0Gb/s Disk (15000 rpm)	43R1993	
• ThinkVantage Productivity Center	300GB SAS 3.0Gb/s Disk (15000 rpm)	43R1994	
• ThinkVantage System Update	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s	41N5620	
• System Migration Assistant	ThinkStation Rail Kit	43R1964	
• Norton Internet Security™ (90 days of virus definitions)	USB 2.0 Ultra Secure Memory Key 8GB	45J5918	
• PC-Doctor™ (diagnostics)	USB 2.0 Portable Secure 320GB Hard Disk	43R2019	
• Adobe® Reader	ThinkVision® L2440p Wide 24" Monitor	4420HB2	
• Microsoft® Office 2007 Trial (60-day)	Lenovo USB Fingerprint Keyboard	73P4730	
• Sonic RecordNow and Drive Letter Access (DVD±RW)	NVIDIA Quadro 512MB FX 570	45J7917	
• Corel® WinDVD® (DVD±RW)	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
			<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 5.25", 1.6" high, external, open</p> <p>Bay ④ 3.5", 1" high, external, std media reader</p> <p>Bay ⑤ 3.5", 1" high, internal, std disk</p> <p>Bay ⑥ 3.5", 1" high, internal, std disk</p> <p>Bay ⑦ 3.5", 1" high, internal, std or opt disk</p> <p>Bay ⑧ 3.5", 1" high, internal, std or opt disk</p> <p>Bay ⑨ 3.5", 1" high, internal, opt disk</p> <p>Slot 1: half-length, full-height, PCIe x4 (x8 mechanical)</p> <p>Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 3: full-length, full-height, PCIe x4 (x8 mechanical)</p> <p>Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 5: full-length, full-height, 64-bit PCI-X</p> <p>Slot 6: full-length, full-height, 64-bit PCI-X</p> <p>Slot 7: full-length, full-height, 32-bit PCI 2.3</p>
			<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> <p>Supports ThinkVantage® technologies</p> <p>RoHS-compliant</p>
			<p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>⇨ 3-year parts and labor</li> <li>⇨ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇨ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>

See footnotes for important warranty information  
 US models announced August 19, 2008  
 US models withdrawn effective February 2010

Partial list of accessories supported on ThinkStation D10

**Memory**

1GB PC2-5300 DDR2 ECC FB-DIMM	43R1771	ann 03/11/08
2GB PC2-5300 DDR2 ECC FB-DIMM	43R1772	ann 03/11/08
4GB PC2-5300 DDR2 ECC FB-DIMM	43R1773	ann 03/11/08

**Optical**

DVD-ROM DL SATA1.5Gb/s 16X-48X Max <sup>4</sup>	41N5618	ann 09/26/06
Super Multi-Burner DL DVD±RW SATA1.5Gb/s	41N5620	ann 09/26/06
Blu-ray™ Burner SATA1.5Gb/s	45K1675	ann 03/31/09

**Storage and removable storage**

*D10 preconfigured with SATA disks:*

160GB SATA 3.0Gb/s Disk (7200 rpm)	09N4254	ann 05/19/03
250GB SATA 3.0Gb/s Disk (7200 rpm)	41N3015	ann 01/24/06
500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990	ann 11/06/07
750GB SATA 3.0Gb/s Disk (7200 rpm)	43R1991	ann 12/18/07
150GB SATA 3.0Gb/s Disk (10000 rpm) 2.5"	43R2030	ann 03/31/09
300GB SATA 3.0Gb/s Disk (10000 rpm) 2.5"	43R2031	ann 03/31/09

*D10 preconfigured with SAS disks:*

146GB SAS 3.0Gb/s Disk (15000 rpm)	43R1993	ann 03/11/08
300GB SAS 3.0Gb/s Disk (15000 rpm)	43R1994	ann 03/11/08

USB 2.0 Essential Memory Key 8GB	45J7905	ann 07/15/08
USB 2.0 Essential Memory Key 32GB	45K1258	ann 10/28/08
USB 2.0 Ultra Secure Memory Key 2GB	45J5916	ann 08/26/08
USB 2.0 Ultra Secure Memory Key 4GB	45J5917	ann 08/26/08
USB 2.0 Ultra Secure Memory Key 8GB	45J5918	ann 08/26/08

USB 2.0 Portable 320GB Hard Disk	45K1689	ann 03/17/09
USB 2.0 Portable 500GB Hard Disk	45K1690	ann 05/26/09
USB 2.0 Portable Secure 160GB Hard Disk	43R2018	ann 11/18/08
USB 2.0 Portable Secure 320GB Hard Disk	43R2019	ann 11/18/08
USB 2.0 Super Multi-Burner Drive	41N5565	ann 01/23/07
Lenovo® USB Portable DVD Burner	43N3264	ann 01/05/10

**Keyboard**

Preferred Pro USB Keyboard	73P5220	ann 06/21/05
Enhanced Performance USB Keyboard	73P2620	ann 03/23/04
Lenovo® USB Fingerprint Keyboard	73P4730	ann 02/22/05
Lenovo USB Smartcard Keyboard	51J0155	ann 03/24/09
UltraSlim Wireless Keyboard and Mouse <sup>52</sup>	57Y4700	ann 09/15/09

<sup>52</sup> Wireless via 2.4GHz technology using a micro-size USB receiver.

More information at [www.lenovo.com/support/keyboards](http://www.lenovo.com/support/keyboards)

**Mouse**

Lenovo Optical Mouse (USB)	06P4069	ann 05/21/03
Lenovo ScrollPoint® Mouse (USB, Optical)	31P7405	ann 08/27/02
Lenovo Laser Mouse (USB)	41U3074	ann 01/23/07
Lenovo Wireless Laser Mouse - Black <sup>52</sup>	45K1696	ann 11/25/08
Lenovo Wireless Laser Mouse - Red/Black <sup>52</sup>	51J0198	ann 11/25/08

<sup>52</sup> Wireless via 2.4GHz technology using a micro-size USB receiver.

More information at [www.lenovo.com/support/mice](http://www.lenovo.com/support/mice)

**Monitors**

ThinkVision® L1711p 17" Monitor	5047HB2	ann 10/20/09
ThinkVision L1900p 19" Monitor	4431HE1	ann 11/11/08
ThinkVision L1951p Wide 19" Monitor	2448HB6	ann 10/20/09
ThinkVision L2250p Wide 22" Monitor	2572HB6	ann 10/20/09
ThinkVision L2251p Wide 22" Monitor	2572HD6	ann 10/20/09
ThinkVision L2251x Wide 22" Monitor	2578HB6	ann 10/20/09
ThinkVision L2440p Wide 24" Monitor	4420HB2	ann 09/17/08

More information at [www.lenovo.com/thinkvision](http://www.lenovo.com/thinkvision)

**Monitor accessories<sup>46</sup>**

ThinkVision USB Soundbar	40Y7616	ann 08/23/05
ThinkVision Soundbar	45K1263	ann 09/16/08
Kensington® MicroSaver® Cable Lock	73P2582	ann 12/29/03
Kensington Twin Head Cable Lock	45K1620	ann 09/30/08
Radial Arm	19K4464	ann 05/05/00

<sup>46</sup> Compatible on selected Lenovo and ThinkVision monitors.

More information at [www.lenovo.com/support/monitoraccessories](http://www.lenovo.com/support/monitoraccessories)

**Graphics**

DisplayPort to Single-link DVI-D Cable <sup>50</sup>	45J7915	ann 08/05/08
NVIDIA® Quadro® 256MB NVS 290	43R1765	ann 12/18/07
NVIDIA Quadro 256MB FX 380	45K1670	ann 03/31/09
NVIDIA Quadro 512MB FX 580	45K1671	ann 03/31/09
NVIDIA Quadro 768MB FX 1800	45K1672	ann 03/31/09
NVIDIA Quadro 1GB FX 3800	45K1673	ann 04/21/09
NVIDIA Quadro 1.5GB FX 4800	45K1674	ann 03/31/09

<sup>50</sup> Attaches to selected DisplayPort graphics cards.

More information at [www.lenovo.com/support/graphiccards](http://www.lenovo.com/support/graphiccards)

**Multimedia**

USB 2.0 Lenovo Multimedia Headset	40Y8518	ann 06/27/06
USB 2.0 Lenovo Webcam	40Y8519	ann 08/29/06

**Security**

Kensington MicroSaver Cable Lock	73P2582	ann 12/29/03
Kensington Twin Head Cable Lock	45K1620	ann 09/30/08
USB Gemplus GemPC Smart Card Reader	41N3040	ann 02/21/06

**Rack mount accessories**

ThinkStation Rail Kit	43R1964	ann 03/11/08
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More information at [www.lenovo.com/support/railkit](http://www.lenovo.com/support/railkit)

**Medialess License Key (MLK)**

Microsoft® Office 2007 Basic, English	43R1528	ann 01/31/07
Microsoft Office 2007 Small Business, Engl	43R1534	ann 01/31/07
Microsoft Office 2007 Professional, English	43R1531	ann 01/31/07

For more information on ThinkStation accessories, please visit:

- [www.lenovo.com/support/accessories](http://www.lenovo.com/support/accessories)
- [www.lenovo.com/support/thinkstationaccessories](http://www.lenovo.com/support/thinkstationaccessories)
- [www.lenovo.com/support/security](http://www.lenovo.com/support/security)

Other accessories at [www.lenovo.com/accessories](http://www.lenovo.com/accessories)

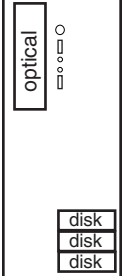
Accessories Guide pdf at [www.lenovo.com/accessoriesguide](http://www.lenovo.com/accessoriesguide)

# ThinkStation® C20 (4265) - TopSeller (Windows XP) - withdrawn

Personal Systems Reference (PSREF)

Type-model	Slot x bay	Processor(s)	GHz	Memory DIMMs	Memory type	Disk(s)	Disk size	Pre-conf RAID	Chassis intr switch	Graphics adapter(s)	ENERGY STAR 5.0	Global	Preload	Avail date
4265-13U	6x4	1 x E5507	2.26	3 x 1GB	UDIMM	1x500GB <sup>2</sup> SATA	3.5"	No	Switch	None	Pending	Global	XP Pro64	Jun 10

- **High performance workstation with smallest-possible form factor**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **This small and medium business (SMB) model is part of the US TopSeller™ Program**

Processor(s)	Up to two processors, one processor standard, <b>Intel® Xeon® Processor E5507</b> with <b>quad-core</b> , 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache	<b>Tower</b> <ul style="list-style-type: none"> <li>• Rack-mountable to 3U</li> <li>• Raven black color; metal case</li> <li>• 5.1"W x 17.5"D x 16.8"H</li> <li>• 130mm W x 444mm D x 427mm H</li> <li>• 40.7 lb (18.5kg) max configuration</li> <li>• 24-liter</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul> 
Implementation	Two LGA1366 sockets	
Memory	<b>3GB</b> std, 24GB max, <b>UDIMM, PC3-10600 1333MHz DDR3**, ECC</b> , 6-channel capable, six 240-pin DIMM sockets*** ** System automatically clocks down for processors with 800MHz DDR3 memory controller *** Over three DIMMs requires dual processors	Bay ① 5.25", 1.6" high, external, std optical Bay ② 3.5", 1" high, internal, std disk Bay ③ 3.5", 1" high, internal, opt disk Bay ④ 3.5", 1" high, internal, opt disk  Slot 1: half-length, full-height, PCIe x1 Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, PCIe x16 (x4 electrical) Slot 6: half-length, full-height, 32-bit PCI 2.3 * Adapters >75W use auxiliary power connector(s) from PSU
Graphics	None	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• USB port disablement (front or all)</li> <li>• Chassis intrusion switch</li> </ul>
Diskette drive	None	
Media reader	None	
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"	
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s	
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, one SATA connector for optical, RAID <sup>0</sup> 0, 1, 5 support	
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10R, Winbond® W83627DHG-P Super I/O	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)	
Rear ports	Eight USB 2.0, eSATA, one ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in	
IEEE 1394 adptr	None	
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec	
Speaker	Internal speaker for business audio	
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755	
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	
Mouse	Optical Wheel Mouse (USB connector), black	
Power supply	800 watts with 80mm side-mounted variable speed fan, universal, <b>Climate Savers® Computing Gold, 80 PLUS® Gold</b> qualified	
Cooling	Five fans standard (power supply, first processor, one on front, two on rear)	
Rack mount	Rack shelf support or optional sliding rack mount rail kit support	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	
- Genuine Windows® XP Professional 32-bit (preinstalled via downgrade rights in Windows 7 Professional 64-bit)	2GB PC3-10600 DDR3 ECC UDIMM 43R2033 4GB PC3-10600 DDR3 ECC UDIMM 57Y4138 Blu-ray™ Burner SATA 1.5Gb/s 45K1675 ThinkVision® L2440p Wide 24" Monitor 4420HB2 ATI™ FirePro™ 1GB V7750 51J0511	
<b>Preloaded applications<sup>5</sup></b> (only some listed)	More accessories on O-MAD sheet	
• Rescue and Recovery™	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	
• ThinkVantage Toolbox		
• McAfee® VirusScan® Plus (30 days of virus definitions)		
• Adobe® Reader®		
• Microsoft® Office 2007 Trial (60-day)		
• Roxio® Creator® Business Edition (DVD±RW)		
• Roxio MyDVD® (DVD±RW)		
• Corel® WinDVD® (DVD±RW)		
		Supports <b>ThinkVantage®</b> technologies
		<b>GREENGUARD®</b> certified RoHS-compliant Pending: <b>ENERGY STAR® 5.0</b> -compliant
		<b>LIMITED WARRANTY<sup>1</sup></b> ↪ <b>3-year parts and labor</b> ↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b> ↪ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> ↪ <b>24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</b>

See footnotes for important warranty information  
US model announced June 15, 2010  
US model withdrawn effective September 2010

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(MAD1-8) October 2010

# ThinkStation® C20 (4262) - Windows 7 - withdrawn

Personal Systems Reference (PSREF)

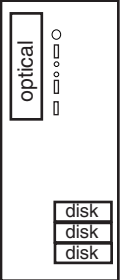
Type-model	Slot x bay	Processor(s)	GHz	Max Turbo GHz	Memory DIMMs	Memory type	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Chassis intrusion switch	Graphics adapter(s)	Global	Win7 preload	Avail date	
4262-14U	6x4	2 x X5667	3.06	3.46	6 x 2GB	UDIMM	2x128GB <sup>2</sup> SSD	1.8"	0	DVD±RW	None	2 x NVS450	None	Pro64	Jun 10	
<ul style="list-style-type: none"> <li>• <b>High performance workstation with smallest-possible form factor</b></li> <li>• <b>Environmentally friendly, cool, and quiet with rock solid engineering</b></li> <li>• <b>This system is Microsoft® Office 2010 Product Key Ready (O10PKR)</b></li> </ul>																
Processor(s)	Up to two processors, two processors standard, <b>Intel® Xeon® Processor X5667</b> with <b>quad-core</b> , 6.4GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology, 1333MHz DDR3 memory controller, and 12MB cache										<b>Tower</b>					
Implementation	Two LGA1366 sockets										<ul style="list-style-type: none"> <li>• Rack-mountable to 3U</li> <li>• Raven black color; metal case</li> <li>• 5.1"W x 17.5"D x 16.8"H</li> <li>• 130mm W x 444mm D x 427mm H</li> <li>• 40.7 lb (18.5kg) max configuration</li> <li>• 24-liter</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>					
Memory	<b>12GB</b> std, 24GB max, <b>UDIMM, PC3-10600 1333MHz DDR3, ECC</b> , 6-channel capable, six 240-pin DIMM sockets** ** Over three DIMMs requires dual processors										<ul style="list-style-type: none"> <li>• Bay ① 5.25", 1.6" high, external, std optical</li> <li>• Bay ② 3.5", 1" high, internal, std disk</li> <li>• Bay ③ 3.5", 1" high, internal, std disk</li> <li>• Bay ④ 3.5", 1" high, internal, opt disk</li> </ul>					
Graphics	<b>NVIDIA® Quadro® NVS 450</b> , PCIe x16 adapter, 512MB, four DisplayPort, 35W										<ul style="list-style-type: none"> <li>• Slot 1: half-length, full-height, PCIe x1</li> <li>• Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 3: full-length, full-height, 32-bit PCI 2.3</li> <li>• Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 5: full-length, full-height, PCIe x16 (x4 electrical)</li> <li>• Slot 6: half-length, full-height, 32-bit PCI 2.3</li> </ul>					
Diskette drive	None										<ul style="list-style-type: none"> <li>* Adapters &gt;75W use auxiliary power connector(s) from PSU</li> </ul>		<p align="center"><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• USB port disablement (front or all)</li> </ul>			
Media reader	None															
SATA disk(s)	<b>128GB</b> Solid State Drive (SSD), SATA 3.0Gb/s, 1.8"															
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s															
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, one SATA connector for optical, RAID <sup>0</sup> 0, 1, 5 support															
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10R, Winbond® W83627DHG-P Super I/O															
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), Eight USB 2.0, eSATA, one ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in															
Rear ports	None															
IEEE 1394 adptr	None															
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec															
Speaker	Internal speaker for business audio															
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755															
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant															
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black															
Mouse	Optical Wheel Mouse (USB connector), black															
Power supply	800 watts with 80mm side-mounted variable speed fan, universal, <b>Climate Savers® Computing Gold, 80 PLUS® Gold</b> qualified															
Cooling	Five fans standard (power supply, first processor, one on front, two on rear) <i>Dual processors model(s):</i> One additional processor fan for second processor															
Rack mount	Rack shelf support or optional sliding rack mount rail kit support															
<b>Preloaded operating system<sup>20</sup></b>					<b>Accessories</b>											
- Genuine Windows® 7 Professional 64					2GB PC3-10600 DDR3 ECC UDIMM					43R2033						
<b>Preloaded applications<sup>5</sup></b> (only some listed)					4GB PC3-10600 DDR3 ECC UDIMM					57Y4138						
• Rescue and Recovery™					Blu-ray™ Burner SATA 1.5Gb/s					45K1675						
• ThinkVantage Toolbox					ThinkVision® L2440p Wide 24" Monitor					4420HB2						
• Norton™ Internet Security (30 days of virus definitions)					More accessories on O-MAD sheet											
• Adobe® Reader®					Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>											
• Adobe Flash® Player																
• Microsoft Office 2010 preloaded; purchase product key to activate																
• Roxio® Creator® Business Edition (DVD±RW)																
• Roxio MyDVD® (DVD±RW)																
• Corel® WinDVD® (DVD±RW)																
Supports <b>ThinkVantage®</b> technologies																
GREENGUARD® certified RoHS-compliant EPEAT™ Gold rating																
<b>LIMITED WARRANTY<sup>1</sup></b>																
↪ <b>1-year parts and labor</b>																
↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b>																
↪ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b>																
↪ <b>24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</b>																

See footnotes for important warranty information  
US model announced June 15, 2010  
US model withdrawn effective May 2011

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Type-model	Slot x bay	Processor(s)	GHz	Max Turbo GHz	Memory DIMMs	Memory type	Disk(s)	Disk size	Pre-conf RAID	SATA optical	1394 adptr	Graphics adapter(s)	Win7 preload	Avail date
4266-11U	6x4	2 x X5680	3.33	3.60	12 x 2GB	RDIMM	2x128GB <sup>2</sup> SSD	1.8"	0	Blu-ray	1394	1 x NVS450 + Tesla	Pro 64	Jun 10

- **High performance workstation with smallest-possible form factor**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor(s)	Up to two processors, two processors standard, <b>Intel® Xeon® Processor X5680</b> with <b>six-core</b> , 6.4GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology, 1333MHz DDR3 memory controller, and 12MB cache	<b>Tower</b>	
Implementation	Two LGA1366 sockets		
Memory	<b>24GB</b> std, 192GB max (Pending availability of 16GB RDIMM), <b>RDIMM, PC3-10600 1333MHz DDR3, ECC</b> , 6-channel capable, twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors	<ul style="list-style-type: none"> <li>• Rack-mountable to 3U</li> <li>• Raven black color; metal case</li> <li>• 5.1"W x 17.5"D x 16.8"H</li> <li>• 130mm W x 444mm D x 427mm H</li> <li>• 40.7 lb (18.5kg) max configuration</li> <li>• 24-liter</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Graphics	<b>NVIDIA® Quadro® NVS 450</b> , PCIe x16 adapter, 512MB, four DisplayPort, 35W	Bay ① 5.25", 1.6" high, external, std optical Bay ② 3.5", 1" high, internal, std disk Bay ③ 3.5", 1" high, internal, std disk Bay ④ 3.5", 1" high, internal, opt disk	
GPU Computing	<b>NVIDIA Tesla™ C1060</b> , PCIe x16 adapter, 4GB, IEEE 754 single-precision and double-precision floating point, 188W	Slot 1: half-length, full-height, PCIe x1 Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, PCIe x16 (x4 electrical) Slot 6: half-length, full-height, 32-bit PCI 2.3 * Adapters >75W use auxiliary power connector(s) from PSU	
Diskette drive	None	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	None		
SATA disk(s)	<b>128GB</b> Solid State Drive (SSD), SATA 3.0Gb/s, 1.8"		
SATA DVD±RW	Blu-ray™ Burner, SATA 1.5Gb/s		
Disk controller	<b>3</b> SATA connectors for optical, SATA 3.0Gb/s, integrated in ICH10; <b>5</b> SATA/SAS <sup>†</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>®</sup> 0, 1, 5, integrated in Marvell® 88SE6480		
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	Two gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	800 watts with 80mm side-mounted variable speed fan, universal, <b>Climate Savers® Computing Gold, 80 PLUS® Gold</b> qualified		
Cooling	Five fans standard (power supply, first processor, one on front, two on rear) <i>Dual processors model(s):</i> One additional processor fan for second processor		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	Supports <b>ThinkVantage®</b> technologies  GREENGUARD® certified RoHS-compliant EPEAT™ Gold rating  <b>LIMITED WARRANTY<sup>1</sup></b> ⇨ <b>1-year parts and labor</b> ⇨ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b> ⇨ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> ⇨ <b>24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</b>	
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 ECC RDIMM 57Y4425		
<b>Preloaded applications<sup>5</sup></b> (only some listed)	4GB PC3-10600 DDR3 ECC RDIMM 57Y4426		
• Rescue and Recovery™	Blu-ray™ Burner SATA 1.5Gb/s 45K1675		
• ThinkVantage Toolbox	ThinkVision® L2440p Wide 24" Monitor 420HB2		
• Norton™ Internet Security (30 days of virus definitions)	More accessories on O-MAD sheet		
• Adobe® Reader®	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
• Adobe Flash® Player			
• Microsoft Office 2010 preloaded; purchase product key to activate			
• Roxio MyDVD® (Blu-ray)			
• Corel® WinDVD® (Blu-ray)			
• Ulead® DVD MovieFactory® (Blu-ray)			

See footnotes for important warranty information  
 US model announced June 15, 2010  
 US model withdrawn effective May 2011

Name	Type-model	Slot x bay	Processor	GHz	Memory DIMMs	Memory speed	Disk(s)	Disk size	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR 5.0	Preload	Avail date
S20	4105-11U	5x6	W3520	2.66	2 x 1GB	1066MHz	1 x 250GB	3.5"		DVD±RW	Media	1 x FX380		ES50	Bus32	Mar 09
S20	4105-12U	5x6	E5504	2.00	2 x 1GB	1066MHz	1 x 500GB	3.5"		DVD±RW	Media	1 x FX1800	1394		Bus32	Mar 09
S20	4105-13U	5x6	E5506	2.13	2 x 2GB	1066MHz	1 x 500GB	3.5"		DVD±RW	Media	1 x FX1800	1394	ES50	Bus64	Mar 09
S20	4105-14U	5x6	E5540	2.53	2 x 2GB	1066MHz	2 x 500GB	3.5"	0	DVD±RW	Media	1 x FX4800		ES50	Bus64	Mar 09
S20	4105-15U	5x6	E5506	2.13	2 x 1GB	1066MHz	1 x 150GB	2.5"		DVD±RW	Media	1 x FX1800	1394	ES50	Bus32	Mar 09
S20	4105-16U	5x6	W5580	3.20	2 x 2GB	1333MHz	2 x 300GB	2.5"	0	DVD±RW	Media	1 x FX4800		ES50	Bus64	Mar 09
S20	4105-38U	5x6	E5540	2.53	4 x 1GB	1066MHz	1 x 250GB	3.5"		DVD±RW	Media	1 x V5700			Bus64	Mar 09
S20	4105-39U	5x6	W3540	2.93	2 x 1GB	1066MHz	1 x 250GB	3.5"		DVD±RW	Media	1 x V3700			Bus32	Mar 09
S20	4105-41U	5x6	E5506	2.13	3 x 1GB	1066MHz	1 x 250GB	3.5"		DVD±RW	Media	1 x FX1800		ES50	Pro64	Mar 09

• These small and medium business (SMB) models are part of the US TopSeller™ Program

Processor	<p><b>Intel® Xeon® Processor W3520</b> or <b>W3540</b> with <b>quad-core</b>, 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology (up to 2.93GHz at max turbo mode), 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor E5504</b> or <b>E5506</b> with <b>quad-core</b>, 4.8GT/s QPI, Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor E5540</b> with <b>quad-core</b>, 5.86GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor W5580</b> with <b>quad-core</b>, 6.4GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, 1333MHz DDR3 memory controller, and 8MB cache</p> <p>Processor uses FC-LGA8 package, one LGA1366 socket</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation	Processor uses FC-LGA8 package, one LGA1366 socket	<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 3.5", 1" high, external, std media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, std or opt disk</p> <p>Bay ⑥ 3.5", 1" high, internal, opt disk</p>	
Memory	<p><b>2GB, 3GB, or 4GB</b> std, 24GB max, <b>UDIMM, PC3-8500 1066MHz DDR3***</b> or <b>PC3-10600 1333MHz DDR3, ECC</b>, 3-channel capable, six 240-pin DIMM sockets</p> <p>*** System automatically clocks down for processors with 800MHz DDR3 memory controller</p>	<p>Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 2: full-length, full-height, PCIe 2.0 x4**</p> <p>Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 4: full-length, full-height, PCIe x1</p> <p>Slot 5: half-length, full-height, 32-bit PCI 2.3</p> <p>** x16 mechanical</p>	
Graphics	<p>Two PCI Express® x16 adapters required for quad monitor support, * Adapters &gt;75W use auxiliary power connector(s) from PSU</p> <p><i>Some:</i> <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 4800</b>, PCIe x16 adapter, 1.5GB, two slot width, two DisplayPort, one dual-link DVI-I****, 121W</p> <p><i>Some:</i> <b>ATI™ FirePro™ V3700</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>ATI FirePro V5700</b>, PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I****, 49W</p> <p>**** Only two display connectors are active at a time</p>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	20-in-1 media reader, internal USB 2.0		
SATA disk(s)	<p><i>Some:</i> <b>250GB</b> or <b>500GB</b>, SATA 3.0Gb/s, 7200 rpm, 3.5"</p> <p><i>Some:</i> <b>150GB</b> or <b>300GB</b>, SATA 3.0Gb/s, 10000 rpm, 2.5"</p>		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	<i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<p><b>Preloaded operating system<sup>20</sup></b></p> <ul style="list-style-type: none"> <li>- <i>Some:</i> Genuine Windows® XP Professional 64-bit (preinstalled via downgrade rights in Windows Vista® Business 64)</li> <li>- <i>Some:</i> Genuine Windows Vista Business 32</li> <li>- <i>Some:</i> Genuine Windows Vista Business 64</li> <li>✦ <i>Vista models:</i> Vista Premium logo</li> </ul>		<p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified</p> <p>RoHS-compliant</p> <p><i>Some:</i> ENERGY STAR® 5.0-compliant</p> <p>EPEAT™ Gold rating (only for ES5.0 models)</p> <p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>	

See footnotes for important warranty information  
 US models announced March 31, 2009  
 US models withdrawn effective March, April, or September 2010

# ThinkStation® S20 (4105) - TopSeller (May 2009) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Memory DIMMs	Memory speed	Disk(s)	Disk size	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Preload	Avail date
S20	4105-54U	5x6	W3503	2.40	2 x 1GB	1066MHz	1 x 500GB <sup>2</sup>	3.5"	None	DVD±RW	Media	1 x FX380		Bus32	May 09
S20	4105-55U	5x6	W3505	2.53	2 x 1GB	1066MHz	1 x 500GB	3.5"	None	DVD±RW	Media	1 x FX580		Bus32	May 09
S20	4105-56U	5x6	W3520	2.66	2 x 2GB	1066MHz	1 x 500GB	3.5"	None	DVD±RW	Media	1 x FX380	ES50	Bus64	May 09
S20	4105-57U	5x6	W3540	2.93	2 x 2GB	1066MHz	1 x 500GB	3.5"	None	DVD±RW	Media	1 x FX580		Bus64	May 09
S20	4105-58U	5x6	W3570	3.20	2 x 2GB	1333MHz	1 x 500GB	3.5"	None	DVD±RW	Media	1 x FX580		Bus64	May 09

• These small and medium business (SMB) models are part of the US TopSeller™ Program

Processor	<b>Intel® Xeon® Processor W3503 or W3505</b> with dual-core, 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor W3520 or W3540</b> with quad-core, 4.8GT/s QPI, 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor W3570</b> with quad-core, 6.4GT/s QPI, 1333MHz DDR3 memory controller, and 8MB cache Processor uses FC-LGA8 package, one LGA1366 socket		<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul> 
Implementation			
Memory	<b>2GB or 4GB</b> std, 24GB max, <b>UDIMM, PC3-8500 1066MHz DDR3 or PC3-10600 1333MHz DDR3, ECC</b> , 3-channel capable, six 240-pin DIMM sockets		
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU Some: <b>NVIDIA® Quadro® FX 380</b> , PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W Some: <b>NVIDIA Quadro FX 580</b> , PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I***, 40W *** Only two display connectors are active at a time		
Media reader	20-in-1 media reader, internal USB 2.0		
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
Supports ThinkVantage® technologies			
<b>Preloaded operating system<sup>20</sup></b> <ul style="list-style-type: none"> <li>- Some: Genuine Windows® Vista® Business 32</li> <li>- Some: Genuine Windows Vista Business 64</li> </ul> ◇ Vista Premium logo		<b>Accessories</b> <ul style="list-style-type: none"> <li>1GB PC3-8500 DDR3 ECC UDIMM 51J0503</li> <li>2GB PC3-8500 DDR3 ECC UDIMM 51J0504</li> <li>1GB PC3-10600 DDR3 ECC UDIMM 43R2032</li> <li>2GB PC3-10600 DDR3 ECC UDIMM 43R2033</li> <li>4GB PC3-10600 DDR3 ECC UDIMM 57Y4138</li> <li>1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918</li> <li>Blu-ray™ Burner SATA 1.5Gb/s 45K1675</li> <li>ThinkStation Rail Kit 43R1964</li> <li>USB 2.0 Ultra Secure Memory Key 8GB 45J5918</li> <li>ThinkVision® L2440p Wide 24" Monitor 4420HB2</li> <li>NVIDIA Quadro NVS 290 43R1765</li> <li>NVIDIA Quadro FX 580 45K1671</li> <li>ATI™ FirePro™ 1GB V7750 51J0511</li> </ul> Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	
<b>Preloaded applications<sup>5</sup></b> (all OSes; only some listed) <ul style="list-style-type: none"> <li>• Rescue and Recovery™</li> <li>• McAfee® VirusScan® Plus (30 days of virus definitions)</li> <li>• Lenovo® System Toolbox</li> <li>• Adobe® Reader</li> <li>• Roxio® Creator® Business Edition (DVD±RW)</li> <li>• Roxio MyDVD® (DVD±RW)</li> <li>• Corel® WinDVD® (DVD±RW)</li> </ul>			
<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>			
GREENGUARD® certified RoHS-compliant Some: ENERGY STAR® 5.0-compliant EPEAT™ Gold rating (only for ES5.0 models)			
<b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>			

See footnotes for important warranty information  
 US models announced May 5, 2009  
 US models withdrawn effective March 2010 or April 2010

# ThinkStation® S20 (4105) - TopSeller (Windows XP) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Preload	Avail date
S20	4105-F6U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	1xFX380	Pending	XP Pro	Mar 10
S20	4105-F7U	5x6	W3530	2.80	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX380	Pending	XP Pro	Mar 10
S20	4105-J3U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX1800	Pending	XP Pro	Mar 10
S20	4105-J4U	5x6	W3503	2.40	2	2x1GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX380	Pending	XP Pro	Mar 10
S20	4105-L1U	5x6	W3530	2.80	4	1x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW			Pending	XP Pro	Jun 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **These small and medium business (SMB) models are part of the US TopSeller™ Program**
- **These models have a 3-year limited warranty<sup>1</sup>**

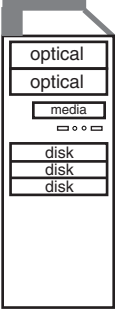
Processor	<b>Intel Xeon® Processor W3503 with dual-core</b> , 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Virtualization Technology, 1066MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor W3530 with quad-core</b> , 4.8GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology (up to 3.06GHz at max turbo mode), 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor E5507 with quad-core</b> , Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache Processor uses FC-LGA8 package, one LGA1366 socket		<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation			Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 3.5", 1" high, external, std media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk Bay ⑥ 3.5", 1" high, internal, opt disk	
Memory	<b>2GB or 4GB</b> std, 24GB max, <b>UDIMM, PC3-10600 1333MHz DDR3***, ECC</b> , 3-channel capable, six 240-pin DIMM sockets *** System automatically clocks down for processors with 800MHz or 1066MHz DDR3 memory controller		Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 2: full-length, full-height, PCIe 2.0 x4** Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 4: full-length, full-height, PCIe x1 Slot 5: half-length, full-height, 32-bit PCI 2.3 ** x16 mechanical	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU Some: <b>NVIDIA® Quadro® FX 380</b> , PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W Some: <b>NVIDIA Quadro FX 1800</b> , PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W **** Only two display connectors are active at a time			
Media reader	Some: 20-in-1 media reader, internal USB 2.0			
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"			
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive			
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals			
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)			
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in			
IEEE 1394 adptr	None			
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec			
Speaker	Internal speaker for business audio			
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755			
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant			
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black			
Mouse	Optical Wheel Mouse (USB connector), black			
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified			
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])			
Rack mount	Rack shelf support			
Preloaded operating system <sup>20</sup>	<b>Accessories</b> - Genuine Windows® XP Professional 32-bit ***** (preinstalled via downgrade rights in Windows 7 Professional 64-bit) ***** Only 3GB of memory can be addressable by a 32-bit operating system limitation		2GB PC3-10600 DDR3 ECC UDIMM 43R2033 4GB PC3-10600 DDR3 ECC UDIMM 57Y4138 1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918 Blu-ray™ Burner SATA 1.5Gb/s 45K1675 ThinkVision® L2440p Wide 24" Monitor 4420HB2 ATI™ FirePro™ 1GB V7750 51J0511 Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	<b>LIMITED WARRANTY<sup>1</sup></b> ⇨ 3-year parts and labor ⇨ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b> ⇨ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> • Onsite service upgrade options (in eligible locations) <sup>7</sup> • Post warranty maintenance services ⇨ 24 hour x 7 day <sup>14</sup> toll-free support during the warranty period <sup>1</sup> via 800-426-7378

See footnotes for important warranty information  
 US models announced March 16 or June 15, 2010  
 US models withdrawn effective September 2010

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 (SEV4-2) October 2010

Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Avail date
S20	4105-K2U	5x6	W3530	2.80	4	3x2GB	1066MHz	1x500GB	3.5"	No	DVD±RW	Media	None	Pending	Pro 64	May 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **This small and medium business (SMB) model is part of the US TopSeller™ Program**
- **This model has a 3-year limited warranty<sup>1</sup>**

Processor	<b>Intel Xeon® Processor W3530</b> with quad-core, 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, 1066MHz DDR3 memory controller, and 8MB cache or		
Implementation	Processor uses FC-LGA8 package, one LGA1366 socket		
Memory	<b>6GB</b> std, 24GB max, <b>UDIMM, PC3-8500 1066MHz DDR3, ECC</b> , 3-channel capable, six 240-pin DIMM sockets		
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU None		
Media reader	20-in-1 media reader, internal USB 2.0		
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® 7 Professional 64	1GB PC3-8500 DDR3 ECC UDIMM	51J0503	
	2GB PC3-8500 DDR3 ECC UDIMM	51J0504	
<b>Preloaded applications<sup>5</sup></b> (only some listed)	1GB PC3-10600 DDR3 ECC UDIMM	43R2032	
• Rescue and Recovery™	2GB PC3-10600 DDR3 ECC UDIMM	43R2033	
• ThinkVantage System Update	4GB PC3-10600 DDR3 ECC UDIMM	57Y4138	
• Norton Internet Security™ (30 days of virus definitions)	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918	
• Adobe® Reader	Blu-ray™ Burner SATA 1.5Gb/s	45K1675	
• Microsoft® Office 2007 Trial (60-day)	NVIDIA Quadro NVS 290	43R1765	
• Roxio® Creator® Business Edition (DVD±RW)	NVIDIA Quadro FX 580	45K1671	
• Roxio MyDVD® (DVD±RW)	ATI™ FirePro™ 1GB V7750	51J0511	
• Corel® WinDVD® (DVD±RW)	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
<b>Tower</b>			
<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>			
Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 3.5", 1" high, external, std media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk Bay ⑥ 3.5", 1" high, internal, opt disk  Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 2: full-length, full-height, PCIe 2.0 x4** Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 4: full-length, full-height, PCIe x1 Slot 5: half-length, full-height, 32-bit PCI 2.3 ** x16 mechanical			
<b>SECURITY</b>			
<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>			
Supports ThinkVantage® technologies			
GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant			
<b>LIMITED WARRANTY<sup>1</sup></b>			
<ul style="list-style-type: none"> <li>↪ 3-year parts and labor</li> <li>↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↪ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>↪ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>			

See footnotes for important warranty information  
 US model announced May 4, 2010  
 US model withdrawn effective June 2010

# ThinkStation® S20 (4105) - TopSeller (Windows XP) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Preload	Avail date
S20	4105-F6U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	1xFX380	Pending	XP Pro	Mar 10
S20	4105-F7U	5x6	W3530	2.80	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX380	Pending	XP Pro	Mar 10
S20	4105-J3U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX1800	Pending	XP Pro	Mar 10
S20	4105-J4U	5x6	W3503	2.40	2	2x1GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX380	Pending	XP Pro	Mar 10
S20	4105-L1U	5x6	W3530	2.80	4	1x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW			Pending	XP Pro	Jun 10

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- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **These small and medium business (SMB) models are part of the US TopSeller™ Program**
- **These models have a 3-year limited warranty<sup>1</sup>**

Processor	<p><b>Intel Xeon® Processor W3503</b> with <b>dual-core</b>, 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Virtualization Technology, 1066MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor W3530</b> with <b>quad-core</b>, 4.8GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology (up to 3.06GHz at max turbo mode), 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor E5507</b> with <b>quad-core</b>, Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache</p> <p>Processor uses FC-LGA8 package, one LGA1366 socket</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation			
Memory	<p><b>2GB</b> or <b>4GB</b> std, 24GB max, <b>UDIMM</b>, <b>PC3-10600 1333MHz DDR3***, ECC</b>, 3-channel capable, six 240-pin DIMM sockets</p> <p>*** System automatically clocks down for processors with 800MHz or 1066MHz DDR3 memory controller</p>	<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 3.5", 1" high, external, std media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p> <p>Bay ⑥ 3.5", 1" high, internal, opt disk</p>	
Graphics	<p>Two PCI Express® x16 adapters required for quad monitor support, * Adapters &gt;75W use auxiliary power connector(s) from PSU</p> <p>Some: <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p>Some: <b>NVIDIA Quadro FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W</p> <p>**** Only two display connectors are active at a time</p>	<p>Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 2: full-length, full-height, PCIe 2.0 x4**</p> <p>Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 4: full-length, full-height, PCIe x1</p> <p>Slot 5: half-length, full-height, 32-bit PCI 2.3</p> <p>** x16 mechanical</p>	
Media reader	Some: 20-in-1 media reader, internal USB 2.0		
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>			
- Genuine Windows® XP Professional 32-bit ***** (preinstalled via downgrade rights in Windows 7 Professional 64-bit)	<p><b>Accessories</b></p> <p>2GB PC3-10600 DDR3 ECC UDIMM 43R2033</p> <p>4GB PC3-10600 DDR3 ECC UDIMM 57Y4138</p> <p>1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918</p> <p>Blu-ray™ Burner SATA 1.5Gb/s 45K1675</p> <p>ThinkVision® L2440p Wide 24" Monitor 4420HB2</p> <p>ATI™ FirePro™ 1GB V7750 51J0511</p> <p>Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a></p>		
***** Only 3GB of memory can be addressable by a 32-bit operating system limitation			
			<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> <p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified</p> <p>RoHS-compliant</p> <p>Pending: ENERGY STAR® 5.0-compliant</p> <p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>↪ 3-year parts and labor</li> <li>↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↪ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>↪ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>

See footnotes for important warranty information

US model announced June 15, 2010; previous models on March 16, 2010

US model withdrawn effective September 2010

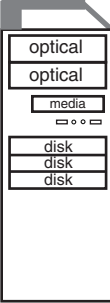
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# ThinkStation® S20 (4157) - Windows 7 - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR 5.0	Win7 preload	Avail date
S20	4157-A1U	5x6	W3503	2.40	2	2x1GB	1333MHz	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	1xFX380		Pending	Pro64	Oct 09
S20	4157-A2U	5x6	W3520	2.66	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX1800		Pending	Pro64	Oct 09
S20	4157-F1U	5x6	W3530	2.80	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX580		Pending	Pro64	Jun 10
S20	4157-D7U	5x6	E5507	2.26	4	1x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xV3700		Pending	Pro64	Mar 10
S20	4157-D8U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX1800	1394	Pending	Pro64	Mar 10
S20	4157-D9U	5x6	W3530	2.80	4	1x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX380	1394	Pending	Pro64	Mar 10
S20	4157-E1U	5x6	W3530	2.80	4	1x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX580	1394	Pending	Pro64	Mar 10
S20	4157-K6U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1xFX380		Pending	Pro64	Oct 10
S20	4157-K9U	5x6	W3680	3.33	6	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1x4000		Pending	Pro64	Oct 10
S20	4157-K4U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1x2000		Pending	Pro64	Oct 10
S20	4157-K5U	5x6	E5503	2.00	2	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media	1x2000		Pending	Pro64	Oct 10

• These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)

Processor	<p><b>Intel® Xeon® Processor W3503</b> with dual-core, 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Virtualization Technology, 1066MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor W3520</b> or <b>W3530</b> with quad-core, 4.8GT/s QPI, 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor W3680</b> with six-core, 6.4GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology, 1333MHz DDR3 memory controller, and 12MB cache or <b>Intel Xeon Processor E5503</b> with dual-core, 4.8GT/s QPI, Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor E5507</b> with quad-core, Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache</p> <p>One LGA1366 socket</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation	One LGA1366 socket	<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 3.5", 1" high, external, std media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p> <p>Bay ⑥ 3.5", 1" high, internal, opt disk</p>	
Memory	<p><b>2GB</b> or <b>4GB</b> std, 24GB max, <b>UDIMM</b>, <b>PC3-10600 1333MHz DDR3***, ECC</b>, 3-channel capable, six 240-pin DIMM sockets</p> <p>*** System automatically clocks down for processors with 800MHz or 1066MHz DDR3 memory controller</p>	<p>Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 2: full-length, full-height, PCIe 2.0 x4**</p> <p>Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 4: full-length, full-height, PCIe x1</p> <p>Slot 5: half-length, full-height, 32-bit PCI 2.3</p> <p>** x16 mechanical</p>	
Graphics	<p>Two PCI Express® x16 adapters required for quad monitor support, * Adapters &gt;75W use auxiliary power connector(s) from PSU</p> <p><i>Some:</i> <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 580</b>, PCIe x16 adapter, 512MB, two DisplayPort™, one dual-link DVI-I****, 40W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W</p> <p><i>Some:</i> <b>NVIDIA Quadro 2000</b>, PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I****, 62W</p> <p><i>Some:</i> <b>NVIDIA Quadro 4000</b>, PCIe x16 adapter, 2GB, two DisplayPort, one dual-link DVI-I****, one stereo, 142W</p> <p><i>Some:</i> <b>ATI™ FirePro™ V3700</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p>**** Only two display connectors are active at a time</p>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	20-in-1 media reader, internal USB 2.0	<p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified</p> <p>RoHS-compliant</p> <p>Pending: ENERGY STAR® 5.0-compliant</p> <p>EPEAT™ Gold rating</p>	
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	<p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>↪ <b>3-year parts and labor</b></li> <li>↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↪ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>• <b>Onsite service upgrade options (in eligible locations)<sup>7</sup></b></li> <li>• <b>Post warranty maintenance services</b></li> <li>↪ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>	
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	<i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Preloaded applications<sup>5</sup></b> (only some listed)		
- Genuine Windows® 7 Professional 64	• Microsoft Office 2010 preloaded; purchase product key to activate		

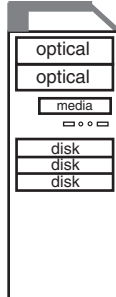
See footnotes for important warranty information

US models announced October 22, 2009 or March 16, June 15, October 12, October 26, 2010  
US models withdrawn effective August, October, December 2010 or February, May, June 2011

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Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR 5.0	Preload	Avail date
S20	4157-79U	5x6	W3550	3.06	4	1x2GB	1066MHz	1x500GB <sup>2</sup>	3.5"		DVD±RW	Media	1xFX1800	None	Pending	Bus64	Aug 09
S20	4157-81U	5x6	W3550	3.06	4	2x2GB	1066MHz	1x500GB	3.5"		DVD±RW	Media	1xFX3800	None	Pending	Bus64	Aug 09
S20	4157-82U	5x6	W3580	3.33	4	2x2GB	1333MHz	1x500GB	3.5"		DVD±RW	Media	1xFX3800	None	Pending	Bus64	Aug 09

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **These models have a 3-year limited warranty<sup>1</sup>**

Processor	<b>Intel Xeon® Processor W3550</b> with <b>quad-core</b> , 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor W3580</b> with <b>quad-core</b> , 6.4GT/s QPI, 1333MHz DDR3 memory controller, and 8MB cache		<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul> 
Implementation	Processor uses FC-LGA8 package, one LGA1366 socket		
Memory	<b>2GB</b> or <b>4GB</b> std, 24GB max, <b>UDIMM</b> , <b>PC3-8500 1066MHz DDR3</b> or <b>PC3-10600 1333MHz DDR3, ECC</b> , 3-channel capable, six 240-pin DIMM sockets		Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 3.5", 1" high, external, std media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk Bay ⑥ 3.5", 1" high, internal, opt disk
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU Some: <b>NVIDIA® Quadro® FX 1800</b> , PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I***, 59W Some: <b>NVIDIA Quadro FX 3800</b> , PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I***, 108W *** Only two display connectors are active at a time		Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 2: full-length, full-height, PCIe 2.0 x4** Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 4: full-length, full-height, PCIe x1 Slot 5: full-length, full-height, 32-bit PCI 2.3 ** x16 mechanical
Media reader	20-in-1 media reader, internal USB 2.0		
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>			
- Genuine Windows® Vista® Business 64			
◇ Vista Premium logo			
<b>Preloaded applications<sup>5</sup></b> (only some listed)			
• Rescue and Recovery™			
• McAfee® VirusScan® Plus (30 days of virus definitions)			
• Lenovo® System Toolbox			
• Adobe® Reader			
• Corel® WinDVD® (DVD±RW)			
<b>Accessories</b>			
1GB PC3-8500 DDR3 ECC UDIMM			51J0503
2GB PC3-8500 DDR3 ECC UDIMM			51J0504
1GB PC3-10600 DDR3 ECC UDIMM			43R2032
2GB PC3-10600 DDR3 ECC UDIMM			43R2033
4GB PC3-10600 DDR3 ECC UDIMM			57Y4138
1TB SATA 3.0Gb/s Disk (7200 rpm)			45J7918
Blu-ray™ Burner SATA 1.5Gb/s			45K1675
ThinkVision® L2440p Wide 24" Monitor			4420HB2
NVIDIA Quadro NVS 290			43R1765
NVIDIA Quadro FX 580			45K1671
ATI™ FirePro™ 1GB V7750			51J0511
Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>			
Supports ThinkVantage® technologies			
GREENGUARD® certified			
RoHS-compliant			
Pending: ENERGY STAR® 5.0-compliant			
<b>LIMITED WARRANTY<sup>1</sup></b>			
⇒ 3-year parts and labor			
⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts <sup>3</sup> , 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)			
⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a>			
• Onsite service upgrade options (in eligible locations) <sup>7</sup>			
• Post warranty maintenance services			
⇒ 24 hour x 7 day <sup>14</sup> toll-free support during the warranty period <sup>1</sup> via 800-426-7378			

See footnotes for important warranty information  
 US models announced August 4, 2009  
 US models withdrawn effective April 2010

# ThinkStation® S20 (4157) - withdrawn

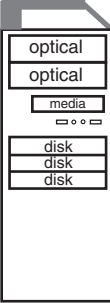
Name	Type-model	Slot x bay	Processor	GHz	Memory DIMMs	Memory speed	Disk(s)	Disk size RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR 5.0	Preload	Avail date
S20	4157-11U	5x6	W3520	2.66	2 x 1GB	1066MHz	1 x 250GB <sup>2</sup>	3.5"	DVD±RW	Media	1 x FX380		ES50	Bus32	Mar 09
S20	4157-12U	5x6	W3520	2.66	2 x 1GB	1066MHz	1 x 500GB	3.5"	DVD±RW	Media	1 x FX580			Bus32	Mar 09
S20	4157-13U	5x6	E5502	1.86	2 x 2GB	1066MHz	2 x 150GB	2.5"	1 DVD±RW	Media	1 x FX1800	1394		Bus64	Mar 09
S20	4157-14U	5x6	E5506	2.13	2 x 1GB	1066MHz	2 x 250GB	3.5"	DVD±RW	Media	1 x FX380	1394	ES50	Bus32	Mar 09
S20	4157-15U	5x6	E5506	2.13	2 x 1GB	1066MHz	1 x 250GB	3.5"	DVD±RW	Media	1 x NVS290	1394		Bus32	Mar 09
S20	4157-16U	5x6	E5506	2.13	2 x 2GB	1066MHz	2 x 500GB	3.5"	0 DVD±RW	Media	1 x FX4800		ES50	Bus64	Mar 09
S20	4157-48U	5x6	W3540	2.93	2 x 1GB	1066MHz	1 x 250GB	3.5"	DVD	Media	1 x V3700			Bus32	Mar 09
S20	4157-49U	5x6	E5506	2.13	4 x 1GB	1066MHz	1 x 250GB	3.5"	DVD	Media	1 x V5700			Bus64	Mar 09
S20	4157-51U	5x6	E5540	2.53	4 x 1GB	1066MHz	2 x 300GB	2.5"	0 DVD±RW	Media	1 x V7750			Bus64	Mar 09
S20	4157-52U	5x6	E5506	2.13	3 x 1GB	1066MHz	1 x 250GB	3.5"	DVD±RW	Media	1 x FX1800			Pro64	Mar 09

Processor	<p><b>Intel® Xeon® Processor W3520</b> or <b>W3540</b> with <b>quad-core</b>, 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor E5502</b> with <b>dual-core</b>, 4.8GT/s QPI, 800MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor E5506</b> with <b>quad-core</b>, 4.8GT/s QPI, 800MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor E5540</b> with <b>quad-core</b>, 5.86GT/s QPI, 1066MHz DDR3 memory controller, and 8MB cache</p> <p>Processor uses FC-LGA8 package, one LGA1366 socket</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation	Processor uses FC-LGA8 package, one LGA1366 socket		
Memory	<p><b>2GB, 3GB, or 4GB</b> std, 24GB max, <b>UDIMM, PC3-8500 1066MHz DDR3***, ECC</b>, 3-channel capable, six 240-pin DIMM sockets</p> <p>*** System automatically clocks down for processors with 800MHz DDR3 memory controller</p>		
Graphics	<p>Two PCI Express® x16 adapters required for quad monitor support, * Adapters &gt;75W use auxiliary power connector(s) from PSU</p> <p><i>Some:</i> <b>NVIDIA® Quadro® NVS 290</b>, PCIe x16 adapter, 256MB, two single-link DVI via DMS-59 with dual DVI-I dongle, 21W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 580</b>, PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I****, 40W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 4800</b>, PCIe x16 adapter, 1.5GB, 2 slot width, two DisplayPort, one dual-link DVI-I****, 121W</p> <p><i>Some:</i> <b>ATI™ FirePro™ V3700</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>ATI FirePro V5700</b>, PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I****, 49W</p> <p><i>Some:</i> <b>ATI FirePro V7750</b>, PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I****, 76W</p> <p>**** Only two display connectors are active at a time</p>	<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 3.5", 1" high, external, std media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, std or opt disk</p> <p>Bay ⑥ 3.5", 1" high, internal, opt disk</p> <p>Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 2: full-length, full-height, PCIe 2.0 x4**</p> <p>Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 4: full-length, full-height, PCIe x1</p> <p>Slot 5: half-length, full-height, 32-bit PCI 2.3</p> <p>** x16 mechanical</p>	
Media reader	20-in-1 media reader, internal USB 2.0		
SATA disk(s)	<p><i>Some:</i> <b>250GB</b> or <b>500GB</b>, SATA 3.0Gb/s, 7200 rpm, 3.5"</p> <p><i>Some:</i> <b>150GB</b> or <b>300GB</b>, SATA 3.0Gb/s, 10000 rpm, 2.5"</p>		
SATA DVD	<i>Some:</i> DVD-ROM DL SATA 1.5Gb/s 16X-48X Max <sup>4</sup> Drive		
SATA DVD±RW	<i>Some:</i> Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in	Supports ThinkVantage® technologies	
IEEE 1394 adptr	<i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<b>Preloaded operating system<sup>20</sup></b>	<ul style="list-style-type: none"> <li>- <i>Some:</i> Genuine Windows® XP Professional 64-bit (preinstalled via downgrade rights in Windows Vista® Business 64-bit)</li> <li>- <i>Some:</i> Genuine Windows Vista Business 32</li> <li>- <i>Some:</i> Genuine Windows Vista Business 64</li> <li>✦ <i>Vista models:</i> Vista Premium logo</li> </ul>	<p><b>Preloaded applications<sup>5</sup></b> (all OSes; only some listed)</p> <ul style="list-style-type: none"> <li>• Rescue and Recovery™</li> <li>• McAfee® VirusScan® Plus (30 days of virus definitions)</li> <li>• Lenovo® System Toolbox</li> <li>• Corel® WinDVD® (DVD±RW)</li> </ul>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> <p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>➤ <b>3-year parts and labor</b></li> <li>➤ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>➤ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>• <b>Onsite service upgrade options (in eligible locations)<sup>7</sup></b></li> <li>• <b>Post warranty maintenance services</b></li> <li>➤ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>

See footnotes for important warranty information  
 US models announced March 31, 2009  
 US models withdrawn effective January, April, or October 2010

Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR 5.0	Preload	Avail date
S20	4157-E3U	5x6	E5640	2.66	4	2x2GB	1333MHz	1x300GB <sup>2</sup>	2.5"	No	DVD±RW	Media 1xV7750	1394	Pending	XP Pro	May 10	
S20	4157-E4U	5x6	W3550	3.06	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media 1xFX1800	1394	Pending	XP Pro	May 10	
S20	4157-E5U	5x6	W3680	3.33	6	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media 1xFX3800	1394	Pending	XP Pro	May 10	
S20	4157-E7U	5x6	E5503	2.00	2	2x2GB	1333MHz	1x150GB	2.5"	No	DVD±RW	Media 1xFX1800	1394	Pending	XP Pro	May 10	
S20	4157-E8U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media 1xFX380		Pending	XP Pro	May 10	
S20	4157-E9U	5x6	E5507	2.26	4	2x2GB	1333MHz	1x500GB	3.5"	No	DVD±RW	Media 1xV5700	1394	Pending	XP Pro	May 10	

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **These models have a 3-year limited warranty<sup>1</sup>**

Processor	<p><b>Intel Xeon® Processor W3550</b> with <b>quad-core</b>, 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, 1066MHz DDR3 memory controller, and 8MB cache or</p> <p><b>Intel Xeon Processor W3680</b> with <b>six-core</b>, 6.4GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, 1333MHz DDR3 memory controller, and 12MB cache or</p> <p><b>Intel Xeon Processor E5503</b> with <b>dual-core</b>, 4.8GT/s QPI, Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache or</p> <p><b>Intel Xeon Processor E5507</b> with <b>quad-core</b>, 4.8GT/s QPI, Intel 64, Virtualization Technology, 800MHz DDR3 memory controller, and 4MB cache or</p> <p><b>Intel Xeon Processor E5640</b> with <b>quad-core</b>, 5.86GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, 1066MHz DDR3 memory controller, and 12MB cache</p> <p>Processor uses FC-LGA8 package, one LGA1366 socket</p>	<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>	
Implementation	Processor uses FC-LGA8 package, one LGA1366 socket	<p>Bay ① 5.25", 1.6" high, external, std optical</p> <p>Bay ② 5.25", 1.6" high, external, open</p> <p>Bay ③ 3.5", 1" high, external, std media reader</p> <p>Bay ④ 3.5", 1" high, internal, std disk</p> <p>Bay ⑤ 3.5", 1" high, internal, opt disk</p> <p>Bay ⑥ 3.5", 1" high, internal, opt disk</p>	
Memory	<p><b>4GB</b> std, 24GB max, <b>UDIMM, PC3-10600 1333MHz DDR3***, ECC</b>, 3-channel capable, six 240-pin DIMM sockets</p> <p>*** System automatically clocks down for processors with 800MHz or 1066MHz DDR3 memory controller</p>	<p>Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 2: full-length, full-height, PCIe 2.0 x4**</p> <p>Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max)</p> <p>Slot 4: full-length, full-height, PCIe x1</p> <p>Slot 5: half-length, full-height, 32-bit PCI 2.3</p> <p>** x16 mechanical</p>	
Graphics	<p>Two PCI Express® x16 adapters required for quad monitor support, * Adapters &gt;75W use auxiliary power connector(s) from PSU</p> <p><i>Some:</i> <b>NVIDIA® Quadro® FX 380</b>, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W</p> <p><i>Some:</i> <b>NVIDIA Quadro FX 3800</b>, PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I****, 108W</p> <p><i>Some:</i> <b>ATI™ FirePro™ V5700</b>, PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I****, 49W</p> <p><i>Some:</i> <b>ATI FirePro V7750</b>, PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I****, 76W</p> <p>**** Only two display connectors are active at a time</p>	<p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	20-in-1 media reader, internal USB 2.0	<p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified</p> <p>RoHS-compliant</p> <p>Pending: ENERGY STAR® 5.0-compliant</p>	
SATA disk(s)	<p><i>Some:</i> <b>500GB</b>, SATA 3.0Gb/s, 7200 rpm, 3.5"</p> <p><i>Some:</i> <b>150GB</b> or <b>300GB</b>, SATA 3.0Gb/s, 10000 rpm, 2.5"</p>		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive	<p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>• <b>Onsite service upgrade options (in eligible locations)<sup>7</sup></b></li> <li>• <b>Post warranty maintenance services</b></li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>	
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	<i>Some:</i> FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		
Rack mount	Rack shelf support		
<p><b>Preloaded operating system<sup>20</sup></b></p> <ul style="list-style-type: none"> <li>- Genuine Windows® XP Professional 32-bit***** (preinstalled via downgrade rights in Windows 7 Professional 64-bit)</li> </ul> <p>***** Only 3GB of memory can be addressable by a 32-bit operating system limitation</p>			

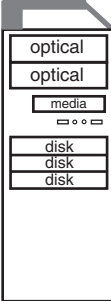
See footnotes for important warranty information  
 US models announced May 4, 2010  
 US models withdrawn effective October 2010

# ThinkStation® S20 (4157) - Global (Windows 7) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date
S20	4157-B1U	5x6	W3520	2.66	4	2x2GB	1066MHz	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	No	1xFX1800	Pending	Pro64	Global	Jan 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **This model has a 3-year limited warranty<sup>1</sup>**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	<b>Intel Xeon® Processor W3520</b> with <b>quad-core</b> , 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache																
Implementation	Processor uses FC-LGA8 package, one LGA1366 socket																
Memory	<b>4GB</b> std, 24GB max, <b>UDIMM</b> , <b>PC3-8500 1066MHz DDR3, ECC</b> , 3-channel capable, six 240-pin DIMM sockets																
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <b>NVIDIA® Quadro® FX 1800</b> , PCI Express® (PCIe) x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I***, 59W *** Only two display connectors are active at a time																
Media reader	None																
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"																
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive																
Disk controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals																
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O																
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)																
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in																
IEEE 1394 adptr	None																
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec																
Speaker	Internal speaker for business audio																
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755																
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant																
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black																
Mouse	Optical Wheel Mouse (USB connector), black																
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified																
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])																
Rack mount	Rack shelf support																
<b>Preloaded operating system<sup>20</sup></b>																	
- Genuine Windows® 7 Professional 64																	
<b>Preloaded applications<sup>5</sup></b> (only some listed)																	
• Rescue and Recovery™																	
• ThinkVantage System Update																	
• Norton Internet Security™ (30 days of virus definitions)																	
• Adobe® Reader																	
• Microsoft Office 2010 preloaded; purchase product key to activate																	
• Roxio® Creator® Business Edition (DVD±RW)																	
• Roxio MyDVD® (DVD±RW)																	
• Corel® WinDVD® (DVD±RW)																	
<b>Accessories</b>																	
1GB PC3-8500 DDR3 ECC UDIMM 51J0503																	
2GB PC3-8500 DDR3 ECC UDIMM 51J0504																	
1GB PC3-10600 DDR3 ECC UDIMM 43R2032																	
2GB PC3-10600 DDR3 ECC UDIMM 43R2033																	
4GB PC3-10600 DDR3 ECC UDIMM 57Y4138																	
1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918																	
Blu-ray™ Burner SATA 1.5Gb/s 45K1675																	
ThinkVision® L2440p Wide 24" Monitor 4420HB2																	
NVIDIA Quadro NVS 290 43R1765																	
NVIDIA Quadro FX 580 45K1671																	
ATI™ FirePro™ 1GB V7750 51J0511																	
Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>																	
<b>Tower</b>																	
<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>																	
																	
Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 3.5", 1" high, external, std media reader Bay ④ 3.5", 1" high, internal, std disk Bay ⑤ 3.5", 1" high, internal, opt disk Bay ⑥ 3.5", 1" high, internal, opt disk  Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 2: full-length, full-height, PCIe 2.0 x4** Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 4: full-length, full-height, PCIe x1 Slot 5: half-length, full-height, 32-bit PCI 2.3 ** x16 mechanical																	
<b>SECURITY</b>																	
<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>																	
Supports ThinkVantage® technologies																	
GREENGUARD® certified																	
RoHS-compliant																	
Pending: ENERGY STAR® 5.0-compliant																	
<b>LIMITED WARRANTY<sup>1</sup></b>																	
⇒ 3-year parts and labor																	
⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts <sup>3</sup> , 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)																	
⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a>																	
• Onsite service upgrade options (in eligible locations) <sup>7</sup>																	
• Post warranty maintenance services																	
⇒ 24 hour x 7 day <sup>14</sup> toll-free support during the warranty period <sup>1</sup> via 800-426-7378																	

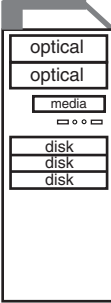
See footnotes for important warranty information  
 US model announced January 12, 2010  
 US model withdrawn effective August 2010

# ThinkStation® S20 (4157) - Global (Windows XP) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Processor	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Preload	Global	Avail date
S20	4157-E6U	5x6	W3530	2.80	4	2x2GB	1333MHz	1x500GB <sup>2</sup>	3.5"	No	DVD±RW	Media	1xFX1800	Pending	XP Pro	Global	May 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **This model has a 3-year limited warranty<sup>1</sup>**

Processor	<b>Intel Xeon® Processor W3530</b> with <b>quad-core</b> , 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, 1066MHz DDR3 memory controller, and 8MB cache		<b>Tower</b>	<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 6.9"W x 19.0"D x 18.8"H (with handle)</li> <li>• 175mm W x 483mm D x 478mm H</li> <li>• 38.5 lb (17.5kg) max configuration</li> <li>• 31-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support</li> </ul>		
Implementation	Processor uses FC-LGA8 package, one LGA1366 socket					
Memory	<b>4GB</b> std, 24GB max, <b>UDIMM, PC3-10600 1333MHz DDR3***, ECC</b> , 3-channel capable, six 240-pin DIMM sockets *** System automatically clocks down for processors with 1066MHz DDR3 memory controller		Bay ① 5.25", 1.6" high, external, std optical	Bay ② 5.25", 1.6" high, external, open		
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <b>NVIDIA® Quadro® FX 1800</b> , PCI Express® (PCIe) x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W **** Only two display connectors are active at a time		Bay ③ 3.5", 1" high, external, std media reader	Bay ④ 3.5", 1" high, internal, std disk		
Media reader	20-in-1 media reader, internal USB 2.0		Bay ⑤ 3.5", 1" high, internal, opt disk	Bay ⑥ 3.5", 1" high, internal, opt disk		
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		Slot 1: full-length, full-height, PCIe 2.0 x16 (75W* max)			
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		Slot 2: full-length, full-height, PCIe 2.0 x4**			
SATA controller	Serial ATA, SATA 3.0Gb/s, integrated in ICH10R, three SATA connectors for disks, two SATA connectors for opticals		Slot 3: full-length, full-height, PCIe 2.0 x16 (75W* max)			
Chipset	<b>Intel X58 Express Chipset</b> , Intel I/O Controller Hub 10 RAID (ICH10R) for RAID 0, 1, 5 support, Winbond® W83627DHG-P Super I/O		Slot 4: full-length, full-height, PCIe x1			
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm)		Slot 5: half-length, full-height, 32-bit PCI 2.3			
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), ethernet (RJ-45), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side-out), Optical SPDIF digital out, Optical SPDIF digital in		** x16 mechanical			
IEEE 1394 adptr	FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		<b>SECURITY</b>			
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec					
Speaker	Internal speaker for business audio		<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>			
Ethernet	One gigabit ethernet on planar, Broadcom® BCM5755					
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		Supports ThinkVantage® technologies			
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black					
Mouse	Optical Wheel Mouse (USB connector), black		GREENGUARD® certified RoHS-compliant <i>Pending:</i> ENERGY STAR® 5.0-compliant			
Power supply	625 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified					
Cooling	3 to 5 fans (power supply, CPU, rear, opt front PCI [>75W graphics], opt front [SAS])		<b>LIMITED WARRANTY<sup>1</sup></b>			
Rack mount	Rack shelf support					
<b>Preloaded operating system<sup>20</sup></b>		<b>Accessories</b>		<ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>		
- Genuine Windows® XP Professional 32-bit***** (preinstalled via downgrade rights in Windows 7 Professional 64-bit)		2GB PC3-10600 DDR3 ECC UDIMM 43R2033				
***** Only 3GB of memory can be addressable by a 32-bit operating system limitation		4GB PC3-10600 DDR3 ECC UDIMM 57Y4138				
<b>Preloaded applications<sup>5</sup></b> (all OSEs; only some listed)		500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990				
• Rescue and Recovery™		Blu-ray™ Burner SATA 1.5Gb/s 45K1675				
• McAfee® VirusScan® Plus (30 days of virus definitions)		ThinkVision® L2440p Wide 24" Monitor 4420HB2				
• Lenovo System Toolbox		NVIDIA Quadro NVS 290 43R1765				
• Adobe® Reader		NVIDIA Quadro FX 580 45K1671				
• Microsoft Office 2007 Trial (60-day)		ATI™ FirePro™ 1GB V7750 51J0511				
• Roxio® Creator® Business Edition (DVD±RW)		Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>				
• Roxio MyDVD® (DVD±RW)						
• Corel® WinDVD® (DVD±RW)						

See footnotes for important warranty information  
US model announced May 4, 2010  
US model withdrawn effective October 2010

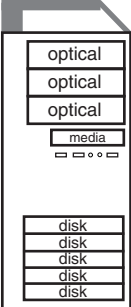
© Lenovo  
(SEV5-2) October 2010

# ThinkStation® D20 (4155) - TopSeller (UDIMM) - withdrawn

Personal Systems Reference (PSREF)

Name	Type-model	Slot x bay	Proc-essor(s)	GHz	Memory DIMMs	Memory speed	Disk(s)	Disk size	Disk type	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Pre-load	Avail date
D20	4155-28U	6x9	2 x E5540	2.53	4 x 1GB	1066MHz	1 x 500GB	3.5"	SATA		DVD±RW	Media 1 x V5700		ES50	Bus64	Apr 09
D20	4155-29U	6x9	2 x E5502	1.86	4 x 1GB	1066MHz	1 x 250GB	3.5"	SATA		DVD±RW	Media 1 x FX580			Bus64	Apr 09
D20	4155-31U	6x9	2 x X5560	2.80	4 x 1GB	1333MHz	2 x 300GB	2.5"	SATA	1	DVD±RW	Media 1 x FX1800			Bus64	Apr 09
D20	4155-32U	6x9	1 x E5506	2.13	4 x 1GB	1066MHz	1 x 250GB, 1 x 500GB	3.5"	SATA		DVD±RW	Media 1 x FX1800			Bus64	Apr 09
D20	4155-33U	6x9	1 x E5540	2.53	4 x 1GB	1066MHz	2 x 300GB	3.5"	SAS	0	DVD±RW	Media 1 x FX4800			Bus64	Apr 09
D20	4155-34U	6x9	1 x E5540	2.53	4 x 1GB	1066MHz	1 x 500GB	3.5"	SATA		DVD±RW	Media 1 x FX580			Bus64	Apr 09

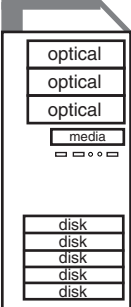
- High performance workstation with premium graphics for specialized professionals
- These small and medium business (SMB) models are part of the US TopSeller™ Program

Processor(s)	Up to two processors, one or two processors standard, <b>Intel® Xeon® Processor E5502</b> with <b>dual-core</b> , 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 800MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor E5506</b> with <b>quad-core</b> , 4.8GT/s QPI, 800MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor E5540</b> with <b>quad-core</b> , 5.86GT/s QPI, 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor X5560</b> with <b>quad-core</b> , 6.4GT/s QPI, 1333MHz DDR3 memory controller, and 8MB cache	<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul> 
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets	
Memory	<b>4GB</b> std, 48GB max, <b>UDIMM, PC3-8500 1066MHz DDR3</b> or <b>PC3-10600 1333MHz DDR3, ECC</b> , 6-channel capable, twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <i>Some: NVIDIA® Quadro® FX 580</i> , PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I***, 40W <i>Some: NVIDIA Quadro FX 1800</i> , PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I***, 59W <i>Some: NVIDIA Quadro FX 4800</i> , PCIe x16 adapter, 1.5GB, two slot width, 2 DisplayPort, 1 dual-link DVI-I***, 121W <i>Some: ATI™ FirePro™ V5700</i> , PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I***, 49W *** Only two display connectors are active at a time	Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 5.25", 1.6" high, external, open Bay ④ 3.5", 1" high, external, std media reader Bay ⑤ 3.5", 1" high, internal, std disk Bay ⑥ 3.5", 1" high, internal, std or opt disk Bay ⑦ 3.5", 1" high, internal, opt disk Bay ⑧ 3.5", 1" high, internal, opt disk Bay ⑨ 3.5", 1" high, internal, opt disk  Slot 1: half-length, full-height, PCIe x1 Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, PCIe x4 (x16 mechanical) Slot 6: full-length, full-height, 32-bit PCI 2.3
Diskette drive	None	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>
Media reader	20-in-1 media reader	
SATA disk(s)	<i>Some: 250GB or 500GB</i> , SATA 3.0Gb/s, 7200 rpm, 3.5" <i>Some: 300GB</i> , SATA 3.0Gb/s, 10000 rpm, 2.5"	
SAS disk(s)	<i>Some: 300GB</i> , SAS 3.0Gb/s, 15000 rpm	
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s	
Disk controller	Three SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; five SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480	
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)	
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in	
IEEE 1394 adptr	None	
Audio	High Definition (HD) Audio, Analog Devices ADI 1988A codec	
Speaker	Internal speaker for business audio	
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754	
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	Supports ThinkVantage® technologies
Mouse	Optical Wheel Mouse (USB connector), black	
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified	GREENGUARD® certified RoHS-compliant <i>Some: ENERGY STAR® 5.0-compliant</i> EPEAT™ Gold rating (only for ES5.0 models)
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)	
Rack mount	Rack shelf support or optional sliding rack mount rail kit support	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	
- Genuine Windows® Vista® Business 64	2GB PC3-8500 DDR3 ECC UDIMM	51J0504
◇ Vista Premium logo	2GB PC3-10600 DDR3 ECC UDIMM	43R2033
<b>Preloaded applications<sup>5</sup></b> (only some listed)	4GB PC3-10600 DDR3 ECC UDIMM	57Y4138
• Rescue and Recovery™	Blu-ray™ Burner SATA 1.5Gb/s	45K1675
• McAfee® VirusScan® Plus (30 days of virus definitions)	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918
• Lenovo® System Toolbox	150GB SATA 3.0Gb/s Disk (10000 rpm)	43R2030
• Corel® WinDVD® (DVD±RW)	300GB SAS 3.0Gb/s Disk (15000 rpm)	43R1994
	450GB SAS 3.0Gb/s Disk (15000 rpm)	43N3424
	ThinkStation Rail Kit	43R1964
	ATI FirePro 1GB V7750	51J0511
	NVIDIA Quadro 1.5GB FX 4800	45K1674
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	
		<b>LIMITED WARRANTY<sup>1</sup></b> ⇨ 3-year parts and labor ⇨ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts <sup>3</sup> , 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time) ⇨ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a> ⇨ 24x7 <sup>14</sup> toll-free support for warranty issues during the warranty period <sup>1</sup> via 800-426-7378

See footnotes for important warranty information  
 US models announced March 31, 2009  
 US models withdrawn effective April 2010

Name	Type-model	Slot x bay	Processor(s) GHz	Memory	Disk(s)	Disk size	Disk type	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Preload	Avail date	
D20	4155-27U	6x9	2 x E5540	2.53	4 x 1GB	2 x 300GB	2.5"	SATA	1	DVD±RW	Media	1 x FX4800	None	Pro64	Apr 09

- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **This small and medium business (SMB) model is part of the US TopSeller™ Program**

Processor(s)	Up to two processors, two processors standard, <b>Intel® Xeon® Processor E5540</b> with <b>quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache	
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets	
Memory	<b>4GB</b> std, 192GB max (pending 16GB RDIMM availability), <b>RDIMM, PC3-8500 1066MHz DDR3, ECC</b> , 6-channel capable, twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors	<b>Tower</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <b>NVIDIA® Quadro® FX 4800</b> , PCIe x16 adapter, 1.5GB, two slot width, two DisplayPort, one dual-link DVI***, 121W *** Only two display connectors are active at a time	Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 5.25", 1.6" high, external, open Bay ④ 3.5", 1" high, external, std media reader Bay ⑤ 3.5", 1" high, internal, std disk Bay ⑥ 3.5", 1" high, internal, std disk Bay ⑦ 3.5", 1" high, internal, opt disk Bay ⑧ 3.5", 1" high, internal, opt disk Bay ⑨ 3.5", 1" high, internal, opt disk  Slot 1: half-length, full-height, PCIe x1 Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, PCIe x4 (x16 mechanical) Slot 6: full-length, full-height, 32-bit PCI 2.3
Diskette drive	None (use optional USB diskette)	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>↔ <b>3-year parts and labor</b></li> <li>↔ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↔ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>↔ <b>24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>
Media reader	20-in-1 media reader	
SATA disk(s)	<b>300GB</b> , SATA 3.0Gb/s, 10000 rpm, 2.5"	
SAS disk(s)	None	
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s	
Disk controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480	
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)	
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in	
IEEE 1394 adptr	None	
Audio	High Definition (HD) Audio, Analog Devices ADI 1988A codec	
Speaker	Internal speaker for business audio	
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754	
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	
Mouse	Optical Wheel Mouse (USB connector), black	
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified	
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)	
Rack mount	Rack shelf support or optional sliding rack mount rail kit support	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>	
- Genuine Windows® XP Professional 64-bit (preinstalled via downgrade rights in Windows Vista® Business 64-bit)	2GB PC3-8500 DDR3 ECC RDIMM 43R2035 4GB PC3-8500 DDR3 ECC RDIMM 43R2036 8GB PC3-8500 DDR3 ECC RDIMM 43R2037	
<b>Preloaded applications<sup>5</sup> (only some listed)</b>	Blu-ray™ Burner SATA 1.5Gb/s 45K1675 750GB SATA 3.0Gb/s Disk (7200 rpm) 43R1991 1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918 150GB SATA 3.0Gb/s Disk (10000 rpm) 2.5" 43R2030 300GB SATA 3.0Gb/s Disk (10000 rpm) 2.5" 43R2031 146GB SAS 3.0Gb/s Disk (15000 rpm) 43R1993 300GB SAS 3.0Gb/s Disk (15000 rpm) 43R1994 ThinkStation Rail Kit 43R1964 USB 2.0 Ultra Secure Memory Key 8GB 45J5918 ThinkVision® L2440p Wide 24" Monitor 4420HB2 ATI™ FirePro™ 512MB V5700 51J0509 ATI FirePro 1GB V7750 51J0511	
• Rescue and Recovery™	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>	
• McAfee® VirusScan® Plus (30 days of virus definitions)		
• Lenovo® System Toolbox		
• Adobe® Reader		
• Microsoft® Office 2007 Trial (60-day)		
• Roxio® Creator® Business Edition (DVD±RW)		
• Roxio MyDVD® (DVD±RW)		
• Corel® WinDVD® (DVD±RW)		

See footnotes for important warranty information  
 US model announced March 31, 2009  
 US model withdrawn effective February 2010

Name	Type-model	Slot x bay	Proc-essor(s)	GHz	Memory DIMMs	Memory speed	Disk(s)	Disk size	Disk type	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Pre-load	Avail date
D20	4155-39U	6x9	2 x E5520	2.26	2 x 2GB	1066MHz	1 x 500GB <sup>2</sup>	3.5"	SATA	None	DVD±RW	Media 1 x FX580	None	Bus64	May 09	
D20	4155-41U	6x9	2 x E5520	2.26	2 x 2GB	1066MHz	1 x 300GB	2.5"	SATA	None	DVD±RW	Media 1 x FX1800	None	Bus64	May 09	

- High performance workstation with premium graphics for specialized professionals
- These small and medium business (SMB) models are part of the US TopSeller™ Program

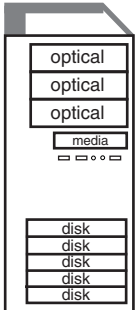
Processor(s)	Up to two processors, two processors standard, <b>Intel® Xeon® Processor E5520 with quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPathInterconnect), 1066MHz DDR3 memory controller, and 8MB cache		
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets		
Memory	<b>4GB</b> std, 48GB max, <b>UDIMM, PC3-8500 1066MHz DDR3, ECC</b> , 6-channel capable (3-channel per processor), twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors		<p><b>Tower</b></p> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul> <p>Bay ① 5.25", 1.6" high, external, std optical                      Bay ② 5.25", 1.6" high, external, open                      Bay ③ 5.25", 1.6" high, external, open                      Bay ④ 3.5", 1" high, external, std media reader                      Bay ⑤ 3.5", 1" high, internal, std disk                      Bay ⑥ 3.5", 1" high, internal, opt disk                      Bay ⑦ 3.5", 1" high, internal, opt disk                      Bay ⑧ 3.5", 1" high, internal, opt disk                      Bay ⑨ 3.5", 1" high, internal, opt disk</p> <p>Slot 1: half-length, full-height, PCIe x1                      Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)                      Slot 3: full-length, full-height, 32-bit PCI 2.3                      Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)                      Slot 5: full-length, full-height, PCIe x4 (x16 mechanical)                      Slot 6: full-length, full-height, 32-bit PCI 2.3</p> <p><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul> <p>Supports ThinkVantage® technologies</p> <p>GREENGUARD® certified RoHS-compliant</p> <p><b>LIMITED WARRANTY<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>↔ 3-year parts and labor</li> <li>↔ Customer Replaceable Unit (CRU)</li> <li>↔ parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>↔ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>↔ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU Some: <b>NVIDIA® Quadro® FX 580</b> , PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I ***, 40W Some: <b>NVIDIA Quadro FX 1800</b> , PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I ***, 59W *** Only two display connectors are active at a time		
Diskette drive	None		
Media reader	20-in-1 media reader		
SATA disk(s)	Some: <b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5" Some: <b>300GB</b> , SATA 3.0Gb/s, 10000 rpm, 2.5"		
SAS disk(s)	None		
SATA DVD±RW	Super Multi-Burner DL DVD±RW SATA 1.5Gb/s Drive		
Disk controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480		
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in		
IEEE 1394 adptr	None		
Audio	High Definition (HD) Audio, Analog Devices ADI 1988A codec		
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754		
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® Vista® Business 64	1GB PC3-8500 DDR3 ECC UDIMM	51J0503	
◇ Vista Premium logo	2GB PC3-8500 DDR3 ECC UDIMM	51J0504	
<b>Preloaded applications<sup>5</sup></b> (only some listed)	1GB PC3-10600 DDR3 ECC UDIMM	43R2032	
• Rescue and Recovery™	4GB PC3-10600 DDR3 ECC UDIMM	57Y4138	
• McAfee® VirusScan® Plus (30 days of virus definitions)	Super Multi-Burner DL DVD±RW SATA 1.5G/s	41N5620	
• Lenovo® System Toolbox	Blu-ray™ Burner SATA 1.5Gb/s	45K1675	
• Adobe® Reader	500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990	
• Roxio® Creator® Business Edition (DVD±RW)	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918	
• Roxio MyDVD® (DVD±RW)	300GB SATA 3.0Gb/s Disk (10000 rpm) 2.5"	43R2031	
• Corel® WinDVD® (DVD±RW)	ThinkStation Rail Kit	43R1964	
	USB 2.0 Ultra Secure Memory Key 8GB	45J5918	
	ThinkVision® L2440p Wide 24" Monitor	4420HB2	
	ATI™ FirePro™ 1GB V7750	51J0511	
	NVIDIA Quadro 1GB FX 3800	45K1673	
	NVIDIA Quadro 1.5GB FX 4800	45K1674	
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		

See footnotes for important warranty information  
 US models announced May 5, 2009  
 US models withdrawn effective April 2010

# ThinkStation® D20 (4155) - TopSeller (UDIMM) - August 2009 - withdrawn Personal Systems Reference (PSREF)

Type- Name	Slot x model bay	Processor(s) GHz Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR 5.0	Preload	Avail date
D20	4155-47U 6x9	2xE5540 2.53 8	2x2GB	1066MHz	1x500GB <sup>2</sup>	SATA 3.5"	DVD±RW	Media	1xFX3800	None	Pending	Bus64	Aug 09

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **This small and medium business (SMB) model is part of the US TopSeller™ Program**
- **This model has a 3-year limited warranty<sup>1</sup>**

Processor	Up to two processors, two processors standard, <b>Intel® Xeon® Processor E5540 with quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache		<b>Tower</b>	
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets		<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Memory	<b>4GB</b> std, 48GB max, <b>UDIMM, PC3-8500 1066MHz DDR3, ECC</b> , 6-channel capable (3-channel per processor), twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors		<ul style="list-style-type: none"> <li>• Bay ① 5.25", 1.6" high, external, std optical</li> <li>• Bay ② 5.25", 1.6" high, external, open</li> <li>• Bay ③ 5.25", 1.6" high, external, open</li> <li>• Bay ④ 3.5", 1" high, external, std media reader</li> <li>• Bay ⑤ 3.5", 1" high, internal, std disk</li> <li>• Bay ⑥ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑦ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑧ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑨ 3.5", 1" high, internal, opt disk</li> </ul>	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <b>NVIDIA® Quadro® FX 3800</b> , PCIe x16 adapter, 1GB, two DisplayPort, one dual-link DVI-I***, 108W *** Only two display connectors are active at a time		<ul style="list-style-type: none"> <li>• Slot 1: half-length, full-height, PCIe x1</li> <li>• Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 3: full-length, full-height, 32-bit PCI 2.3</li> <li>• Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 5: full-length, full-height, PCIe x4 (x16 mechanical)</li> <li>• Slot 6: full-length, full-height, 32-bit PCI 2.3</li> </ul>	
Diskette drive	None			
Media reader	20-in-1 media reader			
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"			
SAS disk(s)	None			
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s			
Disk Controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480			
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O			
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)			
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in			
IEEE 1394 adptr	None			
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec			
Speaker	Internal speaker for business audio			
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754			
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant			
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black			
Mouse	Optical Wheel Mouse (USB connector), black			
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified			
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)			
Rack mount	Rack shelf support or optional sliding rack mount rail kit support			
Supports ThinkVantage® technologies				
<b>Preloaded operating system<sup>20</sup></b>		<b>Accessories</b>		
- Genuine Windows® Vista® Business 64		1GB PC3-8500 DDR3 ECC UDIMM 51J0503		
◇ Vista Premium logo		2GB PC3-8500 DDR3 ECC UDIMM 51J0504		
		1GB PC3-10600 DDR3 ECC UDIMM 43R2032		
		2GB PC3-10600 DDR3 ECC UDIMM 43R2033		
		4GB PC3-10600 DDR3 ECC UDIMM 57Y4138		
		1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918		
		Blu-ray™ Burner SATA 1.5Gb/s 45K1675		
		ThinkVision® L2440p Wide 24" Monitor 4420HB2		
		NVIDIA Quadro NVS 290 43R1765		
		NVIDIA Quadro FX 580 45K1671		
		ATI™ FirePro™ 1GB V7750 51J0511		
		Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
<b>Preloaded applications<sup>5</sup></b> (only some listed)				
• Rescue and Recovery™				
• McAfee® VirusScan® Plus (30 days of virus definitions)				
• Lenovo® System Toolbox				
• Adobe® Reader				
• Corel® WinDVD® (DVD±RW)				
<b>SECURITY</b>				
<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>				
GREENGUARD® certified RoHS-compliant <i>Pending:</i> ENERGY STAR® 5.0-compliant				
<b>LIMITED WARRANTY<sup>1</sup></b>				
<ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>				

See footnotes for important warranty information  
US model announced August 4, 2009  
US model withdrawn effective April 2010

# ThinkStation® D20 (4155) - TopSeller (UDIMM) - Windows 7 - withdrawn

Personal Systems Reference (PSREF)

Type- Name	model	Slot x bay	Processor(s)	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR	Win7 preload	Avail date
D20	4155-68U	6x9	1xE5520	2.26	4	2x2GB	1333MHz	1x500GB <sup>2</sup>	SATA 3.5"	No	DVD±RW	Media	1xFX580	No	Pending	Pro64	Oct 09

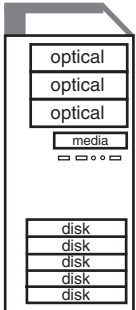
- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **This small and medium business (SMB) model is part of the US TopSeller™ Program**
- **This model has a 3-year limited warranty<sup>1</sup>**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	Up to two processors, one processor standard, <b>Intel Xeon® Processor E5520</b> with <b>quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache		<b>Power</b> <ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets			
Memory	<b>4GB</b> std, 48GB max, <b>UDIMM, PC3-10600 1333MHz DDR3**</b> , ECC, 6-channel capable (3-channel per processor), twelve 240-pin DIMM sockets*** ** System automatically clocks down for processors with 1066MHz DDR3 memory controller *** Over six DIMMs requires dual processors		Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 5.25", 1.6" high, external, open Bay ④ 3.5", 1" high, external, std media reader Bay ⑤ 3.5", 1" high, internal, std disk Bay ⑥ 3.5", 1" high, internal, opt disk Bay ⑦ 3.5", 1" high, internal, opt disk Bay ⑧ 3.5", 1" high, internal, opt disk Bay ⑨ 3.5", 1" high, internal, opt disk	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <b>NVIDIA® Quadro® FX 580</b> , PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I****, 40W **** Only two display connectors are active at a time		Slot 1: half-length, full-height, PCIe x1 Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, PCIe x4 (x16 mechanical) Slot 6: half-length, full-height, 32-bit PCI 2.3	
Diskette drive	None		<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	20-in-1 media reader			
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>	
SAS disk(s)	None			
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s			
Disk Controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480			
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O			
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)			
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in			
IEEE 1394 adptr	None			
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec			
Speaker	Internal speaker for business audio			
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754			
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant			
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black			
Mouse	Optical Wheel Mouse (USB connector), black			
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified			
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)			
Rack mount	Rack shelf support or optional sliding rack mount rail kit support			
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>			
- Genuine Windows® 7 Professional 64	2GB PC3-8500 DDR3 ECC UDIMM	51J0504		
	2GB PC3-10600 DDR3 ECC UDIMM	43R2033		
<b>Preloaded applications<sup>5</sup> (only some listed)</b>	4GB PC3-10600 DDR3 ECC UDIMM	57Y4138		
• Rescue and Recovery™	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918		
• ThinkVantage System Update	Blu-ray™ Burner SATA 1.5Gb/s	45K1675		
• Norton Internet Security™	ThinkVision® L2440p Wide 24" Monitor	4420HB2		
(30 days of virus definitions)	NVIDIA Quadro NVS 290	43R1765		
• Adobe® Reader	NVIDIA Quadro FX 580	45K1671		
• Microsoft Office 2010 preloaded; purchase product key to activate	ATI™ FirePro™ 1GB V7750	51J0511		
• Roxio® Creator® Business Edition (DVD±RW)	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>			
• Roxio MyDVD® (DVD±RW)				
• Corel® WinDVD® (DVD±RW)				

See footnotes for important warranty information  
 US model announced October 22, 2009  
 US model withdrawn effective September 2010

Type-Name	Slot x model	Proc-essor(s)	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-conf RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	ENERGY STAR 5.0	Win7 preload	Global	Avail date	
D20	4158-87U	6x9	1xE5540	2.53	4	2x2GB	1066MHz	1x500GB <sup>2</sup>	SATA 3.5"	No	DVD±RW	No	1xFX1800	Pending	Pro64	Global	Jan 10

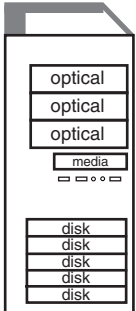
- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **This model has a 3-year limited warranty<sup>1</sup>**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	Up to two processors, one processor standard, <b>Intel Xeon® Processor E5540 with quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache		<b>Tower</b>	
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets		<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Memory	<b>4GB</b> std, 48GB max, <b>UDIMM, PC3-8500 1066MHz DDR3, ECC</b> , 6-channel capable (3-channel per processor), twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors		<ul style="list-style-type: none"> <li>• Bay ① 5.25", 1.6" high, external, std optical</li> <li>• Bay ② 5.25", 1.6" high, external, open</li> <li>• Bay ③ 5.25", 1.6" high, external, open</li> <li>• Bay ④ 3.5", 1" high, external, std media reader</li> <li>• Bay ⑤ 3.5", 1" high, internal, std disk</li> <li>• Bay ⑥ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑦ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑧ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑨ 3.5", 1" high, internal, opt disk</li> </ul>	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <b>NVIDIA® Quadro® FX 1800</b> , PCI Express® (PCIe) x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I***, 59W *** Only two display connectors are active at a time		<ul style="list-style-type: none"> <li>• Slot 1: half-length, full-height, PCIe x1</li> <li>• Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 3: full-length, full-height, 32-bit PCI 2.3</li> <li>• Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 5: full-length, full-height, PCIe x4 (x16 mechanical)</li> <li>• Slot 6: half-length, full-height, 32-bit PCI 2.3</li> </ul>	
Diskette drive	None			
Media reader	None			
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"			
SAS disk(s)	None			
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s			
Disk Controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480			
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O			
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)			
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in			
IEEE 1394 adptr	None			
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec			
Speaker	Internal speaker for business audio			
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754			
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant			
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black			
Mouse	Optical Wheel Mouse (USB connector), black			
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified			
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)			
Rack mount	Rack shelf support or optional sliding rack mount rail kit support			
Supports ThinkVantage® technologies				
<b>Preloaded operating system</b> <sup>20</sup>		<b>Accessories</b>		
- Genuine Windows® 7 Professional 64		1GB PC3-8500 DDR3 ECC UDIMM 51J0503		
<b>Preloaded applications</b> <sup>5</sup> (only some listed)		2GB PC3-8500 DDR3 ECC UDIMM 51J0504		
• Rescue and Recovery™		1GB PC3-10600 DDR3 ECC UDIMM 43R2032		
• ThinkVantage System Update		2GB PC3-10600 DDR3 ECC UDIMM 43R2033		
• Norton Internet Security™ (30 days of virus definitions)		4GB PC3-10600 DDR3 ECC UDIMM 57Y4138		
• Adobe® Reader		1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918		
• Microsoft Office 2010 preloaded; purchase product key to activate		Blu-ray™ Burner SATA 1.5Gb/s 45K1675		
• Roxio® Creator® Business Edition (DVD±RW)		NVIDIA Quadro NVS 290 43R1765		
• Roxio MyDVD® (DVD±RW)		NVIDIA Quadro FX 580 45K1671		
• Corel® WinDVD® (DVD±RW)		ATI™ FirePro™ 1GB V7750 51J0511		
		Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
<b>SECURITY</b>				
<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>				
GREENGUARD® certified RoHS-compliant <i>Pending:</i> ENERGY STAR® 5.0-compliant				
<b>LIMITED WARRANTY<sup>1</sup></b>				
<ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>				

See footnotes for important warranty information  
US model announced January 12, 2010  
US model withdrawn effective August 2010

Type-model	Slot x bay	Processor(s)	Base GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	Global	Avail date
4158-H2U	6x9	1xE5640	2.66	4	2x2GB	1333MHz	1x500GB <sup>2</sup> SATA	3.5"	No	DVD±RW	Media	1x2000	1394	Global	Nov 10
4158-H3U	6x9	1X5680	3.33	6	2x2GB	1333MHz	1x300GB SAS	3.5"	No	DVD±RW	Media	1x5000	1394	Global	Nov 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **These models have a 3-year limited warranty<sup>1</sup>**
- **These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	Up to two processors, one processors standard, <b>Intel® Xeon® Processor E5640</b> with <b>quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology, 1066MHz DDR3 memory controller, and 12MB cache or <b>Intel Xeon Processor X5680</b> with <b>six-core</b> , 6.4GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology, 1333MHz DDR3 memory controller, and 12MB cache		<b>Tower</b>		
Implementation	Two LGA1366 sockets		<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>		
Memory	<b>4GB</b> , 48GB max, <b>UDIMM</b> , <b>PC3-10600 1333MHz DDR3**</b> , <b>ECC</b> , 6-channel capable (3-channel per processor), twelve 240-pin DIMM sockets*** ** System automatically clocks down for processors with 1066MHz DDR3 memory controller *** Over six DIMMs requires dual processors		Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 5.25", 1.6" high, external, open Bay ④ 3.5", 1" high, external, std media reader Bay ⑤ 3.5", 1" high, internal, std disk Bay ⑥ 3.5", 1" high, internal, opt disk Bay ⑦ 3.5", 1" high, internal, opt disk Bay ⑧ 3.5", 1" high, internal, opt disk Bay ⑨ 3.5", 1" high, internal, opt disk  Slot 1: half-length, full-height, PCIe x1 Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, PCIe x4 (x16 mechanical) Slot 6: half-length, full-height, 32-bit PCI 2.3		
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <i>Some: NVIDIA® Quadro® 2000</i> , PCIe x16 adapter, 1GB, two DisplayPort™, one dual-link DVI-I****, 62W <i>Some: NVIDIA Quadro 5000</i> , PCIe x16 adapter, 2.5GB, two DisplayPort, one dual-link DVI-I****, one stereo, 152W **** Only two display connectors are active at a time				
Diskette drive	None (use USB port)				
Media reader	20-in-1 media reader, internal USB 2.0				
SATA disk(s)	<i>Some: 500GB</i> , SATA 3.0Gb/s, 7200 rpm, 3.5"				
SAS disk(s)	<i>Some: 300GB</i> , SAS 3.0Gb/s, 15000 rpm, 3.5"				
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s				
Disk Controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480				
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O				
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)				
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in				
IEEE 1394 adptr	FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear				
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec				
Speaker	Internal speaker for business audio				
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754				
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black		Supports ThinkVantage® technologies		
Mouse	Optical Wheel Mouse (USB connector), black		GREENGUARD® certified		
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		RoHS-compliant		
Cooling	Five fans max (power supply, first processor, second processor, rear, front disk)		EPEAT™ Gold rating		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		<b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>↪ 3-year parts and labor</li> <li>↪ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>↪ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>↪ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>				
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 ECC UDIMM	43R2033			
	4GB PC3-10600 DDR3 ECC UDIMM	57Y4138			
<b>Preloaded applications<sup>5</sup></b> (only some listed)	500GB SATA 3.0Gb/s Disk (7200 rpm)	43R1990			
• Microsoft Office 2010 preloaded; purchase product key to activate	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918			
• Roxio® Creator® Business Edition (DVD±RW)	Blu-ray™ Burner SATA 1.5Gb/s	45K1675			
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>				

See footnotes for important warranty information  
 US models announced November 2, 2010  
 US models withdrawn effective May 2011

# ThinkStation® D20 (4158) - RDIMM - withdrawn

Name	Type-model	Slot x bay	Processor(s) GHz	Memory	Disk(s)	Disk type	Disk type	RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR 5.0	Preload	Avail date
D20	4158-21U	6x9	2 x E5506	2.13	4 x 1GB	2 x 147GB	3.5"	SAS	0	DVD±RW	Media 1 x FX1800	1394	None	Bus64	Apr 09
D20	4158-22U	6x9	1 x X5560	2.80	2 x 1GB	1 x 250GB	3.5"	SATA	0	DVD±RW	Media 1 x FX1800		None	Bus32	Apr 09
D20	4158-52U	6x9	2 x E5540	2.53	4 x 1GB	2 x 147GB	3.5"	SAS	0	DVD±RW	Media 1 x FX4800		None	Pro64	Apr 09
D20	4158-53U	6x9	2 x E5540	2.53	4 x 1GB	2 x 300GB	2.5"	SATA	1	DVD±RW	Media 1 x FX4800		None	Pro64	Apr 09

- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**

Processor(s)	Up to two processors, one or two processors standard, <b>Intel® Xeon® Processor E5506</b> with <b>quad-core</b> , 4.8GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 800MHz DDR3 memory controller, and 4MB cache or <b>Intel Xeon Processor E5540</b> with <b>quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache or <b>Intel Xeon Processor X5560</b> with <b>quad-core</b> , 6.4GT/s QPI, 1333MHz DDR3 memory controller, and 8MB cache		<b>Tower</b>		
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets		<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>		
Memory	<b>2GB</b> or <b>4GB</b> std, 192GB max (pending 16GB RDIMM availability), <b>RDIMM, PC3-8500 1066MHz DDR3, ECC</b> , registered, 6-channel capable, twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors		<ul style="list-style-type: none"> <li>• Bay ① 5.25", 1.6" high, external, std optical</li> <li>• Bay ② 5.25", 1.6" high, external, open</li> <li>• Bay ③ 5.25", 1.6" high, external, open</li> <li>• Bay ④ 3.5", 1" high, external, std media reader</li> <li>• Bay ⑤ 3.5", 1" high, internal, std disk</li> <li>• Bay ⑥ 3.5", 1" high, internal, std or opt disk</li> <li>• Bay ⑦ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑧ 3.5", 1" high, internal, opt disk</li> <li>• Bay ⑨ 3.5", 1" high, internal, opt disk</li> </ul>		
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <i>Some: <b>NVIDIA® Quadro® FX 1800</b>, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I***, 59W</i> <i>Some: <b>NVIDIA Quadro FX 4800</b>, PCIe x16 adapter, 1.5GB, two slot width, 2 DisplayPort, 1 dual-link DVI-I***, 121W</i> *** Only two display connectors are active at a time		<ul style="list-style-type: none"> <li>• Slot 1: half-length, full-height, PCIe x1</li> <li>• Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 3: full-length, full-height, 32-bit PCI 2.3</li> <li>• Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)</li> <li>• Slot 5: full-length, full-height, PCIe x4 (x16 mechanical)</li> <li>• Slot 6: full-length, full-height, 32-bit PCI 2.3</li> </ul>		
Diskette drive	None				
Media reader	20-in-1 media reader				
SATA disk(s)	<i>Some: <b>250GB</b> or <b>500GB</b>, SATA 3.0Gb/s, 7200 rpm, 3.5"</i> <i>Some: <b>300GB</b>, SATA 3.0Gb/s, 10000 rpm, 2.5"</i>				
SAS disk(s)	<i>Some: <b>146GB</b>, SAS 3.0Gb/s, 15000 rpm</i>				
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s				
Disk controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480				
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O		<p align="center"><b>SECURITY</b></p> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>		
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)				
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in				
IEEE 1394 adptr	<i>Some: FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear</i>				
Audio	High Definition (HD) Audio, Analog Devices ADI 1988A codec				
Speaker	Internal speaker for business audio				
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754				
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant				
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black				
Mouse	Optical Wheel Mouse (USB connector), black				
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified		Supports ThinkVantage® technologies		
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)		GREENGUARD® certified		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support		RoHS-compliant		
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		<b>LIMITED WARRANTY<sup>1</sup></b>		
- <i>Some: Genuine Windows® XP Professional 64-bit (preinstalled via downgrade rights in Windows Vista® Business 64-bit)</i>	2GB PC3-8500 DDR3 ECC RDIMM	43R2035	<ul style="list-style-type: none"> <li>↪ <b>3-year parts and labor</b></li> <li>↪ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>↪ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b></li> <li>↪ <b>24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>		
	4GB PC3-8500 DDR3 ECC RDIMM	43R2036			
	8GB PC3-8500 DDR3 ECC RDIMM	43R2037			
	Blu-ray™ Burner SATA 1.5Gb/s	45K1675			
	1TB SATA 3.0Gb/s Disk (7200 rpm)	45J7918			
- <i>Some: Genuine Windows Vista Business 32</i>	150GB SATA 3.0Gb/s Disk (10000 rpm) 2.5"	43R2030			
	300GB SATA 3.0Gb/s Disk (10000 rpm) 2.5"	43R2031			
- <i>Some: Genuine Windows Vista Business 64</i>	300GB SAS 3.0Gb/s Disk (15000 rpm)	43R1994			
	450GB SAS 3.0Gb/s Disk (15000 rpm)	43N3424			
♦ <i>Vista models: Vista Premium logo</i>	ThinkStation Rail Kit	43R1964			
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>				

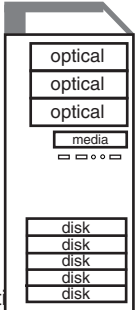
See footnotes for important warranty information  
 US models announced March 31, 2009  
 US models withdrawn effective January 2010 or April 2010

# ThinkStation® D20 (4158) - RDIMM (Windows 7) - withdrawn

Personal Systems Reference (PSREF)

Type- Name	Slot x bay	Processor(s)	GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	ENERGY STAR	Win7 preload	Avail date	
D20	4158-79U	6x9	2xE5520	2.26	8	2x4GB	1066MHz	2x500GB <sup>2</sup>	SATA	3.5"	No	DVD±RW Media	1xFX1800	1394	Pending	Pro64	Oct 09

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **High performance workstation with premium graphics for specialized professionals**
- **Environmentally friendly, cool, and quiet with rock solid engineering**
- **Innovative thermal design with optimized fan placement, for a cooler, quieter, more reliable PC**
- **This model has a 3-year limited warranty<sup>1</sup>**
- **This system is Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	Up to two processors, two processors standard, <b>Intel Xeon® Processor E5520 with quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), 1066MHz DDR3 memory controller, and 8MB cache		<b>Tower</b>	
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets		<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Memory	<b>8GB</b> std, 192GB max (Pending availability of 16GB RDIMM), <b>RDIMM, PC3-8500 1066MHz DDR3, ECC</b> , twelve 240-pin DIMM sockets** ** Over six DIMMs requires dual processors			
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <b>NVIDIA® Quadro® FX 1800</b> , PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I***, 59W *** Only two display connectors are active at a time		Bay ① 5.25", 1.6" high, external, std opt Bay ② 5.25", 1.6" high, external, open Bay ③ 5.25", 1.6" high, external, open Bay ④ 3.5", 1" high, external, std media reader Bay ⑤ 3.5", 1" high, internal, std disk Bay ⑥ 3.5", 1" high, internal, std disk Bay ⑦ 3.5", 1" high, internal, opt disk Bay ⑧ 3.5", 1" high, internal, opt disk Bay ⑨ 3.5", 1" high, internal, opt disk	
Diskette drive	None		Slot 1: half-length, full-height, PCIe x1	
Media reader	20-in-1 media reader		Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max)	
SATA disk(s)	<b>500GB</b> , SATA 3.0Gb/s, 7200 rpm, 3.5"		Slot 3: full-length, full-height, 32-bit PCI 2.3	
SAS disk(s)	None		Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max)	
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s		Slot 5: full-length, full-height, PCIe x4 (x16 mechanical)	
Disk Controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480		Slot 6: half-length, full-height, 32-bit PCI 2.3	
Chipset	<b>Intel 5520 Chipset</b> , Intel ICH10, Winbond® W83627DHG-P Super I/O		<b>SECURITY</b>	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)		<ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in		Supports ThinkVantage® technologies	
IEEE 1394 adptr	FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear		GREENGUARD® certified	
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec		RoHS-compliant	
Speaker	Internal speaker for business audio		<i>Pending: ENERGY STAR® 5.0-compliant</i>	
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754		<b>LIMITED WARRANTY<sup>1</sup></b>	
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		<ul style="list-style-type: none"> <li>⇒ <b>3-year parts and labor</b></li> <li>⇒ <b>Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</b></li> <li>⇒ <b>ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></b> <ul style="list-style-type: none"> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> </ul> </li> <li>⇒ <b>24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</b></li> </ul>	
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black			
Mouse	Optical Wheel Mouse (USB connector), black			
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified			
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)			
Rack mount	Rack shelf support or optional sliding rack mount rail kit support			
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>			
- Genuine Windows® 7 Professional 64	1TB SATA 3.0Gb/s Disk (7200 rpm) 45J7918			
	Blu-ray™ Burner SATA 1.5Gb/s 45K1675			
	ThinkVision® L2440p Wide 24" Monitor 4420HB2			
	NVIDIA Quadro NVS 290 43R1765			
	NVIDIA Quadro FX 580 45K1671			
	ATI™ FirePro™ 1GB V7750 51J0511			
	Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>			
<b>Preloaded applications<sup>5</sup> (only some listed)</b>				
• Rescue and Recovery™				
• ThinkVantage System Update				
• Norton Internet Security™ (30 days of virus definitions)				
• Adobe® Reader				
• Microsoft Office 2010 preloaded; purchase product key to activate				
• Roxio® Creator® Business Edition (DVD±RW)				
• Roxio MyDVD® (DVD±RW)				
• Corel® WinDVD® (DVD±RW)				

See footnotes for important warranty information  
 US model announced October 22, 2009  
 US model withdrawn effective August 2010

Type-model	Slot x bay	Processor(s)	Base GHz	Max GHz	Cores	Memory DIMMs	Memory speed	Disk(s)	Disk size	Pre-config RAID	SATA optical	Diskette or Media reader	Graphics adapter(s)	1394 adptr	Global	Avail date
4158-B2U	6x9	1xE5620	2.40	2.66	4	2x2GB	1333MHz	1x500GB <sup>2</sup>	SATA 3.5"	No	DVD±RW	Media	1xFX580	1394		Mar 10
4158-B3U	6x9	1xE5630	2.53	2.80	4	2x2GB	1333MHz	1x500GB	SATA 3.5"	No	DVD±RW	Media	1xFX1800	1394		Mar 10
4158-B4U	6x9	1xE5640	2.66	2.93	4	2x2GB	1333MHz	1x300GB	SAS 3.5"	No	DVD±RW	Media	1xFX1800	1394		Mar 10
4158-B5U	6x9	1X5650	2.66	3.06	6	2x2GB	1333MHz	1x500GB	SATA 3.5"	No	DVD±RW	Media	1xFX380	1394		Mar 10
4158-B6U	6x9	1X5660	2.80	3.20	6	2x2GB	1333MHz	1x300GB	SAS 3.5"	No	DVD±RW	Media	1xFX4800	1394		Mar 10
4158-B8U	6x9	1xE5640	2.66	2.93	4	2x2GB	1333MHz	1x500GB	SATA 3.5"	No	DVD±RW	Media	1xFX1800	1394	Global	May 10
4158-B9U	6x9	1X5670	2.93	3.33	6	3x2GB	1333MHz	1x300GB	SAS 3.5"	No	DVD±RW	Media	1xFX4800			Jun 10

- **Faster, more efficient architecture with the latest Intel® workstation technology**
- **These models have a 3-year limited warranty<sup>1</sup>**
- **These systems are Microsoft® Office 2010 Product Key Ready (O10PKR)**

Processor	Up to two processors, one processor standard, <b>Intel Xeon® Processor E5620, E5630, or E5640</b> with <b>quad-core</b> , 5.86GT/s (giga-transfers/second) QPI (QuickPath Interconnect), Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology, 1066MHz DDR3 memory controller, and 12MB cache or <b>Intel Xeon Processor X5650, X5660 or X5670</b> with <b>six-core</b> , 6.4GT/s QPI, Intel 64, Hyper-Threading Technology, Virtualization Technology, Turbo Boost Technology, 1333MHz DDR3 memory controller, and 12MB cache	<b>Tower</b>	
Implementation	Processor uses FC-LGA8 package, two LGA1366 sockets	<ul style="list-style-type: none"> <li>• Raven black color; metal case</li> <li>• 8.3"W x 23.7"D x 19.1"H (with handle)</li> <li>• 210mm W x 602mm D x 485mm H</li> <li>• 60 lb (27.1kg) max configuration</li> <li>• 55-liter</li> <li>• Removable handle on top front</li> <li>• Toolless side cover removal</li> <li>• Toolless disk and optical drive removal</li> <li>• Toolless adapter retention</li> <li>• Illuminated front icons</li> <li>• Rack shelf support or optional rail kit</li> </ul>	
Memory	<b>4GB or 6GB</b> std, 48GB max, <b>UDIMM, PC3-10600 1333MHz DDR3**, ECC,</b> 6-channel capable (3-channel per processor), twelve 240-pin DIMM sockets*** ** System automatically clocks down for processors with 1066MHz DDR3 memory controller *** Over six DIMMs requires dual processors	Bay ① 5.25", 1.6" high, external, std optical Bay ② 5.25", 1.6" high, external, open Bay ③ 5.25", 1.6" high, external, open Bay ④ 3.5", 1" high, external, std media reader Bay ⑤ 3.5", 1" high, internal, std disk Bay ⑥ 3.5", 1" high, internal, opt disk Bay ⑦ 3.5", 1" high, internal, opt disk Bay ⑧ 3.5", 1" high, internal, opt disk Bay ⑨ 3.5", 1" high, internal, opt disk  Slot 1: half-length, full-height, PCIe x1 Slot 2: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 3: full-length, full-height, 32-bit PCI 2.3 Slot 4: full-length, full-height, PCIe 2.0 x16 (75W* max) Slot 5: full-length, full-height, PCIe x4 (x16 mechanical) Slot 6: half-length, full-height, 32-bit PCI 2.3	
Graphics	Two PCI Express® x16 adapters required for quad monitor support, * Adapters >75W use auxiliary power connector(s) from PSU <i>Some: NVIDIA® Quadro® FX 380, PCIe x16 adapter, 256MB, two dual-link DVI-I, 35W</i> <i>Some: NVIDIA Quadro FX 580, PCIe x16 adapter, 512MB, two DisplayPort, one dual-link DVI-I****, 40W</i> <i>Some: NVIDIA Quadro FX 1800, PCIe x16 adapter, 768MB, two DisplayPort, one dual-link DVI-I****, 59W</i> <i>Some: NVIDIA Quadro FX 4800, PCIe x16 adapter, 1.5GB, two slot width, two DisplayPort, one dual-link DVI-I****, 121W</i> **** Only two display connectors are active at a time		
Diskette drive	None (use USB port)	<b>SECURITY</b> <ul style="list-style-type: none"> <li>• Security chip (see information on left)</li> <li>• Side cover lock (ships with two identical keys)</li> <li>• Padlock loop (in rear for opt padlock; padlock prohibits side cover removal)</li> <li>• Security slot (in rear for optional Kensington® Microsaver® cable; prohibits side cover removal)</li> <li>• Power-on password</li> <li>• Administrator password</li> <li>• Boot sequence control</li> <li>• Boot without keyboard, mouse, diskette</li> <li>• Serial port I/O control</li> <li>• USB port disablement (front or all)</li> </ul>	
Media reader	20-in-1 media reader, internal USB 2.0		
SATA disk(s)	<i>Some: 500GB, SATA 3.0Gb/s, 7200 rpm, 3.5"</i>	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
SAS disk(s)	<i>Some: 300GB, SAS 3.0Gb/s, 15000 rpm</i>		
SATA DVD±RW	Super Multi-Burner DL DVD±RW, SATA 1.5Gb/s	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
Disk Controller	3 SATA connectors for opticals, SATA 3.0Gb/s, integrated in ICH10; 5 SATA/SAS <sup>4</sup> connectors for disks, SATA 3.0Gb/s, SAS 3.0Gb/s, RAID <sup>5</sup> 0, 1, 5, 10, integrated in Marvell® 88SE6480		
Chipset	<b>Intel 5520 Chipset,</b> Intel ICH10, Winbond® W83627DHG-P Super I/O	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
Front ports	Two USB 2.0, microphone (3.5mm), headphone (3.5mm), FireWire 400 (IEEE 1394a)		
Rear ports	Eight USB 2.0, eSATA, serial (9-pin), two ethernet (RJ-45), FireWire 400 (IEEE 1394a), six analog audio ports (line-in, mic-in, front-out, rear-out, center/sub-out, side out), Optical SPDIF digital out, Optical SPDIF digital in	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
IEEE 1394 adptr	<i>Some: FireWire PCI adapter, 1394a-2000, 400Mbps, two 6-pin ports on rear</i>		
Audio	High Definition (HD) Audio, Analog Devices AD1988A codec	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
Speaker	Internal speaker for business audio		
Ethernet	Dual gigabit ethernet on planar, Broadcom® BCM5755 and BCM5754	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
Security chip	Broadcom Trusted Platform Module, TCG 1.2-compliant		
Keyboard	Preferred Pro USB Keyboard (USB connector), 104-key, black	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
Mouse	Optical Wheel Mouse (USB connector), black		
Power supply	1060 watts with 120mm bottom-mounted variable speed fan, universal, Climate Savers® Computing Bronze, 80 PLUS® Bronze qualified	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
Cooling	Five fans (power supply, first processor, second processor, rear, front disk)		
Rack mount	Rack shelf support or optional sliding rack mount rail kit support	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
<b>Preloaded operating system<sup>20</sup></b>	<b>Accessories</b>		
- Genuine Windows® 7 Professional 64	2GB PC3-10600 DDR3 ECC UDIMM 43R2033 4GB PC3-10600 DDR3 ECC UDIMM 57Y4138	Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	
<b>Preloaded applications<sup>5</sup></b> (only some listed)	500GB SATA 3.0Gb/s Disk (7200 rpm) 43R1990 Blu-ray™ Burner SATA 1.5Gb/s 45K1675 NVIDIA Quadro FX 4800 45K1674 Other accessories at <a href="http://lenovo.com/accessories">lenovo.com/accessories</a>		
• Microsoft Office 2010 preloaded; purchase product key to activate		Supports ThinkVantage® technologies  GREENGUARD® certified RoHS-compliant Pending: ENERGY STAR® 5.0-compliant  <b>LIMITED WARRANTY<sup>1</sup></b> <ul style="list-style-type: none"> <li>⇒ 3-year parts and labor</li> <li>⇒ Customer Replaceable Unit (CRU) parts only (with limited onsite service for selected parts<sup>3</sup>, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time)</li> <li>⇒ ThinkPlus™ services available; see <a href="http://lenovo.com/thinkplus/warranty">http://lenovo.com/thinkplus/warranty</a></li> <li>• Onsite service upgrade options (in eligible locations)<sup>7</sup></li> <li>• Post warranty maintenance services</li> <li>⇒ 24 hour x 7 day<sup>14</sup> toll-free support during the warranty period<sup>1</sup> via 800-426-7378</li> </ul>	

See footnotes for important warranty information  
 US models announced on March 16, May 4, or June 15, 2010  
 US models withdrawn effective February 2011

**Availability:** All offers subject to availability. Lenovo reserves the right to alter product offerings and specifications at any time, without notice. Lenovo is not responsible for photographic or typographic errors.

**Warranty:** For a copy of applicable product 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.

- <sup>1</sup> **Limited warranty:** Support unrelated to a warranty issue may be subject to additional charges.
- <sup>2</sup> **Hard drive:** GB = billion bytes, TB = trillion bytes. Accessible capacity is less.
- <sup>3</sup> **Systems with limited onsite service** are designed to be repaired during the applicable warranty period primarily with customer-replaceable parts provided by Lenovo. Lenovo will only send a technician onsite to perform a repair if (a) remote telephone diagnosis and/or customer part replacement are unable to resolve the problem, or (b) the part is one of the few designated by Lenovo for onsite replacement. For a list of onsite replaceable parts, contact Lenovo. In the United States call 1-800-426-7378. Support unrelated to a warranty issue may be subject to additional charges.
- <sup>5</sup> **Included software** may differ from its retail version (if available), and may not include user manuals or all program functionality. License agreements may apply.
- <sup>6</sup> **Multi-Burner Plus** (part number 73P3305 or 73P3370) is a DVD±RW device that reads and writes to DVD-RAM, DVD-R, DVD-RW, DVD+R, and DVD+RW. It also reads and writes to CD-R and CD-RW media. 73P3370 also writes to DVD+R double layer media.

<sup>6</sup> **Multi-Burner Plus** (part number 73P3305 or 73P3370) is a DVD±RW device that reads and writes to DVD-RAM, DVD-R, DVD-RW, DVD+R, and DVD+RW. It also reads and writes to CD-R and CD-RW media. 73P3370 also writes to DVD+R double layer media.

<sup>7</sup> **ThinkPlus Services:** These services are available for machines normally used for business, professional, or trade purposes, rather than personal, family, or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response time objectives and are not guarantees. If the machine problem turns out to be a Customer Replaceable Unit (CRU), a part will be express shipped to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. P&L means parts and labor. P/U means pick-up. See ThinkPlus terms and conditions for complete details and restrictions.

<sup>8</sup> **Memory:** For PCs without a separate graphics card, memory supports both system and video. Accessible system memory may be up to 384MB less than the amount stated, depending on video mode.

<sup>9</sup> **International Warranty Service** is available in any country in which this product is sold and serviced. Service delivery methods and parts availability vary by country, may be different from that in the country of purchase, and are subject to change without notice. Fees and restrictions may apply in some countries.

<sup>10</sup> **Modem speeds:** Public network download speeds are limited to 53Kbps. Upload speeds are limited to 48Kbps for V.92 modems. Actual speeds depend on many factors and are often less than the maximum possible. V.92 functions and speeds require compatible phone line and server equipment. Check with your telephone and ISP service providers for availability.

<sup>11</sup> **For combination drives,** maximum speeds only are given in the following order: CD read, CD write, CD re-write, DVD read.

<sup>14</sup> **Response times may vary.** May exclude some holidays. Telephone support may be subject to additional charges.

<sup>15</sup> **Update Connector** is available at no charge to registered customers during the limited warranty period. Line charges may apply.

<sup>16</sup> **Embedded Security Subsystem** works with optional VPN software.