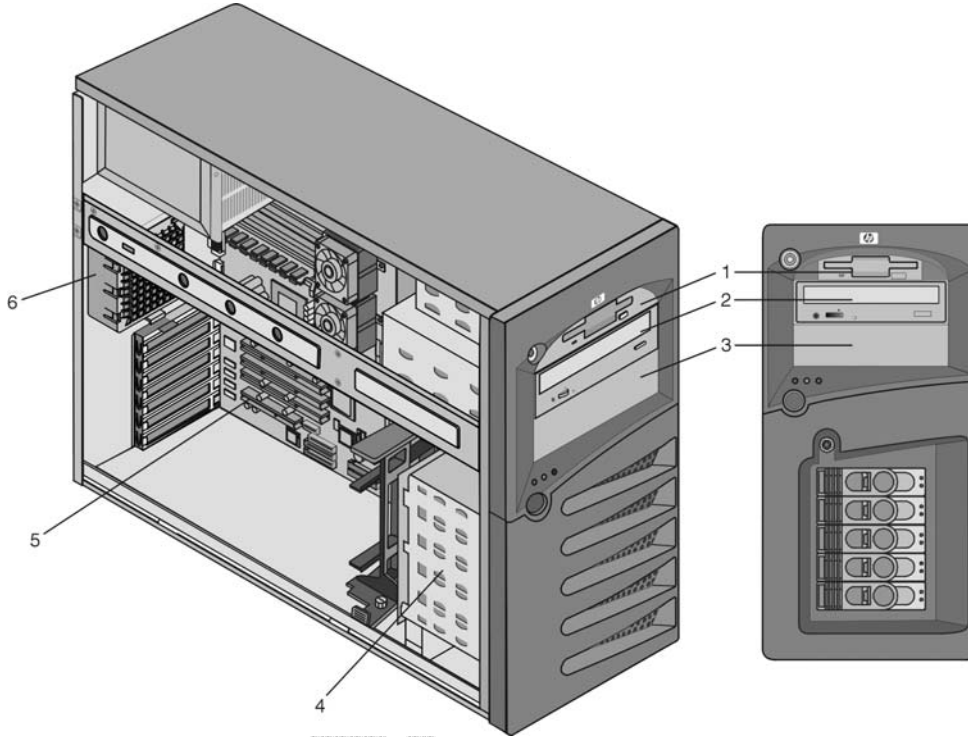


Overview

HP ProLiant ML150

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1. 1.44 MB floppy drive
2. 48x CD-ROM drive
3. Reserved for 5.25" tape drive
4. Five 1" hot plug drive bays or fixed drive bays
5. Two 64-bit PCI-X 100/133 MHz PCI slots, two 64-bit PCI-X 66 MHz PCI slots, and one 32-bit 33 MHz PCI slot
6. System fan

At A Glance

- Intel® Xeon 2.4GHz, 2.8GHz or 3.06GHz processors with 533MHz system bus
- 512 KB level 2 cache per processor
- Intel E7501 chipset
- 256 MB of PC2100 DDR SDRAM running at 266 MHz with registered and ECC capabilities standard, **supports dual channel memory access and** expandable to 12 GB
- Intel 82545EM PCI Gigabit NIC (embedded) 10/100/1000 WOL (Wake-on-LAN)

- Integrated Dual Channel Wide Ultra320 SCSI controller
- Integrated Dual Channel Ultra ATA/100 controller
- Support for up to five 1" Ultra320 HP/NHP SCSI hard drives
- Five PCI slots (two 64-bit 133/100 MHz PCI-X slots at 3.3 volt, two 64-bit 66 MHz PCI-X slots at 3.3 volt, and one 32-bit 33 MHz PCI slot at 5 volt)
- Integrated ATI Rage XL with 8 MB SDRAM video
- 450W Power Supply
- Two USB ports
- ROM Base Setup Utility (RBSU) and PXE support
- Protected by HP Services, Warranty: 3 years of parts, Service: 1 year of labour and on site support (Next Business Day limited in-country on-site service) – certain restrictions and exclusions apply.

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Standard Features

Processor	Intel® Xeon processor 2.4 GHz, 2.8GHz or 3.06GHz 533 MHz Front Side Bus		
Cache Memory	Integrated 512 KB Level 2 cache		
Memory	Standard	256 MB PC2100 DDR SDRAM (ECC, registered)	
	Maximum	12 GB (using 2GB DIMMs)/ 6 slots	
Network Controller	Intel 82545EM PCI Gigabit NIC (embedded) 10/100/1000 WOL (Wake-on-LAN)		
Expansion Slots	I/O (5 Total)	PCI Voltage:	
	64-bit 133/100/66 MHz PCI-X	2	3.3 volts
	64-bit 66 MHz PCI-X	2	3.3 volts
	32-bit 33 MHz PCI	1	5 volts
Storage Controller	Integrated Dual Channel Ultra320 SCSI controller		
Storage	Note: Optional RAID upgrade with Adaptec ZCR card (using green PCI slot)		
	Diskette Drive	1.44 MB	
	CD-ROM Drive	48x IDE (ATAPI) CD-ROM drive	
	Hard Drives	One of the following:	
		<ul style="list-style-type: none"> • 36.4 GB Ultra320 SCSI 10,000 rpm 1" Non hot plug drive • 36.4 GB Ultra320 SCSI 10,000 rpm 1" hot plug drive 	
Interfaces	Maximum Internal Storage	730 GB internal drive cage maximum SCSI capacity (5 x 146 GB)	
	Parallel	1	
	Serial	1	
	Pointing Device (Mouse)	1	
	Video	1	
	Keyboard	1	
	USB	2	
	Network RJ-45 (Ethernet)	1	
Graphics	Integrated ATI RAGE XL video controller with 8MB SDRAM video memory		
Form Factor	Tower (5U)		
Industry Standard Compliance	ACPI V1.0b compliant		
	PCI 2.2 compliant		
	PCI-X 1.0 compliant		
	PXE support		

Manageability	WOL support Microsoft® Logo certifications Online ROM flash utility BIOS serial console
Security	ML150 System Monitor Power-on password Setup password Diskette boot control
Server Power Cords	One power cord, shipped standard
Power Supply	450 Watts, PFC (Power Factor Correcting)
System Fans	system fan, standard CPU heatsink fan, standard
OS Support	Microsoft Windows 2000 Server Microsoft Small Business Server 2000 Microsoft Windows 2003 Server Microsoft Small Business Server 2003 Red Hat 9.0 Professional SCO OpenServer 5.0.7 SCO Unixware 7.1.3 SCO Open Unix 8 Red Flag Linux Professional server 4.0 Turbo Linux 8.0 United Linux 1.0 (Turbo version) United Linux 1.0 (SuSe version) United Linux 1.0 (SCO version)
Service and Support	NOTE: For an up to date listing of the latest drivers available, please refer to http://www.hp.com

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A full range of HP Care Pack packaged hardware and software services are available:

- Installation and startup
- Extended coverage hours and enhanced response times
- System management and performance services
- Availability and recovery services

NOTE: For more information, customers/resellers can refer to:

<http://www.hp.com/services/carepack>

For more information on the warranty, please refer to:

<http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

NOTE: Certain restrictions and exclusions apply.

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Models

ML150 X2.4/533-512 KB 256 MB, 36 GB, SCSI U320 340542-xx1 (Hot Plug) 340543-xx1 (Non Hot Plug)	Processor Cache Memory Memory Network Controller Storage Controller Hard Drive Internal Storage Optical Drive Form Factor Processor	(1) Intel Xeon 2.4 GHz processor standard (up to 2 supported) Integrated 512 KB Level 2 cache 256 MB (Standard) to 12 GB (Maximum) PC2100 DDR SDRAM DIMM Intel 82545EM PCI-X Gigabit NIC (embedded) 10/100/1000 WOL (Wake-on-LAN) Integrated Adaptec 7902W dual channel Ultra320 controller 36 GB Ultra320 10,000 RPM 730 GB maximum (with optional hard drives) 48x IDE (ATAPI) CD-ROM drive Tower (5U)
ML150 X2.8/533-512 KB 256 MB, 36 GB, SCSI U320 340546-xx1 (Hot Plug) 340547-xx1 (Non Hot Plug)	Cache Memory Memory Network Controller Storage Controller Hard Drive Internal Storage Optical Drive	(1) Intel Xeon 2.8 GHz processor standard (up to 2 supported) Integrated 512 KB Level 2 cache 256 MB (Standard) to 12 GB (Maximum) PC2100 DDR SDRAM DIMM Intel 82545EM PCI-X Gigabit NIC (embedded) 10/100/1000 WOL (Wake-on-LAN) Integrated Adaptec 7902W dual channel Ultra320 controller 36 GB Ultra320 10,000 RPM 730 GB maximum (with optional hard drives) 48x IDE (ATAPI) CD-ROM drive

Form Factor	Tower (5U)
Processor	(1) Intel Xeon 3.06 GHz processor standard (up to 2 supported) Integrated 512 KB Level 2 cache
Cache Memory	Integrated 512 KB Level 2 cache
Memory	256 MB (Standard) to 12 GB (Maximum) PC2100 DDR SDRAM DIMM
Network Controller	Intel 82545EM PCI-X Gigabit NIC (embedded) 10/100/1000 WOL (Wake-on-LAN)
Storage Controller	Integrated Adaptec 7902W dual channel-Ultra320-controller
Hard Drive	36 GB Ultra320 10,000 RPM
Internal Storage	730 GB maximum (with optional hard drives)
Optical Drive	48x IDE (ATAPI) CD-ROM drive
Form Factor	Tower (5U)
Country Code Key	XX=37 Asia Pacific XX=AB Taiwan XX=01 Australia XX=AD Korea XX=AA PRC

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Options

Hot Swap Conversion Kit	U320 SCSI backplane with 5 SCA2 connector, 5 HDD carriers, GEM 318 chipset imbedded, Fault LED support.	344289-B21
Rack Mount Kit	Supports HP 10000/9000 series racks and HP Rack System/E racks	344709-B21
Processors	Intel Xeon 2.4GHz-512KB Processor Option Kit (with heatsink, CPU Fan and Retention Module)	347924-B21
	Intel Xeon 2.8GHz-512KB Processor Option Kit (with heatsink, CPU Fan and Retention Module)	347926-B21
	Intel Xeon 3.06GHz-512KB Processor Option Kit (with heatsink, CPU Fan and Retention Module)	347927-B21
Memory (DIMMs)	256MB ECC PC2100 DDR SDRAM ML150 (1X256MB)	355520-B21
	512MB ECC PC2100 DDR SDRAM ML150 (1X512MB)	355521-B21
Hard Drives	36G 10K rpm U320 SCSI Hot-Plug PL100	355522-B21
	72G 10K rpm U320 SCSI Hot-Plug PL100	355523-B21
	36GB 10K rpm U320 SCSI Non Hot-Plug	271832-B21
	72GB 10K rpm U320 SCSI Non Hot-Plug	332751-B21
Tape Drives	HP StorageWorks DAT 40	C5686B
	HP StorageWorks DAT 72	Q1524A
	HP StorageWorks Ultrium 215	Q1543A
Storage Controllers	SCSI RAID 2010S ML150 (Zero Channel SCSI RAID controller, for installation into PCI slot 2, which has a green coloured connector.	355525-B21
Other	Enhanced Keyboard (Carbon)	296433-xxx
	Enhanced Keyboard (Carbon) Country Key Code	
	Dash # Description Dash # Description	
	-005 US -175 Arabic	
	-035 UK -185 Belgium	
	-045 Germany -215 Hungary	
	-055 France -225 Czech	
	-065 Italy -235 Slovak	
	-075 Spain -245 Polish	
	-085 Denmark -255 Russian	
	-085 Norway -295 Japan	
	-105 Sweden/Finland -335 Dutch	
	-125 French Canadian -355 Finish	
	-135 Portugal -B35 Int'l	
	-145 Turkey -B45 BHCSY	
	-155 Greece	

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Tested Product List

Tested Product List

NOTE: The Tested Product List (TPL) is a list of HP and standard 3rd party devices (hardware or software) that have been tested by either HP or independent test houses for basic compatibility with the ML150. For installation and warranty issues pertaining to non HP products, you will need to obtain support from the 3rd party manufacturer.

Non HP 3rd party products have been tested only for compatibility with the specified HP server. This level of testing confirms proper device recognition by the HP server and basic compatibility with the identified HP server. HP disclaims all responsibility and liability for the manufacturing, distribution, marketing, licensing, installation, use, performance, maintenance, safety, regulatory certification and support of these 3rd party products.

Storage Controllers –	NOTE: The following storage controllers are qualified for SCSI drives only.	
SCSI Drives	ATA drives are not supported.	
	Adaptec Ultra320 SCSI HBA, ASC29320-R (Single),	1978100
	Adaptec ZCR card, ASR2010S,	2004000
	Adaptec Ultra320 SCSI RAID card, ASR 2120S (Single),	1961800
	Adaptec Ultra320 SCSI RAID card, ASR 2200R (Dual),	1961700
	LSI Ultra320 SCSI HBA, LSI20320 (single),	356-0003875G
	LSI Ultra320 SCSI RAID card, LSI MegaRAID 320-1(Single),	5201010264AD
	LSI Ultra320 SCSI RAID card, LSI MegaRAID 320-2 (Dual),	5182010264AA
	Intel Pro/1000 MT Server LAN Card	PWLA8490MT
Communications		
Memory	Tested memory modules from 3 rd party manufacturers:	
	256 MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (1 x 256 MB)	Apacer 75.85380.790 Crucial MT9VDDT3272G-265C3 Transcend TS32MDR72V6F5 Nanya NT256D72S89B0GU-75B
	512 MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (1 x 512 MB)	Apacer 75.95380.780 Crucial MT18VDDT6472G-265C3
	1024 MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (1 x 1024 MB)	Apacer 75.07280.793 Crucial MT36VDDT12872G-265C2
Storage	36 GB 10k rpm Ultra320 80-pin hot plug HDD	Seagate ST336607LC p/n : 9V4006-522 Fujitsu: MAP3367MC p/n : CA06200-B10100DC
	36 GB 10k rpm Ultra320 68-pin non hot plug HDD	Seagate ST336607LW p/n : 9V4005-510 Fujitsu: MAP3367NP p/n : CA06200-B16100DC
	73 GB 10k rpm Ultra320 80-pin hot plug HDD	Seagate ST373307LC p/n : 9V3006-522 Fujitsu: MAP3735MC p/n : CA06200-B20100DC
	73 GB 10k rpm Ultra320 68-pin non hot plug HDD	Seagate ST373307LW p/n : 9V3005-510 Fujitsu: MAP3735NP p/n : CA06200-B26100DC
	146 GB 10k rpm Ultra320 80-pin hot plug HDD	Seagate ST3146807LC p/n : 9V2006-002 Fujitsu: MAP3147MC p/n : CA06200-B40100DC
	146 GB 10k rpm Ultra320 68-pin non hot plug HDD	Seagate ST3146807LW p/n : 9V2005-002 Fujitsu: MAP3147NP p/n : CA06200-B460

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Memory

Standard Memory

256 MB of PC2100 ECC DDR SDRAM running at 266 MHz

Standard Memory Plus Optional Memory

Up to 12 GB memory is available with the optional installation of PC2100 Registered ECC DDR SDRAM DIMM memory

kits. (All 6 slots populated with 2GB memory DIMMs)

Standard Memory Replaced with Optional Memory

Up to 12 GB of memory is available with the removal of the standard 256 MB of memory and the optional installation of PC2100 Registered ECC DDR SDRAM DIMM memory kits.

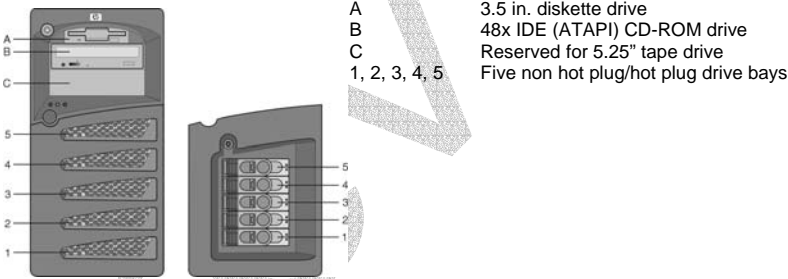
NOTE: The following table does not represent all possible memory configurations.

Memory		Slot					
		1	2	3	4	5	6
Standard	256 MB	256 MB	Empty	Empty	Empty	Empty	Empty
	512 MB	256 MB	256 MB	Empty	Empty	Empty	Empty
	1 GB	512 MB	512 MB	Empty	Empty	Empty	Empty
	1.5 GB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB
	2 GB	512 MB	512 MB	512 MB	512 MB	Empty	Empty
	3 GB	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
	6 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
Maximum	12 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB

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Storage



Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
1.44-MB Diskette Drive	Up to 1	A	Integrated
IDE (ATAPI) CD-ROM Drive	Up to 2	B	Integrated IDE (ATAPI)
Drive Option Kit	Up to 2	C	Integrated IDE (ATAPI)
Hard Drives			
Ultra320 SCSI – Non Hot Plug/ Hot Plug			
	Quantity Supported	Position Supported	Controller
1-inch 36.4 GB 10,000 rpm	Up to 5	1, 2, 3, 4, 5	Integrated Adaptec 7902W dual channel Ultra320 controller
Maximum Storage Capacity -			
Internal	730 GB (5 x 146 GB non hot plug or hot plug hard drives)		
Total	730 GB		

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Power Specifications

Part Number 339874-001
Spare Kit 344674-003
Operational Input Voltage Range (V rms) 100 to 127 or 200 to 240 Universal/Full Range
Frequency Range (Nominal) (Hz) 47 to 63 (50/60)

Nominal Input Voltage (Vrms)	100	115	208	220	230	240
Max Rated Output Wattage Rating	N/A	450	N/A	N/A	450	N/A
Nominal Input Current (A rms)	N/A	9.0	N/A	N/A	4.5	N/A
Max Rated Input Wattage Rating (Watts)	N/A	700(460/0.65)	N/A	N/A	700(460/0.65)	N/A
Max. Rated VA (Volt-Amp)	N/A	555	N/A	N/A	550	N/A
Efficiency (%)	N/A	>65%	N/A	N/A	>65%	N/A
Power Factor	Harmonic Reduction (PFC) > 0.95, IEC 61000					
Leakage Current (mA)	N/A	5mA	N/A	N/A	5mA	N/A
Maximum Inrush Current (A peak)	N/A	120	N/A	N/A	120	N/A
Maximum Inrush Current duration (mS)	N/A					

System Specifications

	Power **
Fully Configured	(see **)
Fully Loaded System Input Wattage (W)	460W Max.
Fully Loaded System Input Current (A rms)	6.0A @ 115V, 3.0A @ 230V
Fully Loaded System Thermal (BTU- Hr)	N/A
Fully Loaded System VA (Volt-Amp)	N/A
System Leakage with all power supplies loaded (mA)	10mA
System Inrush Current with all power supplies loaded (A)	120
Power cord requirements	Nema 5-15P to IEC320-C13 IEC320-C13 to IEC320-C14

**The power shown is for a fully configured system consisting of (1) CPU, (4) double-sided DIMMs, (3) HDDs, (1) CD-ROM, (1) DVD-ROM, (4) PCI cards, and (1) power supply.

Country	Power Cord Part Number
Australia	100661-007
Euro	100614-003
Japan	139867-006
PRC	346001-AA1
UK	100613-003

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TechSpecs

System Unit **Dimensions (H x W x D)** 44.5 x 21.5 x 62.2 cm

Weight (approximate) 23 kg

Input Requirements (per power supply) Range Input Voltage 90 to 140 VAC/180 to 264 VAC
Normal Line Voltage 115 or 230 VAC

Line Frequency 50 to 60 Hz

Rated Input Current	load 4A at 115VAC, 2A at 230VAC	
BTU Rating	1,108 BTU	
SCSI Connectors	Two internal LVD/SE connectors for U320 devices,	
Power Supply Output Power	Rated Steady-State Power	450W
(per power supply)	Maximum Peak Power	450W
Temperature Range	Operating	50° to 93°F/10° to 35°C
	Shipping	-40° to 150°F/-40° to 66°C
Relative Humidity	Operating	20% to 80%
(non-condensing)	Non-operating	5% to 90%
Acoustic Noise	Idle	
	(Fixed Disk Drives Spinning)	
	L WAd (BELS)	5.5
	Operating (Random Seeks to Fixed Disks)	
	L WAd (BELS)	6.0
	L pAm (dBA)	40

1.44-MB Diskette Drive	Diskette Size	3.5 in/8.89 cm
	LED Indicators (front panel)	Green
	Read/Write Capacity per Diskette (high/low density)	1.44 MB/720 KB
	Drive Supported	One
	Drive Height	One-third
	Drive Rotation	300 rpm
	Transfer Rate (high/low)	500 K/250 K bits/s
	Bytes/Sector	512
	Sectors/Track (high/low)	18/9
	Tracks/Side (high/low)	80/80
	Access Times	Track-to-Track (high/low) 3/6 ms
	Average (high/low)	169/94 ms
	Settling Time	15 ms
	Latency Average	100 ms
	Cylinders (high/low)	80/80
	Read/Write Heads	Two

Non Hot Plug/Hot Plug Ultra320 SCSI Hard Drives	36.4 GB 10K 33981-001	Capacity	36,419.2 MB
		Height	1 in/2.54 cm
		Width	4 in/10.16 cm
		Interface	Wide Ultra320 SCSI
		Transfer Rate Synchronous (Maximum)	320 MB/s

Seek Time (typical reads, including settling)	Single Track	0.7 ms
	Average	5.4 ms
	Full-Stroke	11 ms
	Rotational Speed	10,000 rpm
Physical Configuration	Bytes/Sector	512
	Logical Blocks	71,132,000

48X Max IDE (ATAPI) CD-ROM Drive	Disk	Operating Temperature	50° to 95° F/10° to 35° C
		Applicable Disk	CD-ROM, CD-XA, CD-DA (Mode 1, Mode 2, Form 1 and 2) Photo CD (Single and Multi-session) Mixed Mode (Audio and Data combined) CD-R
		Capacity	540 MB (Mode 1, 12 cm) 650 MB (Mode 2, 12 cm)
	Block Size	Mode 1	2,048 bytes

		Mode 2	2,340 bytes, 2,336 bytes
		CD-DA	2,352 bytes
		CD-XA	2,328 bytes
	Interface	IDE (ATAPI)	
	Access Times (typical)	Random	<100 ms
		Full-Stroke	<150 ms
	Data Transfer Rate	Sustained	3000 to 7200 KB/s (20X to 48X)
		Burst	150 KBps to 7,200 KBps
	Cache Buffer	Bus Rate	16.7 MBp
		128 KB	
	Start-up Time (typical)		< 7 seconds
	Stop Time		< 4 seconds
	Laser Parameters	Type	Semiconductor Laser GaAlAs
		Wave Length	780 ± 25 nm
	Operating Conditions	Temperature	41° to 113°F/5° to 45°C
		Humidity	10% to 80%
	Dimensions	(H x W x D, maximum)	1.7 x 5.85 x 8.11 in/42.9 x 150 x 208 cm
		Weight	2.09 lb/0.95 kg
Dual Channel Ultra320 SCSI	Drives Supported	Up to 16 SCSI devices Wide	
	Data Transfer Method	64-bit 66-MHz PCI-X bus-master	
	SCSI Channel Transfer Rate	320 MB/s per channel	
	Maximum Transfer Rate per PCI Bus (peak)	267 MB/s per channel	
	SCSI Protocols	Wide Ultra3 SCSI, Wide Ultra2 SCSI, Wide Ultra SCSI-3, Fast-Wide SCSI-2, and Fast SCSI-2	
	Electrical Protocol	Low Voltage Differential (LVD)	
	SCSI Termination	Active Termination	
	External SCSI Connectors	None	
Giga Bit NIC Intel 82545EM	PCI interface	PCI-X 66MHz	
	MAC Specific Features	64 KB configurable RX and TX packet FIFO	
		Low-latency transmit and receive queues	
		IEEE 802.3x compliant flow control support with software controllable pause times and threshold values	
		Caches up to 64 packet descriptors in a single burst	
		Programmable host memory receive buffers (256 B to 16 KB)	
		Programmable cache line size from 16 B to 256 B	
		128-bit internal data path architecture	
		Ring descriptor buffer structure with cache that promotes long PCI bursts to fetch descriptors	
		Internal Serializer-Deserializer (SERDES)	
	Gigabit PHY Specific Features	Integrated PHY for 10/100/1000 Mb/s full and half duplex operation	
		IEEE 802.3ab Auto-Negotiation	
		Proven PHY technology compatible with IEEE 802.3ab	
		State-of-the-art DSP architecture implements digital adaptive equalization, echo cancellation, and cross-talk cancellation, baseline wander cancellation	
		PHY detects polarity, MDI-X, 2 pair vs. 4 pair cables, and cable length	
		GMII and Ten Bit Interface (TBI)	
	Host Offloading Features	Transmit TCP segmentation	
		IP, TCP, and UDP checksum off-loading capabilities on RX and TX	
		Advanced packet filtering	
		IEEE 802.1Q VLAN support with VLAN tag insertion and stripping and packet filtering for up to 4096 VLAN tags	
		Descriptor ring management hardware for TX and RX	
		Jumbo frame support up to 16 KB	
	Interrupt Management Features	Interrupt moderation controls - bring Intel's experience in Fast Ethernet adaptive technology to Gigabit Ethernet performance levels	
		Small Packet Interrupt	

Manageability Features	On-chip SMBus 2.0 port ASF 1.0 alerting Pre-boot eXecution Environment (PXE) 2.1 flash interface support (32-bit and 64-bit) Compliance with PCI Power Management v1.1/ACPI v2.0 SNMP and RMON statistic counters SDG3.0, WfM 2.0, PC2001 Compliance Wake-on-LAN (WOL) support Automatic link speed switching from 1000 Mb/s down to 10 or 100 Mb/s in standby Diagnostic capabilities including loop back, reporting cable length, cable polarity, number of symbol errors, and incorrectly punched down cable
Additional Device Features	Four programmable LED outputs Four software definable pins Internal PLL for clock generation can use a 25 MHz crystal or a 25 MHz oscillator JTAG (IEEE 1149.1) Test Access Port built in On-chip power regulator control circuitry

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