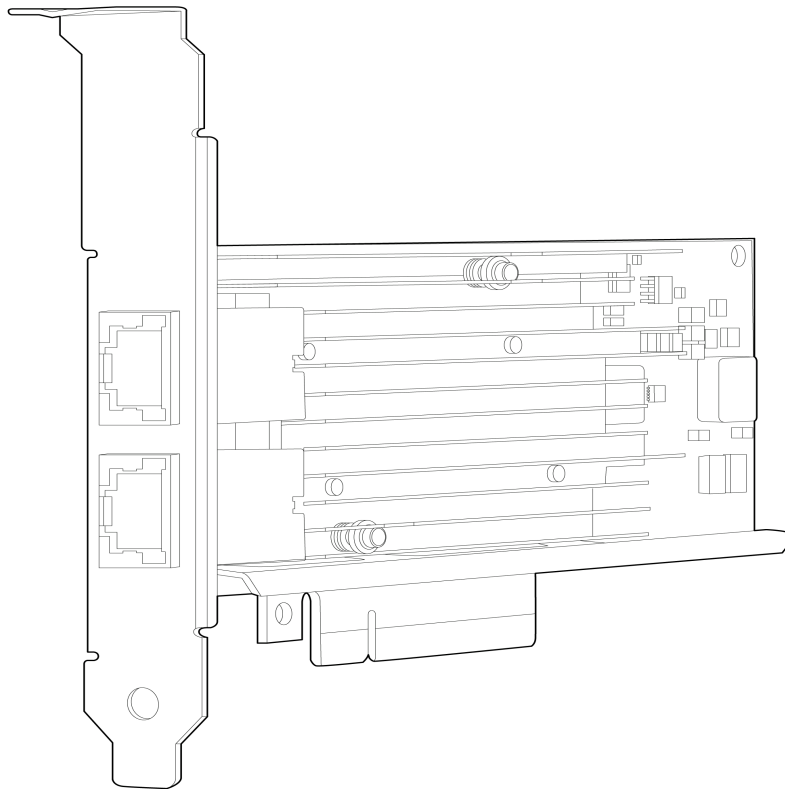


### Overview

The HP Ethernet 10Gb 2-port 561T Adapter is a dual-port 10GBASE-T adapter, featuring the Intel X540 10Gb Ethernet solution in a PCIe 2.1 compliant form factor designed for HP ProLiant Gen8 rack and tower servers. The HP 561T adapter delivers full line-rate performance across all, utilizing CAT 6A UTP cabling (or better) with distances up to 100 meters. Providing high performance Ethernet connectivity, it is ideal for virtual server and cloud computing environments. It supports enterprise class features (VLAN tagging, adaptive interrupt coalescing, MSI-X, NIC teaming (bonding), Receive Side Scaling (RSS), jumbo frames, PXE boot) and virtualization features (VMware NetQueue and Microsoft VMQ).

The adapter's support for HP Sea of Sensors 3D Technology enhances server performance by reducing energy consumption and expense.



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### Models

HP Ethernet 10Gb 2-port 561T Adapter

716591-B21

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### Kit Contents

- HP Ethernet 10Gb 2-port 561T Adapter
- Quick install card
- Product warranty statement

### Compatibility

#### Servers

##### **ProLiant DL (rack-optimized):**

- HP ProLiant DL160 Gen8
- HP ProLiant DL360e Gen8
- HP ProLiant DL360p Gen8
- HP ProLiant DL380e Gen8
- HP ProLiant DL380p Gen8
- HP ProLiant DL385p Gen8
- HP ProLiant DL560 Gen8
- HP ProLiant DL980 G7

##### **ProLiant ML (expansion-optimized):**

- HP ProLiant ML350e Gen8
- HP ProLiant ML350p Gen8

##### **ProLiant SL (scalable line):**

- HP ProLiant SL210t Gen8
- HP ProLiant SL230s Gen8
- HP ProLiant SL250s Gen8
- HP ProLiant SL270s Gen8
- HP ProLiant SL4540 Gen8
- HP ProLiant SL4545 G7

**NOTE:** This is a list of supported servers. Some may be discontinued.

### Standard Features

#### Product Features

- Industry-leading throughput and latency performance
- Operates at 1Gbps/10Gbps, auto-negotiation, on both ports
- 10GBASE-T connectivity supporting up to 100 meters with CAT 6A cabling (or better)
- Up to 40Gb/s bi-directional near line rate throughput
- Hardware acceleration TCP/IP/UDP stateless offloads Superior small packet performance
- Low profile design shipping with standard height and low-profile brackets
- SR-IOV capable in hardware (requires server FW, SW and OS support)
- Active Health System support
- PXE, Jumbo Frames, Checksum & Segmentation Offload, IPv6 and RSS
- On chip temperature monitor (Sea of Sensors)
- Field replaceable and upgradeable
- Support for Preboot eXecution Environment (PXE)
- IEEE 1588 (Time Synchronization) ready

#### Dual-port 10 Gigabit Ethernet Throughput

The HP 561T adapter delivers 20 Gbps full duplex Ethernet transfer rate per port , providing the network performance needed to improve response times and alleviate bottlenecks that impact performance of next generation data centers. 10Gb Ethernet bandwidth is ideal for high performance computing, database clusters, and more.

#### Jumbo Frames

The HP 561T adapter supports jumbo frames (also known as extended frames), permitting up to a 9.5K byte (KB) transmission unit (MTU) when running Ethernet I/O traffic. This is over 5X the size of a standard 1500-byte Ethernet frame. With jumbo frames, networks can achieve higher throughput performance and improve CPU utilization. These attributes are particularly useful for database transfer and tape backup operations.

#### TCP/IP Stateless Offloading

TCP, IP, UDP checksum offload, Large Send Offload (LSO), TCP Segmentation Offload (TSO). These features optimize host efficiency, leaving the CPU available for other duties.

The HP 561T Adapter offers TCP/IP stateless offloading capability.

#### MSI and MSI-X

Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores. The HP 561T Adapter supports MSI and MSI-X.

#### 802.1Q VLANs

IEEE 802.1Q virtual local area network (VLAN) protocol allows each physical port of the HP 561T adapter to be separated into multiple virtual NICs for added network segmentation and enhanced security and performance. VLANs increase security by isolating traffic between users. Limiting the broadcast traffic to within the same VLAN domain also improves performance. The HP 561T adapter provides support for 802.1Q (VLAN).

### Standard Features

#### **Optimized for Virtualization**

I/O Virtualization support for VMware NetQueue and Microsoft VMQ help meet the performance demands of consolidated virtual workloads.

Compliant with Single-Root I/O Virtualization (SR-IOV), accommodating multiple Virtual Machines (VMs) to share single PCIe resources.

The HP 561T Adapter is SR-IOV ready, requiring firmware, software and OS support.

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#### **Checksum & Segmentation Offload**

Normally the TCP Checksum is computed by the protocol stack. By selecting one of the "Checksum Offload" parameters, the checksum can be computed by the adapter.

Segmentation Offload is technique for increasing outbound throughput of high-bandwidth network connections by reducing CPU overhead. The technique is also called TCP segmentation offload (TSO) when applied to TCP, or generic segmentation offload (GSO).

The HP 561T Adapter has Checksum and Segmentation Offload capabilities.

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#### **IPv6**

IPv6 uses 128-bit addressing allowing for more devices and users on the Internet. IPv4 supported 32-bit addressing. The HP 561T Adapter supports IPv6.

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#### **Receive Side Scaling (RSS)**

RSS resolves the single-processor bottleneck by allowing the receive side network load from a network adapter to be shared across multiple processors. RSS enables packet receive-processing to scale with the number of available processors.

The HP 561T Adapter has RSS capabilities.

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#### **Time synchronization implementations (PTP)**

Synchronization of system clocks throughout a network, achieving clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems.

The HP 561T Adapter supports Precision Time Protocol-ready (PTP).

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#### **Network Adapter Teaming**

The HP 561T adapter support for NIC teaming helps IT administrators increase network fault tolerance and increased network bandwidth, The team of adapters can work together as a single virtual adapter. The HP 561T provides support for several different types of teaming enabling IT administrators to optimize availability, improve performance and help reduce costs.

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### Network Management

#### **Management Support**

The HP 561T adapter can be administered from HP Systems Insight Manager (SIM). The adapters can be managed individually or in teams, providing SNMP based statistics for reporting purposes. The HP 561T adapter can also be managed by other applications with SNMP support.

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### Standard Features

#### Server Integration

The HP 561T adapter is a validated, tested, and qualified solution that is optimized for HP ProLiant servers. HP validates a wide variety of major operating systems drivers with the full suite of web-based enterprise management utilities including HP Intelligent Provisioning and HP Systems Insight Manager that simplify network management.

This approach provides a more robust and reliable networking solution than offerings from other vendors and provides users with a single point of contact for both their servers and their network adapters.

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#### Configuration Utilities

Each HP 561T ships with a suite of operating system-tailored configuration utilities that allow the user to enable initial diagnostics and configure adapter teaming. This includes a patented teaming GUI for Microsoft Windows operating systems. Additionally, support for scripted installations of teams in a Microsoft Windows environment allow for unattended OS installations.

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#### LED Indicators

The colored LEDs on each port of the HP 561T adapter indicate link status and link activity.

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#### Preboot eXecution Environment (PXE)

PXE allows the server to boot over the network and download software residing in the network.

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#### HP Sea of Sensors 3D

Support for HP's Sea of Sensors which is a collection of 32 sensors that automatically track thermal activity - heat - across the server. When temperatures get too high, sensors can kick on fans and make other adjustments to reduce energy usage. What makes it better is the upgrade from all six fans kicking on at one time to a new system where only one kicks on - the one in proximity of the area that started heating up - thus reducing the amount of energy used for cooling.

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#### VMware NetQueue and Microsoft Virtual Machine Queue (VMQ)

VMware NetQueue is technology that significantly improves performance of 10 Gigabit Ethernet network adapters in virtualized environments.

Microsoft Virtual Machine Queue (VMQ) is a feature available on servers running Windows Server 2008 R2 with VMQ-enabled Ethernet adapters. VMQ uses hardware packet filtering to deliver packet data from an external virtual machine network directly to virtual machines, which reduces the overhead of routing packets and copying them from the management operating system to the virtual machine.

The HP 561T supports VMware NetQueue and Microsoft Virtual Machine Queue.

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#### Warranty

Maximum: The remaining warranty of the HP product in which it is installed (to a maximum three-year, limited warranty).

Minimum: One year limited warranty.

Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

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### Service and Support

#### Service and Support

#### HP Technology Services

HP Technology Services offers you technical consultants and support expertise to solve your most complex infrastructure problems. We help keep your business running, boost availability, and avoid downtime.

#### Protect your business beyond warranty with HP Care Pack Services

When you buy HP Options, it's also a good time to think about what level of service you may need. HP Care Pack services provide total care and support expertise with committed response choices designed to meet your IT and business need.

HP Foundation Care services deliver scalable support-packages for HP industry-standard servers and software. You can choose the type and level of service that is most suitable for your business needs. New to this portfolio is HP Collaborative Support. If you are running business critical environments, HP offers Proactive Care or Critical Advantage. These services help you deliver high levels of application availability through proactive service management and advanced technical response.

Here is the support service recommendation from the Foundation Care and Proactive Care portfolio. For customized support service solution, HP can work with you to tailor a service solution for your unique support requirements using broader services portfolio of Foundation Care and Proactive Care.

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### Recommended HP Care Pack Services for optimal satisfaction with your HP product

#### Recommended Services

#### 3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf>

OR

#### 3-Year HP 24x7 4 hour Response, HP Collaborative Support

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution, and basic software problem diagnosis, fault isolation, and resolution if available to HP. If the problem is with HP HW, the representative will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged. In case, the issue is with HP or supported third-party software product and cannot be resolved by applying known fixes, HP will contact the third-party vendor and create a problem incident on your behalf.

#### HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf>

### Service and Support

#### Related HP Care Pack Services to enhance your HP product experience

##### Related Services

##### **3-Year HP 24x7 4 hour Response, Proactive Care or Critical Advantage**

Helps optimize your systems and delivers high levels of application availability through proactive service management and advanced technical response. A skilled Technical Manager will own your query or issue end to end until resolved, delivering a single point of contact for you <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf>

**OR**

##### **3-Year HP 6-hour Onsite Call-to-Repair, HP Collaborative Support**

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution to return the hardware in operating condition within 6 hours of the initial service request to the HP Global Solution Center, and basic software problem diagnosis, fault isolation, and resolution if available to HP. In case, the issue is with HP or supported third-party software product and cannot be resolved by applying known fixes, HP will contact the third-party vendor and create a problem incident on your behalf.

##### **HP Proactive Select Service**

Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months. <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN.pdf>

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##### **Insight Remote Support**

Provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. Learn more <http://www.hp.com/go/insightremotesupport>

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##### **HP Support Center**

Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more <http://www.hp.com/go/hpsc>

HP's Support Center Mobile App\* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

\*HP Support Center Mobile App is subject to local availability

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##### **Parts and materials**

HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements. Supplies and consumable parts will not be provided as part of this service; standard warranty terms and conditions apply. Parts and components that have exceeded their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual or the technical product data sheet will not be provided, repaired or replaced as part of this service.

### Service and Support

**Warranty / Service Coverage**

For ProLiant servers and storage systems, this service covers HP-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by HP as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

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**For more information**

To learn more on services for HP ESSN Options, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant> or [www.hp.com/services/bladesystem](http://www.hp.com/services/bladesystem)



### Related Options

<b>Gigabit Server Adapters</b>	HP NC112T PCI Express Gigabit Server Adapter	503746-B21
	HP NC360T PCI-E Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI-E Quad Port Gigabit Server Adapter	435508-B21
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	HP NC373F PCI-E Multifunction 1000SX Gigabit Svr Adapter	394793-B21
	HP NC373T PCI-E Multifunction Gigabit Server Adapter	394791-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21
	HP Ethernet 1Gb 4-port 331T Adapter	647594-B21
	HP Ethernet 1Gb 2-port 332T Adapter	615732-B21
HP Ethernet 1Gb 2-port 361T Adapter	652497-B21	

### 10 Gigabit Server Adapters

**NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

HP NC522SFP Dual Port 10GbE Gigabit Server Adapter	468332-B21
HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP NC524SFP Dual Port 10GbE Module	489892-B21
<b>NOTE:</b> NC524SFP is available only on DL370 G6, ML370 G6, DL580 G7, DL585 G7, and DL980 G7.	
HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21
HP Ethernet 10Gb 2-port 530SFP Adapter	652503-B21
HP Ethernet 10Gb 2-port 530T Adapter	656596-B21
HP Ethernet 10Gb 2-port 560SFP+ Adapter	665249-B21

### FlexibleLOM Adapters

**NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

#### Ethernet Adapters

HP Ethernet 1Gb 4-port 331FLR Adapter	629135-B21
HP Ethernet 1Gb 4-port 366FLR Adapter	665240-B21
HP Ethernet 10Gb 2-port 530FLR-SFP+ Adapter	647581-B21
HP Ethernet 10Gb 2-port 560FLR-SFP+ Adapter	665243-B21
HP Ethernet 10Gb 2-port 561FLR-T Adapter	700699-B21

#### FlexFabric Adapters

HP FlexFabric 10Gb 2-port 526FLR SFP+ Adapter	629138-B21
HP FlexFabric 10Gb 2-port 533FLR-T Adapter	700759-B21
HP FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter	700751-B21
HP FlexFabric 10Gb 2-port 554FLR-SFP+ Adapter	629142-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: [www.hp.com/go/ProLiantNICs](http://www.hp.com/go/ProLiantNICs)

### Technical Specifications

<b>General Specifications</b>	<b>Network Processor</b>	Intel X540
	<b>Data Rate</b>	Two ports, each at 20 Gbps full duplex; 40 Gbps aggregate full duplex theoretical bandwidth.
	<b>Bus Type</b>	PCIe v2.1 (Gen 2) x 8
	<b>Form Factor</b>	Standard and low profile adapter compliant with the PCIe standard
	<b>IEEE Compliance</b>	802.3, 802.3x, 802.3ad, 802.1Qaz, 802.1Qau, 802.1Qbb, 802.1ax
	<b>Connector</b>	RJ-45 (Two)
	<b>Wiring</b>	CAT6 UTP or better twisted-pair
	<b>Cable Distance</b>	Maximum distances for CAT6 cable are 30 meters (98 feet). Maximum distances for CAT6A (or better) are 100 meters (328 feet).

**NOTE:** The HP 561T adapter can use existing UTP CAT6 (or better) cable to deliver Gigabit Ethernet over copper, according to the IEEE 802.3an specifications. For new installations, CAT6a cable is recommended. Cabling details:

- CAT6 UTP or better twisted-pair
- 22-26 AWG, 100? @ 1 MHz
- EIA/TIA 568-B.2-10b

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<b>Power and Environmental Specifications</b>	<b>Operating</b>	Temperature	32° to 131° F (0° to 55° C)
		Humidity	5% to 95% non-condensing
	<b>Power</b>	19W maximum	
	<b>Emissions classification</b>		
	<b>Agency approvals</b>	USA	FCC Part 15 Class B
		Canada	ICES=003, Issue 4
		Japan	VCCI V3 (2010.04) Class B
		International	EN55022:2006 + A1:2007 Class B, EN55024:1998+A1:2011+A2; EN61000-3-2:2006, EN61000-3-3:2008
		Taiwan	BSMI, CNS13438 (2006) Class A
		Australia/New Zealand (AS/NZS):	EN55022:2006+A12007 class B
<b>RoHS Compliance</b>	Korea	KN22 Class B, KN24	
	6 of 6		
	<b>Safety</b>	UL Mark (USA and Canada)	
		CE Mark	
EN 60590			

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### Technical Specifications

#### Operating System Support

Microsoft Windows Server 2008 (32/64), Enterprise, Standard, Datacenter, Web, Embedded, Foundation (SP2 and R2 w/SP1)  
Microsoft Windows HPC Server 2008 (SP2 and R2 w/SP1)  
Microsoft Windows Small Business Server 2011 (SBS V7) - Base  
Microsoft Windows Small Business Server 2011 Essentials  
Microsoft Windows Multipoint Server 2011  
Microsoft Windows Server 2012  
Hyper-V (R2 w/SP1)  
RHEL 5.7/5.8/5.9 x86 and AMD 64 & EM 64T  
RHEL 6.1/6.2/6.3 x86 and AMD 64 & EM 64T  
SLES 10 SP4 x86 and AMD 64 & EM 64T  
SLES 11 SP2 x86 and AMD 64 & EM 64T  
Solaris 10/11  
VMware vSphere 4.1 and 5.0  
Citrix XenServer 6.0/6.1

**NOTE:** For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix: <http://h18004.www1.hp.com/products/servers/linux/hplinuxcert.html>

#### Environment-friendly Products and Approach

#### End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <http://www.hp.com/go/green>. To recycle your product, please go to: <http://www.hp.com/go/green> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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