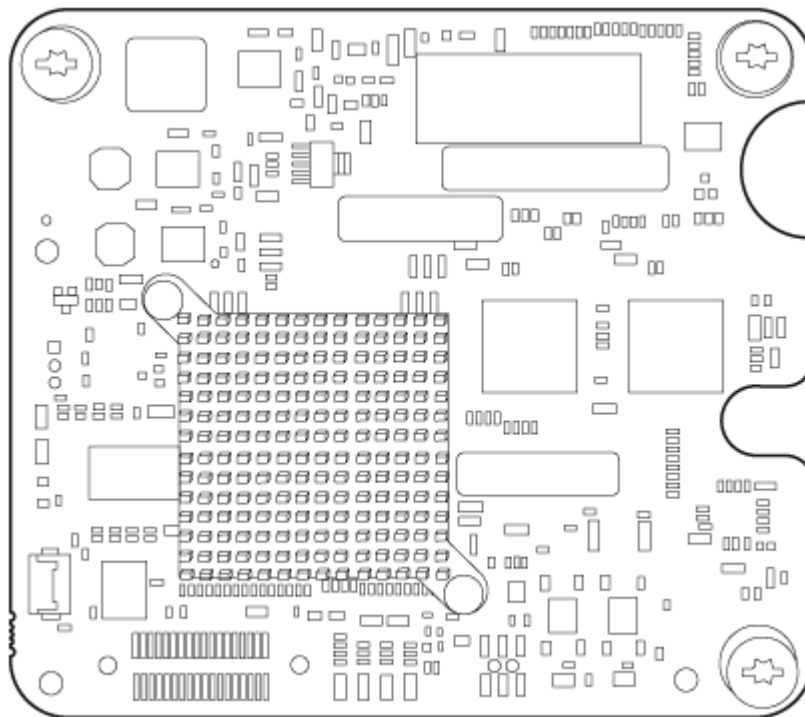


### Overview

The NC551m FlexFabric 10Gb mezzanine adapter supports Virtual Connect Flex-10 that allows each 10Gb port to be divided into four physical NICs to optimize bandwidth management for virtualized servers. When connected to a Convergence Enhanced Ethernet (CEE) capable switch, Fibre Channel over Ethernet (FCoE) and Ethernet I/O are separated and routed to the corresponding network. For iSCSI storage, the NC551m supports full protocol offload providing better CPU efficiency when compared to software initiators enabling the server to handle increased virtualization workloads and compute-intensive applications. This combination of high-performance network and storage connectivity reduces cost and complexity and provides the flexibility and scalability to fully optimize BladeSystem servers. The NC551m delivers the performance benefits and cost savings of converged network connectivity for HP BladeSystem servers. The dual-port NC551m optimizes network and storage traffic with hardware acceleration and offloads for stateless TCP/IP, TCP Offload Engine (TOE), Fibre Channel over Ethernet (FCoE) and iSCSI.

**NOTE:** HP BladeSystem c-Class Integrity Server Blades does not support iSCSI or TCP Offload Engine (TOE).



**HP NC551m Dual Port FlexFabric 10Gb Converged Network Adapter**

### Overview

#### Models

HP BLc NC551m Dual Port FlexFabric 10Gb Converged Network Adapter

580151-B21

**NOTE:** The NC551m network adapter card is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 3-4 (HP BladeSystem c3000 Enclosure)

**NOTE:** The NC551m requires a minimum of 2 GB of server memory.

**NOTE:** The NC551m supports linking at 1000Mbps or 10000Mbps when not connected to a Flex-10 device. The NC551m supports 1000Mbps when connected to a 1Gb Ethernet interconnect.

**NOTE:** The ROM Based Setup Utility (RBSU) feature allows for the configuring of a FlexFabric Adapter to any of the supported protocols. For example iSCSI to FCoE (Fibre Channel over Ethernet). Note that a HP Virtual Connect profile takes precedence over the setting in this menu. Also, some FlexFabric Adapters may require that network boot be enabled in order to configure the protocol. If the protocol is configured without enabling network boot with certain FlexFabric Adapters, the protocol may not take effect. Once the protocol has taken effect on the first boot after configuring this option, network boot may be disabled if desired.

**NOTE:** HP BladeSystem c-Class Integrity Server Blades does not support ROM Based Setup Utility (RBSU).

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#### Kit Contents

HP NC551m Dual Port FlexFabric 10Gb Converged Network Adapter

- NC551m mezzanine adapter
- Quick install card
- Product warranty statement
- Drivers, user guide, and utilities via: <http://www.hp.com>

### Compatibility

#### Server Support

##### HP BladeSystem ProLiant Server Blades

- HP ProLiant BL2x220c G6
- HP ProLiant BL280c G6
- HP ProLiant BL460c G6
- HP ProLiant BL460c G7
- HP ProLiant BL465 G6
- HP ProLiant BL465 G7
- HP ProLiant BL490c G6
- HP ProLiant BL495c G6
- HP ProLiant BL685 G6
- HP ProLiant BL685 G7

##### HP BladeSystem c-Class Integrity Server Blades

- HP Integrity BL860c i2
- HP Integrity BL870c i2
- HP Integrity BL890c i2

**NOTE:** Some servers listed above may be discontinued.

#### Storage Support

##### HP BladeSystem ProLiant Server Blades

- HP 2000i G2 Modular Smart Array
- HP All-in-One Storage
- HP MPX200 Multifunction Router
- HP EVA iSCSI Connectivity Option
- HP 4/256 SAN Director iSCSI Blade (FCoE only, iSCSI not supported)
- HP LeftHand P4000 SAN
- HP LeftHand Virtual SAN Appliance
- HP Enterprise Virtual Array 4000/6000/8000 (2Gb)
- HP Enterprise Virtual Array 4100/6100/8100 (4Gb)
- HP Enterprise Virtual Array 4400
- HP Enterprise Virtual Array 4400s
- HP Enterprise Virtual Array 6400/8400
- HP MSA2000 G2 FC Array System
- HP P2000 G3 FC Array System
- HP Disk Array XP10000/12000
- HP Disk Array XP20000/24000 (4Gb)
- HP Disk Array XP20000/24000 (8Gb)

##### HP BladeSystem c-Class Integrity Server Blades

- HP Enterprise Virtual Array 4000/6000/8000 (2Gb)
- HP Enterprise Virtual Array 4100/6100/8100 (4Gb)
- HP Enterprise Virtual Array 4400
- HP Enterprise Virtual Array 4400s
- HP Enterprise Virtual Array 6400/8400
- HP P2000 G3 FC Array System
- HP Disk Array XP20000/24000 (4Gb)
- HP Disk Array XP20000/24000 (8Gb)

### Compatibility

#### FCoE Switch Support

- HP Disk Array 9500
- HP BladeSystem ProLiant Server Blades
- HP Nexus 5000 Converged Network Switches
  - HP Converged Network Switches
  - HP 10/24 FCoE Blade for DC SAN Directors

**NOTE:** HP BladeSystem c-Class Integrity Server Blades does not support above referenced FCoE Switches.

#### Supported Interconnect Modules

##### HP BladeSystem ProLiant Server Blades

- HP 6120XG Blade Switch
- HP 6120G/XG Blade Switch
- HP GbE2c Layer 2/3 Ethernet Blade Switch
- HP 1:10Gb Ethernet BL-c Switch
- Cisco Catalyst Blade Switch 3020 for HP c-Class BladeSystem
- Cisco Catalyst Blade Switch 3120X/G for HP c-Class BladeSystem
- HP 10GbE Pass-Thru Module
- HP Virtual Connect Flex-10 10Gb Ethernet Module
- HP Virtual Connect FlexFabric 10Gb/24-port Module
- HP Virtual Connect 1/10Gb Ethernet Module
- HP Virtual Connect 1/10Gb-F Ethernet Module
- Cisco Fabric Extender B22HP for HP

**NOTE:** Except for the HP Virtual Connect FlexFabric 10Gb/24-port Module for BladeSystem c-Class, the HP Virtual Connect Flex-10 10Gb Ethernet Module, the 6120XG and the HP 10GbE Pass-Thru Module, all other supported interconnects are limited to 1Gb per port connection.

##### HP BladeSystem c-Class Integrity Server Blades

- HP 6120XG Blade Switch
- HP 6120G/XG Blade Switch
- HP GbE2c Layer 2/3 Ethernet Blade Switch
- HP 1:10Gb Ethernet BL-c Switch
- Cisco Catalyst Blade Switch 3020 for HP c-Class BladeSystem
- Cisco Catalyst Blade Switch 3120X/G for HP c-Class BladeSystem
- HP Virtual Connect Flex-10 10Gb Ethernet Module
- HP Virtual Connect FlexFabric 10Gb/24-port Module
- HP Virtual Connect 1/10Gb Ethernet Module
- HP Virtual Connect 1/10Gb-F Ethernet Module
- Cisco Fabric Extender B22HP for HP

### Standard Features

#### Product Features

- Industry-leading throughput and latency performance
- Type 1 Adapter supported on all G6 and G7 c-Class servers in mezzanine slots 1, 2 or 3 (full height servers) or slots 1 and 2 (half height servers).
- Dual 10Gb ports provide up to 40Gb full duplex per adapter
- Hardware acceleration and offloads for stateless TCP/IP, TCP Offload Engine (TOE), Fibre Channel over Ethernet (FCoE) and iSCSI  
NOTE: HP BladeSystem c-Class Integrity Server Blades does not support iSCSI or TCP Offload Engine (TOE).
- IEEE 802.1p QoS 802.3x flow control, and 802.3ap 10GBase-KR
- Jumbo frames support
- Supports HP's Flex-10 technology that allows setting any bandwidth from 100Mb to 10Gb on up to four physical function NICs or Flex NICs per port when combined with the 10Gb Flex-10 Virtual Connect module
- Supports HP's FlexFabric technology that allows setting any bandwidth from 100Mb to 10Gb on up to four Flex NICs per port when combined with the 10Gb FlexFabric Virtual Connect module. One of the Flex NICs can be configured to support FCoE or accelerated iSCSI.
- Supports VMware NetQueue
- Each FlexNIC and FlexHBA is recognized by the server as a PCI-e physical function device with adjustable speeds from 100Mb to 10Gb in 100Mb increments\*

**NOTE:** HP BladeSystem ProLiant Server Blades Bandwidth adjustment supports speeds from 1Gb to 10Gb in 100Mb increments on NC551i Dual Port FlexFabric 10Gb Converged Network Adapters and NC551m Dual Port FlexFabric 10Gb Converged Network Adapter.

**NOTE:** HP BladeSystem c-Class Integrity Server Blades supports NC551m with speed adjustments from 100Mb to 10Gb.

#### Dual-port 10 Gigabit Ethernet Throughput

The NC551m 20,000 Mbps full duplex Ethernet transfer rate per port (40 Gbps aggregate full duplex) delivers outstanding network performance that improves response time and removes bottlenecks required for the next generation data center.

#### Fibre Channel over Ethernet (FCoE)

Combines the functionality of an industry-standard NIC with an industry-proven Fibre Channel mezzanine card, seamlessly converging the traffic over a shared lossless CEE Ethernet network.

#### HP Virtual Connect FlexFabric 10Gb/24-port Module for BladeSystem c-Class

Evolve 10Gb at your own speed! When paired with the HP Virtual Connect FlexFabric 10Gb/24-port Module for BladeSystem c-Class, take advantage of the Flex NICs, which are PCI Physical Function devices that are OS independent.

Server ROM recognizes them as individual NICs

Speeds can be set per NIC from 100Mb to 10Gbs in 100Mb increments

Three fold increase in number of network connections per port.

Up to four physical function NICs per port one of which can be configured to support FCoE or accelerated iSCSI.

**NOTE:** HP BladeSystem c-Class Integrity Server Blades does not support iSCSI.

### Standard Features

#### Jumbo Frames

The NC551m support for jumbo frames (also known as extended frames) permits up to a 9K byte(KB) transmission unit (MTU) when running Ethernet and/or iSCSI I/O, which is over five times the size of standard 1500 byte Ethernet frame. 8KB jumbo frames are supported when running Ethernet and FCoE I/O concurrently. The use of jumbo frames is a way to achieve higher throughput and better CPU utilization. Jumbo frames are particularly useful for database transfers and tape backups.

**NOTE:** 8KB jumbo frames limitation when running Ethernet and FCoE I/O concurrently is not applicable to HP BladeSystem c-Class Integrity Server Blades.

#### 802.1p QoS Tagging

IEEE quality of service (QoS) 802.1p tagging allows the adapter to mark or tag frames with a priority level across a QoS-aware network for improved traffic flow.

#### TCP/IP Stateless Offloading

For overall improved system response, the NC551m supports standard TCP/IP stateless offloading techniques including:

- TCP/IP checksum offload (TCO) moves the TCP and IP checksum offloading from the CPU to the network adapter.
- Large send offload (LSO), also known as TCP segmentation offload (TSO), allows TCP segmentation to be handled by the adapter rather than the CPU.

#### 802.1Q VLANs

IEEE 802.1Q virtual local area network (VLAN) protocol allows each physical port of the NC551m 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.

#### PXE

Support for pre-boot execution environment (PXE) enables automatic deployment of computing resources remotely from anywhere. It allows a new or existing server to boot over the network and download software, including the operating system, from a management/ deployment server at another location on the network. Additionally, PXE enables decentralized software distribution and remote troubleshooting and repairs.

#### TOE

TCP/IP Offload Engine (TOE) moves the processing of data in the TCP protocol stack from the server CPU to the network card, freeing CPU cycles for other duties.

**NOTE:** HP BladeSystem c-Class Integrity Server Blades does not support TCP Offload Engine (TOE).

#### RDMA

Not Supported

### Standard Features

#### iSCSI

##### HP BladeSystem ProLiant Server Blades

The NC551m supports accelerated iSCSI and iSCSI INT 13 Boot

##### Standards Support:

802.1AB LLDP

802.1Q (VLAN, 1024 maximum, includes Native VLAN support and server side VLAN tag mapping)

IEEE 802.2 LLC

802.3ad Link Aggregation

IEEE 802.3ae 10Gb Fiber Ethernet

IEEE 802.3ak 10Gb CX-4 Ethernet

IEEE 802.3aq 10Gb LRM Ethernet

SNMP v.1, v.2

IGMP v1, v2

RFC 3720 Internet Small Computer Systems Interface (iSCSI)

RFC 5048 Internet Small Computer Systems Interface (iSCSI) Corrections and Clarifications

##### HP BladeSystem c-Class Integrity Server Blades

##### Standards Support:

802.1AB LLDP

802.1Q (VLAN, 1024 maximum, includes Native VLAN support and server side VLAN tag mapping)

IEEE 802.2 LLC

802.2ad (LAN Monitor mode only) SNMP v.1, v.2

IGMP v1, v2

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#### Warranty

HP branded hardware options qualified for BladeSystem c-Class and p-Class servers are covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. The HP branded hardware option diagnostic support and repair is available for one year from date of purchase, or the length of the server they are attached to, whichever is greater. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

Additional information regarding worldwide limited warranty and technical support is available at:

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

### Service and Support

#### Service and Support

##### HP Technology Services

HP Technology Services offers you consultants and support experts 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.

#### Recommended Services

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

##### 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>

##### 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>

#### Related Services

##### 3-Year HP 6 hour Hardware Support

##### Onsite Call-to-Repair Service

Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center

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

##### 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>

#### Insight Remote Support

Delivers secure remote monitoring and support for HP servers and storage, 24x7 at no additional cost. Available as part of HP Warranty, Care Pack and Service Contract offers.

#### 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.

#### 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



### Service and Support

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.

#### **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>Additional c-Class BladeSystem Adapters</b>	<b>NOTE:</b> This is a list of supported options. Some may be discontinued.	
	HP NC325m PCI Express Quad Port Gigabit Server Adapter	416585-B21
	<b>NOTE:</b> Not supported by HP BladeSystem c-Class Integrity Server Blades.	
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
	HP NC532m Dual Port 10GbE Multifunction BL-c Adapter	467799-B21
	HP NC542m Dual Port Flex-10 10GbE BL-c Adapter	539857-B21
	<b>NOTE:</b> Not supported by HP BladeSystem c-Class Integrity Server Blades.	
	HP NC550m 10Gb 2-port PCIe x8 Flex-10 Ethernet Adapter	581204-B21
	<b>NOTE:</b> Not supported by HP BladeSystem c-Class Integrity Server Blades.	
<b>HP 10Gb interconnects</b>	HP Virtual Connect Flex-10 10Gb Ethernet Module for c-Class BladeSystem	455880-B21
	HP 6120XG Blade Switch	516733-B21
	<b>NOTE:</b> Not supported by HP BladeSystem c-Class Integrity Server Blades.	
	HP 6125G Ethernet Blade Switch	658247-B21
	HP 6125G/XG Ethernet Blade Switch	658250-B21
	HP Virtual Connect Flex-10 10Gb Ethernet Module for c-Class BladeSystem	455880-B21
	<b>NOTE:</b> Not supported by HP BladeSystem c-Class Integrity Server Blades.	
	HP 10GbE Ethernet Pass-Thru Module for c-Class BladeSystem	538113-B21
	<b>NOTE:</b> Not supported by HP BladeSystem c-Class Integrity Server Blades.	
	<b>NOTE:</b> Only HP Virtual Connect FlexFabric 10Gb/24-port Module is supported with HP BladeSystem c-Class Integrity Server Blades.	
HP Cisco B22HP Fabric Extender for BladeSystem c-Class	641146-B21	
HP Cisco B22HP Fabric Extender with 16 FET for BladeSystem c-Class	657787-B21	

### Technical Specifications

<b>General Specifications</b>	<b>Network processor</b>	BladeEngines (BE2) Controller		
	<b>Data rate</b>	Two ports, each at 20 Gbps full duplex; 40 Gbps aggregate full duplex theoretical bandwidth.		
	<b>Bus type</b>	PCI Express v2.0 (Gen 2) x8		
	<b>Form factor</b>	The NC551m is a Type I card and is supported in any mezzanine slot on all HP BladeSystem ProLiant Server Blades Generation 6 servers and HP BladeSystem c-Class Integrity Server Blades.		
	<b>IEEE Compliance</b>	802.1p, 802.1q, 802.1qau 802.3u, 802.3ad, 802.3ae, 802.3ap (10GBase-KX4), 802.3x and 802.3z <b>NOTE:</b> HP BladeSystem c-Class Integrity Server Blades does not support 8021q and 802.3z.		
<b>Power and Environmental Specifications</b>	<b>Operating</b>	<b>Temperature</b>	0°C to 55°C / 32°F to 131°F	
		<b>Humidity</b>	10% to 90% non-condensing	
	<b>Power requirement</b>	14W maximum		
	<b>Emissions classification</b>	FCC Class A		
	<b>Agency approvals</b>	USA	FCC (CFR 47 part 15) and UL 60950	
		Canada	ICES-003 and CSA60950	
		Japan	VCCI	
		Korea	MIC (RRL), EMC Registration	
		Australia	ACA, AS/NZS3548/EN55022:1998, EN55024:1998	
		European Union	EN55022:1998 (CISPR 22), EN55024:1998, and IEC60950:1999 (EN60950:2000)	
<b>RoHS Compliance</b>	6 of 6			
<b>Safety</b>	UL Mark (USA and Canada)			
	CE Mark			
	EN 60590			
<b>Operating System Support</b>	<b>HP BladeSystem ProLiant Server Blades</b>			
	<b>Microsoft:</b>			
	Microsoft Windows Server 2003 SP2 (x86 and x64)			
	Microsoft Windows Server 2008 SP2, R2 (x86 and x64)			
	Microsoft Windows Server 2008 SP2, R2 Hyper-V (x86 and x64)			
	<b>Linux:</b>			
	RHEL 5.4 (x86 and x64)			
	RHEL 5.5 (x86 and x64)			
	SLES 10 SP3 (x86 and x64)			
	SLES 11 (x86 and x64)			
<b>Solaris:</b>				
Solaris 10 (x86 and x64)				
<b>VMware:</b>				
VMware ESX 4.0				

### Technical Specifications

VMware ESX 4.1

#### HP BladeSystem c-Class Integrity Server Blades

#### Operating System Support:

HP-UX 11iv3

#### Virtualization Support:

Supports HPVM

#### High Availability:

Supported with HP ServiceGuard

#### Supported Drivers:

FCOC (8Gb FibreChannel) and IOCXGBE (10GbE Networking)

See [release notes](#) for FCOC

See [release notes](#) for IOCXGBE

#### Boot Support:

Supports LAN and SAN boot

#### Other Support:

Supports SSHA, Event Monitoring Services (EVM) and WBEM

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#### 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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