HP Compaq d530 series

May 2003

invent

Product Technology Brief

New Key Technologies and Features of HP Compaq Business Desktops d530 Series

Contents

Introduction

This paper is intended to highlight some of the new features and technologies of the HP Compaq Business Desktop d530 series.

Intel 865G chipset

The Intel 865G chipset is the next max stable chipset from Intel, and succeeds the 845G chipset.

Key features and benefits of the 865G chipset are:

- Support for current Pentium 4 (800MHz and 533MHz front side bus), Celeron processors (400MHz front side bus), and next generation Pentium class processors (code name Prescott). The 865G chipset supports processors with and without HyperThread technology
- Support for DDR PC3200 (400MHz), DDR PC2700 (333MHz) and DDR PC2100 (266MHz) memory, and dual channel DDR support for increased bandwidth and performance. Systems can be configured as dual channel or single channel for flexibility
- Increased graphics performance with Intel Extreme Graphics 2
- Support for Serial ATA (refer to "Serial ATA Q&A" for more detail on HP's support strategy for Serial ATA
- Support for up to 8 USB 2.0 ports (The standard USB configuration for the HP d530 series is 6 USB 2.0 ports: 2 in front, 4 in rear)
- 8X AGP graphics support

Below is a comparison of the new 865G chipset vs the 845G chipset:

Feature	Intel 865G	Intel 845G
Processor Support	Pentium 4, Celeron & Prescott	Pentium 4, Celeron
FSB Speeds	800/533/400 MHz	533/400 MHz
Hyper-Threading Support	Yes	Yes, starting with 3.06GHz
DIMMs per Ch. / # of Channels	2 DIMMs / 2 Channels	2 DIMMs / 1 Channel
Max Memory	4GB	2GB
Dual channel memory support	Yes	No
Memory Type	DDR PC3200/2700/2100 (DDR 400/333/266 MHz)	DDR 2700/2100 (DDR 333/266 MHz) or PC133 SDRAM
ECC/Parity Support	No	No
Integrated Graphics	Intel Extreme Graphics 2	Intel Extreme Graphics
Discrete Graphics	AGP 4x/8x (1.5/0.8V)	AGP 2x/4x (1.5)
IDE/ATA Support	UDMA ATA100 (2 Ch.) SATA150 (2 Ports)	UDMA ATA100 (2 Ch.)
USB	8 USB 2.0 ports	6 USB 2.0 ports
Audio Circuitry	Enhanced 20-bit AC'97 Audio	Enhanced 20-bit AC'97 Audio
Supported ICH	ICH5	ICH4

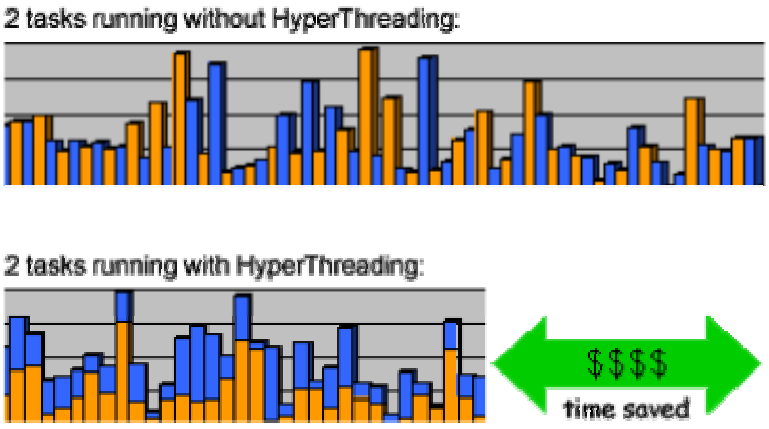
Intel Hyper-Threading Technology

Intel Hyper-Threading (HT) technology enables the processor to work on two sets of tasks simultaneously, by using resources that would otherwise be idle. This allows the user to get more work done in less time. HT offers improved performance and better responsiveness for today's multitasking workloads. HT enables certain specific operating systems to see two *logical* processors where there is only one *physical* processor. Since the operating system sees two logical processors, it can schedule tasks to be processed simultaneously.

Today's applications and operating systems are more feature-rich and power hungry. IT background services (such as virus scans, email compression and file encryption) make the computing infrastructure more robust, but add load to the PC processor. There are two typical approaches to keep systems responsive and users operating at top efficiency:

- increasing clock speeds (MHz) . This increases the number of instructions/second.
- HT fully utilizes the processor's current resources and enables the processor to get more work done on each clock cycle.

The image below highlights the time necessary to complete two tasks with and without HT and illustrates the benefit of HT:



Customer Benefits of HT Technology:

- For IT managers: Keep background services in the background. HT minimizes productivity impact of virus scanning, encryption, compression, and management applications
- For PC users: Work without waiting. HT increases multitasking efficiency and enables greater productivity
- For the future: HT combined with gigabit ethernet speeds data throughput and enables faster networking
- HT Technology improves performance in today's demanding multitasking environment—allowing users to get more done in less time.

HT Technology enables PC usage models previously deemed "impractical". Typically with processor intensive applications and certain workloads, the PC becomes unresponsive and the user is unable to perform any other tasks - basically while the PC works on one thing you cannot do anything else.

DDR Memory

The Intel 865G chipset supports DDR non-ECC (error checking and correction) memory. Three speeds are supported: PC3200 DDR (400MHz), PC2700 DDR (333MHz) and PC2100 DDR (266MHz).

The 865G chipset supports both single and dual channel DDR memory configurations. Memory can be populated in singles or in pairs, but for best performance, memory should be populated in matched pairs (1 DIMM per channel) and all DIMMs should be the same speed. If not all the same speed, maximum operation speed is determined by the slowest DIMM in the system.

With the 865G chipset, actual memory speed is determined by the processor in the system. Refer to the following chart:

CPU FSB (MHz)	Memory Type Inserted	Actual Memory Speed (MHz)	Notes
400	PC3200	266	400MHz DDR results in no performance increase
	PC2700	266	333MHz DDR results in no performance increase
	PC2100	266	optimal
533	PC3200	333	400MHz DDR results in no performance increase
	PC2700	333	optimal
	PC2100	266	
800	PC3200	400	optimal
	PC2700	320	
	PC2100	266	

In order to realize the benefit of dual channel, the following rules must be followed:

- DIMMs must be same density (size): 128MB, 256MB, etc.
- DIMMs must be same DRAM technology: based on 128Mb, 256Mb, etc.
- DIMMs must be same DRAM bus width (x8 or x16 bits)
- DIMMs must be all single-sided or dual-sided
- Channels must be symmetrical – 2 or 4 DIMMs; 3 DIMMs is non-symmetrical so will not get dual channel benefit
- If speeds are mis-matched, actual speed will default to slowest DIMM in the system.

Refer to "Configuring DDR Memory in hp business desktops" whitepaper for more detailed information.

Gigabit NIC

With the introduction of the HP d530 series platforms, integrated Gigabit NIC is now standard.

As the Internet has evolved and applications have become more robust, users have begun to deal with a network environment where visually rich multi-tasking has become routine. In the Internet age, the user can now simultaneously exchange graphic designs, view Web telecasts and surf for information.

This new era of desktop power has created network bottlenecks and congestion that impede user productivity and overall network performance. While processors, memory and hard drives have evolved with application needs, the network has become a limiting factor; clients at the edge of the network now require not only processing power but also communications bandwidth.

Advances in telephony, video streaming, e-mail and instant messaging typically involve the transfer of large files, placing a strain on the entire network. High-speed connectivity is required to support these applications.

Until recently, the cost of Gigabit technology was prohibitive, restricting deployments primarily to server and server backbone applications where its use was reserved for only the highest priority applications. However, the customer can realize significant benefits by bringing Gigabit to the desktop. Demand is being driven by business needs such as:

- creating a collaborative work environment
- routinely sharing of large files
- converging media-rich applications
- multi-tasking multiple applications simultaneously

Gigabit to the desktop is now affordable and easily deployed, enhancing user productivity and network performance.

HP d530 series platforms include the Broadcom NetXtreme Gigabit ethernet solution. Broadcom is a worldwide leader in Gigabit deployments, and is currently deployed across select HP servers, switches, workstations and now desktops and notebooks. Broadcom has helped HP deliver an end-to-end solution and stable/common drivers across all product lines for our customers.

Refer to the "Deploying gigabit to the desktop" whitepaper for more information.

Serial ATA

The Intel 865G chipset supports Serial ATA (SATA). SATA is an evolutionary replacement for the Parallel ATA physical storage interface developed by a group of the industry's leading vendors. Serial ATA is scalable and will allow future enhancements to the computing platform.

The benefits of Serial ATA are:

- Bus data throughput will be increased, with SATA bus data rate initially at 150 MB/sec increasing to 600 MB/sec by 2007 vs 100 MB/sec for current PATA.
- Configuration of Serial ATA devices will be much simpler than PATA, with many of today's requirements on jumpers and settings no longer needed. End users will benefit by being able to easily upgrade their storage devices.

- Ability to use smaller and narrower cables (From 2" w to 1/2"w)
- Use of a low voltage interface for improved noise immunity
- Improved air flow and cable routing in systems due to smaller cables
- SATA is a point-to-point device. This means there is only one dedicated controller per device (under Win2k or WinXP). The entire bandwidth for the interface is dedicated to only one device.
- SATA has increased reliability vs. PATA. Fewer pins and signal wires are required for SATA, enabling more reliable connections on the board and storage device. Also, SATA applies Cyclical Redundancy Checking (CRC) to the data and command packets (for detecting errors that may occur during data transfer) compared to PATA which applies CRC to the data only.

Although the 865G chipset does support SATA, HP engineering does not believe the entire solution is ready for mainstream corporate deployment. Essentially, the current maturity of the SATA subsystem (controller/driver/HDD) does not meet HP's robustness and error recovery requirements and hence will not be made available until after the d530 launch.

The HP d530 series products will be "SATA ready" at launch. A customer can purchase a third party SATA HDD and cable and expect some functionality. This allows customers to begin cursorary SATA testing.

Audio

The HP d530 series platforms feature a number of new audio enhancements. The Intel 865G chipset includes integrated audio support, but HP has chosen to also incorporate the following features:

Integrated Digital Audio with S/PDIF (Sony/Philips Digital Interface)

- All digital: allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format.
- Improved quality: maintaining the digital signal prevents the quality from degrading when it is converted to analog

Stereo Microphone Jack

- Enhances audio support for VoIP (voice over internet protocol) and speech recognition.
- Supports array microphones.
- Located on the rear I/O panel on the CMT and SFFchassis, and the front I/O panel on the USDT chassis

Integrated Digital Noise Canceling

ANDREA Pureaudio
SOUNDMAX

- Algorithm that delivers a pure audio signal and removes unwanted noise in voice-input and microphone
- Continuous and repetitive noise is removed from the audio input
- Less digital distortion when used with speech-enabled applications

Parametric DigitalEQ (A.K.A. - "Soft EQ")

Optimized and enhanced built-in audio support via a 7-band fixed speaker EQ preset

- SoundMAX SPX Animated Audio Enhancement
- Virtual Theater 5.1 Surround Sound via S/PDif
- Wavetable Synthesizer with Yamaha XGLite & 4MB Professional DLS2 MIDI Soundsets
- PureAudio 2.0 Speech Input Enhancement and Noise Cancellation Technology

Support for SoundMAX Superbeam Array Microphone *(available from third party suppliers)*

- Enables stereo microphone arrays to focus their sensitivity on user's voice without use of a cumbersome headset
- Digital Super Direction Array technology from Andrea Electronics

Graphics

The Intel 865G chipset features an 8X AGP slot - offering throughput of 2X that of the Intel 845G chipset. The HP d530 series supports a variety of graphics cards that are either factory configurable (CTO) or as an after-market option (AMO). When a graphics card is placed in the AGP slot, the integrated graphics is turned off. Adding a PCI graphics card will allow dual monitor functionality with the integrated graphics.

Below is a description of the features for each graphics card and their benefits:

Single Display Graphics Integrated Intel Extreme Graphics 2

- Integrated with the 865G chipset - lowest cost solution
- No dedicated memory, uses up to 64MB of system memory
- Supports VGA only
- Ideal for cost-conscious users running standard business applications

Intel DVI ADD Adapter

- Adds DVI support for integrated Intel Extreme Graphics 2
- Lowest cost DVI solution
- Available CTO and AMO

nVidia GeForce2 MX400 (AGP)

- Dedicated 32MB DDR memory
- Supports single VGA
- nVidia unified driver architecture makes deployment and upgrades easy and can separate HW and driver deployments
- Available CTO and AMO
- Not available on USDT

nVidia GeForce4 MX440/8 (AGP 8X)

- Dedicated 64MB DDR memory
- Supports VGA and S-video (tv-out)
- nVidia unified driver architecture makes deployment and upgrades easy and can separate HW and driver deployments
- Ideal for 64MB performance seekers and/or users with tv-out requirement
- Ideal for customers who need a combination of solid 2D graphics, highest quality full-frame rate video playback and superb 3D graphics applications performance
- Ideal for corporate engineering and marketing communication environments
- Available CTO and AMO
- Not available on USDT

Dual Display Graphics

nVidia Quadro4 100NVS (AGP or PCI)

- Supports dual DVI or dual VGA
- Best price/performance for multi-monitor; lowest cost dual solution
- Dedicated 64MB
- nView multi-display management SW
- nVidia unified driver architecture makes deployment and upgrades easy and can separate HW and driver deployments
- AGP version for CMT/SFF, PCI version for USDT
- Available CTO and AMO

nVidia Quadro4 400NVS (PCI)

- Supports quad DVI or quad VGA or 2 VGA/2DVI
- Dedicated 64MB
- Ideal solution for financial traders and market makers requiring quad-head capability
- nView multi-display management SW

- nVidia unified driver architecture makes deployment and upgrades easy and can separate HW and driver deployments
- Available AMO
- Not available on USDT

For additional technical details, refer to the Quickspecs for each individual offering, on http://www.hp.com/

Security Features

The d530 series platforms provide a wide range of security features that protect not only your physical assets but also your data.

Protecting your assets:

Smartcard keyboard

- Restrict access to the user account unless the user has the appropriate Smartcard
- Reads and writes to all ISO7816 compatible smartcards
- Enables deployment of two-level user-authentication policy optional on all platforms

Port control cover

Covers external ports and helps prevents unauthorized access to rear IO; also aids in cable management - optional on all platform

Solonoid lock

Allows chassis to be locked and unlocked remotely over the network - available as pre-installed option on SFF / CMT

Security loop

Accepts a padlock to hinder access to the system - standard on all d530 form factors

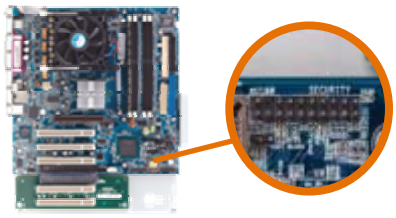
Kensington lock

Cable lock to secure asset to fixed structure, such as a desk - optional on all platforms - kensington slot standard on all d530; lock sold separately

Chassis Clamp Lock

- 3-in-1 Physical locking solution designed for PC Desktop chassis – Locks the cover to the chassis, allowing optional anchoring and the ability to clamp the peripheral cables to deter theft.
- Sold with or without the cable

Protecting your information:



HP ProtectTools Embedded Security

A hardware/software solution that provides platform authentication, protected storage and hardware-based cryptographic functions

- Aids in control of which machines connect to network and/or limits access rights
- Reduces hacking (system attacks, denial of service, network attacks)
- Identifies that a system you are communicating with is the system you believe it is
- Verifies transmitted data was received and not compromised

Disable use of removable media drives

Helps prevent the computer from being booted from removable media on supported devices (and can disable writes to media)

Disable USB, parallel and serial ports

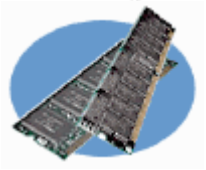
Enables or disables the serial, parallel or USB ports and hides them from the operating system

SMART Hard Drives

- Helps predict failures before they occur
- Tracks fault prediction and failure indication

parameters

- Acts as "insurance" and helps to limit unplanned user downtime and potential data loss from hard drive failure



Memory removal alert

Alerts management console if memory is removed or changed

Thermal sensor

Monitors the temperature within the chassis. There are three modes:

- Normal: computer is operating under normal temperature ranges
- Alerted: computer continues to operate if excessive temperatures are detected, but notifies the user so appropriate action can be taken to avoid shutdown or provide for a smoother system shutdown.

Shutdown: if excessive temperatures are encountered, computer automatically shuts down without warning before any hardware component damage can occur.

Power-on password

Helps prevents an unauthorized person from booting the computer.

Setup password

Helps prevent an unauthorized person from changing the system configuration.

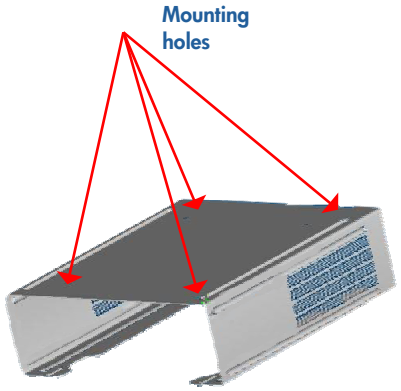
Surge tolerant power supply

Withstands power surges up to 2000 volts.

Usability Features

The new HP d530 small form factor and ultra-slim desktop platforms feature a mounting bracket that can be used to help free up your desk and give you more space (available as an after market option).

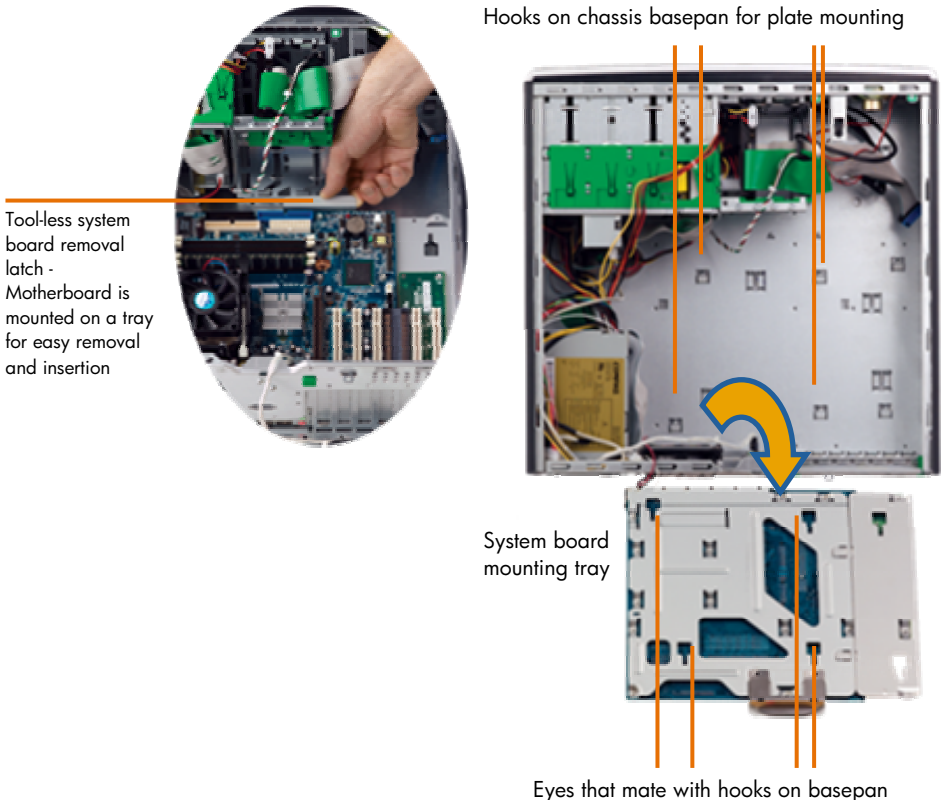
Mounting Bracket - Allows the user to mount a SFF or USDT to a desk in a vertical or horizontal position, or to a wall.



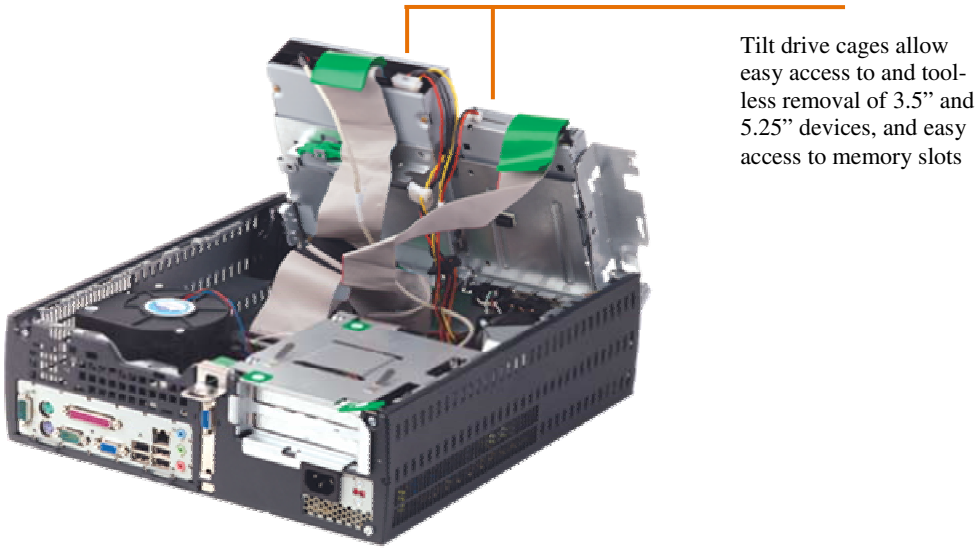
Chassis and Serviceability Improvements

With the introduction of the new HP Compaq Business Desktop d530 Series, many serviceability and chassis enhancements have been made. Some of these changes are highlighted below.

- Both the small form factor and convertible minitower chassis now feature a tool-less plate to which the PCA is attached, making it easy to remove the system board.



- The small form factor features a tilt drive cage that enables easy access to hard drives, memory and system board.



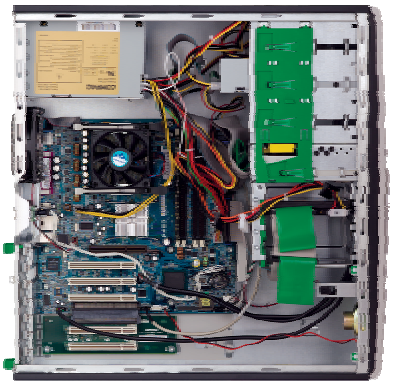
- Both the small form factor and convertible minitower chassis now feature a single latch to remove the side panel and gain access to the inside of the system.

Single latch for easy hood removal on d530 convertible minitower and small form factor

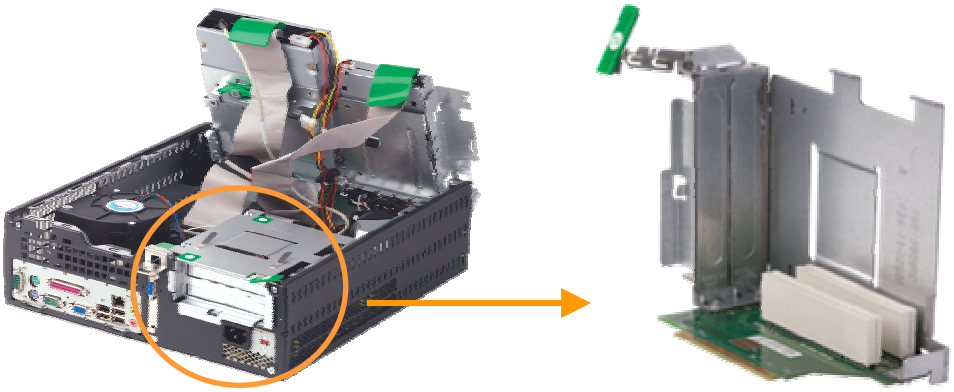
- The convertible minitower features a drive latch mechanism that allows easy removal and installation of components in the drive bays.

Tool-less drive latches for bay removal on d530 convertible minitower

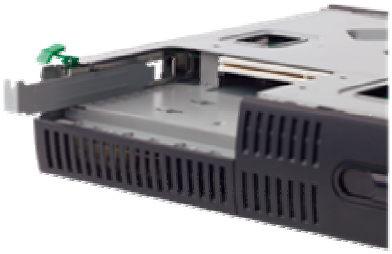
- All d530 series products have color-coded indicators for serviceability features, such as green tabs for PCI slots, green latches, DIMM slots color coded for separate channels, connectors for cables colored depending on type (floppy, HDD, etc.).



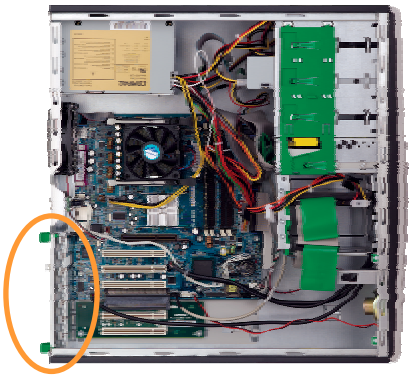
- All d530 series products feature tool-less access to PCI slots, making upgrades quick and easy. The small from factor chassis features a tool-less riser card that contains two PCI slots.



d530 small form factor



d530 ultra-slim desktop



d530 convertible minitower

Manageability Solutions

HP offers many solutions that help you manage your PCs through their entire lifecycle, from planning, to deployment, to management. Most of these tools have a common design and interface due to the extensive work between HP and Altiris, a leader in providing manageability solutions. HP Client Manager ships standard with all client PCs.

Some of the features that aid in manageability are detailed below. For full detail, refer to http://www.hp.com/.

Software Image Deployment

Remote wakeup/shutdown

Allows a system administrator to power on, restart, and power off a client computer from a remote location. This enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM.

Remote System Installation via F12 (PXE)

Allows a new or existing system to boot over the network and download software including the operating system

Replicated setup

Saves BIOS settings to diskette or USB disk-on-key in human readable file. It can then replicate these settings on machines being deployed without entering ROM-based F10 setup.

Personality migration

PC transplant pro

Makes transferring the computer's personality - the files and settings that make your PC unique - a quick

and intuitive process.

Hardware management

Remote ROM flash

Provides secure ROM image management from a central network console.

Product Change Notification

A program designed to proactively communicate product changes by email to customers, based on a user-defined profile.

Software distribution

System Software Manager

Automatically detects and updates BIOS, device drivers, and management agent versions on networked PCs.

Active Update

Receive HP SW updates continuously and automatically via the internet based on user-defined profile; can be deployed by SSM or Client Manager.

Asset management

HP Client Manager

- A solution that ships standard and provides asset tracking, alerting, diagnostics, and SoftPaq distribution for HP business desktops, notebooks, and workstations.
- A Web-based console: manages systems remotely.

Track System Components:

- Tracks the display serial number, model & manufacturer
- Tracks the system serial number, model, & manufacturer
- Tracks ROM revision levels
- Tracks the system board revision level
- Tracks the hard drive serial number, model, and manufacturer
- Tracks the asset tag

Receive Alerts & warnings:

- Disk, memory, chassis intrusion, CPU, battery, thermal
- Set Policy-based notifications: E-mail, Web report, generate help desk work item, SNMP, program launch

Create Web reports:

- Determine how many computers you have of a

specific model

- Many pre-configured reports with drill down
- Reports can be emailed
- Many graph or table types to choose from
- Copy and paste report

Optional Floppy Drive

The HP Compaq Business Desktop d530 Series can be ordered without a floppy drive. Depending on the particular chassis and cable type, this allows the 3.5" bay to be used for a second hard drive, ZIP drive, or some other storage device.

For More Information

For the HP sales office nearest you, please refer to your local phone directory, or call the HP regional office listed below.

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