



Mini White Paper

HP Workstations

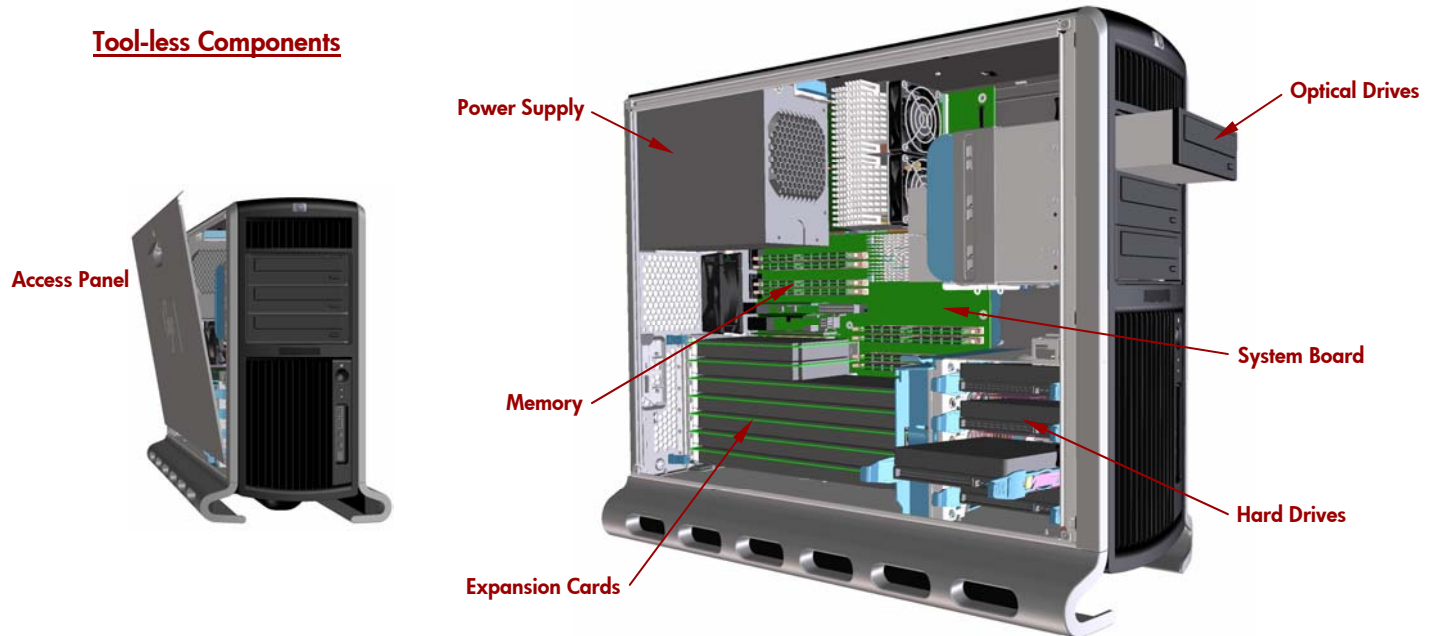
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HP Workstation c8000 Product Design Highlights

Introduction: The HP Workstation c8000 mechanical design showcases a number of improvements over previous designs. All of the customer-accessible components can be removed and replaced without a tool (including the power supply), the noise levels of the product are significantly lower than previous designs, and it incorporates a number of additional features that enhance the customer experience. All of these improvements make the HP c8000 package an outstanding design.

Key Product Features: The HP c8000 has been designed such that all of the customer-accessible components within the product can be accessed and replaced without the use of a tool. This “tool-less” design saves time for customers and minimizes frustration associated with the use of special tools. The illustration below highlights some of the major “tool-less” components.



Acoustic noise is a very important issue to HP and its customers. A noisy environment creates user fatigue and reduces productivity. A significant effort went into the design of the HP c8000 to minimize noise. Here are a few key design features that led to this amazingly quiet system:

- *Acoustic Isolation of key components* – The large system fan and hard disks have been mechanically isolated using a rubber-like material to reduce vibration, which can translate into noise.
- *Strategic Location/Orientation of Fans* – The fans have been embedded in the system very near the components requiring cooling. This allows the fans to be driven at lower speeds to reduce fan noise.
- *Configuration-based “Smart Cooling”* – The system can sense the power load and inlet temperature, and adjust the fan speed accordingly. This allows the fans to run slower nominally when the system load and temperature is low.
- *New CPU Heatsink* – A new “Floor-to-ceiling” heatpipe design provides better cooling than previous CPU coolers.
- *New Fan Design* – The c8000 fans use Pulse-Width-Modulation to minimize impulsive noise.

The HP c8000 has several other features to improve usability. The flexible design allows the unit to be configured as a mini-tower for personal use or rack-mounted. It has been equipped with a front-access information card allowing easy access to important identification numbers, such as product and serial numbers. Internally, the product labeling has been taken to a new level, providing a system overview, system board and memory layouts, and clear identification of touch-points (service access points). Finally, the sleek industrial design makes a strong visual statement conveying powerful performance.

Conclusion: The HP Workstation c8000 incorporates a number of enhancements to improve the customer experience. The main highlights include: tool-less chassis design, very low acoustic noise, flexible deployment (tower/rack), and user-friendly product labeling. Product design is a key differentiator and now, with the HP c8000, it has been taken to a higher level.

