

HP recommends Windows.



# HP Z1 Workstation Core Architecture

## Introduction

The HP Z1 Workstation is a new workstation in an All-in-One form factor, enabling user creativity and productivity in a space efficient manner. The HP Z1 combines features from traditional desktop workstations, notebook workstations, and consumer All-in-One products. The HP Z1 architecture provides significant capabilities, including processor micro architecture, multiple HDD support and performance such as USB 3.0 and 6Gbps SATA.

## Processor and Memory Technology

The HP Z1 fully supports Intel® Xeon® and Intel Core™ 32nm and 22nm processors and utilizes the Intel C206 chipset.

The HP Z1 has two direct attach DDR3 memory channels each with two DIMM connectors. The HP Z1 supports non-ECC and ECC-protected unbuffered DDR3-1600MHz DIMMs. These DIMMs provide system memory sizes up to 32GB (using 8GB ECC DIMMs). The HP Z1 DDR3-1600 DIMMs run at 1333MHz on Intel 32nm processors and run at 1600MHz on Intel 22nm processors.

## I/O and Storage

### Internal I/O

The HP Z1 provides an MXM slot, three internal mini-PCIe slots, two 6Gbps SATA ports, one 3Gbps SATA port and an internal Type A USB 2.0 port. The internal Type A USB 2.0 connector can support a wireless keyboard/mouse dongle or an application license key if it fits in the space indicated. The HP Z1 is equipped with a digital microphone array, internal dual-channel 4W speakers and a 2-megapixel webcam.

The HP Z1 ships with a WLAN/Bluetooth card installed in mini-PCIe slot 1. The WLAN controller connects via a PCIe bus and the Bluetooth controller connects via a USB 2.0 bus. Both controllers can be enabled or disabled in the BIOS F10 menu by enabling/disabling PCIe slot 1.

### Storage

The HP Z1's two 6Gbps SATA ports support one 3.5" HDD or up to two 2.5" SFF hard drives or SSDs. RAID mode 0 or RAID mode 1 is supported on configurations with two HDDs. Intel Rapid Storage Technology (Intel RST) is supported on the HP Z1. This technology improves the performance of disk intensive retrieval applications and boot times and can reduce the power consumption of the chipset and SATA hard drive. The HP Z1 also provides one 3Gbps SATA port for an optical disc drive. HP offers a DVD-R/W drive or a Blu-ray R/W drive.

### External I/O

On the Side I/O area, the HP Z1 provides two USB 3.0 ports, a powered IEEE 1394a port, a 4-in-1 card reader, and headphone and microphone connections.

In the Rear I/O area, the HP Z1 provides Gbit LAN, DisplayPort, audio Line-In, Line-out, sub-woofer and optical SP/DIF output connections.

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## Graphics and Display

### Graphics

The HP Z1 supports Intel® integrated processor graphics (on certain processor SKUs). Intel® fully supports Intel HD Graphics 2000, Intel HD Graphics P3000, Intel HD Graphics 4000 and Intel HD Graphics P4000 with the C206 chipset. The ISV workstation application certifications for the Intel 32nm and 22nm processors apply to the HP Z1. The HP Z1 supports discrete NVIDIA® professional graphics via an MXM slot with a PCIe x16 link. Intel 32nm processors support a Gen2 link to the MXM card; Intel 22nm processors support a Gen3 link to the MXM card. The NVIDIA graphics card determines the speed of the link.

Either the discrete MXM or the integrated processor graphics option can drive the internal LCD or the internal LCD plus an external monitor. The discrete graphics option always overrides the integrated processor graphics. If you want to use the integrated processor graphics, the MXM graphics card must be removed from the system.

### External DisplayPort Connection

The DisplayPort connection functions as an output or an input. As an output, it can drive an external monitor with up to 2560 x 1600 resolution. As an input, an external source such as a notebook can be connected to the DisplayPort connection and drive the HP Z1's internal LCD. To switch from output mode to input mode or vice versa, use the command sequence "Ctrl+Shift+S+D".

### Internal Display

The HP Z1 Workstation has an integrated 27" IPS LED backlit LCD module that provides up to 2560x1440 @ 60Hz resolution. The typical maximum brightness of this display is 380nits cd/m2 (typical) and the minimum brightness is 120 nits cd/m2 (typical). This LCD module supports 10-bit color that can display up to 1.07 billion colors.

The LED backlight brightness can be adjusted using the Windows-based HP MyDisplay application or the Windows > Power Options > Brightness Control feature. These adjustments only affect the intensity of the backlight; they do not impact the color of the pixels.

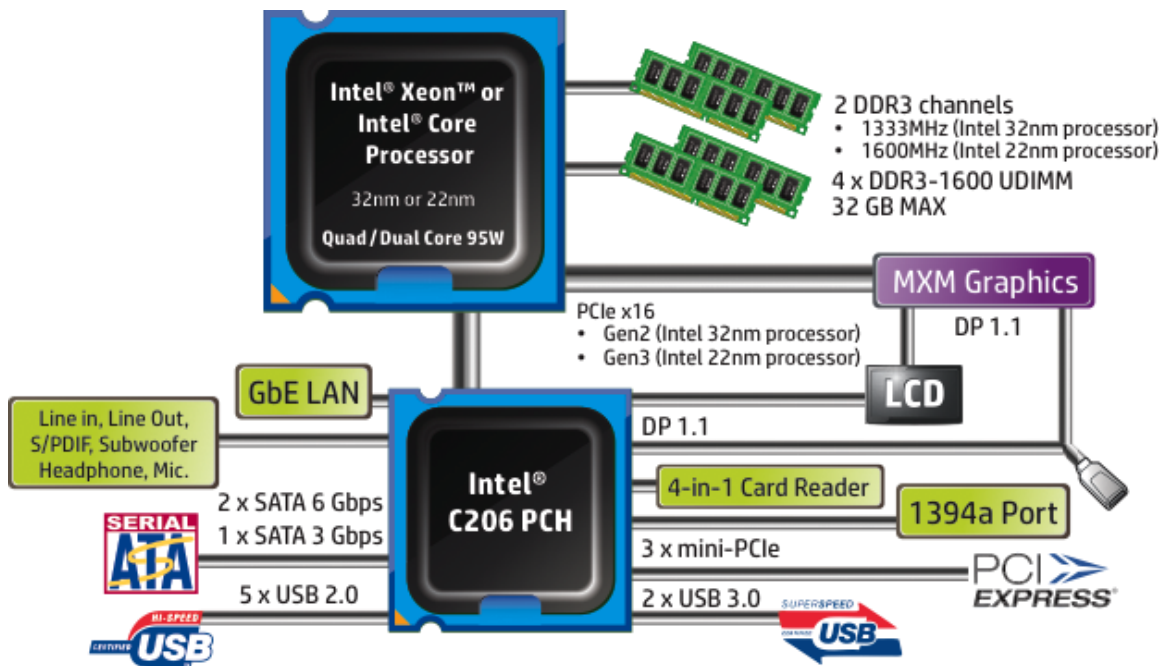
## Other Features

HP ensured that the HP Z1 offers a competitive feature set as compared with Intel Xeon E3-1200v2 and C216 platform (which forms the foundation of the HP Z220 Workstation). HP validated a unique combination of desktop workstation, mobile workstation, and AiO technologies and components in the HP Z1, including Intel Xeon/Core processors, professional MXM graphics, integrated display, WLAN/Bluetooth, and mini-PCIe slots. Like the HP Z210 and HP Z220 Workstations, the HP Z1 supports Intel Turbo Boost Technology and Intel vPro Technology on Intel Xeon processors.

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## Conclusion

The HP Z1 Workstation was designed from the start to ensure a product definition competitive with similar C216-based platforms in 2012. Key new functionalities enabled by Intel® 22nm processors are preserved, like memory speed, while USB 3.0 capability has been integrated. Intel has included in their strategy the support for Intel 22nm processors on C206 for Workstation applications, thereby providing support for essential Workstation elements like Client OSeS or Certifications, and for the HP Z1 Workstation's architecture and some of its groundbreaking capabilities.



## Additional Resources

White Papers [hp.com/go/whitepapers](http://hp.com/go/whitepapers)

Manuals : [hp.com/support/Z1\\_manuals](http://hp.com/support/Z1_manuals)

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