



**HP Z6 G5 A
TECHNICAL
WHITEPAPER**

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Introduction

The HP Z6 G5 A, the newest addition to the Z by HP desktop workstation portfolio, is powered by the AMD Ryzen™ Threadripper™ Pro 7000 WX-Series CPU¹ to meet the demanding needs of virtual production, 3D rendering, AI, and machine learning professionals. Its architecture introduces several newest technologies including DDR5 memory architecture, PCIe Gen 5 technology, front removable hot-swappable NVMe storage, improved thermal management and increased performance.



System Highlights

Maximized Cores. Astounding Graphics. Unbound Potential.

The Z6 G5 A supports up to 96 cores in a single processor while also offering plenty of room to expand as demands change, with space for up to three high-end GPUs and flexible storage options with front-accessible, hot-swappable NVMe drives for quick and easy access to large files.¹ The redesigned layout increases airflow, ensuring the system remains cool even at peak performance, while intelligent fan control tunes the fan speeds in real-time using over 20 temperature sensors to maintain whisper-quiet operation. With 360,000 hours of rigorous testing, MIL-STD testing, and certification for professional applications,² the HP Z6 G5 A is built to endure. As part of the World's Most Sustainable PC Portfolio,³ HP's commitment to sustainability is reinforced in the design with 35% recycled plastics⁴ and is planned to be EPEAT® Gold certified,¹⁰ reflecting the company's dedication to minimizing the environmental impact of its products.⁵

HP Z6 G5 A Product Benefits Include:

• Create, Render, Process - All at Once.

Tear through virtual production or 3D modeling. The system design packs up to 96 cores in a single workstation CPU⁶ so there's room for up to three high-end GPUs⁷ and eight memory channels.⁸ And, do it all with efficient performance per watt.

• Expandable. Flexible. Whisper Quiet.

Designed to pack all the power and components you need now with room to grow. Get maximum expandability with up to 6 PCIe slots (up to gen 5) and 12 NVMe SSDs. Conquer intense projects without throttling on a device designed to run quiet and cool.

• Comprehensive Security. Trusted Reliability.

Get peace of mind with a workstation that's built to endure. The Z6 G5 A undergoes 360K hours of rigorous testing, MIL-STD testing,² and is certified for pro apps. And with HP Wolf Security for Business, it's protected below, in, and above the OS.⁹

• Part of the World's Most Sustainable PC Portfolio³.

At HP, we care about the impact our products have on our people, communities, and the planet. That's why this device contains 35% recycled plastics⁴ and is EPEAT® Gold registered.¹⁰ Take pride knowing that you are helping protect our shared future.



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Newest Technologies

HP Z6 G5 A is unique in the rich configurations and flexible expandability it provides to end-users.

- **AMD Ryzen™ Threadripper™ Pro 7000WX Processors:** AMD's next-generation processors are built on the leading 4nm "Zen 4" architecture and offer up to 384MB of L3 cache along with high memory (DDR5) bandwidth for applications sensitive to memory speed. Compared to previous generation, these processors have higher max CPU cores (up to 96 cores/192 threads) as well as increased base frequency and max turbo boost frequency. With more performance per watt and optimized performance with leading ISVs, these processors ensure peak productivity for end users.
- **HP Remote System Controller:**¹¹ Dedicated onboard connectors provide server-grade remote manageability in a desktop workstation. The HP Remote System Controller is the world's first software-defined remote management solution for PCs and can be installed internally (as PCIe add-in card) or externally to grant IT Administrators with unparalleled control over their fleet of remote workstations.
- **QX448 Front Removable Storage:** HP QX448 supports up to four front-removable, hot-swappable NVMe SSDs. This flexible storage solution provides PCIe Gen4 performance with dedicated PCIe lane support and comes equipped with key & lock for secure management of data drives and FANS software for drive management. A whitepaper with more information can be found [here](#).
- **Flex-IO Interface:** HP-proprietary Flex-IO interface in the rear of the system grants customers the unique ability to customize their rear I/O ports without using additional PCIe slots or USB ports with external adapters. The Flex-IO interface can support up to (1) of the following (optional) Flex-IO Modules: Serial Port v3, Dual USB-A 3.2 Gen1, USB-C® 3.2 Gen2, 10GbE RJ45 single port, 2.5GbE RJ45 LAN single port, 1GbE LC Fiber single port, 1GbE RJ45 single port, and a Wi-Fi6 + BT5.3 WLAN wireless card (to make use of the newest integrated antenna).
- **Integrated Wifi®:** With the increase in hybrid workflows, Z6 G5 A provides support for Wi-Fi 6 or Wi-Fi 6E to allow users the flexibility to connect in many places.





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CPU Lineup at Introduction

The Z6 G5 A Processor Stack offers six AMD Ryzen™ Threadripper™ Pro processors with a wide range of core count to meet workflow computational needs. These processors offer up to 96C processors at a TDP of 350W, which is significantly higher core per watt than previous processor offerings from Intel® per watt.

Name	Cores	Frequency (GHz)		L3 Caches (MB)	Memory Speed (MT/s)	TDP (W)
		Base Clock Speed	Max Boost Technology			
AMD Ryzen™ Threadripper™ Pro 7995WX	96	2.5	5.1	384	5200	350
AMD Ryzen™ Threadripper™ Pro 7985WX	64	3.2	5.1	256	5200	350
AMD Ryzen™ Threadripper™ Pro 7975WX	32	4.0	5.3	128	5200	350
AMD Ryzen™ Threadripper™ Pro 7965WX	24	4.2	5.3	128	5200	350
AMD Ryzen™ Threadripper™ Pro 7955WX	16	4.5	5.3	64	5200	350
AMD Ryzen™ Threadripper™ Pro 7945WX	12	4.7	5.3	64	5200	350

Threadripper™ Pro supplies rich hardware possibilities with PCIe, DDR5, HD Audio Interface, SPI, and eSPI along with USB through the accompanying chipset, AMD B695. This allows for intensive and large graphics and memory configurations or very custom configurations to optimize a workload with add-in cards.

Processor Features:

AMD Pro Security: Security designed to protect at every level. A designated AMD Secure Processor with the CPU to perform security tasks alongside a Trusted Platform Module (TPM 2.0). The AMD Secure Processor allows for AMD Memory Guard, AMD Secure Boot, and a security designed architecture called the Zen4, AMD Shadow Stack at a hardware level and firmware level. Windows Security and additional System Level Software Security rest on top of the hardware security solution to create the full feature.

- AMD Memory Guard: Encryption of system memory with low performance impact to prevent data from being stolen in a usable format. The AMD Secure Processor performs encryption and decryption. An attacker cannot remove a NVDIMM and remove non-encrypted data from it. Full system memory encryption is included and enabled on platforms with AMD Ryzen™ PRO.
- AMD Secure Boot: A protective approach to ensure that only trusted execution occurs during the boot.

AMD Pro Manageability: See Manageability section for more details.



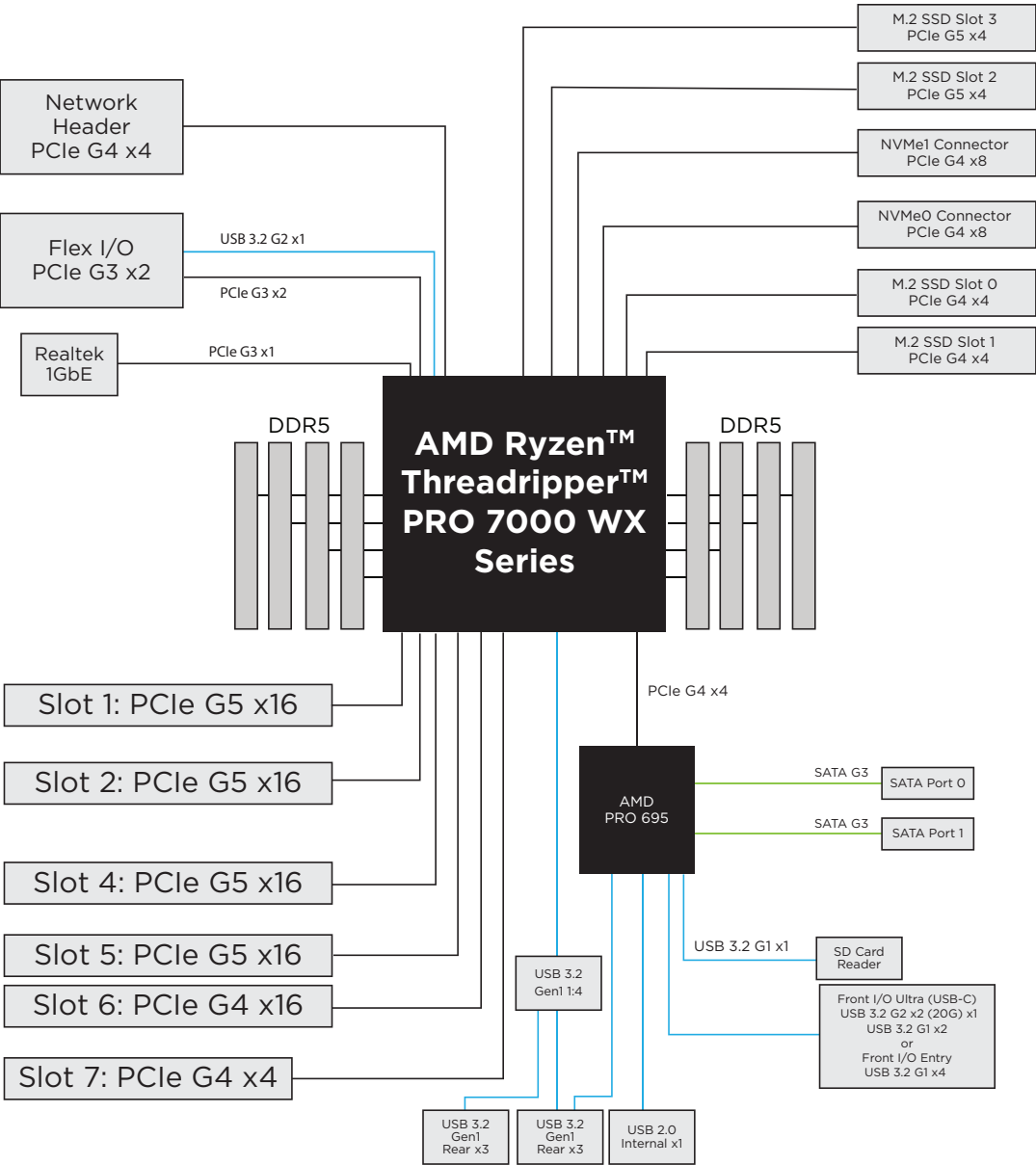
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System Block Diagram and PCI-Express Performance

Z6 G5 A Block Diagram





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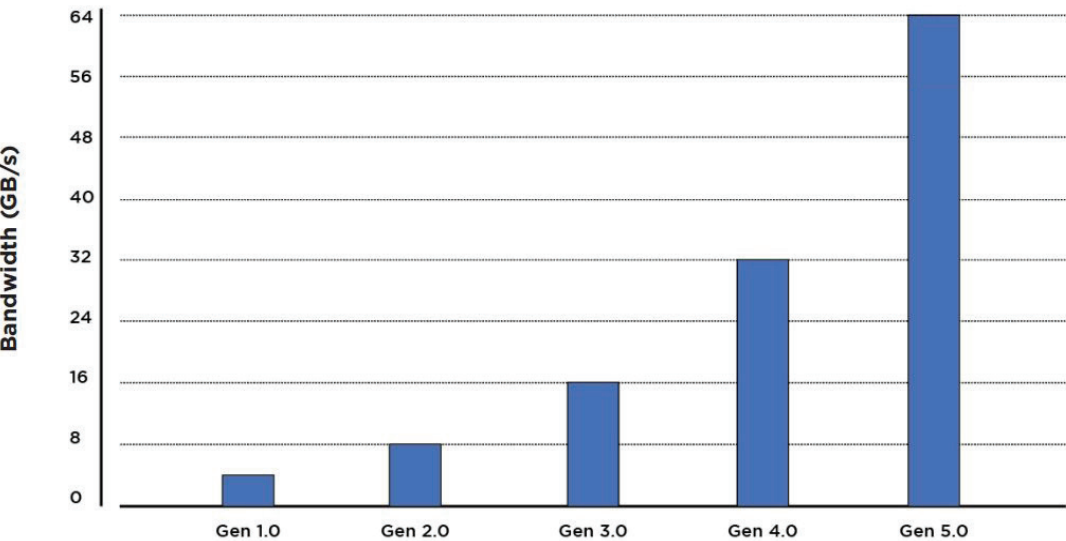
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Integrated PCI-Express 5.0

The HP Z6 G5A uses the AMD Ryzen™ Threadripper™ Pro Processor Family, with integrated PCI-Express 5.0 controllers delivering a peak bandwidth of 64 GB/s per direction on a x16 slot or 4 GB/s per lane. PCIe 5.0 is backward compatible with 1.0, 2.0, 3.0, and 4.0. All PCIe slots will train to the highest common speed supported by the slot and card installed in the slot. PCI-Express slots will initialize at 1.0 and then transition to the max common speed through a training sequence that involves multiple adaptive training phases. It is recommended to carefully evaluate and validate PCI-Express devices that are not available or supported by HP.

Figure 2. x16 Peak Bandwidth per Direction (GB/s)



Recipe for Optimizing PCI-Express I/O Performance

For high I/O bandwidth applications, the choice of slot loading, processor, and memory configuration can be optimized to ensure maximum bandwidth available. Applications and cards sensitive to I/O latency may benefit as well from some of the tips below.

Recommended Configuration Steps

- Place GPU and graphics cards first, following the slot order listed in Figure 3.
- Place I/O cards next, from highest bandwidth to lowest, following the slot order listed in Figure 3. This is the optimal load order for most applications.
- Additional I/O bandwidth refinements may be possible. If necessary, refer to the tips below.



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Figure 3. HP Z6 G5A I/O Slot Recommended Load Order

Card Load	Card Description	Slot1	Slot2	Slot3	Slot4	Slot5	Slot6	Slot7
		PCIe5x16 CPU	PCIe5x16 CPU	Mechanical	PCIe5x16 CPU	PCIe5x16 CPU	PCIe4x16 CPU	PCIe4 x4 CPU
1	1 st Graphics				only			
2	2 nd Graphics (single or double wide cards)		only					
2	2 nd Graphics (2.5 or triple wide cards)	only						
3	Thunderbolt 4 (2 - port)							only
4	3 rd Graphics		3			2	1	
5	Z Turbo Drive Quad Pro (4xM.2 card)*	4	3			2	1	
6	Z Turbo Drive Dual Pro (2xM.2w/Bracket)*	4	3			2	1	
7	Network Interface (LAN,etc.)	4	3			2	1	5
8	Network Interface (WLAN)					3	2	1
9	Internal HP Remote System Controller		3			4	2	1
10	PS2/Serial Module		4	1			3	2

Additional Tips

- If possible, make sure all I/O cards are loaded in slots that have a PCI-Express Lane Width at least as wide as the card.
- Ensure Idle Power Savings BIOS setting is set to Normal (BIOS setup menu -> Advanced -> Power Options -> Idle Power Savings = Normal).
- Use the latest system BIOS version available on [hp.com](https://www.hp.com).
- Check for updates in the latest performance optimization white papers.
- HP Z6 G5 A PCIe Retainer Fans (upper/lower) are required with 3x NVIDIA RTX A4500/4500 Ada, 3x NVIDIA RTX A5000/5000 Ada, 3x NVIDIA RTX A6000/6000 Ada, and after-market high-end consumer graphics (refer to section: System Design: Performance & Reliability).
- HP Z6 G5 A Front System Card Guide Fans (upper/lower) are required for all graphics cards with the exception of single GPU configurations: AMD Radeon RX RX6400, AMD Radeon Pro W7500, NVIDIA T400, NVIDIA T1000 (refer to section: System Design: Performance & Reliability).

Memory Configurations & Optimization

The purpose of this section is to provide an overview of the memory configurations for the HP Z6 G5 A Workstation and to provide recommendations to optimize performance.

Supported Memory Modules:

Types of memory supported on an HP Z6 G5 A Workstation are:

- 16 GB, 32 GB and 64GB PC5-5600-R 5600 MHz DDR5 Registered DIMMs.
- 128 GB PC5-5600 3DS 5600 MHz DDR5 3DS Registered DIMMs.
- Single and dual rank DIMMs based on 16GB DRAMs are supported.
- Quad and octal rank 3DS RDIMMs are supported.

Types of memory NOT supported on an HP Z6 G5 A Workstation include:

- Unbuffered DIMMs.
- Non-ECC DIMMs.
- DDR, DDR2, DDR3, DDR4 DIMMs.

See Memory Technology Whitepaper for more memory module technical information.



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Platform Capabilities

Maximum capacity: 1 TB

- Total of 8 memory sockets.
- 8 Memory controllers with 1 channel per memory controller for a total of 8 channels and 1 socket per channel.

Speed

- 5200MHz memory speed is supported in this platform.
- Memory will operate at the speed of the slowest rated installed processor or DIMM.

Mixing of DIMMs in a System

- Registered and 3DS Registered DIMMs cannot be mixed in a system.

Memory Features

This platform supports the newest DDR5 technology:

- DDR5 supports higher bandwidths, capacities, and power efficiencies.
- Improves reliability features.
- DDR5 has increased technology efficiencies.
- Adds support for on die ECC.
 - On Die ECC is where the data stored on the memory module is monitored by the DRAM for errors.
 - Only single-bit errors are automatically corrected, multi-bit errors are not detected.
- But system ECC is still supported on all RDIMMs.
 - Single-bit errors are automatically corrected.
 - Multi-bit errors are detected and will cause the system to immediately reboot and halt with an F1 prompt error message.
- By way of comparison, non-ECC memory (not supported on this platform) does not detect or correct single-bit or multi-bit errors which can cause instability, or corruption of data, in the platform. See Memory Technology White Paper for more information.

Command and Address parity is supported

- Command and Address errors are detected and will cause the system to immediately reboot and halt with an F1 prompt error message.

Optimize Performance

System performance is largely based on the applications being used. Generally, to obtain the best performance, it is advised that you follow the following guidelines:

- For best performance, it is recommended to load memory into all memory controllers and channels.
- Proper individual DIMM capacity selection is essential to maximizing performance. Evenly distributing total desired memory across all operational channels and memory controllers will deliver the best performance.
- To increase overall performance, install multiple ranks in each channel.

Figure 4: Optimal configurations for the HP Z6 G5 A (Note: the following tables do not include all available orderable configurations).

Configuration	DIMM1	DIMM2	DIMM3	DIMM4	CPU	DIMM5	DIMM6	DIMM7	DIMM8	Rating
16GB (1x16GB)	X									Good
32GB (2x16GB)	X								X	Good
32GB (1x32GB)	X									Good
64GB (4x16GB)	X		X				X		X	Better
64GB (2x32GB)	X								X	Good
64GB (1x64GB)	X									Good
128GB (8x16GB)	X	X	X	X		X	X	X	X	Best
128GB (4x32GB)	X		X				X		X	Better
128GB (2x64GB)	X								X	Good
128GB (1x128GB)	X									Good
256GB (8x32GB)	X	X	X	X		X	X	X	X	Best
256GB (4x64GB)	X		X				X		X	Better
256GB (2x128GB)	X								X	Good
512GB (8x64GB)	X	X	X	X		X	X	X	X	Best
512GB (4x128GB)	X		X				X		X	Better
1TB (8x128GB)	X	X	X	X		X	X	X	X	Best



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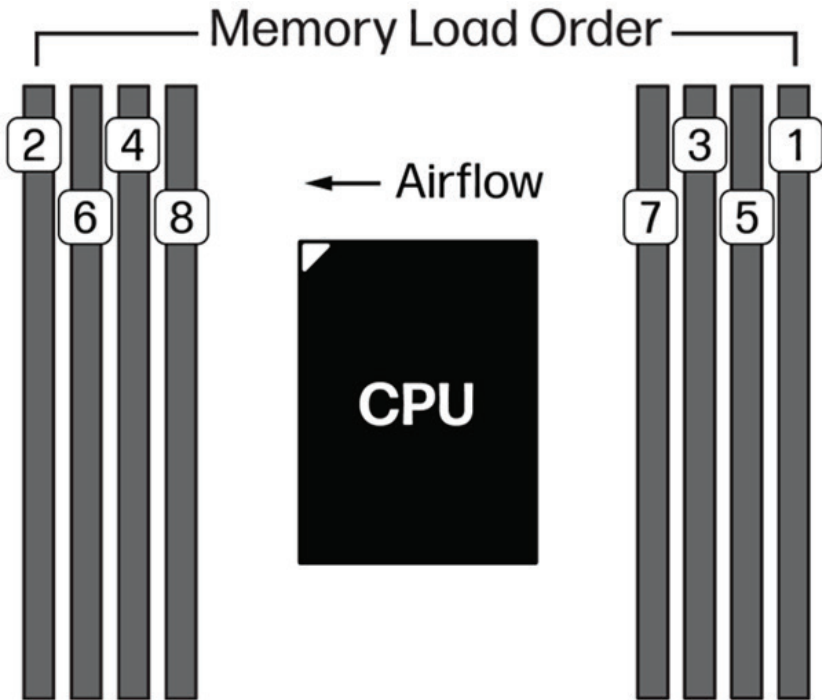
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Loading Rules

- Load the memory modules in order of size, starting with the largest module and finishing with the smallest module.
- The DIMMs should be loaded starting with the DIMM furthest from the CPU, with the first DIMM loaded in the right-most socket and alternating sides of the CPU.
- HP Z6 G5 A Memory Cooling Solution is required when 32GB RDIMMs or greater are installed in system (refer to section: System Design: Performance & Reliability).
- See the figure below for loading order.

Figure 5: Loading order



Memory Summary

The memory configurations of the HP Z6 G5 A Workstation have been specifically crafted to meet strict long-term reliability standards with an optimized performance that provides users with seamless functionality. Design, cooling, and power solutions were validated to ensure DIMMs met max performance. HP values product quality and end user productivity, which is why the products discussed in this document are backed by HP's warranty. For more information, visit <https://www.hp.com/us-en/workstations/desktop-workstation-pc.html>.

System Design Performance & Reliability

The HP Z6 G5 A is designed to deliver the performance, safety, reliability, and low noise that is essential for professional high-compute workflows. Monitoring and maintaining component temperatures is vital to performance, safety, and reliability. Quiet acoustics (through effective thermal management techniques) allows workstation customers to stay focused and in the zone as they work on critical and demanding workflows. Low noise is essential to reducing user fatigue, maximizing productivity, and minimizing distractions.

HP Workstation engineers designed the Z6 G5 A workstation by separating the system into cooling "zones" to manage where heat is added and removed from the system. A split PCIe design separates high heat generating components, like graphics, above and below the CPU to allow dedicated airflow to be directed to each zone using front card guide fans, PCIe retainer fans and/or memory fans. The fans are controlled in real-time using fan control algorithms based on inputs from an array of over 20 sensors continuously monitoring system and component temperatures.



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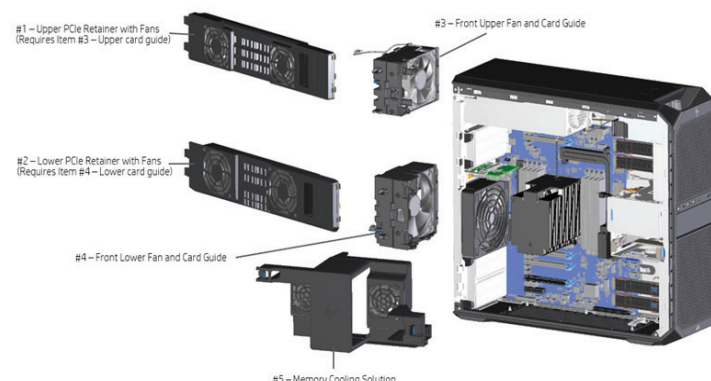
Due to HP's rigorous design requirements, customers can experience peace of mind with a workstation that's built to endure. The Z6 G5 A undergoes 360K hours of validation testing, MIL-STD testing, and is certified for professional applications. Lastly, as part of the world's most sustainable PC portfolio,¹² the Z6 G5 A includes 35% recycled plastic and is planned to be EPEAT® Gold Certified in the US.

Fan Design & Requirements:

A standard base Z6 G5 A configuration can be purchased without including front card guide fans (top and bottom), memory fan/duct, and PCIe retainer fans (top and bottom). However, as higher-end components are added to the system, the following fans are required to maintain thermal requirements and performance. When ordering Z6 G5 A from factory, the fans will automatically be included based on your configuration. If you intend to upgrade your Z6 G5 A over time, including the following fans in your configuration is recommended (fans are orderable at the time of purchase or as after-market-option):

- **HP Z6 G5 A PCIe Retainer Fans (upper/lower) (#1 & #2) (configured together)**
Front System Card Guide Fans are required to install PCIe Retainer Fans. PCIe Retainer Fans are required under the following conditions:
 - Graphics: Required with 3x NVIDIA RTX A4500/4500 Ada, 3x NVIDIA RTX A5000/5000 Ada, 3x NVIDIA RTX A6000/6000 Ada, 2x NVIDIA A800 and after-market high-end consumer graphics.
- **HP Z6 G5 A Front System Card Guide Fans (upper/lower) (#3 & #4) (configured together)**
These fans are required under the following conditions:
 - Onboard SSDs: required with two or more M.2 SSDs installed on system board.
 - Onboard SSDs: required with 2TB or greater M.2 SSDs installed on system board.
 - Graphics: required for all graphics cards with the exception of single GPU configurations: AMD Radeon RX RX6400, AMD Radeon Pro W7500, NVIDIA T400, NVIDIA T1000.
- **HP Z6 G5 A Memory Cooling Solution (#5)**
This fan assembly is required under the following conditions:
 - Meomry: Required when 32GB RDIMMs or greater are installed in system.

Figure 6: Accessory fans configurable on Z6 G5 A



Power Management

Power Supply Details

We offer two power supplies on the HP Z6 G5 A Workstation. See the table below for a breakdown of features and supported power.

PSU Description	Efficiency	Input Voltage AC	Input Current	Max Output Wattage
775W	80 Plus Gold	100-127V	11A	775W
		200V	5.5A	775W
1125W/1275W/1450W	80 Plus Gold	100V	12A	1125W
		115-127V	12A	1275W
		200V	10A	1450W



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Power Configuration Limits

When creating configuration limits, we examine the peak power of all system components. When use this value to make sure that the system will never use more power than the PSU can supply. Keep in mind that the actual power consumption of your system will depend on the workload it is running. For more information, refer to HP Z6 G5 A Site Prep Guide on [HP.com/support](https://www.hp.com/support).

Graphics

The HP Z6 G5 A workstation is meticulously designed to deliver exceptional graphics performance. With four PCIe Gen5 x16 slots, this powerhouse is not only capable of handling the extreme graphics demands of today, but is also future proof for tomorrow, allowing for full utilization of PCIe Gen5 graphics cards as they become available in the market.

The HP Z6 G5 A is engineered to work seamlessly with a wide range of AMD and NVIDIA graphics cards, including the AMD Radeon™ Pro W7900 and NVIDIA RTX™ 6000 Ada. Due to its expansive nature, the HP Z6 G5 A workstation can support up to three high-end graphics cards. For instance, an HP Z6 G5 A equipped with a 1450W power supply can support up to three AMD Radeon™ Pro W7600 graphics cards with an AMD Ryzen™ Threadripper™ Pro 7995WX processor or three NVIDIA RTX™ 6000 Ada graphics cards with an AMD Ryzen™ Threadripper™ Pro 7955WX processor. These configurations boast unparalleled GPU compute power. For a complete list of supported graphics cards, configurations, and enablement requirements such as cables and power adapters, please refer to the Z6 G5 A QuickSpecs.

It is important to review and verify the power requirements for your desired graphics configuration. Specific configurations including graphics, processor, memory, and storage capacities, may be limited and are subject to power regulations depending on country and input voltage.

The HP Z6 G5 A stands as a robust solution for graphics-intensive workloads, ensuring not only current but also future performance needs. For detailed configuration guidance and further specifications, refer to the official Z6 G5 A QuickSpecs. If you have specific inquiries or need assistance, do not hesitate to contact the HPI sales representative.

Storage

Z by HP desktop workstations are designed to offer a diverse range of high-capacity storage options, including several installation positions that provide flexibility for customers based on their configuration needs. The Z6 G5 A supports AMD RAIDXpert2 for NVMe RAID management. For more information, refer to the [RAID Whitepaper](#).

Z6 G5 A provides the several storage options and benefits to our customers:

Front-Accessible Storage

This device is configured with QX448, an HP-unique storage solution designed in partnership with CRU, to support up to four front-accessible, hot-swappable NVMe SSDs for easy access to your storage drives. The QX448 carrier comes equipped with lock & key to provide maximum security of your data as well as HP proprietary FANS software to allow for drive management. Each SSD can support up to 2TB. For more information, refer to [Front-Accessible Storage whitepaper](#). QX is not supported until 2024.



QX448 Carrier (NVMe SSD)

Onboard SSDs

In addition to the four front-accessible NVMe SSDs, Z6 G5 A also supports the most onboard SSDs in the Z by HP portfolio with four SSDs connectors directly on the system board. Of the four onboard SSDs, the upper two onboard connectors support PCIe Gen5 speeds while the lower two onboard connectors support PCIe Gen4 speeds. Each SSD can support up to 4TB.



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PCIe SSDs

For customers with high storage capacity needs, Z6 G5 A supports Z Turbo Dual Pro and Quad Pro carriers for additional storage expandability. These carriers can be configured out of factory or as after-market options. Quad Pro will be available in early 2024.



Z Turbo Dual Pro Carrier



Z Turbo Quad Pro Carrier

SATA HDDs

Z6 G5 A supports up to two SATA 3.5" 7500 RPM HDDs with each drive providing up to 12TB storage capacity. Both HDD positions can only be accessed internally to the system. The Z6 G5 A supports AMD RAIDXpert2 for NVMe RAID management. For more information, refer to the [RAID Whitepaper](#).

Input/Output

Flex-IO Interface

The HP Z6 G5 A includes a HP-proprietary Flex-IO interface in the rear of the system which grants customers the unique ability to customize their rear I/O ports without using additional PCIe slots or USB ports with external adapters. The Flex-IO interface can support up to (1) of the following (optional) Flex-IO Modules: Serial Port v3, Dual USB-A 3.2 Gen1, USB-C 3.2 Gen2, 10GbE RJ45 LAN single port, 2.5GbE RJ45 LAN single port, 1GbE LC Fiber single port, 1GbE RJ45 LAN single port, or a Wi-Fi6 + BT5.3 WLAN (to make use of the newest integrated antenna).



Networking Options

Integrated:

The HP Z6 G5 A includes one (1) built in 1GbE Ethernet port (RJ45). This port can be used for a standard network connection, and it is the only port through which DASH manageability features operate.

Flex-IO:

The HP Z6 G5 A rear I/O area provides a Flex-IO module connector (see above) which can support up to (1) (optional) Flex-IO Module including the following networking options: 10GbE RJ45 LAN single port, 2.5GbE RJ45 LAN single port, 1GbE LC Fiber single port, 1GbE RJ45 LAN single port, or a Wi-Fi6 + BT5.3 WLAN (to make use of the newest integrated antenna). This is one of the many ways HP provides customers with the unique ability to customize their rear I/O ports without using additional PCIe slots or USB ports with external adapters.

PCIe Add-In Card:

The HP Z6 G5 A is compatible with a wide variety of PCIe add-in cards for networking expansion. How many cards may be installed depends on the system configuration. Assuming sufficient PCIe expansion slots are available, the HP Z6 G5 A can accommodate one or multiple of the following add-in cards: 1GbE LC fiber optic single port, 1GbE RJ45 dual port or quad port, 2.5GbE RJ45 single port (Note: Not available at launch; available early 2024), 10GbE RJ45 dual port, 10GbE (SFP+) or 25GbE (SFP28) fiber optic dual port, or Wi-Fi 6E + BT5.2 with an external antenna.



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Network Header:

The HP Z6 G5 A includes a dedicated connector for a Dual Port 10GbE RJ45 network module. This module communicates using PCIe protocol but connects through a customized connector that does not occupy a PCIe expansion slot. This unique architecture enables significant networking expansion without sacrificing any traditional PCIe slot expandability.

Wired LAN			N/A			
	AT-2911T/2-901 (1 GbE)	AT-2914SX/LC (1 GbE)	Intel I226-T1 (2.5 GbE)	Intel X550-T2 (dual 10 GbE)	HP Dual 10GbE	NVIDIA Mellanox ConnectX-6 DX (dual 10 GbE / 25 GbE)

Wi-Fi Options

Wi-Fi can be enabled on the HP Z6 G5 A using either a Flex IO module (must be selected in initial purchase) that connects to an internally integrated antenna, or using a PCIe add-in card that connects to an external antenna. Wi-Fi 6E is only available with the PCIe add-in card. Wi-Fi 6E offers additional frequency ranges compared to Wi-Fi 6 and can thus increase speeds and reduce latency by alleviating congestion.

Wi-Fi 6 vs. 6E hardware

- For Wi-Fi 6E, configure your system with the PCIe Wi-Fi 6E + BT5.2 add in card that includes an external antenna (3 foot (0.9m) long cord to a 5 inch (13cm) tall antenna).
- For Wi-Fi 6, configure your system with the Wi-Fi6 + BT5.3 WLAN wireless card Flex-IO module (see above) that includes an integrated internal antenna.

Wireless		N/A
	Intel AX210 Wi-Fi 6E	HP RZ616 Wi-Fi 6

USB Options

Front: On the front I/O area, the HP Z6 G5 A can be configured two ways.

- The Entry Front I/O option provides 4 USB 3.1 Gen1 Type-A port (the left-most supports battery charging), combo headset/microphone jack, and the option for an SD card reader.
- The Premium Front I/O option provides 1 USB3.2 Gen2x2 Type-C® port, 2 USB3.1 Gen1 Type-A port (the left-most supports battery charging), combo headset/microphone jack, and the option for an SD card reader.

Rear: In the rear I/O area, the HP Z6 G5 A provides 4 USB 3.1 Gen1 ports via a hub and 2 direct USB3.2 Gen1 port. The HP Z6 G5 A rear I/O area also provides a Flex-IO module connector (see above) which can support up to (1) (optional) Flex-IO Module including the following USB options: Dual USB-A 3.2 Gen1 or USB-C® 3.2 Gen2.

Internal: The HP Z6 G5 A provides an internal 1-port USB3.0 header (can be configured with optional front SD card reader) and an internal 1-port USB2.0 header.



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Thunderbolt™ 4

The HP Z6 G5 A can be outfitted with the (optional) HP Dual Port Thunderbolt™ 4 Low Profile PCIe add-in card*. Thunderbolt™ 4 unleashes the power of your computer processor by always offering up to 40Gb/s of data and video performance. With the HP Thunderbolt™ 4 card, connect up to two 4K displays or one 8K display and connect accessories with two downstream Thunderbolt™ 4 ports that support storage speeds up to 3,000 MB/s with Intel® VT-d based direct memory access (DMA) protection for security.

* Thunderbolt and the Thunderbolt logo are trademarks of Intel® Corporation in the U.S. and/or other countries.

*Thunderbolt™ 4 will be available on the HP Z6 G5 A in early-2024.



Manageability

AMD Pro Manageability

A simple manageability solution that is Open Standards-based. It follows the DMTF DASH Standard.

- **AMD Manageability DASH:** Provides all the industry standard DASH remote manageability features. Boot Control, remote power control, asset management, hardware information, event indications and more.
- **AMD Manageability KVM:** The LAN chip from Realtek allows for OS KVM Redirection without integrated graphics in the CPU.

Remote Consoles include Realtek Management Console, AMD Management Console, and DASH CLI to allow both scripting for IT administrators and GUI to manage a system or many systems.

HP Remote System Controller

With dedicated onboard connectors, HP Z6 G5 A provides server-grade remote manageability in a desktop workstation. The HP Remote System Controller is the world's first software-defined remote management solution for PCs and can be installed internally (as PCIe add-in card) or externally to grant IT Administrators with unparalleled control over their fleet of remote workstations.





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OS/Software

HP Z6 G5 A supports the following preinstalled operating systems from factory: Windows 11 Pro, Ubuntu 22.04 (future support for 24.04) and HP Linux®-ready (minimal OS ready for customer OS installation). HP will only support Windows 10 Pro as it pertains to softpaqs and qualified Windows 10 driver packs on HP.com (coming in early 2024). Windows 10 Pro is not supported with AMD Ryzen™ Threadripper™ Pro 7995WX.

For additional information on system support plan, refer to [Windows Server Installation whitepaper](#) or [Linux Hardware Matrix whitepaper](#).

Summary

Discover the power of the HP Z6 G5 A workstation and revolutionize your workflow. The HP Z6 G5 A is designed to stay cool and quiet under high-end professional workflows. Built on the next-generation AMD Ryzen™ Threadripper™ Pro 7000WX series architecture, HP Z6 G5 A delivers peak performance to enable users to analyze increasingly complex datasets and models by supporting up to 96C in a single processor, multiple high-end graphics cards, or 1TB of DDR5 memory, while supporting flexible configuration options so your workstation remains future-proof to expand to your needs over time.

Resources, Contacts, or Additional Links

For additional information on HP products, please visit our [whitepaper learning hub](#). This site includes white papers on Thermals, RAID, Front Removable, OS, Mil-Spec, Rack Mounting, Graphics, Memory, etc. Learn more at <https://www.hp.com/us-en/workstations/z6-a.html>.

Disclaimers:

- Optional, configurable features. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35GB is reserved for system recovery software.
- Testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.
- Applies to HP PCs, Workstations and Displays manufactured after January 2019. Based on most Gold and Silver EPEAT® registrations by meeting all required criteria and achieving 50-74% of the optional points for EPEAT® Silver and 75-100% of the optional points for EPEAT® Gold according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.
- Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 EPEAT® standard.
- Applies to HP PCs, Workstations and Displays manufactured after January 2019. Based on most Gold and Silver EPEAT® registrations. Status varies by country. Visit www.epeat.net for more information.
- Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. AMD's numbering is not a measurement of clock speed.
- Graphics are sold separately or as an optional feature.
- Optional, configurable feature.
- HP Wolf Security for Business requires Windows 10 Pro or higher, includes various HP security features and is available on HP Pro, Elite and Workstation products. See product details for included security features and OS requirement.
- Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.
- Internet access required. Automation of tasks and viewing system information only available with select Z desktop workstations, see datasheet for details. Fleet management and viewing of consolidated reports from all devices requires HP Remote System Management. HP Remote System Controller not compatible with Z2 Mini platforms and not recommended for non-Z devices. HP service and support not available for non-Z devices. Full suite of hardware alerts available with select Z desktop workstations. See datasheet for details.
- Applies to HP PCs, Workstations, and Displays manufactured after January 2019. Based on most Gold and Silver (including Climate+) EPEAT® registrations and according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.

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