Mac Pro (2019) - Technical specifications



Processor
Configure from an 8-core to 28-core Intel Xeon W processor

- **8-Core**
  - 3.5GHz Intel Xeon W
  - 8 cores, 16 threads
  - Turbo Boost up to 4.0GHz
  - 24.5MB cache
  - Supports 2666MHz memory
- **12-Core**
  - 3.3GHz Intel Xeon W
  - 12 cores, 24 threads
  - Turbo Boost up to 4.4GHz
  - 31.25MB cache
  - Supports 2933MHz memory
- **16-Core**
  - 3.2GHz Intel Xeon W
  - 16 cores, 32 threads
  - Turbo Boost up to 4.4GHz
  - 38MB cache
  - Supports 2933MHz memory
- **24-Core**
  - 2.7GHz Intel Xeon W
  - 24 cores, 48 threads
  - Turbo Boost up to 4.4GHz
  - 57MB cache
  - Supports 2933MHz memory
- **28-Core**
  - 2.5GHz Intel Xeon W
  - 28 cores, 56 threads
  - Turbo Boost up to 4.4GHz
  - 66.5MB cache
  - Supports 2933MHz memory

Memory
Configure up to 1.5TB of DDR4 ECC memory in 12 user-accessible DIMM slots

- **32GB**
  Four 8GB DIMMs
- **48GB**
  Six 8GB DIMMs
- **96GB**
  Six 16GB DIMMs
- **192GB**
  Six 32GB DIMMs
- **384GB**
  Six 64GB DIMMs

- **768GB**
  Six 128GB DIMMs or 12 64GB DIMMs
- **1.5TB**
  12 128GB DIMMs
  Requires 24-core or 28-core processor.

8-core processor operates memory at 2666MHz.
12-core to 28-core processors operate memory at 2933MHz.

Graphics
Configure two MPX Modules with up to four GPUs

- **AMD Radeon Pro 580X**
  - 36 compute units, 2304 stream processors
  - 8GB of GDDR5 memory
  - Up to 5.6 teraflops single precision
  - Two HDMI 2.0 ports on card
  - Four DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for up to six 4K displays, two 5K displays, or two Pro Display XDRs
  - Half-height MPX Module fits in an MPX bay and enables PCIe slot 2 for additional expansion
- **AMD Radeon Pro W5500X**
  - 24 compute units, 1536 stream processors
  - 8GB of GDDR6 memory with 224GB/s memory bandwidth
  - Up to 5.6 teraflops single precision or 11.2 teraflops half precision
  - Two HDMI ports on card with support for 4K60
  - Two DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for up to four 4K displays, one 5K display, or one Pro Display XDR
  - Half-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth
- **AMD Radeon Pro W5700X**
  - 40 compute units, 2560 stream processors
  - 16GB of GDDR6 memory with 448GB/s memory bandwidth
  - Up to 9.4 teraflops single precision or 18.9 teraflops half precision
  - Four Thunderbolt 3 ports and one HDMI port on card with support for 4K60
  - Two DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for Display Stream Compression (DSC)
  - Support for up to six 4K displays, three 5K displays, or three Pro Display XDRs
  - Full-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth
- **AMD Radeon Pro Vega II**
  - 64 compute units, 4096 stream processors
  - 32GB of HBM2 memory with 1TB/s memory bandwidth
  - Up to 14.1 teraflops single precision or 28.3 teraflops half precision
  - Infinity Fabric Link connection enables two Vega II GPUs to connect at up to 84GB/s
  - Four Thunderbolt 3 ports and one HDMI 2.0 port on card
  - Two DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for up to six 4K displays, three 5K displays, or two Pro Display XDRs
  - Full-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth
- **AMD Radeon Pro Vega II Duo**
  - Two Vega II GPUs, each with 64 compute units and 4096 stream processors
  - 64GB of HBM2 memory (32GB per GPU), each with 1TB/s memory bandwidth
  - Up to 28.3 teraflops single precision or 56.6 teraflops half precision
  - Onboard Infinity Fabric Link connection connects the two Vega II GPUs at up to 84GB/s
  - Four Thunderbolt 3 ports and one HDMI 2.0 port on card
  - Four DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for up to eight 4K displays, four 5K displays, or four Pro Display XDRs
  - Full-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth
- **AMD Radeon Pro W6800X**
  - 60 compute units, 3840 stream processors
  - 32GB of GDDR6 memory with 512GB/s memory bandwidth
  - Up to 16.0 teraflops single precision or 32.0 teraflops half precision
  - Infinity Fabric Link connection enables two W6800X GPUs to connect at up to 84GB/s in each direction
  - Four Thunderbolt 3 ports and one HDMI port on card with support for 4K60
  - Two DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for up to six 4K displays, three 5K displays, or three Pro Display XDRs
  - Full-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth
- **AMD Radeon Pro W6900X**

- 80 compute units, 5120 stream processors
- 32GB of GDDR6 memory with 512GB/s memory bandwidth
- Up to 22.2 teraflops single precision or 44.4 teraflops half precision
- Infinity Fabric Link connection enables two W6900X GPUs to connect at up to 84GB/s in each direction
- Four Thunderbolt 3 ports and one HDMI port on card with support for 4K60
- Two DisplayPort connections routed to system to support internal Thunderbolt 3 ports
- Support for up to six 4K displays, three 5K displays, or three Pro Display XDRs
- Full-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth

- **AMD Radeon Pro W6800X Duo**
  - Two W6800X GPUs, each with 60 compute units and 3840 stream processors
  - 64GB of GDDR6 memory (32GB per GPU), each with 512GB/s memory bandwidth
  - Up to 30.2 teraflops single precision or 60.4 teraflops half precision
  - Onboard Infinity Fabric Link connection connects two W6800X GPUs at up to 84GB/s in each direction; external Infinity Fabric Link connection enables two W6800X Duo modules to connect four W6800X GPUs
  - Four Thunderbolt 3 ports and one HDMI port on card with support for 4K60
  - Four DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for up to eight 4K displays, four 5K displays, or six Pro Display XDRs
  - Full-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth

- **AMD Radeon Pro W6600X**
  - 32 compute units, 2048 stream processors
  - 8GB of GDDR6 memory with 256GB/s memory bandwidth
  - Up to 9.8 teraflops single precision or 19.6 teraflops half precision
  - Two HDMI ports on card with support for 4K60
  - Up to four DisplayPort connections routed to system to support internal Thunderbolt 3 ports
  - Support for up to four 4K displays, one 5K display, or two Pro Display XDRs
  - Half-height MPX Module fills an MPX bay and uses extra power and PCIe bandwidth

Power Supply
1.4 kilowatts

- **Maximum continuous power:**
  - 1280W at 108–125V or 220–240V
  - 1180W at 100–107V

Expansion Slots
Eight PCI Express expansion slots

- **Two MPX Modules or up to four PCI Express card slots**
  Each MPX bay provides:
  - x16 gen 3 bandwidth for graphics
  - x8 gen 3 bandwidth for Thunderbolt
  - DisplayPort video routing
  - Up to 500W power for an MPX Module

  Alternatively, each MPX bay can support:
  - One full-length, double-wide x16 gen 3 slot and one full-length, double-wide x8 gen 3 slot (MPX bay 1)
  - Or two full-length, double-wide x16 gen 3 slots (MPX bay 2)
  - Up to 300W auxiliary power via two 8-pin connectors
- **Three full-length PCI Express gen 3 slots**
  - One x16 slot; two x8 slots
  - 75W auxiliary power available
- **One half-length x4 PCI Express gen 3 slot with Apple I/O card installed**

Apple Afterburner
ProRes and ProRes RAW accelerator card

- PCI Express x16 card
- Accelerates ProRes and ProRes RAW codecs in Final Cut Pro, QuickTime Player X, and supported third-party apps
- Supports system playback of up to 6 streams of 8K ProRes RAW or up to 23 streams of 4K ProRes RAW[1]

Storage
Configure up to 8TB of SSD storage[2]

- **256GB SSD**
  One 256GB module
- **512GB SSD**
  One 512GB module
- **1TB SSD**
  Two 512GB modules

- **2TB SSD**
  Two 1TB modules
- **4TB SSD**
  Two 2TB modules
- **8TB SSD**
  Two 4TB modules

Up to 3.4GB/s sequential read and 3.4GB/s sequential write performance.
Storage encrypted by the Apple T2 Security Chip.

Input/Output
I/O card installed in the half-length x4 PCI Express slot with:

- **Two USB 3 ports**
  - Support for USB-A (up to 5Gb/s)
- **Two Thunderbolt 3 ports**
  - Support for Thunderbolt 3 (up to 40Gb/s)
  - Support for USB-C (up to 10Gb/s)
  - Support for DisplayPort
- **Two 10Gb Ethernet ports:**
  - Support for 10Gb Ethernet performance over copper cabling
  - Support for Nbase-T industry standard: 1Gb, 2.5Gb, 5Gb, and 10Gb Ethernet link speeds using RJ-45 connectors

Additional Connections
Two Thunderbolt 3 ports on the top of the tower enclosure

- Support for Thunderbolt 3 (up to 40Gb/s)
- Support for USB-C (up to 10Gb/s)
- Support for DisplayPort

Audio

- Built-in speaker
- 3.5 mm headphone jack with headset support

Input Devices

- Magic Keyboard with Numeric Keypad (silver and black)
- Magic Mouse (silver and black)
- Optional Magic Trackpad (silver and black)

Wireless

- **Wi-Fi**
  802.11ac Wi-Fi wireless networking
  IEEE 802.11a/b/g/n compatible
- **Bluetooth**
  Bluetooth 5.0 wireless technology

Enclosure

- Mac Pro tower enclosure with feet; configurable to tower with wheels

Dimensions

- Height: 20.8 inches (52.9 cm)
- Width: 17.7 inches (45.0 cm)
- Depth: 8.58 inches (21.8 cm)
- Height with optional wheels: 21.9 inches (55.7 cm)

Weight[3]

- 39.7 pounds (18.0 kg)

Electrical and Operating Requirements

- Line voltage: 100–125V AC at 12A; 220–240V AC at 6A
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: tested up to 16,400 feet (5000 meters)

In the Box

- Mac Pro
- Magic Keyboard with Numeric Keypad
- Magic Mouse
- USB-C to Lightning Cable (1 m)
- Power cord (2 m)

Operating System
macOS
macOS is the most advanced desktop operating system in the world. macOS Ventura makes the things you do most on Mac even better, so you can work smarter, play harder, and go further.
Learn more about latest operating system

Accessibility
Accessibility features help people with disabilities get the most out of their new Mac Pro. With built-in support for vision, hearing, mobility, and learning, you can create and do amazing things.
Learn more about accessibility

Features include:

- Voice Control
- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Live Captions

Built-in Apps[4]

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- News
- Stocks
- Home
- Voice Memos
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- Books
- App Store
- Time Machine
- TV
- Music
- Podcasts
- Find My
- Freeform
- QuickTime Player
- Shortcuts

Kits and Accessories
Displays

- Pro Display XDR
- Studio Display

Graphics

- Radeon Pro W5500X MPX Module Kit
- Radeon Pro W6600X MPX Module Kit
- Radeon Pro W5700X MPX Module Kit
- Radeon Pro Vega II MPX Module Kit
- Radeon Pro Vega II Duo MPX Module Kit
- Apple Afterburner Kit
- Radeon Pro W6800X MPX Module Kit
- Radeon Pro W6900X MPX Module Kit

- Radeon Pro W6800X Duo MPX Module Kit

Memory

- Apple 16GB DDR4 ECC Memory Kit
- Apple 32GB DDR4 ECC Memory Kit
- Apple 64GB DDR4 ECC Memory Kit
- Apple 128GB DDR4 ECC Memory Kit
- Apple 256GB DDR4 ECC Memory Kit

Storage

- Apple 1TB SSD Kit
- Apple 2TB SSD Kit
- Apple 4TB SSD Kit
- Apple 8TB SSD Kit
- Promise Pegasus R4i 32TB RAID MPX Module Kit
- Promise Pegasus J2i

Mac Software

- Final Cut Pro
- Logic Pro

Other Accessories

- AppleCare+ for Mac
- Feet Kit
- Wheels Kit
- Belkin Lock Adapter for Mac Pro
- Belkin AUX Power Cable Kit for Mac Pro
- Logitech Pro Magnetic Webcam

Acoustic Performance
Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ **(B)**	**Sound Pressure Level Operator Position** $L_{pA,m}$ **(dB)**
Idle	2.7 (K_V = 0.3)	11
Wireless web	2.7 (K_V = 0.3)	11

1. $L_{WA,m}$ is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2. $L_{pA,m}$ is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4. K_V is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity, $L_{WA,c}$ (formerly called L_{WAd}) may be computed from the sum of $L_{WA,m}$ and K_v.
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 3.5GHz 8-core Intel Xeon W processor, 32GB (4X8GB) memory, Radeon Pro 580X MPX Module, 256GB SSD.

Mac Pro and the Environment
Apple takes a complete product life cycle approach to determining our environmental impact. Learn more about Mac Pro and the Environment

Mac Pro is designed with the following features to reduce its environmental impact:

Made with better materials

- Enclosure made with low-carbon aluminum

Responsible packaging

- Recyclable, majority-fiber packaging
- 100% of primary wood fiber comes from responsibly managed forests

Energy efficient

- Meets ENERGY STAR requirements[5]

Smarter chemistry

- BFR-, PVC-, and beryllium-free

1. Testing conducted by Apple in November 2019 using preproduction 2.5GHz 28-core Intel Xeon W-based Mac Pro systems with 384GB of RAM and dual AMD Radeon Pro Vega II graphics with Infinity Fabric Link and 32GB of HBM2 each, configured with Afterburner and a 4TB SSD. Mac Pro systems tested with an attached 5K display. Tested with Final Cut Pro 10.4.7 using a 50-second picture-in-picture project with 6 streams of Apple ProRes RAW video at 8192x4320 resolution and 29.97 frames per second, a 50-second picture-in-picture project with 23 streams of Apple ProRes RAW video at 4096x2160 resolution and 29.97 frames per second, and a 5-minute picture-in-picture project with 16 streams of Apple ProRes 422 video at 4096x2160 resolution and 30 frames per second. Performance tests are conducted using specific computer systems and reflect the approximate performance of Mac Pro.
2. Testing conducted by Apple in November 2019 using preproduction 2.5GHz 28-core Intel Xeon W-based Mac Pro systems with 384GB of RAM and a 4TB SSD. Mac Pro systems tested with an attached 5K display. Tested with FIO 3.16, 1024KB request size, 150GB test file and IO depth=8. Performance tests are conducted using specific computer systems and reflect the approximate performance of Mac Pro. 1GB = 1 billion bytes; 1TB = 1 trillion bytes; actual formatted capacity less.
3. Weight varies by configuration and manufacturing process.
4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
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