Inside the new Apple Mac Pro: an in-depth look at Apple's most powerful hardware yet

We've learned a lot about Apple's new pro workstation at WWDC – including what really might make them a success in a way that wasn't possible before.

Apple's Mac Pro is more than just a return to tower workstations, it's a stake in the ground. It's an attempt by Apple to say 'we can do unashamed power too', rather than balancing performance against other considerations such as sleekness, portability and unique design.

It's not a move Apple's been able to do by itself – their choice of components have meant that it's had to bring the developers of your favourite creative apps and rendering engines along with its plans, from Adobe and Autodesk to Maxon and OTOY. But the end result is an ultra-powerful desktop and display that no-one's going to discount as 'just another Mac'.

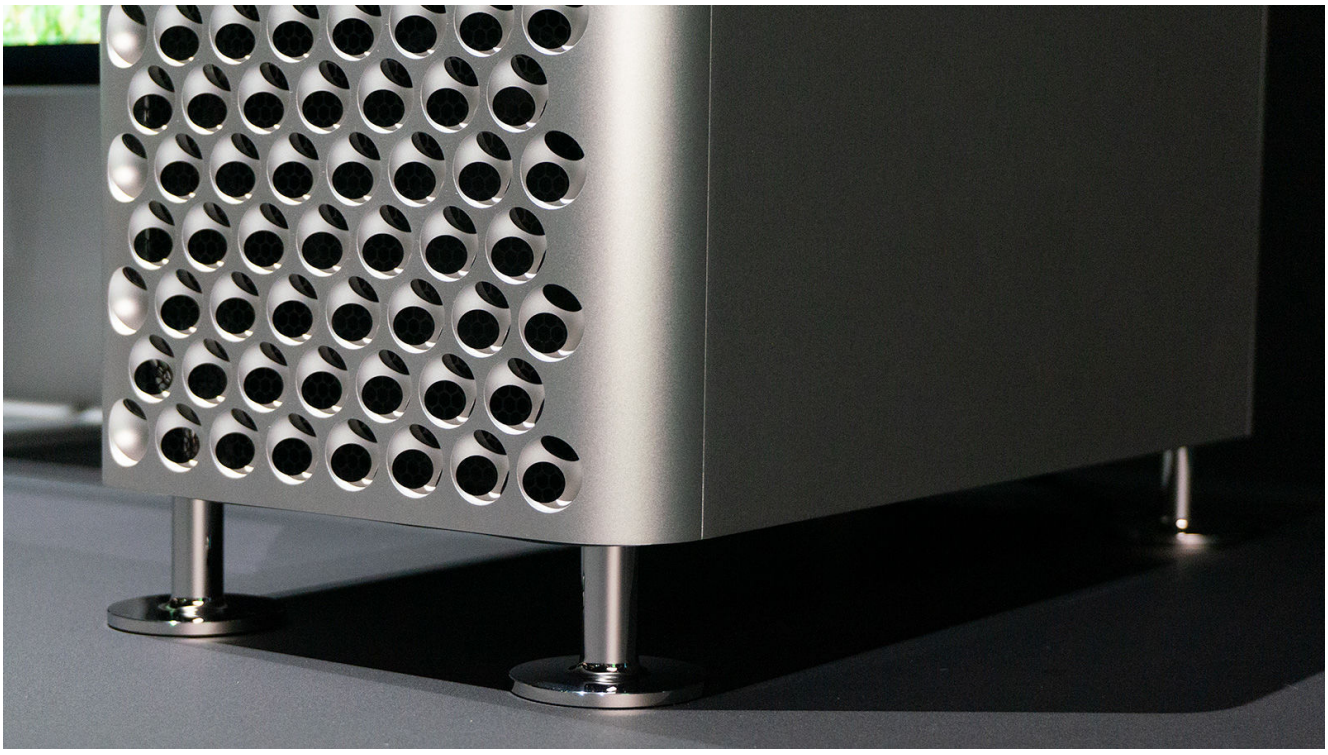
After spending a few days here at WWDC, watching the keynote, getting some hands-off-but-you-can-look-and-ask-questions time with both and seeing how Apple is presenting the products in the context of how they expect them to be used, we've had chance to learn a lot about the Mac Pro and Pro Display, and get a real feel for what they're made of (and for). So here's an in-depth look at what they offer – and to who.

Apple has been talking about a redesigned, upgraded Mac Pro since 2017 – but now we've finally seen what the company has been working on at its WWDC conference in San Jose. But if you want to get your hands on one, you'll have to wait a while longer – as it won't ship until the autumn.

The 2019 Mac Pro ditches the 'dustbin' look of the 2013 model,

returning to a variation of the ‘cheesegrater’ aluminium design it used for the model from its initial launch in 2006 until 2012 – a design that drew on older Mac desktops for creative pros going back to the original PowerMac G3. It’s an upgradable modular design that lets you add or swap out components over time.

The lattice of circular holes that open into a three-dimensional web of more holes on the front and back of the Mac Pro – and the back of the Pro Display – is less about aesthetics and more a way to deliver the kind of airflow and heat dissipation that this workstation and display needs. It’s not an unappealing design – unless you have trypophobia – drawing more on architecture than conventional product design. It’s functional, not beautiful. Dieter Rams would probably have loved it.



Twist the top and slide off the chassis in a single graceful motion and I could see that you have quick access to both sides of the motherboard. Most of the components are hidden under plastic flowguards, but these apparently pop off easily to give you access. On the left side (from the front), you can

access the RAM. On the right, there's a conventional motherboard layout with eight PCI Express slots, and a 1.4kW power supply. The design means that cards, drives and memory can be replaced quickly and the workstation returned to use quickly. It's all so elegantly and cleanly designed – and cable free – making the inside of your average PC workstation look like a nest of vipers by comparison.

The same pragmatic approach is why Apple's offering a rack-mounted version, and Thunderbolt ports on the top for easy access, and optional wheels. There's been a lot of attention given to the wheels online and, yes, they do make the Mac Pro look like a drinks trolley, but pushing it around on them is easier than lifting it in certain studio or on-set setups – and again it's about Apple showing that it's thinking of the needs of its highest-end users (and those who aspire to be one of them).



Those controversial, optional wheels.

At the heart of the 2019 Mac Pro is a new, second-generation Intel Xeon W-series processor, which Intel formally announced to coincide with Apple's launch. There are nine chip models in the range, and Apple is offering five of them with a choice of

8, 12, 16, 24 and 28 cores.

The second-gen W-series processors are based on Intel's Cascade Lake architecture – and the main changes from the first generation that Apple currently offers in the iMac Pro is that you no longer need to compromise on clock speed if you want more cores. The first-gen 28-core processor, the Xeon W-3175X, ran at 3.1GHz. Using Intel's Turbo Boost technology to raise the speed when fewer cores we being used, this could be pushed up to 3.8GHz. If you wanted faster clock speeds – as many creative applications run better with faster chips rather than more cores – you could get a 10-core chip that ran at 3GHz (4.5GHz Turbo Boosted).

With the new W-series, the 28-core chips still have lower base speeds than the 12- or 16-core models (2.5GHz vs between 3.2- and 3.7GHz) but they can all go as high as 4.4GHz through Turbo Boost. And Intel is debuting a new version of Turbo Boost – v3.0 – that can push speeds even further, up to 4.6GHz.

The end results is that you no longer have to decide between having a fast chip that's better for real-time, creative work and a high-core chip that'll delivers faster results when rendering. The decision becomes all about your budget and requirements.

No other workstation vendor is currently offering, but we'd expect to see updates to Dell's Precision, HP's Z-series and Lenovo's ThinkStation workstations to offer the new chips soon – possibly before the Mac Pro ships in the autumn.



There are eight PCI Express slots: one half-length slot in which Apple places I/O board with two Thunderbolt 3 ports, two USB 3.0 ports and a headphone socket (which you can see *above*); three single-height slots; and four double-height slots. Above this is a USB port where you can securely place dongles for apps like Pro Tools.



Image: Apple

Two of the double height slots have a proprietary PCIe

connector next to them that gives Thunderbolt 3 throughput and up to 475W of power, so you can plug in cards that support this without having unsightly cables running through the insides of your workstation. Apple calls the cards that plug into these MPX modules – and there will be three graphics cardfs available on launch that support this tech. There's an entry-level – if anything at this end of the workstation market can be called entry-level – AMD Radeon Pro 580X with 36 compute units and 8GB of RAM.

Above this is the Radeon Pro Vega II with 64 compute units and 32GB of HBM2 memory (which has a 1TBps memory bandwidth). And then there's the Radeon Pro Vega II Duo – which is essentially two Vega II cards on the same board.

With support for up to two MPX modules you could put in two Vega II Duo cards for a computer than Apple says outclasses a workstation with three of Nvidia's most powerful graphic cards, the RTX 8000.

You can add other AMD boards, using a traditional power connector and just the PCI Express slot. You can even add Nvidia boards, though these won't work with MacOS – only Windows through Boot Camp (and Linux, if you like installation hassles).



The base Mac Pro chassis

Sticking with AMD as their only graphics card partner could have been a risky strategy for Apple if it wanted to sell the Mac Pro to studios working with 3D and VFX. GPU-accelerated 3D rendering through Arnold, Octane, Redshift or V-ray typically requires an Nvidia graphics card, as they use that company's CUDA and/or Optix technologies for GPU acceleration – or run significantly faster on Nvidia cards using CUDA/Optix than AMD ones using the open sources OpenCL standard.

However, alongside the launch, new Redshift owner Maxon and OTOY, developer of Octane, confirmed in an Apple press release they were working on versions of their renderers that will use Apple's Metal technology for performance at least on a par with the Windows/Nvidia version. Autodesk's Arnold GPU is still in beta, and the company didn't mention it by name when saying it's working on Mac Pro-specific updates to AutoCAD, Maya, Fusion and Flame. However, Chaos Group, which showed both its V-ray GPU and its Project Lavina real-time raytracing application in the same conference centre as WWDC back in March at Nvidia's GTC conference, told us that "we have taken a careful look at Metal for providing GPU acceleration, and we do not feel it's sufficient for the requirements of our products at this time."

The other application developers lining up to promise support for the Mac Pro included those in the areas you'd expect such as video editing, including Blackmagic and Adobe (as well as what appeared to be an as-yet-unreleased version of Final Cut Pro). Others seemed more excited by the Pro Display XDR – including Foundry, Serif and Pixelmator. More on that later.



The Mac Pro and two Pro Monitor XDRs editing 8K footage.

Video editors will also appreciate Apple's Afterburner card – or at least any working with 8K footage will. This add-in card that takes up one of the PCI Express x16 slots and is designed to let you edit ProRes RAW footage in real-time in Final Cut Pro: up to 3 streams of 8K or 12 streams of 4K.

If this sounds niche, it is. But the card is programmable, so Apple could add support for other video editing applications – or even tasks in other creative areas such as rendering. Oddly, while pricing has been announced for the Mac Pro – or a 'from' price of US$5,999 (around £4,700) – Apple isn't telling us the price of the Afterburner card yet.

The Mac Pro supports up to 1.5TB of RAM, and up to 4TB of SSD storage. You will also be able to purchase RAID storage systems designed specifically for the Mac Pro, such as Promise's Pegasus R4i, which can fit up to four hard drives or SSDs.

Apple's 2019 Mac Pro answers many of the criticisms that been levelled at Apple for not producing a tower workstation. I do wish that there was a more affordable version for those who want the equivalent of a 5k iMac, but you can keep the

wonderful display when you upgrade – but for what the Mac Pro is, it’s impossible not to be impressed.

https://www.digitalartsonline.co.uk/features/creative-hardware/inside-new-apple-mac-pro-in-depth-look-at-apples-most-powerful-hardware-yet/