HP Z820 Teardown

Teardown of the HP Z820 Workstation on February 26, 2014.

Written By: Sam Goldheart

This document was generated on 2019-09-16 02:43:15 PM (MST).

INTRODUCTION

HP's flagship workstation is called super upgradeable, and touts "tool-free serviceability." Join us to see if this machine is too good to be true, or just what the doctor ordered!

Full disclosure: Generally speaking, iFixit will only perform a teardown on a device we've sourced ourselves through normal retail channels. This gives us the most unbiased, fair assessment of a device, without giving manufacturers a chance to pretty things up for our repairability scanners.

So when HP offered to loan us their pride and joy for the teardown altar, we were a bit hesitant. But in the end, we couldn't resist the chance to get inside this monster and see how it compares to Apple's new fancy mini-tower, the Mac Pro. We told HP to come as close as possible to Mac Pro's $3000 starting price, so it's not so much of an Apples to Oranges comparison.

Find our friendship on Facebook, cool contests and sweet photos on Instagram and digestible nuggets of wisdom on Twitter.

🔧 TOOLS:

- Phillips #2 Screwdriver (1)
- T15 Torx Screwdriver (1)

Step 1 — HP Z820 Teardown

- The Apple of HP's eye, the Z820 workstation is their biggest and baddest PC on the market, as well as the closest PC equivalent to Apple's new Mac Pro. So what can you get in your Z820?
  - 16 DIMM slots, configurable to half a Terabyte of ECC DDR3 RAM
  - Up to 5 3.5-inch 7200 rpm SATA drives for a 15 TB max
  - Three external 5.25" drive bays
  - A whole slew of graphics cards options, ranging from the entry-level Nvidia Quadro K600 our sample arrived with, to the $4500 Quadro K6000
  - Support for one or two Intel Xeon E5 processors
  - 3 x USB 3.0 and 5 x USB 2.0 ports, plus optional Thunderbolt 2 via add-in PCIe card

Step 2

- Before we get inside, let's take a minute to address the difference in size between the Z820 and the Mac Pro.

  - *Scale included for scale.*

- Hulking in at 17.5" x 8" x 20.7" and 55.4 pounds, the Z820 dwarfs our scale and makes photographing it a challenge.

- On the lesser hand, the diminutive Mac Pro is 9.9" tall, 6.6" across, and 16.4 pounds by our bathroom scale.

  - *We'll say it before the comments roll in, it looks like our scale isn't completely accurate at low weights, as Apple specs out the Mac Pro at 11 lbs. Not certified by department of weights and measures.*

Step 3

- Flip this, pull that, open it right up, the Z820's side panel pops off with the greatest of ease.

- Our motherboard's map is conveniently etched on the interior of the side panel, directing us to all of the riches, and the proper loading order for RAM installation.

  - We love a good treasure map, and HP seems happy to provide them.

- The Mac Pro features a similarly easy-to-open case, so we're one for one so far. But for how long?

Step 4

- Welcome to the [space station Z820](). Here you will find green-labeled access handles for all of your upgrade and maintenance needs:

  - Power supply unit

  - CPU fan assembly

  - Optical drive release lever

  - Lower case shroud

  - Hard drive release catches

- (i) Stowed away on the bottom we find clear evidence that this is no ordinary unit: this computer is "Property of Hewlett Packard Company," comes with a return address, and has some labeled specs that didn't quite line up with what's inside. (More on that soon!)

Step 5

- We understand that designing a complex device involves a lot of compromise and trade-off.

- When Apple decided to make the new Mac Pro compact and power-dense, they gave up a lot of the options that HP felt their top-of-line machine needed. Options like extensive, easily-upgraded internal storage (completely tool-free!), dual CPUs, a ridiculous maximum RAM capacity, optical drives, and user-upgradeable graphics cards.

- So what was HP's trade-off? A computer that weighs as much as a siberian husky.

Step 6

- Bulk and weight are certainly of interest, but this is iFixit, so let's talk repairability.

- Our Mac Pro guides show you everything you need to know to replace the power supply, in 26 easy steps.

- But what if you need to replace the power supply in your Z820? Remove scores of screws, some motherboard power connectors, flip some flops? ...oh wait, we're done.

  - (i) We're pretty sure this is gonna be a recurring theme for this tower, so we'll try our best not to overdo the repair-compares.

Step 7

- Continuing our tool-less streak, let's see what's behind these huge panels. The lower is a fairly featureless cover that keeps your PCIe cards separate and cozy.

- As for door number two's contents, if you follow us on Instagram, you'll have already seen this sweet piece of hardware.

- Provided by our Instagram followers, here's a list of things this component *isn't*:

  - A printer of some kind

  - A miniaturized Portal 2 level

  - Пылесос (vacuum cleaner)

  - That carbon 3d printer by max idontknowhislastname

- (i) Surprise, it's the CPU fan array! Home to two main fans aligned to the CPU heat sinks, and four smaller fans to help the RAM modules keep their cool.

Step 8

- As expected, getting the PCIe video card out of the Z820 was akin to stealing treats from an infant.

- The card HP dropped in our loaner box isn't much to write home about, but the upgrade potential is pretty great.

    - Users can install their own PCIe graphics card, or configure their Z820 with one of several different AMD or Nvidia cards.

    - ⓘ Oh and did we mention? They have guides for this upgrade, and loads more in their self-repair guide library. It's enough to make a fixer swoon.

- So to recap, that's an easy to upgrade card with a wealth of compatible options now and in the future. Not looking so great right now, Mac Pro.
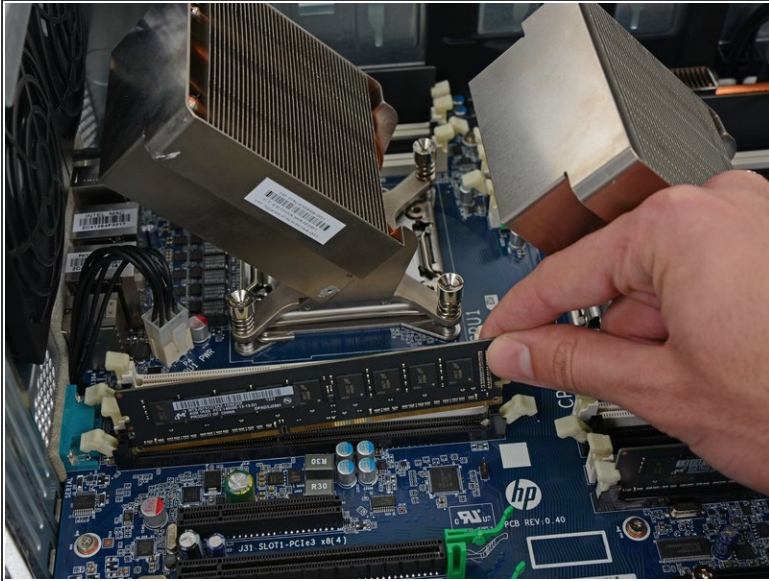
Step 9

- *Time for a break to stop and admire the scenery.*
  - *oooh*
  - *ahhh*
  - **Ahem.**
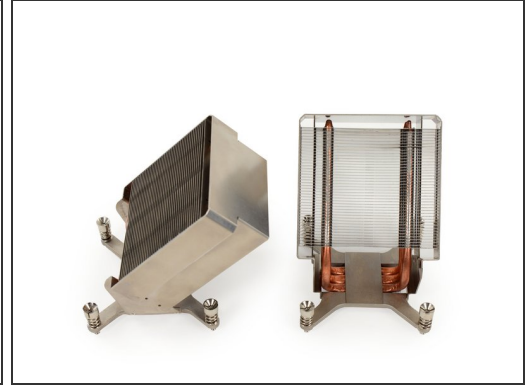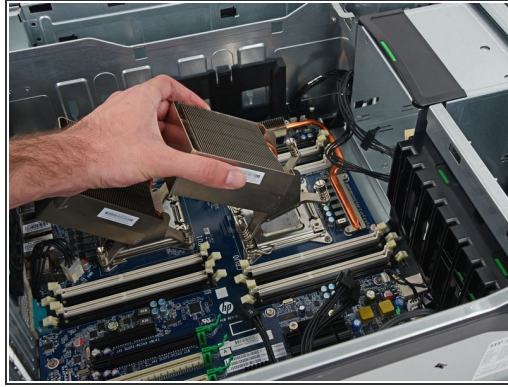- Right, of course, moving along.

Step 10

- A gentle tug on the drive release lever retracts spring-loaded pins from either side of the three drive bays, allowing us to easily free the filler block... full of turtles.*

- The same trick releases the DVD+/-RW drive. Ordinary it may be, but useful if you want to re-watch old favorites unavailable on Netflix streaming.

- ** No turtles were actually provided by Hewlett Packard. iFixit makes no express or implied warranty to the effect that the Hewlett Packard Z820 workstation PC includes turtles, but holds that it would be totally rad.*
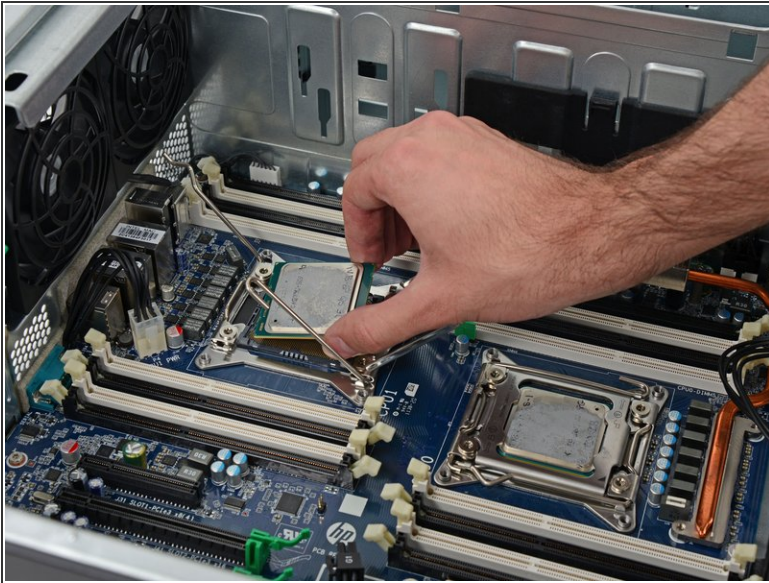
Step 11

- To get to the RAM, we had to open the case and remove the fan assembly—one more step than the Mac Pro, so we'll kick a point to Apple for being slightly easier in this respect.

- Once you do get to the treasure chamber, the Z820 has some mighty impressive upgrade opportunities.

- 16 DIMM slots are laid out with 4 individual channels over 8 slots per CPU. Fully loaded, you'll be sporting 512 GB of 8-channel ECC DDR3, up to 1866 MHz.

  - ⓘ You'll also be out over $10,000 for your efforts.

- For what it's worth, our unit came loaded with 4 sticks of Micron 4 GB DDR3, for 16 GB total.
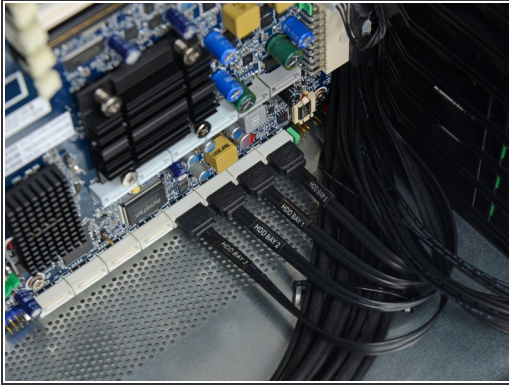
Step 12

- Screws ahoy! We got so far without tools, we almost forgot what they were, but we're finally busting out some bits to continue the disassembly.

- The CPU heat sinks are strapped in with combination flathead/T15 Torx screws. Pick your poison: the accessibility of flathead or the reliability of Torx. Neat!

- For big devices, we bust out the big tools. Our Macro Bit Set and ratcheting driver handle are the ideal team to pull out these ~~Patriot missile launchers~~ finely finned heat sinks.
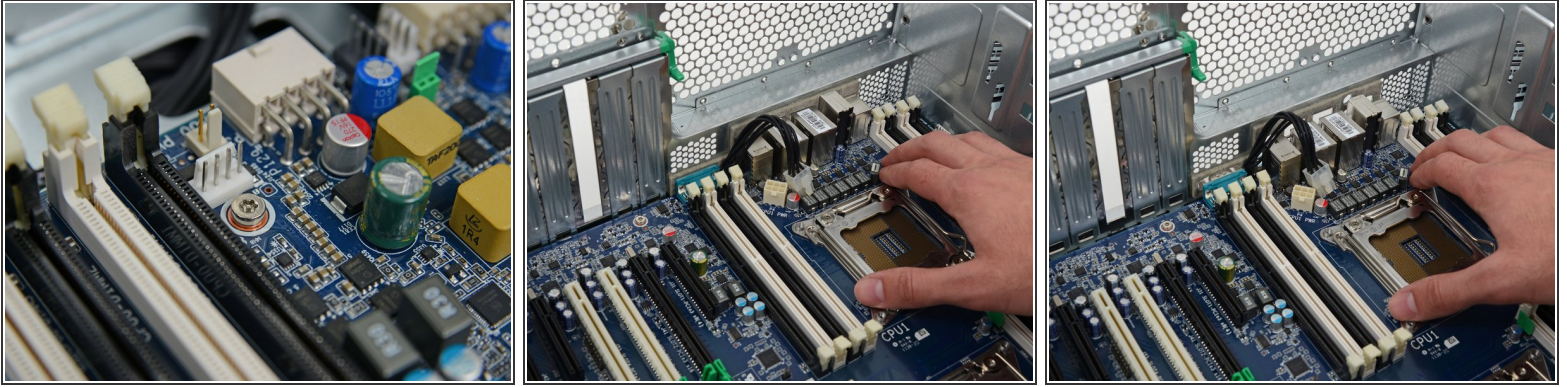
Step 13

- 'Sinks off, CPUs out. What's our ~~cereal box~~ PC prize to be?

- A pair of Intel Confidential Xeon E5-2602 quad core processors!

  - The Intel Confidential stamp indicates that these are engineering sample processors, loaned out to folks (like HP) who'll be designing computers and applications utilizing its new tech before it hits the market.

  - ⓘ That's something you won't find in your run-of-the-mill retail option.

Step 14

- Sights set on the motherboard, we've got to do a bit of housework to get it extractable.

- The hard drive SATA cables are all neatly labeled, and routed out of the way to the opposite side of the case.

- A fan assembly between the motherboard and hard drive cage is sporting that friendly user-serviceable green we love to see. A bit of prying and we pull them out, clearing the way to the motherboard.

This document was generated on 2019-09-16 02:43:15 PM (MST).

Step 15

- What's this? Security screws? We reluctantly followed this red herring, only to discover HP's engineers had an easier solution in mind.

- Don't touch that [security driver](#), these screws actually stay in place and the entire motherboard assembly slides forward on locking pegs.

- (i) Close call for its repairability score, but it looks like the Z820 was discouraging the removal of these screws for the right reasons.

Step 16

- [Safe cracked](#), motherboard extracted. Let's see what we got:
  - Intel C602 Chipset

  - Support for one or two Intel Xeon processors

  - Three integrated SATA RAID controllers, with 2, 4, and 8 channels

  - Loads of expansion slots, from the newest PCI Express Gen3 x 16 to legacy PCI for maximum compatibility

  - Dual integrated Intel GbE LAN

Step 17

- After tunneling through the motherboard we realized the second side panel was hiding a secret compartment. A few failed attempts to open the hidden door reminded us that HP had our backs with their repair documentation.

- Lo and behold there were some screws we'd missed and a sliding action we hadn't gotten quite right. Surprising no one, it's a lot easier to work on a machine that has a service manual!

- Popping the side panel, we find some nicely bundled cables routed along the interior wall to poke into the main compartment. HP is good at this spring cleaning thing.

- The front panel is now free to leave, allowing access to the power buttons and some port action.

Step 18

- HP Z820 Repairability Score: **10 out of 10** (10 is easiest to repair)
  - The Z820 is insanely modular, even for a PC desktop, and full of user-replaceable and upgradeable parts.
  - A whole mess of parts can be pulled out without touching a screwdriver: power supply, hard drives, RAM, optical drives, PCI expansion cards, motherboard assembly, and several fans.
  - The heat sink screws are combination flathead/Torx, which pairs accessibility with quality.
  - Lots of room for upgrades means lots 'o' service from this machine.
  - HP created and shares an entire set of repair and replacement manuals with the world, empowering anyone to fix their workstations. Way to go HP!

To reassemble your device, follow these instructions in reverse order.

www.iFixit.com