General Info

I'm starting here because this is, by far, the most common server people will want.

Simply put, it's a device that centralizes storage on your network. There's a lot to say about the software side but not actually a whole lot to discuss for the hardware.

Your best bet here would be either an old PC that you already have that's collecting dust or a new mini PC. You very well could even get by with just a SBC.

If you're looking to buy new hardware, I'd recommend going to the Mini PCs sub Reddit and look at the spreadsheet (posted here) comparing mini PCs. Alternatively, you could just get something like the ZimaBlade.

I do **not** recommend prebuilt NAS devices anymore, unless you are just super desperate to trade money for effort on setting it up. If you really need to go this route, Synology is currently the big dog in this arena but be sure to do your own research. Know that you will absolutely save money rolling your own storage solution.

Something worth noting is that, there's basically three routes to massive storage.

The absolute cheapest is USB enclosures. You can get 5 bay and 8 bay Syba USB enclosures for a lot cheaper than you can add that many hard drives to a server through literally any other method known to man. However, the caveat is that hardware RAID absolutely will not work with it. Software RAID still works just fine though. You might also encounter performance and reliability issues but the enclosures I recommend shouldn't really have much of an issue in that regard. It's worth noting that you need 5 (1 parity, 4 data) hard drives to max out single disk parity/raid and 8 (1 parity, 7 data) hard drives each for each additional disk worth of parity. I should mention that the second parity disk upgrades the total data disks from 4 max to 14 max. I don't know the specifics of why the first parity disk by itself only handles 4 data disks vs 7 data disks once you add the second parity disk.

The second cheapest is to use eSATA enclosures. This gets a little more pricey, even if the enclosure itself costs/is the same. Why? You need eSATA ports with port multipliers to make it work. This usually involves buying a PCI expansion card (eSATA or more likely HBA SAS controller/eBay/YubTub) and a break out cable. There are a few variations you can make with the hardware but the result is roughly the same, even if the cost can vary quite a bit.

The last route is to just buy a massive storage server. Those things cost bank, tend to have a high power draw and noise level but they absolutely provide performance and reliability.

When it comes to hard drives, it's currently difficult to beat the 18 TB Seagate IronWolf Pro drives for sheer quantity of storage. You can save even more by buying them refurbished. You do have to be careful about buying refurb drives. There are reputable sites that specialize in selling them. (Found the links on Reddit but can't find them right now.)

For SSDs, SAMSUNG and Crucial are usually the best deals considering price, performance and reliability. As usual, you should shop around yourself for the actual best deals. This counts for both SATA and NVME SSDs. The best bang per TB is currently fluctuating but I recommend sticking with at least 1 TB for any SSD. I couldn't find any good NVME SSDs for non-standard sizes. The standard size is 2280 but they can be smaller and require different (such as B and M key) slots. The last time I tried to buy a non-standard NVME, it didn't go well. If your PC includes a non-standard NVME slot, just don't put a SSD in it, would be my recommendation. If you're feeling adventurous, feel free to gamble on it but know that you'll have to figure that out yourself.

There's actually a lot of ways you can try to expand storage options on a PC but it's usually cheaper to either add more external USB enclosures until you reach the device limit of your PC's USB controller (which usually isn't that high and can be really low on older PCs) or to just buy another PC to use as a storage server.

If you don't mind paying a premium, there are mini PCs that are designed to work as NAS.

If you're wondering why I don't really recommend full sized desktops or used Enterprise servers, it's purely due to the power draw and noise. You can usually put in a bit of effort to silence them but there's really nothing that can be done about the power draw. A typical mini PC should be using about 1/10th the power of a full desktop or Enterprise server. Admittedly, this isn't always the case. So, be sure to shop around.

Now, if you have money to burn and noise isn't a concern, you can absolutely build yourself a network rack with tons of used enterprise servers with tons of built-in hot swappable drive bays. Otherwise, I don't suggest it.

NoteToSelf: Find and link more sources

Revision #6
Created 2024-12-05 16:48:56 UTC by Admin
Updated 2026-05-01 08:09:53 UTC by Admin