How Much Of X Do I Need? - The Costs, The Realisation And The Reality

Everyday, we get asked questions which are extremely difficult to answer and no one has the definitive answer to them so we have to do estimates. Some include the below:

- How much RAM would I need for my factions server?
- Is this going to be enough disk space for my geopolitical map?
- What about this CPU? Is it powerful enough?
- I am expecting my player base to be around 200 players? How much will this cost?

Think about the phrase "How long is a piece of string?". You might of heard this one before and it might come across as a little insulting, but that's honestly the truth! You asking someone how much RAM you need for your Survival SMP is like asking an open ended question. You've got to take into consideration so many factors before you even start looking for Minecraft hosting providers, VPS's or dedicated systems:

> Remember, this is not an extensive list. You have a good thousand other variables you've got to take into consideration. The game is extremely frustrating to micromanage!

> We will not provide definitive answers and provide a recommendation. If we tell you an amount and it's not the right amount, don't blame us for it, we can help

work out downgrades or upgrades, it's not the end of the world!

CPU

- **Single Thread Ratings** - 2.8k and above is optimal for Minecraft. Don't rely on the benchmark of the full CPU as that might be 45k but only 1.2k single thread. **This is bad.**
- **Cores + Threads:** Remember, Minecraft is mostly single core. If you are running a huge network, you will need 6+ cores to even support the game. Threads aren't a huge issue here, it's about how many "CPU parts" can you fit into your dedicated server.

RAM

- **The Type** - DDR3/DDR4/DDR5 are the most common ones and mainly R4 is used for Minecraft. Using R3 isn't too problematic for performance, just slower and not designed for intensive operations of a huge MC network.
- **The Protection** - ECC RAM is Error Correcting. This is immensely helpful for protection against SIGSEGV errors (Java Crash Faults) and increases the longevity of the hardware.
- **The Amount** - This is the most asked one out of all the above and below. Think about this - Normal MC Server? 2-3GB. Modded? 4GB+. Players, Plugins, Datapacks and more will always increase this amount. Start with 8GB and work your way up, this is the best option.

Disk

- **The Type** - You do not want to be running your MC servers on HDD's, hard platter disks. This will take a long time to load Minecraft worlds, won't support high intensity reading/writing and more. Stick to SSD's or, even better, NVMe drives.
- **The Size** - How big is your MC world? Geopolitical maps are going to be 200GB+. Normal servers are around 20-100GB. You've then got to take into account all the plugins, their data, room for expansion on additional servers you want to release and more. Our recommendation? Use 512GB at least, preferably two in RAID 1. This helps prevent issues if one randomly dies. You are still running while backups take place and a replacement drive is put in.

Network

- **The Speed** - If you are buying from a host that limits speed, keep this in mind when getting a system. 250mbps isn't brilliant as this is only 31.25MBps, Megabits and Megabytes. You will want to aim for at least a 1gbps uplink to your server such as an Advance 1 system from OVH. Remember, it's always divide by 8 when it's a small B to get the actual amount. When a player uses 500-900KBps, that's only 50-100 players you can support. You have resource packs and other features? This will go much higher.
- **The Budget** - With the same thought in mind on the above, some hosts limit the bandwidth you can use, or the "budget" you are allowed to "spend". If you hit 50TB for example, you are immediately disallowed anymore network traffic until that monthly limit has rolled around, leaving you in the dark immediately. Do some calculations on previous releases and see how much you will need. Our note is 10TB is **MORE** than enough for a 100 player server for a whole month, as they use around 2.6-3.0TB. On the other hand, a 600+ concurrent one will use 22.7-25TB.

Remember, it's never "one size fits all". We can't give the exact amount of anything as it's extremely difficult to do so, but with over 10 years combined knowledge, we've mostly got it figured out. AMD Ryzen 5 5600X with 64GB RAM? Yeah, go for it for your 50 player or below server, not an issue. 600+ players? Yeah, you will need Ryzen 9's for that one! Feel free to ask one of the team if you are needing a hand in looking for a suitable system.

If we've missed anything, feel free to let us know so we can add additional parts to this documentation.

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