**Appendix A: Power Consumption**

**Table detailing readings from Watt meter for various PC states:**

|  |  |  |
| --- | --- | --- |
| **Component/State of PC** | **Average watts in a minute** | **Average kilowatts in a minute** |
| Monitor | 17.8 | 0.0178 |
| Booting PC | 71.2 | 0.0712 |
| Quiescent PC | 24.5 | 0.0245 |
| Stress Test PC | 82.9 | 0.0829 |

Using these results I made two calculations:

* I calculated the cost of leaving a PC with a monitor on for a year non-stop. The assumption I made for this calculation was that the PC would only boot once, I also assumed that for 20% of the time it would be operating under maximum load. I then calculated that the cost of leaving this PC on for a year using the measurements above. I calculated that if it costs €0.16 per kilowatts per hour, the cost of leaving this PC on for a year would be €75.72.
* I then calculated the cost of operating a server farm containing 1000 PC’s and 1 monitor. The monitor and PC’s would be left on for a year. The assumptions I made for this calculation were that the 1000 PC’s would only boot once, I also assumed that for 20% of the time the server farm would be operating under maximum load. I calculated the cost of running the server farm for a uear using the measurements above and that it costs €0.16 per kilowatts per hour. The cost of operating a server farm for a year with just 1 monitor and 1000 PC’s came out to be €50,800.29.

**Table detailing range of power consumption in different parts of a PC:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Power Consumption (Watts)** | **Reference** |
| Power Supply | 350 watts 🡪 1000 watts | www.komplett.ie |
| Motherboard | 25 watts 🡪 80 watts | www.buildcomputers.net |
| Processor | 55 watts 🡪 150 watts |
| RAM | 2 watts 🡪 5.5 watts |
| HDD | 0.7 watts 🡪 9 watts |
| SSD | 0.6 watts 🡪 2.8 watts |
| GFX Card | 5 watts 🡪 350 watts |

**Appendix B**

I will be setting up a mid-range gaming computer. The reason I will be setting up this computer is that it is often assumed that to get a PC that is good for gaming you must spend a lot of money. This is not true; my gaming computer will cost between €600 and €800. I used amazon.co.uk to source all my components as it is a cheap website to use and components can be shipped to Ireland either directly or by Parcel Motel. This computer’s goal is that it will be able to comfortably play most new video games and achieve 45-60 frames per second on medium to high settings.

The first item I looked at when looking for components for my gaming PC was a CPU. I chose an Intel core i5 4460 quad-core CPU clocked at 3.2 ghz. I chose this CPU as quad core CPU’s can handle processor heavy video games. One of the sacrifices I made to keep the processor within my budget was that it is a previous generation processor and this processor cannot be overclocked. However, for the price of £169.99 on Amazon, which translates to €191.34, it is good value for money.

I wanted to create a PC with a small form factor so I needed a micro ATX motherboard and a micro ATX case. I decided to pick the Gigabyte GA-H81M-D2V motherboard and the Aerocool QC-203 case. This case supports micro ATX motherboards and has USB 2.0 and 3.0 ports. The motherboard I have chosen supports the LGA1150 socket that is found on the i5 4460. It also has 2 DDR3 slots for RAM and has a PCIE 2.0 slot for a graphics card. This motherboard gets the job done well for the price of £59.99 or €67.53 on Amazon and the case is good quality for the price of £22.99 or €25.88 on Amazon.

I then needed to source RAM and a graphics card. I decided to get a single stick of 8gb of DDR3 RAM. I decided to choose the HyperX FURY Series 8 GB DDR3 RAM clocked at 1600 MHz. I chose this RAM as it’s fast and having 1 stick of 8 gb of RAM on a motherboard with just 2 sockets for RAM allows you to double the amount of RAM you have if you choose. For £39.99 or €43.86 for a stick of 8gb of ram on Amazon this is great value.

Having a good graphics card is an integral part of any gaming PC. However, to keep our costs low I will be using a mid-range graphics card. The graphics card I will be using is the MSI NVIDIA GTX 750Ti 2GB card. This graphics card preforms well in new video games as it achieves 30 to 40 frames per second on ultra in most graphically intensive games and can easily achieve 50+ frames per second on medium to high settings on most new releases.

For storage, I decided to choose both a solid-state drive and a hard disk drive for my PC. I did this because many gamers often complain about long loading times in their video games and one of the causes of this problem is with their hard drive speeds, an SSD can dramatically increase loading times in many video games. I decided to pick an ADATA Premier SP550 120GB SSD as this gives a gamer enough space for a few of their favourite games. I then chose the WD Caviar Blue 500GB HDD to hold the operating system and any other games or files. These two components are very good value for money as the SSD costs £39.64 or €44.62 on Amazon and the HDD costs £37.75 or €63.01 on Amazon.

Finally, I decided to look for the power supply I was going to use. Once I had all my other components I used the power supply calculator on outervision.com to see how much power my PC needed to run. Once I ran the calculation I decided that a 500 watt power supply would meet the requirements of the system. I then picked the Corsair CP-9020047-UK Builder Series power supply. This power supply has enough power for my PC and is well worth the price of £59.99 or €67.42 on Amazon.

These components combined cost a total of €638.74 which is within my cost margin. This gaming PC has good components and is good for a gamer who doesn’t have a lot of money to spend. The cost of this PC does not include the cost of an OS but a copy of Windows 10 can be bought for €135.00.