

Volume

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How to: Build your own server

DANIEL RODRIGUES COMMUNICATIONS

How to build your own server

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Creating your own server : Purchase

The first step to successfully creating your own server is to purchase all the necessary materials that will be used throughout the process, this may include tools if they are not present in one's toolbox.

ITEMS TO PURCHASE

- ☐ Storage – HDD, SSD
- ☐ Motherboard
- ☐ CPU
- ☐ RAM
- ☐ Case Fans
- ☐ Heat Sink + Fan
- ☐ PC Case
- ☐ Thermal Compound
- ☐ PSU
- ☐ Anti-Static wrist strap
- ☐ GPU (Optional)
- ☐ Standard toolset (Optional)

Thoughts when purchasing

Storage

When purchasing a Hard Drive there are many factors to consider such as speed, reliability and longevity. An SSD will give you speed and reliability but the length of life for SSD's are very small compared to HDD's which give you a longer life on average and are reliable, but don't give one the rate of an SSD. To get the best of both worlds consider purchasing an SSHD, which is a hybrid of both.

CPU

When on a budget, the CPU is not an area where one should be compromising. To have a fast computer one first needs a fast processor. They come in different flavors but the two main competitors are AMD and Intel; both are different architectures, your choice of CPU will later affect your choice of motherboard and corresponding RAM since these will go hand in hand. If tweaking the CPU speed is in your list of priorities consider purchasing a CPU with a K at the end of the model, (i.e Intel I-7-6700K) these types of models are generally unlocked, allowing customization.

RAM

RAM can also affect the speed of one's computer if not enough is purchased. The latest RAM technology is DDR4, if the purchased motherboard and CPU are on the high end one can indulge in the latest, otherwise DDR3 is more than capable to handle any modern applications. Consult motherboard specifications when purchasing RAM to see if desired RAM is compatible.

Heat Sink + Fan

The Heat sink is a chunk of aluminum/copper that touches the CPU to distribute the heat from CPU away from the motherboard to avoid melting of the circuits. A good Heat Sink allows the processor to not throttle speed and prevents breaking of the CPU. There are many flavors but the desired qualities for Heat Sink are the amount of Heat pipes, the CFM (Air Flow) and Noise level (dBA). The noise level doesn't affect performance but can be a nuisance.

Motherboard

The motherboard is the Central Nervous system of the computer and the limiting factor for many of the other components. A cheap motherboard can generally only support older processors and slower RAM so the motherboard is not a place where one can skim off the top. When purchasing a motherboard one must also take into account the PC Case to make sure it fits. There are different sizes to motherboards (Micro ATX, ATX, Extended ATX, etc.) Performance isn't generally affected by size, but an ATX motherboard will not fit in a Micro ATX case.

PSU

The Power Supply Unit is used to drive power to the components, of course this means that it should be chosen last generally because of the need to know how much power is being consumed. There are calculators online that will tell you the minimum PSU for all of your components. Places like newegg.com are generally good resources for such things.

Thermal Compound

Thermal Compound is used between the CPU and the Heat Sink to create an even plane between the two creating more surface area which allows heat to travel more readily from the CPU to the Heat Sink. Generally there are only two types of Thermal Compound, regular and High-End.

Case Fan's

Case fan's are used to cool the overall system to prevent the melting or degradation of any of the other components. These are cheap so having 2 or 3 will not put you into red.

PC Case

The Case is just the shell of computer; there are generally no requirements for this except that it fit your motherboard. One could even build the outer shell themselves if they were handy enough.

Anti-Static Wrist Strap

This is more important in areas of low humidity because of the lack of static discharge to the environment, but is still a good investment to prevent your fragile electronics from

GPU

These are optional but can add a lot of value to your computer allowing for things like split screening and higher resolution, these prices may vary extensively depending upon how much dedicated memory and GPU cores the GPU has among other features, the only requisite is that the type of port it uses (i.e PCI-Express, PCI, etc.) must also exist on the motherboard, and be free for use.

Standard Toolset

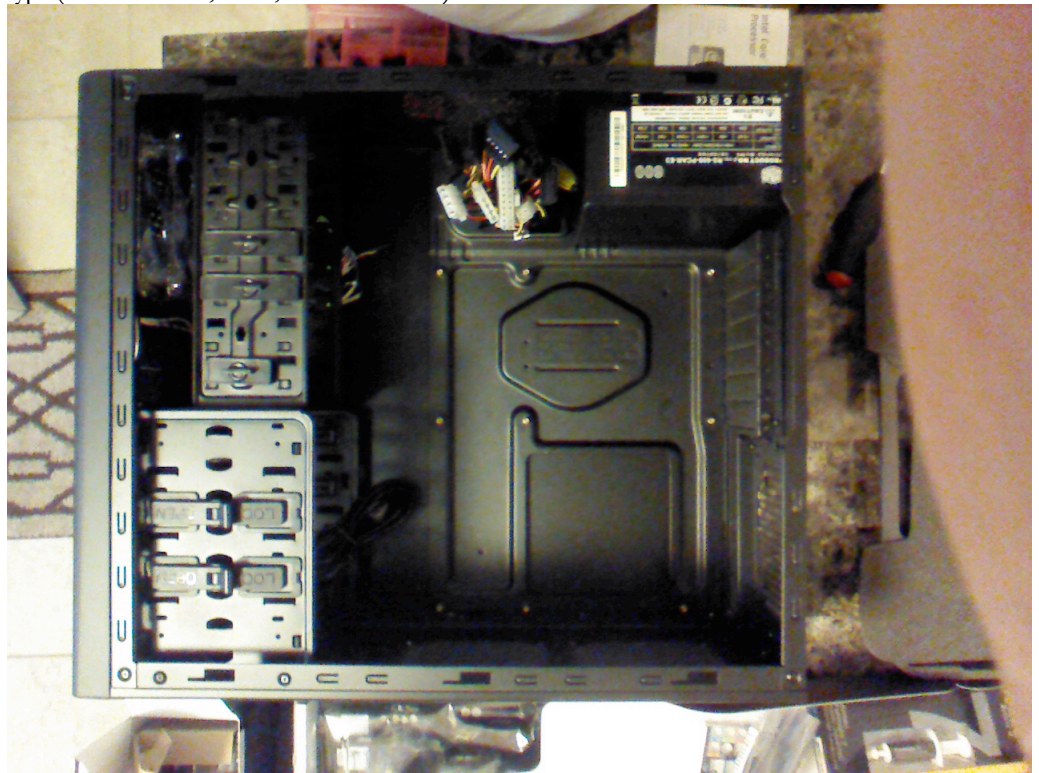
This is generally just a screwdriver with different heads, and a case to put screws in to not lose track of them.

Prepare

Once all of the components have been created the components will need to be checked to ensure they are not damaged and an area will need to be cleared so all the components can be left on the table

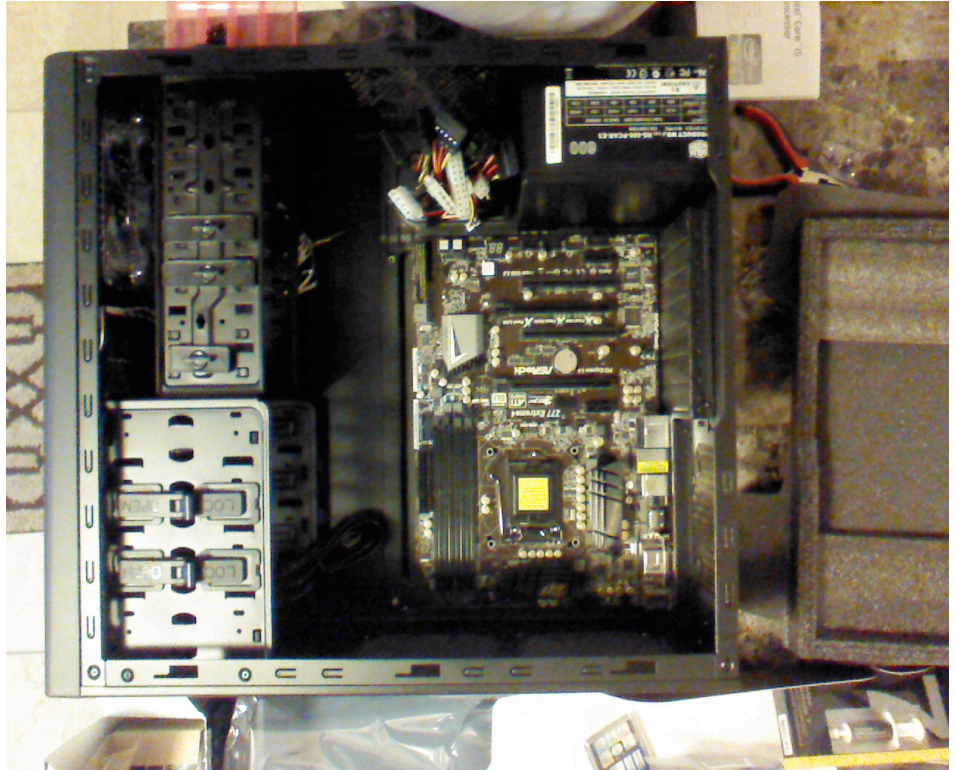
Put Together

1. Screw copper lugs into the case corresponding to your motherboard type (i.e Micro ATX, ATX, Extended ATX)

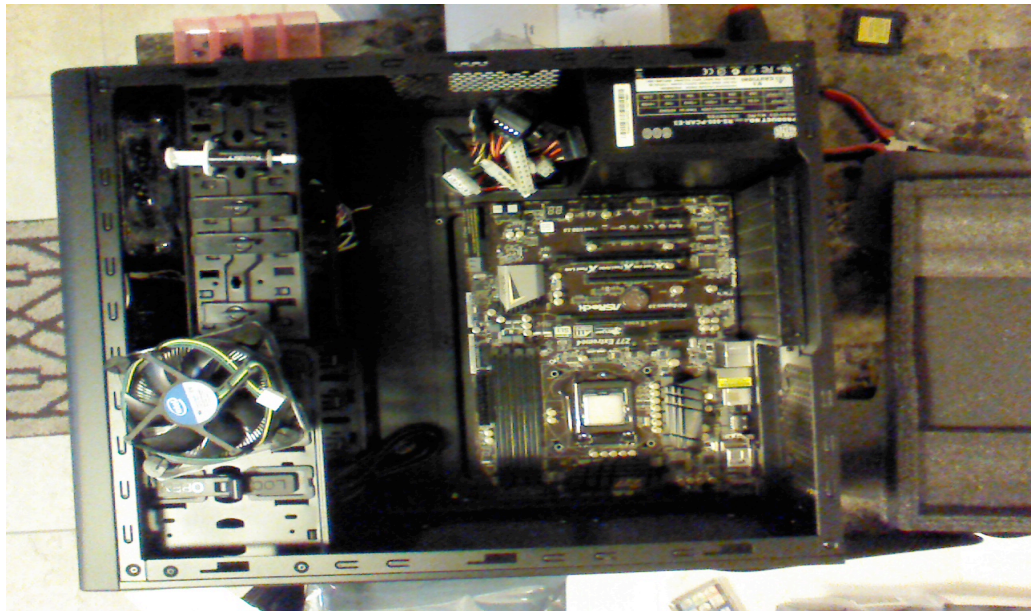


2. Place motherboard carefully on the lugs so the top of the lugs correspond to the screw holes on the motherboard
 - a. Use Screwdriver to screw the motherboard into place
3. Add the CPU to the corresponding CPU spot located on the motherboard

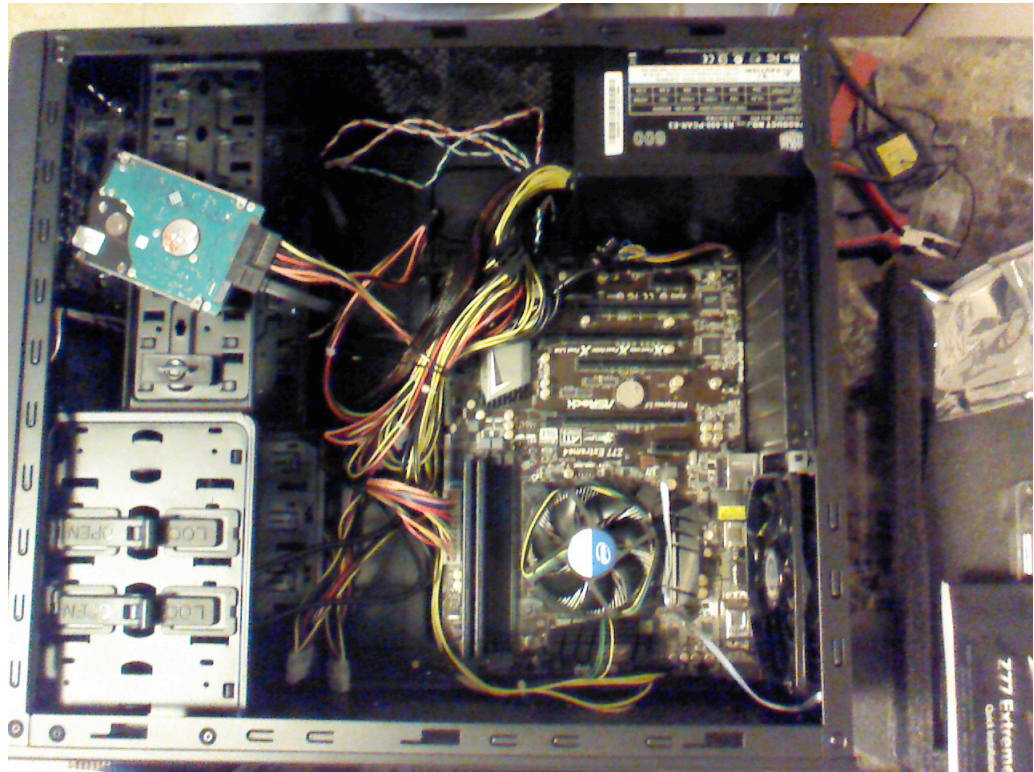
- a. Follow directions for each CPU which may be different, there is usually a little lever to lock the CPU into place



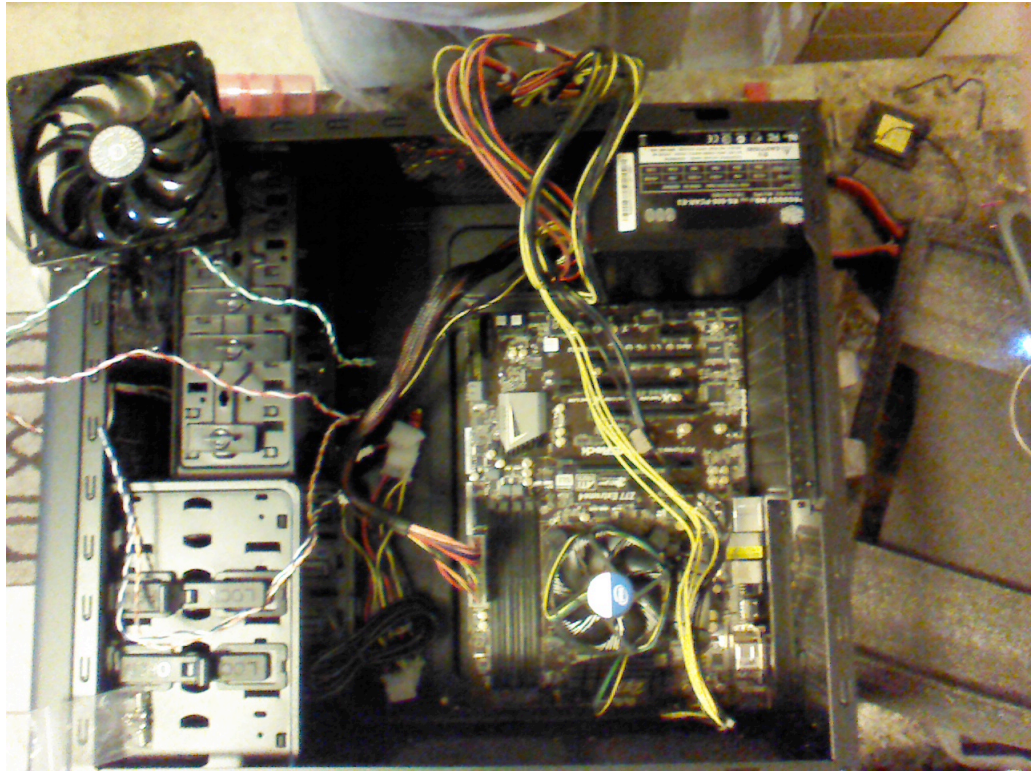
4. Insert RAM into the RAM slot located on the motherboard, push gently but firmly until a click is heard



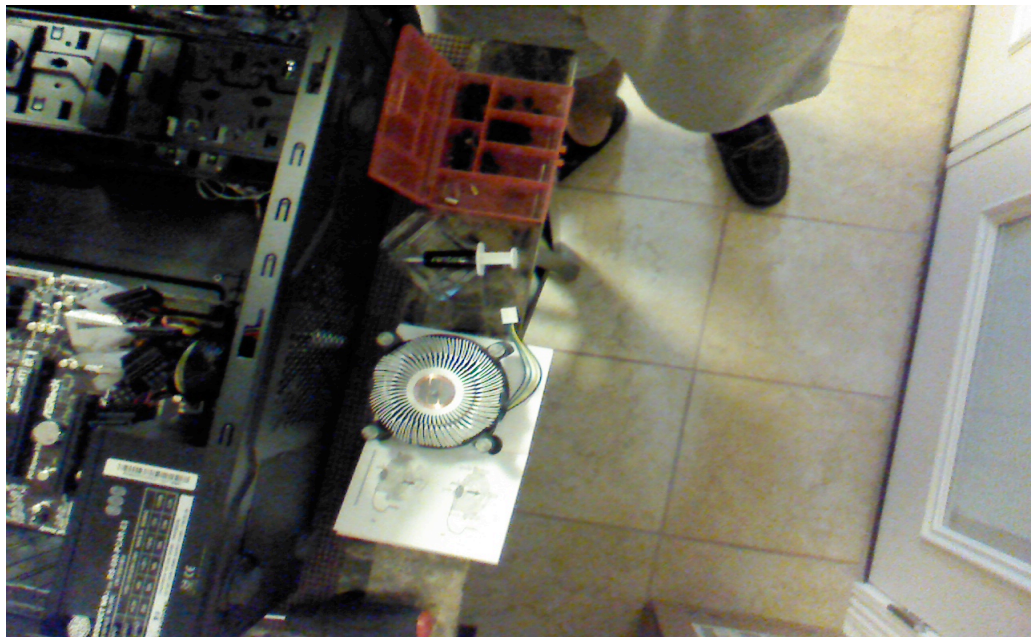
5. Insert HDD/SSD into Drive bay, this may vary per desktop but is usually located towards the front of the computer and involves screwing the drive into place to avoid damage to the other parts.



6. Connect your drive to the motherboard using the SATA Cable that came with the drive
7. Install Case Fan's by screwing the fan into the corresponding slots located on the outer edge of the case inside the computer
 - a. Connect the power cord from the fan to the motherboard in the corresponding slot on the motherboard (Usually Denoted Chassis Fan on the motherboard)
8. Install the PSU into it's home at the bottom of the computer, this will usually be evident by the big open space on the back end of the computer
 - a. Screw the PSU into place and move the large amount of cables to the side
 - b. Connect the large 24 pin connector from the PSU to the motherboard in the corresponding slot on the motherboard
 - c. Connect the 8 pin connector to your drive in the Drive bay you accessed earlier during installation of the hard drive



9. Break out the thermal paste and heat sink, apply a pea-size dot of the thermal paste on top of the CPU, slowly and evenly spread the paste on the CPU by pressing down on the paste with the heat sink making sure that none of it spills onto the motherboard, this can break/short your motherboard



10. Once the heat sink is snug there will be a way to lock the heat sink in place, this may vary per Heat Sink but usually involves screwing the heat sink into place.
11. If purchased, add the GPU by locating the corresponding port on the motherboard and firmly pushing the end of the GPU that that interfaces with the motherboard into place
12. Done! Enjoy your new Server!

**Note**

Results may vary and depend widely on what components are chosen.