Easy Media Server

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I have had my media server running for a few months now, so I thought I would document how I have it set up in case anyone else wanted to follow along.

The What and The Why

I have read several articles on media servers and most of them do a lousy job explaining what one is. Instead of trying to define a media server (and almost certainly failing badly), I will describe some of how I use mine.

Before I get to the fancy uses, let me start with the most basic. For anyone who remember VCRs, you will remember how you could stop your movie in the middle and take the tape to another player and start playing from where you left off. With a DVD, you can continue where you left off but only from the same player. With movies on my media server, I can play them on any television in the house (or even an iPad) and start where I left off from any one of them to any other of them - whether I am still at home or not.

My media server allows me to have one place for all of my movies and television shows that I have on DVD, all of my music, all of my photos, all of my audio books, all of my home videos. I can then access any of these from any television in my house, any computer, any of my Android devices, my iPad, my iPhone (yes, we actually use all of those). I can access any of this data on my mobile devices (tablets and phones) whether I am in the house or not. I can either use WiFi or mobile data to access them or I can download any media to any device (with minimal effort) before I travel and watch it without data usage.

This means that when we travel, we can watch a DVD movie on our iPad from our hotel even if we don't have internet there (so long as we thought to download it before we left) or any movie we have anywhere we do have internet. With two five year old kids, this has proven to be wonderful. We can pull up a movie in the car if we need to (we generally don't, but there have been times that it has been comforting that we could).

We can even share any of this media that we choose with anyone we want who has a (free) Plex account and a way to view Plex, whether or not that have a media server themselves (this serves as a Spoiler as to what software we use for our media server).

The Computer

My system starts with a dedicated desktop computer. This isn't really necessary, but it works for me for reasons I will explain soon. A laptop or even a computer that is also being used for another purpose as well should work OK - so long as the computer is always on.

I bought a new computer for mine, so I went with a desktop because they are cheap. I also got a separate internal hard-drive on which to store my media (and named it "M" for media). I did this because it is cheaper to buy a computer with a small drive and add on a bigger one that buy one with as big a drive as I wanted. I also wanted something that I could transfer to a new computer that would just hold the media data and not anything else (such as the OS). If you are on Windows, be sure you are running at least Windows 7 here or you may run into some limitations on drive size. An internal drive is cheaper and faster than an external one as well.

I also got an external Blu-ray drive. Again, for me I was able to get a very cheap computer by not including this in the purchase. In my case, I also waited a while to buy this until I wanted to start loading Blu-ray movies, which helped reduce the up-front cost.

At this point, I should back-up and say that my earlier statement that I bought a new computer is both true and false. I actually started with a very old Windows XP computer to make sure I liked the media

server and then upgraded to a new computer when I was convinced I liked it. I initially ran my media server for a few months with no money invested at all until I was sure I liked it and wanted to make it a bit fancier.

Basically my recommendation is to either use a spare computer or get the cheapest computer that you can find capable of running at least Windows 7 and then get a large (preferably internal) hard drive. Installing an internal drive is actually pretty easy. I had very little trouble and I am not good with hardware generally. https://www.youtube.com/watch?v=WbBJlaMBfxg#t=33

The Software

The media server software that I use is **Plex**. I really can't say enough good things about Plex (but I will say a few of them later). I read about both Plex and **Kodi** (then XBMC). It looked to me like XBMC (now Kodi) was more flexible but that Plex was much easier, did the things that were important to me, and was flexible enough. More on Plex soon.

The thing about a media server is that it isn't any good unless you have media on it. A media server can handle movies, television shows, music, photos and more.

In terms of media types, that generally means you are trying to import photos, DVDs (and Blu-rays), and music.

Music is the easiest. My media server is a Windows machine and I use **Windows Media Player** to import audio. It is free and it easy to set it up so that it will start ripping a CD as soon as you put it in the drive and eject it as soon as it is done. This is one reason to have a dedicate machine - that setting could be annoying on a computer that you are using for other purposes.

To set up Windows Media Player to automatically copy and eject, you first need to open it up. Then hit the "alt" key on your keyboard and go to Tools -> Options. The select the "Rip Music" tab and make sure "Rip CD automatically" and "Eject CD after ripping" are both checked.

You could also manually copy over .mp4 files, but I have taken all my music directly from CDs I own.

Getting movies and television from DVD and Blu-ray is a little bit harder. DVDs and Blu-ray are encrypted, which makes it a little harder to copy them to your media server.

I used **MakeMKV** to rip my movies from DVD and Blu-ray disks onto my media server. This creates .mkv files. This may be a great file format, but I prefer .mp4. The files are smaller and play almost everywhere (and they are a preferred format for Plex). So, I use Handbrake to convert the movies to .m4. The pre-sets are generally good for this. Just make sure to name the movies appropriately.

Plex needs them in "MovieName (Year)" format in a folder of the same name. So, if I owned "Avatar" (I don't), it would be "M:\Movies\Avatar (2009)\Avatar (2009).mp4". Naming it in this way will allow Plex to automatically get the poster for the movie and plenty of other helpful information about it as well. It might seem a waste to have a whole folder for just one file, but there are reasons why this can be nice later on.

Photos I copy on both manually when provided by other people and automatically from our phones using a feature of the Plex apps that we have on our phones. I have two photo libraries. One I call "Mobile Photos", which is where the phones copy their files to and another one called "Photos", where I manually sort and copy photos. I look at photos from the "Photos" library.

Given that I now have all of media in one place, it is important that I keep it safe. To that end I have **Kaspersky Anti-Virus** running and back-up all of my files to **Amazon Glacier** using **Cloudberry Desktop** (though **Amazon Cloud Drive** will probably be a better choice for the less technically inclined). Glacier is slow, but cheap for lots of data. This makes it an ideal choice for an emergency back-up for all of my media.

I use Cloudberry Backup Desktop edition to handle my backups to Amazon Glacier, but there are plenty of other options as well I'm sure. For $30, though, it does all of the scheduling and management and that is worthwhile for me.

Media Players

Of course, it does little good to have all of this media in one place unless you can actually use it. Here is where **Plex** really shines.

You can access Plex content on an iPad, iPhone, or Android device using a Plex app available for each. The apps cost a little money or you can get them for free if you pay for the Plex Pass. Plex is also available on several Smart TVs, game systems such as PlayStation and Xbox, computers such as Windows and Macs, **Chromecast**, **Amazon Fire TV**, and **Roku**.

In our house, we have three televisions, none Smart TVs: Two are less than 2 years old and one is about 8 years old. When we first started watching things like **Netflix** and **Hulu Plus**, we got a **Roku** for our television and it worked great for those and for Plex as well when we set that up. Now we have an Xbox and Plex works great on that as well. In all cases, the set up is very easy. At around $50, Roku is a pretty cheap way to get Plex and other services (such as **Netflix**, **Amazon Instant Video**, and **Hulu Plus**) to your television.

Amazon Fire TV wasn't an available option when we chose Roku. It looks like a good option as well. Based on my reading of it, I would still say that Roku looks like a better option, but Amazon Fire TV may be worth looking into. The biggest argument for Roku, in my opinion, is that Amazon provides both the player and content which means that it will naturally gear things towards its service. In any event, getting a player for an older television is relatively cheap and easy.

The Cost

I don't know how much I actually paid to get this all set up, so I am going to aim a little high to duplicate my set up to give you a flavor of how much you might end up paying both to set it up and ongoing. I'm going to term this in terms of how much you *could* pay and mention ways to reduce that cost.

One Time Costs

- The computer: $400. I'm not sure how much I paid, but I do know I paid a little extra to get a "Standard Tower" form factor as that is really needed if you want an internal hard drive. So, I paid a little extra for that so that I could get a cheaper computer and still have a large internal hard drive. Cost based on a cheap Standard Tower desktop on Dell.com. You could probably find a used computer for much less without much trouble.

- Hard Drive: $100. I got a 3 TB drive because I didn't want to worry about running out of space. I think I got way more space than I needed. A 1TB drive should be ample for most cases (it would have been for mine) and runs closer to $50. Mind you, these are all rough prices from quick internet searches.

- Blu-ray drive: $50. You can skip this if you don't have Blu-ray movies. Even if you do, you can wait on this step. I would expect the price of Blu-ray drives to steadily decrease over time.

- **Roku**: $50 per television. If you already have a Smart TV, ChromeCast, Xbox, or PlayStation 3 then you don't need this. Otherwise this is about the cheapest option to get media to your television. Chromecast is a little cheaper, but I think Roku is the much better route.

- **Clouberry Backup Desktop Edition**: $30. There are probably cheaper options out there for the back-up, but this one works well. This purchase only makes sense, of course, if you are using cloud storage, such as Amazon Glacier (though it does work with several storage providers).

- **Kaspersky Anti-Virus**: $30. There are plenty of good anti-virus programs out there, but Kaspersky is relatively inexpensive and it is effective without always getting in the way. Don't bother with "Internet Security" or any of the other more robust programs from Kaspersky if all you need is anti-virus protection.

- **Plex**: $150 or free. A lifetime membership to Plex Pass was $75 when I set mine up. Now it is doubled. I expect the price to increase again. You can absolutely use Plex without Plex Pass, but Plex Pass has some nice features such as synching photos from your phone and free apps. Plus it just feels good to support such great software.

- **MakeMVK**: free. You have to download a new version occassionally, but that is hardly a bother. If I could find a way to pay for it on their site, though, I probably would just to support the project.

- **Handbrake**: free. Another project that needs a "donate" button. If it had one, I would donate.

So, your up front costs could be as much as $860 for two televisions, but will likely be quite a bit less than that. In my case, I had two Rokus before I even thought about a media server and then I started with an old computer, a free version of Plex, and nothing else and that worked for me for months. No need to invest more money until you need to. If you are careful, then you shouldn't spend money until you already know what value you are going to get for it and you should have plenty of time to plan for those expenses.

Monthly costs:

- **Plex**: $5 or free. If you want Plex Pass (which is nice, but not needed) you have the choice to pay for a monthly subscription instead of a lifetime membership.

- **Amazon Glacier**: $3. My media server has over 100 movies (most standard resolution, but a few HD), 12 seasons of television, over 50 audio CDs, several hundred high-res photos, over a dozen audio courses. In my case, that totals to about 300 GB of data. Amazon Glacier charges a penny per GB per month. So, for me that is about $3 per month to back up all of my data to the cloud. Your cost will vary based on your usage. Of course, this is only practical if you have very good internet that doesn't charge for bandwidth. Otherwise, create a physical back-up and store it off site.

So, even in the worst case you should be able to keep your monthly cost to well under $10 per month and you could keep it to zero with very little trouble at all. My monthly cost is under $3 per month and that protects me from data loss in case of computer failure or even loss of house. Have you ever heard people say that the thing that would miss the most if their house burned down would be all of their pictures? If my house burns down, all of my pictures are safely stored at Amazon (and all of my movies, music, audio books, and television shows to boot).

The Set up

This entry is already too long, so I am not going to go into much detail here.

1) Make sure you have a way to watch internet video on your television. If you don't already have that capability, then buy a Roku and spend some time getting used to the Roku with Netflix, Amazon Instant Video, Hulu Plus, Crackle, ESPN, or some other common ROku channel. Don't move on until you are pretty comfortable here.

2) Set up your media server computer.

2 a) If needed, install your external hard drive on your computer and hook it up to your operating system.

2 b) Install Plex, MakeMKV, Handbrake, Windows Media Player.

2 c) Install Cloudberry back-up and set up Amazon Glacier (this may be the most confusing step of the entire process).

3) Make sure that you can connect to your Plex server from any device that you wish to use. This can involve a bit of trial and error on setting up ports correctly on both your computer and your router and it is less frustrating to endure if you do this *before* you have spent several hours loading data on your computer. Plex does a very good job in helping with this and has very good online help as well, but

expect a few bumps here.

3 a) If you want to view Plex content while you are away from home or share it with others (both very cool capabilities in Plex), then you will need to set up port-forwarding on your router. There is a security concern here, so make sure you have your anti-virus program set up before you do it. This is another reason, in my opinion, to separate out your media server from any other use. In the unlikely event that it is compromised, you want to minimize your losses. If you only have media data and you back-up the media data then you shouldn't have much to lose. That being said, I think the risk here is quite minor.

3) Set up your libraries in Plex and copy your data. I found that I could have MakeMKV rip one DVD while Handbrake converted another one.

After that, enjoy!