

DAVE BROWN

## MythTV: some assembly required



... BUT THE RESULTS CAN BE  
SPECTACULAR

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### WHEN I FIRST HEARD ABOUT MYTHTV

I was impressed, but I figured it was pretty "out there." I guessed someone had set up a super-customized Linux build with custom hardware and then posted the code. A Linux-based personal video recorder (PVR) that played music and most normal computer video clips, and that was free, was too good to believe. TiVo, still going strong at the time, wanted some hundreds of dollars to get the box and a promise of \$15 a month to keep it going, and ReplayTV was similar; there were no other options worth considering. You couldn't take video off either TiVo or ReplayTV, lawyers were circling the companies like vultures, and I only paid \$15 a month for cable. So I couldn't justify getting MythTV, but I kept reading. Before long I realized that this was a pretty standard bit of hardware, and the software didn't look all that scary. I was fascinated.

This is where I should probably mention my nervous twitch. I almost always have to be doing something. Often two or more things. I can't stand to wait on a build. I have to have something sitting open on the side to switch back to. You might say I have a preemptive nervous system. You might also say I'm slightly neurotic.

Some of the features I was looking for I simply could not find in commercial packages. This is because when money changes hands, lawyers know they can get a slice. Faceless projects have the advantage of being allowed to do many things that companies can't, at least not in the long term. Things like commercial detection and skipping, semi-automatic conversions to DVD or MPEG-4, and all sorts of things that lawyers and their owners really don't want you to do unless you're paying them each time you do it.

But as I realized how expensive commercial DVRs were over time and how ultimately nerfed they were, I started looking harder at the other options. When I looked at the mounting pile of unused hardware in the corners of my house, I decided it was worth a shot. I was newish to Linux, having come recently from a BeOS background, and was looking for a reason to get out of Windows-land. Ultimately, I was tired of finding my movies and CDs lying around the house because someone,

and I'm not saying who, couldn't be bothered to find the jacket. If I could get something able to play back videos and CDs without damaging the originals, so much the better.

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## About the Project

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The project itself allows a pretty flexible combination of hardware. The suggested hardware list is much beefier than what you can actually get away with, but I have to admit that using something in the suggested range would make most of the setup considerably easier and faster. I won't repost their suggested hardware list, but as generalities you need:

- A video and audio input
- A tuner. I separate this because you can use an external tuner instead of an in-computer tuner
- A window manager
- A way to see: VGA-enabled TVs seem to be favorites, but I use a plain '80s-era TV
- A way to interact with your system: Most people will want to use a remote control, but you can use a keyboard and mouse
- A network connection
- Linux flavor of the month, preferably with a 2.6 kernel

The suggested range of hardware at the time I was working was a 1.2GHz processor, an nVidia-based video card and a 2.6 kernel; the rest was flexible. Some of these were “suggested hardware” as described by documentation, and some of it was required-because-nobody-is-going-to-help-you-with-anything-else. Honestly, this is still a really good base setup. If you want to do hardware-compressed encoding, most people are using `ivtv` driver-compatible cards from Hauppauge.

If you want only—and I mean only—hardware-assisted MPEG-2 encoding and playback, you could go with a slower processor. I actually do this at home right now.

If you want to use the DVD ripper/converter/player, you will need a DVD-ROM and, I strongly suggest, a processor over 1.5GHz.

If you plan on doing commercial detection, second the processor upgrade.

If you want to do general video playback (e.g., MPEG-4), second the processor upgrade again.

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## Pseudo-Log

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I think the most useful thing to others would be my view of building my various MythTV boxes and the problems and impressions I had of each try. I'll try to keep things factual, although opinion and impression have a lot to do with the experience. Please keep in mind that while communities as a whole may be good, I'm recording impressions of a specific implementation as experienced by a new-to-Linux user.

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## First Try: RedHat Linux 9

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My first attempt to install MythTV was on RedHat Linux 9.1. I was not looking to subscribe to anything, but I had used RedHat 7.x before and was familiar with the conventions. I had to compile MythTV by hand, which was not difficult. However, what was difficult was gathering the various prerequisites, requiring a couple of days full of bad links, out-of-date

mirrors, etc. Once the prerequisites were installed, things compiled cleanly. I found a very good walk-through of someone else's install to help me. Base MythTV worked on a monitor. I remember clearly thinking, "This is what I have wanted a computer to do for years." Others online had most of the subpackages working as well (MythWeather, MythDVD, MythMusic, etc.), but I was stuck on getting TV-Out to work on the Hauppauge 350 video card. Display on a SVGA monitor was quite good, but in my house it was hardly a usable solution. I also could not get past a compiler error in one of the codecs required for the transcode daemon (to convert DVDs to MPEG-4). On the MythTV forums I met a stunned silence. Eventually I found there were version conflicts between the base RedHat libraries and what was expected by the codecs, so I had to chase down the source and compile the modules (with lots of optional flags—must always have lots of optional flags).

By the end of this attempt I was turned off by constantly having to update random unconnected bits of the RedHat system to suit the current bug fixes. I would not be surprised if someone has had better luck than me. I know at the time I was a Linux newbie. But I was willing to try the hype of Gentoo, whose instructions on the MythTV site, "emerge mythtv," seemed alluring.

### Second Try: Gentoo 2004.1

The second attempt was based on numerous reports of the Gentoo Linux distro, 2004.1 at the time. For the out-of-the-box experience, this went far better. First of all, Gentoo for the layman is just wonderful. No more wandering from search to bad link to bad link looking for where to get package xyzzy. You just tell it what item you really want, and it does it. Having an BeOS background, I'd rather just tell it "put this on and don't be dumb about it." My first trip through Gentoo was a learning experience in the nuts and bolts of the Linux world—the first time really building my own kernel and truly understanding some of the lower services of Linux.

I was still using my dual P3-500 system with my MPEG-2 encoder card. I blanked the hard drives with a cheer, followed the very friendly documentation on the gentoo.org site, and was on my way. I can't praise this documentation enough. It probably taught me more about the basics of Linux as a kernel than anything else I've done. I won't bore you with the details of how I got from hardware and kernel to command line, but I did, and that's where I started working on the MythTV install.

I was able to get MythTV's base features working with the magic incantation "emerge mythtv" and about 20 minutes of configuration. But it took 28 hours to compile on my relic. Had I but known, there was a binary package CD I could have used to get everything up to the X11 install prebuilt, but I didn't notice it at the time. At the end of the compile, I followed the Gentoo X11 configuration guide for my monitor and the basic setup guide for MythTV. The drivers for the Hauppauge card were available with another simple command ("emerge ivtv"), and in no time I could capture precompressed video. I finished the MythTV setup, and, bang, I was up and running on my monitor, pausing live TV, saving videos to my hard drive. I was extremely happy with this. And, even on this old hardware, it was very, very usable.

It was also very rough. I had to start X manually each time, which I later fixed. I had to unmute ALSA every time, which I never quite solved. There was a lot of configuration left to do. I also wanted MythVideo and

MythDVD to work. So I started on these extra functions, and this is where I got hung up in the end. MythWeather worked in one shot. MythDVD was particular, but far easier to fix than in RedHat. Some minor searches on the Internet provided me with the required configuration settings, and I was able to get it working, for the most part, in a few hours. But now I was hitting hardware limits. After all, I was using hardware that was current in 1999 or 2000, not 2004. MPEG-4 playback was impossible, and background processes like ripping or converting video took up all the processor time far too easily. I was also unhappy with the unbelievable amount of noise generated by the six different fans in the case.

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## A Sidebar on Hardware

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This also marked my first real attempt at TV-Out. I was using a low-end nVidia AGP card at the time that included a TV-Out. Before I get jumped over this, let me say that I have good friends at nVidia who really, truly know their stuff. But I'm also telling you, if I ever try to use an on-card TV-Out again, I will poke my eyes out. It's awful. The same is true of my ATI cards. I don't know the hardware specifics of why, but it is. But as I was having trouble with the configuration that would pipe the video correctly to the TV-Out of the Hauppauge PVR-350 card, I stuck with the nVidia TV-Out. Please note that MythTV's support for the Hauppauge card has improved greatly since this time.

At this point I'm going to digress into the wild and woolly topic of hardware in the living room. This is a matter that people vary on greatly, from the silence zealous to the power zealous. I'm going to try to give you an abbreviated version based on my experience, simply so that you can see how it might affect you. First of all, my system was far too loud. Vacuum cleaner decibels. Unwatchably loud. The images were on the screen, but you couldn't hear over the system until your stereo was Far Too Loud. After about three days, I just yanked the plug and the house as a whole gave a cry of relief for the lack of noise. In two weeks I had substituted a Zalman ultra-quiet power supply and (from the junk bin) a quieter hard drive, and was far happier. But it was still a four-year-old system doing things that were over its head, and the video quality was really starting to wear on us. To compensate, I got the remote control working. This is when my wife first started showing signs of interest.

Concerning hardware as a whole, though, I was able to find many near-silent PCs designed for the living room, ranging from \$100 "quiet kits" to \$1500 complete silent systems. I was still being a cheapskate, so I watched and bought nothing. What killed this system was the unmute-by-hand problem between ALSA and the 2.4 kernel. By this time a 2.6 kernel version of Gentoo was out, and the audio problem and video quality were the system's deathblow.

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## Attempt 2.5: SageTV

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Honestly, I'm glad I tried SageTV. SageTV is a commercial product that uses the same hardware, only it runs Windows. I converted my Gentoo box to Windows 2000 and installed SageTV. To their credit, in about an hour the thing ran. But it never ran for more than a day. Blame it on whatever you want: hardware, OS issues, driver issues, or anything else, but the stability problems were formidable. I eventually set it up to reboot every day at 3 a.m. to try to keep it going. It would still occasionally lock up and destroy a show or two. I have no idea what the real causes were, but the instability

of the hardware and software in combination killed this configuration. What I did love about this solution, however, was that the shows were stored as MPEG-2 and were easily shared to a PC with a DVD burner, and the files had nice obvious names. With some basic DVD authoring software, I was able to burn DVDs of my kids' favorite shows at broadcast quality.

I must also mention that this was the first time the PVR-350 TV-Out worked. And let me tell you, it is a beautiful thing. It's not double-interlaced, it's not desaturated, it's . . . right. It looks like it comes out of my VCR instead of an overhead projector. This alone is what kept me plugging away at SageTV for almost two months.

Then MythTV added the ability to detect and flag commercials, and automatically skip them. Between SageTV not having all the things I wanted and the stability problem, I stopped trying. SageTV is a base PVR that worked with little configuration and used very little CPU time, and I'm glad I saw that it is possible. But I wanted the rest of the checkpoints on my list. Also note that SageTV now has a DVD and video player built in.

### Third Try: KnoppMyth 5.1

A number of people were talking about how easy it was to slap a system together with KnoppMyth. So I downloaded and burned KnoppMyth 5.1, which included MythTV 0.18 (iirc), which was just out and included all the features on my list.

By now, I realized I was going to have to break down and get some dedicated hardware for this adventure if I wanted everything. I settled on a VIA Epia M-10000 system and a quiet case with an integrated low-noise power supply. As far as decibels go, this combination is great. The hard drive is still the loudest part of the system, but the total cash investment was \$400 including RAM.

KnoppMyth is a dream to install when it works. It does a very competent job of detecting your hardware and bringing up the default configuration. But it took three tries to get the KnoppMyth installer to finish correctly. This may have been an anomaly, but it made me skeptical. I was pleasantly surprised to find that the KnoppMyth distribution included a Nehemiah kernel. It even included the ivtv capture driver. If you look hard enough, there are instructions that show how to put video out the PVR-350 card as well.

After the base install and 20 minutes of configuration, I was again able to watch live TV on the monitor, as well as use most of the other base functions. As long as I was satisfied with just MythTV, MythVideo, MythWeather, and had a monitor or TV with VGA to work with, the system had almost zero bring-up time and was truly a delight.

But it was fraught with other bugs that made it harder and harder to finish and polish. I could not watch or rip DVDs (later fixed). Configuration of the TV-Out of the PVR-350 took me *much* too far from the "click and go" configuration I was after. I rapidly ended up in the same swarm of one-off versioning problems I had with RedHat, plus some bugs peculiar to KnoppMyth, having to retrieve and hand-install everything. The mire deepened, and I moved back to . . .

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### Fourth Try: Gentoo 2005.1

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This one was by far the most successful install. I decided to stage the system on a full AMD Athlon 1GHz system with 1GB of RAM—an otherwise quiet system that I had used as my Windows machine for two years. The base install of Gentoo had changed while I was away, but not by much. This time through I used the binary install for most basic packages, probably saving me a full day of compiling.

After the magic “emerge mythtv,” I left for about an hour and came back to find everything compiled and waiting. Then I unzipped my old configuration files and copied the relevant parts onto the new system. Before long I was able to get to a full KDE 3.4, MythTV 0.18, MythDVD, MythWeather, MythVideo, TV-Out on the Hauppauge PVR-350, and all associated hardware acceleration. Everything I wanted to work was working; I couldn’t believe the day had come. The sound was set correctly at boot time, the video hardware acceleration was fine, and I was able to watch MPEG-4s flawlessly. I was a happy camper. So I packed it into the trunk and hauled it off to show a friend. On the drive home, the extra-super-quiet-all-copper heatsync cracked the stinking processor. Needless to say, I was miffed. I just didn’t feel like dealing with trying to find a three-year-old processor for my generic brand motherboard. I took the hard drive out, placed it in the Nehemiah system, and started reconfiguring.

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### Fifth Try: Gentoo 2005.1 Again (Success!)

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After recompiling the kernel, changing a couple of drivers, and recompiling mplayer, almost everything was working again. Setting X to use the Hauppauge PVR-350 meant that I didn’t have to reconfigure xorg or video drivers. The basic features are currently working, and it is far more stable. It goes a week or more before needing to relaunch MythFrontend. I suspect this is because the front end crashes and I don’t have a way to kill it with the remote. Because of the difference in true processor speed, I’m not able to get full speed out of most MPEG-4s.

Now that the basics are working, I’ve started working on other attached projects. I have become OS-agnostic over time, and have a pair of Mac OS X systems in the house. Someone has a precompiled MythFrontend for OS X that was able to connect to my master system, read the program guide, and play video (once I ran 100bT to the front room). I was very, very impressed. There is also the opportunity to set up secondary Linux front ends so you can have the master system do recording (headless if you like) in one room and have other systems watch throughout the house, networks and bus bandwidth permitting.

One thing happened very recently that brought me to a standing halt: Digital Cable. My wife accepted some special or another from the cable company, and they came out and installed one of those vile digital channel changer boxes. MythTV does have support for external channel changers, but I don’t have the external IR broadcaster cable. A friend of mine has built one, but says that they are wily beasts to set up. We immediately switched back to “Standard Standard Cable,” and things have been fine since. Some people have great success in using such changers, but if I can get away without one, I will.

## Results and Overall Reaction

If I weren't so stubborn about the other requirements on my checklist (skipping commercials, DVD caching, etc.), I would probably be better off with a commercial player and their service. But as TV is not the prevailing entertainment in my life, I am happy to set up my own recorder, play with the internals, get it working, and often end up with shows and videos I am interested in when I want them and with fewer ads per hour.

What I see as the biggest threat to this type of system is the difficulty in getting show listings. Since I started working with MythTV, there have been three separate systems for getting show listings. The first required nothing but was slow. The second required a sign-up and then a survey every three months to keep it going. The third is a cheap subscription with proceeds going back into the MythTV development community. There is no permanent answer here that I can see.

While I'm glad I set it up, I realize this system is not for everyone. But I have been thoroughly impressed with the results. I don't want to sound preachy or prophetic, but I feel that this is one of the things that has excited people about computers for years—the possibility that all these functions could be combined into one box. I hold with the conclusion of one of our local reporters: “The time of Appointment TV is fading.” But as long as I have some control over what features I get to use, I'll be glad to go out of my way to get them.

### INSTRUCTIONAL AND OTHER RESOURCES

MythTV and subprojects: <http://www.mythtv.org/>

Wiki: <http://www.mythtv.info/>

Mailing list archive: <http://www.gossamer-threads.com/lists/mythtv/users/ivtv> (hardware driver for MPEG encoders): [http://ivtvdriver.org/index.php/Main\\_Page](http://ivtvdriver.org/index.php/Main_Page)

nuv2disc (burning directly from MythTV): [http://extras.mythtvtalk.com/install\\_htm.html](http://extras.mythtvtalk.com/install_htm.html)

One extremely complete install guide: <http://wilsonet.com/mythtv/>