Mythbuntu 8.10 Installation Manual

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Chapter 1

Introduction

1.1 What is Mythbuntu

Mythbuntu is a combination of MythTV and Ubuntu. MythTV is a GPL licensed suite of programs that allow you to build the mythical home media convergence box on your own using Open Source software and operating systems. MythTV is known to work on Linux and Mac OS X (PowerPC and Intel). It does not run on Windows.

MythTV's robust PVR functions allow you to do the following:

- You may pause, fast-forward and rewind live Television.

- You may install multiple video capture cards to record more than one program at a time or use for picture-in-picture functions.

- You may watch and record SDTV and HDTV via firewire if you have a firewire-enabled cable or satellite tuner.

- You can have multiple servers (called "backends" in MythTV parlance), each with multiple capture cards in them. All servers are centrally managed and all programs are scheduled by the Master backend.

- You can have multiple clients (called "frontend" in MythTV parlance), each with a common view of all available programs. Each client can watch all programs recorded by any of the servers, assuming that they have the hardware capabilities to view the content; a low-powered frontend, for example, will not be able to watch HDTV. Clients can be diskless and controlled entirely by a remote control.

- You may use combinations of standard analog capture cards, MPEG-2, MJPEG, DVB, HDTV, USB and firewire capture devices. With a firewire capable backend, MythTV can control a variety of set top boxes often found in digital cable and satellite TV systems.

- Program Guide Data in North America is downloaded from Schedules Direct, a third party provider that licenses the data provided by Tribue Media Services. Schedules Direct charges a nominal rate for the data, broken up into several month increments. Schedules Direct accounts can be made at their website, http://www.schedulesdirect.org. Program Guide Data in other countries is obtained using XMLTV. MythTV uses this information to create a schedule that maximizes the number of programs that can be recorded if you don't have enough tuners.

- MythTV implements a UPNP server, so a UPNP client may automatically see content from your MythTV system. N.B.: this feature has not been verified to work on every available UPNP client.

- Plugins from the MythTV community provide functionality for: DVDs, Personal Video Collection, Music, Weather, News, Gaming, Netflix and much, much more. See section 17.1.

Chapter 2

Hardware

Hardware selection is a complex topic, one this HOWTO will only discuss briefly and in general terms. The following subsections offer some general guidance but stop short of offering specific recommendations.

For a good MythTV experience, you must understand that MythTV exercises your hardware more than a typical desktop. Encoder cards generate DMA across the PCI bus. The CPU is busy encoding / decoding video. Hard drives are constantly reading and writing data. Building a MythTV system on older / "spare" hardware may be an exercise in frustration and can waste many hours of valuable time.

For more detail about actual configurations that others have used, Mark Cooper has setup a hardware database at `http://pvrhw.goldfish.org/`. The website will let you browse what other users have reported as their hardware configuration, and how happy they are with the results.

If you have specific questions about the suitability of specific hardware choices, you can consult the archives of the mythtv-users mailing list at `http://www.gossamer-threads.com/lists/mythtv/` or post a question to the list.

2.1   CPU Type and Speed

Selection of CPU type and speed is one of the trickiest elements of hardware selection, mainly because there are so many tradeoffs which can be made. For example, if you have plenty of CPU, you can use higher bitrates or capture sizes, etc.

MythTV has two modes of operation. First, it can function as a software video encoder, which means that it uses a fairly generic "dumb" video capture card to get frames of video, encodes them using the CPU on your motherboard and writes them to disk. High-end video capture cards and devices like the TiVo and ReplayTV have dedicated encoder chips which use specialized hardware to convert the video stream to the MPEG-2 format without using the motherboard CPU. The main CPU has the responsibility of running the Operating System and reading and writing the encoded frames to the disk. These tasks have fairly low CPU requirements compared to encoding video, which is why a device like a Series 1 TiVo can run with only 16MB of RAM and a 54MHz CPU.

There are many variables that go into the question: "How fast a CPU do I need to run MythTV?" Obviously, the faster your CPU, the better your experience will be with MythTV. If you are using the software MPEG-4 encoder and performing the "Watch TV" function, where the CPU is both encoding and decoding video simultaneously to allow Pause, Fast Forward and Rewind functions for live TV requires more CPU then just encoding or decoding. MythTV also supports multiple encoder cards in a single PC, thereby increasing the CPU requirements if you plan on simultaneously encoding multiple programs. As a general guideline, plan on 1GHz per encoder if you are doing software-based encoding, less if you are using a hardware-based encoder.

Here are a few data points:

- A PIII/733MHz system can encode one video stream using the MPEG-4 codec using 480x480 capture resolution. This does not allow for live TV watching, but does allow for encoding video and then watching it later.

- A developer states that his AMD1800+ system can almost encode two MPEG-4 video streams and watch one program simultaneously.

- A dual Celeron/450MHz is able to view a 480x480 MPEG-4/3300kbps file created on a different system with 30% CPU usage.

- A P4 2.4GHz machine can encode two 3300Kbps 480x480 MPEG-4 files and simultaneously serve content to a remote frontend.

- A PIII/733MHz system can capture two DVB streams and serve them both up for live TV - but is slow at commercial flaggig.

If you have a Via mini-itx board with MPEG2 decoder or a Hauppauge PVR-350, MythTV can use the hardware-based video decoder for playback, which further reduces CPU requirements.

2.2   Memory

A MythTV host that is both a backend and a frontend and using software encoding with a single capture card should run adequately in 256MB of RAM. Additional RAM above 256MB will not necessarily increase performance, but may be useful if you are running multiple encoders.

2.3   Hard Disk(s)

Encoded video takes up a lot of hard disk space. The exact amount depends on the encoding scheme, the size of the raw images and the frames per second, but typical values for MythTV range from 700 megabytes/hour for MPEG-4, 2 GB/hour for MPEG-2 and RTjpeg and 7 GB/hour for ATSC HDTV.

If your building a seperate backend machine it can be advisable to install Mythbuntu on a smaller >10GB disk with your recordings located on a second larger disk. This is because of all the additonal read/writes made to a disk with the recordings it can cause disks to fail earlier than when used with desktops.

2.4   Video Capture Devices

In order to capture video, MythTV will need one or more video capture devices with Linux drivers. There are a number of classes of hardware available for capturing video.

2.4.1   Frame Grabbers

This class of card is the simplest and is usually the cheapest. There is no on-board encoding of the analog video; hardware known as a Digital-Analog Converter (DAC) takes the video and presents it to the computer in an essentially raw digital form.

For a list of video capture cards known to work with Linux, please see /usr/src/linux/Documentation/video4linux/bttv for a partial listing; even if your specific card is not listed, it may be that the vendor is actually using a standard reference design and placing their own name on it. See the video4linux mailing list https://listman.redhat.com/mailman/listinfo/video4linux-list for more information and for specific hardware questions.

The most common inexpensive cards available use the Bt848, Bt878 or CX2388x series of video capture chips; examples are the "Hauppauge WinTV Go" card and the "AverTV Desktop PVR" card, both of which use the bttv kernel module.

NOTE: The ATI TV Wonder series and the ATI All-in-Wonder series of cards are not the same. The All-in-Wonder cards will not work with MythTV.

The ATI All-in-Wonder cards (which are not the same as the ATI TV Wonder, TV Wonder VE or TV Wonder Pro) will not work as a MythTV capture device because the GATOS http://gatos. sourceforge.net drivers that are available provide only a limited subset of the V4L API. The TV Wonder series of cards are supported by the Bt8x8 Video4Linux driver.

After you have installed a suitable capture device, you can check that the kernel sees it with lspci. Look for an entry labeled "Multimedia video controller". To get more detailed information about the card, use lspci -v or lspci -vv. Ensure that your system is loading the bttv modules by typing:

    # lsmod —grep bttv

You want to see the bttv module listed.

2.4.2   Hardware MPEG-2 encoders

While inexpensive video-capture cards simply capture raw frames, leaving encoding to software, some higher-end cards incorporate hardware-based encoding. Using either a G200 MJPEG encoder card, or a MPEG-2 encoder card supported by the IvyTV project http://ivtvdriver.org such as the Hauppauge PVR-150/250/350/500, Avermedia M179, Hauppauge "Freestyle" or Yuan M600 cards will allow you to use dedicated hardware encoders rather than your CPU. (The PVR-350 can simultaneously be used as an output device.) Using the on-board MPEG-2 encoder greatly reduces the CPU requirements for encoding.

NOTE: Motherboards with the Via chipset are notoriously bad with DMA and have caused numerous issues with ivtv, including hard locks. See the ivtv website http://ivtvdriver.org for the latest information on what works and what doesn't.

Here are some data points for encoding:

  • A Celeron 450 uses 2

Here are some data points for decoding:

  • An Athlon 1800XP can decode a 720x480 8Mbps MPEG-2 file using 10% CPU

  • An Athlon 1GHz can decode a 720x480 16Mbps MPEG-2 file using 30-50% CPU, can decode a 480x480 16Mbps MPEG-2 using 30% CPU and approximately 30% for Live TV at 416x480.

  • A P3-550 can decode a 480x480 16Mbps MPEG-2 file with 55% CPU.

  • A Celeron 450 (no SSE) can decode a 480x480 16Mbps MPEG-2 file with 80% CPU.

2.4.3   DVB capture cards

DVB is a video standard primarily found in Europe (where it comes in DVB-C, DVB-T and DVB-S varieties for Cable, Terrestrial and Satellite) and is also used as the programming interface for HDTV capture cards in Linux. To see if your DVB card is supported, see the list of cards in the "Supported Hardware" section of the DVB Wiki at http://www.linuxtv.org/wiki/index.php/Main_Page for more information.

In the United States, you may use a card such as the TwinHan to obtain unencrypted Free-To-Air satellite channels. See http://www.lyngsat.com/ for the types of content which is available.

2.4.4   HDTV

There are a number of HDTV cards with Linux drivers which are known to operate in the United States; a complete list of cards with DVB drivers can be found at http://www.linuxtv.org/wiki/index.php/ATSC_devices Some cards support capture of unencrypted digital cable TV (utilizing QAM256), others will only work with Over The Air signals captured with an antenna (with 8VSB).

Cards that have been reported to work include:

- pcHDTV HD-2000, Air2PC PCI rev 1-3 (8VSB only)

- SiliconDust HDHomeRun (8VSB, QAM256)

- pcHDTV HD-3000/5500 (8VSB, QAM256)

- Air2PC HD-5000 (8VSB, QAM256)

- DViCO Fusion HDTV Lite/Gold 5 (8VSB, QAM256)

NOTE: There are no known consumer-level capture devices which will allow you to capture the HDTV output (DVI, HDMI, VGA, YPbPr / Component) from a set-top box commonly found with digital cable systems or satellite systems. None of the capture devices listed above perform any encoding; they merely allow your computer to save a copy of a HDTV stream which has already been converted to MPEG-2 at the broadcast facility.

NOTE: All of the cards listed above (except for the HD-2000 and HDHomeRun) should be configured as DVB cards. The HD-2000 can be configured as a pcHDTV card if you use the V4L drivers from http://www.pchdtv.com and use Linux kernel 2.6.9 or earlier. With kernel 2.6.10 and higher it must be configured as a DVB card, but you lose access to the second antenna input in ATSC mode. The HDHomeRun should be configured as two HDHomeRun cards, one for each tuner.

To playback HDTV content, plan on a powerful CPU. "How powerful?" depends on a number of factors, such as the capture resolution, whether the video is progressive or interlaced, and whether your display card has hardware-assist support for Linux.

The Simple Answer: Once you are in the 3.2 Ghz P4-class of CPU you should have no issues with viewing HDTV.

The Complicated Answer:

- For 720p content (1280x720), a 2.4GHz P4 should be sufficient.

- For 1920x1080i-¿1920x1080p with the better deinterlacing methods done in real time a 2.4GHz CPU is taxed, but should work if you use "Bob and Weave" deinterlacing, or if you have an NVIDIA card with MPEG-2 hardware acceleration. If you enable the hardware acceleration, you may be able to use a 1.8GHz processor.

2.4.5   Firewire

You may use the Firewire output of the Motorola DCT6200 or the SA3250. If your provider uses 5C encryption on a particular channel, you won't be able to get any content.

2.4.6   DBoxII or other devices running Neutrino

You may use the Ethernet port of an DBoxII or a similar device to capture MPEG2. Your set top box has to be running the Neutrino GUI.

2.4.7 USB Capture Devices

The Plextor ConvertX PVR devices are supported through Linux drivers available from http://www.plextor.com/english/support/LinuxSDK.htm. MythTV uses the Plextor to capture hardware encoded MPEG-4, so the host CPU requirements are low.

Hauppauge WinTV-PVR-USB2 (driver available at http://www.isely.net/pvrusb2/) emulates a PVR-x50 card. IP Recorder (RTSP, RTS, UDP)

MPEG-2, MPEG-4 and H.264 internet TS stream recording is supported using the IPTV recorder in MythTV. This recorder expects the channels to be supplied as a m3u playlist. If your DSL/Fiber provider supplies television service, but does not provide a m3u playlist for the channels, you can construct one for your own use. You do not need to download it from the same server as the streams themselves, and can also read it from a file if this is more convenient.

NOTE: Some DSL providers only allow you to use one recorder at a time, so you may need to limit yourself to one recorder in MythTV and turn off any set top box the cable provider sold or rented to you with your service. This limitation is independent of the bandwidth you have purchased.

2.4.8 Hardware known NOT to work and other issues

- Hauppauge WinTV-D or -HD (no driver)

- Hauppauge WinTV-USB series

- Hauppauge WinTV-PVR-usb (model 602), or WinTV-PVR-PCI (model 880) cards (no driver - this is not the PVR-250/350 series of cards supported by the IvyTV driver)

- Hauppauge HVR-1600. (no driver). NOTE: There have been reports (2006-12 timeframe) that Hauppauge is putting the HVR-1600 inside of the PVR-150 box; if you're purchasing a retail PVR-150, carefully examine the packaging - there should be some indication that the hardware inside is actually a HVR-1600 and not a PVR-150. Check the Supported Hardware (http://www.ivtvdriver.org/index.php/Supported_hardware) page of the ivtv driver for updated support information.

- ATI All-in-Wonder series

2.5 Sound Card

The system needs a sound card or an on-board equivalent on the motherboard to play back and in most cases, to record sound. Any sound card that can be operated by the ALSA (Advanced Linux Sound Architecture) kernel modules will work with MythTV. However, some cards and drivers will provide better quality or compatibility than others. In particular, many audio devices included on motherboards can be problematic.

The usual practice for capturing the audio associated with the video is to run a cable from an audio output on the video capture card to the Line input on a sound card. However, some video capture cards provide on-board audio capabilities that work with the kernel btaudio module instead, thereby eliminating the need for a cable. This is useful if you will be using multiple capture cards in a single chassis, since each capture card will not need its own sound card. Note that a separate sound card is still required for playback when using btaudio, and that often the audio recorded in this way will be mono only. See the btaudio section for more information.

NOTE: Analog video capture cards are the only ones which require a sound card for capturing audio. DVB, HDTV, and other hardware encoder cards all provide a combined audio / video stream.

NOTE: Plugging a Line-level device into the Mic input is not recommended. Line-level devices have higher voltages and can damage the sound card. In addition, even if it doesn't break your card, you will

be getting Mono sound. See the Linux MP3 HOWTO at http://www.tldp.org/HOWTO/MP3-HOWTO.html for additional information.

2.6   Video Display Card

MythTV will work with just about any video card. However, it is highly recommended that you use a card which supports XVideo (XV) extensions. If your card does not support XV, color conversion and scaling will be performed by your CPU rather than the video card. This is very CPU and memory intensive and will often result in dropped frames and a corresponding degradation of quality. Check the X documentation for details if you are uncertain about your preferred card. You may also run xvinfo; look for your video card to be listed as one of the adapters.

If you want to use MythTV with a standard television, you will need a physical connection from your video card to your TV set, which can either be a TV-out port on the card itself or an external adapter that converts the VGA signal to an appropriate video signal. "Appropriate" depends on a number of factors, such as video standard (NTSC vs. PAL), the type of input connection (Composite vs. SVideo), etc.

Note that with some video cards and X drivers, XVideo extensions are only supported on the VGA output, and not on the TV output. Cards with TV-out

The next section deals with a number of cards that are known to have TV-out ports. The list is unlikely to be complete, so if you know of others, please post a message to the mythtv-users mailing list so the information can be included in future versions of the HOWTO. The list is organized by manufacturer.

2.6.1   ATI

ATI makes many cards with TV-out capability, but only offers Linux drivers for Radeon 8500 and above cards. See the Drivers and Software section of http://www.ati.com for the driver and additional information.

The enhanced ati.2 X driver created by the GATOS http://gatos.sourceforge.net project offers some support for TV-out on other ATI cards, but only in its "experimental" version, available through CVS. There have been reports from people who say they have made this driver work with one or another ATI card. For example, Bruce Markey mailto:bjm@lvcm.com writes (on the mythtv-users mailing list): "I got this to work. You can quote me on that. I've used TV-out on several models of ATI cards both All-In-Wonder and regular cards with TV-out." See the "Adventurous Setup" section of http://gatos.sourceforge.net/watching_tv.php for details. Also see http://www.retinalburn.net/linux/tvout.html for more information.

2.6.2   NVIDIA

Some NVIDIA cards with TV-out can be run using the standard nv driver in X, combined with the userspace application nvtv to control the TV-out port. See http://sourceforge.net/projects/nv-tv-out/ for details. Recent versions of the NVIDIA driver have better support for overscan and other features useful with TV-Out, so the nvtv application may not be required.

Some NVIDIA cards can be run with a proprietary NVIDIA X driver made available by NVIDIA. See http://www.nvidia.com/object/unix.html for more information.

NOTE: It's strongly recommended that you use the proprietary NVIDIA drivers; they have excellent support for XvMC and ship with a good configuration utility. XvMC provides MPEG-2 hardware acceleration, which is important if you want to display HDTV.

2.6.3 Hauppauge PVR-350

MythTV supports the TV-out and MPEG-2 decoder functions in the IvyTV driver.

The PVR-350 is unique amongst the Hauppauge PVR-x50 cards in that it also supports audio output, but you need to connect that audio output to something. There are two courses of action you may take:

1. Take the audio output from the PVR-350 and plug it into an input on a sound card on your machine. You may then use MythTV's internal audio controls.

2. Take the audio output from the PVR-350 and connect it directly to your television / audio system. You must indicate that you are using external audio control on the PVR-350 setup page.

2.6.4 Other Options

Some devices with on-board TV-out capability, such as mini-itx boards, Xboxes converted to Linux and some laptops can be used as MythTV frontends to display on a television screen. Please consult the mythtv-users mailing list for messages that report the details of these special arrangements.

2.6.5 External Adapters

External adapters convert standard VGA output to a form suitable for display on a television. The output format varies by region, since different countries have different TV standards. People on the mythtv-users list have mentioned these adapters:

- AITech Web Cable Plus, powered by external transformer or takes power from PS/2 keyboard connector, support resolutions up to 1024x768, outputs composite and SVideo, provides position adjustment.

- Averkey lite, powered by a USB port, has Composite, SVideo, YPbPr outputs; pan, brightness, overscan/underscan controls; supports up to 1024x768 outputs; and supports PAL and NTSC.

- ADS TV Elite XGA

- AverKey iMicro (comments are generally favorable)

- AITech Web Cable (comments are generally unfavorable, different than the "Plus" version above)

- TVIEW Gold (mentioned once, favorably)

Chapter 3

Installation Types

A new Mythbuntu installation may be performed via three methods. Each of the methods has distinct advantages, so compare your circumstances before selecting one:

1. Installation from a Mythbuntu Live CD.

2. Installation from a Mythbuntu Alternate CD.

3. Installation of the *mythbuntu-desktop* meta-package on top of an existing ubuntu install.

3.1   Live CD

Most people will want to install using the Live CD. Of the three options, this is the fastest selection. It also provides the most granularity for selecting options, and configuring packages. The GUI for installation is very easy to follow and friendly for new users.

Another advantage to performing a Mythbuntu installation from CD is the higher level of automation that the Mythbuntu ubiquity CD installer provides. To achieve the same results in method 2 or 3 as those of 1 would require additional configuration steps to be performed.

Installation method 1 provides several options immediately during the installation process that are not available in method 3 or 2 until the Mythbuntu Control Center (MCC) can be run post-install. For example, installation of the *mythbuntu-desktop* meta-package does not install any plugins. Installation of plugins in method 3 requires installing plugins as a separate step. Additional tasks that can be performed during install include:

- configuring remote controls supported by LIRC,

- enabling and configuring proprietary front-end video drivers, including TV-OUT function,

- configuring backend drivers, including installing the Silicon Dust HDHomerun configuration utility, and enabling XMLTV guide data provider for subscribers of Schedules Direct.

Also, you may choose to install the mythweb plugin in order to access mythtv functions from a remote web browser. To prevent unauthorized external access to your Mythbuntu installation, the CD installation method allows you to setup an access password. No steps are taken to secure mythweb in method 3. Mythweb must be secured post-install via the MCC in method 3.

3.2   Alternate CD

As previously mentioned, the preferred method of installation on a new system is the Live CD. That being said, the Mythbuntu Alternate CD has three main intended uses.

The first use is for people who have troubles with the Live CD. Sometimes people with older graphics cards or too little memory aren't able to start up the Live CD. For these users, the Alternate CD may be able to perform an installation, allowing a user to defer configuration of this dsyfunctional hardware later.

The second use is for people who want to use Logical Volume Management (LVM). LVM can allow multiple physical drives to appear to the system as a single *logical* partition. This has become less of an issue with the advent of storage groups, which are available in Mythbuntu 8.04+ *and MythTV 0.21+*. Users that would still like to use LVM however, can install via the alternate disk.

The last use is for pre-configuring and installing a diskless server role. Diskless servers have been introduced with Mythbuntu 8.04. Unfortunately, the only way to install and configure one at installation time is via the Altenate disk. If a user installs using any other method, the diskless server will have to be created and configured after installation. Doing it during installation has the distinct speed advantage of all packages (debs) being cached on the CD rather than needing to download them after install.

By choosing this method, unfortunately the only selectable options will be the **type** of install, *Frontend*, *Backend*, etc.

3.3 Metapackage

There may be a variety of reasons for installing the *mythbuntu-desktop* meta-package on an existing ubuntu install.

The most common reason users follow this is because they have already configured the box that they intend to use Mythbuntu on to their liking. Adding on the Mythbuntu tasks makes more sense in that case. NOTE: If you are setting up a new mythtv box, please use the Live CD or Alternate CD. For assistance with installation method 3, please refer to the instructions on http://www.mythbuntu.org/existing-ubuntu. These instructions will enable you to add any of the Mythbuntu roles directly to an existing Ubuntu installation.

The biggest reason to stay away from this method on a new install is because Mythbuntu uses the XFCE4 desktop. Applications such as OpenOffice, Evolution, and a full Gnome desktop are not installed for a Mythbuntu installation. Thus, if these applications are unnecessary for your Mythbuntu box, this excess bloat of an existing install can be easily avoided by installation method 1.

Chapter 4

Booting the Mythbuntu Live CD

In this chapter we will walk you through the booting from the Mythbuntu CD. If you haven't downloaded it yet you should visit http://www.mythbuntu.org/downloads to download and burn it to a disc.

Once the ISO has been downloaded and burned to a disc, simply pop it into your CD-ROM drive with your BIOS set to boot from CD. You will be presented with a boot loader menu as shown in figure 4.1 From this screen you can start the installer two ways. If you select the **Mythbuntu Live Environment**, you will be booted into LiveCD mode. From this mode, you can operate any applications available on the Mythbuntu disk, including the installer. If you won't be needing anything *other* than the installer, select the **Install Mythbuntu** option by selecting it via the up-down keys and pressing enter. This option is particularly useful on memory limited systems that may not be able to handle the entire live environment.
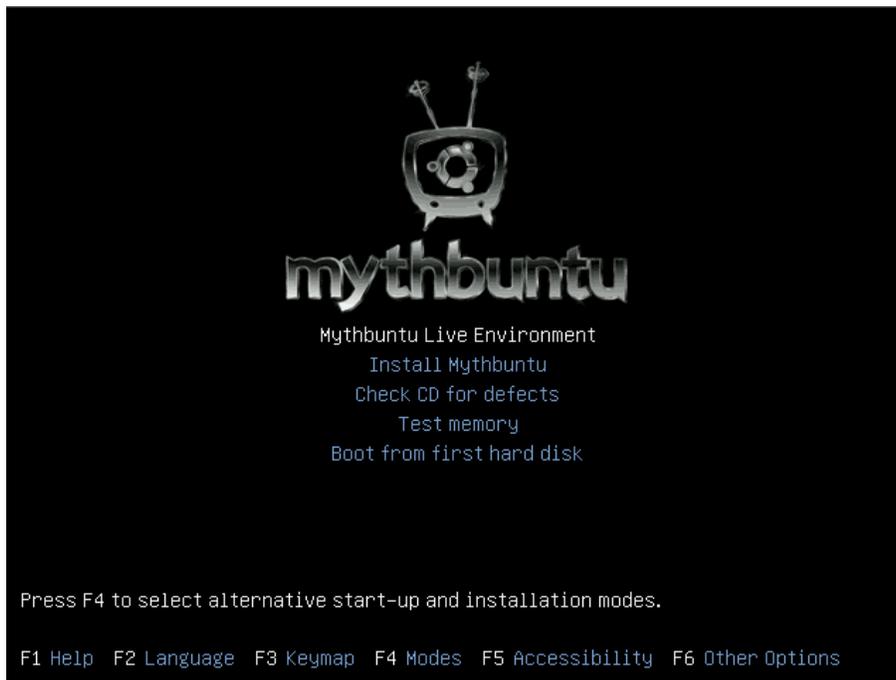
Figure 4.1: ISOLinux Boot Screen

Once the disc has booted you'll be presented with the screen shown in figure 4.2
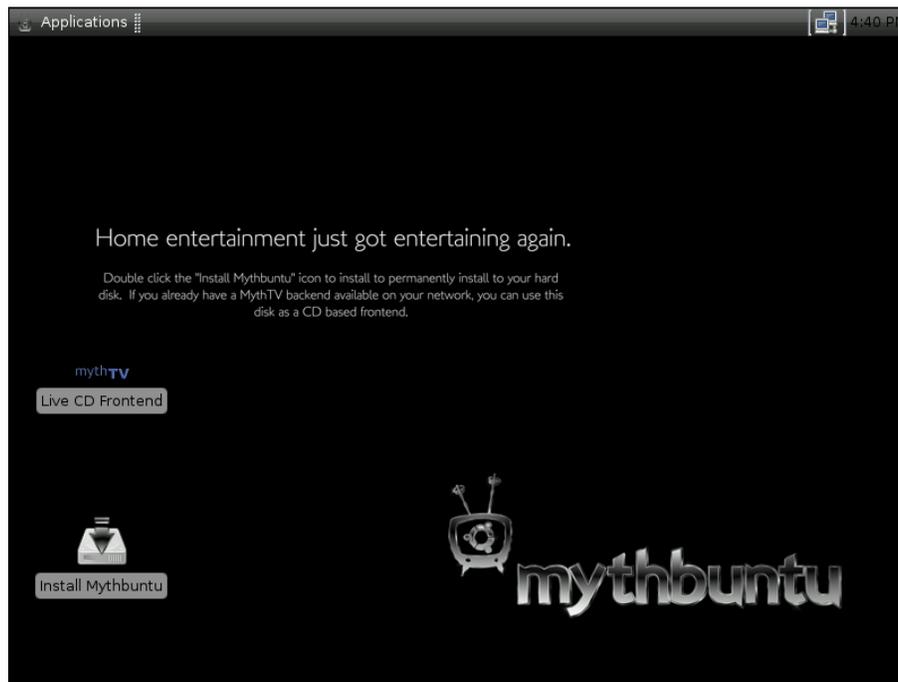
Figure 4.2: The Mythbuntu desktop

From this environment, you will be able to either run a Live CD Frontend, Install Mythbuntu, or use any preinstalled applications on the disk. Feel free to explore around the disk. No changes will be made to your system unless you proceed with **Install Mythbuntu**.

Chapter 5

Live CD Environment

5.1 Running a Frontend from CD

After lanching the "Live CD Frontend" you'll be shown the following screen where you can configure the plugins you'll like to use and enter your master backend connection information. You can either launch the session straight away or save your settings to a usb stick / mounted network drive and then launch mythtv. If you choose to save your settings you'll be prompted with a choice of where you'd like the settings saved to.
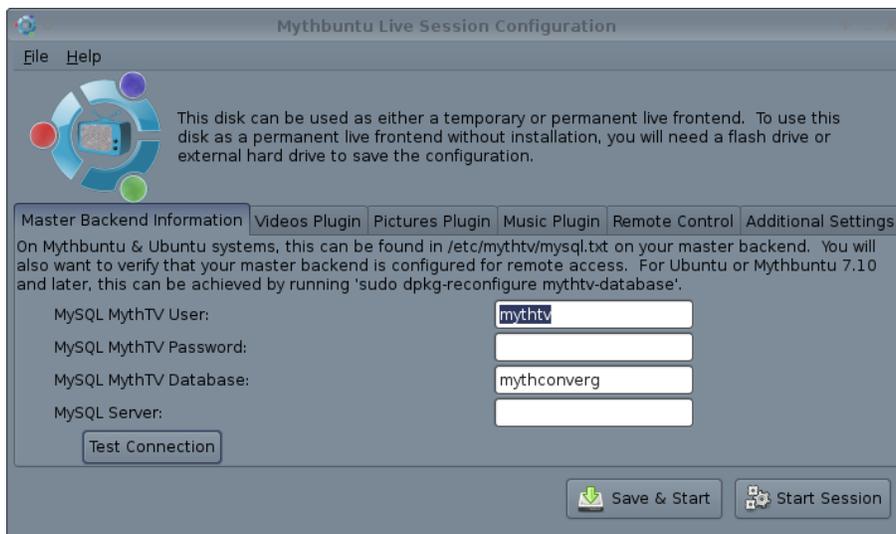
Figure 5.1:

Master Backend Information

To connect to your Master Backend you'll need to enter the database connection details here, these can be found on your backend in /etc/mythtv/mysql.txt although the host in file will mostly like need to be replaced with the ip address of the machine. Once your settings have been entered test your connection to make sure everything is working.
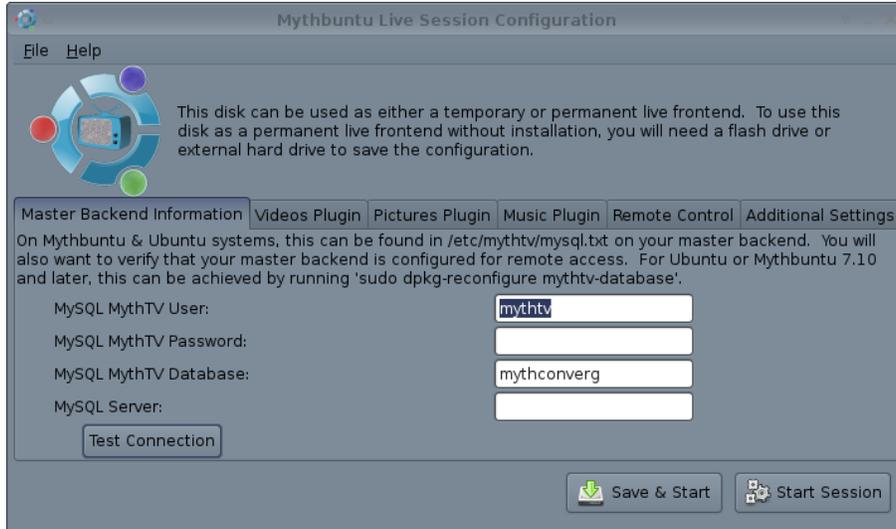
Figure 5.2: Master Backend Information Tab

Videos Plugin

Within the LiveCD you can also watch videos which is mounted via either SMB or NFS. Simply select the share type from the box and enter the details required.
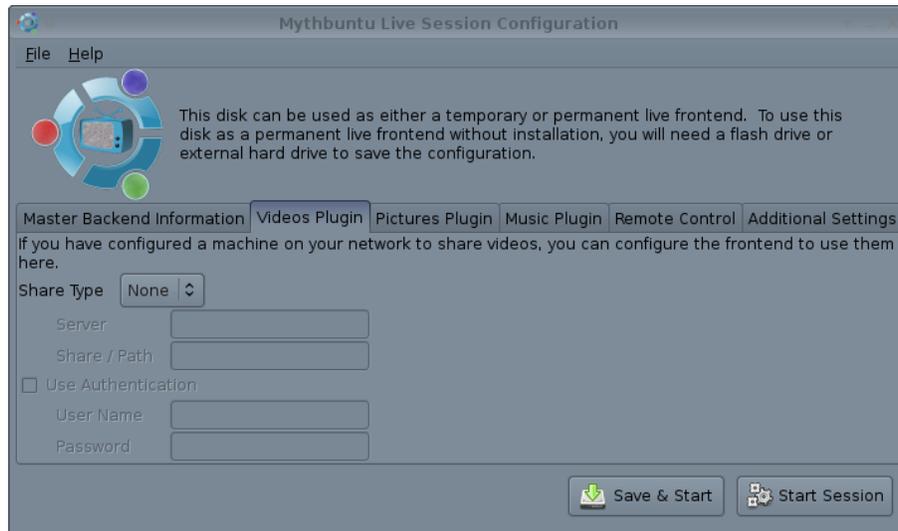

Figure 5.3: Video Plugin Tab

Pictures Plugin

Within the LiveCD you can also look at pictures which is mounted via either SMB or NFS. Simply select the share type from the box and enter the details required.
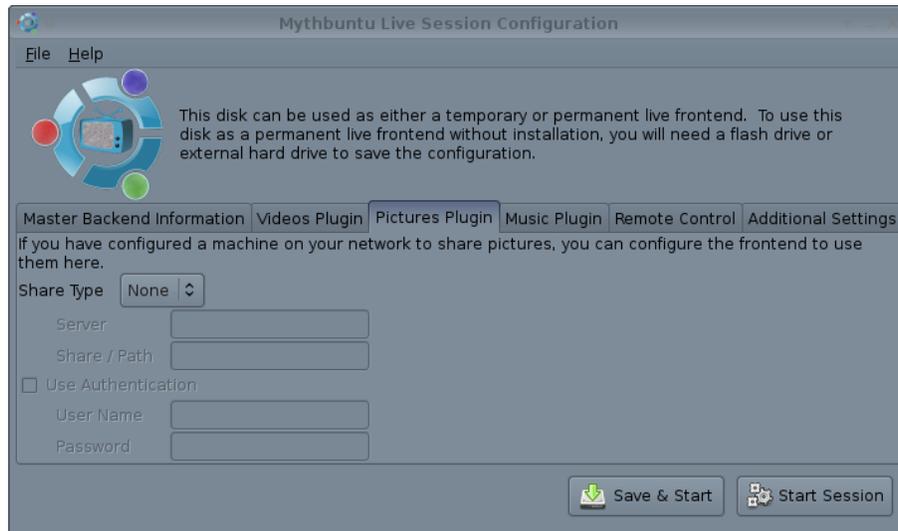
Figure 5.4: Picture Plugin Tab

Music Plugin

Within the LiveCD you can also listen to music which is mounted via either SMB or NFS. Simply select the share type from the box and enter the details required.
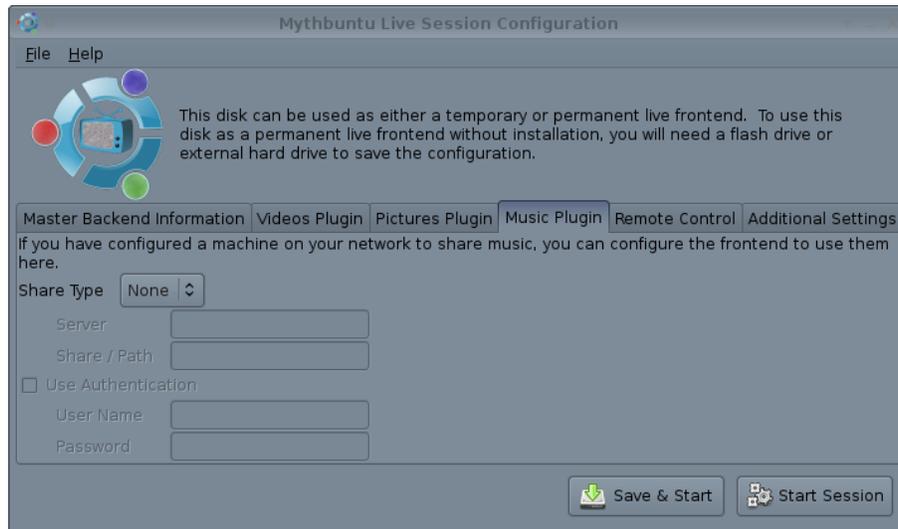
Figure 5.5: Music Plugin Tab

Remote Plugin

Another great thing with the LiveCD is the ability to use preset controls, simply enable the remote control and then choose your control type from the drop down menus.
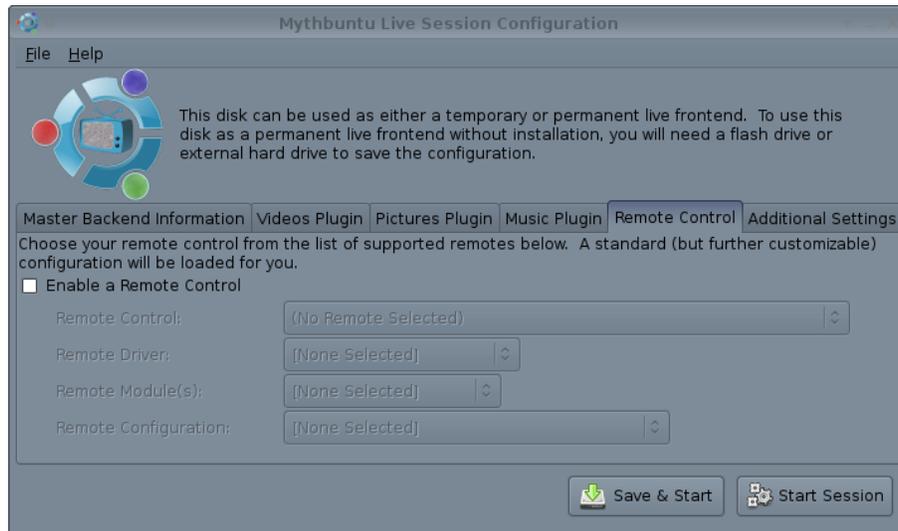
Figure 5.6: Remote Control Plugin Tab

Additional Settings

Under additional settings you can set the LiveCD to autostart MythTV on boot (only worthwhile if you save the settings) along with setting the home dir to an external disk. The hostname can also be changed here if you wished.
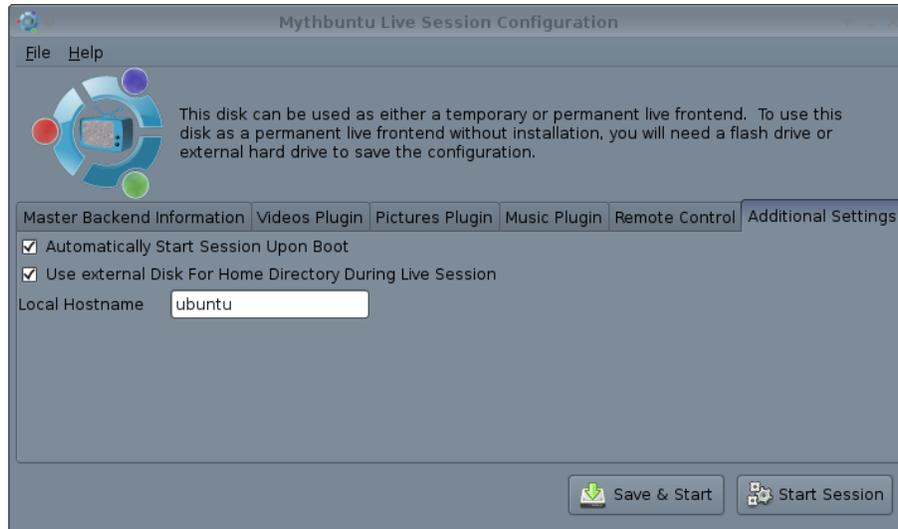

Figure 5.7: Additional Settings Tab

Chapter 6

Networking Configuration

By default, the Mythbuntu networking configuration will use DHCP via ethernet. If you have a need for wireless support, or a static network you will need to adjust your configuration. This can be done both on the Live disk as well as after the system is installed.

6.1 Wireless Support

If you have a wireless card, you will need to use Network Manager to modify your networking settings. At the top right of the Xfce environment, click the network icon. You should see a list of wireless networks that are not blocking their ESSID. Click a network to connect to it.
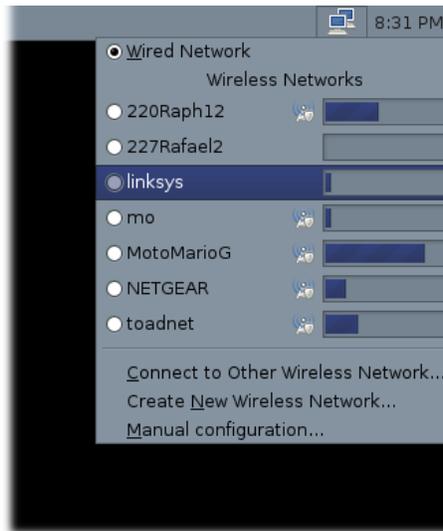

Figure 6.1: Network Manager (Automatic)

6.1.1 Advanced Wireless

If you will be moving among different networks with this machine, it is recommended that you use Network Manager. There are a few caveats to using wireless via Network Manager:

- If you have a network with a protected key, you will need to enter a password to unlock the keyring every time you login.

- Network Manager can't handle networks with static IP addresses.

- Hidden networks will not show up in the list.

All of these items can be handled by setting up a wireless network manually. To do so, choose the Network Manager icon and choose **Manual configuration**.
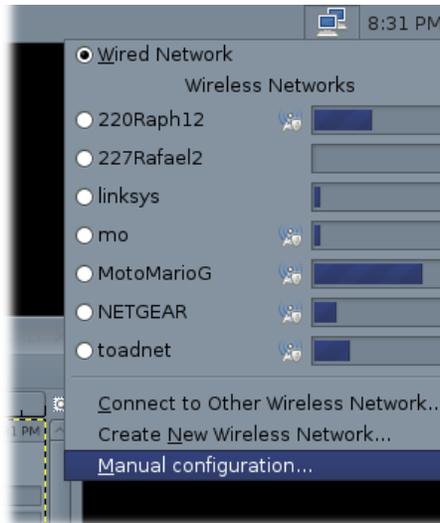

Figure 6.2: Network Manager (Manual Step 1)

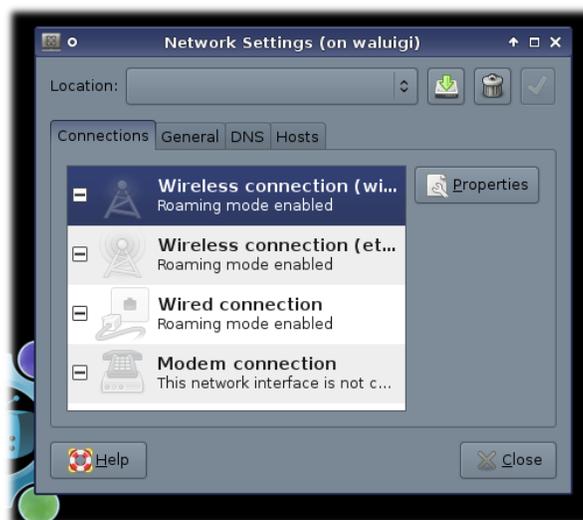In the dialog that appears, choose your wireless card and hit properties.

Figure 6.3: Network Manager (Manual Step 2)

In the dialog that appears, uncheck **Enable roaming mode**. Select (or enter) your network information in the Network Name (ESSID) box, and fill out the rest of the dialog.

Figure 6.4: Network Manager (Manual Step 3)

6.2   Wired support

By default, Network Manager will configure your network for DHCP via ethernet.

6.2.1   Advanced Wired

If you have a need for a static IP address, you will need to disable Network manager from handling your wired network. To do so, choose the Network Manager icon and choose **Manual configuration**.
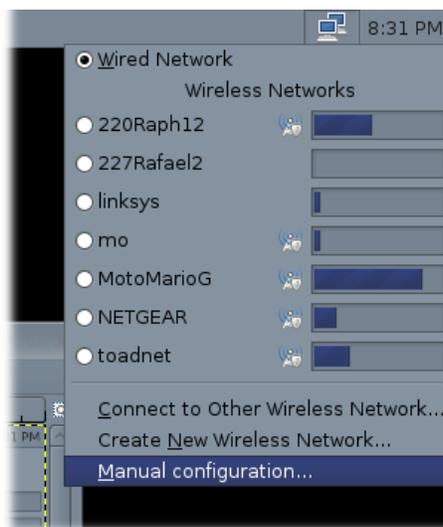

Figure 6.5: Network Manager Wired (Manual Step 1)

In the dialog that appears, choose your wired card and hit properties.

Figure 6.6: Network Manager Wired (Manual Step 2)

Fill out the dialog that appears.

Figure 6.7: Network Manager Wired (Manual Step 3)

Chapter 7

Installing Mythbuntu from Live CD

7.1 Starting Off

To launch the installation program double click on the **Install Mythbuntu** icon located on the desktop, this will launch the screen shown in figure 7.1. You can now select the language to be used once installed and during installation, select your chosen language and click on the *Forward* button.
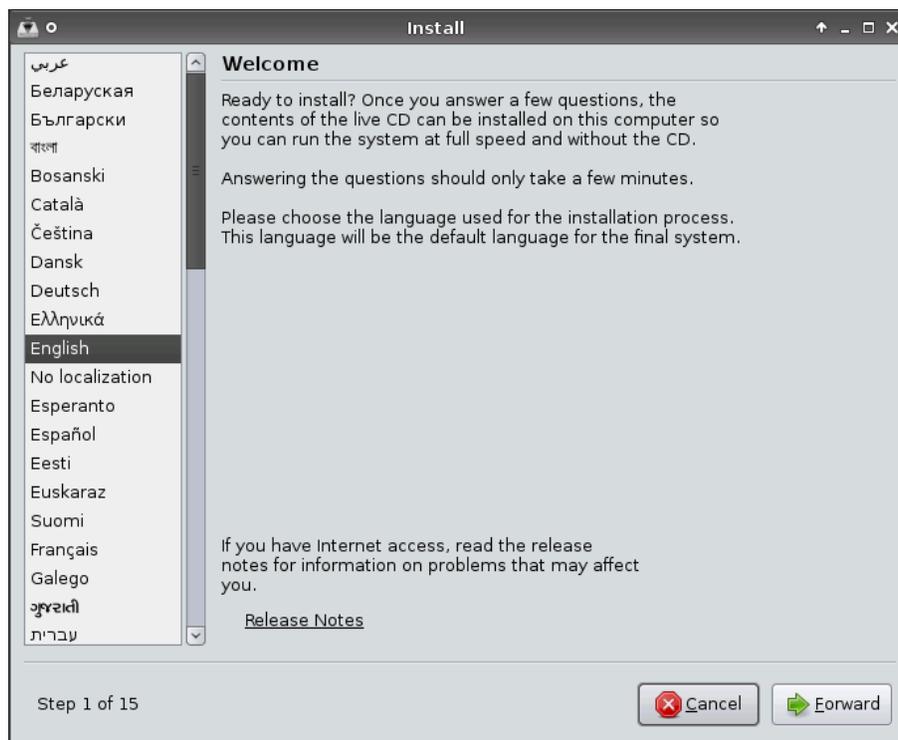

Figure 7.1: Step 1 of 15

This brings us to figure 7.2. On this screen you need to select the a city that located within your country and timezone, this allows for automatic changes for day light savings etc. You can select your city either by selecting it on the map or via the selection box. Once you're happy with your choice click on the *Forward* button.
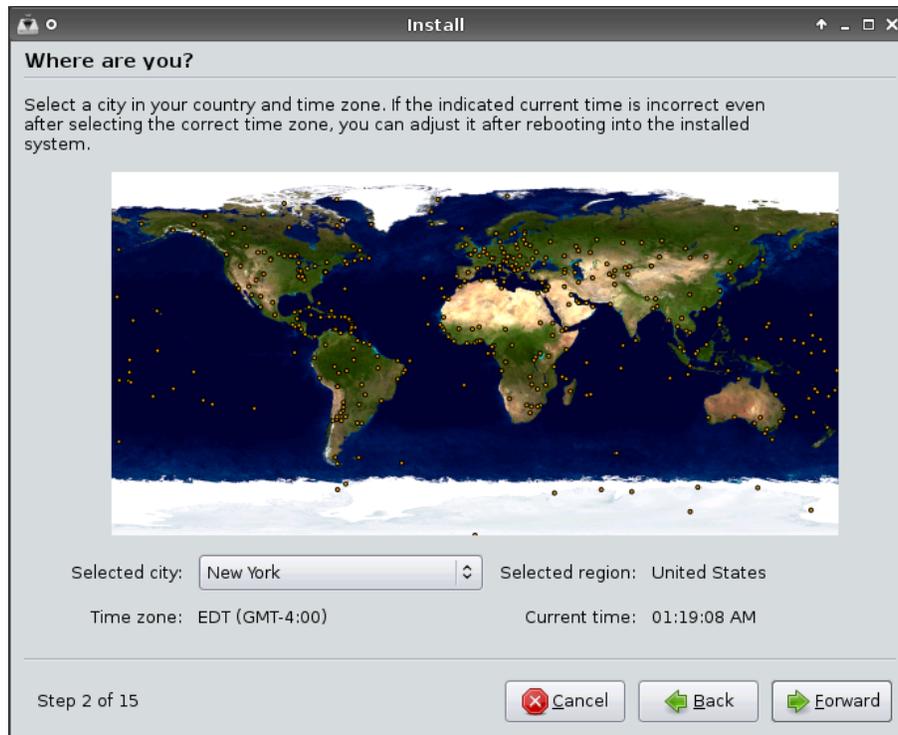

Figure 7.2: Step 2 of 15

You are now able to choose your keyboard layout. Select your keyboard layout from the options and test the keys to ensure they behave as expected. Once you're happy click on the *Forward* button.
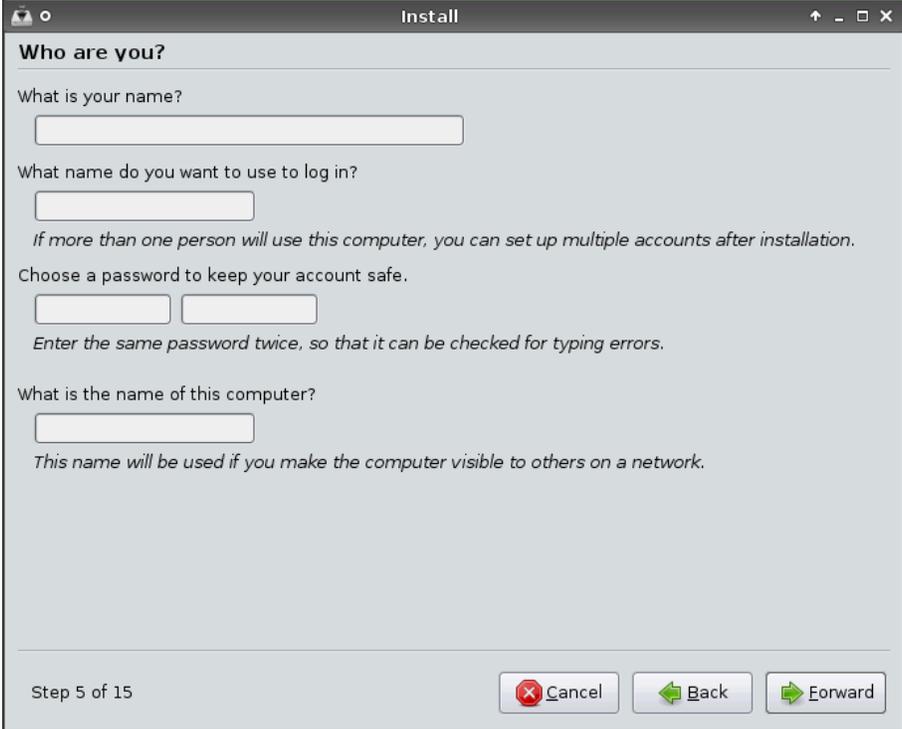

Figure 7.3: Step 3 of 15

You're now able to choose how you wish to partition the disk space. It's recommended that you select **Guided Partition** and the drive you wish to partition. and click the *forward* button. You can however manually partition your drive but it won't be covered here. You would do this if you where to install the OS onto one drive and your recordings onto another.

Figure 7.4: Step 4 of 14

It's now time to enter your login details, password and your computer's name. So enter the required details and continue by clicking the *forward* button. **NOTE: Please don't use the userid mythtv.**

Figure 7.5: Step 5 of 15

7.2 Standard Installation

NOTE: This installation should only be used if it is your first Mythbuntu machine on the network, otherwise follow the Advanced Installation 7.3 guide.

A standard installation will install and configure every option with minimal user interaction, it configures the system up to run as a frontend and a backend as well as installing all the plugins, themes. Samba and ssh are also install and configured to allow for easier maintenance. You should have a screen similar to figure 7.6, select the **Standard Installation** option and click on the *Forward* button.

Figure 7.6: Step 6 of 15

Mythbuntu is able to make use of any remote which is supported by the LIRC project, a list of them is available at `http://www.lirc.org/html/table.html`. If you wish to configure one then click on the **Enable a Remote Control** checkbox. This will provided a drop down menu to enable the selection of a supported remote. Upon selection the required fields are automatically filled in. However if your remote isn't listed you can either select **Other Remote** option and fill the required info in or file a bug at `https://bugs.launchpad.net/mythbuntu/+filebug` with details of the remote and we'll try and get it added for the future.

You can also enable an IR transmitter at this stage as well. Click on the **Enable an IR Transmitter** checkbox. This will provide a drop down menu to enable the selection of a supported blaster. Upon selection the required field should automatically be filled in.

When you're satisfied with the options click on the *Forward* button.

Remotes which require extra work once mythbuntu is installed are:

- AppleTV remotes

- Remotes supported via dev/input

Figure 7.7: Step 12 of 15

Proprietary drivers can be enabled for your video cards here if you choose to use them. This is done by selecting *Modify Video Driver & Settings* and selecting the driver you wish to use. If you chose to enable the proprietary drivers then you're now able to configure TV-OUT. Refer to the TV-OUT reference section 17.2 for more information as to the settings you'll likely require.

The Silicon Dust HDHomerun Configuration Utility should be enabled if you wish to use your backend with HD Homerun.

Figure 7.8: Step 13 of 15

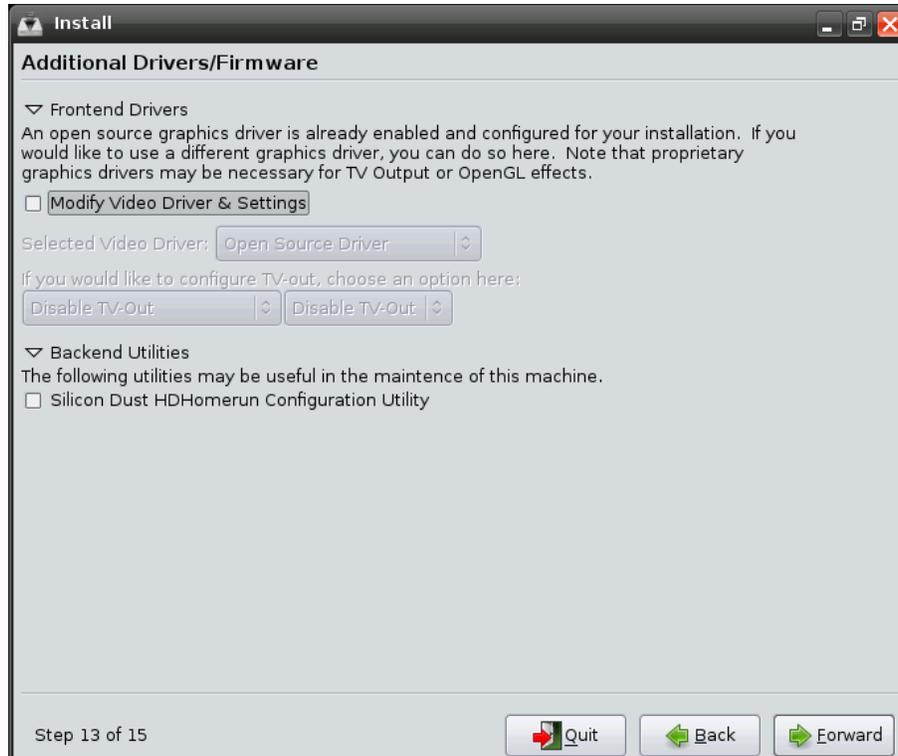At this stage you can review the selection you've made, where if you're unhappy with any of them you can return and change your choices. If you are happy with the settings you've chosen, click on the *Install* button to install.

Figure 7.9: Step 14 of 15

Note *The installer may appear to hang around 94%-95% however alot of packages are installed and setup in this stage which take a while*

When the installation process has completed, you will be able to create your SchedulesDirect account if you haven't already. This will launch the included browser and send you to the http://www.schedulesdirect.org website. If you previously created an account this is not necessary, and you can go directly to the backend setup. When you're ready, select *MythTV Setup* and move along to Chapter 9

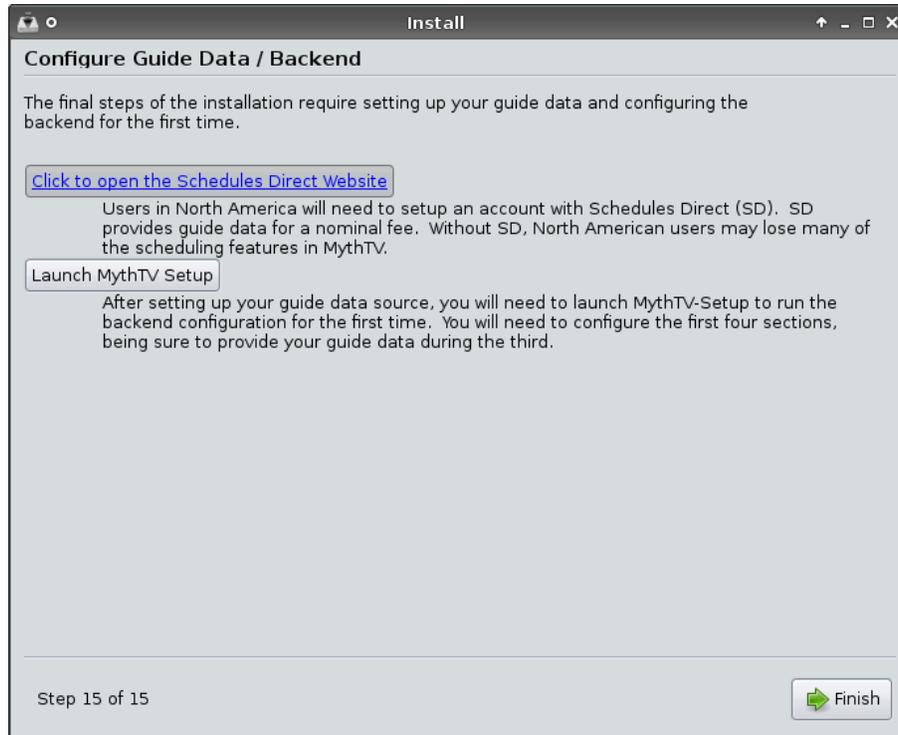Figure 7.10: Step 15 of 15

7.3 Advanced Installation

An advanced installation can be used to customize what is needed for the Mythbuntu install. It must also be used if you wish to add this Mythbuntu installation to an existing MythTV setup. You should have a screen similar to figure 7.11, select the **Advanced Installation** option and click on the *Forward* button.
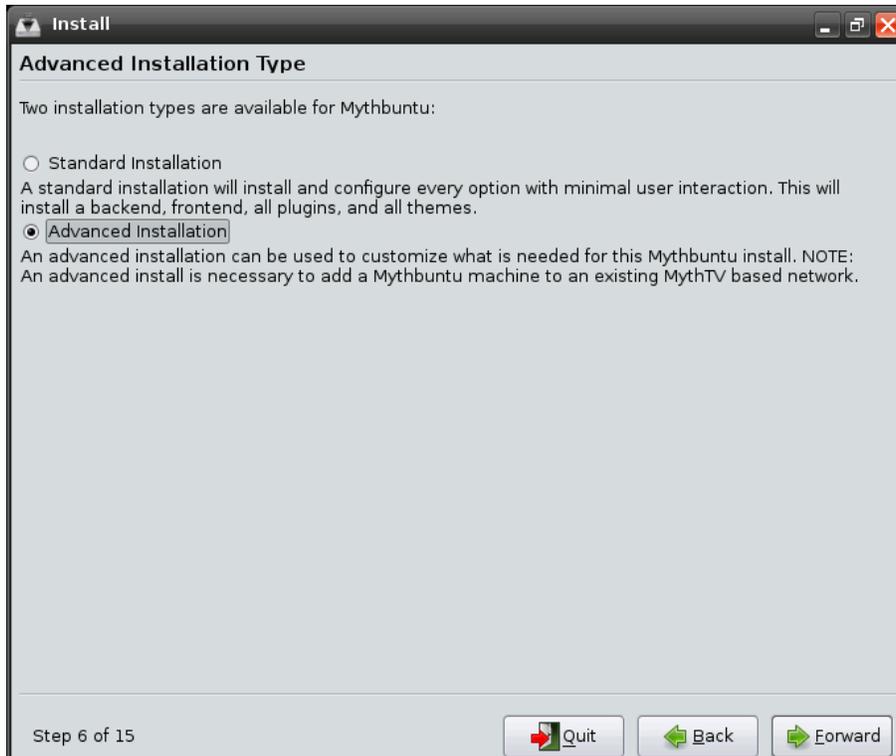

Figure 7.11: Step 6 of 15

You are now presented with a screen similar to figure 7.12. After reading the options outlined below follow the relevant section.

Primary Backend with Frontend A Backend/Frontend combination machine. This will be the most common setup for people wanting to use Mythbuntu for HTPC/PVR applications. This type of installations is intended for use as a component in your home theatre and where an existing MythTV setup isn't in existence. See section 7.4

Secondary Backend with Frontend A Backend/Frontend combination machine. This will be the most common setup for people wanting to use Mythbuntu for HTPC/PVR applications. This type of installations is intended for use as a component in your home theatre and where an existing MythTV backend server is already in existence. See section 7.5

Primary Backend A Backend only machine is typically designed to function like an appliance; requiring very little maintenance. This is intended to be installed as the first backend on a network. This should be chosen if you wish to run your frontend and backend on physically different computers. See section 7.6

Secondary Backend A Backend only machine is typically designed to function like an appliance; requiring very little maintenance. This is intended to be installed as an additional backend on a network. See section 7.7

Frontend A frontend only machine's main function is to receive media content from the backend(s) and play it back. This requires a backend to already exist on the network. See section 7.8
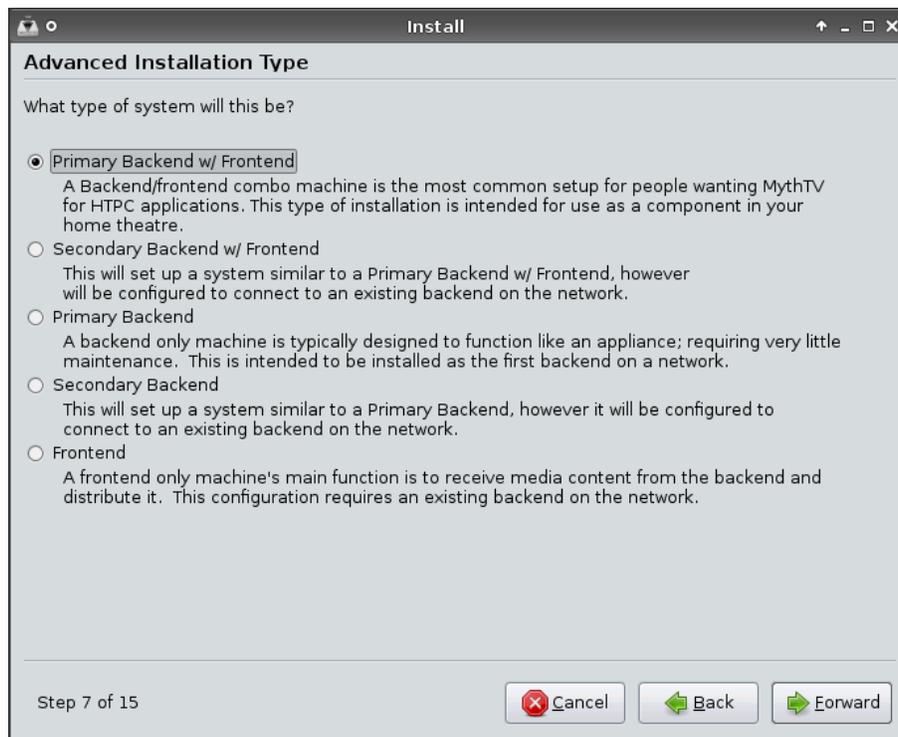
Figure 7.12: Step 7 of 15

7.4 Primary Backend with Frontend

Select the **Primary Backend w/Frontend** option and click on the *Forward* button

You are offered the choice of various Myth plugin's which can be installed, for a list of these and what they do please look at myth plugin reference section located at 17.1. Select the plugins you require and click the *forward* button.
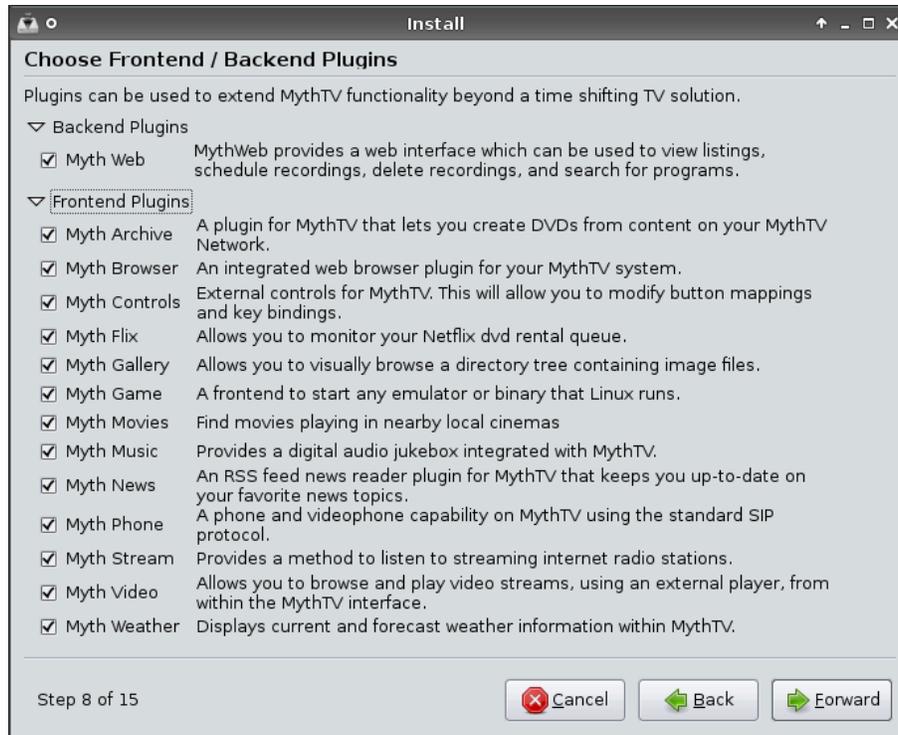
Figure 7.13: Step 8 of 15

You're now offered with the chance to choose the themes you require. Select your themes and click the *forward* button.

Figure 7.14: Step 9 of 15

On this screen, you may choose the additional services which you wish to have installed and configured to run automatically. Beside each option is a description of the service, select the ones you want and click the *forward* button. If you're going to have remote backends/frontends then you need to enable the "MythTV Service" so that they can connect.

Figure 7.15: Step 10 of 15

Passwords. It's advisable to set a password for the root account of your database. If you opted to install Mythweb you can also define a user and password here. Enter your passwords and click the *forward* button.

Figure 7.16: Step 11 of 15

Mythbuntu is able to make use of any remote which is supported by the LIRC project, a list of them is available at http://www.lirc.org/html/table.html. If you wish to configure one then click on the **Enable a Remote Control** checkbox. This will provided a drop down menu to enable the selection of a supported remote. Upon selection the required fields are automatically filled in. However if your remote isn't listed you can either select **Other Remote** option and fill the required info in or file a bug at https://bugs.launchpad.net/mythbuntu/+filebug with details of the remote and we'll try and get it added for the future.

You can also enable an IR transmitter at this stage as well. Click on the **Enable an IR Transmitter** checkbox. This will provide a drop down menu to enable the selection of a supported blaster. Upon selection the required field should automatically be filled in.

When you're satisfied with the options click on the *Forward* button.

Remotes which require extra work once mythbuntu is installed are:

- AppleTV remotes

- Remotes supported via dev/input

Figure 7.17: Step 12 of 15

Proprietary drivers can be enabled for your video cards here if you choose to use them. This is done by selecting *Modify Video Driver & Settings* and selecting the driver you wish to use. If you chose to enable the proprietary drivers then you're now able to configure TV-OUT. Refer to the TV-OUT reference section 17.2 for more information as to the settings you'll likely require.

The Silicon Dust HDHomerun Configuration Utility should be enabled if you wish to use your backend with HD Homerun.

Figure 7.18: Step 13 of 15

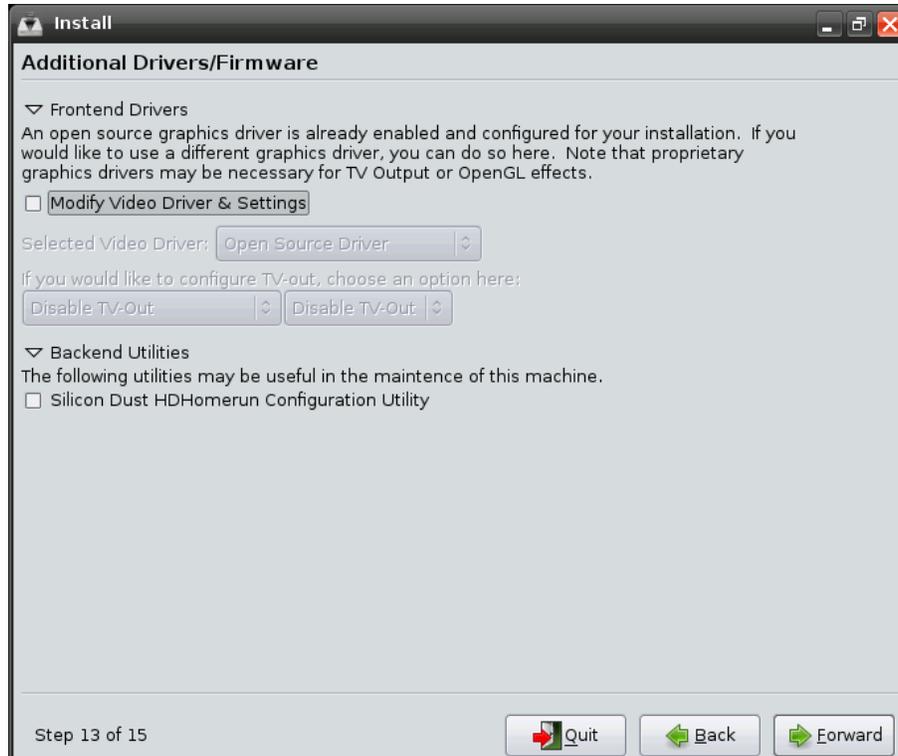At this stage you can review the selection you've made, where if you're unhappy with any of them you can return and change your choices. If you are happy with the settings you've chosen, click on the *Install* button to install.

Figure 7.19: Step 14 of 15

Note *The installer may appear to hang around 94%-95% however alot of packages are installed and setup in this stage which take a while*

When the installation process has completed, you will be able to create your SchedulesDirect account if you haven't already. This will launch the included browser and send you to the http://www.schedulesdirect.org website. If you previously created an account this is not necessary, and you can go directly to the backend setup. When you're ready, select *MythTV Setup* and move along to Chapter 9
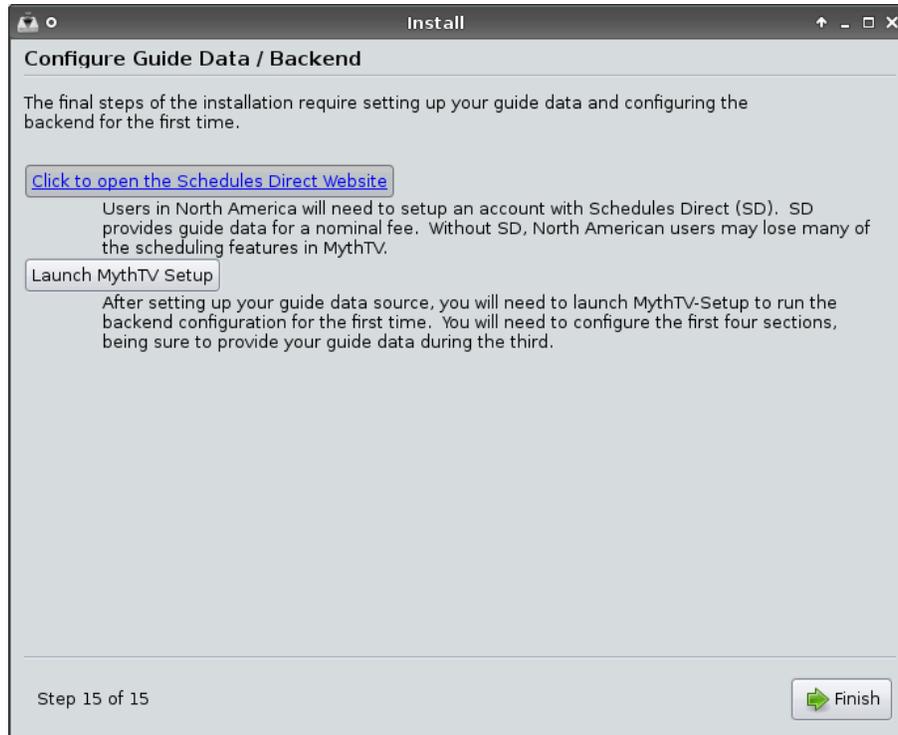
Figure 7.20: Step 15 of 15

7.5   Secondary Backend with Frontend

Select the **Secondary Backend w/Frontend** option and click on the *Forward* button

    You are offered the choice of various Myth plugin's which can be installed, for a list of these and what they do please look at myth plugin reference section located at 17.1. Select the plugins you require and click the *forward* button.
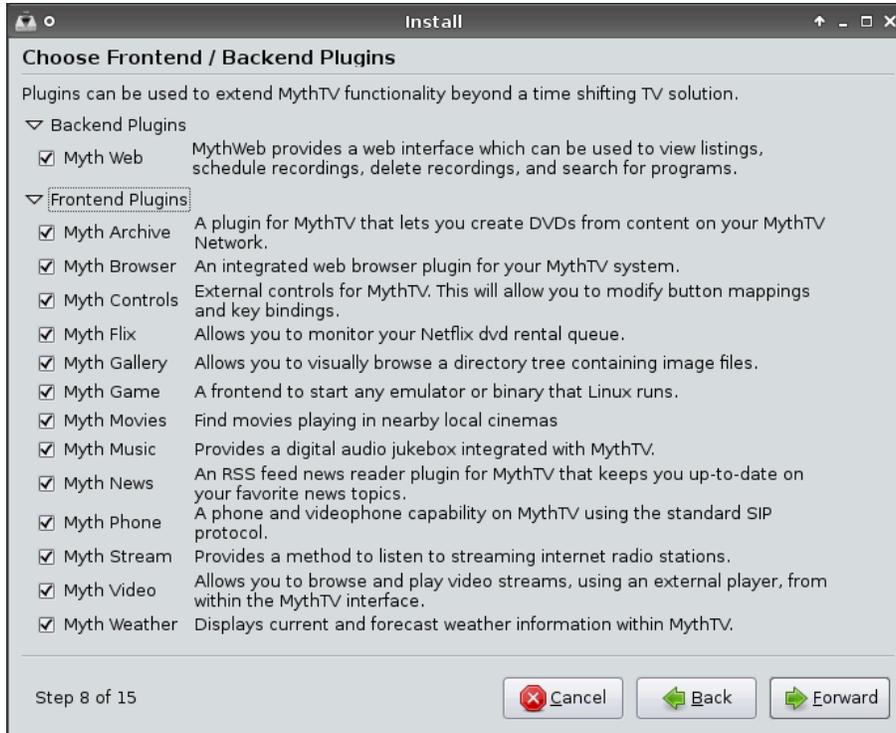
Figure 7.21: Step 8 of 15

You're now offered with the chance to choose the themes you require. Select your themes and click the *forward* button.
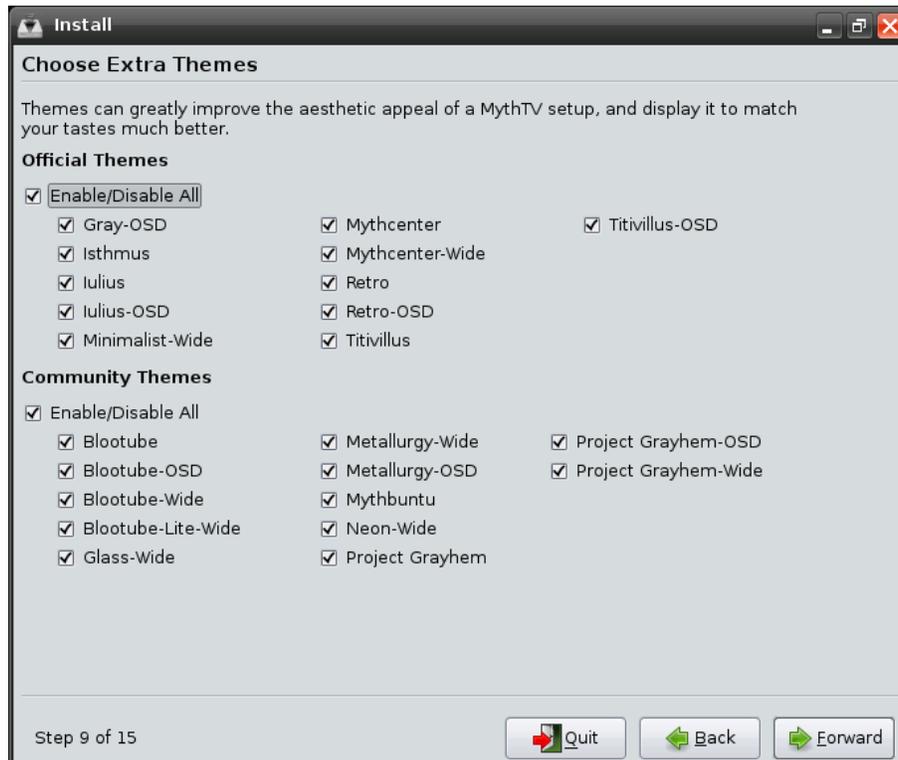
Figure 7.22: Step 9 of 15

On this screen, you may choose the additional services which you wish to have installed and configured to run automatically. Beside each option is a description of the service, select the ones you want and click the *forward* button.
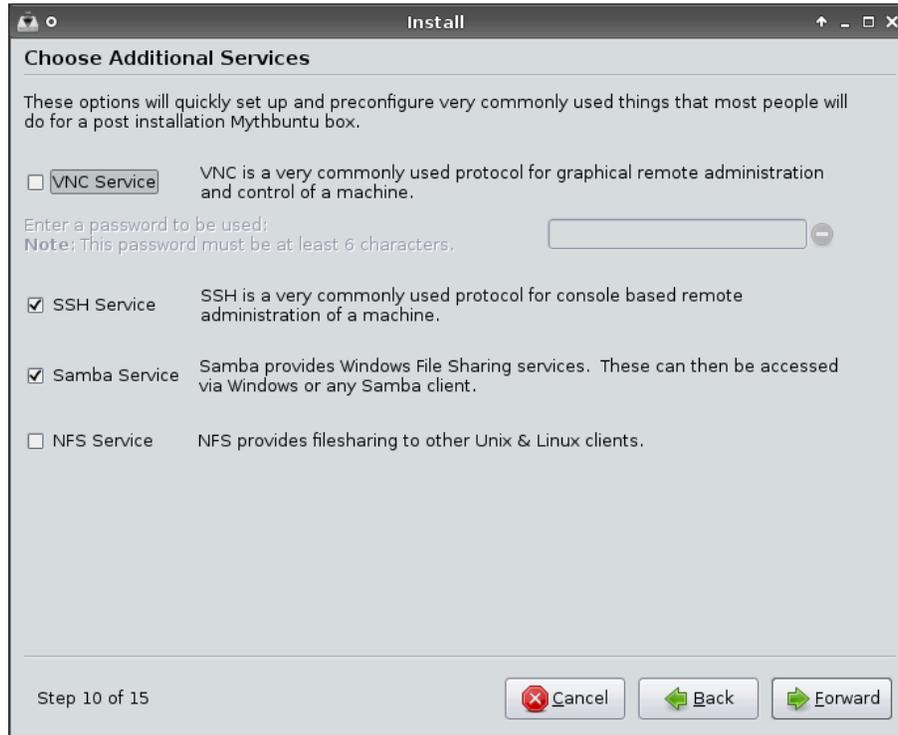
Figure 7.23: Step 10 of 15

Mythbackend connection information, this is where you enter the details to connect to your master backend, the MYSQL server box should take an IP address or hostname of the backend. The password should match what you use on your master backend. Once you're details are entered test the connection to save problems later on. If you opted to install Mythweb you can also set a password here. Enter your passwords and click the *forward* button.

Figure 7.24: Step 11 of 15

Mythbuntu is able to make use of any remote which is supported by the LIRC project, a list of them is available at `http://www.lirc.org/html/table.html`. If you wish to configure one then click on the **Enable a Remote Control** checkbox. This will provided a drop down menu to enable the selection of a supported remote. Upon selection the required fields are automatically filled in. However if your remote isn't listed you can either select **Other Remote** option and fill the required info in or file a bug at `https://bugs.launchpad.net/mythbuntu/+filebug` with details of the remote and we'll try and get it added for the future.

You can also enable an IR transmitter at this stage as well. Click on the **Enable an IR Transmitter** checkbox. This will provide a drop down menu to enable the selection of a supported blaster. Upon selection the required field should automatically be filled in.

When you're satisfied with the options click on the *Forward* button.

Remotes which require extra work once mythbuntu is installed are:

- AppleTV remotes
- Remotes supported via dev/input

Figure 7.25: Step 12 of 15

Proprietary drivers can be enabled for your video cards here if you choose to use them. This is done by selecting *Modify Video Driver & Settings* and selecting the driver you wish to use. If you chose to enable the proprietary drivers then you're now able to configure TV-OUT. Refer to the TV-OUT reference section 17.2 for more information as to the settings you'll likely require.

The Silicon Dust HDHomerun Configuration Utility should be enabled if you wish to use your backend with HD Homerun.

Figure 7.26: Step 13 of 15

At this stage you can review the selection you've made, where if you're unhappy with any of them you can return and change your choices. If you are happy with the settings you've chosen, click on the *Install* button to install.

Figure 7.27: Step 14 of 15

Note *The installer may appear to hang around 94%-95% however alot of packages are installed and setup in this stage which take a while*

When the installation process has completed, you will be able to create your SchedulesDirect account if you haven't already. This will launch the included browser and send you to the `http://www.schedulesdirect.org` website. If you previously created an account this is not necessary, and you can go directly to the backend setup. When you're ready, select *MythTV Setup* and move along to Chapter 9

Figure 7.28: Step 15 of 15

7.6   Primary Backend

Select the **Primary Backend** option and click on the *Forward* button

  You are offered the choice of various Myth plugin's which can be installed, for a list of these and what they do please look at myth plugin reference section located at 17.1. Select the plugins you require and click the *forward* button.

Figure 7.29: Step 8 of 15

On this screen, you may choose the additional services which you wish to have installed and configured to run automatically. Beside each option is a description of the service, select the ones you want and click the *forward* button. If you're going to have remote backends/frontends then you need to enable the "MythTV Service" so that they can connect.

Figure 7.30: Step 10 of 15

Passwords. It's advisable to set a password for the root account of your database. If you opted to install Mythweb you can also define a user and password here. Enter your passwords and click the *forward* button.

Figure 7.31: Step 11 of 15

The Silicon Dust HDHomerun Configuration Utlity should be enabled if you wish to use your backend with HD Homerun.

Figure 7.32: Step 13 of 15
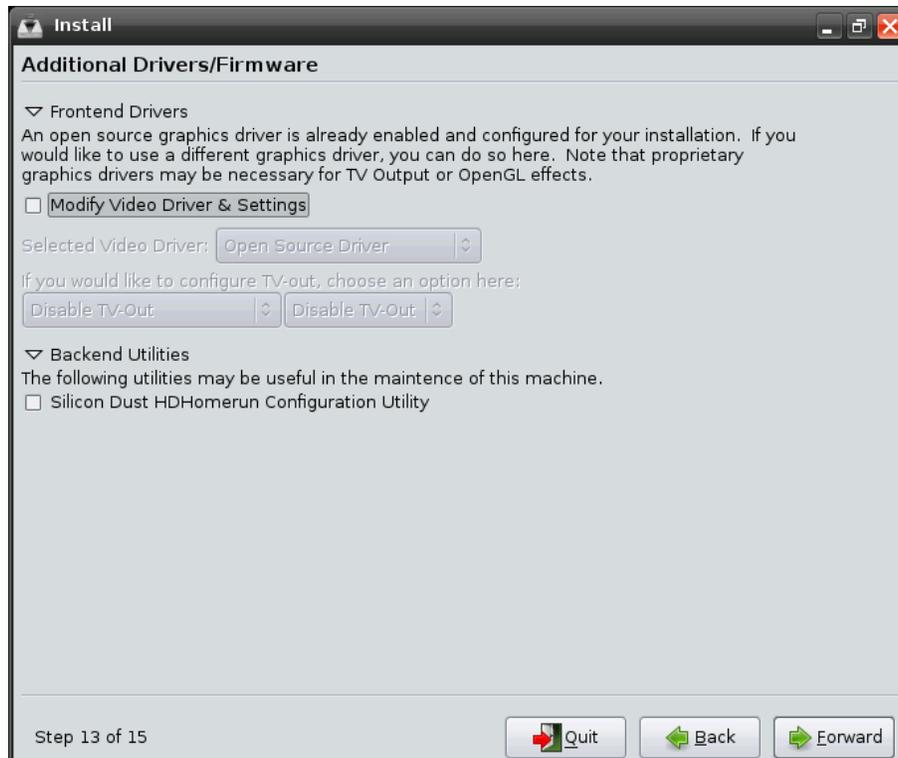
At this stage you can review the selection you've made, where if you're unhappy with any of them you can return and change your choices. If you are happy with the settings you've chosen, click on the *Install* button to install.

Figure 7.33: Step 14 of 15

Note *The installer may appear to hang around 94%-95% however alot of packages are installed and setup in this stage which take a while*

When the installation process has completed, you will be able to create your SchedulesDirect account if you haven't already. This will launch the included browser and send you to the http://www.schedulesdirect.org website. If you previously created an account this is not necessary, and you can go directly to the backend setup. When you're ready, select *MythTV Setup* and move along to Chapter 9
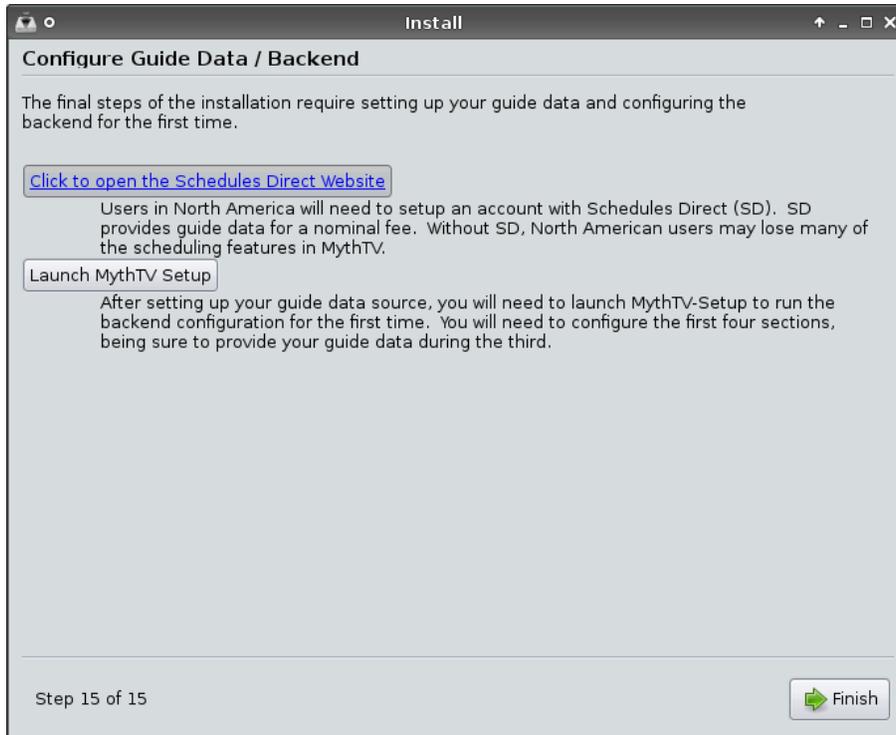

Figure 7.34: Step 15 of 15

7.7   Secondary Backend

Select the **Secondary Backend** option and click on the *Forward* button

You are offered the choice of various Myth plugin's which can be installed, for a list of these and what they do please look at myth plugin reference section located at 17.1. Select the plugins you require and click the *forward* button.
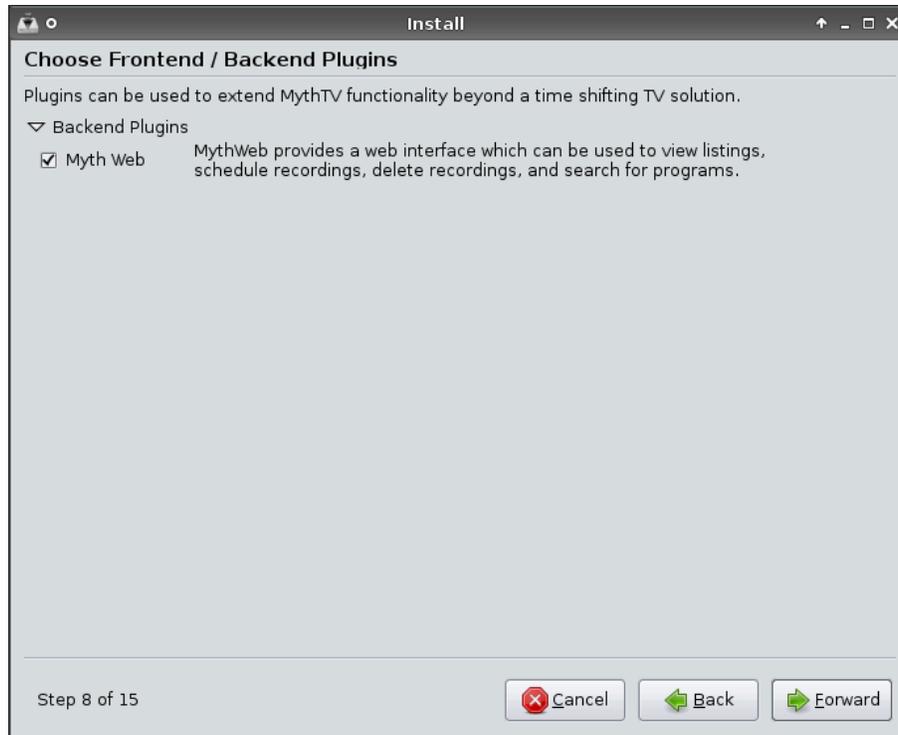

Figure 7.35: Step 8 of 15

On this screen, you may choose the additional services which you wish to have installed and configured to run automatically. Beside each option is a description of the service, select the ones you want and click the *forward* button.

Figure 7.36: Step 10 of 15

Mythbackend connection information, this is where you enter the details to connect to your master backend, the MYSQL server box should take an IP address or hostname of the backend. The password should match what you use on your master backend. Once you're details are entered test the connection to save problems later on. If you opted to install Mythweb you can also set a password here. Enter your passwords and click the *forward* button.

Figure 7.37: Step 11 of 15

The Silicon Dust HDHomerun Configuration Utlity should be enabled if you wish to use your backend with HD Homerun.

Figure 7.38: Step 13 of 15

At this stage you can review the selection you've made, where if you're unhappy with any of them you can return and change your choices. If you are happy with the settings you've chosen, click on the *Install* button to install.

Figure 7.39: Step 14 of 15

Note *The installer may appear to hang around 94%-95% however alot of packages are installed and setup in this stage which take a while*

When the installation process has completed, you will be able to create your SchedulesDirect account if you haven't already. This will launch the included browser and send you to the http://www.schedulesdirect.org website. If you previously created an account this is not necessary, and you can go directly to the backend setup. When you're ready, select *MythTV Setup* and move along to Chapter 9
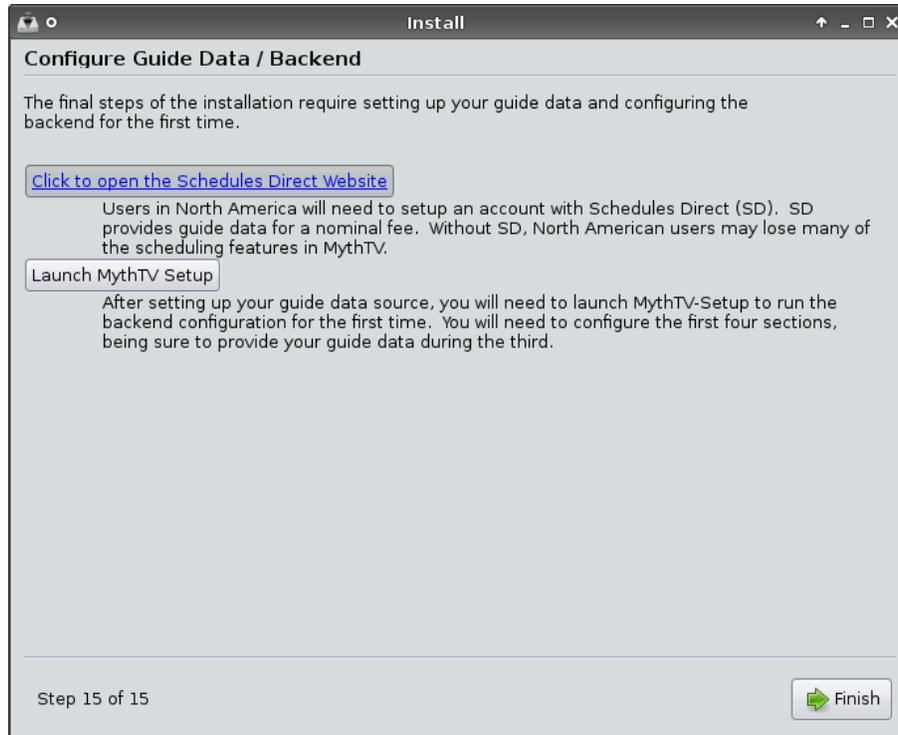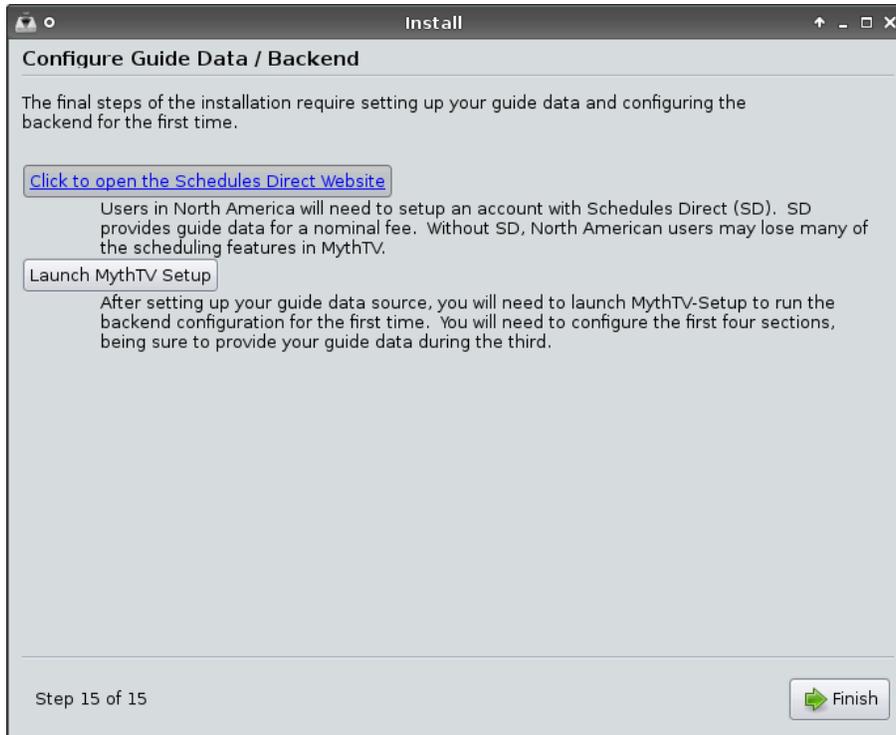

Figure 7.40: Step 15 of 15

7.8 Frontend

Select the **Frontend** option and click on the *Forward* button

You are offered the choice of various Myth plugin's which can be installed, for a list of these and what they do please look at myth plugin reference section located at 17.1. Select the plugins you require and click the *forward* button.
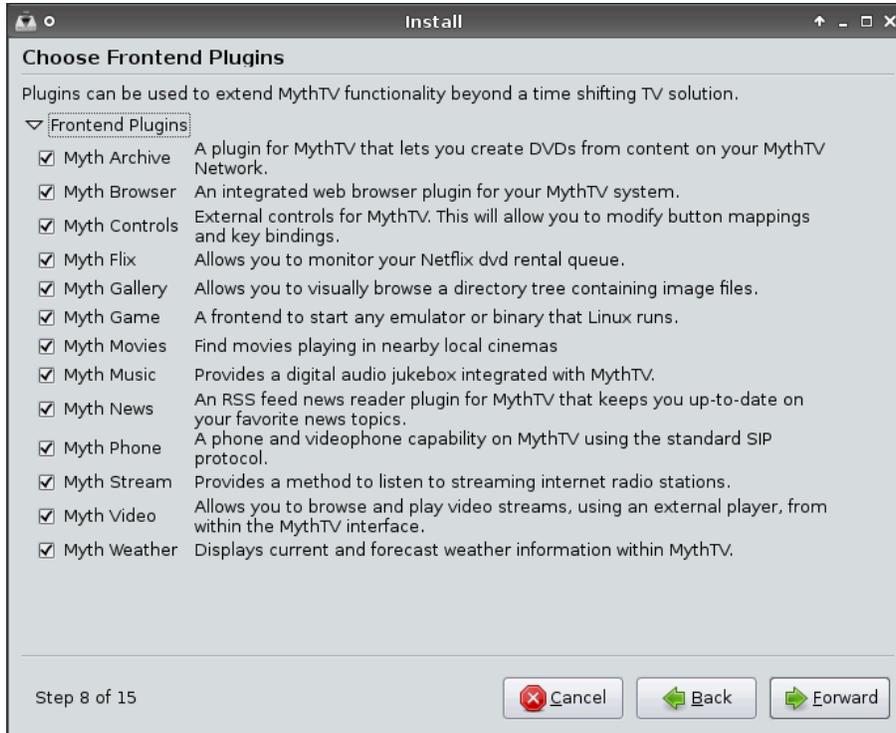
Figure 7.41: Step 8 of 15

You're now offered with the chance to choose the themes you require. Select your themes and click the *forward* button.
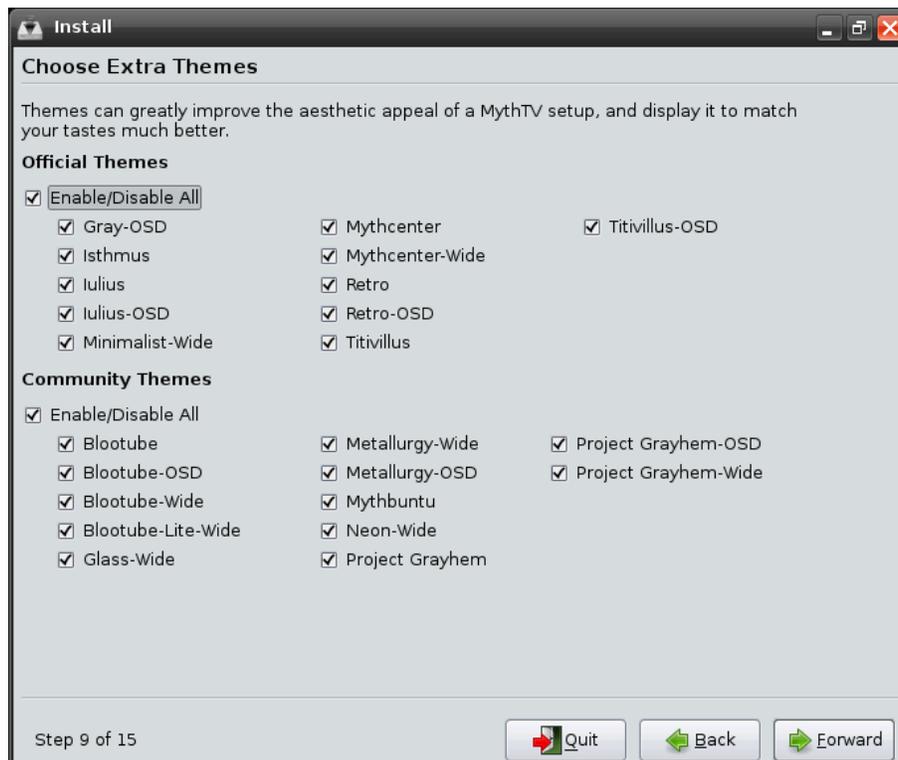
Figure 7.42: Step 9 of 15

On this screen, you may choose the additional services which you wish to have installed and configured to run automatically. Beside each option is a description of the service, select the ones you want and click the *forward* button.
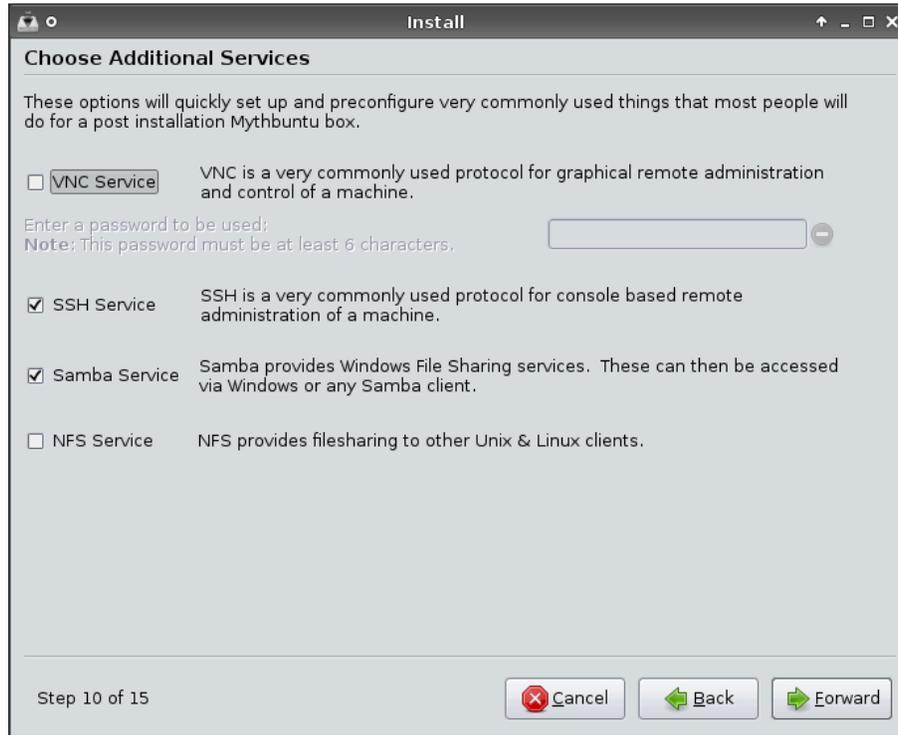

Figure 7.43: Step 10 of 15

Mythbackend connection information, this is where you enter the details to connect to your master backend, the MYSQL server box should take an IP address or hostname of the backend. Once your details are entered test the connection to save problems later on.

Figure 7.44: Step 11 of 15

Mythbuntu is able to make use of any remote which is supported by the LIRC project, a list of them is available at http://www.lirc.org/html/table.html. If you wish to configure one then click on the **Enable a Remote Control** checkbox. This will provided a drop down menu to enable the selection of a supported remote. Upon selection the required fields are automatically filled in. However if your remote isn't listed you can either select **Other Remote** option and fill the required info in or file a bug at https://bugs.launchpad.net/mythbuntu/+filebug with details of the remote and we'll try and get it added for the future.

You can also enable an IR transmitter at this stage as well. Click on the **Enable an IR Transmitter** checkbox. This will provide a drop down menu to enable the selection of a supported blaster. Upon selection the required field should automatically be filled in.

When you're satisfied with the options click on the *Forward* button.

Remotes which require extra work once mythbuntu is installed are:

- AppleTV remotes
- Remotes supported via dev/input

Figure 7.45: Step 12 of 15

Proprietary drivers can be enabled for your video cards here if you choose to use them. This is done by selecting *Modify Video Driver & Settings* and selecting the driver you wish to use. If you chose to enable the proprietary drivers then you're now able to configure TV-OUT. Refer to the TV-OUT reference section 17.2 for more information as to the settings you'll likely require.

Figure 7.46: Step 13 of 15

At this stage you can review the selection you've made, where if you're unhappy with any of them you can return and change your choices. If you are happy with the settings you've chosen, click on the *Install* button to install.

Figure 7.47: Step 14 of 15

Note *The installer may appear to hang around 94%-95% however alot of packages are installed and setup in this stage which take a while*

Chapter 8

Booting the Mythbuntu Alternate CD

In this chapter we will walk you through the booting from the Mythbuntu Alternate CD. If you haven't downloaded it yet you should visit now http://www.mythbuntu.org/downloads to download and burn it to a disc.

Once the ISO has been downloaded and burned to a disc, simply pop it into your CD-ROM drive with your BIOS set to boot from CD. You will be presented with a boot loader menu as shown in figure 8.1 From this screen you can either directly start the installer, or activate the diskless server task.

Figure 8.1: ISOLinux Boot Screen

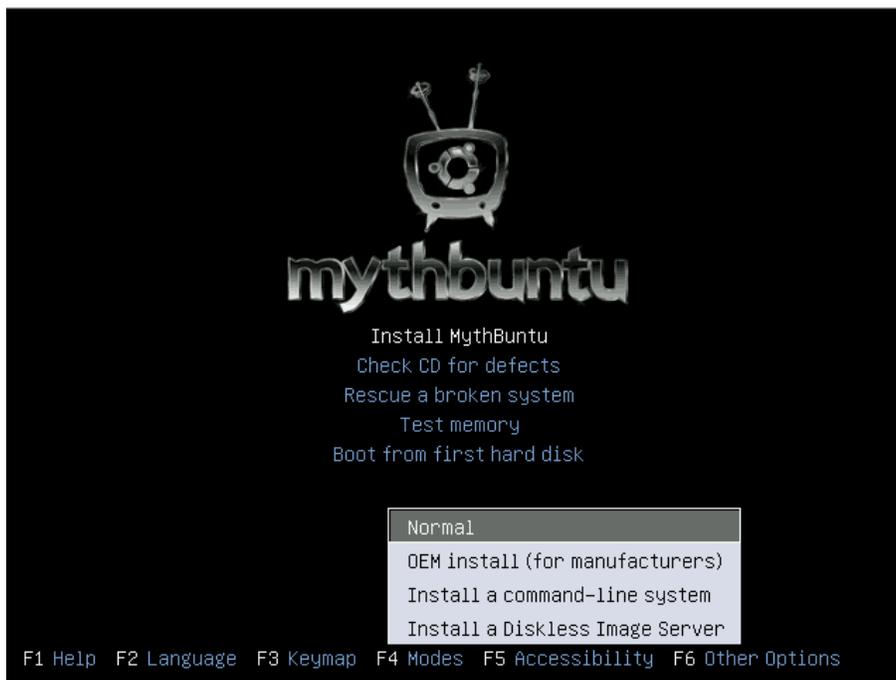If you would like to activate the diskless server task, press F4 and select **Install a Diskless Server**

Chapter 9

MythTV Backend Setup

9.1   Initial Configuration Page

The initial configuration page will present you with 6 options. *It is strongly recommended that you follow these in order the first time you configure a backend installation.*

Figure 9.1: Initial configuration page

9.2   General

The general section is where you will set up the major information related to the master backend, job scheduling, and default locale information. It is setup in a sequential design with Back and Next buttons. You can also use the underlined letters with *alt* to move around. i.e., *alt-N* is "Next", *alt-B* is "Back", *alt-C* is "Cancel", and *alt-F* is "Finish".

The first screen of the General configuration deals with IP addresses of the backend system that you're running mythtv-setup on. If you are setting up only one backend/frontend installation, then the default values are fine and you can move to the next page by pressing Enter. If you need to move around the screen, use the arrow keys to move focus between settings.

The default value shown on install will be 127.0.0.1, which is the internal loopback for the local machine. If you plan on deploying multiple backends, running mythweb from another computer, or if your backend is on one system and you're running the frontend on another machine then do not use the "127.0.0.1" IP address. Set this to the ip address of the backend as recognized by other machines on your network. If you are using a router on your network that only hands out dynamic addresses, you might consider setting up this machine with a static IP address instead.

NOTE: If you modify the 127.0.0.1 address and use a "real" IP address, you must use real IP addresses in both fields, otherwise your frontend machines will generate "Unexpected response to MYTH_PROTO_VERSION" errors.

Changing any of the port settings is very strongly discouraged. (If you do accidentally change them, the defaults are 6543 for the master/backend server, and 6544 for the HTTP requests)

Once you're satisfied with the values, move the focus down to Next and hit Enter.

Figure 9.2: Host Address Backend Setup

The next screen details the Host-specific Backend setup. This is where you will set the specific directory path for this particular backend.

As long as you setup a separate partition for /var/lib during the initial setup, the default option here - /var/lib/mythtv will work fine. If you setup a different mount point or won't be recording with this machine, be sure to set this accordingly. (Also, if you used a non-default location, be sure and set the ownership and permissions to match /var/lib/mythtv.)

If for some reason you chose a file system other then XFS or JFS for this partition, choose to delete the files slowly. This will avoid some nasty bugs related to using ReiserFS or ext3.
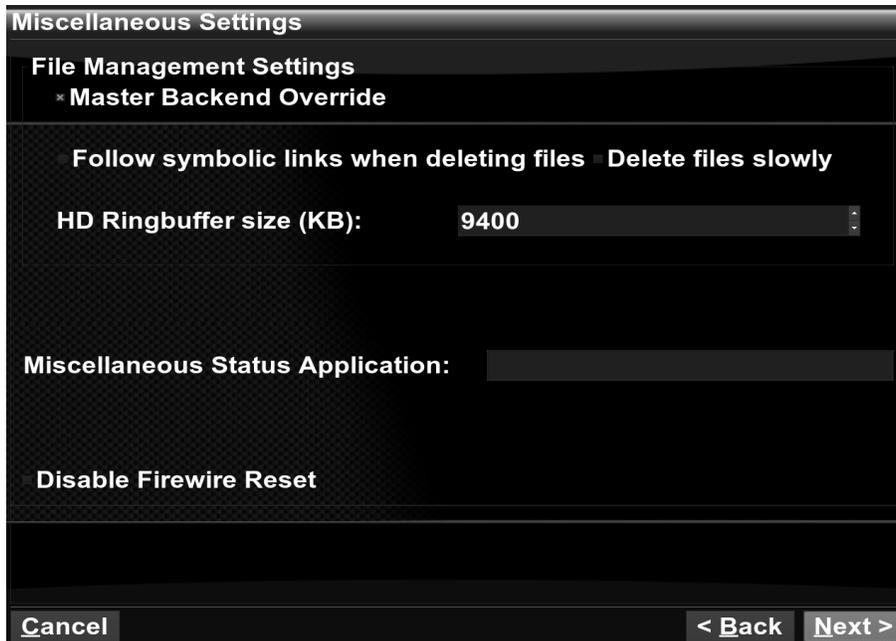
Figure 9.3: Host-specific Backend Setup

The Global Backend Setup screen will change settings that affect all backends.

Your TV standard should be determined based on your locale. US users should choose NTSC. European users should chose PAL

The VBI Format is used for closed captioning.

The channel frequency table is also based on your locale.

US and Canadian users using Schedules Direct can skip the time offset for xmltv listings. International users will need to set this appropriately so that their data matches up at the correct time.
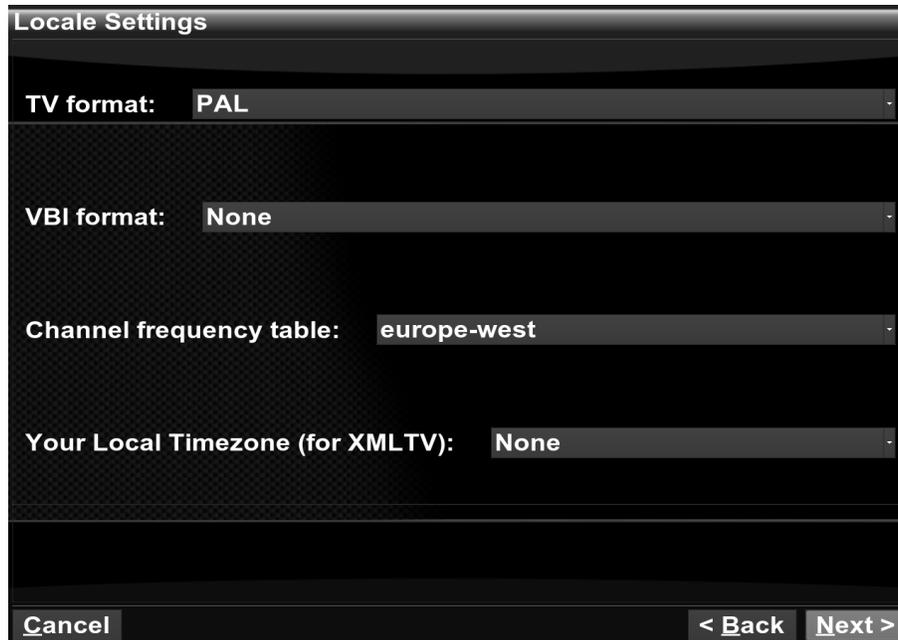
Figure 9.4: Global Backend Setup

The EIT scanner is used to gather data on the fly. If you have a DVB based source or a source providing this data, you will configure it here
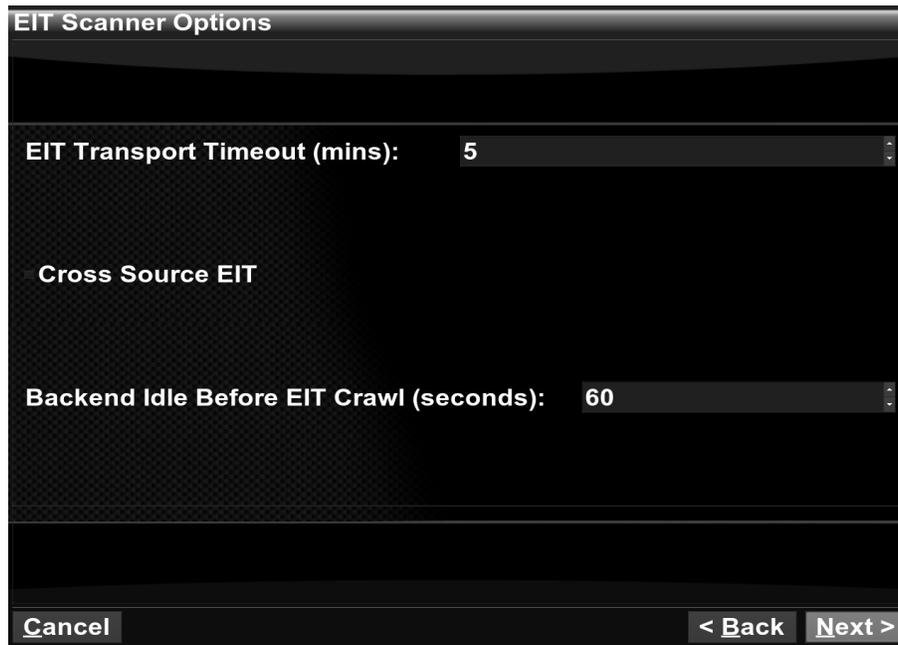
Figure 9.5: EIT scanner

The Shutdown/Wakeup options are used for suspending or shutting down the backend server when it has been idle for the set limit. You can configure the master and/or secondary backend(s) to go into a sleep, suspend, or shutdown mode when not in use- depending on the capabilities of your motherboard.

There are different methods you can use to accomplish this. A tutorial on ACPI wakeup/shutdown can be found on the ACPIWake page https://help.ubuntu.com/community/MythTV/Install/WhatNext/ACPIWake. You should complete MythTV installation and ensure the backend is properly functioning before trying to set up this function.

Figure 9.6: Shutdown/Wakeup

WakeOnLan is another method of configuring secondary backends to wakeup. `https://help.ubuntu.com/community/WakeOnLan`
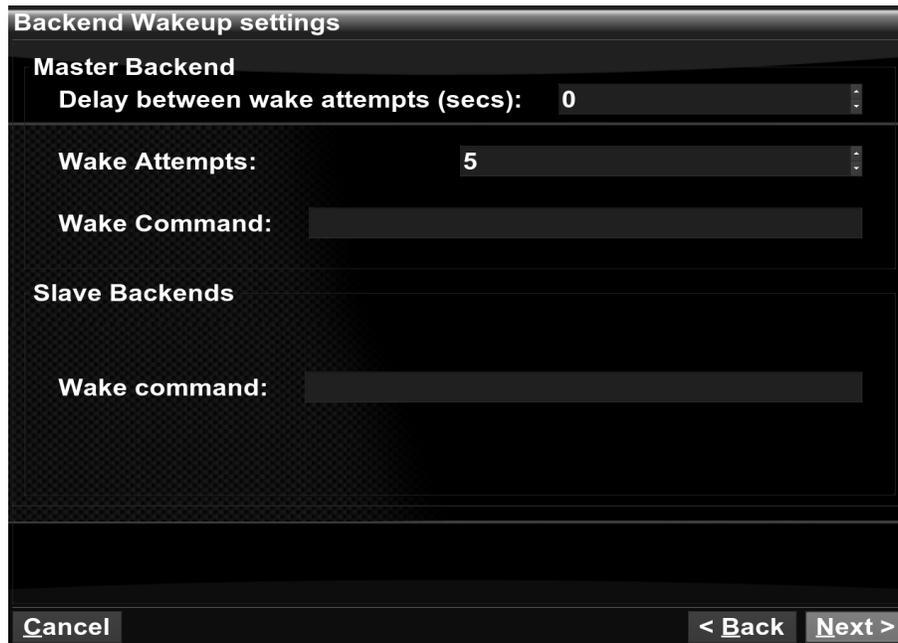
Figure 9.7: Wake On Lan

The Host Specific Job Queue sets up the types of jobs that are allowed to run on this machine. If you have multiple backends, you can configure certain backends to only handle particular types of jobs. This is especially useful if some are much more underpowered then others.

It isn't recommended to have more then 2 simultaneous jobs running on any backend at any given time.

The default job queue frequency of 60 seconds is adequate and doesn't need to be changed typically.

Unless this backend is dedicated to only Transcoding/Commercial flagging jobs, don't change the CPU usage. Anything set higher then "Low" may jeopardize the ability to record programs due to being starved for IO/CPU usage.
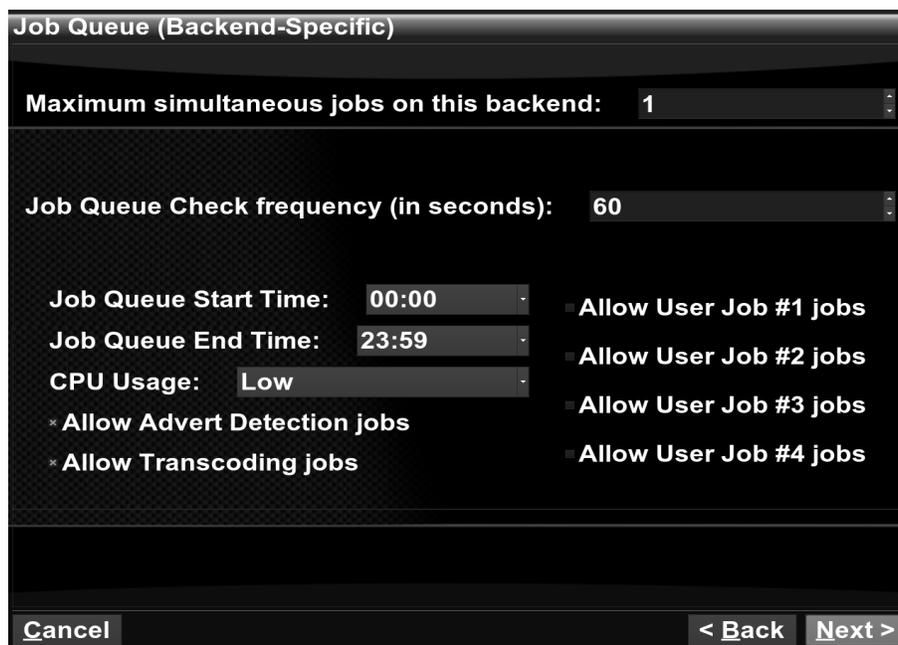
Figure 9.8: Job Queue - Host Specific

The Global Specific Job Queue sets up things affecting any and all backends on a mythtv network.

If you don't check "Run Jobs only on original recording host", each of the jobs will be evenly distributed against possible backends. This will lessen the load on each machine.

A decently powered backend with hardware encoding cards (1Ghz+) should be able to flag commercials at the same time as the recording is going. This helps if you ever plan to time shift your recording viewing by 10 or 20 minutes and want to have the commercials flagged as you watch.

Typically you won't want to run your transcode jobs before commercial flagging. The idea should be that you will flag commercials, verify they are right and manually queue them up to be transcoded and removed. If you have a particular reason to transcode first, check this box.

If you set up the backend to save the original files after transcoding, these will not be automatically deleted, but rather fill up your recordings directory with .old files. You will have to manually go in there and delete them to free up recording space as necessary.
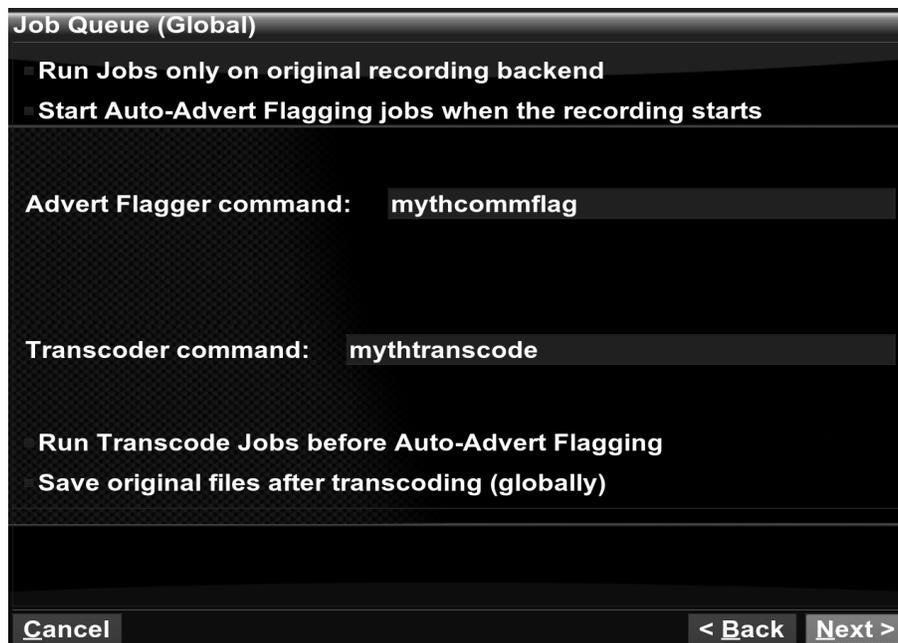
Figure 9.9: Job Queue - Global Specific

The Job Queue page provides an area to add your own scripts to perform on recordings.

Some ideas for additional things can range from scp'ing a recording somewhere, transcoding it to fit on an ipod and copying it to a directory, or running it through a denoising filter.

Figure 9.10: Job Queue

9.3   Capture Cards

The capture cards section will list all capture cards setup locally on this backend.

The initial capture cards page will list all cards in this backend.

Choose "New Capture Card" to begin and add your tuner(s).

If you need to reset the order of the tuners recognized, you can either delete these capture cards, or all capture cards in the mythtv network from this screen.
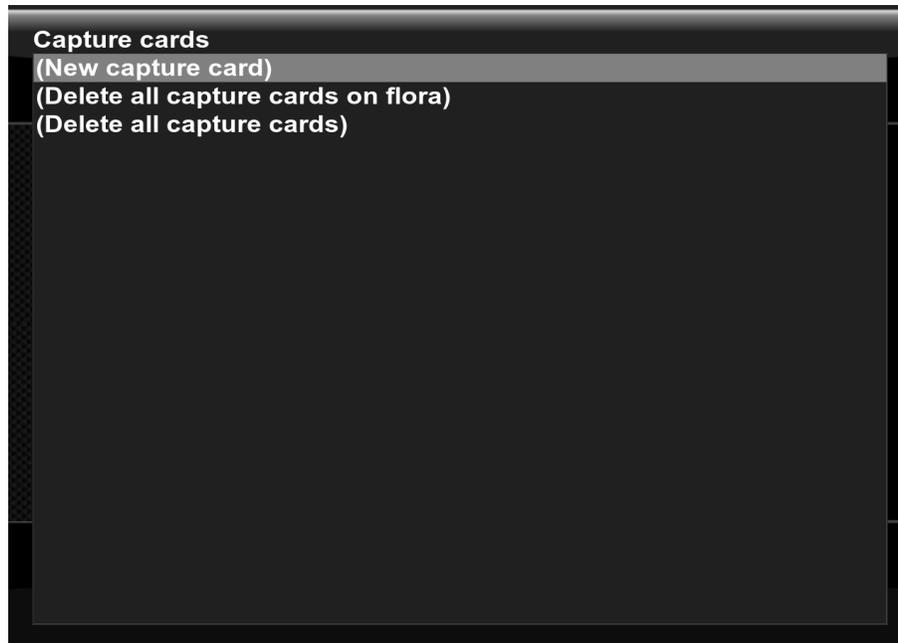
Figure 9.11: Capture Cards

When choosing a capture source, it's important to choose the correct type.

A very common error is when choosing the Hauppauge PVR Cards. There is an option for MPEG-2 Encoder Card (PVR-X50, PVR-500) as well as for standard V4L card. Be sure to choose the MPEG-2 encoder option here if you use a Hauppauge card.

Each of the different types of sources has several options available to it.

If you are confused about any of the options, see the mythtv documentation, mailing list, MythTV wiki http://mythtv.org/wiki/index.php/Video_capture_card, or LinuxTV wiki http://linuxtv. org/v4lwiki/.

If you are configuring a firewire connection, settings can be found on the MythTV Firewire Page https://help.ubuntu.com/community/MythTV_Firewire.
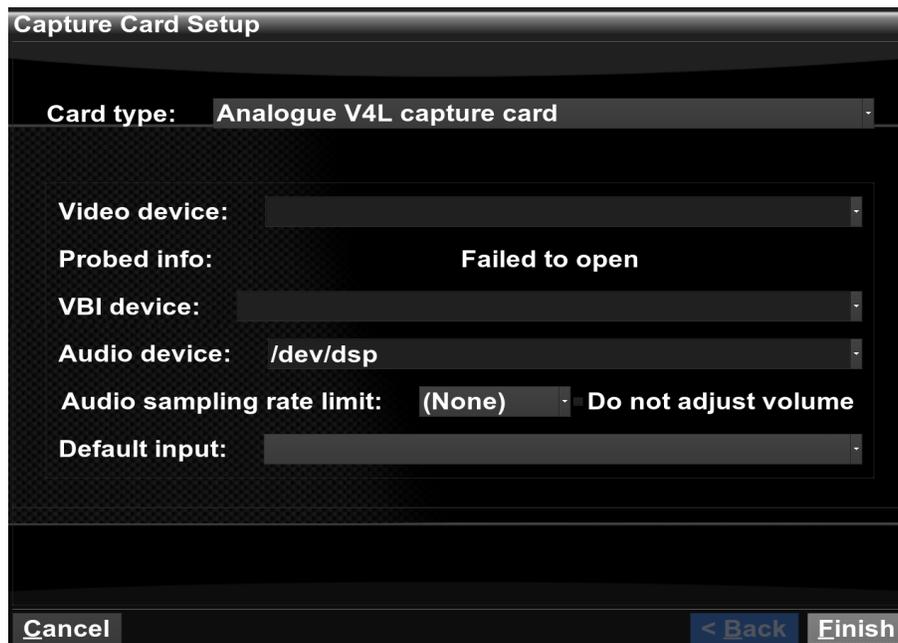
Figure 9.12: Capture Card Setup

9.4 Video Sources

Video sources section will list all video sources in use for the mythtv database. The video sources will be configured to connect to the listing service you are using such as Data-Direct, XMLTV, EIT. Select "New video source" as shown below.

Figure 9.13: Video Source Setup

     Provide your video source with a logical name into the "Video source name" text area. Its a good idea to provide detail now, because later you may end up adding more tuners, digital cable, satellite, etc.

     For the "XMLTV listings grabber" choose Data-Direct for North America or XMLTV for elsewhere. For Schedules Direct, enter the username and password you obtained during Schedules Direct registration. Retrieve the lineup and choose your option.

     If the "Channel frequency table" needs changing for a different frequency then set it here.
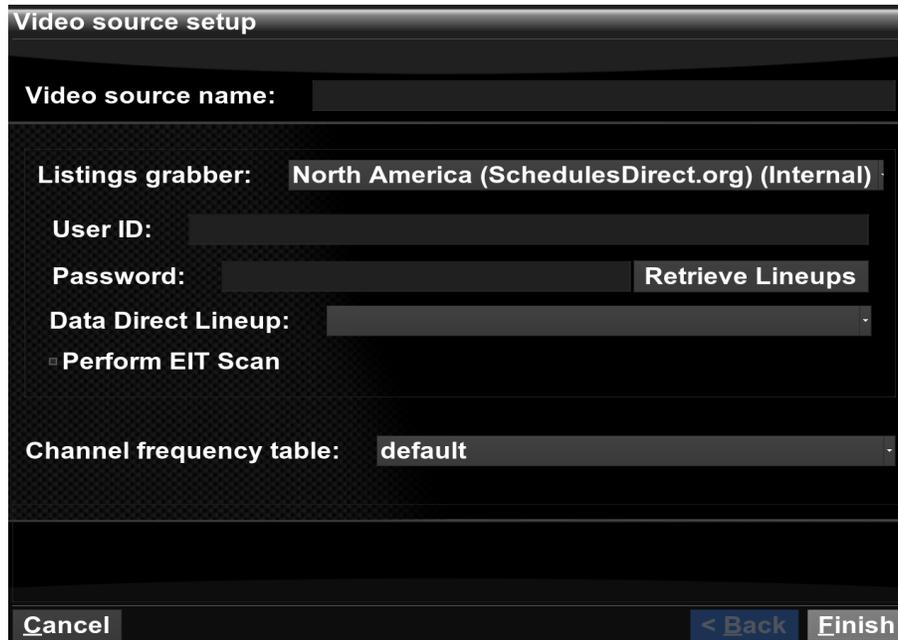
Figure 9.14: Video Source Setup

9.5   Input Connections

The input connections page allows you assign any Video Sources to Inputs on your capture sources before. Choose the particular input you will need to assign and press enter.

Figure 9.15: Video Input Setup

Again, it's a good idea to provide a name for your Input here. Later on, if you have a tuner not working, it's easier to debug if it says "Digital Cable" in the frontend and then doesn't work. Choose the Video source associated with the input in the "Video source". If you need to use an external channel changer script (firewire, serial, IR), you will need to enter the name of the binary/script that needs to be launched here. See https://help.ubuntu.com/community/MythTV_External_Channel_Changer for more information.

If you are using a static channel listing, fetch channels from your listings source via "Fetch channels from listings source". If you are using something that scans on the fly via EIT or OTA HD, scan for the initial channels by selecting "Scan for channels".

Figure 9.16: Video Input Setup

You can assign the priority you wish to have for the card. These enables you to prefer certain tunner cards over others, for instance to prefer DVB-T over DVB-S when both can record the same show. Input groups can also be created to provide a way to mange groups of cards, such as all DVB-T cards and all DVB-S cards.
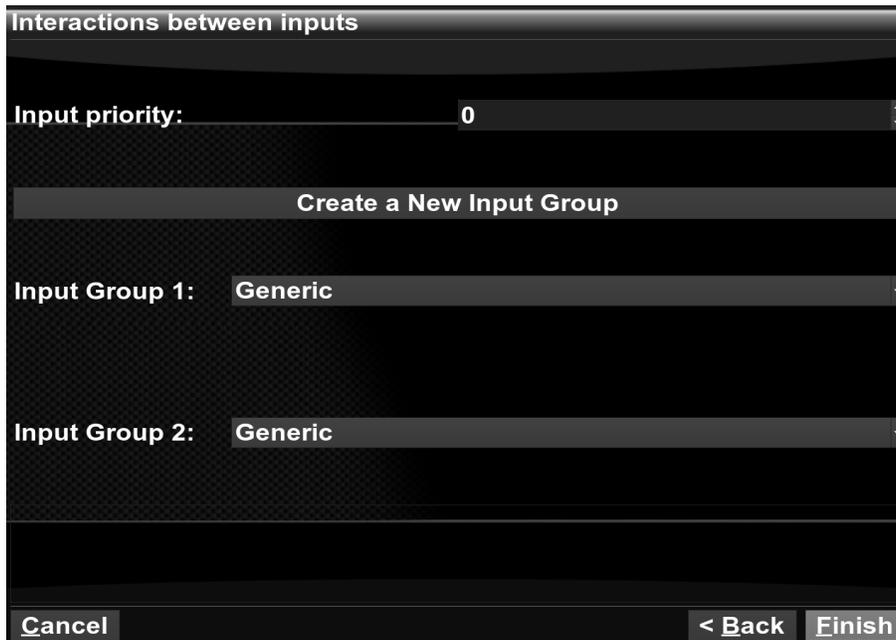
Figure 9.17: Video Input Setup

9.6   Channel Editor

Warning *The delete channels button deletes* **ALL** *channels. If you want to delete just one, choose it in the list and press the delete key.*

The channel editor isn't necessary for the inital setup. You can safely ignore it for now, but remember to come here if you need to modify transports, change channel numbers, or delete channels.

The listing of all channels is on the top half of the screen. If you need to repeat a scan for any sources already setup, you can preform this via "Channel Scanner".

If your DVB trasports are messed up, you can adjust them in the Transport Editor via "Transport Editor".

Figure 9.18: Channel Editor

Storage groups can be created which allows for recordings to be spread out across different disks. This allows you to avoid the use of LVM or raid arrays. You simply define the storage groups you require. Then when you setup the recording rule you have an option for which storage group to write to. It's also possible to define storage groups for the automatic database backup and live TV.

Local Storage Groups (directories for new recordings)
(Create Default group)
(Create LiveTV group)
(Create DB Backups group)

Figure 9.19: Storage Groups

Once you've choosen to create or edit a storage group your presented with a screen similar to the one below. This allows you to add, edit and delete directories within this group.

Figure 9.20: Storage Groups
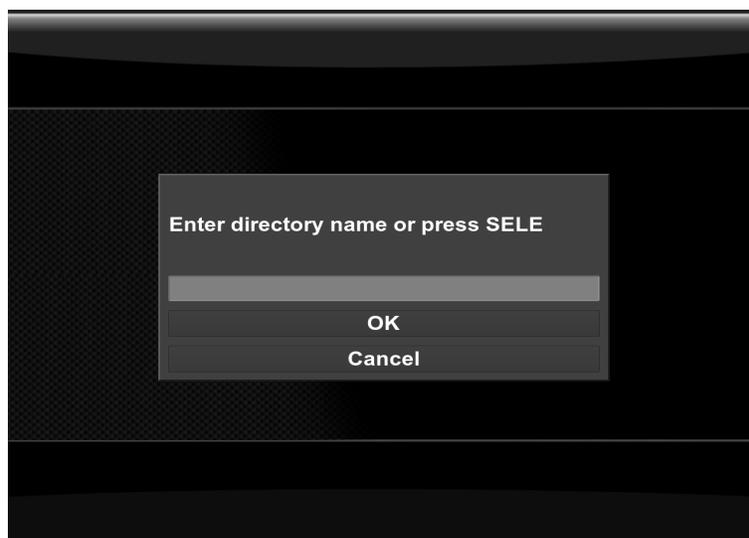
Figure 9.21: Storage Groups

Chapter 10

Mythbuntu Control Center (MCC)

The Mythbuntu Control Centre is the main area for configuring different items within Mythbuntu. It strives to prevent having to use the command line to reconfigure items. Instead, an easy to use pyGTK interface is provided.
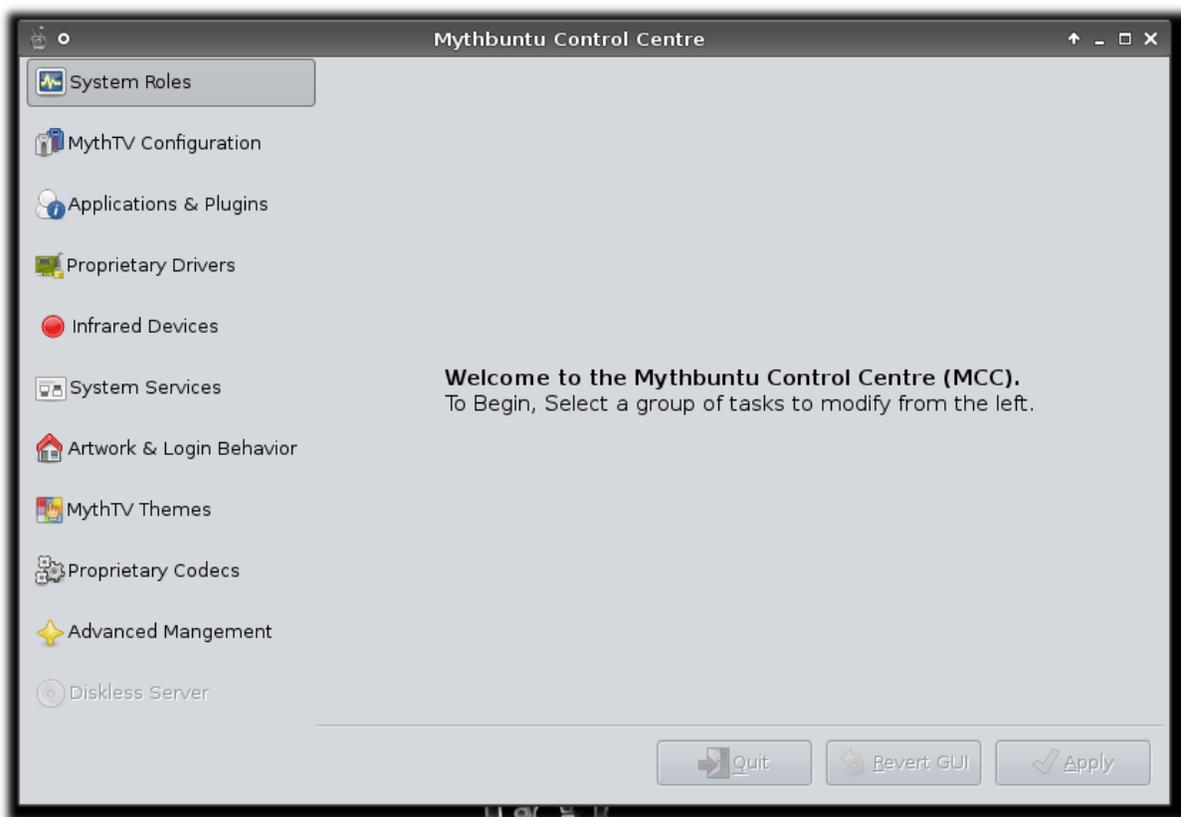
Figure 10.1: MCC Main Screen

10.1 Starting MCC

There are three ways to launch the Mythbuntu Control Centre. Depending on what your goal of the interaction is and your current system setup will depend on the way you decide to launch it.

10.1.1 Inside MythTV

If you have a MythTV frontend running, you can access the control centre by Choosing **Utilities/Setup**, **Setup**, **Mythbuntu**. MCC will request that you enter your user password, and then will launch on top of MythTV frontend. If you accidently click outside the MCC window, simply press *alt-tab* to switch back to MCC.

Figure 10.2: Starting MCC From MythTV

10.1.2 From Xfce

Mythbuntu uses the Xfce desktop. All applications are directly available from an Applications menu at the top left corner of the screen. To get to the Xfce desktop, you will need to quit MythTV Frontend. Choose the **Applications** Menu, and then **System**. MCC will be an item listed in this menu.
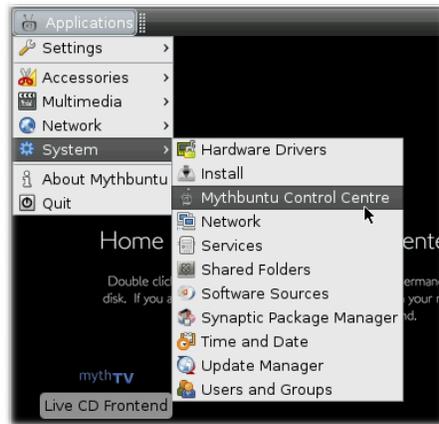
Figure 10.3: Starting MCC From Xfce

10.1.3   From Gnome

If you have installed from an Ubuntu desktop, or added an Ubuntu desktop to your Mythbuntu system, you will be able to access MCC from your gnome menu system. Simply click the **System** menu, and choose **Administration**. MCC will be one of the menu items listed in this menu.

Figure 10.4: Starting MCC From Gnome

10.2   Using MCC

As previously discussed, MCC attempts to provide an easy to use interface for reconfiguring all important items on a Mythbuntu system. The interface is broken up into logical groups of items. Each item is discussed in detail below.

10.2.1   System Roles

The *System Roles* tab is used to determine what type of box you have configured.

- **Primary Backend**: All MythTV setups must have a single Primary Backend. All backends and frontends will connect to this machine.

- **Secondary Backend**: Secondary backends are useful to expand the power of a MythTV network by harnassing additional power from more machines.
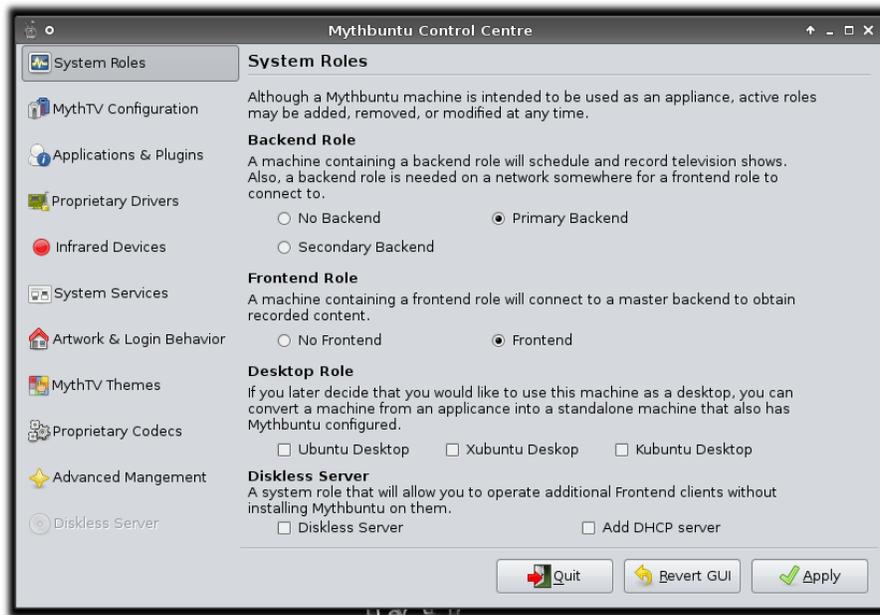
Figure 10.5: MCC System Roles Tab

- **Frontend**: Frontends are used to view any content recorded on a MythTV network.

- **Desktop**: If you decide that you would like to use this machine as a normal desktop at any time, you can add as many desktop roles as desired.

A **Standard** Mythbuntu installation will have a *Primary Backend*, and *Frontend* role installed. If at any time you decide that you would like to change the behavior of the box to add or remove functional roles, you can do so here. After installing a Secondary Backend or Frontend role, you will want to update the information listed on the MythTV Configuration tab 10.2.2.

NOTE: You must apply changes to the System Roles tab before proceeding to modify other tabs. If you try to switch to another tab without applying, you will be forced to revert changes or apply them at that time.

10.2.2   MythTV Configuration

Figure 10.6: MCC MythTV Configuration Tab

The *MythTV configuration* tab has different purposes depending on which role(s) you have installed. If you have either a **Primary** or **Secondary** backend role installed, you will be able to launch MythTV Setup from here to reconfigure backend specific items.

If you have any Mythbuntu roles other than a **Primary Backend**, you will be able to reconfigure any MySQL information used for contacting the **Primary Backend**. This information can be found on your **Primary Backend** under the file /etc/mythtv/mysql.txt. Before applying the changes, be sure to test your MySQL connection.

10.2.3   Applications and Plugins
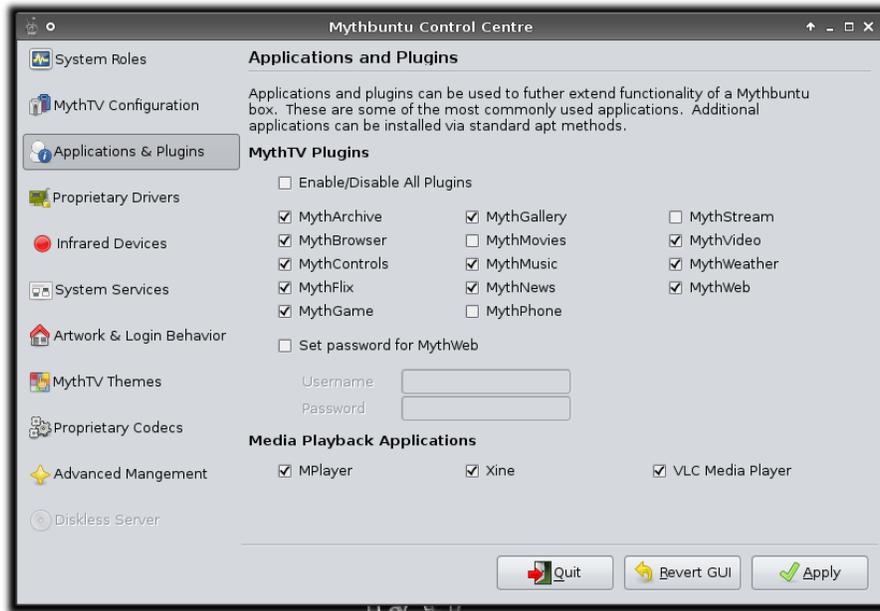
Figure 10.7: MCC Applications and Plugins Tab

The *Applications and Plugins* tab can be used to install all available MythTV plugins as well as applications that are well paired with them. You can also enable or disable a password for Mythweb on this page.

The following plugins are installable:

1. Mytharchive

2. Mythbrowser

3. Mythcontrols

4. Mythdvd

5. Mythflix

6. Mythgame

7. Mythgallery

8. Mythmusic

9. Mythnews

10. Mythphone

11. Mythstream

12. Mythvideo

13. Mythweather

14. Mythweb

The following applications are installable:

1. Mplayer

2. Xine

3. VLC

NOTE: Plugins may or may not be greyed out. If a plugin is greyed out, this is because it isn't applicable to the chosen role.

10.2.4   Proprietary Drivers

Proprietary drivers provide enhanced performance for video playback and allow for OpenGL effects within the MythTV menus. To install a proprietary driver, you can open up Restricted Manager.

Depending on which proprietary driver is installed, one of the buttons for configuration of your particular graphics card will be available. You can modify the tv out settings using the configuration utility here.

Also in this area you can modify which resolutions are available by modifying your monitor type.

10.2.5   Remote Control

Figure 10.8: MCC Remote Control Tab

10.2.6   System Services

10.2.7   Artwork and Login Behavior

10.2.8   Proprietary Codecs

10.2.9   Advanced Management
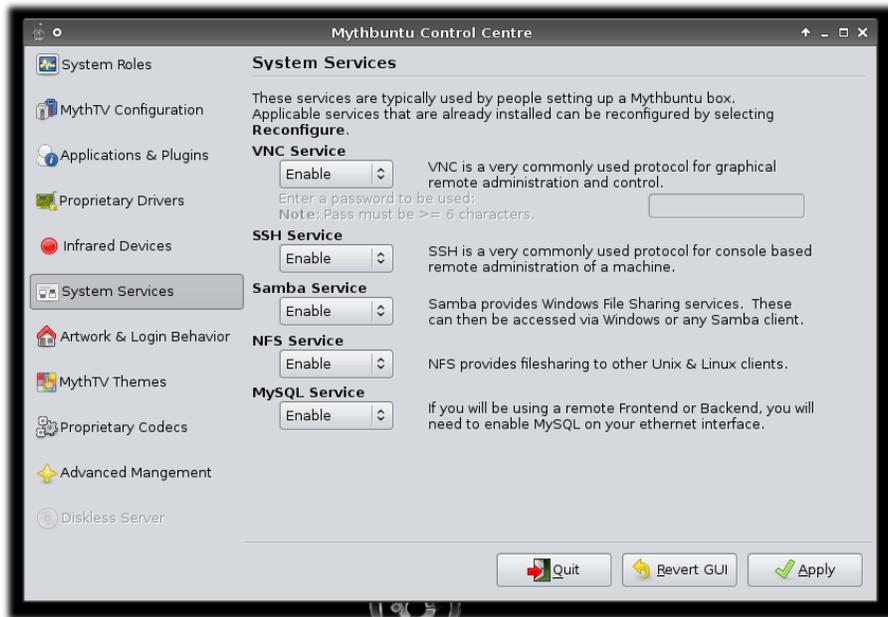
Figure 10.9: MCC Services Tab
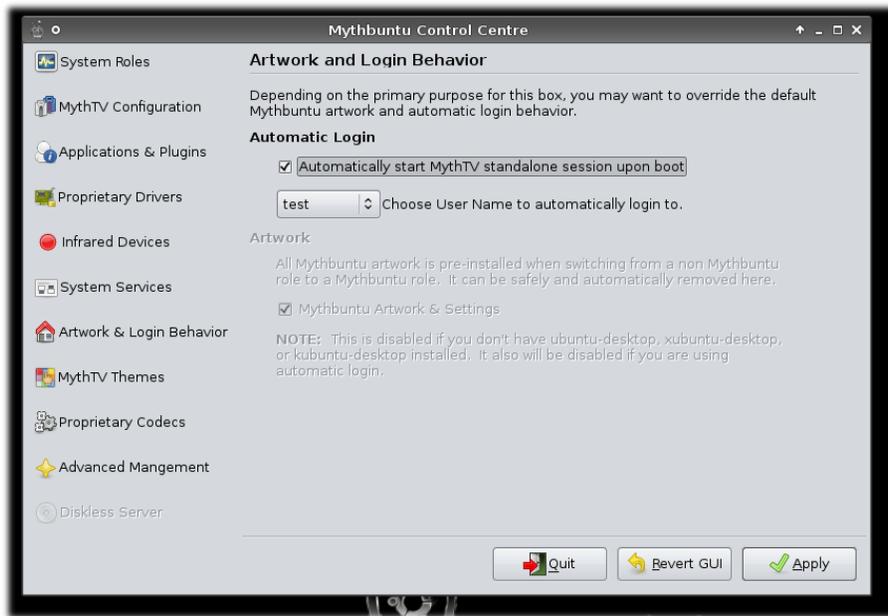
Figure 10.10: MCC Artwork and Login Tab
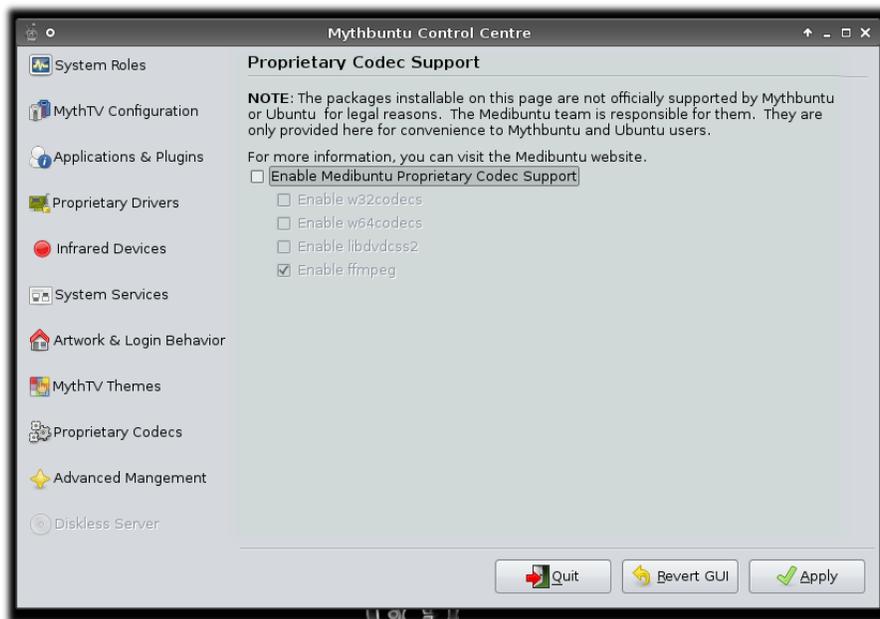
Figure 10.11: MCC Proprietary Codecs Tab
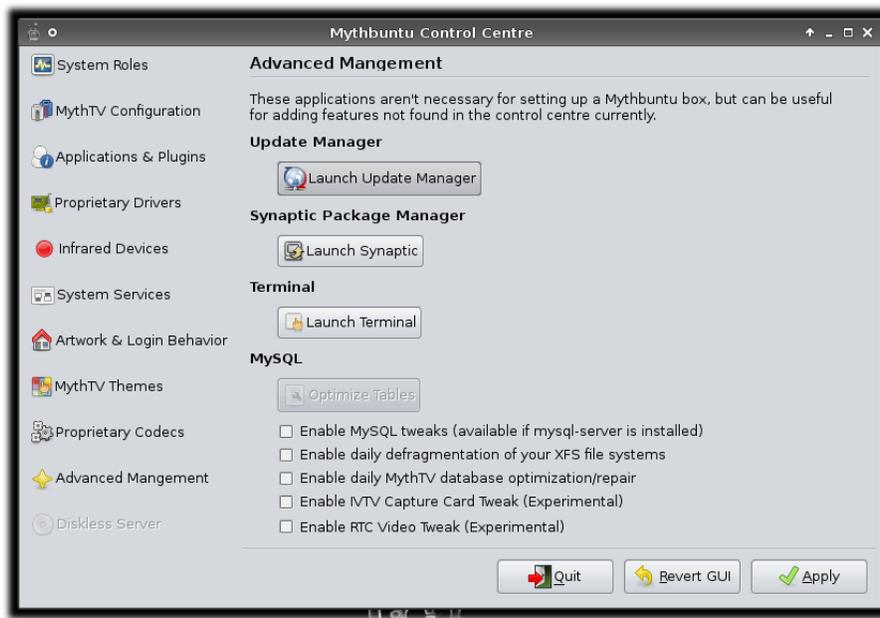
Figure 10.12: MCC Advanced Tab

Chapter 11

Configuring Mythtv Plugins

11.1   Myth Web

11.2   Myth Archive

To configure the Archive plugin, using the default theme, navigate to *Music Settings* via *Utilities / Setup ->Setup ->Media Settings*. You'll then be presented with a screen as below:

Figure 11.1: Archive Plugin

11.3   Myth Browser

11.4   Myth Controls

11.5   Myth Dvd

To configure the Dvd plugin, using the default theme, navigate to *Music Settings* via *Utilities / Setup ->Setup ->Media Settings*. You'll then be presented with a screen as below:

Figure 11.2: Archive Plugin

11.6   Myth Flix

11.7   Myth Gallery

To configure the Gallery plugin, using the default theme, navigate to *Music Settings* via *Utilities / Setup ->Setup ->Media Settings*. You'll then be presented with a screen as below:

Figure 11.3: Gallery Plugin

11.8   Myth Game

To configure the Game plugin, using the default theme, navigate to *Music Settings* via *Utilities / Setup ->Setup ->Media Settings*. You'll then be presented with a screen as below:

Figure 11.4: Myth Game

11.9   Myth Music

To configure the Music plugin, using the default theme, navigate to *Music Settings* via *Utilities / Setup* *->Setup ->Media Settings*. You'll then be presented with a screen as below:

Figure 11.5: Music Tools

There are various options you can change here most of which are self explanatory, however below is some info for those which aren't.

Tree Sorting Determines the order in which the music tree is sorted, this should be entered as a space-separated list. Options are **album**, **artist**, **genre**, **splitartist**, **splitartist1** and **title** *OR* use the keyword **directory** to mirror the filesystem tree.

Filename Format This is the filename format which your music collection is stored in, and used used to determine Album, Artist, Genre, Title and Track Number when Ignore ID3 Tags is set to true or when no ID3 information is found. Options are **ALBUM**, **ARTIST**, **GENRE**, **TRACK_TITLE**.

Ignore ID3 Tags MythMusic will determine the Album, Artist, Genre, Title and Track Number from the ID3 tags of the music files to play. If this option is set to true then it'll determine the information from the path and filename of the music file instead. For this to work the Filename Format needs to be correctly set for your collection.

11.10   Myth News

11.11   Myth Phone

11.12   Myth Video

To configure the Video plugin, using the default theme, navigate to *Music Settings* via *Utilities / Setup ->Setup ->Media Settings*. You'll then be presented with a screen as below:

Figure 11.6: Video Plugin

11.13   Myth Weather

Chapter 12

Remote Control (LIRC)

Most remote control configuration occurs from within the Mythbuntu Control Centre. From there, you can choose and change your remote control as well as re-generate button mappings. See chapter 10 for more information.

Some remote controls require additional setup that has not yet been automated. See section 12.1 for more information what remotes need extra design.

Also, for more advanced setups, such as IR and RF transmitting, or multiple remotes, you will need to refer to the section 12.2.

12.1 Drivers needing extra effort

The Ubuntu 8.04 packaging can't currently handle the extra work required for some remotes. The parts necessary for these are detailed here.

Serial Receiver The serial port needs to be disabled from kernel usage so that lirc_serial can use it. See section 12.2 for how to do this.

GPIO Devices Kernel 2.6.22 no longer allows the lirc_gpio driver to be used. Instead all gpio devices will load from the dev/input native lirc driver. See this specification for more information about what needs to be done. `https://blueprints.launchpad.net/mythbuntu/+spec/lirc-gpio-alternative`

Apple Remote You will need to find your event device in /dev and set the **DEVICE** item in /etc/lirc/hardware.conf

12.2 IR Transmitting

As installed, the default Lirc init scripts are properly setup to handle a single device, but the driver build scripts can be adapted to handle multiple devices. If you are looking to set up a transmitter and a receiver, multiple transmitters, or multiple receivers, set up a Single Device first and verify functionality.

IR transmitters can be used to control external devices such as cable boxes or television sets. They are very useful in home theatre automation by reducing the number of remotes necessary to control your devices.

The following drivers have support for IR transmission

- Serial IR Transmitter (Supported by lirc_serial module). 12.2.1

- Command IR Receiver / Quadruple Transmitter (Supported by lirc_cmdir module). 12.2.2

- Microsoft Media Center Remote Version 2 (Supported by lirc_mceusb2 module). 12.2.3

- Hauppauge PVR-150 (Supported by lirc_pvr150 module). 12.2.4

- USB-UIRT (Supported by native lircd binary).

12.2.1   Serial IR Transmitter

When installing lirc or reconfiguring (sudo dpkg-reconfigure lirc) , choose the option for either "Serial Receiver" or "Serial receiver (igor cesko's variant)". Depending upon which port you have your serial transmitter attached to, you may have to modify the modprobe options that are used for loading the kernel module. Create a file entitled /etc/modprobe.d/lirc with these contents:

```
#COM1 equivalent , /dev/ttyS0
options lirc\_serial irq=4 io=0x3f8
#COM2 equivalent , /dev/ttyS1
#options lirc\_serial irq=3 io=0x2f8
```

Uncomment the appropriate line to represent serial port you have connected your transmitter.

If you are running the lirc_serial driver either for a transmitter or receiver, you will need to disable kernel serial support.

- First you will need the **setserial** utility to do this.

```
$ sudo apt−get install setserial
```

- Reconfigure setserial.

```
$ sudo dpkg−reconfigure setserial
```

- Choose manual.

- Modify /var/lib/setserial/autoserial.conf
  Add (or modify if its there already) (switch to ttyS1 if your using that instead)

```
$ /dev/ttyS0 uart none
```

- Copy that script to /etc/serial.conf
```
$ sudo cp /var/lib/setserial/autoserial.conf /etc/serial.conf
```

12.2.2   Command IR Receiver / Quadruple Transmitter

One site (http://support.commandir.com/guides/index.php?distro-ubuntu-gutsy) has automated the above procedure for their CommandIR Mini transceiver which has a remote receiver and 4 IR blasters (http://www.commandir.com/). The device's emitters allow control of multiple devices and **do not require different codesets** since each emitter can be individually selected for transmitting using irsend set_transmitters. It is possible to use their script to setup LIRC on Mythbuntu for CommandIR then make minor modifications for other hardware.

12.2.3   Microsoft Media Center Remote Version 2

Gutsy packages include support for the mceusb2 IR transmitter. Simply select a **Microsoft Media Center (New Version)** remote from the list of remotes during lirc installation.

12.2.4 Hauppauge PVR-150

You need to download the Hauppauge firmware and add the appropriate codeset to your lircd.conf for the device you want to control. The firmware can be found at http://www.blushingpenguin.com/mark/lmilk/haup-ir-blaster.bin. Download it and put it in /lib/firmware The codesets can be found at http://www.blushingpenguin.com/mark/lmilk/lircd.conf. This file contains the codesets for every device in the database. You will need to extract the information for the device you want to control, and append it to your /etc/lirc/lircd.conf – but for now, just save it someplace safe. When you have downloaded and moved the firmware and have the codeset file, **Reboot** before continuing.

You will need to determine the codeset of your device. To help you determine the possible codeset, consult the list here: http://www.blushingpenguin.com/mark/lmilk/IRcodesets.html. Note that finding the correct codeset for your device can be tricky- but the master list can usually help you track them down by process of elimination. Once you have determined a codeset, you need to extract those codes from the master file you downloaded and add them to your /etc/lirc/lircd.conf as another remote.

For example, to blast a Power Button a Motorola DCT6200 series cable box, you would use the POWER button raw code from codeset 85. If you are linking it to a key on your remote, you want to change the button name to the name reported by irw.

```
$ sudo nano /etc/lirc/lircd.conf
```

First, add the blaster header:

```
begin remote

name            blaster
bits            32
flags           RAW_CODES
eps             0
aeps            0
plead           0
gap             333333
repeat_bit      0
begin raw_codes
```

Next, find the power button in codeset 85- since this is a cable box, it is prefixed in the master file as 0_85:

```
name 0_85_KEY_POWER
5570570
```

Then make it conform to how irw reports the keypress- in this case, irw reports it as POWER, so that is what to name it:

```
name 0_85_KEY_POWER
5570570
```

Keep adding your buttons (only the ones you want to control with the blaster). When you are finished, add:

```
end raw_codes
end remote
```

To close out that remote definition. In this example, the entire remote definition for the power button only looks like:

```
    begin  remote

  name            blaster
  bits            32
  flags           RAW_CODES
  eps             0
  aeps            0
  plead           0
  gap             333333
  repeat_bit      0
  begin  raw_codes
  name  0_85_KEY_POWER
   5570570
 end  raw_codes
end  remote
```

After saving the new lircd.conf, restart lirc:

```
    $ sudo /etc/init.d/lirc restart
```

and test it. In the example the command:

```
    $ irsend SEND_ONCE blaster POWEROFF
```

turns the DCT6200 cable box on and off. Even if it does not control the device as intended, you should see the blaster flashing.

Troubleshooting codeset selection, blaster placement, etc. is beyond the scope of this guide. A wealth of information is readily available via Google.

12.3   General Setup and Usage

Unlisted Remotes

If your remote isn't listed in the lirc installation, you should file a bug on Launchpad (https://bugs.launchpad.net/ubuntu/+source/lirc/+filebug)

Using a premade lircd.com

```
    $ wget "<download link>" -O lircd.conf
```

For other remotes, a good place to start looking is the Lirc Website Remotes list (http://lirc.sourceforge.net/remotes/). The online remote configuration tool LIRC Config (http://lircconfig.commandir.com/) also maintains a customizable database of lircd.conf's.

To replace /etc/lirc/lircd.conf with the lircd.conf that you have found:

```
    $ sudo cp <name of downloaded.conf> /etc/lirc
```

Recording a Remote

Insert the module that you intend to record from. For example

```
$ sudo modprobe lirc_mceusb2
```

Record the remote using irrecord

Using a premade lircd.com

```
$ sudo irrecord −d /dev/lirc0 lircd.conf
```

Once you have completed your configuration, move this lircd.conf to /etc/lirc/lircd.conf

```
$ sudo mv lircd.conf /etc/lirc
```

Add the modules for the remote to /etc/lirc/hardware.conf under MODULES==

Additional lircrc information

Multiple applications can be listed in the .lircrc file, but you will need a seperate begin and end block for each button in each application.

MythTV lircrc

If you are using this for mythtv, you will either need to create a standalone lircrc for mythtv in /.mythtv/lircrc or create a symbolic link to this file and place all the lircrc related content in /.lircrc.

- Creating a symbolic link. [All mythtv buttons will need to be placed in /.lircrc with the rest of the applications you use lirc for]

```
$ ln −s ~/.lircrc ~/.mythtv/lircrc
```

- Creating a standalone file. [All mythtv buttons will be placed in /.mythtv/lircrc]

    – Here is an example using a mceusb/mceusb2 remote:
    – Here is an example using a hauppauge remote: http://wilsonet.com/mythtv/lircrc-haupgrey-g3.txt

- IRexec
  irexec is able to interpret keypresses and launch applications when the keys are pressed. The syntax is:

```
    begin
    prog = irexec
    button = REMOTE_BUTTON
    config = APPLICATION
end
```

APPLICATION is simply the path and name of a file marked executable.

Configuring a lircrc by hand

If you are intending on using lirc for only IR transmitting, you don't need to create a ~/.lircrc file. If you are going to use it for IR receiving, you will need to create a ~/.lircrc file describing what each of the buttons does for each application you will use lirc in.

The basic syntax is as follows:

```
    begin
    prog = PROGRAM
    button = REMOTE_BUTTON
    config = ACTION
end
```

Where:

PROGRAM is the program you are recording buttons for. Some examples for PROGRAM are **mythtv**, **mplayer**, **xine**, **vlc** and **irexec**.

REMOTE_BUTTON is the name of the button in accordance with what is listed in your /etc/lirc/lircd.conf

ACTION is the action that will be performed when this button is pressed. You can find a list of actions in the attached .lircrc example file.

For a mceusb2 remote, you might need to change the button names from "chan-", "chan+", "vol-", "vol+" to "chandown", "chanup", "voldown", "volup".

Restarting Lirc

Should you ever need to restart lirc due to adding a remote, or after a suspend or anything like that:

```
    $ sudo /etc/init.d/lirc [start | stop | restart]
```

12.4   Setting up Multiple Devices

After you have proven LIRC works with a single device, you can modify your scripts to include support for multiple devices. The first thing you will have to make sure you have kernel modules for the additional devices. If during the single device setup, you built modules for all the devices you thought you would need, you can skip the next step.

Modify Init Scripts

•Modify /etc/lirc/hardware.conf

- Make sure that all of your modules are now added to the list of MODULES="". Take note of the order you provide these modules. This will be the order that lirc recognizes the devices, and important if you are going to need to differentiate between different lirc devices.

- Modify LIRCD_ARGS="" to match

```
LIRCD_ARGS="−d /dev/lirc0 −−output=/dev/lircd −−listen"
LIRCD2_ARGS="−d /dev/lirc1 −−output=/dev/lircd1 \
    −−connect=localhost:8765 −−pidfile=/var/run/lircd2.pid"
```

•Modify /etc/init.d/lirc

• Change this block:

```
LIRCD_ARGS=`build_args \$LIRCD_ARGS`
    start−stop−daemon −−start −−quiet −−exec /usr/sbin/lircd  \
        −− \$LIRCD_ARGS < /dev/null
```

• To be:

```
LIRCD_ARGS=`build_args \$LIRCD_ARGS`
LIRCD2_ARGS=`build_args \$LIRCD2_ARGS`
start−stop−daemon −−start −−quiet −−exec /usr/sbin/lircd
  \−− \$LIRCD_ARGS  < /dev/null
/usr/sbin/lircd \$LIRCD2_ARGS < /dev/null
```

•If you have more then 2 LIRC devices, you will need to add additional blocks to /etc/lirc/hardware.conf and /etc/init.d/lirc to connect to the main lirc process.

Testing Lirc

Start lirc via

```
$ sudo /etc/init.d/lirc start
```

You should have two lircd processes running. You will need to provide a parameter to any lirc process trying to interact with lircd now to indicate which lircd you want to interact with.

Chapter 13

Diskless Clients

13.1   Installing the packages

If you want to use diskless clients, you need to install the appropriate packages first. In 13.1, you should select the "Diskless Server" checkbox. If you also want your MythTV computer to act as a DHCP server, also select **Add DHCP server**. The upsides and downsides of this option are discussed a bit later in this document. Hit **Apply** to install the packages.
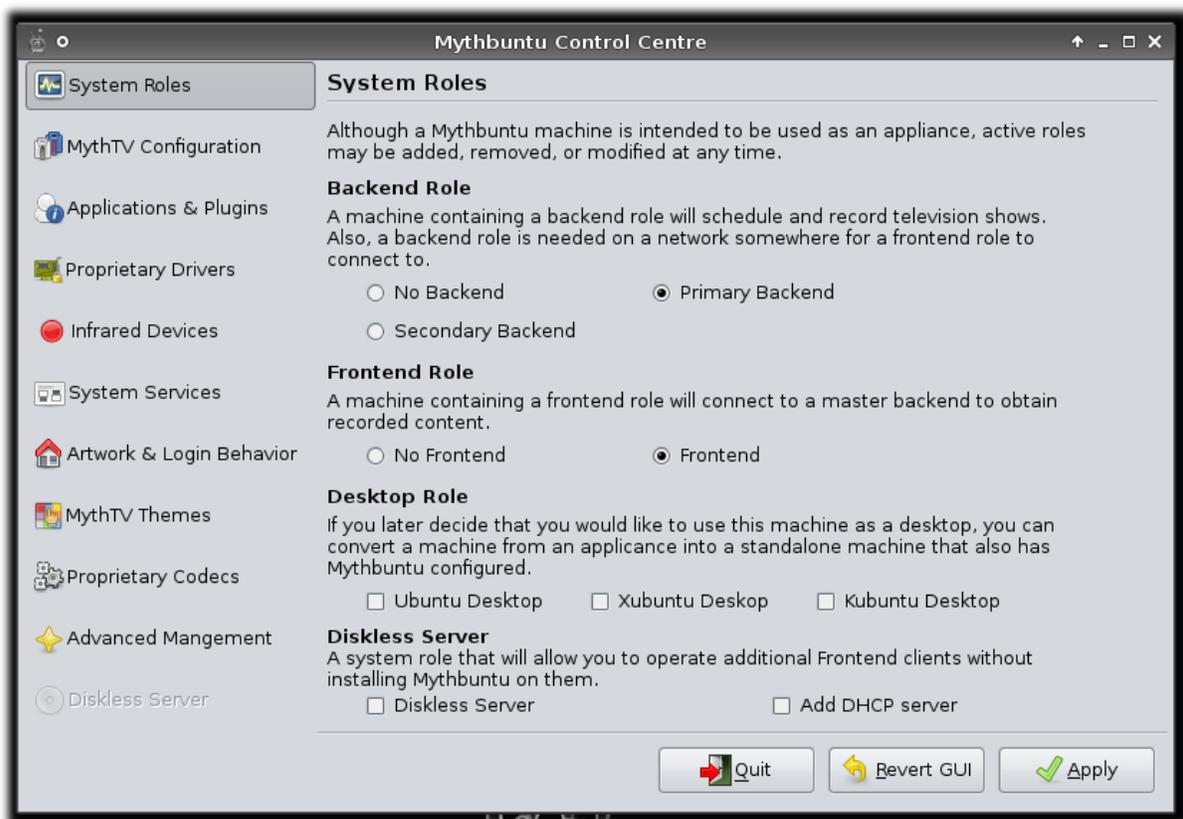

Figure 13.1: MCC System Roles

13.2   Server Preparation

Once the packages are installed, switch to the "Diskless Server" tab as shown in 13.2. For now, we will concentrate on the upper part of that screen where you can see the **Server Preparation** section.

Figure 13.2: MCC Diskless tab

First, you need to select a CPU architecture for your clients. Unless you have installed an amd64 or ppc version of Mythbuntu, the only choice available will be **i386** which will work for most clients. Now select **Build Image** and click **Apply**. Building the image for your diskless clients will take a while, depending on the speed of your internect connection and of your computer.

Please note that a copy of your /etc/apt/sources.list will be used to build the image. If you have any third-party package repositories, it is a good idea to select **Allow unsigned packages** before building the image.

13.3   Booting your diskless client

There are several options available for booting your diskless clients.
Let's start with a little bit of theory:

In order to boot successfully, your client must load the Linux kernel and the corresponding "initramfs" (basically a very minimal linux system which is used to mount the root file system). Inside the initramfs, a connection is made to the nbdrootd ("NBD" meaning "network block device") to mount the diskless image you created earlier. Additional, the overlay file system is mounted over NFS from your server. Because the diskless image is mounted read-only, the image and the overlay NFS share are merged using a stacking file system called 'aufs' ('another unionfs'). The client then boots. Any changes you make to the file system end up on the overlay file system.

You can either load the kernel (and its initramfs) from a normal block device like a hard disk or a CD-R or you can use PXE. With PXE, you don't need to have any disks in your client but it can be a bit harder to set up.

13.3.1   Block devices

Boot your client from a USB thumb drive

Any recent computer today has USB ports, and most can boot from them. The Mythbuntu Control Centre can prepare your thumb drive for you. Please make sure there is no valuable data on that drive as data loss might occur!

All you need is a thumb drive where the first partition is formatted as fat32/vfat. As you can see in figure 13.2, the settings for preparing flash drives are located in the **Client Bootable Flash Drive** section. Before anything can be done in this section, please select your image in the **Client Maintenance** section above.

Now you need to choose your flash drive. In the empty area next to that drop-down menu, the name of your flash drive will be displayed. Make sure you select the correct one to avoid data loss. Next, select the network interface which is connected to the network where your clients reside. This will often be "eth0". If your server is not running all the time, you can also enable Wake on Lan there. The initramfs will attempt to wake up the server before mounting the root file system.

Now select **Write Drive** and click **Apply**.

Boot your client from hard disk

Write me!

Boot your client from CD-R

Write me!

13.3.2   PXE

If you want to use PXE instead, you will need two things: a DHCP server and a PXE stack on your client.

The DHCP server

Again, we have a few options.

DHCP server on your diskless server

Simply select **Add DHCP server** in the **System Roles** tab in the Control Centre (figure 13.1) and click **Apply**. It'll try to customize the DHCP configuration to suit your network, but you might want to make corrections in /etc/ltsp/dhcpd.conf. If you adjust that file, issue 'sudo /etc/init.d/dhcp3-server restart' in a terminal to reload the DHCP server.

This option works best if there's not other DHCP server on your network. However, many people will already have small SOHO routers/NAT boxes which act as DHCP servers, so please be careful here. It is still possible to use a second DHCP server in addition to your existing one; read on:

Unauthoritative DHCP server on your diskless server

This document explains it quite well: http://www.etherboot.org/wiki/twodhcpservers Note: you'll need to use etherboot, see below.

Using alternate DHCP ports for the DHCP server on your diskless server

You can run your whole mythbuntu-diskless DHCP setup on different ports so it never conflicts with your current DHCP setup. It'll only work if you use etherboot as your PXE stack (see below)

Prepare the initramfs Open a Terminal and chroot to the your diskless base system: sudo chroot /opt/ltsp/i386 Now that you're inside the chroot, open /etc/initramfs-tools/conf.d/ltsp in your favourite editor:

```
nano /etc/initramfs−tools/conf.d/ltsp
```

Modify the DHCPPORT variable. A value of 1068 works well there. Save your changes and run

```
update−initramfs −k all −c
```

to update the initramfs. Now type

```
exit
```

to exit the chroot and run

```
sudo ltsp−update−kernels
```

Prepare the DHCP server
Open /etc/init.d/dhcp3-server in your favourite text editor:

```
sudo nano /etc/init.d/dhcp3−server
```

Around line 90, you'll find a line saying:

```
−−exec /usr/sbin/dhcpd3 \−− −q −pf \$DHCPDPID −cf \$CONFIG\_FILE \$INTERFACES
```

Modify it to say:

```
−−exec /usr/sbin/dhcpd3 −− −p 1067 −q −pf \$DHCPDPID −cf \$CONFIG\_FILE \$INTERFACES"
```

Prepare the PXE stack When you create the etherboot image for your hardware at http://rom-o-matic.net/, click **Configure** during step 3. Select

```
ALTERNATE\_DHCP\_PORTS\_1067\_1068
```

there and proceed as usual.
Done.

DHCP server on a SOHO router/different computer
It's possible that your SOHO router will grant you enough control over its DHCP server. Refer to its documentation to find out how to set up PXE booting. If you're running an alternate firmware like OpenWRT, you should have no problem adding a config entry.
On your diskless server, you can find example configuration files for the ISC dhcpd and for dnsmasq in /usr/share/doc/ltsp-server/examples/. You probably have to expand these configuration files by adding a 'next-server' statement to point to your mythbuntu server where the tftp server with the kernel resides.

PXE

'PXE' stands for 'Preboot eXecution Environment'. In our case, PXE talks to the DHCP server to get an IP address and to download a boot loader (pxelinux), which will in turn download the kernel and the initramfs.

PXE stack supplied with your computer/network card
A lot of computers today come with a PXE stack as a part of their BIOS ROM for their onboard network interface card (NIC). It's also possible to buy NICs which have a PXE stack.

PXE stack from the etherboot project
If you don't have a PXE stack already or if you think yours might be buggy, you can download a PXE stack for many NICs at http://rom-o-matic.net/. Make sure to select the correct **ROM output format**. This will allow you to load a PXE stack from a floppy disk, hard drive or from CD-ROM.

13.3.3   Maintenance

Of course, most things you can do with your normal Mythbuntu installation can also be done with a diskless client.

Installing packages Packages should always be installed inside the client image. Only hardware-specific packages like proprietary drivers should be installed on the clients themselves (see below for further explanation).

To install new software inside the client image, bring up Mythbuntu control centre on your server and switch to the diskless tab (13.2). Select your image below the **Client Maintenance** heading and click the **Control Centre** button to start a new instance of the Mythbuntu control centre. You can now perform packages updates and configuration tasks as usual.
Note: take care not to mistake the newly started Control Centre instance diskless image for the Control Centre of your server as they look very similar.

Why shouldn't I install packages on the client itself? One of the few limitations of the diskless clients is the way packages are handled. All packages you've installed are listed in a database which resides inside the diskless image. When a client changes a file in the diskless image, the image 13.2itself is not changed. Instead, the modified file is copied to the overlay directory.
When you install a package on your client, a copy of the package database is created which means that the database on the client won't know about any updates or new packages inside the image. This can lead to awkward situations where the client uses a version of a proprietary driver which doesn't match a newer kernel

Configuration Any configuration on the client can be performed as usual in the Control Centre or using your favourite editor. For example, one thing that most people might want to enable on a diskless client is automatic login.

13.3.4   Troubleshooting

If something goes wrong, don't panic. There are several log files waiting for you:
On the server, textbf/var/log/daemon.log will contain some information concerning NFS and tftp, so

it's a good idea to look there if your client doesn't boot. Another option to find out more is removing the two words "quiet" and "splash" from the boot line in **/var/lib/tftpboot/ltsp/i386/pxelinux.cfg/default**. You can then see all kinds of information when you boot your clients.

If your client manages to boot but shows other problems, it's a good idea to look in **/var/cache/mythbuntu-diskless/overlay/$KEY/var/log/** (where $KEY is the MAC address of your client without colons) to find log files for your client.

13.3.5 FAQ

I've switched my network card and I want my settings back!
You can either move the overlay directory in **/var/cache/mythbuntu-diskless/overlay/** to the new MAC address or you can pass the "overlaykey=" boot option. The argument passed to "overlaykeys=" is the name of the directory inside **/var/cache/mythbuntu-diskless/overlay/**.

13.3.6 Interesting Files/further configuration

Here is a (possibly incomplete) list of configuration files used by mythbuntu-diskless.

On the server:

/etc/inetd.conf: used to launch nbdrootd which serves the diskless images. Often, the tftpd is started from here. * /etc/exports: Used to export /var/cache/mythbuntu-diskless/overlay * /var/lib/tftp-boot/ltsp/i386/pxelinux.cfg/default: Bootloader configuration. Note that this will be overwritten every time 'ltsp-update-kernels' is ran. You can create client-specific pxelinux configuration files if you don't want to lose your custom configuration. Refer to the pxelinux documentation to find out how. Alternatively, you can specify additional boot arguments inside the image.

Inside the chroot:
After you've switched to the chroot environment using

```
chroot /opt/ltsp/i386
```

or simply by clicking "Open Terminal" in the Control Centre (see 13.2), you can edit the following files:

* /etc/ltsp/update-kernels.conf: If you create this file, you can add a BOOTPROMPT_OPTS variable to specify your boot options. To apply your changes, run

```
/etc/kernel/postinst.d/ltsp-update-kernels
```

On the server (outside the chroot), you need to run

```
sudo ltsp-update-kernels
```

to copy the new bootloader configuration (and possibly a new version of the kernel) to the TFTP directory.

* /etc/initramfs-tools/conf.d/ltsp: This is the configuration file for the initramfs script used to bring up your client. It's not recommended to change anything here, but someone might benefit from changing $HOSTNAMEOVERRIDE or $OVERLAYKEY.

Chapter 14

Advanced Setup Options

14.1   Windows Frontend

For a MS Windows Frontend we recommend MythTV Player. It is available at http://www.sudu.dk/mythtvplayer/ Be sure to remember to turn on the MySQL Service on your backend.

14.2   Xbox Frontend

A python based frontend for MythTV which runs on xboxmediacenter can be found at http://sourceforge.net/projects/xbmcmythtv/

Chapter 15

Frequently Asked Questions

- **Q. I've successfully installed Mythbuntu and have it up and running, but I'd like to install the Ubuntu desktop on it now to add other features. I switched to the Ubuntu flag in the Mythbuntu settings and it downloaded and installed the packages, but when exiting MythTV, I still get the old xfce interface. What else do I need to do?** (gtr33m)

  A. You need to change your session type. Log out and at the login screen hit the session button. Choose GNOME. It will ask you to change settings, and then hit yes.

- **Q. I am looking to do a nightly backup of my Mythbuntu backend to my server. I am looking to compile a list configuration files, etc. that would be useful in restoring the machine, should something happen to it. The database backups are a given.** (dmfrey)

  A. The database is setup currently to backup already via a cron job, but I believe its a weekly backup rather than a nightly. You probably just need to move that cron job over from cron.weekly to cron.daily. So now if you are looking for a backup that you can literally press a key and restore the entire drive, I almost think you are better off using a full out rsync of the entire system partition. Most installations are only 1-1.5gb so this is doable especially if you use compression. Comparatively, you probably can get away with backing up , as well as any config files that you have to tweak post installation. All the information about your tuners, storage areas, etc are all stored in the mysql database. You might want to record the options you chose during installation to make sure you remember to set them up next time, but otherwise I think this is the way to go. The backups are saved to /var/backups with rotation done on them so a few weeks worth is there.

Chapter 16

Trouble Shooting

If you have problems with your installation of Mythbuntu then you can get help within IRC (chat) in #ubuntu-mythtv or #mythtv-users on freenode.net. You can also get help on the Mythbuntu forums at http://ubuntuforums.org/forumdisplay.php?f=301

Chapter 17

Reference

17.1 MythTV Plugins

17.1.1 Backend Plugins

Myth Web MythWeb provides a web interface which can be used to view listings, schedule recordings, delete recordings, and search for programs. It can also browse mythmusic's music database, and may eventually support playing music streams as well. *packname:mythweb*

17.1.2 Frontend Plugins

Myth Archive MythArchive is a plugin for MythTV that lets you create DVDs from your recorded shows, MythVideo files and any video files available on your system. It can also archive recordings in a proprietary format that archives not only the file but also all the associated metadata like title, description and cut list information which will mean you can create backups of myth recordings which can later be restored or it will also allow you to move recordings between myth systems without losing any of the metadata. It is a complete rewrite of the old MythBurn bash scripts, now using python, and the mythfrontend UI plugin. *packagename:mytharchive*

Myth Browser Mythbrowser is an integrated web browser plugin for your MythTV system. *packagename:mythbrowser*

Myth Controls External controls for MythTV. This will allow you to modify button mappings and key bindings. *packagename:mythcontrols*

Myth Dvd MythDVD provides an interface for launching your preferred DVD player from MythTV, and also supports transcoding DVDs into audio/video streams which can be played by MythVideo, using the transcode package. *packagename:mythdvd*

Myth Flix Allows you to monitor your Netflix dvd rental queue. http://www.netflix.com/ *packagename:mythflix*

Myth Gallery MythGallery allows you to visually browse a directory tree containing image files. It can display any image file format supported by Qt, and supports image rotation and simple slideshows. *packagename:mythgallery*

Myth Game MythGame can be used as a frontend to start any emulator that your host OS runs. *packagename:mythgame*

Myth Music MythMusic provides a digital audio jukebox integrated with MythTV. It supports Ogg Vorbis, FLAC and MP3 streams, displays visualizations, and can also encode new Ogg Vorbis or FLAC streams from audio CDs using a CD-ROM drive. *packagename:mythmusic*

Myth News An RSS feed news reader module for MythTV. *packagename:mythnews*

Myth Phone Mythphone is a phone and videophone capability on MYTH using the standard SIP protocol. It is compatible with Microsoft XP Messenger (see caveat below) and with SIP Service Providers such as Free World Dialup <http://fwd.pulver.com>. *packagename:mythphone*

Myth Video MythVideo allows you to browse and play video streams, using an external player, from within the MythTV interface. *packagename:mythvideo*

Myth Weather MythWeather displays current and forecast weather information within MythTV. *packagename:mythvideo*

17.2   TV-OUT

The images and information on this page have mainly come from wikipedia.

17.2.1   Connections Explained

Composite Video Composite video, also called CVBS (Composite Video Blanking and Sync), is the format of an analog television (picture only) signal before it is combined with a sound signal and modulated onto an RF carrier. See figure 17.1(a)

S-Video Separate video, abbreviated S-Video and also known as Y/C (or erroneously, S-VHS and "super video") is an analog video signal that carries the video data as two separate signals (brightness and color), unlike composite video which carries the entire set of signals in one signal line. S-Video, as most commonly implemented, carries high-bandwidth 480i or 576i resolution video, i.e. standard definition video. It does not carry audio on the same cable. See figure 17.1(b)

Component Video Component video is a video signal that has been split into two or more components. In popular use, it refers to a type of analog video information that is transmitted or stored as three separate signals. Component video can be contrasted with composite video (such as NTSC or PAL) in which all the video information is combined into a single line level signal. See figure 17.1(c)
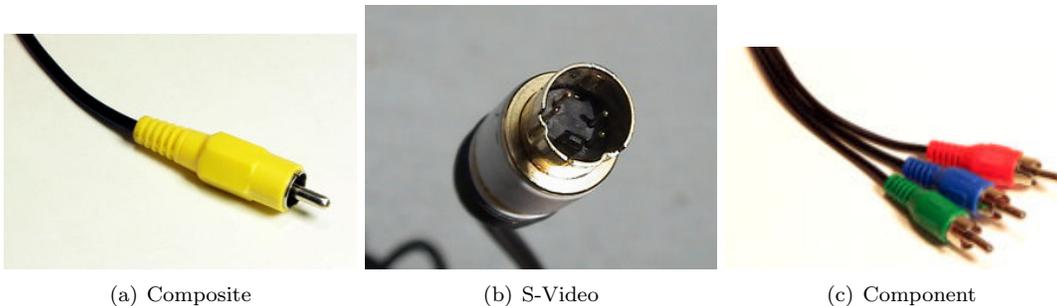
(a) Composite   (b) S-Video   (c) Component

Figure 17.1: Pictures of connections

17.2.2   TV Formats

17.3 References

- The information for section 2 is mainly based upon the mythtv docs found at `http://www.mythtv.org/docs/mythtv-HOWTO-3.html`

- The information for **??** was posted by apauna on the Mythbuntu forms and can be found at `http://ubuntuforums.org/showthread.php?t=584473`

- The pictures and information in 17.2 is from wikipedia.