# Manage Your Media
With Kodi

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IF YOU, LIKE ME, like to own your own data, then chances are you also purchase blurays or DVDs as well. For a little while it might be manageable to have a bunch of files stored in some sort of directory structure. However, once your collection grows, you may want features like resuming from a specific spot, maintaining watched status, episode or movie summaries. Perhaps you like to store trailers with your movies, maybe you buy media that has multiple languages, or maybe you just want a sane way to play the iso [1] you have made to have an exact digital copy of the disc.

This is where Kodi comes in.

What is Kodi

Modern Kodi is the successor to XBox Media Player which was discontinued way back in 2003. In June 2004 XBox Media Center (XBMC) was born. For over 3 years XBMC remained on the XBox. Then in 2007 work began in earnest to port the media player over to Linux.
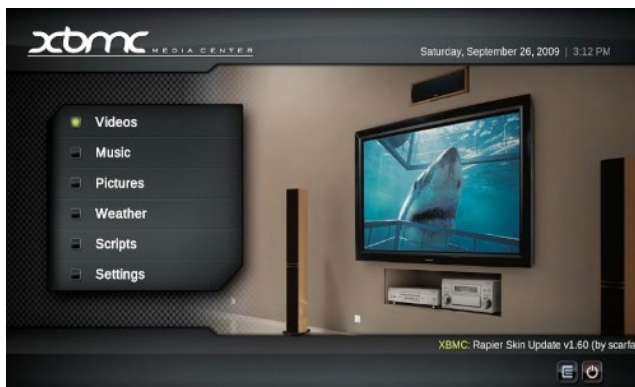
Aside from some uninteresting technical history, things remained fairly stable and XBMC grew in prominence. By 2014 XBMC had a thriving community and the core functionality grew to include playing games, streaming from the web, connect to mobile devices. This combine with legal issues involving having XBox in the name, lead the team behind XBMC to rename it as Kodi [2]. The team now describes Kodi as an "entertainment hub that brings all your digital media together into a beautiful and user friendly package".
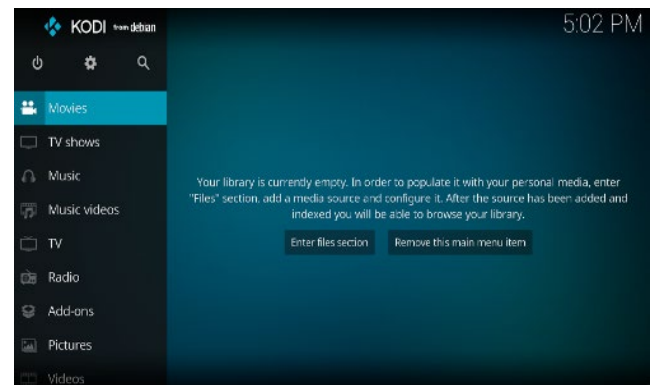
Today, Kodi has an extensible interface which have allowed the open source community to build new functionality through plugins. *DISCLAIMER: as with all open source software, the developers are **NOT** responsible for the plugins which are available in their ecosystem.*

Great How Do I Start?

For Ubuntu based distributions its a few short commands away:

```
sudo apt install software-properties-common
sudo add-apt-repository ppa:team-xbmc/ppa
sudo apt update
sudo apt install kodi
```

In Arch you can install the latest from the community repo:

```
sudo pacman -S kodi
```

While there were packages maintained by RPM Fusion for Fedora 26 as referenced by the Kodi Documentation [3] I tried this on Fedora 29 and it was quite unstable. I'm sure that this will improve over time, but at the time of writing, my experience was that Fedora 29 was not the ideal platform for Kodi.

Ok It's Installed... Now What?

So I am making a few assumptions in this article:
1) I assume you have your own local, legally attained content
2) You have already transferred this content from DVD/Bluray/digital distribution source to local directory

Kodi uses a scraping service in order to pull down TV and Movie metadata. In order for Kodi to match things appropriately I suggest adopting a directory and file naming structure similar to the following:

```
Utopia
├── Utopia.S01.dvd_rip.x264
│   ├── Utopia.S01E01.dvd_rip.x264.mkv
│   ├── Utopia.S01E02.dvd_rip.x264.mkv
│   ├── Utopia.S01E03.dvd_rip.x264.mkv
│   ├── Utopia.S01E04.dvd_rip.x264.mkv
│   ├── Utopia.S01E05.dvd_rip.x264.mkv
│   ├── Utopia.S01E06.dvd_rip.x264.mkv
└── Utopia.S02.dvd_rip.x264
    ├── Utopia.S02E01.dvd_rip.x264.mkv
    ├── Utopia.S02E02.dvd_rip.x264.mkv
    ├── Utopia.S02E03.dvd_rip.x264.mkv
    ├── Utopia.S02E04.dvd_rip.x264.mkv
    ├── Utopia.S02E05.dvd_rip.x264.mkv
    └── Utopia.S02E06.dvd_rip.x264.mkv
```

I chose to put the source (my DVDs) and the codec (x264) in the title but these are optional. You can also have the Episode title in the file name as well. The important part is SxxExx which stands for Season and Episode. This is how Kodi (and by extension the scrapers) are able to identify your media.

So assuming that you have your media organized like that, lets talk about doing some basic Kodi configuration.

Adding Video Sources

Now that you have the program installed, you will be greeted with the screen shown above. For the impatient, the steps below are a summary of what will be explained in more detail with screen shots. Feel free to attempt to navigate these on your own.
1. Select your media type, and click "Enter Files Section"
2. Click On Files
3. Click Add Source
4. Browse to your source
5. Define the video content type
6. Refresh the metadata

How to Add Video Sources
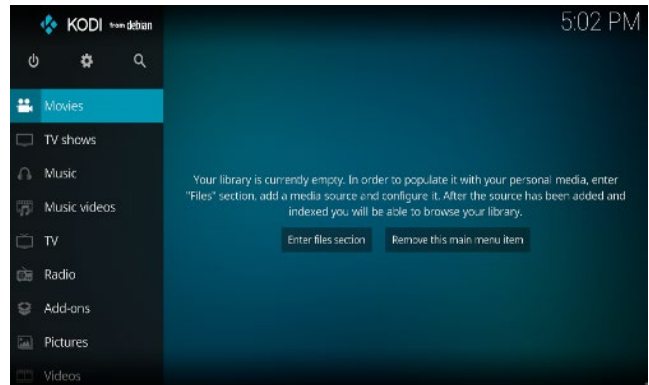
When you first launch Kodi you will be greeted with the screen above. Enter the file section. It does not matter whether you do this under *Movies* (as show in the screen shot above) or *TV Shows*.
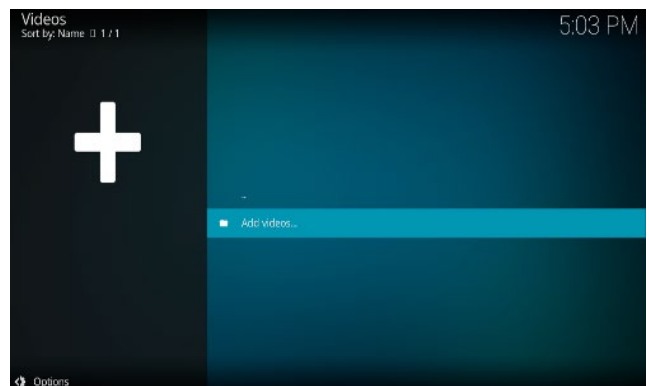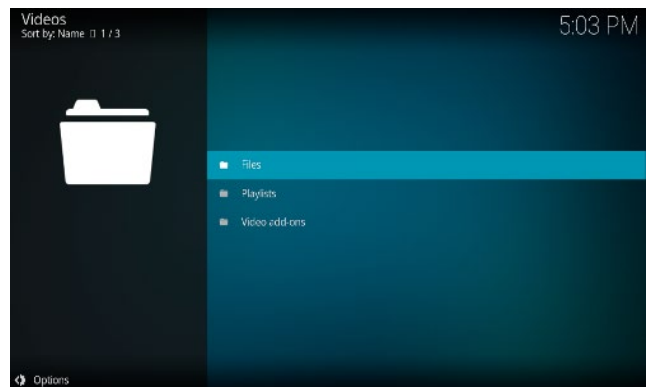

Next, select the videos folder and then click *Files* and then *Add Videos*. Finally, you can either click on the word *None* and start typing the path to your files, or you can click *Browse*.
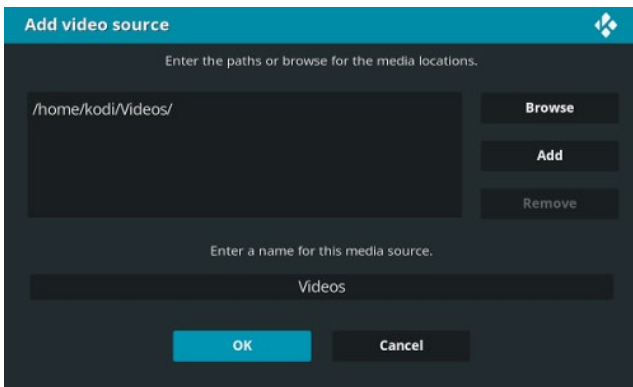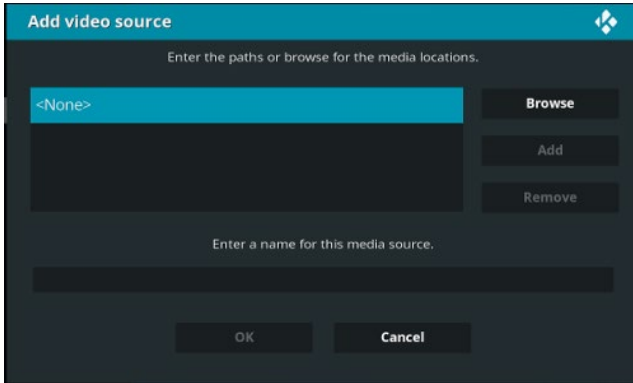
In the screenshot above, I have added my local Videos directory. There are some default options in browse such as your *Home* folder, any drives you have mounted, *Network File System (NFS)*, UPnPdevices, *Windows Network (SMB/CIFS)* and Zeroconf. I am not going to cover most of these as they are outside of the scope of this article. However, we will make use of NFS later on for some of the more advanced features.

After you have selected your path and clicked *OK* you will be greeted with the window below which allows you to select the type of content.
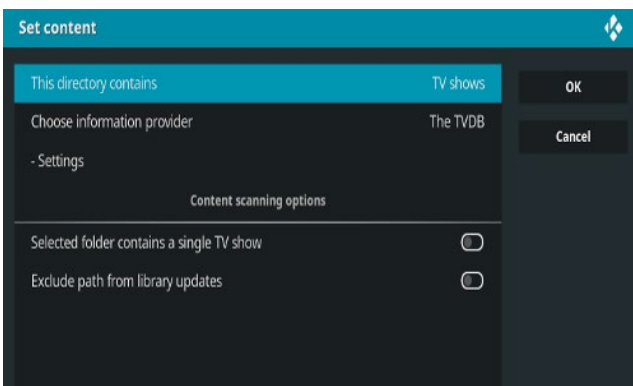

Next you will be prompted to refresh the metadata for the content in the directory you have selected. This is how Kodi knows what videos you have, what the synopsis for the content is, actor/author information and thumbnails/fan art. When you select *Yes* in the top right hand corner you will see the video scanning progress.
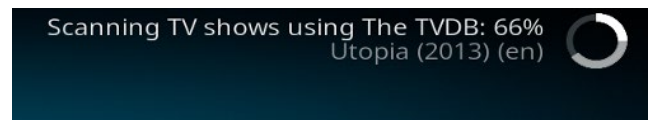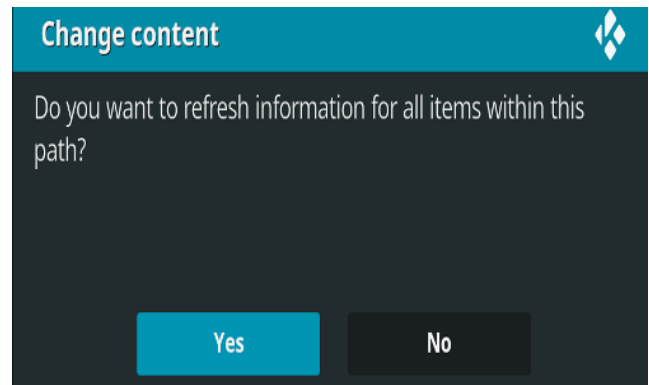
When it is completed you will be able to see lots of useful information such as video overviews and if they are TV shows, you can see season and episode descriptions as well.
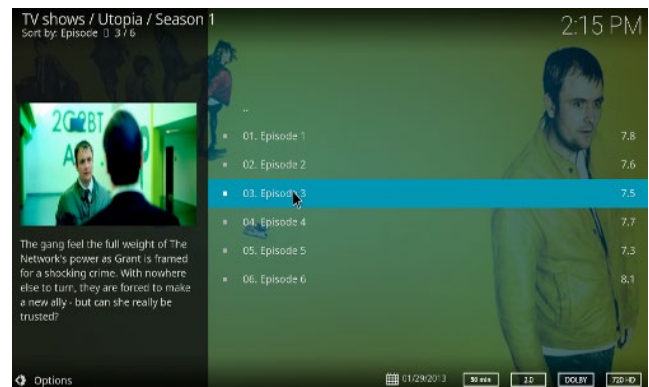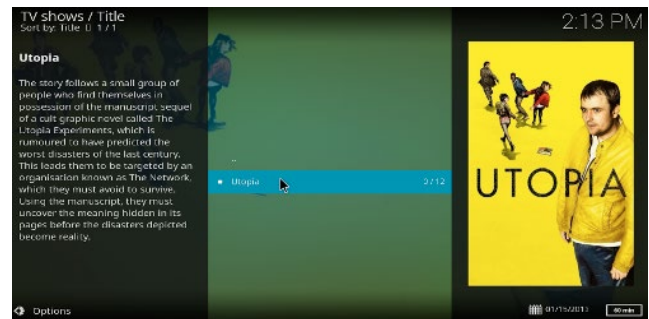
The same process works for other types of content such as Music or Music Videos.

Increasing Kodi Functionality with Add-ons

The interesting thing about open source projects is that they are often extended well beyond their initial scope.

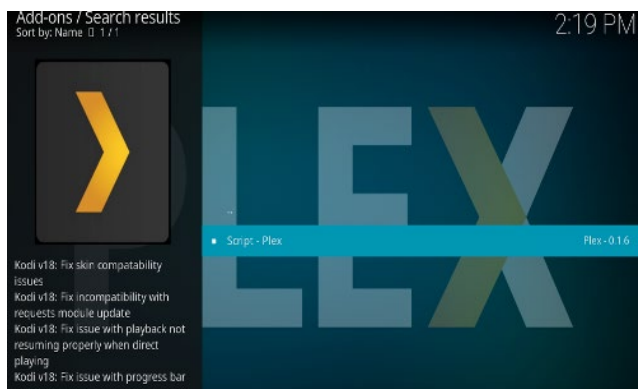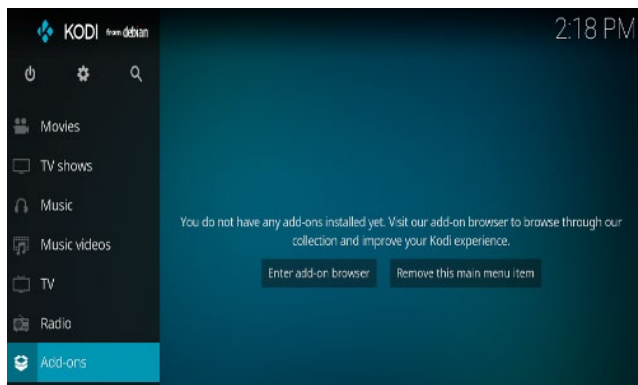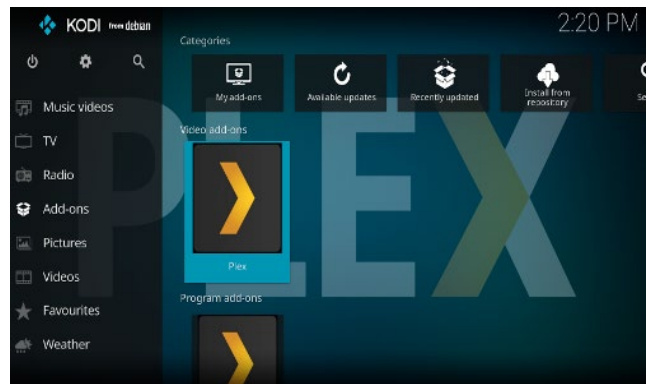Kodi has a very robust add-on infrastructure. Most of the Add-ons are produced by fans of Kodi wishing to extend the default functionality. Sometimes, companies release official plugins for Kodi (such as Plex). Be very careful about adding plugins from untrusted sources. Just because you can find an add-on on the internet does not mean it is safe!

BE WARNED ADD-ONS ARE NOT SUPPORTED BY THE CORE TEAM!

Having said that, I'll give you a brief introduction to using add-ons. In my house we use Kodi for local playback and Plex when we want access to our content outside of the house. There is a small exception to this. In one room of the apartment the wifi signal is not very performant. Since I rip my blurays to very large MKV files (usually 20-40GB in size) the wifi (and therefore Kodi) cannot handle these files without stuttering. While you can (and we have) dug into some of the advanced buffering options, as file sizes increase, even these tweaks have proved insufficient. Since we already have a Plex [4] server able to transcode content, we solved our problem with a Kodi Add-On.

First, go to *Add-ons* in the side panel and click on *Enter add-on browser*. You can either use the search functionality or simply scroll down to the *P* section and select Plex. Once you have selected the Add-On, click on the *Install* button in the lower right-hand corner.

Once the Add-On has finished downloading it will be available on the main Kodi screen under *Add-ons*.

Some Add-ons such as *NHL TV* have their configuration done via a menu accessed by right clicking the *NHL TV* add on and clicking configure. Others, such as *Plex* have the configuration walk-through once you launch the Add-on itself. If the Add-on you have selected does not seem configured when you first launch it, try right clicking on its menu entry and seeing if the settings option is available there.

Watched Status Between Kodi Devices

In our house we have multiple machines which run Kodi. By default Kodi tracks metadata, such as Watched Status and Show Information, locally. Therefore updating the content on one machine will not be reflected on any other machine. Fortunately Kodi has the ability to store metadata inside of an SQL database. This means that you must configure Kodi in such a way that all the machines have access to both content and metadata. This technique is more advanced. It is not particularly difficult but it may be more effort than what you are willing to put in. Nevertheless, I will document the process here.

There are a few things you need to know before attempting to have shared status for Kodi.
1. All content *must* be on a network share (samba, nfs etc).
2. All content *must* be mounted via the network protocol even if the disks are local to the machine. That means

that no matter where the content is physically located each client is configured to use a network fileshare source

3. You need to be running an SQL style database. The official guide walks through MySQL, I chose MariaDB.
4. All clients either need to have the database port open (port 3306 in the case of MySQL/MariaDB) or the firewalls should be disabled
5. All clients **must** be running the same version of Kodi

Installing and Initial Configuration

You can install MariaDB in Ubuntu with the following commands:

```
sudo apt update
sudo apt install mariadb-server -y
```

For this demo, I am running mysql on an Arch Linux machine. The Arch Wiki [5] has a well documented process for the initial setup. I will summarize here.

To install issue the following command:

```
sudo pacman -S mariadb
```

Most distributions of MariaDB will have the same following setup commands. It is recommended that you understand what these commands do, but you can also safely take the defaults if being used in a **HOME** environment

```
sudo systemctl start mariadb
sudo mysql_install_db --user=mysql --basedir=/usr
  --datadir=/var/lib/mysql
sudo mysql_secure_installation
```

Next, edit the MariaDB config file. This file is different depending on your distribution. On Ubuntu you want to edit `/etc/mysql/mariadb.conf.d/50-server.cnf`. On Arch the file is simply `/etc/my.cnf` or `/etc/mysql/my.cnf`. Locate the line that says `bind-address = 127.0.0.1` and change this to either your desired ethernet port ip or simply put `bind-address = 0.0.0.0` to listen on all interfaces.

Restart the service for the change to take affect:

```
sudo systemctl restart mariadb
```

Kodi and MariaDB/MySQL Configuration

In order for Kodi to be able to write to the database one of two things needs to happen. You can create the database yourself or you can let Kodi do that for you. In this case, since the only database on this system is for Kodi, I am going to create a user with the rights to create any databases that Kodi requires. **DO NOT DO THIS IF THE MACHINE HAS MORE THAN ONE DATABASE ALREADY RUNNING**

```
mysql -u root -p
CREATE USER 'kodi' IDENTIFIED BY 'kodi';
GRANT ALL ON *.* TO 'kodi';
flush privileges;
\q
```

This use has been granted all rights and is essentially a root user. For me purposes this is fine.

Next, on each Kodi device you want to share the shared metadata with, you need to create the following file `/home/<USER>/.kodi/userdata/advancedsettings.xml`. This file can contain a lot of very advanced tweakable settings. My devices have these settings

```
<advancedsettings>
    <videodatabase>
        <type>mysql</type>
        <host>mysql-arch.example.com</host>
        <port>3306</port>
        <user>kodi</user>
        <pass>kodi</pass>
    </videodatabase>
    <videolibrary>
        <importwatchedstate>true</importwatchedstate>
        <importresumepoint>true</importresumepoint>
    </videolibrary>
    <cache>
        <!--- The three settings will go in this space, between
            the two network tags. --->
        <buffermode>1</buffermode>
        <memorysize>322122547</memorysize>
        <readfactor>20</readfactor>
    </cache>
</advancedsettings>
```

The `<cache>` section is completely optional for this scenario. It has to do with how much of a file Kodi will buffer over the network. See the Kodi wiki [6] for a full breakdown on this file and its options.

Now that the configuration has been completed close Kodi and reopen it just to make sure the settings are applied. This step is not strictly necessary but it is a good idea.

The final step is to configure all of the Kodi clients to use the same network share for all their content. Only one client needs to scrap/refresh the metadata if everything has been created successfully. When data has been collected you should be able to see that Kodi has created a new database on your SQL server:

```
[kodi@kodi-mysql ~]$ mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 180
Server version: 10.1.37-MariaDB MariaDB Server
```

```
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and
others.

Type 'help;' or '\h' for help. Type '\c' to clear the current
input statement.

MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| MyVideos107        |
| information_schema |
| mysql              |
| performance_schema |
+--------------------+
4 rows in set (0.00 sec)
```

Wrapping Up

We have walked through how to get up and running with the basic functionality of Kodi. You should now be able to add content and pull down metadata to make browsing your media more convenient.

We also briefly touched on *Add-ons*. You know how to search for, install and potentially configure these additional features. Be extra careful when downloading Add-ons as these are provided by the community at large and not the core developers. As such it is best to limit Add-ons to only those companies you trust.

Finally, I've touched on sharing metadata across multiple devices. You've been introduced to the `advancedsettings.xml` and hopefully it has piqued your interest. Kodi has a lot of dials and knobs to turn and you can squeeze a lot of performance and functionality out of the platform with enough experimentation.

Links

[1] https://en.wikipedia.org/wiki/ISO_image
[2] https://kodi.tv/about
[3] https://kodi.wiki/view/HOW-TO:Install_Kodi_for_Linux#Fedora
[4] http://www.plex.tv
[5] https://wiki.archlinux.org/index.php/MySQL
[6] https://kodi.wiki/view/Advancedsettings.xml