

# Building a Home Theater PC

Front Range Unix Users Group  
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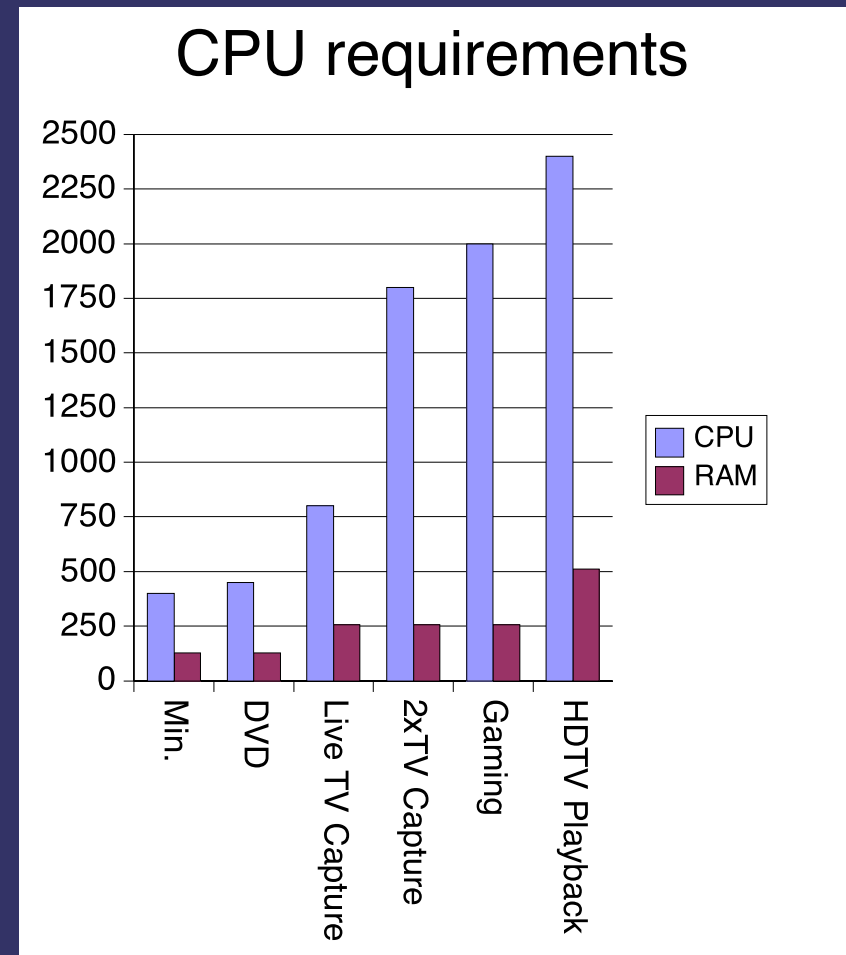
# What is a Home Theater PC?

- Audio and Video
  - playback, library, time shifting
- Web Browsing
- Photo Viewer
- Weather/TV Guide
- IP Telephone/Chat
- RSS News Feed Reader



# Goals and Tradeoffs

- Speed and Features
  - Power, Cooling, Background Noise
- Budget
  - Quality, Features
- Support
  - Customization, ease of maintenance



# Speed and Features

- Hard disks are noisy and generate heat
- Faster CPUs need more power and cooling
  - TV Capture requires medium CPU power
  - Hopefully some processing can be shifted elsewhere
- Add on cards require case space
- Digital audio output to AV receiver (S/PDif)
- Transcoding to MPEG4
  - Reduces hard drive space
  - Increases CPU utilization

# Video Capture

- SDTV
  - Plenty of cheap capture cards are available
  - Connectors (1394, S-video, composite, RF)
  - Hardware Encoder/Decoder
- HDTV
  - Not so many cards
  - Greater bandwidth, quality (8x better than TV)
  - HDTV stream already in MPEG2 format
  - HDTV decoding taxes CPU
- Both require a lot of disk space
  - Up to 2 GB/hour for SDTV
  - Up to 9 GB/hour for HDTV

# MythTV

- Modular media player front end
- Modular, adding components is easy
- Focused on time shifting TV
- Configuration, preferences stored in MySQL database



# MythTV Components

- Web Browser
- TV
- Music (+visualizations)
- Game
- Photo Gallery
- Weather
- DVD
- Video
- News Reader
- SIP Phone

<http://www.mythtv.org/>

# MythTV Architecture

- Front End
  - Graphical
  - User Input
  - Plugins
- Back End
  - Files
  - Database
- Separate functions
  - Recording
  - Playback
  - Transcoding





# MythTV PVR

- Electronic Program Guide
- Automatic commercial detection
- Video Editing capabilities
  - Commercial removal
  - Transcoding
- Web interface for setting recordings remotely

**Law & Order**  
"Kid Pro Quo"  
Wed Apr 30, 10:00 pm - 11:00 pm  
Several people are suspects when the head of admissions for a private school is killed.

Not Recording 10:23 pm

Wed	10:00 pm	10:30 pm	11:00 pm	11:30 pm
70 FX	The World's Worst Driver...		The Practice (Crime)	
73 TRAV	< World Poker Tour (Travel)		Top Ten Predators Up Clo...	
3 WKYC	Law & Order (Crime)		Channel 3 Ne...	The T... >
4 WUAB	Action News at Te...	Sp...	Seinfeld ()	Seinfeld ()
5 WEWS	< ... Extreme Makeover (M...		Newschanne...	Nightlin...

# MythMusic

- Rip, categorize and play music
- Visualizations
- MP3/Ogg/FLAC formats
- Create complex playlists



# MythGame

- Game emulator frontend
  - MAME
  - SNES
  - Generic PC Games



The screenshot shows the MythGame emulator interface. On the left, a list of game genres is displayed: Platform / F..., Puzzle, Puzzle / Drop, Puzzle / Toss, Quiz / Japan..., Shooter / Fl..., and Shooter / W... The 'Puzzle / Toss' category is selected, and a list of games is shown on the right. The game 'Pop 'N Pop (World)' is highlighted. Below the list, the details for 'Pop 'N Pop (World)' are displayed, including the system (Mame), year (1997), and genre (Puzzle / Toss). A small thumbnail image of the game is also visible.

Platform / F...	Magical Drop III
Puzzle	Money Puzzle Exchanger / Money Idol Ex...
Puzzle / Drop	Pop 'N Pop (Japan)
<b>Puzzle / Toss</b>	<b>Pop 'N Pop (World)</b>
Quiz / Japan...	Puzzle Bobble 4 (Japan)
Shooter / Fl...	Puzzle Bobble 4 (US)
Shooter / W...	Puzzle Bobble 4 (World)
	Puzzle De Pon! R!

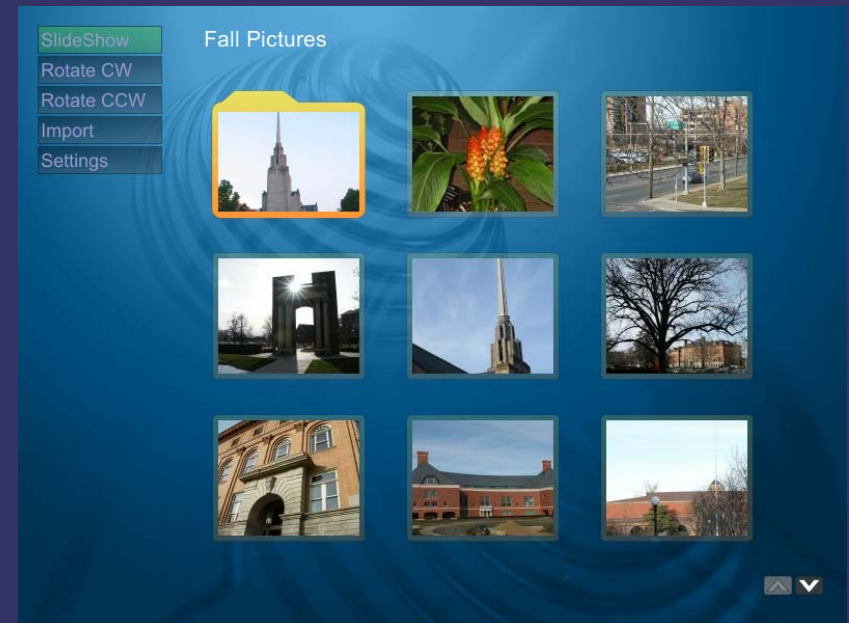
**Pop 'N Pop (World)**

System: Mame  
Year: 1997  
Genre: Puzzle / Toss



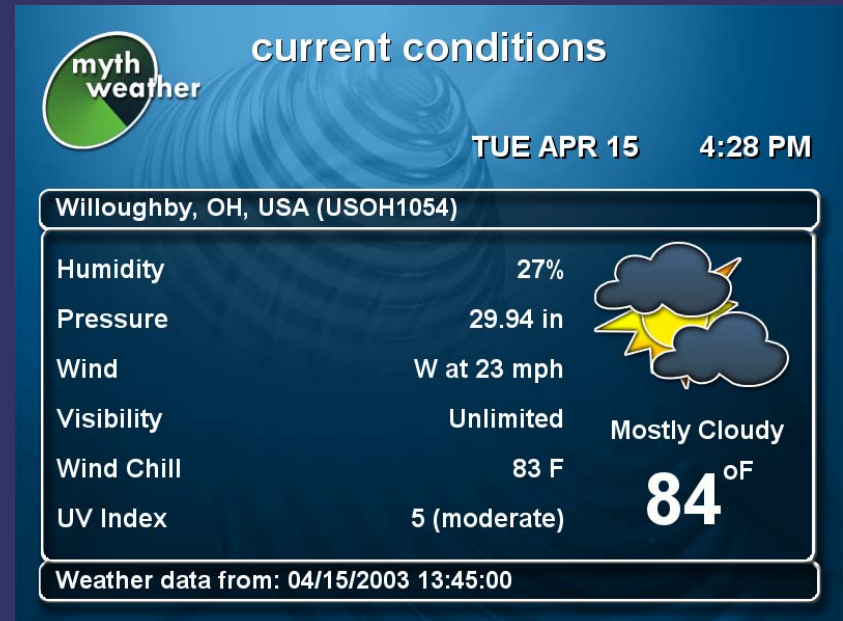
# MythGallery

- Image viewer
- Slideshow application
- OpenGL transitions



# MythWeather

- Weather module
- Current conditions
- Short term forecast
- Long term forecast
- Radar loop



The screenshot displays the 'myth weather' application interface. At the top left is the 'myth weather' logo. The main title is 'current conditions'. The date and time are 'TUE APR 15 4:28 PM'. The location is 'Willoughby, OH, USA (USOH1054)'. A table of weather data is shown on the left, and a weather icon and temperature are on the right. The temperature is 84°F. At the bottom, it says 'Weather data from: 04/15/2003 13:45:00'.

Humidity	27%
Pressure	29.94 in
Wind	W at 23 mph
Visibility	Unlimited
Wind Chill	83 F
UV Index	5 (moderate)

Mostly Cloudy  
**84**<sup>oF</sup>

Weather data from: 04/15/2003 13:45:00

# MythDVD

- DVD player
- DVD ripper
  - Perfect backups
  - Transcode to smaller size
- Use player of choice
  - Xine
  - Mplayer
  - etc



# MythVideo

- Generic video player
- Automated metadata lookups
  - Rating
  - Director
  - Year
  - Movie poster
  - Runtime

**Airplane!**  
Directed by Jim Abrahams Year: 1980



Plot:  
An airplane crew takes ill. Surely the only person capable of landing the plane is an ex-pilot afraid to fly. But don't call him Shirley.

Rated:  
USA:PG

Runtime:  
88 minutes

Use the left and right arrows  
◀ 2 of 52 ▶



# MythNews

- RSS news reader



Arstechnica >	Judge rules Lindows-backed refund site invalid
BSD Today	Internet savvy more akin to anti-boob tube man than geeks
Bureau 42	Sony beefs up the mini-disc, finally
CNN	National Geographic tries digital photography
CNN Europe	<b>Kodak cutting film camera sales in the West</b>
Daemon News	The Internet gives a voice to Death Row, but not everyone!...
desktopian.org	The answer to video piracy... not quite.
dot.kde.org	Et Cetera: bu-bu-bu-baby production complete, commander

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**Kodak cutting film camera sales in the West**

Updated  
Wed Jan 14  
09:20 PM

Eastman Kodak has announced that they will no longer be selling film-based cameras in the US, Western European, and Canadian markets.



# MythPhone

- SIP phone module
- Free SIP calls
- Audio and video support
- CallerID popup on TV
- NAT and firewall support



# Alex's MythTV

- AMD Athlon 2500
- ASUS A7N8X-VM micro ATX motherboard
- Onboard TV/Ethernet/Sound/video
- Coolermaster 620 black case
- 200Gb Seagate IDE hard disk
- Generic DVD+RW drive
- Hauppauge WinTV 401 NTSC capture card
- pcHDTV HDTV tuner card
- LIRC
- Gyration wireless keyboard and mouse
- KnoppMyth

# Alex's MythTV



# What I learned

- Determine what features you want
- Make sure components are supported by Linux
- PCs are noisy
- Wife Acceptance Factor (WAF)
- Mplayer seems to have the most flexibility
- Xine has DVD menu support
- Use NTP to keep your clock accurate
- The KnoppMyth Wiki is your friend
- It's easier than you think

# Useful Links

- MythTV - <http://www.mythtv.org/>
- KnoppMyth - <http://mysettopbox.tv/>
- KnoppMyth Wiki -  
<http://knoppmythwiki.homelinux.org/>
- PVR Hardware Database -  
<http://pvrhw.goldfish.org/>
- Linux HTPC Howto -  
<http://www.linuxis.us/linux/media/howto/linux-htpc/>
- Quiet PC Parts - <http://www.endpcnoise.com/>

Questions?

Demo