Building a Home Theater PC

Front Range Unix Users Group
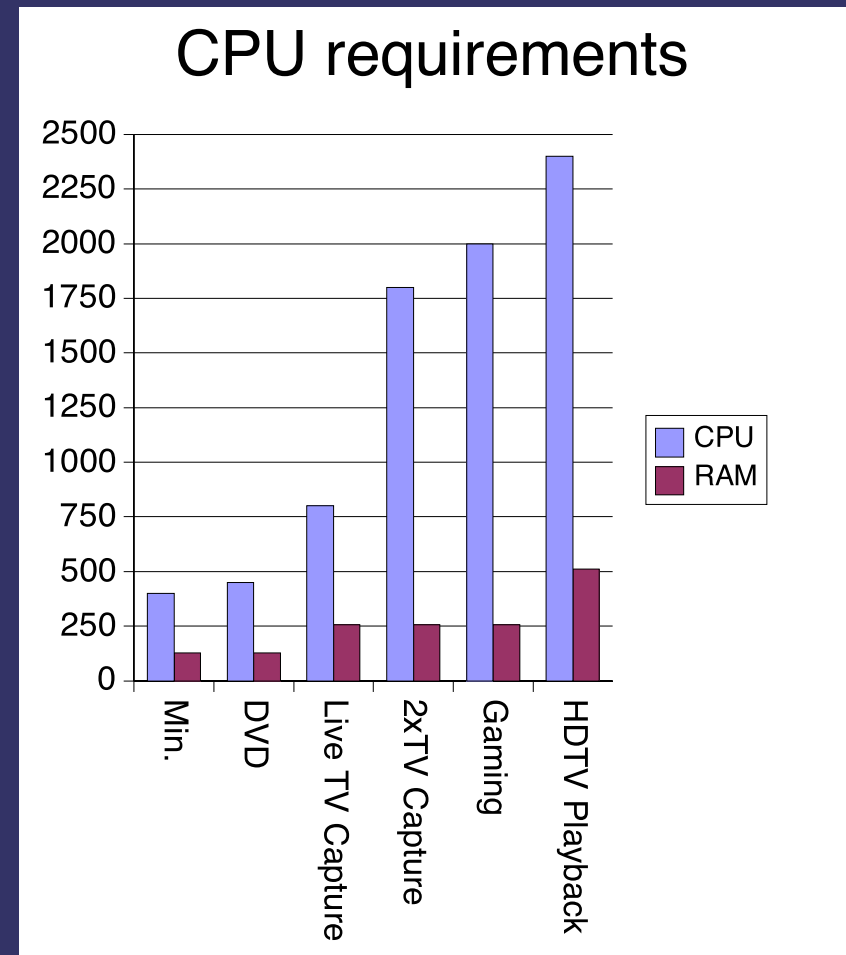March 2005

Presented by:
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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, Back-ground Noise
- **Budget**
  - Quality, Features
- **Support**
  - Customization, ease of maintenance

CPU requirements

Legend:
- CPU
- RAM

Categories (x-axis): Min., DVD, Live TV Capture, 2xTV Capture, Gaming, HDTV Playback

y-axis: 0, 250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, 2500

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 else-where
- 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**

MythMusic

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

MythGame

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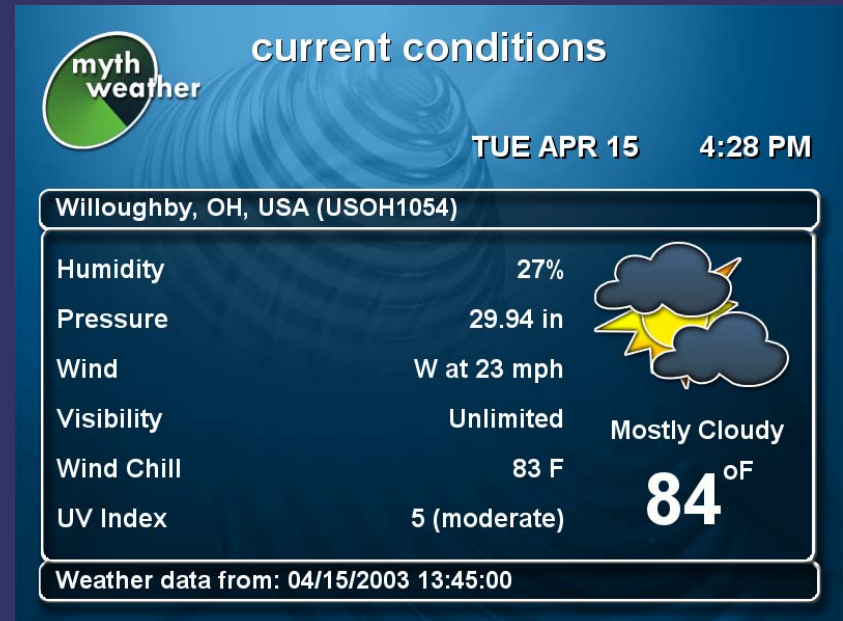 - MAME
  - SNES
  - Generic PC Games

MythGallery

- Image viewer
- Slideshow application
- OpenGL transitions
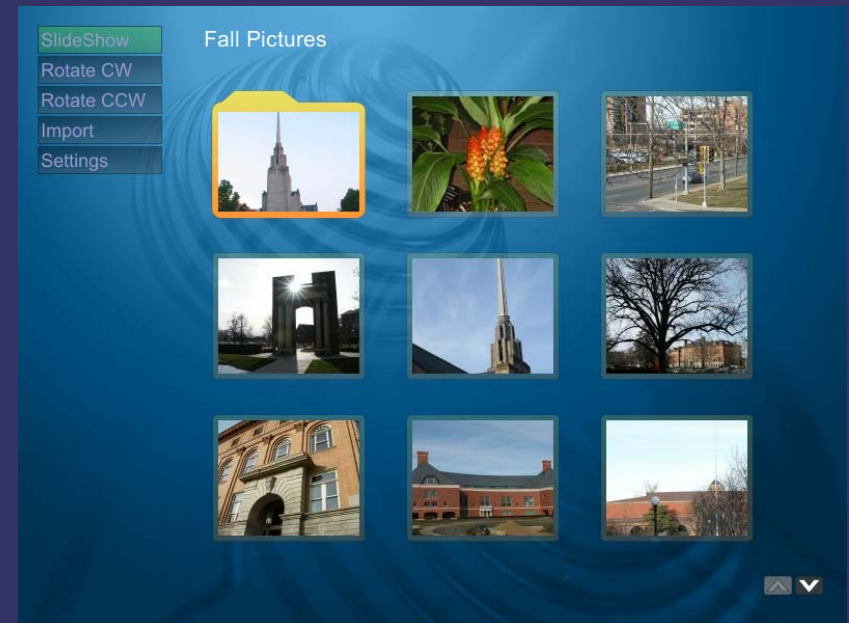
MythWeather

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

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

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MythVideo

MythNews

- RSS news reader

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