Universal Home API for Linux
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• Goal of this project
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• How to use UHAPI4Linux
History

**logica**
- Founded 1969
- Floated on London Stock Exchange in 1983

**CMG**
- Founded 1964
- Floated on London & Amsterdam Stock Exchanges in 1995

Merged 30 December 2002

Listed on the London (FTSE 250 & techMARK 100) & Amsterdam (Euronext) Stock Exchanges
• a major international force in IT services and wireless telecoms with a leading position in Europe

• over 21,000 staff

• operating in 34 countries

• £1.6 billion revenues*

• a broad portfolio of offerings across key industry sectors

• more than 40 years of experience in IT services

• a worldwide client base of blue-chip organisations

* for the 12 months to 31 December 2004
Did you know that…

• LogicaCMG’s financial software solutions enable the transfer of more than $5 trillion per day

• LogicaCMG’s systems process two out of every three text messages sent in the world

• LogicaCMG has delivered one out of every four multimedia messaging centres installed by wireless service providers across the globe

• LogicaCMG’s software supports a third of the world’s satellites

• LogicaCMG's systems have been fundamental to the regulatory transformation of energy markets around the world

• LogicaCMG’s HR outsourcing services process more than $100 billion of salaries globally each year

• LogicaCMG has around 2,000 SAP experts worldwide and is one of a small number of SAP Global Services Partners
Goal of the UHAPI4Linux project

• Offer a common open Multimedia API for both PC and embedded
  – Contribute to the open source community an API that incorporates years of experience in digital/analogue A/V embedded products
  – Provide the environment, documentation and support for developing on UHAPI
  – Provide a basis to enhance and enrich the UHAPI Linux PC implementation ⇒ Feel free to contribute!

• Provide development platform on PC for application software
  – Enable application developers to have a quick start with using UHAPI

• Can be a starting point for an embedded implementation
Work Break Down

• Two main areas of work
  – Platform that provides the UHAPI
  – Demo Application that provides complete system
Step 1: Analogue video support
Work Break Down – Demo Application

• StreamDemo is provided for quick start and testing
• MythTV is chosen as the demo application
  – www.mythtv.org for background information
  – Rich set of features
  – Modular approach
Additions to MythTV

• Wrapper from Myth to UHAPI
  – Change as little as possible in MythTV

**Myth2UHAPI**

Translates IOCtrl calls to UHAPI calls
# Universal Home API 1.0 contents

## General documents (7):
- API Specification Reader's Guide
- API Naming Conventions
- Error Handling
- Execution Architecture
- Notification
- Qualifiers Quick Reference
- API Evolution Rules

## Type specifications (2):
- Basic Types
- Global Types

## API specifications (50):

### Front End Components (12)
- Analog Audio & Video Demodulation
- Analog AV Input
- Anti Aging
- Analog Audio Decoding
- Channel Decoding
- RF Amplification
- Out Of Band Tuning & Demodulation
- Signal Strength
- Tuning
- HdmI
- SPDIF-in
- VBI Slicing

### Decoders/Encoders (5)
- ATSC Decoder
- Image Decoding
- SPDIF Decoding
- STC Decoding
- Transport Stream Demultiplexing

### Video Processing Components (15)
- Ambient Level
- Analog Video Decoding
- Analog Video Encoding
- Analog Video Encryption
- Basic Video Featuring
- Black Bar Detection
- Color transient improvement
- Dynamic Noise Reduction
- Histogram Modification
- Noise Measurement
- Scan Rate Conversion
- Sharpness Enhancement
- Sharpness Measurement
- Video Color Enhancement
- Video Mixing

### Audio Processing Components (10)
- Audio Automatic Volume Leveling
- Audio Bass Enhancements
- Audio Dynamic Range Control
- Audio Mixing
- Audio Noise Generation
- Audio Program Selection
- Audio Volume Control
- Equalizing
- Speaker Set /Headphones
- Output Configuration

### Various (8)
- Analog AV Output
- SPDIF-out

- Connection Management
- Fatal Error Handling
- I am Alive
- Pin Objects
- Unknown
- URL Source
# UHAPI 1.0 implementation roadmap

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Which UHAPI Interfaces are implemented?

- Analogue Video Decoding
  - uhIAnaVdec
- Analogue AV Input
  - uhIAvIn
- Analogue Audio Volume Control
  - uhIAvoICtrl
- Connection Management
  - uhIConnMgr
- Image Decoding
  - uhIImageDec
- Tuning
  - uhITuning
- Basic Video Featuring
  - uhIVfeat
  - Brightness, Contrast, etc.
- Video Mixing
  - uhIVmix
How does it fit into Linux?
Audio example

User space

MythTV
myth2uhapi
libuhsound
libasound

A/V Hardware
Control/data
Control/data
Interrupts

Linux Kernel
Other Drivers
ALSA Drivers
Task Scheduler
How does it fit into Linux?
Graphics example

User space

- MythTV
  - myth2uhapi
  - libuhmister
- SDL
- XLib
- X

A/V Hardware

- Control/data
- Control/data
- interrupts

Linux Kernel

- Drivers
- Video4Linux 2
- Task Scheduler
How does it fit into Linux?
Tuning example

![Diagram showing the relationship between MythTV, myth2uhapi, libuhtuning, A/V Hardware, Linux Kernel, Other Drivers, Video4Linux 2, and Task Scheduler.]
Status & Plans

• Enrich implementation with more interfaces from UHAPI Specification 1.0
  – Currently analogue audio/video
  – DVB support as next step
  – Roadmap is to be defined according to market needs
• Add with interfaces from next UHAPI Specification release
  – PVR functionality
• LogicaCMG will add specific functionality from our Unified Messaging solution uOne™
  – E.g. Voice mail, Video Services, uBiquitous messaging
How to get started?

- A standard PC with Hauppauge WinTV PCI-FM Tuner card (model 747)
  - Intel Pentium 4 – 2.8GHz, 533MHz FSB W/1MB Cache, 512MB (1 Dimm), 40GB (Serial ATA) 7200RPM, CD-RW/DVD Combo drive, integrated Intel Extreme Graphics 2
- Universal Home API Specification 1.0
  - [www.uhapi.org](http://www.uhapi.org)
- Mandriva 2005 LE
  - [www.mandriva.com](http://www.mandriva.com)
- MythTV 0.18.1
  - [www.mythtv.org](http://www.mythtv.org)
- Extension to MythTV
  - Preperations for publication on SourceForge in progress
  - For questions, etc. mail to [info.eindhoven@logicacmg.com](mailto:info.eindhoven@logicacmg.com)
- Video4Linux 2
  - [www.linuxtv.org](http://www.linuxtv.org)
- UHAPI for Linux
  - Preperations for publication on SourceForge in progress
Demonstration

• Setup
  – Laptop providing the audio/video
  – Linux PC with external USB ATV Capture card
your trusted business partner in information technology

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