

# The Continuous Media Web

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# Overview

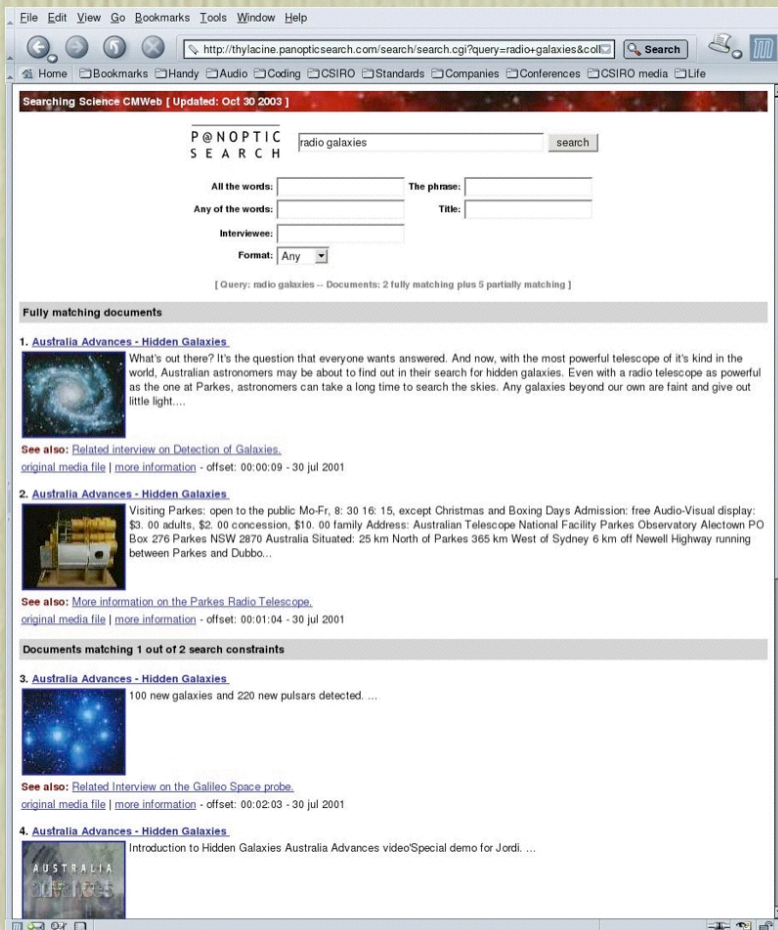
- What is the “Continuous Media Web”?
- Markets and Businesses for Annodex
- Applications, Tools and Research for Annodex
- Technology Status, Outlook

What is the “Continuous  
Media Web”?

# CMWeb Technology

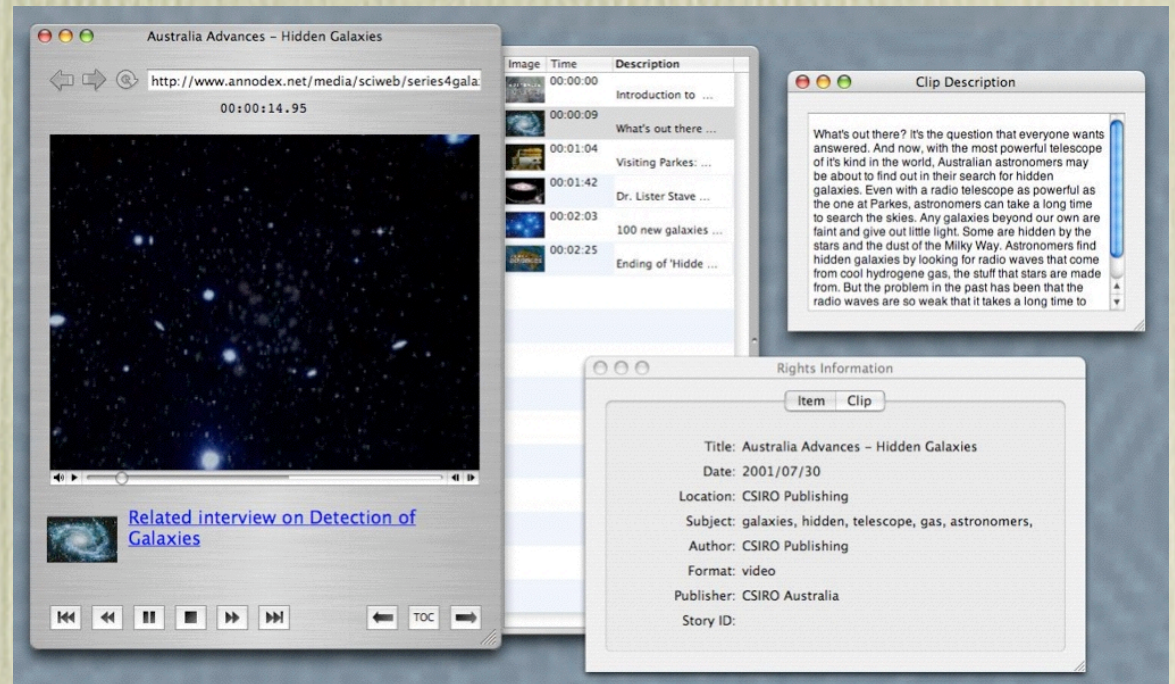
- Web is predominant information retrieval system
- Audio and Video files (and other time-continuous resources) on the Web are alien file formats
- It is a powerful concept to integrate time-continuous data into the Web paradigms:
  - surfing: hyperlinks between a/v parts
  - searching: marking-up a/v textually

# Demo of CMWeb



## Searching

`http://bureau.panopticsearch.com/search/search.cgi?  
collection=cmweb`



## Surfing

# Standards for Online Media

- SMIL: “Synchronised Multimedia Interaction Language”
- MPEG-7: open framework for describing multimedia content
- MPEG-21: open framework for multimedia delivery and consumption
- CMWeb: open standards for annotating and indexing networked media

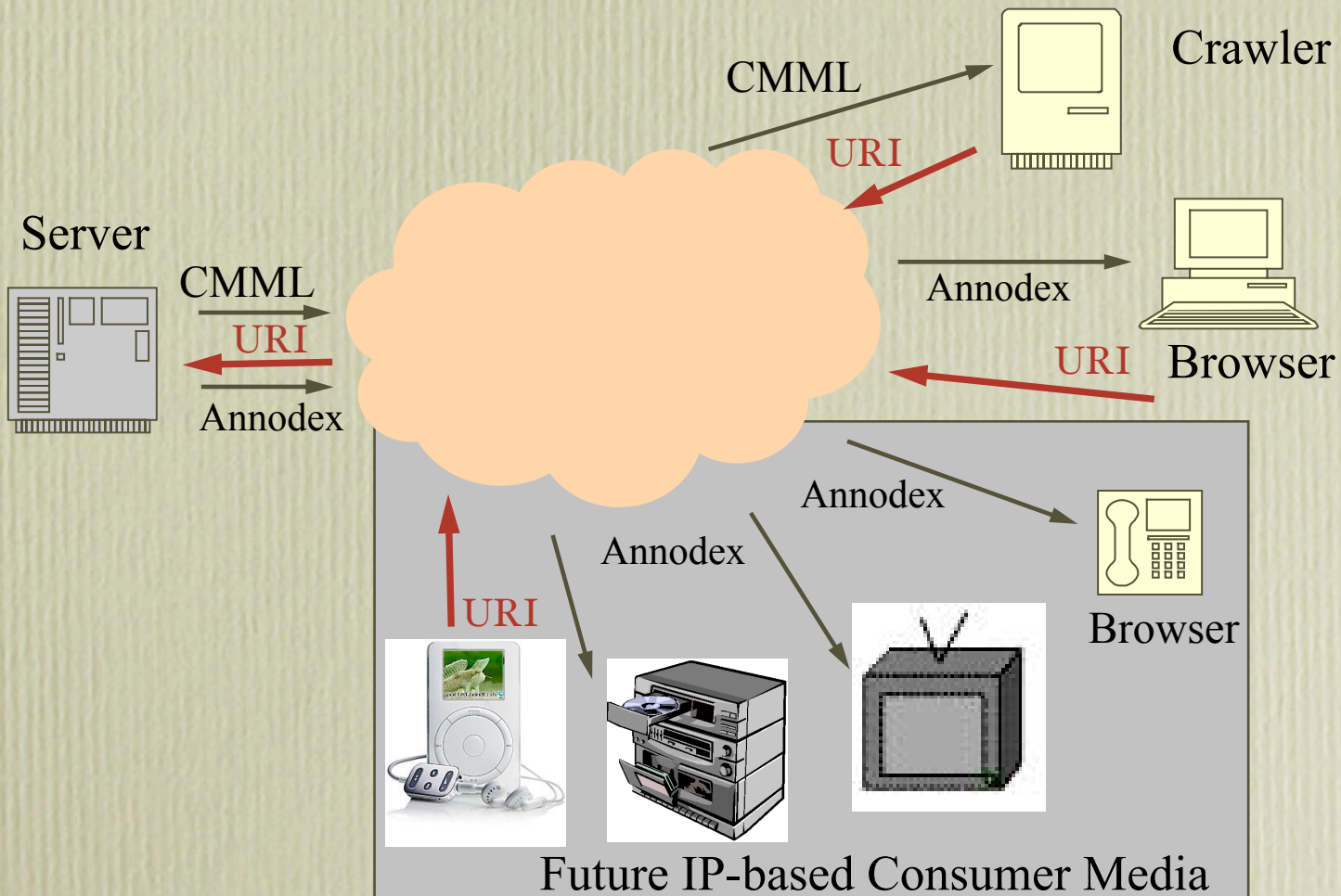
# CMWeb Philosophy

- Simplicity
- Build on existing Web infrastructure
- Device independence
- Open standards
- Free codecs
- Open source
- No patents on core
- Annodex trademark

# CMWeb Technology

- CMML: Continuous Media Markup-Language
- Annodex: Annotated and Indexed Time-Continuous Data Container
- Hyperlinks into Annodex/CMML: temporal offsets & named clips

# The CMWeb



# CM Markup Language

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!DOCTYPE cmml SYSTEM "cmml.dtd">
<cmml>

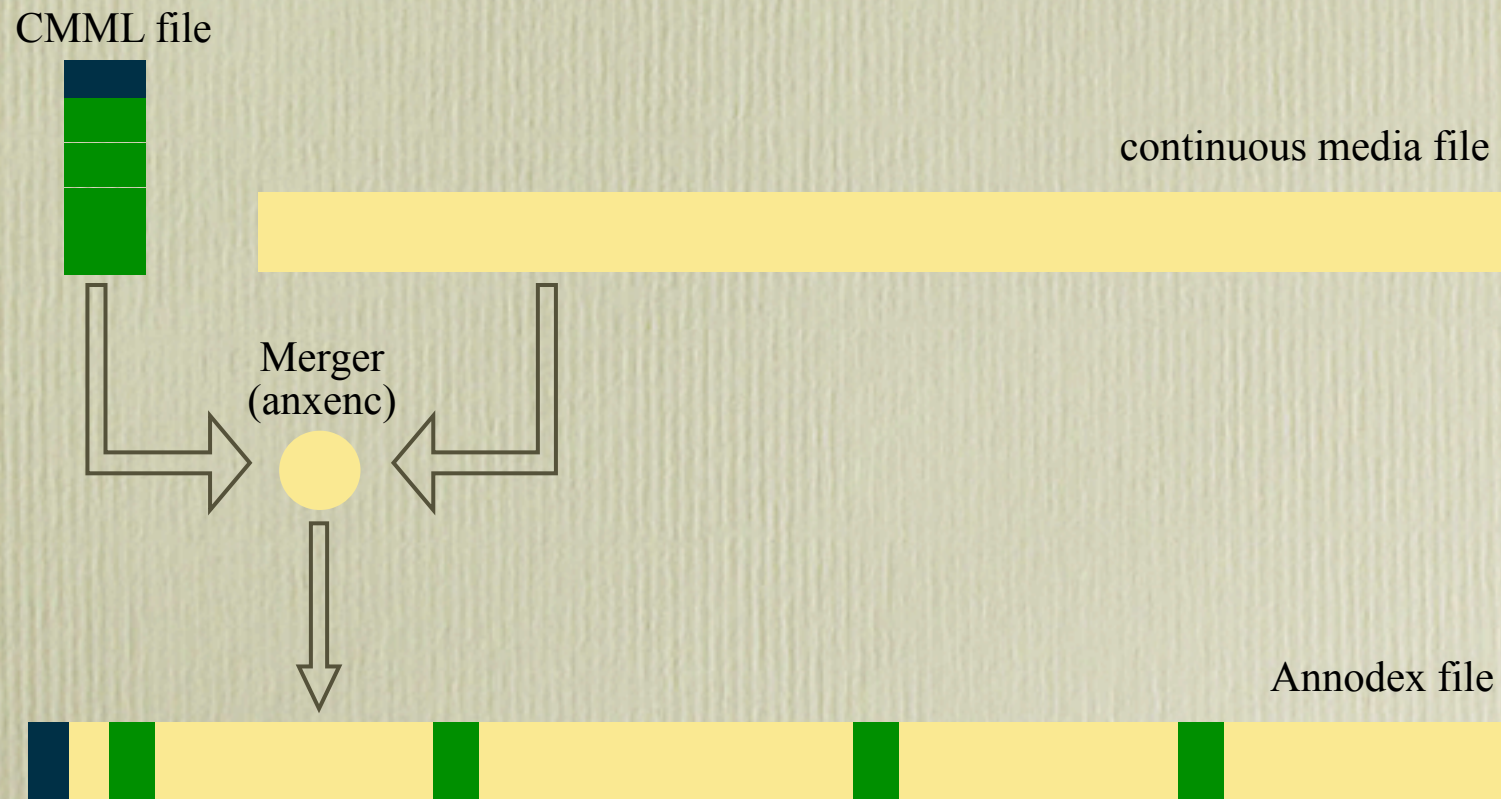
  <stream timebase="0" utc="20040114T153500.00Z">
    <import src="galaxies.mpg" contenttype="video/mpeg" start="npt:0"/>
  </stream>

  <head>
    <title>Hidden Galaxies</title>
    <meta name="author" content="CSIRO"/>
  </head>

  <clip id="findingGalaxies" start="15">
    <a href="http://www.aao.gov.au/galaxies.anx#radio">Related video on Detection of Galaxies</a>
    
    <desc>What's out there? ...</desc>
    <meta name="KEYWORDS" content="Radio Telescope, Galaxies"/>
  </clip>

</cmml>
```

# Annodex Resources



# URL addressing schemes

Addressing of time offset / segment:

<http://www.foo.bar/csiro.anx?t=smpte-25:00:01:25:07>

<http://www.foo.bar/csiro.anx?t=npt:85.28-105>

<http://www.foo.bar/csiro.anx?t=clock:20030327T103045.25Z>

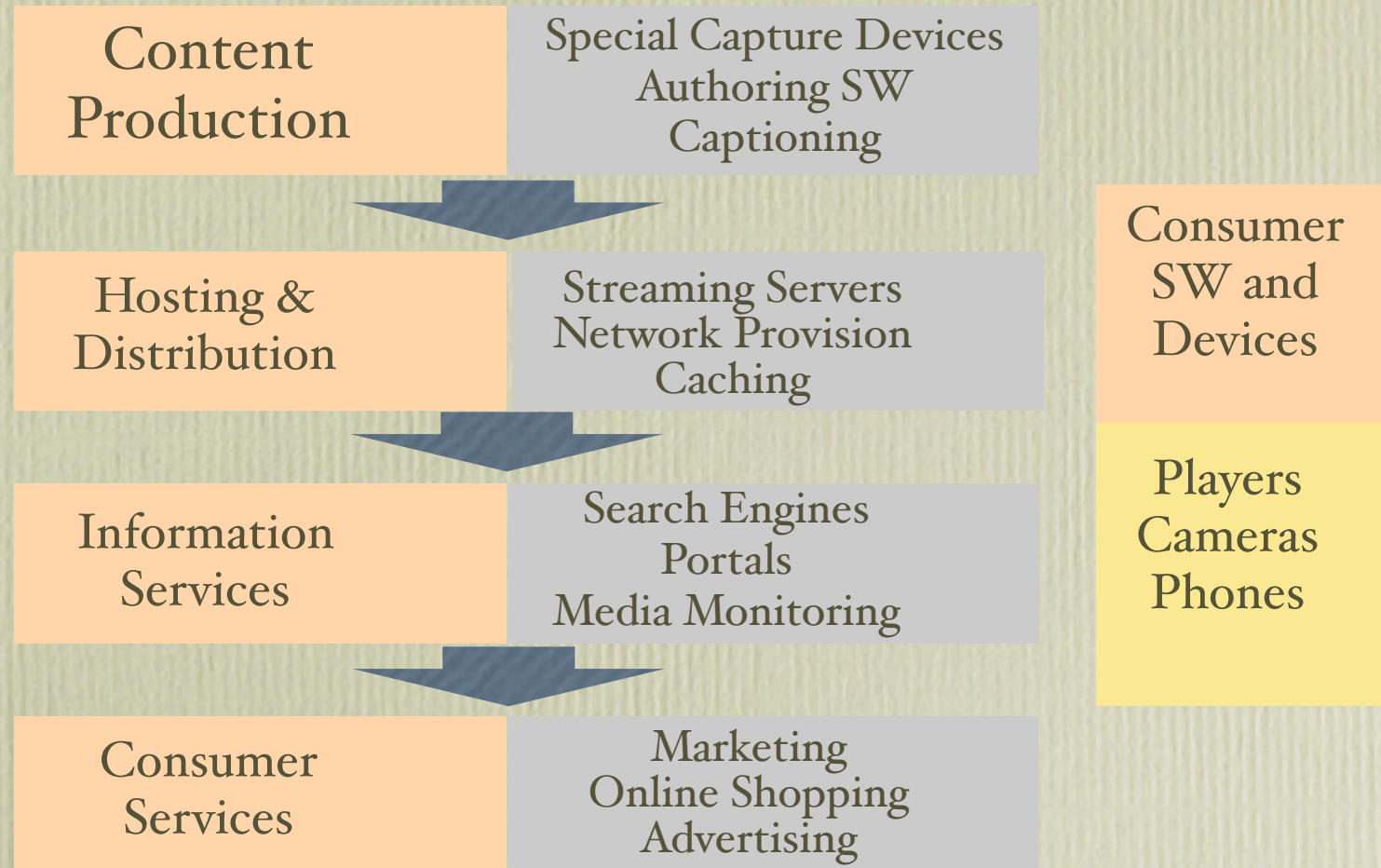
Addressing of named clips:

[http://www.foo.bar/csiro.anx?id="findingGalaxies"](http://www.foo.bar/csiro.anx?id=)

<http://www.foo.bar/csiro.anx#findingGalaxies>

# Markets & Businesses

# The Media Chain



# Example Markets

- Entertainment / Infotainment: Music, TV, movies, home video on converging platforms
- eBusiness: Marketing, advertising
- Communication: video email, video blogs
- Education: telelearning
- Corporate Memory: meeting recordings
- Art & Culture: expression, capture
- Surveillance

# Applications, Tools & Research

# CMWeb server

e.g. Apache Server with Annodex plugin



# CMWeb search engine

e.g. CSIRO Panoptic Search engine supports Annodex



# CMWeb clients

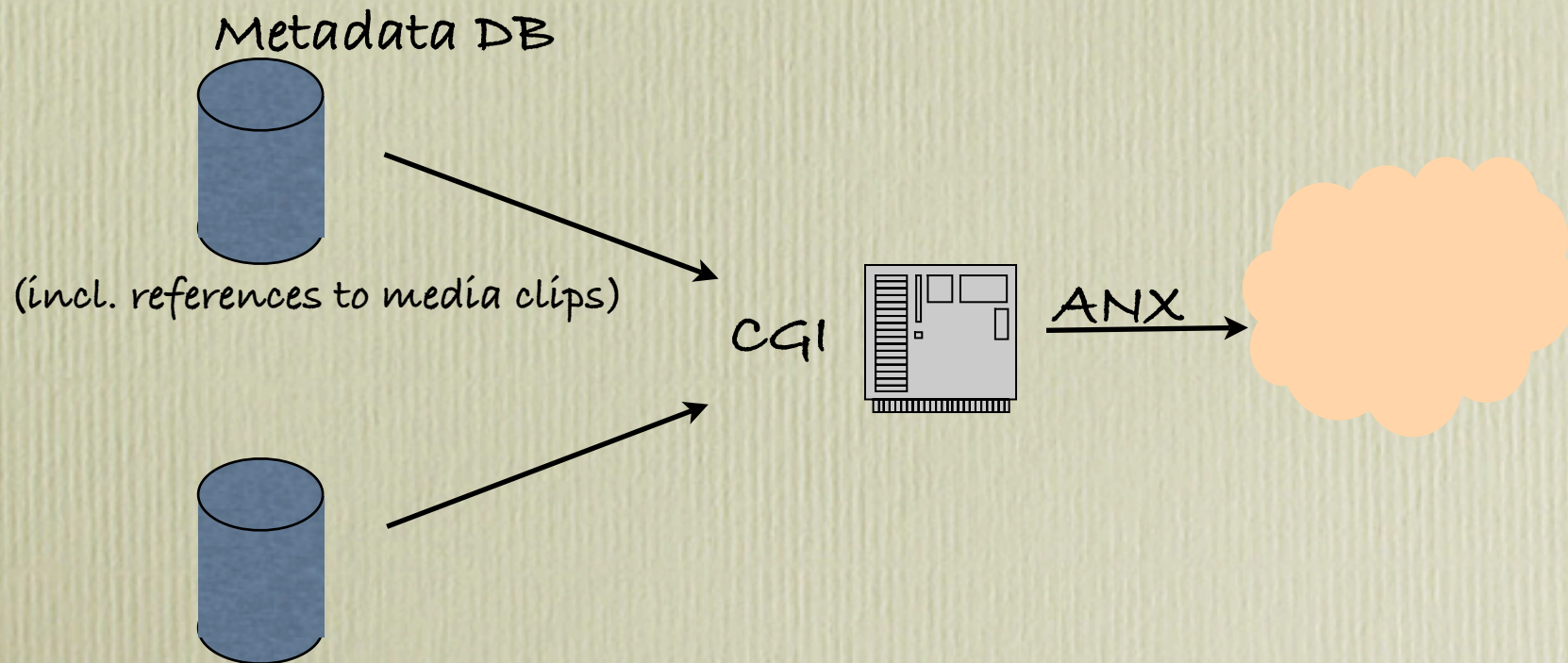
- Browsers or Browser plugins on Desktops
- Browsers on mobile devices
- Specialised clients for specialised applications (e.g. meeting recording)

e.g. VideoLAN client supports Annodex decoding



# Scripting of Annodex

- Dynamic content creation from collections of clips, e.g. news sites, video blogs



- video news with CMML: use stream tag for composition, e.g.

```
<stream>  
  <import contenttype="video/x-annodex" src="http://flim.org/sydney.anx"/>  
  <import contenttype="audio/x-annodex"  
    src="http://foo.bar/newyork.anx" start="npt:10"/>  
  <import contenttype="audio/x-annodex"  
    src="http://foo.bar/frankfurt.anx" start="npt:20"/>  
</stream>  
<head><title>News from Around the World</title></head>
```

# Automated Annodexing

- Use signal analysis for automating the CMML creation task, e.g. speaker segmentation for meeting recordings + speech recognition



# Transcoding of Meta Data

- Use XSLT for transcoding between different XML languages, e.g. NewsML to CMML
- Database backend applications



# Further Opportunities

## Software:

- Video editing, annotation and web-publishing sw
- Media asset management software
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## Research:

- Annotating of other time-continuously sampled data, e.g. medical recordings, environmental monitored data, physics measurements

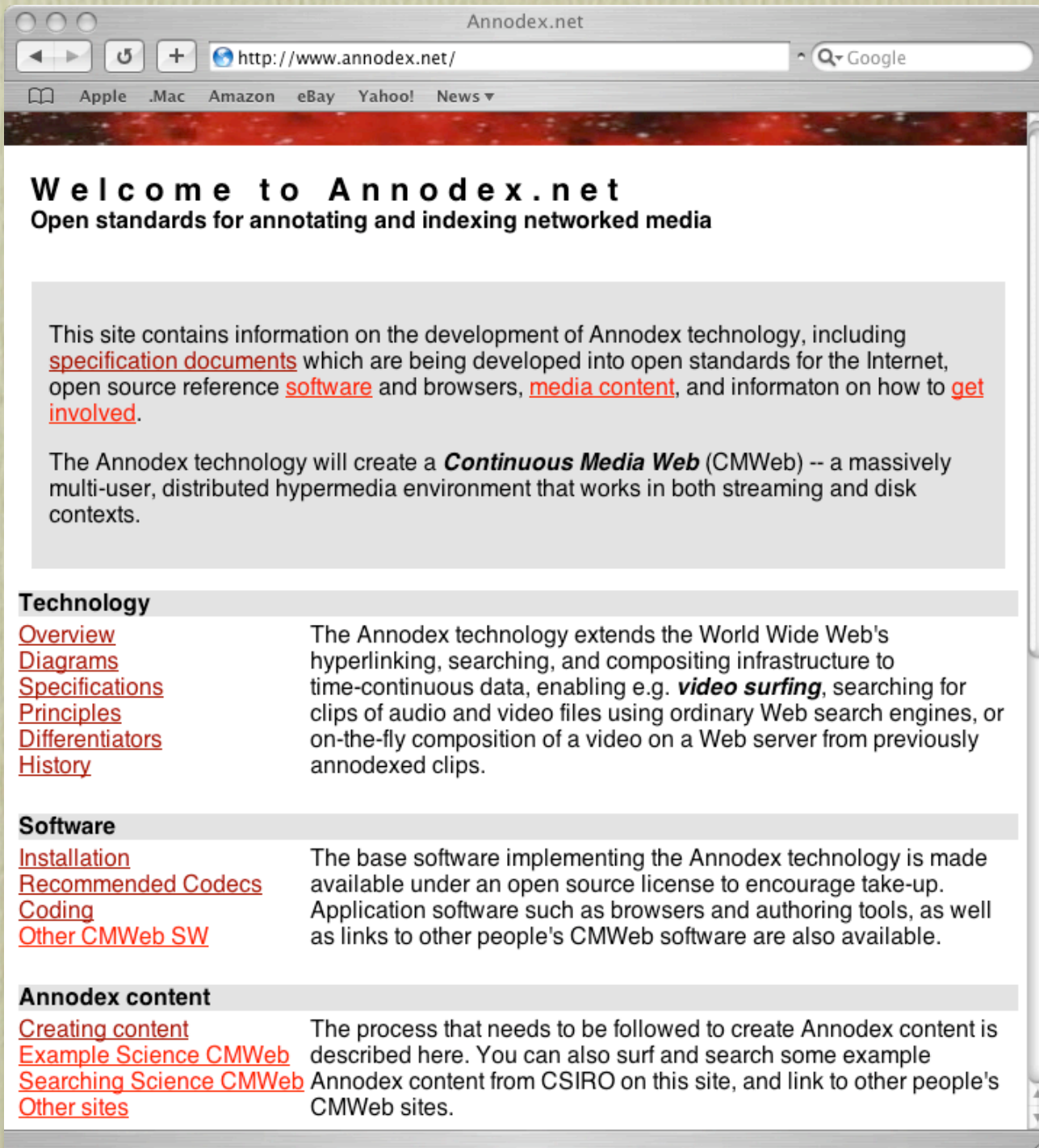
# Status & Outlook

# Development Status

- Open Standards: IETF Internet-Drafts submitted and under discussion at IETF, W<sub>3</sub>C, MPEG, TV Anytime, and SMPTE.
- Open source reference software libraries for Linux, OS X, MS Windows released at <http://www.annodex.net>
- Software available from debian
- Perl and Python bindings under development outside
- Media Framework support under development for VideoLAN, DirectShow, Xine

# Industry involvement

- Stable specifications since December 2003 provide excellent basis for industry investment
- Annodexed content material available from CSIRO Corporate Media
- proof-of-concept project with ABC
- further industry trials & research projects in pipeline



# Getting involved

<http://www.annodex.net/>

# Summary

- Continuous Media Web is novel, Australian-developed media standard for online use on converging platforms
- Australian industry can get head start into novel online media applications with CSIRO support
- Annodex, CMML and temporal URLs enable searching and surfing of online media
- Annodex file format is interoperable independent of media coding format

# Contacts

<http://www.annodex.net/>

- Contact speaker at: [Silvia.Pfeiffer@csiro.au](mailto:Silvia.Pfeiffer@csiro.au)

- Mailing lists at:

<http://www.annodex.net/ mailing.html>