

Ripping and Encoding to MP3 with the Java Sound API

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Overall goal

- Digitally Extracting Audio CDs
- Encoding to mp3
- Do it with Java technology

Presentation Agenda

- Demo of example application: Ripper
- Cdda reading
- Encoding to MP3
- Your questions

Ripper Demo

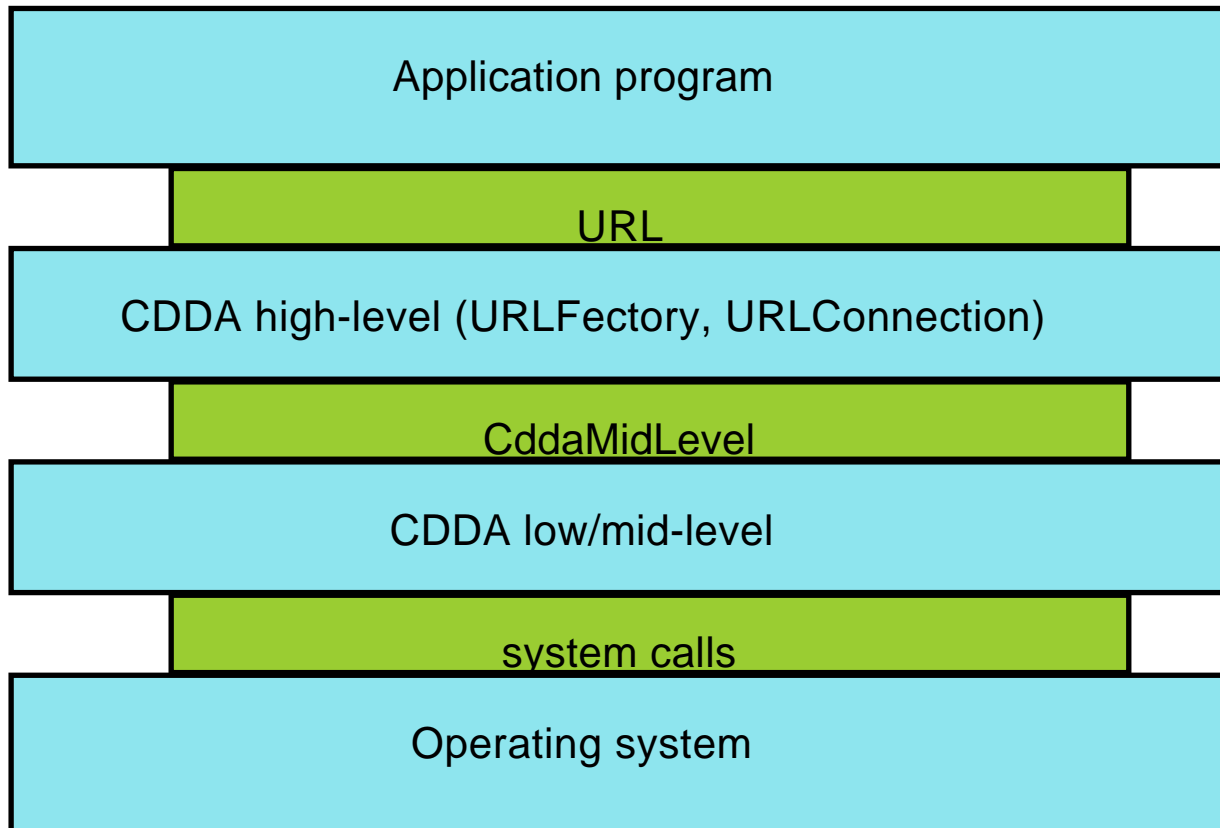
[screenshot ripper.png]

CDDA Reading

- Digital reading of Audio CDs (a.k.a. Ripping, Grabbing, Digital Extraction)
- Low-level APIs are highly OS-dependent
- Low-level interface requires native calls
- High-level interface using URLs
 - Table of contents as XML
 - Audio data as `AudioInputStream`

CDDA: Compact Disc Digital Audio

CDDA Architecture



Legend:

Interfaces

SW Layers

CDDA Programming: ToC

Table of content of drive /dev/cdrom:

```
URL    url = new URL("cdda:/dev/cdrom");
```

```
InputStream  stream = url.openStream();
```

Result:

```
<tracklist>
  <track id="1" start="100" length="407109" ... />
  <track id="2" start="407209" length="2232" ... />
  <track id="3" start="410002" length="518820" ... />
  ...
</tracklist>
```

CDDA Programming: audio data

audio data of drive /dev/cdrom, track 4:

```
URL url = new URL("cdda:/dev/cdrom#4");  
AudioInputStream cddaStream = (AudioInputStream)  
url.openStream();
```

Result:



CDDA Low-level Implementations

- Linux (cdparanoia): working
- Linux: ("cooked ioctls"): no longer maintained
- Windows (??): under development

CDDA Problems & Solutions

- No way to register custom file system implementations: therefore we use URLs
- Drive list query: not yet implemented
- Media change detection: not yet solved

MP3

- MPEG I Layer 3
- Good compression with near CD-quality (e.g. 11:1 at 128KBit/s)
- Widely used to archive/share/transfer CDs

MP3 Encoder Plugin for Java Sound

- Native encoder: LAME (historical: Lame Ain't an MP3 Encoder)
- Using Java Sound's Service Provider Architecture
- Download of the plugin on tritonius.org (binaries for Linux and Windows)

MP3 Programming

Create MP3 AudioFormat.Encoding:

```
AudioFormat.Encoding format =  
    Encodings.getEncoding("MPEG1L3");
```

Get an AudioInputStream in MP3 format:

```
AudioInputStream mp3Stream =    AudioSystem.getAudioInputStream(  
    encoding, cddaStream);
```

Write mp3 file:

```
AudioSystem.write(AudioFileTypes.getType("MP3"),  
    mp3Stream, new File("foobar.mp3"));
```

MP3 Problems & Solutions

- Parameters: how to specify quality (bitrate, VBR, channel mode, etc.)
- Licensing (in US\$):
 - Decoder: 0.75 per unit or 50,000 -100,000 per year
 - Encoder: 2.50 - 5.00 per unit
 - Additional fees: hardware, games, content distribution (streaming)

Links

- Tritonus (CDDA and MP3 plugins):
 - <http://www.tritonius.org/plugins.html>
- Java Sound Resources (Demo program)
 - <http://www.jsresources.org/apps/ripper/>
- MP3 license terms:
 - <http://www.mp3licensing.com>
- Javazoom (mp3 player, ogg decoder)
 - <http://www.javazoom.com>

Q&A

