Mapping Free Internet Radio for GNOME 3

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https://people.gnome.org/~ole/GUADEC2017.pdf

Introduction

gnome-internet-radio-locator is a Free Software program that allows its users to easily locate and listen to radio programs on broadcasters on the Internet such as BBC, KEXP and WMBR, as well as NASA's Third Rock Station and 82 other Internet Radio stations broadcasting from many universities around the world.

gnome-internet-radio-locator is developed for the GNOME desktop and requires gst-player from gstreamer (`https://gstreamer.freedesktop.org/`) to be installed for audio playback.

gnome-internet-radio-locator is not officially a part of GNU or GNOME, but using the *.gnome.org infrastructure on
`http://git.gnome.org/gnome-internet-radio-locator` and
`https://download.gnome.org/sources/gnome-internet-radio-locator/`

Why do I write gnome-internet-radio-locator?

I am a supporter of

- Free Radio
- Free Software
- Free Speech

I want to give something back to the Free Software community

Internet Radio is a free Internet resource

Many Universities run non-profit Internet radio stations

History of gnome-internet-radio-locator

2017

- gnome-internet-radio-locator version 0.1.0 was released on April 26th

- gnome-internet-radio-locator version 0.2.0 was released on June 16th

- gnome-internet-radio-locator version 0.3.0 was released on June 20th

- gnome-internet-radio-locator version 0.4.0 was released on June 27th

- gnome-internet-radio-locator version 0.5.0 was released on July 17th

- gnome-internet-radio-locator version 0.6.0 was released on July 19th

- gnome-internet-radio-locator version 0.7.0 was released on August 4th

What is the definition of Free Software?

From FSF's home page (`https://www.gnu.org/philosophy/free-sw.html`):

Free Software is a good idea because you have

- The freedom to run the program as you wish, for any purpose (freedom 0).
- The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

Existing Music Services

Apple Music, Google Music and Spotify

- Require non-free client software
- DRM (Digital Restrictions Management)
- Impose EULAs that restrict more than copyright
- Track what the user listens to

One redeeming feature of some of them:

- You can't access them from GNU/Linux at all. If you're a GNU/Linux user, this protects you from the temptation to use them.

Why did I write gnome-internet-radio-locator?

The last public talk I gave in the UK, was a talk on Music Recording, Production and Distribution with Free Software at UKUUG Linux 2005 at University of Wales, Swansea, in 2005. The talk is available from `http://home.nuug.no/~ole/UKUUG2005.pdf`

12 years is a long time, a lot of stuff has happened in these 12 years.

Free Radio

Free Software

Free Speech

Features in gnome-internet-radio-locator version 0.7.0

86 non-profit and independent radio stations are supported.

10 language translations (see gnome-internet-radio-locator/AUTHORS and gnome-internet-radio-locator/THANKS).

Radio station search by physical location, but just city names.

Click-to-play map feature for KALX in Berkeley, CA and WAMU in Washington, DC

Support for New/Personal Stations ("$HOME/.gnome-internet-radio-locator/gnome-internet-radio-locator.xml").

Radio playback in all audio codecs supported by gstreamer.

Supported Internet Radio Stations

The following major cities are supported in gnome-internet-radio-locator 0.7.0:

- Adelaide, Australia
- Auckland, New Zealand
- Austin, TX
- Ayr, Scotland
- Bergen, Norway
- Berkeley, CA
- Bern, Switzerland
- Boston, MA
- Bristol, United Kingdom
- Brno, Czech Republic
- Bronx, New York City, NY
- Brooklyn, New York City, NY
- Bruxelles, Belgium
- Budapest, Hungary
- Buenos Aires, Argentina

- Calgary, Canada
- Cambridge, United Kingdom
- Cape Town, South Africa
- Centralia, DC
- Chapel Hill, NC
- Chicago, IL
- Cleveland, OH
- Coimbra, Portugal
- Copenhagen, Denmark
- Cornwall, United Kingdom
- Dublin, Ireland
- Gent, Belgium
- Guatemala City, Guatemala
- Hammond, LA
- Honolulu, HI
- Houston, TX
- Kingston, Canada
- Kristiansand, Norway
- Leeds, United Kingdom

- London, United Kingdom
- Long Island, NY
- Los Angeles, CA
- Lund, Sweden
- Manchester, United Kingdom
- Memphis, TN
- México City, México
- Minneapolis, MN
- Narvik, Norway
- Nashville, TN
- Newcastle, Australia
- New Orleans, LA
- New York City, NY
- Nicosia, Cyprus
- Nottingham, United Kingdom
- Oslo, Norway
- Oswego, NY
- Ottawa, Canada
- Oxford, United Kingdom

- Palo Alto, CA
- Paris, France
- Phoenix, AZ
- Pisa, Italy
- Pittsburgh, PA
- Portland, OR
- Reykjavik, Iceland
- Rochester, MI
- Salford, United Kingdom
- San Marcos, TX
- Santiago, Chile
- São Paulo, Brazil
- Seattle, WA
- Space
- Stockholm, Sweden
- St. Pölten, Austria
- Sydney, Nova Scotia, Canada
- Toronto, Canada
- Trondheim, Norway

- Tuscaloosa, AL

- Washington, DC

- Waterloo, Canada

- York, United Kingdom

- Zürich, Switzerland

See `https://people.gnome.org/~ole/gnome-internet-radio-locator/gnome-internet-radio-locator.xml` for the current list of supported radio stations in gnome-internet-radio-locator.

Supported Radio Codecs

The radio stations stream live audio with several different audio codecs supported by the gstreamer program, see `https://gstreamer.freedesktop.org/`

The audio codecs in usage among the supported 82 radio stations are:

- "AAC, v4 LC"
- "MPEG 1 Audio, Layer 3 (MP3)"
- "MPEG ADTS, layer III (Joint Stereo)"
- "MPEG-2 AAC (AAC+)"
- "MPEG-2 AAC"
- "MPEG-4 AAC"
- "Ogg Vorbis"

gnome-internet-radio-locator Data Type Definition (DTD)

gnome-internet-radio-locator 0.1.0 DTD

Short description of each radio station (<station ...>).

Short description of each radio station stream (<stream ...>).

gnome-internet-radio-locator 0.1.0 DTD is available from `https://people.gnome.org/`
`~ole/gnome-internet-radio-locator/gnome-internet-radio-locator-0.1.dtd`

gnome-internet-radio-locator 0.7.0 XML data renders as HTML using XSLT in at least Firefox 54.0 at `https://people.gnome.org/~ole/gnome-internet-radio-locator/`
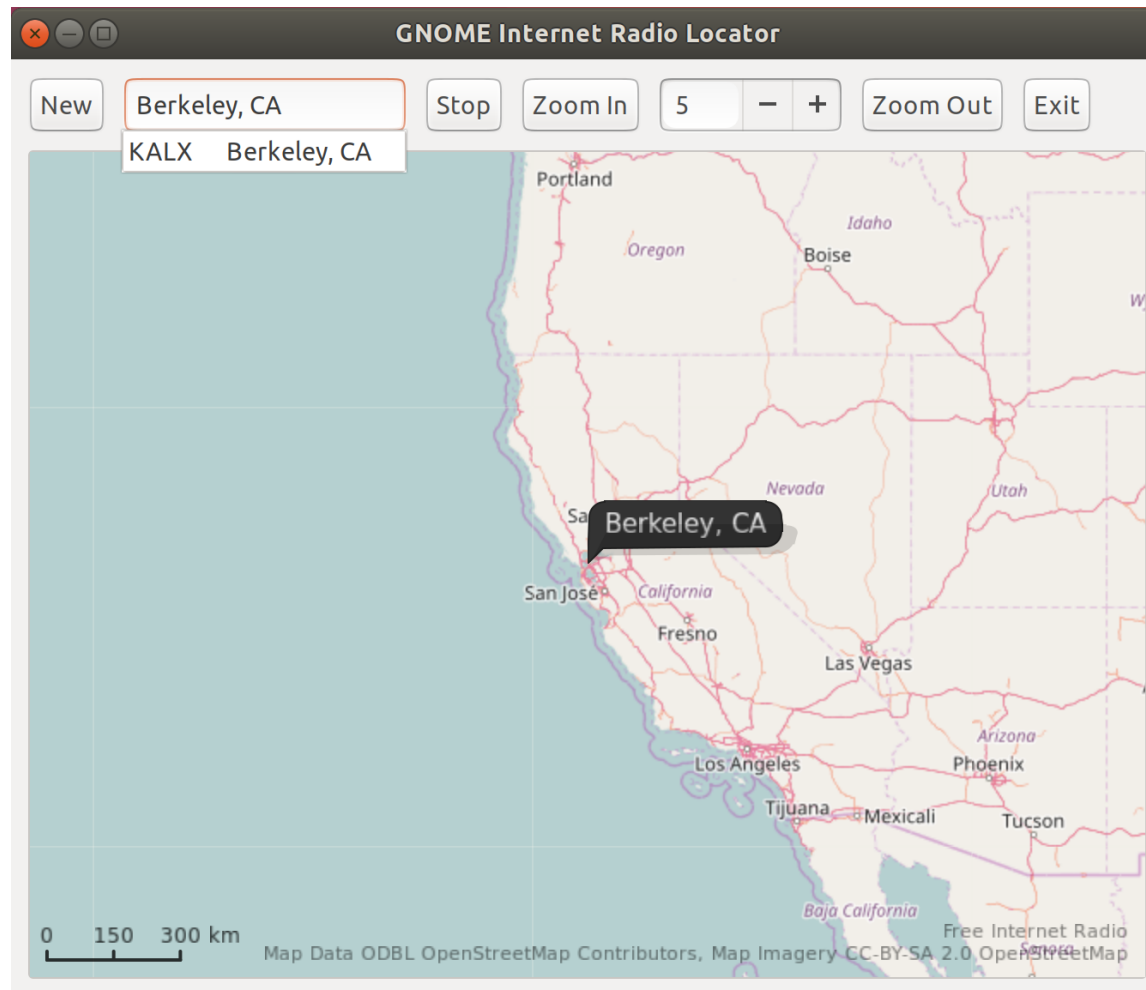`gnome-internet-radio-locator.xml`

Current gnome-internet-radio-locator 0.1.0 DTD

```
<!ATTLIST frequency uri CDATA #REQUIRED >
<!ELEMENT description ( #PCDATA ) >
<!ATTLIST description lang CDATA #REQUIRED >
<!ELEMENT frequency ( #PCDATA ) >
<!ELEMENT email ( #PCDATA ) >
<!ELEMENT location ( lat | lon | href)* >
<!ELEMENT gnome_internet_radio_locator ( station+ ) >
<!ATTLIST gnome_internet_radio_locator version NMTOKEN #REQUIRED >
<!ELEMENT station ( frequency | location | description | stream)* >
<!ATTLIST station band CDATA #REQUIRED >
<!ATTLIST station icon CDATA #REQUIRED >
<!ATTLIST station id NMTOKEN #REQUIRED >
<!ATTLIST station lang CDATA #REQUIRED >
<!ATTLIST station name CDATA #REQUIRED >
<!ATTLIST station rank CDATA #REQUIRED >
<!ATTLIST station type CDATA #REQUIRED >
<!ELEMENT stream EMPTY >
<!ATTLIST stream bitrate NMTOKEN #REQUIRED >
<!ATTLIST stream channels NMTOKEN #IMPLIED >
<!ATTLIST stream codec CDATA #REQUIRED >
<!ATTLIST stream mime CDATA #REQUIRED >
<!ATTLIST stream samplerate NMTOKEN #REQUIRED >
<!ATTLIST stream uri CDATA #REQUIRED >
```

Example of gnome-internet-radio-locator 0.7.0 XML data

```xml
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl"
  href="https://people.gnome.org/~ole/gnome-internet-radio-locator/gnome-internet-radio-locator.xsl" ?>
<!DOCTYPE gnome-internet-radio-locator SYSTEM "gnome-internet-radio-locator-0.1.dtd">
<gnome_internet_radio_locator version="0.7.0">
  ...
  <station band="88.1FM"
           id="wmbr"
           lang="en"
           name="WMBR"
           rank="1.0"
           type="edu">
    <frequency>88.1 FM in Cambridge, MA</frequency>
    <location>Boston, MA</location>
    <description lang="en">WMBR is the MIT campus radio station.
    We broadcast on 88.1 FM between 20 and 24 hours per day, 365 days a year.
    We transmit at 720 watts, effective radiated power from the top of the
    Eastgate Building in Kendall Square in Cambridge, Massachusetts.
    Our programming includes a wide range of music shows, public affairs
    programs and eclectic audio entertainment.</description>
    <stream mime="audio/mpeg"
            uri="http://wmbr.org/WMBR_live_128.m3u"
            codec="MPEG 1 Audio, Layer 3 (MP3)"
            samplerate="44100 Hz"
            channels="Stereo"
            bitrate="128 kbps" />
    <uri>http://wmbr.org/</uri>
  </station>
  ...
</gnome_internet_radio_locator>
```

Screenshot

Screenshot of gnome-internet-radio-locator 0.7.0

Legal stuff

Internet Radio stations in the U.S. need a broadcast license permit from the F.C.C.

- Read gnome-internet-radio-locator/BROADCAST for some details on radio and music licensing
- `http://en.wikipedia.org/wiki/Broadcast_license`
- `https://www.dnalounge.com/backstage/webcasting.html`

Personal Radio Stations can be set up using Icecast streaming server

- Download Icecast from `http://www.icecast.org/` and add your station in $HOME/.gnome-internet-radio-locator/gnome-internet-radio-locator.xml

Only Internet radio stations with broadcast permit are included in gnome-internet-radio-locator

Internet Radio Fairness Act

Many Internet radio stations can't afford to pay royalty fee collection agencies

- The American Society of Composers, Authors and Publishers (ASCAP)
- Broadcast Music, Inc. (BMI)
- Society of European Stage Authors and Composers (SESAC)

New bill in support of Internet Radio introduced in U.S. Congress 2002:

- `https://www.eff.org/Internet-Radio-Fairness-Act-Explanation`
- `http://en.wikipedia.org/wiki/Internet_Radio_Equality_Act`

EFF had a 2012 campaign in support of the Internet Radio Fairness Act

- `https://www.eff.org/Internet-Radio-Fairness-Act-Explanation`

The IRFA bill may be reintroduced in U.S. Congress in 2017, but who knows?

Email from Dr. Richard M. Stallman of FSF

```
From: Richard Stallman <rms@gnu.org>
Subject: Re: Internet Radio Fairness Act? (Re: It's your birthday)
Date: Mon, 23 Mar 2015 22:43:25 -0400
To: oka@oka.no


[[[ To any NSA and FBI agents reading my email: please consider    ]]]
[[[ whether defending the US Constitution against all enemies,      ]]]
[[[ foreign or domestic, requires you to follow Snowden's example. ]]]


  > Regarding updating the LETTER included in GNOME Internet Radio Locator,
  > I don't know what to write/who to contact to promote Internet Radio
  > Fairness Act again in U.S. politics, except you.


Ask people to contact their congressional representatives.


Can you write a message to the public about this?


--
Dr Richard Stallman
President, Free Software Foundation
51 Franklin St
Boston MA 02110
USA
www.fsf.org   www.gnu.org
Skype: No way! See stallman.org/skype.html.
```

Questions?

gnome-internet-radio-locator 0.7 is available here and now.

- `http://download.gnome.org/sources/gnome-internet-radio-locator/0.7/gnome-internet-radio-locator-0.7.0.tar.xz`

Debian testing package

- `https://people.gnome.org/~ole/gnome-internet-radio-locator/debian/gnome-internet-radio-locator_0.7.0-1_i386.deb`

Fedora 26 RPM

- `https://people.gnome.org/~ole/gnome-internet-radio-locator/gnome-internet-radio-locator-0.7.0-1.fc26.x86_64.rpm`

Ubuntu 17.04 package

- `https://people.gnome.org/~ole/gnome-internet-radio-locator/gnome-internet-radio-locator_0.7.0-1_amd64.deb`

Source repository

- `git://git.gnome.org/gnome-internet-radio-locator`
- `https://git.gnome.org/browse/gnome-internet-radio-locator`
- `ssh://$USERNAME@git.gnome.org/git/gnome-internet-radio-locator`

Mailing List for gnome-internet-radio-locator is pending

- See Bugzilla #781841: `https://bugzilla.gnome.org/show_bug.cgi?id=781841`

  ```
  I published the 0.2.0 release of gnome-internet-radio-locator in

  https://download.gnome.org/sources/gnome-internet-radio-locator/

  I would like the mailing list for the project to be created as
  gnome-internet-radio-locator-list@gnome.org to correspond with
  the correct name of the project: gnome-internet-radio-locator

  I have already referred to
  http://mail.gnome.org/mailman/listinfo/gnome-internet-radio-locator-list
  in gnome-internet-radio-locator.doap

  <mailing-list rdf:resource=''http://mail.gnome.org/mailman/listinfo/gnome-internet-radio-locator-list'' />

  I maintain the source tree in GNOME git on https://git.gnome.org//browse/gnome-internet-radio-locator/

  Thanks in advance.

  Happy hacking,
  Ole
  ```

- `http://mail.gnome.org/mailman/listinfo/gnome-internet-radio-locator-list/`

LATEX source code for this presentation

https://git.gnome.org/browse/gnome-internet-radio-locator/plain/talk/GUADEC2017.tex

GNOME Wiki page

https://wiki.gnome.org/Apps/GNOMEInternetRadioLocator