

# Building FFplay for Windows Using MinGW and MSYS \*

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## 1 Introduction

FFplay is a simple and portable media player using the FFmpeg and SDL libraries. We modified it and use it as the video decoder of our wireless video transmission testbed.

FFplay is developed under Linux but it is possible to build for Windows. This document presents the tools and procedures for cross compiling FFplay under Windows. It is based on the online tutorial “Building ffmpeg for Windows with MSYS and MinGW” with our own updates. The original tutorial can be found from:

<http://www.gooli.org/blog/building-ffmpeg-for-windows-with-msys-and-mingw/>

## 2 Tools

We use MinGW and MSYS as the cross compiling platform. In this section, we list all the tools and software we will use.

### 2.1 MinGW and MSYS

MinGW stands for Minimalist GNU for Windows. It is a native Windows port of the GNU Compiler Collection (GCC), with freely distributable import libraries and header files for building native Windows applications.

MSYS is a Minimal SYSTEM providing a POSIX compatible Bourne shell environment, with a small collection of UNIX command line tools. It is primarily developed as a means to execute the configure scripts and Makefiles used to build Open Source software.

MinGW and MSYS can be downloaded from:

[http://sourceforge.net/project/showfiles.php?group\\_id=2435](http://sourceforge.net/project/showfiles.php?group_id=2435)

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## 2.2 SDL Runtime Library

SDL stands for Simple DirectMedia Layer. It is a cross-platform multimedia library designed to provide low level access to audio, keyboard, mouse, joystick, 3D hardware via OpenGL, and 2D video framebuffer. FFplay requires SDL library and here we need the Win32 runtime library "SDL.dll". The library can be found from:

<http://www.libsdl.org/download-1.2.php>

## 2.3 FFmpeg

Download our video encoding/decoding software based on FFmpeg.

## 2.4 Updates

Before start building, we need some updates for MinGW and MSYS. These updates resolve bugs and compatibility issues in older versions. Below is the list of necessary updates.

### 2.4.1 coreutils

Download coreutils-5.97-MSYS-1.0.11-snapshot.tar.bz2 from following address:

<http://downloads.sourceforge.net/mingw/coreutils-5.97-MSYS-1.0.11-snapshot.tar.bz2>

### 2.4.2 w32api

Get MinGW API for MS-Windows w32api-3.13 from following address:

[http://sourceforge.net/project/showfiles.php?group\\_id=2435&package\\_id=11550](http://sourceforge.net/project/showfiles.php?group_id=2435&package_id=11550)

Download w32api-3.13-mingw32-dev.tar.gz which has been compiled for i386.

### 2.4.3 make

Get make-3.81 (or newer version) from:

[http://sourceforge.net/project/showfiles.php?group\\_id=2435&package\\_id=24963](http://sourceforge.net/project/showfiles.php?group_id=2435&package_id=24963)

Download make-3.81-MSYS-1.0.11-2.tar.bz2 which has been compiled for i386.

### 2.4.4 bash

Since FFplay's configure script doesn't work with bash 2.0.4 that comes with MSYS. We need bash with a newer version. bash-3.1-MSYS-1.0.11-1.tar.bz2 can be downloaded from:

[http://sourceforge.net/project/showfiles.php?group\\_id=2435&package\\_id=24963](http://sourceforge.net/project/showfiles.php?group_id=2435&package_id=24963)

### 2.4.5 SDL Development Library

To cross compile FFplay, we need SDL development library to be installed. The library can be obtained from:

<http://www.libsdl.org/download-1.2.php>

Download the SDL source codes `SDL-1.2.13.tar.gz`.

## 3 Install and Build

Now we are ready to install the tools and updates.

1. Install MinGW (choose “MinGW base tools” and “MinGW make”) into `c:\mingw`
2. Install MSYS into `c:\msys\1.0`
3. After MSYS installation, it will run a post install script. It will ask you some questions which you should answer as following:
  - Do you wish to continue with the post install? [yn ] —> y
  - Do you have MinGW installed? [yn ] —> y
  - Where is your MinGW installation? —> C:/mingw
4. Extract `coreutils-5.97-MSYS-1.0.11-snapshot.tar.bz2`. This file contains four directories: *bin*, *info*, *lib*, and *man*. Copy all files within these four directories to corresponding directories under `C:\MinGW` to overwrite old files.
5. Extract `w32api-3.13-mingw32-dev.tar.gz`. This file contains two directories: *include* and *lib*. Copy all files within these two directories to corresponding directories under `C:\MinGW` to overwrite old files.
6. Extract `make-3.81-MSYS-1.0.11-2.tar.bz2`. This file contains three directories: *bin* and *share*. Copy all files within these two directories to corresponding directories under `C:\MinGW` to overwrite old files. And copy “`make.exe`” to `C:\msys\1.0\bin`.
7. Extract `bash-3.1-MSYS-1.0.11-1.tar.bz2`. It contains three directories: *bin*, *info*, and *man*. Copy all files within these three directories to corresponding directories under `C:\MinGW` to overwrite old files. And copy “`bash.exe`” to `C:\msys\1.0\bin`.
8. Extract `SDL-1.2.13.tar.gz`. Under MSYS shell, go to directory `SDL-1.2.13` and run following commands to install SDL:
  - `./configure`
  - `make`
  - `make install`
9. FFmpeg (our trimmed version)
  - Create a file called “`myconfig`” in `C:\work\ffmpeg` and copy the following into it:

```
#!/bin/sh
./configure --extra-cflags="-mno-cygwin -mms-bitfields"
--extra-ldflags="-Wl,-add-stdcall-alias" --enable-memalign-hack
--target-os=mingw32 --disable-shared --enable-static --disable-mmx
--disable-mmx2 --disable-ffmpeg
--enable-swscale --enable-gpl
```

- Under MSYS shell, go to directory `c/work/ffmpeg` and run following commands to build FFplay:

- (a) `./myconfigure`
- (b) `make`

Before running `make`, read the configuration output and make sure that the SDL check is “yes”. This means you have correctly installed SDL libraries. Otherwise FFplay won’t be built.

If everything goes right, now you should be able to get `ffplay.exe` that runs under Windows.

## 4 To Use FFplay

To run FFplay, collect `ffplay.exe` and `SDL.dll` and put them in one directory. Now you are ready to go! You will be able to play local H.264 bitstreams, as well as receiving UDP packets. Table 1 and 2 list frequently used options and hot keys of *ffplay*.

Option	Usage
-h	show help
-f	force format
-s	set frame size (WxH or abbreviation)
-dest_port	specify destination port number
-fs	force full screen
-x width	force displayed width
-y height	force displayed height

Table 1: *ffplay* frequently used options.

Hot keys	Usage
q, ESC	quit
f	toggle full screen
p, SPC	pause

Table 2: *ffplay* frequently used hot keys.

