

C API libhdfs

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1 Overview

libhdfs is a JNI based C API for Hadoop's Distributed File System (HDFS). It provides C APIs to a subset of the HDFS APIs to manipulate HDFS files and the filesystem. libhdfs is part of the Hadoop distribution and comes pre-compiled in `${HADOOP_HOME}/libhdfs/libhdfs.so`.

2 The APIs

The libhdfs APIs are a subset of: [hadoop fs APIs](#).

The header file for libhdfs describes each API in detail and is available in `${HADOOP_HOME}/src/c++/libhdfs/hdfs.h`

3 A Sample Program

```
#include "hdfs.h"

int main(int argc, char **argv) {

    hdfsFS fs = hdfsConnect("default", 0);
    const char* writePath = "/tmp/testfile.txt";
    hdfsFile writeFile = hdfsOpenFile(fs, writePath, O_WRONLY|O_CREAT, 0, 0, 0);
    if(!writeFile) {
        fprintf(stderr, "Failed to open %s for writing!\n", writePath);
        exit(-1);
    }
    char* buffer = "Hello, World!";
    tSize num_written_bytes = hdfsWrite(fs, writeFile, (void*)buffer, strlen(buffer)+1);
    if (hdfsFlush(fs, writeFile)) {
        fprintf(stderr, "Failed to 'flush' %s\n", writePath);
        exit(-1);
    }
    hdfsCloseFile(fs, writeFile);
}
```

4 How To Link With The Library

See the Makefile for `hdfs_test.c` in the libhdfs source directory (`${HADOOP_HOME}/src/c++/libhdfs/Makefile`) or something like:

```
gcc above_sample.c -I${HADOOP_HOME}/src/c++/libhdfs -L${HADOOP_HOME}/libhdfs -lhdfs -o above_sample
```

5 Common Problems

The most common problem is the CLASSPATH is not set properly when calling a program that uses libhdfs. Make sure you set it to all the Hadoop jars needed to run Hadoop itself.

Currently, there is no way to programmatically generate the classpath, but a good bet is to include all the jar files in `${HADOOP_HOME}` and `${HADOOP_HOME}/lib` as well as the right configuration directory containing `hdfs-site.xml`

6 Thread Safe

libhdfs is thread safe

- **Concurrency and Hadoop FS "handles"**
The Hadoop FS implementation includes a FS handle cache which caches based on the URI of the namenode along with the user connecting. So, all calls to `hdfsConnect` will return the same handle but calls to `hdfsConnectAsUser` with different users will return different handles. But, since HDFS client handles are completely thread safe, this has no bearing on concurrency.
- **Concurrency and libhdfs/JNI**
The libhdfs calls to JNI should always be creating thread local storage, so (in theory), libhdfs should be as thread safe as the underlying calls to the Hadoop FS.