



Enabling Grids for E-science

Grid File Access Library (GFAL) JAVA API

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Information Society

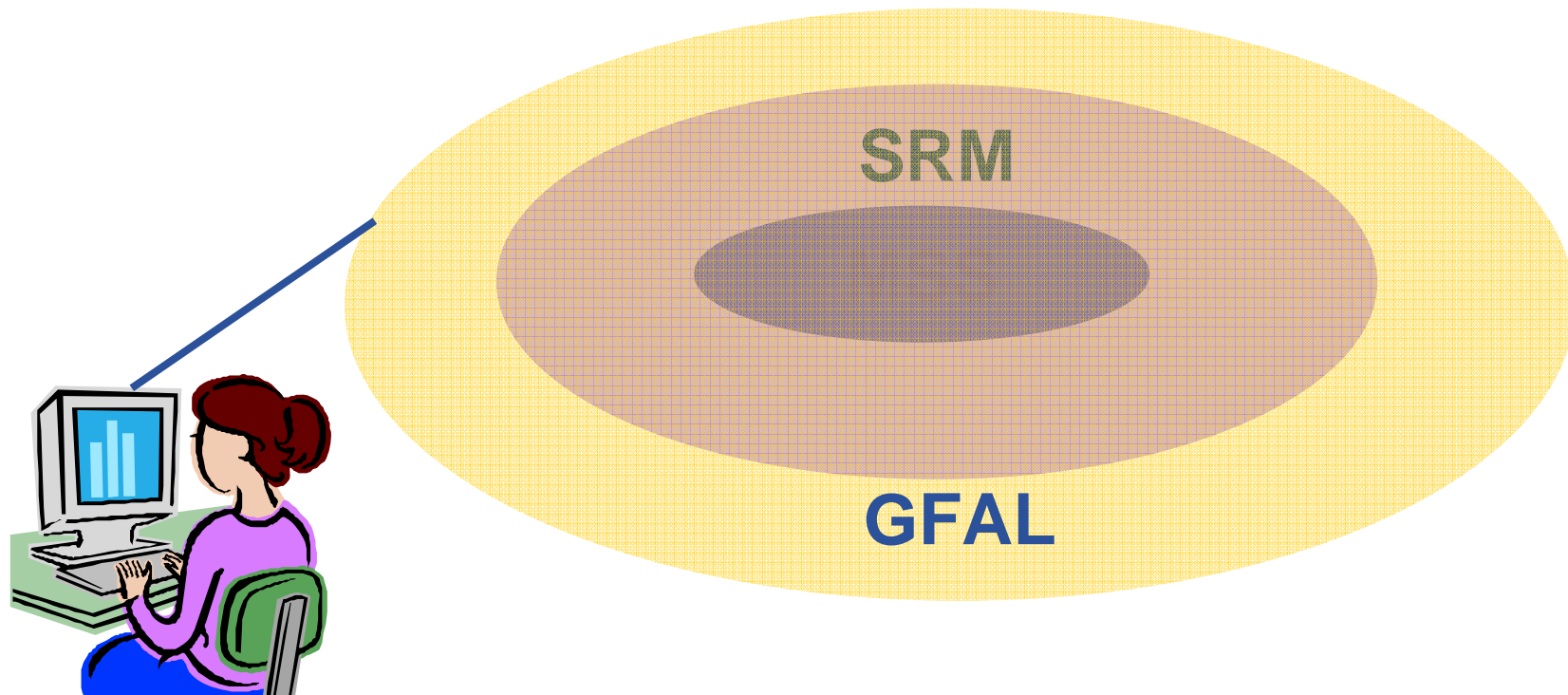


- **What is GFAL for?**
 - Grid storage interactions today require using some existing software components:
 - The catalog services to locate valid replicas of files in order to :
 - **Download** them to the user local machine
 - **Move** them from a SE to another one
 - Make job running on the worker node able to **access and manage** files stored on remote storage element.
 - The SRM software to ensure:
 - Files existence on disk or disk pool (they are recalled from mass storage if necessary)
 - Space allocation on disk for new files (they are possibly migrated to mass storage later)

- **The GFAL Features**

- Hides interactions to the SRM to the end user
- Provides a Posix-like interface for File I/O Operation
- Based on shared libraries (both threaded e unthreaded version)
- Needs only one header file (gfal_api.h) to write C applications
- Supports following protocols :
 - file for local access **nfs-like**
 - dcap, gsidcap and kdcap for dCache access protocol
 - rfio for CASTOR access protocol.
- Access to SRMs in secure mode, i.e. using a valid Grid proxy obtained by voms-proxy-init command.

1. **GFAL** will be the highest level interface
2. It will take care of **SRM** and Replica Managers and protocols (transparent for the user)
3. **SRM** will take care of the handling with **MSS** (not visible for the user)



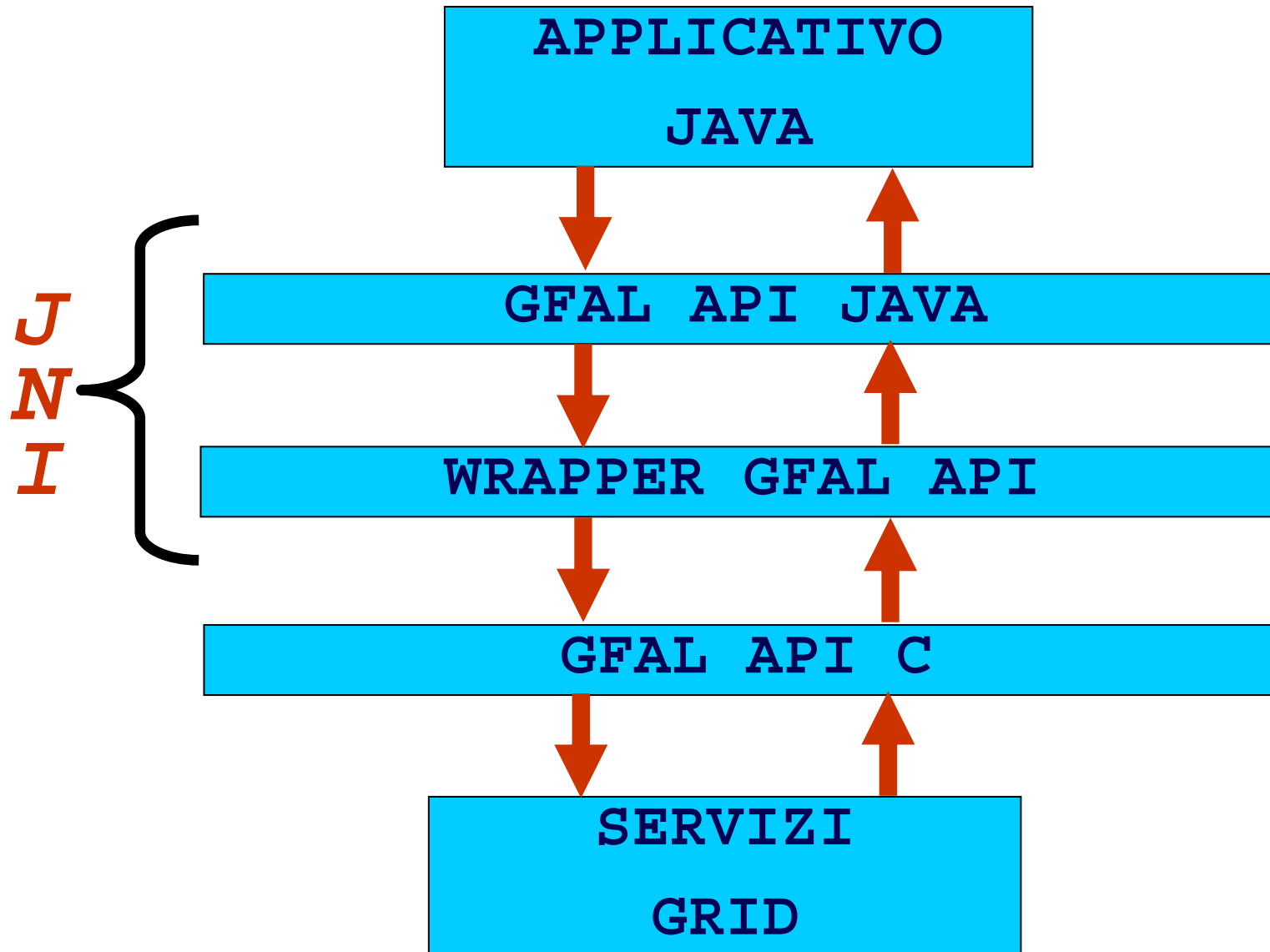
- **GFAL works with all Grid types name:**
 - Logical File Name (LFN)
 - lfn:baud/testgfal15
 - Grid Unique IDentifier (GUID)
 - guid:2cd59291-7ae7-4778-af6d-b1f423719441
 - File Replica (SURL)
 - srm://wacdr002d.cern.ch:8443/castor/cern.ch/user/b/baud/testgfal
 - Transport file name (TURL).
 - rfiio:///castor/cern.ch/user/b/baud/testgfal15

- **Auxiliary linked libraries**
 - libcgssi_plugin_gsoap_2.3
 - libglobus_gss
 - api_gsi_gcc32dbg
 - libglobus_gss_assist_gcc32dbg).

- **Environment Variables**
 - LCG_GFAL_VO (-> **gilda**)
 - LCG_GFAL_INFOSYS (-> *grid004.ct.infn.it:2170*)
 - LCG_CATALOG_TYPE (-> *lfc*)
 - LCG_RFIO_TYPE (-> *dpm*)
 - LFC_HOST (-> *lfc-gilda.ct.infn.it*)
 - LD_LIBRARY_PATH

```

import it.infn.catania.gfal.*;
public class Sample {
    public static void main (String args[]) {
        String fileName = "aliserv6.ct.infn.it";
        try {
            GFalFile gFalFile= new GFalFile();
            gFalFile.createFile(fileName,644,false,false);
            byte[] dati = new byte[1024];
            int ret = gFalFile.writeFile(dati);
            if (ret== -1) {
                System.exit(1);
            }
            ret = gFalFile.closeFile();
            if (ret== -1) {
                System.exit(1);
            }
            ret = gFalFile.lfcRegisterFile("lfn:/grid/gilda/test/1.dat");
            if (ret== -1) {
                System.exit(1);
            }
        }
        catch (GFalFileException exc) {
            exc.printStackTrace();
        }
    }
}
    
```



Classe Java:

```

package it.infn.catania.gfal;

...

public class GFalFile
{
    static {
        System.loadLibrary("GFalFile");
    }
    ...
    private native int openGFalFile(String fileName, int mode, int
perm, boolean isLargeFile);
    private native int closeGFalFile(int fd);
    ...
    public int openFile(String fileName, int flags, int mode, boolean
isLargeFile) throws GFalFileException {
        ...
        int ret = openGFalFile(fileName, flags, mode, isLargeFile);
        ...
    }
}

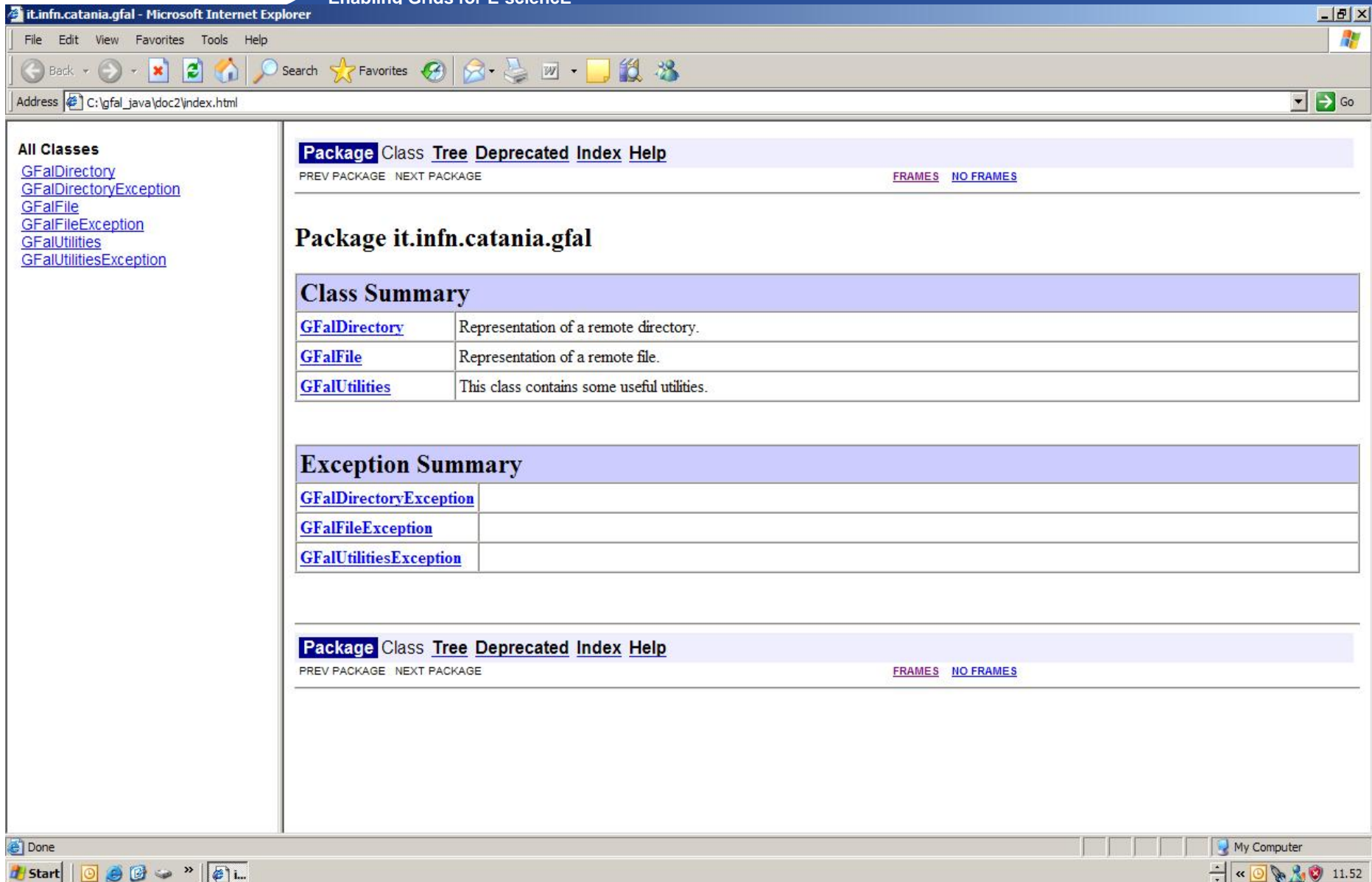
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Wrapper C (libGFalFile.so):

```

#include <gfal_api.h>
#include <jni.h>
#include "it_infn_catania_gfal_GFalFile.h"
...
JNIEXPORT jint JNICALL
  Java_it_infn_catania_gfal_GFalFile_openGFalFile (JNIEnv *env,
    jobject obj, jstring fileName, jint mode, jint permission,
    jboolean largeFile)
{
  int fd;
  const char *str = (*env)->GetStringUTFChars(env, fileName, 0);
  if(largeFile)
    fd = gfal_open64(str, mode, permission);
  else
    fd = gfal_open(str, mode, permission);
  (*env)->ReleaseStringUTFChars(env, fileName, str);
  ...//check errors
  return fd;
}

```



it.infn.catania.gfal - Microsoft Internet Explorer

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Address C:\gfal_java\doc2\index.html Go

All Classes

- [GFalDirectory](#)
- [GFalDirectoryException](#)
- [GFalFile](#)
- [GFalFileException](#)
- [GFalUtilities](#)
- [GFalUtilitiesException](#)

Package [Class](#) [Tree](#) [Deprecated](#) [Index](#) [Help](#)

[PREV PACKAGE](#) [NEXT PACKAGE](#) [FRAMES](#) [NO FRAMES](#)

Package it.infn.catania.gfal

Class Summary

GFalDirectory	Representation of a remote directory.
GFalFile	Representation of a remote file.
GFalUtilities	This class contains some useful utilities.

Exception Summary

GFalDirectoryException	
GFalFileException	
GFalUtilitiesException	

Package [Class](#) [Tree](#) [Deprecated](#) [Index](#) [Help](#)

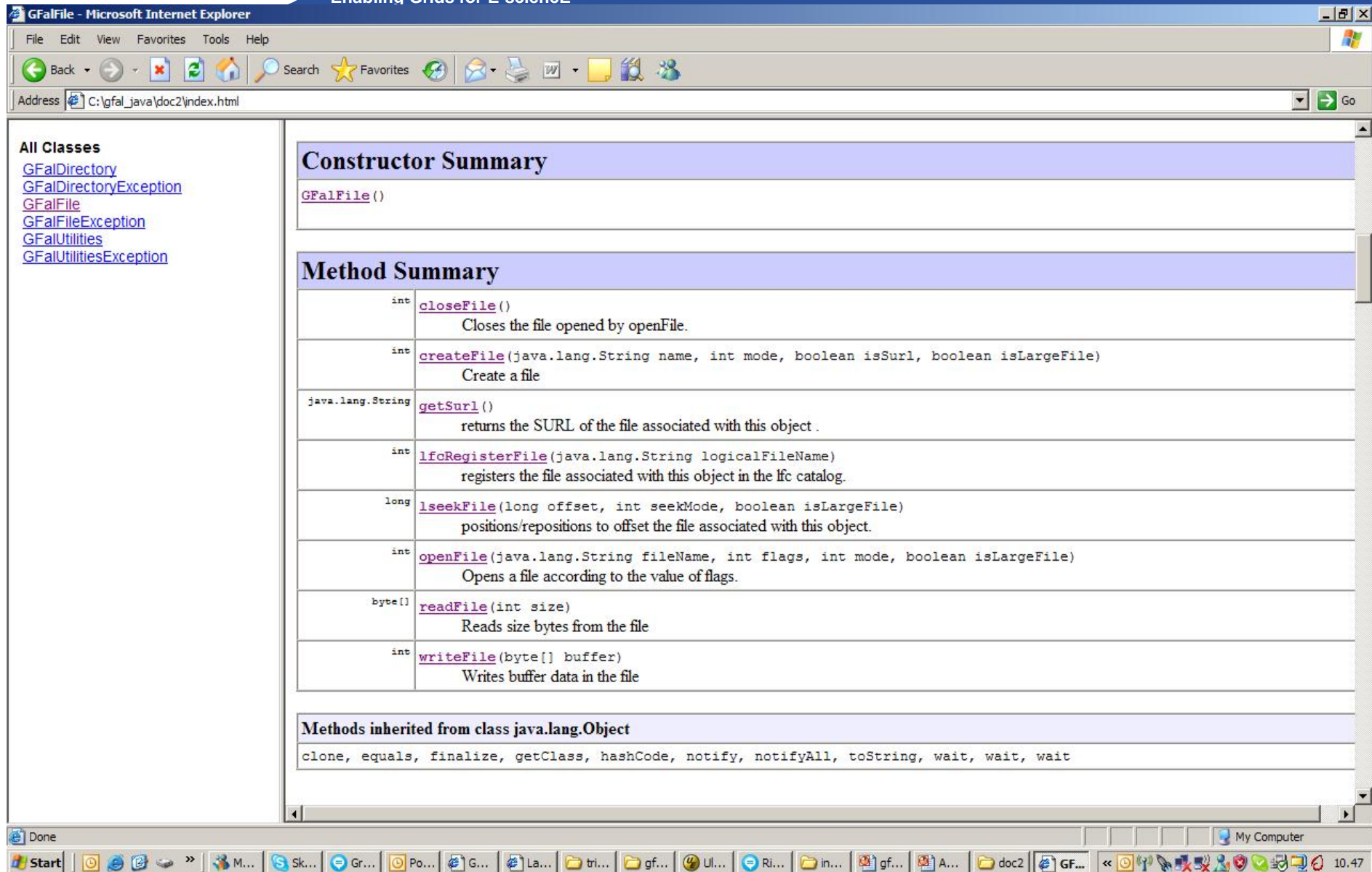
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All Classes

- [GFalDirectory](#)
- [GFalDirectoryException](#)
- [GFalFile](#)
- [GFalFileException](#)
- [GFalUtilities](#)
- [GFalUtilitiesException](#)

Constructor Summary

`GFalFile()`

Method Summary

<code>int</code>	<code>closeFile()</code>	Closes the file opened by <code>openFile</code> .
<code>int</code>	<code>createFile(java.lang.String name, int mode, boolean isSurl, boolean isLargeFile)</code>	Create a file
<code>java.lang.String</code>	<code>getSurl()</code>	returns the SURL of the file associated with this object .
<code>int</code>	<code>lfcRegisterFile(java.lang.String logicalFileName)</code>	registers the file associated with this object in the lfc catalog.
<code>long</code>	<code>lseekFile(long offset, int seekMode, boolean isLargeFile)</code>	positions/repositions to offset the file associated with this object.
<code>int</code>	<code>openFile(java.lang.String fileName, int flags, int mode, boolean isLargeFile)</code>	Opens a file according to the value of flags.
<code>byte[]</code>	<code>readFile(int size)</code>	Reads size bytes from the file
<code>int</code>	<code>writeFile(byte[] buffer)</code>	Writes buffer data in the file

Methods inherited from class java.lang.Object

`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

- Browse to the agenda page:
<http://agenda.cern.ch/fullAgenda.php?ida=a063217>
- Follow the link “more information” on the topic
“Practicals on GFAL Java API usage”

