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User-Created Libraries with existing Applications

Libraries also have dedicated support. This mostly depends on the application, in particular for Marlin, so here I show only the default method, but please check if the application you want to run for specificities. All applications come with their own dependencies, so a user does not need to take care of those. He should only take care of those libraries that are not part of the software stack.

Let's say you have an application that depends in `libSomething.so` that is not a default library (in the Marlin case, one can replace existing processors, so this is covered in the Marlin section, in the Marlin case one also needs a special directory structure is mandatory! See here).

You will copy this `libSomething.so` into a `lib` directory. Now, 2 solutions are possible:

Just one job:

If and only if you have just 1 job: Simply input the `lib` directory like this

```
job.setInputSandbox("lib")
```

If you have a tar ball, you may as well use it:

```
job.setInputSandbox("lib.tar.gz")
```

as any tar ball is automatically untarred in the job running directory.

Only directly add files if you have one job and you are testing your libraries. Because every job submitted uploads its sandbox to the main DIRAC servers, filling its hard drive, and slowing down your job submission. All files are uploaded except those that start with `LFN:`.

More than one job:

You are planning on submitting many jobs: I recommend you to put that `lib` directory on the grid and specify the LFN in the job definition. How to do that?

```
tar czf lib.tar.gz lib/
dirac-dms-add-file /ilc/user/i/initial/some/path/lib.tar.gz lib.tar.gz CERN-SRM
```

The `/ilc/user/...` is the LFN (Logical File Name). The `i/initial/` part is user specific: you need to use your own DIRAC user name. You can find it in the `dirac-proxy-init` output, check for `username`. The `some/path/` part is free to you, you can use whatever you want. There are a few limitations: you can not have a total number of subsequent directories greater than 14, and the final file name (here `lib.tar.gz`) cannot be longer than 128 chars. The last element, `CERN-SRM` indicates the logical name of the Storage Element on which you wish to upload your file.

This LFN is registered in the DIRAC File Catalog, so it can now be used in the job definition.

You now have a file on the GRID that you wish to input for a series of jobs. You would use the following:

```
job.setInputSandbox("LFN:/ilc/user/i/initial/some/path/lib.tar.gz")
```

Notice the `LFN:` part that is used by DIRAC to identify the files that must be downloaded from the grid. If you omit it, the job submission should fail because an input sandbox file will be missing. The fact that it's a tar ball does not matter, it will be untarred automatically.

Replicate your libraries:

For better reliability and reducing load on individual storage elements you should also replicate your library file to a few storage elements by running

```
dirac-dms-replicate-lfn /ilc/user/i/initial/some/path/lib.tar.gz DESY-SRM
dirac-dms-replicate-lfn /ilc/user/i/initial/some/path/lib.tar.gz RAL-SRM
dirac-dms-replicate-lfn /ilc/user/i/initial/some/path/lib.tar.gz CERN-DIP-4
dirac-dms-replicate-lfn /ilc/user/i/initial/some/path/lib.tar.gz CERN-DST-EOS
dirac-dms-replicate-lfn /ilc/user/i/initial/some/path/lib.tar.gz PNNL-SRM
```

Replacing your files:

If you wish to replace the file, you cannot overwrite the file, you need first to issue a

```
dirac-dms-remove-files /ilc/user/i/initial/some/path/lib.tar.gz
```

then re upload. The `dirac-dms-remove-files` command will remove the file from all storage elements.

Moving a file cannot be done on the GRID: if really needed, you need to get the file (`dirac-dms-get-file /ilc/...`) then remove it from the GRID (same as above), then re upload it to the new location. Don't forget to replicate the files again.

Calice VO:

 When running with the CALICE VO, the path has a different beginning: `/calice/users/i/initial`. Notice the `s` at `users`. Also, CERN-SRM is not a valid storage element for CALICE users, so DESY-SRM or IN2P3-SRM must be preferred.

-- AndreSailer - 2014-12-08

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