



# Backends and Data

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Most users deal with multiple computing backends – one of the principles of Ganga is to simplify changing from e.g. LSF → Dirac

Generally speaking you can switch to a different backend by simply changing the backend setting for your job



As an example, here is a script that submits a job to the Local backend first and then submits the same job to the Dirac backend

```
j = Job()
j.application = Executable()
j.backend = Local()
j.submit()

j2 = j.copy()
j2.backend = Dirac()
j2.submit()
```

Start by creating a basic Job object

Set the application to the default 'Hello World' application

Set the backend to be the machine Ganga is running on

Copy the job

Set the backend of this new job to Dirac

In practise, there may be other settings/configuration needed (e.g. a grid proxy) but after this has been done once, swapping backends should be this simple!

The input/output file system is very powerful and can be used to include and send files to and from all sorts of systems:

- Input Files specified in the job will be transferred to the WN
- Output files are checked for by the job and sent back as requested
- Wildcards are supported for both file types
- Ganga will handle transfers from different systems in the background
- Very configurable depending on how/where you want the transfer
- Allows easy transfer of output data → input data
- Can be used standalone as an API to storage systems

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There are a number plugins supplied with Ganga Core apart from the experimentally specific ones (e.g. LHCb and Atlas) for backends and data:

## *Backends*

*Local – The computer you're on*  
*PBS – Torque/Slurm style batch system*  
*SGE – Sun Grid Engine*  
*Condor*  
*LCG – Glite WMS Grid*  
*CREAM – Direct CREAM CE*  
*Dirac – The Dirac WMS*  
*ARC – Diract ARC CE*

## *Input/OutputFiles*

*LocalFile – A Local (direct access) File*  
*DiracFile – File handled by DIRAC DMS*  
*MassStorageFile – e.g. CASTOR*  
*LCGSEFile – Glite/LFC Storage*  
*GoogleFile – Google Drive*  
*CERN Box File – The new Cloud service*  
*WebDAV File – In development*

You should now work through the two sections of the tutorial that cover backends and data:

- Using Different Backends
- Input and Output Data

Be aware that to use Dirac you will need to setup the client:

*[https://www.gridpp.ac.uk/wiki/Quick\\_Guide\\_to\\_Dirac](https://www.gridpp.ac.uk/wiki/Quick_Guide_to_Dirac)*

And also do some configuration changes in Ganga