AliEn Job Splitting

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CAF and Grid User Forum

Job Splitting

- Simplify the handling of multiple jobs
- The user submits one single JDL (masterjob)
- AliEn will split it in several subjobs
- Each subjob can be executed independently
- Possible to merge the output of the subjobs
- Once all the subjobs and the merging finish, the masterjob will be marked as DONE
- ‘masterjob <jobid>’

Splitting methods

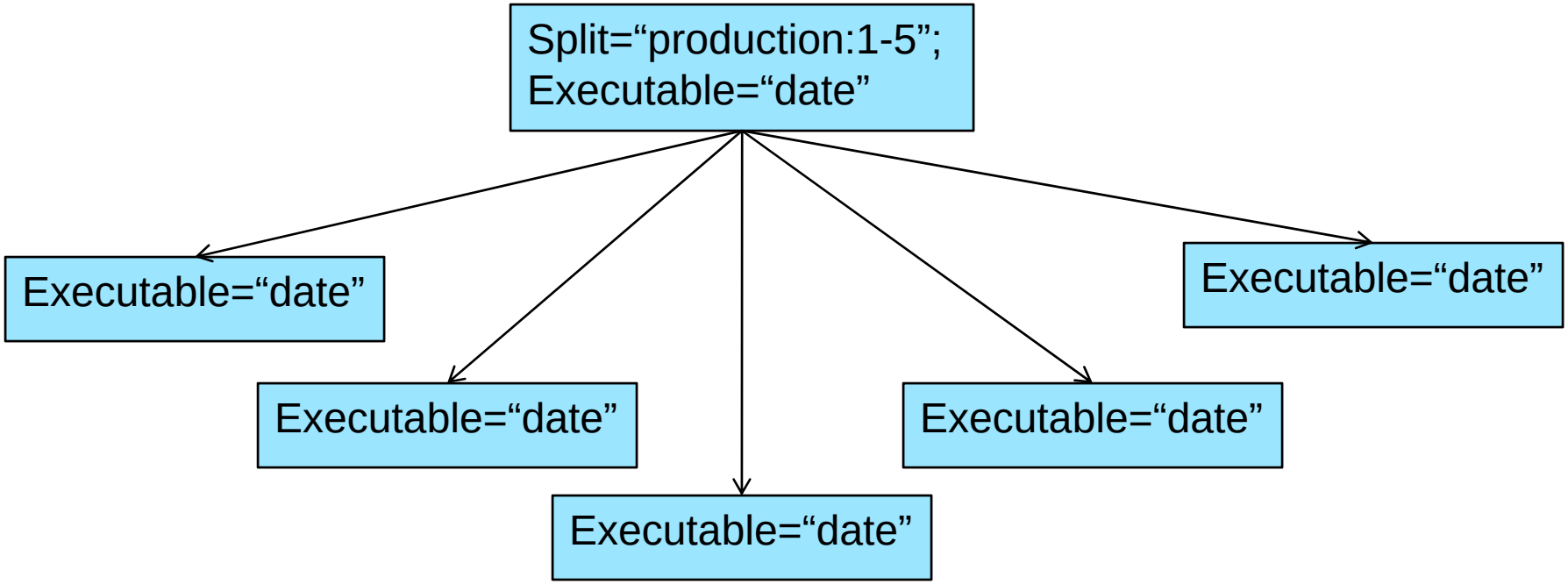
- Possible splitting methods:
  - Production
  - File
  - SE
  - Directory
  - Event

  According to InputData and/or InputDataCollection

  - Splitting Arguments

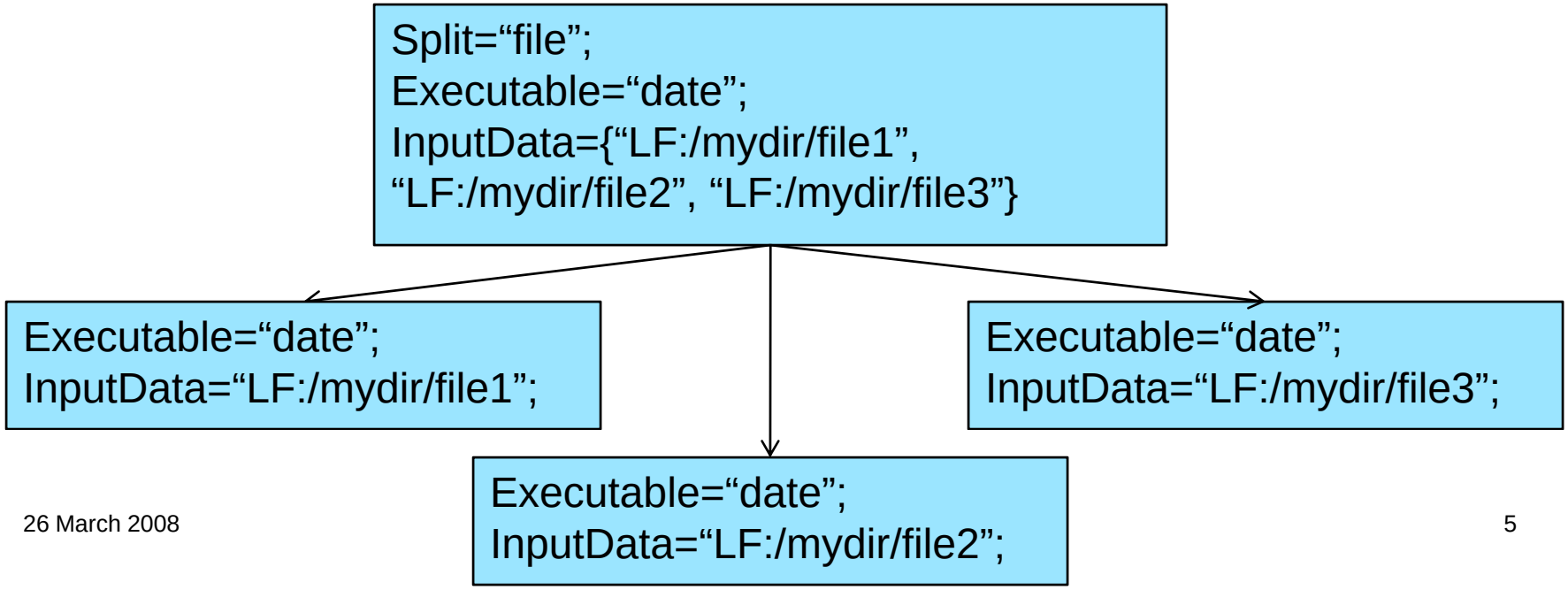
Production splitting

- The JDL of the masterjob will be the same for each subjob
- Example:



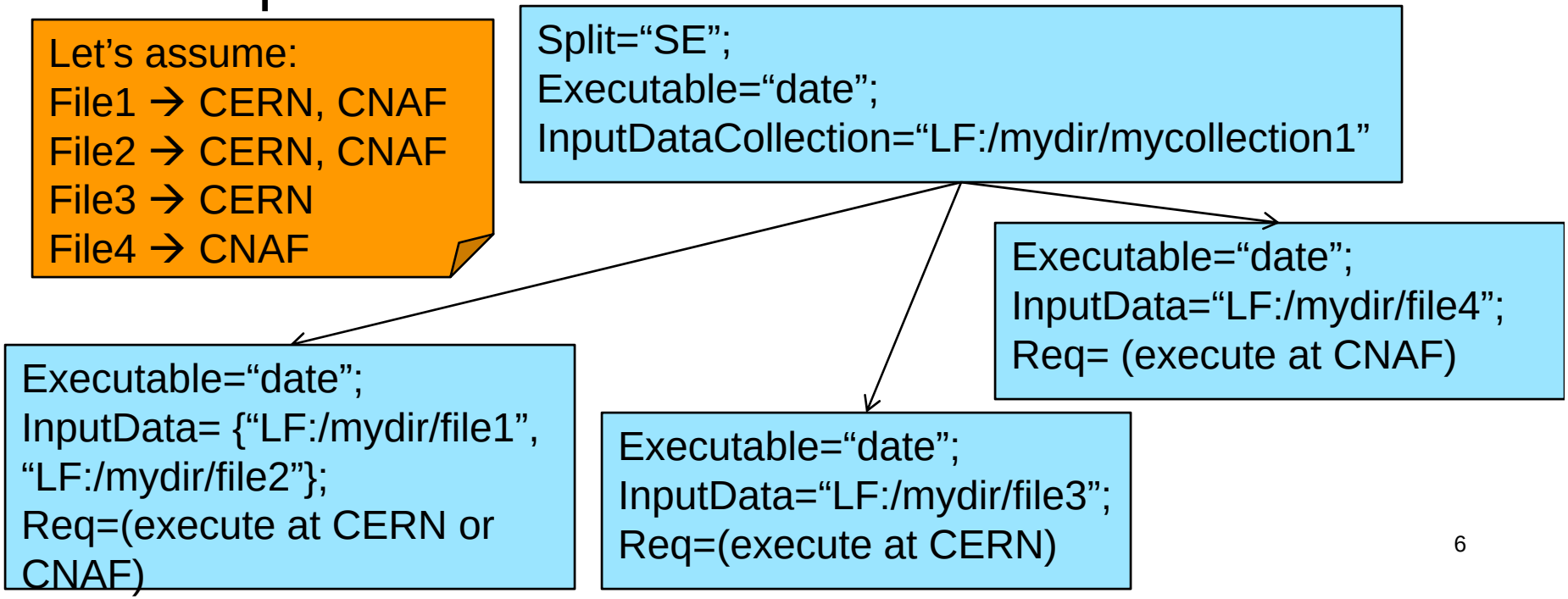
File splitting

- Each subjob has one file as InputData
- It can be used with InputData or InputDataCollection
- Example:



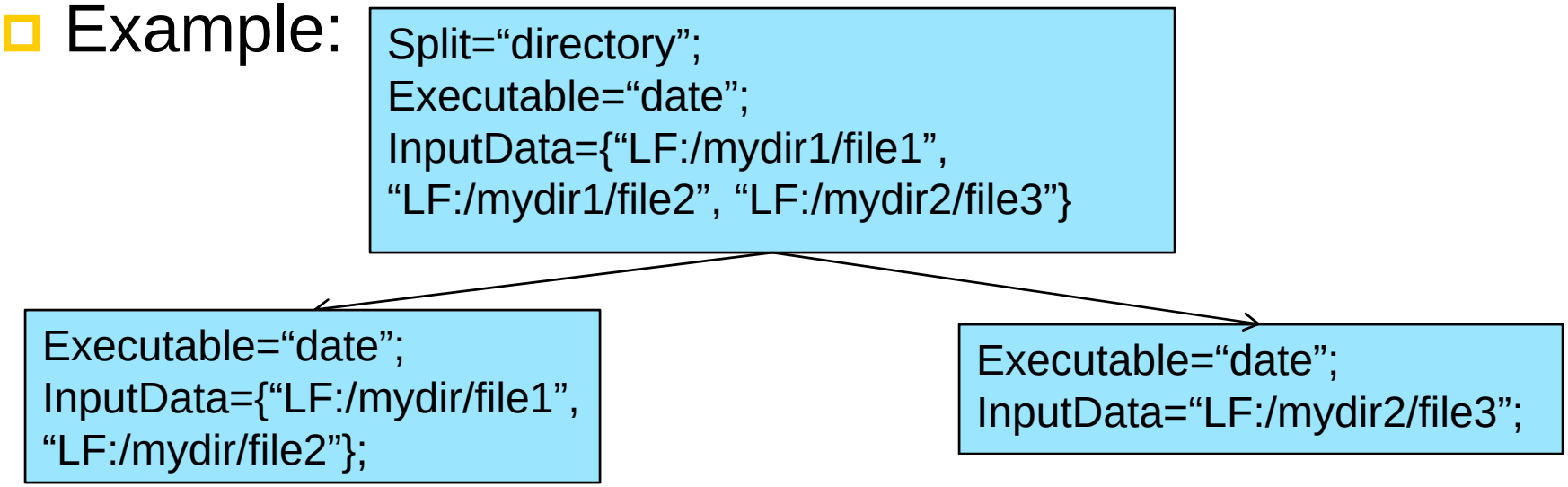
SE splitting

- Each subjob has all the files on the same Ses
  - Possible to restrict with “SplitMaxInputFileSize” and “SplitMaxInputFileNumber”
- Example:



Directory splitting

- All the files in the same directory will be analyzed by the same job
  - Possible to restrict with “SplitMaxInputFileSize” and “SplitMaxInputFileNumber”
- Example:



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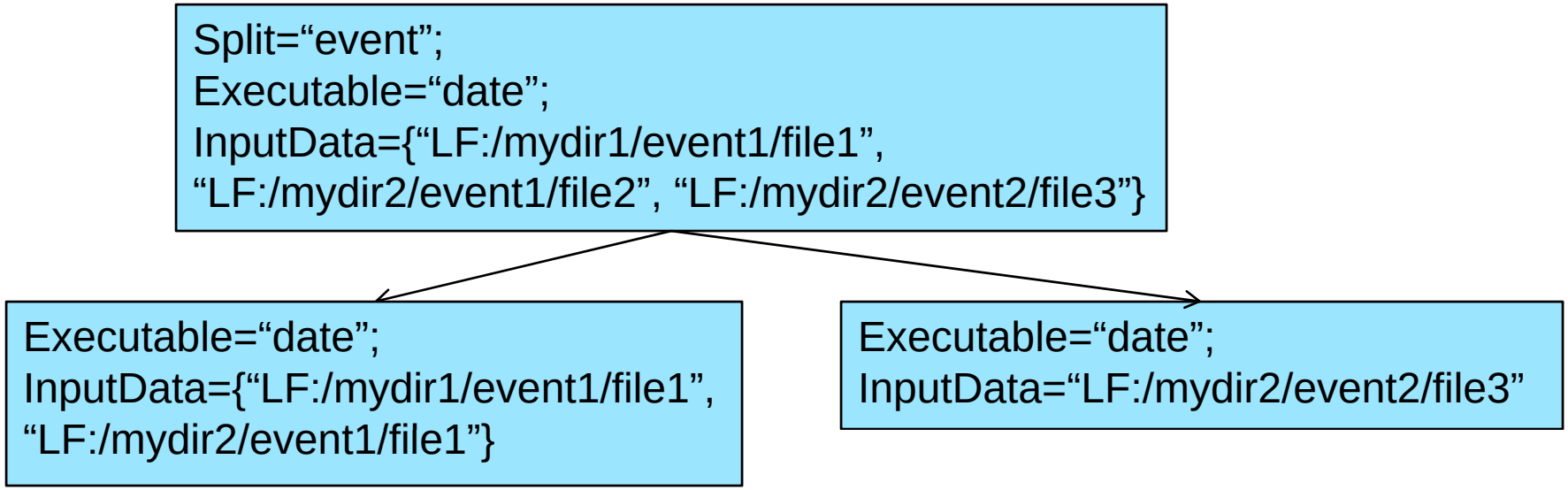
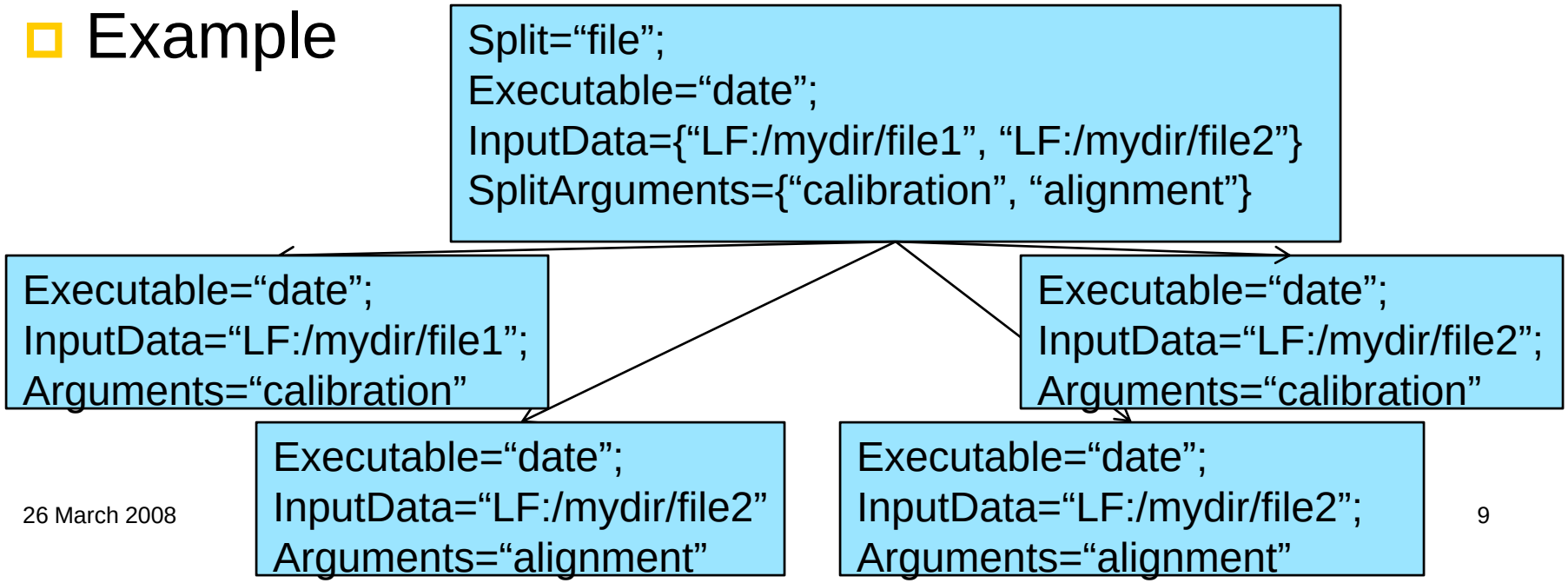
Event splitting

- All the subjobs under the same directory name will be analyzed together
  - Not the full directory name!!
- Example:



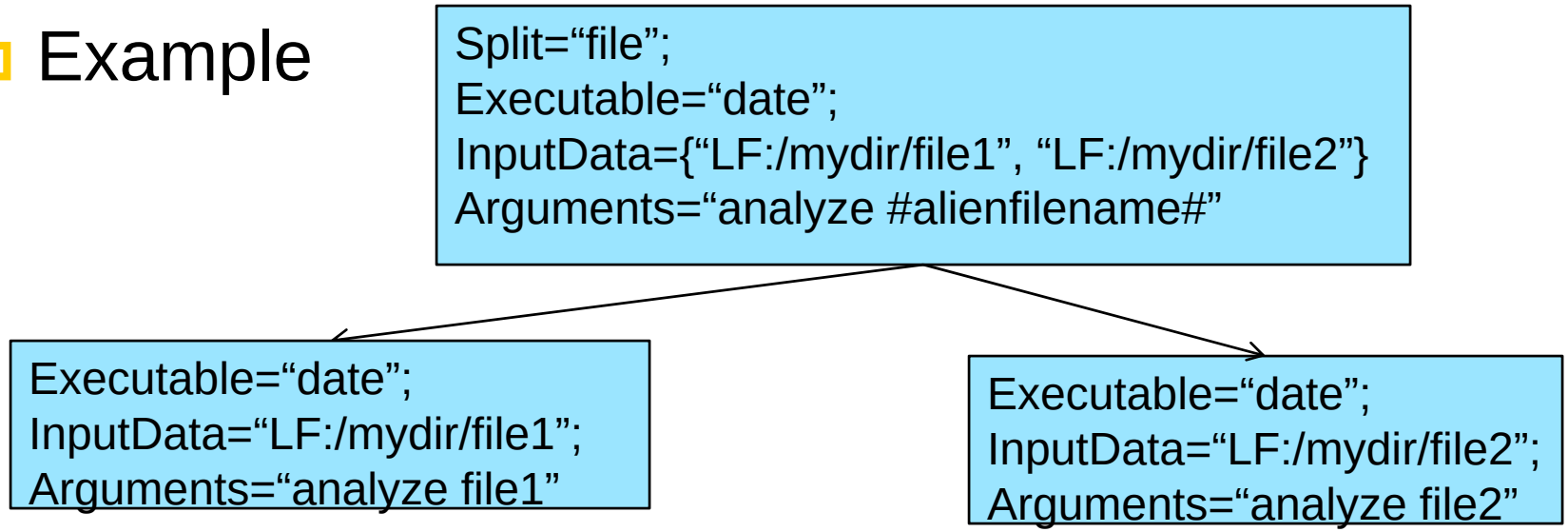
SplitArguments

- Can be combined with any of the previous methods.
- Every job will be submitted as many times as entries in the SplitArguments
- Example



Splitting Patterns

- Used to have different values on each subjob
- Can be used for: OutputDir, OutputFile, Arguments
- #alien(pattern)#
- Example



All possible patterns

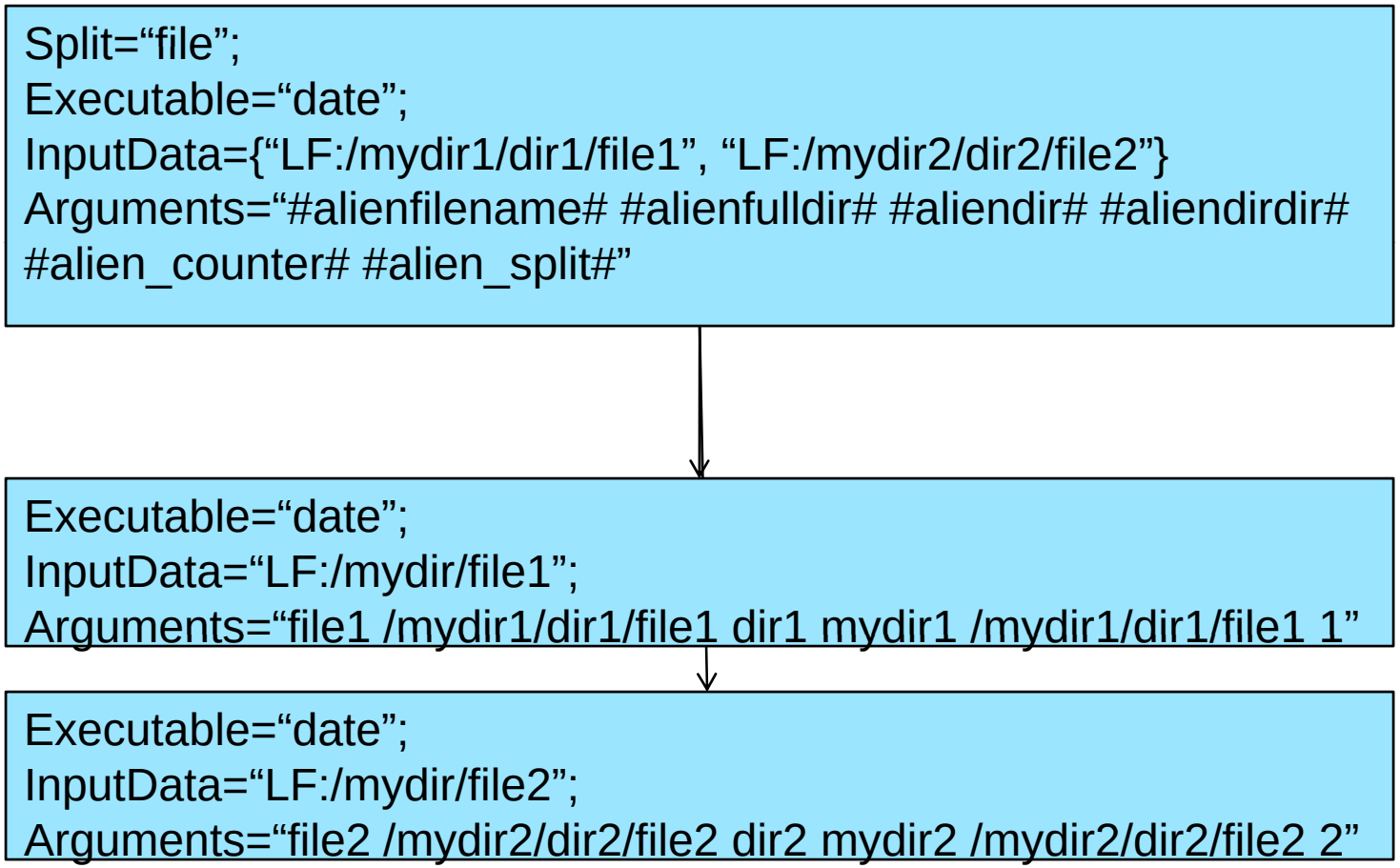
- filename
- fulldir
- (dir)+

Based on the InputData. If there is more than one inputdata, the pattern can be prepended by: first, last, all

- _counter
  - Category of the splitting (be careful!!)
- _split
  - Number of the subjob: 1, 2, 3 …

_counter and _split can specify format (i.e. _split%03i)

AliEn pattern examples



Merging

- Once all the subjobs finish, AliEn can submit jobs to merge the output
- Merge={“<input>:<jdl>:<output>”}
- Example:

```
Split=“file”;
Executable=“aliroot”;
InputData={“LF:/mydir/file1”, “LF:/mydir/file2”};
OutputFile={“histogram.root”, “histogram.log”}
Merge={“histogram.root:/alice/jdl/mergeroot.jdl:Newhistogram.root”,
        “histogram.log:/alice/jdl/mergetxt.jdl:Newhistogram.log”}
```

InputDataList

- Get the list of files that will be anylized by the job
- AliEn will create a file in the working directory before the job runs
- InputDataListFormat:
  - Xml-single
  - Xml-group
  - Merge:<lfn>:
    - <lfn> is an xml file with one entry per file
    - The output will be another xml file with the files that the subjob has as inputdata

Conclusions

- Splitting jobs simplifies handling multiple jobs
  - ‘masterjob <id>’ to follow up status
- Several splitting mechanism:
  - Production, file, SE, directory, event
  - SplitArguments
- Split patterns can be used to configure subjobs
- Easy merging of all the subjobs

http://alien.cern.ch/twiki/bin/view/AliEn/HowToUseAliEn#Splitting_jobs