

ALIBUILD / PANDADIST

The New Build System for Panda

Reason for a new “Build Tool”

- FairSoft only weakly defines dependencies between packages
 - ▣ Package order hard coded in the scripts
 - ▣ Recompile of updated package not possible
 - ▣ Different versions of the same package not possible due to installation scheme

AliBuild – Build tool from ALICE

- Get it from GitHub <https://github.com/alisw/alibuild>
- Documentation at <https://alisw.github.io/alibuild/>
- Set of tools to install HEP software from source
 - ▣ aliBuild
 - Main tool
 - ▣ aliDeps
 - Create dependency graphs
 - ▣ aliDoctor
 - Test the system and shows warnings/errors
 - ▣ alienv
 - Setup runtime environment
 - alienv enter pandaroot/latest-fairsoft

aliBuild – What is it?



- Written in Python
- Multi-Platform
- “Recipes” define how to build a software (e.g. root) from source
- Calculate correct dependencies
- Recompile only needed packages on recipe changes

- `alibuild/aliBuild -a <platform> -j<ncpu> -w <workdir> -- defaults <defaults> <command> <pckage>`

Get Started for PandaRoot

```
git clone https://github.com/alisw/alibuild.git
```

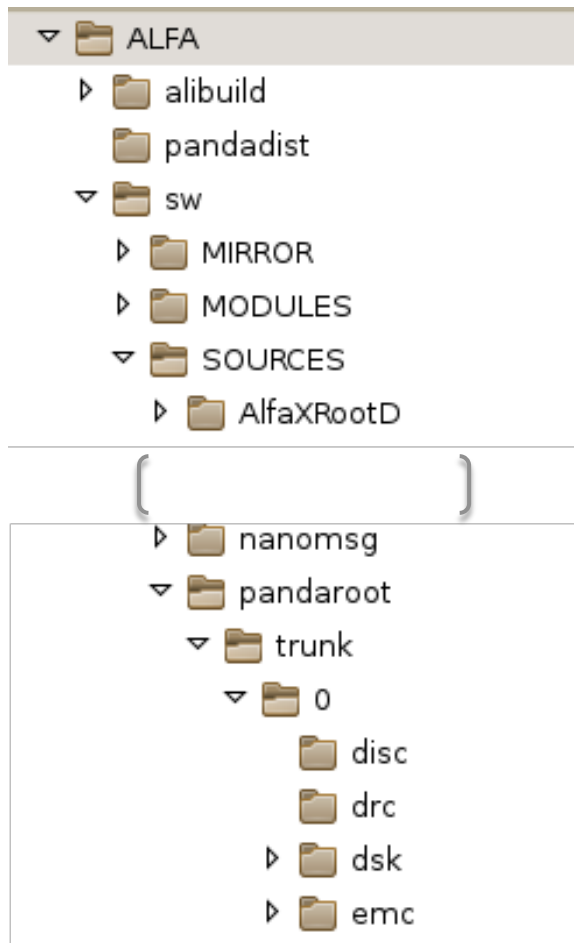
```
git clone https://pandaatfair.github.io/PandaRootGroup/pandadist.git
```

```
./alibuild/aliBuild --config-dir=pandadist  
--defaults fairsoft  
build pandaroot
```

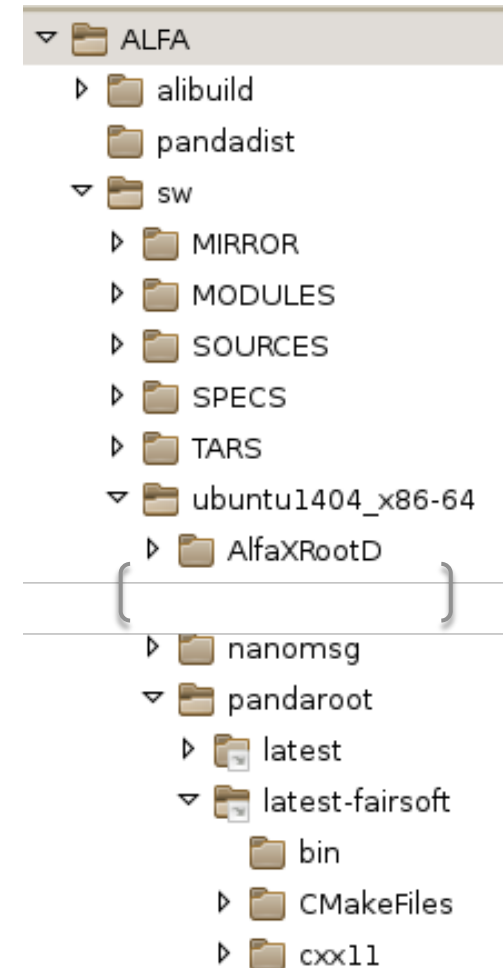
```
./alibuild/aliBuild enter pandaroot/latest-fairsoft  
→ enters new shell
```

Source and Build Location

Sources

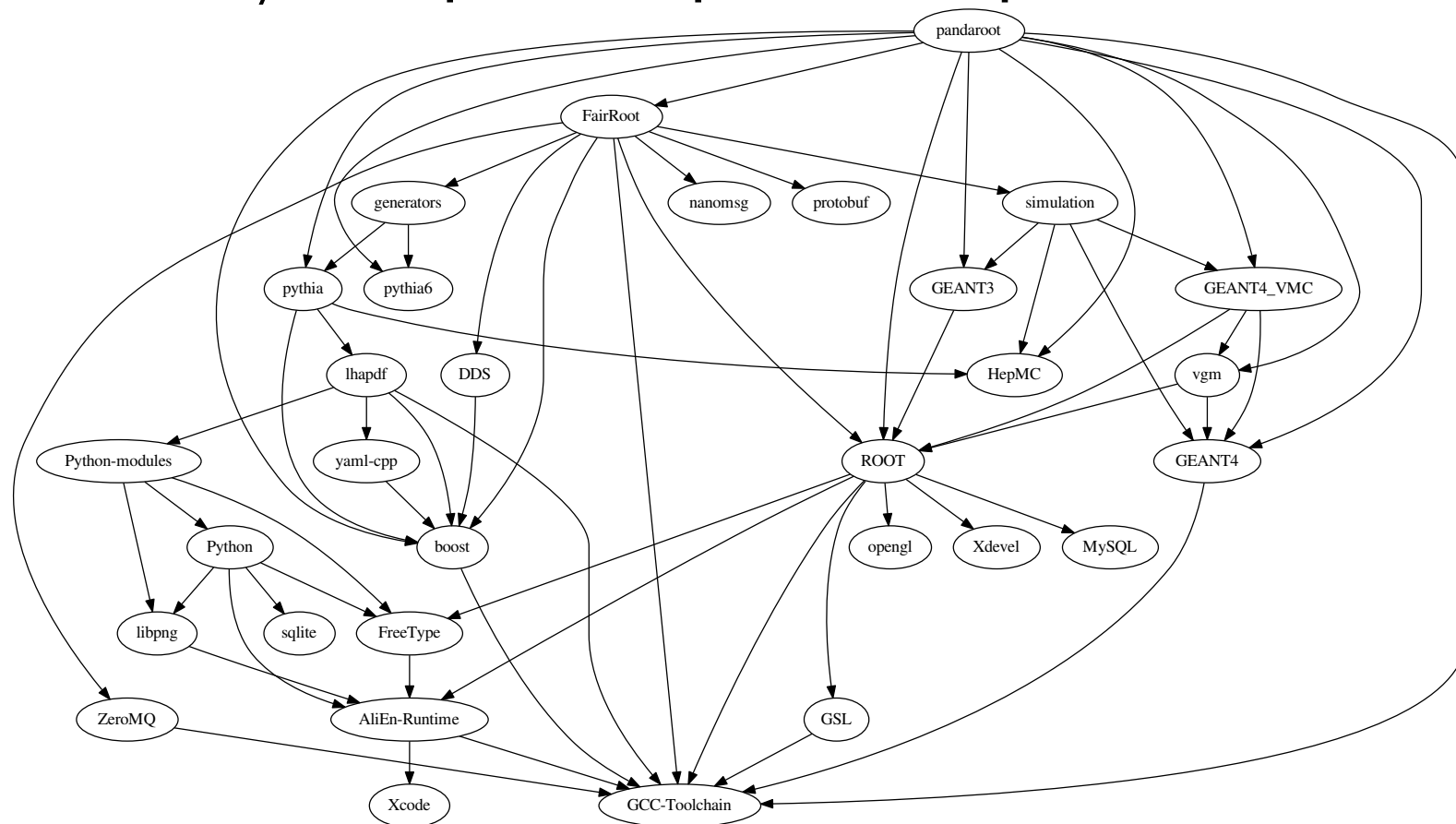


Build



Dependency graphs: aliDeps

- ❑ `alibuild/aliDeps --dist <recipe_dir> <package>`
- ❑ `alibuild/aliDeps --dist pandadist pandaroot`



Recipes

- Each recipe consist of two parts
 - ▣ YAML Header
 - contains metadata about the package
 - Name
 - Version
 - URL of the sources (GIT)
 - ...
 - ▣ Build script
 - Describes the steps to come from the sources to the installed software
 - Standard shell script

PandaRoot recipe Header

package: pandaroot

version: trunk

requires:

- FairRoot
- boost
- GEANT4
- ROOT
- pythia6
- pythia
- HepMC
- GEANT3
- GEANT4_VMC
- vgm
- "GCC-Toolchain:(?!osx)"

env:

VMCWORKDIR: "\$PANDAROOT_ROOT/macro"

GIT integration would
be here in the future

PandaRoot recipe Script

```
#!/bin/bash  
unset SIMPATH
```

SVN hack by Radek



```
svn checkout https://subversion.gsi.de/fairroot/pandaroot/trunk $SOURCEDIR
```

```
mkdir -p $INSTALLROOT  
cd $INSTALLROOT
```

```
cmake $SOURCEDIR  
    -DMACOSX_RPATH=OFF  
[...]
```

```
make -j ${JOBS} &> ~/build_pandaroot.txt
```

```
[...]
```

Default recipes

- Special recipe
- Dependence for all other packages
- Only Header part of recipe used to
 - ▣ Define global variables
 - ▣ Disable specific packages
 - ▣ Override package defaults like
 - tag
 - version
 - ...
- Different default files for different use cases in the repository
 - ▣ Fairsoft
 - ▣ O2
 - ▣ O2-DAQ
 - ▣ ...

Fairsoft Defaults

package: defaults-fairsoft

version: v1

env:

CXX: "g++"

CC: "gcc"

FC: "gfortran"

CXXFLAGS: "-fPIC -g -O2 -std=c++11"

CFLAGS: "-fPIC -g -O2"

CMAKE_BUILD_TYPE: "RELWITHDEBINFO"

FAIRROOT: "1"

disable:

- AliEn-Runtime
- AliRoot
- lhpdf
- DDS

For MAC:

CXX: „clang++“

CC: „clang“

CXXFLAGS: „-fPIC -g -O2 -std=c++11
-stdlib=libc++“

overrides:

boost:

tag: "v1.61.0"

source: "https://github.com/FairRootGroup/boost.git"

geant3:

source: "https://github.com/FairRootGroup/geant3.git"

tag: "v2.1"

pythia6:

tag: "alice/416"

ROOT:

version: "%(tag_basename)s"

tag: "v6-06-04"

CMake:

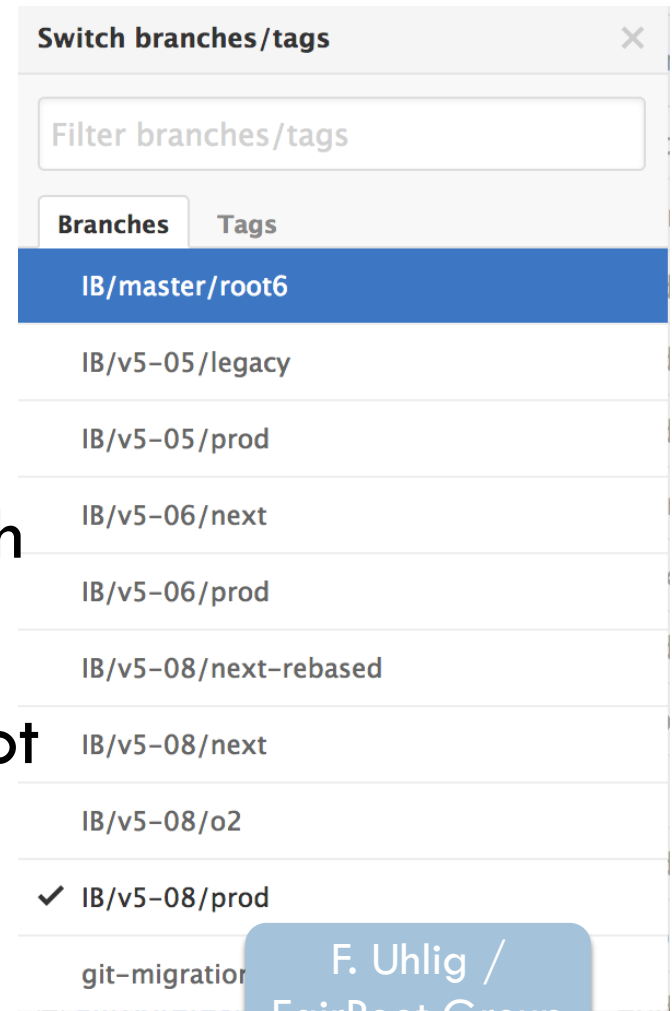
tag: "v3.6.2"

prefer_system_check: |

```
which cmake && case `cmake --version | sed -e s/.* // | \
cut -d. -f1,2,3 | head -n1` in [0-2]*|3.[0-3].*| \
3.4.[0-2] exit 1 ;; esac
```

AliRoot/O2/FairRoot versions

- ❑ Software releases are defined via branches (e.g. IB/v5-08/prod)
- ❑ No Tags are used
- ❑ A production branch doesn't change after creation
- ❑ Development is done in “next” branch
- ❑ Special branch for O2
- ❑ We would need a branch for FairRoot
- ❑ What about Cbm/Panda/R3B ???



Switch branches/tags

Filter branches/tags

Branches Tags

- IB/master/root6
- IB/v5-05/legacy
- IB/v5-05/prod
- IB/v5-06/next
- IB/v5-06/prod
- IB/v5-08/next-rebased
- IB/v5-08/next
- IB/v5-08/o2
- ✓ IB/v5-08/prod
- git-migration

F. Uhlig /
FairRoot Group

AliRoot/O2/FairRoot versions

- ❑ Software releases are defined via branches (e.g. IB/v5-08/prod)
- ❑ No Tag
- ❑ A prod branch is created after a release
- ❑ Development branch
- ❑ Special branch for O2
- ❑ We would need a branch for FairRoot
- ❑ What about Cbm/Panda/R3B ???

We may or may not adopt that scheme



Open Issues



- We fork from alfadist (maintained by FairRoot Group) -- They fork from alidist
- Do we want to stay „downstream“?
- Scrutinize the package versions/defaults

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```

```
git clone  
https://pandaatfair.github.io/PandaRootGroup/  
pandadist.git
```

```
./alibuild/aliBuild --config-dir=pandadist  
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