CEPC Software Management Proposal

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Outline

- Package Management
- cepcenv Toolkit
- Software Development and Release

Package Management

CEPC Software Package Category

- Package category
  - System
    - Should be pre-installed before installation
  - External
    - Common libraries used by offline packages
    - Will be installed before offline
  - Offline
    - Core CEPC software
- External and offline packages could have multiple root directories
  - Official and user development
  - Reuse external

Package List

- System
  - git, svn, curl / wget
  - gcc, python, java, CMake
  - libraries
    - libX11, libXpm, libXft, libXext
    - openssl, pcre, libxml2
    - mesa-libGL, mesa-libGLU
    - …
- External
  - MySQL, xerces-c, GSL, QT
  - geant4, ROOT, CLHEP, CERNLIB, FastJet
- Offline
  - LCIO, GEAR, CED, CondDBMySQL, ILCUTIL, DRUID
  - FastJetClustering, MarlinFastJet
  - KalTest, KalDet, GBL, LCCD, RAIDA
  - MarlinUtil, Marlin, MarlinReco, MarlinTrk, MarlinTrkProcessors
  - Clupatra, LCFIVertex, LCFIPlus, KiTrack, KiTrackMarlin
  - Mokka
  - …

Directory Structure

- Official release directory
  - Could be selected in user profile or "cepcenv" command argument
  - afs / cvmfs / user directory / ...
- User work directory
  - User could develop new packages or modify already existed one
- Directory structure
  - <install dir>/<arch>-<os>-<compiler>/<release version>/

```
<install dir>
`-- x86_64-sl6-gcc44
    |-- external
    |   |-- root
    |   |   |-- 5.34.10
    |   |   `-- 5.34.30
    |   |-- geant4
    |   |   `-- 9.6.p02
    |   `-- ...
    `-- release
        |-- v01-17-05
        |   |-- external
        |   |   `-- FastJet
        |   |       `-- 2.4.2
        |   `-- offline
        |       |-- Simulation
        |       |   |-- Mokka
        |       |   |   `-- mokka-08-03
        |       |   |-- gear
        |       |   `-- ...
        |       |-- Reconstruction
        |       |   `-- ...
        |       `-- ...
        `-- v01-17-06
```

cepcenv

cepcenv

- This toolkit could simplify the management of cepc offline software for both administrator and user
  - Installation
  - Environment variable
  - Version selection
  - Package management

cepcenv Command

- cepcenv install <version>
  - Install the specified release version
- cepcenv list
  - List all installed versions
- cepcenv use <version>
  - Select release version
- cepcenv package-list
  - List all active packages of the current release
- cepcenv setup
- …

Full Installation from Scratch

- Install cepcenv with single command
  - sh -c "$(curl -fsSL https://raw.githubusercontent.com/cepc/cepcenv/master/script/install.sh)"
- cepcenv install --check <release-version>
- cepcenv install <release-version> --root <root_dir> --os slc6 --arch x86_64
  - Installation root directory specified in user profile or command argument

Setup Software Environment

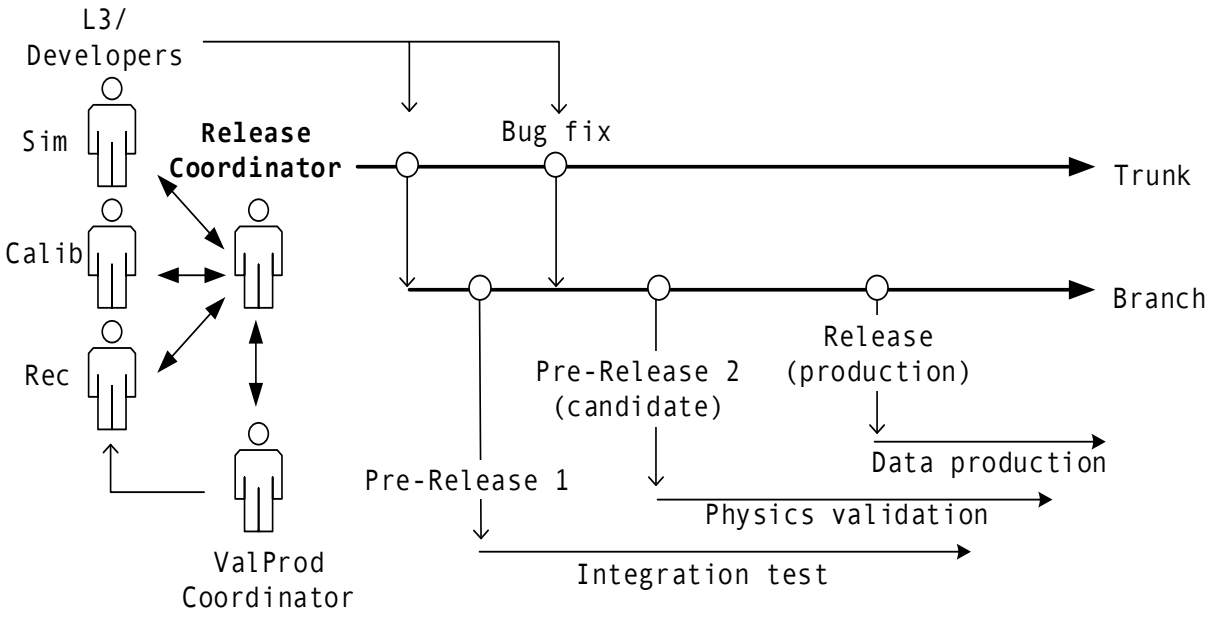
- Setup cepcenv environment
  - source setup.sh
- Default cepc software version is active automatically
- Change version is easy (should be installed already)
  - cepcenv use <new-version>
- Change package version temporarily
  - cepcenv package-use <version>
  - Restore to default when newly logged in

Software Development and Release

How to Develop a Package

- Version control with git
- Each offline package corresponds to a project under github CEPC organization
- Development procedure
  - Fork the project from CEPC organization
  - Create new branch and start development
  - Commit changes
  - Push to your own repository
  - Create pull request
  - The manager of the project accepts or denies the request
  - The manager create release of the package

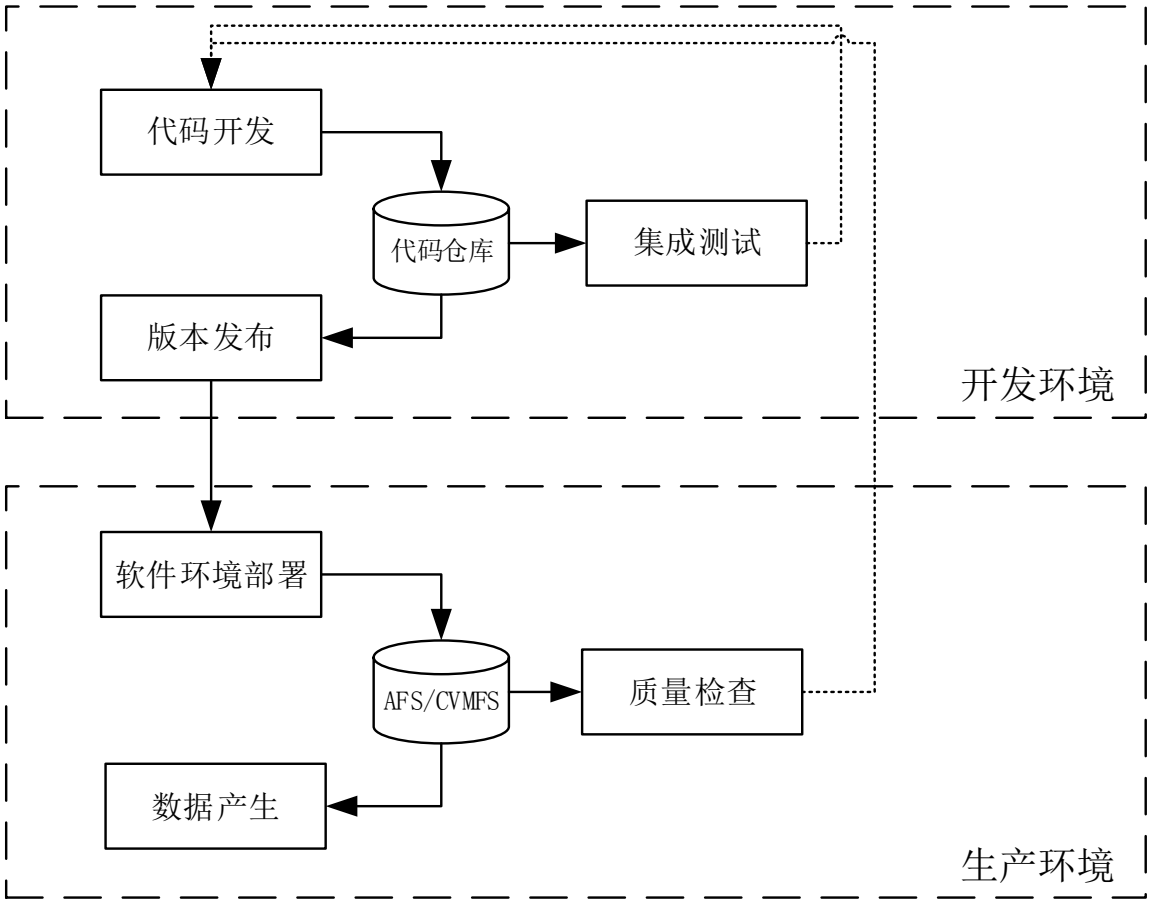
- JUNO development procedure for reference



How to Create a New Release

- Write release files in CepcRelease project
  - Package dependency
  - Package version
  - Package parameters
- Tag CepcRelease with version
- All package versions should be fixed once the new version is released
  - NEVER change the content of a specified version after release
  - If bugs found, create a new patch release. The bugged release could be removed

- JUNO software release procedure for reference



License

- iLCSoft added GPL3.0 license recently
- If package from iLCSoft is modified, it must be open sourced
- Any software must also be open source and licensed under GPL3.0 if using iLCSoft

Discussion

- iLCSoft has been already migrated to github
  - Just use these repositories?
  - Fork to CEPC organization?
- How to define version if we are developing some packages which originated from iLCSoft?
  - Do we need to merge new iLCSoft version?

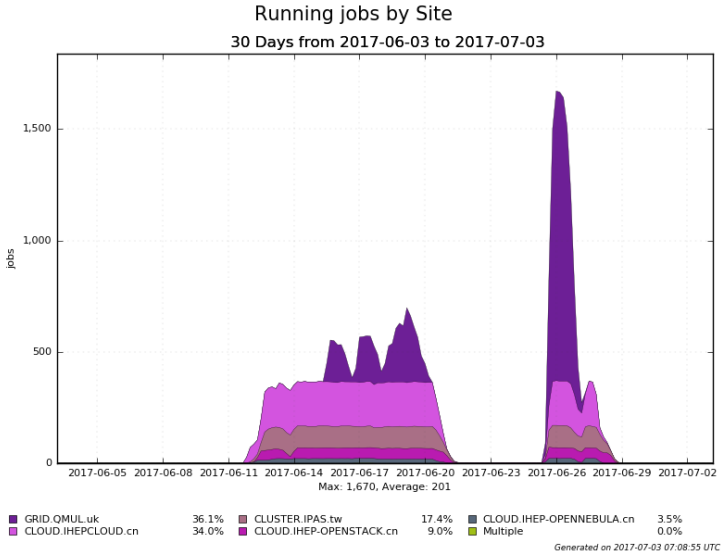
Future Plan

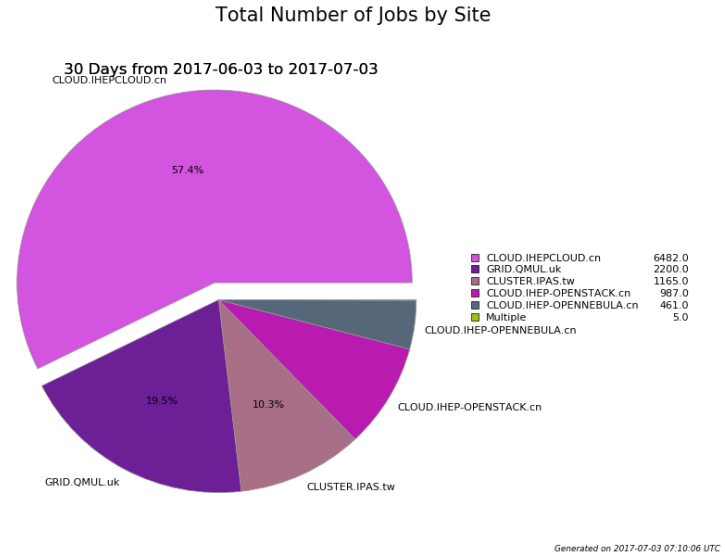
- Develop cepcenv toolkit
- Migrate software to github
- Provide detailed manual on release and development
- Standardize the physics validation for each release

CEPC Jobs Status on Distributed Computing System

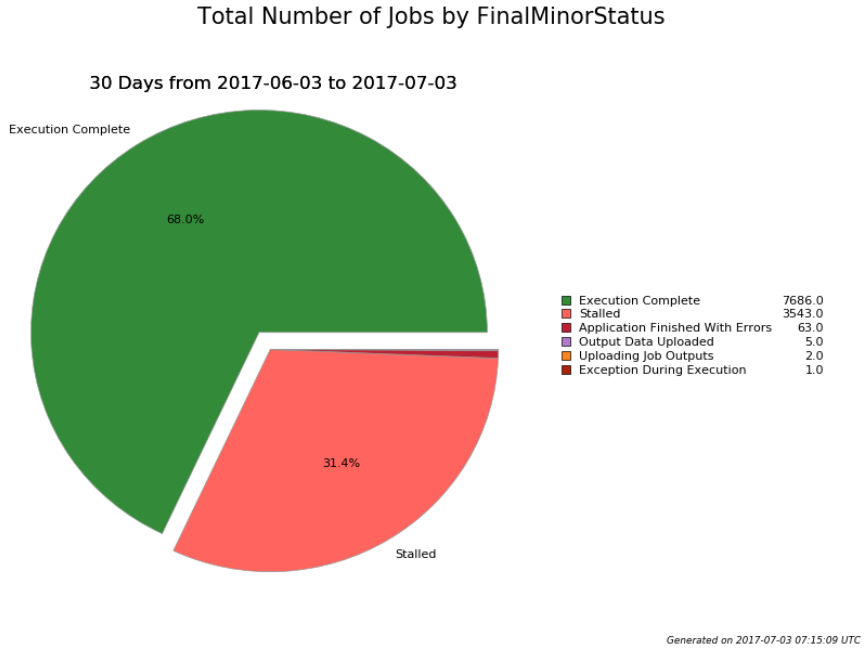
Recent Jobs

- CEPC jobs





- Most failed jobs caused by bug from submission script
- Already fixed



Thanks!