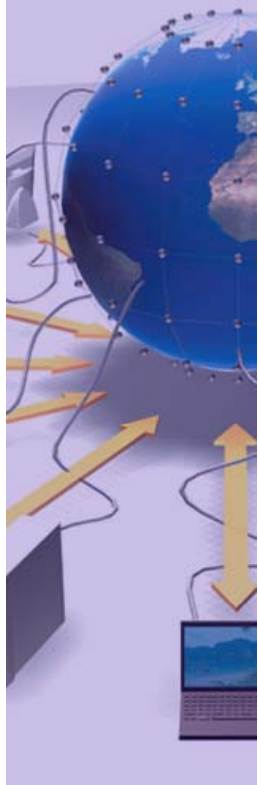# LHCb Software Distribution

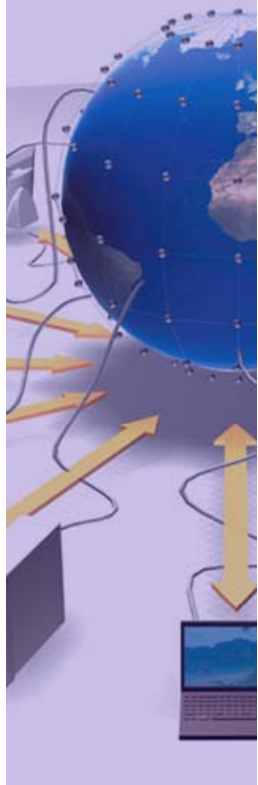## Roberto Santinelli

CERN IT/GS

Outline

- The librarian job: configuration and installation

- The Software Manager job: distribution

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The librarian…

The software, once released by developers, is properly packaged into tarball files by librarians.

The structure of these tarballs reflects the final structure of the distributed application on the site.

Dependencies and conflicts are all managed at this level by expert hands of package managers.

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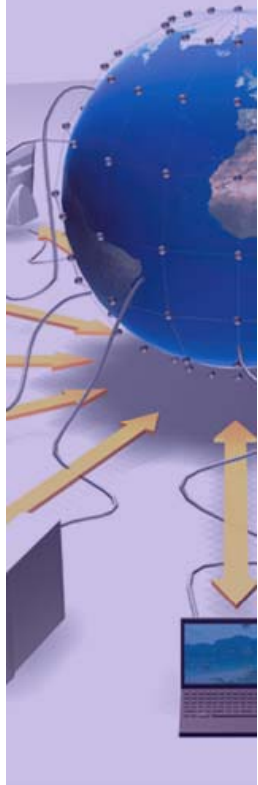
The librarian (cont'd)

- The software is organized in projects.
  - Each project has its version and supported platforms

- Each project is organized in packages
  - A package is the minimum self-consistent quantum of software that can be installed

- Dependencies and conflicts are described in configuration files (with opportune conventions)
  - pre-cooked installation.

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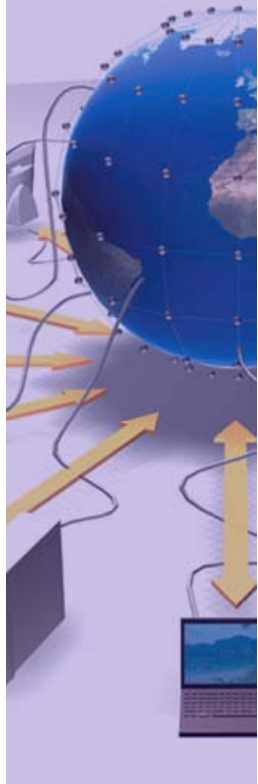
CMT

- LHCb librarians use CMT (**Configuration Management Tool - http://www.cmtsite.org/**)

- *CMT is just an environment that*
  - Defines conventions (for *naming* packages, files, directories and for *addressing* them)
  - Provides tools for *automating* as much as possible the implementation of these conventions.
  - Permits the *description* of the configuration requirements
  - Automatically deduces from the description the effective set of configuration parameters needed to operate the packages (typically for *building* them or for *using* them).
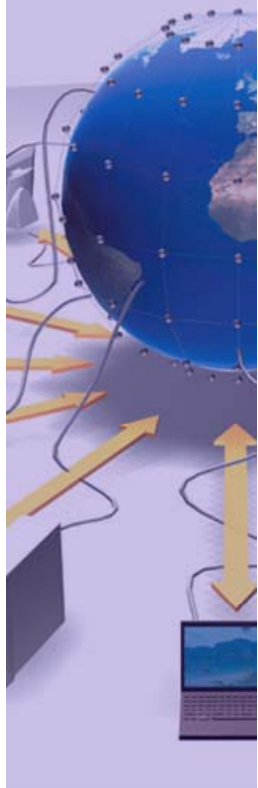
Special Package:LCGCMT

• LCG-AA provides "external" packages containing utilities used by LHCb application (like ROOT,CORAL,POOL, SEAL…). These go into the LCGCMT package that represents then the interface to all non-LHCB specific packages.

• The same mechanism is used now also to deploy grid-middleware clients (gfal/lcg-utils/lfc…) . The motivations:

1. Having a tighter control on their version (guaranteeing stability of the environment as soon as some configuration is demonstrated working fine)

2. Requested features becomes suddenly available instead of waiting for the whole release and deployment cycle that might take a very long time

Done

Installation

- The well structured tarballs from librarians make the installation a <u>trivial operation</u>
  - Wget for downloading the necessary tar files from a web server that sees the LHCb software repository organized in packages *conventionally versioned*
  - Untar the archive into the **Shared Area**
  - Set few environment variables
    - The complexity of the configuration and installation is only translates one step above, at packaging level.
    - The software is compiled in building nodes centrally at CERN and binary are only shipped

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Distribution

SAM framework (<u>now integrated in DIRAC</u>) is used for running *(on a continuous basis)* jobs for distributing and validating software on the sites:

– Dedicated queues/priorities to sgm users → speeding up resource access

– SAM jobs have to run in any case → minimization of resources wasting

– Publication of results → allowing for a better understanding of the installation process

– Pertinence of the activity → software validation/distribution is part of a site monitoring
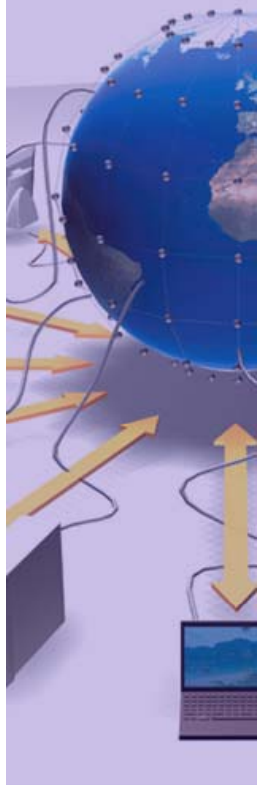
Distribution: workflow

- The job guesses the platform. If fails (because not recognized) it exits.

- The job checks all projects that must be installed (it contacts the central DIRAC Configuration Service that contains all official releases to be distributed)

- The jobs checks which packages are installed and which version/platform

- The job installs the missing packages for completing the requested project installation

- The job validates the software by running the application against few test events