

Software Tools and NOVA Offline Software Upgrade

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09/09/09 NuComp Steering Meeting

Build and Running Environment Tool

Version Control System and Web-Interface

Bug/Issue Tracker

Unit-test

Other tools

NOVA Offline Software Upgrade

Configuration Management Tool -CMT

- ▶ CMT is a very flexible system that organizes
 - ▶ packages and projects (single person to teams, etc.)
 - ▶ versions
 - ▶ consistent files and directories
- ▶ The build process
 - ▶ dependencies, internal and external
 - ▶ multiple platform support
 - ▶ partial software build
 - ▶ override “official” with locally customized code
- ▶ Runtime environment
 - ▶ required variables like PATH
 - ▶ idempotent setup scripts
- ▶ ATLAS (2001, SRT→ CMT), LHCb, HARP, GLAST, Daya Bay, BES III, Auger, Opera, **T2K**, **Minerva**, etc
- ▶ The latest version (v1r20p20090520) has the interface between CMT and Subversion, “cmt checkout” from Subversion repository

CMT Example requirements

- ▶ meta-info. (package, version, etc.)
- ▶ dependencies (use)
- ▶ constituents (libraries, applications, documents)
- ▶ configuraton parameters (macros, environment variables, include search path, etc.)

```

tianxc@-bash ~/nova/nova-trunk/fmstk>cd JobControl/
tianxc@-bash ~/nova/nova-trunk/fmstk/JobControl>l
total 0
drwxr-xr-x 16 tianxc staff 544 Aug 16 13:15 JobControl
drwxr-xr-x 5 tianxc staff 170 Sep 7 16:42 cmt
drwxr-xr-x 3 tianxc staff 102 Aug 15 10:51 doc
drwxr-xr-x 32 tianxc staff 1088 Aug 16 14:57 1388-darwin-gcc40-dbg
drwxr-xr-x 17 tianxc staff 578 Aug 15 10:51 src
drwxr-xr-x 12 tianxc staff 408 Aug 15 10:51 test
drwxr-xr-x 13 tianxc staff 442 Aug 15 10:51 util
tianxc@-bash ~/nova/nova-trunk/fmstk/JobControl>cd cmt/
tianxc@-bash ~/nova/nova-trunk/fmstk/JobControl/cmt>l
total 16
-rw-r--r-- 1 tianxc staff 450 Sep 7 16:42 requirements
-rw-r--r-- 1 tianxc staff 3 Aug 15 10:51 version.cmt
tianxc@-bash ~/nova/nova-trunk/fmstk/JobControl/cmt>cat requirements
package      JobControl
version      v0

branches     cmt doc src

use          EventDataModel    v*
use          IoModules         v*
use          Config             v*
use          XMLInterface       v*

include_dirs ${JOBCONTROLROOT}

library      JobControl    ../src/*.cxx
library      JobControlXML ../xml/*.cxx

macro        JobControl_linkopts "-lJobControl -lXMLInterface "
application  ans ../src/*.cc

apply_pattern linker_library library=JobControl
  
```

Version Control System

- ▶ Subversion
 - ▶ CVS users like it (cvs \rightarrow svn)
- ▶ GIT
 - ▶ has some cool stuff, such as be able to glue CVS and SVN repositories together, etc.
 - ▶ cvs (svn) \rightarrow git works in most cases
- ▶ Daya Bay upgraded from CVS to SVN in 2007

Web-Interface

- ▶ WEBSVN (PHP) - 5-minute to setup
 - ▶ Easy to use interface
 - ▶ Customisable templating system
 - ▶ Colourisation of file listings
 - ▶ Blame view
 - ▶ Log message searching
 - ▶ RSS feed support, etc.
- ▶ Trac¹ - easier installation on newer version Linux using yum
 - ▶ Support Subversion and GIT (GitPlugin)
 - ▶ changesets/revisions diff presentation
 - ▶ Colourisation of file listings
 - ▶ “blame” annotation: who did what?
 - ▶ revision history
 - ▶ Log message searching, etc.

¹<http://trac.edgewall.org/wiki/TracUsers>

WEBSVN - Gaudi

Safari File Edit View History Bookmarks Window Help

WebSVN - gaudi - Rev 5937 - /packages/

https://svnweb.cern.ch/world/wsvn/audi/packages/#path_packages_ RSS Google

Apple Yahoo! Google Maps YouTube Wikipedia News (277) Popular

SUBVERSION REPOSITORIES GAUDI

gaudi Go

[/] [packages/] - Rev 5937

Rev HEAT Go

Changes View Log RSS feed

LAST MODIFICATION

Rev 5936 2009-08-01 11:37:45
Author: marcode

Log message:
Included the latest change in the pre tag of GaudiKernel

Path		Last modification	Log	Tarball	R
distribution/	5932	18d 02h	marcode	View Log	RSS
packages/	5936	17d 13h	marcode	View Log	RSS
Gaudi/	5932	18d 02h	marcode	View Log	RSS
GaudiAlg/	5932	18d 02h	marcode	View Log	RSS
GaudiAud/	5932	18d 02h	marcode	View Log	RSS
GaudiExamples/	5932	18d 02h	marcode	View Log	RSS
GaudiGridSvc/	5683	200d 10h	marcode	View Log	RSS
GaudiGSL/	5932	18d 02h	marcode	View Log	RSS
GaudiKernel/	5936	17d 13h	marcode	View Log	RSS
GaudiMonitor/	5932	18d 02h	marcode	View Log	RSS
GaudiPolicy/	5932	18d 02h	marcode	View Log	RSS
GaudiPoolDb/	5932	18d 02h	marcode	View Log	RSS
GaudiPython/	5932	18d 02h	marcode	View Log	RSS
GaudiRelease/	5932	18d 02h	marcode	View Log	RSS
GaudiSvc/	5932	18d 02h	marcode	View Log	RSS
GaudiSys/	5932	18d 02h	marcode	View Log	RSS
GaudiUtils/	5934	17d 13h	marcode	View Log	RSS
HbookCnv/	5767	113d 05h	marcode	View Log	RSS
PartPropSvc/	5932	18d 02h	marcode	View Log	RSS
RootHistCnv/	5932	18d 02h	marcode	View Log	RSS
projects/	5937	17d 13h	marcode	View Log	RSS

Compare Paths

powered by: WeBSVN 2.2.0

Trac - Daya Bay

Trac - Daya Bay

http://dayabay.ihep.ac.cn/tracs/dybsvn/browser

Offline Software

logged in as dayabay | Logout | Help/Guide | About Trac | Preferences

Wiki | Timeline | Roadmap | **Browse Source** | View Tickets | New Ticket | Search | Tags | Builds Status | Query

Last Change | Revision Log

root

View revision:

Name	Size	Rev	Age	Last Change
data		5673	6 months	bv: Move old muon data files into dedicated data area.
db		2320	20 months	tagg: Some minor edits and attempts at expanding functionality of python (not ...
dybdmz		7045	25 hours	patton: Move into new project
dybgaudi		7060	2 hours	wangzhe: Avoid any query in "world" volume since no touchable history is available ...
dybspade		6898	4 weeks	patton: Prepare for next development cycle
dybsplicer		7045	25 hours	patton: Move into new project
g4dyb		3439	15 months	patton: Adjusted release to point to corrected versionof code
gaudi		7011	7 days	patton: Matched naming convention
groups		5434	7 months	ww: 1. bring the archived minimal conical geometry to minimal by removing the ...
Installation		7032	26 hours	patton: Updated to be more general
logcmt		7019	7 days	kboddy: Add tag for RHEL.
ldm		5879	4 months	bv: Branch for upgrade.
legacy		4017	12 months	jliu: Added a more realistic Ge68 positron/gamma generator. Jianglai
lhcb		7012	7 days	patton: Note: cmt/version.cmt is completely wrong, this tag based on LHCBsys v26r2 ...
NuWa		7017	7 days	patton: Defined contents of release
people		7058	13 hours	jetter:

Find: ☒ Match case

Done

Bug/Issue Tracker

- ▶ Mantis - written in the PHP and works with MySQL, MS SQL, and PostgreSQL databases and a webserver (abandoned).
- ▶ Trac - Trac is an enhanced wiki and issue tracking system for software development projects.
 - ▶ Search - changesets (r1234), tickets (#123), wiki, etc.
 - ▶ Assigning ticket to milestone, setting the “component”, allows prioritization

Tour of Bug/Issue Tracker features of Trac - Daya Bay

Page 5-15 supplementary documents “NuWa Trac and Test System” given by Simon C. Blyth for the Offline Tutorial, IHEP Beijing, Dec. 15th 2008.

Unit-test

- ▶ Standardized testing - a natural part of development
- ▶ A simple test is the best possible bug report - maximizing fix probability
 - ▶ Nose - A popular python test finding/running package
 - ▶ Bitten - Bitten is a Python-based framework for collecting various software metrics via continuous integration. It builds on Trac to provide an integrated web-based user interface.
 - ▶ Master - Subversion Trac instance
 - ▶ Slaves - Any machine capable of running NuWa, with nosebit installed

Unit-test - Daya Bay

Page 18-22 supplementary documents “NuWa Trac and Test System” given by Simon C. Blyth for the Offline Tutorial, IHEP Beijing, Dec. 15th 2008.

Other Trac features on Page 23.

Others Tools

- ▶ Twiki (IHEP)
- ▶ DocDB (IHEP)
- ▶ Swish-e and/or htdig for searching (IHEP)
- ▶ ELOG (IHEP & LBNL [mirror])
- ▶ MySQL database (LBNL)
- ▶ MediWiki and Doxygen (BNL)
- ▶ Spade for data transfer (stolen from IceCube)
- ▶ Picasa (Google) for pictures (Detector fabrication, Civil construction, Detector commissioning, etc)

novainst

- ▶ Steal from Daya Bay ([dybinst](#))
- ▶ [novainst](#) - automatic build system for external and internal packages
 - ▶ Pulls down CMT, builds and installs - manages the build and runtime environment
 - ▶ Downloads and installs all external packages
 - ▶ Checks out and builds FMWK ²
 - ▶ Checks out and builds NOνA's CMT project - novafmwk ³
- ▶ A local SVN repository to hold the novainst package and FMWK, novafmwk, LCGCMT.

²ROOT reflex directory problem needs to be fixed

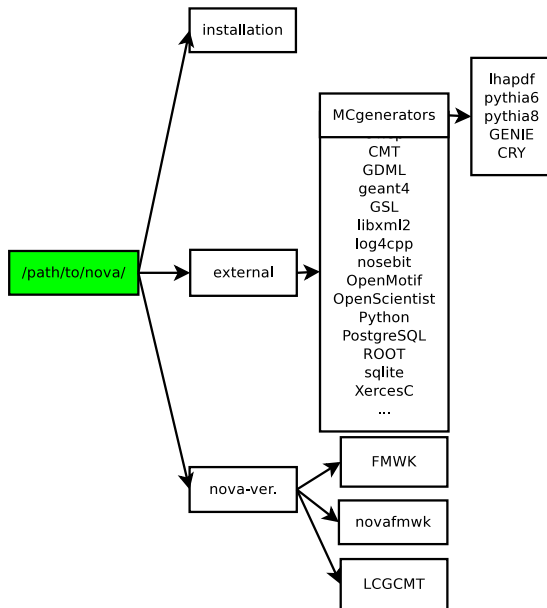
³ROOT reflex directory problem needs to be fixed as in FMWK

externals

- ▶ Each package handled by a dedicated sub-script
- ▶ Driven by LCGCMT requirements files, adapts to new versions
- ▶ Allows patching or platform-specific builds where needed
- ▶ Flexible - new packages can be integrated very easily
 - ▶ clhep CMT GDML geant4 GSL libxml2 log4cpp nosebit OpenMotif Openscientist Python PostgreSQL ROOT sqlite XercesC
 - ▶ MCGenerators
 - ▶ pythia6 ⁴ lhpdf GENIE CRY
 - ▶ pythia8 is optional for future upgrade
 - ▶ AIDA is optional for physics analysis

⁴Steal Robert's build_pythia6.sh

Offline Software Hierarchy



Offline Upgrade Schedule - tentative

- ▶ Auto-installation package (**novainst**) externals (**done**)
- ▶ FMWK (SRT) → FMWK (CMT?) - (**in progress**)
- ▶ novasoft (SRT) → novafmwk (CMT?) (**in progress**)
- ▶ Integrate the FMWK and novafmwk auto-build into **novainst** (**done**)
- ▶ Setup SVN (GIT) + Trac (?), etc at Fermilab
- ▶ Immigrate SVN (GIT), Trac (?) etc. to FNAL and stop using CVS
- ▶ Offline workshop/tutorial in Oct. (or next Jan.) Collaboration meeting
- ▶ Unit test implementation

Backup slides

- ▶ Redmine
 - ▶ Support SVN and GIT
 - ▶ Hudson and CruiseControl
 - ▶ Need to learn Ruby and Ruby-on-rails