SL5 for the Experiments

LCG GDB, May 13th 2009

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Agreed Initial Strategy

- The AF agreed on the following strategy to maximize the probability to have validated experiment software ready when sizeable resources will be in the form of SL5
  1. Verify that the existing SL4 (gcc-3.4) binaries run normally in SL5
     - Should allow running "old releases" of experiment software unchanged on SLC5
     - Ensure that all needed backward compatibility modules in the current SLC5 distribution
  2. Produce a native build for SL5 with gcc-3.4 and verify that it works properly
     - We do not expect any major work here since the code runs correctly with this version of the compiler.
     - → not being followed and going directly to (3)
  3. Native builds for SL5 and gcc-4.3 (skipping the native version 4.1 of gcc)
     - gcc-4.3 is a better compiler (more strict, better performance) and probably will keep it for a while
     - LCG-AA nightly build needed to be made fully operational for SL5
     - We expected most of the problems here: code adaptations, full data validations, etc.
     - Requires middle-ware client libraries to be made available for gcc-4.3

1-Existing SL4 (gcc-3.4) binaries

- Incompatibilities with SELinux module affecting
  - ROOT/Cintex (trampoline code)
    - fix available starting from ROOT 5.18-00e (Oct-2008)
    - older experiment software will not run unless hot-patches are applied
  - Oracle client library (-fPIC missing)
    - Waiting for a patch/new release from Oracle (October???)
    - Affecting Tier-1/Tier-0 mainly
  - CERNLIB and some Generator libraries(-fPIC missing for 32 bit)
    - New (static) libraries are being made
    - Requires re-building old experiment software (e.g. generators)
- Compatibility libraries
  - Identified the required libraries (e.g. libcrypto, libssl,…)
  - Not decided yet on its deployment mechanism
    - Experiments could add them in their distribution
    - As a meta-RPM distributed by LCG/GD
- Making gcc-3.4 available on SLC5 systems

1-Status

- ATLAS
  - Would like to distinguish (a) SL5, (b) SL5 with SELinux partially disabled (*allow_execheap*)
  - No production release is compatible with (a)
  - Fully compatible with (b) (as long as the necessary compatibility libraries RPM is installed)
  - The first release compatible with (a) (15.2.0) is expected next week. Validated for production before September.
- CMS
  - They are now compatible with (a)
    - By deprecating legacy releases, back-porting patches to older release series and updates to new release series
  - Not in favor to have sites messing around with the default settings for SELinux
    - Likely to be not possible in all sites and to avoid divergence of configurations

1 – Status

- LHCb
  - No problem with (a) for analysis of existing MC data, and for the ongoing MC production based on LCG_55c (since January 2009)
    - Older releases will not be able to run on (a)
    - Still needs to be resolved and tested the distribution of the compatibility libraries
- ALICE
  - No problem

3-Native builds for SL5 with gcc-4.3

- Quite a lot of effort porting the C++ code
  - The compiler is quite different and generates more warnings and errors
- Availability of 'external' libraries has been an issue
  - So far libraries for gcc-4.1 are compatible
  - Some affected also by SELinux (Oracle client, CERNLIB)
- Requires a unified approach for the installation or shipping the gcc-4.3 compiler or libraries

3 – Status and Plans

- ATLAS
  - The goal is to have a full native build by next week (deployed on the GRID by ~August 2009)
  - Will continue to produce binaries for SL4 and SL5 concurrently
  - Inclined to retain the existing default (SLC4/gcc34/32-bit) as primary platform until after the 2009-2010 physics run
- CMS
  - Finished native port 64 bit/SL5. Everything builds, basic tests seem okay, will proceed to full validation.
  - Rather switch from SL4 to SL5 binaries in one go at their convenience
- LHCb
  - Port not yet finalized (not yet a complete working release)
  - Plan is to use native SL5/gcc43/64bit for the real data and the corresponding MC productions
- ALICE
  - No problem. They would like to see the transition to 64 bits/SL5 to happen as soon as possible

Slow Migration

- Delays in making SL5 build servers available to the collaborations
  - Instabilities (AFS, acron, CVS, etc.)
  - Slow reaction from service/support groups
  - E.g. still today ATLAS misses some build servers
- Changed policy (w.r.t. SLC4) on what is installed by default – minimalistic installation
  - Discovering the missing pieces one-by-one
  - Configuring individual systems differently (heterogeneity)
- Slow identification of problems and response from 'owners' of external libraries
  - Oracle, CERNLIB

Summary

- CMS, LHCb and ALICE expect to run SL4 binaries in SL5/64bit systems smoothly
- ATLAS requires to disable (partly) SELinux in order to run in compatibility mode
  - I guess this is a GDB issue
- Remaining issues still to be tackled
  - Distribution of SL4/SL5 compatibility libraries
  - gcc-4.3 compiler installation (or distribution of runtime libraries)
- As long as the experiments primary platform is SL4, the interactive services (e.g. lxplus), Grid UI, build servers need to be maintained (and the 'alias')
  - They do not plan to build/prepare SL4 binaries on SL5 systems

Additional Personal Thoughts

- What SL5 brings to the application software?
  - So far I have not seen any benefit
  - I have seen work, slow progress and a bit of frustration
- Synchronize computer center migration schedules with experiments schedules is very hard
  - Often a chicken-and-egg problem
  - Not obvious if we can agree among the experiments (VOs)
- The solution is called Virtualization
  - A virtual appliance to decouple host OS from the OS services required by the application (e.g. CernVM)
  - Experiments could "customize" what OS they need
- Workshop on "Adapting applications and computing services to multi-core and virtualization" in June
  - http://indico.cern.ch/conferenceDisplay.py?confId=56353