

PROOF Status and Plans

G. Ganis, CERN, PH-SFT

ALICE Software week, CERN, 25 June 2009





- Scheduling features (see Jan's talk)
- Plug-in improvements
 - New binary '[xproofd](#)' running the 'XrdProofd' protocol by default
 - Simplify setups when data-serving is not needed
 - Allows to disentangle problems related to a given protocol
 - Enable [variable substitution](#) in configuration files
 - [Improved configuration flexibility](#)
 - New directives (xpd.port, xpd.datasetsrc, ...)
 - support for placeholders <uid>, <gid>, <user>, <group>, <host>, <homedir>, <workdir> in 'xpd.putenv'
 - More flexibility in using proof.conf
 - Dynamic validation (used by Anar's PoD)
- Many consolidation fixes
 - Several fixes in the GSI authentication plug-ins



- Described in

http://xrootd.slac.stanford.edu/doc/dev/Syntax_config.htm

- Allows to write constructs like this

```
# global setting
set gPath = /pool/proofbox

# Use gPath everywhere
xpd.workdir $gPath
xpd.sec.protocol gsi -dlgpxy:1 \
    -exppxy:$ (gPath) /<user>/ .creds/x509_u<uid>
```



- Enable **schema evolution**
 - Controlled by Proof.SchemaEvolution <bool>; default 1
- Add possibility to control **message compression**
 - Controlled by ProofServ.CompressMessage <level> ; default 0
- Optimized **transfer of results**
 - Small objects are **bufferized** up to 1 MB
 - Controlled by ProofServ.MsgSizeHWM <bytes>
 - Relevant, e.g., when working with a lot (1000s) of 1D histos
- Optimized **merging for histograms**
 - Merged in one go at the end instead of one-by-one
 - Much more efficient
- Progress **counter** for the **merging** phase
 - Visible if you run, e.g., the ProofSimple tutorial

```
root [] p->Process("tutorials/proof/ProofSimple.C", 1000000)
...
Mst-0: merging output objects ... / (4 workers still sending)
```



We found and fixed two serious issues with the implementation of TTreeCache in PROOF

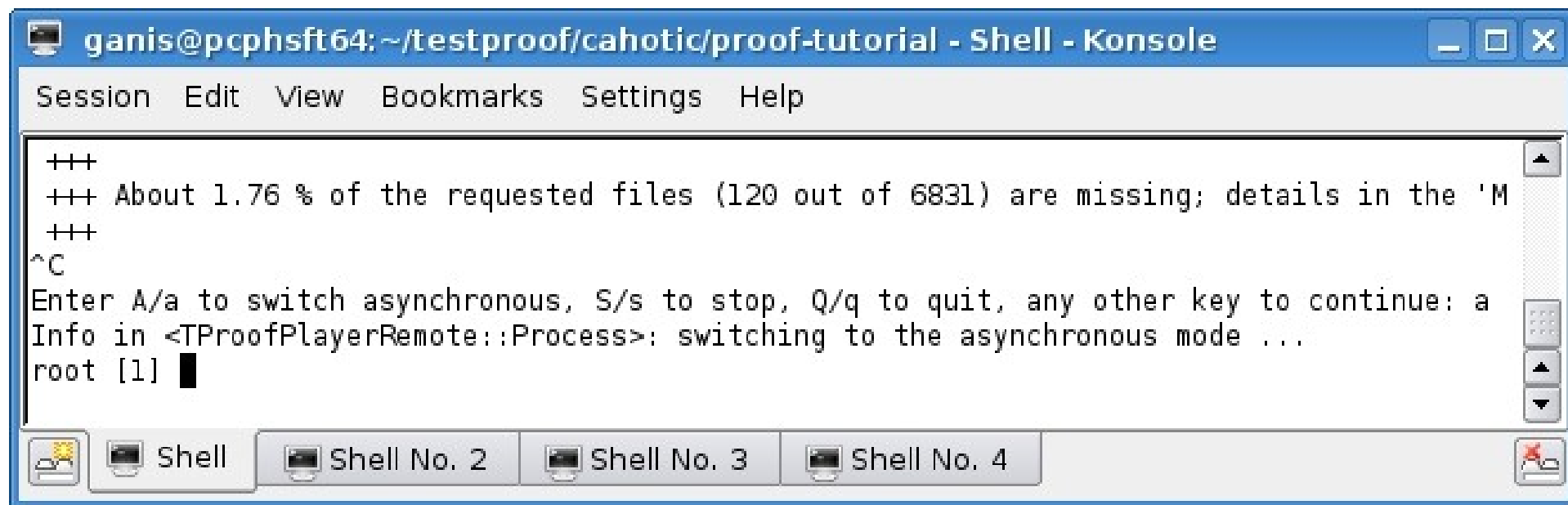
- The call to **TTreeCache::SetEntryRange**, needed to avoid reading too much on the workers, was re-initializing each time the cache, making it de facto ineffective
- The cache initialization for local files is completely wrong and causes a **crash when moving to a remote file** (this forced on CAF the use of 'TFile.ForceRemote 1' which now can be removed)
 - Problem fixed on PROOF, not yet for local TChain processing



- Add possibility to **switch to asynchronous mode** when running synchronously
- New static **TProof::LogViewer(...)** providing a graphic interface to log files
 - **Optimized log retrieval**
- Add support for **automatic** running of a session under **valgrind**
- Improved dataset manager API
 - New methods **ExistsDataSet** and **SetDataSetTreeName**
 - Search information per-server
- Set of **scripts** for quick interaction with the **dataset manager** (under etc/proof/utils/pq2)



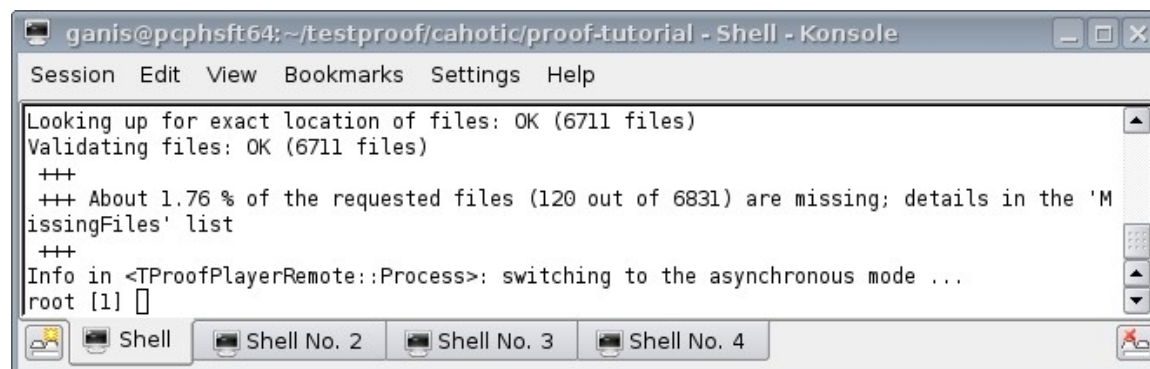
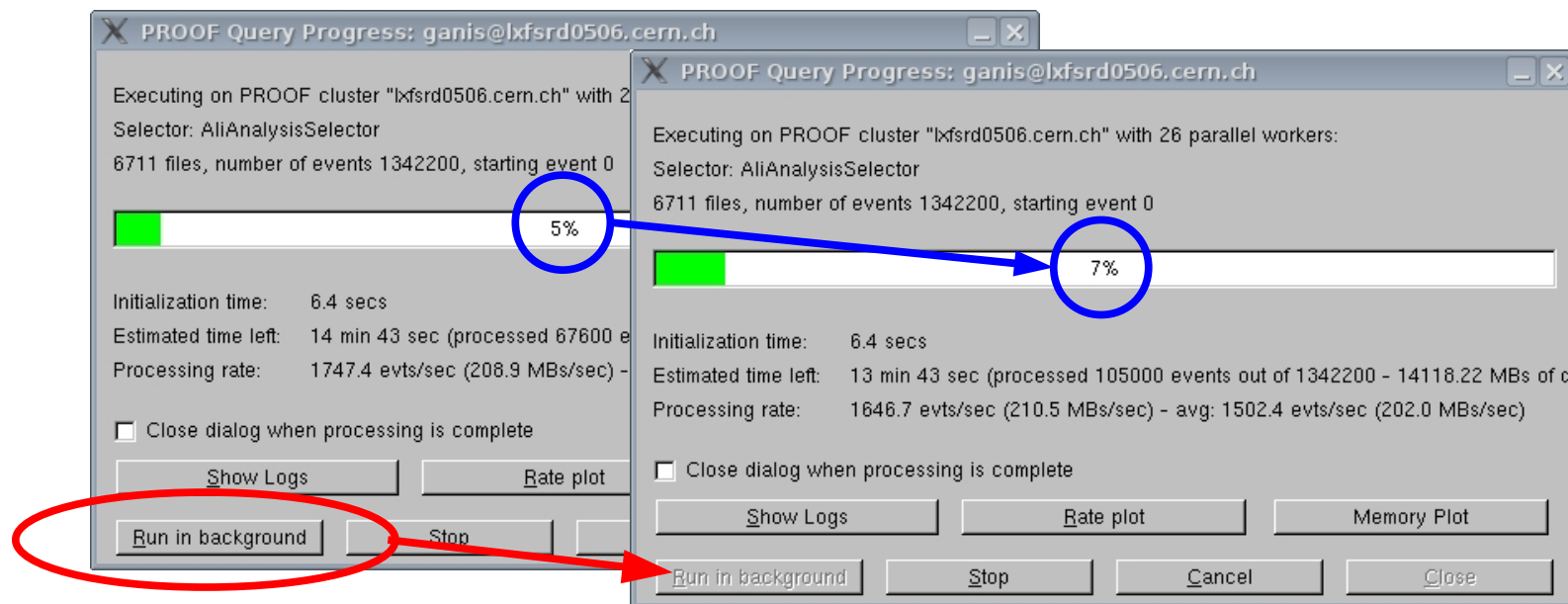
- Gives the prompt back for other actions, including disconnecting to retrieve the results later on
- On the command line
 - Do 'Ctrl-C' and answer 'A'



```
ganis@pcphsft64: ~/testproof/cahotic/proof-tutorial - Shell - Konsole
Session Edit View Bookmarks Settings Help

+++
+++ About 1.76 % of the requested files (120 out of 6831) are missing; details in the 'M
+++
^C
Enter A/a to switch asynchronous, S/s to stop, Q/q to quit, any other key to continue: a
Info in <TProofPlayerRemote::Process>: switching to the asynchronous mode ...
root [1] █
```

- On the progress dialog
 - Hit the “Run In Background” button





- The **results** of the queries run in asynchronous mode are kept **on the master**
- Just reconnect and run **TProof::ShowQueries("A")**
 - However, currently, task based AliAnalysisManager require loading of the PARs and of the task before ShowQueries, otherwise you get streaming errors; being investigated
- **Finalize** the query according to the number given by ShowQueries



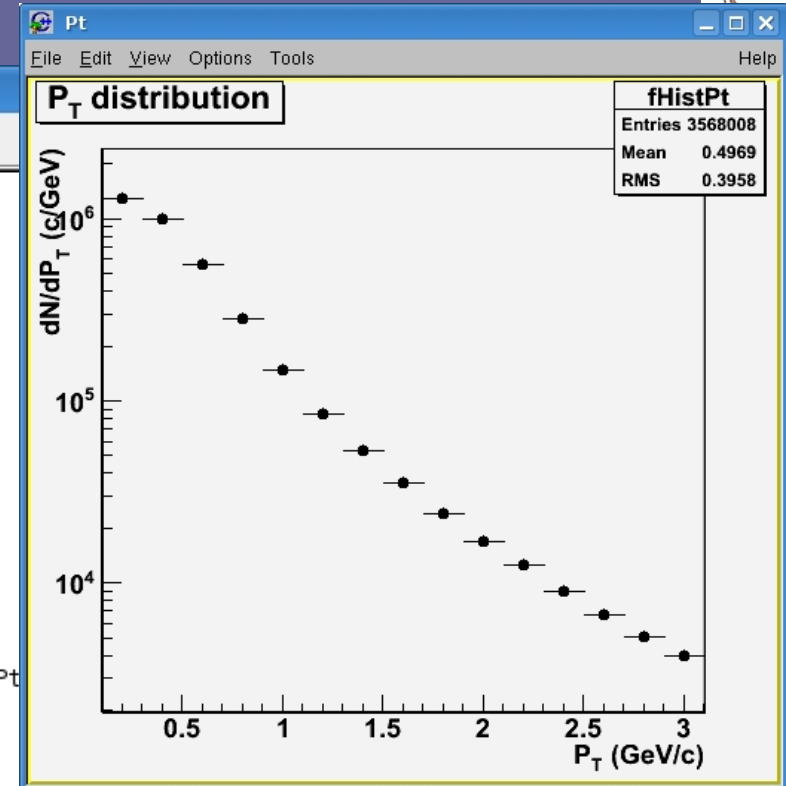
ganis@pcphsft64:~/local/root/trunk/root - Shell No. 4 - Konsole

Session Edit View Bookmarks Settings Help

```

root [0] p = TProof::Open("ganis@alicecafe.cern.ch:31093")
Starting master: opening connection ...
Starting master: OK
Opening connections to workers: OK (26 workers)
Setting up worker servers: OK (26 workers)
PROOF set to parallel mode (26 workers)
(class TProof*)0xc03b00
root [1] p->EnablePackage("STEERBase")
make: `libSTEERBase.so' is up to date.
...
root [2] p->EnablePackage("ESD")
make: `libESD.so' is up to date.
...
root [3] p->EnablePackage("ANALYSIS")
make: Nothing to be done for `default-target'.
...
root [4] p->Load("AliAnalysisTaskPt.cxx+g")
12:27:57 10007 Mst-0 | Info in <TXProofServ::HandleCache>: loading macro AliAnalysisTaskPt
...
root [5] p->ShowQueries("A")
+++
+++ Queries processed during other sessions: 9
+++ #:1 ref:"session-lxfsrd0506-1245741044-3255:q1" sel:AliAnalysisSelector stopped evts:0-189216
+++ #:2 ref:"session-lxfsrd0506-1245742416-9932:q1" sel:AliAnalysisSelector completed evts:0-193799
+++ #:3 ref:"session-lxfsrd0506-1245759790-32682:q1" sel:ProofSimple completed evts:0-99999999
+++ #:4 ref:"session-lxfsrd0506-1245760702-2073:q1" sel:ProofSimple completed evts:0-99999999
+++ #:5 ref:"session-lxfsrd0506-1245760702-2073:q2" sel:ProofSimple completed evts:0-99999999
+++ #:6 ref:"session-lxfsrd0506-1245760994-2970:q1" sel:AliAnalysisSelector stopped evts:0-56709
+++ #:7 ref:"session-lxfsrd0506-1245761214-4379:q1" sel:AliAnalysisSelector completed evts:0-193799
+++ #:8 ref:"session-lxfsrd0506-1245923052-2827:q1" sel:AliAnalysisSelector stopped evts:0-562657
+++ #:9 ref:"session-lxfsrd0506-1245924014-5923:q1" sel:AliAnalysisSelector completed evts:0-1342199
+++
+++ Queries processed during this session: selector: 0, draw: 0
+++
root [6] p->Finalize(2)
Mst-0: sending result of session-lxfsrd0506-1245742416-9932:q1 (21.8 KB)
...
<-AliAnalysisSelector::Terminate()
(Long64_t)0
pcphsft64:~/local/root/trunk/root $

```



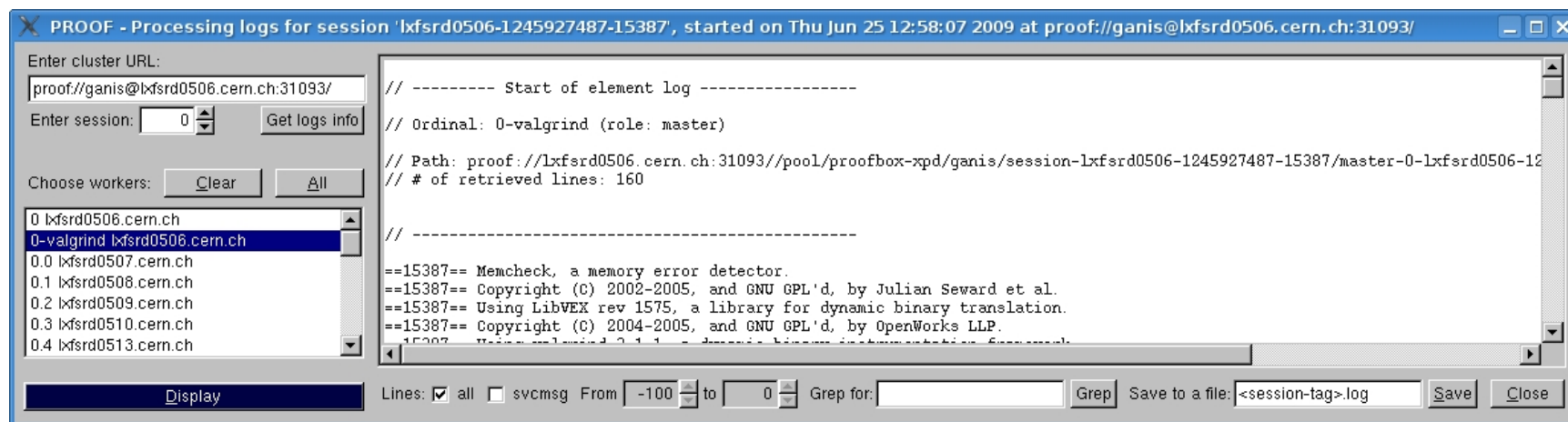


- Allows to open the log window without being running a session
- Just type **TProof::LogViewer("alicecaf.cern.ch")**



- New features
 - Optimized retrieval
 - Retrieve only when asked and what asked
 - Human readable query starting time in the title bar
 - Can start several log windows and compare logs from different sessions

- Automatically start Master or Workers under valgrind
 - TProof::Open("alicecaf.cern.ch", "valgrind=master")
 - TProof::Open("alicecaf.cern.ch", "valgrind=workers")
- Internal timeouts and log paths are automatically set
 - But not check (yet) for valgrind availability and for debug symbols in ROOT
- Results are available via the log window



- Remarks
 - Two workers sessions by default: to get N use "workers#N"
 - Use TProof::AddEnvVar("PROOF_WRAPPERCMD", "valgrind_opts:<opts>") to add options to the valgrind command, e.g. --leak-check=full
 - May need to go out and in again to get the full log



- Consolidation
 - Cache and package handling (cache-, package-managers)
 - Documentation
 - Improved **test** and **benchmark** suites
- Server-side specific
 - **Automatic re-reading** of the config file
 - No need to restart when changing some config options
 - **Worker discovery** using 'bonjour'
 - Experience with recent interface in ROOT
 - Generalize the **multi-user option**
 - Disentangle it from the password file in su mode
- New features
 - Merging via dynamically determined **sub-mergers**
 - Running on **multiple datasets** in either 'joined' or 'separated' modes
 - Multiple entry lists is a subcase of the 'separated mode'
- Issues w/ multi-master setups
 - Dataset management, Dynamic setup



Thank you. Questions?





- TPackageManager
 - Support for versions and dependencies
 - Optimized distribution of packages
- Worker auto-discovery
- Worker pre-emption (scheduling)
- Admin interfaces to TProofMgr:
 - ShowSessions
 - KillSessions
- Redundant master setup
 - Sandbox (partial) sharing
- Issues w/ multi-master setups
 - Dataset management
 - Dynamic setup