



**ALICE**

# Infrastructure for QA and automatic trending

F. Bellini, M. Germain

ALICE Offline Week, 19<sup>th</sup> November 2014

# Production detector QA



**The detector QA is run centrally on the Grid during the reconstruction / production (cpass1, vpass1, ppass1, special passes, MC...)**

- the QA train contains wagons from each detector + PWGPP wagons (tracking, PID, Physics Selection, ...)
- it runs on ESs only
- the output is a single (merged) file per run, "QAresults.root"
- QAresults.root is stored for each run in AliEn together with the reconstruction or production output (e.g. /alice/data/2013/LHC13b/000195483/ESs/cpass3/)

**The QA validation is done by the detector experts + PWGPP QA:**

- each detector expert post-processes the QA train output to produce a run-wise trending of the main observables
  - Privately / locally at the Home Institutes
  - Output stored privately or in a TWiki
- The trending is discussed at the PWG-PP QA meetings
- A feedback is provided on the Jira ticket for that production

# The key points



## ① Producing the trending

- done by each detector/group (Run I)
- for all detectors/groups the input is the same file
- Done for all productions, it evolved to a standard procedure

## ① Storing the output of the trending

- Collect in one place information now scattered in Twiki, slides, RCT, emails, ...
- Collect the output of detector QA (trending plots, ...) currently stored privately
- Allow to correlate information from different detectors
- Ease access to information of QA users and standardize access to the QA data

# QA repository overview



**Twiki:** <https://twiki.cern.ch/twiki/bin/viewauth/ALICE/CentralQaRepository>

**Last report:** <https://indico.cern.ch/event/323580/contribution/8/material/slides/1.pdf>

- Structured AFS-Web based central QA repository at CERN under the responsibility of the QA group
- For **old productions** each detector has to copy **manually** the trending outputs JIRA (with sub-tasks): <https://alice.its.cern.ch/jira/browse/PWGPP-27>
- For **new productions** (2010, 2012 re-production, run2) the repository will be filled **centrally**
  - scripts for automatic trending + generation of the folder structure + Web pages borrowed from the TPC procedure at GSI (*M. Krzewicki , M. Ivanov, A. Tarantola, J. Wagner* )
  - Detectors have implemented/adapted trending macros  
JIRA (with sub-tasks): <https://alice.its.cern.ch/jira/browse/PWGPP-41>
  - **Available scripts in AliRoot: TPC, TOF, T0, EMC, FMD, MU, PHO, ZDC,TRK,V0**
  - **Detectors still missing: ITS, TRD, PMD**

# AFS Web space - details



- **CERN web pages based on AFS**

AFS Home: </afs/cern.ch/user/a/aliqa<det>> (10 GB)

AFS Workspace: </afs/cern.ch/work/a/aliqa<det>> (100 GB)

- base folder that will collect the QA trending output, to be published on the web
- Conventions described in the Twiki

## **QA moderator (aliqamod)**

- has read/write permissions in all detectors repositories
- can add other people to do administration of QA page
- PWG-PP-QA conveners for the moment
- create folder structure according to agreed convention
- Launch automatic scripts + other possible central services...
- Service task in Run II ?

## **Users = detectors have one service account and one “Web <DET> QA” each**

- Username: **aliqa<detector>**: e.g aliqatpc
- the service account is the owner of the AFS home and workspace
- each service account is owned by an expert
- Individual users with permissions are defined by each detector/group
- Non-expert users (eg. analysers) will not access AFS space, just Web pages

# People responsible for detector accounts



System/group	Service account	Owner( ** ), other moderators
QA moderator	aliquamod	Francesca Bellini**, Andreas Morsch
ITS	aliquaits	Stefania Beole **, Riccardo Russo
TPC	aliquatpc	Attilio Tarantola, Marian Ivanov**, Jan Wagner
TRD	aliquatrd	Ionut Arsene**, Julian Book
TOF	aliquatof	Francesca Bellini **, Annalisa De Caro
HMPID	aliquahmp	Marco Tangaro **, Giacomo Volpe
PHOS	aliquapho	Dmitri Peressunko **, Boris Polishchuk
EMCAL	aliquaemc	Marie Germain **, Alexandre Shabetai, Gustavo Conesa Balbastre
V0	aliquav0	Brigitte Cheynis **, Cvetan Cheshkov
T0	aliquat0	Alla Maevskaya**
FMD	aliquafmd	Christian Holm Christensen, Valentina Zaccolo**
PMD	aliquapmd	Satyajit Jena**
MUON	aliquamu	Cynthia Hadjidakis, Diego Stocco**
ZDC	aliquazdc	Chiara Oppedisano, Marco Leoncino**, Nora De marco
PID	aliquapid	Jens Wiechula**, Pietro Antonioli, <a href="mailto:alice-pwg-pp-pid-qa@cernSPAMNOT.ch">alice-pwg-pp-pid-qa@cernSPAMNOT.ch</a>
Tracking	aliquatrk	Marian Ivanov**, Ruben Shahoyan, Philippe Pillot
Event Selection	aliquaevs	Alexander Kalweit**, Sandro Bjelogrljic, Zaida Conesa del Valle
Calibration	aliquacal	Marian Ivanov**, Chiara Zampolli
Monte Carlo	aliquamc	Indranil Das, ???

# Repository structure

$\$PATH = \$prefix / \$datatype / \$year / \$period / \$reco\ pass / \$suffix$

$\$prefix = http://cern.ch/aliqa<DET>$

$\$datatype = "data" / "sim"$

$\$year = 2013, 2012, 2011, 2010, \dots$

$\$period = \text{e.g. LHC13b, } \dots$

$\$reco\ pass = cpass1, vpass1, ppass1, ppass2, \dots, muon\_calo, \dots$

$\$suffix$  can be one or more of the following

same naming  
convention and folder  
structure as AliEn

## ProductionQA

- post-processed output of the QA train during reco passes and/or central productions
- should be filled by every detector
- trending of QA variables
- controlled by the QA group + report to QA meetings

## ExpertQA

- additional information for the users or for internal purposes
- no limit except quota limits.

## Calibration QA

- mainly trending of calibration variables
- controlled by the Calibration group

# Repository content



## Trending output (basic output)

- naming convention
  - standard output is a TTree named "trending"
  - TTree contains the trending variables and the run number as the primary key
  - TTree in a ROOT file named **<\$suffix>.trend.root** (<suffix>= ProductionQA, CalibrationQA, ExpertQA ...)
  - any other file with custom object <obj> (eg. histograms, Tgraph, ... ) named after **<\$suffix>.<obj>.root**, eg. "ProductionQA.plot.root"
- This format is input for (common?) scripts for variable correlation analysis
- Correlate with production info (Jira: <https://alice.its.cern.ch/jira/browse/ALIROOT-4345>)
- Other custom outputs will be allowed

Examples:

TPC: <http://aliquatpc.web.cern.ch/aliquatpc/>

FMD: <http://aliquafmd.web.cern.ch/aliquafmd/>

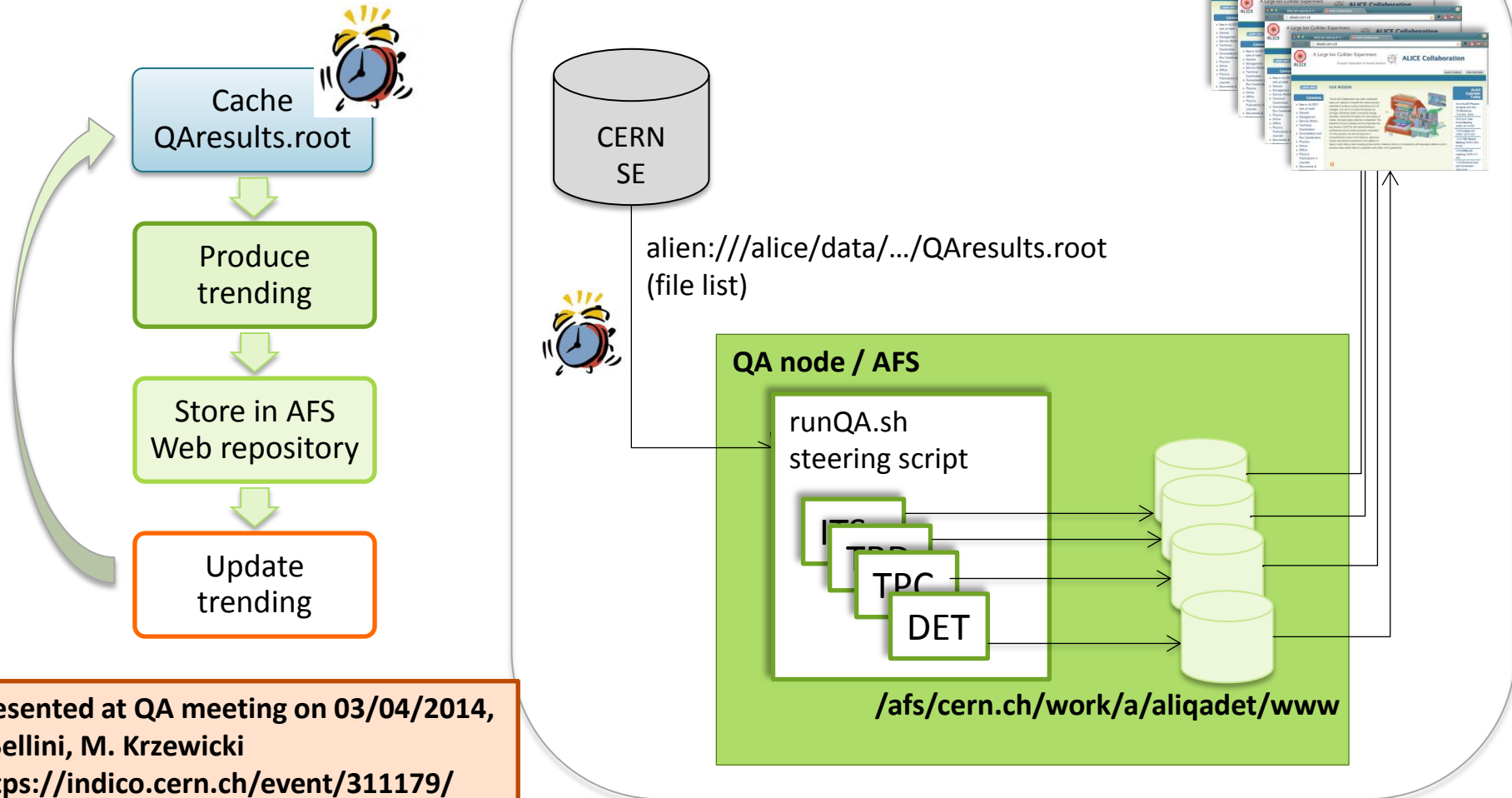
TOF: <http://aliquatof.web.cern.ch/aliquatof/>

Event selection: <http://aliquaevs.web.cern.ch/aliquaevs/>



# Automatic trending data flow

Draft schema for the data flow



Presented at QA meeting on 03/04/2014,  
F.Bellini, M. Krzewicki  
<https://indico.cern.ch/event/311179/>

# Automatic QA trending / QA node



Dedicated QA node at CERN to host caching of the QA output and automatic trending procedure

*thanks to Dario B.*

- Based on VMs on the CERN Agile Infrastructure (Cloud)
- Shared Cloud Service Project “ALICE Quality Assurance”
  - E-group of project members: alice-pwg-pp-qa-admin
  - Owner, ie primary account name of the person owning the project: fbellini
  - Requested Virtual Machine quota
    - Number of virtual machines = 4
    - Number of cores =16
    - RAM (GB) = 256
  - Requested Volume quota
    - Amount of diskspace [GB] = 1024 GB
    - Number of volumes = 10
- ALICE software environment loaded from CernVM-FS
  - Latest Analysis Tag to be used, to include latest versions of the trending macros/scripts
- Synch to AFS repository via automatically renewable AFS token
  - **Limitation:** AFS token can be renewed automatically up to 5.days, then manually
  - Alternative solution: use sshpass

# aliqa1.cern.ch



aliqa1 specifics:

- 4 VCPUs
- 80GB disk (max.) → needed for caching the QA outputs
- 8 GB RAM
- SLC6 CERN

Accounts

- **aliqadummy@aliqa1** only for tests
- **aliqaoperator@aliqa1**
- Grid Certificate for **aliqamod** installed

ALICE software loaded via CVM-FS

- Dario Berzano's instructions: <https://dberzano.github.io/alice/install-aliroot/cvmfs/>
- Installation of CVMFS done as root on aliqa1
- Loading of aliroot done as user aliqaoperator on aliqa1

# What is still missing



- ① one person assigned to (service) task or running QA trending on the VM as aliqaoperator
  - For now, tests on the VM are run by M. Germain and F. Bellini
  - Service task
  
- ② Cron jobs for QA output synching for daily operations
  - not there due to lack of time and busy schedules
  - In place for Run 2, at the latest