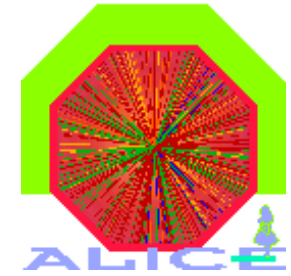# Status of the Shuttle Framework

Alberto Colla
Jan Fiete Grosse-Oetringhaus

ALICE Offline Week
2. - 6. October 2006
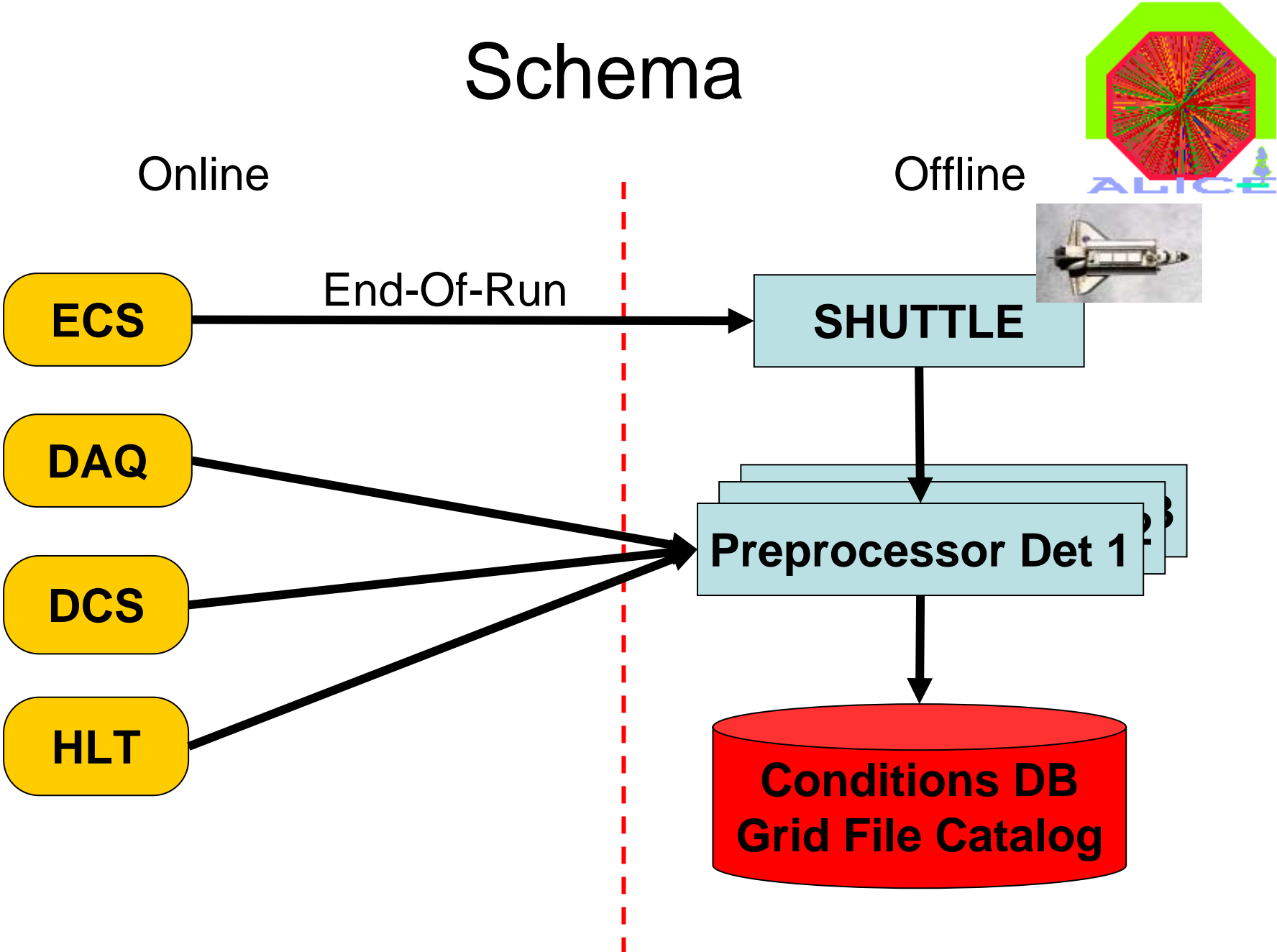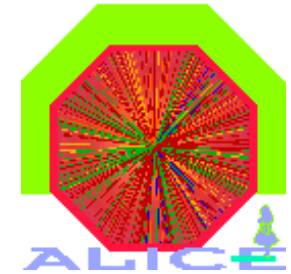
Content

- The Shuttle
- Recent developments
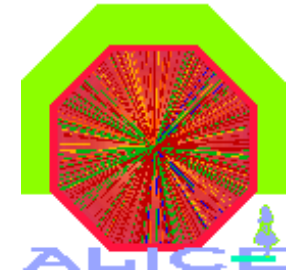- Demo
- Todo list

Concept

- Online machinery is shielded by firewalls

- Conditions data produced online has to be extracted online

→ Shuttle collects data at end of run and puts it into the Condition DB

Schema

Online

Offline

ECS →(End-Of-Run)→ **SHUTTLE**

DAQ

DCS

HLT

Preprocessor Det 1
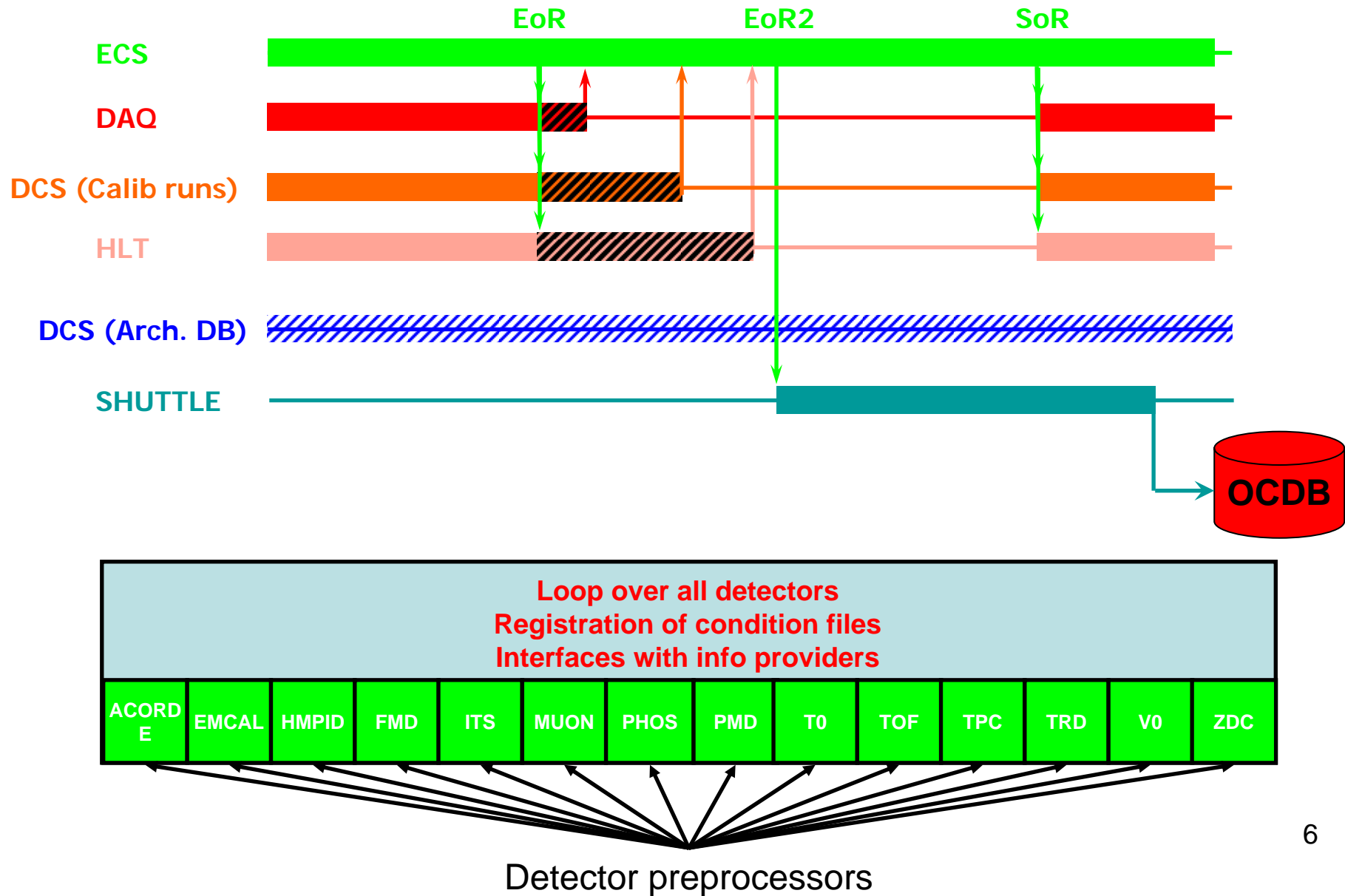
Conditions DB Grid File Catalog
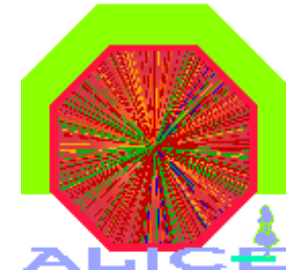
Sub-detectors preprocessor

- Runs inside the Shuttle

- Is executed once for each finished run

- Gets information from the DAQ LB and DCS

- Retrieves files produced by calibration routines running in DAQ, DCS, HLT online machines

- Processes data (ROOTifying, summarizing, fitting, ...)

- Writes results into Conditions DB

- No alternative system to extract data (including online calibration results) between data-taking and first reconstruction pass!

Sequence diagram

EoR   **EoR2**   **SoR**

ECS

DAQ

DCS (Calib runs)

HLT

DCS (Arch. DB)

SHUTTLE

OCDB

Loop over all detectors
Registration of condition files
Interfaces with info providers

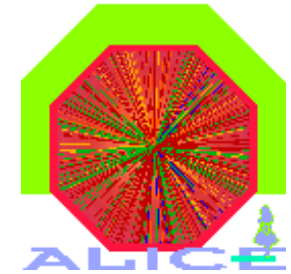| ACORDE | EMCAL | HMPID | FMD | ITS | MUON | PHOS | PMD | T0 | TOF | TPC | TRD | V0 | ZDC |

Detector preprocessors

Developments since June

- DAQ File eXchange Server (FES=FXS) interfaced
- DCS, HLT agreed, but not implemented yet
- Checksum added to FXS tables
- Support for calibration runs
- Log file per sub detector
- Online/ Offline naming conversion (see next slides)
- Status system / Crash recovery (see next slides)
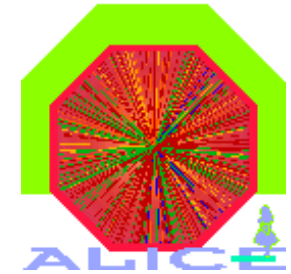- Introduction of reference data (see next slides)

Reference Data

- Data stored in OCDB is divided into two logical categories

- Conditions data (CD)
  - Data needed for reconstruction
  - E.g. calculated calibration values (pedestals, drift velocities)
 - Is replicated to all sites participating in reconstruction
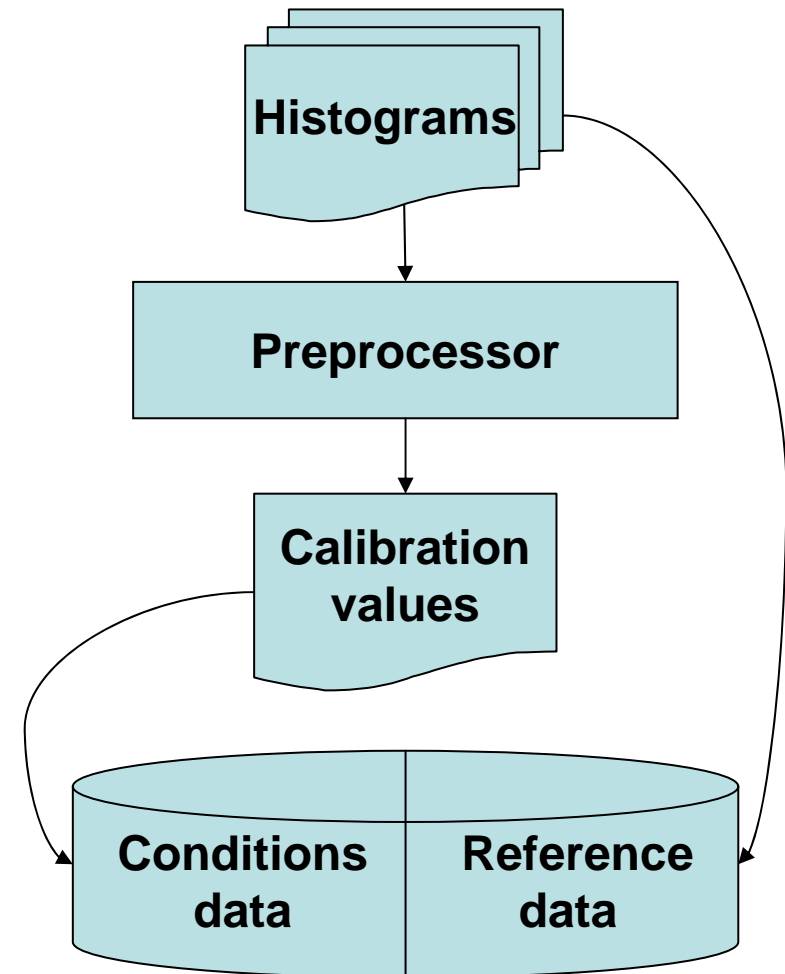
Reference Data (2)

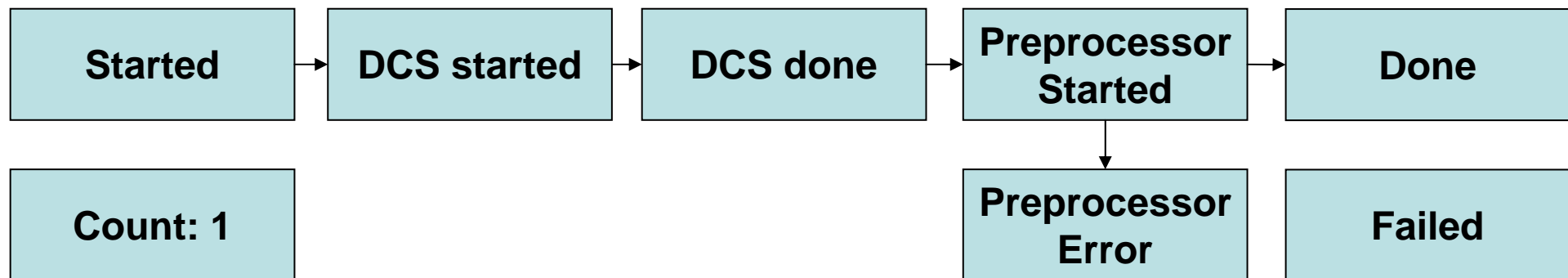- Reference data (RD) (optional)
  - Optional data that can be used to understand the origin of the calibration values
  - E.g. input for calculation of calibration values (histograms, ...)

- Usually size(CD) << size(RD): Estimated sizes of both are to be submitted to Yves Schutz for the calibration readiness tables (please check this)

- Both are stored safely in the Grid and accessible by the CDB framework

Status System / Crash Recovery
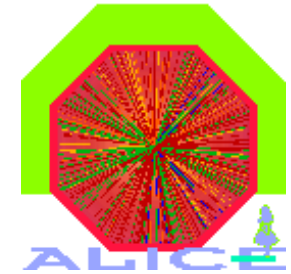
- Detailed status is stored locally
 - Processing status per sub detector (e.g. receiving DCS values, running preprocessor)
  - Crash recovery at startup (only not processed sub detectors are processed)
  - Crash count: After a maximum number of crashes this run is skipped for this sub detector

| Started | → | DCS started | → | DCS done | → | Preprocessor Started | → | Done |

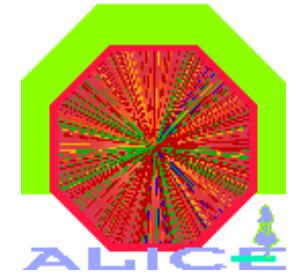| Count: 1 | | | | | | Preprocessor Error | | Failed |

Status System / Crash Recovery (2)

- Global status is stored in a MySQL table in DAQ
  - Contains simplified status per run and sub detector
  - Could be included in the global ALICE monitoring

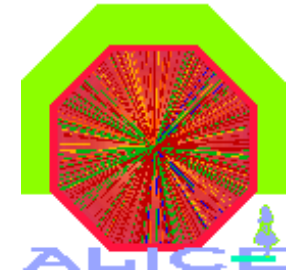| Inactive	Unprocessed	Done
		Failed
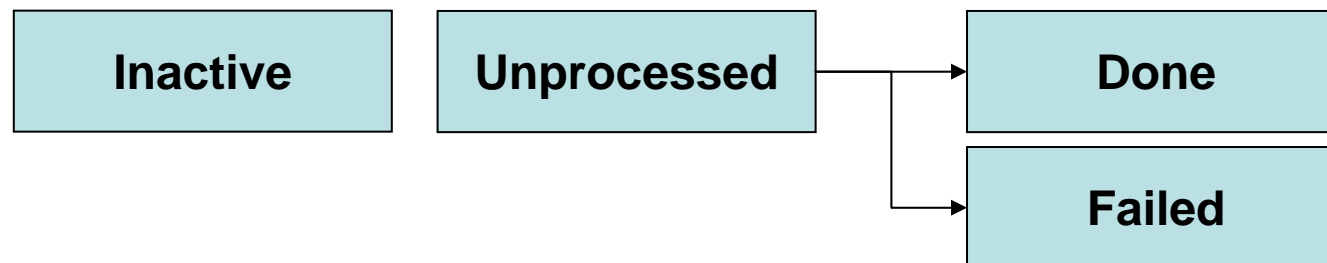
Changes in the interface

- **Store(pathLevel2, pathLevel3, object, metaData, validityStart, validityInfinite)**
  - Full path can be specified:
    <DET>/<**pathLevel2**>/<**pathLevel3**>
  - **validityStart** dates validity back w.r.t. current run (default: 0)
  - **validityInfinite** dates this data valid until infinity (or until a newer version is stored), needed for calibration runs (default: kFALSE)
- **StoreReferenceData(pathLevel2, pathLevel3, object, metaData)**
  - Used to store reference data, stored for current run

Online vs. Offline Naming

- Preprocessors are to be implemented following the online naming (https://edms.cern.ch/document/406393/1)

- Put online name in constructor of your preprocessor

- Several preprocessors for 3 sub detectors:
  - ITS: SPD, SDD, SSD
  - MUON: MCH (muon tracker), MTR (muon trigger)
  - PHOS: PHS, CPV (charged particle veto)

- The Store() function of the Shuttle converts the naming → e.g. AliITSSPDPreprocessor::Store saves in the namespace of ITS

Open Issues
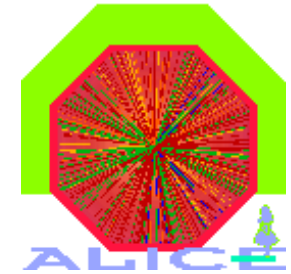
- **Is it needed that a preprocessor reads from the OCDB?**
  - Preprocessor that needs data from OCDB can only run when Grid connection is available
  - Data from previous run might not yet be available (no strict ordering of runs currently)

- **Is validityStart needed?**
  - Data from an older run might overwrite data from newer run (no strict ordering of runs currently)
  - How would a sub detector define the value for validityStart? (e.g. the magnetic field could have been changed before this run)

Demo

- 2 preprocessors, 2 runs
  - For the second run one of the preprocessors will fail because it misses a file in the file exchange server

- 4 runs of the Shuttle
  - 1. We simulate the Grid is not working, the resulting files are stored locally
  - 2. The Grid is working, the already created files are uploaded
  - 2. - 4. The second run for one preprocessor is repeated because it failed before, until the maximum number of retries is exceeded

Todo list

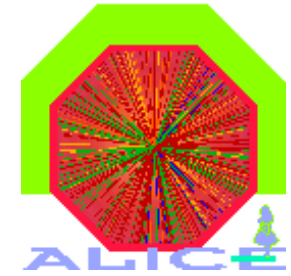- All information from the DAQ Logbook available to the preprocessor (run type, ...)

- Monitoring process that aborts Shuttle if a preprocessor gets stuck

- Shuttle status website
  - Status of Shuttle processing per run
  - Log files per sub detector
  - Mail sent to sub detector expert if preprocessor fails

- Full test system by the end of this year
  - Nightly runs with the preprocessors from AliRoot HEAD

Reminder to sub detectors

- Provide preprocessor
  - Communicate size of produced data to Yves Schutz
    http://aliceinfo.cern.ch/static/Documents/Computing_Board/R.htm
  - Commit preprocessor into CVS
  - Communicate list of DCS data points to Shuttle team

- Provide input data for full test setup
  - Give input files to Shuttle team
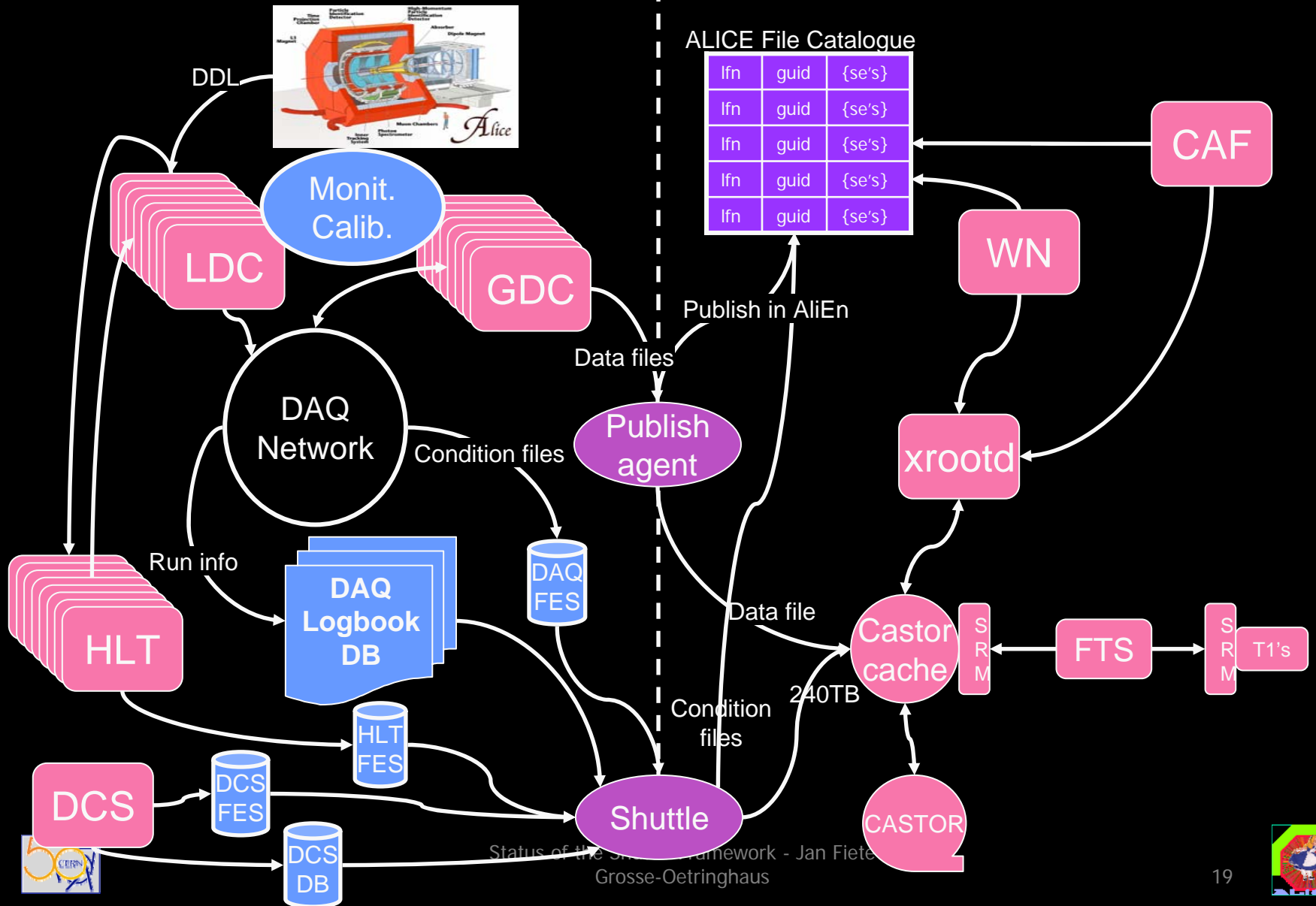 - Give simulated list of DCS values to Shuttle team

Backup

High-level dataflow

Online ← → **Offline**

DDL

Monit. Calib.

LDC

GDC

DAQ Network

Run info

DAQ Logbook DB

Condition files

DCS

DCS FES

HLT FES

HLT

DAQ FES

ALICE File Catalogue

lfn	guid	{se's}
lfn	guid	{se's}
lfn	guid	{se's}
lfn	guid	{se's}
lfn	guid	{se's}

Publish in AliEn

Data files

Publish agent

Data file

Condition files

240TB

Shuttle

DCS DB

CAF

WN

xrootd

Castor cache

S R M

FTS

S R M

T1's

CASTOR

CTP

TRG

LTU

HLT

E C S

DET

DCS

LDC's

DAQ

GDC

Run1 ¦ Path ¦ OK
Run2 ¦ Path ¦ OK
...

Run1
Run2
...

RUN LgBk

FS Table

1. EOR notification
2. Query Logbook for Run nb
3. Query FS table for file path
4. Collect files
5. Process and store files in CDB
6. Send Status flag

File
System

SHUTTLE

CDB
Grid FC

1

2

3   6

4

5

Status of the Shuttle Fra...
Jan Fiete Grosse-Oetringhaus