

PDP/EPN Shifter Instructions

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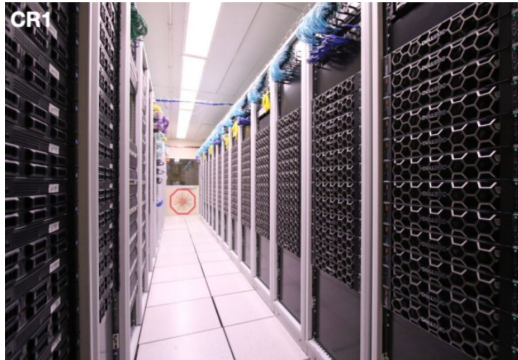
Disclaimer

- This is a brief introduction to PDP/EPN and the services which are available at the moment
- A new shift class will be set up in July or August (when more tools are available) which will be **mandatory to attend even after following this class** for future shifts

ALICE online-offline processing

200 First Level Processors (**FLP**) in CR1

(The CRUs are installed here)



1) Readout of detectors and raw data processing

(e.g. TPC baseline corrections, ZS)

3.5 TB/s → 600 GB/s

250 Event Processing Nodes (**EPN**)

(Each node equipped with 8 GPUs)

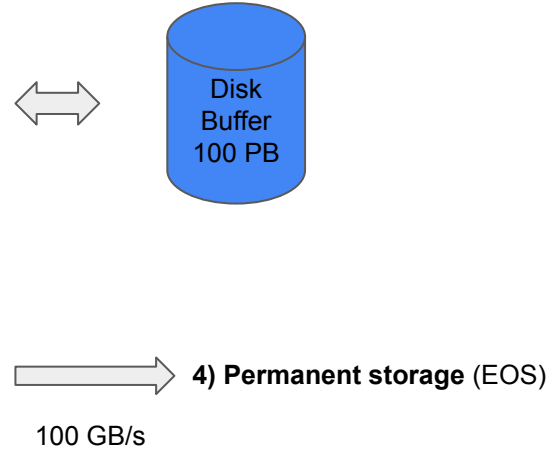


2) Synchronous processing

- Event / time frame building
- Online reconstruction and calibration

3) Asynchronous processing

- Final calibration
- Full reconstruction



PDP responsible for software running on these servers, not the hardware itself (more details on next slide)



ALICE O2-EPN

https://alice-collaboration.web.cern.ch/menu_proj_items/O2-EPN

The Alice O2 Event Processing Nodes (EPNs) consists of 250 servers, each with 2 AMD Rome 32 core CPUs, 512 GB RAM, 8 AMD MI50 GPUs with 32GB memory each, as well as an Infiniband HDR network interface. The main purpose and the driving design factors of the cluster are the real-time online reconstruction capabilities during Alice Pb-Pb data taking. The EPNs get up to 635 GB/s of zero suppressed detector data as input. Most of this data comes from the Time Projection Chamber (TPC). The EPNs use General Purpose Graphics Processing Units (GPGPUs) to do a full reconstruction of the data, to get the total data size down to ca. 100 GB/s, so it can be stored in our disk buffer. While the experiment is not taking data, the cluster is used as an analysis facility, reading the data from the disk buffer for additional processing and physics analysis.

Project Leader: Volker Lindenstruth



ALICE O2-PDP

https://alice-collaboration.web.cern.ch/menu_proj_items/O2-PDP

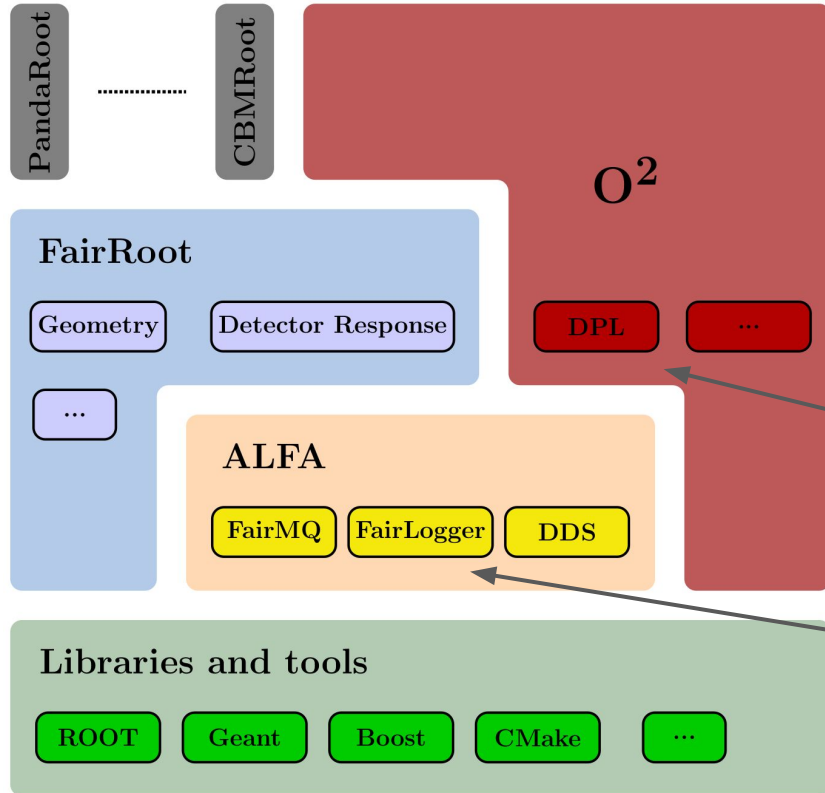
The **Physics Data Processing** project is in charge of providing the common software infrastructure (build, test and deployment tools), software components and frameworks for the calibration, reconstruction, simulation, analysis, and visualization for the ALICE Online/Offline Upgrade (O2). It is also providing an interface to the conditions database (CCDB) and is in charge of overall data management, including the disk storage buffer. It develops and operates the distributed computing infrastructure that combines the computing and storage capacity of the ALICE computing facility at P2 with the WLCG.

Organized in 8 Work Packages:

- WP3 Common Tools and System Infrastructure (Ivana Hrivnakova)
- WP4 O2 Software Framework (Giulio Eulisse)
- WP9 Event Display (Julian Myrcha)
- WP10 Calibration and Constant Data Base (Costin Grigoras)
- WP12 Detector Simulation (Roberto Preghenella, Sandro Wenzel)
- WP13 Reconstruction and Calibration (Ruben Shahoyan, Chiara Zampolli)
- WP14 Analysis and Facilities (Peter Hristov, Jan Fiete Grosse-Oetringhaus)
- WP15 Data Management (Latchezar Betev)

Project Leader: Andreas Morsch

PDP nomenclature



Our main software framework O2 depends on various other software & tools

Data Processing Layer is the core O2 framework (build on top of FairMQ)

We use this to generate log messages

Monitoring tools

- The monitoring services are currently under development and will be added here in the near future
 - E.g. grafana dashboards – overall EPN status view for shifter
- At the moment we have the InfoLogger service available to monitor DPL processes running on the EPNs

How to connect to the CERN network (GPN)

To access the GPN from home you will need to configure a SOCKS proxy:

https://security.web.cern.ch/recommendations/en/ssh_browsing.shtml

There are many ways to achieve this, for example on linux with the Firefox:

```
oschmidt@lenovo: ~  
oschmidt@lenovo:~$ ssh -D 8080 lxtunnel.cern.ch -N -l marten  
Password:  
[REDACTED]
```

1)

*Also possible in Windows and of course macOS!
See link for detailed HowTos*

Connection Settings

Configure Proxy Access to the Internet

☐ No proxy

☐ Auto-detect proxy settings for this network

☒ Use system proxy settings

Manual proxy configuration

HTTP Proxy Port

☐ Also use this proxy for FTP and HTTPS

HTTPS Proxy Port

FTP Proxy Port

SOCKS Host Port

☐ SOCKS4 ☒ SOCKS v5

☐ Automatic proxy configuration URL

No proxy for

Example: mozilla.org, net.nz, 192.168.1.0/24

Connections to localhost, 127.0.0.1/8, and ::1 are never proxied.

☐ Do not prompt for authentication if password is saved

☐ Proxy DNS when using SOCKS v5

☐ Enable DNS over HTTPS

Use Provider Cloudflare (Default)

Help Cancel OK

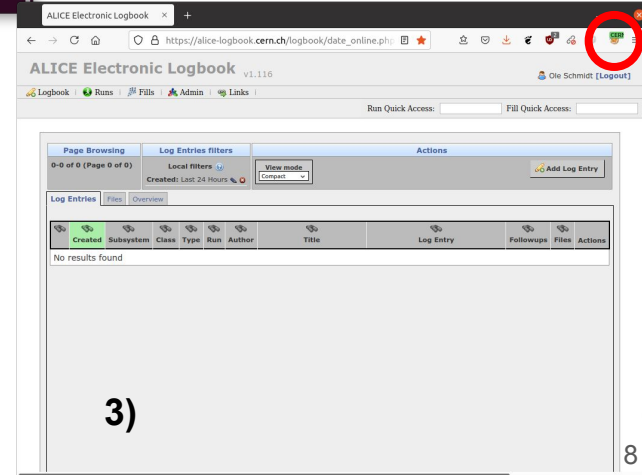
Port 8080

localhost

2)

- 1) Start proxy
- 2) Configure browser
(In Firefox go to Settings → General → Network Settings)

- 3) Reach services in GPN



InfoLogger

- You will need to be connected to GPN
- Access the logger at <http://alihlt-gw-prod.cern.ch:8081/>

Filter messages by severity

Click to query logs

InfoLogger - Alice 02 08

Query Live Clear

Debug Info Warn Error Fatal

1k 10k 100k Reset filters

Date Time Hostname Rolename PID Username System Facility Detector Partition Run ErrCode ErrLine ErrSource Message

from match

to exclude

Sev...	Time	Rolename	Syste...	Facility	ErrCo...	Message
E	16:01:33.223		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:01:33.227		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:01:33.335		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:01:33.373		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:01:33.385		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:01:33.430		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:01:33.488		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:31:46.968		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:31:47.172		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:31:47.782		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:34:03.006		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:34:03.007		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	15:35:55.709		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	15:35:55.711		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:03:39.564		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:03:39.570		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:09:24.111		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:09:24.120		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:12:28.693		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:12:28.694		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use
E	16:14:55.790		QC	ServiceDiscovery		ServiceDiscovery.runHealthServer - bind: Address already in use

3845 messages (loaded out of 3845 in 0.07 second(s)) 0 debug 0 info 0 warn 3833 error 12 fatal

SELECT * FROM `messages` WHERE `severity` IN (E,F,...)

☐ Autoscroll ☐ Inspector