



Marie Curie Early Stage Trainee Program at CERN

EST Fellow : Lionel Wallet, CERN

Supervisor : Andre Augustinus, CERN

Alice Detector Control System



MARIE CURIE ACTIONS



About me...



-
- Lionel Wallet, 26 y.o.
 - Nationality : French
 - Studies : Master Degree in Engineering.
 - Skills : Control System / Software Engineering
 - EST Fellow at CERN since August 2006
 - Integration of the Alice Controls Coordination Team



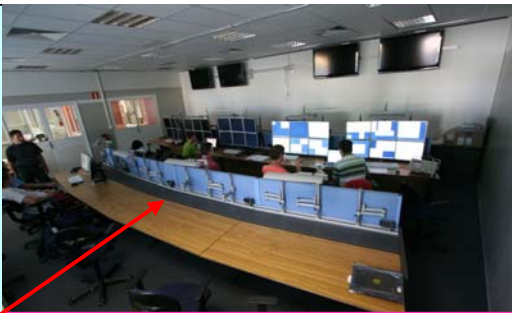
Marie Curie Fellowship



My work in 3 Key Words....

COORDINATION
DEVELOPMENT
SUPPORT

ALICE environment



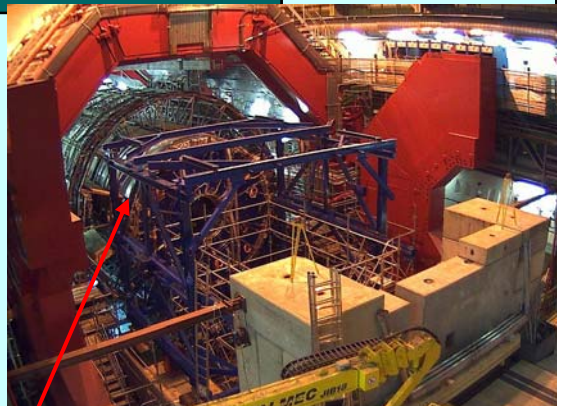
ALICE Control Room
operator consoles

Counting rooms
computer farms
databases

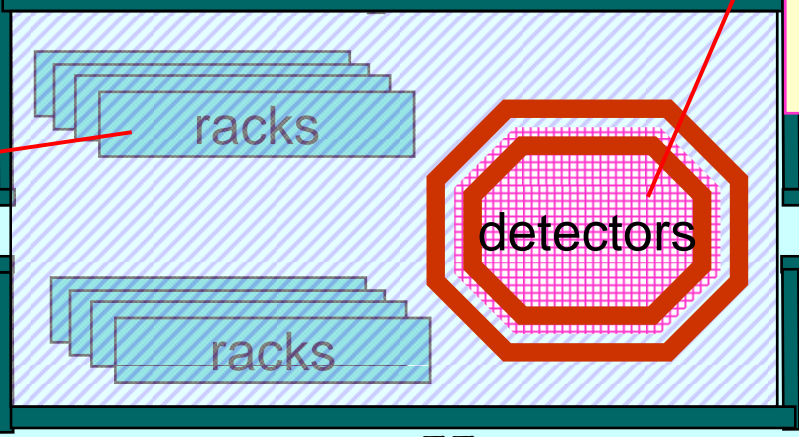
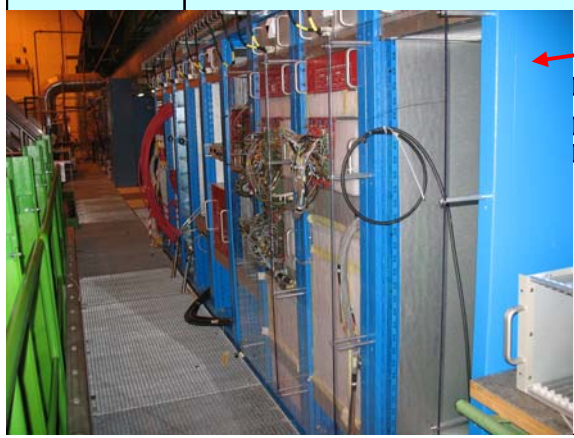
ACR

DAQ
HLT
Control

Experimental cavern



~ 50m



Detectors
strong magnetic field

← BEAM

~ 55m



Control Context



External Systems

- Accelerator
- Offline

- ECS
- Trigger
- DAQ
- HLT

Safety

- DSS
- CSAM

Controls Back-end

Services

- Gas
- Electricity
- Cooling
- Magnets
- Access

Infrastructure

- B-field
- Space Frame
- Beam Pipe
- Environment
- Radiation

18 detectors

SPD SDD SSD TPC TRD TOF HMP PHO FMD TO VO PMD MTI MTK ZDC ACO

~150 sub-systems



System Layer



ALICE
Control
Room

operator



counting
room

Operator Node

PVSS
D

Ethernet

Worker Node

D
PVSS

HV OPC

HV Devices

CANbus

Worker Node

D
FVSS

LV OPC

LV Devices

Ethernet

...

Worker Node

D
FVSS

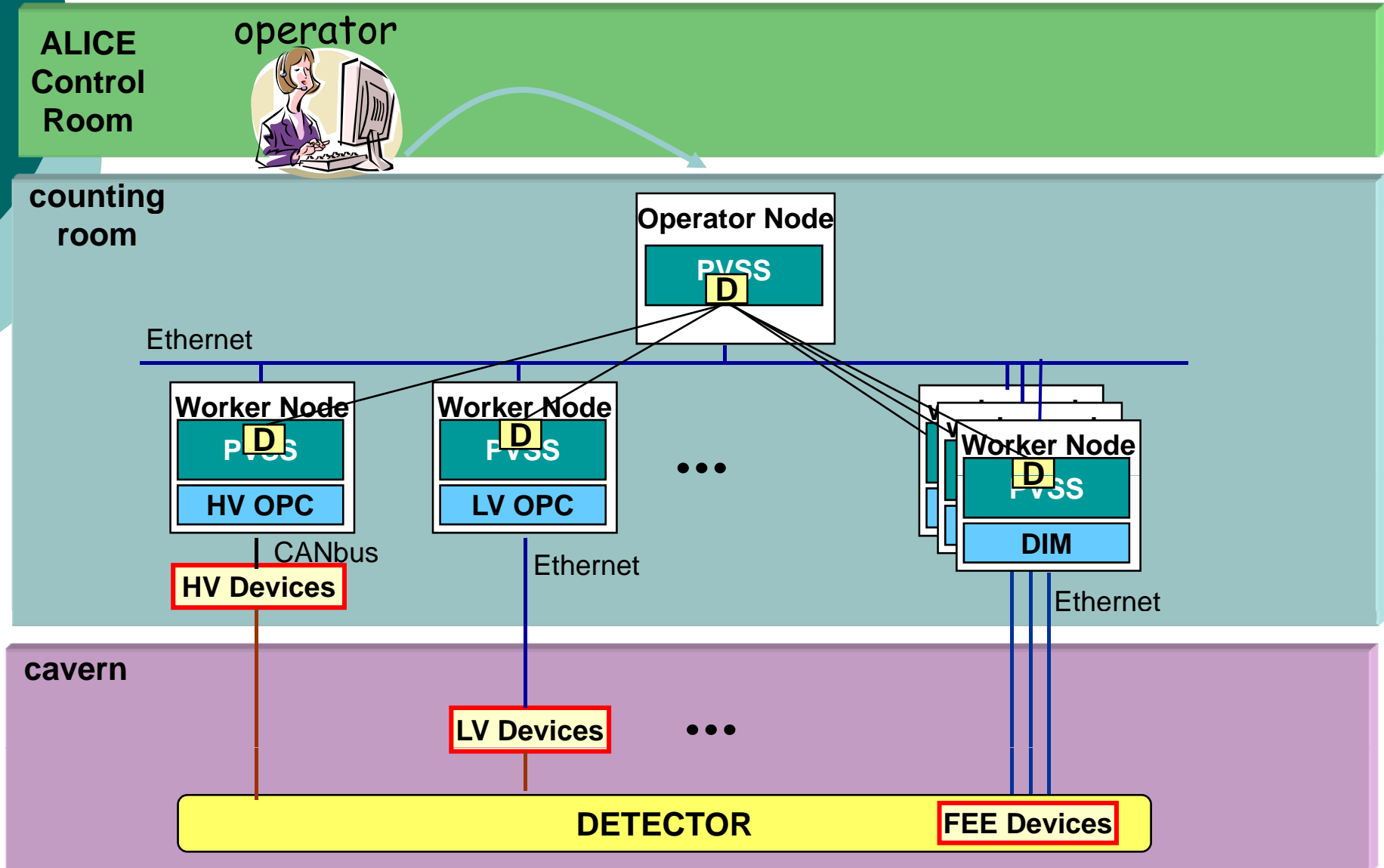
DIM

FEE Devices

Ethernet

cavern

DETECTOR





My Contributions



3 Key Words....

COORDINATION
DEVELOPMENT
SUPPORT



Coordination



Small central team (ACC) collaborating with :

- Alice Detector Experts & LHC experiments (JCOP)
- In total ~100 people involved

Coordination for the control of the devices based on OPC servers

- High Voltage, Low Voltage, ELMB....around 1000 devices in total
- Test of the control tools (Interfaces, OPC server, Client)
- Writing guidelines
- Integration of the software tools in Alice DCS (Installations / Upgrades)

→ **Achieve a homogeneous Control System**



Development



Based on PVSS 3.6 SCADA

ISEG Framework component

- (Generic client for a High Voltage Device control)

Custom Framework Component

- (Alice VME Crate, Alice Magnet Control System)

Monitoring of the Services

- (Bfield, MCS, NMR, VME crates)

Finite State Machine custom solution for Alice users



Support



ISEG High Voltage Device at CERN (OPC server + PVSS Client)

- Official Contact at CERN for the ISEG Company (Germany)
- Centralize the Users requests at CERN
- Report (or fix) the problems

Devices controlled via OPC server and PVSS client in Alice

- Provide help to the Users
- Provide the recommended / tested versions of the software's
- Fix (or report) the problems

Alice DCS operator

- Shifts in the control room
- On call support



Trainings & Publications



Trainings

JCOP – Joint PVSS – JCOP Framework (September 2006, 1 week, CERN)

JCOP – Finite State Machine (October 2006, 3 days, CERN)

English Courses LEVEL 8 (September 2006, few months, CERN)

Computing School of CERN (August 2007, 2 weeks, Croatia)

C++ Object Oriented programming (2008, 3 days, CERN)

Matrikon OPC server workshop (coming soon, 2 days, Amsterdam / Netherlands)

Conferences

ICALEPCS'07 (October 2007, 1 week, Knoxville / USA)

ESOF'08 (August 2008, 1 week, Barcelona / Spain)



Trainings & Publications



Papers

Standard Device Control via PVSS Object Libraries in Alice. (Author)

Alice Control System – Ready for the LHC operation. (co-Author)

Presentations / Posters

7 presentations for the Alice DCS workshop :

- Oct'06, Mar'07, July'07, Oct'07, Mar'08, July'08, Oct'08

Participation to the Poster Session at ICALEPCS'07 (USA)

Participation to the Control Poster Session at CERN



Conclusion



Thank you for your attention !