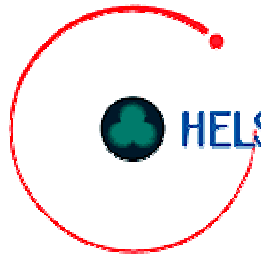


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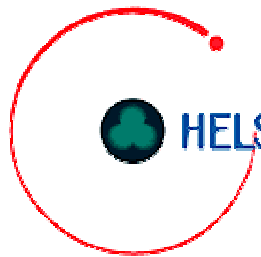
Tracker Outer Barrel Rod Test Setup

Teppo Mäenpää
Helsinki Institute of Physics, Helsinki, Finland



Contents of these slides

- Overview
- Run Control and XDAQ in brief
- Introduction to example application



CMS Tracker Outer Barrel Rod Test Setup Status

- System tests have been possible previously also

(See abbaneo.hone.cern.ch/abbaneo/cms/TOB/TOB_Data/General_talks.html)

- Current aim:

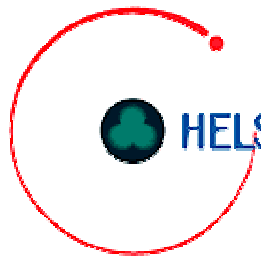
Mass production of test results

- More than 700 rods need to be tested within 1 ½ years.



CMS Tracker Outer Barrel Module Test Setup Upgrade

- Testing of one to three rods in a row
- Pedestal runs, physics runs with source.
12 or 6 modules/rod, 3 rods at a time.
- New HW
- New SW to handle the data

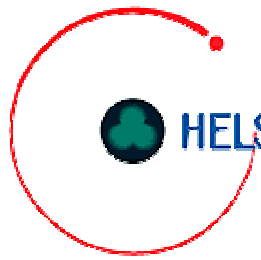


The Compact Muon Solenoid Tracker Outer Barrel System Software (CMSTOBSS by Bartalini et al.)

is a Pilot project which relies on

RCMS (Gulmini et al.) ,
X-DAQ (Cittolin et al.) and
Tracker Column software (Laurent Mirabito et al.)

for ROD production and ROD integration



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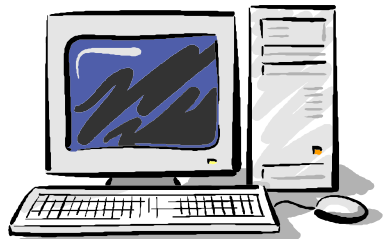
XDAQ and RCMS in brief



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Overview of Module Test Setup Structure

Run Control



DAQ



Overview of Run Control

The Run Control is based on RCMS which is also being used in tracker test beam this year.

Run Control Client

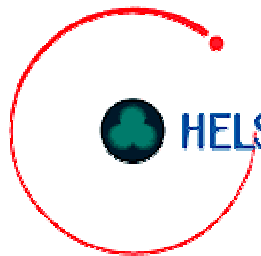


Run Control Server

Run Control consists of

a client, which resides on
the computer in front of the operator

And of a server.



Overview of Run Control

Run Control Client



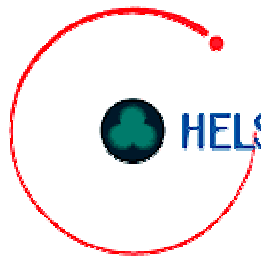
Run Control client provides a graphical user interface. Client computer is also the place where decisions and most of the computing takes place.



Run control client is a Java applet which is loaded from the server.

Run Control Server

Run control server provides access to outside resources, such as databases.



Overview of Run Control Client



Consists of

- Framework (RCMS)
- RC applications



Client is modular

Applet Viewer: rcmv.rs.gui.XRC.class

Applet

File Edit Tools

My favourite X-Y table

Hide Me

xpos: 0 [move]

ypos: 0 [reset]

v_x: 2000 [apply]

v_y: 2000

A nice high voltage GUI

Hide Panic Page 1 Page 2 Page 3

OFF

	Vmon	Imon	Status	Vref			
channel0	0	0	OFF	200			
channel1	0	0	OFF	200			
channel2	0	0	OFF	200			
channel3	0	0	OFF	200			
channel4	0	0	OFF	200	10	10	50
channel5	0	0	OFF	200	10	10	50
channel6	0	0	OFF	200	10	10	50
channel7	0	0	OFF	200	10	10	50

Vref: 0 [set]

Iref: 0 [set]

Rup: 0 [set]

Rdwn: 0 [set]

0 1 2 3 4 5 6 7

HV on HV off [Let] [Set] [toggle]

RunControl_0

Session Tools

Configure Start Run Stop Run Reset Scan

XYtable Mux HV OFF

Events taken: 0

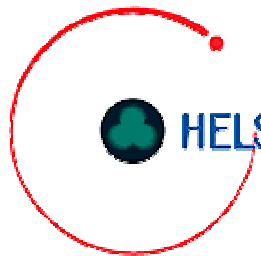
Run number: 21122

```

Here is where log messages will appear
New status: Halted
Creating the multiplexer GUI
Creating manager for Multiplexer/runNumber
Using partition KaMux
number of run: 21122
Using partition HighVoltage for HighVoltage
Creating XYtable
Using partition 3 (xytable) for XYtable
New status: Halted
  
```

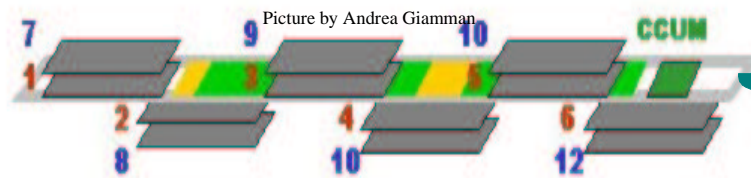
Applet started.

Controller



Overview of XDAQ-based DAQ

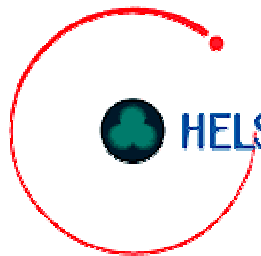
Independent Components



Independent -> Simple

Simple -> Easy to maintain and extend.

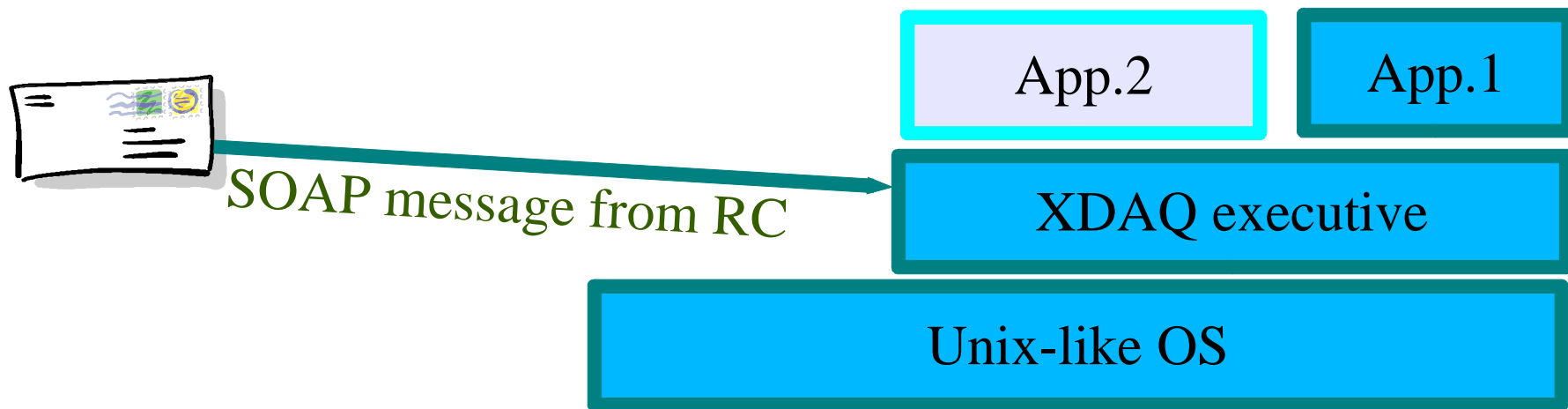




Organisation of XDAQ-based DAQ

XDAQ server loads and starts the applications as ordered by commanding Run Control

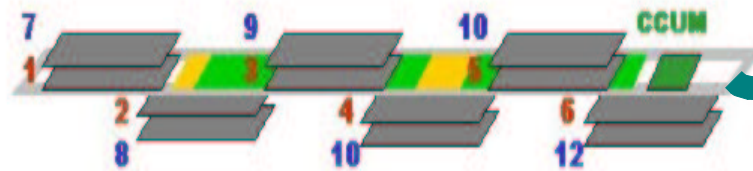
The applications are configured and controlled by RC.





Overview of Module Test Setup Structure

Run Control Client

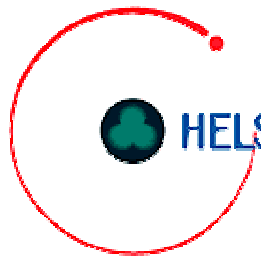


Run Control Server



Ws's w/ XDAQ apps.



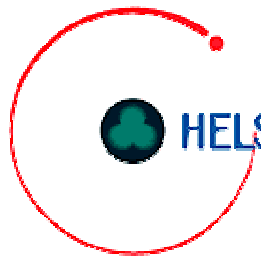


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X-DAQ HOWTO

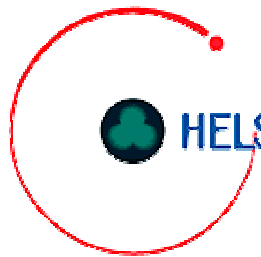
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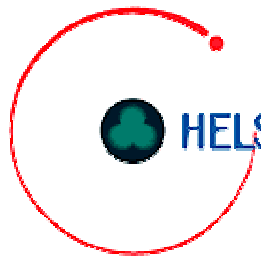
Constructing a XDAQ application

- XDAQ package is easily available at net
(<http://xdaq.web.cern.ch/xdaq/>)
- Examples provided with the environment speed up learning
- Project is fairly well documented.
- In case of problems, the feedback to XDAQ development works also (<http://sourceforge.net/projects/xdaq>)



Constructing a XDAQ application

- XDAQ is a framework for DAQ-like applications.
- XDAQ provides interfaces for inter-process messaging (SOAP and I2O) → User does not need to implement these.
- XDAQ examples implement the state machine used in DAQ systems. → Same implementation is likely to appear in applications.



Next : Case study

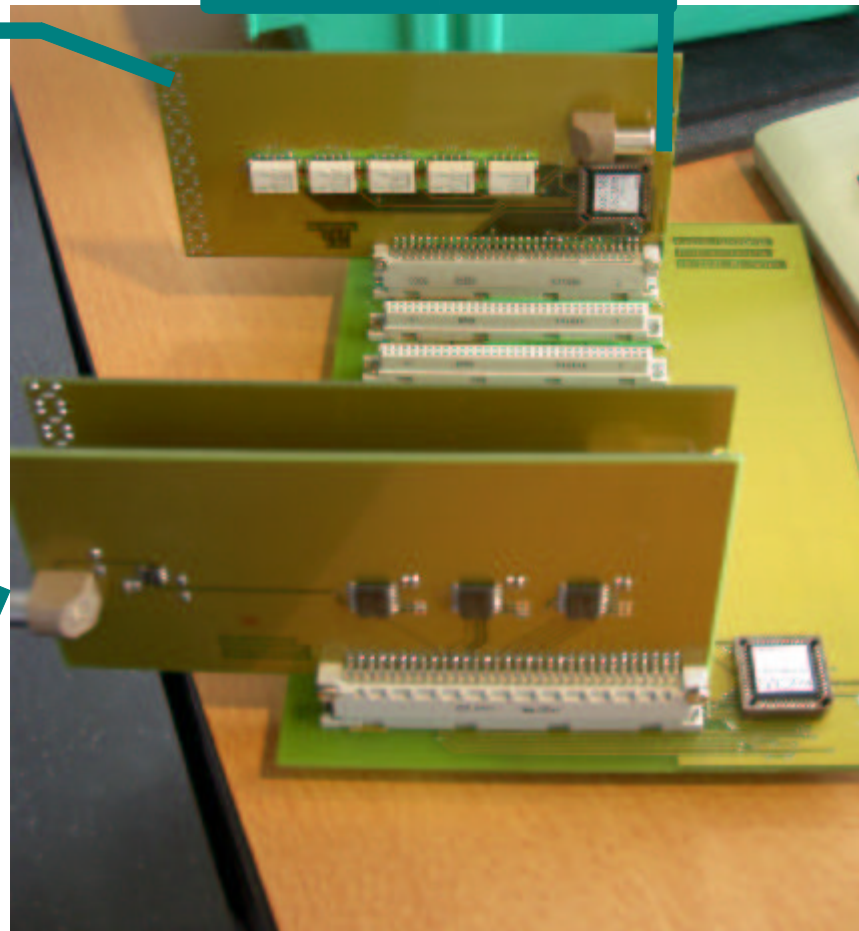


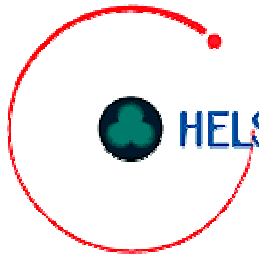
Payload (analog) data in

Analog data out

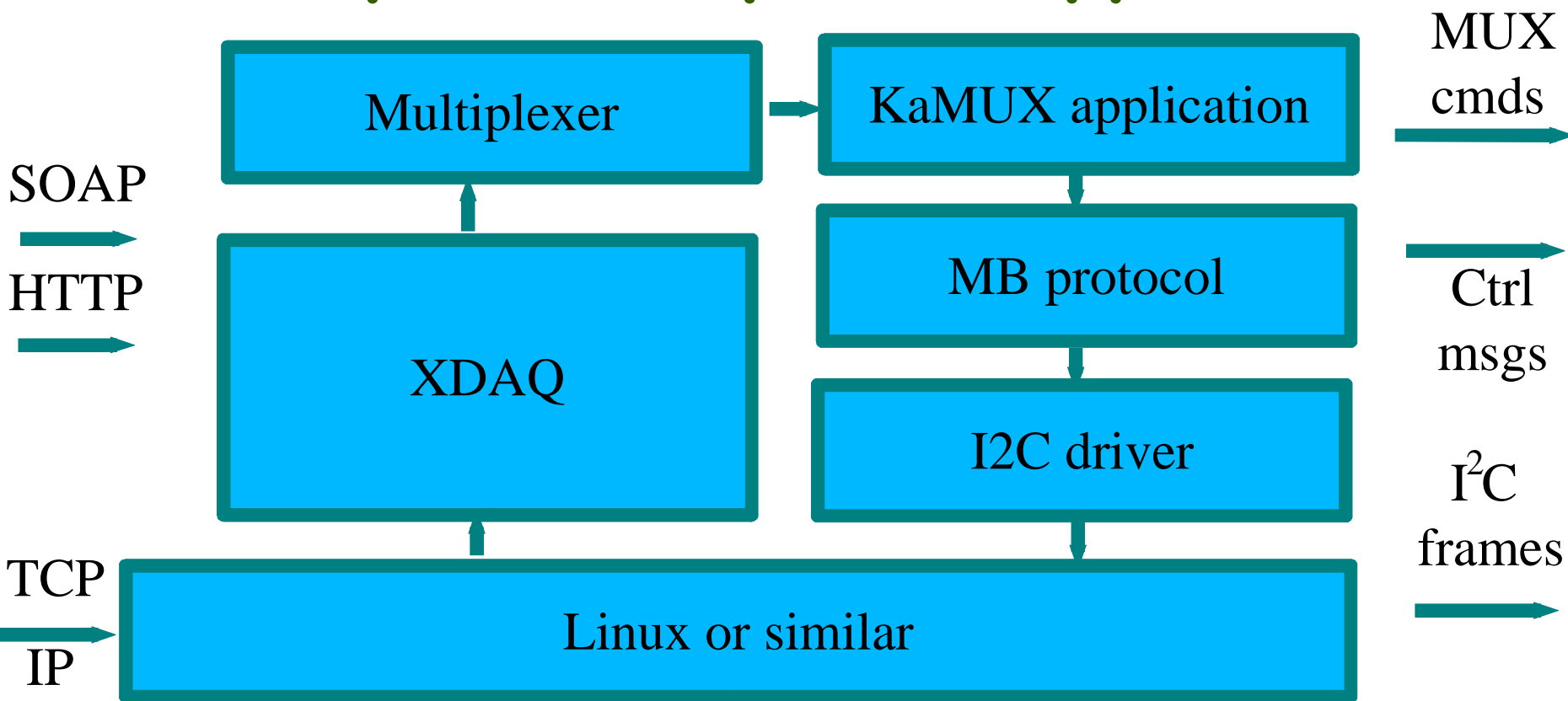
Example: Multiplexer application

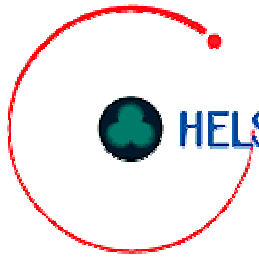
Control data in



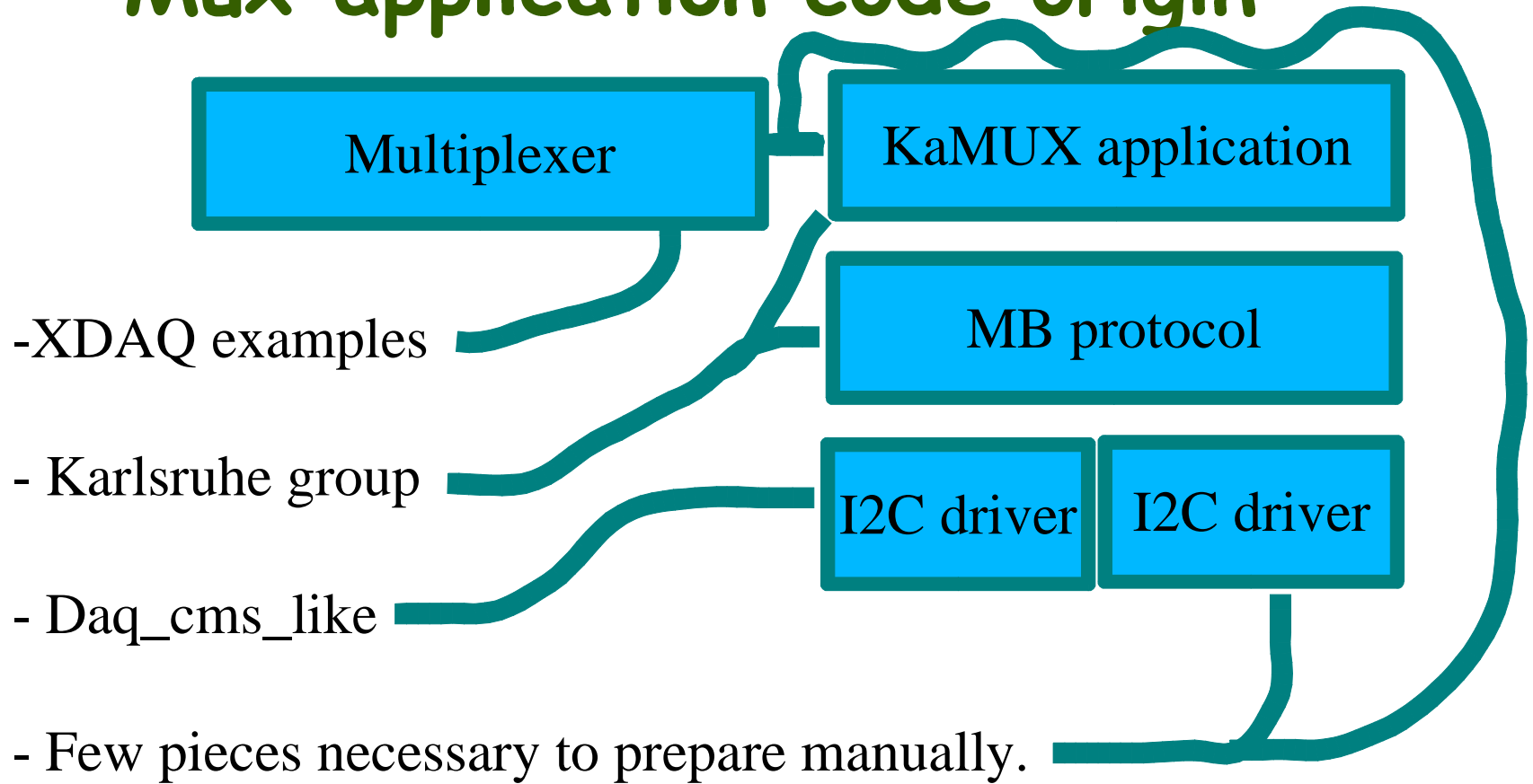


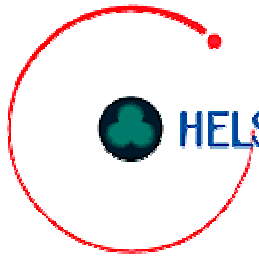
Example: Multiplexer application





Mux application code origin



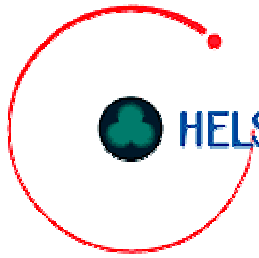


Try it yourself !

```
export CVS_RSH=ssh
CVSROOT=cmscvs.cern.ch:/cvs_server/repositories/CMSTOBSS
export CVSROOT
```

```
cvs co CMSTOBSS
```

```
tcsh:
setenv XXX YYY
```



Try it yourself !

```
export CVS_RSH=ssh
CVSROOT=cmscvs.cern.ch:/cvs_server/repositories/CMSTOBSS
export CVSROOT
```

```
cvs co CMSTOBSS
```

```
cvs update
```

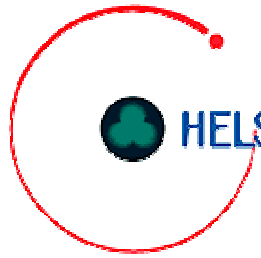
Remark about CVS: First time you should do a checkout, later update-command import changes in the database to local disk. Similarly, a commit-command puts locally made changes into database. It pays to learn CVS, do not trust these slides but read the documentation.

```
tcsh:
```

```
setenv XXX YYY
```

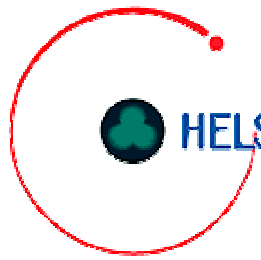
Extra bonus for CVS users:
Run Control is there, too!

(same price, twice the fun)



Conclusions

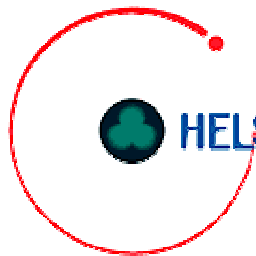
- TOB rod test setup has been upgraded during summer
- Upgrade was easy and went smoothly due to good system design.
- There were variations in the quality of documentation of software from system to system.



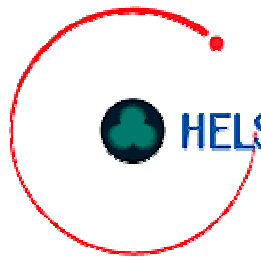
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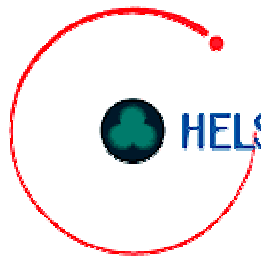
Applaud



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