

LHCb Farm Installation Guidelines

LHCB Technical Note

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Abstract

This document describes the configuration and installation of the LHCb EFF farm. The latest version of this document can be downloaded from the web at <http://lhcb-online.web.cern.ch/lhcb-online/testbed/>

Document Status Sheet

Table 1 Document Status Sheet

1. Document Title: [Project Name Qualification] User Requirements Document			
2. Document Reference Number: [Document Reference Number]			
3. Issue	4. Revision	5. Date	6. Reason for change
Draft	1	14 November 2006	First version
Draft	1.1	15 January 2007	Corrected paths of PVSS projects
Draft	1.2	15 January 2007	Clarified the path of PVSS components and projects; linux pcs for TFC and CC-PC

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1. Introduction

The purpose of this note is to establish a documented and agreed procedure to obtain a coherent, working, reference installation of the Online software (Controls and Gaudi applications).

This procedure is to be applied to our testbed in building 157.

The reference installation should be used for copying to cracks, testbeam installations, and eventually the EFF in the pit.

Using this note, it should be at any time be possible to regenerate the PRO and DEV farms from scratch.

2. Farm architecture (hw)

There will be a PRO (production) farm and a DEV (development) farm on the daq.lhcb network. The DEV farm will be first setup; when it is working, it will be cloned to PRO.

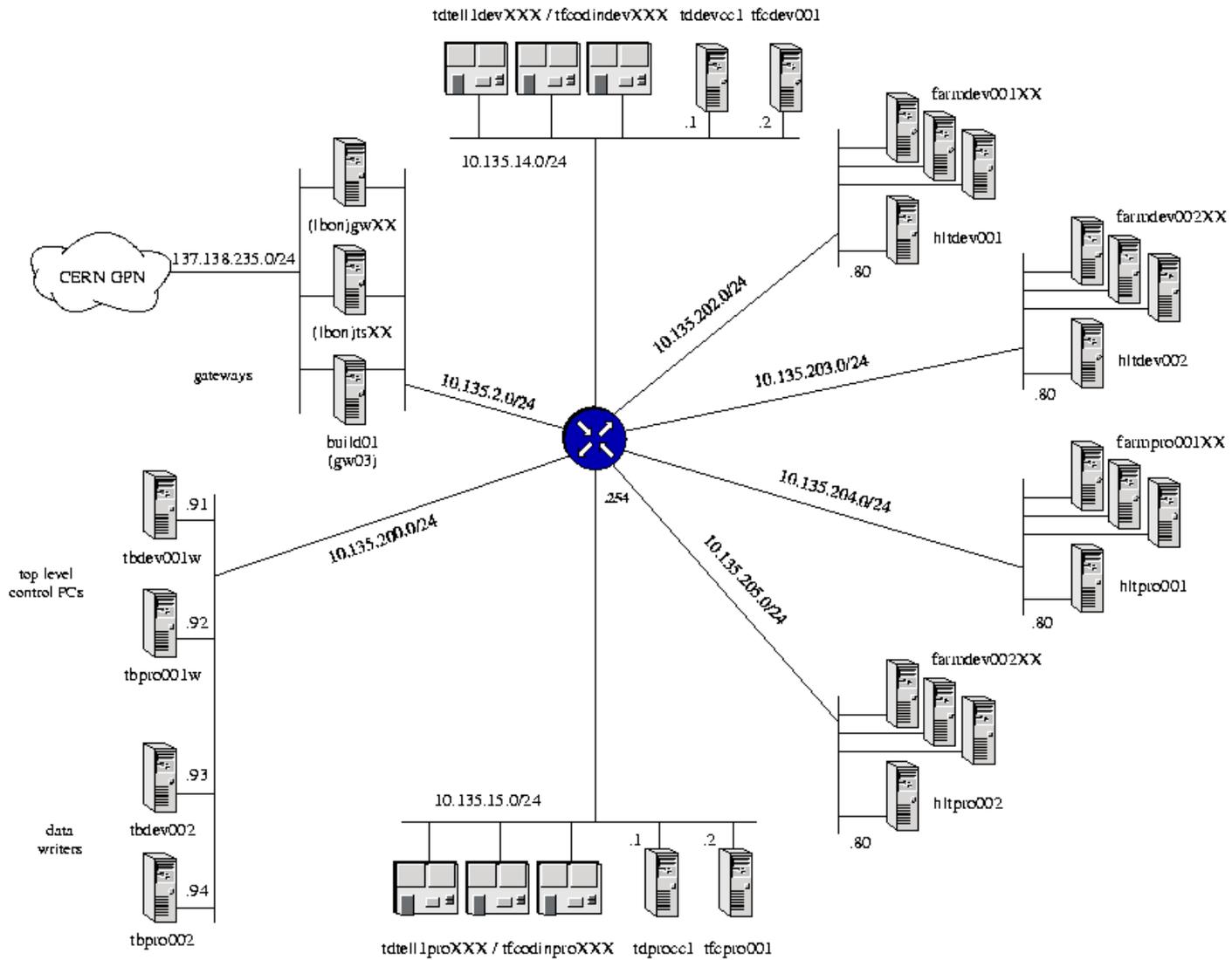
The following hardware will be installed.

PRO	DEV	remarks
1 TFC – Readout Supervisor	1 TFC – Readout Supervisor	
1 TFC – Throttle OR	1 TFC – Throttle OR	
TFC - >= 2 Tell1s	TFC - >= 2 Tell1s	There is a problem obtaining Tell1s
1 Data switch	1 Data switch	
1 Ctrl switch	1 Ctrl switch	
20 Farm Nodes (called PRO00101-PRO00110, PRO00201-PRO00210)	20 Farm Nodes (called DEV00101-DEV00110, DEV00201-DEV00210)	Diskless (boot off controls pcs)
2 Linux controls PCs	2 Linux controls PCs	One per subfarm (DHCP, DNS)
2 Linux controls PCs`	2 Linux controls PCs	Controls Tell1s, TFC, bootserver.
1 Windows controls PC	1 Windows controls PC	Overall control
1 gateway	Share with PRO	afs + cvs access
Oracle Server	Oracle Server	Can 1 server serve both PRO and DEV? Installation could wait.
1 storage node	1 storage node	

Access will be via a gateway from cern.ch to daq.lhcb.

Fig. X shows the logical topology of the farm related part of the testbed network. Two changes were made wrt the LHCb naming conventions, in order to accommodate the fact that a) there is no sub-detector involved, and b) there are two systems (PRO and DEV):

- 1) two additional sub-system names (TB for “test bed” general purpose devices, and TD for “test detector”), and two additional domain names (PRO and DEV).
- 2) CC-PCs names are extended to include the domain name (PRO or DEV).



3. Farm architecture (sw)

3.1. Operating systems

	PRO	Date	DEV	By	Date
Linux controls pc	SLC4, 32 bit + compatibility libraries		SLC4, 32 bit + compatibility libraries	Artur, Niko (for compatibility libraries)	
Windows controls pc	XP + terminal server		XP + terminal server -> Vista?	Loic	
nodes	SLC4		SLC4	Artur	

3.1.1. Userids/passwords

	PRO	Date	DEV	By	Date
Linux controls pc	Root, online, afs/lhcb userids. For ccpc: TFC + account for Stefan		Root, online, afs/lhcb userids. For ccpc: TFC + account for Stefan		
Windows controls pc	Admin, online, nice userids		Admin, online, nice userids		
nodes	Root, online, afs/lhcb userids. For ccpc: TFC + account for Stefan		Root, online, afs/lhcb userids. For ccpc: TFC + account for Stefan		

N.B. All userids should be able to execute all programs on the system.

3.1.2. Login scripts

	PRO	Date	DEV	By	Date
Linux controls pc	path of standard login script (bash)		path of standard login script (bash)	Niko	
nodes	path of standard login script (bash)		path of standard login script (bash)	Niko	

3.2. 3rd party software

	PRO	Date	DEV	By	Date
Linux controls pcs	PVSS 3.1 (in /opt/pvss/pvss2_v3.0)		PVSS 3.1 (in /opt/pvss/pvss2_v3.0)	Loic	
	PCtrlRDBAccess-31Linux-0.1.zip		PCtrlRDBAccess-31Linux-0.1.zip (patch required for configuration db)	EvH	21/12/2006
	DIM_DNS_NODE server		DIM_DNS_NODE server	Niko	
Windows controls pcs	PVSS 3.1(in c:/etm//pvss2/3.0)		PVSS 3.1(in c:/etm/pvss2/3.0)	Loic	
	DIM_DNS_NODE server		DIM_DNS_NODE server	Niko	
Build node (geateway)	AFS + cvs access; cmt		AFS + cvs access; cmt.	Loic	
			Common Linux & Windows filebase. Nfs/Samba?	Artur	

It is understood that AFS will only be installed to checkout. We will not run off AFS. Cmt is required to run the LHCb software.

4. LHCb software

The LHCb PVSS framework should be unzipped in the directory `/home/online/frameworks/`, e.g. `/home/online/frameworks/lhcbfw-1.14`. The directory `/home/online` is mounted on both windows and linux systems so this installation only needs to be done once.

All project owners can install the components from this directory. (As the place where to look for components; the directories for installed components are described below).

4.1. ECS

The projects should be installed and run using the generic userid online.

The projects should be installed in the directory `/home/online/pvss_projects/` which is owned by userid online.

4.1.1. Runcontrol

	PRO	Date	DEV	By	Date
Top level Windows controls PC	Runcontrol package v1r0 in <code>/home/online/pvss_projects/runcontrol</code>		Runcontrol package v1r?	Richard	
	LHCb framework 1.14 (in <code>/home/online/pvss_projects/ fwComponents_runcontrolpro</code> , required components installed).		LHCb framework 1.4 (in <code>/home/online/pvss_projects/ fwComponents_runcontroldev</code>)		

4.1.2. TFC

	PRO	Date	DEV	By	Date
Windows controls PC	TFC v2.4 in <code>/home/online/pvss_projects/TFC_v2r4</code>		TFC v2.4 in <code>/home/online/pvss_projects/TFC_v2r4</code>	Richard	
	LHCb framework 1.14 (in <code>/home/online/pvss_projects/ fwComponents_TFCpro</code> ; required components installed)		LHCb framework 1.4 (in <code>/home/online/pvss_projects/ fwComponents_TFCdev</code>)		

4.1.3. DAQ

	PRO	Date	DEV	By	Date
Windows controls PC	CCPC 2.0, Tell1 2.5 in /home/online/pvs__projects/daq		CCPC 2?, Tell1 2?	Stefan	
	LHCb framework 1.14 (in /home/online/pvs__projects /fwComponents_daqpro)		LHCb framework 1.4 (in /home/online/pvs__projects /fwComponents_daqdev)		

4.1.4. HLT

	PRO	Date	DEV	By	Date
Linux PC	GaUCHO 2.14 in /home/online/pvs__projects/farm		GaUCHO 2.14	Eric	
	LHCb framework 1.14 (in /home/online/pvs__projects/ fwComponents_Gauchopro)		LHCb framework 1.4 (in /home/online/pvs__projects/ fwComponents_Gauchodev)		

4.2. Gaudi applications

The Gaudi applications are installed on the head node. The directory structure should be an exact copy of the afs release area, without /afs/cern.ch/.

Multiple versions can be installed. Different versions can be executed by giving the directory path of the script to be executed. It should be possible to only make modifications on the DEV farm.

The currently required (but in some cases not yet tagged and released) versions are:

	PRO	date	DEV	by	date
	OnlineEnv v2r2		OnlineEnv v2r2		
	OnlineEnv v2r3		OnlineEnv v2r3		
	Gaudi Applications		Gaudi Applications		

5. Installation procedures

5.1. ECS software

5.1.1. The overall runcontrol

This section to be verified and completed.

The system is distributed. The port numbers and system names allocated to the subsystems are as follows.
For the second digit: 1=crack1, 2=reserved, 3=velo testbeam, 4=crack2, 5=PRO, 6=DEV).

```
- TFC
System Name:  TFC_15
System number: 15
```

```
Config file:
[general]
pmonPort = 11500
dataPort = 11501
eventPort = 11502
```

```
[dist]
distPort = 11510
```

```
- TELL1
System Name:  DAQ_25
System number: 25
```

```
Config file:
[general]
pmonPort = 12500
dataPort = 12501
eventPort = 12502
```

```
[dist]
distPort = 12510
```

```
- FARM
System Name:  HLT_35
System number: 35
```

```
Config file:
[general]
pmonPort = 13500
dataPort = 13501
```

eventPort = 13502

[dist]

distPort = 13510

- DCS/DAI

System Name: DCS_45

System number: 45

Config file:

[general]

pmonPort = 14500

dataPort = 14501

eventPort = 14502

[dist]

distPort = 14510

- RUN_CONTROL

System Name: ECS_55

System number: 55

Config file:

[general]

pmonPort = 15500

dataPort = 15501

eventPort = 15502

[dist]

distPort = 15510

- OT_FrontEnds

System Name: FE_165

System number: 165

Config file:

[general]

pmonPort = 26500

dataPort = 26501

eventPort = 26502

[dist]

distPort = 26510

Notes on applying these settings:

In order to create a second (or more) project for the same machine:

- If a project is running using the default port numbers
 1. It has to be stopped (including pmon)
 2. Create the project(s) (but don't start it/them)

3. Modify the config file (with the settings above)
 4. (Re)start the projects
- In order to change the port numbers for an existing project:
 1. Stop the project (from PA to make sure also pmon is stopped)
 2. Modify the config file
 3. (Re)start the project

The overall runcontrol runs on the top level controls PC. However, the panels of the embedded projects (TFC, DAQ and HLT) need to be accessible from the path. These components should not be installed. This is achieved by modifying the config file as follows:

```
[general]
pvss_path = "C:/ETM/PVSS2/3.0"
proj_path = "D:/downloads/lhcbfw-1.8"
proj_path = "D:/pvss_projects/TFC_20060926"
proj_path = "D:/pvss_projects/TELL1_20060926"
proj_path = "D:/pvss_projects/fwComponents_RunControl_v1"
proj_path = "D:/pvss_projects/RunControl_v1"
proj_version = "3.0"
userName = "root"
password = ""
langs = "en_US.iso88591"
distributed = 1

[general]
pmonPort = 16100
dataPort = 16101
eventPort = 16102

[dist]
distPort = 16110
distPeer = "crack1wi1:11110" 11
distPeer = "crack1wi1:12110" 21
distPeer = "crack1li1:13110" 31
```

The following applications: need to be started as Windows services:

```
ApplicationList.txt
c:\etm\pvss2\3.0\bin\PVSS00pmon -proj TELL1_20060926 -port 12100
c:\etm\pvss2\3.0\bin\PVSS00pmon -proj TFC_20060926 -port 11100
c:\etm\pvss2\3.0\bin\PVSS00pmon -proj RunControl_v1 -port 16100
```

The software to do this can be found at: <http://sergueev.home.cern.ch/sergueev/hcal/AppliMon.zip>

Allocating subfarms needs to be done according to a prototype of Clara's.

5.1.2. The DAQ

This section to be written.

5.1.3. The TFC

This section to be written.

5.1.4. The HLT

To install the HLT control system proceed as follows.

1. export DIM_DNS_NODE=linuxcontrolspc.daq.lhcb
2. startPA
3. make a new distributed project with name 'farm'
4. give it System Name: HLT_35 and System number: 35
5. edit the config file:

```
[general]
pmonPort = 13500
dataPort = 13501
eventPort = 13502
```

```
[dist]
distPort = 13510
```

6. copy the fwInstallation tool into the project directory and unzip -a
7. download and unzip -a the latest LHCb Framework 1.10
8. install the 7 components:
 - o fwAccessControl 2.4.6
 - o fwConfigurationDB 3.0.95
 - o fwCore 2.3.7
 - o fwFSM 24.13
 - o fwDIM 14.15.0
 - o fwEFF 1.1.4
 - o fwFarmMonitorControl 3.2

- fwGaucho 2.13
- 9. add a Motif User Interface to the project with options -menuBar -cionBar -p fwEFF/fwEFFNavigator.pnl
- 10. remove the corresponding windows ui
- 11. run the fwEFF/fwEFFNavigator.pnl manager
- 12. configure the nodes and tasks to run on the farm:
 - add the following tasktypes (right click):
 - MBMinit
 - ErrorSrv
 - EvtHolder
 - EvtProd
 - MEPRx
 - MDFWriter
 - add 2 subfarms
 - inside the subfarm, add 10 nodes, give the name in uppercase: FARMxxx
 - for each node, add the tasks:
 - the 5 above, click the 'enabled' button for all, the 'daemon' button for MBMinit and ErrorSrv to indicate they are class1 tasks
 - GauchoHLT (4x)
 - MON - leave the panel empty, but click on enabled
 - for the tasks, the paths are ./MBMinit.sh, ./ErrorSrv.sh, ./EvtHolder.sh, ./EvtProd.sh, ./MEPRx.sh, ./MDFWriter.sh
 - the working directory is /home/daq/cmtuser/Online/OnlineTasks/job (to be verified)
 - the UTGID is node001%d_taskname_%n (same as the Process Name)
 - the user is daq (to be verified)
 - make sure the nodenames are correct FARM00101, etc.
 - note that copy/paste doesn't work when you are filling in the panels
- 13. configure the farm monitoring control (Bologna part), start the manager -p fwFarmMonitorControl/fwFMCMMainPanel.pnl:

- choose the tab DataPoint Utilities, create all
 - choose fwEFF, Update FMC's DPs (3 times)
 - choose Node Utilities, FMC Autoupdate
14. start the manager -p fwGaucho/GauchoConfig.pnl:
- create the FSM
 - start PVSSDIM -num 30 (DimCowboy)
 - set the startup for all PVSSDIM managers to always
 - run the discovery jobs
 - click on create panels (redo steps 1-4 in case of problems)
15. start the device editor navigator, FSM, start all, right click on subfarm001, view

5.2. Gaudi applications

5.2.1. CMT/CVS

This section to be written.

5.2.2. The LHCb offline software base

Use Florence's script which takes the source tarballs, debug version.

Build on Farm.

Have latest version always available on the DEV farm.

Propose Radu to make an automatic procedure which does this.

Deletion of old versions will be require prior approval.

6. Modification procedures

The PRO farm is supposed to always be in a working state. (Responsible?)

When a change is required, the DEV farm is reserved by the person making the change.

The changes are applied to the DEV farm.

When the DEV farm is working, it is copied to the PRO farm. The version numbers in this note are updated, and the modifications are documented in this note. Perhaps we should use ELOG?