# Table of Contents

**LCG Applications Area Workbook**

Getting Started ........................................................................................................................................1
  - Getting started at CERN ................................................................................................................1
  - Getting an Account and Logging In ..........................................................................................1
  - Procurement and installation of computing material ............................................................1

Developing Software .................................................................................................................................1
  - Edit, Compile, Link and Run ......................................................................................................1
  - Storing, Printing and Other Common Activities .................................................................1
  - Debugging Applications ..........................................................................................................1
  - Setting up your software project ............................................................................................2
  - The CERN central computing services ...............................................................................2

Ideas for further sections .........................................................................................................................2
  - Programming languages and common packages ..................................................................2
  - Developing C++ Applications (TO BE DONE) ....................................................................2

Testing Software Applications .................................................................................................................2
  - Testing Frameworks ............................................................................................................2
  - Procedures for Testing (ON THE WAY) .................................................................................2

Documentation ........................................................................................................................................3
  - Documentation Templates (ON THE WAY) ..........................................................................3
  - Documentation Tools (TO BE DONE) ..................................................................................3

Configuring your hardware .....................................................................................................................3
  - Configuring your computer ....................................................................................................3

Useful Links ............................................................................................................................................3
LCG Applications Area Workbook

Getting Started

Taking the user through procedures for getting a computer account and for ordering and installing computing equipment at CERN.

Getting started at CERN

Getting an Account and Logging In

- Getting an Account
- Checking your account exists
- Connecting to LXPLUS from your linux desktop computer
- Connecting to LXPLUS from your Windows desktop computer

Procurement and installation of computing material

- Ordering Equipment
- Installation procedure for a new machine at the user's workplace
- Procedure to request the move of a computer from one room/desk to another
- Procedure to request re-installation of the OS on a computer
- Procedure for requesting the repair of computer equipment

Developing Software

This section covers the basic tasks without going into design issues.

Edit, Compile, Link and Run

- Editing, compiling and running code on Unix
- Editing, compiling and running code on Windows

Storing, Printing and Other Common Activities

- Storing your files safely
- Printing your files
- Accessing your emails

Debugging Applications

Watching the code execute, and basic problem solving.

- Introduction
- Compile options for Debugging
- Command Line debugger: gdb
- GUI debugger: ddd
Setting up your software project

- Software Tools and Packages available
- A bug tracker for your application
- How to get a CVS repository: the CERN CVS Central Service
- AFS central files system?
- Setting up XWindows?

The CERN central computing services

- CERN Computing Rules
- Linux Central Services
- Windows Central Services
- Mail Services

Ideas for further sections

- Getting started with the LCG environment

Programming languages and common packages

- C++
- Python
- XML
- Boost, Root, Clhep,...

Developing C++ Applications (TO BE DONE)

Using an OO design approach to make proper use of C++.

- OO Courses and References
- LCG C++ Coding Conventions
- External Class Libraries
- Warning and Error Messages
- Code Wizard: a Tool for Checking Coding Style
- Valgrind: a Tool for Finding Memory Leaks
- Insure++: a Tool for Checking for Memory Misuse

Testing Software Applications

Testing Frameworks

- CppUnit, PyUnit, Oval, QMtest
- Valgrind, callgrind, kchachegrind

Procedures for Testing (ON THE WAY)

- Introduction
- Types of Testing
- Test Cases
Documentation

Documentation Templates (ON THE WAY)

Templates for the documents needed in software development

- Task lists, project documents
- Use cases, user requirements
- Work plans and reports

Documentation Tools (TO BE DONE)

Procedures and tools for creating documentation

- Introduction
- Use of Doxygen - simple example
- External Class Libraries

Configuring your hardware

Configuring your computer

- Security Recommendations
- Registering your portable computer
- Installing a computer at CERN

Useful Links

- PH-SFT group Web Site
- LCH Applications Area Web Site
- SPI Workbook

-- AlbertoAimar - 31 Aug 2005