VLT Software Workshop - April 1999

CCS On-line Database Loader

and

Extended CCS

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Contents

Introduction

The VLT Software makes extensive usage of Object Oriented design and development methodologies.

In order to support the Object Oriented approach, CCS provides 4 cornerstone components:

- **On-line-Database Loader**
- **The Foundation Class Library**
- **Extended CCS**
- **The Event Handling Toolkit**

They are standard components of CCS available since end of 1994 and since July 1995 release they are very stable.

A lot of care has been spent in the initial design, so that no big changes and only limited extensions have been necessary after that date.

The Event Handling Toolkit will be presented in details in a specific presentation.

The DBL database loader

All data that can be of interest for external modules, to get a picture of the status of the system or for system's tuning and configuration are stored in the real-time database

The database is a corner-stone of the VLT software architecture and must be uniform and coherent through all the applications developed internally and by consortia.

- It is a real-time distributed database, based over the hierarchical model
- We have developed a database loader that extend the semantic and syntax of the RTAP database definition language introducing OO concepts like:
    - inheritance
    - overloading
    - methods, implemented with C++ classes
    - a "database class" is a new structured data type
- It also supports:
    - all standard C preprocessor features
    - definition of scan links
    - RTAP calculation engine (on full CCS)

DBL: An example

A class definition:

```
#ifndef waSET_VALUE_CLASS
#define waSET_VALUE_CLASS

#include "evhSTD_COMMANDS.class"
#include "lcumodWS.class"

CLASS evhSTD_COMMANDS waSET_VALUE
BEGIN
    ATTRIBUTE DOUBLE  position
    ATTRIBUTE lcumod  lcu
END

#endif /*!waSET_VALUE_CLASS*/
```

An application database:

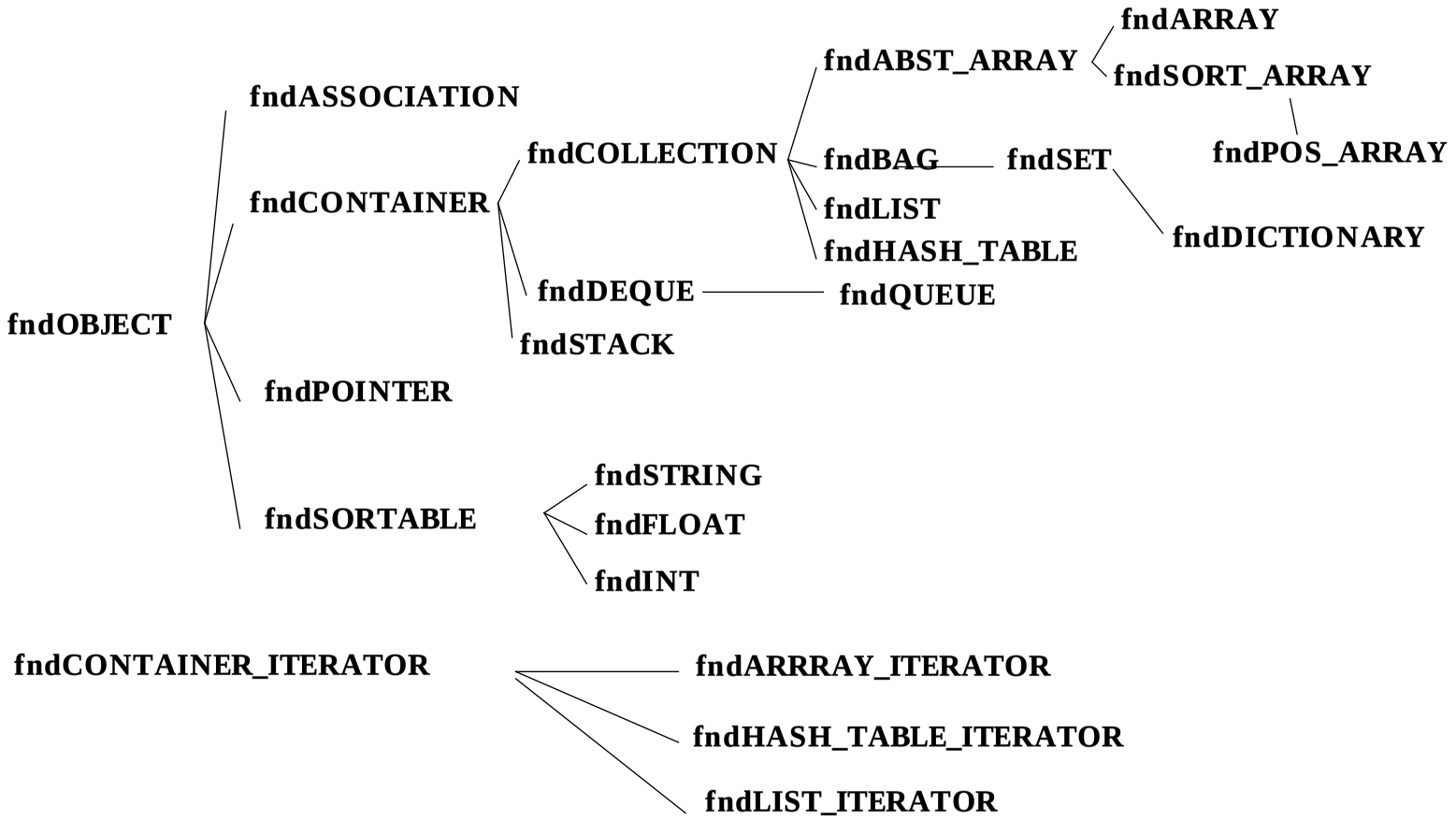
```
#include "CCS.db"

#include "waSET_VALUE.class"

POINT waSET_VALUE "Appl_data:setValue"
BEGIN
       Alias"setValue"
END
```

The Foundation Class Library (FND)

**The FND library provides
generic classes for data handling
that can be used for the development of
any C++ application.**

**It uses a model very similar to
Java classes
and
can be used
together or in alternative to C++ standard libraries.**

FND Class Hierarchy



Extended CCS

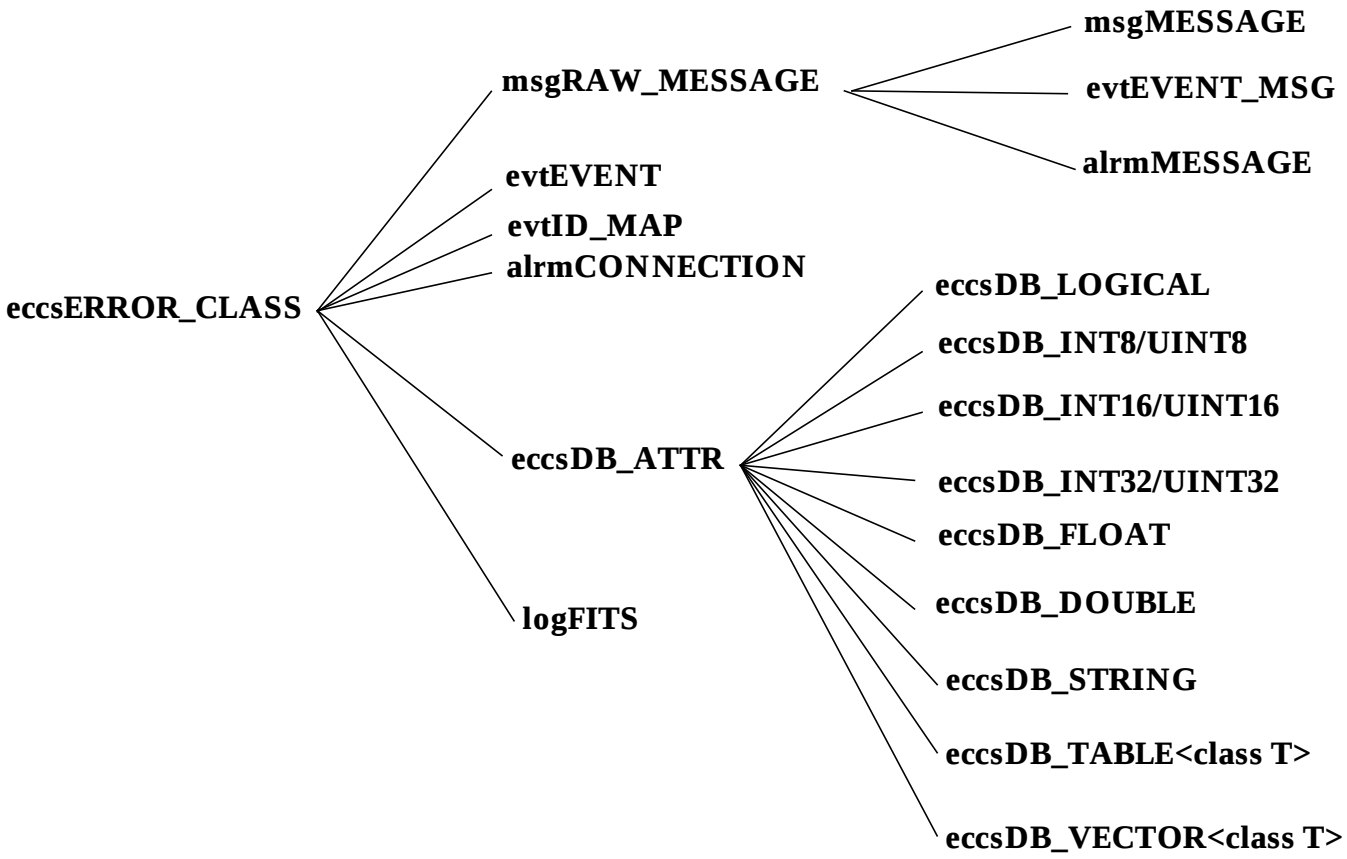
Extended CCS is a library written in C++ on top of CCS. It contains functions and simple classes and requires a minimal knowledge of C++ syntax.

Purpose of the library is:

- Provide easier usage of common CCS features
- Embed in functions or simple classes commonly used application patterns
- Provide base CCS classes for the development of truly object oriented applications
- Prevent common errors in applications
- Standardise produced code

Only the commonly used parts of CCS are integrated in ECCS.

ECCS Class Hierarchy



ccsERROR ——— eccsERROR

ccsTIMEVAL ——— eccsTIMEVAL

eccsBUFFER

eccsDB_VECTOR_HELPER<class T>

eccsDB_TABLE_HELPER<class T>

eccsDB_TABLE_RECORD

classes whose name ends as <class T> are templates

ECCS: An example

The following example is a typical WS coordination application.

It can:

- Receive SETVAL and GETVAL commands. They are re-routed to another application, on LCU, for processing.
- Handle the TEST command. It is processed internally.

In this session we show:

- The structure of the application
- The application development and build using the vlt Makefile
- Testing and debugging using VLT development tools (in particular the usage of ccseiMsg and evhDummy for manual testing).

ECCS: example code

The actual code of the example is provided
as an appendix to the printed copy
of these transparencies
and
will be analyzed on-line

Conclusion

This presentation has shown only some of the most important aspects of these development tools.
For more details look at:

- **VLT Software - CCS On-Line Database Loader User Manual (VLT-MAN-ESO-17210-0707)**
- **VLT Software - FND Foundation Library User Manual (VLT-MAN-ESO-17210-1504)**
- **VLT Software - Extended CCS User Manual (VLT-MAN-ESO-17210-0770)**
- **VLT Software - CCS Event Tool Kit User Manual (VLT-MAN-ESO-17210-0771)**
- **Guidelines for the Development of VLT Application Software (VLT-MAN-ESO-17210-0667)**
- **Code examples in <mod>/test directories.**