

AALib::Framework __concepts__

Asynchronous Action Library
AALib - PyAALib - JyAALib
Tutorial and Techniques

by
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AALib
__main::concept__ = Think OBJECT !!

Everything is an object to be managed by
objects.

Objective TODAY

- Overview
- Understand the basis
- View of the main classes and tree
- Basic Callback Concepts
- Understand the main “Use Cases”
- Design of the main use cases
- Plugin architecture
- Plugin mapping using XML files
- Data Binding with XSD
- Plugins based on XSD definitions
- Documentation
- Code syntax and rules
- Examples using the CVS repository
- Discussion about Best Practices

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AAlib Framework

Main Features

- Independent of the System architecture and OS;
- Independent of the Programming Language;
- Independent of the Programming IDE;
- Full OOP design - Object Oriented Programming;
- One code running in all platforms with the same features and actions;
- Asynchronous Multithread Actions + Thread Safety + Grid Computing;
- Advanced Resources and Generic Application Design (i.e.: RAID);
- Implements the standard internet services and protocols;
- Use only Objects with simple and standard definitions;
- Each Object is independent and self-contained (no hierarchy to generate and manage entities);
- The data persistence is assured by each individual object and is preserved when it is shared with other entities or stored (duplication or other operation);
- Complete and independent Unittest framework;
- Multithread exception handling and log;
- Automatic generation of code documentation in html, PDF, and man;
- Incorporate Debug and Exception control Model;
- Well defined code syntax and rules for the code design;
- Simple code maintenance (everything is an independent object defined by a class, all code is identical in all operational system);
- Code reliability (i.e.: runtime flow control robustness);
- No necessary external licenses or agreements;

AA Lib

Basic Design Patterns

- **MVC**

Model-View-Controller

- **Object Factory**

Plugin Model

- **Callback**

Generic code connection and execution

AALib Framework Implementation

- **Python**

PyAALib 1.0

2005-2007

<http://pyaalib.sourceforge.net>

- **JAVA-Jython-Python**

PyAALib-JyAALib 2.0

- initiated on July 2007

- full functional - testing and adding new features

- to be released on 2008

<http://jyaalib.sourceforge.net>

Why?

It allows mix Java code and the AALib framework with the simplicity of Python and the portability

TODAY

PyAALib - JyAALib
version 2.0

PyAALib-JyAALib Overview

It is a **well tested** open source framework to be used on RAID development of asynchronous multi-thread applications.

It implements the **basic plugin architecture** to be used with the special PyAALib action objects and standard Python and JAVA classes. This mechanism allows the rapid development of dynamic and modular applications to facilitate the continuous improvement.

Modern software engineering techniques based on **unittest** are used to guarantee the quality of each part of the code during the development cycle.

The library is **full compatible** with all standard frameworks using C, C++ , Fortran, Java, Jython and Python.

Projects Using The Framework?

[DRank]

Crystal Data Ranking Module in DNA Package.

The DNA project - <http://www.dna.ac.uk> - BioXHIT

<http://www.bioxhit.org>

TODAY

PyAALib - JyAALib
version 0.9

The screenshot displays the DNA Expert System interface. The main window is titled "DNA - automatd collection of data" and includes a menu bar (File, Login to Database, Sample Screening, Sample Ranking, Collect Reference Images, Auto Index, Strategy, Results) and a toolbar with buttons for "Redo Rank", "View Rank Result", "Import Rank Project", and "Export Rank Project".

The "Ranking Results" section shows a table with columns for "Collect", "Rank", "Prefix", and "Information". The table lists 9 entries, each representing a different data set (Dps_P23_-Dps1 to Dps_P23_-Dps9) with their respective total exposure times.

Below the table are buttons for "Total exposure time", "Characterize Single Crystal", and "Collect Automatically".

The "Feedback for PROPOSAL: MX415" section shows "Collection status: Ready" and "Processing status: Ready", with a "Submit Feedback" button.

The "Executive Output" window shows a log of system messages, including resolution results, strategy parameters, and file paths.

The "MOSFLM Output" window shows a table of parameters for four different data sets (Dps_P23_-Dps1, Dps_P23_-Dps4, Dps_P23_-Dps2, Dps_P23_-Dps3). The table includes columns for "Parameter", "Indexing successful", and "Indexing successful" values.

Parameter	Dps_P23_-Dps1	Dps_P23_-Dps4	Dps_P23_-Dps2	Dps_P23_-Dps3
Status	Indexing successful	Indexing successful	Indexing successful	Indexing successful
Resolution obtained	1.509251	1.509115	1.508716	1.508861
Diffraction rings	false	false	false	false
Mosicity	0.45	0.31	0.61	0.46
No refl. rejected	453	861	553	457
No spots found	1851	1876	2069	1769
No spots used	1402	1549	1414	1387
No spots rejected	-56	-67	-73	-38
Beam shift X	-0.205421	+0.236152	+0.259254	+0.243423
Beam shift Y	-0.017006	-0.00248	-0.022011	-0.021927
Spot dev. R	0.216972	0.220821	0.264684	0.219707
Spot dev theta	0.0	0.0	0.0	0.0
Space group	P222	P222	P222	P222
Unit cell a	54.205227	53.886574	54.051582	54.029049
Unit cell b	58.21067	56.930092	57.206631	56.912693
Unit cell c	66.85833	66.006882	66.240974	65.994873
Unit cell alpha	90.0	90.0	90.0	90.0
Unit cell beta	90.0	90.0	90.0	90.0
Unit cell gamma	90.0	90.0	90.0	90.0
Strategy phi start	165.0	158.0	0.0	42.0
Strategy phi end	234.05	256.0	78.3	110.4
Strategy phi rotation	1.45	1.75	1.35	0.95
Strategy no images	49	56	57	72
Strategy exp. time per image	0.1	0.1	0.1	0.1
Strategy total exp. time	4.9	5.6000000000000005	5.7	7.2
Strategy resolution	1.58	1.38	1.58	1.58

Projects Using The Framework?

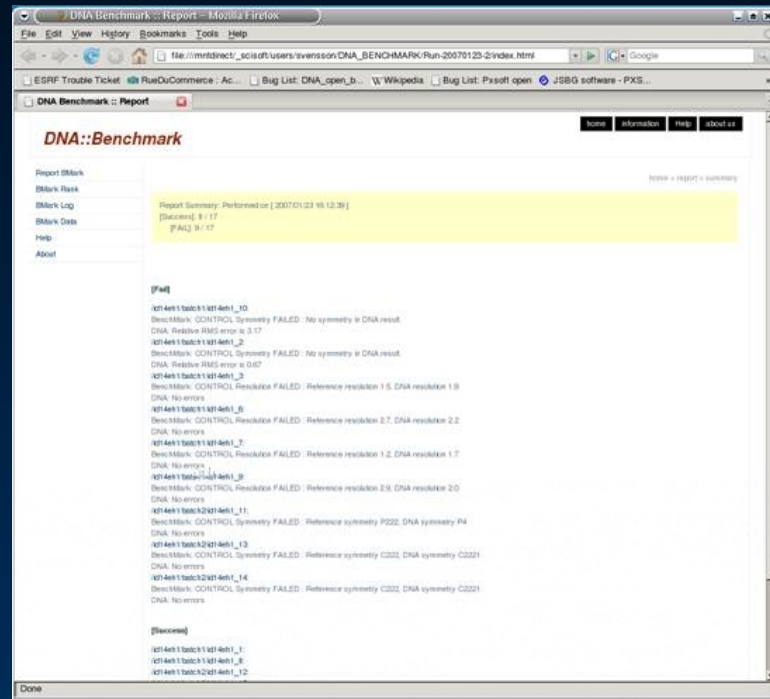
[DNABenchmark]

Test benchmark manager to evaluate the scientific results.

The DNA - <http://www.dna.ac.uk> - project is a collaboration initially between the ESRF, the CCLRC Daresbury Laboratory and MRC-LMB in Cambridge, with the aim of completely automating the collection and processing of X-Ray protein crystallography data - Founded by European Community Project: BioXHIT <http://www.bioxhit.org>

TODAY

PyAALib - JyAALib
version 1.0



Projects Using The Framework?

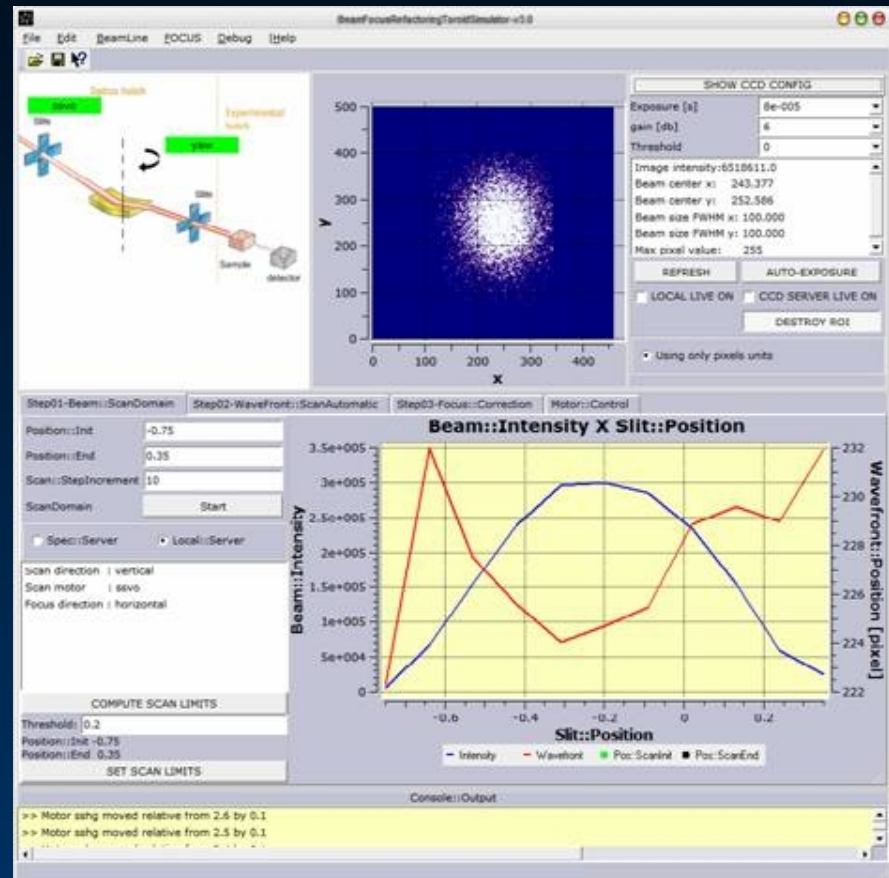
[BeamFocus]

BeamLine Assisted Focus Application.

Software used to assist the beamline operator to optimally focus X-Rays beams at ESRF European Synchrotron Radiation Facility - SciSoft Group <http://beamfocus.sourceforge.net>

TODAY

PyAALib - JyAALib
version 1.0



Projects Using The Framework?

[EDFExplorer]

Software used to assist the beamline user to transfer his data in EDF format to an HDF5 container - ESRF European Synchrotron Radiation Facility - SciSoft Group - <http://edfexplorer.sourceforge.net>

TODAY

PyAALib - JyAALib
version 2.0

The screenshot shows the EDFExplorer website. At the top, there is a navigation bar with links for EDFExplorer, PyAALib, HDF5, ESRF, about us, and web. The main heading is "EDFExplorer - EDF Data File Converter to HDF5", with a sub-heading "Powered by PyAALib". On the left, there is a vertical menu with links for Home, Description, Features, Download, Tutorial, License, and Contact. The main content area is divided into sections: ["EDFExplorer"], ["How does it work?"], and ["Technology?"]. The ["EDFExplorer"] section states the main objective is to help ESRF users transfer data from EDF to HDF5. The ["How does it work?"] section describes the command-line interface. The ["Technology?"] section explains the use of the PyAALib plugin framework. At the bottom, there is a footer with copyright information and a SOURCEFORGENET logo.

EDFExplorer PyAALib HDF5 ESRF about us web

EDFExplorer - EDF Data File Converter to HDF5

Powered by PyAALib

- Home
- Description
- Features
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["EDFExplorer"]

Main objective of the project is to help the ESRF user

- European Synchrotron Radiation Facility -
- to transfer data from the file type EDF ("ESRF Data Format")
- to/from the free and open HDF5 Container
- Hierarchical Data Format - version 5.

["How does it work?"]

The user creates a HDF5 container from the command line interface to transport his files and use a free software from the internet to manipulate the ESRF data from the file...

["Technology?"]

The software uses the plugin technology from the PyAALib Framework. It is entirely constructed by plugins and a command line interface. The user can easily add or modify the plugins to new features. Each plugin is compiled and managed on runtime. The entire application is multi-threaded and safe thread: it does a lot of things at the same time for each plugin available.

Document Designed by © 2007 EDFExplorer Team
Site Version 1.0 - 20070723

SOURCEFORGENET

Overview Resume

- AALib is an OOP Framework
- It is composed by classes
- It is free and Open Source
- It has a built in multithread plugin architecture
- PyAALib runs on Python
- PyAALib- JyAALib runs on Jython-
JAVA virtual machine platform

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You can use an AALib class in any kind of code or library

```
from ALVerbose import ALVerbose  
ALVerbose.screen( "Hello world" )
```

```
from ALVerbose import ALVerbose  
from ALString import ALString  
  
oalString = ALString( "Hello world" )  
ALVerbose.screen( oalString )
```

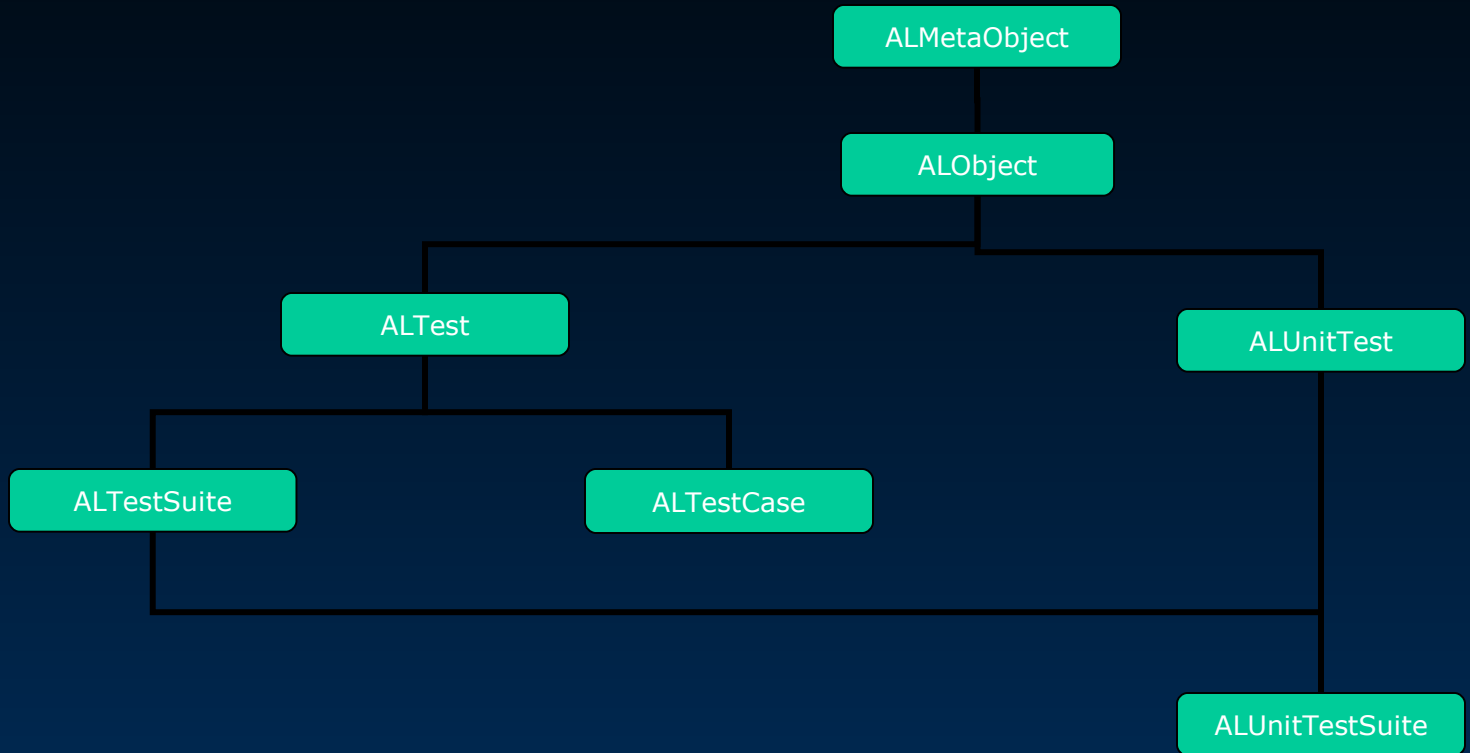
AALib Basis

We have about 140 different classes today
(october/ 2008)

We have at least 1000 methods to test these classes
(and increasing)

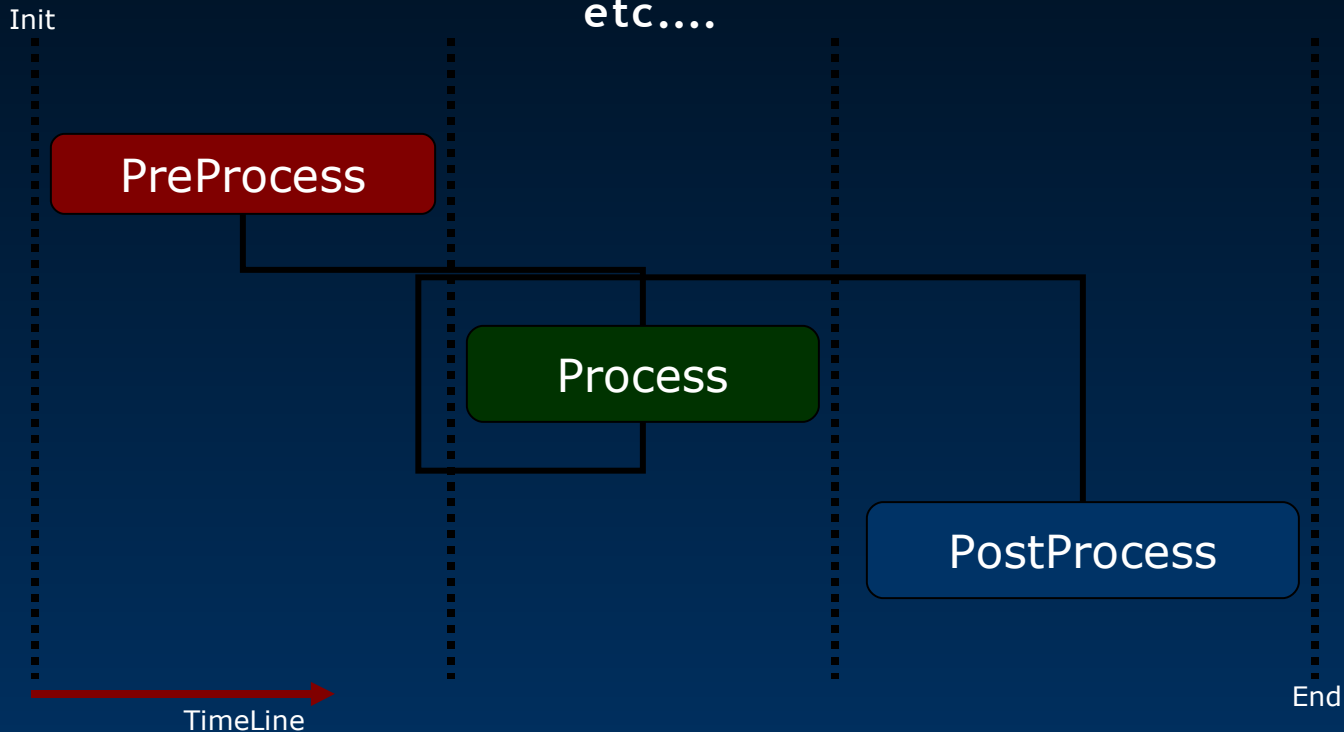
We use the `UnitTest` concept to test all methods and classes of the Library

AALib Basis



AALib Basis

- All complex events (i.e.: Actions, ALApplication, etc) are modelled by a simple standard sequential STEP cycle “engine”
- These “engines” are encapsulated on threads and can be used in a massive multithread application - i.e.: ALAction, ALApplication, ALComandLine, ALTest, etc....



AALib Basis

[Basic Application Framework skeleton]

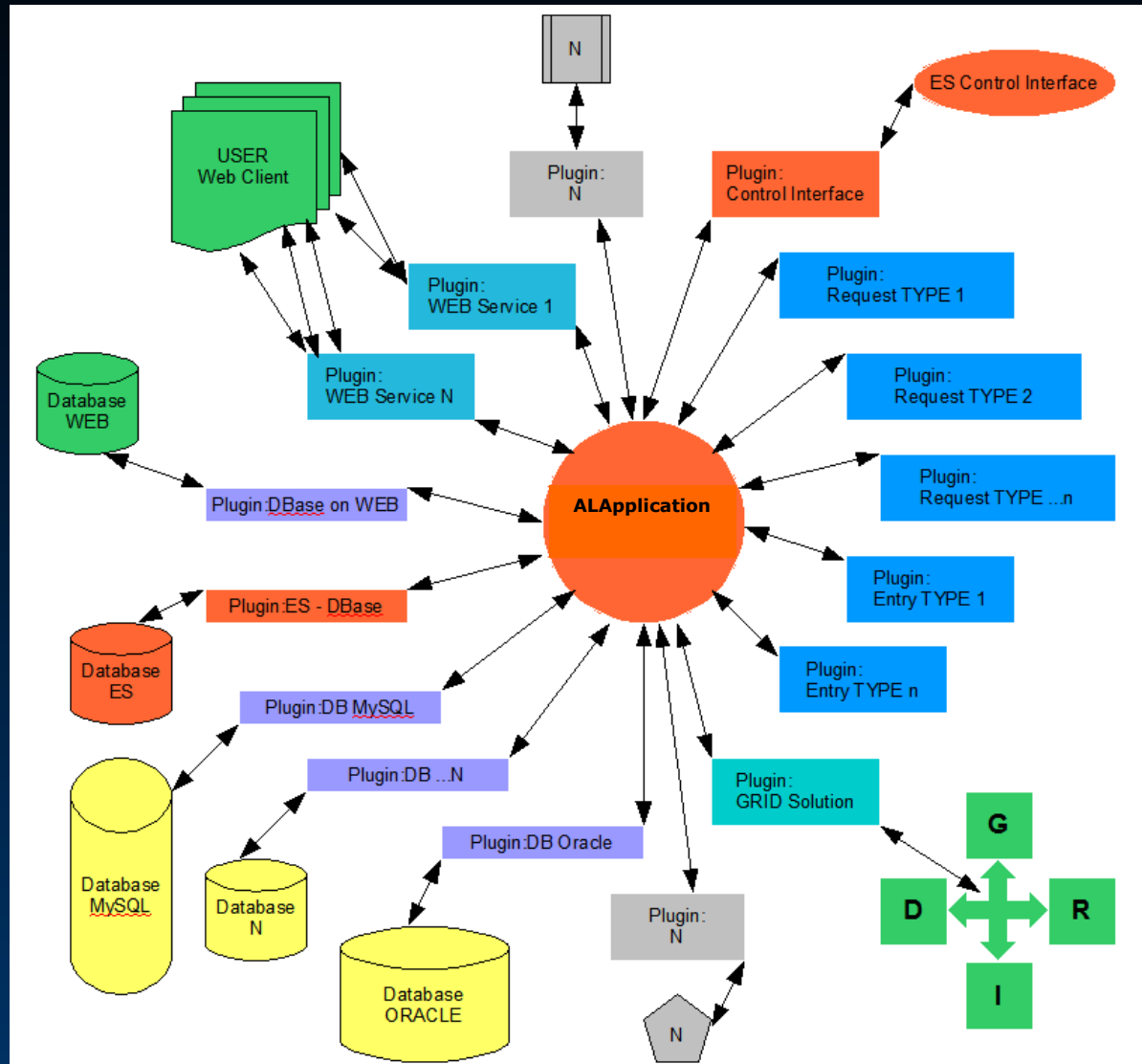
“A single code line to define and run a complete asynchronous multithread application based on a dynamic plugin architecture”

```
from ALImportKernel    import ALApplication
if __name__ == '__main__':
    ALApplication( "DemoApplication", "2.0" ).execute()
```

- **Dynamic Plugin Architecture**

The plugin architecture add new functionalities to the ALApplication.

AALib Basis - Plugin



AALib Basis Resume

- AALib has “out of the box” classes for modern software
- The basic engine model is simple and flexible:
PreProcess - Process - PostProcess
- The main use case is “one line of code”
- The basic use case is a complete modern application model
- It has resources, multithread log manager, built-in basic controls, etc
- The plugin model is built-in in the main use case

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Callback Design Pattern

- What does that mean?

It allows connect different codes (or programs) with NO RELATION between each other!! and control them...

X

- Why?

To extend a code with no changes, to add features to a complex code, to connect asynchronous code, to synchronize events, etc....

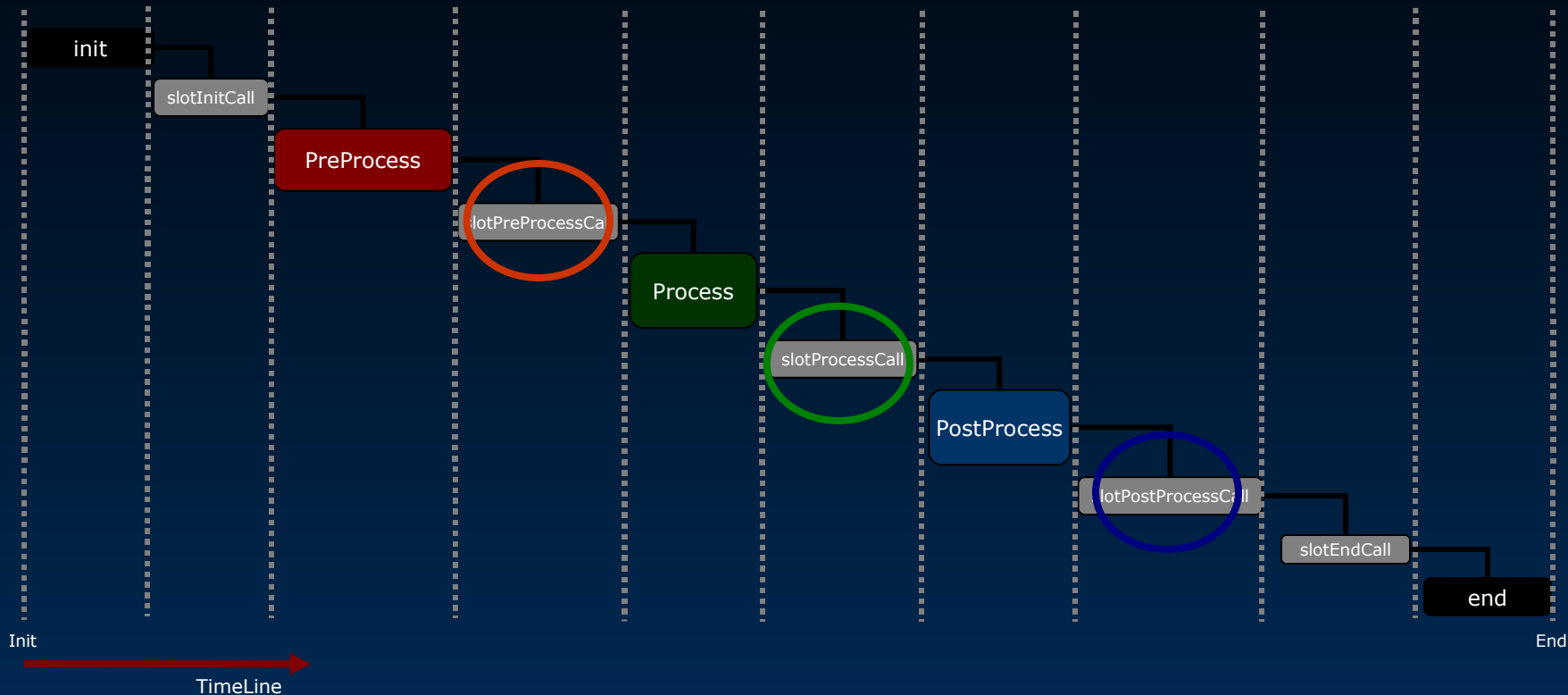
- How does it works? - Steps:

- A `Container` has a “`Slot`” object to connect the `Container` (in fact: the `Slot` object store a list of `Code`);
- An `Code` is connected to the `Container` Slot;
- In the `Container` loop, an “Event” calls the `Slot` to execute the `Code`;
- Optional: the `Code` can pass an Object to the `Container` list by its `Slot`.

CallBack Example: ALAction::executeAction ()

```
class ClassBT :  
  
    def methodPrintInit( self, _obj = None ):  
        ALVerbose.unitTest( "    Class B::printing in INIT: " + ALString( _obj ) )  
  
    def methodPrintEnd( self, _obj = None ):  
        ALVerbose.unitTest( "    Class B::printing in END : " + ALString( _obj ) )  
  
    def methodPrintRun( self, _obj = None ):  
        ALVerbose.unitTest( "    Class B::printing in RUN : " + ALString( _obj ) )  
  
.....  
  
oClassBT = ClassBT()  
  
oalAction = ALAction()  
  
oalAction.connectPreProcess( oClassBT.methodPrintInit )  
oalAction.connectPostProcess( oClassBT.methodPrintEnd )  
oalAction.connectProcess( oClassBT.methodPrintRun )  
  
oalAction.executeAction()
```

CallBack Example: AAction::executeAction ()



```
oalAction.connectPreProcess( oClassBT.methodPrintInit )  
oalAction.connectProcess(   oClassBT.methodPrintRun   )  
oalAction.connectPostProcess( oClassBT.methodPrintEnd )
```



CallBack Example: ALAction::executeAction ()

connecting a sequence
of events

```
class ClassBT :  
  
  def methodPrintInit( self, _obj = None ):  
    ALVerbose.unitTest( "   Class B::printing in INIT: " + ALString( _obj ) )  
  
  def methodPrintEnd( self, _obj = None ):  
    ALVerbose.unitTest( "   Class B::printing in END : " + ALString( _obj ) )  
  
  def methodPrintRun( self, _obj = None ):  
    ALVerbose.unitTest( "   Class B::printing in RUN : " + ALString( _obj ) )
```

.....

```
oClassBT = ClassBT()
```

```
oalAction = ALAction()
```

```
oalAction.connectPostProcess( oClassBT.methodPrintEnd )  
oalAction.connectPostProcess( oClassBT.methodPrintEnd )  
oalAction.connectPostProcess( oClassBT.methodPrintEnd )
```

```
oalAction.connectPreProcess( oClassBT.methodPrintInit )  
oalAction.connectPreProcess( oClassBT.methodPrintInit )  
oalAction.connectPreProcess( oClassBT.methodPrintInit )
```

```
oalAction.connectProcess( oClassBT.methodPrintRun )
```

```
oalAction.executeAction()
```


Callback Resume

It allows connect different codes (or programs) with NO RELATION between each other!! and control them...

To extend a code with no changes, to add features to a complex code, to connect asynchronous code, to synchronize events, etc....

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[Case 1: Basic Application Framework skeleton]

“A single code line to define and run a complete asynchronous multithread application based on a dynamic plugin architecture”

Main Use Case

```
from ALImportKernel    import ALApplication
if __name__ == '__main__':
    ALApplication( "DemoApplication", "2.0" ).execute()
```

Main Use Case

[Case 1: Basic Application Framework skeleton]

A basic application class defines a “skeleton” to RAID (“Rapid Application Development and Deployment”).

It manages all logs, resources and actions creating and connecting all code with the heterogeneous operational system.

All signals and events are controlled and monitored by the main code inspector.

The main architecture to generate and control the multi-thread actions is encapsulated on the framework and its basic classes to simplify the code development.

[Case 1: Basic Application Framework skeleton]

The code fragment shows the construction of the basic skeleton. It implements the RAID platform. These code implements the **ALApplication** class to manage all actions (controlled threads) and callbacks. The External method "methodPrintHello" is connected to the application by the callback system.

[Case 1: Basic Application Framework skeleton]

```
from ALImportKernel    import ALApplication
from ALImportSystem   import ALVerbose

def methodPrintHello( _oalObject = None ):
    ALVerbose.screen( "Hello World" )

if __name__ == '__main__':

    # JIT compiler accelerator
    ALCompiler.accelerator()

    # Application Framework definition
    obLoadPlugins = False
    oalApplication = ALApplication( "DemoApplication", "2.0", obLoadPlugins )

    # Application Callback Connexion
    oalApplication.connectExecute( methodPrintHello )

    # Application Execution
    oalApplication.execute()
```

How does it work?

```
# JIT compiler accelerator  
ALCompiler.accelerator()
```

- The Python runtime code accelerator is optional. It optimises the code execution only in X86 processors.

```
# Application Framework definition  
obLoadPlugins = False  
oalApplication = ALApplication( "DemoApplication", "2.0", obLoadPlugins )
```

- The ALApplication class is created with the option "no plugins". It avoid the search and store of the information of plugins. The plugins are loaded when the plugin object is instantiated, not when it is found. This mechanism is introduced later in other tutorial.

```
# Application Callback Connexion  
oalApplication.connectExecute( methodPrintHello )
```

- The callback system is a "slot" to connect any external code to the central loop of the application. In the example, the "methodPrinterHello" method is glued to the main execution point. The main loop will call this external method

```
d # Application Execution  
oalApplication.execute()
```

- The main application loop is started when the

[Case 1: Basic
Application Framework
skeleton]

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Design of the main use case

```
from ALImportKernel    import ALApplication

if __name__ == '__main__':

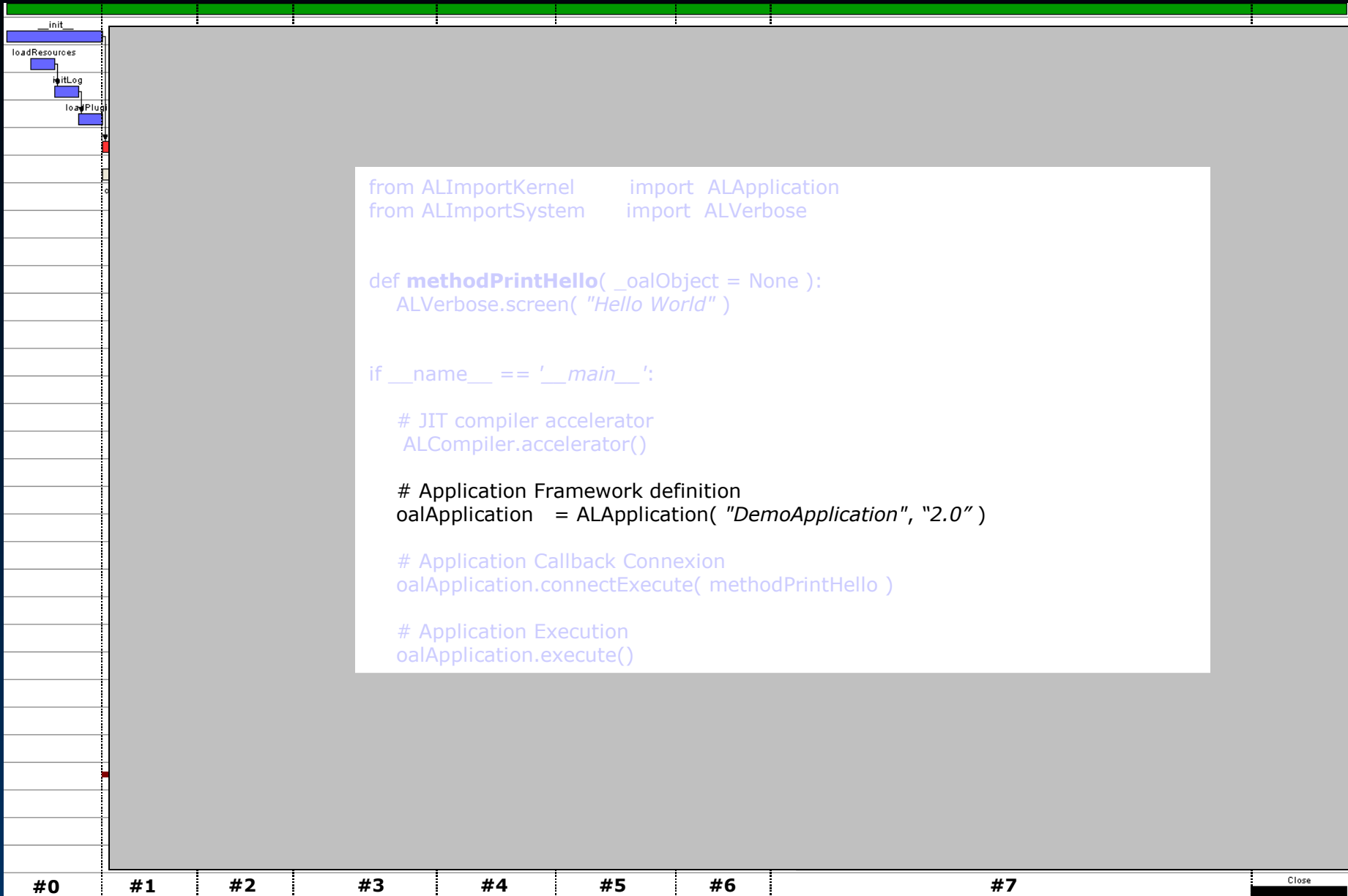
    ALApplication( "DemoApplication", "2.0" ).execute()
```


AA Lib Internals:

ALApplication::execute ()

**The Massive Parallel
Kernel**

ALApplication::execute() “Gantt Chart - 8 STEPS”



#0

#1

#2

#3

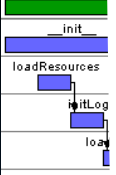
#4

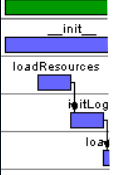
#5

#6

#7

Close

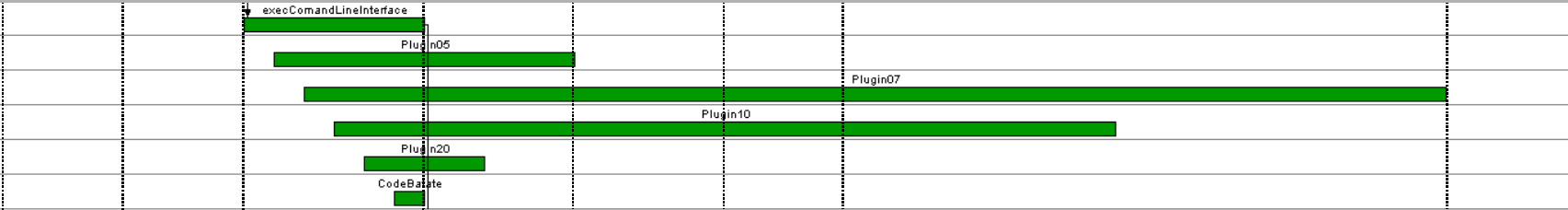
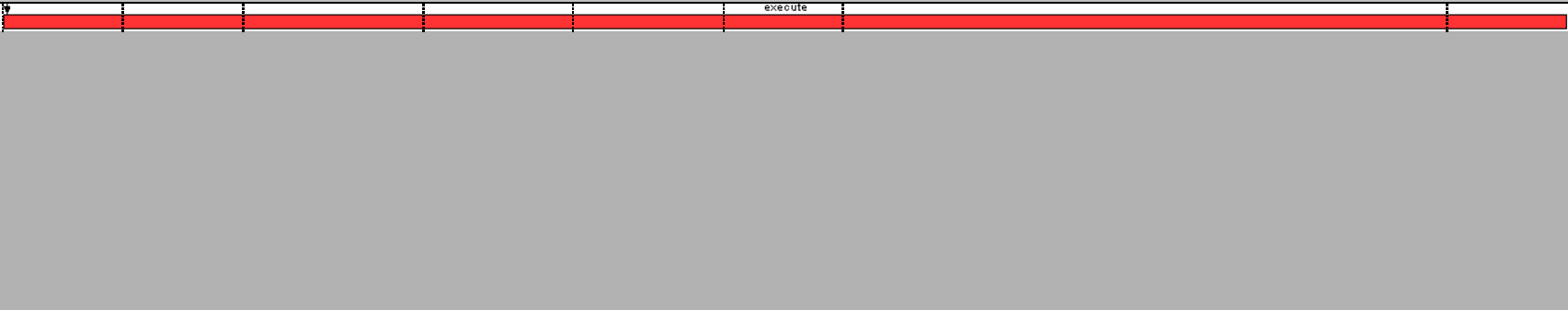




ALApplication::execute() “Gantt Chart - 8 STEPS”

Application Execution
oalApplication.execute()

i.e.: running 15 different plugins or codes in parallel



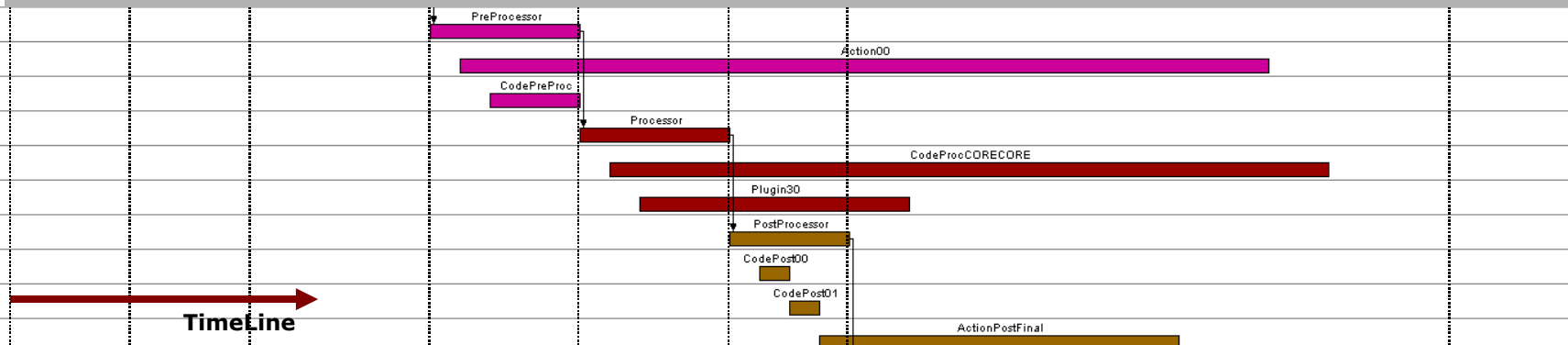
TimeLine

#0 #1 #2 #3

ALApplication::execute() “Gantt Chart - 8 STEPS”

Application Execution
oalApplication.execute()

i.e.: running 15 different plugins or codes in parallel



TimeLine →

#0

#1

#2

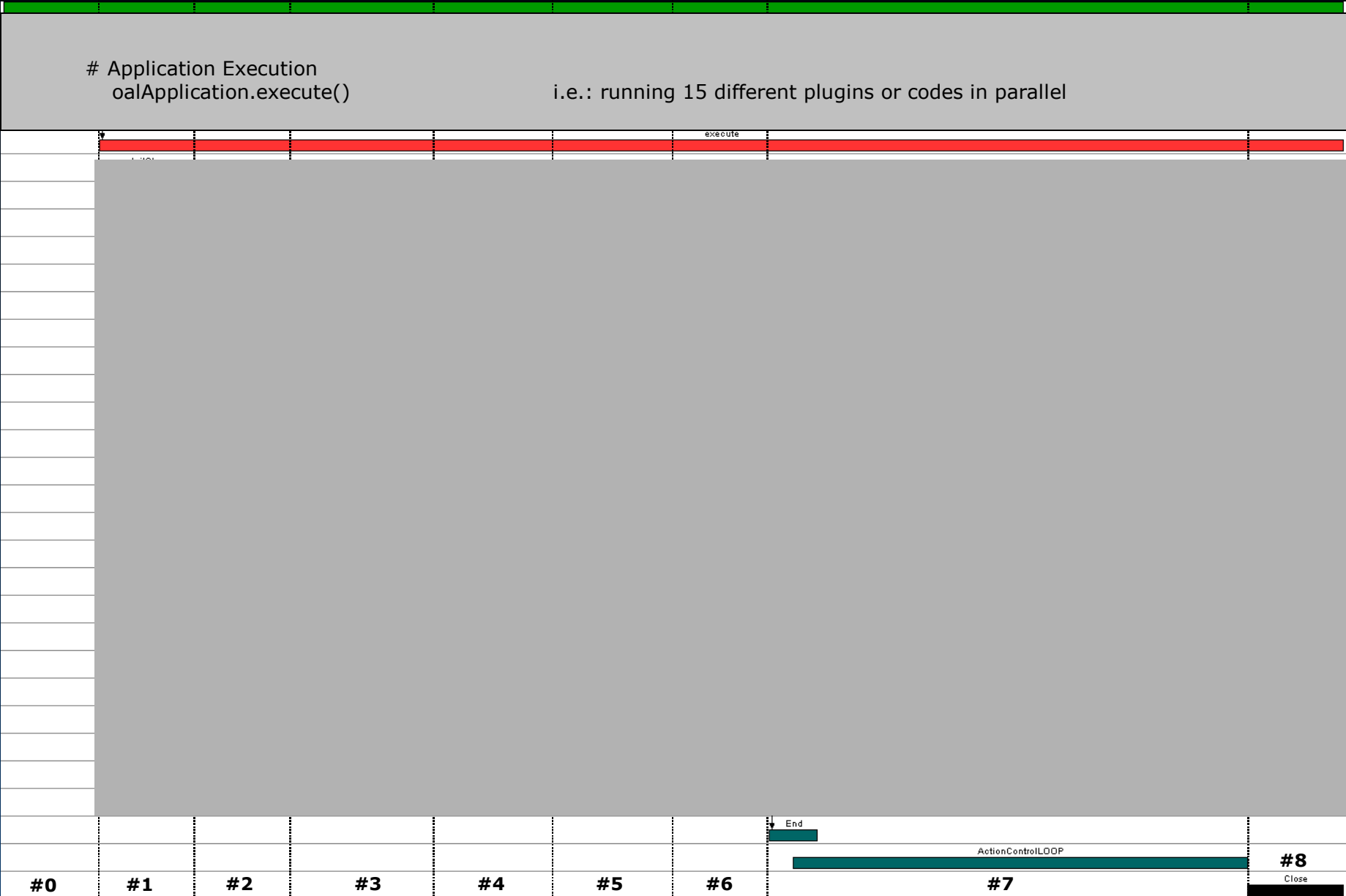
#3

#4

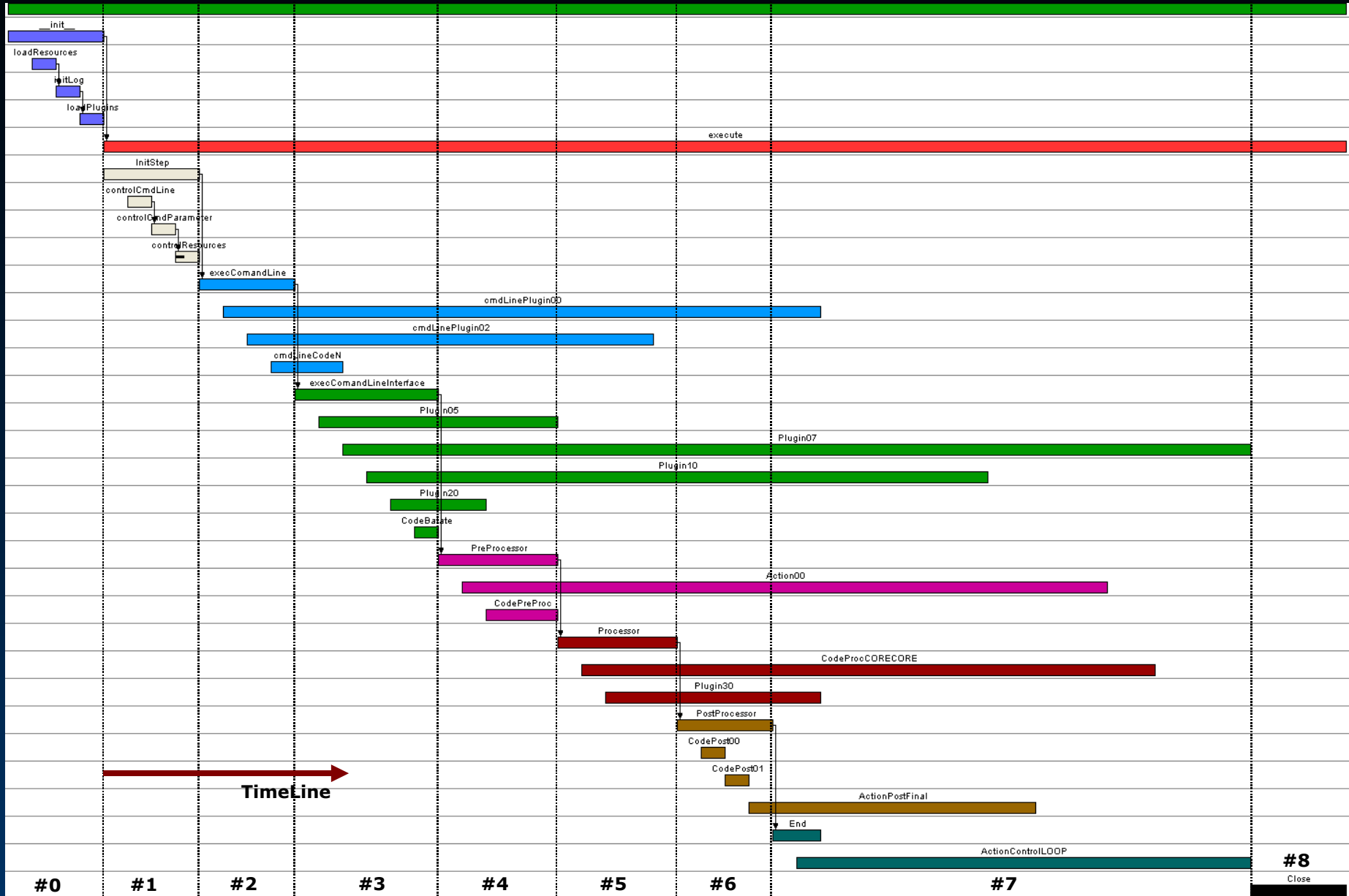
#5

#6

ALApplication::execute() “Gantt Chart - 8 STEPS”



ALApplication::execute() “Gantt Chart - 8 STEPS”



ALib Internals: ALApplication::execute () The CODE

```
#####  
  
def execute( self, _bInit = True ):  
    """  
    This is the Main ALAppDefinitionCore Loop Control.  
    """  
    ALVerbose.DEBUG( "Execution: ALAppDefinitionCore.execute()" )  
    try:  
        try:  
            if (self.__executeCoreInit( _bInit )==True):  
                self.__executeCore()  
  
        except ALExceptionSignal, _oalExceptionSignal:  
            oalSignal = _oalExceptionSignal.getSignal()  
            ALVerbose.DEBUG( "Execution: ALAppDefinitionCore.execute() - AL_FRAMEWORK_FORCE_CLOSE_APPLICATION" )  
            if ( oalSignal!=None ):  
                ALVerbose.DEBUG("ALAppDefinitionCore.execute() - stopped by Signal: " + ALString( oalSignal.getSignal() ) )  
            else:  
                ALVerbose.DEBUG("ALAppDefinitionCore.execute() - stopped under Unknown signal: " + ALString( oalSignal.getSignal() ) )  
            self.__executeCoreRaise()  
  
        except:  
            ALVerbose.error( "Execution: ALAppDefinitionCore.execute() - FATAL ERROR - UNEXPECTED ERROR RAISED" )  
            self.__executeCoreRaise()  
  
    finally:  
        self.__executeCoreClose()  
  
#####
```

Show Time

Other Use Cases

[Plugin Framework]

[XML-RPC server plugin architecture]

[Basic Callback System]

[Data Binding - XML Scheme object construction]

[SubProcess Management]

Main Use Case Resume

A basic application class defines a “skeleton” to RAID (“Rapid Application Development and Deployment”).

It manages all logs, resources and actions creating and connecting all code with the heterogeneous operational system.

All signals and events are controlled and monitored by the main code inspector.

The main architecture to generate and control the multi-thread actions is encapsulated on the framework and its basic classes to simplify the code development.

Main Use Case Resume

A basic application “skeleton” elements for dynamic plugins:

Automatic:

- One line code to define the ALApplication object;
- a folder to store the directories of plugins
 default place = “PROJECT_ROOT/plugins”;
- the folders with plugins;

Static:

- One line code to define the ALApplication object;
- a folder to store the directories of plugins
 default place = “PROJECT_ROOT/plugins”;
- the folders with plugins;
- a plugin mapping file definition in the plugin folder -
 default file =
 “PROJECT_ROOT/plugins/comandLineInterface.xml”;

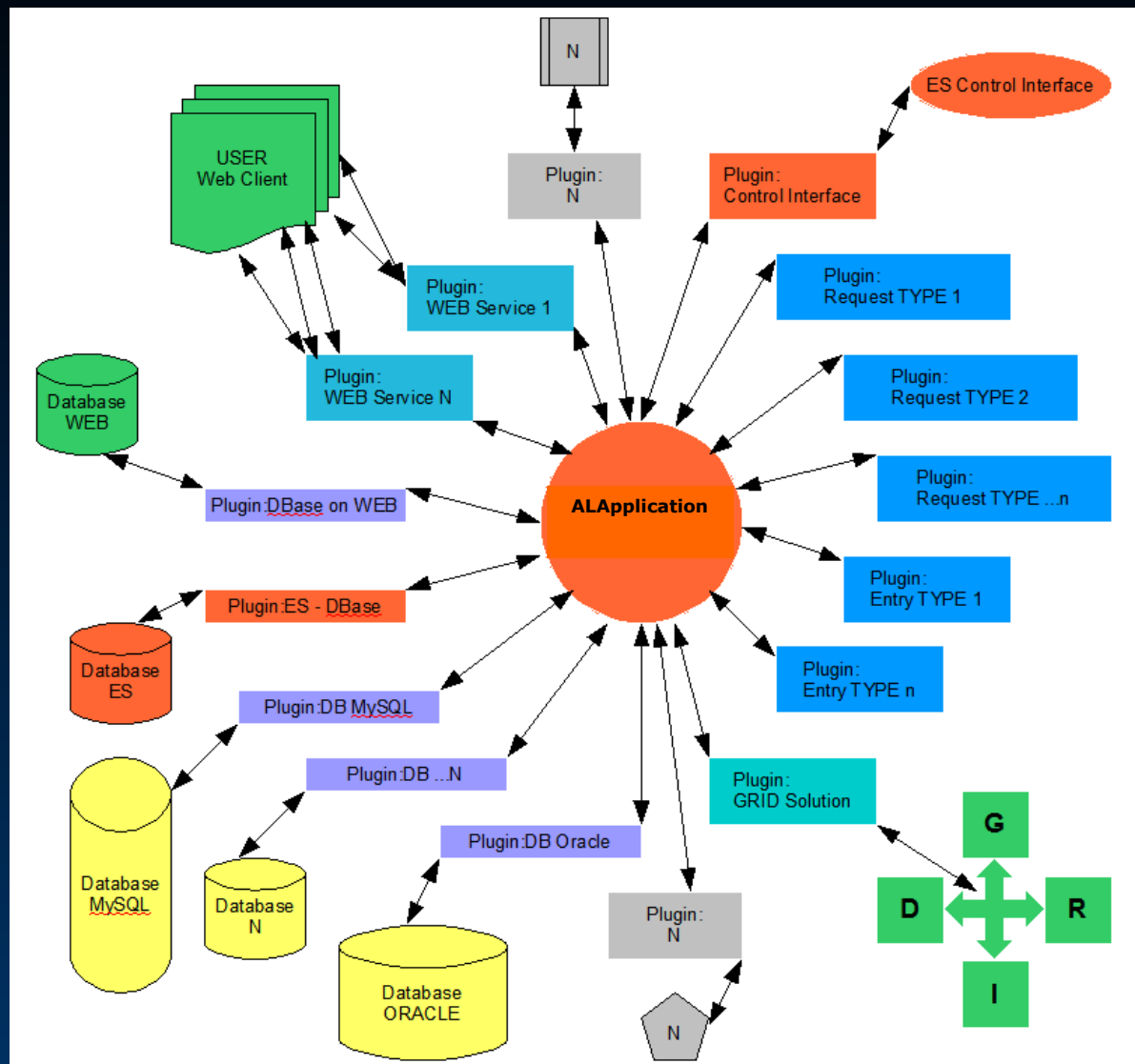
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- **Dynamic Plugin Architecture**

The plugin architecture add new functionalities to the ALApplication.

Plugin Architecture



- **Dynamic Plugin Architecture**

The “plugin” is a python-jython-java code dynamically generated and add to the main ALApplication framework. The mechanism can be used with any code.

The based “plugin” defined by the AALib comes from the ALAction and it is full “multi-thread” and “Thread Safety”

Plugin Architecture

The “plugin” is defined by the name of the “file”. The main class inside must have the same “name”

The “plugin” can be generated from a pair of “XSD+Xml” files = Data Binding Mechanism.

A special xml file(s) can “map” the plugin set. It manages all information needed to characterise the commands and information of the plugin (help, man, etc...)

A basic Plugin

- A standard plugin code

```
the file: "PluginExample.py"
from ALVerbose import ALVerbose
from ALPlugin import ALPlugin

class PluginExample( ALPlugin ):

    def process( self, _oalObject = None ):
        ALVerbose.screen( "Hello World from the PluginExample" )

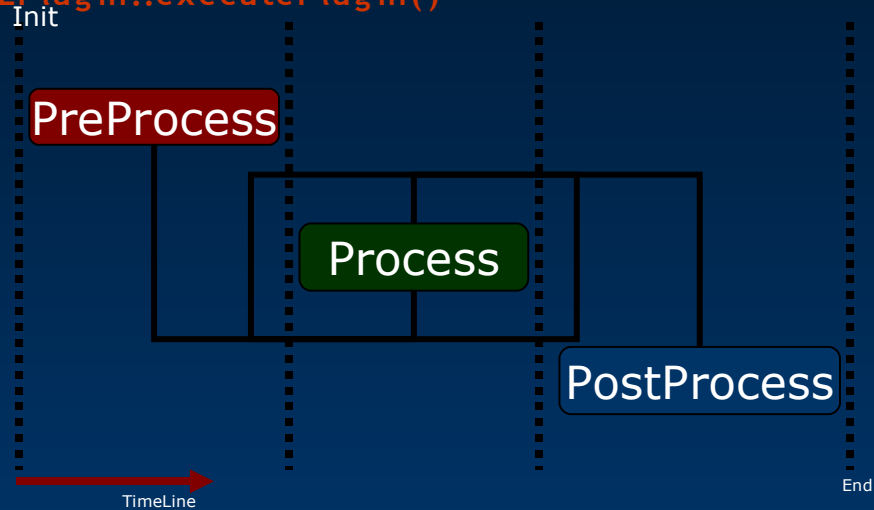
    .....

# To be used in a code somewhere:

oalPlugin = ALApplication.getPluginObject( "PluginExample" )
if (oalPlugin!=None):
    oalPlugin.executePlugin()
```

- Thread Architecture (inherits from ALAction)

ALPlugin::executePlugin()



Plugin Architecture Resume

The “plugin” is a python-jython-java code dynamically generated and add to the main ALApplication framework.

The based “plugin” is full “multi-thread” and “Thread Safety”

The “plugin” can be generated from a pair of “XSD+Xml” files = Data Binding Mechanism.

A special xml file(s) can “map” the plugin set. It manages all information needed to characterise the commands and information of the plugin (help, man, etc...)

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- Plugins based on XSD definitions
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Data Binding by XSD definition

- **Why?**

XML data binding refers to the process of representing the information in an XML document as an object in computer memory.

This allows applications to access the data in the XML from the object rather than using the DOM to retrieve the data from a direct representation of the XML itself.

- **How?**

An XML data binder accomplishes this by automatically creating a mapping between elements of the XML schema of the document we wish to bind and members of a class to be represented in memory.

- **Where?**

When this process is applied to convert an XML document to an object, it is called unmarshalling. The reverse process, to serialize an object as XML, is called marshalling.

Data Binding by XSD definition

Example:
“The ComandLineInterface Data”

The XSD Definition

```
<?xml version="1.0"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:complexType name="ALCommandLineInterfaceElement">
    <xsd:sequence>
      <xsd:element name="command" type="xsd:string"/>
      <xsd:element name="argument" type="xsd:string"/>
      <xsd:element name="commandDescription" type="xsd:string"/>
      <xsd:element name="class" type="xsd:string"/>
      <xsd:element name="classMethod" type="xsd:string"/>
      <xsd:element name="classFileName" type="xsd:string"/>
      <xsd:element name="plugin" type="xsd:string"/>
      <xsd:element name="pluginMethod" type="xsd:string"/>
      <xsd:element name="pluginFileName" type="xsd:string"/>
      <xsd:element name="help" type="xsd:string"/>
      <xsd:element name="manual" type="xsd:string"/>
      <xsd:element name="webAdress" type="xsd:string"/>
      <xsd:element name="webUpDate" type="xsd:string"/>
      <xsd:element name="copyright" type="xsd:string"/>
      <xsd:element name="author" type="xsd:string"/>
      <xsd:element name="date" type="xsd:string"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

```
<?xml version="1.0"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:include schemaLocation="ALCommandLineInterfaceElement.xsd"/>

  <xsd:complexType name="ALCommandLineInterfaceDefinition">
    <xsd:sequence>
      <xsd:element name="date" type="xsd:string"/>
      <xsd:element name="version" type="xsd:string"/>
      <xsd:element name="name" type="xsd:string"/>
      <xsd:element name="information" type="xsd:string"/>
      <xsd:element name="author" type="xsd:string"/>
      <xsd:element name="commandLineElement"
        type="ALCommandLineInterfaceElement"
        minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

The code:

```
oalXsdDataBinding = ALXsdDataBinding( "cmdLineInt.xsd" )
oalObject = oalXsdDataBinding.getObject( "cmdLineIntModel.xml" )
If (oalObject!=None):
    oalObject.outputXml()
```

Data Binding by XSD definition

Example:
"The CommandLineInterface Data"

The XML File

```
<!-- This example shows the minimum to execute an standart PyAALib plugin : executePlugin() -->
<commandLineElement>
  <command>--jython01</command>
  <plugin>PluginJythonTest01</plugin>
  <help>The HELP lines on the screen for
    the command --jython.</help>
  <manual>The MANUAL lines on the screen for
    the command --jython.</manual>
  <webAddress>http://pypaalib.sourceforge.net</webAddress>
  <webUpdate>http://pyaalib.sourceforge.net</webUpdate>
  <copyright>PyAALib 2005-2007</copyright>
  <author>Romeu Andre Pieritz</author>
  <date>[ 2007/09/10 13:47:13 ]</date>
</commandLineElement>

<!-- This example shows the minimum to execute an standart PyAALib plugin : executePlugin() -->
<commandLineElement>
  <command>--jython02</command>
  <plugin>PluginJythonTest02</plugin>
  <help>The HELP lines on the screen for
    the command --jython.</help>
  <manual>The MANUAL lines on the screen for
    the command --jython.</manual>
  <webAddress>http://pypaalib.sourceforge.net</webAddress>
  <webUpdate>http://pyaalib.sourceforge.net</webUpdate>
  <copyright>PyAALib 2005-2007</copyright>
  <author>Romeu Andre Pieritz</author>
  <date>[ 2007/09/10 13:47:13 ]</date>
</commandLineElement>

<!-- This example shows the minimum to execute an standart PyAALib plugin : executePlugin() -->
<commandLineElement>
  <command>--jython03</command>
  <plugin>PluginJythonTest03</plugin>
  <help>The HELP lines on the screen for
    the command --jython.</help>
  <manual>The MANUAL lines on the screen for
    the command --jython.</manual>
  <webAddress>http://pypaalib.sourceforge.net</webAddress>
  <webUpdate>http://pyaalib.sourceforge.net</webUpdate>
  <copyright>PyAALib 2005-2007</copyright>
  <author>Romeu Andre Pieritz</author>
  <date>[ 2007/09/10 13:47:13 ]</date>
</commandLineElement>
```


Data Binding by XSD definition

Example:
“The code example to generate
the Python - Jython Binding”

```
ALVerbose.unitTest( "Test ALTestCaseALXsdDataBinding" )

oalStrXsdInputFile = ALString( "../DataForTests/people.xsd" )
oalStrXmlInputFile = ALString( "../DataForTests/people.xml" )

ALVerbose.unitTest( "Testing the people.xsd import module people.py" )
oalXsdDataBinding3 = ALXsdDataBinding( oalStrXsdInputFile )
oalObject3 = oalXsdDataBinding3.getObject( oalStrXmlInputFile )
oalObject3.outputFile( "testOuputPeopleXsd03.xml" )

ALVerbose.unitTest( "Testing the people.xsd import module module_people4.py" )
oalStrPyOutputFile = ALString( "module_people4.py" )
oalXsdDataBinding4 = ALXsdDataBinding( oalStrXsdInputFile, oalStrPyOutputFile )
oalObject4 = oalXsdDataBinding4.getObject( oalStrXmlInputFile )
oalObject4.outputFile( "testOuputPeopleXsd04.xml" )

ALVerbose.unitTest( "Testing the people.xsd import module module_people5.py" )
oalStrPyOutputFile = ALString( "module_people5.py" )
oalXsdDataBinding5 = ALXsdDataBinding( oalStrXsdInputFile )
oalObject5 = oalXsdDataBinding5.getObject( oalStrXmlInputFile, oalStrPyOutputFile )
oalObject5.outputFile( "testOuputPeopleXsd05.xml" )

ALVerbose.unitTest( "Testing the empty instance of the object" )
oalXsdDataBinding6 = ALXsdDataBinding( oalStrXsdInputFile )
oalObject6 = oalXsdDataBinding6.getObject( oalStrXmlInputFile )
oalObject6.setOutputFile( "testOuputPeopleXsd06.xml" )

ALVerbose.unitTest( )
```

Data Binding by XSD definition

Resume

- It is used to represent only DATA
- Extremely powerful to describe complex object hierarchy of Data
- It can NOT to be used to store LOGIC (“code”)
- It can be used to simplify the data manipulation : automatic generation of code
- It is used also for data plugin generation “on the fly” by AALib framework

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Plugins based on XSD definitions

- The plugin is defined by an XSD scheme file
- The object instance will be created from the XML data file.

```
odtFileName = odtTestSet.getFileNameCrystalTestResult( )
if( DTDiskExplorer.existFile( odtFileName )):
    odtPlugin = DTApplication.getPluginObject( "DTCrystalTestResult", odtFileName )
    if (odtPlugin!=None):
        odtGroupTestResult.addCrystalTestResult( odtPlugin )
```

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PyAALib :: Python Asynchronous Action Library Project

AALib Framework in Python Language

- Home
- Description
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- License
- Contact

["Code once and run anywhere"]

The PyAALib project is a Python implementation of the Asynchronous Action Framework based in Pure Object Oriented Concepts to develop asynchronous communication between threads (thread safety) and external process, allowing the development of complete applications in different programming languages and platforms for heterogeneous developers.

[Why?]

"We want to code easily asynchronous actions to do a lot of things together and independently"

[Where?]

Only a single code for all platforms: Windows, MacOSX, Linux and Solaris

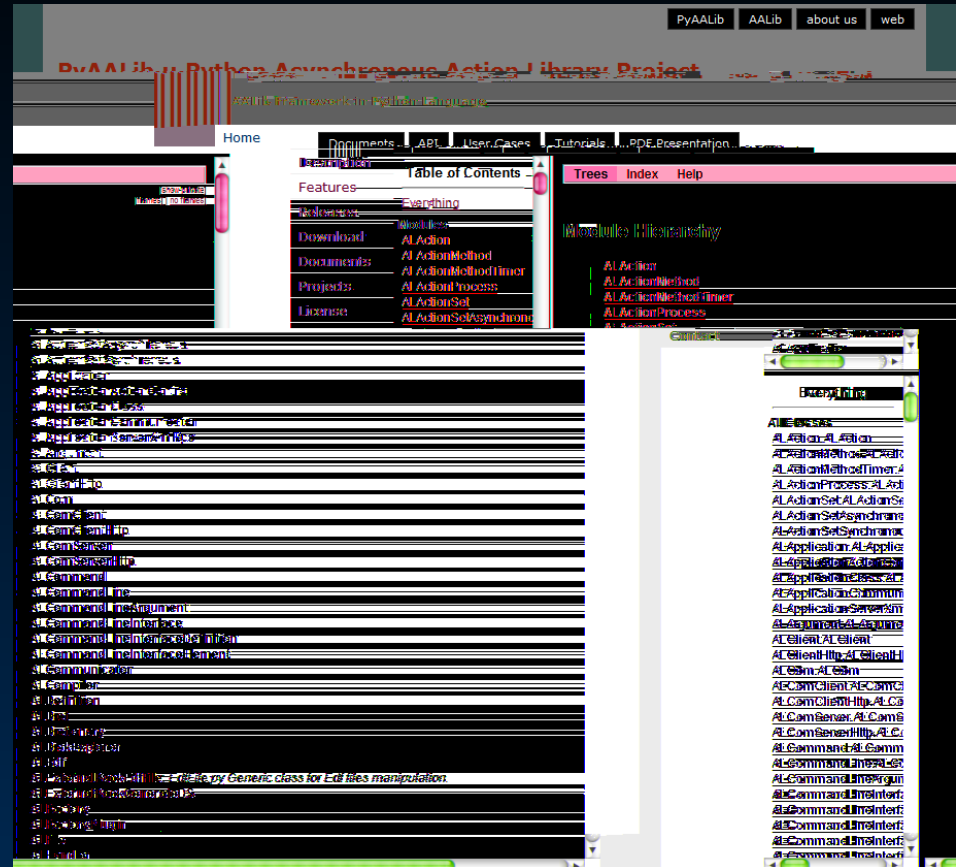
[How? PyAALib]

The actual version was developed using Python in the basic layer, it is called PyAALib, and it is designed to be natively translated to Java.

Note: this site is in development [Beta version]

Document Designed by © 2007 AALib - PyAALib Team
Site Version 2.1 - 20070710

SOURCEFORGE.NET



Documentation

<http://aalib.sourceforge.net>

<http://pyaalib.sourceforge.net>

<http://jyaalib.sourceforge.net>

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Code Syntax and rules

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from ALPlugin import ALPlugin

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    def process( self, _oalObject = None ):
        ALVerbose.screen( "Hello World from the PluginExample" )

.....

# To be used in a code somewhere:

oalPlugin = ALApplication.getPluginObject( "ALPluginExample" )
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```


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Show Time

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Discussion

- What we are still developing until the release?
Process manager class

Plugin manager class - Plugin version system

Improve some sub systems to be more flexible -
XSD, XML parsing by “path”, etc.

Documentation, documentation, documentation

Bugzilla

External packages for Jython-JAVA: Image
manipulation, HDF5, EDF files, etc.

Test and Add some interfaces for “high value”
standard JAVA libraries as “External Packages”

Testing and encapsulating the SWT (eclipse GUI
native elements) to be “easy” to use

..... more

- The Limitations of the JAVA architecture!
OOP limitations - the virtual mechanism is not trivial
External Process manager is Poor - or NULL
2x slower compared to native python

Thanks !

Documents:

<http://aalib.sourceforge.net>

<http://pyaalib.sourceforge.net>

<http://jyaalib.sourceforge.net> - 2008

<http://edfexplorer.sourceforge.net>

<http://beamfocus.sourceforge.net>

[http://www.esrf.eu/UsersAndScience/Experiments/TBS/S
ciSoft/](http://www.esrf.eu/UsersAndScience/Experiments/TBS/S
ciSoft/)

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