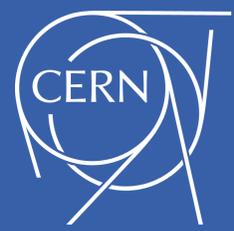


VISUALISATION OF REAL-TIME FRONT-END SOFTWARE ARCHITECTURE (FESA) DEVELOPMENTS AT CERN

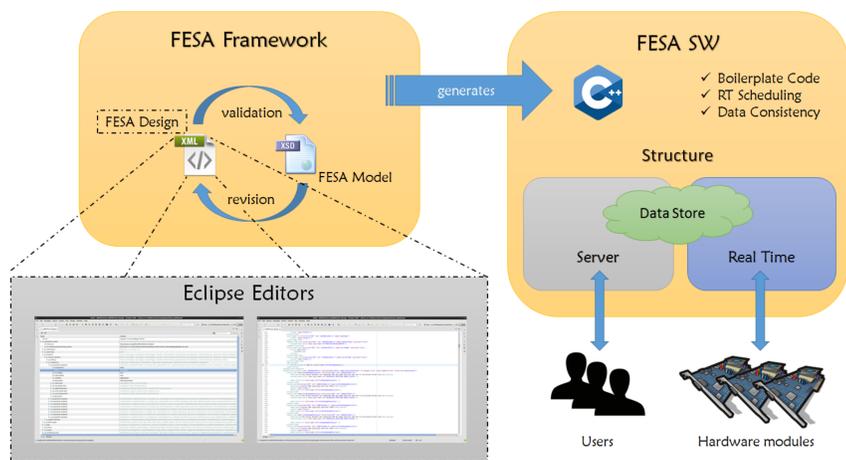


Introduction

This poster presents a structured graphical representation of the software developed with the FESA framework. In addition, it demonstrates a GUI that facilitates editing to make the resulting graph cleaner and more user-friendly.

FESA

- A framework for real-time software development.
- Integrated in Eclipse IDE.
- Software design is stored in an XML document.
- Generated C++ boilerplate code.
- Resulting software is structured in three major segments:
 - *Server* – software API.
 - *Real-Time* – hardware access.
 - *Data Store* – shared, internal data model.

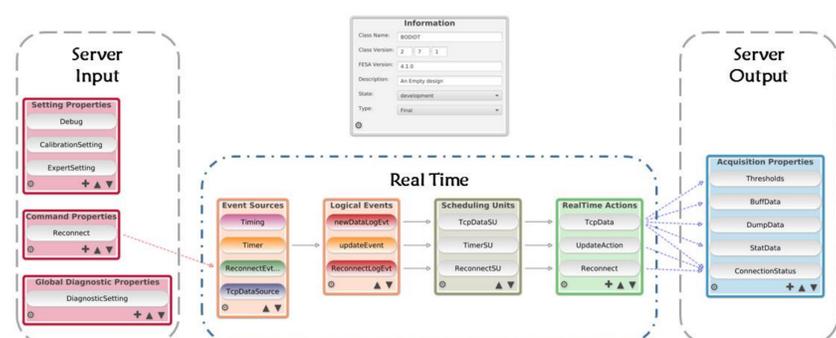


Software development with the FESA framework

Graphical Representation of a FESA Design

Visualising a FESA-design in a graph benefits from:

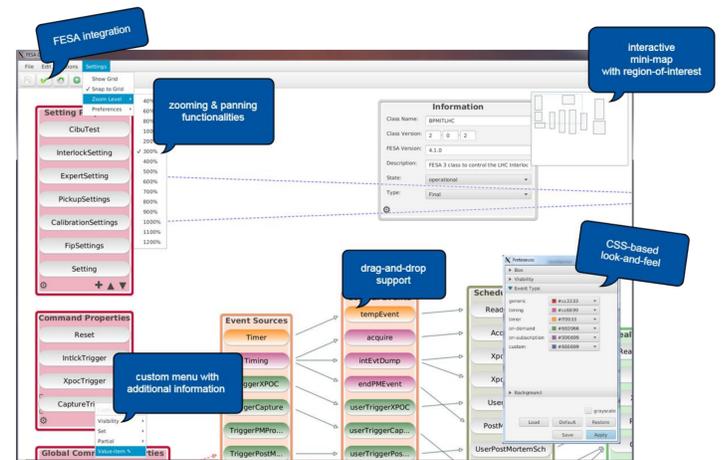
- a *structured fragmentation* grouping the elements from the different parts.
- a clean, yet descriptive *overview*, hiding internal details, while emphasising its public API.
- quick *error detection* as the association between the logical groups are visible in the form of arrows.



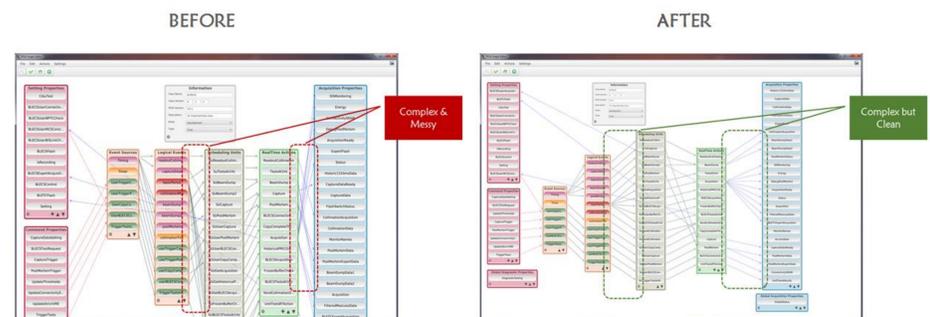
Structured graphical fragmentation of a FESA design

FESA Graph Editor

FESA Graph Editor is an interactive, stand-alone, JavaFX application that eases the transformation of a FESA-design document to its graphical depiction.



FESA Graph Editor features



Graph customisation for a cleaner software overview

DATA STORE SUMMARY

The *Data Store* is summarised in classified *tables* for better readability and it can be made *visible on demand*, when the internal details of the design are required.

name	persistent	multiplexed	data-consistent	type	dim1	dim2	unit	Exp	True	False	default	description
bool_field				bool							true	This is my boolean field
byte_2d_array_field				uint8_t	FIRST_DIM_SIZE	SECOND_DIM_SIZE					{(0,0,0),(0,0,0),(0,0,0)}	This is my byte 2D array field
double_2d_array_field				double	FIRST_DIM_SIZE	SECOND_DIM_SIZE					{(0,0,0),(0,0,0),(0,0,0)}	This is my double 2D array field
enum_array_field				CUSTOM	FIRST_DIM_SIZE							This is my custom enum array field
enum_field				HEX2_2							ITEM_0	This is my custom enum field
float_field				IEEE4_1				NChanges: 10			0.4	This is my float field
int_field				IEEE4_1				m/s	-3		100	This is my second field
long_field				uint32_t							1024	This is my long field
short_field				uint32_t							10	This is my first field
string_field				uint64_t							default string	This is my string field
uint_array_field				float							1024	This is my unsigned int array field
uint_field				double								This is my unsigned int field
ulong_2d_array_field				CUSTOM_ENUM	T_DIM_SIZE	SECOND_DIM_SIZE						This is my unsigned long 2D array field
ushort_field				DIAG_TOPIC							144	This is my unsigned short field

Data Store summary in classified tables

Conclusion

- A structured, pictorial fragmentation of a FESA-design benefits from the effortless overview of the software.
- A graphical application with in-built editor allows the graph customisation, resulting in a cleaner illustration.
- The integration of the framework into the application is highly promising for producing a complete visual layout tool.