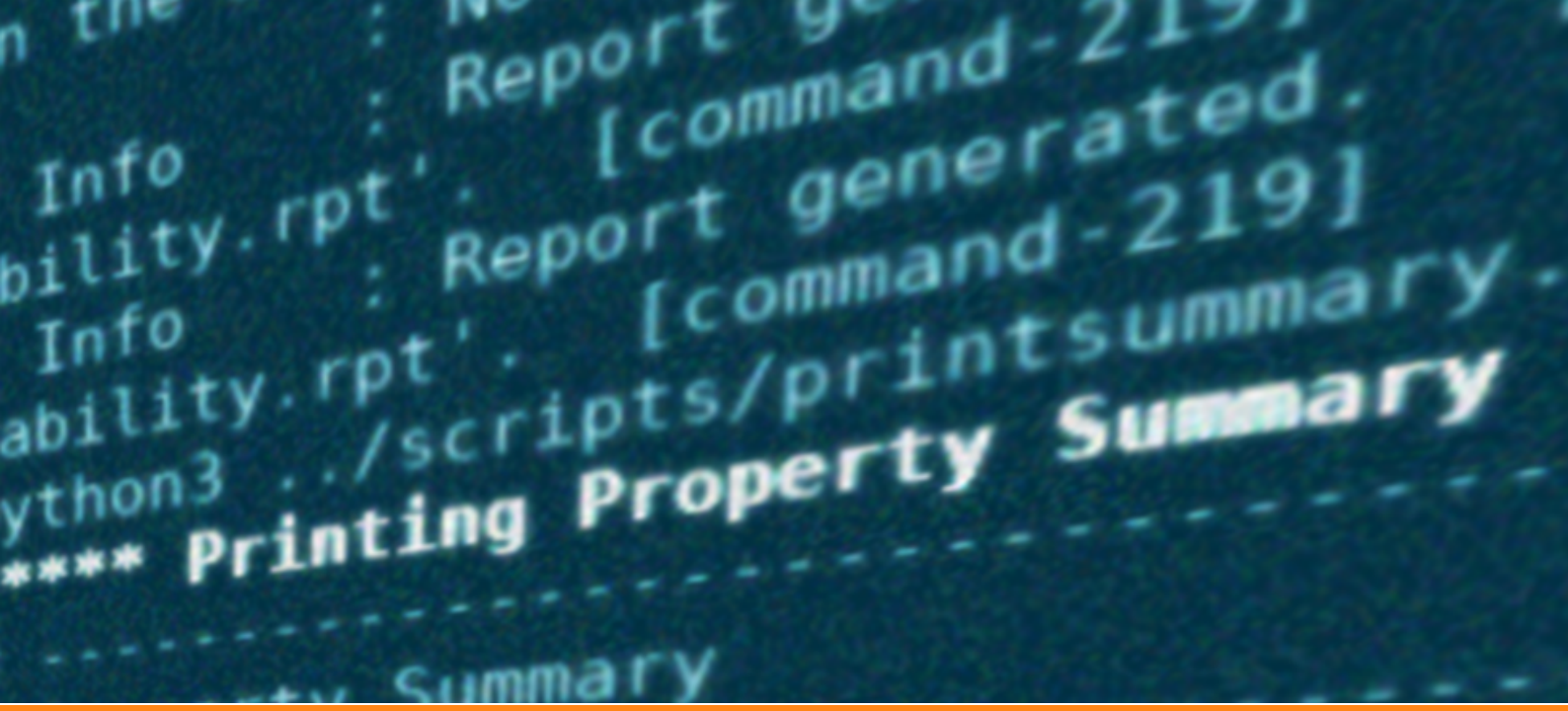


Progress Meeting

Progress Meeting 2: December 2024

Activity name: Lowering the adoption barriers for Formal Verification of ASIC and FPGA designs in the Space sector

ESA Contract No: 000144681/24/NL/GLC/ov

ESA signatures	AICIA signatures
Alberto Urbón Aguado Digitally signed by Alberto Urbón Aguado Date: 2024.12.17 08:48:20 +01'00'	Firmado por GUZMAN MIRANDA HIPOLITO - ***2077** el día 17/12/2024 con un certificado emitido por AC FNMT Usuarios

Contents

Meeting

Date 13/12/2024

Meeting place Teams

Participants

- Alberto Urbón Aguado (ESA, TEC-EDM)
- David Merodio Codinachs (ESA, TEC-EDM)
- Hipólito Guzmán-Miranda (AICIA - Universidad de Sevilla)
- Marcos López García (AICIA - Universidad de Sevilla)

Subject

Progress meeting 2, ESA Contract No. 000144681/24/NL/GLC/ov, *"Lowering the adoption barriers for Formal Verification of ASIC and FPGA designs in the Space sector"*

Description

1. Summary of the relevant dates since the project kick-off:

- 1-Jun-2024: Kick-off (administrative)
- 4-Jun-2024: Kick-off meeting
- 20-Sep-2024: Progress Meeting 1
- 13-Dec-2024: Progress Meeting 2 (this meeting)

2. Summary of the work performed since the last meeting, which was Progress Meeting 1 (September 2024) (#107):

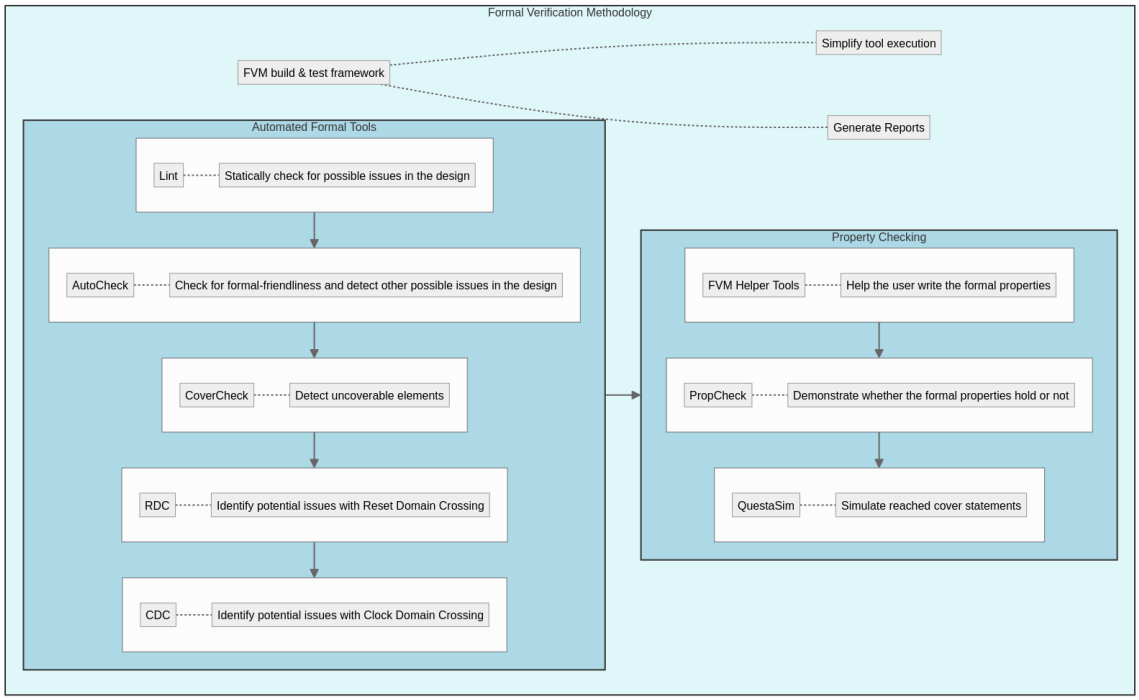
- Actually, the work summarized during the meeting was the work since September 1st, since that work is detailed in the previous progress reports.

- All work detailed in the previous three progress reports:
  - Progress Report 4 (September 2024) (#5):
    - Mainly advancing on %“WP.1: Formal methodology definition”.
    - Some improvements also on the build & test framework.
  - Progress Report 5 (October 2024) (#6):
    - Closed %“WP.1: Formal methodology definition”.
    - Advanced %“WP.2: Formal methodology implementation”.
      - Reading and interpreting JSON wavedrom files. No outputs were generated at this moment, but we were able to read the wavedrom files, traverse and interpret all their fields, and detect some common errors.
      - Hipólito had an interesting meeting with Stefano Stablum, Account Manager from Siemens EDA. They (Siemens EDA) are interested in our project and want to support US. They mentioned making a press release when the project is more advanced. They also asked if we had the funds to buy a better license for the formal tools that included some kind of support from the higher-up engineers from Siemens EDA (Hipólito had had some interesting email exchanges with a couple of Siemens experts whom Stefano had put him in contact with), which is an improvement over the typical Support Cases that we can open at the Siemens Support website. The Support Cases are included in the academic license but of course the experts personally answering emails are not. Hipólito also suggested to Stefano that this new license could help solve the legal issue with verifying the ESA IP core (with the academic license, we can verify it, but if we find any bugs the improved version will need a commercial license to be used, unless we get some kind of waiver from Siemens EDA). Since that meeting, we have not had any answer from Stefano, so Hipólito will write to him again after the Christmas holidays.
  - Progress Report 6 (November 2024) (#7):
    - Closed %“WP.2: Formal methodology implementation”.
      - Finished `drom2psl` tool, which reads Wavedrom JSON files and outputs `.psl` files with sequences extracted from the `.json` files. In the case of having two top-level groups in the JSON file, a property is also automatically generated relating the two generated sequences. The generated file is a PSL `vunit` which can be imported, using the PSL keywork `inherit`, from the user’s PSL sources.
      - There are also some assumptions we are making here, such as the clock being the first signal in the wavedrom, and the `|` symbol only appearing in the clock signal and meaning “repeat 0 or more cycles”. This is a tradeoff that must be made since JSON is not a programming language (it is a data interchange language), so not all than can be expressed in PSL can be written in wavedrom JSON.
      - For now, the tool is intended to reduce the learning curve since PSL will be a new language for our target users. So -at least at this stage of the development- it is expected that the user creates a PSL file using `drom2psl` and afterwards makes some manual changes if needed.
      - Generated sequences of some common protocols.
      - Wishbone in classic and pipelined modes, SPI in its 4 polarity/phase combinations, and UART.

- Work performed during December 2024:
  - Onboarding for the new hire, Marcos López García (issue #170: "T.0.44: Onboarding for Marcos").
    - Documentation to read, handoff of the new laptop computer, VPN access, assigning his first tasks, and any other related work.
  - Working on %"WP.4: Creation of repository with examples", towards creating the repository of examples.
    - We are using the design vs formal complexity diagram provided by Olivier Bocquillon from Siemens EDA as a guide to make our repository of examples. We are working on #123: "T.4.1: Determine the bare minimum of example designs we need", of which Marcos has completed subtask #169: "ST.4.1.1: Overview of the OpenLogic IP library and what components we could use".
  - Some bug fixing on %"WP.6: Validation and consolidation of the proposed approach".
    - Not a bug in our code per se, but when making a local install of the FVM on Marcos' laptop, which has Ubuntu 24.04, the poetry dependency manager got stuck in an infinite loop. This has been documented and solved in #171: "Poetry stuck resolving dependencies in Ubuntu 24.04".
    - Also Marcos has found an actual bug in our code, while working on #179: ST.4.1.2: Testing the examples to determine their viability. The bug appears when configuring more than one generic in a design configuration and a fix has been proposed by Marcos. Issue #180, "Bug: design configurations fail when there is more than one generic", has been created to track it.

3. The FVM Methodology was summarized:

- The methodology leverages:
  1. The automated questa formal tools for detecting common issues with designs, including clock and reset domain crossing.
  2. The Questa Simulator to generate simulation traces of all formally-reached `cover` statements, also merging the code coverage metrics collected during these simulations into a simulation code coverage metric.
  3. The Questa PropCheck tool to prove user-specified properties in the designs.
  4. The FVM helper tools to help the user write these properties.
  5. The FVM framework to simplify tool execution and generate reports.
- David Merodio and Alberto Urbón from ESA state that this is interesting, because even if a user knows that a specific automated tool is useful, configuring the tool and getting it to run for a specific project is extra work that may ultimately not be done due to time and effort constraints.
- David and Alberto also state that using simulation to bridge the user confidence gap to the tools is a good idea, because in our sector everybody is used to trust simulations, but there may be some reluctance to trust the formal tools if there are no traces/waveforms that support the obtained results.
- A diagram of the methodology was shown on the slides and is reproduced here for the reader's convenience:



4. The FVM framework was summarized:

- The user writes a simple python script, then runs it with the python interpreter (`python3 formal.py`), and the framework runs all the tools and generates a final summary.

5. The FVM reports were introduced:

- Reports are automatically generated both in JUnit XML format and HTML format. The former is for Continuous Integration systems, and the latter is a human-readable format.

6. The actual progress vs scheduled progress was shown:

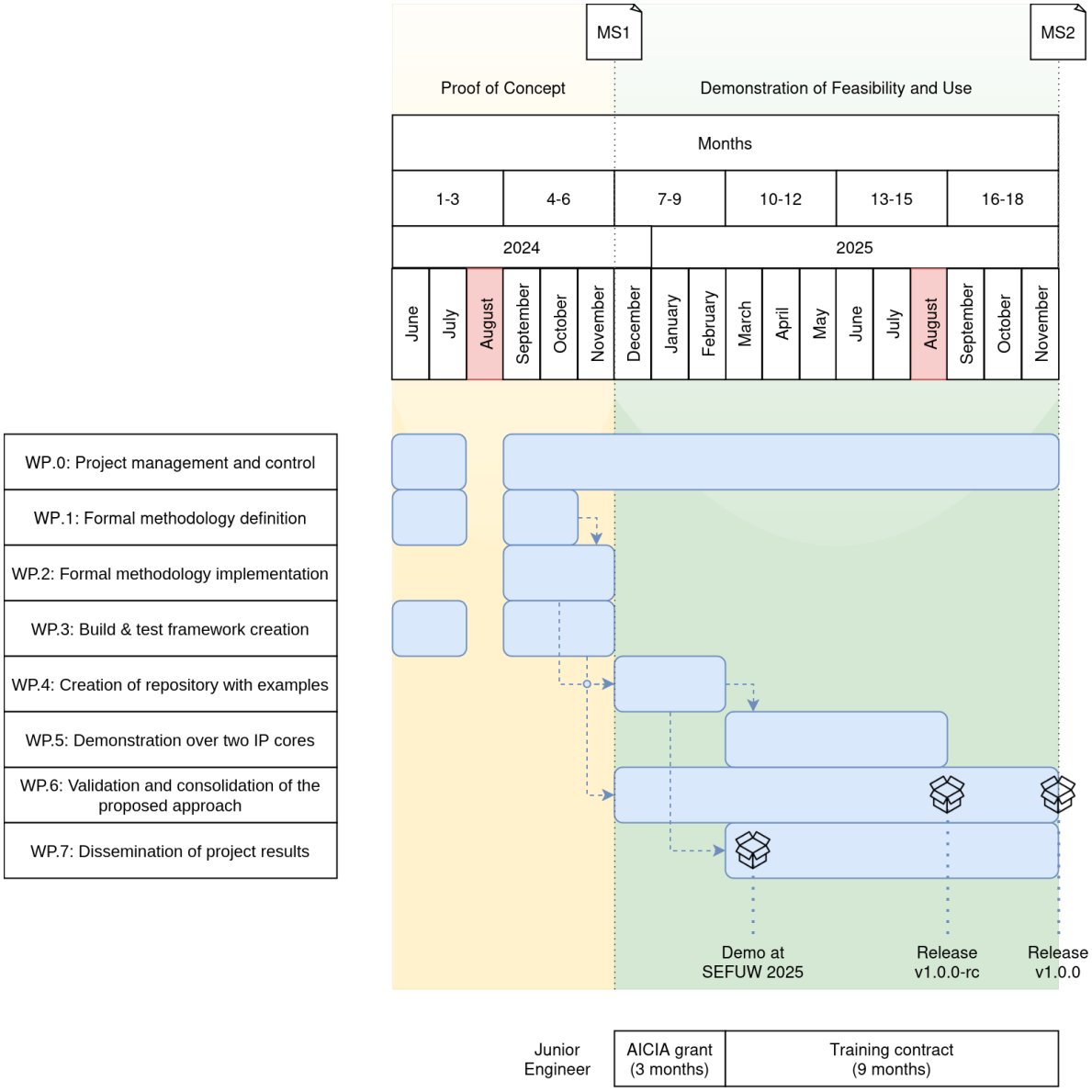
- Of the 6 Work Packages that are not upcoming (meaning they are either open or closed):
  - %“WP.0: Project management and control”: is on schedule.
  - %“WP.1: Formal methodology definition”: is closed.
  - %“WP.2: Formal methodology implementation”: is closed.
  - %“WP.3: Build & test framework creation”: is closed.
  - %“WP.4: Creation of repository with examples”: has just opened.
  - %“WP.6: Validation and consolidation of the proposed approach”: has just opened.
- We have closed the three Work Packages that needed to be closed in order to achieve Milestone MS1: Proof of Concept.

- The evolution of the bar chart of the project since last Progress Meeting was shown in the slides. The bar chart at the time of the Progress Meeting is also reproduced here:

WP.0: Project management and control	eda / fvm	Jun 1, 2024–Nov 30, 2025	Open	24/49 complete 48%
WP.1: Formal methodology definition	eda / fvm	Jun 1, 2024–Aug 31, 2024	Closed	17/17 complete 100%
WP.2: Formal methodology implementation	eda / fvm	Sep 1, 2024–Nov 30, 2024	Closed	2/2 complete 100%
WP.3.bis: (Wishlist) Improvements over the build & test framework	eda / fvm		Open	1/15 complete 6%
WP.3: Build & test framework creation	eda / fvm	Jun 1, 2024–Nov 30, 2024	Closed	38/38 complete 100%
WP.4: Creation of repository with examples	eda / fvm	Dec 1, 2024–Feb 28, 2025	Open	2/11 complete 18%
WP.5: Demonstration over two IP cores	eda / fvm	Mar 1, 2025–Aug 31, 2025	Upcoming	0/4 complete 0%
WP.6: Validation and consolidation of the proposed approach	eda / fvm	Dec 1, 2024–Nov 30, 2025	Open	1/26 complete 3%
WP.7: Dissemination of project results	eda / fvm	Feb 1, 2025–Nov 30, 2025	Upcoming	1/15 complete 6%

- A new ‘virtual’ Work Package, %“WP.3.bis: (Wishlist) Improvements over the build & test framework” was created to group and track all the improvement tasks that have emerged while working on the FVM framework. Since these are not mandatory according to the project proposal, they have been moved out of WP.3 so it could be closed.

7. The updated Gantt Chart was also shown:



- WP.1 was delayed a couple of months but milestone MS1 was not affected.

8. Some considerations about the abstract for SEFUW (#65) were made:

- The idea is to make a short abstract, around 1/2 to 1 page, in order to later be able to publish the FVM on a journal paper.
- Alberto and David confirmed that this is ok for SEFUW.
- All the participants showed interest in contributing to the abstract, so Hipólito will work on a first version soon after coming back from the Christmas holidays (around 7-9 of January 2025) and send it to Alberto, David and Marcos so they can review and contribute to it.

9. Demo:

- We didn't have time for the demo, so all participants agreed to make the demo during the next Progress Meeting.

- Nevertheless, at any point in time, if the TO Alberto and/or support David want to run the tools by themselves, they can clone the project repository and use the `Makefile`, following the instructions in the `README.md`.
- Even if they don't have the time to run them, they can see the logs and results (including reports) of the tools in the Continuous Integration of the project, which can be accessed on the left sidebar of the project website in https://woden.us.es/eda/fvm, in Build -> Pipelines.

Discussion

Improvements on the reports:

- Hipólito and Alberto agree that the reports could be improved by adding coverage information to them.
  - There is some effort to be done in order to implement this, due to the Allure framework being a test report framework and not a coverage report framework.
  - *Update: issue #182: "T.6.26: Add coverage information to generated reports" was created on 15/12/2024 in %"WP.6: Validation and consolidation of the proposed approach" to track this development*
- Alberto commented that text reports may be necessary in some projects, and while there is always the possibility of manually parsing the generated XML, having direct generation of text reports would be helpful.
  - Hipólito will do a search to see if there are any tools that convert XML to some kind of text reports. Also, having conversion to `.tex` would help, because many documentation systems inside companies require PDF documents.
  - *Update: issue #183: "T.6.27: (Wishlist) Generate text reports" was created on 15/12/2024 in %"WP.6: Validation and consolidation of the proposed approach" to track this development*

Terminology:

- Alberto suggested, in his comments to the latest Progress Report (#7: "T.0.7: Progress report 6: November 2024"), that we may use the terms 'procedure', 'steps', 'test' and 'campaign'.
  - **step**: a single step of the FVM (such as lint, prove, etc)
  - **test**: an execution of all steps over a single design
    - *Update after the meeting:* ***'suite'*** *seems also an appropriate term for the execution of a number of tools, and doesn't suggest any kind of dynamic testing*
  - **campaign**: an execution of all steps over multiple designs: either different designs and/or the same design with a different configuration of its generics
  - At the moment we don't have a 'use case' for the term **'procedure'**. Maybe we will have more abstraction/subdivision levels when we start working with more complex designs that may have different operation modes, and when we start applying techniques to reduce proof complexity, as those could also generate different design versions.
  - The exact terminology to be used has not been fully decided here, but it is a good food for thought to keep in mind while we start working with more complex designs.
- Comments over Progress Report 6: November 2024

- During the meeting, AICIA and ESA agreed that the TO's comments on the previous Progress Report (https://git.woden.us.es/eda/fvm/-/issues/7#note_5599) didn't require changes to the PR, but it would be interesting to have them documented in the minutes of this meeting. Thus, the main points of the comments follow below:
  - "A sort of a scoreboard reporting summary by metric, tool and step being used and their compliance is a must these days"
    - We are almost there, the only missing piece is that our reports should be improved with the addition of coverage metrics.
  - "Each test should produce a summary that clearly states its status. The whole test campaign shall produce an overall status"
    - This is already implemented, both in the final summary when executing the tools and in the generated reports.
  - "I understand that not being functional, the concept of agent or monitor doesn't apply at all, is that correct? Anything to monitor somewhere?"
    - That is correct, but while discussing that, Hipólito had an idea on how we could implement something similar to the functional coverage we have in simulation (see comment https://git.woden.us.es/eda/fvm/-/issues/7#note_5647).
    - *Edit: issue #184, "T.6.27: (Wishlist) Formal-functional coverage" was created on 15/12/2024 in %"WP.6: Validation and consolidation of the proposed approach" to track this development*
  - Comments about the terminology, which has been discussed above.
  - "I understand we are already in the place to begin using the FVM with examples from lower to higher level of complexity. Important to have as many examples as possible for SEFUW, in 3 months"
    - That is correct. We expect of course to have some changes to the methodology and the framework, but in the shape of small improvements and not big overhauls. We are currently working on the examples: according to our project planning, we have three months for %"WP.4: Creation of repository with examples", so we should have interesting examples to show at SEFUW.

Next Actions

1. AICIA-US will continue to work on:

- %"WP.4: Creation of repository with examples". We want to have both:
  1. Examples of both different complexity / difficulty to formally verify
     - We are using the design vs difficulty chart provided by Siemens EDA as a guide.
  2. Examples of the specific functionalities offered by the FVM

  - Such as defining clock and reset domains, cutpointing, blackboxing, hooks, etc, from the `formal.py` script.

- %“WP.6: Validation and consolidation of the proposed approach”
  - Writing the training materials.
  - Documenting the FVM.
  - Add formal coverage reporting.
- %“WP.7: Dissemination of project results”
  - Abstract for SEFUW.
- %“WP.0: Project management and control”
  - Hipólito will write to Stefano Stablum (Siemens EDA) in January, to follow up on the legal questions of the license and the Support offered by Siemens EDA, see issue #143: “T.0.42: Follow-up on questions asked about Siemens Academic License”.

Conclusions

- ESA congratulates the team for the work. The milestone **MS1: Proof of Concept** is achieved.
- AICIA - Universidad de Sevilla can proceed to invoice ESA.

Attachments

Attachment 1: Slides for the meeting: FVM_Progress_Meeting_2.pdf

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Progress Meeting 2

Lowering the adoption barriers for Formal Verification of ASIC and FPGA designs in the Space sector

ESA Contract No. 000144681/24/NL/GLC/ov

Hipólito Guzmán-Miranda
Department of Electronic Engineering
Universidad de Sevilla
Sevilla, Spain

Date: 13 December 2024

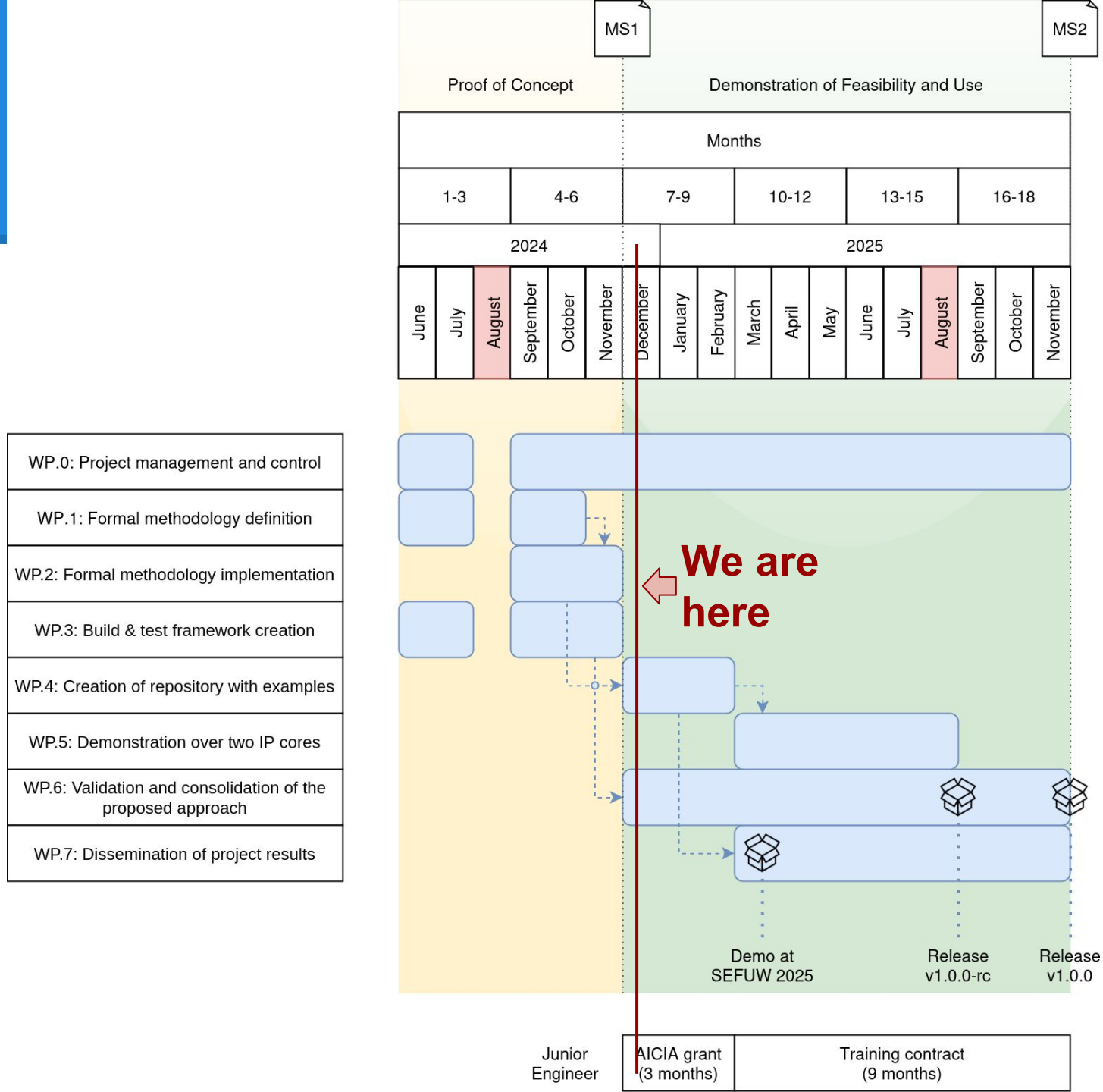
Outline

- The story so far…
- Work performed
- FVM Methodology
- FVM Framework
- FVM Reports
- Progress: actual vs schedule
- Updated schedule
- Abstract for SEFUW
- Demo
- Discussion
- A couple of questions for ESA
- Next actions
- Conclusions
- Any other business

The story so far…

(since the kick-off)

- 1-Jun-2024: Kick-off (administrative)
- 4-Jun-2024: Kick-off meeting
- 20-Sep-2024: Progress Meeting 1
- 13-Dec-2024 (**today!**): Progress Meeting 2


MS1
MS2
Proof of Concept
Demonstration of Feasibility and Use
Months
1-3
4-6
7-9
10-12
13-15
16-18
2024
2025
June
July
August
September
October
November
December
January
February
March
April
May
June
July
August
September
October
November
WP.0: Project management and control
WP.1: Formal methodology definition
WP.2: Formal methodology implementation
WP.3: Build & test framework creation
WP.4: Creation of repository with examples
WP.5: Demonstration over two IP cores
WP.6: Validation and consolidation of the proposed approach
WP.7: Dissemination of project results
We are here
Demo at SEFUW 2025
Release v1.0.0-rc
Release v1.0.0
Junior Engineer
AICIA grant (3 months)
Training contract (9 months)

Work performed

Since last meeting (I):

(actually, since September 1st)

- All work detailed in the three last Progress Reports:
  - PR.4: September 2024
    - Mainly advancing WP.1 (Methodology definition)
    - Some improvements on the build & test framework
  - PR.5: October 2024
    - Closed WP.1 (Methodology definition)
    - Advanced WP.2 (Formal methodology implementation)
      - Reading and interpreting JSON wavedrom files
    - Interesting meeting with Stefano Stablum (Account Manager from Siemens EDA)
      - They want to support us

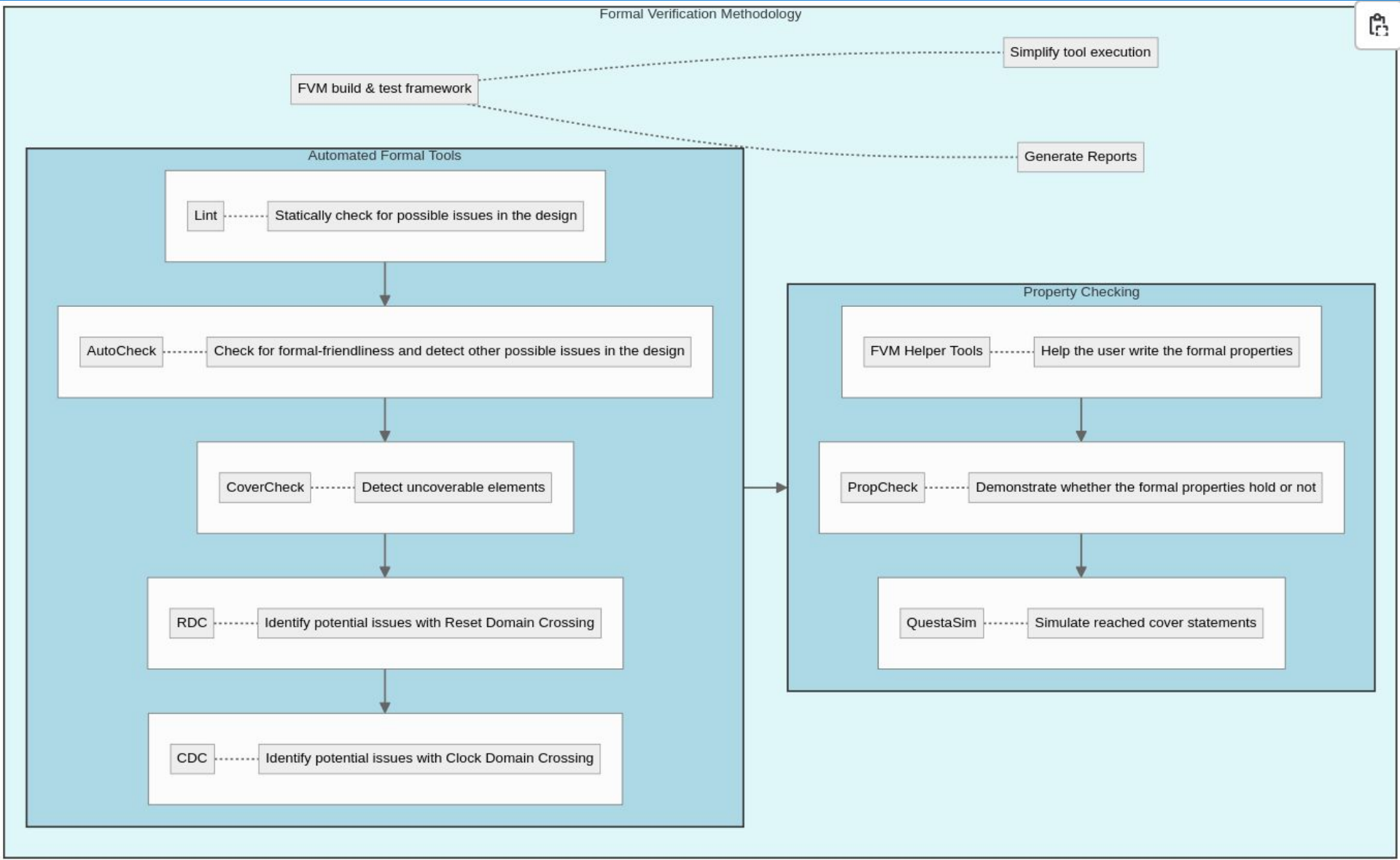
Work performed

Since last meeting (II):

(actually, since September 1st)

- All work detailed in the three last Progress Reports:
  - PR.6: November 2024
    - Closed WP.2 (Formal methodology implementation)
    - Finished drom2psl tool
    - Generated sequences of some common protocols
      - We expect to test those and generate more in the future as we work through the examples and IP cores
    - Closed WP.3 (Build & test framework)
      - All “Mandatory” tasks implemented
      - Non-implemented “Wishlist” tasks moved to a new ‘virtual’ Work Package
- This month (december)
  - Marcos’ onboarding
  - Working towards creating the repository of examples
  - Some bug fixing on WP.6 (Validation & consolidation)

FVM Methodology



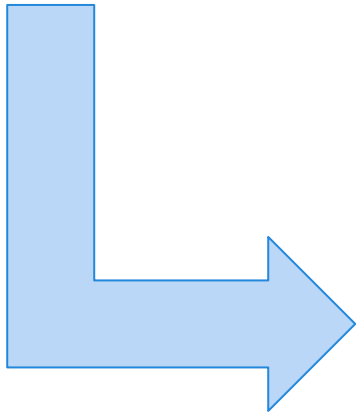
FVM Framework

formal.py

```
from fvm import fvmframework

fvm = fvmframework()
fvm.add_vhdl_sources("examples/02-linearinterpolator/*.vhd")
fvm.add_psl_sources("examples/02-linearinterpolator/*.psl")
fvm.set_toplevel("interpolator")
fvm.run()
```

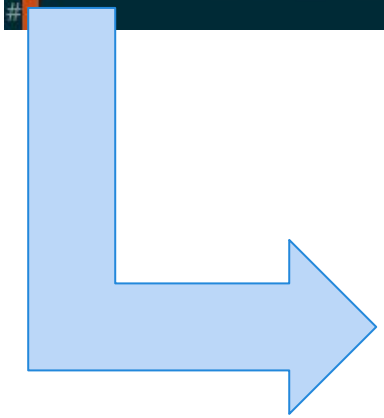
```
python3 formal.py
```

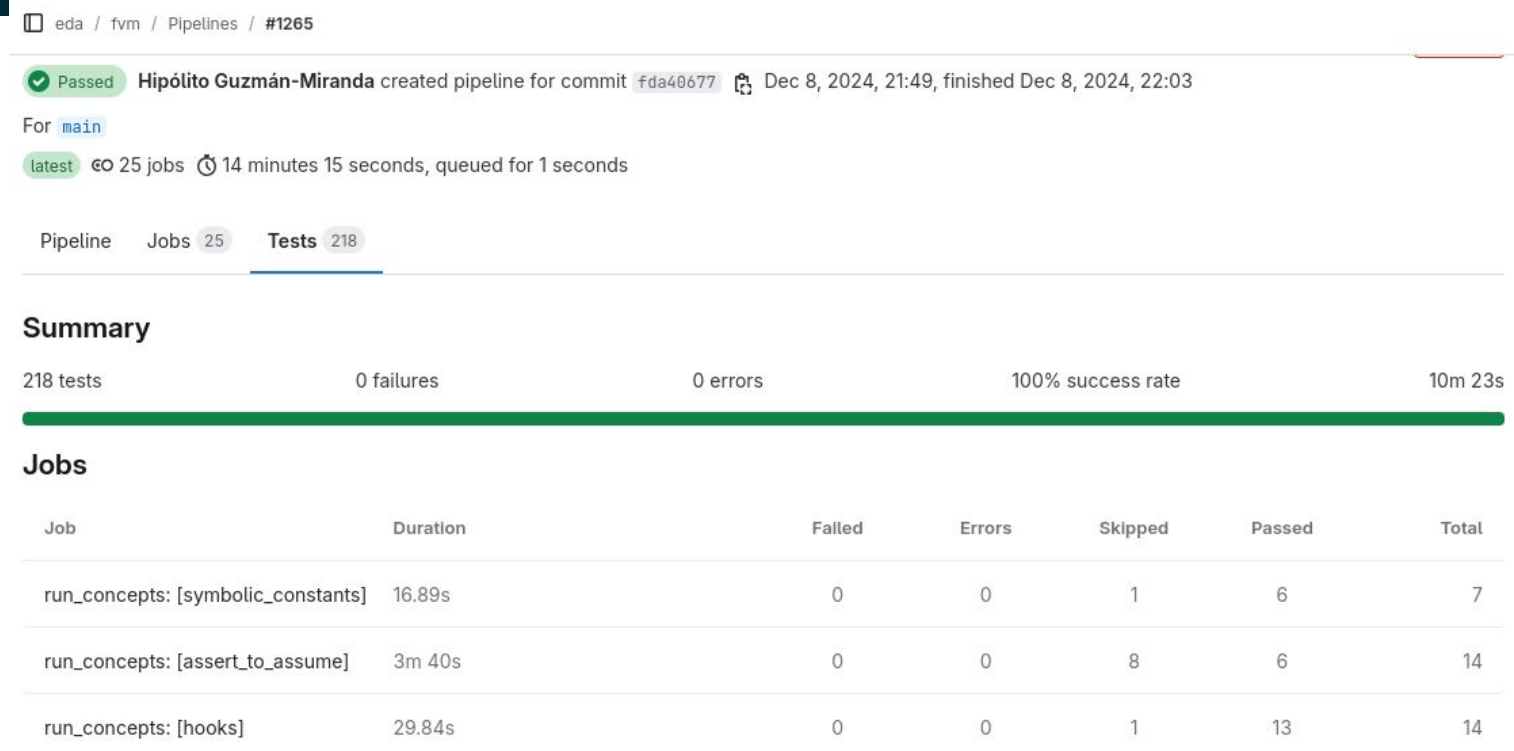


```
==== Summary ================================================
pass interpolator.lint                                (5 seconds)
pass interpolator.friendliness   (score: 94.75%)     (5 seconds)
pass interpolator.reachability                        (5 seconds)
pass interpolator.resets                              (6 seconds)
pass interpolator.clocks                              (7 seconds)
fail interpolator.prove                               (1 second)
=============================================================
pass 5 of 7
fail 1 of 7
omit 1 of 7 (not executed due to early exit)
=============================================================
Total time  : 31 seconds
Elapsed time: (not yet implemented)
=============================================================
```

FVM Reports: XML

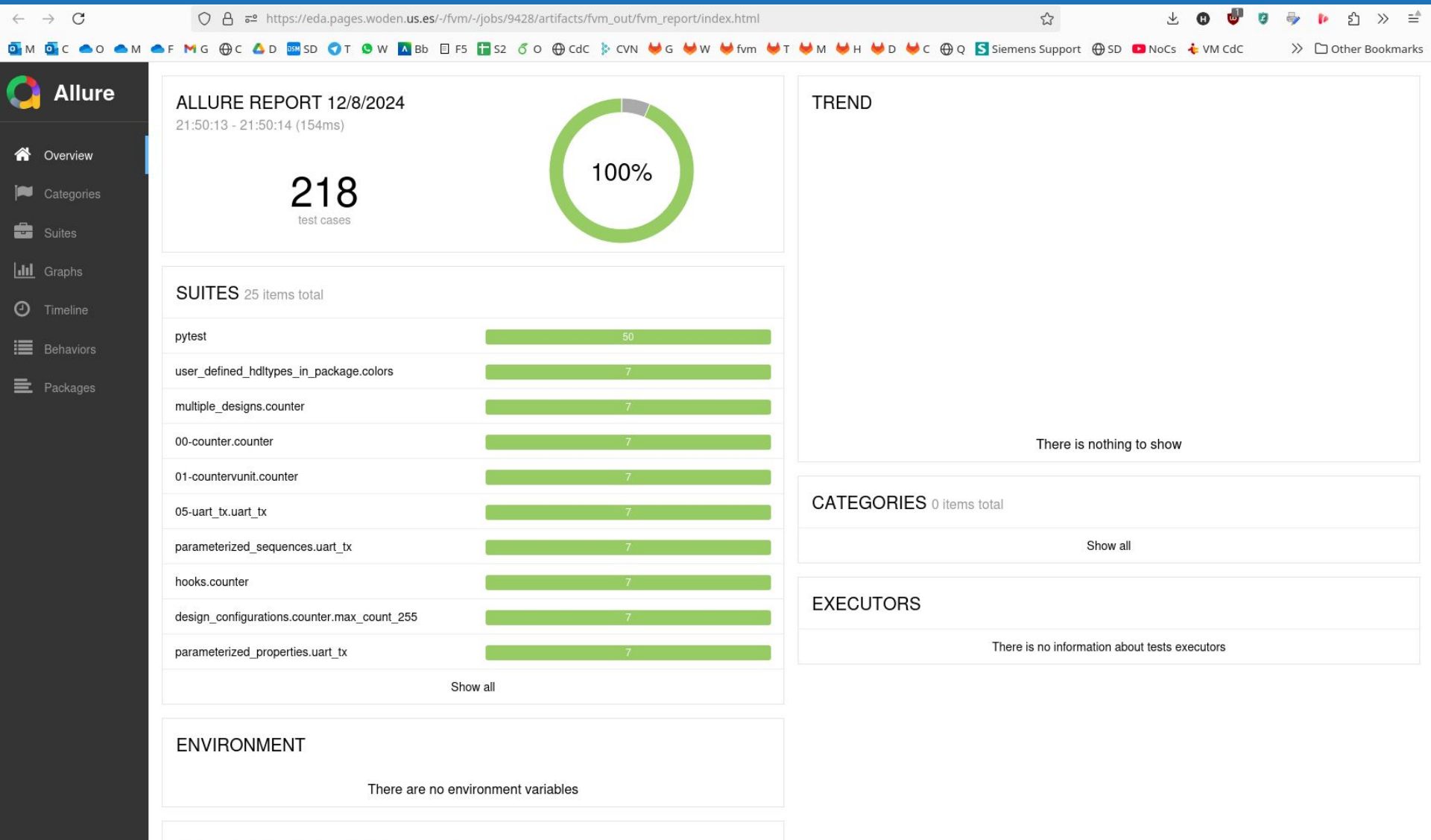
```
<?xml version="1.0" ?>
<testsuites name="/home/hipolito/devel/eda/fvm/examples/02-linearinterpolator/formal
        <testsuite disabled="0" errors="0" failures="1" name="02-linearinterpolator
                <testcase name="interpolator.lint" time="5.808415" timestamp="2024-
s/02-linearinterpolator/formal.py" log="fvm_out/interpolator/lint.log">
                        <system-out>#
# Questa Static Verification System
# Version 2024.3 5867496 linux_x86_64 19-Sep-2024
#
```





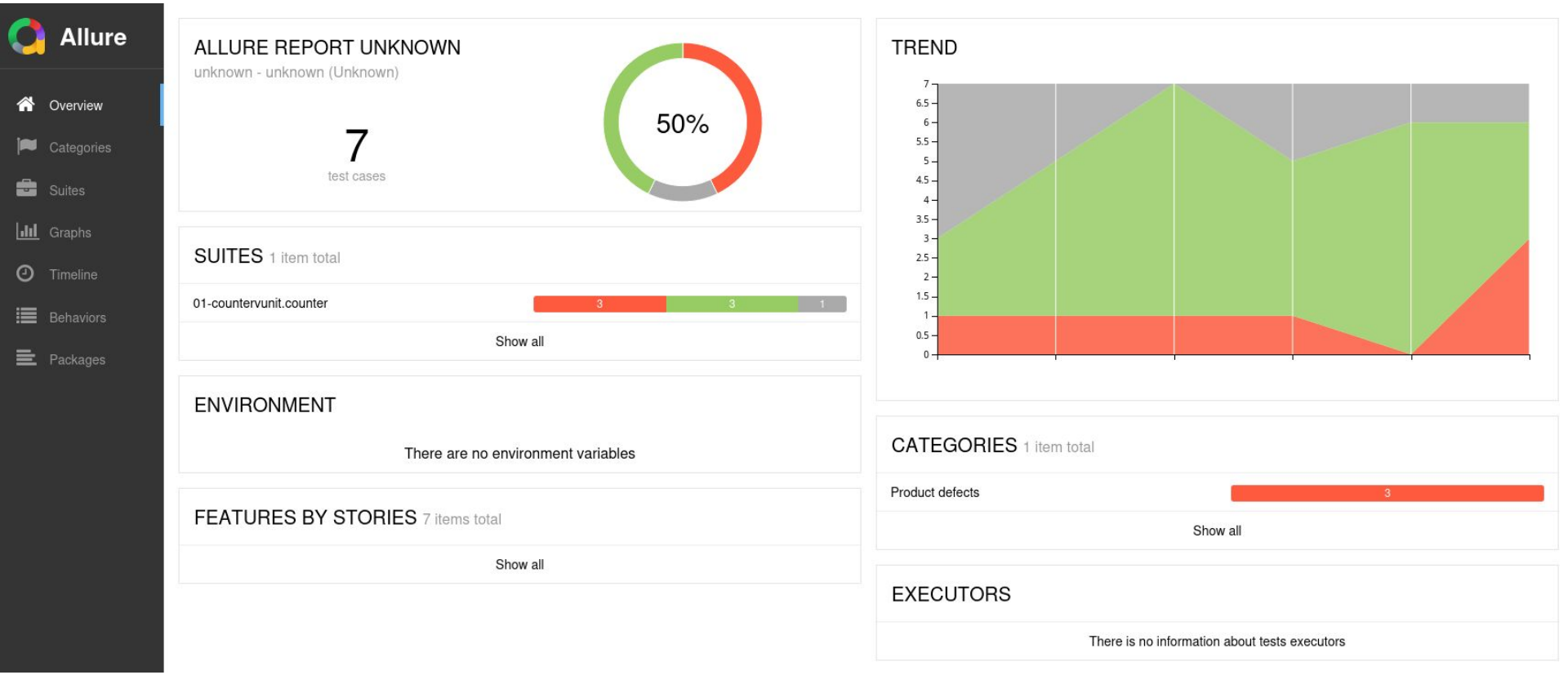
JUnit XML format for CI systems

FVM Reports: HTML




Allure
Overview
Categories
Suites
Graphs
Timeline
Behaviors
Packages
En
Collapse
Suites
order
name
duration
status
Status: 0 0 204 14 0
Marks:
00-counter.counter 7
01-countervunit.counter 7
02-linearinterpolator.interpolator 5 2
04-dualcounter.dualcounter 6 1
05-uart_tx.uart_tx 7
assert_to_assume.counter 7
assert_to_assume.dualcounter 6 1
defining_clocks_and_resets.counter 7
design_configurations.counter.max_count_128 7
design_configurations.counter.max_count_200 7
#3 counter.max_count_200.clocks 2s 546ms
#1 counter.max_count_200.friendliness 2s 405ms
#2 counter.max_count_200.lint 2s 249ms
#4 counter.max_count_200.prove 3s 201ms
#6 counter.max_count_200.prove.simcover 214ms
#5 counter.max_count_200.reachability 2s 388ms
#7 counter.max_count_200.resets 2s 204ms
design_configurations.counter.max_count_255 7
hooks.counter 7
hooks.dualcounter 6 1
inheriting_multiple_vunits.uart_tx 7
inheriting_vunits.uart_tx 7
multiple_designs.counter 7
multiple_designs.dualcounter 6 1
parameterized_properties.uart_tx 7
parameterized_sequences.uart_tx 7
pytest 50
symbolic_constants.uart_tx 6 1
transactions_deprecated.minicalc 7
user_defined_hdltypes.colors 7
user_defined_hdltypes_in_external_package.colors 7
user_defined_hdltypes_in_package.colors 7
Passed
counter.max_count_200.prove
Overview
History
Retries
Severity: normal
Duration: 3s 201ms
Execution
Test body
Unknown
Questa Static Verification System Unknown
Version 2024.3 5867496 linux_x86_64 19-Sep-2024 Unknown
Unknown
This material contains trade secrets or otherwise Unknown
confidential information owned by Unknown
Siemens Industry Software Inc. or its affiliates Unknown
(collectively, "SISW"), or its licensors. Access Unknown
to and use of this information is strictly limited Unknown
as set forth in the customer's applicable Unknown
agreements with SISW. Unknown
Unknown
Unpublished work. Copyright 2024 Siemens Unknown
Unknown
do fvm_out/counter.max_count_200/prove.do Unknown
Command : onerror exit Unknown
Command : vdel -all Unknown
Command : vlib work Unknown
Command : vmap work work Unknown
QuestaSim-64 vmap 2024.3 Lib Mapping Utility 2024.09 Sep 10 2024 Unknown
vmap work work Unknown
Modifying /opt/questa/formal/2024.3/questa_static_formal/linux_x86_64/share/modeltech/linux_x86_64/../modelsim.ini Unknown
Command : vcom -2008 -autoorder -f fvm_out/counter.max_count_200/design.f Unknown
QuestaSim-64 vcom 2024.3 Compiler 2024.09 Sep 10 2024 Unknown
Start time: 20:54:09 on Dec 08,2024 Unknown
vcom -2008 -autoorder -f fvm_out/counter.max_count_200/design.f Unknown
-- Loading package STANDARD Unknown
-- Scanning entity counter Unknown
-- Scanning architecture behavioral of counter Unknown
End time: 20:54:09 on Dec 08,2024, Elapsed time: 0:00:00 Unknown
Errors: 0, Warnings: 0 Unknown
QuestaSim-64 vcom 2024.3 Compiler 2024.09 Sep 10 2024 Unknown
Start time: 20:54:09 on Dec 08,2024 Unknown
vcom -refresh_marked Unknown

FVM Reports: HTML



Auto-leverages history if previous results found

FVM Reports: future improvements

- As stated on the comments to Progress Report 6: November 2024:
  - We are missing coverage information in the reports
  - The Allure framework seems to be more of a test result reporting framework than a coverage report framework
  - Nevertheless we will check how we can generate those reports and if we can integrate with or at least link to them from the Allure-generated reports
  - Coverage information can still be manually viewed by launching the tools in GUI mode, but of course a dashboard with the summary is preferred

Progress: actual vs schedule

- Status of Work Packages:
  - WP.0: Project Management and control
    - On schedule
  -  WP.1: Formal Methodology definition
    - Closed
  -  WP.2: Formal Methodology implementation
    - Closed
  -  WP.3: Build and test framework creation
    - Closed
  - WP.4: Creation of repository with examples
    - Just opened
  - WP.6: Validation & consolidation of the proposed approach
    - Just opened

Bar chart after month 3

Aug 2024

WP.0: Project management and control
Jun 1, 2024–Nov 30, 2025
Open eda / fvm
40 Issues · 0 Merge requests
30% complete

WP.1: Formal methodology definition
Jun 1, 2024–Aug 31, 2024
Expired eda / fvm
16 Issues · 0 Merge requests 0% complete

WP.2: Formal methodology implementation
Sep 1, 2024–Nov 30, 2024
Open eda / fvm
0 Issues · 0 Merge requests 0% complete

WP.3: Build & test framework creation.
Jun 1, 2024–Nov 30, 2024
Open eda / fvm
24 Issues · 0 Merge requests
45% complete

WP.4: Creation of repository with examples
Dec 1, 2024–Feb 28, 2025
Upcoming eda / fvm
0 Issues · 0 Merge requests 0% complete

WP.5: Demonstration over two IP cores
Mar 1, 2025–Aug 31, 2025
Upcoming eda / fvm
5 Issues · 0 Merge requests 0% complete

WP.6: Validation and consolidation of the proposed approach
Dec 1, 2024–Nov 30, 2025
Upcoming eda / fvm
7 Issues · 0 Merge requests 0% complete

WP7: Dissemination of project results
Feb 1, 2025–Nov 30, 2025
Upcoming eda / fvm
12 Issues · 0 Merge requests 0% complete

Bar chart on Progress Meeting 1

Sep 2024

WP.0: Project management and control
Jun 1, 2024–Nov 30, 2025
Open eda / fvm
42 Issues · 0 Merge requests
30% complete

WP.1: Formal methodology definition
Jun 1, 2024–Aug 31, 2024
Expired eda / fvm
16 Issues · 0 Merge requests 12% complete

WP.2: Formal methodology implementation
Sep 1, 2024–Nov 30, 2024
Open eda / fvm
0 Issues · 0 Merge requests 0% complete

WP.3: Build & test framework creation.
Jun 1, 2024–Nov 30, 2024
Open eda / fvm
24 Issues · 0 Merge requests
45% complete

WP.4: Creation of repository with examples
Dec 1, 2024–Feb 28, 2025
Upcoming eda / fvm
0 Issues · 0 Merge requests 0% complete

WP.5: Demonstration over two IP cores
Mar 1, 2025–Aug 31, 2025
Upcoming eda / fvm
5 Issues · 0 Merge requests 0% complete

WP.6: Validation and consolidation of the proposed approach
Dec 1, 2024–Nov 30, 2025
Upcoming eda / fvm
7 Issues · 0 Merge requests 0% complete

WP7: Dissemination of project results
Feb 1, 2025–Nov 30, 2025
Upcoming eda / fvm
12 Issues · 0 Merge requests 0% complete

Bar chart after month 4

WP.0: Project management and control eda / fvm	Jun 1, 2024–Nov 30, 2025	Open	14/42 complete 33%
WP.1: Formal methodology definition eda / fvm	Jun 1, 2024–Aug 31, 2024	Expired	4/17 complete 23%
WP.2: Formal methodology implementation eda / fvm	Sep 1, 2024–Nov 30, 2024	Open	0/0 complete 0%
WP.3: Build & test framework creation. eda / fvm	Jun 1, 2024–Nov 30, 2024	Open	14/31 complete 45%
WP.4: Creation of repository with examples eda / fvm	Dec 1, 2024–Feb 28, 2025	Upcoming	0/4 complete 0%
WP.5: Demonstration over two IP cores eda / fvm	Mar 1, 2025–Aug 31, 2025	Upcoming	0/4 complete 0%
WP.6: Validation and consolidation of the proposed approach eda / fvm	Dec 1, 2024–Nov 30, 2025	Upcoming	0/14 complete 0%
WP7: Dissemination of project results eda / fvm	Feb 1, 2025–Nov 30, 2025	Upcoming	0/12 complete 0%

Sep 2024

Gitlab changed Milestones page format

Bar chart after month 5

WP.0: Project management and control eda / fvm	Jun 1, 2024–Nov 30, 2025	Open	18/45 complete	40%
WP.1: Formal methodology definition eda / fvm	Jun 1, 2024–Aug 31, 2024	Closed	17/17 complete	100%
WP.2: Formal methodology implementation eda / fvm	Sep 1, 2024–Nov 30, 2024	Open	0/2 complete	0%
WP.3: Build & test framework creation eda / fvm	Jun 1, 2024–Nov 30, 2024	Open	19/45 complete	42%
WP.4: Creation of repository with examples eda / fvm	Dec 1, 2024–Feb 28, 2025	Upcoming	0/6 complete	0%
WP.5: Demonstration over two IP cores eda / fvm	Mar 1, 2025–Aug 31, 2025	Upcoming	0/4 complete	0%
WP.6: Validation and consolidation of the proposed approach eda / fvm	Dec 1, 2024–Nov 30, 2025	Upcoming	0/19 complete	0%
WP.7: Dissemination of project results eda / fvm	Feb 1, 2025–Nov 30, 2025	Upcoming	0/14 complete	0%

Oct 2024

Bar chart after month 6

WP.0: Project management and control	eda / fvm	Jun 1, 2024–Nov 30, 2025	Open	22/49 complete 44%
WP.1: Formal methodology definition	eda / fvm	Jun 1, 2024–Aug 31, 2024	Closed	17/17 complete 100%
WP.2: Formal methodology implementation	eda / fvm	Sep 1, 2024–Nov 30, 2024	Closed	2/2 complete 100%
WP.3.bis: (Wishlist) Improvements over the build & test framework	eda / fvm		Open	1/15 complete 6%
WP.3: Build & test framework creation	eda / fvm	Jun 1, 2024–Nov 30, 2024	Closed	38/38 complete 100%
WP.4: Creation of repository with examples	eda / fvm	Dec 1, 2024–Feb 28, 2025	Open	1/10 complete 10%
WP.5: Demonstration over two IP cores	eda / fvm	Mar 1, 2025–Aug 31, 2025	Upcoming	0/4 complete 0%
WP.6: Validation and consolidation of the proposed approach	eda / fvm	Dec 1, 2024–Nov 30, 2025	Open	0/26 complete 0%
WP.7: Dissemination of project results	eda / fvm	Feb 1, 2025–Nov 30, 2025	Upcoming	1/15 complete 6%

Nov 2024

New ‘virtual’ WP: WP.3.bis to group all “Wishlist” improvements to the build & test framework

Bar chart today

WP.0: Project management and control	eda / fvm	Jun 1, 2024–Nov 30, 2025	Open	24/49 complete	48%
WP.1: Formal methodology definition	eda / fvm	Jun 1, 2024–Aug 31, 2024	Closed	17/17 complete	100%
WP.2: Formal methodology implementation	eda / fvm	Sep 1, 2024–Nov 30, 2024	Closed	2/2 complete	100%
WP.3.bis: (Wishlist) Improvements over the build & test framework	eda / fvm		Open	1/15 complete	6%
WP.3: Build & test framework creation	eda / fvm	Jun 1, 2024–Nov 30, 2024	Closed	38/38 complete	100%
WP.4: Creation of repository with examples	eda / fvm	Dec 1, 2024–Feb 28, 2025	Open	2/11 complete	18%
WP.5: Demonstration over two IP cores	eda / fvm	Mar 1, 2025–Aug 31, 2025	Upcoming	0/4 complete	0%
WP.6: Validation and consolidation of the proposed approach	eda / fvm	Dec 1, 2024–Nov 30, 2025	Open	1/26 complete	3%
WP.7: Dissemination of project results	eda / fvm	Feb 1, 2025–Nov 30, 2025	Upcoming	1/15 complete	6%

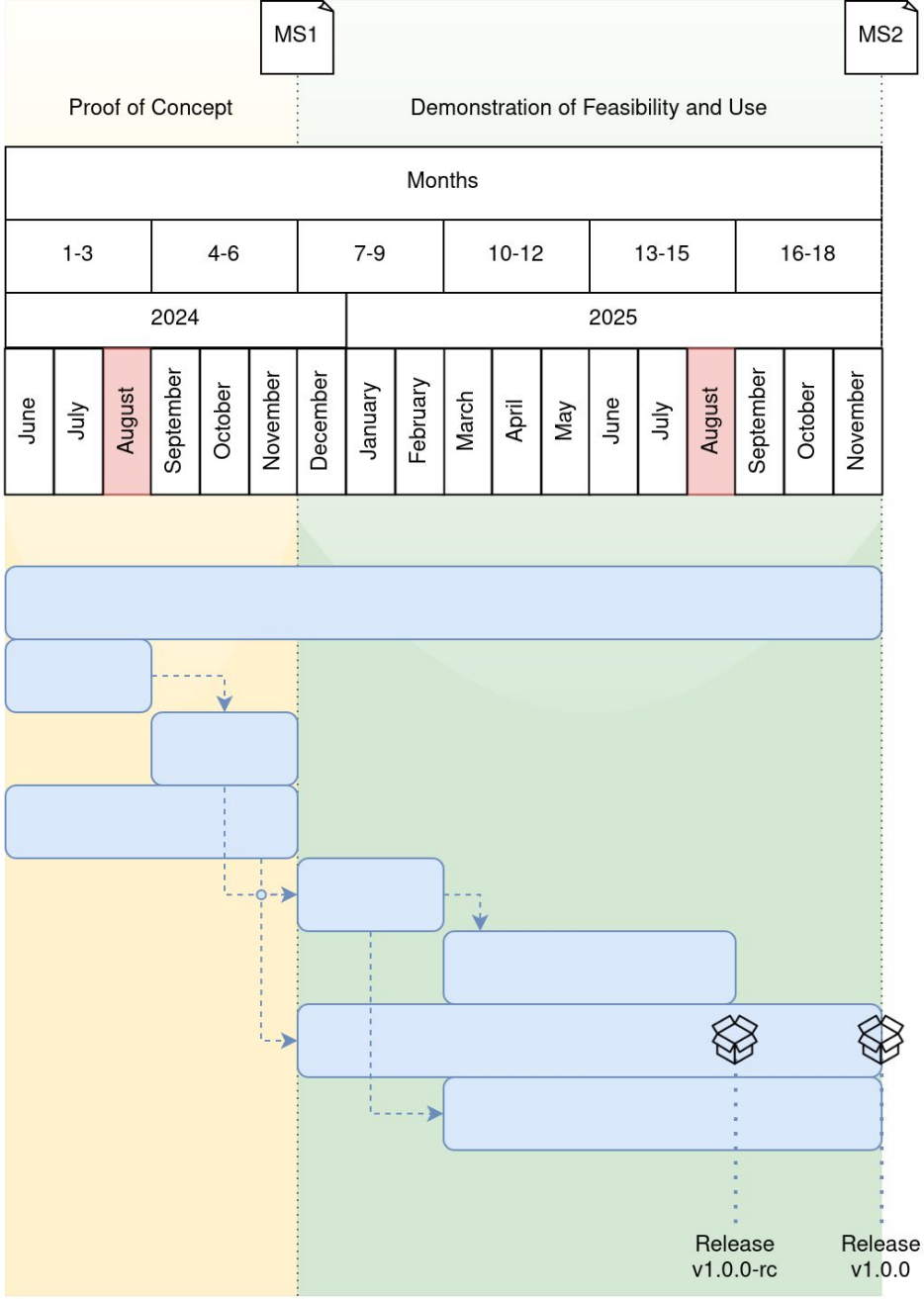
13 Dec 2024

Updated Schedule

- The Gantt Chart has been updated to better reflect the reality of the development
- Previous and updated Gantt Charts follow in the next slides
- No impact in milestones

Original Gantt Chart

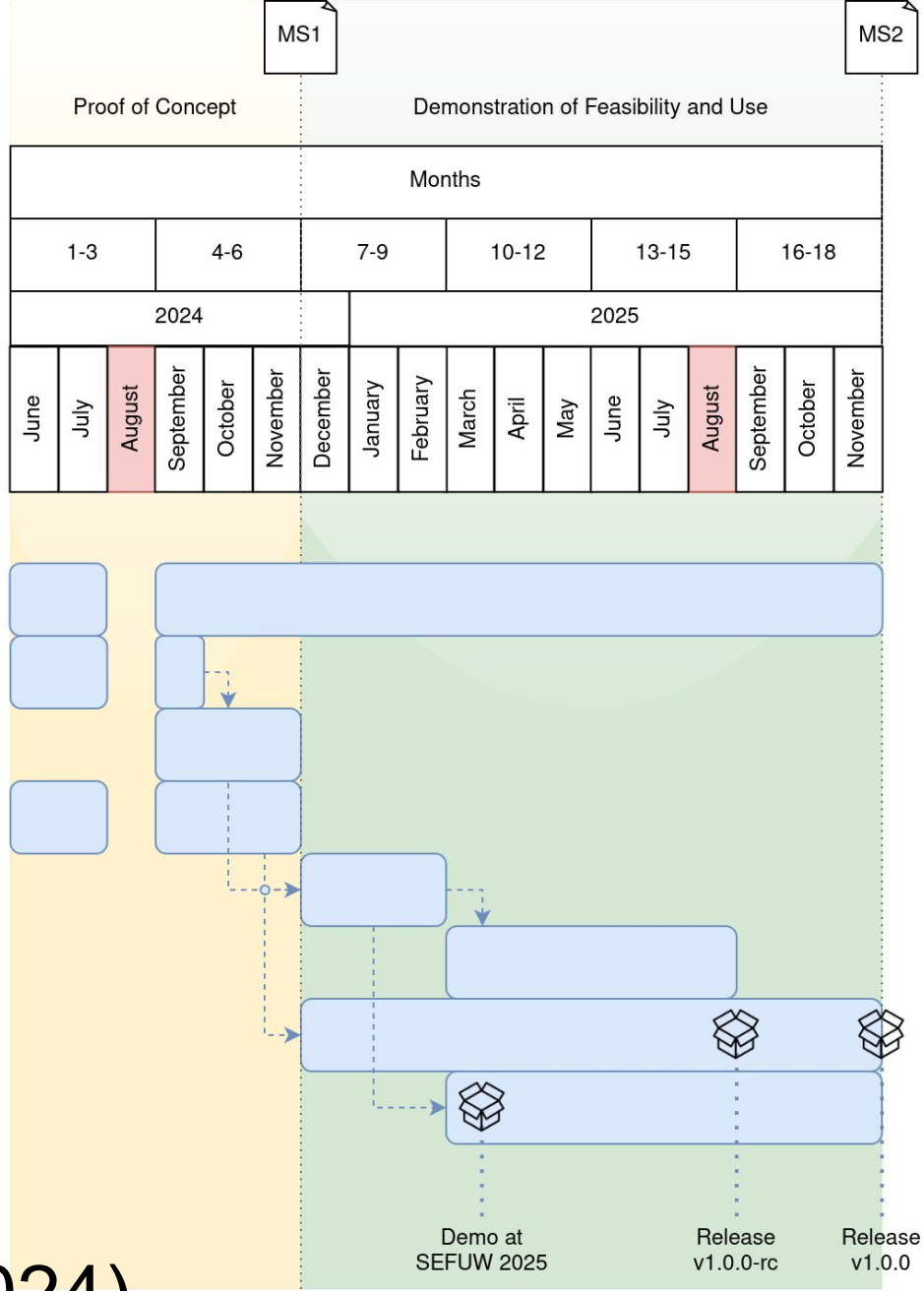
WP.0: Project management and control
WP.1: Formal methodology definition
WP.2: Formal methodology implementation
WP.3: Build & test framework creation
WP.4: Creation of repository with examples
WP.5: Demonstration over two IP cores
WP.6: Validation and consolidation of the proposed approach
WP.7: Dissemination of project results



(Project Kick-off)

Junior Engineer	AICIA grant (3 months)	Training contract (9 months)

1st Updated Gantt Chart



WP.0: Project management and control
WP.1: Formal methodology definition
WP.2: Formal methodology implementation
WP.3: Build & test framework creation
WP.4: Creation of repository with examples
WP.5: Demonstration over two IP cores
WP.6: Validation and consolidation of the proposed approach
WP.7: Dissemination of project results

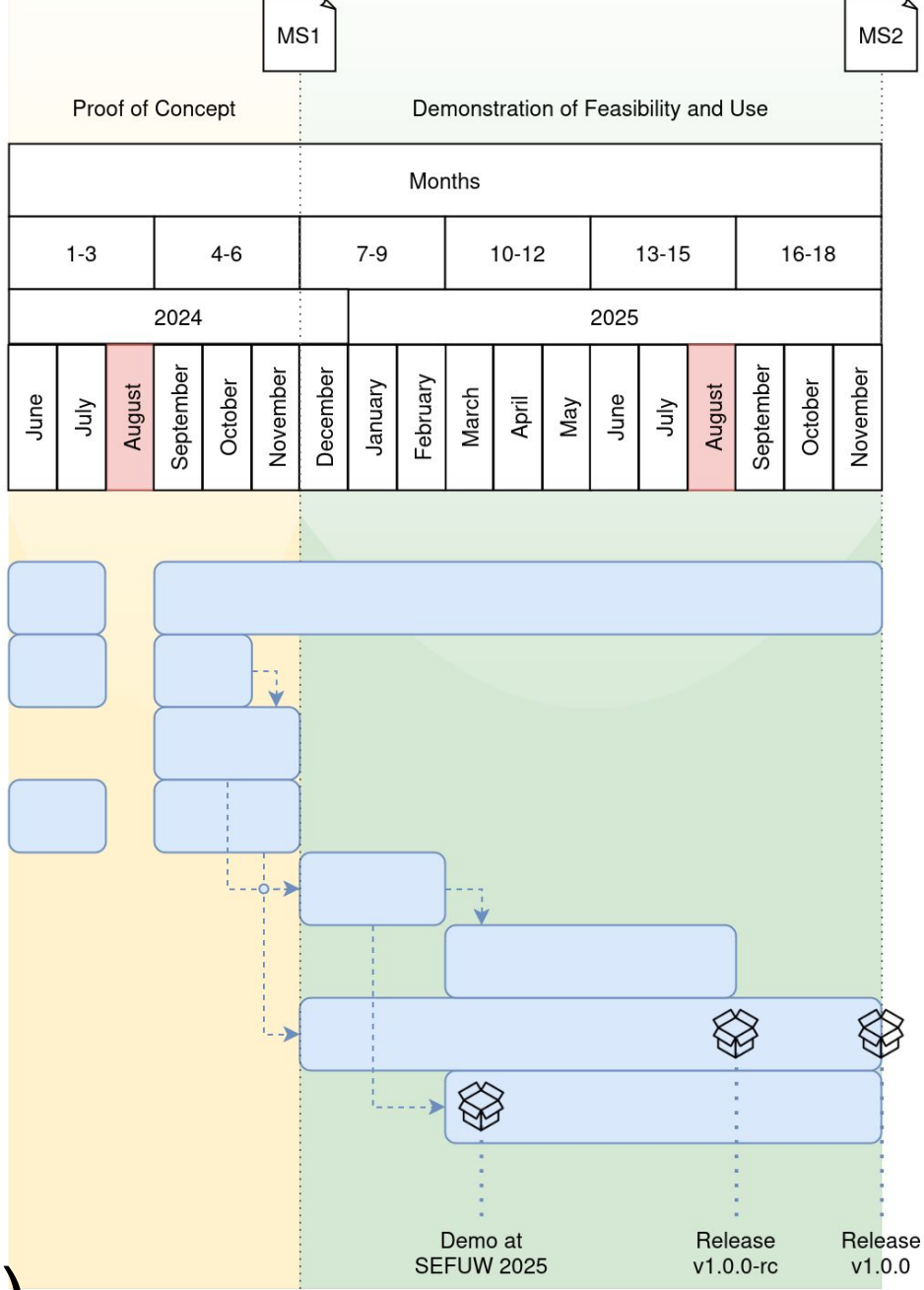
Junior Engineer	AICIA grant (3 months)	Training contract (9 months)

(1st Progress Meeting)

(Updated September 2024)

Current Gantt Chart

WP.0: Project management and control
WP.1: Formal methodology definition
WP.2: Formal methodology implementation
WP.3: Build & test framework creation
WP.4: Creation of repository with examples
WP.5: Demonstration over two IP cores
WP.6: Validation and consolidation of the proposed approach
WP.7: Dissemination of project results



Junior Engineer	AICIA grant (3 months)	Training contract (9 months)

(Updated October 2024)

Modifications to the Gantt Chart

With respect to Progress Meeting 1:

- WP.1 delayed one extra month
  - Finished at the end of October 2024
  - Part of the work in WP.1 was integrated into the framework as it is being developed, so it was also advancing WP.2 and WP.3
  - More or less the same effort as planned
    - 4 months instead of 3, but during the majority of the first month we didn't have access to the SW licenses
  - No impact on milestones

Abstract for SEFUW

- To be written and submitted after the Christmas holidays
- Deadline Jan 13th, 2025
- ½ to 1 pages
  - In order to not hinder the possible future publication of a journal paper describing the methodology
  - Is that ok?
  - We can give more information on the slides and during the demo session

Demo

Let’s make a demo!

-> the demo could not be made due to lack of time. We all agree to make the demo during the next meeting.

Discussion

- Improving the reports
  - Adding coverage metrics
  - Configurable threshold for failing some tests/checks if actual coverage < target coverage
  - **-> ESA and AICIA-US agree on this point**
- Terminology
  - “from lower level to higher level --> procedure, steps (within a test), test and campaign”
  - **-> steps could be a single step of the FVM over a single design, test could be all steps over a single design, and a campaign could have tests over different designs and/or design configurations.**

A couple of questions for ESA

- Any changes to implement in Progress Report 6: November 2024?
  - **-> Add the comments to the MoM**
- Last progress meeting (September), Alberto Urbón stated that he wanted to try locally what we were developing
  - Anything to report?
  - **-> Nothing yet**

Next actions (I)

- AICIA-US: Work on:
  - WP.4: Creation of repository with examples
    - Examples of both:
      - Different complexity/difficulty levels
      - Specific functionalities offered by the FVM
  - WP.6: Validation & consolidation of the proposed approach
    - Writing the training materials
    - Documenting the FVM
  - WP.7: Dissemination
    - Abstract for SEFUW
  - WP.3.bis: Improving the generated reports
    - Add formal coverage reporting
      - Could be moved to WP.6
      - **-> moved to WP.6 after the meeting**

Next actions (II)

- Next progress meeting: in 2-3 months
  - WP.5: Demonstration over two IP cores begins on March 2025
  - **February 2024** would be a great moment to review the repository of examples and to decide on the ESA-provided IP core

    -> ESA and AICIA-US agree on February 2024

  - **March 2024** is also possible, but we all have SEFUW
    - Less time available
      - But we will meet in person
    - We should have the repository of examples ready to show
    - If we decide on the IP through the project's issue tracking system and/or other short meetings, we may do the progress meeting on March

Conclusions

The big question: did we reach the milestone?

- **MS1: Proof of Concept**

Any other business?

- Tangential topic: status of the Memorandum of Understanding?
  - Last news we had was that the higher-ups and/or legal team at ESA were going to review it