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ERC32 EVALUATION

WORKSHOP ESTEC

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Laurent MAINSANT

E-Mail : laurent.mainsant@espace.aerospatiale.fr

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ERC32 EVALUATION

- EVALUATION AIMS
- STUDIED PRODUCTS
- TESTS PLAN
- POSITIVE ASPECTS
- PROBLEMS
- FUTURE PROSPECTS
- CONCLUSION

EVALUATION AIMS

- CHECKING "INDUSTRIAL" CAPABILITIES OF PRODUCTS

  – Management of complete application

  – Performance of executable code

  – Performance of real time kernel

  – Capabilities of Target Simulator to be used during the different phases of software production

EVALUATION AIMS

- EVALUATE THE TECHNICAL SUPPORT PROVIDED WITH PRODUCTS
  - Technical solutions towards our difficulties
  - Reactivity

- STUDY THE ASSOCIATED DOCUMENTATION
  - Is it complete ?
  - Is it clear ?

STUDIED PRODUCTS

- ERC32 Ada Compilation System from AONIX with Microtec Package

- ERC32 Target Simulator

- Worst Case Execution Time Estimator prototype (WCETE)

- ERC32 Scheduling Analysis Tools (Analyser and Simulator)

TESTS PLAN

- Unit test of the A5 pilot algorithm (~100 lines, no Ada tasks),

- Unit test of the A5 out-atmosphere guidance initialisation algorithm (~3000 lines, no Ada tasks),

- Simple benchmarks which contain real-time mechanisms (rendez-vous, suspension delay,...)

- Complete A5 Flight Software (contains 5 Ada tasks).

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POSITIVE ASPECTS
COMPILATION SYSTEM

- Ada Probe :
  - Powerful debugger, non intrusive debug (.cui file)
  - ➤ ***DEBUG SOFTWARE = EMBEDDED SOFTWARE***
  - Possibilities of low level debug
- Library management : *SECURITY*
  - Lock during compilation
  - Lock during debugging
  - Lock during execution

POSITIVE ASPECTS
TARGET SIMULATOR

- Good man/machine interface
- System based on scripts
  - Batch mode (input, output, breakpoint, etc.)
  - OS Emulation - IO Simulation
- Marker system
  - Breakpoint at address
  - Breakpoint on memory access (write or read)
  - Script launch on various actions
- Very good technical support

PROBLEMS
COMPILATION SYSTEM

- COFF Format

  – Too many relocations (without segmentation) : max 65535 objects

  – Too many sections (with segmentation) :
  max 32767 sections but beyond 512 sections
  => "lnksp, can't open"

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PROBLEMS
COMPILATION SYSTEM

- Binder does not verify the units obsolescence

- Compilation options create errors during execution (object = extensive)

- Symbols can not be used outside

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PROBLEMS

TARGET SIMULATOR

- Very "light" documentation

- Problems with UART simulation : lost time

- Not easy protocol (TCP/IP, pipes, etc.), especially the link with AONIX (TS-GATEWAY)

FUTURE PROSPECTS

- GNU linker instead of Microtec linker
  => No more problem with COFF format

- New version of Target Simulator
  => Perhaps quicker execution, with UART output by example

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CONCLUSION

- Aonix compiler <u>with Microtec linker</u> is not ready for an industrial process

- With few modifications, especially on documentation, Spacebel target simulator is usable in an industrial process.