



AEROSPATIALE

ERC32 EVALUATION

WORKSHOP ESTEC
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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



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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"

PROBLEMS

COMPILATION SYSTEM

- Binder does not verify the units obsolescence
- Compilation options create errors during execution
(object = extensive)
- Symbols can not be used outside

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

CONCLUSION

- Aonix compiler with Microtec linker is not ready for an industrial process
- With few modifications, especially on documentation, Spacebel target simulator is usable in an industrial process.