



**Safety-Critical Object-oriented Real-time Embedded
Development Environment**

Multi-Language

Multi-Target

Multi-Host

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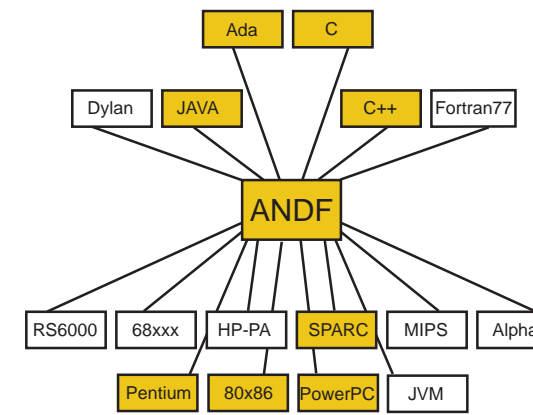


Flexible Solutions for Safety Critical Real-Time Embedded Needs

The SCORE development environment has been designed to address the needs of safety-critical, real-time, embedded systems. The environment provides support for the development of reusable components written in different languages targeting both native and embedded platforms. The key to this strategy and the flexibility to cover multiple targets, hosts, and languages, is the ANDF technology (Architecture Neutral Distribution

Format) which defines a common intermediate format used by the compilers and associated tools.

SCORE supports Ada and C programming languages with plans for C++ in the near future. Target architectures include SPARC and PowerPC with Intel 80x86 and Pentium following shortly thereafter. Support for additional languages and target architectures will be included as demanded.



Multi-Language Debugger Full Ada 95 Library Management

Benefits

- Multi-language: Ada 95 and C
- Multi-host and multi-target
- Risk reduction through reuse
- Common native and cross development environment
- No major rewrite of application
- Shorter time to market for new applications
- Built on open standards (Ada, C, ANDF, ELF, DWARF)
- Coexistence with ANDF tool chain
- Generates ELF compatible code

Features

- Robust, proven compiler technology
- Multi-language symbolic debugger
- Debugger can handle programs written in a mixture of C and Ada
- Ada-like or C-like debugger commands
- May be used stand-alone or within the SCORE environment
- Code compiled without debug may be debugged at the machine level
- Excellent run-time performance
- Support for multiple target platforms
- Point and click, easy-to-learn GUI
- Command-line interface
- Fast edit-compile-link-debug cycle
- Fast ethernet downloading
- Preconfigured for common target boards
- Certifiable run-time (with tasking)
- Very compact and efficient ROMable code

Symbolic Multi-Language Debugger

The SCORE multi-language debugger offers a full-featured, multi-windowed, non-intrusive debugging environment accessible from the SCORE GUI or the command-line. The MLD is a symbolic debugger which supports the debugging of Ada, C, or mixed Ada and C language applications. Seamless transition between languages provides symbolic debugging in a syntax that is familiar to a programmer in that language. In addition, the MLD fully supports machine level debugging including access and modification of memory and registers.

- Define start-up scripts
- Define symbols
- Log and replay debug sessions
- Define debugger script subprograms
- Restart program
- Supports high-level language debugging
 - Set breakpoints and tracepoints at any statement or declaration
 - Singlestep by statement, into or over subprograms, and to subprogram return
 - Display and modify object values
 - Display and modify program variables
 - Trace program execution at statement level
 - Display the call chain
- Supports full machine-level debugging
 - Set breakpoints and tracepoints on memory access
 - Singlestep at instruction level
 - Trace program execution at instruction level
 - Display and modify memory
 - Display and modify I/O ports
 - Display and modify machine code
 - Display and modify registers
 - Display and modify the stack
 - Report hardware exception
- Supports full Ada-level debugging
 - Optional constraint checking
 - Debugging of programs using tasking and synchronization
 - Display task structure and status
 - Break on exceptions, accepting an entry, leaving block/body containing tasks
 - Raise exceptions
 - Change Ada/C viewpoints
- Supports full C-level debugging
 - Change C/Ada viewpoints

Compilers

The SCORE compilers from DDC-I provide:

- Interface data and functions between languages
- Extensive diagnostic messages

In addition, the Ada compiler offers:

- Successfully validated under ACATS 2.2 (formerly ACVC)
- Full Chapter 13 support including:
 - Representation clauses
 - Machine code insertions
- Two levels of interrupt handling
 - Task entries
 - Protected procedures
- Support for:
 - Annex A - Predefined Language Environment
 - Annex B - Interface to Other Languages
 - Annex C - Systems Programming
 - Annex D - Real-Time Systems
 - Annex H - Safety and Security

Run-Time System

The SCORE system offers an Ada run-time system (RTS) and C run-time libraries which support:

- Pre-emptive priority scheduling
- Fast scheduling
- Scalable (several RTS variants included)
- Configurable to custom hardware

Ada RTS

- Task scheduling policies
- Queuing policies
- Rate monotonic time package
- Priority

Library Management

The SCORE environment includes C libraries which support execution on target platforms. The SCORE Ada library manager supports:

- Flexible library structure
- Library unit inspection tools
- Program unit preservation over program lifetime
- Automatic recompilation of obsolete program units

Flexible Project Management

SCORE supports both large scale and small scale projects via:

- Project, program, file, and user-level options
- Automatic program recompilation

Additional Tools

The SCORE environment includes a collection of additional tools to supplement the development of safety-critical, object-oriented, real-time, embedded applications:

- GUI
- Assembler
- Disassembler
- Stack size analyzer
- Code size analyzer
- Object map-tool
- Stand-alone ethernet and serial downloaders
- User controllable linker

Documentation

Extensive documentation is provided:

- User's guide for all tools
- Installation guide
- On-line help
- Quick reference guide
- Extensive compile time diagnostics
- Release notes