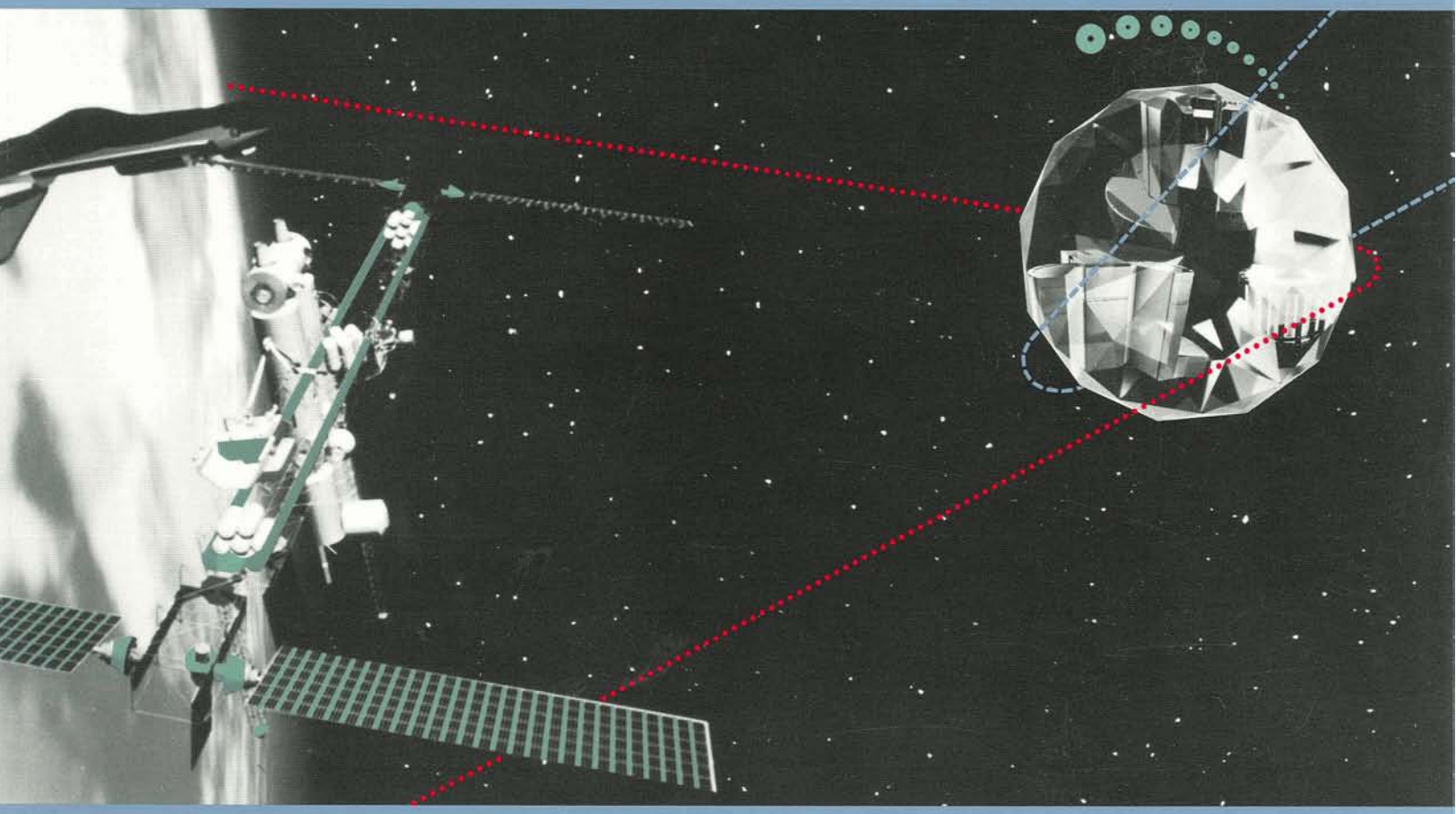
ADA

for Cray supercomputers



CRAY

Delivering the power . . .

ADA

Cray Research is pleased to announce the availability of the Cray Ada compiler for Cray supercomputers, offering Cray customers the option of combining the strengths of Ada with the capabilities inherent in the large memories and extremely fast processing speeds of Cray systems.

A language for the future
In 1975, the U.S. Department of Defense, seeking an alternative to maintaining hundreds of specialized computer languages used in strategic applications, put out a call for a single new language that could handle its diverse needs. The result was Ada, which incorporates many modern software development principles.

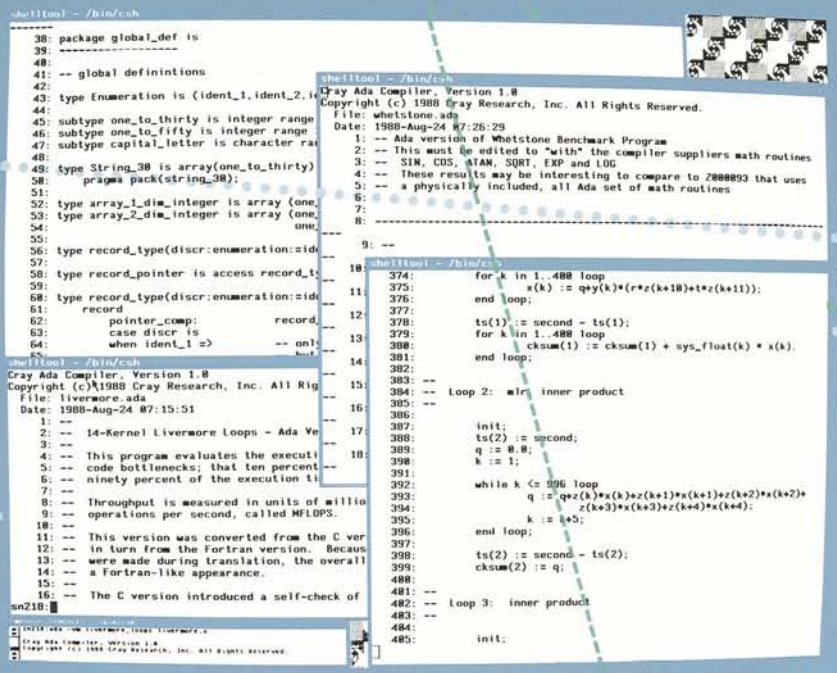
Features of Ada
Ada is a very powerful language and is correspondingly very large. As might be expected, its compile and execution times are slower than those of more compact languages, such as Fortran. However, Ada has many features that are unavailable in Fortran, including exception handling, packages, tasks, records, assignment of structured expressions, generic program units, low-level I/O, physical representation of data, abstract data types, data encapsulation, and dynamic data declarations.

If used effectively, Ada offers a reliable, portable, and efficient modular programming environment, yielding code that is easy to enhance and maintain. It is especially well suited for developing large, complex software systems. For example, it encourages separate compilation and testing of packages that will be combined later.

Although originally designed to develop large, real-time embedded systems within the scientific and engineering community, Ada is receiving a broader audience for application code development in process design and control, communication sytems, intelligent systems, geophysical analysis, robotics, distributed applications, and management information systems.

Features of Cray Ada
Cray Research's Ada environment incorporates a set of tools and libraries that provide for flexible, project-oriented software development. The first phase of Cray Ada conforms to the Ada language as defined in the *American National Standard Reference Manual for the Ada Programming Language* (LRM), the official, authoritative source on the syntax and semantics of the Ada language. Cray Ada includes the following components:

- The Ada Compiler, which generates code for execution on Cray computer systems.
- The Library Manager and its tools, which support program configuration control, allow



flexible manipulation of libraries, and promote sharing of code among developers and applications.

- The Ada Linker, which binds together each Ada subprogram and invokes the Cray loader SEGLDR.
- The Ada Execution Environment, the run-time system that provides an environment for executing Ada programs, which includes support for built-in language facilities, such as Ada tasking and memory allocation, and support for predefined packages, such as Text __IO and Calendar.
- Language tools, consisting of the Ada Cross-Referencer, Ada Source Dependency Lister, and Ada Source Formatter.
- The Source Level Debugger, which provides an interactive environment for examining the behavior of compiled Ada programs.

In addition to standard LRM features, Cray Ada has the ability to call routines written in Fortran, C, Pascal, and the Cray assembly language CAL.

Validation

The Department of Defense (DoD) now requires all contractors to use validated Ada in mission critical applications. The Ada Validation Facility publishes the Ada Compiler Validation Capability (ACVC) test suite to verify the functionality and completeness of Ada compilers as specified in the LRM. Cray Ada has passed the ACVC 1.9 test suite.

Development of Cray Ada

Cray Ada is being implemented in two phases. The first phase, available now, offers full Ada LRM capability. The second phase will add increased performance by way of scalar optimization (although some optimizations are prohibited by the nature of Ada), vectorization, and instruction scheduling, while retaining a compatible user interface.

Release 1.0 of Cray Ada runs on CRAY X-MP and CRAY-2 systems under the UNICOS operating system (release 4.0 or later). Cray Ada release 2.0 will also run on CRAY Y-MP systems.

Publications, training, and support

The Cray Ada Environment Reference Manual is supplied with Ada for Cray computer systems. This manual supplements the LRM.

Cray Software Training in Mendota Heights, Minnesota, offers a programmer's introduction to Ada (five days) and a manager's introduction to Ada (one day). Classes are arranged as needed. For current information, call the Cray Software Training registrar at (612) 452-9410.

For more information on Ada for Cray computer systems call or write your nearest Cray Research sales office.

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VALIDATED Ada

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