

SPARK Pro

► High Assurance by Design

Integrated Development Environment and Toolsuite

overview

SPARK Pro is an Integrated Development Environment for High-Assurance software, comprising Praxis' SPARK language and toolset integrated into AdaCore's GNAT Programming Studio (GPS). The SPARK Pro tools help prevent, detect, and eliminate defects early in a system's life cycle, as the source code is developed. Frontline support is provided through GNAT Tracker, AdaCore's web-based support system.

Designed by Praxis, SPARK is an Ada subset extended with a contract language that allows a program's specification to be precisely expressed and verified. The SPARK language is especially suitable for applications where correct operation is vital for reasons of safety, security, or both. The SPARK toolset performs static (before run time) verification that is unrivalled in terms of its soundness, low false-alarm rate, depth, and efficiency. The toolset also generates evidence for correctness that can be used to build a constructive assurance case to meet the requirements of industry regulators and certification schemes.

benefits

► Standards

SPARK Pro meets or exceeds the requirements of all high-assurance software standards, including DEF STAN 00-56, DO-178B, IEC 61508, and the Common Criteria. It is likewise expected to exceed the requirements of the forthcoming DO-178C standard.

► Processes

SPARK's zero-tolerance approach to defects is compatible with all mature high-assurance software processes, including CMM, Six Sigma, Agile Methods, and the SEI's PSPSM and TSPSM.

► Ada compatibility

SPARK toolsets are available for Ada 83, Ada 95, and Ada 2005. Since all SPARK language features are legal constructs in the corresponding version of Ada, a SPARK program can be compiled by any compiler implementing that version of the Ada standard. SPARK Pro does not require a subscription to GNAT Pro.

► Correctness by Construction

The SPARK language supports the Correctness-by-Construction concept that is based on expecting requirements to change, eliminating errors before testing, developing incrementally, and writing software that is easy to verify.

services

Integral to SPARK Pro is the frontline support provided directly by the product developers themselves. Engineers from AdaCore and Praxis serve, in essence, as online consultants to your project. Questions on all language and toolset aspects are answered promptly, comprehensively, and accurately. Blocking issues receive immediate attention; if appropriate, a wavefront release with the relevant repair can be provided.

AdaCore and Praxis can also provide specialized engineering and/or training services based on specific customer requirements.



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features

► Soundness

Analysis by the SPARK tools has no “false negatives”. For example, if the tools indicate that no potential out-of-range index errors were detected, then none will occur when the program is run.

► Precision / Completeness

Analysis by the SPARK tools minimizes the number of “false alarms” (also known as “false positives”), in which a problem that is reported is in fact not an error at all. With SPARK the incidence of such false alarms is significantly lower than with traditional languages and static analysis tools.

► Depth

SPARK checks for deep and subtle bugs, including run-time errors such as buffer overflow and arithmetic overflow, and can even verify that application-specific safety and security properties are not violated.

► Efficiency

The algorithms used by the SPARK tools scale up for usage on large programs.

► Modularity

SPARK is a modular language, and the SPARK tools can work incrementally during system development. There is no need to wait until a program is complete before obtaining useful results.

platforms

SPARK Pro is supported on a wide of range of host environments for native platforms, including UNIX, Windows, and GNU/Linux. For specific configuration information, please refer to the AdaCore website or contact a sales representative.

North American Headquarters

104 Fifth Avenue, 15th floor

New York, NY 10011-6901

tel +1 212 620 7300

fax +1 212 807 0162

info@adacore.com

www.adacore.com

European Headquarters

46 rue d'Amsterdam

75009 Paris, France

tel +33 1 49 70 67 16

fax +33 1 49 70 05 52

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