CLEANSCAPE *Software development powerfully simplified*

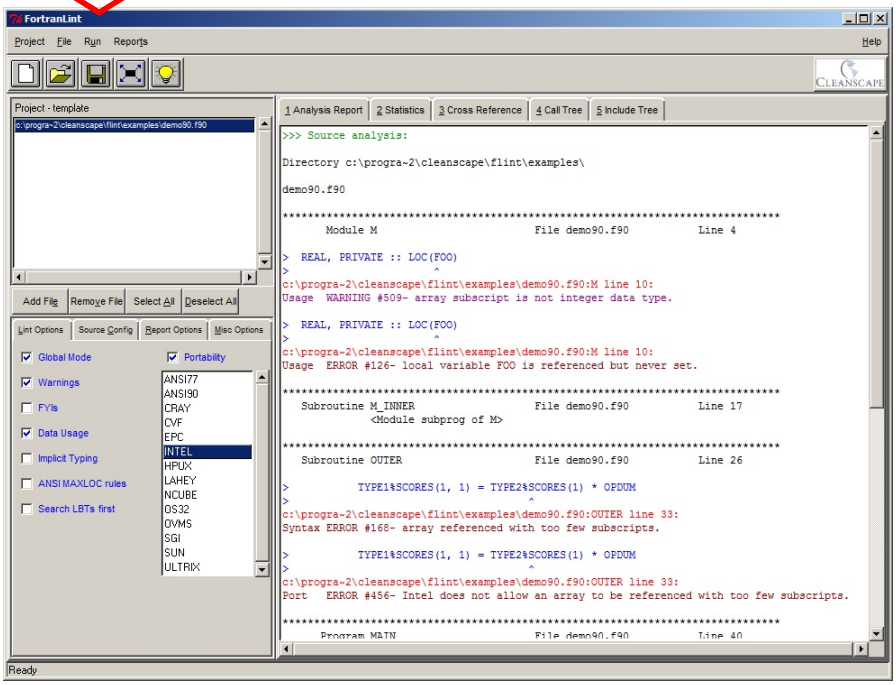
NEW
- F03/F08 Support
- Whole Program Analysis Filters

Cleanscape FortranLint

Static Source Analyzer

Key Features & Benefits

- *Whole program analysis!* A step beyond what compilers offer – assess your program in its entirety
- New: Filter the WPA for just files you're currently working on, dramatically reducing results to review
- Quickly find hundreds of problems your compiler can't
- Isolate problems in minutes that can take days using a runtime debugger
- Search and destroy security holes
  - One Definition Rule (ODR) violations
- Powerful static source analyzer with 1560 code checks
- Comprehensive cross reference including COMMON blocks for refactoring or converting from serial to parallel code
- Call Tree for fast code familiarization
- Three interface options fit the way *you* code
  - Easy to operate Cleanscape GUI provides point-and-click control and reports hyper-linked to sources via your favorite code editor
  - Command line mode with return codes for script and/or build operations
  - Integration with Visual Studio and Eclipse both extracts project settings and hyperlinks reports directly in the IDE's output window
- OpenMP analysis
- Library interface files for MPI, OpenMP, and NetCDF with set/reference information for 100% thorough analysis
- The *most* in *hosts* (Windows, Linux, Mac, Unix, VMS) and flexible licensing options
- ***Get – and keep – your project on track***



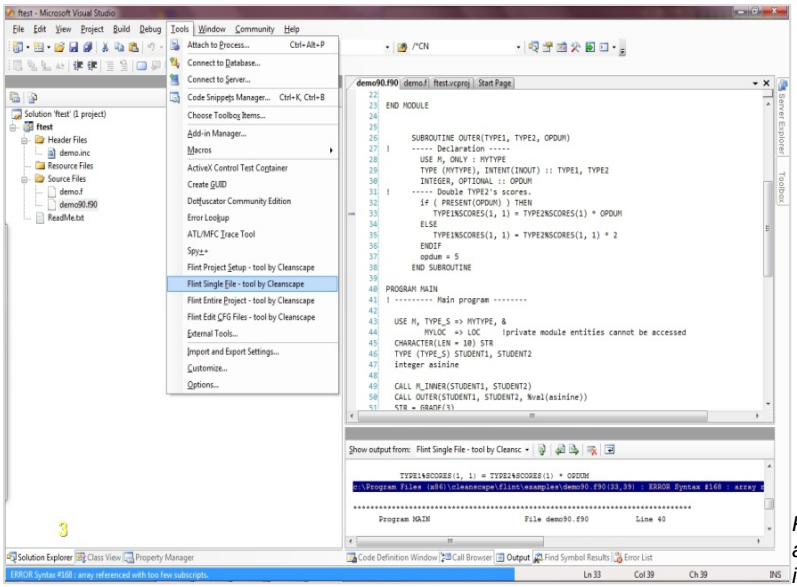
The Cleanscape GUI interface mode delivers powerful and comprehensive analysis from a couple mouse clicks, cutting hundreds of hours from design, debug, or test.

In this era of large, complex Fortran code – often using OpenMP and/or MPI, often collaborative between industry, government, and educational institutions – Flint provides fast, flexible, yet *powerful* analysis to help you produce code that is bug-free, runs as expected for all inputs, and is free from weaknesses to security threats.

Cleanscape FortranLint *(Flint)* is a static source code analyzer that automatically identifies problems at their source, prior to compiling or executing. From its first use, this tool can save you hours and hours of tedious debugging, and greatly reduces the resources required for testing – both development and integration phases.

Flint rigorously examines source files both individually and as a project, almost instantly generating comprehensive and meaningful reports on problems often overlooked by Fortran compilers.

A *free* demo is available on Linux, Windows, and Mac hosts. For more information or to order, call or visit our website today!



Flint's Visual Studio integration mode makes running static analysis simple and convenient. With three distinct user interface modes, one will be right for you!

Cleanscape FortranLint · Static Source Analyzer

Key Features

Feature	Description
KEY LINT ANALYSIS OPTIONS (out of 39 major controls)	
-g Global mode	Perform Whole Program Analysis to detect errors between modules and track data values across interface boundaries
-w, -f, -m	Control the depth of analysis to be performed: add warnings, informational (FYI) and implicitly typed variables
-o "format"	Specify analysis message format for use with IDEs like Visual Studio
-p invoke Preprocessor *and* '-#<path> Specify Preprocessor Path	Use a C or Fortran preprocessor. Flint will automatically invoke preprocessor for filenames with capitalized extensions (e.g., .F, .F90)
REPORT OPTIONS	
Cross Reference (xref)	Show symbols used throughout entire program with usage info (e.g., set/reference, allocated), source file, procedure, and line number. Extensive filtering options (e.g., omit probable loop counters)
Call Tree	Structural diagram of the "call" structure used by the source code. Extremely useful for code familiarization and documentation
Include Tree (GUI)	Show where INCLUDE and #include have been used to include additional source content – make sure you're using the right version
External Editor (GUI)	Select the external code editor to be invoked when clicking a hyperlink. External program 'seteditor' can add your own editor to the dropdown list
Statistics	File counts, symbol types/counts, and message counts/summary
INNOVATIVE CODE ANALYSIS	
WPA Filtering	See results for the files you're updating in the context of the whole program. Filtering provides maximum information about these files while screening out 99+% of the WPA which is not relevant to your work at hand. See the Benchmark section below for an example.
Dataflow Analysis	Detect dead code Detect reference-before-set issues for all branches of conditional constructs and forward GOTOs
Fileset dependency analyzer	For a given UUT, what is the minimum set of files necessary to resolve USE, INCLUDE, and #include dependencies? Necessary for local-mode analysis of specified UUT(s) and critical to successful dataflow analysis
Security and anti-hacking analyses	Analyses to detect coding practices that leave code vulnerable, such as bounds checking. An enhanced Flint is included with CASAF, Cleanscape's CWE Analyzer, available separately.
Powerful yet intuitive graphical interface *(included)*	Fast and interactive environment overlays powerful Flint command line engine to control four innovative analyses, and hyperlinking to source using *your* external programming editor.
OpenMP analysis *(option)*	Race conditions and deadlock Misplaced directives, nested blocks, modify outside critical section xref: Usage info for parallel regions; private/shared attributes
BENCHMARK	
Test case description	Quantum chemistry solver • 331 files • 65MB of source • 1.5MLOC
Analysis Time	36.0 sec on quad-core i7 Windows 7 workstation with 16 GB memory
Working set (memory) size	37.6 MB
Unfiltered results, initial whole program run. Includes complete analysis, full cross reference, call tree, statistics	1,494,904 lines – 911,772 lines were the cross reference – 181297 were the call tree
Filtered results for whole program, single UUT sourcefile	3611 lines – 2886 lines were the cross reference, 87 were the call tree
Key Benefit	**0.242%** filted/unfiltered lines Only 581 analysis lines to review (out of 459,997)

Specifications

Classification

- Static Source Code Analyzer for Fortran 77/90/05/03/08 (non o-o)

Available Analyses and Reports

- Over 1500 static checks
- Comprehensive cross reference
- Call tree
- Include tree
- GUI: All reports depict hyperlinks in red; clicking a hyperlink opens the source file at the line number associated with the analysis message in the user's specified code editor

Three User Interface Options

1. Cleanscape Graphical User Interface
2. Microsoft Visual Studio 6 through 2015 and Eclipse: extracts settings from project file and presents analysis with hyperlinks directly in the IDE's output window
3. Command-line interface with return codes suitable for *make* or other scripts

Help System

- Online help
- Balloon help for each control option
- User Documentation (PDF format)

Development Platforms

- Microsoft Windows 98 – 10
- Linux including **NEW** OpenPOWER
- Mac OS/X
- VMS
- Unix – AIX, HP-UX, Irix, Solaris
- Product requires activation key (30-day key included with purchase, instructions for permanent key included)
- Unlicensed Demo version for Win/Lin/Mac

Supported Environments

- All compilers compliant with ANSI Fortran standards from Fortran 77 to Fortran 2008 (non o-o)
- Library shell files included to provide 100% thorough interface analysis for
  - MPI
  - OpenMP
  - NetCDF
  - IEEE_FEATURES, IEEE_EXCEPTIONS, IEEE_ARITHMETIC
  - ISO_FORTRAN_ENV, ISO_C_BINDING

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