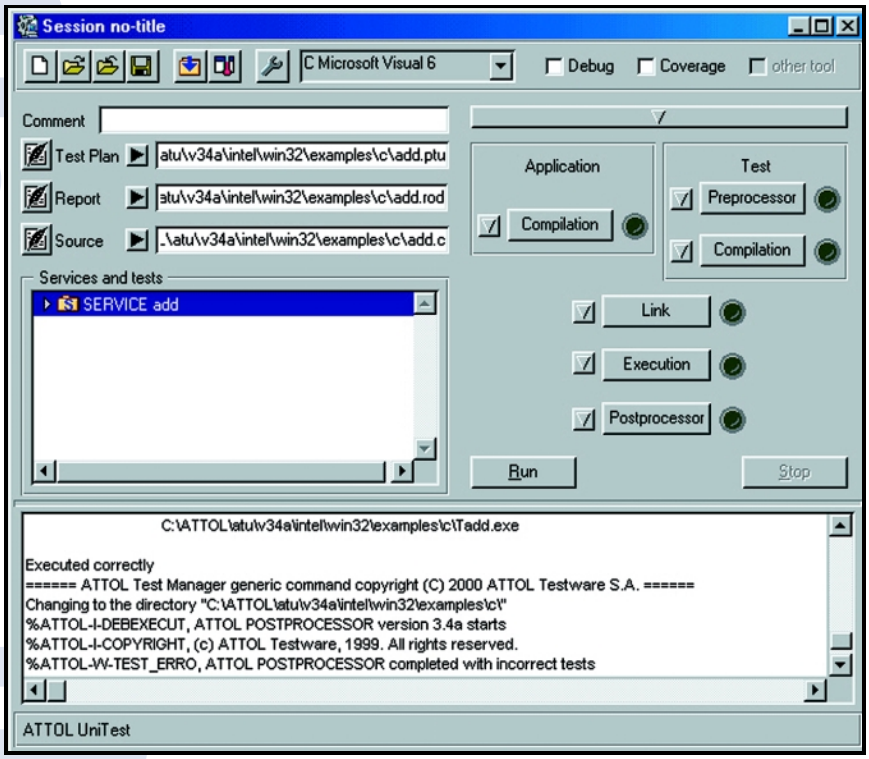
ATTOL UniTest

Automated software component testing tool

Key Features

- Automates entire software component testing process:
  - *Generates test scripts and programs*
  - *Executes test programs*
  - *Analyzes test results*
  - *Produces test reports*
- Open architecture supports:
  - *Linux, Microsoft Windows, and UNIX platforms*
  - *C/C++, Ada, and CSQL languages*
  - *Most emulation environments*
- Automatically generates test harnesses
- Supports black box and white box test strategies
- Automates regression testing
- Executable tests on host or embedded target
- Intuitive graphical user interface joins all UniTest components into an easy-to-use integrated environment
- Preprocessor translates the default test script into a test program in C, C++ or ADA
- Post-processor automatically produces the document that corresponds to the test report
- Automated report and analysis production provides consistent report format project-wide
- Produces portable tests for use in multiple environments
- Integrates with ATTOL Coverage to automatically measure test coverage and effectiveness



ATTOL UniTest from Cleanscape (UniTest) is a software component testing tool that helps programmers to easily identify and eliminate problems early in the development cycle by automating test script and program generation, test execution, test reports, and test analysis.

UniTest provides an environment for building a test harness that programmers can use to automatically subject critical components to functional or black box testing. It automatically simulates and monitors the interfaces of target software without altering the source code. Programmers can then measure test coverage to evaluate test effectiveness by using ATTOL Coverage from Cleanscape. By reusing test scripts during the maintenance phase, testers can also use UniTest to facilitate regression testing.

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Summary

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Applications

UniTest allows programmers to operate in native and cross-development environments that require maximum reliability with optimized resource utilization. It is particularly suited for the following applications:

- Embedded systems development
- Development of critical systems with high testing constraints
- Test control in large and complex software projects
- Environments with strict software quality policies, like SEI
- Companies that develop reusable components (C Modules, Ada Packages, C++ or Corba Objects, etc.)

Components

Test frame generator

- Creates a default test script in UniTest language
- Analyzes the source file under test
- Programmer modifies default test script by specifying input and output values to set the variables and parameters of functions, procedures or methods contained in the source file.

Test Manager

- Intuitive graphical user interface that joins all UniTest components into an easy-to-use integrated environment

Preprocessor

- Translates the test script into a test program in C, C++ or Ada

Post processor

- Automatically produces the document that corresponds to the test report just executed

Features & Specifications

Automated component testing

- Automatically generates test scripts:
  - Analyzes a component's source code
  - Identifies significant variables, parameters and stubs
  - Automatically generates a test frame outline
  - User-definable test design functions: components simulation, criteria-based test classification, complex data testing, etc.
- Automatically generates test programs in C, C++, Ada, CSQL
- Automatic generation of intelligent stubs for simulation of missing components

Automated test execution

- Uses runtime technology to execute tests in native or cross-development environments
- Single or batch test case execution
- Execute modified test cases without re-compilation
- Automatic expected versus actual result comparison
- Execute test harness under control of compiler's debugger

Automated report analysis and production

- Provides consistent report format project-wide
- Execution history shows control flow between units
- Input and output data values show data flow between units
- Pass/Fail comparison of expected and actual results
- Automatically feeds results into formal reports
- Provides documentation resource for developers, quality departments and customers

Automated regression testing

- Automatically generates regression test scripts
- Complete or selective test re-execution during maintenance
- Provides automatic recreation of environments and execution of test cases

Portable tests

- Tests that are defined on the development platform can be rerun on the execution platform
- Test scripts and test programs can be used in multiple environments
- Facilitates cross-platform development and testing of real-time embedded applications

Harness construction

- Automatically generates test harnesses
- Supports bottom-up or top-down testing
- Test environments built for unit or integration testing
- Rapid prototyping
- Test harness components available as source code

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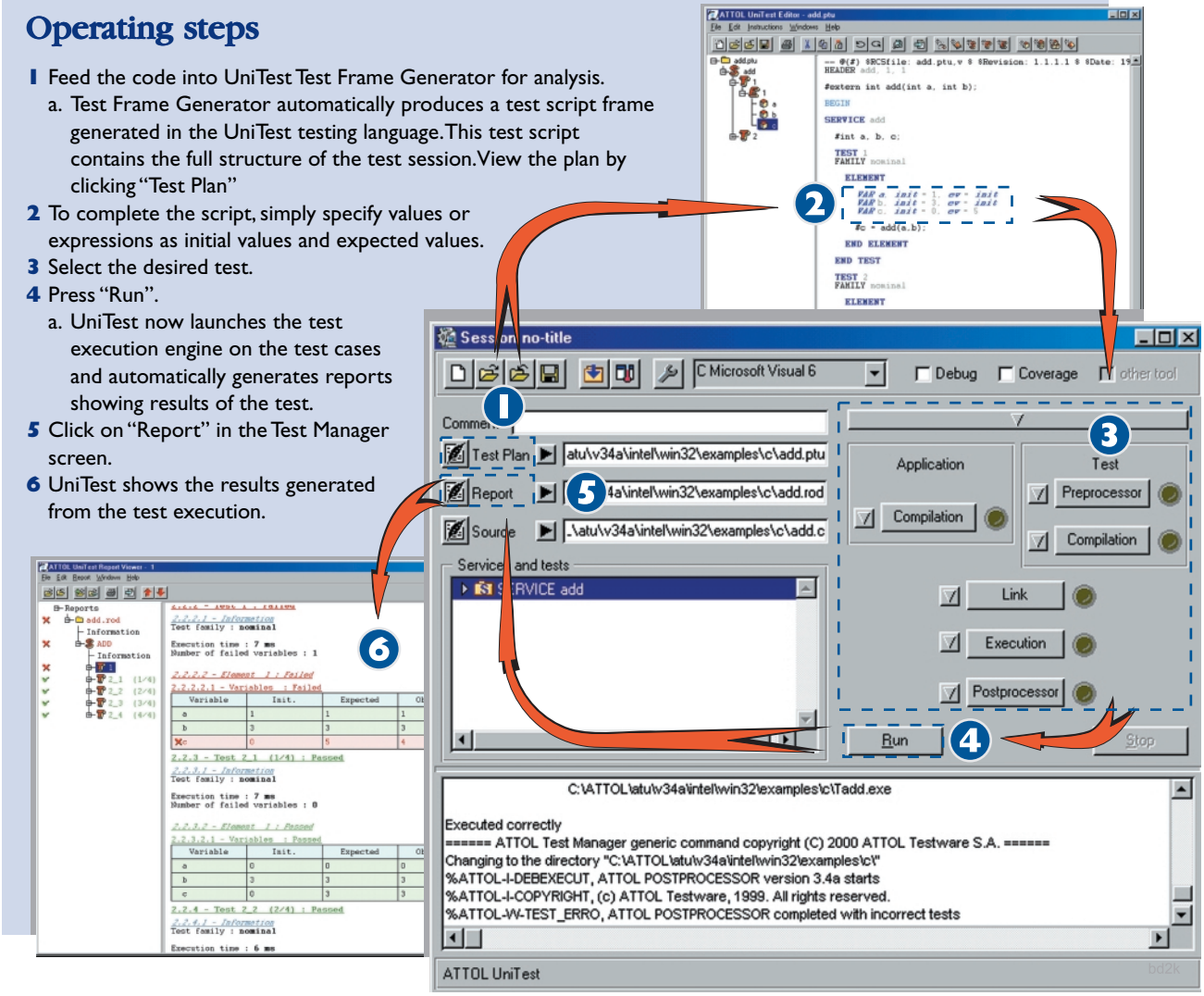
Operating steps

1. Feed the code into UniTest Test Frame Generator for analysis.
   a. Test Frame Generator automatically produces a test script frame generated in the UniTest testing language. This test script contains the full structure of the test session. View the plan by clicking "Test Plan"
2. To complete the script, simply specify values or expressions as initial values and expected values.
3. Select the desired test.
4. Press "Run".
   a. UniTest now launches the test execution engine on the test cases and automatically generates reports showing results of the test.
5. Click on "Report" in the Test Manager screen.
6. UniTest shows the results generated from the test execution.



Black-box testing

- Simulates and monitors the interfaces of target software according to specifications without altering the source code
- Helps the programmer to concentrate on inputs and outputs without having to be concerned about code structure

White-box, or functional, testing

- Facilitates functional testing by allowing manipulation of hidden data and subprograms
- Simple, powerful UniTest language allows programmers to automatically produce white box, or functional, tests with approximately 15 instructions to do the following:
  - Design tests using application data
  - Write multiple initializations for variables
  - Obtain full structural coverage
  - Generate simulation stubs

Open architecture

UniTest's runtime technology supports all real-time operating systems, platforms, languages, environments:

Platforms

- Linux
- PC: Windows 3.1, 95/8, NT, 2000
- Unix: Digital, HP, IBM, Sun

Languages

- C
- C++
- Ada
- CSQL

Environments

- Alsys
- Ashling
- Diab-SDS
- Hiware
- Lauterbach
- Nohau
- Tartan
- WindRiver
- Aonix
- BSO
- Green Hills
- HP
- LynxOS
- Pentica
- Tasking
- Others
- AMC
- CAD-UL
- Hitachi
- IAR
- Microtec
- QNX
- Texas
- ARM
- Cosmic
- Hitex
- Keil
- NEC
- Rational
- TLD

Benefits

Faster

- Significantly increase test efficiency over manual process
- Identify problems earlier, more quickly, more efficiently
- Boost productivity with intuitive graphical user interface
- Facilitate a distributed test environment

Better

- Increase product quality
- Prevent simple errors from becoming serious problems
- Eliminate software regression problems
- Meet high constraints from rigid standards

Smarter

- Use a single product for all projects
- Ease implementation with automated install-shield
- Implement customized control process
- Automatically develop tests for multiple environments
- Provide a documentation resource for developers, quality departments and customers

Cheaper

- Maximize resource utilization by reducing cost of development, testing, support and maintenance
- Increase return on investment
- Reduce total number of required licenses with floating licenses

Cleaner

- Streamline development process
- Seamlessly integrate automated testing with existing environment and processes
- Facilitate cross-platform development and testing of real-time embedded applications
- Reduce the errors that are often introduced into applications when programmers manually write programs for multiple languages or platforms

Other Cleanscape testing tools

ATTOL SystemTest

Automated testing for distributed computational environments

SystemTest automates the production and management of integration, validation and load tests for distributed systems. SystemTest has an open architecture that allows testers to use both standard communication and proprietary interfaces. SystemTest automatically generates interfaces that exercise and control the behavior of the System Under Test.

ATTOL Coverage

Test effectiveness measurement tool

Coverage increases test efficiency and optimizes development results by measuring frequency and effectiveness of code tests. UniTest directly interfaces with ATTOL Coverage to do the following:

- Measure test coverage and effectiveness
- Color-code tested and untested application source code
- Generate color-coded coverage reports
- Perform metrics analysis of tested code
- Consolidate results for several scenarios or during a test campaign
- Check compliance with DO178B standard with increasingly higher levels of coverage

Software development just got a lot cleaner

Cleanscape is a leading innovator of automated software development and testing solutions that simplify build environments for enabling customers to shorten development cycles, optimize resource utilization, increase product quality, and boost Return on Investment.

Cleanscape's product line includes the following automation tools for simplifying the software development process:

- **Cleanscape Fortran-lint & Cleanscape lintPlus.** Static source code analyzers that can automatically identify and clean problems that your compilers can't catch.
- **Cleanscape XTC-1750A.** The only "C" language cross-development environment for MIL-SPEC-1750A processors.
- **Cleanscape ectype.** Bridges design and coding by automatically generating C++ classes from object models.
- **qef.** Team leaders can replace the *make* utility with this advanced software construction management system that generates complete, accurate builds.
- **ATTOL test automation tool kit.** Automated test generation, report generation, and coverage analysis for software components and systems.

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