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LDRA Ltd
C/C++ LDRA tool suite
RELEASE NOTES

For Platform specific configuration, please refer to the Installation Guide.

New Features for 9.8.5

TBrun Section

NEW

TBextreme. If a variable which is used solely to access sub-elements of the variable, then tbextreme can add just the used sub-elements to the test case (instead of the default all elements) by unselecting the option Extreme Test -> Extreme Test Values -> Add All Elements of Accessor Variables.

NEW

Improved declaration of conversion functions for ranged test cases of enumerated types when the enumeration is declared via a typedef.

NEW

Improved handling of the volatile qualifier in user globals.

NEW

Mingw. Data file stdmath_cpptbrunlib.h updated to handle std::string for version 4.9.3 of g++.

NEW

Java. Improved test case validaton of static member variables.

NEW

Improved display of multi-inheritance relationships in the class hierarchy report .

NEW

Improved calculation of automatically generated derived classes particularly for abstract classes which have a long inheritance chain. (LM ref. 8603)

NEW

Improved call resolution to member functions of classes declared locally in functions. (LM ref. 9169)

NEW
When loading user defined calls from a tcf, duplicates are removed from the importing process.

NEW
Global stubs can be used to set the declarative parts of a stub such as return type or declarations.

LDRA Testbed Section

NEW
Command line qualifiers and TCF options to set language dialects.

These have the same effect as setting the equivalent INI entries such as CPP14_DIALECT=TRUE
in switching on specific language version dialect elements. These settings are now retained for files or sets unless modified by command line or TCF options. Use "none" to switch off language dialect setting.

c_language=c99|c11|none

cpp_language=cpp11|cpp14|cpp17|none

Command Line Example:

contestbed example1.c /11q /c_language=c99

contestbed example2.cpp /11q /cpp_language=cpp14

contestbed example3.cpp /11q /cpp_language=none

TCF Example:

...

Begin Options

cpp_language = cpp17

c_language = c11

End Options

...

NEW
INI flag ALLOW_C_LANG_DIALECT_FOR_CPP. Set = FALSE to prevent C99 or C11 language dialects being set for C++ source files using command line qualifiers, TCF options or C99/C11_DIALECT INI file entries.

NEW

Removal/optimisation of standards violations.

Where the count of a specific standards violation exceeds a set limit within a particular scope, most violations of that standard are removed.

Violation records above a set limit are removed from the SIF, so are not otherwise processed or reported on.

A configurable number of violations are retained as a representative sample so that they can be reported.

This process is controlled by the following INI entries:

EXTRACT_EXCESS_SIF_PEN=FALSE disables this process.

SIF_PEN_DCL_LIMIT=N The limit for any specific violation within a code section such as a structure, array or class (default 250).

SIF_PEN_DCL_RETAIN=N The number of violations (of a specific type) to retain within a code section (default 10).

For example if 719 violations of 90 S (Basic type declaration used) where found in a structure declaration, all but the first 10 would be removed.

SIF_PEN_FILE_LIMIT=N The limit for any specific violation within a source file (default 1500).

SIF_PEN_FILE_RETAIN=N The number of violations (of a specific type) to retain within a source file (default 100).

Where the SIF_PEN_FILE_LIMIT is exceeded, procedures retain 1 instance of each violation to ensure

procedure pass/fail is correctly indicated. To disable, set SIF_PEN_1_PER_PROC=FALSE in INI file.

Rules checked by C/C++ lexical analysis (indicated in the <lang>pen.dat file by a lower case s).

The detailed scope for these violations is not determined and they are removed from the scope of the reformatted file as a whole, configurable as follows:

SIF_PEN_LIMIT=N The limit for any specific violation within the reformatted file (default 1500).

SIF_PEN_RETAIN=N The number of violations (of a specific type) to retain within the reformatted file (default 100).

Additional instances of lexical analysis violations may be retained to be reported against the main source file and associated header, up to an additional N in each.

To prevent specific penalties from being removed use SIF_PENS_NO_REMOVAL= < comma separated list >

For example:

SIF_PENS_NO_REMOVAL=209 S,273 S,69 D

Retained violations are shown with an (R) marking. To disable set SHOW_RETAINED_IN_CODE_REVIEW=FALSE

Summary tables show rules that have been optimised with an (o) and the number of violations removed as (-n). To disable set SHOW_OPTIMISATIONS_IN_SUMMARY=FALSE.

NEW
Added INI flags to control reporting of 69 D with specific qualifiers for function arguments.

Set PEN_69_D_OVERRIDE_804=TRUE for all 69 D violations to be reported.

SIF 804 records can be generated for function arguments with the following qualifiers:

1 unknown function

4 syscalls function

5 ellipsis function

By default all 69 D with these qualifiers are not reported.

The INI flag PEN_69_D_FILTER_804 can override this by setting the integer values to be used e.g.

PEN_69_D_FILTER_804=1 5

hides 69 D where the usage is in a call to an unknown function or to a function declared with the ellipsis specifier.

CHG
Code Review. For mixed language sets, violations of the same rule in a header file may be reported differently when the header is included in both a .c and a .cpp file.

CHG
The command line argument -create_set=<group/system> overrides the set_type setting in a TCF file when creating a new set from the TCF.

CHG
If ENABLE_DOT_NET_VCX_PROJECTS or ENABLE_DOT_NET_PROJECTS is set TRUE and PROJECT_EXTENSIONS is not set, the default project extension for selection will be vcxproj or vcproj instead of dsp.

CHG
Modified information message when there are no previously analysed files. (LM ref. 9260)

FIX
Use of both INI flags FORCE_EXIT_VAL=TRUE and FORCE_ABORT_VAL=TRUE (or the command line equivalents) concurrently did not function correctly.

FIX
Shorten. Improvement to process for adding full path to nested unexpanded include files that are not in the same directory as the main source.

FIX
Improved reporting of penalty 5 Q for long file names.

FIX
Advanced Configuration dialog, switching off the Forcedataflow setting is retained. (LM ref. 9235)

FIX
Advanced Configuration dialog, modification of workfiles directory is retained.

The workfiles directory cannot be modified when the dialog is invoked from applications other than LDRA Testbed. (LM ref. 9235)

FIX
The instrumentation data file is retained when modified on the Instrumentation Configuration dialog, in the case where an individual file is not selected from a set. (LM ref. 9234, 9236)

FIX
For mixed language sets, resizing of main static analysis routines did not occur for the second language in the set if the first language had already resized to the maximum size. (LM ref. 9180)

FIX
TBexclude. Certain violations were not correctly excluded in the Code Review Report. (LM ref. 9151)

TBvision Section

FIX
Enhanced Code Review by Violations performance. (LM ref. 9191)

TBmanager Section

NEW
Integration with Kovair.

NEW
Standard Conformance Pack available for IEC 15408.

NEW
Standard Conformance Pack available for IEC 60730.

NEW
Standard Conformance Pack available for IEC 62443.

NEW
Standard Conformance Pack available for SAE J3061.

NEW
EN 50128 resources are now available via a Standard Conformance Pack.

NEW
Standard Conformance Pack available for EN 50128 containing Objectives grouped by SIL level and TBmanager sample project.

NEW
IEC 61508 resources are now available via a Standard Conformance Pack.

NEW
Standard Conformance Pack available for IEC 61508 containing Objectives grouped by SIL level and TBmanager sample project.

NEW
Custom attributes which are of type enumeration can now be edited in place by double clicking the text in the column in the Requirement and Test Case Grids.

CHG
Updated Safe_Utilities example project on Linux with increased TIP compatibility. (LM ref. 9143)

CHG
Renamed "GLH Files" view to "LDRA Result Files" view.

CHG
Updated PTC Integration documentation to include information on API access.

CHG
Enhanced codeBeamer Integration connection test. (LM ref. 9182)

CHG
Enhanced Jama Integration to support multi picklist item types. (LM ref. 8857)

CHG
DOORS Next Generation Integration icon updated. (LM ref. 9161)

CHG
Enhanced DOORS Next Generation Integration logging.

CHG
Enhanced DOORS Next Generation Integration connection test. Hard coded usage of appending /rm onto the URL has been removed. Users should now provide a fully qualified URL to the requirements management service.
e.g. https://server:port/rm (LM ref. 9162)

CHG
DOORS Next Generation Integration link processing.

Any links encountered in previous versions would be added to the 'links' column in TBmanager.

DOORS Next Generation links can have different types and directions associated with them and therefore you may only be interested in a particular directed link. The 'links' column is now only populated with links where the 'isParentLink' property is true. All other links are now provided in their own columns prefixed by 'LINK:'. This separates the links and allows you to select only the link type and direction you are interested in. You can assign the $(RefReq) property to multiple link columns by invoking the context menu on the link header and selecting the $(RefReq) property. It will then combine the link columns data together and can be visualized in the Preview window. (LM ref. 9163)

CHG
Enhanced DOORS Next Generation Integration processing of Enum values. (LM ref. 9164)

CHG
Enhanced DOORS Next Generation Integration processing of multiple Description sections. (LM ref. 9165)

CHG
DOORS Next Generation Integration link data is now returned comma separated instead of space separated so that it matches the default regex pattern for the $(RefReq) property. (LM ref. 9017)

CHG
Enhanced DOORS Next Generation Integration processing of Primary Text. (LM ref. 9013)

CHG
Support added for Custom Attributes that contain a slash in their name during import from Microsoft Excel. (LM ref. 5735)

CHG
Support added for '\n' and '\t' to be used as split characters during import from Microsoft Excel. Replace the default comma ',' split character for the $(RefReq) variable with either of the characters for new line or tab support. (LM ref. 6037)

FIX
Enhanced Create Test option for TBrun test types. (LM ref. 9269, 9270)

FIX
Display of Group Name to be used during import from Microsoft Word. (LM ref. 9261)

FIX
Display of Traceability Matrix reports for Groups with multiple relationships. (LM ref. 9262)

Static Analysis Module

CHG
Enhanced detection of 255 S. This may result in fewer reported instances. (LM ref. 9215)

CHG
Enhanced detection of 397 S. This may result in fewer reported instances. (LM ref. 9100)

CHG
Enhanced Static Analysis. (LM ref. 9138)

CHG
Enhanced detection of 306 S. This may result in fewer reported instances. (LM ref. 9119)

CHG
Enhanced detection of 439 S. This may result in fewer reported instances. (LM ref. 9119)

CHG
Enhanced detection of 101 S. This may result in fewer reported instances. (LM ref. 9108)

CHG
Enhanced Static Analysis. (LM ref. 8904)

CHG
Enhanced detection of 41 D. This may result in fewer reported instances. (LM ref. 9123)

CHG
Enhanced Static Analysis. (LM ref. 9022)

CHG
Enhanced Static Analysis. (LM ref. 9226)

CHG
Enhanced Static Analysis. (LM ref. 9227)

CHG
Enhanced Static Analysis. (LM ref. 9231)

CHG
Enhanced detection of 109 S. This may result in fewer reported instances. (LM ref. 9171)

CHG
Enhanced Static Analysis of complex lambda expressions. (LM ref. 9214)

CHG
Enhanced Static Analysis. (LM ref. 9228)

CHG
Enhanced detection of 70 S. This may result in fewer reported instances. (LM ref. 9092)

CHG
Enhanced detection of 94 S. This may result in fewer reported instances. (LM ref. 9098)

CHG
Enhanced detection of 139 S. This may result in fewer reported instances. (LM ref. 9101, 9120)

CHG
Enhanced detection of 119 D. This may result in fewer reported instances. (LM ref. 9198)

CHG
Enhanced detection of 139 S. This may result in fewer reported instances. (LM ref. 9195)

CHG
Enhanced Static Analysis. (LM ref. 9076)

CHG
Enhanced Static Analysis. (LM ref. 9039)

CHG
Enhanced Static Analysis. (LM ref. 9045)

CHG
Enhanced Static Analysis. (LM ref. 9044)

CHG
Enhanced Static Analysis. (LM ref. 9225)

CHG
Enhanced detection of 527 S. This may result in fewer reported instances. (LM ref. 9170)

CHG
Enhanced detection of 21 S. This may result in fewer reported instances. (LM ref. 8970)

CHG
Enhanced detection of 446 S. This may result in fewer reported instances. (LM ref. 8971)

CHG
Enhanced detection of 576 S. This may result in fewer reported instances. (LM ref. 8966)

CHG
Enhanced Static Analysis. (LM ref. 9216, 9272)

CHG
Enhanced detection of 105 D. This may result in fewer reported instances. (LM ref. 9208)

CHG
Enhanced detection of 114 S. This may result in fewer reported instances. (LM ref. 8149)

CHG
Enhanced Static Analysis. (LM ref. 9213)

CHG
Enhanced Static Analysis. (LM ref. 9172)

Instrumentation Module

NEW
Strategies for handling the use of constexpr in C++ source code. (LM ref. 9190)

The instrumenter, and specifically the instrumentation functions, cannot be limited to code which may be evaluated at compile-time. As function calls from within constexpr functions can only be made to other constexpr functions, i.e. the value of the called function is also evaluated at compile-time, calls from within constexpr functions must be inhibited.

Three strategies are available:

1. Remove the branches associated with constexpr functions which would normally result in probes in the instrumented code, via:
- a. Retrospective removal of the branches in the instrumenter.
- b. Removal of the branches in main static analysis.

2. Remove all instances of the constexpr qualifier from the instrumented code.

The default strategy for C++11 is 1a (C++ vals flag 542 set to 1). It is the least intrusive, dynamic analysis may issue missing level warnings.

Strategy 1b (C++ vals flag 542 set to 2) reduces the scope of analysis but permits reporting of 100% coverage, where constexpr functions are treated as non-executable.

Strategy 2 (C++ vals flag 543 set to 1, 542 set to 0). There may be cases where the code may require constexpr qualification in order to compile.

These strategies are mutually exclusive, the single option most suitable for the source file(s) under analysis should be selected.

Dynamic Coverage Module

CHG

Enhanced Dynamic Analysis. (LM ref. 9185)

C/C++ Penalties and Standards Mappings

NEW

AUTOSAR-C++:19-03/19-11 standard model - Guidelines for the use of the C++14 language in critical and safety-related systems (Release 19-03).

AUTOSAR-C++ now refers to this version.

NEW

FACE-2.1.1-CVM and FACE-3.0-CVM models added for users with a FACE Conformance Package license.

NEW

F Penalties are reported for users with a FACE Conformance Package license.

NEW

1 F Function restricted by POSIX Safety Profile substitution.

NEW

2 F Use of FACE Security Profile excluded function.

NEW

3 F Use of FACE Safety Base Profile excluded function.

NEW

4 F Use of FACE Safety Extended Profile excluded function.

NEW

5 F Use of FACE General Purpose Profile excluded function.

NEW

6 F Use of POSIX function restricted to IOSS/TSS segments.

NEW

7 F Use of ARINC 653 function restricted to IOSS/TSS segments.

NEW

8 F Safety Profile use of message queue API needs inspection.

NEW

9 F Use of data structure pragmas.

UPDATE

255 S Found #if, #ifdef, #else, #elif .

Vals flag 544 set on for AUTOSAR-C++

Vals flag 544 set on for AUTOSAR-C++:17-03

Vals flag 544 set on for AUTOSAR-C++:18-10

Vals flag 544 set on for AUTOSAR-C++:19-03/19-11

Vals flag 544 set on for HIC++v4

Utilities Section

NEW

IBM Engineering Systems Design Rhapsody Integration.

NEW

TBglhapi. Added method forwardReferenceOwner to NLDRAAnalysis::CClassDeclaration so that if a class is declared by forward reference inside a class or a namespace and then the class is implemented outside of the owner class or namespace, then a NLDRAAnalysis::CdeclarationBuilder will be returned that will link the class to the type where the forward reference was declared. (LM ref. 9015)

NEW

TBglhapi. Added method parentDeclaration to NLDRAAnalysis::CClassDeclaration and NLDRAAnalysis::CnamespaceDeclarative so that the positional parent object (a class , namespace or function) of those types may be obtained.

NEW

TBglhapi. Addition of NLDRAAnalysis::CDeclarationBuilder class which allows objects of CClassDeclaration , CNamespaceDeclarative and CFunctionDeclaration to be constructed if the information in the CDeclarationBuilder matches one of those types.

NEW

TBglhapi. Addition of NLDRAAnalysis::CKeywordType class.

This class can be used to provide lexical values and sizes of types found in analysis.

NEW

TBglhapi. Addition of NLDRAAnalysis::CHeaderGuard::guardTypeText member function.
Provides text describing the type of header protection e.g. #ifndef, #pragma.

NEW
TBglhapi. Improved searching for file objects associated with declarations, particularly for local variables.

NEW
TBglhapi. Addition of typedef's that exist within functions added as LocalTypedef.

CHG
Visual Studio Integration - Enhanced handling of missing files. (LM ref. 9127)

CHG
Visual Studio Integration - Enhanced navigational menu structure. (LM ref. 9233)

CHG
Cashregister Examples - Increased consistency across makefiles on Linux. (LM ref. 9240)

CHG
Cashregister 6 Example - Added DOORS Next Generation connection.

CHG
Safe Utilities Example - Added DOORS Next Generation connection.

Licensing Section

CHG
LDRA licenses will now be provided in a file with extension .ldralic instead of .ldra.