Use Case 2 Analysis of a Windows Application with C or Cpp

Analysis of a Windows application with C/C++

> ⓘ Please note that these instructions may be outdated!

In this use case, we will focus now on how to analyze a Microsoft Windows application:

Sample application

From ‘Help – Samples’ option, in Visual Studio 13 Community edition, you can download the source code of our sample application.

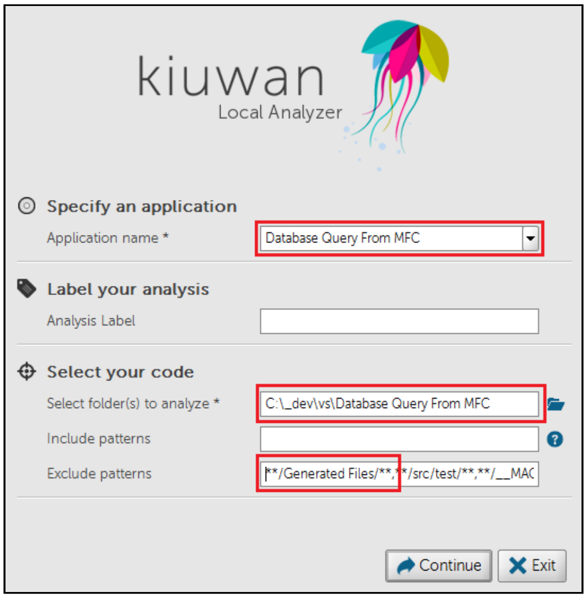
Database Query From MFC

Technologies	SQL Server, Visual Studio 2012
Topics	User Interface, Data Access, Database Synchronization, Database, Database Connectivity
Platforms	Desktop, Data

Analizing the code

First of all, start ‘Kiuwan Local Analyzer’ with the {KiuwanLocalAnalyzer_install_dir}\kiuwan.cmd script.

Then, create a new application and set the source code directory.



Application name * Database Query From MFC

Analysis Label

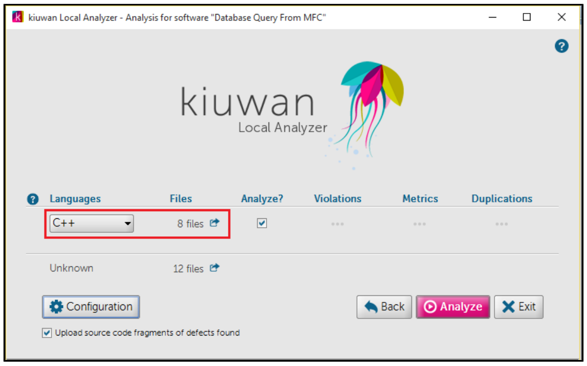
Select folder(s) to analyze * C:_dev\vs\Database Query From MFC

Include patterns

Exclude patterns **/Generated Files/**,**/src/test/**,**/__MAC

In the ‘exclude patterns’ option, add the ‘**/Generated Files/**’ path. Visual Studio generates temporal files in this directory and we need to exclude them from the analysis because we don’t want to analyze files we haven’t coded.

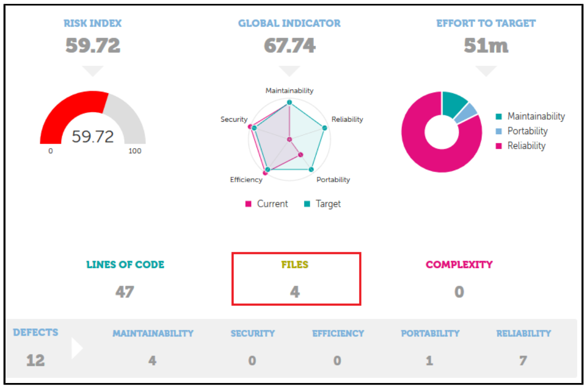
Click ‘Continue’, select ‘C++’, and analyze…


kiuwan Local Analyzer - Analysis for software "Database Query From MFC"

Languages	Files	Analyze?	Violations	Metrics	Duplications
C++	8 files	☑	···	···	···
Unknown	12 files				

☑ Upload source code fragments of defects found

Once the analysis has finished, you can see the results on Kiuwan:

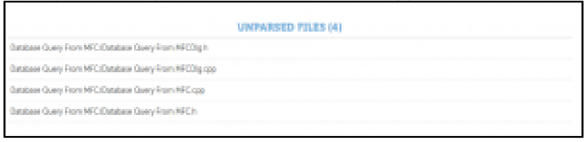


LINES OF CODE	FILES	COMPLEXITY
47	4	0

DEFECTS	MAINTAINABILITY	SECURITY	EFFICIENCY	PORTABILITY	RELIABILITY
12	4	0	0	1	7

Everything seems just ok, but if you look closely, only four files were analyzed out of the eight files detected by Kiuwan Local Analyzer.

If we go to the log screen to find out what happened, we can see which files were left out:


UNPARSED FILES (4)

```
Database Query From MFC\Database Query From MFCDlg.h
Database Query From MFC\Database Query From MFCDlg.cpp
Database Query From MFC\Database Query From MFC.cpp
Database Query From MFC\Database Query From MFC.h
```

Solving parser problems

Looking in the log directory for this analysis ({KiuwanLocalAnalyzer_install_dir}\temp\Database Query From MFC.1444389776635-0\results), we can find the file cpp.unresolved.headers.log.

The content of this file are the header files that Kiuwan couldn’t find during the analysis. Most probably because they are not in our project folders:

<SDKDDKVer.h>

<afxwin.h>

<afxext.h>

<afxdisp.h>

<afxdtctl.h>

<afxcmn.h>

<afxcontrolbars.h>

“afxwin.h”

<afxdb.h>

“afxdialogex.h”

In fact, these are Windows and Visual Studio header files our application uses, but are located in external directories. As we can see in the previous post, the resolution of these files is necessary to get a complete and reliable analysis.

With the last version of Kiuwan Local Analyzer, you can autoconfigure the header files paths and macro definitions using the log file that Visual Studio generates on the compilation phase.

To get the default Visual Studio header files paths, run the following commands from a DOS console:

```
> cd C:\_dev\vs\Database Query From MFC

> call “C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\vcvarsall.bat”

> echo %INCLUDE% > include.txt
```

(update the source code and Visual Studio directories with those of your installation).

To get Visual Studio log file we need to compile the application from the command line:

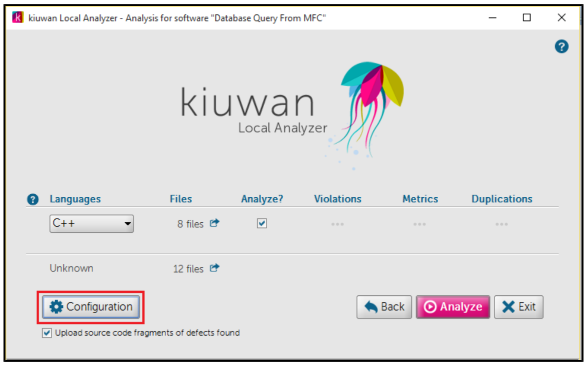
```
> cd C:\_dev\vs\Database Query From MFC

> call “C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\vcvarsall.bat”

> msbuild.exe “Database Query From MFC.sln” /nologo /target:Rebuild /p:Configuration=Release /p:
Platform=Win32 > msbuild.log
```

Now, we can use the generated ‘include.txt’ and ‘msbuild.log’ files to configure Kiuwan Local analyzer.

Before clicking on ‘Analyze’, open the configuration section:


kiuwan Local Analyzer - Analysis for software "Database Query From MFC"
kiuwan
Local Analyzer
Configuration
Back
Analyze
Exit

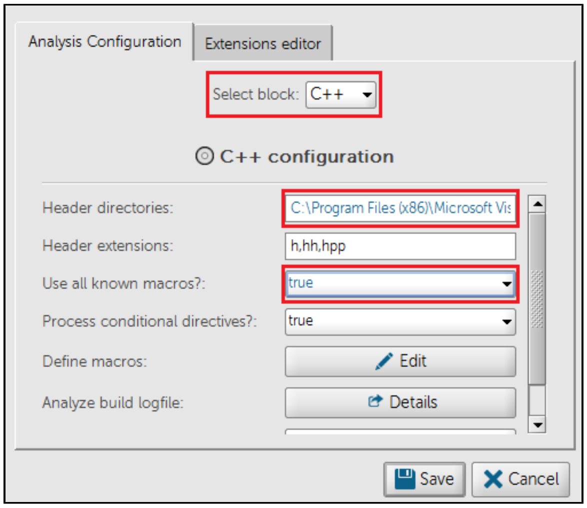
Languages	Files	Analyze?	Violations	Metrics	Duplications
C++	8 files	☑	...	...	...
Unknown	12 files				

☑ Upload source code fragments of defects found

Copy the content of ‘include.txt’ file in ‘Header directories’ option. You need to replace the semicolon separator by a comma separator before the copy.

C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\INCLUDE,C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\ATLMFC\INCLUDE,C:\Program Files (x86)\Windows Kits\8.1\include\shared,C:\Program Files (x86)\Windows Kits\8.1\include\um,C:\Program Files (x86)\Windows Kits\8.1\include\winrt

You should also set the ‘Use all know macros?’ to true.

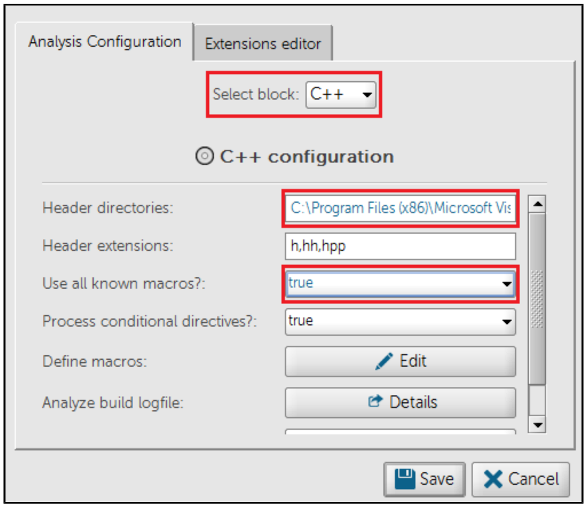


Select block: C++

C++ configuration

Header directories: C:\Program Files (x86)\Microsoft Vis
Header extensions: h,hh,hpp
Use all known macros?: true
Process conditional directives?: true
Define macros:
Analyze build logfile:

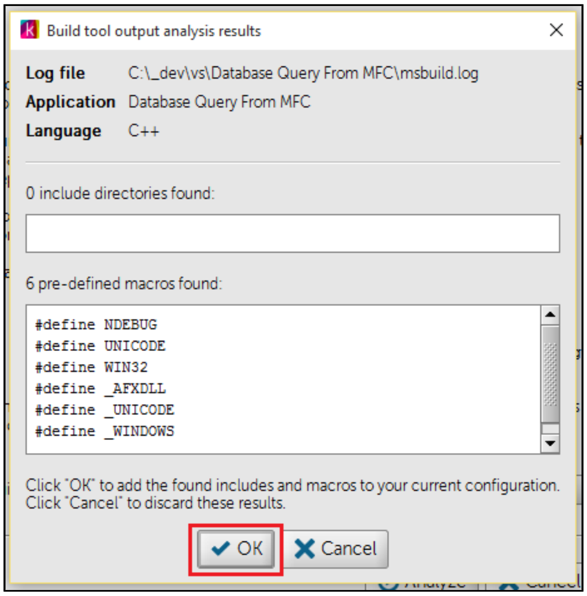
Now, in this same screen, click ‘Analyze build logfile – Details’ button, to load the msbuild output logfile:



Select block: C++

C++ configuration

Header directories: C:\Program Files (x86)\Microsoft Vis
Header extensions: h,hh,hpp
Use all known macros?: true
Process conditional directives?: true
Define macros:
Analyze build logfile:



Build tool output analysis results

Log file C:_dev\vs\Database Query From MFC\msbuild.log
Application Database Query From MFC
Language C++

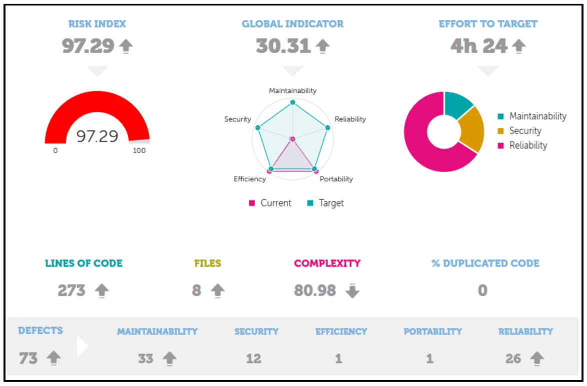
0 include directories found:

6 pre-defined macros found:

```
#define NDEBUG
#define UNICODE
#define WIN32
#define _AFXDLL
#define _UNICODE
#define _WINDOWS
```

Click "OK" to add the found includes and macros to your current configuration.
Click "Cancel" to discard these results.

After these steps, run the analysis again and check the new results on Kiuwan:



RISK INDEX
97.29

GLOBAL INDICATOR
30.31

EFFORT TO TARGET
4h 24

LINES OF CODE
273

FILES
8

COMPLEXITY
80.98

% DUPLICATED CODE
0

DEFECTS
73

MAINTAINABILITY
33

SECURITY
12

EFFICIENCY
1

PORTABILITY
1

RELIABILITY
26

Now, all the eight C++ files of this sample application were correctly analyzed.