Redistributing Application Binaries Built
with
11.x Intel® Compiler Professional Editions for Microsoft Windows*

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I. Overview

Applications built with 11.x Intel® Compiler Professional Editions or with Intel® Parallel Composer may be installed on systems where the Intel Compiler Professional Edition or Intel Parallel Composer is not installed. This document provides help for application developers to build the redistribution kit.

Due to the many differences in redistributing applications built for Microsoft Windows* vs. Linux* vs. Mac OS* X, a separate redistribution article is provided in Intel® Software Knowledge Base for each OS for Intel Compiler Professional Edition products (Microsoft Windows*, Linux* and Mac OS* X) and for Intel Parallel Composer. Please use the search capability in the Intel® Software Knowledge Base to find each version of the redistribution information you desire.

Beginning with 11.0, the Intel Compiler Professional Editions is a fully integrated product; in contrast, the 10.x Intel Compiler Professional Edition licenses "bundled" separate component products.

- The 11.x Intel® C++ Compiler Professional Edition for Windows* products include the Intel® C++ Compiler, the Intel® Math Kernel Library, the Intel® Integrated Performance Primitives, and the Intel® Threading Building Blocks products.

- The 11.x Intel® Visual Fortran Compiler Professional Edition for Windows* products include the Intel® Visual Fortran Compiler with the Intel® Math Kernel Library.

This document includes information on redistributable libraries for all the component products included with Intel Compiler Professional Editions for Microsoft Windows*.

Intel's redistributable compiler libraries package may be added to the distributed application package for any end-user application built or partially built with an Intel compiler that is distributed by an Intel customer who holds an Intel Commercial or Academic license for the associated Intel compiler product. The Intel redistributable compiler libraries package may be distributed as a separate non-modified module to the end-users of the distributed application.

II. Redistribution of Microsoft Windows* Applications

A.   Applications Built with Intel® Compilers

1.   Statically Link Your Application

An application built with statically-linked libraries eliminates the need to distribute runtime libraries with the application executable. By linking the application to the static libraries, the application is not dependent on the Intel Fortran or C/C++ DLLs, or the Microsoft Visual C++ DLLs.

To build a program with statically-linked libraries from the command line:

- o Use /MT to link with static multithreaded runtime libraries.
- o Use /libs:static for Fortran and do not use /dbglib.
- o Use /Qopenmp-link:static to link the static OpenMP* runtime library from Intel Compilers. By default, the dynamic OpenMP runtime library will be linked. Linking static OpenMP runtime library is not recommended.

To build a program with statically-linked libraries from within the Microsoft Visual Studio* IDE

- o For a C/C++ project, for multithreaded runtime libraries, use the "Multi-threaded (/MT)" setting under [Project Property -> C++ -> Code Generation -> Runtime Library].
- o For a Fortran project, for multithreaded runtime libraries, use the "Multithreaded" setting under [Project Property -> Fortran -> Library -> Runtime Library].

NOTE: Intel® Visual Fortran Compiler Professional Edition for Windows* has an exception to the static libraries. The exception involves use of the module IFLOGM feature supported by ifdlg100.DLL. The module IFLOGM is implemented as dynamic linked library only, otherwise, ActiveX controls in dialogs will not work. So if your application uses the module IFLOGM, you need to redistribute the "ifdlg100.dll" even if you use the /MT option. In addition, ifdlg100.dll needs to be "registered" on the target system using the regsvr32 command.

2.   Dynamically Link Your Application

If you must build your application with dynamically linked DLLs, the following concerns should be addressed:

a. Building your application for redistribution

Applications must be built with DLLs that are redistributable. See sections 2.d and 2.h in this document for information on Intel's redistributable Compiler Professional Edition libraries. Applications linked with debug libraries are not redistributable. Be sure to build a "Release" configuration if you will be distributing your application to other systems.

For information on building your program with optimizations, please consult the product documentation installed with your Compiler Professional Edition product files, or the visit the website links below to view comprehensive information on optimizing your applications:

Intel® Knowledge Base articles on compiler optimization options:

Intel® compiler options for SSE generation (SSE2, SSE3, SSSE3, SSE4) and processor-specific optimizations

Performance Tools for Software Developers - SSE generation and processor-specific optimizations continue

The whitepaper "Optimizing Applications with Intel® C++ and Fortran Compilers for Windows*, Linux*, and Mac OS* X Version 11.x" and the "Quick Reference Guide (card) for Optimizing Applications with Intel® Compilers version 11.x" can be found at the following link:

Optimizing Applications with Intel® C++ and Fortran Compilers for Windows*, Linux*, and Mac OS* X Version 11.x

b. **Note for Building DLLs**

The Intel® Visual Fortran Compiler Professional Edition for Windows* has an exception to the statically-linked library rule of not requiring redistribution of any DLLs. The exception involves use of the module IFLOGM which requires redistribution of ifdlg100.DLL. This DLL is used when the application uses the module IFLOGM, and the support is provided only in DLL form; otherwise, ActiveX controls in dialogs will not work.

- For redistributing DLLs provided by Microsoft Visual Studio*, please check the redist.txt provided under the Visual Studio's installation directory.
- Please see section 2.c on how to set the program to use dynamic multi-threaded libraries (/MD).
- Build your program with "Release" configuration.
- Use the "Dependency Walker Tool" (http://www.dependencywalker.com/) to check which DLLs must be redistributed for your application.
  Dependencies are also generated by Microsoft Visual Studio 2008* and 2005* manifest files, and dictate components that must be redistributed or obtained by the end user of the application.

c. **Special considerations for building programs using Intel® and Microsoft DLLs**

It is critical to ensure that your applications use only the dynamic libraries (DLLs) from Intel and Microsoft that are redistributable.

Specifying DLLs from the Command Line

Use the /MD option to tell the compiler to use the multithreaded, dynamic-link run-time libraries.

Specifying DLLs from within the Microsoft Visual Studio* IDE
o   For a C/C++ project, for multithreaded runtime libraries, use the "Multi-threaded DLL (/MD)" setting under [Project Property -> C++ -> Code Generation -> Runtime Library].
o   For a Fortran project, for multithreaded runtime libraries, use the "Multithreaded DLL" setting under [Project Property -> Fortran -> Library -> Runtime Library].

d. **Redistributable Library packages for Intel® Compiler 11.x Professional Editions for Windows***

   i.   For the convenience of the application vendor, redistributable library packages for Intel® Compiler 11.x Professional Editions for Windows* are available as separate downloadable files from Intel Registration Center (https://registrationcenter.intel.com/). Specific filename conventions are listed below.

   Intel® C++ Compiler Professional Edition for Windows*
   11.0 File name format: w_cproc_p_x.x.xxx_redist.zip
   Example: w_cproc_p_11.0.074_redist.zip

   11.1 File name format:
   w_cproc_p_x.x.xxx_redist_<architecture>.exe
   Examples: w_cproc_p_11.1.054_redist_ia32.exe
   Examples: w_cproc_p_11.1.054_redist_intel.exe
   Examples: w_cproc_p_11.1.054_redist_ia64.exe

   Intel® Visual Fortran Compiler Professional Edition for Windows*
   11.0 File name format: w_cprof_p_x.x.xxx_redist.zip
   Example: w_cprof_p_11.0.74_redist.zip

   11.1 File name format:
   w_cprof_p_x.x.xxx_redist_<architecture>.exe
   Examples: w_cprof_p_11.1.054_redist_ia32.exe
   Examples: w_cprof_p_11.1.054_redist_intel.exe
   Examples: w_cprof_p_11.1.054_redist_ia64.exe

   ii. For the convenience of the end-user of an application that is built or partially built with Intel compilers, redistributable library packages for Intel® Compiler 11.x Professional Editions for Windows* are also available from the following Intel Knowledge Base article. Please note there is one redistributable package for every compiler update. If you are an end-user of an application, make sure you download and install the update version recommended by the application vendor.

http://software.intel.com/en-us/articles/redistributable-libraries-of-the-intel-c-and-fortran-compiler-for-windows/

e. **Redistributable Files from Microsoft**
   Microsoft also provides the redistributable package for Microsoft Visual Studio 2005* and 2008*:

   - For Microsoft Visual C++ 2005* x86 - http://www.microsoft.com/downloads/details.aspx?FamilyID=200b2fd9-ae1a-4a14-984d-389c36f85647&displaylang=en
   - For Microsoft Visual C++ 2005* x64 - http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=eb4ebe2d-33c0-4a47-9dd4-b9a6d7bd44da
   - For Microsoft Visual C++ 2008* x86 - http://www.microsoft.com/downloads/details.aspx?familyid=A5C84275-3B97-4AB7-A40D-3802B2AF5FC2&displaylang=en
   - For Microsoft Visual C++ 2008* x64 - http://www.microsoft.com/downloads/details.aspx?familyid=BA9257CA-337F-4B40-8C14-157CFDFFEE4E&displaylang=en

f. **Distribution of Object Code and Static Libraries**

   Please check the Microsoft redist.txt file, installed by default at the path below for Microsoft Visual Studio 2005*, to make sure their static libraries are redistributable.

   C:\Program Files (x86)\Microsoft Visual Studio 8\redist.txt

   The redist.txt file for Microsoft Visual Studio 2008* is installed by default at the path below, and should be checked for the associated redistributable static libraries.

   C:\Program Files (x86)\Microsoft Visual Studio 9\redist.txt

   The Intel Compiler Professional Edition static libraries are redistributable.

g. **Installing the Redistributable Intel Compiler DLLs**

   It is best to put compiler redistributable DLLs in the same folder as the application's executable. If the application is a DLL, the redistributables must be in a folder listed in the PATH environment variable.

   To do a silent install of a redistributable package, add the switches "/S /v/qn" (no space after v) to the .exe name. For example:

   w_cprof_p_11.1.054_redist_ia32.exe /S /v/qn

There is no feedback from the installation and it will return immediately, doing the install quietly in another process. It will create a separate Add/Remove Programs entry for the Redistributables, as in the examples below.

Intel® C++ Redistributables for Windows* on IA-32
Intel® C++ Redistributables for Windows* on Intel® 64

Intel® Visual Fortran Redistributables for Windows* on IA-32
Intel® Visual Fortran Redistributables for Windows* on Intel® 64

Please note that the entry will not indicate the product version number. To obtain the product version number for an installed Intel redistributable library, select the Redistributables item from Add/Remove Programs, and click on the hyperlink "Click here for support information".

h. **Lists of Redistributable Intel Runtime Libraries**

The lists of redistributable runtime libraries (credist.txt or fredist.txt) for all components of the 11.1 Intel C++ Compiler Professional Edition for Windows* or the Intel Visual Fortran Compiler Professional Edition for Windows* can be found in the following installed product directory location:

Intel C++ Compiler Professional Edition for Windows*:
<program files>\ Intel\Compiler\<major version>\<buildversion>\Documentation\credist.txt

Example:
C:\Program Files\Intel\Compiler\11.1\054\Documentation\en_US\credist.txt

Intel Visual Fortran Compiler Professional Edition for Windows*
<Program Files>\Intel\Compiler\<major version>\<buildversion>\Documentation\fredist.txt

Example:
C:\Program Files\Intel\Compiler\11.1\054\Documentation\en_US\credist.txt

i. **Redistributable IMSL* Libraries from Intel Visual Fortran Compiler Professional Edition for Windows* with IMSL* product**

IMSL redistributable libraries are not included in the compiler redistributable library package. The customer must identify the redistributable files needed for their application, and include those files separately with their application installation package.

For redistribution of IMSL* libraries used by an application, use of the application must fall within the extent provided in the VNI license included

with the purchase of the license for the Intel® Visual Fortran Compiler Professional Edition for Windows* with IMSL*. Please read the IMSL* license agreement which can be found at the following link:

http://software.intel.com/en-us/articles/imsl-fortran-library-license-agreement/

B.   Applications Built with Intel® Math Kernel Library (Intel® MKL)

Intel MKL redistributable libraries are not included in the compiler redistributable library package. The customer must identify the redistributable files needed for their application, and include those files separately with their application installation package.

With a license that includes access to Intel MKL, you receive rights to redistribute computational portions of Intel MKL with your application. Evaluation licenses do not include redistribution rights. There is no per copy royalty fee for redistribution. Check the product end user license agreement (EULA) for more details.

In general, the redistributable files include the linkable files (.DLL and .LIB files for Windows*). With your purchase of the Intel Compiler Professional Edition (and updates through the support service subscription), you receive the Intel credist.txt or fredist.txt file which outlines the list of files that can be redistributed.   You may redistribute an unlimited number of copies of the files that are found in the directories defined in the Redistributables section of the product EULA.

Please see section 2.h of this document for the installed product directory location of the complete redistributable file list, including redistributable files for Intel MKL.

For the latest information on redistribution concerns for Intel MKL, please see the following link:
http://www.intel.com/cd/software/products/asmo-na/eng/266854.htm

C.   Applications Built with Intel® Integrated Performance Primitives (Intel® IPP)

Intel IPP redistributable libraries are not included in the compiler redistributable library package. The customer must identify the redistributable files needed for their application, and include those files separately with their application installation package.

With a license that includes access to Intel IPP, you receive rights to redistribute the static library files with your application as outlined in the end user license agreement (EULA). Evaluation licenses do not include redistribution rights. There is no per copy royalty fee for redistribution. Check the product EULA for more details.

In general, the redistributable files include linkable files (.DLL and .LIB files for Windows*). With your purchase of the Intel Compiler Professional Edition (and updates through the support service subscription), you receive the Intel credist.txt or fredist.txt

file which outlines the list of files that can be redistributed. You may redistribute an unlimited number of copies of the files that are found in the directories defined in the Redistributables section of the product EULA.

Please see section 2.h of this document for the installed product directory location of the complete redistributable file list, including redistributable files for Intel IPP.

For the latest information on redistribution concerns for Intel IPP, please see the following links:
http://www.intel.com/cd/software/products/asmo-na/eng/219693.htm
http://software.intel.com/en-us/articles/intel-integrated-performance-primitives-intel-ipp-which-intel-ipp-libraries-are-redistributables/

For more information on deploying applications using Intel IPP dlls, please see the following link:
http://software.intel.com/en-us/articles/intel-integrated-performance-primitives-intel-ipp-for-windows-deploying-applications-with-intel-ipp-dlls/

D.   Applications Built with Intel® Threading Building Blocks (Intel® TBB)

Intel TBB redistributable libraries are not included in the compiler redistributable library package. The customer must identify the redistributable files needed for their application, and include those files separately with their application installation package.

With a license that includes access to Intel TBB, you may redistribute debug and release versions of the library of Intel Threading Building Blocks 2.1.

In general, the redistributable files include linkable files (.DLL and .LIB files for Windows*), headers, examples, and most of the product documentation.   Evaluation licenses do not include redistribution rights. There is no per copy royalty fee for redistribution. Check the product EULA for more details.

Please see section 2.h of this document for the installed product directory location of the complete redistributable file list, including Intel TBB.

For the latest information on redistribution concerns for Intel TBB, please see the following links:

http://www.intel.com/cd/software/products/asmo-na/eng/372300.htm

III. Appendix

a. Dependency Walker Tool

To determine which DLLs your application references, download and use the third-party tool Dependency Walker from http://www.dependencywalker.com/ **.

This is a free utility that will report the DLL dependencies for an application.

A sample Dependency Walker output can be seen in the screen shot can be below.
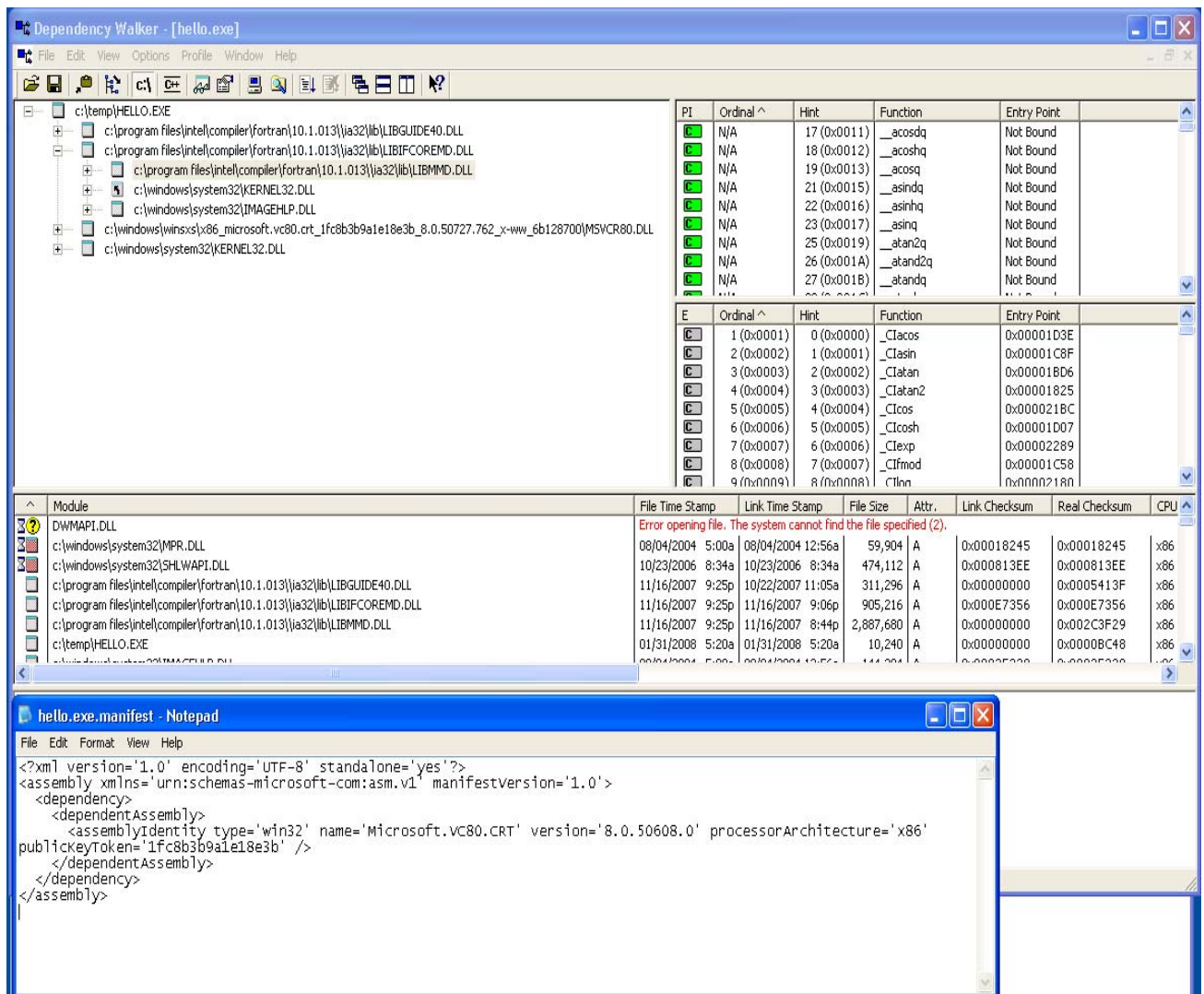
b. A C/C++ Example Program

redist_c.cpp

```c
#include <stdio.h>
#include "math.h"

int main(int argc, char* argv[])
{
        int i;
        float data[5];

        data[0] = -4.7654321;
        data[4] = cos(data[0]);

        for (i = 1; i <= 3; i++)  {
              data[i] = data[i-1]*0.25 + data[4]*0.25;
              data[4] = cos(data[i]);
        }

        // Print out the results
        printf("Calculation Results\n");

        for (i = 0; i <= 4; i++)  {
              printf("Element %d has value %lf\n", i, data[i]);
        }

        return 0;
}
```

Build the example program from command line using multi-threaded DLL:

icl /MD redist_c.cpp

Run Dependency Walker

- Launch depends.exe from your Dependency Walker installation directory.
- Select File >> Open, then browse to the redist_example.exe file.
- View the resulting list of DLLs that must be packaged with your application for redistribution.

c. A Fortran Example Program

redist_f.f90

```fortran
    PROGRAM REDIST_EXAMPLE
    INTRINSIC COS

    REAL*8  DATA(5)
    INTEGER I

    DATA(1) = -4.7654321
    DATA(5) = COS(DATA(1))

    DO I = 2,4
      DATA(I) = DATA(I-1)*0.25 + DATA(5)*0.25
      DATA(5) = COS(DATA(I))
    END DO

! Print the resulting values
    PRINT *, 'Calculation Results'

    DO I = 1,5
      PRINT 100, I, DATA(I)
100    FORMAT(' Element', I4, ' has value',F10.6)
    END DO

 END PROGRAM REDIST_EXAMPLE
```

Build the example from command line using multi-threaded DLL

ifort /MD redist_f.f90

Run Dependency Walker

- Launch depends.exe from your Dependency Walker installation directory.
- Select File >> Open, then browse to the redist_example.exe file.
- View the resulting list of DLLs that must be packaged with your application for redistribution.

* Other names and brands may be claimed as the property of others.

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