Articles / Programming Languages / C++

How to Build libiconv with Microsoft Visual Studio

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The GNU library libiconv does not provide the way to build the library with Microsoft Visual Studio now. But, I want to share my way to do so

- **Download source - 1.13 MB**
- **Download demo - 5.36 MB**

Introduction

`Libiconv` is one of the most useful and famous libraries that converts texts between encodings and has been developed under GNU projects. However, now it does not provide the way to build it with Microsoft Visual Studio but with gcc. Before, it had provided but now stopped explaining how to build it with Microsoft Visual Studio. However, many of the computer programmers are using Microsoft Visual Studio and want to build `libiconv` with Microsoft Visual Studio. So, this article is about how to build `libiconv` with Microsoft Visual Studio. If you can build `libiconv` with Microsoft Visual Studio, you will be able to change various compilation options and build it in order to optimize `libiconv` according to your preference and needs.

Background

If you have no idea about `libiconv`, you can refer to it here or you can Google for it. You may be confused with `iconv` and `libiconv`. `Iconv` is the executable program that uses `libiconv` while `libiconv` is the library for converting text strings between two different encodings. This article is related to `libiconv`. However, this article is not about `libiconv` but about how to build `libiconv` with Microsoft Visual Studio. The GNU library `libiconv` is under LGPL license. So, you have to be really careful when you use `libiconv` for your commercial use or when you don't want to publicize your source code. About LPGL license, you can refer here.

How to Get the Source Code of libiconv

At the moment, the most recent version of `libiconv` is 1.14. You can download the source code of `libiconv` 1.14 here and here. Of course, you can get the older versions of `libiconv` here.

How to Build

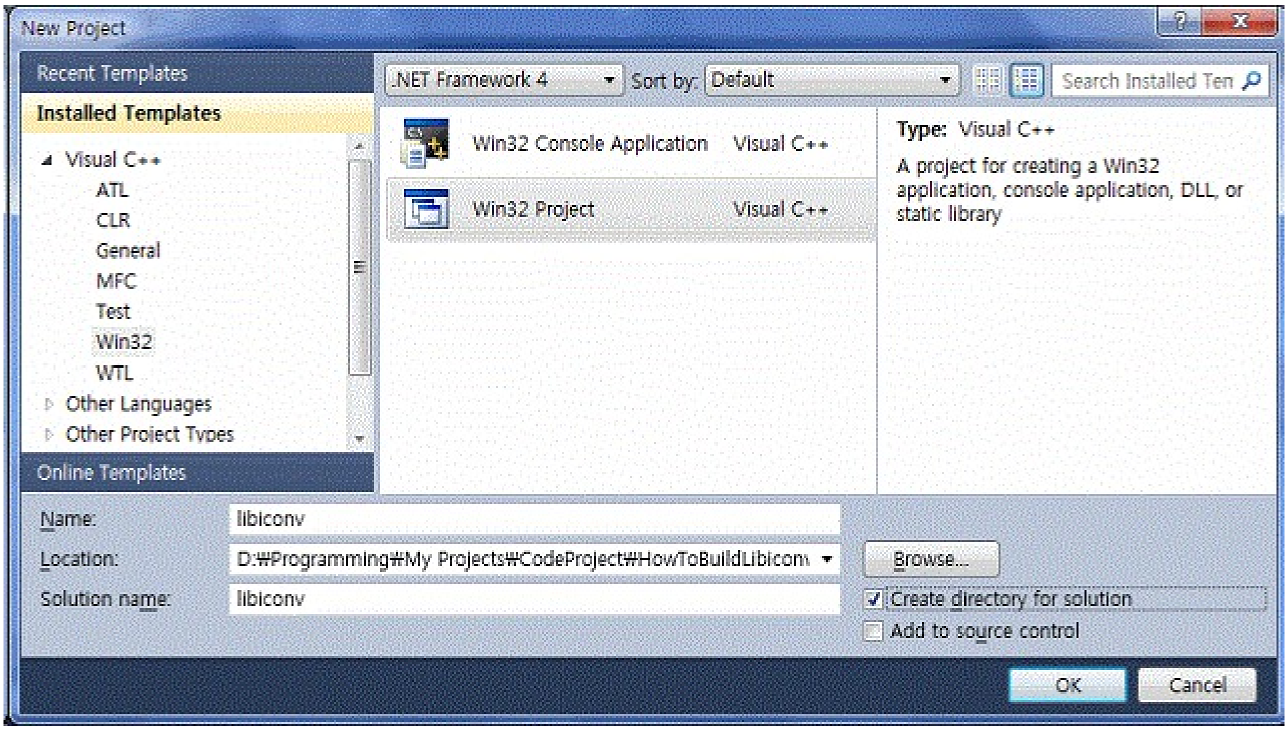
I am going to explain the case of Microsoft Visual Studio 2010 professional edition but the explanation can be applied to the earlier versions of Microsoft Visual Studio and to the express edition of each of them.

First Step

You download the most recent version of `libiconv` which is 1.14 from here or here. And unzip the downloaded file "*libiconv-1.14.tar.gz*" on your certain folder.

Second Step

You run your Microsoft Visual Studio. Then, you make a new `WIN32` project. Let's say "`libiconv`" as the project name. Check to create directory for solution. Choose DLL as the application type and check Empty project for additional options. Click the button "finish" to generate the new project.



Type: Visual C++

A project for creating a Win32 application, console application, DLL, or static library

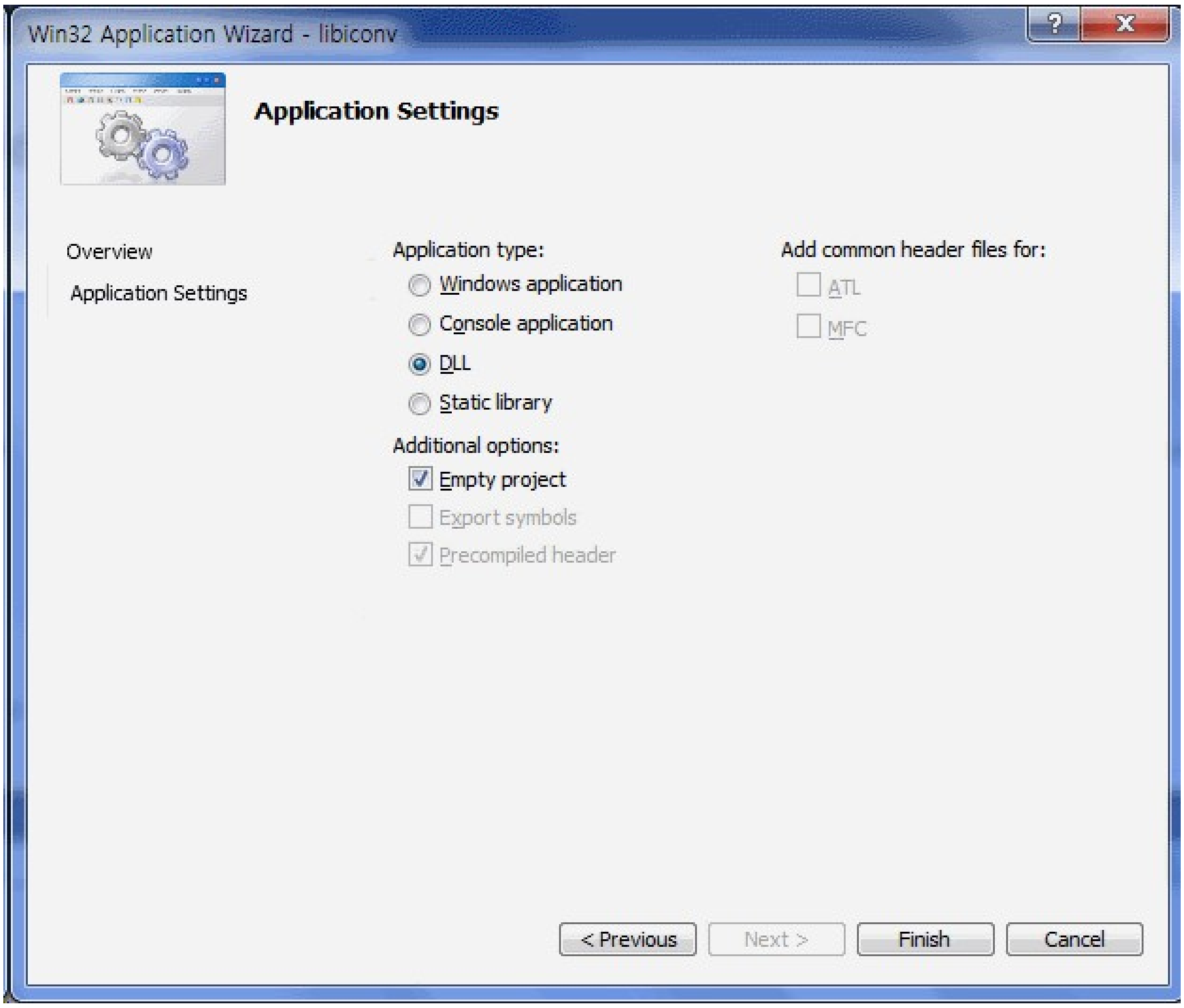
Name: libiconv

Location: D:₩Programming₩My Projects₩CodeProject₩HowToBuildLibicon

Solution name: libiconv

[✓] Create directory for solution

[ ] Add to source control


Win32 Application Wizard - libiconv

Application Settings

Application type:
- ○ Windows application
- ○ Console application
- ● DLL
- ○ Static library

Additional options:
- ☑ Empty project
- ☐ Export symbols
- ☑ Precompiled header

Add common header files for:
- ☐ ATL
- ☐ MFC

Third Step

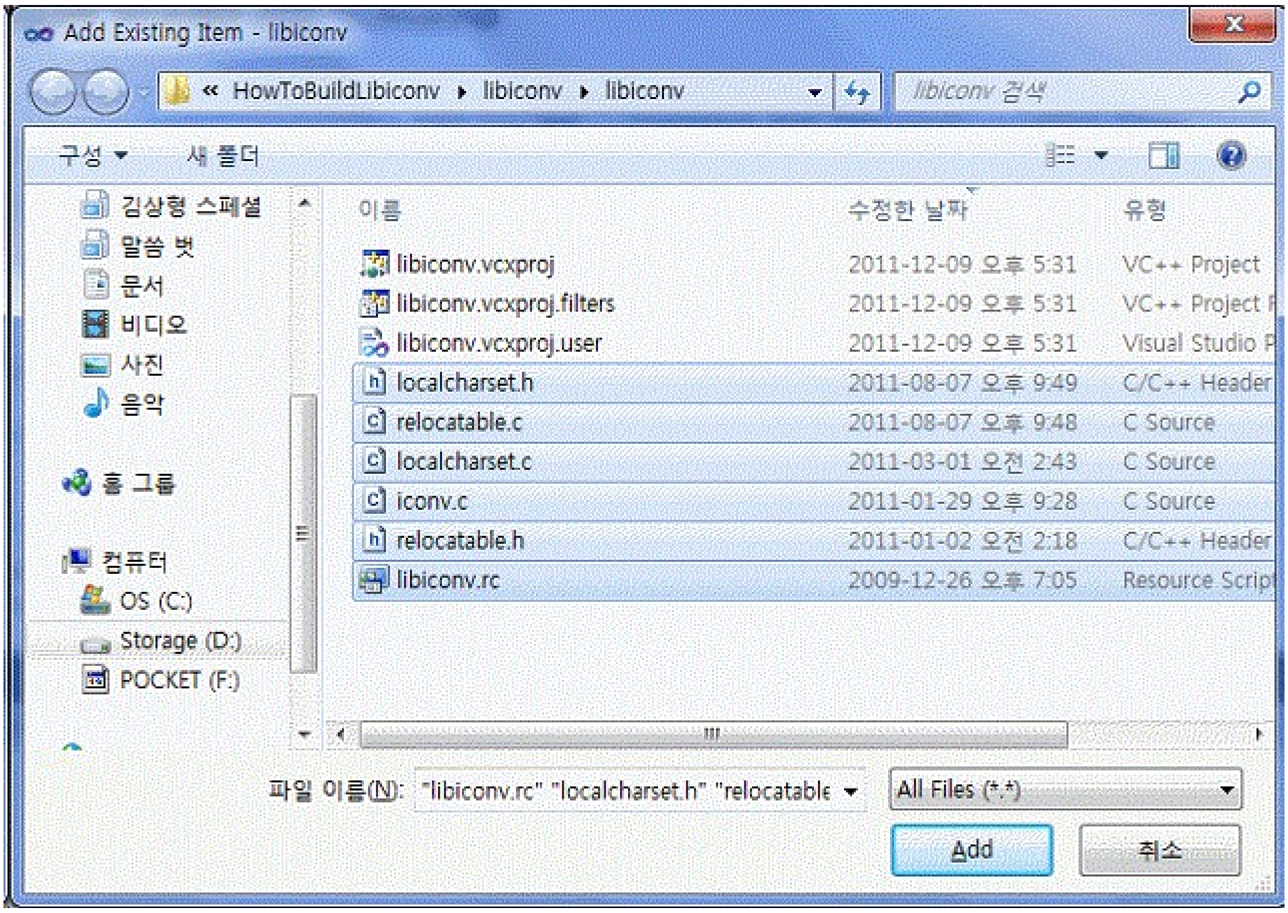
Now, you have to copy some files from the folders generated by unzipping "*libiconv-1.14.tar.gz*" to the project folders. To build "`libiconv`", you need to compile three files "*localcharset.c*", "*relocatable.c*" and "*iconv.c*". That is the key idea!

Copy three files "*relocatable.h*", "*relocatable.c*" and "*iconv.c*" in the folder "...*libiconv-1.14**lib*\" to the project folder "...*libiconv**libiconv*\".
Copy "...*libiconv-1.14**libcharset**lib**localcharset.c*" to the project folder "...*libiconv**libiconv*\".
Copy "...*libiconv-1.14**libcharset**include**localcharset.h.build.in*" to the project folder "...*libiconv**libiconv*\" and then, rename the copied "*localcharset.h.build.in*" to "*localcharset.h*.
Copy "...*libiconv-1.14**windows**libiconv.rc*" to the project folder "...*libiconv**libiconv*\".

Make folder "*include*" under the project folder "...\libiconv\" so to make "...*libiconv**include*".
Copy "...*libiconv-1.14**include**iconv.h.build.in*" to the project include folder "...*libiconv**include*" and then, rename the copied "*iconv.h.build.in*" to "*iconv.h*".
Copy "...*libiconv-1.14**config.h.in*" to the project include folder "...*libiconv**include*" and then, rename the copied "*config.h.in*" to "*config.h*".
And then, copy all the header files (**.h*) and definition files (**.def*) in the folder "...*libiconv-1.14**lib*" to the project include folder "...*libiconv**include*".

Fourth Step

Now, you have to add existing items to the project "`libiconv`" that we made at the second step. Execute "project > Add Existing items..." at the main menu to add existing items to the project.



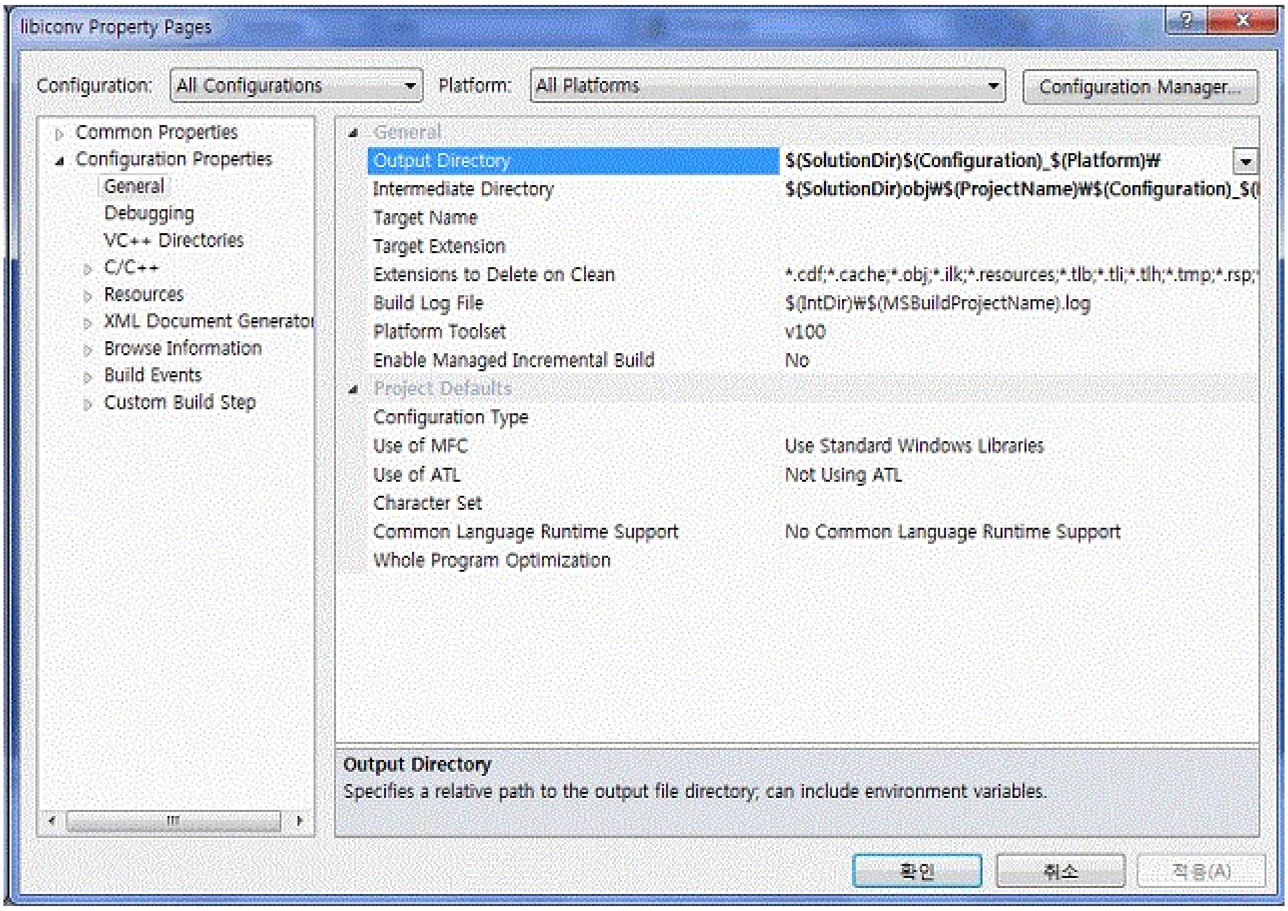
이름	수정한 날짜	유형
libiconv.vcxproj	2011-12-09 오후 5:31	VC++ Project
libiconv.vcxproj.filters	2011-12-09 오후 5:31	VC++ Project F
libiconv.vcxproj.user	2011-12-09 오후 5:31	Visual Studio P
localcharset.h	2011-08-07 오후 9:49	C/C++ Header
relocatable.c	2011-08-07 오후 9:48	C Source
localcharset.c	2011-03-01 오전 2:43	C Source
iconv.c	2011-01-29 오후 9:28	C Source
relocatable.h	2011-01-02 오전 2:18	C/C++ Header
libiconv.rc	2009-12-26 오후 7:05	Resource Script

파일 이름(N): "libiconv.rc" "localcharset.h" "relocatable

Fifth Step

You can make 64-bit platform through configuration manager in order to generate *libiconv.dll* for 64-bit system. You can also make two other configurations "`ReleaseStatic`" and "`DebugStatic`" in order to generate `libiconvStatic.lib` as a static link library.

At the project properties, change Output Directory as "*$(SolutionDir)$(Configuration)_$(Platform)*\" and Intermediate Directory as "*$(SolutionDir)obj**$(ProjectName)**$(Configuration)_$(Platform)*\".


libiconv Property Pages

Configuration: All Configurations Platform: All Platforms Configuration Manager...

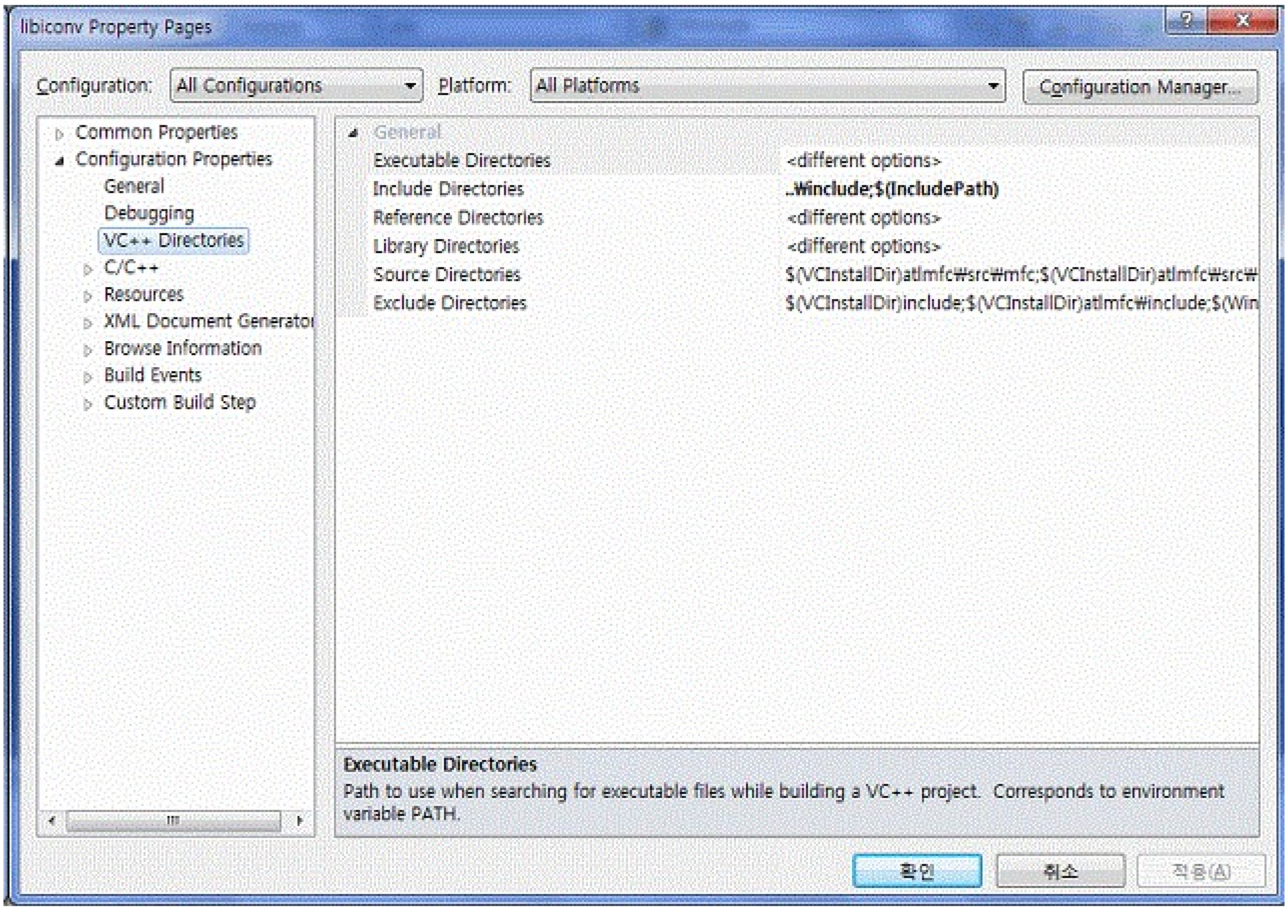
- Common Properties
- Configuration Properties
  - General
  - Debugging
  - VC++ Directories
  - C/C++
  - Resources
  - XML Document Generator
  - Browse Information
  - Build Events
  - Custom Build Step

General	
Output Directory	$(SolutionDir)$(Configuration)_$(Platform)₩
Intermediate Directory	$(SolutionDir)obj₩$(ProjectName)₩$(Configuration)_$(
Target Name	
Target Extension	
Extensions to Delete on Clean	*.cdf;*.cache;*.obj;*.ilk;*.resources;*.tlb;*.tli;*.tlh;*.tmp;*.rsp;
Build Log File	$(IntDir)₩$(MSBuildProjectName).log
Platform Toolset	v100
Enable Managed Incremental Build	No
Project Defaults	
Configuration Type	
Use of MFC	Use Standard Windows Libraries
Use of ATL	Not Using ATL
Character Set	
Common Language Runtime Support	No Common Language Runtime Support
Whole Program Optimization	

Output Directory
Specifies a relative path to the output file directory; can include environment variables.

확인 취소 적용(A)

Change Include Directories as "..*include;$(IncludePath)*":


libiconv Property Pages

Configuration: All Configurations Platform: All Platforms Configuration Manager...

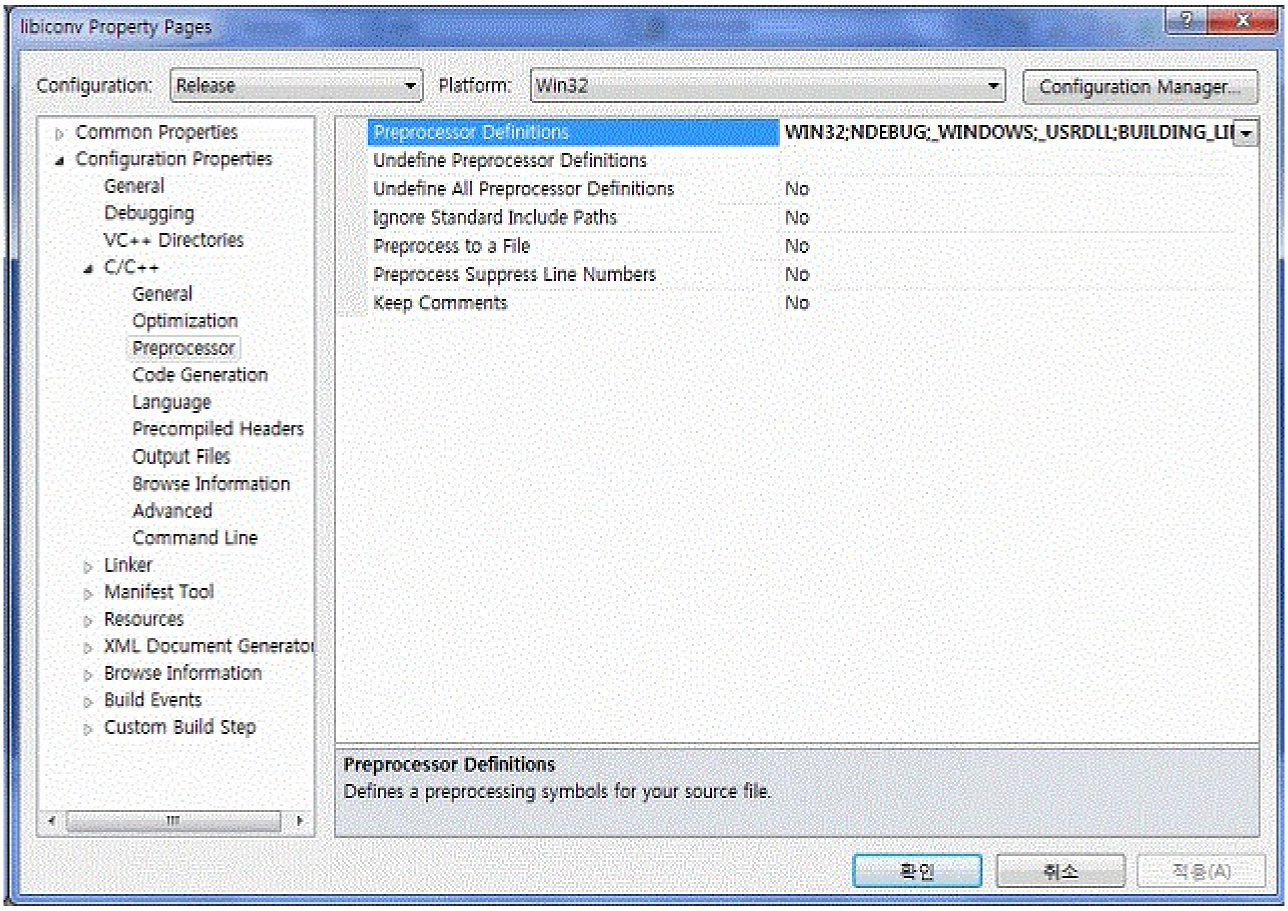
- Common Properties
- Configuration Properties
  - General
  - Debugging
  - VC++ Directories
  - C/C++
  - Resources
  - XML Document Generator
  - Browse Information
  - Build Events
  - Custom Build Step

General	
Executable Directories	<different options>
Include Directories	..₩include;$(IncludePath)
Reference Directories	<different options>
Library Directories	<different options>
Source Directories	$(VCInstallDir)atlmfc₩src₩mfc;$(VCInstallDir)atlmfc₩src₩
Exclude Directories	$(VCInstallDir)include;$(VCInstallDir)atlmfc₩include;$(Win

Executable Directories
Path to use when searching for executable files while building a VC++ project. Corresponds to environment variable PATH.

확인 취소 적용(A)

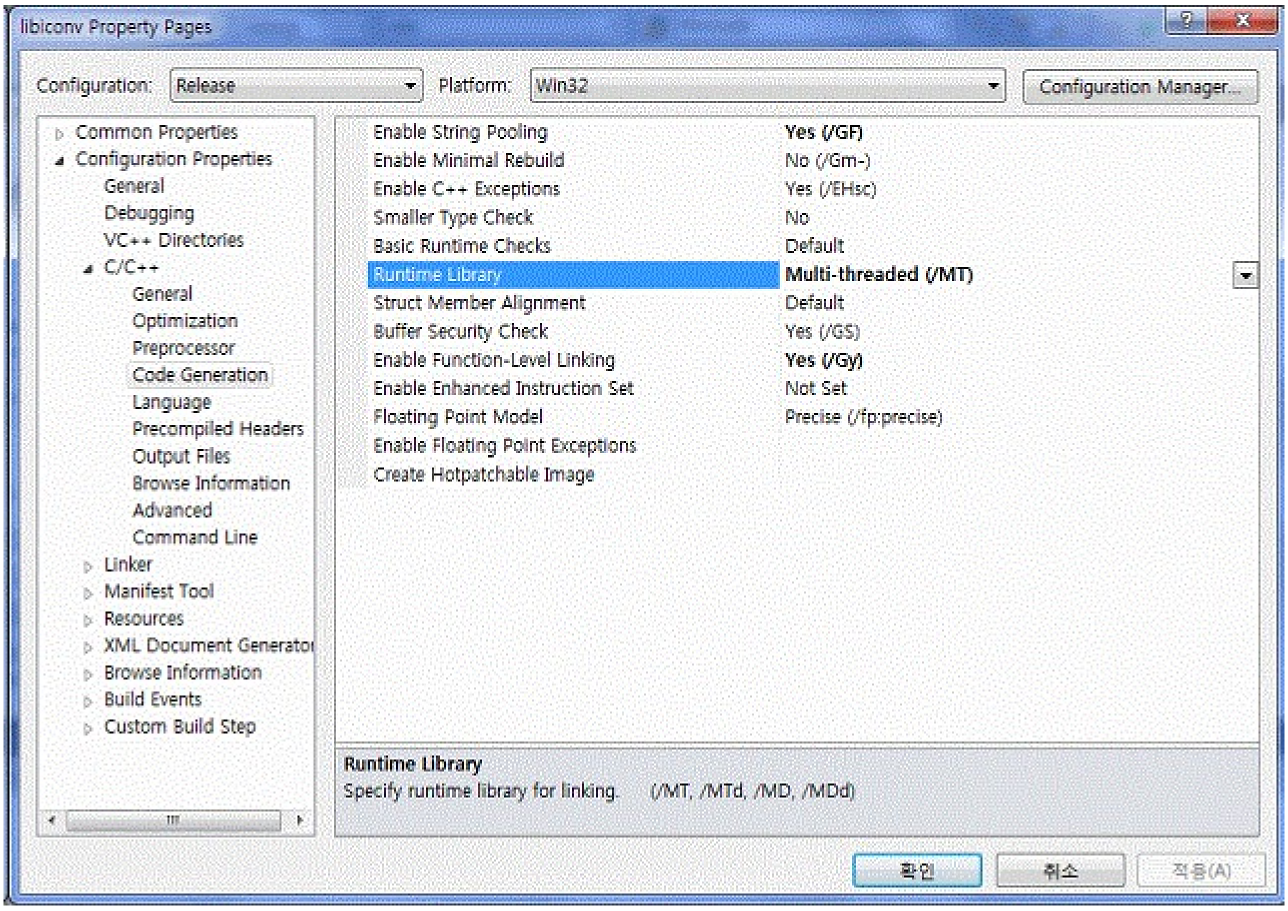
You have to add "`BUILDING_LIBICONV`" and "`BUILDING_LIBCHARSET`" to Peprocessor Definitions of all Platforms and of all configurations.



Preprocessor Definitions	WIN32;NDEBUG;_WINDOWS;_USRDLL;BUILDING_LI
Undefine Preprocessor Definitions	
Undefine All Preprocessor Definitions	No
Ignore Standard Include Paths	No
Preprocess to a File	No
Preprocess Suppress Line Numbers	No
Keep Comments	No

Preprocessor Definitions
Defines a preprocessing symbols for your source file.

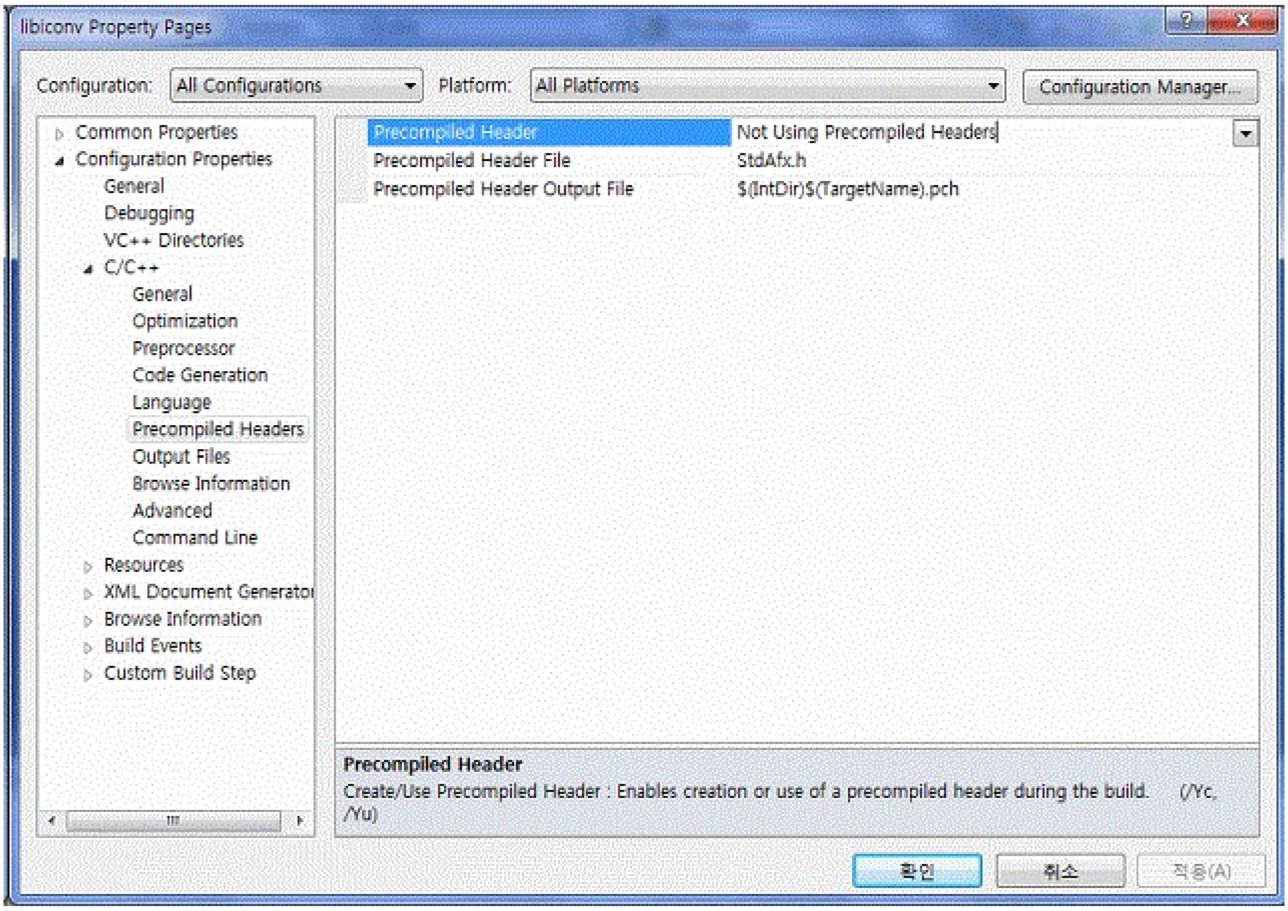
You'd better set Runtime Library to "Multi-threaded" when building dynamic link library *libiconv.dll*. Then, the dependency on VC Runtime library can be controlled by the applications that will be built and dynamically linked with *libiconv.dll* because *libiconv.dll* does not need VC Runtime library but only the application that uses *libiconv.dll* may or may not need VC Runtime library. However, when building the `static` link library *libiconvStatic.lib*, you can choose Runtime Library option for *libiconvStatic.lib* depending on the application that uses *libiconvStatic.lib*.



Enable String Pooling	Yes (/GF)
Enable Minimal Rebuild	No (/Gm-)
Enable C++ Exceptions	Yes (/EHsc)
Smaller Type Check	No
Basic Runtime Checks	Default
Runtime Library	Multi-threaded (/MT)
Struct Member Alignment	Default
Buffer Security Check	Yes (/GS)
Enable Function-Level Linking	Yes (/Gy)
Enable Enhanced Instruction Set	Not Set
Floating Point Model	Precise (/fp:precise)
Enable Floating Point Exceptions	
Create Hotpatchable Image	

Runtime Library
Specify runtime library for linking. (/MT, /MTd, /MD, /MDd)

You have to change Precompiled Header option to "Not Using Precompiled Headers".



Precompiled Header	Not Using Precompiled Headers
Precompiled Header File	StdAfx.h
Precompiled Header Output File	$(IntDir)$(TargetName).pch

Precompiled Header
Create/Use Precompiled Header : Enables creation or use of a precompiled header during the build. (/Yc, /Yu)

Sixth Step

Now, it is the time to tweak the source code of the `libiconv`.

libiconv.rc

Open *libiconv.rc* with text editor or the source code editor of Visual Studio IDE by double-clicking *libiconv.rc* in the Solution explorer and insert some code at line 4 as follows:

C++

```
///////////////////////// 추가 / ADD / ДОВАВЛЯТЬ //////////////////////
#define PACKAGE_VERSION_MAJOR       1
#define PACKAGE_VERSION_MINOR       14
#define PACKAGE_VERSION_SUBMINOR    0
#define PACKAGE_VERSION_STRING      "1.14"
//////////////////////////////////////////////////////////////////////////////
```

You may be asked to change Line endings to "Windows (CR LF)". Then, let it do so. It will be more convenient for you if you mainly use Windows.

localcharset.c

Open *localcharset.c* and delete or comment the lines 76 - 79 as follows:

C++

```
///////////////////////// 삭제 / DELETE / удалить //////////////////////
///* Get LIBDIR.   */
//#ifndef LIBDIR
//# include "configmake.h"
//#endif
//////////////////////////////////////////////////////////////////////////////
```

iconv.c

Open *iconv.c* and delete or comment the lines 246 - 248 and add three lines there as follows:

C++

```
///////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
//size_t iconv (iconv_t icd,
//              ICONV_CONST char* * inbuf, size_t *inbytesleft,
//              char* * outbuf, size_t *outbytesleft)
///////////////////////// ?? / ADD / ????????? ////////////////////
size_t iconv (iconv_t icd,
              const char* * inbuf, size_t *inbytesleft,
              char* * outbuf, size_t *outbytesleft)
//////////////////////////////////////////////////////////////////////////////
```

localcharset.h

Open *localcharset.h* and delete or comment the lines 23 - 27 and add 7 lines there as follows:

C++

```
/////////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
//#if @HAVE_VISIBILITY@ && BUILDING_LIBCHARSET
//#define LIBCHARSET_DLL_EXPORTED __attribute__((__visibility__("default")))
//#else
//#define LIBCHARSET_DLL_EXPORTED
//#endif
/////////////////////////// ?? / ADD / ????????? ////////////////////
#ifdef BUILDING_LIBCHARSET
#define LIBCHARSET_DLL_EXPORTED __declspec(dllexport)
#elif USING_STATIC_LIBICONV
#define LIBCHARSET_DLL_EXPORTED
#else
#define LIBCHARSET_DLL_EXPORTED __declspec(dllimport)
#endif
////////////////////////////////////////////////////////////////////////////////
```

config.h

Open *config.h* in the project include folder "...*libiconv**include*" and delete or comment the lines 29 - 30 as follows:

C++

```
/////////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
///* Define as good substitute value for EILSEQ. */
//#undef EILSEQ
////////////////////////////////////////////////////////////////////////////////
```

Otherwise you can redefine `EILSEQ` as good substitute value.

iconv.h

Open *iconv.h* in the project include folder "...*libiconv**include*" and delete or comment the line 175 and add 1 line as follows:

C++

```
/////////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
//#if @HAVE_WCHAR_T@
/////////////////////////// 추가 / ADD / ДОБАВЛЯТЬ ////////////////////
#if HAVE_WCHAR_T
////////////////////////////////////////////////////////////////////////////////
```

Delete or comment the line 128 and add 1 line as follows:

C++

```
/////////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
//#if @USE_MBSTATE_T@
/////////////////////////// 추가 / ADD / ДОБАВЛЯТЬ ////////////////////
#if USE_MBSTATE_T
////////////////////////////////////////////////////////////////////////////////
```

Delete or comment the lines 107-108 and add 2 lines as follows:

C++

```
/////////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
//#if @USE_MBSTATE_T@
//#if @BROKEN_WCHAR_H@
/////////////////////////// 추가 / ADD / ДОБАВЛЯТЬ /////////////////////
#if USE_MBSTATE_T
#if BROKEN_WCHAR_H
////////////////////////////////////////////////////////////////////////////////
```

Delete or comment the line 89 and add 2 lines as follows:

C++

```
/////////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
//extern LIBICONV_DLL_EXPORTED size_t iconv (iconv_t cd, @ICONV_CONST@ char* * inbuf,
//size_t *inbytesleft, char* * outbuf, size_t *outbytesleft);
/////////////////////////// 추가 / ADD / ДОБАВЛЯТЬ /////////////////////
extern LIBICONV_DLL_EXPORTED size_t iconv (iconv_t cd, const char* * inbuf,
    size_t *inbytesleft, char* * outbuf, size_t *outbytesleft);
////////////////////////////////////////////////////////////////////////////////
```

Delete or comment the lines 26 - 31 and add 8 lines as follows:

C++

```
/////////////////////////// 삭제 / DELETE / УДАЛИТЬ //////////////////////
//#if @HAVE_VISIBILITY@ && BUILDING_LIBICONV
//#define LIBICONV_DLL_EXPORTED __attribute__((__visibility__("default")))
//#else
//#define LIBICONV_DLL_EXPORTED
//#endif
//extern LIBICONV_DLL_EXPORTED @DLL_VARIABLE@ int _libiconv_version; /* Likewise */
/////////////////////////// 추가 / ADD / ДОБАВЛЯТЬ /////////////////////
#if BUILDING_LIBICONV
#define LIBICONV_DLL_EXPORTED __declspec(dllexport)
#elif USING_STATIC_LIBICONV
#define LIBICONV_DLL_EXPORTED
#else
#define LIBICONV_DLL_EXPORTED __declspec(dllimport)
#endif
extern LIBICONV_DLL_EXPORTED int _libiconv_version; /* Likewise */
////////////////////////////////////////////////////////////////////////////////
```

How to Use

When you use newly built `libiconv`, the only header file that you need is *iconv.h*. You will need to link either the import library *libiconv.lib* or the `static` library *libiconvStatic.lib* in your project property or write the code in one of your source file as follows:

C++

```
#pragma comment (lib, "libiconv.lib")
```

```
or
#pragma comment (lib, "libiconvStatic.lib")
```

In the source of the application that uses this library either *libiconv.dll* or *libiconvStatic.lib*, if you don't define anything but only include *iconv.h*, your application will use *libiconv.dll* while it will use *libiconvStatic.lib* if you define `USING_STATIC_LIBICONV` before you include *iconv.h* in your application as follows:

C++

```cpp
//#define USING_STATIC_LIBICONV
#include <iconv.h>
```

Copyright Issues

The original `libiconv` is under LGPL licence. So, the tweaked `libiconv` has also to be under LGPL. If you develop any application that uses `libiconv`, you have to be careful about copyright issues. If your application is linked with *libiconv.dll* dynamically, you don't have to publicize your source code of your application. However, if your application is linked statically with *libiconvStatic.lib*, you have to publicize either the source code of the application or the object files (**.obj*) of the application so that others can build the application that is linked statically with the library under LGPL license.

License

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Korea (Republic of)

I like programming.
I am teaching at AUCA (American University of Central Asia) now.

Comments and Discussions

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