

# CTIP for C

<T2>

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Software Verification

Konkuk Univ.

# contents

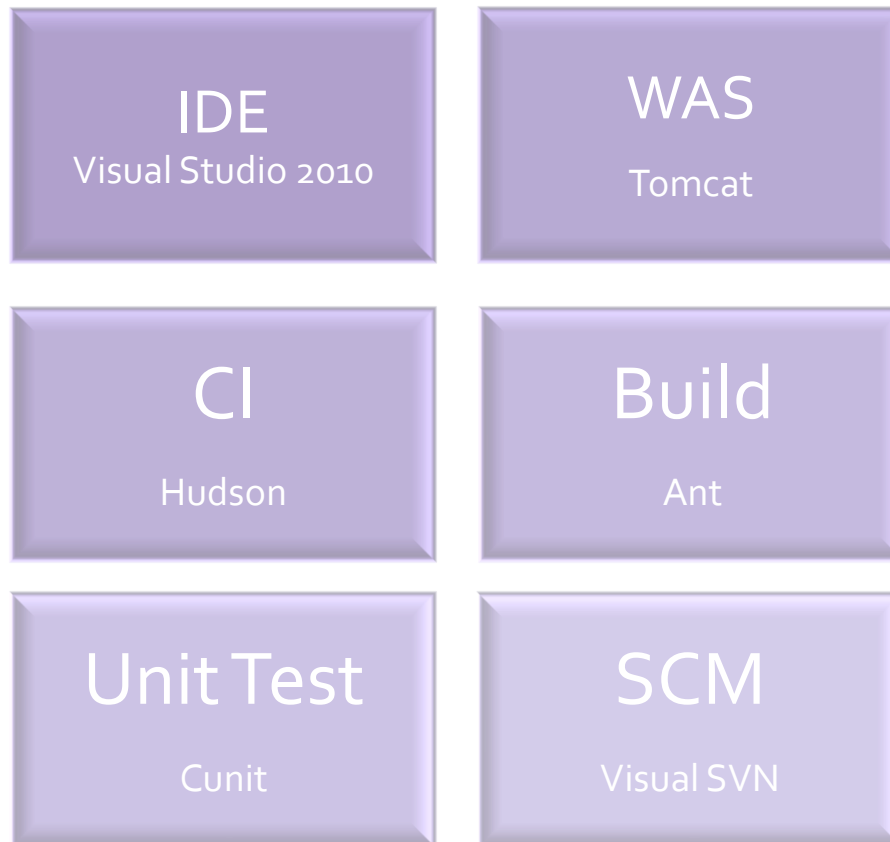
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- Chapter 1. Setting CTIP Environment for C
- Chapter 2. Testing

# Chapter 1. Setting CTIP Environment for C

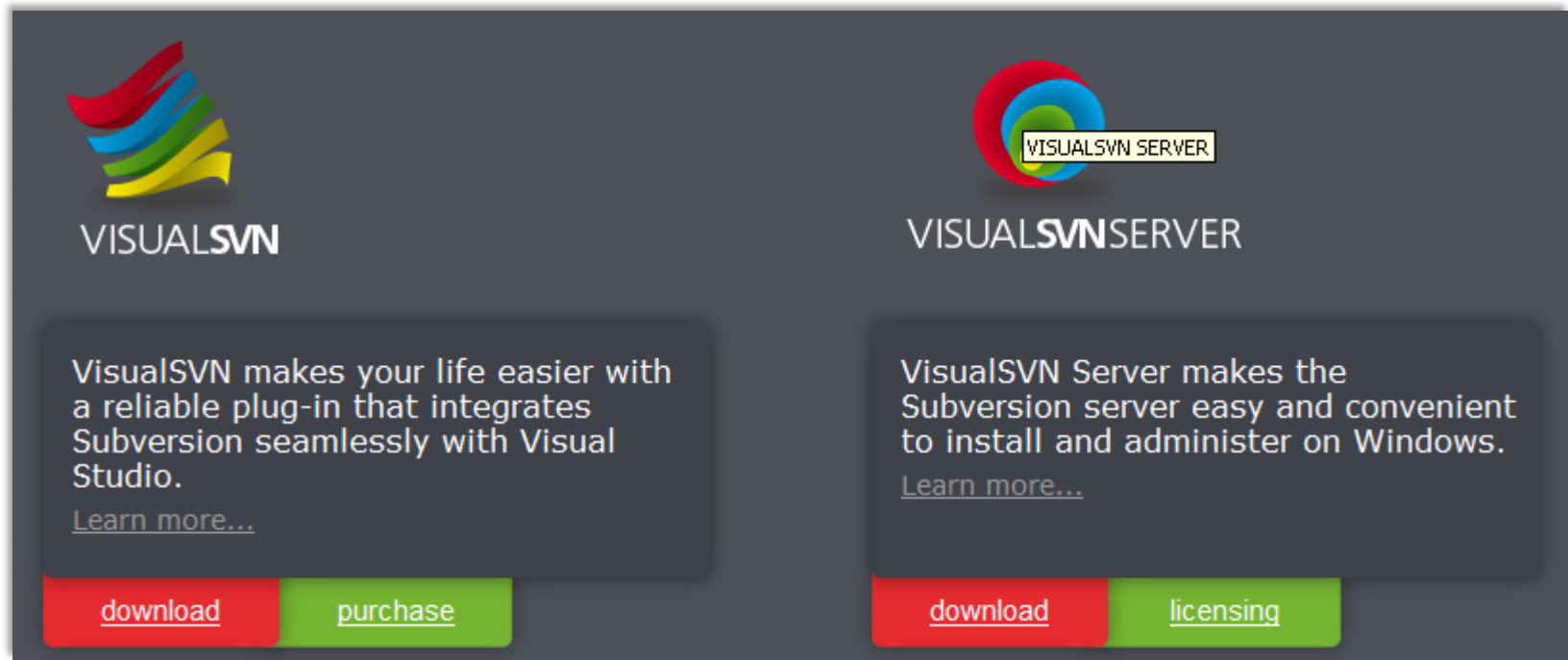
# Set up CTIP Environment

- The tools of T2's project



# Install Visual SVN

- <http://www.visualsvn.com/>



The image shows a screenshot of the VisualSVN website. It features two main product cards on a dark grey background. The left card is for VisualSVN, featuring a logo of four colored ribbons (red, blue, green, yellow) and the text 'VISUALSVN'. Below the logo is a description: 'VisualSVN makes your life easier with a reliable plug-in that integrates Subversion seamlessly with Visual Studio.' and a link '[Learn more...](#)'. At the bottom of the card are two buttons: a red 'download' button and a green 'purchase' button. The right card is for VisualSVN Server, featuring a logo of three overlapping circles (red, blue, green) and the text 'VISUALSVN SERVER'. Below the logo is a description: 'VisualSVN Server makes the Subversion server easy and convenient to install and administer on Windows.' and a link '[Learn more...](#)'. At the bottom of the card are two buttons: a red 'download' button and a green 'licensing' button.

**VISUALSVN**

VisualSVN makes your life easier with a reliable plug-in that integrates Subversion seamlessly with Visual Studio.

[Learn more...](#)

[download](#) [purchase](#)

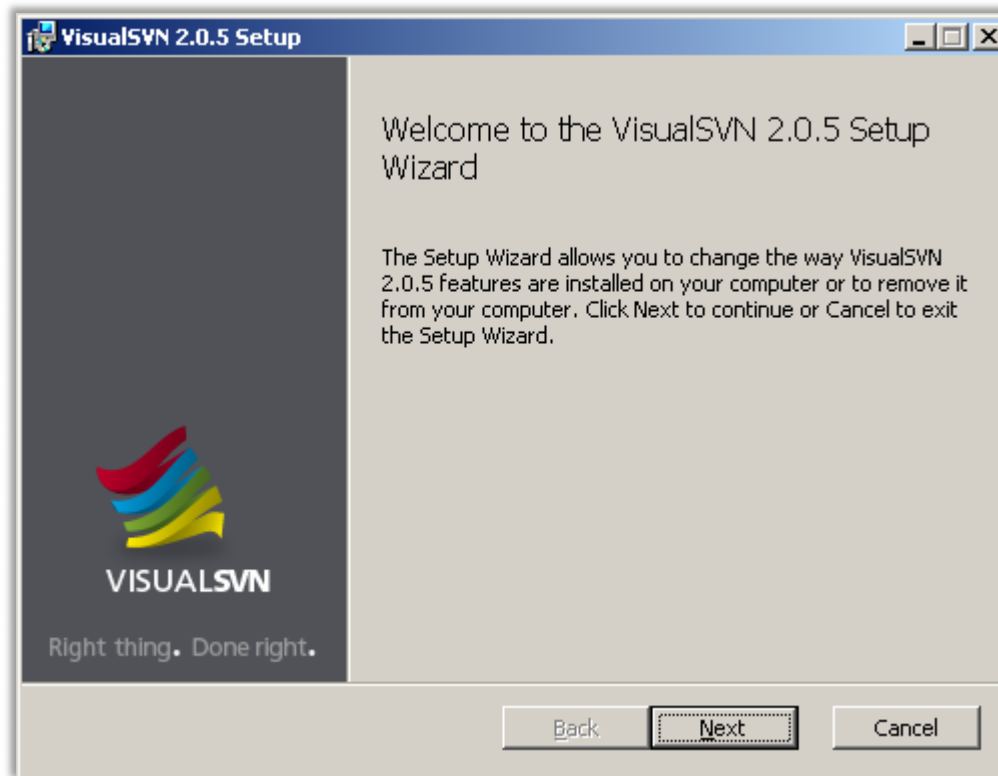
**VISUALSVN SERVER**

VisualSVN Server makes the Subversion server easy and convenient to install and administer on Windows.

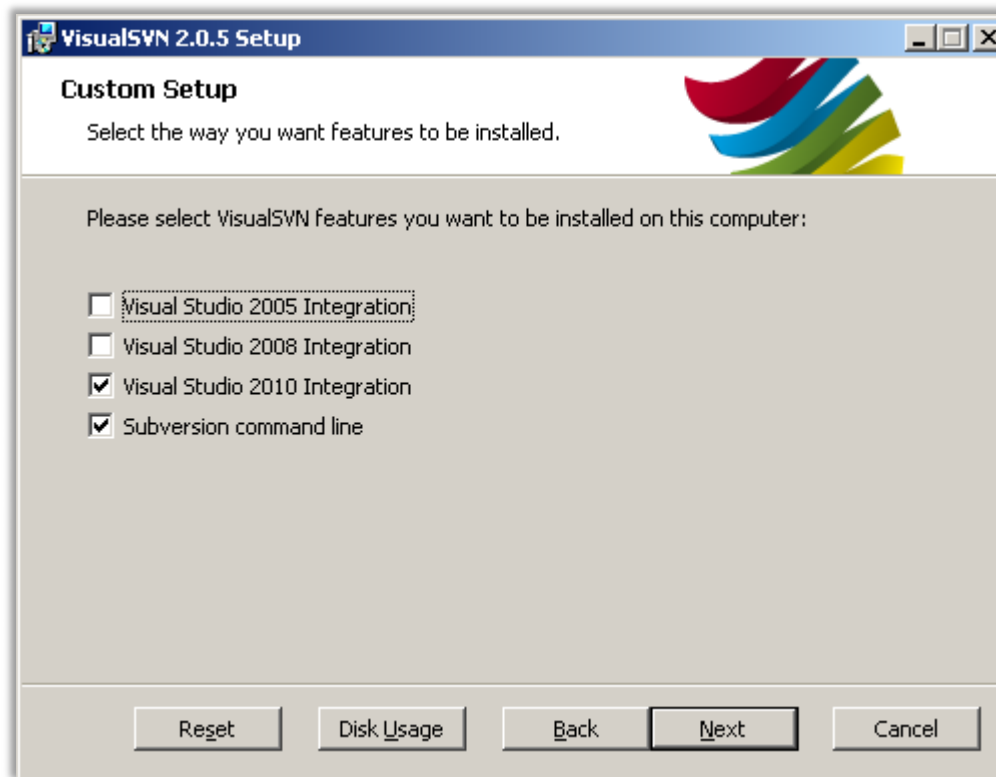
[Learn more...](#)

[download](#) [licensing](#)

# Install Visual SVN

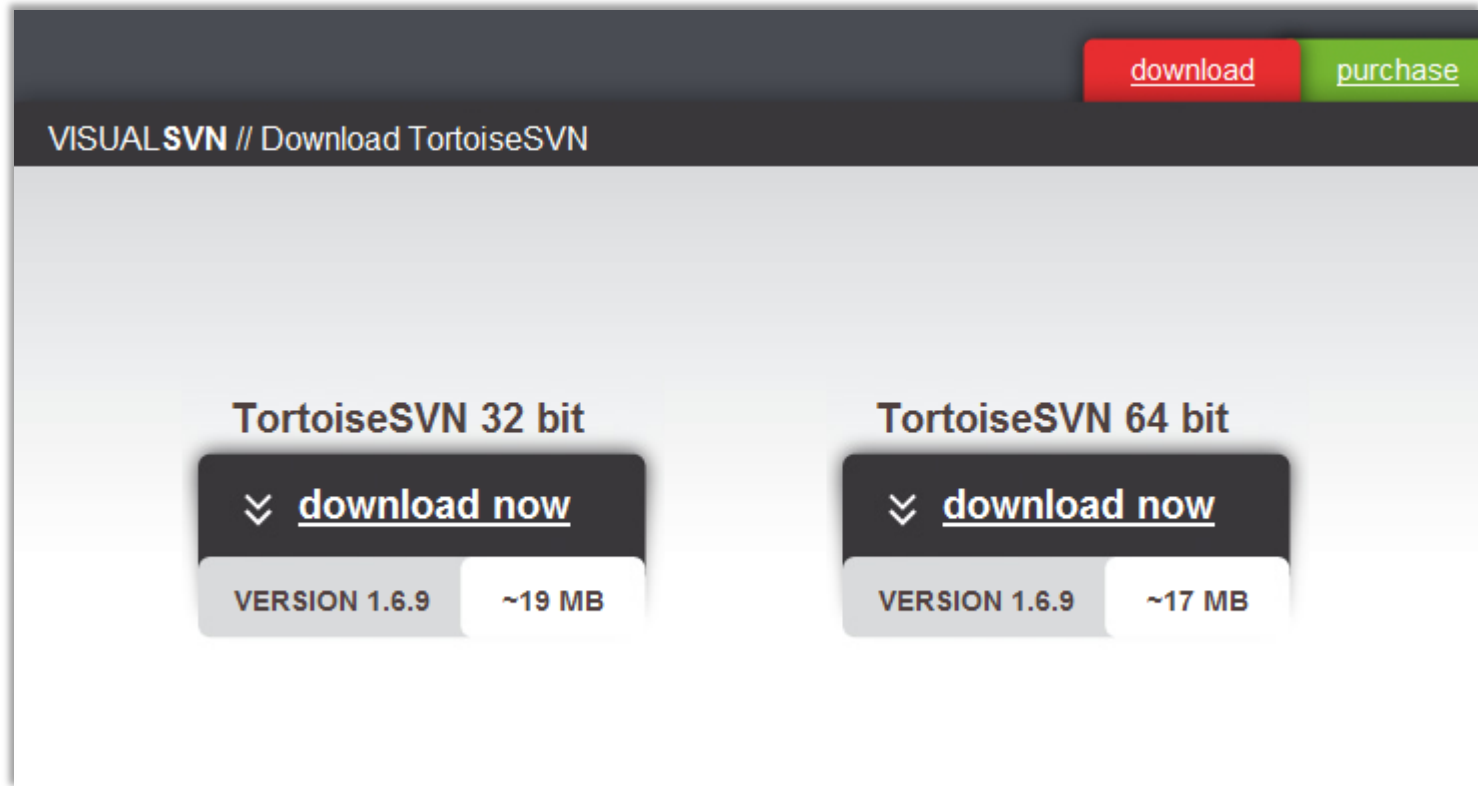


# Install Visual SVN



# Install Visual SVN

- <http://www.visualsvn.com/visualsvn/download/tortoisesvn/>

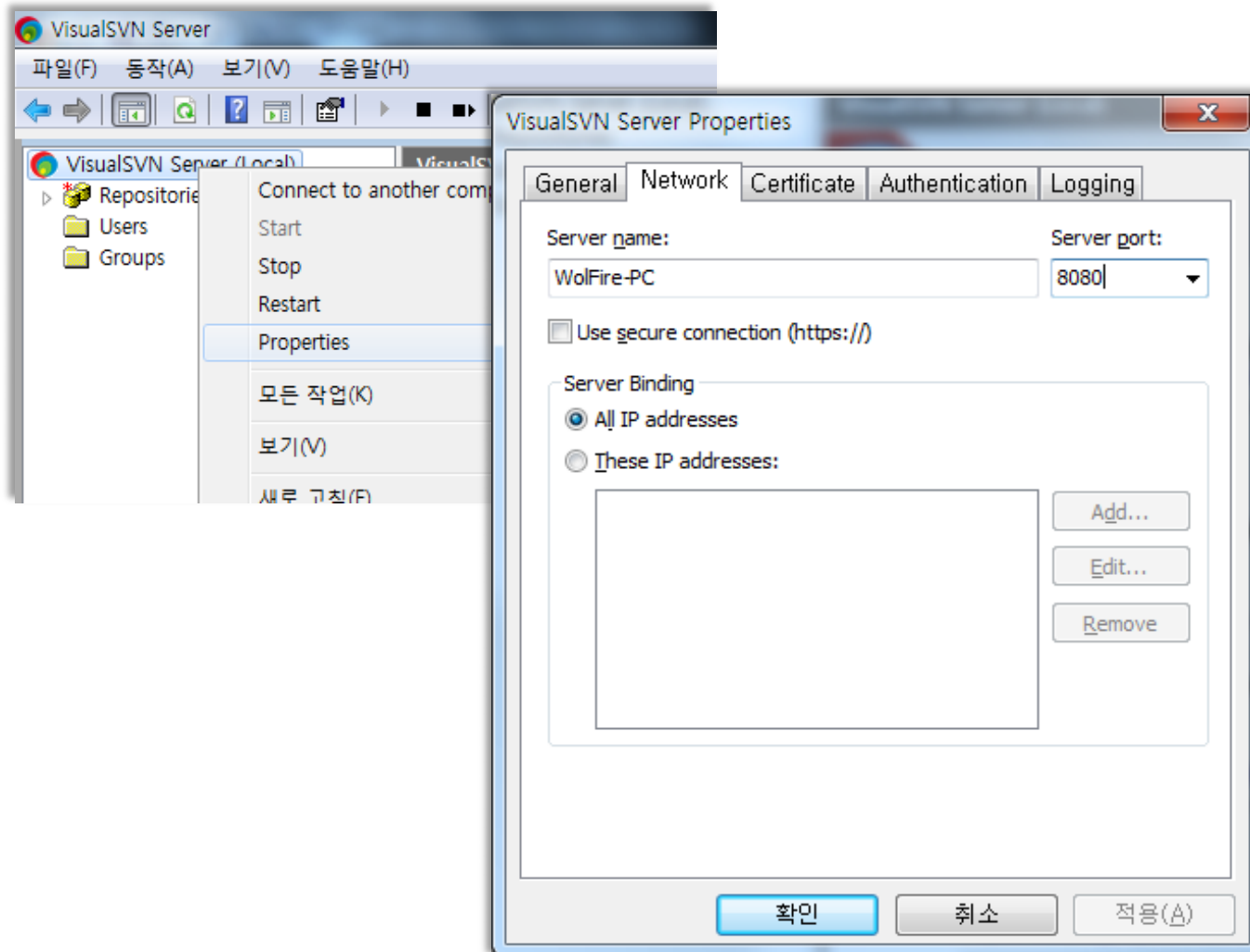


The screenshot shows the VisualSVN website's download page for TortoiseSVN. At the top right, there are two buttons: a red 'download' button and a green 'purchase' button. Below the navigation bar, the page title reads 'VISUALSVN // Download TortoiseSVN'. The main content area features two download options:

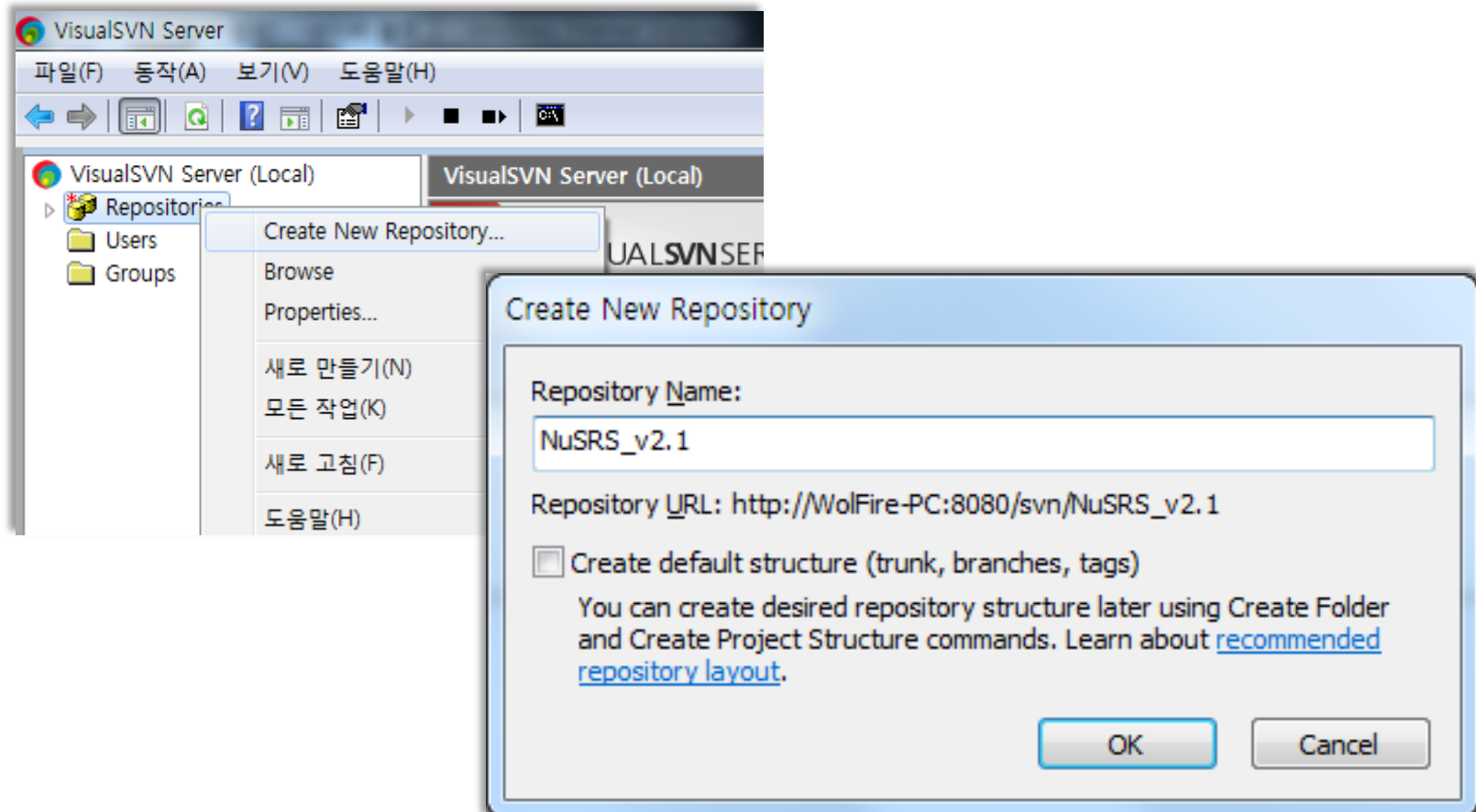
- TortoiseSVN 32 bit**: A dark button with a white downward arrow and the text 'download now'. Below it, a light gray box displays 'VERSION 1.6.9' and '~19 MB'.
- TortoiseSVN 64 bit**: A dark button with a white downward arrow and the text 'download now'. Below it, a light gray box displays 'VERSION 1.6.9' and '~17 MB'.



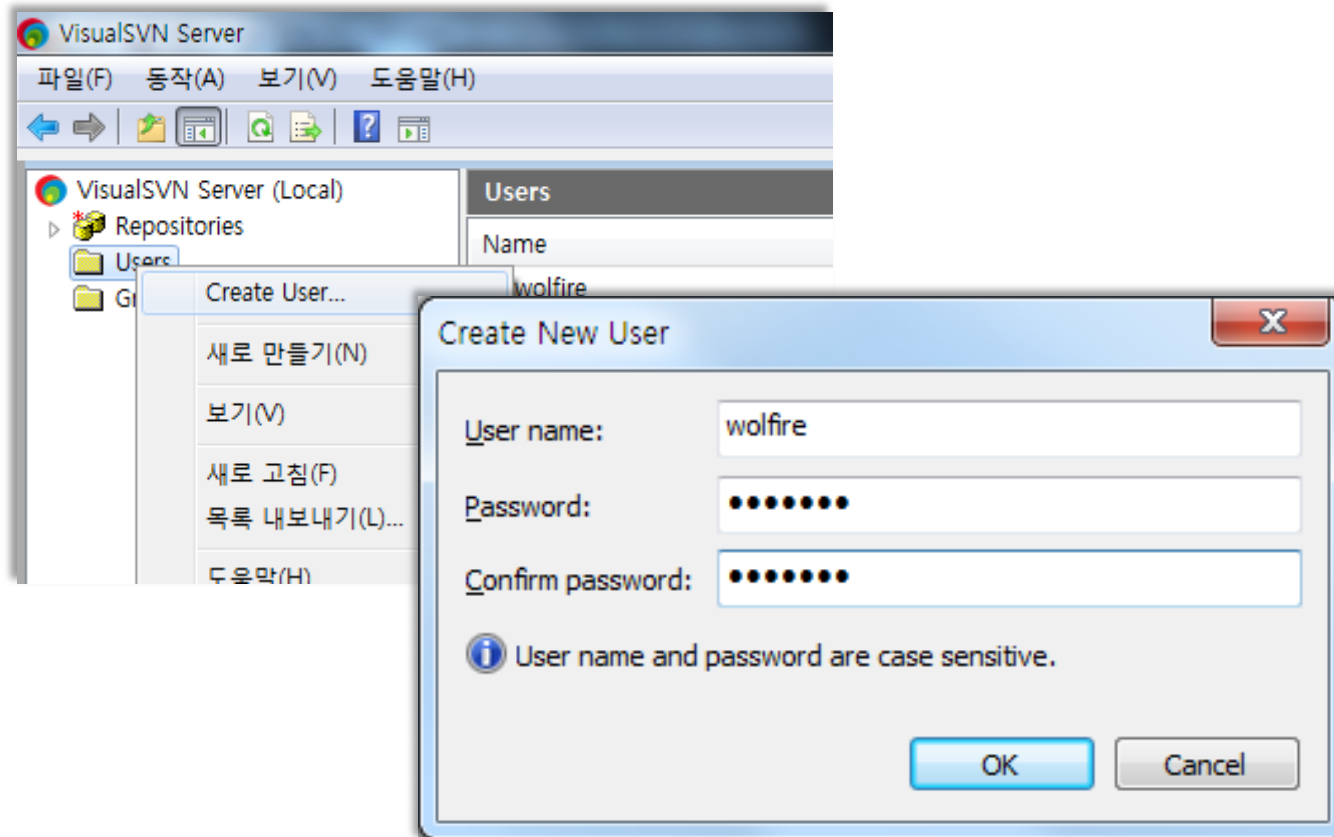
# Setting Visual SVN



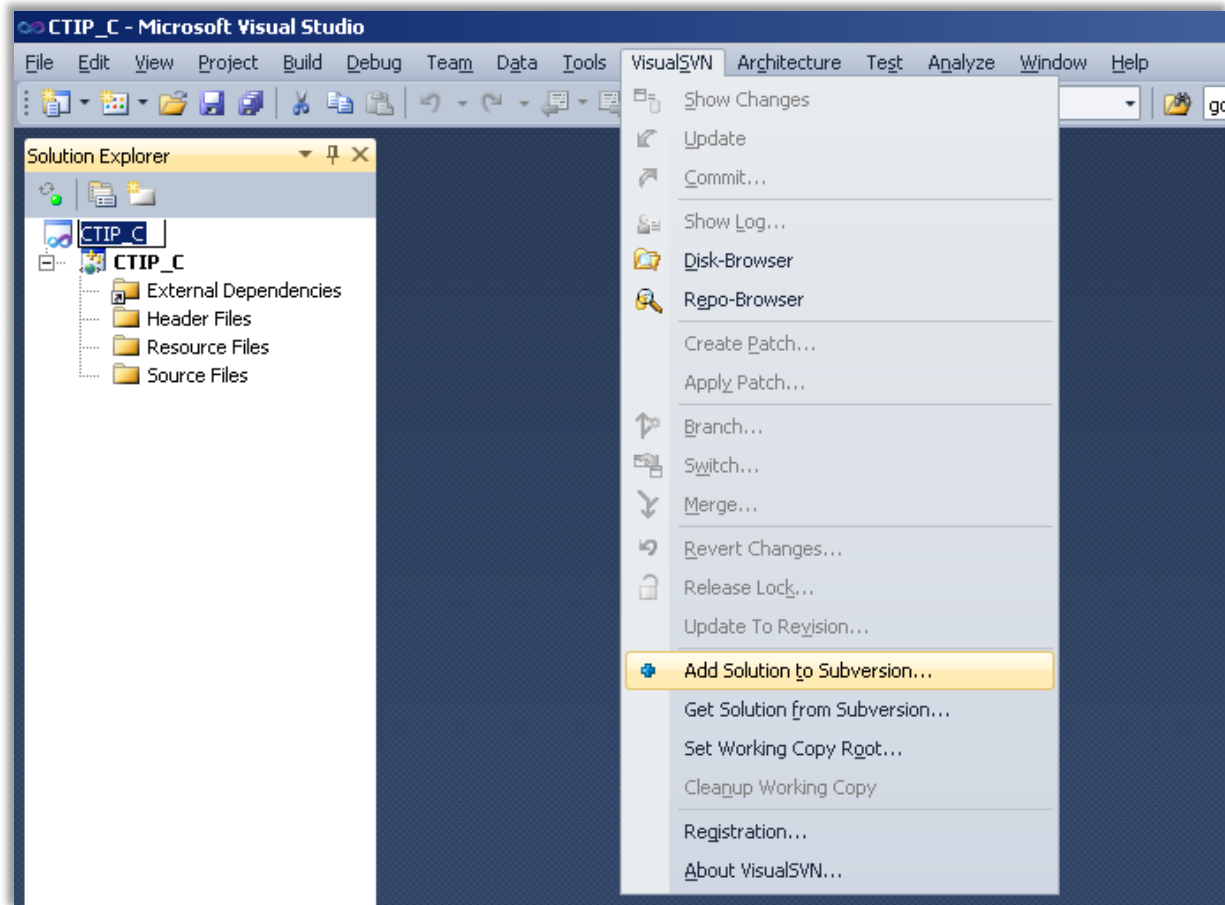
# Setting Visual SVN



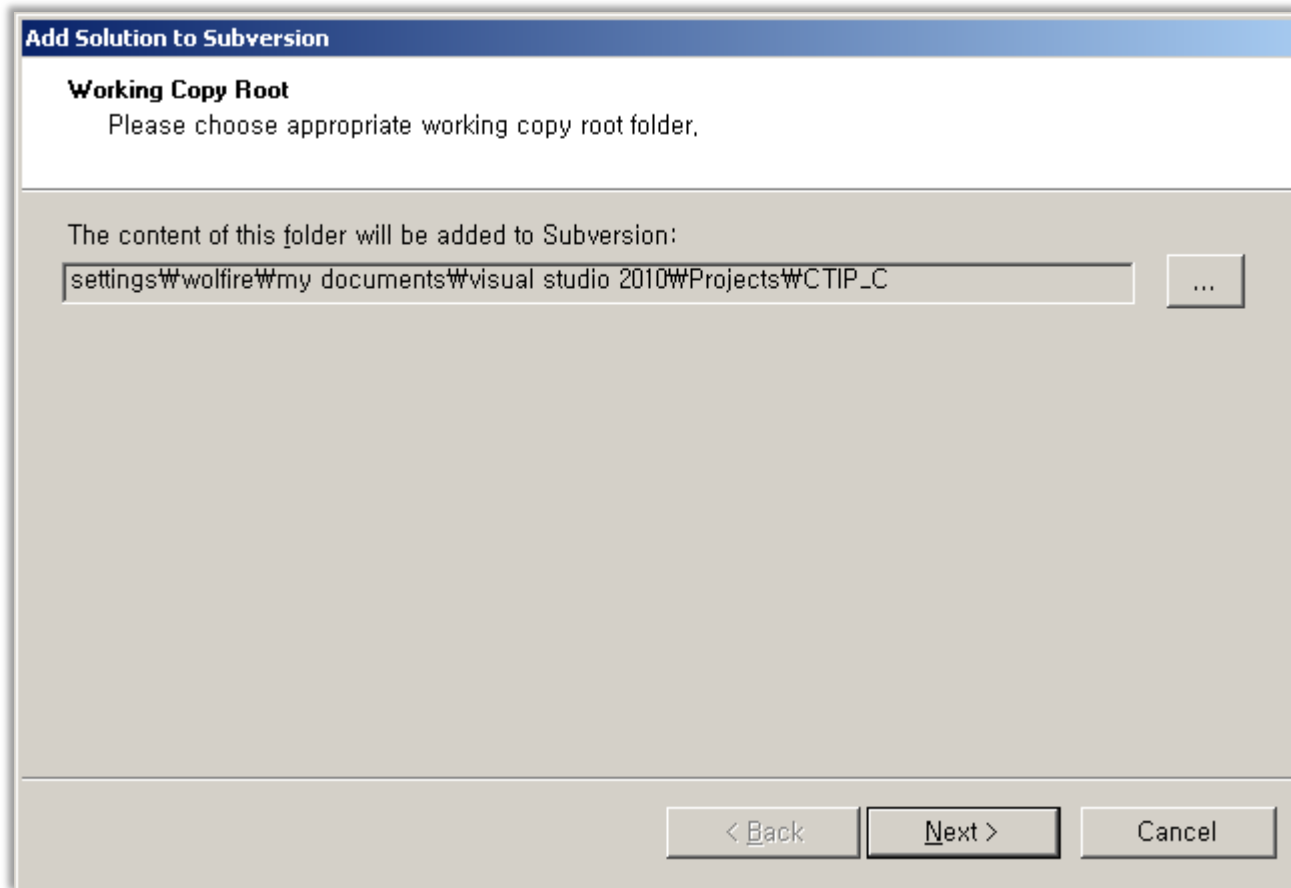
# Setting Visual SVN



# Setting Visual SVN



# Setting Visual SVN



# Setting Visual SVN

**Add Solution to Subversion**

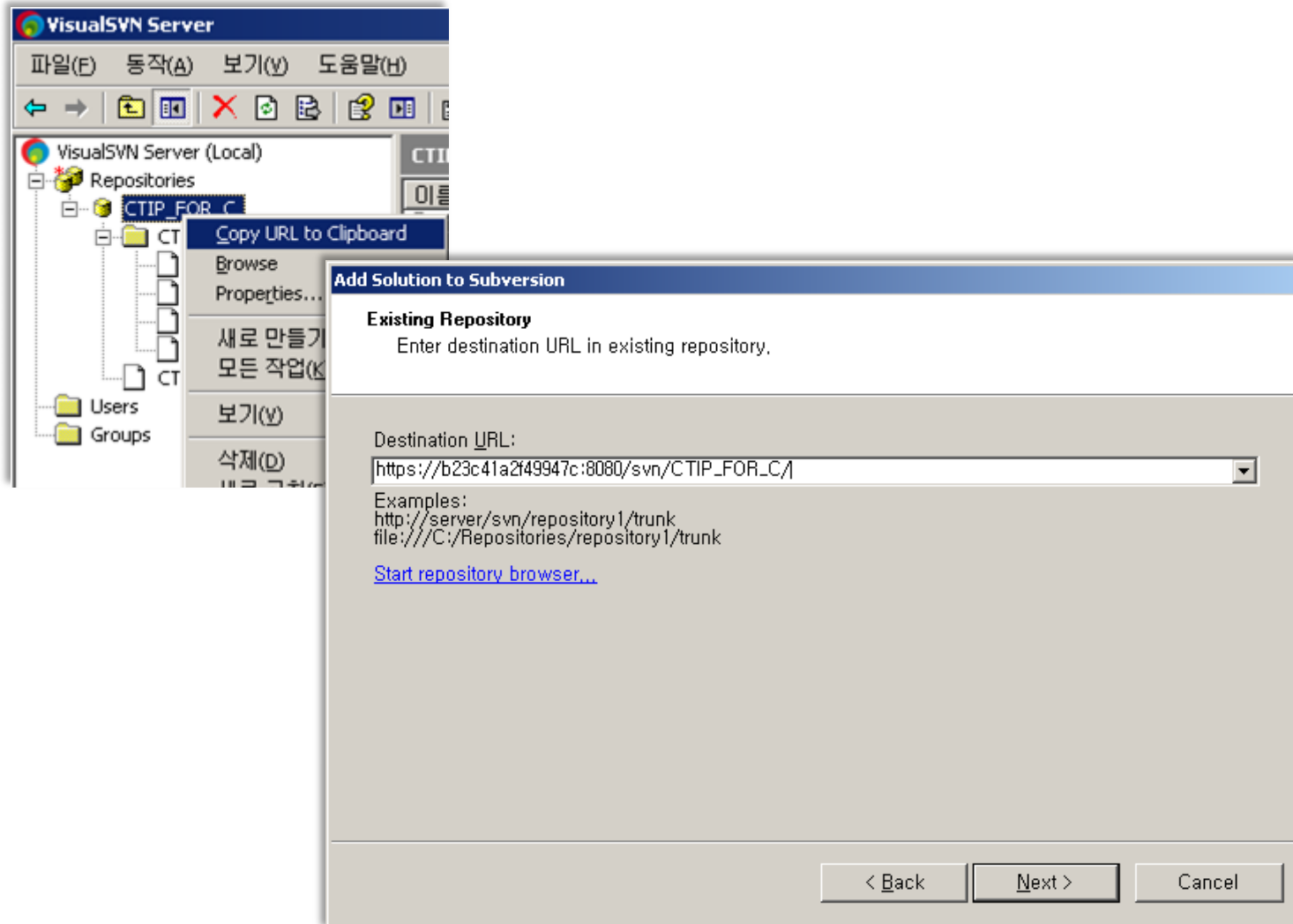
**New or Existing Repository**  
The wizard needs to know URL of repository.

New Repository  
New local Subversion repository will be created.

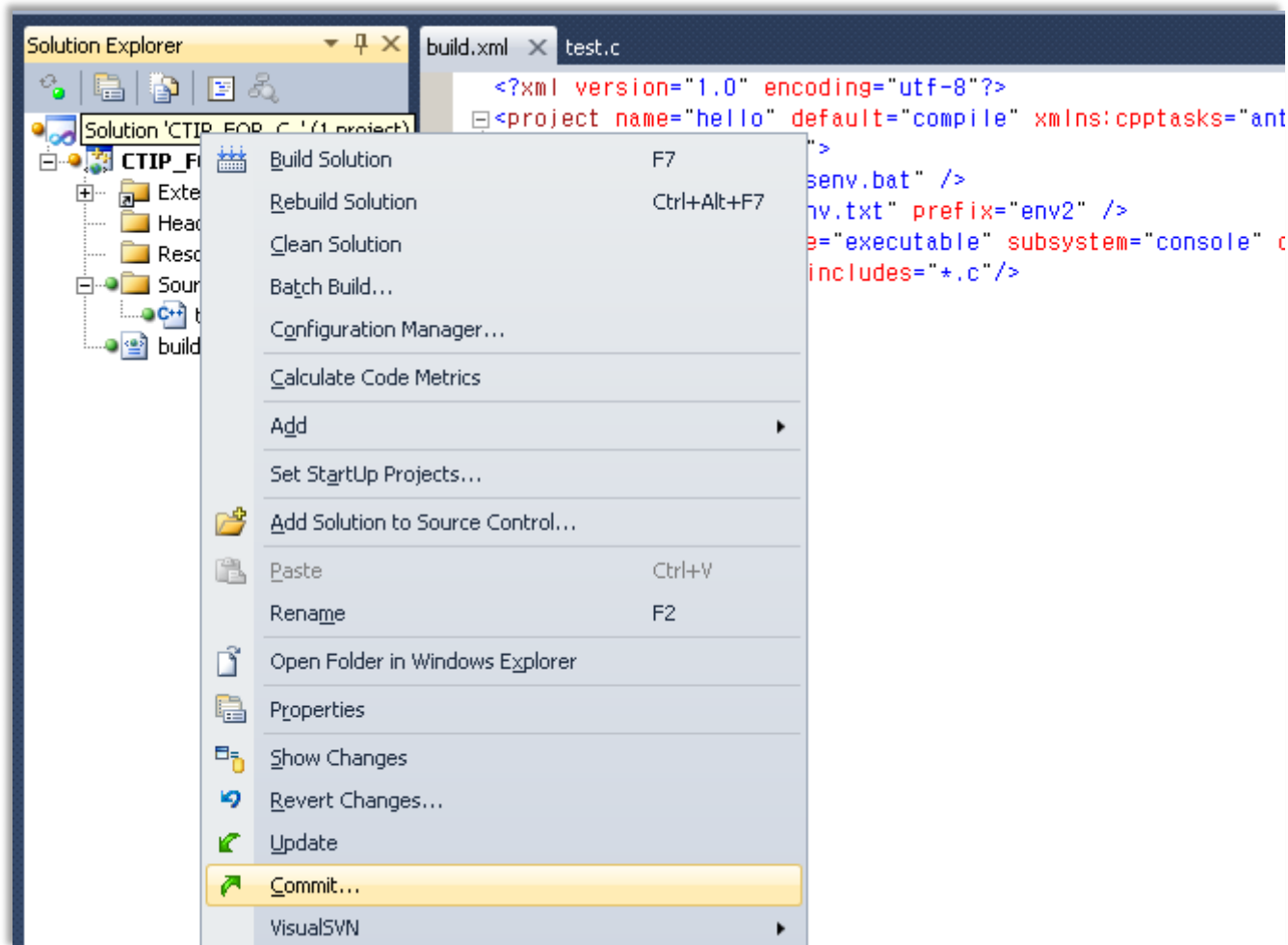
Existing Repository  
Solution will be added to existing Subversion repository.

< Back    Next >    Cancel

# Setting Visual SVN

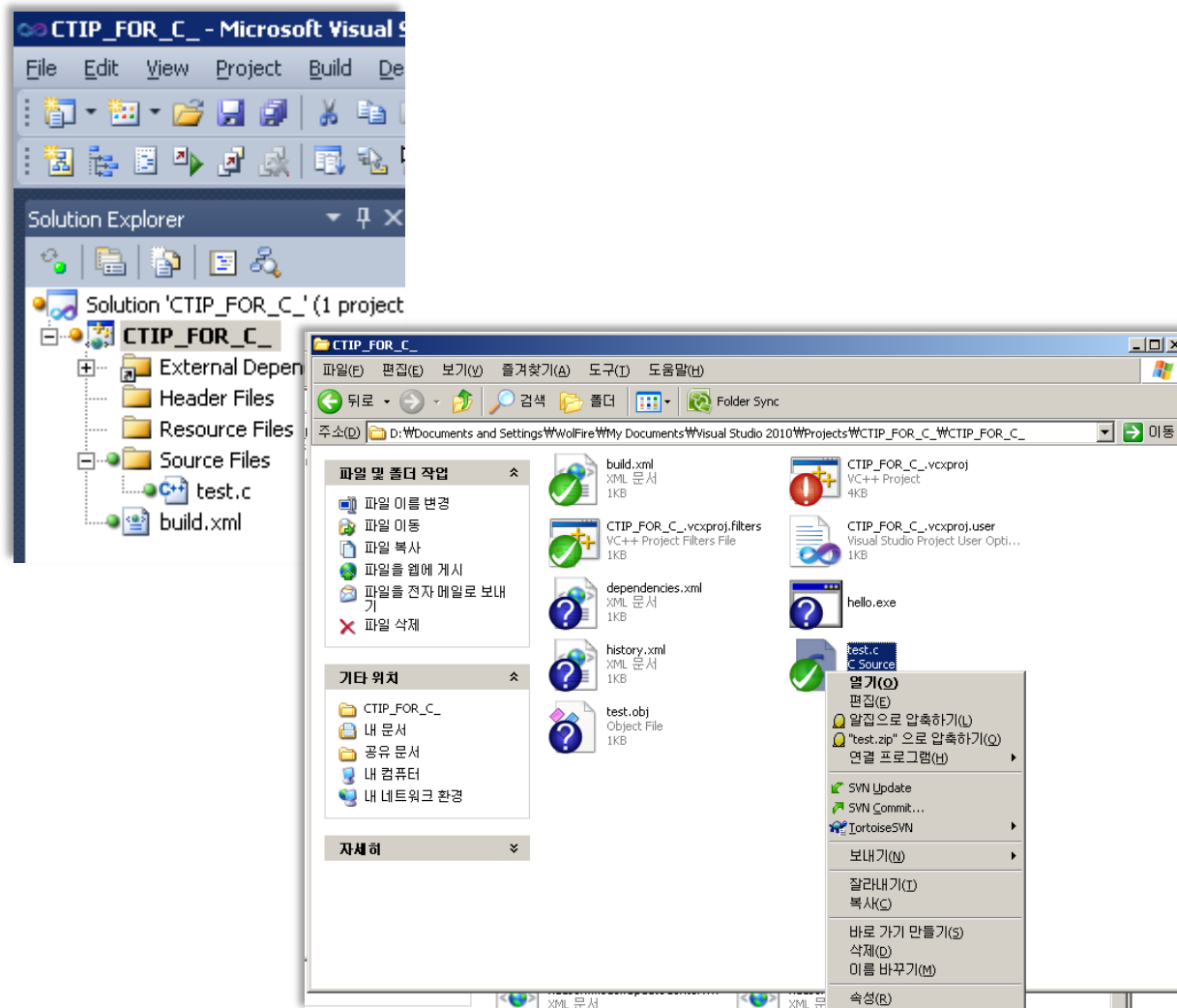


# Setting Visual SVN





# Setting Visual SVN



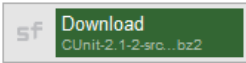
# Install CUnit

- <http://sourceforge.net/projects/cunit/>

The screenshot shows the SourceForge project page for CUnit. At the top, the SourceForge logo is on the left, a search bar with the text "Find Open Source Software" is in the center, and "Register" and "Log In" links are on the right. Below the search bar is an advertisement for "Free download 3D CAD CAM" with the text "All-in-one CAD/CAM, ZW3D Easy on your budget!" and the URL "zw3d.zwcad.org/freedownloadCADCAM". To the right of this ad is another advertisement for "Multiple Devices. One Platform." with icons for various devices and the text "Find out more at the Hub!".

The main content area features the project title "C Unit Testing Framework" by "anilsaharan, jdpipe, jds2, tlh2000". Below the title is a navigation bar with tabs for "Summary", "Files", "Reviews", "Support", "Develop", "Hosted Apps", "Tracker", "Mailing Lists", "Forums", and "Code". The "Summary" tab is selected.

The summary section includes the text "Automated testing framework for 'C'." and a table of project information:

Project Home <a href="http://cunit.sf.net">cunit.sf.net</a>	Recommended By 34 users	 Download CUnit-2.1-2-src...bz2
Develop <a href="http://sf.net/projects/cunit/develop">sf.net/projects/cunit/develop</a>	Last Update 2 hours ago	Other Versions <a href="#">Browse all files</a>
Support <a href="http://sf.net/tracker/?func=add&amp;group_id=32992&amp;atid=40...">sf.net/tracker/?func=add&amp;group_id=32992&amp;atid=40...</a>	License GNU Library or Lesser General Public License (LGPL)	More Detail <a href="#">Show</a>

On the right side of the summary section is another advertisement for "UI test in Visual Studio" with the text "Easy-to-use and flexible test tool. Record your tests in 100% .NET code" and the URL "www.testautomationfx.com".

# Install CUnit

- <http://w3.scs.ryerson.ca/~schi/cps707/install-linux.html>

1. configure - cd to the directory where you extracted the files and type:

```
$ ./configure
```

this will configure the install script and may take a few minutes.

2. compile - type

```
$ make
```

to compile the package

3. install - type

```
$ make install
```

to install the compiled files

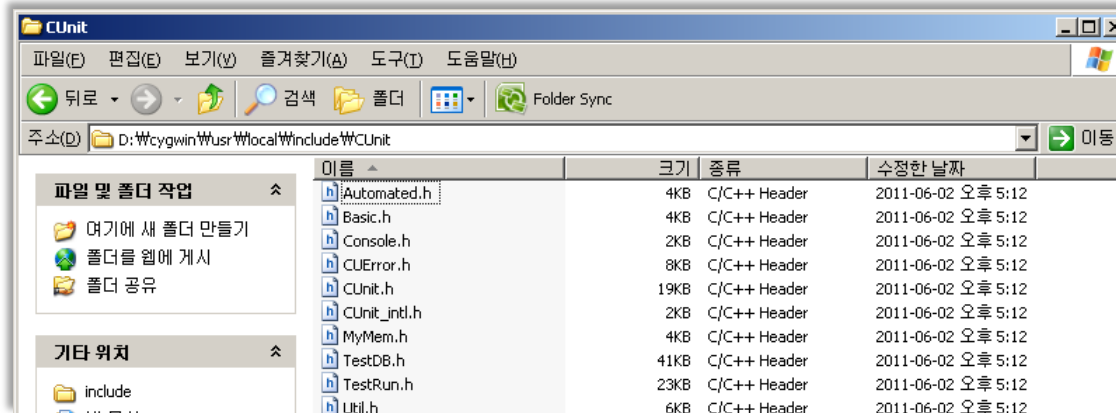
4. clean up - type

```
$ make clean
```

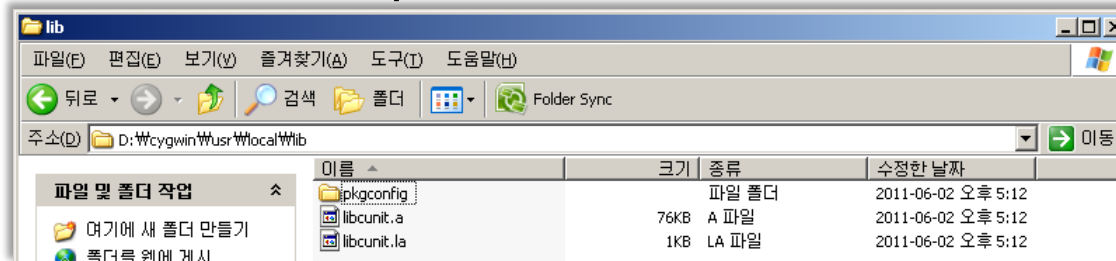
to remove any temporary files created during the configuration and compiling process

# Install CUnit

- /usr/local/include/Cunit - Header File



- /usr/local/lib - Library File



# Install Ant CPPTASKS

- <http://ant-contrib.sourceforge.net/>  
Download : ant-contrib & cpptasks

## Ant-Contrib Tasks

SOURCEFORGE.NET

### Contents

- [What's this?](#)
- [Installation](#)
- [cc compilation task](#)
- [Other tasks](#)

### What's this?

The Ant-Contrib project is a collection of tasks (and at one point maybe types and other tools) for [Apache Ant](#).

This Software is distributed under the [Apache Software License](#).

### Installation

First you must install Apache Ant itself, most of the Ant-Contrib tasks require Ant 1.5 or higher to work properly. You can download Ant [from Apache](#).

Ant-contrib releases are available at the [downloads](#) page. Mailing lists, CVS and bug trackers can be accessed from the [project](#) page.

See the [cc](#) tasks for installation instructions for cpptasks. To install ant-contrib:

1. Copy ant-contrib-0.3.jar to the lib directory of your Ant installation. If you want to use one of the tasks in your own project, add the lines

```
<taskdef resource="net/sf/antcontrib/antcontrib.properties"/>
```

to your build file.

2. Keep ant-contrib-0.3.jar in a separate location. You now have to tell Ant explicitly where to find it (say in /usr/share/java/lib):

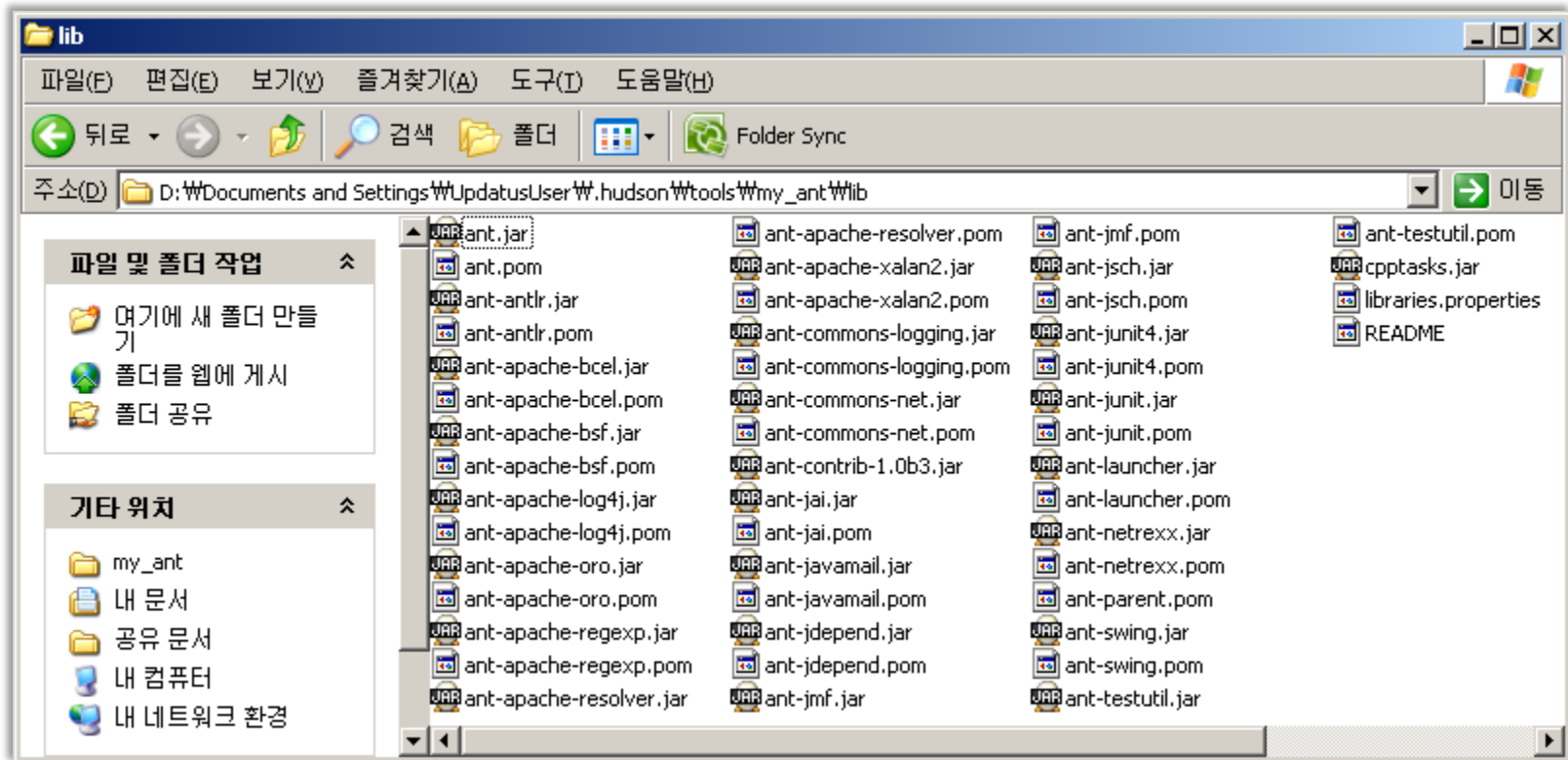
```
<taskdef resource="net/sf/antcontrib/antcontrib.properties">  
  <classpath>  
    <pathelement location="/usr/share/java/lib/ant-contrib-0.3.jar"/>  
  </classpath>  
</taskdef>
```

---

Copyright © 2002-2003 Ant-Contrib Project. All rights Reserved.

# Install Ant CPPTASKS

## ■ Hudson - Ant







# Hudson Setting

## ■ Subversion

**Source Code Management**

None  
 CVS  
 Subversion

Modules

Repository URL	<input type="text" value="https://b23c41a2f49947c:8080/svn/CTIP_FOR_C_GO"/> <a href="#">Update credentials</a>	
Local module directory (optional)	<input type="text" value="."/>	
Repository depth option	<input type="text" value="infinity"/>	
Ignore externals option	<input type="checkbox"/>	

Check-out Strategy   
Use 'svn update' whenever possible, making the build faster. But this causes the artifacts from the previous build to remain when a new build starts.

Repository browser

# Install Ant CPPTASKS

## ■ Ant

**Build**

**Invoke Ant**

Ant Version

Targets

Build File

Properties

Java Options



# Ant Build Script

## ■ Compiler - MSVC

```
<?xml version="1.0" encoding="utf-8"?>
<project name="hello" default="compile">
  <property environment="env"/>
  <target name="compile">
    <exec executable="cmd" failonerror="true">
      <arg value="/C"/>
      <arg value="vsvars32.bat"/>
      <arg value="&&"/>
      <arg value="ant.bat"/>
      <arg value="-f"/>
      <arg value="cpp-build.xml"/>
    </exec>
  </target>
</project>
```

# Ant Build Script

```
<?xml version="1.0" encoding="utf-8"?>
<project name="hello" default="compile" xmlns:cpptasks="antlib:net.sf.antcontrib.cpptasks">
  <property name="link1" value="lib/libcunit.a"/>
  <property name="link2" value="lib/libcunit.la"/>

  <target name="compile">

    <cpptasks:cc subsystem="console" name="msvc" link="static" multithreaded="true" exceptions="true">
      <fileset dir="." includes="*.c"/>
      <linker name="msvc">

        <libset libs="${link1}"/>
        <libset libs="${link2}"/>
      </linker>
    </cpptasks:cc>
  </target>
</project>
```

# Hudson Build

Hudson \* CTIP\_FOR\_C\_GO #10 Console [Hudson]

**Hudson**

Hudson \* CTIP\_FOR\_C\_GO #10

- 프로젝트로 돌아가기
- 상단
- 변경사항
- 콘솔 출력
- Configure
- Tag this build
- 이전 빌드

**Executed Ant Targets**

- compile


## 콘솔 출력

Started by user anonymous  
Updating [https://b23c41a2f49947c:8080/svn/CTIP\\_FOR\\_C\\_GO](https://b23c41a2f49947c:8080/svn/CTIP_FOR_C_GO) revision: 2011. 6. 3 오전 6:45:31 depth:infinity ignoreExternals: false  
At revision 4  
no change for [https://b23c41a2f49947c:8080/svn/CTIP\\_FOR\\_C\\_GO](https://b23c41a2f49947c:8080/svn/CTIP_FOR_C_GO) since the previous build  
[CTIP\_FOR\_C] \$ cmd.exe /C ""D:\Documents and Settings\UpdatatusUser\.hudson\tools\my\_ant\bin\ant.bat" -file build.xml && exit %ERRORLEVEL%%""  
Buildfile: D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP\_FOR\_C\_GO\workspace\CTIP\_FOR\_C\build.xml

compile:

```
[exec] Setting environment for using Microsoft Visual Studio 2010 x86 tools.
[exec] Buildfile: D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\cpp-build.xml
[exec]
[exec] compile:
[exec] [cpptasks:cc] 2 total files to be compiled.
[exec] [cpptasks:cc] test_c.c
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(13) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(20) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(34) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(48) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(73) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(79) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(100) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(112) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(142) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(148) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(162) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(176) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(200) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(206) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(228) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(240) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(292) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(297) : warning C4047: '=': 'int' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] D:\Documents and Settings\UpdatatusUser\.hudson\jobs\CTIP_FOR_C_GO\workspace\CTIP_FOR_C\test_c.c(298) : warning C4047: '=': 'char' differs in levels of indirection from 'void **
[exec] [cpptasks:cc] cunit.c
[exec] [cpptasks:cc] Generating Code...
[exec]
[exec] BUILD SUCCESSFUL
[exec] Total time: 1 second
```

BUILD SUCCESSFUL  
Total time: 2 seconds  
Finished: SUCCESS



# Chapter 2. Testing

# Target Project

- Digital Encoding
  - NRZL (Non-return-to-zero)
  - NRZI (Non-return-to-zero, inverted)
  - Manchester
  - DifMan

# Target Project

- NRZL (Non-return-to-zero)

- Input : 10110101



- NRZI (Non-return-to-zero, inverted)

- Input : 10110101



# Target Project

- Manchester

- Input : 10110101



- DifMan

- Input : 10110101



# Test Case

- NRZL & NRZI

Test Case - Input
00
01
10
11

- Manchester & DifMan

Test Case - Input
000
001
010
011
100
101
110
111



# Test C File

```
//NRGL Encoding
⊕ int NRZL(char a[100], char b[100]) { ... }

//NRZI Encoding
⊕ int NRZI(char a[100], char b[100]) { ... }

// Manchester Encoding
⊕ int Manchester(char a[100], char b[100]) { ... }

//Differential Manchester
⊕ int DifMan(char a[100], char b[100]) { ... }
```

```
#include "CUnit/Console.h"
#include "CUnit/CUnit.h"

⊕ void test_NRZL_001() { ... }
⊕ void test_NRZL_002() { ... }
⊕ void test_NRZL_003() { ... }
⊕ void test_NRZL_004() { ... }

⊕ void test_NRZI_001() { ... }
⊕ void test_NRZI_002() { ... }
⊕ void test_NRZI_003() { ... }
⊕ void test_NRZI_004() { ... }

⊕ void test_MANCHESTER_001() { ... }
⊕ void test_MANCHESTER_002() { ... }
⊕ void test_MANCHESTER_003() { ... }
⊕ void test_MANCHESTER_004() { ... }
⊕ void test_MANCHESTER_005() { ... }
⊕ void test_MANCHESTER_006() { ... }
⊕ void test_MANCHESTER_007() { ... }
⊕ void test_MANCHESTER_008() { ... }

⊕ void test_DIFMAN_001() { ... }
⊕ void test_DIFMAN_002() { ... }
⊕ void test_DIFMAN_003() { ... }
⊕ void test_DIFMAN_004() { ... }
⊕ void test_DIFMAN_005() { ... }
⊕ void test_DIFMAN_006() { ... }
⊕ void test_DIFMAN_007() { ... }
⊕ void test_DIFMAN_008() { ... }
```

# Test C File

```
int main(void)
{
    CU_pSuite NRZL_suite, NRZI_suite, MANCHESTER_suite, DIFMAN_suite;

    CU_initialize_registry();

    NRZL_suite = CU_add_suite("NRZL_TEST", NULL, NULL);
    CU_add_test(NRZL_suite, "NRZL_TEST_01", test_NRZL_001);
    CU_add_test(NRZL_suite, "NRZL_TEST_02", test_NRZL_002);
    CU_add_test(NRZL_suite, "NRZL_TEST_03", test_NRZL_003);
    CU_add_test(NRZL_suite, "NRZL_TEST_04", test_NRZL_004);

    NRZI_suite = CU_add_suite("NRZI_TEST", NULL, NULL);
    CU_add_test(NRZI_suite, "NRZI_TEST_01", test_NRZI_001);
    CU_add_test(NRZI_suite, "NRZI_TEST_02", test_NRZI_002);
    CU_add_test(NRZI_suite, "NRZI_TEST_03", test_NRZI_003);
    CU_add_test(NRZI_suite, "NRZI_TEST_04", test_NRZI_004);

    MANCHESTER_suite = CU_add_suite("MANCHESTER_TEST", NULL, NULL);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_01", test_MANCHESTER_001);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_02", test_MANCHESTER_002);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_03", test_MANCHESTER_003);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_04", test_MANCHESTER_004);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_05", test_MANCHESTER_005);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_06", test_MANCHESTER_006);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_07", test_MANCHESTER_007);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_08", test_MANCHESTER_008);

    DIFMAN_suite = CU_add_suite("DIFMAN_TEST", NULL, NULL);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_01", test_DIFMAN_001);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_02", test_DIFMAN_002);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_03", test_DIFMAN_003);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_04", test_DIFMAN_004);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_05", test_DIFMAN_005);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_06", test_DIFMAN_006);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_07", test_DIFMAN_007);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_08", test_DIFMAN_008);

    CU_console_run_tests();
    CU_cleanup_registry();

    return 0;
}
```

- CU\_initialize\_registry()
- CU\_add\_suite()
- CU\_add\_test()
- CU\_console\_run\_tests()
- CU\_cleanup\_registry()

# Console Testing

```
WolFire@b23c41a2f49947c /home/CUnit-2.1-2/Examples
$ gcc -I/usr/local/include/CUnit -L/usr/local/lib test.c -lcunit -o test
```

```
WolFire@b23c41a2f49947c /home/CUnit-2.1-2/Examples
$ ./test

      CUnit - A Unit testing framework for C - Version 2.1-2
      http://cunit.sourceforge.net/

***** CUNIT CONSOLE - MAIN MENU *****
(R)un (S)elect (L)ist (A)ctivate (F)ailures (O)ptions (H)elp (Q)uit
Enter command: _
```

# Console Testing

```
Running Suite : NRZL_TEST
  Running Test : NRZL_TEST_01
  Running Test : NRZL_TEST_02
  Running Test : NRZL_TEST_03
  Running Test : NRZL_TEST_04
Running Suite : NRZI_TEST
  Running Test : NRZI_TEST_01
  Running Test : NRZI_TEST_02
  Running Test : NRZI_TEST_03
  Running Test : NRZI_TEST_04
Running Suite : MANCHESTER_TEST
  Running Test : MANCHESTER_TEST_01
  Running Test : MANCHESTER_TEST_02
  Running Test : MANCHESTER_TEST_03
  Running Test : MANCHESTER_TEST_04
  Running Test : MANCHESTER_TEST_05
  Running Test : MANCHESTER_TEST_06
  Running Test : MANCHESTER_TEST_07
  Running Test : MANCHESTER_TEST_08
Running Suite : DIFMAN_TEST
  Running Test : DIFMAN_TEST_01
  Running Test : DIFMAN_TEST_02
  Running Test : DIFMAN_TEST_03
  Running Test : DIFMAN_TEST_04
  Running Test : DIFMAN_TEST_05
  Running Test : DIFMAN_TEST_06
  Running Test : DIFMAN_TEST_07
  Running Test : DIFMAN_TEST_08

Run Summary:
  Type      Total   Ran  Passed  Failed  Inactive
  suites     4     4    n/a     0       0
  tests    24    24    24     0       0
  asserts   64    64    64     0       n/a

Elapsed time = 0.000 seconds

***** CUNIT CONSOLE - MAIN MENU *****
(R)un (S)elect (L)ist (A)ctivate (F)ailures (O)ptions (H)elp (Q)uit
Enter command: _
```

# Test C File

```
#include "CUnit/Automated.h"
#include "CUnit/CUnit.h"

int main(void)
{
    CU_pSuite NRZL_suite, NRZI_suite, MANCHESTER_suite, DIFMAN_suite;

    CU_initialize_registry();

    NRZL_suite = CU_add_suite("NRZL_TEST", NULL, NULL);
    CU_add_test(NRZL_suite, "NRZL_TEST_01", test_NRZL_001);
    CU_add_test(NRZL_suite, "NRZL_TEST_02", test_NRZL_002);
    CU_add_test(NRZL_suite, "NRZL_TEST_03", test_NRZL_003);
    CU_add_test(NRZL_suite, "NRZL_TEST_04", test_NRZL_004);

    NRZI_suite = CU_add_suite("NRZI_TEST", NULL, NULL);
    CU_add_test(NRZI_suite, "NRZI_TEST_01", test_NRZI_001);
    CU_add_test(NRZI_suite, "NRZI_TEST_02", test_NRZI_002);
    CU_add_test(NRZI_suite, "NRZI_TEST_03", test_NRZI_003);
    CU_add_test(NRZI_suite, "NRZI_TEST_04", test_NRZI_004);

    MANCHESTER_suite = CU_add_suite("MANCHESTER_TEST", NULL, NULL);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_01", test_MANCHESTER_001);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_02", test_MANCHESTER_002);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_03", test_MANCHESTER_003);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_04", test_MANCHESTER_004);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_05", test_MANCHESTER_005);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_06", test_MANCHESTER_006);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_07", test_MANCHESTER_007);
    CU_add_test(MANCHESTER_suite, "MANCHESTER_TEST_08", test_MANCHESTER_008);

    DIFMAN_suite = CU_add_suite("DIFMAN_TEST", NULL, NULL);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_01", test_DIFMAN_001);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_02", test_DIFMAN_002);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_03", test_DIFMAN_003);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_04", test_DIFMAN_004);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_05", test_DIFMAN_005);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_06", test_DIFMAN_006);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_07", test_DIFMAN_007);
    CU_add_test(DIFMAN_suite, "DIFMAN_TEST_08", test_DIFMAN_008);

    CU_automated_run_tests();
    CU_list_tests_to_file();
    CU_set_output_filename("Result.xml");
    CU_cleanup_registry();

    return 0;
}
```

- CU\_initialize\_registry()
- CU\_add\_suite()
- CU\_add\_test()
- CU\_automated\_run\_tests()
- CU\_list\_tests\_to\_file()
- CU\_set\_output\_filename()
- CU\_cleanup\_registry()

# CUnit XML

## ■ CUnit Result Xml



```
<?xml version="1.0" ?>|
<?xml-stylesheet type="text/xsl" href="CUnit-Run.xsl" ?>
<!DOCTYPE CUNIT_TEST_RUN_REPORT SYSTEM "CUnit-Run.dtd">
<CUNIT_TEST_RUN_REPORT>
  <CUNIT_HEADER/>
  <CUNIT_RESULT_LISTING>
    <CUNIT_RUN_SUITE>
      <CUNIT_RUN_SUITE_SUCCESS>
        <SUITE_NAME> NRZL_TEST </SUITE_NAME>
        <CUNIT_RUN_TEST_RECORD>
          <CUNIT_RUN_TEST_SUCCESS>
            <TEST_NAME> NRZL_TEST_01 </TEST_NAME>
          </CUNIT_RUN_TEST_SUCCESS>
        </CUNIT_RUN_TEST_RECORD>
        <CUNIT_RUN_TEST_RECORD>
          <CUNIT_RUN_TEST_SUCCESS>
            <TEST_NAME> NRZL_TEST_02 </TEST_NAME>
          </CUNIT_RUN_TEST_SUCCESS>
        </CUNIT_RUN_TEST_RECORD>
        <CUNIT_RUN_TEST_RECORD>
          <CUNIT_RUN_TEST_SUCCESS>
            <TEST_NAME> NRZL_TEST_03 </TEST_NAME>
          </CUNIT_RUN_TEST_SUCCESS>
        </CUNIT_RUN_TEST_RECORD>
        <CUNIT_RUN_TEST_RECORD>
          <CUNIT_RUN_TEST_SUCCESS>
            <TEST_NAME> NRZL_TEST_04 </TEST_NAME>
          </CUNIT_RUN_TEST_SUCCESS>
        </CUNIT_RUN_TEST_RECORD>
      </CUNIT_RUN_SUITE_SUCCESS>
    </CUNIT_RUN_SUITE>
    <CUNIT_RUN_SUITE>
      <CUNIT_RUN_SUITE_SUCCESS>
        <SUITE_NAME> NRZI_TEST </SUITE_NAME>
        <CUNIT_RUN_TEST_RECORD>
          <CUNIT_RUN_TEST_SUCCESS>
            <TEST_NAME> NRZI_TEST_01 </TEST_NAME>
          </CUNIT_RUN_TEST_SUCCESS>
        </CUNIT_RUN_TEST_RECORD>
        <CUNIT_RUN_TEST_RECORD>
          <CUNIT_RUN_TEST_SUCCESS>
            <TEST_NAME> NRZI_TEST_02 </TEST_NAME>
          </CUNIT_RUN_TEST_SUCCESS>
        </CUNIT_RUN_TEST_RECORD>
      </CUNIT_RUN_SUITE_SUCCESS>
    </CUNIT_RUN_SUITE>
  </CUNIT_RESULT_LISTING>
</CUNIT_TEST_RUN_REPORT>
```

# CUnit To JUnit



```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
  <xsl:output method="xml" indent="yes" />

  <xsl:param name="suiteName" />

  <xsl:variable name="cunitCount" select="count(//CUNIT_RUN_TEST_RECORD)"/>
  <xsl:variable name="cunitFailureCount" select="count(//CUNIT_RUN_TEST_FAILURE)"/>

  <xsl:template match="/">
    <testsuites>
      <xsl:attribute name="errors">0</xsl:attribute>
      <xsl:attribute name="failures">
        <xsl:value-of select="$cunitFailureCount"/>
      </xsl:attribute>
      <xsl:attribute name="tests">
        <xsl:value-of select="$cunitCount"/>
      </xsl:attribute>
      <xsl:attribute name="name">
        <xsl:value-of select="$suiteName" />
      </xsl:attribute>
      <xsl:apply-templates />
    </testsuites>
  </xsl:template>

  <xsl:template match="/CUNIT_TEST_RUN_REPORT/CUNIT_RESULT_LISTING">
    <xsl:for-each select="CUNIT_RUN_SUITE/CUNIT_RUN_SUITE_SUCCESS">
      <xsl:variable name="localCunitFailureCount" select="count(CUNIT_RUN_TEST_RECORD/CUNIT_RUN_TEST_FAILURE)"/>
      <xsl:variable name="localCunitCount" select="count(CUNIT_RUN_TEST_RECORD)"/>
      <xsl:variable name="sn" select="normalize-space(SUITE_NAME/text())"/>
      <testsuite>
        <xsl:attribute name="errors">0</xsl:attribute>
        <xsl:attribute name="failures">
          <xsl:value-of select="$localCunitFailureCount"/>
        </xsl:attribute>
        <xsl:attribute name="tests">
          <xsl:value-of select="$localCunitCount"/>
        </xsl:attribute>
        <xsl:attribute name="name">
          <xsl:value-of select="$sn"/>
        </xsl:attribute>
        <xsl:apply-templates select="CUNIT_RUN_TEST_RECORD" />
      </testsuite>
    </xsl:for-each>
  </xsl:template>
</xsl:stylesheet>
```

# XSLTPROC

- <http://xmlsoft.org/XSLT/index.html>
- Used Cygwin Plug-in

```
WolFire@b23c41a2f49947c ~  
$ xsltproc --stringparam suiteName testall -o out.xml cunit-to-junit.xsl CUnitAutomated-Results.xml
```



# JUnit Result Report

## ■ Out.xml



out.xml  
XML 문서  
2KB

```
<?xml version="1.0"?>
<testsuites errors="0" failures="0" tests="24" name="testall">
  <testsuite errors="0" failures="0" tests="4" name="NRZL_TEST">
    <testcase classname="" name="NRZL_TEST_01" time="0"/>
    <testcase classname="" name="NRZL_TEST_02" time="0"/>
    <testcase classname="" name="NRZL_TEST_03" time="0"/>
    <testcase classname="" name="NRZL_TEST_04" time="0"/>
  </testsuite>
  <testsuite errors="0" failures="0" tests="4" name="NRZI_TEST">
    <testcase classname="" name="NRZI_TEST_01" time="0"/>
    <testcase classname="" name="NRZI_TEST_02" time="0"/>
    <testcase classname="" name="NRZI_TEST_03" time="0"/>
    <testcase classname="" name="NRZI_TEST_04" time="0"/>
  </testsuite>
  <testsuite errors="0" failures="0" tests="8" name="MANCHESTER_TEST">
    <testcase classname="" name="MANCHESTER_TEST_01" time="0"/>
    <testcase classname="" name="MANCHESTER_TEST_02" time="0"/>
    <testcase classname="" name="MANCHESTER_TEST_03" time="0"/>
    <testcase classname="" name="MANCHESTER_TEST_04" time="0"/>
    <testcase classname="" name="MANCHESTER_TEST_05" time="0"/>
    <testcase classname="" name="MANCHESTER_TEST_06" time="0"/>
    <testcase classname="" name="MANCHESTER_TEST_07" time="0"/>
    <testcase classname="" name="MANCHESTER_TEST_08" time="0"/>
  </testsuite>
  <testsuite errors="0" failures="0" tests="8" name="DIFMAN_TEST">
    <testcase classname="" name="DIFMAN_TEST_01" time="0"/>
    <testcase classname="" name="DIFMAN_TEST_02" time="0"/>
    <testcase classname="" name="DIFMAN_TEST_03" time="0"/>
    <testcase classname="" name="DIFMAN_TEST_04" time="0"/>
    <testcase classname="" name="DIFMAN_TEST_05" time="0"/>
    <testcase classname="" name="DIFMAN_TEST_06" time="0"/>
    <testcase classname="" name="DIFMAN_TEST_07" time="0"/>
    <testcase classname="" name="DIFMAN_TEST_08" time="0"/>
  </testsuite>
</testsuites>
```

# JUnit Result Report

```
<?xml version="1.0" encoding="utf-8"?>
<project name="hello" default="compile" xmlns:cpptasks="antlib:net.sf.antcontrib.cpptasks">
  <property name="link1" value="lib/libcunit.a"/>
  <property name="link2" value="liblibcunit.la"/>
  <target name="compile">
    <cpptasks:cc subsystem="console" name="msvc" multithreaded="true" exceptions="true" outtype="executable" outfile="test.exe">
      <fileset dir="." includes="*.c"/>
    </cpptasks:cc>
  </target>
</project>
```

- Output ... test.exe.lib
  - I don't know Why...