# Tutorial - Using Version Control in Altium Designer

Altium Designer supports Subversion (SVN), Concurrent Versions System (CVS) and other version control systems that support the Microsoft® standard SCC Interface. Because it has direct support for SVN it gives access to many of the standard SVN commands, including the ability to create a repository, commit/update files, as well as being able to access file revisions from within Altium Designer. This works well with the schematic and PCB comparison features, making it easy to quickly compare and identify differences between two revisions of a schematic or two revisions of a PCB.

If you are new to version control systems and are wondering where to start, read the article Understanding Version Control, an Introduction.

Enabling Version Control

To work directly from within Altium Designer to a Version Control System you must first enable the appropriate options:

1. Select **DXP»Preferences** to open the *Preferences* dialog,
2. on the **Version Control - General**page, select the appropriate provider.
   - Choose the SCCI - Source Code Control Interface option if you have an SCC Interface compliant version control system, such as Starteam.
   - Choose the CVS - Concurrent Versions System option if you are using the Concurrent Versions System version control system.
   - Choose the SVN - Subversion option if you are using the Subversion version control system.
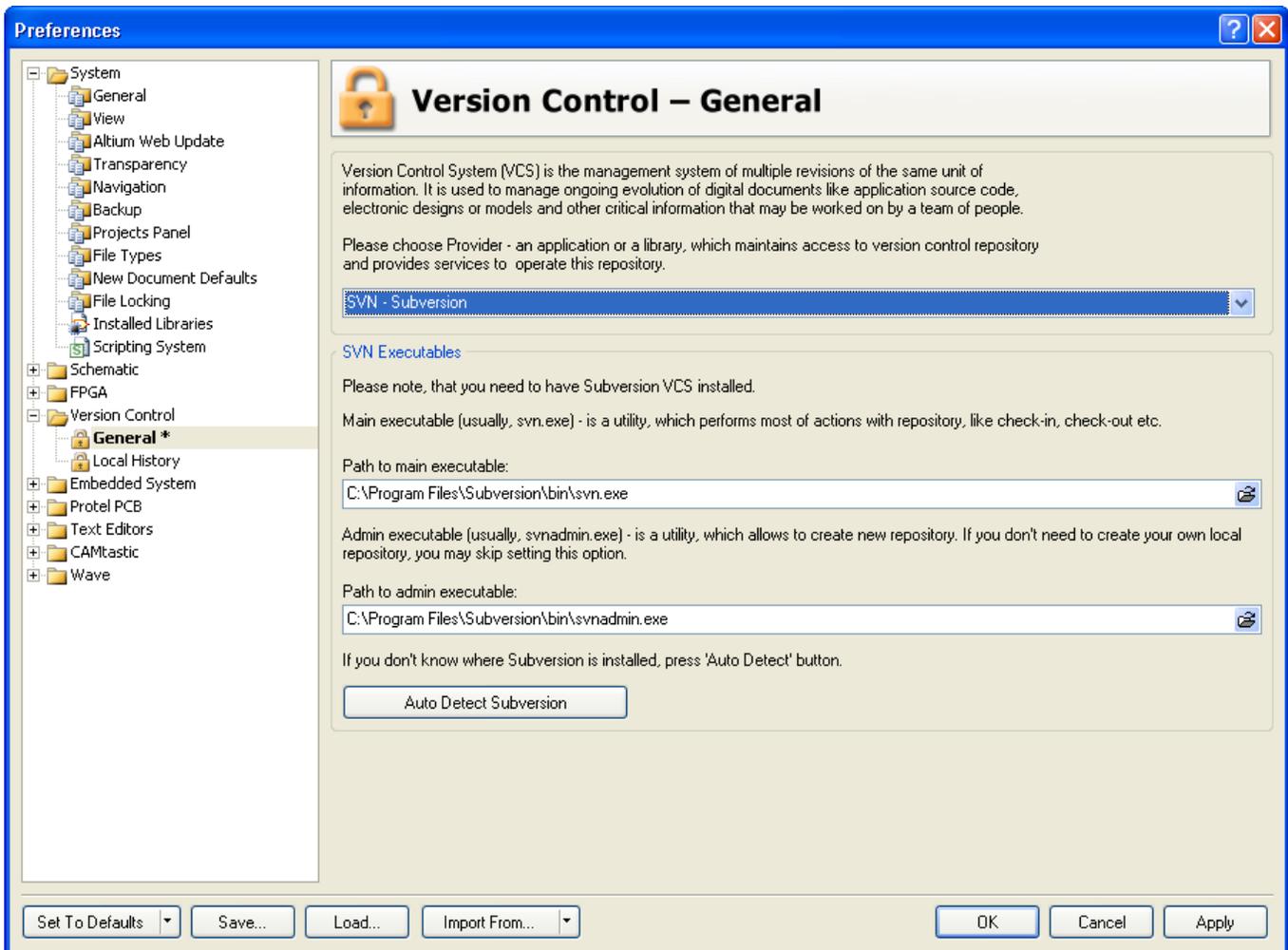
Version Control - General preferences - choosing SVN as the Version Control provider

For Subversion you will need to additionally:

1. Specify the path to the main executable, usually svn.exe. This will then allow Altium Designer to perform most of Subversions repository actions, such as commit and update.
2. Specify the path to the admin executable, usually svnadmin.exe.This will then allow Altium Designer to create a repository. If you already have a repository you may skip this option. Restart Altium Designer to confirm your choice of version control system.
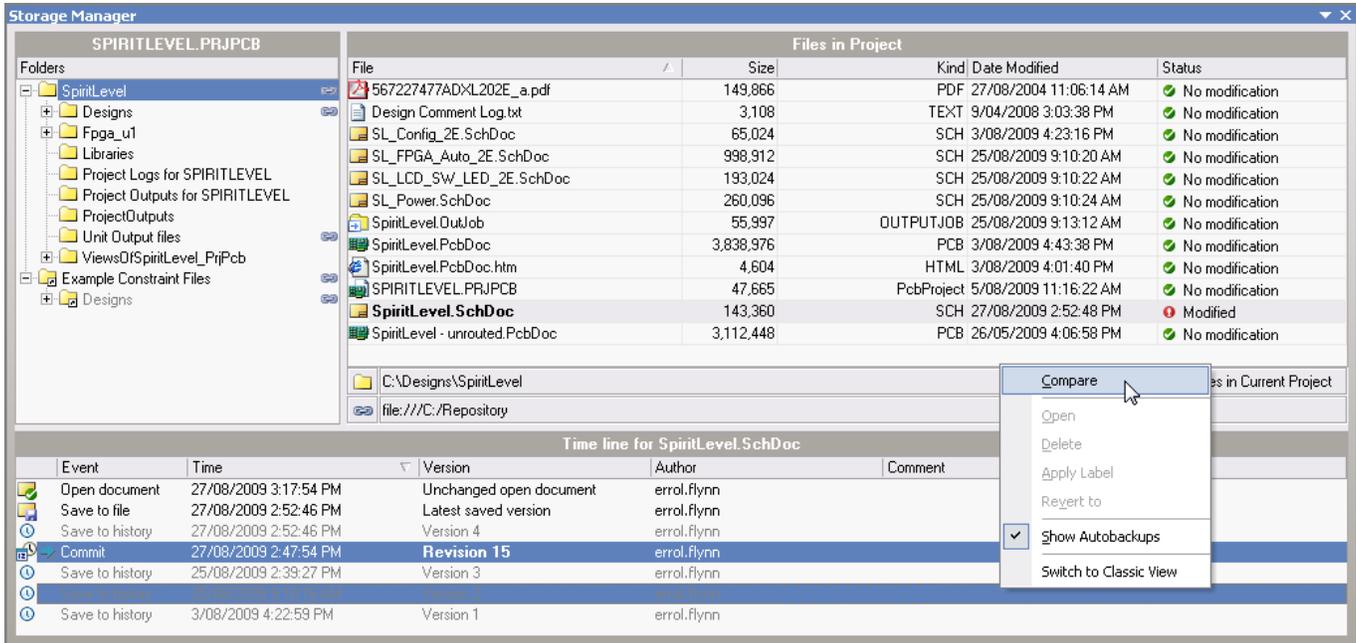
> ⚠ Note that it is necessary to have Subversion 1.5.0 or later installed in order for the SVN commands to work correctly from Altium Designer.

The Storage Manager panel

Main Article: Storage Manager Panel

All VCS-related actions are performed through the Storage Manager panel, you can display it by clicking the System button at the bottom right of the workspace and choosing the Storage Manager entry from the menu. The basic approach is to select the file(s) of interest, then choose the required command in the right-click menu.

Storage Manager

SPIRITLEVEL.PRJPCB

Folders

- SpiritLevel
  - Designs
  - Fpga_u1
  - Libraries
  - Project Logs for SPIRITLEVEL
  - Project Outputs for SPIRITLEVEL
  - ProjectOutputs
  - Unit Output files
  - ViewsOfSpiritLevel_PrjPcb
- Example Constraint Files
  - Designs

Files in Project

File	Size	Kind	Date Modified	Status
567227477ADXL202E_a.pdf	149,866	PDF	27/08/2004 11:06:14 AM	No modification
Design Comment Log.txt	3,108	TEXT	9/04/2008 3:03:38 PM	No modification
SL_Config_2E.SchDoc	65,024	SCH	3/08/2009 4:23:16 PM	No modification
SL_FPGA_Auto_2E.SchDoc	998,912	SCH	25/08/2009 9:10:20 AM	No modification
SL_LCD_SW_LED_2E.SchDoc	193,024	SCH	25/08/2009 9:10:22 AM	No modification
SL_Power.SchDoc	260,096	SCH	25/08/2009 9:10:24 AM	No modification
SpiritLevel.OutJob	55,997	OUTPUTJOB	25/08/2009 9:13:12 AM	No modification
SpiritLevel.PcbDoc	3,838,976	PCB	3/08/2009 4:43:38 PM	No modification
SpiritLevel.PcbDoc.htm	4,604	HTML	3/08/2009 4:01:40 PM	No modification
SPIRITLEVEL.PRJPCB	47,665	PcbProject	5/08/2009 11:16:22 AM	No modification
SpiritLevel.SchDoc	143,360	SCH	27/08/2009 2:52:48 PM	Modified
SpiritLevel - unrouted.PcbDoc	3,112,448	PCB	26/05/2009 4:06:58 PM	No modification

C:\Designs\SpiritLevel

file:///C:/Repository

Compare
Open
Delete
Apply Label
Revert to
✓ Show Autobackups
Switch to Classic View

...es in Current Project

Time line for SpiritLevel.SchDoc

	Event	Time	Version	Author	Comment
	Open document	27/08/2009 3:17:54 PM	Unchanged open document	errol.flynn	
	Save to file	27/08/2009 2:52:46 PM	Latest saved version	errol.flynn	
	Save to history	27/08/2009 2:52:46 PM	Version 4	errol.flynn	
	Commit	27/08/2009 2:47:54 PM	**Revision 15**	errol.flynn	
	Save to history	25/08/2009 2:39:27 PM	Version 3	errol.flynn	
	Save to history	3/08/2009 4:22:59 PM	Version 1	errol.flynn	

All VCS related tasks can be performed through the Storage Manager panel. Note that in this figure the lower region of the panel is configured to be in Timeline view.

The Projects Panel

Main Article: Projects Panel

The current VCS status of each file that is under version control is displayed next to the file's name in the Projects panel. The status is dependent on which VCS method you are using, and it can be one of the following:
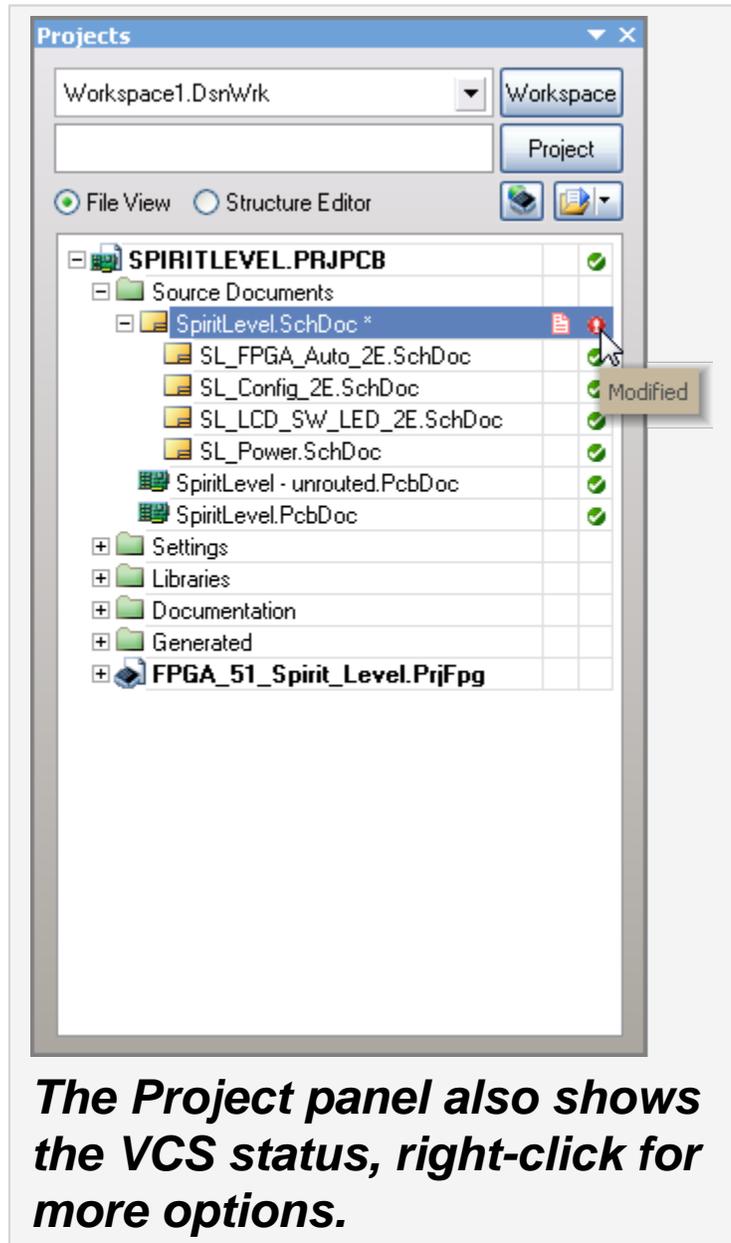
SCCI

- [blank] Version control disabled – file has not been added to the VCS.
- [blank] Not in version control - file has not been added to the VCS.
- No modification - The file is checked in to the repository, and your local copy is up to date. Depending on the provider, your local copy may be marked read-only so that it cannot be modified until you Check Out.
- Out of date- The file is checked in to the repository, but your local copy is out of date. Use Get Latest Version to update your local copy.
- Checked out exclusively by me – You have checked out the file exclusively, but there are no changes to check in. Use Undo Check Out when you are finished with the file and want to allow other people to check it out.
- Modified exclusively by me – You have checked out the file exclusively and modified it. Use Check In to check your changes into the repository or Undo Check Out to discard them.
- Locked exclusively – Someone else has checked out the file exclusively. You cannot check out the file until he or she selects Undo Check Out. Depending on the provider, your local copy may be marked read-only so that it cannot be modified.
- Locked exclusively by me - You have somehow managed to check out the file exclusively somewhere

else (perhaps in another directory). Refer to the documentation for your Source Code Control plug-in on how to remove the lock.

CVS and Subversion

- [blank] Version control disabled – file has not been added to the VCS.
- [blank] Not in version control - file has not been added to the VCS.
- ✔ No modification – The file is checked in to the repository, and your local copy is up to date. Depending on the provider, your local copy may be marked read-only so that it cannot be modified until you Check Out.
- ❓ Out of date – The file is checked in to the repository, but your local copy is out of date. Use Get Latest Version to update your local copy.
- ❗ Modified – the checked out file is locally modified by you. Save the file and check in / commit the file to the repository.
- ⚠ Conflict - the file has been committed by some one else before you had a chance to commit this file.
- ✖ Missing – the file is present in the repository but not in your working folder. Use Restore menu item from the menu by right clicking to obtain a copy from the repository in your working folder.

You can right click and select Refresh Status to refresh the current VCS status of each file on the Projects panel. A document that is not in the version control database will not display an icon.

The Project panel also shows the VCS status, right-click for more options.

Using Subversion

Before using version control, the project files must be recognized by both the VCS and Altium Designer as being under version control. This process can be different for the different VCS methods, so we will demonstrate how to do this with Subversion.

Creating a Repository

Subversion saves its version control information in a central repository. The repository stores information in a hierarchy of files and directories, referred to as a file tree. If you do not already have a repository you will need to create one.

To create a repository:

1. Display the Storage Manager panel
2. Right-click and select Create Repository
3. Specify a directory to contain the Subversion repository in the dialog shown below. Note the Repository Type option, unless you are familiar with Berkeley databases it is recommended to use the Native Filesystem option.
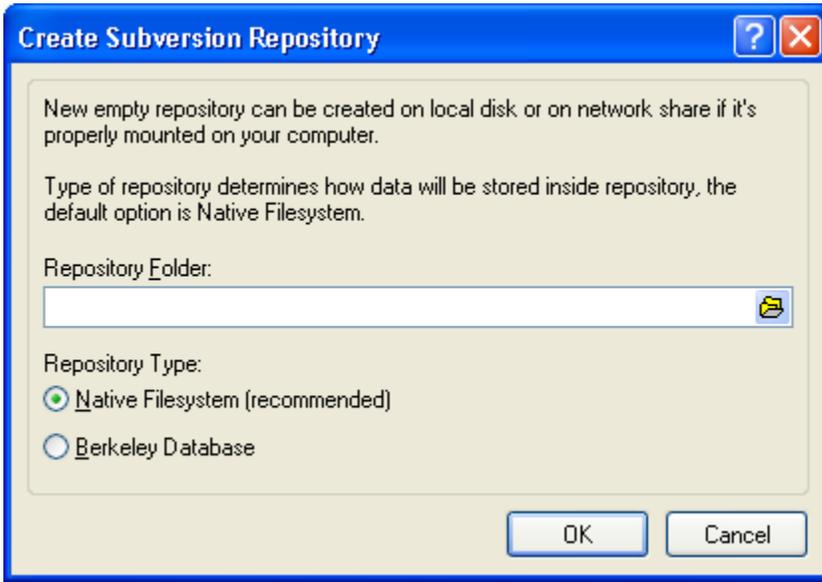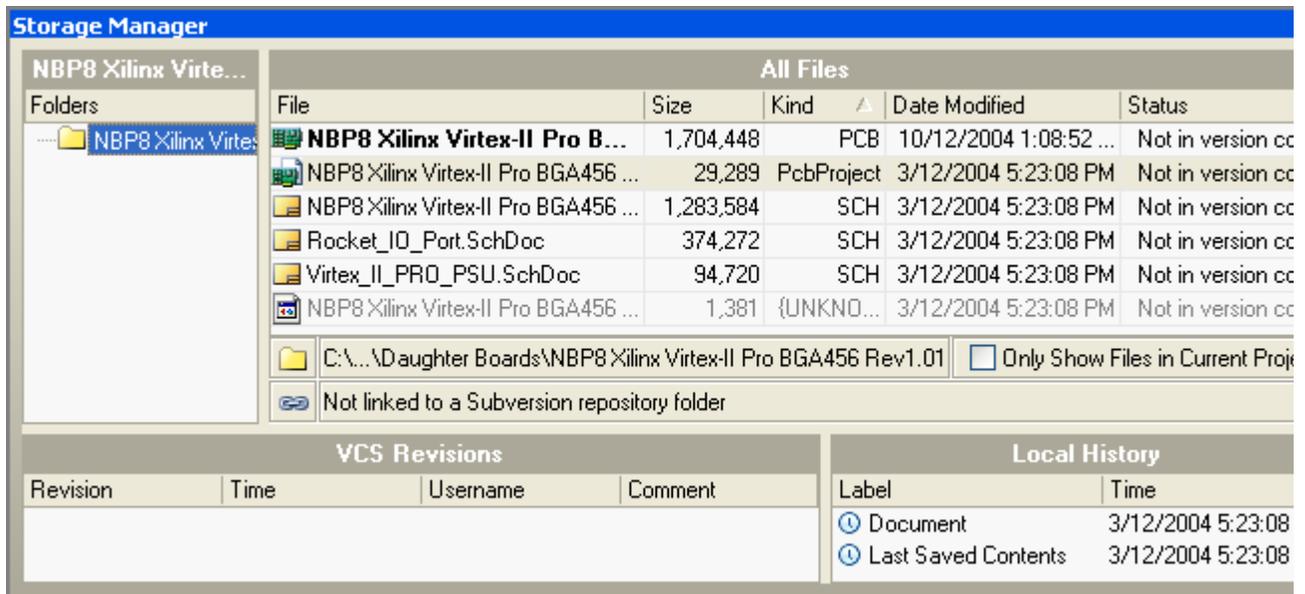

Create the SVN repository from within Altium Designer.

Adding a directory to the Repository

Subversion monitors changes to the files in a specified directory. These changes are saved in the repository. The next step is deciding which directory you would like to monitor with Subversion.

1. Open a free file or project
2. Display the Storage Manager panel.

All VCS actions can be performed through the Storage Manager panel, via the right-click menu.

3. You will see the directory structure of the project/file that you have selected in the Folders section of the Storage Manager panel. Select a directory. Note that Altium Designer will not automatically monitor sub-directories, you will need to specify each directory.
4. Select Link Folder to Repository folder from the right-click menu on the Storage Manager panel.
5. This will open the SVN Link Setup dialog which will allow you to link the directory to the Subversion repository.
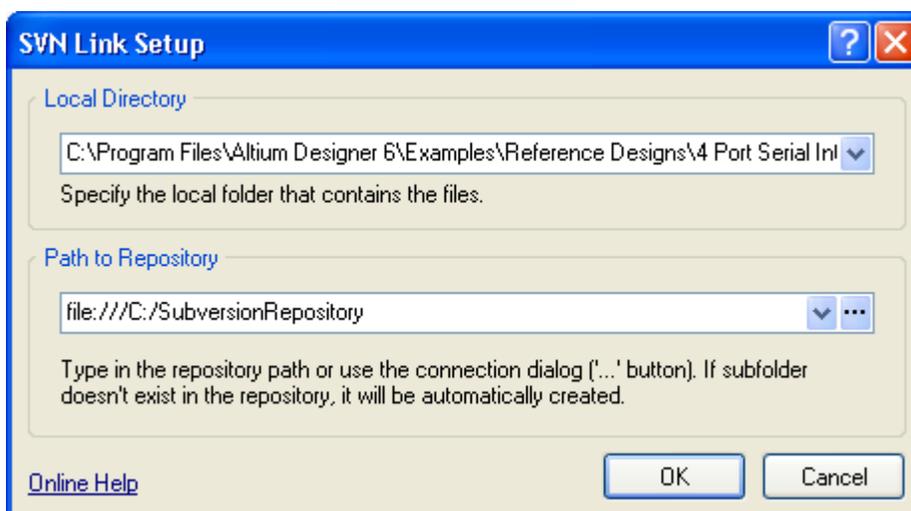
Configure the working directory and the repository location.

6. Confirm the Local Directory is the directory you have selected in Step 3 and that the Path To Repository specifies which Subversion repository you want to use. Then click Ok.

This directory is now being monitored by Subversion. This is indicated by the chain icon next to the directory name in the Storage Manager Panel, as shown in the figure below.
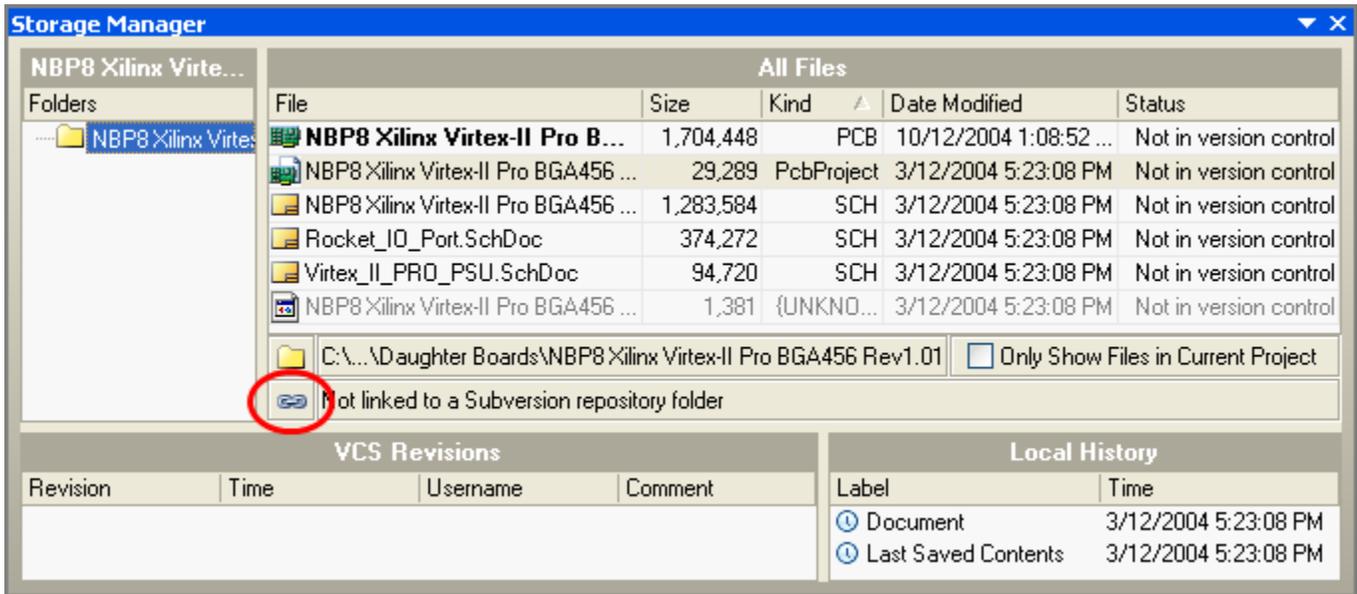
Adding files to the Repository

After adding a directory to the Subversion repository, you now need to specify which files in that directory you want to add to the repository. All files in a directory that has just been added to the repository will initially have the status **Not in version control**.

With Subversion you can add files to the repository by:

1. Select a directory which has been added to the repository
2. Select one or more files in the Storage Manager. The option Only Show Files in the current Project controls which files are displayed in the directory.
3. Select Add to Version Control command from the right mouse menu
4. Add a comment to indicate the reason for adding the files, if desired, then click Ok.

After you have added the files to the repository, the status of the files are changed to **No Modification**, as indicated in the figure below.
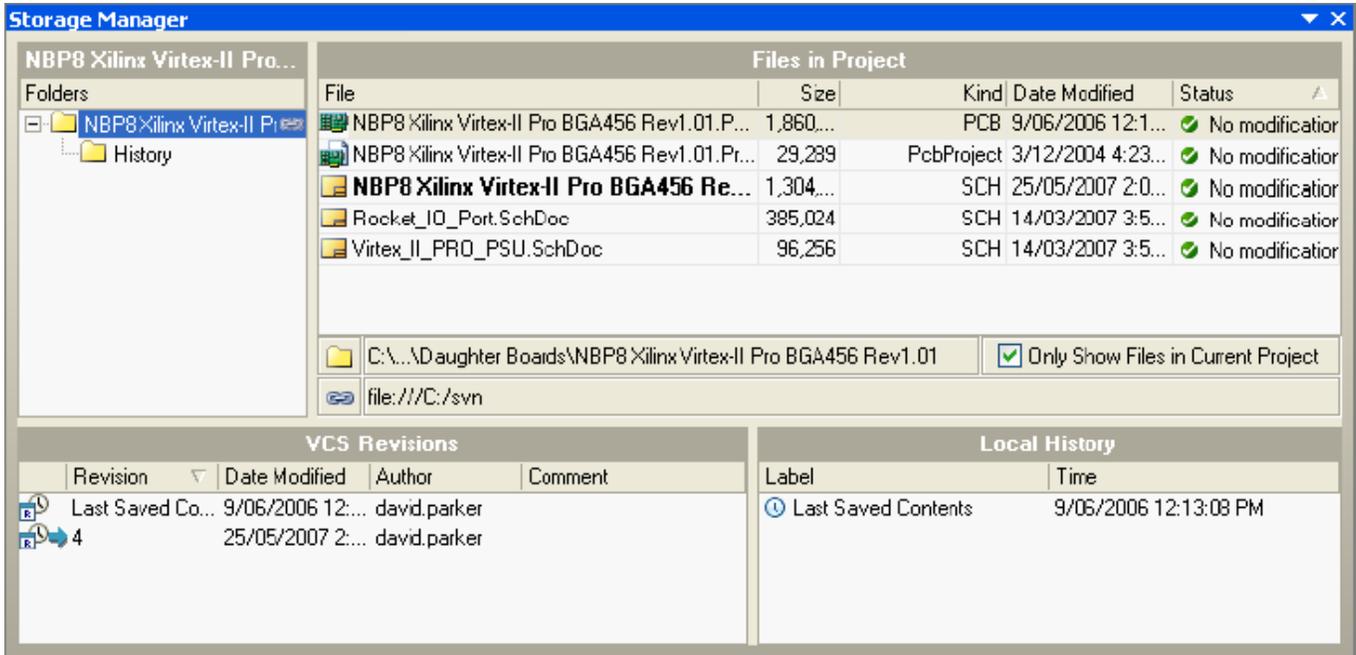
The VCS Revisions section of the Storage Manager panel has a blue arrow ➡ that shows the revision of the file that you currently checked out.
With this version of Altium Designer, files cannot be locked exclusively when being added to the repository with Subversion.

Updating Files in and out of the VCS

Once the project and its files have been added to the VCS you can check them out when you wish to work on them, and then check them back into the VCS when you have completed the work. Your day-to-day work VCS practices will depend on your company's requirements, and to some extent the approach of the VCS. For example, if your VCS favors the lock-modify-unlock model, such as Microsoft's Visual SourceSafe, then your company policy might be that you should always check your work in at the end of the day so that the file is made available to others. On the other hand if you are using CVS or SVN, which are built around the philosophy of multiple check-outs (the unreserved check-out model), then your company policy might be that you can keep design files checked-out in your working folder, and are only required to check-in at major file update points.

Updating a file from the Repository

- When using the CVS or Subversion VCS systems you right-click on the selected file(s) and use the **Update** command to "check out" a working copy of the file from the repository. You can also use the **Update** command to ensure that your working copy includes any modifications made by other users who are working with the file.
- When using an SCC interface-compliant version control system, check-out a file by right-clicking on the file name in the Storage Manager panel and selecting **Check Out** from the context menu.

The VCS keeps track of what is in the repository compared to what exists in your working folder, so when you check-out a file the VCS copies the latest revision of the file from the repository to your working folder (nothing will happen if they are the same revision). Altium Designer supports this further, by disabling the **Update** command in the Storage Manager when the file in the repository is identical to your working copy.

If the file was open in the Altium Designer environment when you executed the **Update** command you should close and reopen the file in order to display and work on the checked-out version of the file.

The Update Status

After updating a file its VCS status is shown in the Storage Manager panel as No Modification. This indicates that the repository and working versions of the file are the same. The figure below shows the status after updating the project files when using CVS or Subversion version control systems.

VCS file status for Subversion

The figure below shows the check-out status for various project files with SourceSafe as the VCS. Since SourceSafe uses the lock-modify-unlock model then the file can be checked out exclusively, or just checked out.

VCS file status for SourceSafe

For the file that is checked out exclusively, another designer will not be able to check-out this file. The VCS will have a mechanism to allow them to get a copy of the file, but the only person that can check-in an updated version of the file is the designer that checked it out exclusively. With this version of Altium Designer, files cannot be locked exclusively when being added to the repository with Subversion.

Committing files into the Repository

When you have finished working on a file, you need to check it back in to the VCS. This process will copy the file from your working folder back into the repository, incrementing the revision number. Note that if the file you want to commit is active (open), it should be saved prior to committing, or else the last saved version of the file will be

checked in to the VCS and not the open file.

To commit the file(s):

1. Right-click on one ore more files you want to commit in the Storage Manager panel and select **Commit**.

If you are using CVS or SVN you will not be allowed to perform a Commit if someone else has committed an update since you checked out your copy of the file. In this case you will be required to perform an Update first. In CVS and SVN language, an Update is the act of applying changes that exist in the repository copy to your working version of the file, once this is done you will be permitted to Commit the file. Since it is not possible to apply the changes from the repository copy of the file onto your copy of the file (because they schematic/PCB files are binary files), the result of an Update will be that CVS/SVN will check-out a copy of the file to your working folder, with a hash (#) character at the start of the filename. Use the difference feature described in the following section to identify any differences and help you decide how the differences should be resolved.

Showing Differences Between Versions

Probably one of the most often used features in a VCS is the comparison, or difference checking tool. Typically the VCS will include an ASCII diff tool, and there are also excellent 3 rd party ASCII diff tools available. As well as being able to compare ASCII files, Altium Designer also includes physical compare tools for schematic files, and for PCB files. You can use this capability to show changes such as a schematic component being moved, or the path of a route being altered.
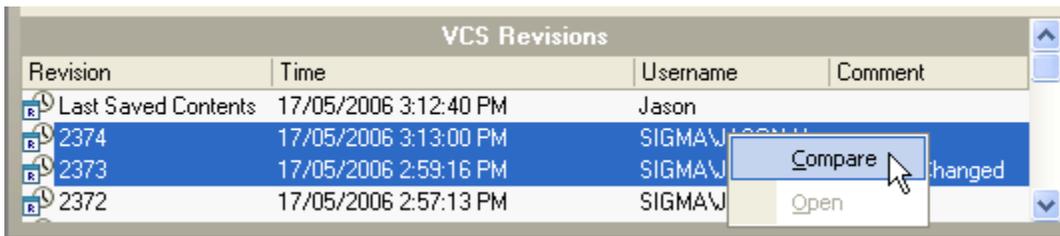
Use the Difference capabilities to quickly identify changes in your schematic and PCB design files

If you are using CVS or SVN as your version control system you can perform a compare directly in the VCS Revisions section of the Storage Manager panel. To do this:

1. Ctrl+click to select each of the 2 revisions,
2. right-click and select **Compare** from the context menu,
3. the 2 files will be opened side-by-side, compared, and all differences will be listed in the Differences panel,
4. double-click on an entry in the Differences panel to examine it on the actual schematic or PCB.

Since the SCC software interface does not support passing a list of revisions to Altium Designer, for any other version control system you will need to:

1. manually check-out the revisions of the files you want to compare,
2. open them both in Altium Designer,
3. select **Show Physical Differences** from the **Projects** menu,
4. enable the **Advanced** mode in the *Choose Documents to Compare* dialog,
5. select 1 document in the left list and 1 in the right list, and click **OK**,
6. the 2 files will be compared and all differences will be listed in the Differences panel,
7. double-click on an entry in the Differences panel to examine it on the actual schematics or PCBs (To view them side-by-side, right click on the document tab and select **Split Vertical**).

Removing files from the VCS

Some VCS systems allow you to remove directories/projects. By removing a directory/project from the VCS, means it will no longer be associated with version control and the link between Altium Designer and the VCS software will be removed. Removing the directory/project alone does not remove all associated project files from your VCS however. They will appear again if the project is added back into the VCS and a refresh is carried out to resynchronize the system (right-click on the project file entry in the Storage Manager panel and choose the Refresh Status command). You will need to use the VCS interface to permanently remove project files from the repository.

Removing a file from the VCS

To remove the selected files from your VCS:

1. Right-click on one or more files that you want to remove in the Storage Manager panel and select **Remove from Version Control**.
2. The status for the removed file will change to an empty box [Not in version control] in the Projects panel.

Removing a directory from the VCS

Directories cannot be removed from the VCS repository from within Altium Designer at this stage.

Refreshing the Status

Should you wish to make sure the status of your files is up to date, use the **Refresh Status** command. This command can be used at any time, but is especially useful when you have performed an action, such as checking in or out, directly in the VCS software.

1. Right-click on the project filename in the Files section of the Storage Manager panel and select **Refresh Status**.
2. The link between the active project in Altium Designer and the project that resides in the VCS is checked, and the status of the project and its related files is refreshed.

The corresponding status is updated both in the Storage Manager panel and in the right-hand box next to each file's name in the Projects panel – providing the **Show VCS status** option is enabled in the associated options for the panel. Access these options on the System – Projects Panel page of the Preferences dialog (**DXP»Preferences**). You can also use the F5 key on the Storage Manager panel to refresh the VCS status.

Showing a File's VCS history

You can view the history of a file that is under version control. If you are using the CVS or Subversion version control systems, the history of the selected file is shown directly in the VCS Revisions, or Time line section of the Storage Manager panel (depending on which View you have opted for in the right-click menu). To review any revision:

1. Select the file, then choose **Open** from the right-click menu. This will open the file in Altium Designer.

If you are using a SCCI version control system, to view the history:

1. Right-click on the file whose VCS history you want in the Storage Manager panel and select Show History.
2. Login to the VCS if required.
3. Depending on the VCS software, you may get a History Option dialog prior to seeing the history of the file, such as the one shown below. Click OK and the history of the selected file inside the VCS will be shown.
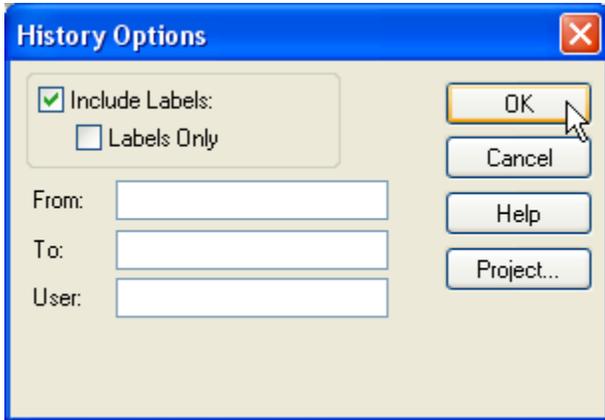
Click OK in the History Options dialog to select the revisions of interest from a list

The information shown will depend on the version control software you are using. Consult your VCS software documentation for more information on these dialogs.

See Also

[Understanding Version Control, an Introduction](#)

[Version Control Terminology](#)

References

SVN community website http://subversion.tigris.org/
SVN online manual http://svnbook.red-bean.com/
CVS community website https://www.cvshome.org/
CVS installation tips http://www.cvsnt.org/wiki/InstallationTips
CVS manual (known as the Cederqvist, after the author) https://www.cvshome.org/docs/manual/
Using and administering CVS http://cvsbook.red-bean.com/cvsbook.html
Alternate CVS download site http://www.cvsnt.com