

Quartus Revision Control Software Support

Technical Brief 54

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Introduction

Engineers use hardware description languages (HDLs) such as VHDL, Verilog HDL, and the Altera Hardware Description Language (AHDL) for creating complex programmable logic device (PLD) designs. Even with advancements in HDLs, complex designs for million-plus-gate devices, such as the APEX™ 20K device family, often require a team of engineers.

Increasing design complexity poses new challenges for team leaders who want to effectively manage large design projects. To meet these challenges, revision control software provides design management solutions, allowing engineers to control and track design changes. This technical brief discusses the advantages of using revision control software and explains how the Quartus™ software integrates with different revision control software programs.

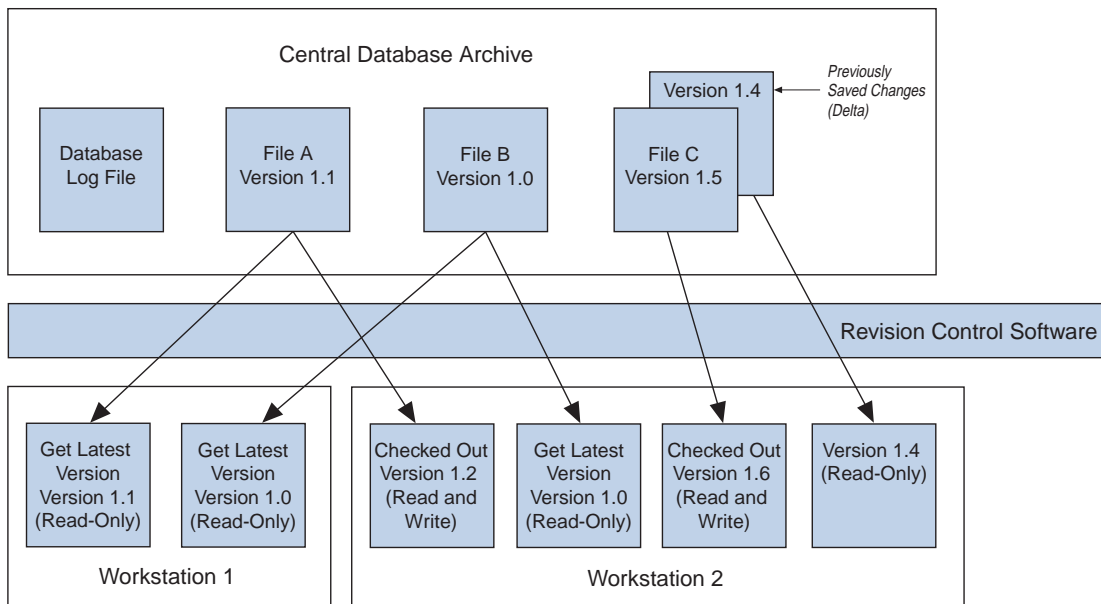
Revision Control Software

Revision control software creates a formal process for tracking changes to a source file. The software saves and archives each successive version of the file and records the changes, along with comments to the source file. Using this information, engineers can analyze and troubleshoot errors in a design file by retrieving previous versions.

Revision control software allows engineers to collaborate more effectively on large projects. Although only one engineer at a time can make changes to the source file, other engineers may simultaneously view read-only copies of the file. A project can be stored in a central location, making it easier to manage the design flow.

Revision control software determines how an engineer can use the design file. An engineer can check out, check in, or retrieve a read-only copy of the design file's latest version. When an engineer checks out a file, the software gives that engineer read and write privileges for the file. However, other engineers can retrieve read-only versions of the design file using the "Get Latest Version" feature, even if changes are currently being made to it. [Figure 1](#) shows how engineers at different workstations might use revision control software to work on the same design project simultaneously.

Figure 1. Revision Control Software File Management Structure



Revision control software provides the following benefits:

- Stores all design files in a central location for easy file management and increased security.
- Establishes a formal method for documenting changes to design files, allowing for more thorough quality control.
- Saves only the changes between file versions instead of saving the entire file, which conserves disk space and decreases file access time.
- Arbitrates design file changes and prevents two engineers from overwriting a single design file at the same time, which increases productivity and minimizes redundancy.
- Allows for easy recovery of previously saved files.

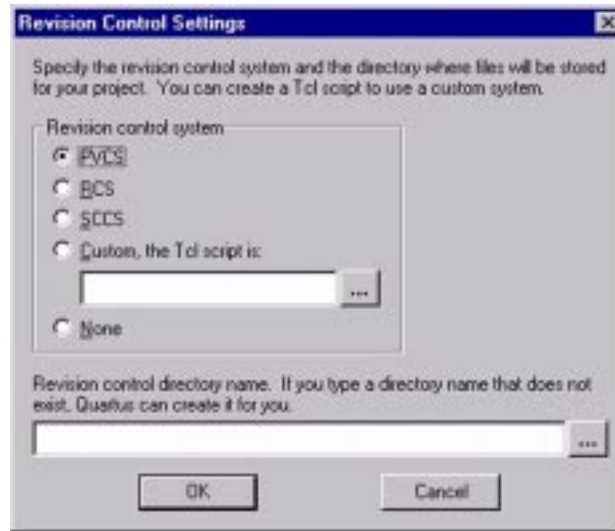
Quartus Support for Revision Control Software

The Quartus software has built-in support for three common revision control software packages: PVCS for the PC platform, and RCS and SCCS for UNIX platforms. The Quartus software also allows engineers to create a custom interface using a Tcl script, which allows the use of other revision control software packages.

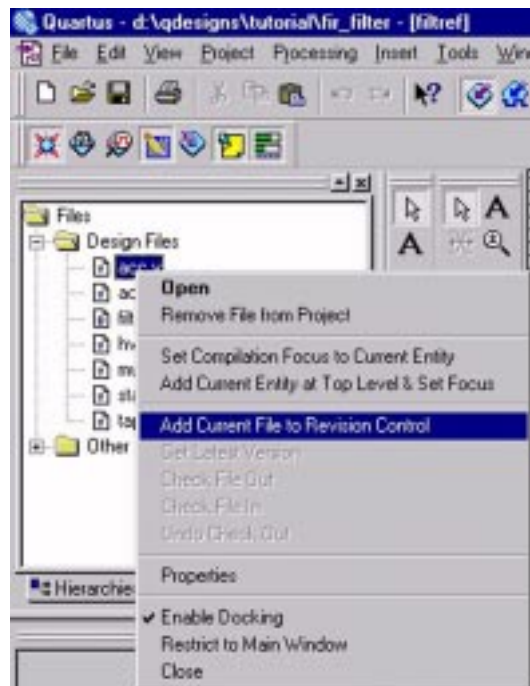
To set up the Quartus interface to work with revision control software, perform the following steps:

1. Open a project and choose **Revision Control Settings** (Project menu).
2. In the **Revision Control Settings** dialog box, select the appropriate revision control software and the design's directory path.
3. Click **OK**.

Figure 2 shows the **Revision Control Settings** dialog box in the Quartus software.

Figure 2. Choosing the Revision Control Software

To add a project's design files to the revision control software, right-click on the design file name and select **Add Current File to Revision Control**, or add the design file using the Tcl/tk command console. See [Figure 3](#).

Figure 3. Adding Design Files to Revision Control Software

The Quartus interface supports the revision control software functions shown in [Table 1](#).

Table 1. Supported Revision Control Software Functions

Function	Description
Add to Revision Control	Adds a file to the archive.
Get Latest Version	Retrieves a read-only copy of the latest checked-in version of the file.
Check File Out	Retrieves a read and write copy of a file if it is not already checked out by another user.
Check File In	Returns a new version of a checked-out file into the archive.
Undo Check Out	Cancels the checked-out file and keeps the last checked-in version of the file.

Other revision control software commands can be supported by running Tcl scripts in the Tcl/Tk console.

Example Tcl scripts for the PVCS, RCS, and SCCS software packages are located in the Quartus software `\bin` directory. These files should not be modified, but can be used as an example for writing custom scripts to interface with other revision control software packages. You will need a Tcl debugger to test custom Tcl scripts.

The Quartus software, along with revision control software, can be used to manage the check in and out of design files. A file can be added to an archive at any time during the design process by right-clicking on a design file name and selecting **Add Current File to Revision Control**. See [Figure 3](#). When a file is checked in for the first time, it is assigned a version number (e.g., 1.0). As changes are made and the file is checked in, the revision control software updates the version number (e.g., 1.1, 1.2, 1.3). The latest revision of a file is the only complete file that exists. Previous versions of the file only contain change information. The central archive records changes to a file when it is updated with a new version.

The Quartus software does not require the use of revision control software packages. If you choose not to use revision control software, changes made to the design file are stored directly to the working copy of the design file. You can turn off revision control at any time in the design process but all old file version information will be lost.

Conclusion

Revision control software is becoming critical for designs that target high-density devices such as APEX devices. It gives engineers an easy way to track changes and recover older versions of a design file. The Quartus software allows engineers to interface with popular revision control software packages quickly and easily. Custom Tcl scripts can also be developed for other revision control software packages.



For more information on Quartus revision control software support, see Quartus Help or your local Altera sales representative.



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