

Installing TCAD

Version A-2007.12, December 2007

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Printed in the U.S.A.

Installing TCAD, A-2007.12

Installing TCAD Products

This document describes how to install the TCAD products.

Note:

The installation instructions in this document are the most up-to-date available at the time of production. However, changes might have occurred. For the latest installation information, see the product release notes or documentation in SolvNet.

For TCAD product versions for this release, see [Table 2 on page 5](#).

This document includes the following sections:

- [Supported Platforms and Media Availability](#)
- [Disk Space Requirements](#)
- [Installing the Software](#)
- [Setting Up the User Environment](#)
- [Viewing and Printing TCAD Sentaurus Documentation in Portable Document Format](#)
- [Using Sentaurus Options](#)
- [Troubleshooting](#)

Supported Platforms and Media Availability

Table 1 lists the supported platforms, operating systems, and corresponding Synopsys platform keywords for this release.

Table 1 Supported Platforms and Keywords

Platform	Operating system	Synopsys platform keyword	Window environment
AMDOpteron	Red Hat Enterprise Linux v4, 5 ¹	amd64 (64-bit mode)	GNOME
Sun SPARC	Solaris 9, 10 ¹	sparcOS5 (32-bit mode) sparc64 (64-bit mode) gccsparcOS5	CDE
IBM RS/6000	AIX 5.3	rs6000 aix64 (64-bit mode)	CDE
IA-32 (x86)	Red Hat Enterprise Linux v4, 5 ¹	linux (32-bit mode)	GNOME

1. *Binary-compatible operating system. Note, however, that binary compatibility is not guaranteed.*

TCAD products are available on CD or by Electronic Software Transfer (EST). Obtain the appropriate binary executable files for your operating system, common files, and example files.

Table 2 lists TCAD products with their associated versions and supported platforms. For the latest product-specific platform information, see the release notes for your tool.

Table 2 TCAD Products and Supported Platforms

Product	Version	Platform keyword
Raphael	A-2007.09	linux, rs6000, sparcOS5, sparc64
Raphael NXT	A-2007.09	amd64, linux, gccsparcOS5, sparc64
TCAD Sentaurus	A-2007.12	amd64, linux, rs6000, sparc64
Taurus Medici	A-2007.12	amd64, linux, rs6000, sparc64
Taurus TSUPREM-4	A-2007.12	amd64, linux, rs6000, sparc64

Table 2 TCAD Products and Supported Platforms (Continued)

Product	Version	Platform keyword
Taurus Environment Modeling	X-2005.10	hp32, linux, rs6000, sparcOS5

Disk Space Requirements

The disk space requirements vary depending on the platform and the features selected for installation. Table 3 shows the maximum space required for installing TCAD products on one platform.

Table 3 TCAD Disk Requirements

Product	Disk (megabytes)
Raphael	325
Raphael NXT	140
TCAD Sentaurus	3500
Taurus Medici	300
Taurus TSUPREM-4	250
Taurus Environment Modeling	355

Installing the Software

The TCAD tools use the Synopsys Installer tool, which allows you to use a graphical user interface (GUI) or a text script. For information about downloading Synopsys Installer and the TCAD tools, see *Installing Synopsys Tools*, available at <http://www.synopsys.com/install>.

To install the TCAD tools by EST or from the CD, follow the procedures described in *Installing Synopsys Tools*.

Installing TCAD Products

Setting Up the User Environment

Installing Synopsys Tools shows an example Synopsys media installation script for the synthesis tools. The TCAD software is installed in a similar manner.

The TCAD tools are a stand-alone product and cannot be installed over other existing Synopsys products. You must create a new directory for each TCAD product (such as Sentaurus, Taurus, Raphael NXT).

Sentaurus can be installed in the same Sentaurus directory (STROOT) used for earlier Sentaurus releases (this is recommended). However, do not install Sentaurus in a ISE directory (ISEROOT) containing an earlier ISE TCAD software release.

The Sentaurus examples and the Sentaurus Device Monte Carlo files are packaged separately from the base Sentaurus package. If you want to install either of these packages, you should install them into the same Sentaurus directory where the base package was installed.

Setting Up the User Environment

To set up a new tool user, you must

- Set the STROOT environment variable
 - Modify the search path
 - Set the SNPSLMD_LICENSE_FILE or LM_LICENSE_FILE variable
- Set the STDB environment variable for Sentaurus WorkBench.

Setting the STROOT Environment Variable

If you are installing Sentaurus, each user must have the STROOT environment variable set to the Sentaurus installation directory. In the following example, the Sentaurus installation directory is named /usr/sentaurus.

- If you are using the C shell, add the following line to your \$HOME/.cshrc file:

```
setenv STROOT /usr/sentaurus
```

- If you are using the Bourne, Korn, or Bash shell, add the following line to the .profile, .kshrc, or .bashrc file:

```
STROOT=/usr/sentaurus  
export STROOT
```

Modifying Your Search Path

If the TCAD program is not found on the search path, it will need to be added. In the following examples, the TCAD directory on your system is named `/usr/tcad`.

If you are using the C shell, add the following line to your `$HOME/.cshrc` file:

```
set path=(/usr/tcad/bin $path)
```

- If you are using the Bourne, Korn, or Bash shell, add the following line to the `.profile`, `.kshrc`, or `.bashrc` file:

```
PATH=/usr/tcad/bin:$PATH
```

Note:

If you are installing Sentaurus and have earlier ISE TCAD releases installed on your system, make sure the Sentaurus bin directory precedes the ISE TCAD installation in your search path. For example:

```
% set path=($STROOT/bin $ISEROOT/bin $path)
```

Setting the `SNPSLMD_LICENSE_FILE` or `LM_LICENSE_FILE` Environment Variable

You must install the SCL software and define the `SNPSLMD_LICENSE_FILE` or `LM_LICENSE_FILE` variable before you can verify the TCAD installation.

For information about downloading and installing SCL and on setting the license variable, see [Installing Synopsys Tools](#).

Setting the `STDB` Environment Variable

If you will be using Sentaurus Workbench, create a directory to store your Sentaurus Workbench projects (if one does not exist) and set the `STDB` environment variable to it.

- For example, add the following line to your `$HOME/.cshrc` file:

```
mkdir $HOME/STDB
```

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Viewing and Printing TCAD Sentaurus Documentation in Portable Document Format

- If you are using the C shell, add the following line to your \$HOME/.cshrc file:

```
setenv STDB $HOME/STDB
```

- If you are using the Bourne, Korn, or Bash shell, add the following lines to the .profile, .kshrc, or .bashrc file:

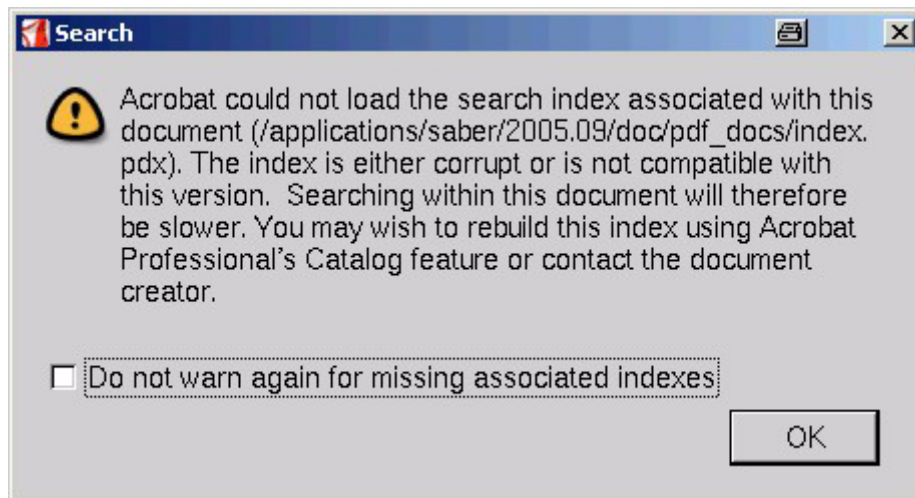
```
STDB=$HOME/STDB
export STDB
```

Viewing and Printing TCAD Sentaurus Documentation in Portable Document Format

To view and print TCAD Sentaurus documentation in Portable Document Format (PDF), you must have Adobe Acrobat Reader installed on your machine. To determine which version of Adobe your operating system requires, see [Table 4 on page 12](#).

Adobe Reader Full-Text Search Issue on UNIX

When you do a full-text search of Astro documentation on UNIX operating systems, you might see the following error message:



The file mentioned in the message, index.pdx, is a full-text search index that lets you search a collection of manuals shipped with your release. This

message appears when your version of Adobe Reader cannot use the version of the full-text search index provided.

You can use TCAD Sentaurus documentation without the full-text search feature. All other features, including searches within a single document, still work. The only task you will not be able to do is to search more than one document in the collection.

Table 4 shows which version of Adobe Reader you need to use with a particular release. It also indicates whether full-text search is available for a particular platform and release.

Table 4 Platform and Supported Version

Platform	Product documentation version	Full-text search available	Adobe Reader version
Linux	Y-2006.03, Y-2006.06 or later	Yes	Adobe Reader 7.0
	X-2005.12 or earlier	No	Any version
Sun SPARC (Solaris) ¹	Y-2006.03, Y-2006.06 or later	Yes	Adobe Reader 7.0
	X-2005.12 or earlier	Yes	Adobe Reader 5.0 or earlier

1. On Solaris operating systems, the GNOME desktop manager must be installed to support Adobe Reader 7.0.

For detailed information, see SolvNet article 017761, “An Error Message Appears When Doing a Full-text Search of Synopsys Product Documentation.”

Using Sentaurus Options

The following command-line options can be used with any Sentaurus tool to select specific versions/releases of the Sentaurus tools:

`-releases`

Lists all available releases in the Sentaurus installation directory under \$STROOT (for example, X-2005.10, X-2005.10-SP1, Y-2006.06).

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Using Sentaurus Options

`-versions`

Lists all subversions in a particular release directory. (This might include a patch or engineering release, for example, version 1.0 of X-2005.10.) Use `-releases` and `-versions` together to list the entire set for a given tool.

`-rel release`

Specifies execution of a particular release. For example, `-rel X-2005.10` overrides the `STRELEASE` and `STROOT_LIB` environment variables and executes the X-2005.10 release of the tool.

`-ver version`

Specifies execution of a particular subversion. Uses the specified version instead of the default version. For example, `-rel 1.3` overrides the default version and executes version 1.3 of the tool.

`-64bit`

Invokes the 64-bit binary files when they are available, but not the default. Setting the `STBITS` environment variable to 64 makes this the default behavior.

`-32bit`

Invokes the 32-bit binaries on platforms where both 64-bit and 32-bit binaries are available. The default is 64-bit. Setting the `STBITS` environment variable to 32 makes this the default behavior.

Troubleshooting

Error 1

Error Message:

```
Xlib: connection to "machine:0.0" refused by server
Xlib: Client is not authorized to connect to Server
Bad return from XOpenDisplay
```

Explanation:

The program does not have permission to open a window on the display .

- Check to be sure the `DISPLAY` environment variable is set correctly on the machine where the tool is being run.
- On the console of the display, enter the following command:

```
% xhost +
```

Error 2

Error Message:

```
tmafork: command not found
```

Explanation:

The `tmafork` TCAD utility cannot be found.

- Check to be sure the TCAD bin directory is in the search path.
 - Check to be sure the TCAD utilities are installed correctly and that `tmafork` is linked to the TCAD bin directory.
-

Error 3

Error Message:

```
*** Open Pipe = signal 13 code 0
```

Explanation:

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Troubleshooting

The TMAPLOT process is terminating abnormally, leaving the TCAD program piping data to a broken pipe.

- Check to be sure TMAPLOT works correctly outside the TCAD program by entering the following command:

```
% tmaplot x test
```

- If TMAPLOT works correctly outside the TCAD program, the error is most likely caused by insufficient system resources to start the TMAPLOT process. Check your system resources when running the TCAD program to be sure there are enough resources to run the TMAPLOT process.