New SmartLIb Library of Models

Overview

In all previous versions of ***SmartSpice*** the model code (BSIM, diode etc.) was included in the one executable (***SmartSpice***). This means any updates to the model code would take a while to reach the customer because of the full SPICE functionality checks required before releasing a new ***SmartSpice*** version. We have therefore separated the ***SmartSpice*** core from the modeling code to eliminate this delay and dependency. Now the new model release time has been reduced by having a separate library that the customer can download from the web and include into the ***SmartSpice*** program through the use of these described new functions. All previous ***SmartSpice*** functionality is maintained as before. This new configuration is only of interest to customer who wish to explore model changes in more depth.

The -slinstall Option

The "-slinstall" option moves libraries from a download directory to the installation directory.

Example 1

```
smartspice -slinstall mydir 0.2.0.R
```

where `mydir` is the directory of the libraries that have to be installed, and 0.2.0.R is the version number of the ***SmartLib*** library it belongs to.

This command will inspect the files that lay in the mydir directory. ***SmartSpice*** moves each file to the installation directory if it can be used as a library, and there is no file with the same name. This insures that the file installed will work correctly, and that an installed file cannot be lost while adding a new one.

To use this option, you must have the rights to modify the installation. Ask to your system Administrator if you are allowed such rights.

How to Use the -slinstall Option

Example 1

The situation: I've downloaded the Solaris library `libSGP105R.so.tar` which is in a PUB directory from my home.

At this point, you need to untar the file. Move it to the PUB directory:

```
cd ~/PUB
tar -xvf libSGP105R.so.tar
```

Now you must have the `libSGP105R.so` in the directory:

```
smartspice -slinstall . 1.0.0.R
```

SmartSpice indicates that `libSGP105R.so.tar` cannot be loaded so it won't be installed. It also indicates that `libSGP105R.so` has been copied, and that the installation has been successful.

Example 2

The situation: I've downloaded the full set of Windows libraries for ***SmartSpice*** 1.1.0.R, and they are in the C:\tmp folder.

Use a Zip de-compactor to get the dll files. If you can delete the zip files it will make the following simpler.

In the Start Menu click on Run. When the window appears, type the following command:

```
smartspice -slinstall c:\tmp 1.1.0.R
```

A window opens and indicates that the folder has been created, and that each dll is being copied in the installation folder.

The -sllist Option

The list option lets you have a look at the installed libraries for a given ***SmartLib*** version.

Example 1

```
smartspice -sllist 0.2.0.R
```

where 0.2.0.R is the version number of the ***SmartLib*** you want to inspect.

This command indicates the interface version number of each file in the installation directory, if it is a compatible library, and if the lib can be used or even loaded. It also can be used to confirm if the installation procedure succeeded.

The -slremove Option

The remove option removes the older version of the ***SmartLib*** .

Example 1

```
smartspice -slremove 0.2.0.R
```

where 0.2.0.R is the ***SmartLib*** you want to erase.

To use this option, you must have the rights to modify the installation. Ask to your system Administrator if you are allowed such rights.

Warning: Once a ***SmartLib*** has been removed it cannot be used again.

The -slsmartlibconf Option

This option updates the configuration file, so that ***SmartSpice*** will use the newer libraries.

Example 1

```
smartspice -slsmartlibconf 0.2.0.R
```

where 0.2.0.R is the version number of the ***SmartLib*** you want to use.

SmartSpice inspects the files in the ***SmartLib*** installation directory. It chooses the valid files with the higher version number to update the configuration file.

How to Use the -slsmartlibconf Option

Example 1
I've just installed my Solaris library libSGP_1_0_5_R.so, and I want ***SmartSpice*** to use this library.

Just type:

```
smartspice -slsmartlibconf 1.0.0.R
```

and insure you have a `.SmartSpice.conf` file in your home directory:

```
mv ~/.SmartSpice.conf SmartSpice.conf.old
```

Example 2
I've just downloaded and installed the full set of libraries from ***SmartLib*** 1.1.0.R. How do I make ***SmartSpice*** use it?

In the Start Menu click **Run**, and then type:

```
smartspice -slsmartlibconf 1.1.0.R
```

How to Install a Downloaded Library

- Create a download directory in your home directory:
  ```
  cd $HOME
  mkdir download
  ```
- Using your web browser, go to the Silvaco Resource Centre Web site and download the library into the folder you have just created.
- Prepare the library to be installed:
  ```
  cd $HOME/download
  tar -xvf *.tar
  ```
- Install the library:
  ```
  cd $HOME
  smartspice -slinstall download 1.0.0.R
  ```
- Verify that the library has been installed and is in the list:
  ```
  smartspice -sllist 1.0.0.R
  ```
- Make the Library Active:
  ```
  smartspice -slsmartlibconf 1.0.0.R
  ```

Typegroup	Technology	Internal name	Info	Level	Lib name
npn	BJT	BJT	Bipolar Junction Transistor	1, 2	libSGP
pnp		VBIC	VBIC Bipolar Junction Transistor	5	libVBIC
lpnp		HICUM	HICUM Bipolar Junction Transistor	6	libHICUM
		PBJT	Mextram BJT (Philips)	503	libMEXTRAM
		MODELLA	Philips TPL500 Bipolar Transistor	500	linMODELLA
		HBT	Hetero-Junction Bipolar Transistor	20	libHBT
nmos	SOI	BSIM31SOI	Berkeley SOI MOSFET model version 1 (level 25)	25	libBSIM3SOIv1
pmos		BSIM3SOI2DD	Berkeley SOI MOSFET model version 2 (level 27)	27	libBSIM3SOIv2_DD
ntft		BSIM3SOI2FD	Berkeley SOI MOSFET model version 2 (level 26)	26	libBSIM3SOIv2_FD
ptft		BSIM3SOI2PD	Berkeley SOI MOSFET model version 2 (level 29)	29	libBSIM3SOIv2_PD
		BSIM3SOI3	Berkeley SOI MOSFET model version 3 (level 33)	33	libBSIM3SOIv3
		UFS	University of Florida SOI Model (level 21)	21	libUFS
		LETISOI	CEA/LETI SOI MOSFET model	32	libLETISOI
	TFT	TFT	MOS field-effect transistor	15	libLeroux
		PTFT	PolySi TFT model	16	libBerkeleyTFT
		MOS15	MOS15 TFT Model	35	libRPIaSi
		MOS16	RPI Poly-Si TFT Model	36	libRPIpolySi
	MOSFET	MOS123	MOS field-effect transistor	1, 2, 3	libMOSlevel123
		BSIM1	Berkeley Short Channel IGFET Model	4, 13	libBSIM1
		BSIM3	Berkeley Short Channel IGFET Model) Version-3 (level 81)	81	libBSIM3
		BSIM3v3	Berkeley Short Channel IGFET Model Version-3 (level 8, 49, 53)	8, 49, 53	libBSIM3v3
		BSIM3M	Modified Berkeley Short Channel IGFET Model Version 3 (level 7,10,47)	7, 10, 47	libBSIM3v3
		BSIM4S	Berkeley Short Channel IGFET Model-4 (level 14, 54)	14, 54	libBSIM4
		MOS11	Philips MOS11 model	11,63	libMOS11
		MOS31	MOS31 MOSFET Model	30, 31, 40	libMOS31
		MOS20	Philips MOS20 LDMOS model	20	libMOS20
		EKV	EKV MOSFET Model	44	libEKV
		BSIM3H	High-Voltage MOSFET Model (level 88)	88	libHVMOS
		HISIM	Hiroshima University STARC IGFET Model (level 111)	111	libHiSIM
njf	JFET/	JFET	Junction/Schottky contact	1, 2, 3, 4, 5, 6	libJFETMESFET
pjf	MESFET		field-effect transistor		
nmf					
pmf					
d	Diode	DIO	Junction Diode	1, 3	libDiodeL13
		DIO2	Fowler-Nordheim Diode	2	libDiodeL2
		DIO500	Diode Level 500	500	libDiodeL500
		JCAP	Junction Capacitor	9	libJuncap
		LAS1	VCSEL model	4	libVCSEL
c	Capacitance	FCAP	Ramtron Ferroelectric Capacitance Model	5	libFCAP
cap		FRMC	Ramtron Ferroelectric Capacitance Model	6	libFRMC

Table 1. ***SmartLib*** Models and Corresponding Shared libraries.