cadence®

Spectre AMS Designer and Xcelium Simulator Mixed-Signal What's New

Product Version 22.09
September 2022

Cadence Design Systems, Inc. (Cadence), 2655 Seely Ave., San Jose, CA 95134, USA.

Contents

1

What's New in the Spectre AMS Designer and Xcelium Simulator With Mixed-Signal Option

This section contains information about the mixed-signal features in the Xcelium simulator and the Spectre AMS Designer simulator in the current XCELIUM release.

⚠ To reduce the size of Cadence software downloads, this MAIN release installation does not contain document PDF files. User guides can be accessed using the Cadence Help viewer, or for access to PDF files for this and all releases, please visit Cadence Online Support.

Versions of the Spectre AMS Designer Simulator

The Spectre AMS Designer simulator supports 64-bit operations on all platforms that are officially supported by Cadence. You must run all software in one mode or the other; you cannot mix modes. For example, if you run `xmvlog` in 64-bit mode, you must also run the 64-bit versions of `xmelab` and `xmsim`.

To run the Spectre AMS Designer simulator in 64-bit mode, do one of the following:

- Set the path variable and the library path environment variable to point to the executable files that enable the software to run in 64-bit mode (see Setting the Path Variable to Point to the 64-Bit Version and Setting the Library Path for 64-Bit Mode).
- Use the `-64bit` command-line option when you run each executable (`xmvlog`, `xmelab`, `xmsim`, or `xrun`).

  ⚠ When you use the `-64bit` command-line option, the software sets the `PATH` variable and the library path environment variable to run the software in 64-bit mode. Do not use this command-line option when linking the software to 64-bit applications, such as PLI, VPI, or VHPI. Set the path variable and the library path environment variable, instead.

- Set the `CDS_AUTO_64BIT` environment variable.

  ✓ Use the `xmbits` command, as shown below, to see the bit mode that has been set up to run the software:

  ```
  xmbits
  64
  ```

  The `-version` command-line option also reports the version of the simulator being used. For example:

  ```
  xrun -version
  TOOL: xrun(64) 22.03-s001
  ```

For additional information, see *Running the Simulator in 64-Bit Mode* in the *Overview of Running the XceliumSimulator* book.

Setting the Path Variable to Point to the 64-Bit Version

You will find 64-bit executables installed in <*install_dir*>/tools/bin/64bit.

To set the path variable to point to the 64-bit executables, use one of the following commands (depending on the shell that you are running):

```
setenv CDS_AUTO_64BIT ALL
setenv PATH /xceliumInstallDir/tools/bin:$PATH
setenv PATH /spectreInstallDir/tools.lnx86/bin:$PATH
```

Setting the Library Path Environment Variable

You need to set the `LD_LIBRARY_PATH` environment variable before you can use the three-step method to run the simulation. However, setting this path is not required if you are using the `xrun` command to run the simulation.

Setting the Library Path for 64-Bit Mode

For non-SUSE Linux, set the library path environment variable, as shown below.

```
setenv LD_LIBRARY_PATH install_dir/tools/lib/64bit:install_dir
/tools/lib:${LD_LIBRARY_PATH}
```

For SUSE Linux, set the library path environment variable, as shown below.

```
setenv LD_LIBRARY_PATH
install_dir/tools/lib/64bit/SuSE:install_dir/tools/lib/64bit:install_dir/tools/lib/SuSE
:install_dir/tools/lib:${LD_LIBRARY_PATH}
```

New Spectre AMS Designer Features

The following new features are available in the current XCELIUM release:

- Newly Added Tcl Commands
- Support for the Efficient Usage of CPU Cores in Interactive Spectre AMS Designer Simulations

Newly Added Tcl Commands

From this release, you can use the following Tcl commands:

- `get_analog_param`: Returns the value for the specified parameter on the Tcl command prompt.
- `set_analog_param`: Specifies the value for the given analog analysis control parameters for the

subsequent analog time step.

For more information, see get_analog_param and set_analog_param.

Support for Managing Analog Resource Usage During Interactive Simulations

From this release, you can control how and which CPU core Spectre is booted to, by using the newly added xrun option `analogsolver`. The Tcl commands `exit` and `run` have also been enhanced to support a new option called `-analogsolver`. When used with the exit command, this option lets you exit the analog solver and saves a snapshot of the setup so that you can rework from that checkpoint. When used with the run command, it lets you reboot the analog solver to the exact setup you left at during the last run.

For more information, see Managing Analog Resource Usage During Interactive Simulations and Specifying a Host for Spectre.

New Xcelium Simulator Mixed Signal Features

The following new features are available in the current XCELIUM release:

- New Option to Import Built-In RNM Package
- Enhancement to Low-Power Simulation
- Supports Incremental Elaboration in Low-Power Designs with SV-RNM

New Option to Import Built-In RNM Package

A new `xrun` option, `-wreal` has been added to easily port the built-in nettypes defined in the pre-compiled SystemVerilog (SV) Package (`cds_rnm_pkg`). When `wreal` is used as a datatype in the design, you can use the `-wreal` option in the command-line, without having to specify the import `cds_rnm_pkg` statement in the design. The tool then internally imports the `cds_rnm_pkg` definition for `wreal`.

For more information, see https://rdwiki.cadence.com/display/amssimug2209/Using+Real+Number+Modeling+in+SystemVerilog.

Enhancement to Low-Power Simulation

Starting the 22.07-a release, you can enable SystemVerilog (SV) interface in low-power mixed-signal designs using the `-lps_sv_interface_port` option.

For more information, see Enabling SystemVerilog Interface in LP-MS Designs.

Supports Incremental Elaboration in Low-Power Designs with SV-RNM

Starting 22.06-a release, incremental elaboration is supported by default in low-power mixed-signal designs with SV-RNM datatypes. See Incremental Elaboration in Low-Power Mixed-Signal Designs.

New Features Common to Both Spectre AMS Designer and Xcelium Simulator with Mixed-Signal Option

The following enhancement is available in the Spectre AMS Designer and Xcelium simulator with mixed-signal option:

- New License for Digital Mixed-Signal Designs
- Enhancements to the dms_report Option
- New xrun Command-Line Option

⚠ The above common features work in both the simulators; Spectre AMS Designer for Verilog-AMS modules and Xcelium Simulator with the mixed-signal option for SystemVerilog + Mixed Signal.

New License for Digital Mixed-Signal Designs

Starting Xcelium 22.09 Main release, Xcelium licensing has been updated to work with Apps for accessing specific advanced technologies beyond core logic simulation. For advanced mixed-signal technologies such as RNM and co-sim/AMS simulations, you must use the Xcelium Mixed-Signal App license. For more information, see Feature-Specific License Checkout Order.

Enhancements to the dms_report Option

Starting Xcelium 22.09, the `xrun` command-line option, `-dms_report` has been enhanced to provide the following details:

- Specific information about all the Verilog-AMS files used. That is if there are Verilog-AMS files with digital, electrical, generic wreal, or wreals with RF. It also provides information about the mixed-signal array of instances (AOI).
- Design configuration reports of co-simulation designs with details such as VHDL + SPICE flow, SV Interface Interact, SV Bind Interact, SV Logic variable/Real variable to Electrical, Electrical IE, Built-in IE, and SV UDN IE.

For more information, see `-dms_report`.

New xrun Command-Line Option

Starting the 22.06-a release, a new command-line option, `-no_analog_solver` has been added to the *xrun* utility. This option ensures that in digital-only logic and/or RNM simulations the tool does not invoke the Spectre AMS simulator and runs the Xcelium simulator with mixed-signal option. This option is automatically turned on when there is digital-only logic and/or RNM designs that do not have electrical/SPICE or need ie card (.scs).

See `-no_analog_solver`.