SDNet Compiler Installation, Release Notes, and Getting Started Guide

UG1018 (v2017.2) October 2, 2017

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Revision History

The following table shows the revision history for this document.

Date	Version	Revision
10/02/2017	2017.2	Updated Release Notes and Known Issues for v2017.2 Updated build number in Examples.
07/27/2017	2017.1.1	Initial Xilinx release.

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SDNet Compiler Installation, Release Notes, and Getting Started Guide

Release Notes and Known Issues

Release Notes

1. SDNet 2017.2 contains important runtime bug fixes and fixes to the default options:
   a. -tf1 is the default for designs having a datapath of 256 bits or greater.
   b. -tf2 is the default for designs having a datapath of 128 bits or less.
   c. A backpressure option for externally connected lookup engines is added.
   d. Issues related to compatibility issues with floating license checking and the other Xilinx license tools are resolved.
2. Resource improvements have been made for sync blocks.
3. Other compiler runtime bug fixes have been implemented for larger data flow graphs (e.g., 120 connections) having a long compiler runtime.
4. Fixed an issue with the P4 examples provided.

Known Issues

An issue has recently been reported with the -tf2 (or default for bus widths of 128 bits or less) when there are bubbles in the packet TVALID data stream. We are working to correct this issue for the next release.

RECOMMENDED: *Explicitly specify -tf1 for designs with data bus widths of 128 bits or less.*

System Requirements

CPU Architecture

SDNet Compiler only supports x86-64 processor architecture.

Operating Systems

SDNet Compiler supports either Windows 64-bit or Linux 64-bit operating systems.

Windows Support

Ensure that Cygwin is installed in order to run the generated bash scripts. When installing Cygwin, packages for graphviz and gcc/g++ should be selected and installed. See the detailed instructions under Installing Cygwin, page 11.

Linux Support

The following Linux distributions are officially supported. Refer to the Vivado Design Suite v2017.2 release notes for a more detailed list of supported Linux distributions.

- Red Hat Enterprise Workstation (64-bit)
- SUSE Linux Enterprise (64-bit)
- Ubuntu (64-bit)
- CentOS (64-bit)

Xilinx Vivado Design Software

SDNet Compiler requires Vivado Design Suite to be installed and licensed on the target system. For Windows operating systems, Vivado Design Suite 2017.2 is required for RTL simulation.

Additional Tools and Recommended Software

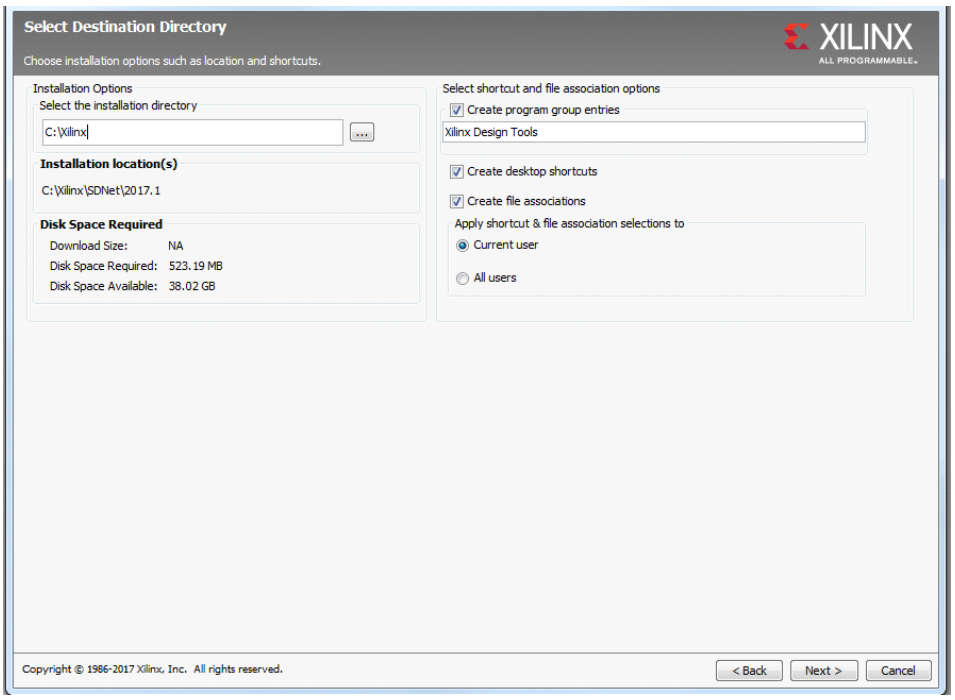
Additional tools and recommended software include:

- gcc 6.2.0
- Questa v10.4c
- GraphViz DOT graph visualization software library
- Wireshark

See the *SDNet Packet Processor User Guide* (UG1012) [Ref 1] for more information.

Basic Installation

Extract the zip file and run the `xsetup` command to initiate installation. After accepting the EULA, you will be prompted for the directory in which to install SDNet Compiler. No program group entries or desktop shortcuts will be created as SDNet is currently a command-line based tool.



If the directory doesn't already exist the installer will display a prompt to create it. The SDNet installation requires approximately 850 MB of free disk space for Linux and approximately 530 MB for Windows.

After installation has completed SDNet can be run from the specified installation directory.

RECOMMENDED: *Add the specified installation directory to your PATH environment variable.*

Linux Installation

Add the path to the bin directory of your specified installation location to your path to finish setting up the compile.

RECOMMENDED: *Add this environment variable to your profile loaded at login.*

In the bash shell:

```
$ export PATH=${PATH}:sdnet-location/SDNet/2017.2.1/bin
```

In the csh shell:

```
$ setenv PATH ${PATH}:sdnet-location/SDNet/2017.2.1/bin
```

Note that Linux uses colons for concatenating items in a list.

For Vivado simulation support, it is necessary to set the environment variable XILINX_VIVADO to the location of the current Vivado tool installation.

Installing the License File

You will have received an email containing an SDNet license file as an attachment. Save the attachment to a local drive.

If the Vivado Design Suite is licensed using a local licensing daemon, the SDNet compiler license can be installed by appending the license file location to the LM_LICENSE_FILE environment variable:

In the bash shell:

```
$ export LM_LICENSE_FILE=${LM_LICENSE_FILE}:absolute-license
-filename
```

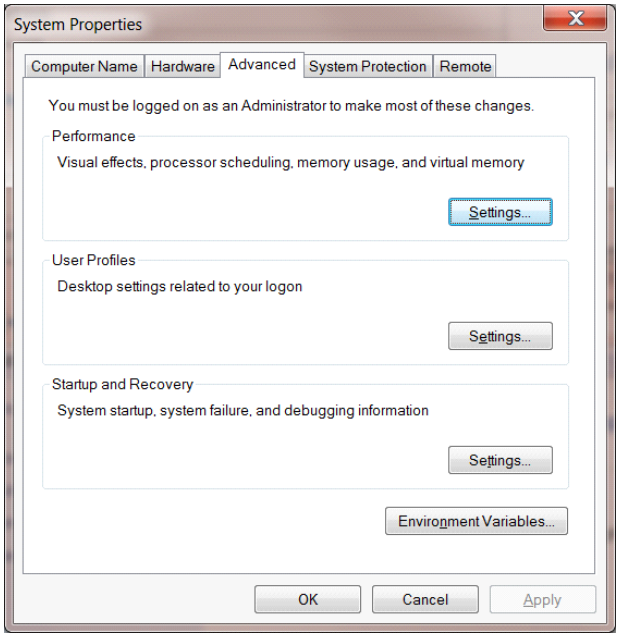
In the csh shell:

```
$ setenv LM_LICENSE_FILE ${LM_LICENSE_FILE}:absolute-license
-filename
```

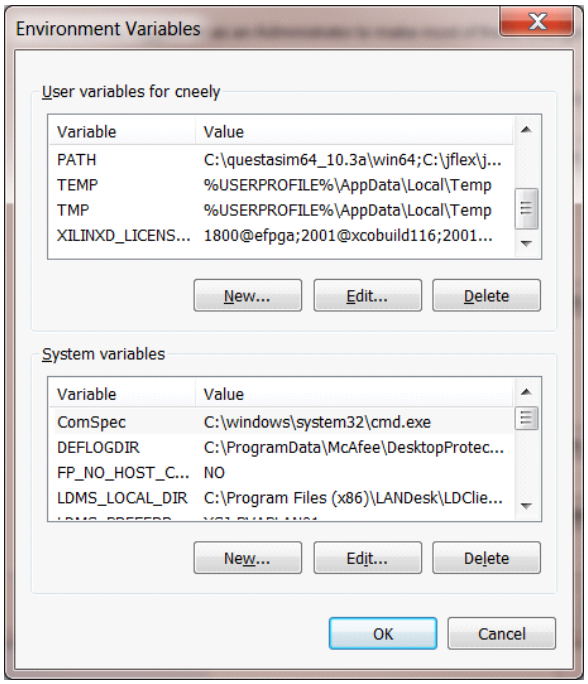
Refer to the *Vivado Design Suite User Guide: Release Notes, Installation, and Licensing* (UG973) [Ref 2] or contact your system administrator for the network license installation instructions.

Windows Installation

1. Go to **Control Panel > System and Security > System Properties > Advanced** to set up the environment variables.



2. Select **Environment Variables**, which brings up a new window for adding or modifying the environment variables.



3. Add the SDNet installation location `SDNet\2017.2.1\bin` directory to the PATH variable.
4. Set the XILINX_VIVADO system variable to the location of the Vivado tool installation, (`C:\Xilinx\Vivado\2017.2.1`).

Note that Windows uses semi-colons for concatenating items in a list.

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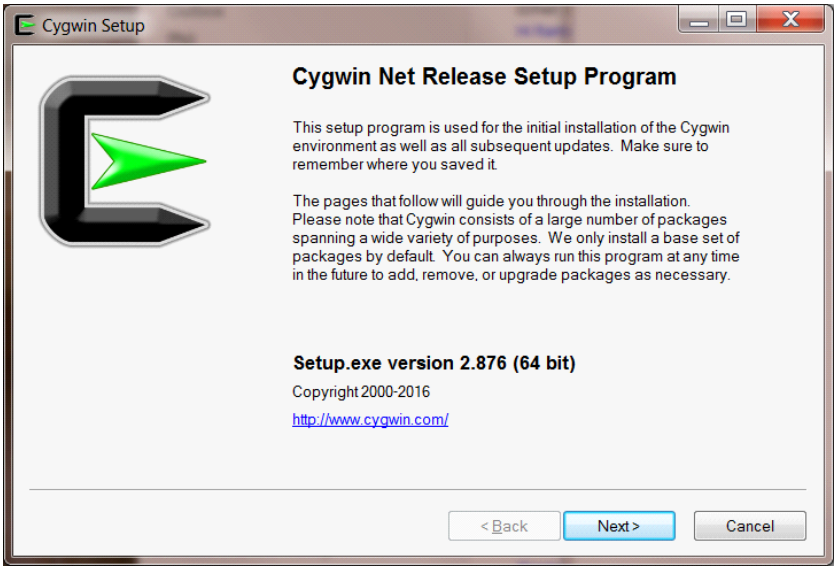
-filename
```

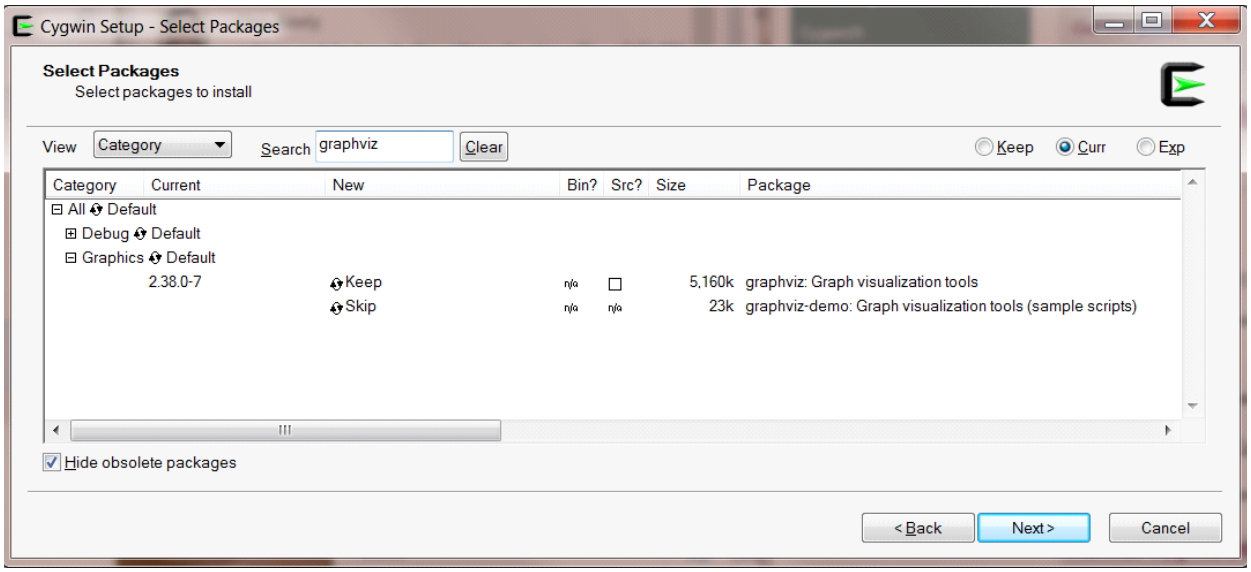
Refer to the *Vivado Design Suite User Guide: Release Notes, Installation, and Licensing* (UG973) [Ref 2] or contact your system administrator for the network license installation instructions.

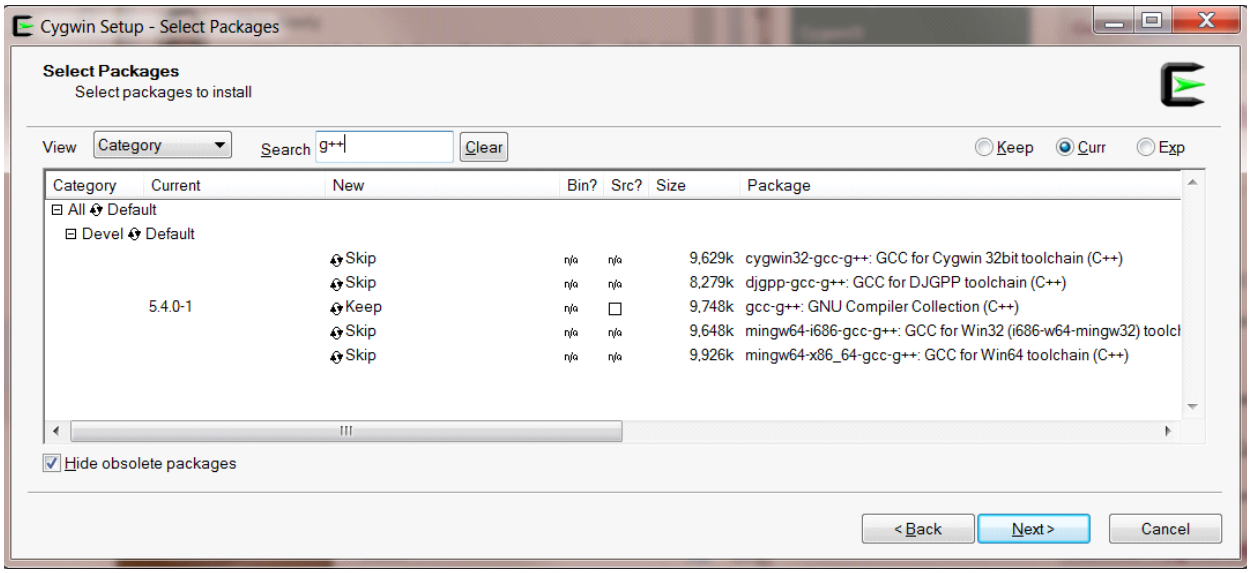
Installing Cygwin

Cygwin installed on a Windows system can interpret and run the shell scripts generated by SDNet compiler. You can download the latest 64-bit version of the Cygwin installer at http://www.cygwin.com.



Select and install the libraries (packages) for graphviz and gcc/g++ when prompted.




Cygwin Setup - Select Packages
Select Packages
Select packages to install
View
Category
Search
g++
Clear
Keep
Curr
Exp
Category
Current
New
Bin?
Src?
Size
Package
All Default
Devel Default
Skip
n/a
n/a
9,629k
cygwin32-gcc-g++: GCC for Cygwin 32bit toolchain (C++)
Skip
n/a
n/a
8,279k
djgpp-gcc-g++: GCC for DJGPP toolchain (C++)
5.4.0-1
Keep
n/a
9,748k
gcc-g++: GNU Compiler Collection (C++)
Skip
n/a
n/a
9,648k
mingw64-i686-gcc-g++: GCC for Win32 (i686-w64-mingw32) toolch
Skip
n/a
n/a
9,926k
mingw64-x86_64-gcc-g++: GCC for Win64 toolchain (C++)
Hide obsolete packages
< Back
Next >
Cancel

Test the Installation Using a Provided Example

Linux

Open a terminal window and enter the following commands:

```
$ cd <install_area>/SDNet/2017.2.1

$ source settings.csh

$ # alternatively source settings.sh

$ cd <work_area>

$ <run sdnet>
```

Windows

Open a Cygwin window or command prompt by selecting from the Windows startup menu and enter the following commands to add SDNet to the PATH for the current terminal. If SDNet is already in the PATH, this can be skipped).

Using Cygwin:

```
$ cd <install_area>/SDNet/2017.2.1

$ source settings64.sh
```

Using a command prompt:

```
$ cd <install_area>\SDNet\2017.2.1

$ settings64.bat

$ cd <work_area>

$ <run sdnet>
```

Examples

The SDNet installation comes with a few examples contained in the `SDNet/2017.2.1/examples/` directory:

- ethernetVlan
- fiveTuple
- openflowClassifier
- p4examples

Copy the selected example files to your <work area>, and then run sdnet on the example.

For `.sdnet` examples, run:

```
sdnet <example_name>.sdnet -busType axi -workDir mytest1
```

For p4 examples, run the P4-SDNet Translator, followed by the sdnet command:

```
p4c-sdnet <example_name>.p4 –o <example_name>.sdnet

sdnet <example_name>.sdnet -busType axi -workDir mytest1
```

Note: P4-SDNet Translator only runs on Linux operating systems. See the *P4-SDNet Translator User Guide* (UG1252) [Ref 2] for more information.

The output should display the following, and the generated files will be in the mytest1 directory:

```
Xilinx SDNet Compiler version 2017.2.1, build 1997167

Compilation successful
```

Troubleshooting

If you do not have a license request one from Xilinx within the SDNet Lounge website.

If you receive the message “Cannot obtain license” and are running Linux with a node-locked license, check the Xilinx Vivado Design Suite license manager for local system Information as to whether the NIC address is `000000000000`. If so, refer to the instructions posted at: http://www.xilinx.com/support/answers/60510.html

Under Linux the Ethernet interface must be named eth0, eth1, or similar. For example, on Ubuntu 16.04, run the following steps to change the default interface names to eth0:

1. Enter `$ sudo vi /etc/default/grub`
2. Add
   `net.ifnames=0 biosdevname0`
   to the end of
   `GRUB_CMDLINE_LINUX_DEFAULT="..."`
3. Enter `$ sudo update-grub`
4. Enter `$ sudo vi /etc/udev/rules.d/70-persistent-net.rules`
5. Add the line:
   ```
   SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*",
   ATTR{address}=="0c:c4:7a:aa:ab:4a",
   ```
   [substitute your MAC address]
   ```
   ATTR{dev_id}=="0x0", ATTR{type}=="1", NAME=="eth0"
   ```
6. Enter `$ sudo vi /etc/network/interfaces`
7. Change all occurrences of the old interface name (`enp3s0f0` or similar) to the new interface name (`eth0`)
8. Enter `$ sudo reboot`

Xilinx Resources

For support resources such as Answers, Documentation, Downloads, and Forums, see Xilinx Support.

Solution Centers

See the Xilinx Solution Centers for support on devices, software tools, and intellectual property at all stages of the design cycle. Topics include design assistance, advisories, and troubleshooting tips.

Documentation Navigator and Design Hubs

Xilinx® Documentation Navigator provides access to Xilinx documents, videos, and support resources, which you can filter and search to find information. To open the Xilinx Documentation Navigator (DocNav):

- From the Vivado® IDE, select **Help > Documentation and Tutorials**.
- On Windows, select **Start > All Programs > Xilinx Design Tools > DocNav**.
- At the Linux command prompt, enter `docnav`.

Xilinx Design Hubs provide links to documentation organized by design tasks and other topics, which you can use to learn key concepts and address frequently asked questions. To access the Design Hubs:

- In the Xilinx Documentation Navigator, click the **Design Hubs View** tab.
- On the Xilinx website, see the Design Hubs page.

Note: For more information on Documentation Navigator, see the Documentation Navigator page on the Xilinx website.

References

Contact Xilinx customer support for access to documents not yet available on the Xilinx website.

1. *SDNet Packet Processor User Guide* (UG1012)
2. *Vivado Design Suite User Guide: Release Notes, Installation, and Licensing* (UG973)
3. *P4-SDNet Translator User Guide* (UG1252)

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