ZeBu Transactor Library Installation Guide

Version V-2024.03-SP1, February 2025

SYNOPSYS®

Copyright and Proprietary Information Notice

Destination Control Statement

All technical data contained in this publication is subject to the export control laws of the United States of America. Disclosure to nationals of other countries contrary to United States law is prohibited. It is the reader's responsibility to determine the applicable regulations and to comply with them.

Disclaimer

SYNOPSYS, INC., AND ITS LICENSORS MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Trademarks

Synopsys and certain Synopsys product names are trademarks of Synopsys, as set forth at https://www.synopsys.com/company/legal/trademarks-brands.html.
All other product or company names may be trademarks of their respective owners.

Free and Open-Source Licensing Notices

If applicable, Free and Open-Source Software (FOSS) licensing notices are available in the product installation.

Third-Party Links

Any links to third-party websites included in this document are for your convenience only. Synopsys does not endorse and is not responsible for such websites and their practices, including privacy practices, availability, and content.

www.synopsys.com

Feedback

Contents

About this Guide 4
Intended Audience 4
Related Documentation 4
Synopsys Statement on Inclusivity and Diversity 4

1. Introduction 5

2. Installing ZeBu Transactors 6
Knowledge 6
Software Requirements 6
Installing ZeBu Transactors 7
Package Description 7
Packages in ZeBu Transactor Library 8

Preface

About this Guide

The ZeBu Transactors Installation Guide contains information about hardware and software prerequisites for the correct installation, the steps to install ZeBu transactors, and contents of the package after installation.

Intended Audience

This manual is intended for experienced EDA hardware and software engineers to help with the installation of ZeBu transactors. and engineers should have experience with

the Linux operating system.

Related Documentation

For an overview of ZeBu transactors, see *ZeBu Vertical Solutions User Manual*.

For information about the new features and enhancements in the ZeBu Transactors Library for this release, see *ZeBu Transactor Library Release Notes*.

For details about the ZeBu supported features and limitations, see the *ZeBu Release Notes* in the ZeBu documentation package which corresponds to the software version you are using.

Synopsys Statement on Inclusivity and Diversity

Synopsys is committed to creating an inclusive environment where every employee, customer, and partner feels welcomed. We are reviewing and removing exclusionary language from our products and supporting customer-facing collateral. Our effort also includes internal initiatives to remove biased language from our engineering and working environment, including terms that are embedded in our software and IPs. At the same time, we are working to ensure that our web content and software applications are usable to people of varying abilities. You may still find examples of non-inclusive language in our software or documentation as our IPs implement industry-standard specifications that are currently under review to remove exclusionary language.

1

Introduction

ZeBu transactors are a family of over 30 protocol specific transaction-based verification solutions that allows verification/design engineer to quickly build a complete system-level test environment for their SOC design to be emulated in the ZeBu system. These transactors include synthesizable bus functional models that are loaded into ZeBu re-configurable testbench (RTB) hardware, providing maximum performance and ensuring that the transactor is always synchronized to the emulated design.

Each transactor also includes C/C++ APIs to quickly create testbenches and drivers to generate real-world traffic, and to link to virtual platforms. Off-the-shelf ZeBu transactors are complemented by the ZEMI-3 transactor compiler, which enables you to create your own ZeBu-compatible custom synthesizable transactors.

ZeBu transactors support common protocols and standards specifications, such as, PCI Express, USB, MIPI CSI-2, JTAG, Gigabit Ethernet, and so on.

2

Installing ZeBu Transactors

This section explains the following topics:

- Knowledge
- Software Requirements
- Installing ZeBu Transactors
- Package Description
- Packages in ZeBu Transactor Library

Knowledge

You must be familiar with the ZeBu products and should have a good knowledge of the transactors' architecture and setup.

Ideally, you should have previously attended Synopsys' training about *Using Transactors* and/or succeeded in the *ZeBu Tutorials* concerning transactors.

Software Requirements

You need the following software elements with appropriate licenses, if required:

- ZeBu V-2024.03-1-TZ release correctly installed
- One of the following:
  - RHEL 8+
  - CentOS: 7.3.1611+
  - Suse
  - C/C++ compiler: GCC 9.5.0 and above for 64-bit environments

Feedback

Installing ZeBu Transactors

Prerequisite

WRITE permissions on the IP directory and the current directory.

Installation Process

To install a transactor package, perform the following steps:

1. Download the respective transactor compressed shell archive (*.sh*).
2. Install the respective transactor using the following command:

```
$ sh <Transactor_Name>.<version>.sh install [ZEBU_IP_ROOT]
```

where *[ZEBU_IP_ROOT]* is the path to your ZeBu IP directory. The following are the exceptions to specifying this input:

- If no path is specified, the *ZEBU_IP_ROOT* environment variable is used automatically.
- If the path is specified and a *ZEBU_IP_ROOT* environment variable is also set, the transactor is installed at the defined path and the environment variable is ignored.

The installation process is complete and successful when the following message is displayed:

```
<Transactor_Name> v.<version> has been successfully installed.
```

If an error occurred during the installation, a message is displayed to point out the error as shown in the following example:

```
ERROR: /auto/path/directory is not a valid directory.
```

Package Description

Once correctly installed, the transactor package comes with the following elements:

- *$ZEBU_IP_ROOT/doc/foss*: Contains FOSS documents
- *$ZEBU_IP_ROOT/doc: Contains user guide for the transactor.*
- *$ZEBU_IP_ROOT/third_party_sw*: The third party libraries used in the XTOR library are available as part of the installation.

Feedback

Packages in ZeBu Transactor Library

The following table lists the ZeBu transactor titles available as part of the library and their respective package names.

Table 1 ZeBu Transactor Library Packages

XTOR Title	Package Name
ZeBu CAN_FD Transactor	xtor_can_fd_svs.V-2024.03-SP1.sh
ZeBu DP Source Transactor	DP_Source.V-2024.03-SP1.sh
ZeBu ENET Transactor	xtor_enet_svs.V-2024.03-SP1.sh
ZeBu EtherAVB Transactor	xtor_etheravb_svs.V-2024.03-SP1.sh
ZeBu GPIO Transactor	GPIO.V-2024.03-SP1.sh
ZeBu HDMI2 Source Transactor	HDMI2_Source.V-2024.03-SP1.sh
ZeBu I2C Transactor	I2C.V-2024.03-SP1.sh
ZeBu AHB Monitor	monitor_ahb_svs.V-2024.03-SP1.sh
ZeBu AMBA Monitor	monitor_amba_svs.V-2024.03-SP1.sh
ZeBu APB Monitor	monitor_apb_svs.V-2024.03-SP1.sh
ZeBu CHI Monitor	monitor_chi_svs.V-2024.03-SP1.sh
ZeBu MIPI I3C Monitor	monitor_mipi_i3c_svs.V-2024.03-SP1.sh
ZeBu OCP Monitor	monitor_ocp_svs.V-2024.03-SP1.sh
ZeBu PCIe Monitor	monitor_pcie_svs.V-2024.03-SP1.sh
ZeBu CXL Monitor	monitor_cxl_svs.V-2024.03-SP1.sh
ZeBu UFS Monitor	monitor_ufs_svs.V-2024.03-SP1.sh
ZeBu Multi-Transactor/Memory Model Examples	multi_xtor_mm_examples.V-2024.03-SP1.sh
ZeBu SATA Device Transactor	SATA_Device.V-2024.03-SP1.sh
ZeBu SATA Host Transactor	SATA_Host.V-2024.03-SP1.sh
ZeBu SPI Master Transactor	xtor_spi_master_svs.V-2024.03-SP1.sh

Feedback

Table 1 ZeBu Transactor Library Packages (Continued)

XTOR Title	Package Name
ZeBu SPI Slave Transactor	xtor_spi_slave_svs.V-2024.03-SP1.sh
ZeBu Stream Transactor	xtor_stream_svs.V-2024.03-SP1.sh
ZeBu Virtual USB Device	virtual_usb_device_svs.V-2024.03-SP1.sh
ZeBu Virtual External Display Transactor	VirtualExtDisplay.V-2024.03-SP1.sh
ZeBu AHB Master Transactor	xtor_ahb_master_svs.V-2024.03-SP1.sh
ZeBu AHB Slave Transactor	xtor_ahb_slave_svs.V-2024.03-SP1.sh
ZeBu AMBA Master Transactor	xtor_amba_master_svs.V-2024.03-SP1.sh
ZeBu AMBA Slave Transactor	xtor_amba_slave_svs.V-2024.03-SP1.sh
ZeBu APB Master Transactor	xtor_apb_master_svs.V-2024.03-SP1.sh
ZeBu APB Slave Transactor	xtor_apb_slave_svs.V-2024.03-SP1.sh
ZeBu AVSBus Transactor	xtor_avsbus_slave_svs.V-2024.03-SP1.sh
ZeBu AXI4 Master Stream Transactor	xtor_aximstream_svs.V-2024.03-SP1.sh
ZeBu AXI4 Slave Stream Transactor	xtor_axisstream_svs.V-2024.03-SP1.sh
ZeBu CHIRN Transactor	xtor_chirn_svs.V-2024.03-SP1.sh
ZeBu CHISN Transactor	xtor_chisn_svs.V-2024.03-SP1.sh
ZeBu CXL Transactor	xtor_cxl_svs.V-2024.03-SP1.sh
ZeBu CXL CTS Transactor	xtor_cxl_cts_svs.V-2024.03-SP1.sh
ZeBu DDR4 Transactor	xtor_ddr4_svs.V-2024.03-SP1.sh
ZeBu DDR4 DIMM Transactor	xtor_ddr4_dimm_svs.V-2024.03-SP1.sh
ZeBu DDR5 Transactor	xtor_ddr5_svs.V-2024.03-SP1.sh
Zebu DDR5 DIMM Transactor	xtor_ddr5_dimm_svs.V-2024.03-SP1.sh
ZeBu DP Sink Transactor	xtor_dp_sink_svs.V-2024.03-SP1.sh
ZeBu DS5 Transactor	xtor_ds5_svs.V-2024.03-SP1.sh

Feedback

Table 1 ZeBu Transactor Library Packages (Continued)

XTOR Title	Package Name
ZeBu FlexE Transactor	xtor_enet_multi_port_phy_svs.V-2024.03-SP1.sh
ZeBu ENET Transactor (DPI)	xtor_enet_svs.V-2024.03-SP1.sh
ZeBu Flash Transactor	xtor_flash_svs.V-2024.03-SP1.sh
ZeBu GDDR6 Transactor	xtor_gddr6_svs.V-2024.03-SP1.sh
ZeBu GHS Probev4 Transactor	xtor_ghs_probev4_svs.V-2024.03-SP1.sh
ZeBu HDMI2 Sink Transactor	xtor_hdmi2_sink_svs.V-2024.03-SP1.sh
ZeBu I2S Transactor	xtor_i2s_svs.V-2024.03-SP1.sh
ZeBu Input Video Tranasctor	xtor_input_video_svs.V-2024.03-SP1.sh
ZeBu Interlaken Transactor	xtor_interlaken_svs.V-2024.03-SP1.sh
ZeBU JTAG Open OCD Transactor	xtor_jtag_open_ocd_svs.V-2024.03-SP1.sh
ZeBu JTAG SWD Transactor	xtor_jtag_swd_svs.V-2024.03-SP1.sh
ZeBu JTAG T32 Transactor	xtor_jtag_t32_svs.V-2024.03-SP1.sh
ZeBu JTAG TAP Transactor	xtor_jtagtap_svs.V-2024.03-SP1.sh
ZeBu KMI Transactor	xtor_kmi_svs.V-2024.03-SP1.sh
ZeBu LPDDR4 Transactor	xtor_lpddr4_svs.V-2024.03-SP1.sh
ZeBu LPDDR5 Transactor	xtor_lpddr5_svs.V-2024.03-SP1.sh
ZeBu LIN Transactor	xtor_lin_svs.V-2024.03-SP1.sh
ZeBU MIPI CSI Transactor	xtor_mipi_csi_svs.V-2024.03-SP1.sh
ZeBu MIPI DSI Device Transactor	xtor_mipi_dsi_device_svs.V-2024.03-SP1.sh
ZeBu MIPI DSI Host Transactor	xtor_mipi_dsi_host_svs.V-2024.03-SP1.sh
ZeBu MIPI I3C Transactor	xtor_mipi_i3c_svs.V-2024.03-SP1.sh
ZeBu MMC Device Transactor	xtor_mmc_device_svs.V-2024.03-SP1.sh
ZeBu MMC Host Transactor	xtor_mmc_host_svs.V-2024.03-SP1.sh

Feedback

Table 1 ZeBu Transactor Library Packages (Continued)

XTOR Title	Package Name
ZeBu OCP Master Transactor	xtor_ocp_master_svs.V-2024.03-SP1.sh
ZeBu OCP Slave Transactor	xtor_ocp_slave_svs.V-2024.03-SP1.sh
ZeBu ONFI Transactor	xtor_onfi_svs.V-2024.03-SP1.sh
ZeBu OTU4 Transactor	xtor_otu4_svs.V-2024.03-SP1.sh
ZeBu PCIe Transactor	xtor_pcie_svs.V-2024.03-SP1.sh
ZeBu PCIe Compliance Test Suite	xtor_pcie_cts_svs.V-2024.03
ZeBu SDIO Device Transactor	xtor_sdio_device_svs.V-2024.03-SP1.sh
ZeBu SDIO Host Transactor	xtor_sdio_host_svs.V-2024.03-SP1.sh
ZeBu SRAMSW Transactor	xtor_sramsw_svs.V-2024.03-SP1.sh
ZeBu Transactors and Memory Models Smart Search	xtor_smartsearch_svs.V-2024.03-SP1.sh
ZeBu UART Transactor	xtor_uart_svs.V-2024.03-SP1.sh
ZeBu UFS Device Transactor	xtor_ufs_device_svs.V-2024.03-SP1.sh
ZeBu UFS Host Transactor	xtor_ufs_host_svs.V-2024.03-SP1.sh
ZeBu USB Transactor	xtor_usb_svs.V-2024.03-SP1.sh
ZeBu USB2 Transactor	xtor_usb2_svs.V-2024.03-SP1.sh
ZeBu VbyOne Transactor	xtor_vbyone_svs.V-2024.03-SP1.sh
ZeBu Video Transactor	xtor_video_svs.V-2024.03-SP1.sh
ZeBu ZDDR2 Transactor	ZDDR2_XTOR.V-2024.03-SP1.sh
ZeBu ZDDR3 Transactor	ZDDR3_XTOR.V-2024.03-SP1.sh
ZeBu ZLPDDR3 Transactor	ZLPDDR3_XTOR.V-2024.03-SP1.sh
ZeBu ZLPDDR4 Transactor	ZLPDDR4_XTOR.V-2024.03-SP1.sh
ZeBu ZWIDEIO2 Transactor	ZWIDEIO2_XTOR.V-2024.03-SP1.sh