ZeBu® Server 4 Site Planning Guide

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SYNOPSYS®

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Contents

List of Figures

List of Tables

Preface

About This Book

The *ZeBu® Server 4 Site Planning Guide* contains information to prepare for the installation of ZeBu Server 4 hardware.

Physical installation of the ZeBu Server 4 hardware is performed by a qualified Synopsys personnel. To prepare for the installation of the ZeBu Server 4 hardware, you must plan the following items:

- Floor space
- Relative locations of elements to each other
- Electrical power supply
- Cooling
- Host and Compilation PCs

This guide provides you the necessary information to make the most adequate choices.

Note *In this guide, the term "ZeBu Server 4 system" refers to a single unit or multi-unit configuration for ZeBu Server 4.*

Host PCs and Compilation PCs

Synopsys does not provide host PCs and Compilation PCs. The number of necessary PCs depends on the characteristics of the user designs and testbenches. For recommendations, see *PC Requirements*.

Floor Space

Floor space is needed for the following items:

- ZeBu Server 4 Racks: Configurations can vary from 1 to 5 racks. For details, see *ZeBu Server 4 Racks*.
- Host PCs: These are usually installed in racks (not provided by Synopsys). They must be located adjacent to the ZeBu Server 4 Racks. For details, see *Host PCs*.
- Compilation PCs: These are usually installed in racks (not provided by Synopsys). There is no location constraint for compilation PCs. For details, see *Compilation PCs*.

Electrical Power Supply

Electrical power supply is required for the following items:

- ZeBu Server 4 Racks: Based on the configuration, ZeBu Server 4 Racks are fitted with up to five power cords. For details, see *Power Cords*.
- Host PCs: See the documentation from the PC manufacturer.
- Compilation PCs: See the documentation from the PC manufacturer.

Cooling

- ZeBu Server 4 Racks: For details, see *ZeBu Server 4 Racks*.
- Host PCs: See the documentation from the PC manufacturer.
- Compilation PCs: See the documentation from the PC manufacturer.

Intended Audience

This guide is intended for users to help them in preparing the installation of their ZeBu Server 4 System.

Contents of This Book

The *ZeBu® Server Site Planning Guide* has the following sections:

Chapter	Describes...
ZeBu Server 4 Hardware	ZeBu Server 4 hardware and its configurations
Interconnection With Host PCs	Components required for interconnecting with the host PC
PC Requirements	Hardware and software components to be installed on Linux operated PCs
End-User Operations	Information on the hardware operations

Related Documentation

Document Name	Description
ZeBu Server 4 Site Planning Guide	Describes planning for ZeBu Server 4 hardware installation.
ZeBu Server 3 Site Planning Guide	Describes planning for ZeBu Server 3 hardware installation.
ZeBu Server Site Administration Guide	Provides information on administration tasks for ZeBu Server 3 and ZeBu Server 4. It includes software installation.
ZeBu Server Getting Started Guide	Provides brief information on using ZeBu Server.
ZeBu Server User Guide	Provides detailed information on using ZeBu Server.
ZeBu Server Debug Guide	Provides information on tools you can use for debugging.
ZeBu Server Debug Methodology Guide	Provides debug methodologies that you can use for debugging.
ZeBu Server Unified Command-Line User Guide	Provides the usage of Unified Command-Line Interface (UCLI) for debugging your design.
ZeBu Server Functional Coverage User Guide	Describes collecting functional coverage in emulation. For VCS and Verdi, see the following: - Coverage Technology User Guide - Coverage Technology Reference Guide - Verification Planner User Guide - Verdi Coverage User Guide and Tutorial For SystemVerilog, see the following: - SystemVerilog LRM (2017)
ZeBu Server Power Estimation User Guide	Provides the power estimation flow and the tools required to estimate the power on a System on a Chip (SoC) in emulation. For SpyGlass, see the following: - SpyGlass Power Estimation and Rules Reference - SpyGlass Power Estimation Methodology Guide - SpyGlass GuideWare2018.09 - Early-Adopter User Guide
ZeBu Verdi Integration Guide	Provides Verdi features that you can use with ZeBu. This document is available in the Verdi documentation set.
ZeBu Server LCA Features Guide	Provides a list of LCA features available with ZeBu Server.
ZeBu Server Release Notes	Provides enhancements and limitations for a specific release.

Typographical Conventions

This document uses the following typographical conventions:

To indicate	Convention Used
Program code	`OUT <= IN;`
Object names	`OUT`
Variables representing objects names	*<sig-name>*
Message	Active low signal name '<sig-name>' must end with _X
Message location	`OUT` <= IN;
Reworked example with message removed	OUT_X <= IN;
Important Information	**NOTE:** This rule...

The following table describes the syntax used in this document:

Syntax	Description
[ ] (Square brackets)	An optional entry
{ } (Curly braces)	An entry that can be specified once or multiple times
| (Vertical bar)	A list of choices out of which you can choose one
. . . (Horizontal ellipsis)	Other options that you can specify

1 ZeBu Server 4 Hardware

This chapter provides information about the ZeBu Server 4 hardware.

This section describes the following subtopics:

- *ZeBu Server 4 System*
- *ZeBu Server 4 Single Unit Configuration*
- *ZeBu Server 4 Multiunit Configuration*
- *ZeBu Server 4 Hardware Elements*
- *Floor Space Requirements*
- *Electrical Power Supply*
- *Cooling and Airflow*

1.1 ZeBu Server 4 System

A ZeBu Server 4 System consists of 1 to 16 Units.

ZeBu Server 4 multi unit Systems can accommodate up to 32 users (for a 16-unit System) and can handle designs up to 9 billion ASIC-equivalent gates (exact capacity utilization is dependent on design and use case).

The ZeBu Server 4 System is connected to the host PCs through host adapter cards. In multi-user environments, depending on the configuration, a maximum of 8 to 32 PCs can be connected to one ZeBu Server 4 unit.

The ZeBu Server 4 hardware has the following configuration:

- *ZeBu Server 4 Single Unit Configuration*
- *ZeBu Server 4 Multiunit Configuration*

1.2 ZeBu Server 4 Single Unit Configuration

The ZeBu Server 4 unit can act as the ZeBu Server 4 system in a single unit configuration, and consists of the following elements:

- One backplane
- One to four ZeBu Server 4 modules
- One power supply
- One control interface

A single Short Rack contains up to two ZeBu Server 4 single unit systems.

1.3 ZeBu Server 4 Multiunit Configuration

A ZeBu Server 4 multi-unit system consists of 1 to 16 units that are interconnected by hubs to offer more emulation resources.

Depending on the number of units, a ZeBu Server 4 system consists of:

- One or more ZeBu Server 4 units
- One or more system hub
- One or more data hub
- One or more clock hub
- One or more power supply

A ZeBu Server 4 two-unit system fits in a single Short Rack.

A ZeBu Server 4 three-unit system fits in one or two Tall Racks.

Note *A ZeBu Server 4 three-unit system that is contained in one Tall Rack cannot be upgraded.*

Starting from ZeBu Server 4 four-unit systems, one Tall Rack is required for every 4 units and one Tall Rack for the hubs in the entire system. For example, a 16-unit system is contained in 5 Tall Racks.

TABLE 1 Number of Racks for Each Configuration

Number of Units in System	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Number of Racks	1	1	1 or 2	2	3	3	3	3	4	4	4	4	5	5	5	5

1.4 ZeBu Server 4 Hardware Elements

The following hardware elements are present in a ZeBu Server 4 system:

- *ZeBu Server 4 Module*
- *ZeBu Server 4 Unit*
- *System, Clock, and Data Hubs*
- *ZeBu Server 4 Racks*
- *Control Interface*
- *Power Supply*

1.4.1 ZeBu Server 4 Module

Each ZeBu Server 4 Module can handle 150M ASIC gates and provides 28 gigabytes of memory to model design memories. Each Unit can contain up to 4 Modules.

1.4.2 ZeBu Server 4 Unit

The ZeBu Server 4 unit is the basic component of any ZeBu Server 4 system. The unit can act as the ZeBu Server 4 system in a single unit configuration or is a part of the ZeBu Server 4 system in a multiunit configuration.

Each ZeBu Server 4 unit can handle designs from 150M to 600M ASIC-equivalent gates (exact capacity utilization is design and use case dependent). Up to 8 users can connect to a unit at the same time.

Each ZeBu Server 4 unit also provides a Smart Z-ICE interface for connecting the DUT to a standard software debugger using a JTAG cable or to a target system. This interface and its usage are described in the *ZeBu Server User Guide*.

1.4.3 System, Clock, and Data Hubs

System Hub

This System Hub routes the communications between any of the host PCs and any of the connected units (through the Control Interface) within the multiunit system.

Clock Hub

The Clock Hub routes the clock to multiple ZeBu Server 4 units.

Data Hub

This Data Hub routes signals between several ZeBu Server 4 units.

Note

- *This information is provided to you for description purposes only.*
- *The connection of the system hub is performed by an authorized Synopsys personnel.*
- *DO NOT attempt to plug/unplug a cable to/from a system hub. You may damage the ZeBu System 4 system.*

1.4.4 ZeBu Server 4 Racks

Depending on the configuration, the ZeBu Server 4 hardware is deployed in Short or Tall Racks.

- Up to two ZeBu Server 4 units can fit in a Short Rack.
- Up to four ZeBu Server 4 units can fit in a Tall Rack.

Note

- *Starting from 4-unit multi-unit systems, a dedicated rack is used to accommodate the hubs connecting the units together. 3-unit multi-unit systems may optionally use a dedicated rack for the hubs.*
- *A ZeBu Server 4 3-unit system that is contained in one Tall Rack cannot be upgraded.*

FIGURE 1. ZeBu Server 4 Racks

1.4.4.1 Short Rack

A ZeBu Server 4 Short Rack can contain one or two single unit systems or one 2-unit multi-unit system.

TABLE 2 Characteristics of Short Rack

Width of Rack	72 cm	28.4’’
Depth of Rack	129 cm	50.8’’
Height of Rack	147 cm	57.8’’
Empty Weight	< 200 kg	
Loaded Weight	~ 320 kg	

1.4.4.2 Tall Rack

A ZeBu Server 4 Tall Rack can be used for different purposes in a ZeBu Server 4 system.

One ZeBu Server 4 Tall Rack can contain one 3-unit multi-unit system, including the necessary hubs.

For larger multi-unit systems, a Tall Rack can contain four units and one additional Tall Rack is required to contain the necessary hubs. For example, a 16-unit system is accommodated in five Tall Racks.

TABLE 3 Characteristics of Tall Rack

	Cm	**Inches**
Width of Rack	72 cm	28.4’’
Depth of Rack	129 cm	50.8’’
Height of Rack	214 cm	84.3’’
Empty Weight	256 kg	
Loaded Weight	466 kg	

1.4.5 Control Interface

The primary function of the Control Interface is to support the connection from host PCs.

In a single unit system, the host PCs are directly connected to the Control Interface using the dedicated cables.

In a multiunit system, the host PCs are connected using system hubs, which reroute the connection to the Control Interfaces of the units within the system.

The following figure illustrates the front panel of a Control Interface.

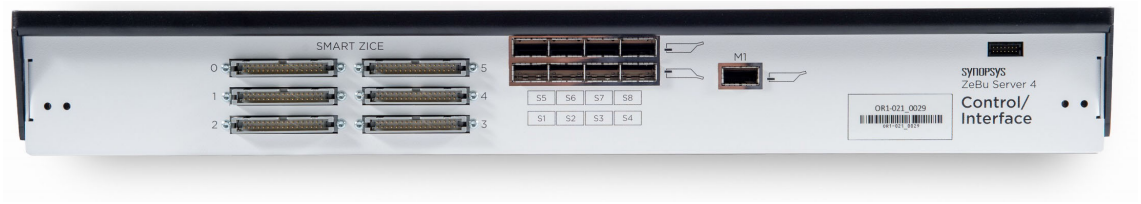

FIGURE 2. Front Panel of a Control Interface

Six Smart-ZICE connectors (each with 16 data, 1 clock pin) are located on the left of the front panel of the Control Interface. You can connect cables from these connectors to standard software debuggers or to a target system.

The cabling of the other connectors located on the front panel are not to be changed by customers.

Note

- *The connection of the Control Interface is performed by an authorized Synopsys personnel.*
- *Customers are only allowed to plug cables into the Smart-ZICE connectors.*
- *DO NOT attempt to plug/unplug a cable other than Smart-ZICE to/from a Control Interface. You may damage the ZeBu Server 4 system.*

1.4.6 Power Supply

This device supplies power to ZeBu Server 4 units or to hubs. Depending on the configuration, there may be several power supplies in a ZeBu Server 4 system.

The following figure illustrates the front panel of a power supply.

FIGURE 3. Front Panel of the Power Supply

The power switch (ON/OFF) switch is located on the left side of the front panel.

The cabling of the other connectors located on the front panel are not to be changed by customers.

Note

- *This information is provided to you for description purposes only.*
- *The connection of the power supply is performed by an authorized Synopsys personnel.*
- *Customers are only allowed to use the On/Off switch.*
- *DO NOT attempt to plug/unplug a cable to/from a power supply. You may damage the ZeBu Server 4 system.*

1.5 Floor Space Requirements

The Short and Tall Racks have the same footprint.

TABLE 4 Dimensions of Rack

	Cm	Inches	
Width of Rack	72		
Depth of Rack	129		
Lateral clearance	10	3.73’’	On right side for airflow Enforced by the modesty panel

TABLE 4 Dimensions of Rack

	Cm	Inches
Front clearance	100	
Rear clearance	100	
Width of floor occupation	82	
Depth of floor occupation	329	

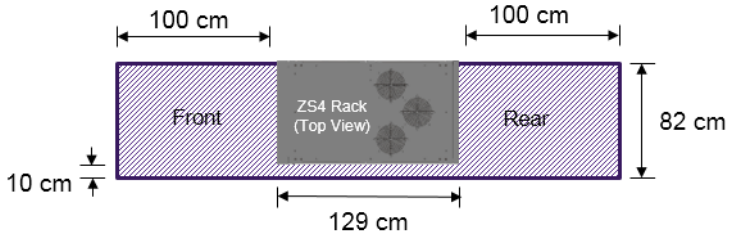

FIGURE 4. Footprint of One Rack

TABLE 5 Number of Racks for Each Configuration

Number of Units in System	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Number of Racks	1	1	1 or 2	2	3	3	3	3	4	4	4	4	5	5	5	5

Note *A 10 cm clearance must be provided to the left of the system to allow opening of the left-most rack.*

1.6 Electrical Power Supply

The ZeBu Server 4 has the following power supply features:

- *Uninterruptible Power Supply*
- *Characteristics of the Power Supply*
- *Power Consumption of ZeBu Server 4*
- *Power Cords*

1.6.1 Uninterruptible Power Supply

The whole server room must be equipped with an Uninterruptible Power Supply (UPS).

1.6.2 Characteristics of the Power Supply

Each ZeBu Server 4 power supply is protected by a 15 Ampere fuse and the input voltage range is 200-240 V, 50-60 Hz, single phase.

1.6.3 Power Consumption of ZeBu Server 4

The power consumption of the ZeBu Server 4 system depends on the following factors:

- Number of FPGAs in the system
- Number of FPGAs used by the DUT
- Fill rate and toggle rate of your DUT FPGAs
- Initial state of the design and the memory requirements
- Frequencies of the system clock and design clocks

The measurement of mean power provides variable results depending on the application. This measurement is always lower than the values given in the following tables:

Number of units	1	2	3	4	5	6	7	8
Maximum power consumption (W)	3800	7400	11000	18400	25800	29400	33000	36600
Number of units	9	10	11	12	13	14	15	16
Maximum power consumption (W)	40400	44000	47600	51200	58600	62200	65800	69400

Note *The numbers given in the preceding table are based on the maximal output of the power supply. Actual consumption may be significantly lower. However, the external power supply must be chosen based on the maximum possible power consumption. For more precise evaluation of the power consumption, contact Synopsys Support.*

1.6.4 Power Cords

Power cords are provided with ZeBu Server 4.

There is one power cord for each unit and one for the rack. By default, the power cords are located at the top of the rack. By requesting Synopsys, they can be relocated at the bottom of the rack.

TABLE 6 Number of Power Cords for Each Configuration

Number of units	1	2	3	4	5	6	7	8
Number of Power Cords	2	3	4	7	10	11	12	13

TABLE 6 Number of Power Cords for Each Configuration

Number of units	9	10	11	12	13	14	15	16
Number of Power Cords	15	16	17	18	21	22	23	24

Each of these power cords must be connected to a separate 16 Ampere circuit.

Note *Prior to installation, you must ensure that the correct power cords are shipped for your premises. For more information, contact Synopsys support.*

1.7 Cooling and Airflow

The operating temperature is a critical point for ZeBu Server 4. For proper air circulation around ZeBu Server 4, Synopsys recommends installing it in an air-conditioned room with sufficient clearances on both left and right sides.

TABLE 7 Environmental Constraints

Operating ambient temperature	**10°C to 20°C (50°F to 68°F)**
Operating relative humidity	Up to 80% non-condensing
Cooling for a 2-slot unit	TBD
Cooling for a 5-slot unit	TBD
Noise generated by a 2-slot unit	TBD
Operating altitude	Up to 2,000 m (up to 6,500 feet)
Installation	Category II
Pollution	Pollution degree 2
RoHS	Compliant with Directive 2002/95/EC

Airflow

It is required to make a 10 cm clearance on the right side of each ZeBu Server 4 rack.

This clearance is enforced by a modesty panel. The following figure indicates the required clearance.

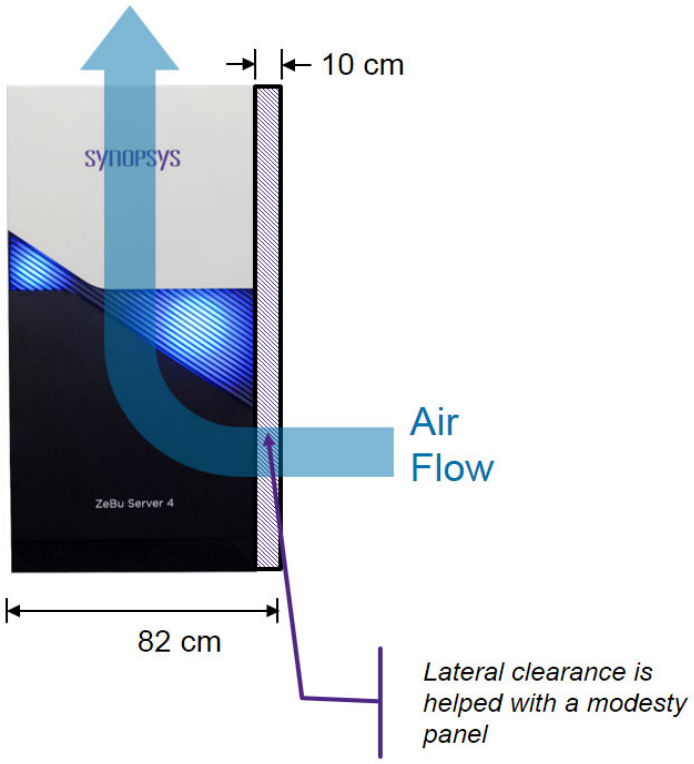

FIGURE 5. Airflow

2 Interconnection With Host PCs

This section describes the following subtopics:

- *Host Adapter Card*
- *Host Adapter Cable*
- *Numbers of Host PC*
- *Location Constraints*

Note

The connection of the ZeBu Server 4 units to the host PCs and interconnections between ZeBu Server 4 units are physically performed by an authorized Synopsys personnel.

Do not attempt to plug or unplug a cable to or from a unit. You might easily damage it.

2.1 Host Adapter Card

The host adapter card for ZeBu Server 4 is compliant with the PCI Express 3.0 standard. It is 8-lanes PCIe interface board and can fit into any 8- or 16-lane PCIe slot.

TABLE 8 External Dimensions of Host Adapter Card

	W x H
Host Adapter Card	16.8cm x 11.2cm 6.6” x 4.4”

2.2 Host Adapter Cable

The length of the host adapter cable is up to 5 meters (9.8 feet).

Length	Material Number	Tab Color
1.3 m	HW0412-0	Grey
1.8 m	HW0413-0	Purple
2.3 m	HW0449-0	Green
3 m	HW0414-0	Blue
4 m	HW0450-0	Black
5 m	HW0415-0	Red

WARNING *Always remove the host adapter cable by pulling the plastic tab. Do not pull on the metal housing itself.*

Note *The connection of the host adapter cable to the ZeBu Server 4 must only be performed by an authorized Synopsys personnel.*

2.3 Numbers of Host PC

Following are the different types of modules supported:

- *Half-Module Support*
- *Full-Module Support*

2.3.1 Half-Module Support

ZeBu Server 4 Modules are organized as 2 half-modules. Each half-module is self-contained and can support its emulation job for small designs. However, only specific configurations (up to 4 units) of ZeBu Server 4 systems allow to take advantage of this feature.

For configurations supporting the half-module use, the maximum number of hosts are listed in the following table:

TABLE 9 Maximum Numbers of Host PCs (half-module granularity)

Number of Units	1	2	3	4
Maximum number of concurrent hosts/users	8	16	24	32
Maximum number of hosts with full system access	8	32	32	32

Note *Ensure that you order the right number of host adapter cards and Cables from Synopsys.*

2.3.2 Full-Module Support

The full-module support has the following configurations:

- *Host PCs*
- *Host Adapter Cards*

Host PCs

For configurations using only full-modules, the maximum number of host PCs are listed in the following table:

TABLE 10 Maximum Number of Host PCs (full-module granularity)

Number of Units	1	2	3	4	5	6	7	8
Maximum Number of Concurrent Host PCs/Users	4	8	12	16	20	24	28	32
Maximum Number of Host PCs With Full System Access	8	32	32	32	32	32	32	32
Number of Units	9	10	11	12	13	14	15	16
Maximum Number of Concurrent Host PCs/Users	32	32	32	32	32	32	32	32
Maximum Number of Host PCs With Full System Access	32	32	32	32	32	32	32	32

Note *Make sure that you order the right number of host adapter cards and cables from Synopsys.*

Host Adapter Cards

The number of host adapter cards depends on the number of host PCs that you decide to connect to the ZeBu Server 4 system. The number of host adapter cards is given in the following table:

TABLE 11 Number of Host Adapter Cards

Number of Units	**1-4**	**5-8**	**9-12**	**13-16**
Number of Host PCs	N	N	N	N
Number of Host Adapter Cards	N	N	2*N	2*N
Number of Host Adapter Cables	N	2*N	3*N	4*N
Required number of PCIe slots in each Host PC	1	1	2	2

2.4 Location Constraints

Due to the limited length of the Host Adapter Cables, the racks containing the host PCs must be located next to the ZeBu Server 4 system.

3 PC Requirements

The ZeBu Server 4 hardware and software can be installed on most Linux-operated PCs.

Read this chapter before installing the ZeBu Server 4 software and hardware to ensure that the chosen PC is suitable for installation.

This section describes the following subtopics:

- *General Requirements*
- *Host PCs*
- *Compilation PCs*
- *Hard Disk Requirements*

3.1 General Requirements

The ZeBu Server 4 compilation and runtime software are 64-bit programs that can only be used on 64-bit PC configurations.

It is recommended to use only PC configurations that have been previously tested by Synopsys. If you use a PC configuration that has not been tested by Synopsys, you might encounter malfunction during installation and at runtime. In such a case, see the "*Troubleshooting*" section in the *ZeBu Server Software Installation Manual*.

You must inform Synopsys if you want to use a PC configuration, which is not part of the list of PC configurations tested and recommended by Synopsys. It is important that Synopsys has enough time to test this new PC before you use it with ZeBu Server 4.

The list of recommended PC configurations for compilation and emulation runtime are listed in this chapter.

3.2 Host PCs

The ZeBu Server 4 host adapter card is plugged in a PCIe slot in the host PC.

TABLE 12 Number of PCIe Slots in Host PCs

Number of units	1-4	5-8	9-12	13-16
Required number of PCIe slots in each Host PC	1	2	3	4

For debug purposes, use a PC with a RESET button to restart the system without powering OFF.

You must have several host PCs as testbenches that might run simultaneously on your ZeBu Server 4 system. For more information, see *Numbers of Host PC*.

The fan should be set at the maximum speed. It is usually done in the BIOS but in some cases (for example, SuperMicro), it has to be done by a super-user command.

This section describes the following subsections:

- *Number of Host PCs*
- *Suggested Machines for Emulation Runtime*
- *Numbers of Cores*
- *RAM Requirements for Emulation Runtime*
- *Cooling*
- *Operating System*

3.2.1 Number of Host PCs

You must have several host PCs as testbenches that might run simultaneously on your ZeBu Server 4 system. For more information, see *Numbers of Host PC*.

3.2.2 Suggested Machines for Emulation Runtime

The following PCs have already been tested by Synopsys and are recommended for use with ZeBu Server 4:

- HP Proliant DL360p, Gen8,Gen9, Gen10
- HP DL380 Gen9
- HP DL580 Gen8
- HP Z620, HP Z640
- HP Z820, Z840
- HP Z420, HP Z440
- SuperMicro PCs
  - SYS-1028U-TR4+
  - SYS-6028R-TR

For the host PC, the ZeBu Server 4 emulation runtime software requires PC configurations with at least 4 cores. Additional cores are required when using advanced features or multithreaded verification environments.

Some of the recommended models that are listed are available in various form-factors. Ensure that the form-factor can accommodate the ZeBu Server 4 host adapter card.

For large configurations, PC Hosts that can accommodate multiple ZeBu Server 4 host adapter cards are required.

The list of PCs can frequently be outdated based on the rapid market changes. You must do your research and ask Synopsys for feedback on their potential.

3.2.3 Numbers of Cores

The ZeBu Server 4 emulation runtime software is multithreaded. The number of threads depend on the type of testbench and the features used. It is recommended to use a host PC with a minimum of 8 cores.

3.2.4 RAM Requirements for Emulation Runtime

RAM requirements, when using ZeBu Server 4, vary based on the design size.

For emulation runtime, the host PC must have enough memory to load the runtime database. Synopsys recommends the following:

- Minimum 64 GB RAM
- 320 GB RAM for designs that require many transactors or a testbench that allocates many memories

Based on your verification environment (in particular for an HDL simulator) and the architecture of your testbench, you might need to increase the memory capacity to achieve the required performance.

3.2.5 Cooling

⚠WARNING *The fan should be set at the maximum speed. It is usually done in the BIOS but in some cases (for example, SuperMicro), it has to be done by a super-user command.*

3.2.6 Operating System

The ZeBu Server 4 software runs on Linux. Note that only a few variants of Linux are tested. To check the tested Linux version, see the latest *ZeBu Server Release Notes*.

3.3 Compilation PCs

This section describes the following subsections:

- *Suggested Machines for Compilation*
- *Farm Requirements*

3.3.1 Suggested Machines for Compilation

The following PCs are tested by Synopsys and are recommended for use with ZeBu Server 4:

- Dell PowerEdge R630
- HP Proliant DL360p Gen8, Gen9, and Gen10
- HP Proliant DL380p Gen8, Gen9
- SuperMicro PCs
  - SYS-1028U-TR4+
  - SYS-6028R-TR

The preceding information can frequently be outdated based on the rapid market changes. You must do your research and ask Synopsys for feedback on their potential.

3.3.2 Farm Requirements

For any ZeBu Server 4 configuration, it is recommended to compile the design in parallel on a PC farm with the memory requirements listed in the following table.

The ZeBu Server 4 compilation software consists of many components with different requirements. The software allows to send jobs on different compilation PCs depending on the component. It is recommended to use a grid engine to dispatch

computing jobs.

A high-level view of these requirements is shown in the following table (where N is the number of units):

	RAM (GB)	CPU Cores / Job	Number of Jobs
Synthesis	64 + N * 12	16	1
Backend	128 + N * 60	16-32	1
FPGA Place & Route	48	4	N * 96

If your computing farm allows for more fine tuning, contact Synopsys support for more detailed information.

Actual data is design-dependent.

3.4 Hard Disk Requirements

This section describes the following subsections:

- *Hard Disk Requirements for Installation of Software Package*
- *Hard Disk Requirements for Configuration Directory*
- *Hard Disk Requirements for Design Compilation*

3.4.1 Hard Disk Requirements for Installation of Software Package

The ZeBu Server 4 software, including the specific Xilinx Place and Route subset, and the additional packages require a maximum of 25 GB on your hard disk after installation.

For more information, see the *Downloading the Packages for Installation* section in the *ZeBu Server Installation Manual.*

The overall size recommended for your hard disk to install the ZeBu Server 4 software is 37 GB, due to the temporary data stored during installation.

This disk space must be accessible from host PCs and Compilation PCs.

3.4.2 Hard Disk Requirements for Configuration Directory

The ZeBu Server 4 software uses a central directory to store information about the configuration of the system and to store log files.

This disk space must be accessible from host PCs and Compilation PCs.

It is recommended to enable the NFS flock so that ZeBu tools works as intended.

3.4.3 Hard Disk Requirements for Design Compilation

When compiling the design for ZeBu Server 4, the estimated disk space is 1GB for each FPGA.

This disk space must be accessible from host PCs and compilation PCs.

4 End-User Operations

This chapter provides information on the hardware operations that may performed by customers.

Hardware installation (or upgrade) of a ZeBu Server 4 unit must be performed by a Synopsys personnel. In addition, the ZeBu Server 4 unit must not be moved without explicit authorization of a Synopsys personnel.

Only the following operations may be performed without the presence of Synopsys personnel:

- *Switching the Power ON and OFF for ZeBu Server 4*
- *Installing the ZeBu Server 4 Host Adapter in a Host PC*
- *Removing the ZeBu Server 4 Host Adapter From a Host PC*
- *Connecting the ZeBu Server 4 Cable to the Host PC*
- *Connecting ZeBu Server 4 Units to the Power Supply*

4.1 Switching the Power ON and OFF for ZeBu Server 4

Each ZeBu Server 4 contains several power supplies, from 1 to 19, depending on the number of units. To power on or off the ZeBu Server 4 system, use the power switch (ON/OFF) of every power supply in the system. For more information, see *Power Supply*.

4.2 Installing the ZeBu Server 4 Host Adapter in a Host PC

Safety Note

Installation of the host adapter must be performed by a trained personnel (with sufficient knowledge and training, and suitably equipped). Especially, the host PC and the power socket outlet must be switched OFF (wherever possible), and then the power cord must be removed BEFORE you attempt to install the host adapter inside a host PC.

⚠WARNING

- *Electricity can kill. Even non-fatal shocks can cause severe and permanent injury. Voltages inside the host PC are POTENTIALLY LETHAL.*
- *The host adapter can become very hot.*

To install the ZeBu Server 4 Host Adapter in a host PC, perform the following steps:

1. Remove all jewelry from your hands and wrists.
2. Use only insulated or non-conducting tools.
3. Switch OFF the PC and then switch OFF the power socket (if possible).
4. Unplug the power cord connected to the PC.
5. Wait for 10 to 20 seconds to allow voltage levels inside the PC to fall.
6. Remove the cover from the PC.
7. Remove the slot-cover from a vacant, unshared bus-mastering PCIe slot and save the screw.
8. Carefully insert the Host Adapter in the PCIe slot.

9. Secure the Host Adapter in place using the slot-cover screw removed in *step 6*.
10. Replace the PC cover.
11. Reconnect the power cord to the PC.

NOTE: *The Host Adapter is powered from the PCIe bus and the white power connector on the board MUST NOT be connected directly to the PC power supply.*

4.3 Removing the ZeBu Server 4 Host Adapter From a Host PC

Safety Note

Installation of the host adapter must be performed by a competent personnel (with sufficient knowledge and training, and suitably equipped). Above all, the host PC and the power socket outlet must be switched OFF (wherever possible), then the power cord removed BEFORE you attempt to install the host adapter inside a host PC.

- *Electricity can kill. Even, non-fatal shocks can cause severe and permanent injury. Voltages inside the host PC are POTENTIALLY LETHAL.*
- *The host adapter can become very hot.*

To remove the host adapter from a host PC, perform the following procedure:

1. Remove all jewelry from your hands and wrists.
2. Use only insulated or non-conducting tools.
3. Switch OFF the PC and then switch OFF at the power socket (if possible).
4. Unplug the power cord connected to the PC.
5. Wait for 10 to 20 seconds to allow voltage levels inside the PC to fall.
6. Check and write down the cabling between the host PC and the unit. This facilitates your next installation.
7. On the host PC, unplug the cables from the host adapter.
8. Remove the cover from the PC.
9. Unmount the host adapter carefully.

4.4 Connecting the ZeBu Server 4 Cable to the Host PC

You may need to connect or disconnect one ZeBu Server 4 cable on the host adapter while replacing a host PC in your system.

The connection of the ZeBu Server 4 cables to the ZeBu Server 4 units is performed by an authorized Synopsys personnel.

End-users are only allowed to connect the ZeBu Server 4 cables to the host PCs.

Note *Configurations with more than 4 units require several cables per PCs. Configurations with more than 8 units require 2 host adapters.*

In these cases, it is recommended to ask Synopsys personnel to connect the cables to the host PCs.

There is no need for tools to connect/disconnect the cables on the host adapter.

To connect the ZeBu Server 4 cable to a host PC:

1. Check that the ZeBu Server 4 units are already switched OFF and unplugged.
2. Switch OFF the host PC.
   a. Unplug the PC's power cord.
   b. Wait for 10 to 20 seconds to allow voltage levels inside the PC to fall.
3. If necessary, plug the Host Adapter in the new host PC as described.
4. Connect the cable to the connector of the Host Adapter located nearest the PCIe bus.
   a. For a good connection, the connector should be correctly locked.
   b. The connector can be inserted both ways up.

      You can insert its full length and hear the locking click only when inserting it the correct way up.

Always remove by pulling the plastic tab! Do not pull on the metal housing itself.

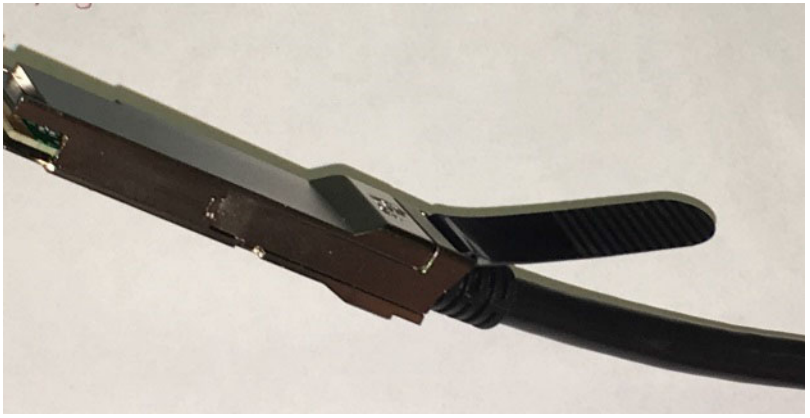

FIGURE 6. Connector of the Host Cable

FIGURE 7. Connectors on the Host Adapter

4.5 Connecting ZeBu Server 4 Units to the Power Supply

There is one power cord for each ZeBu Server 4 unit plus one for the ZeBu Server 4 Rack. They are located by default at the top of the Rack. By requesting Synopsys, they can be located at the bottom of the Rack.

Ensure that the main socket and the ZeBu Server 4 units are all switched OFF (panel switch position on the ZeBu Server 4 units = O).

Select the appropriate cord and connect it as follows:

1. Connect the power cords to the respective ZeBu Server 4 units.
2. Connect the power cords to the mains socket.
3. Switch ON the mains socket.
4. Switch ON the ZeBu Server 4 units (panel switch position = I).

You can now switch ON the host PCs connected to ZeBu Server 4 units and initialize the ZeBu Server 4 system from the relevant PC.

For more information, see chapters *ZeBu Server System Setup* and *Initializing the ZeBu Server System* sections in the *ZeBu Software Installation Manual*.

Note *Changing the fuse in a ZeBu Server 4 unit is not an end-user operation.*