

Sun Netra X4270 Server

Site Planning Guide



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Using This Documentation

This site planning guide provides the specifications and site requirements you can use to prepare your site before installing the Sun Netra X4270 server from Oracle. This guide is written for data center administrators and experienced system installers who have advanced experience maintaining a data center environment.

This preface contains the following topics:

- “Related Documentation” on page v
- “Documentation, Support, and Training” on page vii
- “Documentation Feedback” on page vii

Related Documentation

The following tables list the Sun Netra X4270 server documentation and related documentation.

The documents listed as online are available at:

(<http://docs.sun.com/app/docs/prod/nt4270.srvr#hic>)

TABLE: Sun Netra X4270 Server Documentation

Application	Title	Part Number	Location
Late-breaking news	<i>Sun Netra X4270 Server Product Notes</i>	821-0577-xx	Online
Site planning	<i>Sun Netra X4270 Server Site Planning Guide</i>	821-0571-xx	Online
Getting started	<i>Sun Netra Rack Server Getting Started Guide</i>	820-3016-xx	Included in shipping kit
Installation	<i>Sun Netra X4270 Server Installation Guide</i>	821-0572-xx	Online
Service	<i>Sun Netra X4270 Server Service Manual</i>	821-0573-xx	Online
Remote management	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Netra X4270 Server</i>	821-0574-xx	Online

TABLE: Sun Netra X4270 Server Documentation (Continued)

Application	Title	Part Number	Location
Operating system installation	<i>Sun Netra X4270 Server Operating System Installation Guide</i>	821-0576-xx	Online
Safety and compliance	<i>Sun Netra X4270 Server Safety and Compliance Guide</i>	821-0575-xx	Online
Safety information	<i>Important Safety Information for Sun Hardware Systems</i>	816-7190-xx	Included in shipping kit

TABLE: ILOM 3.0 Documentation

Application	Title	Part Number	Location
Late-breaking news and issues	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Feature Updates and Release Notes</i>	820-7329-xx	Online
Installation and configuration	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Getting Started Guide</i>	820-5523-xx	Online
Conceptual information	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide</i>	820-6410-xx	Online
Browser interface procedures	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide</i>	820-6411-xx	Online
CLI procedures	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide</i>	820-6412-xx	Online
SNMP and IPMI procedures	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Management Protocols Reference Guide</i>	820-6413-xx	Online

TABLE: SAS Controller HBA and LSI 106x RAID Documentation

Application	Title	Part Number	Location
Disk management overview	<i>Sun Disk Management Overview</i>	820-6350-xx	Online
RAID management	<i>Sun LSI 106x RAID User's Guide</i>	820-4933-xx	Online
SAS HBA installation	<i>Sun StorageTek PCI Express SAS 8-Channel Internal HBA Installation Guide</i>	820-4932-xx	Online

TABLE: Diagnostics for x64 Servers

Application	Title	Part Number	Location
Diagnostics available for x64 servers	<i>Sun x64 Servers Diagnostics Guide</i>	820-6750-xx	Online

Documentation, Support, and Training

These web sites provide additional resources:

- Documentation (<http://docs.sun.com>)
- Support (<http://www.sun.com/support>)
- Training (<http://www.sun.com/training>)

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Submit comments about this document by clicking the Feedback[+] link at (<http://docs.sun.com>).

Include the title and part number of your document with your feedback:

Sun Netra X4270 Server Site Planning Guide, part number 821-0571-10.

Preparing the Site for Installation

This guide provides the specifications and site requirements for planning the installation of the Sun Netra X4270 server.

Note – For safety and compliance information, refer to the online *Sun Netra X4270 Server Safety and Compliance Guide* and the *Important Safety Information for Sun Hardware Systems* that came with your server.

- [“Reviewing Server Specifications” on page 2](#)
- [“Preparing the Facility” on page 7](#)

Related Information

- [Sun Netra X4270 Server Installation Guide](#)
- [Sun Netra X4270 Server Safety and Compliance Guide](#)
- [Important Safety Information for Sun Hardware Systems](#)

Reviewing Server Specifications

Review the following specifications and requirements to prepare for the server installation.

- [“Physical Specifications” on page 2](#)
- [“AC and DC Server Environmental Specifications” on page 3](#)
- [“Minimum Clearance for Service Access” on page 4](#)
- [“AC and DC Power Source Requirements” on page 4](#)
- [“Acoustic Noise Emissions” on page 5](#)
- [“Agency Compliance Specifications” on page 6](#)
- [“NEBS Level 3 Certification” on page 7](#)

Related Information

- [“Preparing the Facility” on page 7](#)
- *Sun Netra X4270 Server Installation Guide*

Physical Specifications

Dimension	Server Dimensions	Measurements
Width	Bezel	17.4 in. (442.0 mm)
	Server chassis	16.75 in. (425.5 mm)
Depth	To connector plane	20 in. (502 mm)
	Maximum overall	20.67 in. (525 mm)
Height	2 rack unit (2U) nominal	3.44 in. (87.4 mm)
Weight	Server only	41.23 lbs (18.70 kg)

Related Information

- [“Minimum Clearance for Service Access” on page 4](#)
- [“Operating Environment Requirements” on page 8](#)

AC and DC Server Environmental Specifications

Specification	Operating	Nonoperating
Ambient temperature*	Maximum: 41°F to 104°F (5°C to 40°C) up to 6000 feet (1829 meters) [†] Optimal: 69.8°F to 73.4°F (21°C to 23°C) Short term maximum: 23°F to 131°F (-5°C to 55°C)	-40°F to 158°F (-40°C to 70°C)
Relative humidity	10% to 90% noncondensing, short term 25°F to 113°F (-5°C to 55°C) 5% to 90% noncondensing, but not to exceed 0.024 kg of water per kg of dry air (0.053 lbs. water/2.205 lbs. dry air)	Up to 93% noncondensing 100.4° (37.7°C) maximum wet bulb
Elevation (Company requirement)	Maximum 9840 feet (3000 meters) at 104°F (40°C)	Maximum 39370 feet (12000 meters)
Elevation (NEBS requirement)	-200 feet to 5900 feet (-60 meters to 1800 meters) at 104°F (40°C) 5900 feet to 13100 feet (1800 meters to 4000 meters) at 86°F (30°C)	

* Does not apply to removable media devices.

† Maximum ambient operating temperature is derated by 1 degree C per 500m elevation.



Caution – Netra rack mounted servers are certified to meet these worst-case operating conditions only when using an approved rackmount kit. You must strictly follow the rackmounting instructions in the *Sun Netra X4270 Installation Guide* in order to meet these environmental specification.

Related Information

- [“Acoustic Noise Emissions” on page 5](#)
- [“Operating Environment Requirements” on page 8](#)
- [“Airflow Considerations” on page 10](#)
- [Sun Netra X4270 Installation Guide](#)

Minimum Clearance for Service Access

Description	Specification
Clearance, front of server	36 inches (91 cm)
Clearance, rear of server	36 inches (91 cm)

Related Information

- [“Physical Specifications” on page 2](#)
- *Sun Netra X4270 Server Service Manual*

AC and DC Power Source Requirements

The server has two power supplies. Both the AC and the DC power supplies are capable of current sharing. To ensure redundant operation of the power supplies, connect the two power cords to separate circuits.

Note – The system does not require an additional surge protector for the AC or DC power configurations if the facility has a surge protector that limits voltage surges to less than 2000 volts. You can, however, install a surge protector if your site requires an additional protector.

Parameter	AC Version Requirement	DC Version Requirement*
Voltage (nominal)	100 to 120/200 to 240 VAC (90 to 132/180 to 264 VAC ranges)	-48 or -60 VDC (-40 to -75 VDC range)
Input current (maximum)	9.0 A @ 100 VAC (900 VA)	15.4 A @ -48 VDC (740 VA)
Frequency (nominal)	50/60 Hz (47 to 63 Hz range)	N/A
DC input treatment	N/A	Isolated DC Return (DC-I)

* The DC power source must be reliably connected to ground.

Note – The values in the preceding table are the power supply specifications.



Caution – The DC power source must be reliably grounded. The server chassis must be grounded with the PSU ground pins or with the chassis ground studs. It is acceptable to have both grounds connected.



Caution – The port(s) of this equipment or subassembly are suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly **MUST NOT** be metalically connected to interfaces that connect to the outside plant wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed outside plant cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to outside plant wiring.

Related Information

- [“Electrical Power” on page 8](#)
- [“Power Supply Inputs” on page 9](#)
- [Sun Netra X4270 Server Installation Guide](#)

Acoustic Noise Emissions

Declared noise emissions are in accordance with ISO 9296 standards.

Parameter	Operating Noise Emissions
Acoustic power LWA (dBA)	67.9 dBA (AC system) 69.3 dBA (DC system)

Related Information

- [“AC and DC Server Environmental Specifications” on page 3](#)
- [“NEBS Level 3 Certification” on page 7](#)
- [“Agency Compliance Specifications” on page 6](#)

Agency Compliance Specifications

The server complies with the following specifications.

Category	Relevant Standards
Safety	UL/CSA-60950-1, 2nd Edition, 2007-03-27 EN60950-1 IEC60950-1 CB Scheme with all country deviations IEC825-1, 2 CFR21 part 1040 CNS14336 GB4943
Ergonomics	EK1-ITB-2000
RFI/EMC	EN55022:2006+A1:2007/CISPR22:2005+A1:2005+A2:2006 Class A 47 CFR 15B Class A ICES-003 Class A VCCI Class A AS/NZ 3548 Class A CNS 13438 Class A KSC 5858 Class A GB9254 Class A EN61000-3-2 GB17625.1 EN61000-3-3
Immunity	EN55024 IEC 61000-4-2 Electrostatic discharge IEC 61000-4-3 RF E-field immunity IEC 61000-4-4 Electrical Fast Transient/Burst IEC 61000-4-5 Surge IEC 61000-4-6 RF-Conducted immunity IEC 61000-4-8 Power frequency magnetic field immunity IEC 61000-4-11 Voltage dips, short interruptions
Telecommunications	EN300-386 IEC 60068
Regulatory markings (pending)	CE, FCC, ICES-003, C-tick, VCCI, GOST-R, BSMI, KCC, UL/cUL, UL/DEMKO/GS, UL/S-mark, CCC

Related Information

- [“NEBS Level 3 Certification” on page 7](#)

- *Sun Netra X4270 Server Safety and Compliance Guide*

NEBS Level 3 Certification

Telcordia certified that the server meets NEBS Level 3 requirements per SR-3580, including the appropriate sections of GR-63-CORE (*Network Equipment-Building System Requirements: Physical Protection*) and GR-1089-CORE (*Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment*).



Caution – In order to comply with NEBS lightning requirements, all I/O connections (except the Ethernet and power connections) must be made using shielded cables, and both ends of the shield must be grounded.

Related Information

- [“AC and DC Server Environmental Specifications” on page 3](#)
- [“Agency Compliance Specifications” on page 6](#)

Preparing the Facility

Follow these requirements and considerations when preparing the facility for the server.

- [“Operating Environment Requirements” on page 8](#)
- [“Electrical Power” on page 8](#)
- [“Power Supply Inputs” on page 9](#)
- [“Optimal Ambient Temperature” on page 9](#)
- [“Optimal Ambient Relative Humidity” on page 10](#)
- [“Airflow Considerations” on page 10](#)
- [“Heat Dissipation Calculation” on page 11](#)

Related Information

- [“Reviewing Server Specifications” on page 2](#)
- *Sun Netra X4270 Server Installation Guide*

Operating Environment Requirements

Your environmental control system must provide intake air for the server that complies with the limits specified in [“AC and DC Server Environmental Specifications” on page 3](#).

To avoid overheating, *do not* direct warmed air toward these areas of the server:

- The front air intake of the server
- The server access panels

Note – When you receive your server, place it in the environment in which you will install it. Leave the server in its shipping crate at its final destination for 24 hours. This resting period prevents thermal shock and condensation.

The server has been certified to meet all functional requirements when operating in the operating environmental limits presented in [“AC and DC Server Environmental Specifications” on page 3](#). Operating computer equipment in extremes of temperature or humidity increases the failure rate of hardware components. To minimize the chance of component failure, use the server within the optimal temperature and humidity ranges.

Related Information

- [“AC and DC Server Environmental Specifications” on page 3](#)
- [“Minimum Clearance for Service Access” on page 4](#)

Electrical Power

Connect each power supply to a separate circuit if possible. This redundancy enables the server to remain operational if one of the circuits fails. Consult your local electrical codes for any additional requirements.

Related Information

- [“AC and DC Power Source Requirements” on page 4](#)
- [“Power Supply Inputs” on page 9](#)

Power Supply Inputs

The total input power for the system is divided equally among the power supplies in operation. Reversing the positive and negative inputs to the power supplies of a DC input system will not cause damage. However, the power supplies with reversed input will not operate.

The inputs to a power supply are isolated from the system chassis and the other power supply inputs. The AC or DC power inputs might be at different voltages within the acceptable range and might have different offset voltages relative to the system chassis.



Caution – Safety agency requirements prohibit the Oracle Corporation from changing a product from AC input to DC input or from DC input to AC input after the product has been removed from the agency approved manufacturing site.

Related Information

- [“AC and DC Power Source Requirements” on page 4](#)
- [“Electrical Power” on page 8](#)

Optimal Ambient Temperature

An ambient temperature range of 69.8°F (21°C) to 73.4°F (23°C) is optimal for server reliability. At 71.6°F (22°C) it is easy to maintain safe relative humidity levels. Operating in this temperature range provides a buffer if the environmental support systems fail.

Related Information

- [“AC and DC Server Environmental Specifications” on page 3](#)
- [“Operating Environment Requirements” on page 8](#)

Optimal Ambient Relative Humidity

Ambient relative humidity levels between 45% and 50% are the most suitable for data processing operations in order to:

- Prevent corrosion
- Provide an operating time buffer in the event of environmental control system failure
- Help avoid failures caused by the intermittent interference from static discharges that occur when relative humidity is too low

Electrostatic discharge is easily generated and less easily dissipated in areas where the relative humidity is below 35%. ESD risk becomes critical when levels drop below 30%.

Related Information

- [“AC and DC Server Environmental Specifications” on page 3](#)
- [“Operating Environment Requirements” on page 8](#)

Airflow Considerations

- Ensure unobstructed airflow through the chassis. The server uses internal blowers that can achieve a total airflow of 130 CFM (221 m³/hr) in normal operating conditions.
- Ensure that inlet air enters at the front of the server and exits from the back.
- Ensure that ventilation openings such as cabinet doors, for both the inlet and exhaust of the server, provide a minimum open area of 35.5 in.² (231 cm²) each. This size equates to a 60% open area perforation pattern across the front and rear area of the server 17.4 in. x 3.4 in. (442 mm x 87.1 mm). You must evaluate the impact of other open area characteristics that are more restrictive.
- Ensure that front and rear clearance of the server allow a minimum of 0.2 in. (5 mm) at the front of the server and 3.15 in. (80 mm) at the rear of the server when mounted. These clearance values are based on the inlet and exhaust impedance (available open area) stated in the third bullet assume a uniform distribution of the open area across the inlet and exhaust areas. These values also improve cooling performance.

Note – The combination of inlet and exhaust restrictions such as cabinet doors and the spacing of the server from the doors can affect the cooling performance of the server. You must evaluate these restrictions. The server placement is particularly important for high-temperature NEBS environments where the server inlet ambient temperature is 131°F (55°C).

- Take care to prevent recirculation of exhaust air within a rack or cabinet.
- Manage cables to minimize interference with the server exhaust vent.
- Ensure that air temperature rise through the server is no greater than 68°F (20°C).

Related Information

- [“Operating Environment Requirements” on page 8](#)
- [“Optimal Ambient Temperature” on page 9](#)
- [“Optimal Ambient Relative Humidity” on page 10](#)

Heat Dissipation Calculation

To calculate the heat generated by a server so that you can estimate the heat your cooling system must dissipate, convert the figure for the server’s power requirement from Watts to BTU/hr. A general formula for doing this is to multiply the average operating power requirement figure in Watts by 3.412.

Related Information

- [“Operating Environment Requirements” on page 8](#)
- [“Optimal Ambient Temperature” on page 9](#)
- [“Optimal Ambient Relative Humidity” on page 10](#)
- [“Airflow Considerations” on page 10](#)

Glossary

Numerics

2U two rack units (3.5 in./89 mm).

A

ACPI advanced configuration and power interface.

AWG American wire gauge.

B

BIOS basic input/output system.

BMC baseboard management controller.

C

CLI command-line interface.

CMA cable management arm, used to route and secure cables extending from the rear of the system.

CMOS	complementary metal-oxide semiconductor. Refers to the memory used to store BIOS settings.
CTS	clear to send.

D

DB-15	15-pin d-subminiature connector.
DDR3 SDRAM	double-data rate three synchronous dynamic random access memory.
DHCP	Dynamic Host Configuration Protocol.
DIMM	dual in-line memory module.
DR	dual-rank DIMM.

E

ECC	error correction code.
EMI	electromagnetic interference.
ESD	electrostatic discharge.
ESM	energy storage module.

G

GRUB	GNU grand unified bootloader. An open source boot loader.
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H

HBA	host bus adapter.
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I

- ILOM** Oracle Integrated Lights Out Manager. Firmware that enables you to manage the system even when system is shut down.
- IM** integrated mirror.
- IME** integrated mirror enhanced array.
- IPMI** intelligent platform management interface.
- IS** integrated striping array.

J

- JBOD** just a bunch of disks.

K

- KBC BAT** keyboard controller basic assurance test.

L

- LED** light-emitting diode.
- LSF** Low smoke fume.

M

- MPS** multiprocessor specification.

N

NEBS	Network Equipment-Building Standards. Defined standards for equipment to be installed in a telecommunications central office. Telecordia maintains these standards and tests equipment for NEBS certification.
NET MGT	network management port. After connecting a network cable to this NET MGT port, you can configure the system ILOM SP through this port.
NIC	network interface card.
NTP	network time protocol.
NVRAM	non-volatile random access memory.

O

OS	operating system.
OSP	outside plant.

P

PCIe2	peripheral component interconnect express 2.0. Refers to cards or slots that support the PCI Express 2.0 specification.
PDB	power distribution board.
POST	power-on self-test.
PSH	predictive self-healing.
PSU	power supply unit.
PXE	preboot execution environment.

Q

QR DIMM quad-rank DIMM.

R

RAID redundant array of independent disks.
RAS Reliability, Availability, and Serviceability.
RIS remote installation services.
RPM rotations per minute.
RTS request to send.

S

SAS serial attached SCSI.
SATA serial advanced technology attachment.
SCSI small computer system interface.
SER MGT serial management port. The default port for system management, especially during the initial system configuration.
SFF small form factor.
S.M.A.R.T. self-monitoring, analysis, and reporting technology.
SP service processor.
SR DIMM single-rank DIMM.
SSH secure shell.
STP shielded twisted pair.

T

- TCG** Trusted Computing Group.
- TPM** trusted platform module. For more information, refer to the Microsoft Windows Trusted Platform Module Management documentation.

U

- USB** universal serial bus.
- US NEC** United States National Electrical Code. A United States standard for the installation of electrical wiring and equipment.

V

- VAC** volts of alternating current.
- VDC** volts of direct (continuous) current.
- VGA** video graphics array.
- VT-d** virtualization technology for directed I/O.

W

- WDT** watchdog timers.

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