Lenovo ThinkAgile
SX for Nutanix
Planning and Setup Guide

Models: SXN3000

Note

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at the following address:

http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your solution, which can be found at the following address:

http://datacentersupport.lenovo.com/warrantylookup

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Chapter 1. ThinkAgile SX for Nutanix overview

The Lenovo® ThinkAgile™ SX for Nutanix products are workload-optimized, hyperconverged infrastructure offerings, based on the industry-leading Lenovo ThinkAgile HX Series appliances and switches, with one-click virtualization automation and management via Nutanix™ Prism. Additional management capabilities are provided by Lenovo XClarity Administrator. The products support VMware vCenter® and Nutanix Acropolis hypervisors.

Note: The ThinkAgile SX for Nutanix product group is commonly referred to as "ThinkAgile SXN" in the documentation.

The ThinkAgile SXN is intended for small, medium, and large enterprises. Typical uses include the following:

- Virtualization
- Virtual Desktop Infrastructure (VDI)
- Private and hybrid cloud implementation
- Database applications
- Enterprise applications

Lenovo Professional Services provides a setup and configuration engagement, to speed deployment in your data center.

ThinkAgile SXN configurations

The following configurations are available:

- **SXN3000**

  The ThinkAgile SXN3000 includes four to thirty-two ThinkAgile HX appliances/enclosures, including 1U, 2U, and 2U4N options. This can be ordered in a 25U or 42U rack.

  Traffic is routed through RackSwitch G8272, ThinkSystem NE1072T RackSwitch, or ThinkSystem NE2572 RackSwitch switches. A RackSwitch G8052 switch is used for the management network.

Models and Machine Types

This documentation refers to the following products:

Table 1. ThinkAgile SXN Machine Type and Models

Product	Machine Type	Model
ThinkAgile SXN3000 — 25U rack	9565	RCG
ThinkAgile SXN3000 — 42U rack	9565	RCF

Hardware

The ThinkAgile SXN models include ThinkAgile HX appliances, network switches, and power distribution units (PDUs).

SXN3000 configurations

The SXN3000 is available in either a 25U or a 42U rack. The product is available with the following ThinkAgile HX form factors:

- 1U node

- 2U node
- 2U4N enclosure (42U rack only)

The 25U rack model contains the following hardware:

- A maximum of 16U in rack space for the following:
    - Up to sixteen 1U ThinkAgile HX appliances.
    - Up to eight 2U ThinkAgile HX appliances.
- One RackSwitch G8052 network switch, for the management network.
- Two Top-of-Rack switches for the VM and storage networks.
    - RackSwitch G8272
    - ThinkSystem NE1072T RackSwitch
- Two to four PDUs.

The 42U rack model contains the following hardware:

- A maximum of 36U in rack space for the following:
    - Up to thirty-two 1U ThinkAgile HX appliances.
    - Up to eighteen 2U ThinkAgile HX appliances.
    - Up to eight 2U4N ThinkAgile HX enclosures.
- One RackSwitch G8052 network switch, for the management network.
- Two Top-of-Rack switches for the VM and storage networks.
    - RackSwitch G8272
    - ThinkSystem NE1072T RackSwitch
    - ThinkSystem NE2572 RackSwitch
- Two to six PDUs.

Software

The hypervisor and tools to manage VMs and the hardware in the rack are provided with the ThinkAgile SXN product.

Note: Some license agreements might be accepted on the customer's behalf by Lenovo Manufacturing during the installation and provisioning processes. When required, license agreements will be shipped hardcopy or softcopy with the product.

The following software is provided with the ThinkAgile SXN:

- Lenovo XClarity Pro

    The Lenovo XClarity Pro suite includes the following:

    - Lenovo XClarity Administrator

        Lenovo XClarity Administrator provides a single interface for managing the switches and servers in the configuration.

    This product is preconfigured and provided as a VM.

- Lenovo Cloud Networking Operating System (CNOS)

    CNOS is pre-installed on the RackSwitch G8272, ThinkSystem NE1072T, and ThinkSystem NE2572 switches.

Note: The ThinkAgile Network Orchestrator feature of CNOS is supported in the Nutanix Acropolis hypervisor environment.

- Lenovo Enterprise Networking Operating System (ENOS)

  ENOS is pre-installed on the RackSwitch G8052 switch.

- Relevant hypervisor

  Based on the original ThinkAgile SXN order, Nutanix Acropolis or VMware ESXi can be shipped with the racked solution. Microsoft Windows Server™ 2016 Datacenter can be installed during product deployment.

ThinkAgile SXN documentation and related content

Information about the ThinkAgile SXN components are available online and in downloadable Portable Document Format (PDF) files. In addition, documentation is available for each of the components in the product.

ThinkAgile SXN publications

The most recent Lenovo ThinkAgile SXN documentation is on the Web, at the following site:

http://thinkagile.lenovofiles.com/help/topic/com.lenovo.thinkagile.sxn.doc/sxn_introduction.html

The following ThinkAgile SXN product publications are available in PDF format. The entire content of these publications is contained in the Web-based documentation set.

- **Planning and Setup Guide**

  Provides an overview of the ThinkAgile SXN configuration and deployment requirements and activities.

- **Administrator's Guide**

  Describes the management and maintenance of the product, as well as how to engage ThinkAgile Advantage for critical issue resolution.

If you need to download the Adobe Reader to view PDF files, you can download it at http://get.adobe.com/reader.

SXN3000 product information

For information about the ThinkAgile SXN SXN3000 models, refer to the following Web sites:

- SXN3000 Product Guide

  See the following Web site:

  https://lenovopress.com/lp0731-lenovo-thinkagile-sx-nutanix-sxn3000

- ThinkAgile SX for Nutanix product page

  See the following Web site:

  https://www3.lenovo.com/us/en/data-center/Lenovo-ThinkAgile-SX-for-Nutanix/p/WMD00000325

ThinkAgile SXN Support page

For the latest information and links to helpful content, refer to the Lenovo Support page. You can search for support information for the ThinkAgile SXN and other Lenovo products. See the following Web site:

http://datacentersupport.lenovo.com/

Resources include the following:

- Support Plan for each model
- Recovery media
- Timely product information

Related hardware documentation

The following documentation describes ThinkAgile SXN components. Some publications are also available in PDF format.

Product	Documentation	Website
Lenovo ThinkAgile HX appliances and enclosures	• Hardware Replacement Guide	http://thinkagile.lenovofiles.com/help/topic/ com.lenovo.thinkagile.hx/overview_thinkagile_hx_solutions.html
ThinkSystem NE2572 RackSwitch	• Installation Guide • Application Guide • ISCLI – Industry Standard CLI Command Reference • Release Notes • REST API Guide • Python Programming Guide • Open Network Install Environment (ONIE) User Guide Relevant documentation is also available for the Cloud Network Operating System.	http://systemx.lenovofiles.com/help/topic/ com.lenovo.thinksystem.ne2572.doc/ts_ne2572.html
ThinkSystem NE1072T RackSwitch	• Installation Guide • Application Guide • ISCLI – Industry Standard CLI Command Reference • Release Notes • REST API Guide • Python Programming Guide • ONIE User Guide Relevant documentation is also available for the Cloud Network Operating System.	http://systemx.lenovofiles.com/help/topic/ com.lenovo.thinksystem.ne1072t.doc/ts_ne1072t.html

Product	Documentation	Website
RackSwitch G8272	• Installation Guide • Application Guide • ISCLI – Industry Standard CLI Command Reference • Release Notes • REST API Guide • Python Programming Guide • ONIE User Guide Relevant documentation is also available for the Cloud Network Operating System and Enterprise Network Operating System.	http://systemx.lenovofiles.com/help/topic/com.lenovo.rackswitch.g8272.doc/rs_g8272.html
RackSwitch G8052	• Installation Guide • Application Guide • ISCLI – Industry Standard CLI Command Reference • Release Notes Relevant documentation is also available for the Enterprise Network Operating System.	http://systemx.lenovofiles.com/help/topic/com.lenovo.rackswitch.g8052.doc/rs_g8052.html

Related software documentation

The following software publications are related to ThinkAgile SXN components. The content should be available in either PDF format or HTML format.

Product	Website
Lenovo XClarity Administrator	http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/aug_product_page.html
ThinkAgile Network Orchestrator	Product Information: https://www3.lenovo.com/us/en/data-center/networking/networking-software/network-management/ Planning/ Implementation: https://lenovopress.com/lp0604-thinkagile-network-orchestrator-for-nutanix
• VMware vSphere® Standard Edition™ • VMware vCenter Server® Appliance™ • VMware vCenter®	http://pubs.vmware.com/vsphere-60/index.jsp

Nutanix documentation

Go to the Nutanix documentation site. Filter by the software type and version to see the applicable documents. The Web site is at the following address:

https://portal.nutanix.com/#/page/docs

Documentation	Type	Description
Field Installation Guide	Setup	Instructions on how to use the Foundation tool to do a field installation, including installing a different hypervisor and creating a cluster.
Acropolis Advanced Setup Guide	Setup	Instructions on how to set up in advanced situations not covered by the Foundation tool.
Hardware Replacement Documentation	Administration	Instructions on how to replace failed hardware components used by Lenovo customers.
Prism Web Console Guide	Administration	Instructions on how to manage your clusters through the Prism Web console.
Acropolis Advanced Administration Guide	Administration	Instructions on how to administer the Nutanix software outside of Prism GUI.
Acropolis Hypervisor (AHV) Administration Guide	Administration	Instructions on how to use the Nutanix AHV.
Acropolis App Mobility Fabric Guide	Administration	Instructions on how to manage Virtual Machines (VM), including Acropolis command line interface (ACLI) and VM management API reference.
vSphere Administration Guide for Acropolis	Administration	Instructions on how to manage Nutanix nodes by the VMware ESXi hypervisor.
Nutanix Cluster Check (NCC) Guide	Administration	A framework of scripts that can help diagnose cluster health.
Acropolis API Reference	Reference	Reference for the Acropolis REST API, including Powershell cmdlets.
Acropolis Command Reference	Reference	Reference for the nCLI. The nCLI enables you to run system administration commands against the Nutanix cluster and CVM utilities.

ThinkAgile SXN Support page

For the latest information and links to helpful content, refer to the Lenovo Support page. You can search for support information for the ThinkAgile SXN and other Lenovo products. See the following Web site:

http://datacentersupport.lenovo.com/

Chapter 2. ThinkAgile SXN Planning and Setup considerations

The following considerations and limitations apply to the ThinkAgile SXN products.

Limitation on automated service requests (Call Home)

Because the ThinkAgile SXN products are serviced and supported at the overall rack level, it is recommended that you not activate Call Home functionality for the components. If you choose to activate Call Home, be aware that your product entitlement might not be recognized immediately.

Firmware and "Best Recipe" adherence

Lenovo publishes a ThinkAgile SXN firmware "Best Recipe", which identifies the supported levels for the various components. See Appendix B "Firmware maintenance and Best Recipe" on page 35 for more details.

Rack-level entitlement

The ThinkAgile SXN products are entitled at the overall rack level.

If you need support for the product or any of its components or included software, be sure to use the product serial number associated with Machine Type 9565. If you use the component or software serial number, ThinkAgile Advantage Support might not immediately recognize the correct entitlement, which could delay proper case handling. You can find the product serial number on the rack label.

Chapter 3. Overview of planning and deployment activities

The ThinkAgile SXN products are intended to be installed and set up in your data center by Lenovo Professional Services. Review the following information to ensure that you are properly prepared for the installation and configuration engagement.

Predeployment planning and preparation

Lenovo Professional Services will work with you to confirm the on-site engagement and the necessary prework. If the necessary predeployment activities are not completed properly, the deployment engagement will be delayed. See "Predeployment requirements" on page 9 for details.

Deployment engagement overview

See "Deployment activities" on page 9 for the high-level activities that Lenovo Professional Services will perform.

Predeployment requirements

Lenovo Professional Services will work with you to plan the deployment engagement. Be aware of the necessary planning and pre-work that needs to occur before the on-site engagement.

The following activities are the responsibility of the customer.

- Unboxing the rack.
- Placing the rack in the data center.
- Connecting power to the rack.
- Determining the needed implementation architecture, including the connections to the data center network.

Lenovo Hardware Services are available for certain predeployment tasks.

Deployment activities

Lenovo Professional Services performs a specific set of activities to help ensure proper deployment of the ThinkAgile SXN products.

Note: The success of the onsite engagement is dependent on the correct planning and prework. See Predeployment requirements for more details.

The onsite installation and configuration activities that Lenovo Professional Services will perform include the following:

- Review the deployment worksheet that was completed during the predeployment engagement.
- Verify that the customer network is ready.
- Verify the as-shipped product configuration.
- Connect the Top-of-Rack switches to the customer network.
- Perform basic network configuration to integrate the ThinkAgile SXN rack into the customer environment.
- Set up Lenovo XClarity Administrator management of the product.
- Ensure that the product adheres to the ThinkAgile SXN Best Recipe firmware profile.
- Create credentials for XCC and Prism access.
- Configure the Prism user interface (e.g., SMTP, Pulse, containers) and license.

- Register the ThinkAgile SXN product with Nutanix.
- Verify the product environment, to ensure a successful handover.
- Provide a knowledge transfer to the customer. This includes basic operational tasks and Support plan.

Lenovo Professional Services will provide information about the configured system, for your records.

The following items are not in the scope of the initial ThinkAgile SXN engagement. Many of these can be handled via other available Professional Services offerings.

- Installation or configuration of server applications.
- Advanced hypervisor configuration.
- Complete administrative or operations training.
- Data migration from existing storage systems and hypervisor environments.
- Installation assistance for non-standard hardware components or components not purchased from Lenovo. Note that this activity can affect the support for the product.

Chapter 4. Port availability requirements

If the ThinkAgile SXN product is behind a firewall and you need to access components from outside of the firewall, you must ensure that certain ports are open.

Required ports for ThinkAgile HX appliances

At a minimum, the following ports must be open to enable Nutanix functionality:

Table 2. Ports required for ThinkAgile HX appliances

Port	Purpose
22	Used for SSH.
443	Used for SSL.
2074	Used for Nutanix Guest Tools communication with Controller VM.
8000	Used for Nutanix foundation page.
9440	Used for Nutanix Prism, including REST API calls and remote nCLI.

For additional information, refer to the Nutanix documentation. See "ThinkAgile SXN documentation and related content" on page 3 for relevant links.

Required ports for Lenovo XClarity Administrator server

At a minimum, the following ports must be open to access Lenovo XClarity Administrator:

Table 3. Ports required for Lenovo XClarity Administrator server

Port	Purpose
80	Used for HTTP and DDP file downloads as part of the update process (Call Home).
443	Used by HTTPS for Web access and REST communications. **Note:** If Call Home is enabled, outbound direction is used.
4944	Used for the help-system server.

Additional ports might need to be open if you intend to forward events from Lenovo XClarity Administrator. For a complete list of ports that must be open for Lenovo XClarity Administrator, see that documentation. See the following Web site:

http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/plan_openports.html

Required ports for VMware vCenter Server Virtual Appliance (if used)

At a minimum, the following ports must be open to access vCSA:

Table 4. Ports required for vCSA

Port	Purpose
80	Used for direct HTTP connections.
443	Used for connections with the vSphere Client.

For a complete list of required ports for vCSA, see that documentation. See the following Web site:

https://pubs.vmware.com/vsphere-60/topic/com.vmware.vsphere.migration.doc/ GUID-F4F3E3DE-5DA2-49BE-BE4A-BFCA2EFF9FB4.html

Chapter 5. Management considerations

Day-to-day management of the ThinkAgile SXN product and components can be accomplished through multiple interfaces.

Lenovo XClarity Administrator

Lenovo XClarity Administrator is a centralized, resource-management solution that simplifies infrastructure management, speeds responses, and enhances the availability of server systems and switches.

You can use one of the following management interfaces:

- Web-based interface
- PowerShell
- REST APIs

Lenovo ThinkAgile HX

For information about using the ThinkAgile HX management capabilities, refer to the ThinkAgile HX documentation. See "ThinkAgile SXN documentation and related content" on page 3 for relevant links.

Lenovo ThinkAgile Network Orchestrator

The ThinkAgile Network Orchestrator feature of CNOS enables automatic reconfiguration of switch ports when editing, moving or creating virtual machines. ThinkAgile Network Orchestrator is supported in the Nutanix Acropolis hypervisor environment.

For information about using ThinkAgile Network Orchestrator, refer to that documentation. See "ThinkAgile SXN documentation and related content" on page 3 for relevant links.

Important: Be sure to provide a relevant value for the VM description field in the Nutanix Prism app. Leaving the field blank could cause errors with ThinkAgile Network Orchestrator.

Nutanix

For information about using Nutanix Acropolis or Nutanix Prism, refer to the Nutanix documentation. See "ThinkAgile SXN documentation and related content" on page 3 for relevant links.

Important: Be sure to provide a relevant value for the VM description field in the Nutanix Prism app. Leaving the field blank could cause errors with ThinkAgile Network Orchestrator.

VMware vCenter

For information about using VMware vCenter, refer to the vSphere Documentation Center. See "ThinkAgile SXN documentation and related content" on page 3 for relevant links.

Switch management

The management interfaces include the following:

- The Industry Standard Command Line Interface provides a simple, direct method for switch administration. Using a basic terminal, you can issue commands that allow you to view detailed information and statistics about the switch, and to perform configuration and switch software maintenance.
- The Browser-based Interface provides access to the common configuration, management and operation features of the switch through a browser.

Chapter 6. License considerations

Relevant software licenses are provided with the ThinkAgile SXN products; they must be accepted by the customer.

Note: Some license agreements might be accepted on the customer's behalf by Lenovo Manufacturing during the installation and provisioning processes. When required, license agreements will be shipped hardcopy or softcopy with the product.

The following licenses are provided:

Application	EULA	License type	License installation
VMware vSphere 6 Standard for 2 processor Server	Manufacturing	60-day evaluation	Customer must obtain a valid license within the 60-day trial period.
VMware vCenter Server 6 Standard for vSphere 6	Manufacturing	60-day evaluation	Customer must obtain a valid license within the 60-day trial period.
Lenovo XClarity Pro (for XClarity Administrator)	Customer	3 years	Software is loaded in manufacturing. Customer must log in to Lenovo XClarity Administrator and accept the license.
Nutanix Acropolis Pro or Ultimate edition	Customer		See the "Nutanix license management information" on page 15.

Additional licenses might be available for purchase during the ThinkAgile SXN ordering process.

Nutanix license management

A Nutanix Acropolis license file must be downloaded from the Nutanix customer Web site and install it into the cluster; this applies to both the Pro and Ultimate editions. When additional nodes are added, the license file must be regenerated and reinstalled into the cluster. The Nutanix customer Web site contains information about the license types and expiration. The Web site is at the following address:

http://portal.nutanix.com

For information about managing your Nutanix cluster licenses, refer to the "License Management" section in the Nutanix *Prism Web Console Guide*. To obtain Nutanix documentation, go to the Nutanix documentation site. Filter by the software type and version to see the applicable documents. The Web site is at the following address:

https://portal.nutanix.com/#/page/docs

Chapter 7. Initial IDs and passwords

Most initial passwords must be changed during the setup process; that is essential for the security of the components and the overall product. Default initial IDs and an initial password are set for the preinstalled hardware and software components, as well as the recovery account and root.

Changing initial passwords

During the deployment engagement, Lenovo Professional Services will assist you in changing the applicable initial IDs and passwords. The Deployment Worksheet provided at the end of the deployment engagement will list the new values.

Important: Changing some IDs or passwords without proper planning (for example, the XCC on any of the ThinkAgile HX appliances) will affect the overall configuration for the cluster. See Managing IDs and passwords for information about ID and password guidelines and procedures.

Initial values

The following information is provided for your reference. See Managing IDs and passwords for information about ID and password guidelines and procedures.

Table 5. Initial IDs and passwords

Component	Initial ID	Initial Password
• RackSwitch G8052 • RackSwitch G8272 • ThinkSystem NE1072T • ThinkSystem NE2572	admin	admin
RackSwitch G8052 Secure Copy (SCP)	scpadmin	admin2
ThinkAgile HX node XCC	USERID	PASSW0RD
Nutanix Acropolis hypervisor	root	nutanix/4u
Nutanix Controller VM (CVM)	nutanix	nutanix/4u
Prism console		(set by user at login)

Managing IDs and passwords

Proper maintenance of IDs and passwords is essential for the security of the components and the overall product. Lenovo's Software Security Review Board stresses in the strongest possible terms that customers should manage all product credentials according to the recommendations stated here.

Initial IDs and passwords

Default initial IDs and an initial password are set for the preinstalled hardware and software components, as well as the recovery account and root. See Chapter 7 "Initial IDs and passwords" on page 17 for more information.

During the deployment engagement, Lenovo Professional Services will assist you in changing the applicable initial IDs and passwords. The Deployment Worksheet provided at the end of the deployment engagement will list the new values.

Changing passwords

For the password change procedures, refer to the specific component documentation. See "ThinkAgile SXN documentation and related content" on page 3.

Important: Changing some IDs or passwords without proper planning (for example, the XCC on any of the ThinkAgile HX appliances) will affect the overall configuration for the cluster.

Password criteria

The following password criteria are strongly recommended by Lenovo's Software Security Review Board:

- No less than twenty (20) characters.
- Includes letters, specifically mixed case.
- Includes numbers.
- Includes punctuation.
- Does not include any repeated characters.

It is also recommended that a random password generator be used. One example is the Norton Identity Safe Password Generator. See the following Web site:

https://identitysafe.norton.com/password-generator

Appendix A.   SXN3000 models

The SXN3000 (Machine Type 9565) is available in a 25U or 42U rack.

SXN3000 25U rack views (model RCG)

The SXN3000 in the 25U rack is Machine Type 9565, Model RCG.
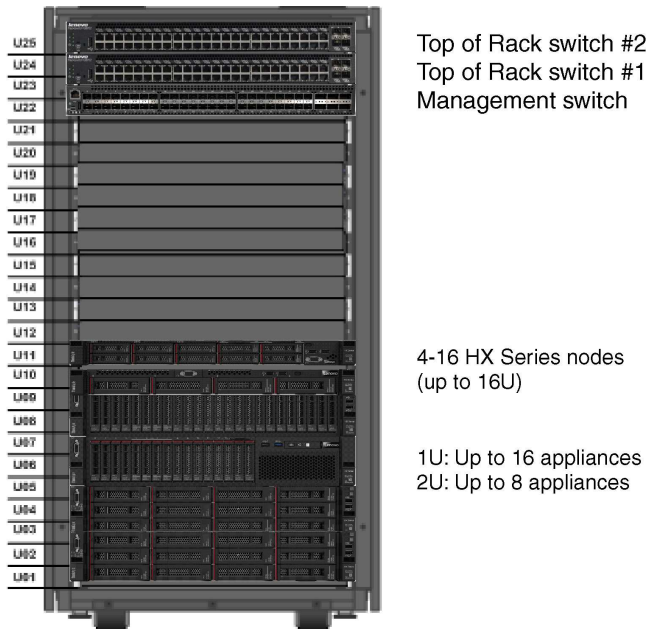
Figure 1. Front view of SXN3000 in 25U rack

SXN3000 42U rack views (model RCF)

The SXN3000 in the 42U rack is Machine Type 9565, Model RCF.
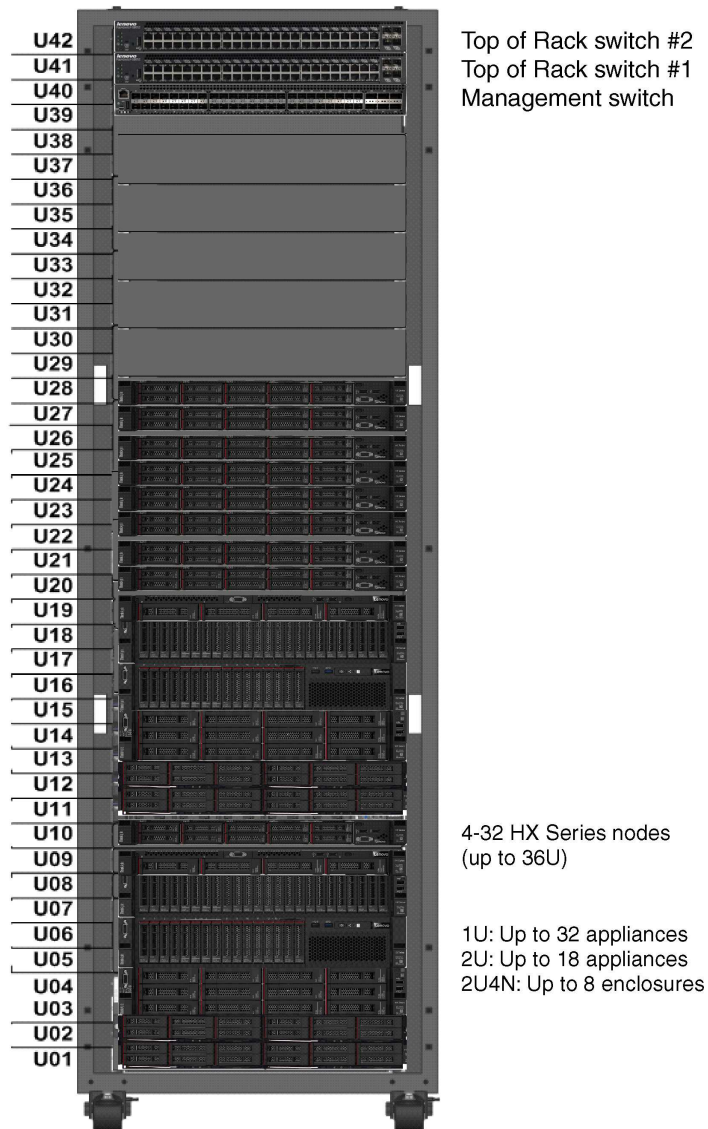
Figure 2. Front view of SXN3000 in 42U rack

SXN3000 network, management, and storage cabling

The ThinkAgile SXN3000 product is precabled for the management network and data network. This information is provided for your reference.

Cabling for ThinkSystem NE2572

Note: The ThinkSystem NE2572 utilizes the dual-port Mellanox ConnectX-4 25GB HCA to enable 25 Gb Ethernet. The implementation is analogous to 10 Gb SFP+.

The following images show the ThinkSystem NE2572 cabling connections for the ThinkAgile HX appliances and enclosures in the SXN3000:.
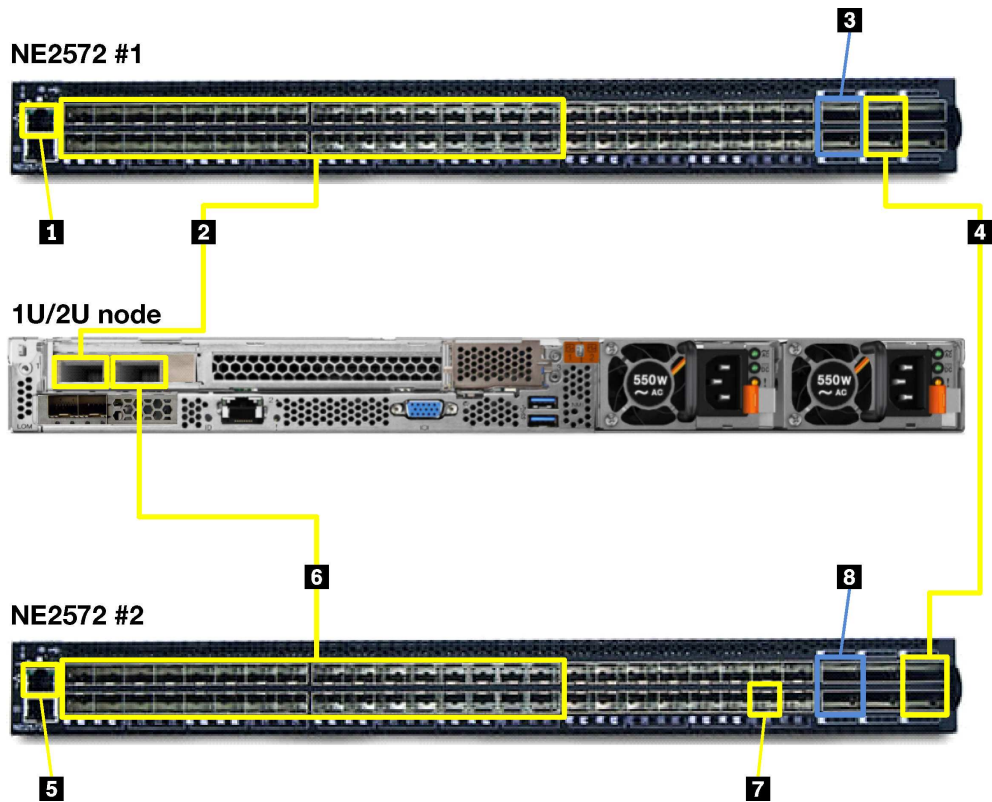
Figure 3. ThinkSystem NE2572 cabling for 1U and 2U appliances

Table 6. ThinkSystem NE2572 Switch 1 cabling for 1U/2U appliances

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
1	Management		RackSwitch G8052	37	1.25m CAT6 Green Cable
2	25 Gb NIC1	1–32	ThinkAgile HX appliances	1	3m SFP28 DAC Cable
3	Uplink	QSFP28 1, 2	Customer switch		Any 2 of the following: • 20m 100G QSFP28 Active Optical Cable • 20m SFP+ to SFP+ Active Optical Cable • 20m 25G SFP28 Active Optical Cable • 20m 40G QSFP+ to QSFP+ Active Optical Cable
4	VLAG	QSFP28 3	ThinkSystem NE2572 switch 2	QSFP28 5	1m Passive 100G QSFP28 DAC Cable
		QSFP28 4	ThinkSystem NE2572 switch 2	QSFP28 6	

Table 7. ThinkSystem NE2572 Switch 2 cabling for 1U/2U appliances

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
5	Management		RackSwitch G8052	38	1.25m CAT6 Green Cable
6	25 Gb NIC1	1–32	ThinkAgile HX appliances	2	3m SFP28 DAC Cable
7	10 Gb DAC connection (initial setup only)	48	RackSwitch G8052		1m Passive DAC SFP+ Cable
8	Uplink	QSFP28 1, 2	Customer switch		Any 2 of following: • 20m 100G QSFP28 Active Optical Cable • 20m 20m SFP+ to SFP+ Active Optical Cable • 25G SFP28 Active Optical Cable • 20m 40G QSFP+ to QSFP+ Active Optical Cable

Figure 4. ThinkSystem NE2572 cabling for 2U4N enclosures

Table 8. ThinkSystem NE2572 Switch 1 cabling for 2U4N enclosures

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
1	Management		RackSwitch G8052	37	1.25m CAT6 Green Cable
2	25 Gb NIC1	1–32	ThinkAgile HX enclosures	1	3m SFP28 DAC Cable
3	Uplink	QSFP28 1 and 2	Customer switch		Any 2 of the following: • 20m 100G QSFP28 Active Optical Cable • 20m SFP+ to SFP+ Active Optical Cable • 20m 25G SFP28 Active Optical Cable • 20m 40G QSFP+ to QSFP+ Active Optical Cable
4	VLAG	QSFP28 3	ThinkSystem NE2572 switch 2	QSFP28 5	1m Passive 100G QSFP28 DAC Cable
		QSFP28 4	ThinkSystem NE2572 switch 2	QSFP28 6	

Table 9. ThinkSystem NE2572 Switch 2 cabling for 2U4N enclosures

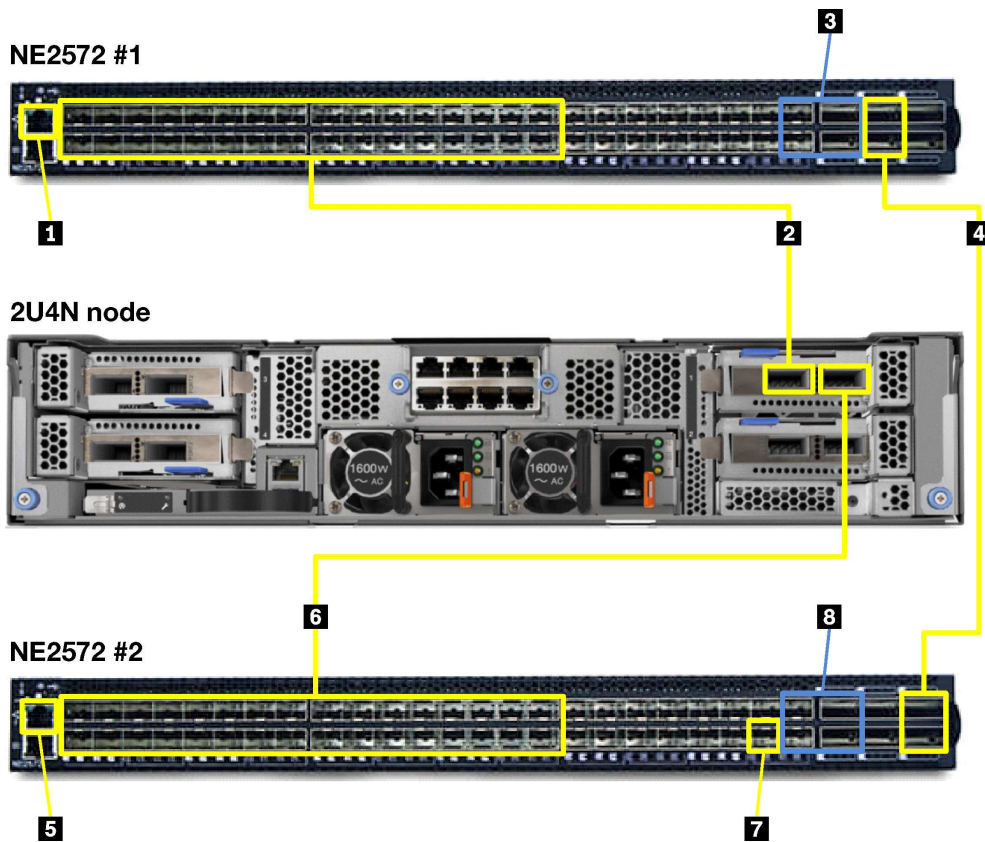|	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
5	Management		RackSwitch G8052	38	1.25m CAT6 Green Cable
6	25 Gb NIC1	1–32	ThinkAgile HX enclosures	2	3m SFP28 DAC Cable
7	10 Gb DAC connection (initial setup only)	48	RackSwitch G8052		1m Passive DAC SFP+ Cable
8	Uplink	QSFP28 1 and 2	Customer switch		Any 2 of following: • 20m 100G QSFP28 Active Optical Cable • 20m SFP+ to SFP+ Active Optical Cable • 20m 25G SFP28 Active Optical Cable • 20m 40G QSFP+ to QSFP+ Active Optical Cable

Cabling for ThinkSystem NE1072T

Note: The switch can be configured with 10Gb SFP+ or 10Gb Base-T. Different LOMs can be selected, but are limited to dual-port.

The following images show the ThinkSystem NE1072T cabling connections for the ThinkAgile HX appliances and enclosures in the SXN3000.
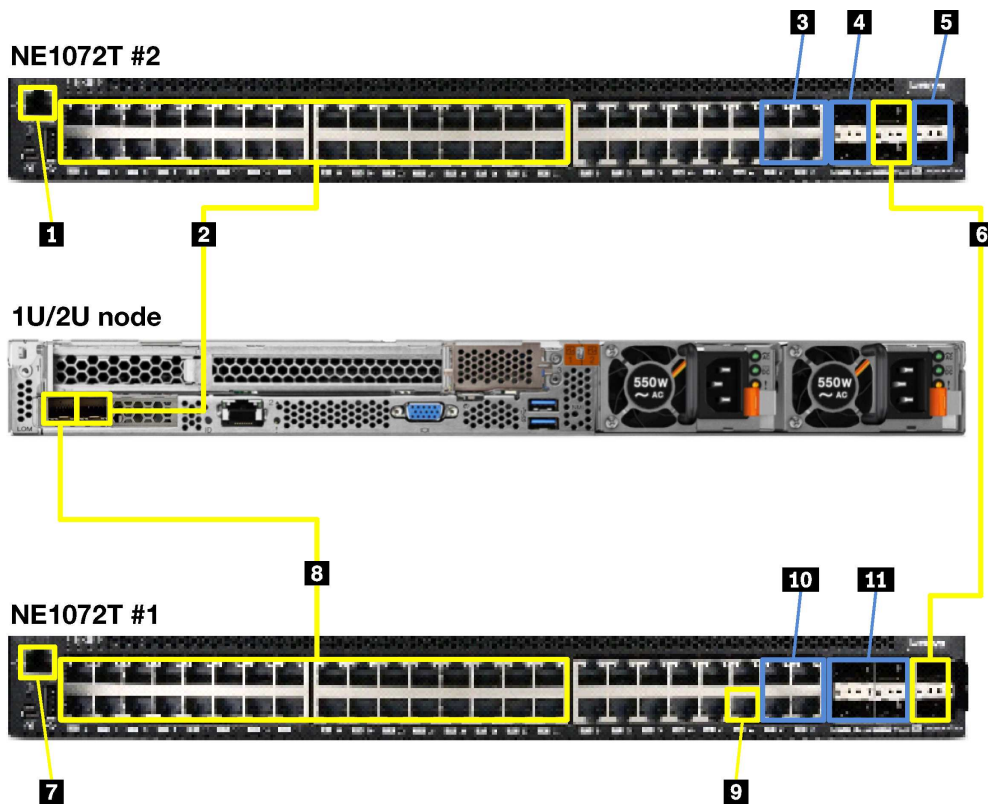
Figure 5. ThinkSystem NE1072T cabling for 1U and 2U appliances

Table 10. ThinkSystem NE1072T Switch 1 cabling for 1U/2U appliances

	Source		Destination		Connection type
	Usage	Port	Device	Port	
1	Management		RackSwitch G8052	37	1.25m CAT6 Green Cable
2	10 Gb NIC1	1–32	ThinkAgile HX appliances	1	3m Green Cat5e Cable
3	Uplink (option 1)	Ethernet 45–48	Customer switch		25m CAT6 Green Cable
4, **5**	Uplink (option 2)	40 Gb QSFP+ 1, 2, 5, 6	Customer switch		20M 40Gb QSFP+ to QSFP+ Active Optical Cable
6	VLAG	40 Gb QSFP 3	ThinkSystem NE1072T switch 2	QSFP 5	1m QSFP+-to-QSFP+ cable
		40 Gb QSFP 4	ThinkSystem NE1072T switch 2	QSFP 6	

Table 11. ThinkSystem NE1072T Switch 2 cabling for 1U/2U appliances

	Source		Destination		Connection type
	Usage	Port	Device	Port	
7	Management		RackSwitch G8052	38	1.25m CAT6 Green Cable
8	10 Gb NIC1	1–32	ThinkAgile HX appliances	2	3m Green Cat5e Cable

Table 11. ThinkSystem NE1072T Switch 2 cabling for 1U/2U appliances (continued)

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
9	1 Gb connection (initial setup only)		RackSwitch G8052		3m Green Cat5e Cable
10	Uplink (option 1)	Ethernet 45–48	Customer switch		25m Cat6 Green Cable
11	Uplink (option 2)	40 Gb QSFP+ 1–4	Customer switch		20m 40Gb QSFP+ to QSFP+ Active Optical Cable

Figure 6. ThinkSystem NE1072T cabling for 2U4N enclosures

Table 12. ThinkSystem NE1072T Switch 1 cabling for 2U4N enclosures

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
1	Management		RackSwitch G8052	37	1.25m Cat6 Green Cable
2	10 Gb NIC1	1–32	ThinkAgile HX enclosures	1	3m Green Cat5e Cable
3	Uplink (option 1)	Ethernet 45–48	Customer switch		25m Cat6 Green Cable

Table 12. ThinkSystem NE1072T Switch 1 cabling for 2U4N enclosures (continued)

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
4, **5**	Uplink (option 2)	40 Gb QSFP+ 1, 2, 5, 6	Customer switch		20m 40Gb QSFP+ to QSFP+ Active Optical Cable
6	VLAG	40 Gb QSFP 3	ThinkSystem NE1072T switch 2	QSFP 5	1m QSFP+-to-QSFP+ cable
		40 Gb QSFP 4	ThinkSystem NE1072T switch 2	QSFP 6	

Table 13. ThinkSystem NE1072T Switch 2 cabling for 2U4N enclosures

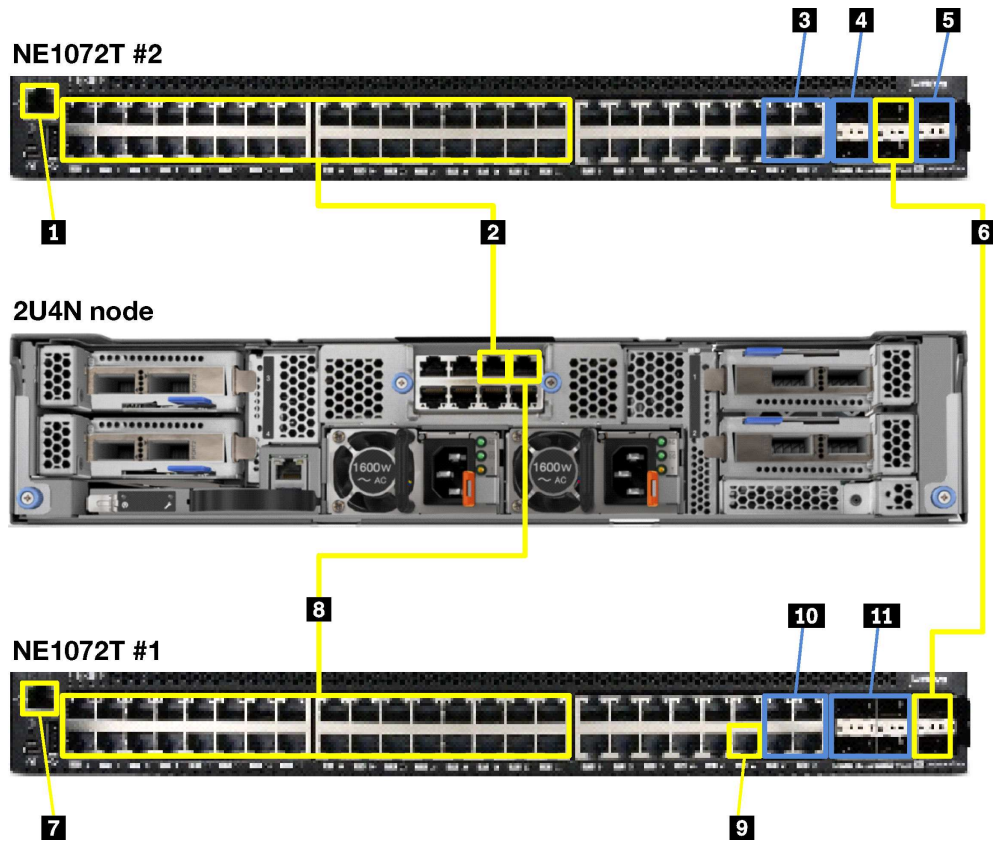|	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
7	Management		RackSwitch G8052	38	1.25m Cat6 Green Cable
8	10 Gb NIC1	1–32	ThinkAgile HX enclosures	2	3m Green Cat5e Cable
9	1 Gb connection (initial setup only)		RackSwitch G8052		3m Green Cat5e Cable
10	Uplink (option 1)	Ethernet 45–48	Customer switch		25m Cat6 Green Cable
11	Uplink (option 2)	40 Gb QSFP+ 1–4	Customer switch		20m 40Gb QSFP+ to QSFP+ Active Optical Cable

Cabling for RackSwitch G8272

Note: The switch can be configured with 10Gb SFP+ or 10Gb Base-T. Different LOMs can be selected, but are limited to dual-port.

The following images show the RackSwitch G8272 cabling connections for the ThinkAgile HX appliances and enclosures in the SXN3000.
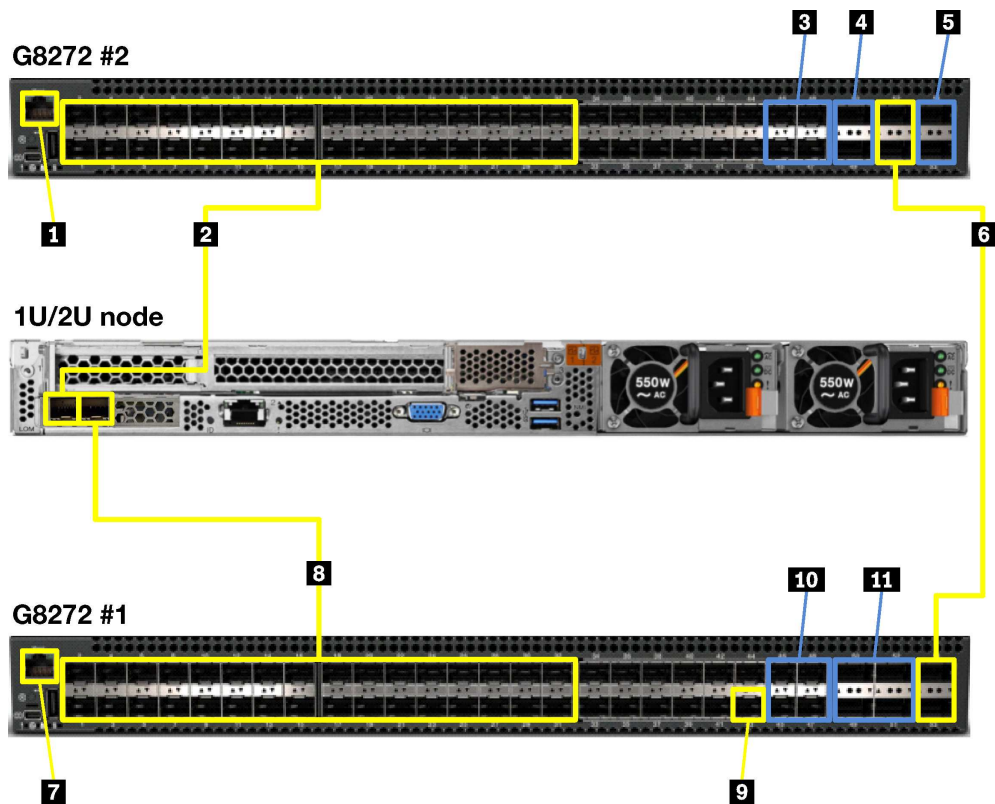
Figure 7. RackSwitch G8272 cabling for 1U and 2U appliances

Table 14. RackSwitch G8272 Switch 1 cabling for 1U/2U appliances

	Source		Destination		Connection type
	Usage	Port	Device	Port	
1	Management		RackSwitch G8052	37	1.25m Cat6 Green Cable
2	10 Gb NIC1	1–32	ThinkAgile HX appliances	1	3m Passive DAC Cable
3	Uplink (option 1)	10 Gb SFP+ 45–48	Customer switch		20m SFP+ to SFP+ Active Optical Cable
4, **5**	Uplink (option 2)	40 Gb QSFP+ 1, 2, 5, 6	Customer switch		20m 40Gb QSFP+ to QSFP+ Active Optical Cable
6	VLAG	40 Gb QSFP 3	ThinkSystem NE1072T switch 2	QSFP 5	1m QSFP+-to-QSFP+ cable
		40 Gb QSFP 4	ThinkSystem NE1072T switch 2	QSFP 6	

Table 15. RackSwitch G8272 Switch 2 cabling for 1U/2U appliances

	Source		Destination		Connection type
	Usage	Port	Device	Port	
7	Management		RackSwitch G8052	38	1.25m Cat6 Green Cable
8	10 Gb NIC1	1–32	ThinkAgile HX appliances	2	3m Passive DAC Cable

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
9	10 Gb DAC connection (initial setup only)		RackSwitch G8052		1m Passive DAC SFP+ Cable
10	Uplink (option 1)	10 Gb SFP+ 45–48	Customer switch		20m SFP+ to SFP+ Active Optical Cable
11	Uplink (option 2)	40 Gb QSFP+ 1–4	Customer switch		20m 40Gb QSFP+ to QSFP+ Active Optical Cable

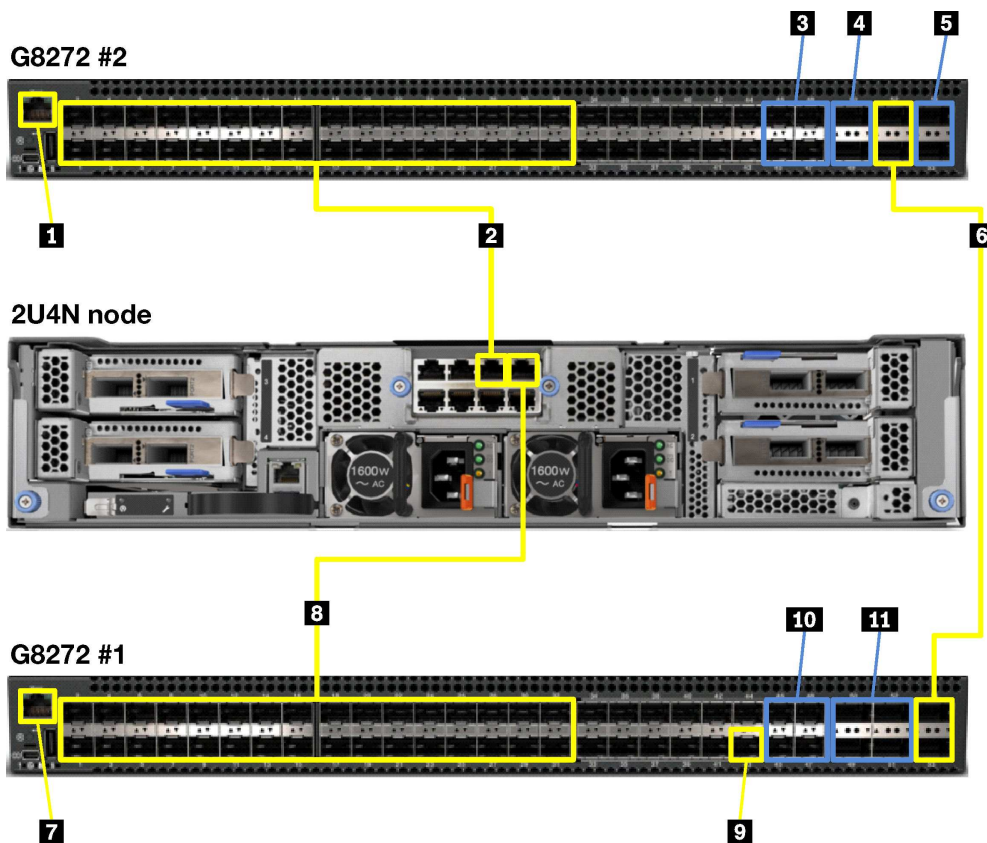*Figure 8. RackSwitch G8272 cabling for 2U4N enclosures*

Table 16. RackSwitch G8272 Switch 1 cabling for 2U4N enclosures

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
1	Management		RackSwitch G8052	37	1.25m Cat6 Green Cable
2	10 Gb NIC1	1–32	ThinkAgile HX enclosures	1	3m Passive DAC Cable

Table 16. RackSwitch G8272 Switch 1 cabling for 2U4N enclosures (continued)

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
3	Uplink (option 1)	10 Gb SFP+ 45–48	Customer switch		20m SFP+ to SFP+ Active Optical Cable
4, **5**	Uplink (option 2)	40 Gb QSFP+ 1, 2, 5, 6	Customer switch		20m 40Gb QSFP+ to QSFP+ Active Optical Cable
6	VLAG	40 Gb QSFP 3	ThinkSystem NE1072T switch 2	QSFP 5	1m QSFP+-to-QSFP+ cable
		40 Gb QSFP 4	ThinkSystem NE1072T switch 2	QSFP 6	

Table 17. RackSwitch G8272 Switch 2 cabling for 2U4N enclosures

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
7	Management		RackSwitch G8052	38	1.25m Cat6 Green Cable
8	10 Gb NIC1	1–32	ThinkAgile HX enclosures	2	3m Passive DAC Cable
9	10 Gb DAC connection (initial setup only)		RackSwitch G8052		1m Passive DAC SFP+ Cable
10	Uplink (option 1)	10 Gb SFP+ 45–48	Customer switch		20m SFP+ to SFP+ Active Optical Cable
11	Uplink (option 2)	40 Gb QSFP+ 1–4	Customer switch		20m 40Gb QSFP+ to QSFP+ Active Optical Cable

Cabling for RackSwitch G8052

Note: ThinkAgile HX typically use only the 10Gb Ethernet connections. System management for ThinkAgile HX is handled in-band, so the 1Gb is typically only needed if systems require reimaging or out-of-band access.

The following images show the RackSwitch G8052 cabling connections for the ThinkAgile HX appliances and enclosures in the SXN3000.
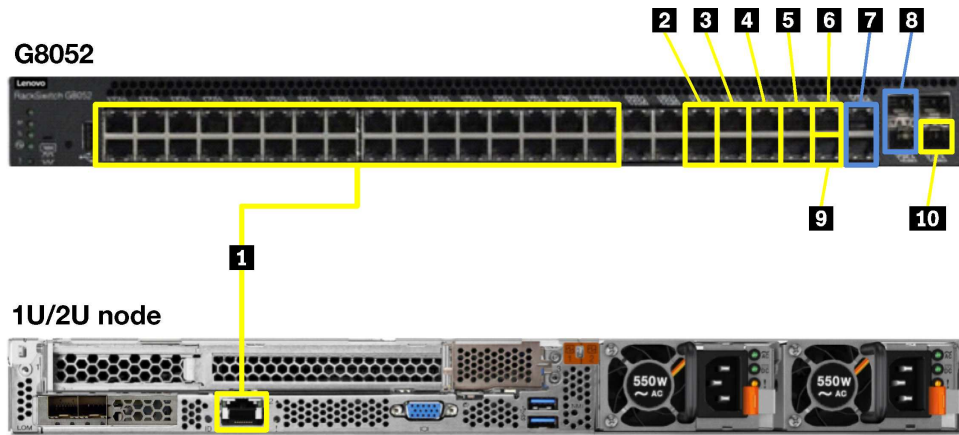
Figure 9. RackSwitch G8052 cabling for 1U and 2U appliances

Table 18. RackSwitch G8052 cabling for 1U/2U appliances

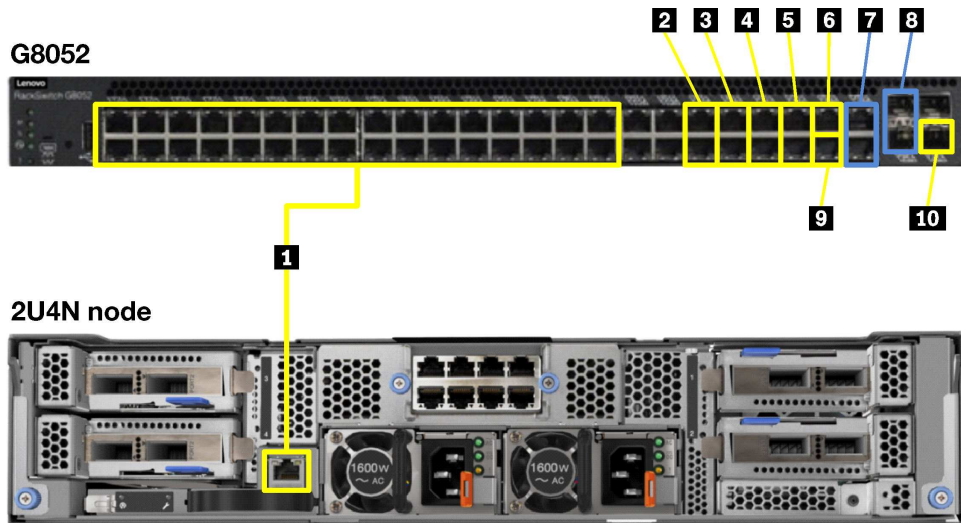|	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
1	XCC	1–32	ThinkAgile HX appliances	1	3m Green Cat5e Cable
2	Top-of-Rack switch management	37, 38	Top-of-Rack switch		1.25m Cat6 Green Cable
3	PDU management	39, 40	PDUs in Bays A and B		3m Green Cat5e Cable
4		41, 42	PDUs in Bays C and D		3m Green Cat5e Cable
5		43, 44	PDUs in Bays E and F		3m Green Cat5e Cable
6	Service/install	45	Service laptop		10m Cat6 Green Cable
7	Uplink (option 1)	47, 48	Customer switch (Ethernet)		25m Cat6 Green Cable
8	Uplink (option 2)	49, 50	Customer switch (SFP+)		20m SFP+ to SFP+ Active Optical Cable
9	Ethernet (initial setup option 1)	46	ThinkSystem NE1072T switch 2	44	3m Green Cat5e Cable
10	10 Gb DAC connection (initial setup option 2)	4	RackSwitch G8272 switch 2	44	1m Passive DAC SFP+ Cable

Figure 10. RackSwitch G8052 cabling for 2U4N enclosures

Table 19. RackSwitch G8052 cabling for 2U4N enclosures

	Source		Destination		Connection type
	Usage	**Port**	**Device**	**Port**	
1	XCC	1–32	ThinkAgile HX enclosures	1	3m Green Cat5e Cable
2	Top-of-Rack switch management	37, 38	Top-of-Rack switch		1.25m Cat6 Green Cable
3	PDU management	39, 40	PDUs in Bays A and B		3m Green Cat5e Cable
4		41, 42	PDUs in Bays C and D		3m Green Cat5e Cable
5		43, 44	PDUs in Bays E and F		3m Green Cat5e Cable
6	Service/install	45	Service laptop		10m Cat6 Green Cable
7	Uplink (option 1)	47, 48	Customer switch (Ethernet)		25m Cat6 Green Cable
8	Uplink (option 2)	49, 50	Customer switch (SFP+)		20m SFP+ to SFP+ Active Optical Cable
9	Ethernet (initial setup option 1)	46	ThinkSystem NE1072T switch 2	44	3m Green Cat5e Cable
10	10 Gb DAC connection (initial setup option 2)	4	RackSwitch G8272 switch 2	44	1m Passive DAC SFP+ Cable

SXN3000 power cabling

The SXN3000 rack and components are precabled for power. This information is provided for your reference.

The power design for the SXN3000 in a 42U rack is N+N redundancy. Power cabling is designed to spread the load over each phase, as well as each breaker. Based on the as-ordered configuration and region, the

PDUs are treated as Full density or Half density. This applies to systems using 1U, 2U, or 2U4N appliance/enclosures.

In the images below, the switch in U40 is the RackSwitch G8052 management switch. The switches in U41 and U42 are the RackSwitch G8272, ThinkSystem NE1072T, or ThinkSystem NE2572 VM/storage switches.

Full density PDUs

The following image shows the node-to-port mapping for Full density PDUs. The number indicate the ThinkAgile HX appliance/enclosure number, as defined relative to EIA space 1. The relevant power cable is as follows:

- 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
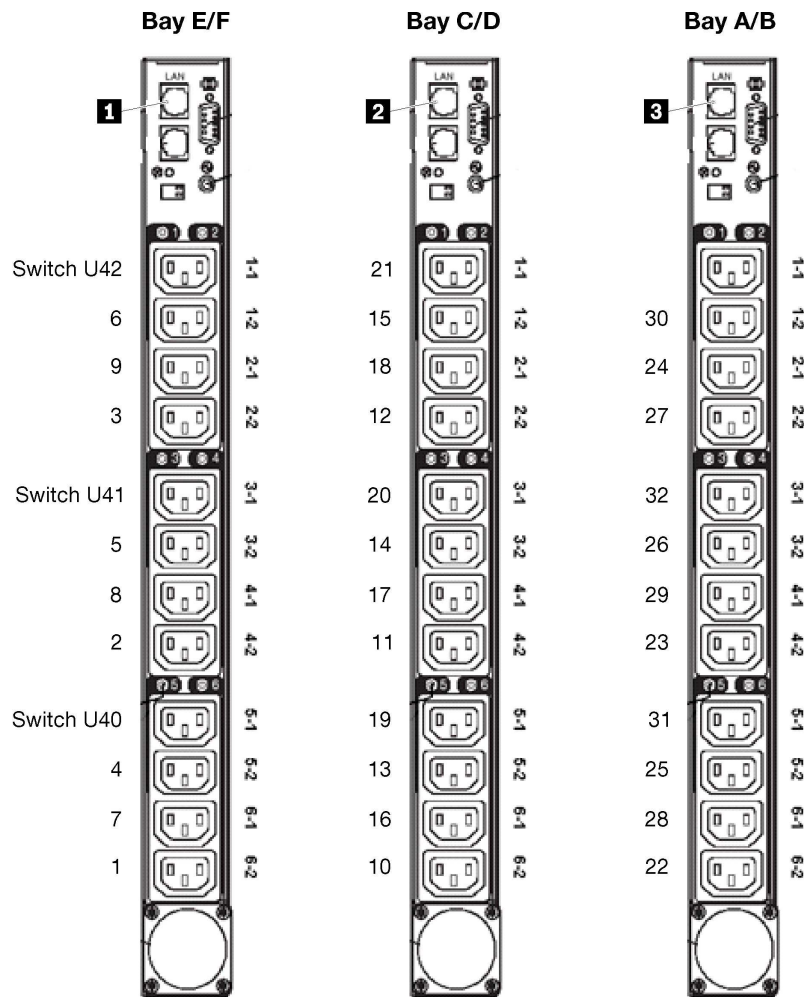

Figure 11. Full density mapping for SXN3000 PDUs

The following table lists the destination ports on the RackSwitch G8052 management switch.

Table 20. Management connections for Full density PDUs

	PDU	Management switch port
1	E	44
	F	43

Table 20. Management connections for Full density PDUs (continued)

	PDU	Management switch port
2	C	42
	D	41
3	A	40
	B	39

Half density PDUs

The following image shows the node-to-port mapping for Half density PDUs. The number indicates the ThinkAgile HX appliance/enclosure number, as defined relative to EIA space 1. The relevant power cable is as follows:

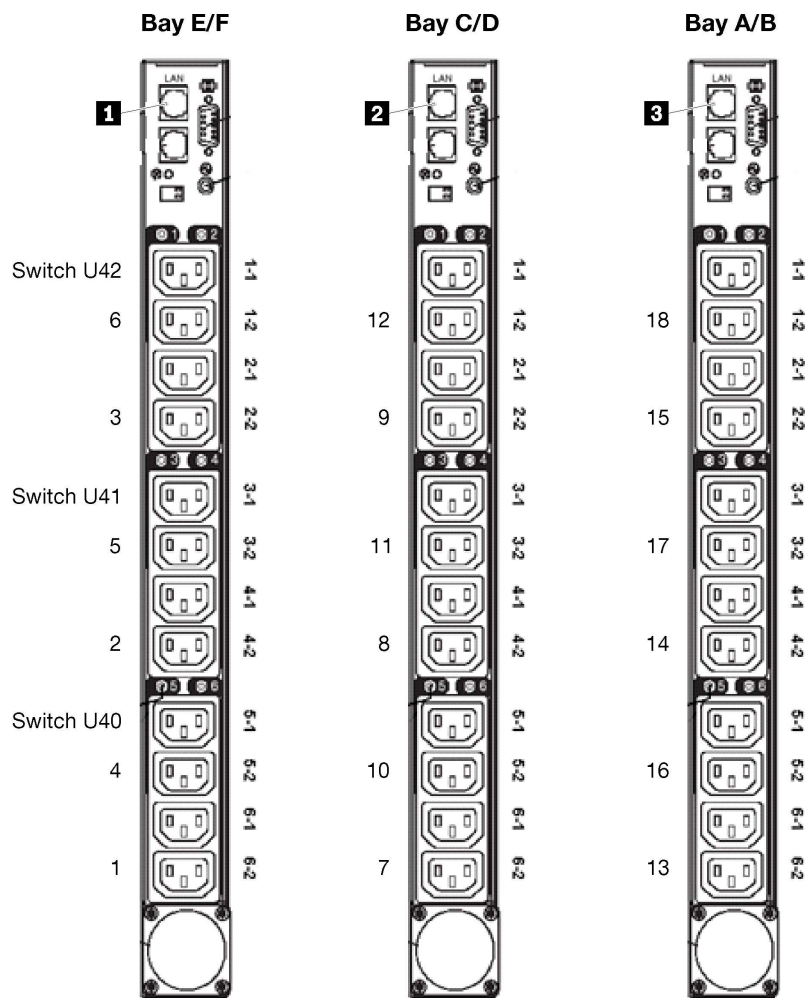- 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable

Figure 12. Half density mapping for SXN3000 PDUs

The following table lists the destination ports on the RackSwitch G8052 management switch.

Table 21. Management connections for Half density PDUs

	PDU	Management switch port
1	E	44
	F	43
2	C	42
	D	41
3	A	40
	B	39

Appendix B. Firmware maintenance and Best Recipe

The ThinkAgile SXN products use a "Best Recipe" to identify the supported firmware levels for the product.

SXN3000

For information about the SXN3000 Best Recipe, refer to the following Web site:

https://datacentersupport.lenovo.com/us/en/solutions/ht505554

Adherence to Best Recipe and Support impact

The ThinkAgile SXN Best Recipe includes component firmware levels that have been tested in a converged environment. Any specific firmware that is above or below the level indicated in the Best Recipe is not supported and might impact Lenovo's ability to support any issues with the relevant component.

Updating firmware

To find specific update procedures for ThinkAgile SXN components, refer to the component documentation. See "ThinkAgile SXN documentation and related content" on page 3 for relevant links.