Management software

ThinkSystem DE Series arrays management console

Lenovo

Management software overview

All ThinkSystem DE Series storage arrays support the following ThinkSystem SAN OS software:
- ThinkSystem System Manager
  - A single storage system management. System Manager supports GUI only.
  - It is preinstalled on the controllers
- ThinkSystem SAN Manager
  - A host-installed GUI-based application for centralized management of multiple DE Series storage systems
  - It supports Windows or Linux host environments
- ThinkSystem Storage Manager
  - A host-installed GUI-based application, required to support the Secure CLI interface, multi-path drivers, and multi-system firmware updates
  - It supports Windows or Linux host environments

Lenovo

Software updates in May 2020

The following software updates are included in DE Series storage arrays firmware version 11.60.2, released in May 2020:

- ThinkSystem System Manager
  - Users can now download the secure management CLI (SMcli) through System Manager
  - Synchronous and asynchronous mirroring settings have been removed from the System Manager → Storage page
- ThinkSystem SAN Manager
  - Users can now set up synchronous or asynchronous mirroring with SAN Manager (requires additional license keys)
- ThinkSystem Storage Manager
  - It is no longer bundled together with SMcli, and users will need to download SMcli with System Manager
  - In-band CLI is no longer supported

Click **HERE** to see a comparison of the DE Series 11.50.x and 11.60.2 management software. Go to the Management software section for more information.

Lenovo

Version 11.50.x

Storage Manager

- SMcli
- DSM
- Host utilities

SAN Manager

- Update Center

System Manager

- Mirroring setup

Version 11.60.2

- SMcli
- DSM

Storage Manager

- Host utilities

SAN Manager

- Add mirroring setup

System Manager

- Remove mirroring setup
- Add SMcli download option

DSM:
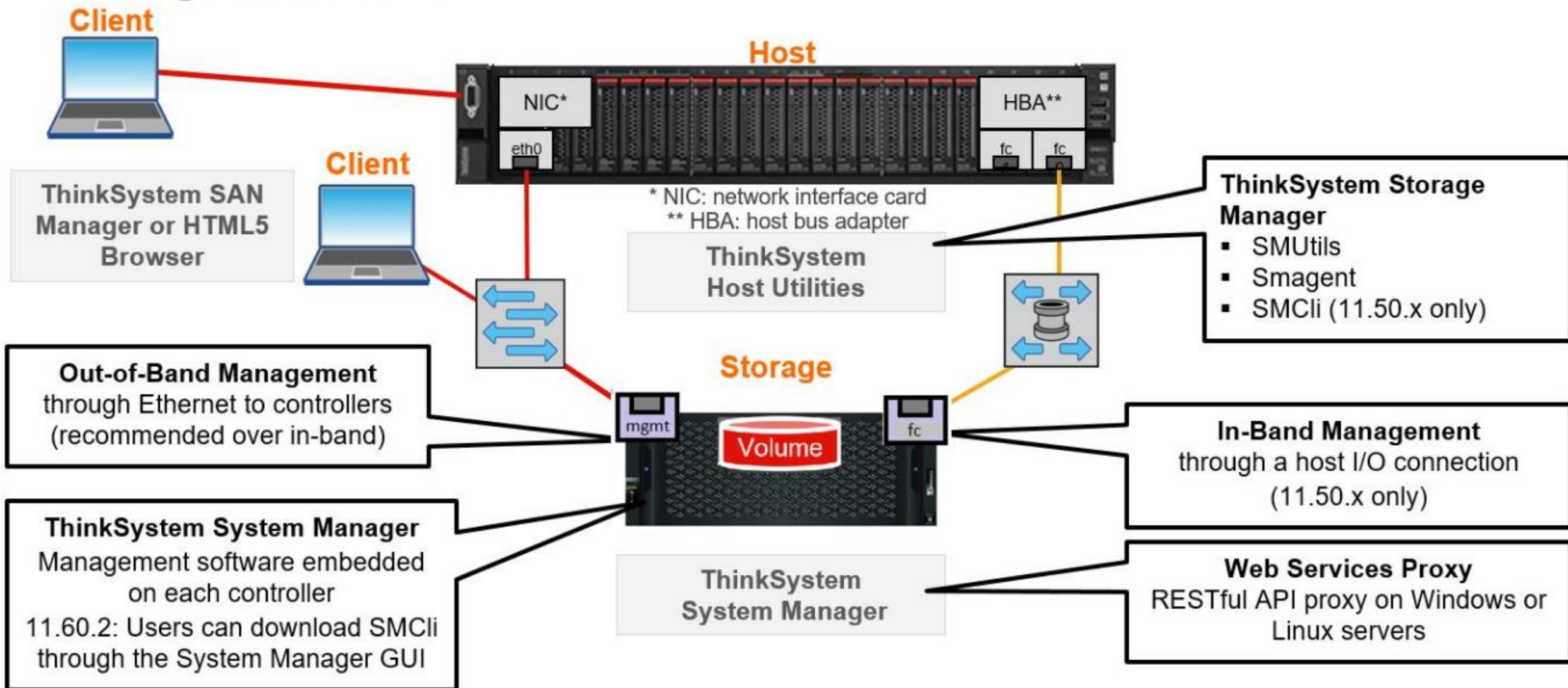Device Specific Module
Host utilities of 11.6.2:
Storage Manager Agent Package (SMAgent)
Storage Manager Utilities Package (SMUtil)
Storage Manager Runtime Package (SMruntime)

Lenovo

Management flow

Client

Host

Client

NIC*

eth0

HBA**

fc   fc

* NIC: network interface card
** HBA: host bus adapter

ThinkSystem SAN Manager or HTML5 Browser

ThinkSystem Host Utilities

ThinkSystem Storage Manager
- SMUtils
- Smagent
- SMCli (11.50.x only)

Out-of-Band Management
through Ethernet to controllers
(recommended over in-band)

Storage

mgmt

Volume

fc

In-Band Management
through a host I/O connection
(11.50.x only)

ThinkSystem System Manager
Management software embedded
on each controller
11.60.2: Users can download SMCli
through the System Manager GUI

ThinkSystem System Manager

Web Services Proxy
RESTful API proxy on Windows or
Linux servers

Note: In-band management is supported by the 11.50.3 CLI interface for controllers running 11.50 or later versions of SAN OS. 11.60.2 or later versions do not support in-band management.

Lenovo

ThinkSystem System Manager

ThinkSystem System Manager (TSM) is the management console for a single DE storage system. TSM supports the web GUI. Users can monitor, configure, and perform troubleshooting actions on the storage through TSM.
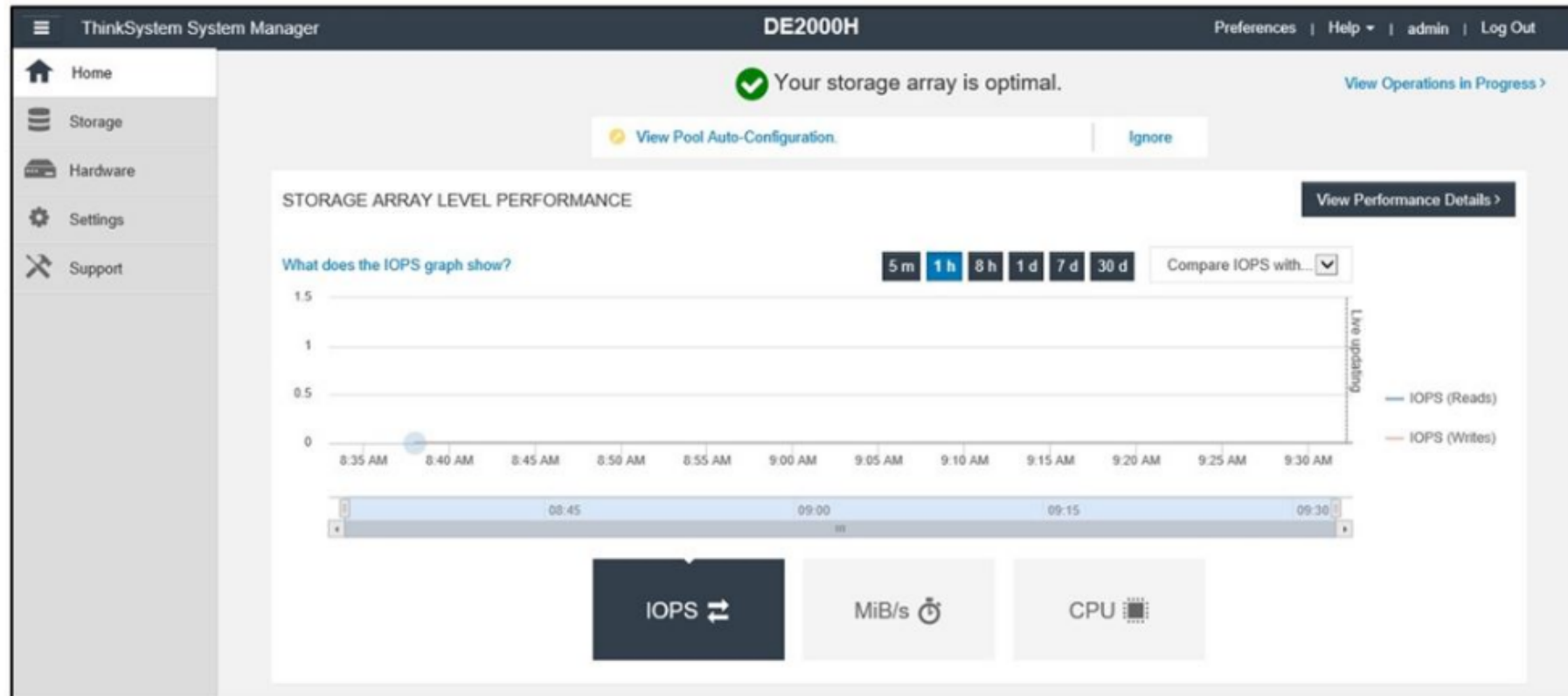
Access to SAN OS

The DE Series Storage Array's operating system is SAN OS. SAN OS supports both GUI and CLI mode:

- GUI mode (ThinkSystem System Manager)
  - o   Open a web browser and enter the System Manager IP address to log in to System Manager
  - o   It requires an Ethernet management port connection between the host and the storage array
- CLI mode (SMcli)
  - o   11.50.3 or earlier versions:
    - Storage Manager must be installed to support the secure CLI interface
    - In-band CLI from 11.50.3 can be used to manage 11.50 and 11.60 controllers
    - In-band CLI cannot manage controllers running NVMe-oF protocols
  - o   11.60.2 or later versions:
    - The out-of-band CLI interface is installed through the System Manager's System page → Add-on section
    - Runs in secure mode only
    - Requires an Ethernet management port connection
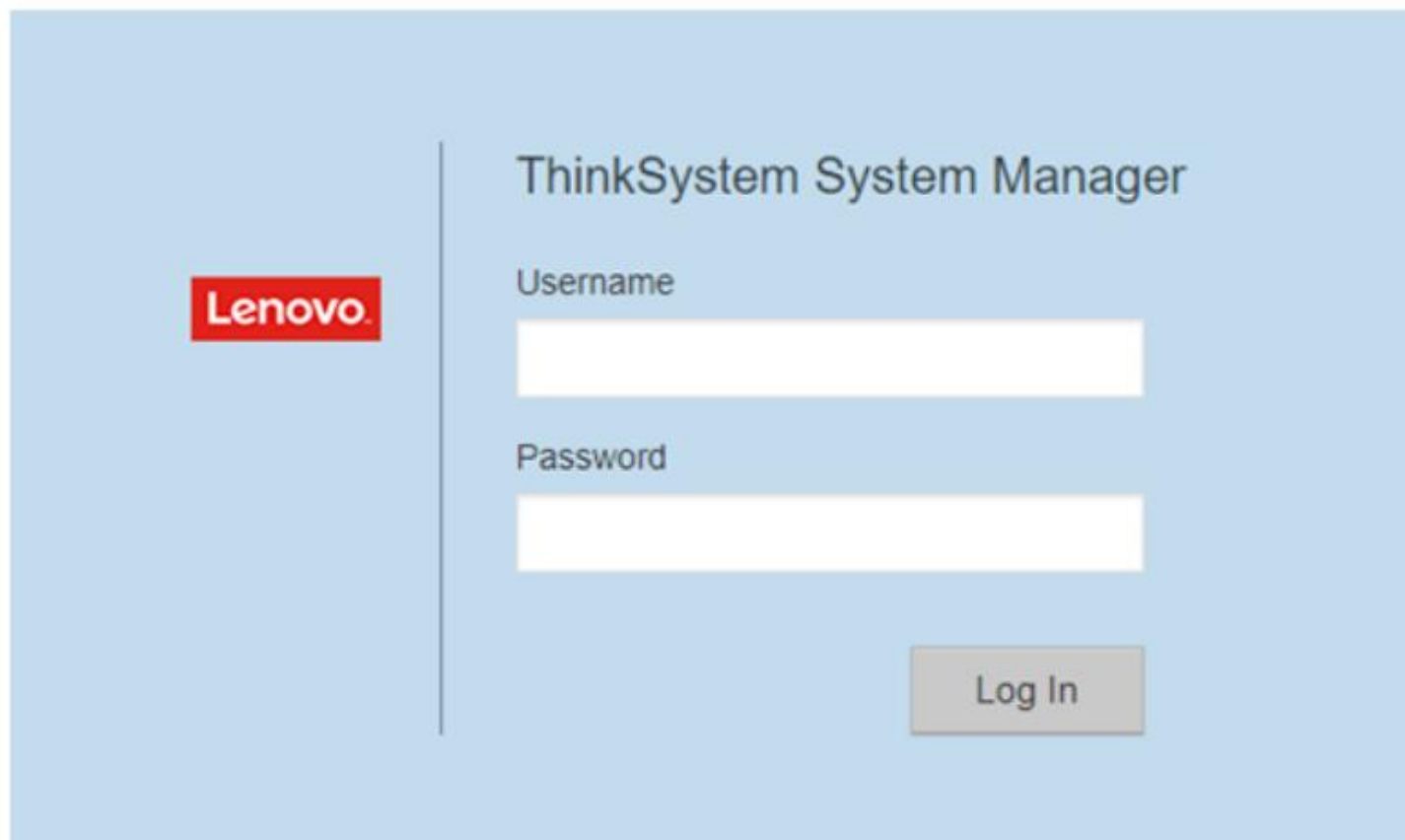
Lenovo

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

Click the buttons on the left to see more information about the TSM functions.

ThinkSystem System Manager

Lenovo.

Username

Password

Log In

ThinkSystem System Manager functions
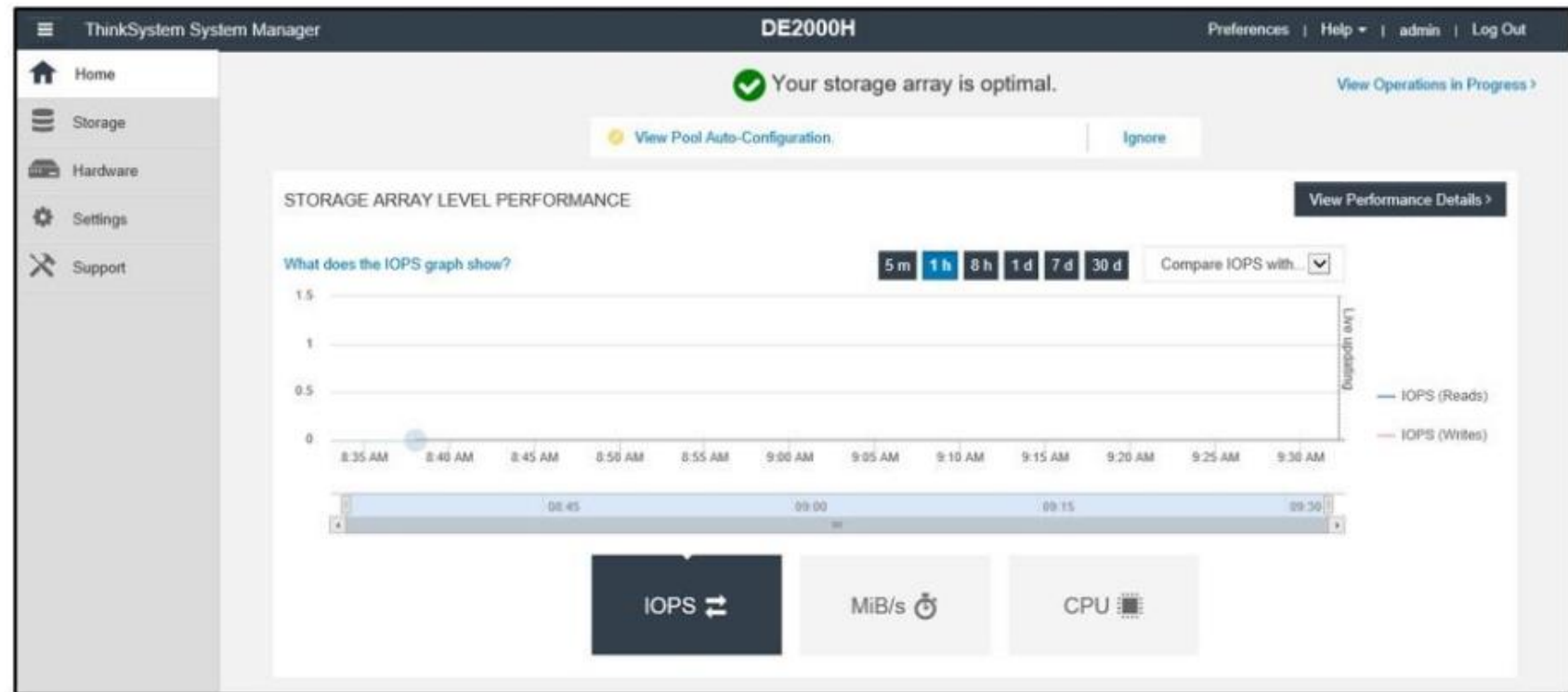
Home

Storage

Hardware

Settings

Support

The Home page shows live storage array performance monitoring information. If an error occurs on the storage array, an error or warning message will be displayed at the top of the Home page.

Click the arrow to see more information about the Home page.

ThinkSystem System Manager functions
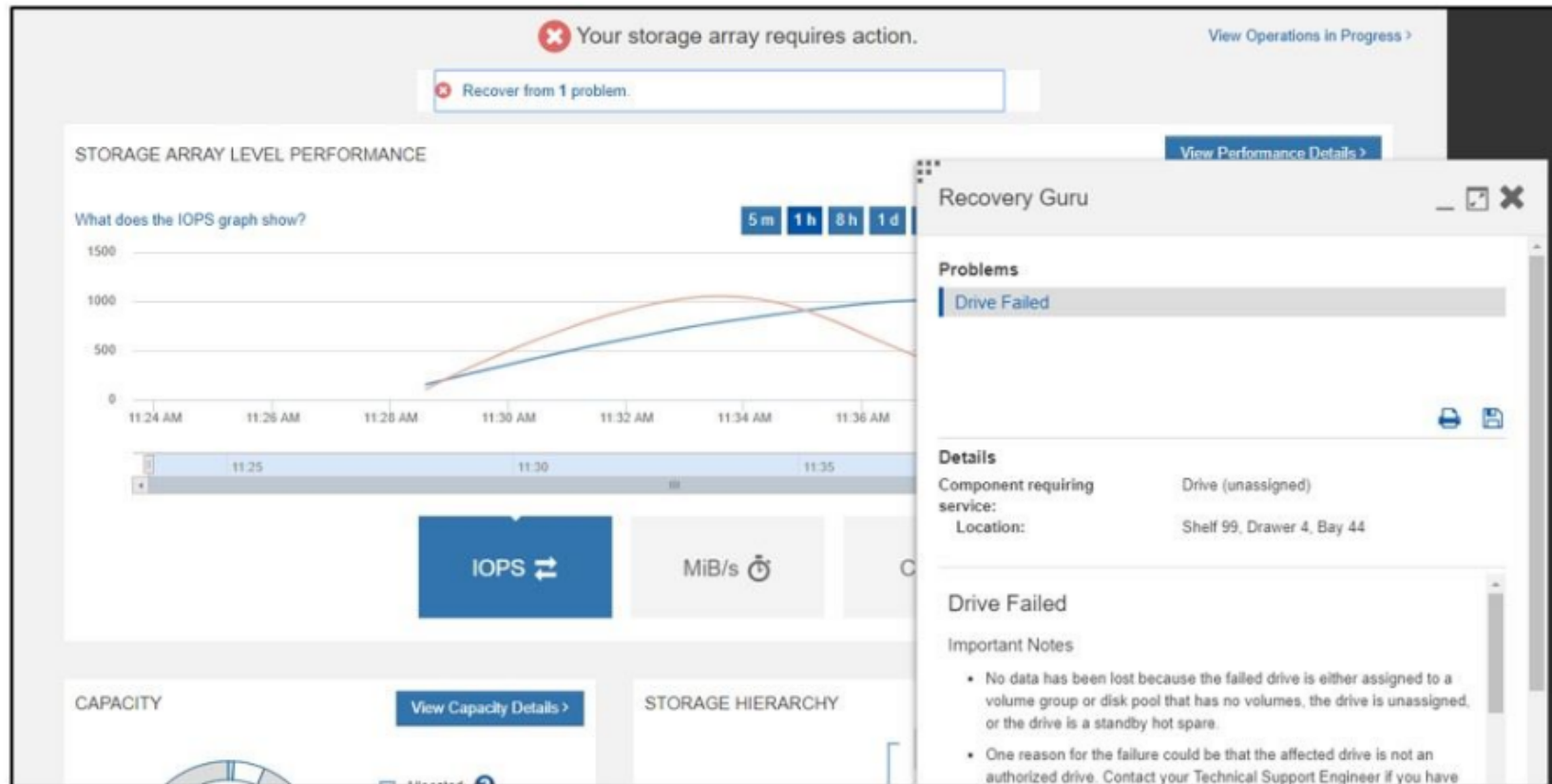
Home

Storage

Hardware

Settings

Support

If an error occurs on the storage array, users should see a warning message at the top of the Home page.

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

The storage capacity and storage hierarchy information is displayed at the bottom of the Home page.

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support
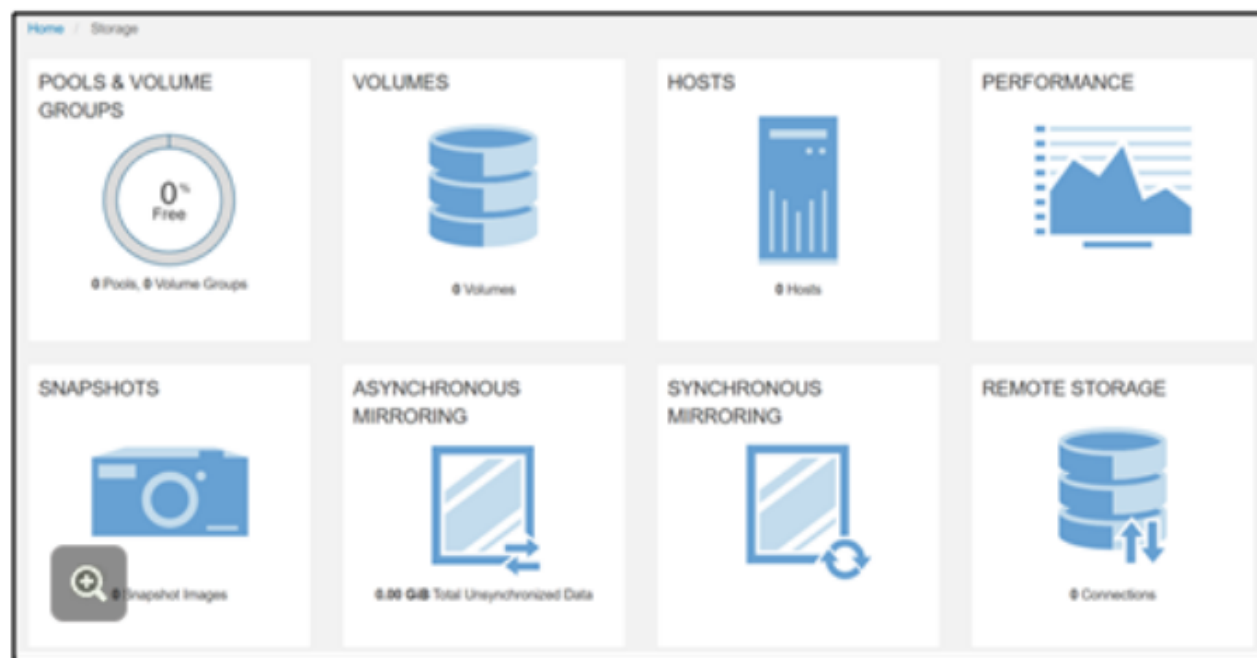
Users can go to the Storage page to perform configuration actions on the storage. This includes pools configuration, creating and editing pools, and setting volumes and hosts. For 11.50.x users, use this page to set up synchronous or asynchronous mirroring. For 11.60.2 or later versions, use ThinkSystem Storage Manager to set up mirroring. This requires an additional license key.

Lenovo

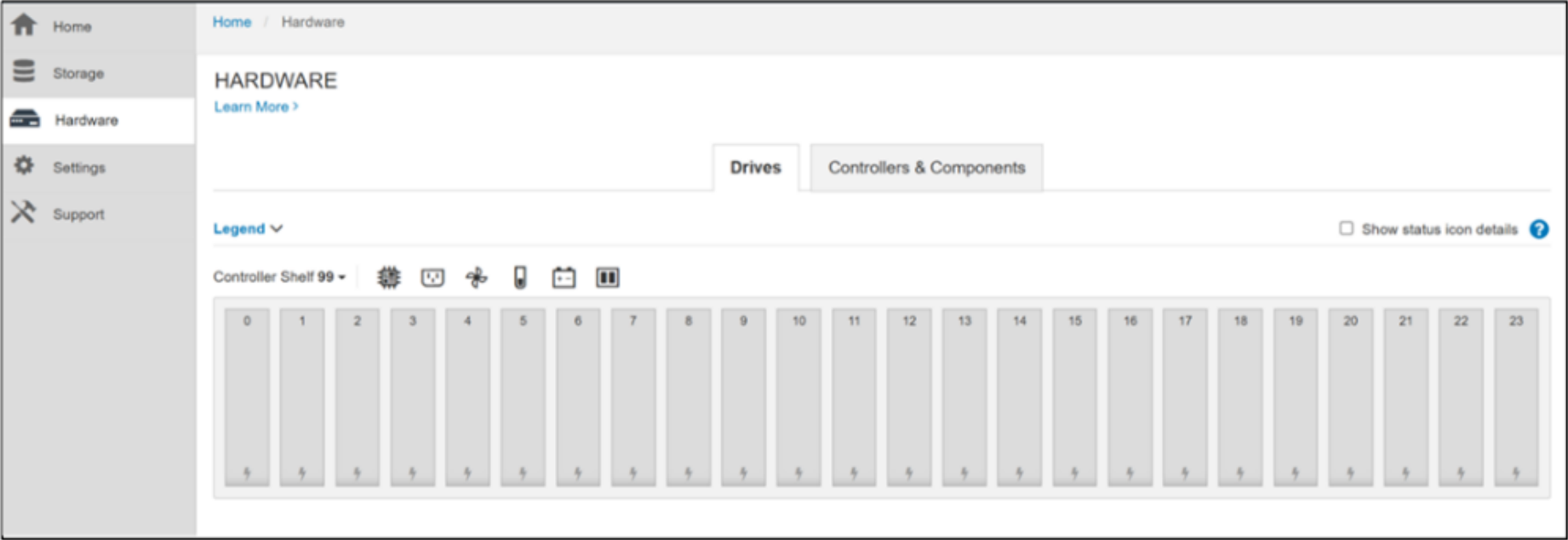# ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

Users can go to the Hardware page to monitor the storage hardware status of each component – for example, drives, fans, and power supplies.

Click to enlarge the image.

Lenovo

ThinkSystem System Manager functions

Users can go to the Hardwa[...]are status

Home / Hardware

Home

Storage

Hardware

Settings

Support

HARDWARE
Learn More >

Users can click the icons to see information about different components – for example, controller firmware version, fan speed, and temperature.

Drives | **Controllers & Components**

Legend ∨

Controller Shelf 99 ▾

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

If there is a hardware failure, the corresponding hardware component icon will be displayed in red on this page.

Click to enlarge the image.

Lenovo

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

The System Manager page includes various storage array system setting functions.
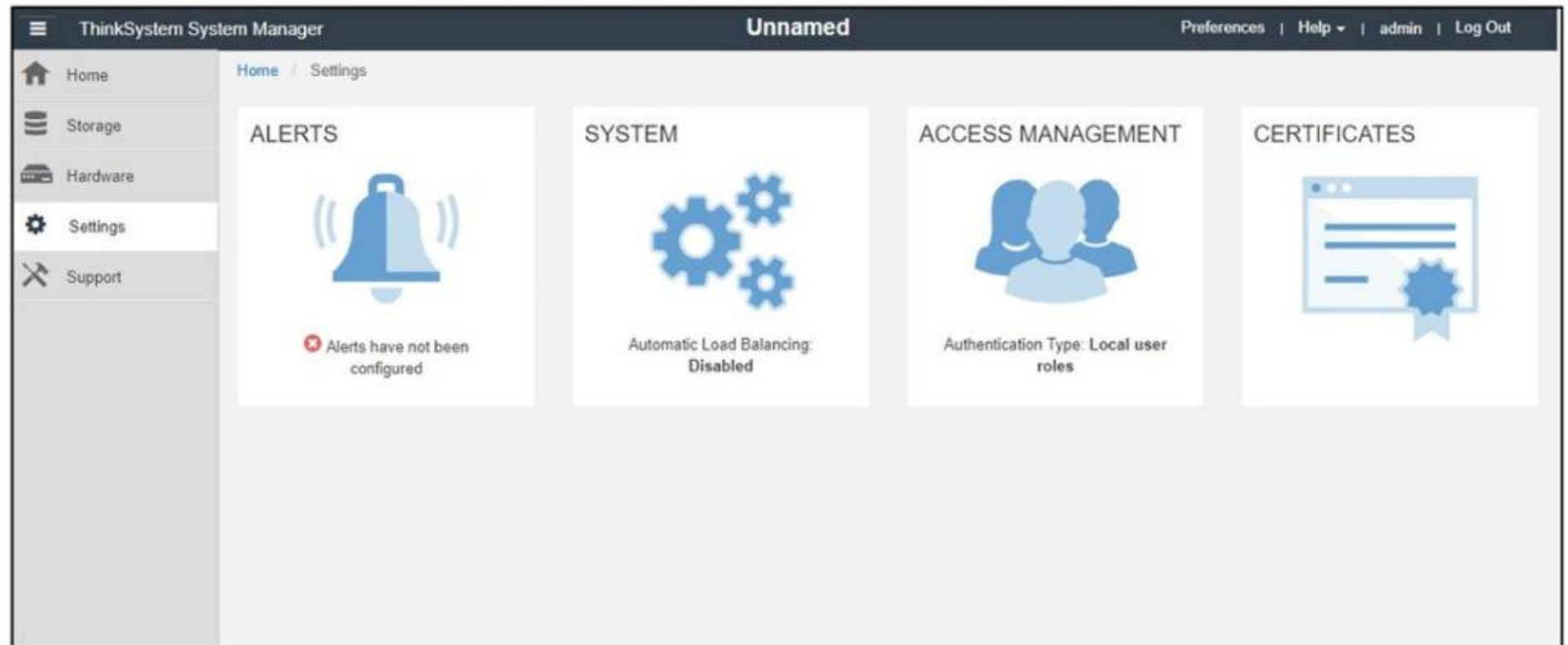
Lenovo

ThinkSystem System Manager functions

Users can configure System Manager to send storage array alerts through email, SNMP traps, and syslog messages.

Home

Storage

Hardware

Settings

Support

Home / Settings / Alerts

ALERTS

Learn More >

| Email | SNMP | Syslog |

Filter ❓

Add Emails | Test All Emails | **Configure Mail Server** | Delete

⊕ Configure Mail Server

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

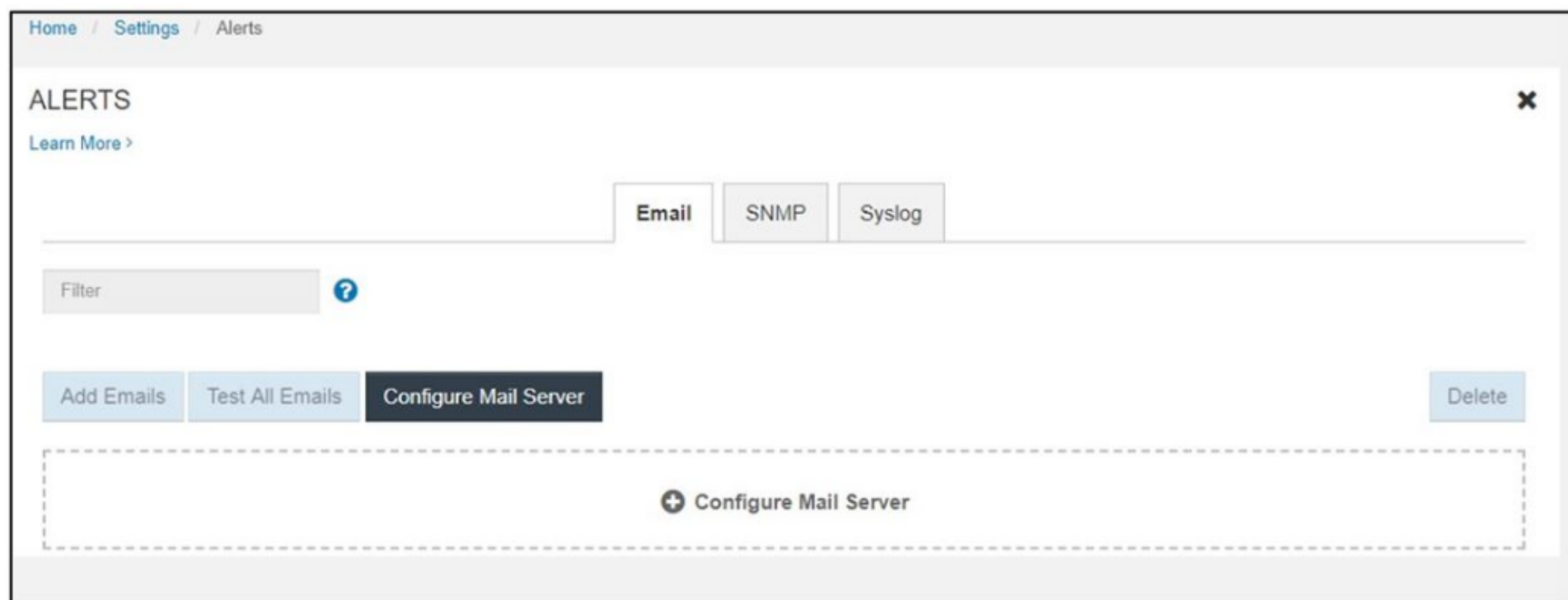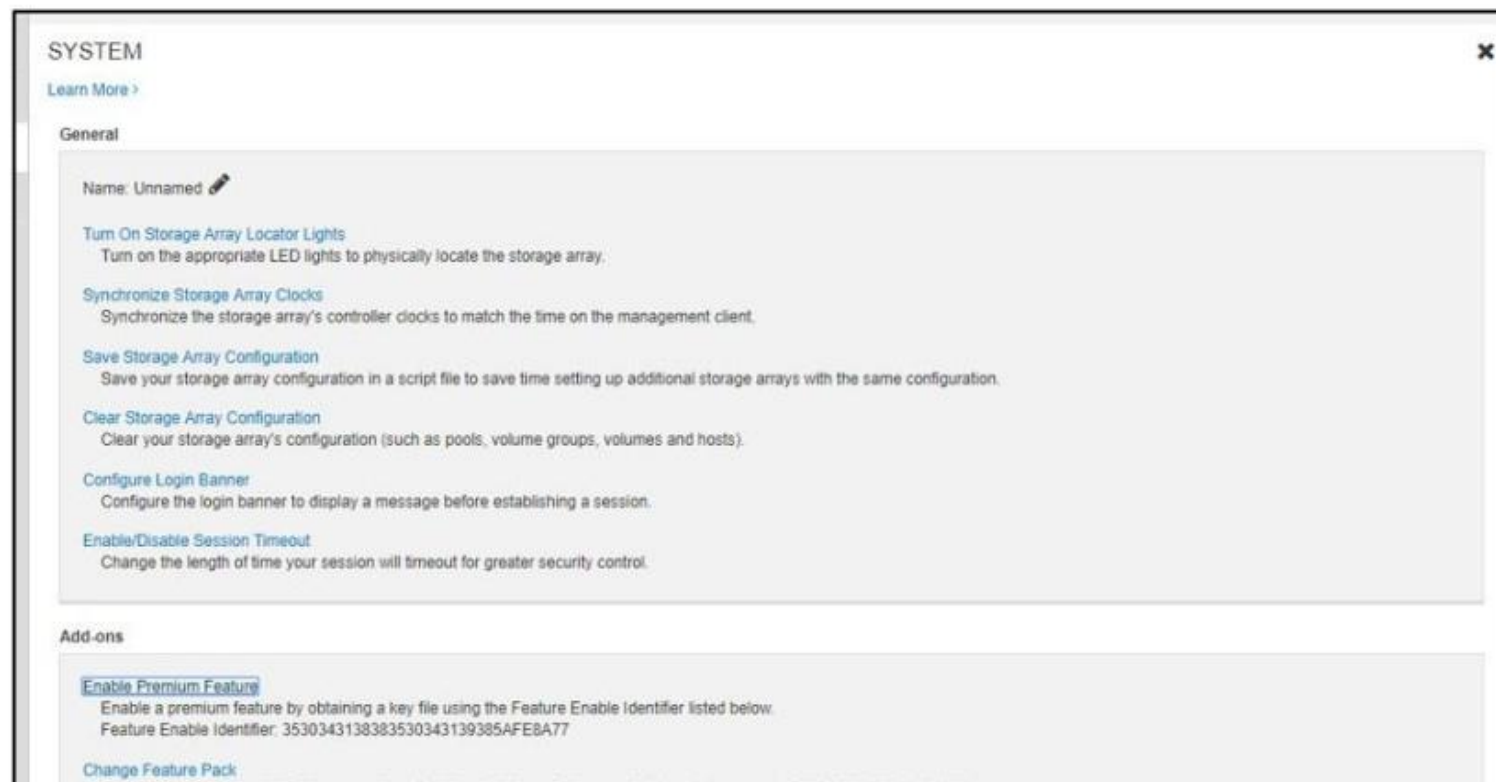On the SYSTEM page, users can perform various storage system settings, such as saving the storage array configuration and enabling the premium feature key.

SYSTEM ✕

Learn More >

General

Name: Unnamed ✏

Turn On Storage Array Locator Lights
Turn on the appropriate LED lights to physically locate the storage array.

Synchronize Storage Array Clocks
Synchronize the storage array's controller clocks to match the time on the management client.

Save Storage Array Configuration
Save your storage array configuration in a script file to save time setting up additional storage arrays with the same configuration.

Clear Storage Array Configuration
Clear your storage array's configuration (such as pools, volume groups, volumes and hosts).

Configure Login Banner
Configure the login banner to display a message before establishing a session.

Enable/Disable Session Timeout
Change the length of time your session will timeout for greater security control.

Add-ons

Enable Premium Feature
Enable a premium feature by obtaining a key file using the Feature Enable Identifier listed below.
Feature Enable Identifier: 35303431383835303431393385AFE8A77

Change Feature Pack

Click the arrows to go to the next or previous pages.

ThinkSystem System Manager functions

For 11.6.2 or later versions, on the SYSTEM page → Add-ons section, users can click Command Line Interface to download and install the SAN OS command line interface (SMcli). An smcli.zip file will be downloaded to users' local system. Click **HERE** to see the SMcli installation tips.

Home
Storage
Hardware
Settings
Support

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

For 11.6.2 or later versions, on the SYSTEM page → Add-ons section, users can click Command Line Interface to download and install the SAN OS command line interface (SMcli). An smcli.zip file will be downloaded to users' local system. Click **HERE** to see the SMcli installation tips.

| ≡ | ThinkSystem System Manager | **DE6000H** | Preferences | Help ⌄ | admin | Log Out |

🏠 Home	Home / Settings / System
🗄 Storage	
🖴 Hardware	**SYSTEM** ✕
⚙ Settings	Learn More >
🛠 Support	**Add-ons**

Enable Premium Feature
Enable a premium feature by obtaining a key file using the Feature Enable Identifier listed below.
Feature Enable Identifier: 3430303432383430303430315AFE0773

Change Feature Pack
Change the feature pack that is currently installed by obtaining a feature pack file using the Feature Enable Identifier listed below.
Feature Enable Identifier: 3430303432383430303430315AFE0773

Command Line Interface ⬀
Download and install the ThinkSystem SAN OS Command Line Interface.

◀ **Click the arrows to go to the next or previous pages.** ▶

Lenovo

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

Users can use System Manager to create Certificate Signing Requests (CSRs), import certificates, and manage existing certificates.

Home / Settings / Certificates

CERTIFICATES

Learn More >

| Array Management | Trusted | Key Management |

Filter ?

Import   Complete CSR   Reset

Certificate Type	Controller	Issued To	Issued By	Valid From	Valid To
Server	A	Unknown	Unknown	Unknown	Unknown
Server	B	CN=localhost	CN=localhost	Jul 20, 2018 6:16:05 AM	Apr 14, 2021 6:16:05 AM

Total rows: 2

Lenovo

Click the arrow to go back to the previous page.

Management software

ThinkSystem System Manager functions

Storage

Hardware

Settings

Support

On the Support page, users can go to the SUPPORT CENTER page to collect service data, or to the EVENT LOG page to see and collect event logs for problem determination and escalation.

Lenovo

Click the arrow to see more information about the Support page. ▶

ThinkSystem System Manager functions
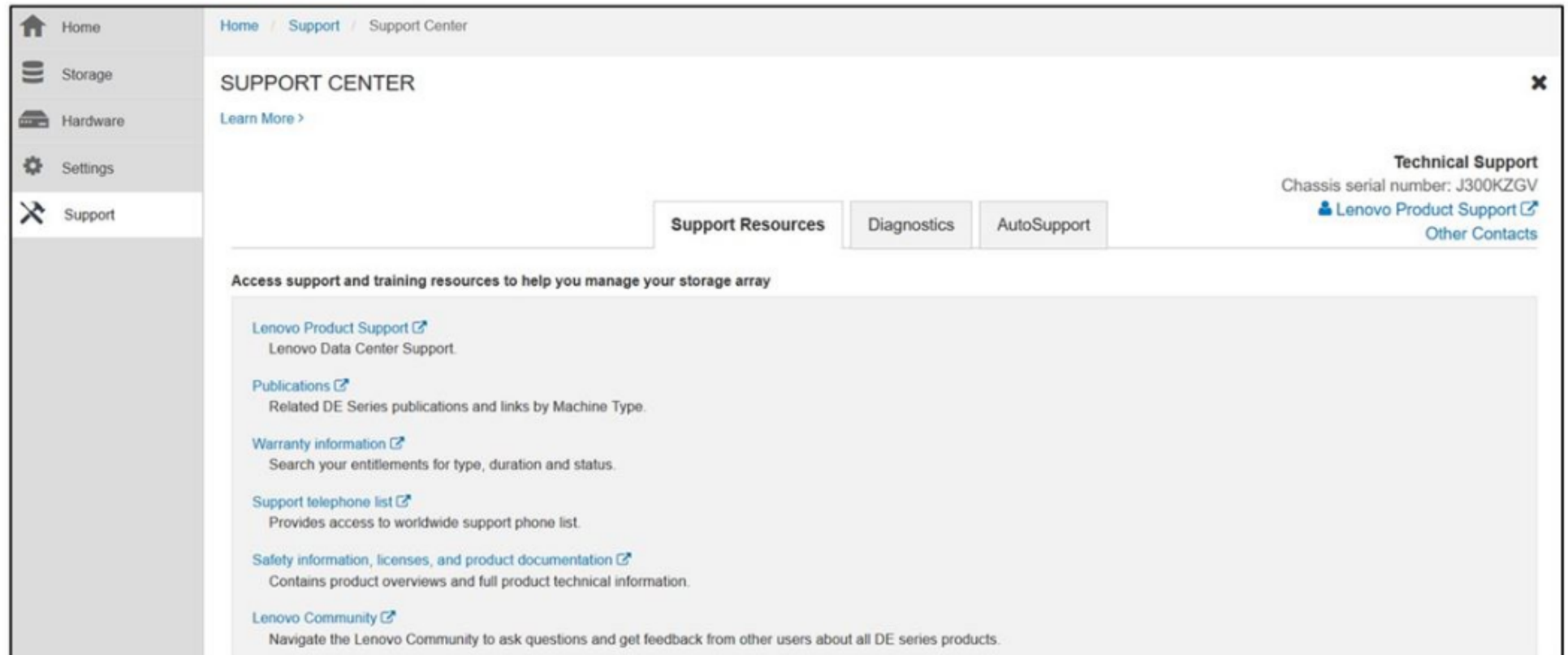
Home

Storage

Hardware

Settings

Support

On the SUPPORT CENTER page, users can click the Support Resource tab for a list of Lenovo website with support resources such as documentation and support telephone lists.

Home / Support / Support Center

SUPPORT CENTER

Learn More >

Technical Support
Chassis serial number: J300KZGV

👤 Lenovo Product Support ⌇
Other Contacts

Support Resources | Diagnostics | AutoSupport

Access support and training resources to help you manage your storage array

Lenovo Product Support ⌇
   Lenovo Data Center Support.

Publications ⌇
   Related DE Series publications and links by Machine Type.

Warranty information ⌇
   Search your entitlements for type, duration and status.

Support telephone list ⌇
   Provides access to worldwide support phone list.

Safety information, licenses, and product documentation ⌇
   Contains product overviews and full product technical information.

Lenovo Community ⌇
   Navigate the Lenovo Community to ask questions and get feedback from other users about all DE series products.

Click the arrows to go to the next or previous pages.

ThinkSystem System Manager functions
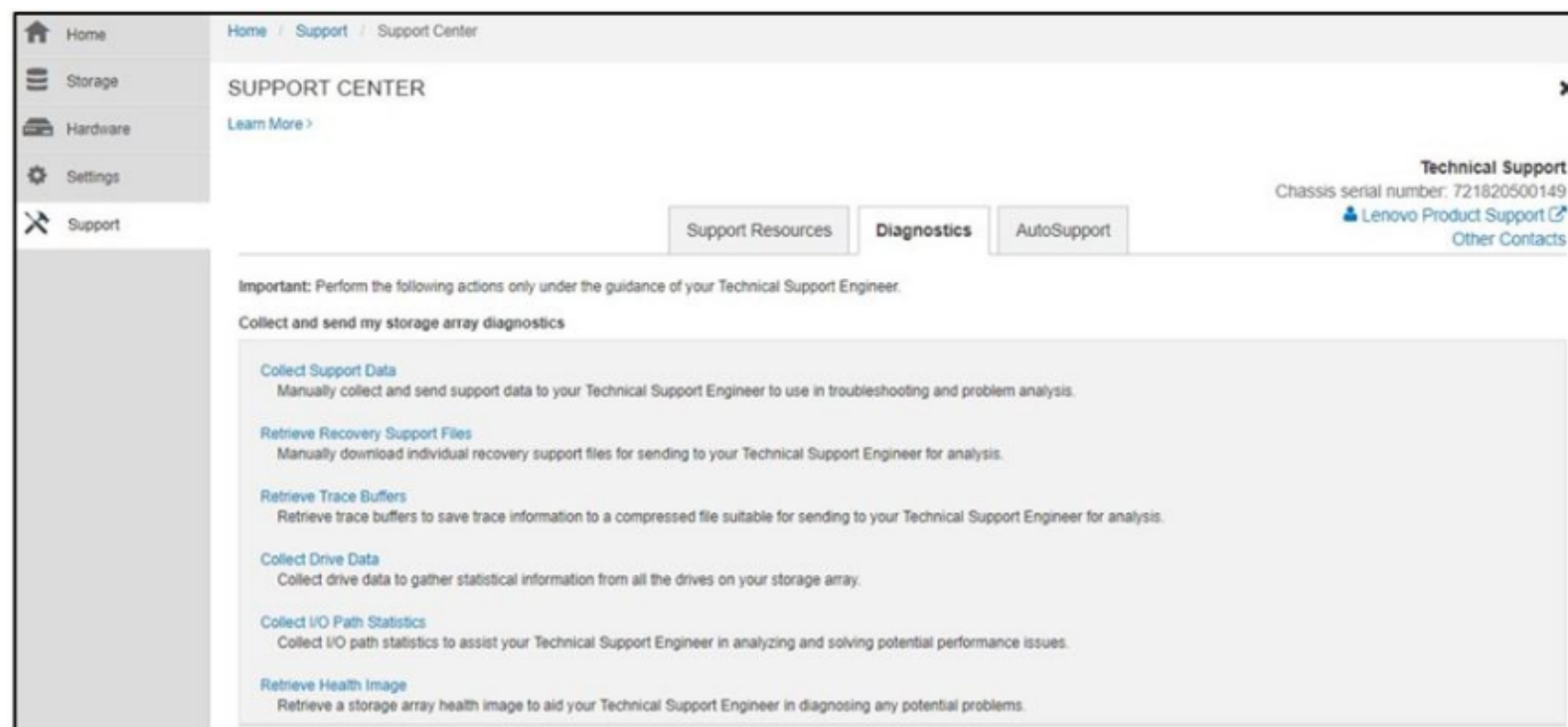
Home

Storage

Hardware

Settings

Support

Users can click the Diagnostics tab to collect Support Data, Drive Data, and I/O Path Statistics for problem escalation. Users can also select this tab to find the storage machine type and serial number for an entitlement check.

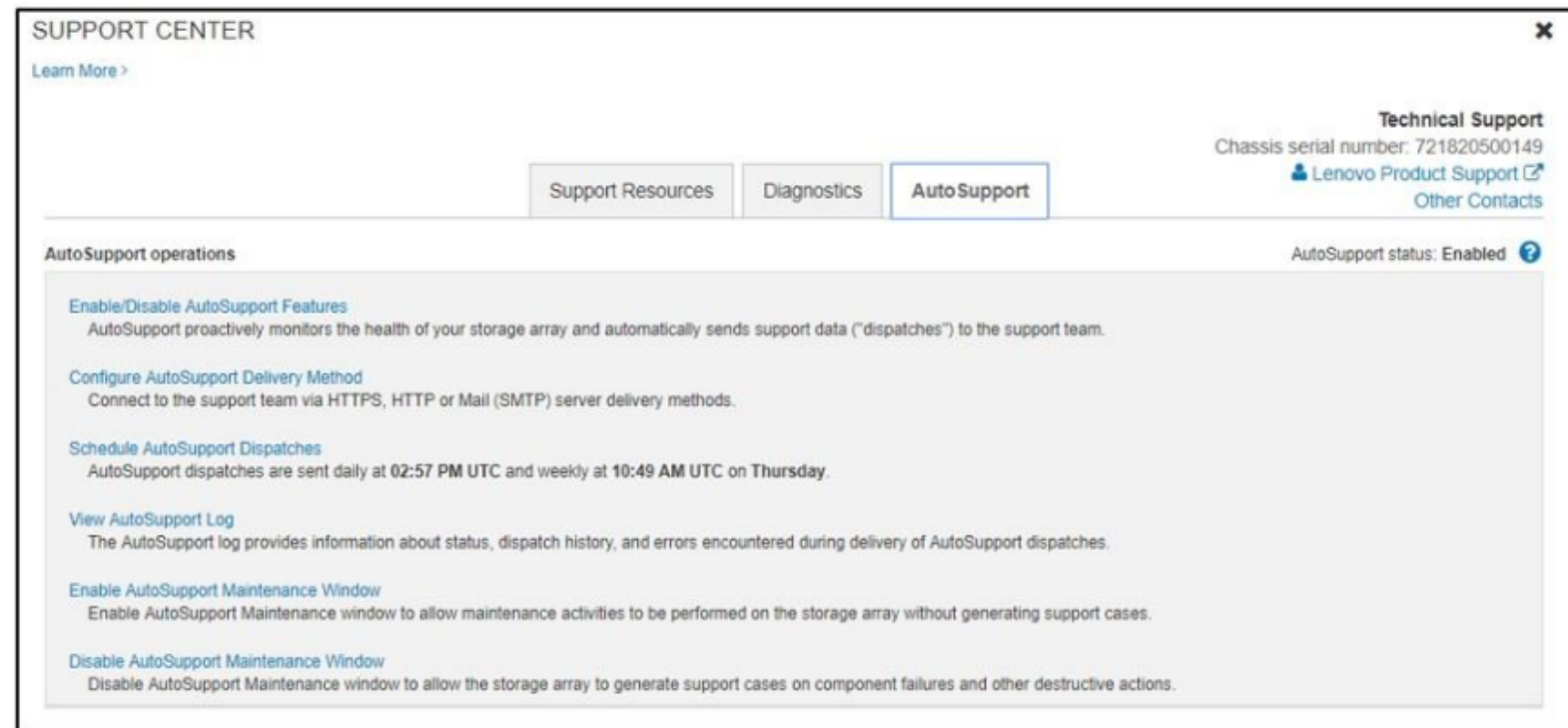# ThinkSystem System Manager functions
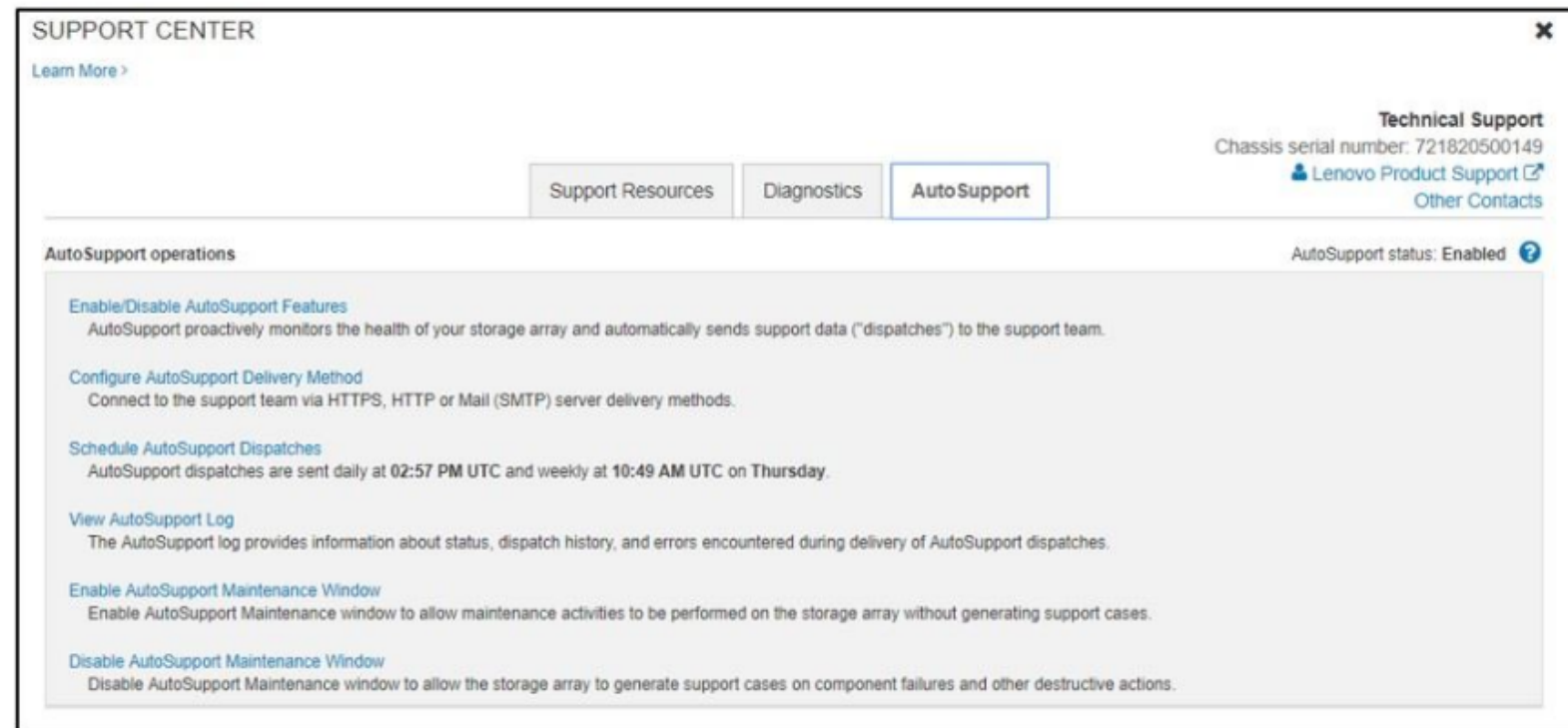
Home

Storage

Hardware

Settings

Support

AutoSupport proactively monitors the health status of the storage system, and automatically sends the support data to the technical support site.

SUPPORT CENTER ✕

Learn More >

Technical Support
Chassis serial number: 721820500149
👤 Lenovo Product Support ☑
Other Contacts

| Support Resources | Diagnostics | AutoSupport |

AutoSupport status: **Enabled** ❓

AutoSupport operations

Enable/Disable AutoSupport Features
AutoSupport proactively monitors the health of your storage array and automatically sends support data ("dispatches") to the support team.

Configure AutoSupport Delivery Method
Connect to the support team via HTTPS, HTTP or Mail (SMTP) server delivery methods.

Schedule AutoSupport Dispatches
AutoSupport dispatches are sent daily at **02:57 PM UTC** and weekly at **10:49 AM UTC** on **Thursday**.

View AutoSupport Log
The AutoSupport log provides information about status, dispatch history, and errors encountered during delivery of AutoSupport dispatches.

Enable AutoSupport Maintenance Window
Enable AutoSupport Maintenance window to allow maintenance activities to be performed on the storage array without generating support cases.

Disable AutoSupport Maintenance Window
Disable AutoSupport Maintenance window to allow the storage array to generate support cases on component failures and other destructive actions.

Note: AutoSupport is disabled by default setting.

Lenovo

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

AutoSupport proactively monitors the health status of the storage system, and automatically sends the support data to the technical support site.

SUPPORT CENTER ✕

Learn More ›

Technical Support
Chassis serial number: 721820500149
👤 Lenovo Product Support ↗
Other Contacts

| Support Resources | Diagnostics | AutoSupport |

AutoSupport status: **Enabled** ❓

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Note: AutoSupport is disabled by default setting.

Lenovo

ThinkSystem System Manager functions

Home

Storage

Hardware

Settings

Support

On the EVENT LOG page, users can see a record of changes and events that have happened on the storage array.

Home / Support / Event Log

EVENT LOG   ✖

Learn More >

View All   ▾

Filter   ❓

Refresh   Save   Clear All

☑ Date/Time	Priority	Component Type	Component Location	Description
☑ Sep 20, 2018 11:39:55 AM	❌ Critical	Drive	Shelf 99, Bay 45	Fail drive
☑ Sep 20, 2018 11:23:18 AM	❌ Critical	Controller Firmware	None	Clear controller firmware started
☑ Sep 20, 2018 11:23:18 AM	❌ Critical	Alarm	Shelf 99, Bay 0	Activate controller firmware failed
☑ Sep 20, 2018 11:23:18 AM	❌ Critical	Power/Fan Canister	Shelf 99, Bay 0	Activate controller firmware completed

ThinkSystem SAN Manager overview

ThinkSystem SAN manager is a web browser-based GUI console for multiple DE Series systems. ThinkSystem SAN Manager can be installed on a Windows- or Linux-based host system. Users can also open TSM for each managed DE storage array through SAN manager. Following the 11.60.2 updates, users must use SAN Manager to set up synchronous or asynchronous mirroring.

Note: The synchronous and asynchronous mirroring features require the premium feature key installed through ThinkSystem System Manager.

Lenovo

ThinkSystem SAN Manager functions
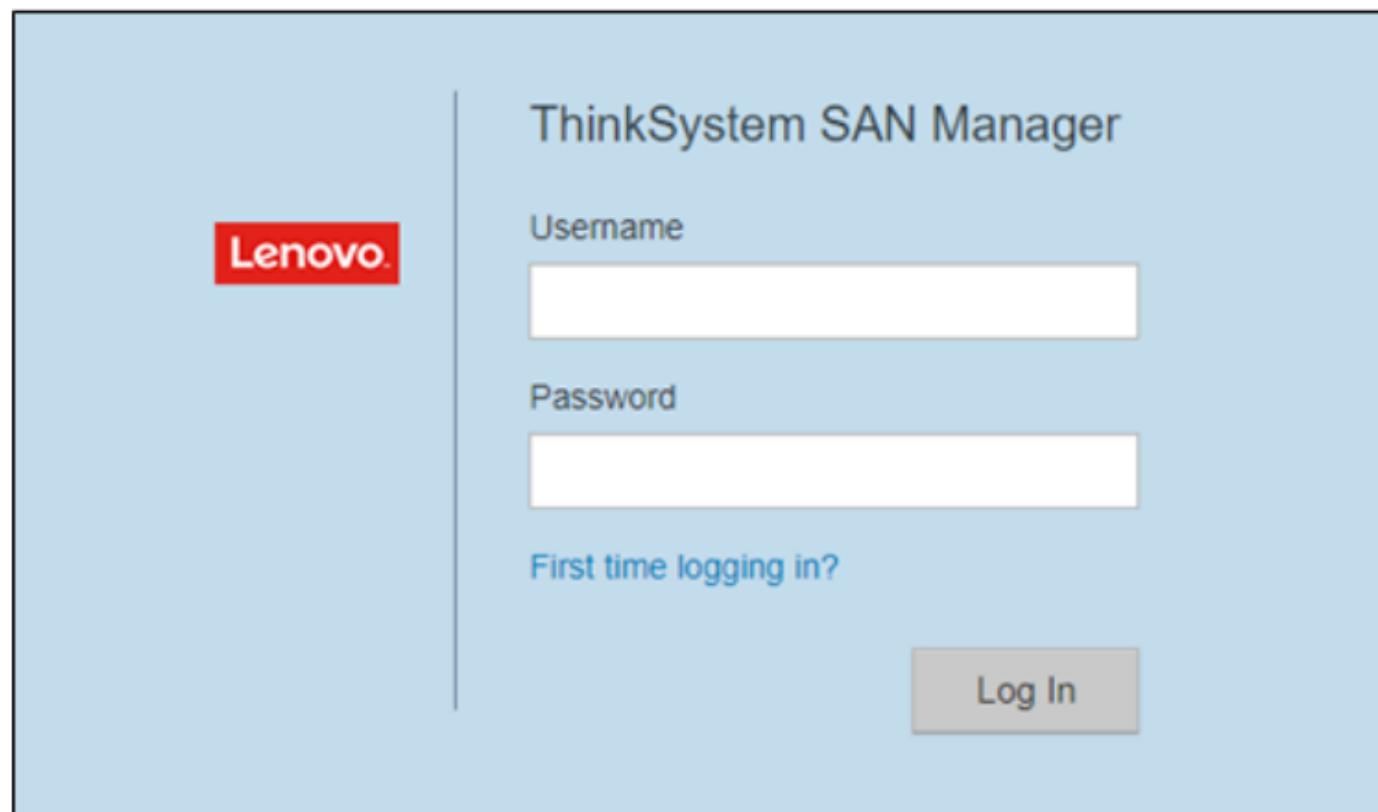
Manage

Operations

Certificate Management

Access Management

Support

Click the buttons on the left to see more information about the SAN Manager functions.

ThinkSystem SAN Manager

Lenovo.

Username

Password

First time logging in?

Log In

ThinkSystem SAN Manager functions

Manage

Operations

Certificate Management

Access Management

Support

Use the Manage page to discover storage arrays in the network, launch TSM for an array, import settings from one array to multiple arrays, and manage array groups. Select the check boxes next to the array names to perform operations on them, such as importing settings and creating array groups.

ThinkSystem SAN Manager functions

Manage

Operations

Certificate Management

Access Management

Support

Use the Operations page to view the progress of batch operations, such as importing settings from one array to another.

Manage	⌄
All	5
Operations	
Certificate Management	
Access Management	
Support	

OPERATIONS

Filter ❓

Refresh

Lenovo

ThinkSystem SAN Manager functions

Manage

Operations

Certificate Management

Access Management

Support

The Certificate Management page manages certificates to authenticate between browsers and clients.

CERTIFICATE MANAGEMENT

Trusted | Management

Show certificates that are...

user installed

Filter ❓

Import ▾   Delete

	Issued To	Status	Issued By	Expiration Date	
☐	10.240.43.109	✓ Trusted	Self-Signed	Jun 19, 2021 10:47:07 PM	•••
☐	10.240.43.118	✓ Trusted	Self-Signed	Apr 10, 2021 6:12:15 PM	•••
☐	10.240.43.148	✓ Trusted	Self-Signed	Jun 20, 2021 3:37:19 PM	•••
☐	10.240.43.148	✓ Trusted	Self-Signed	Apr 10, 2021 6:12:12 PM	•••

ThinkSystem SAN Manager functions

Manage

Operations

Certificate Management

Access Management

Support

The Access Management page manages the user authentication for the SAN Manager interface.

Manage	⌄	ACCESS MANAGEMENT	
All	5		Local User Roles / Directory Services
Operations			
Certificate Management		Filter ❓	
Access Management			
Support		Change Password / View/Edit Settings	

Username	Mapped Roles
admin	Root admin, Security admin, Storage admin, Support admin, Monitor
rw	Storage admin, Support admin, Monitor
storage	Storage admin, Support admin, Monitor
security	Security admin, Monitor
support	Support admin, Monitor
monitor	Monitor
ro	Monitor

Total rows: 7 ↺

Lenovo

ThinkSystem SAN Manager functions

Manage

Operations

Certificate
Management

Access
Management

Support

The Support page shows the technical support options, resources, and contacts.

SUPPORT

Access support and training resources to help you manage your storage array

Lenovo Product Support ☑
Lenovo Data Center Support.

Safety information, warranties and licenses, product documentation ☑
Related DE Series publications and links by Machine Type.

Warranty information ☑
Search your entitlements for type, duration and status.

Support telephone list ☑
Provides access to worldwide support phone list.

Safety information, licenses, and product documentation ☑
Contains product overviews and full product technical information.

Lenovo Community ☑
Navigate the Lenovo Community to ask questions and get feedback from other users about all DE series products.

Related Software Downloads ☑
Find downloads for related software products.

Lenovo

Storage Manager overview

For the 11.50.x version, Lenovo Storage Manager is a host-installed GUI-based application required to support the System Manager Secure CLI interface (SMcli), multi-path drivers, and multi-system firmware upgrades. Storage Manager supports both Windows or Linux host environments.

Storage Manager is needed along with SAN Manager to fully manage multiple storage arrays. Some of the Storage Manager functions – for example, firmware upgrade – are not integrated into the SAN Manager.

After the 11.6.2 release, Storage Manager only supports the following functions:

- SMAgent: Storage Manager Agent Package
    - SMAgent contains the software that provides a connection from the host's Ethernet port through the Fibre Channel I/O path to one or more Storage arrays.
- SMUtil: Storage Manager Utilities Package
    - SMUtil contains utilities used to locate and register newly added volumes with the host's operating system.
- Smruntime: Storage Manager Runtime Package
    - Smruntime contains the core runtime environment shared by other Storage Manager packages

Lenovo

ThinkSystem DE plugin for vCenter overview

The DE plugin for vCenter provides integrated management of DE Series storage arrays with a vSphere Client. Most of the options in the DE plugin for vCenter GUI are similar to those in the ThinkSystem SAN manager.

The plugin requires VMware vCenter Server Appliance to be deployed in the VMware environment and an application host to install and run the plugin web server.
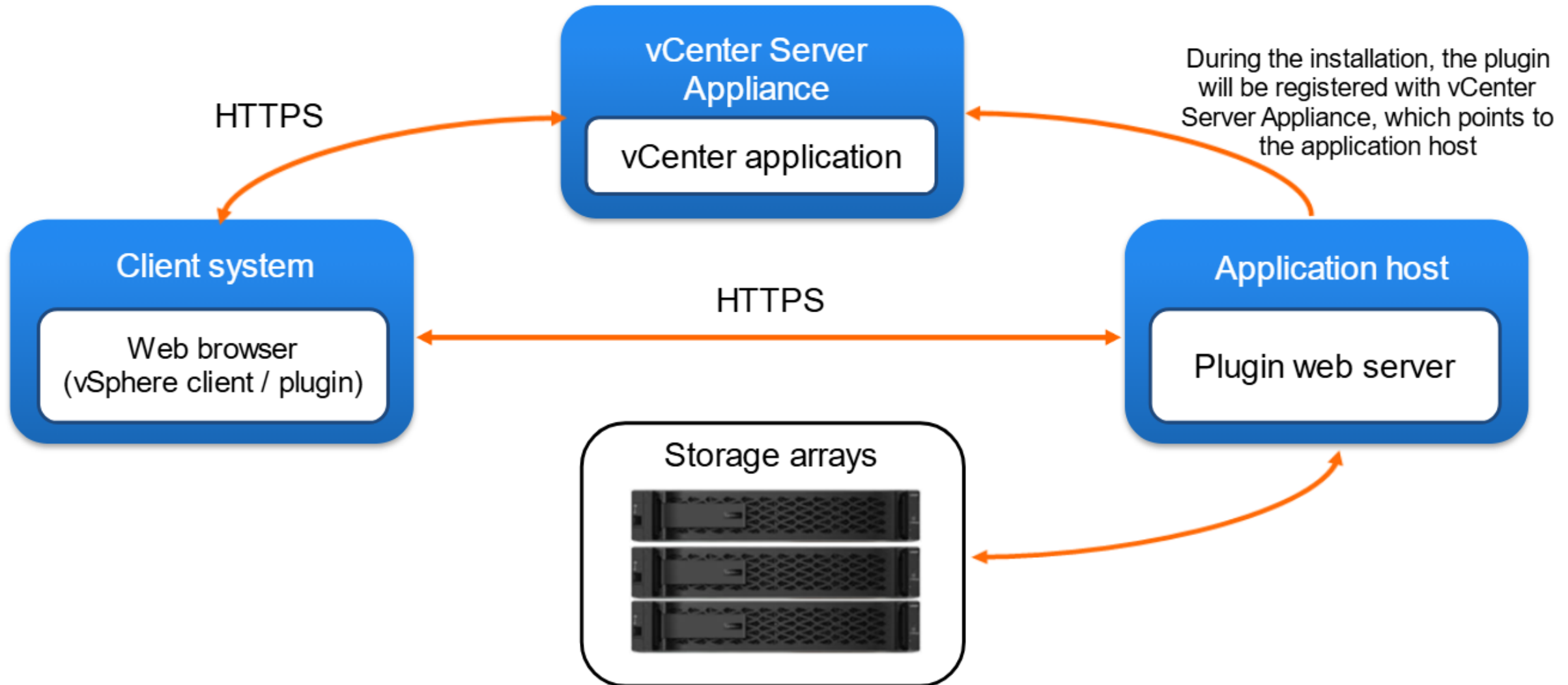
To install the DE plugin for vCenter, be sure that systems meet the following requirements:
- VMware vCenter Server Appliance supported versions: 6.7u3 or 7.0u1
- Controller firmware for Lenovo storage arrays: 11.60.2 or later
- Supported application host versions: Windows 2016 or Windows 2019
- Supported host protocols: iSCSI or FC

For more information about the DE plugin for vCenter, refer to the following documentation:
- ThinkSystem DE Plugin for vCenter: Installation and Configuration guide on Lenovo Support
- ThinkSystem DE Plugin online help on ThinkSystem Storage Documentation

Lenovo

ThinkSystem DE plugin for vCenter communications

vCenter Server
Appliance

vCenter application

HTTPS

During the installation, the plugin
will be registered with vCenter
Server Appliance, which points to
the application host

Client system

Web browser
(vSphere client / plugin)

HTTPS

Application host

Plugin web server

Storage arrays

ThinkSystem DE plugin for vCenter GUI

When the DE plugin for vCenter has been installed, users can open vSphere Client and go to **Menu → Lenovo ThinkSystem DE Series Plugin** to manage DE Series storage arrays. Click the buttons on the left to see more information about the DE plugin for vCenter functions.

Manage

Certificate Management
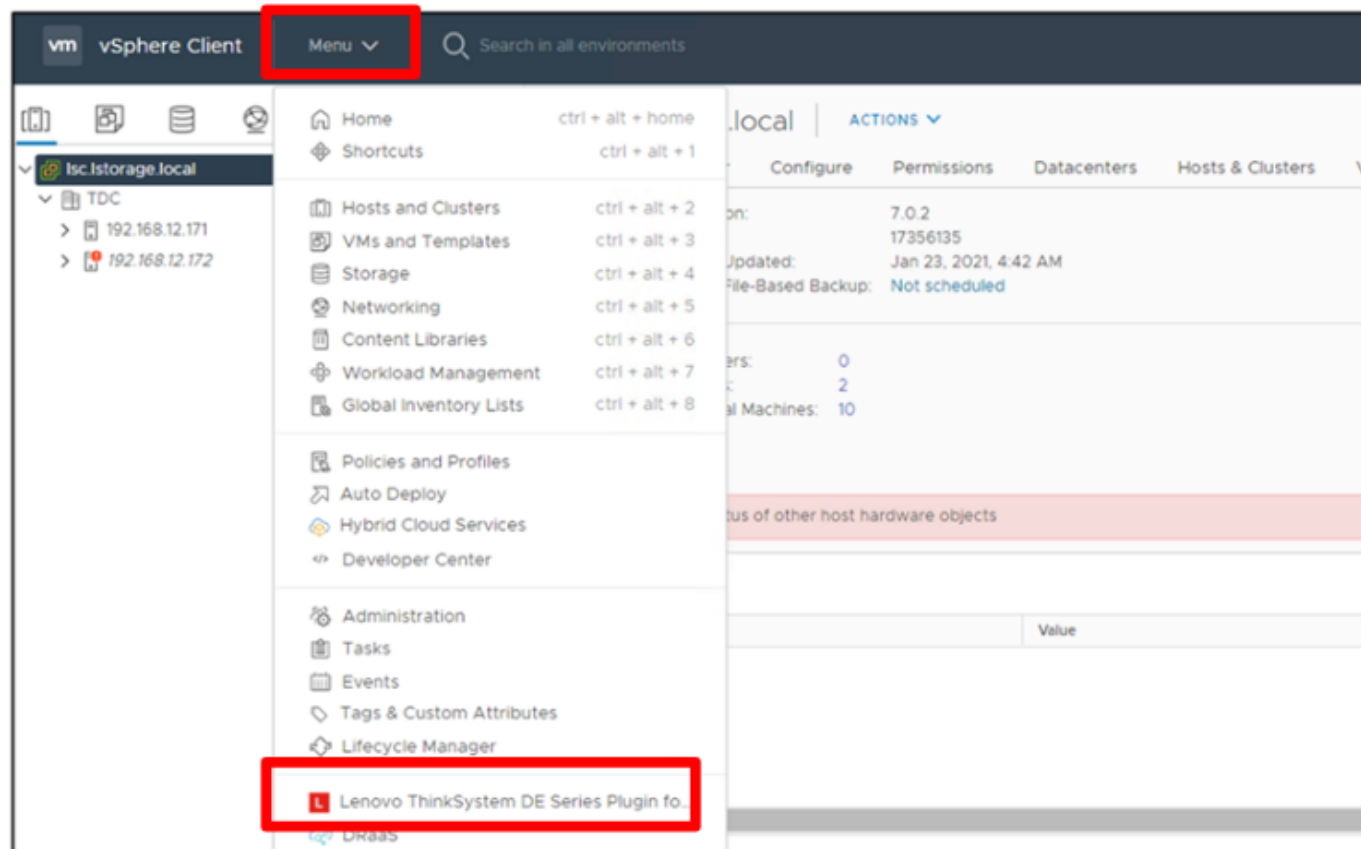
Operations

Support

ThinkSystem DE plugin for vCenter GUI

Use the **Manage** page to discover storage arrays in the network, launch TSM for an array, import settings from one array to multiple arrays, and manage array groups. Select the check boxes next to array names to perform operations on them, such as importing settings and creating array groups.

Manage

Certificate Management

Operations

Support

ThinkSystem DE Plugin for vCenter | Help ▾

Manage	▾
All	1
Certificate Management	
Operations	
Support	

MANAGE - All

Filter | ❓

| Add/Discover | Launch | Actions ▾ | Manage Groups ▾ | Upgrade Center ▾ | Provisioning ▾ | | Uncommon Tasks ▾ |

Manage Volumes
Configure Hosts
Configure Pools and Volume Groups
View Operations in Progress

☑ Storage Array	Status	Model Nam	IP Addresses	
☑ DE2K_D	⊗ Needs Attention	DE4000	2 configured addresses	⋯

Selected rows: 1 of 1   ▥ ↻

Lenovo

ThinkSystem DE plugin for vCenter GUI

Use the **Certificate Management** page to manage certificates to authenticate between browsers and clients.

Manage

Certificate Management

Operations

Support

ThinkSystem DE plugin for vCenter GUI

Use the **Operations** page to monitor the progress of batch operations. This includes importing settings from one array to another.

Manage

Certificate Management

Operations

Support

ThinkSystem DE Plugin for vCenter

Manage	⌄
All	1
Certificate Management	
Operations	
Support	

OPERATIONS

Filter ❓

Refresh

No operations found.

Lenovo

ThinkSystem DE plugin for vCenter GUI

The **Support** page shows the technical support options, resources, and contacts.

Manage

Certificate Management

Operations

Support

ThinkSystem DE Plugin for vCenter   Help ▾

Manage   ▾

All   1

Certificate Management

Operations

Support

SUPPORT

Access support and training resources to help you manage your storage array

Lenovo Product Support ☑
Access Lenovo Data Center Support to find the latest troubleshooting tools, documentation, and downloads.

Publications ☑
Related DE Series publications and links by Machine Type.

Warranty information ☑
Search your entitlements for type, duration, and status.

Support telephone list ☑
Provides access to worldwide support phone list.

Safety information, licenses, and product documentation ☑
Contains helpful links to DE Series technical information, deployment guides, interoperability matrix, Open Source files, product registration, and license keys.

Lenovo Community ☑
Navigate the Lenovo Community to ask questions and get feedback from other users about all DE series products.

Related Software Downloads ☑
Click on the 'Support' tab to access documentation, Knowledge Base (KB) articles, firmware and software downloads for each DE model.

Technical Support
👤 Lenovo Product Support ☑
Other Contacts

XClarity Administrator

Users can access XClarity Administrator (LXCA) to manage DE Series storage and other ThinkSystem server products at the same time. Users can also use the Inventory page to monitor DE storage status.
The following DE storage features are not supported in LXCA:
- Centralized user management
- Server certificates and Encapsulation
- Configuration Patterns
- Operating-system deployment
- Firmware and software updates
- Remote control
- Graphical view of hardware

Reference

For the latest DE series software documentations, go to Lenovo Storage Documentation
website: https://datacentersupport.lenovo.com/tw/en/storagepubs/