Olnfortrend[®]

User Manual

SANWatch Web-Based Interface

Version 6.7 (November 2018)



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About This Manual

This manual describes how to access and use the browser-based interface version of SANWatch software suite for EonStor, EonStor DS, ESVA, and EonServ series. For the following subjects, consult other resources for more information: Desktop software application version of SANWatch: Consult the SANWatch manual version 4.x or earlier. \geq Components that are not user-serviceable: Contact our support sites. Hardware operation: Consult the Hardware Manual in the CD-ROM. Version 5.0 Initial release for the browser-based interface version of SANWatch. Version 5.1 Updated contact information Version 5.2 Added Data Replication Added Storage Tiering Version 5.3 Updated descriptions to match GUI Version 5.4 Added SANWatch installation Version 5.5 Incorporated and updated ESVA user manual contents Rearranged chapter order Added new features: SED Security, Storage Tiering enhancement, Host Channel Group enhancement, etc Version 5.6 Added new feature: SSD Cache Pool Added firmware update Added miscellaneous notes and warning information Version 5.7 Removed Load Balancing related information Added reserved IP information Added description for converged host board Added notes regarding EonServ models Version 5.8 Removed Installing EonPath (Multipathing) Driver Added Working with Multipath Added Eonpath limitation – only for Windows server 2003 & before



Version 5.9	 Added compatibility notice of disk roaming and remote duplication. Updated language, system tab, UI, etc.
Version 6.0	 Updated link to Oracle SQL utility Updated links to Link Activation and Provisioning and reserved space
Version 6.1	 Added InfiniBand channel configurations Updated the installation folder name in the installation CD
Version 6.2	 Updated the section <u>Exporting System Settings</u> Add the section <u>Creating a Logical Volume with RAID Level 30/50/60</u> Correct that Thin Provisioning is available with standard license (no need for advanced license)
Version 6.3	Updated license related procedures
Version 6.4	Update <u>Data Replication</u>
Version 6.5	Updated Logical Volume
Version 6.6	Updated <u>Appendix</u>
Version 6.7	Updated <u>Summary of System Configurations</u> ; <u>Adding a Host</u> ; <u>Data</u> Replication; Configuring Automatic Failover for Remote Replication



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Appendix



Introduction

E Device	Device Stat	tus		_	_	_	_	_	_	
Device List	Name •	•	🍤 Status 👻		System Perfo	rmance		Capacity	у	
È- DS 3024	<u> </u>	24RTEB	📀 ок		CPU: 0% Memory: 0%	Read: 0.00 Write: 0.00 I		Free: 0 MB Usage:	Total: 6.1:	3 TB
	Tasks									
		Add Device Add a devic	e ce using its IP address or h	ost name			<u>Remove D</u> Remove a	evice device from the I	list.	
	Q		<u>very</u> I devices that are connecte out-of-band connections.	d to this e	erver via	×		ip for New Device nd configure a n tup wizard.		this step-
	Ø	Edit Group Group devi	ces together to simplify dev	vice mana	gement.					

SANWatch Browser Interface is the proprietary software suite for the Infortrend storage systems. SANWatch can be accessed through a web browser as long as both the computer and the subsystems are online. You are no longer required to install complex desktop application to your local computer: everything is always available over the network.



Connecting SANWatch to Storage Subsystems

SANWatch, storage subsystems and the host computers can be connected in either in-band (connection through host links) or out-of-band (connection through LAN management port). Because SANWatch is web-based, you may access the GUI from anywhere on the network. The flexible connection schemes allow you to manage SANWatch according to your needs and system configurations, notably the following two factors:

- > Local management vs. Remote management
- > Full configuration vs. Monitoring & notification

Elements of a Storage Subsystem Network

Storage Subsystems	A storage subsystem refers to a hard drive array (RAID subsystems + JBODs).
Host Computer	The host computer refers to the computer to which the storage subsystem's host links are connected.
Remote Computer	The remote computer refers to a computer on the network to which the host computer is connected via LAN.
In-Band Connection	In-band connection refers to the host computer and the storage subsystems connected through host links: Fibre, SAS, or iSCSI host connectors on the storage subsystem controller module.
Out-of-Band Connection	Out-of-band connection refers to the host computer and the storage subsystems connected through Ethernet: Management LAN connector on the storage subsystem controller module.





Computer Requirements

Computer	Hardware					
Requirements	Broadband access					
	OS					
	Microsoft Windows XP, Vista, 7, 8 (32/ 64 bit), Windows Server 2003 R2, 2008 (32/ 64 bit)					
	Apple Mac OS X 10.5, 10.6 or later					
	Redhat Linux					
	Browser					
	Internet Explorer 7 or later					
	Firefox 3.5 or later					
	Google Chrome v15.0.874 or later					
Firewall	If you cannot access the browser-based interface in a Windows environment (such as Windows Server 2003), it is probably because the default network firewall setting of the OS is set to "High," forbidding users from entering the user interface as admin. Please change the network settings in the OS.					



Installation

This section lists the installation procedures for SANWatch and other software modules included in the CD-ROM. Refer to <u>the previous section</u> to determine which modules apply to your environment.

Installing Java

	SANWatch installation requires Java version 6 or later. When you install SANWatch on your computer (refer to the next section), the installation wizard or scripts that come with your SANWatch installation CD will help you install Java 6 along the way, but you can also install a newer version manually using the installation package downloaded from <u>http://java.com/download</u> . For users wanting to install Java 6 provided by SANWatch Installation CD, you can jump to the next section directly.
For Windows	You can install the JAVA installation package downloaded from <u>http://java.com/download</u> .
For Mac OS X	Before installing Java on a Mac, make sure the root user is enabled. For instructions on how to enable the root user, visit <u>Apple Support</u> . Manual installation of Java varies depending on the OS version. For OS X Snow Leopard 10.6 or earlier, you can install Java using Software Update (at the Apple icon > Software Update); For OS X 10.7 Lion or later, you can install it using the installation package downloaded from <u>http://java.com/download</u> .
For Linux	Here is a brief instruction on how to download and install Java for Linux, and then enable it in Firefox. For more options and details, visit <u>here</u> . Download <u>Java self extracting binary file for Linux</u> . Change the file permission to be executable. chmod a+x jre- <version>-linux-i586.bin Select the installation directory. cd <directory name="" path=""></directory></version>

Run the self-extracting file.



./jre-<version>-linux-i586.bin

Verify the jre<version> sub-directory under the current directory.

Go to the plugins sub-directory in Firefox.

cd <Firefox installation directory>/plugins

Create a symbolic link.

ln -s <Java installation
directory>/plugin/i386/ns7/libjavaplugin_oji.so

Start Firefox, and run this applet to verify Java installation.

 For Solaris
 Here is a brief instruction on how to download and install Java 6 self-extracting binary file for 32-bit Solaris, and then enable it in Firefox. For more options and details, see: installation package overview, JRE installation procedures, JRE plug-in installation procedures for Firefox.

Download Java self extracting binary file for Solaris.

Change the file permission to be executable.

```
<SPARC processors> chmod +x jre-<version> <update>
-solaris-sparc.sh
<x86/x64/EM64T processors> chmod +x jre-<version> <update>
-solaris-i586.sh
```

Select the installation directory, and run the self-extracting file.

```
<SPARC processors> ./jre-6 <update> -solaris-sparc.sh
<x86/x64/EM64T processors> ./jre-6 <update> -solaris-i586.sh
```

Verify the jre1.6.0_<version> sub-directory under the current directory.

Remove the symbolic links to libjavaplugin-oji.so and libnpjp2.so from the Firefox plugins directory.

Create a symbolic link to the Java Plugin in the Firefox plugins directory.

ln -s <JRE>/lib/sparc/libnpjp2.so



Start the Firefox browser.

Type about :plugins in the browser's Location bar to verify Java Plugin installation.

Initiating SANWatch Installation

Initially, ways and tools to launch SANWatch installation vary depending on the operating system (OS) you are using, but they are basically helping you install Java 6 (optionally) and launch the SANWatch Installation Wizard.

If you choose NOT to install the Java provided by the installation CD, make sure you already have Java 6 or later installed on your computer. Refer to the previous section for details.

For Windows

From the installation CD, open SANWatch.exe, and from the navigation menu that appears, choose SANWatch GUI Software Installation, and then select Windows Platform under SANWatch Management Tool. Proceed to the next section.



- Solaris Platform (run unix.sh)

For MacFrom the installation CD, locate the "SANWatch" folder and open "install.app."Proceed to the next section.

For Linux andNote: If you want to install the data host only instead of the GUI-based SANWatch.SolarisSkip to the next section directly.

Locate the "SANWatch" folder on the installation CD and copy it to your computer.

Open the command line utility of your OS (such as Terminal for Linux), and log into the command line shell as root.

For Linux users, locate the "SANWatch" folder copied to your computer, and then browse its contents to make sure the "linux.sh" script is in the folder. If you are using Solaris, make sure "unix.sh" is in the folder.

[root@localhost ~]# cd <computer_path>/SANWatch/ [root@localhost <computer_path>/SANWatch]# ls -l ... -rw-r--r-. 1 root root 4279 Jun 23 19:55 linux.sh

```
-rw-r--r-. 1 root root 2037 Jun 23 19:55 unix.sh
```

If you are using Linux, make "linux.sh" executable, and then execute it.

```
[root@localhost <computer_path>/SANWatch]# chmod +x linux.sh
[root@localhost <computer_path>/SANWatch]# ./linux.sh
```

If you are using Solaris, do the same to "unix.sh."

```
[root@localhost <computer_path>/SANWatch]# chmod +x unix.sh
[root@localhost <computer_path>/SANWatch]# ./unix.sh
```

The first two sections of the script will take you through Java installation. If you already have Java 6 or later installed on your computer, you can skip Java installation by typing "no" and pressing Enter. Otherwise, keep typing "yes" (shown below) and pressing Enter until Java is installed on your computer.

```
Java-based GUI RAID Manager Installation Procedure
 SECTION I : JRE <version> Installation
. . .
Would you like to install JRE <version> now?
Please type yes or no.
yes
. . .
Done.
. . .
Install JRE v1.6.0_25 finished!
_____
SECTION II : Java Plug-in v1.2.2 Installation
. . .
Would you like to install Java Plug-in v1.2.2 now?
Please type yes or no.
yes
. . .
       Java(TM) Plug-in 1.2.2 Pre-Release
        Binary Code Evaluation License
. . .
Do you agree to the above license terms?
```

```
If you do not agree to the terms, installation cannot proceed
Please type yes or no.
yes
```

The final section of the script will ask you whether you want to install SANWatch. Just type "yes" and press Enter to proceed to the next section.

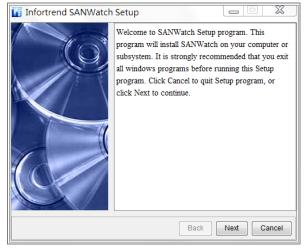
```
SECTION III : Java-based GUI RAID Manager Installation
*NOTE: To install and configure Java-based GUI RAID Manager
successfully,
We highly recommend you refer to INSTALLATION GUIDE first.
Would you like to install Java-based GUI RAID Manager now?
Please type yes or no.
yes
```

Installing SANWatch

This section introduces how to install the whole GUI-based SANWatch on various OS platforms.

For the Linux platform, you can also install the data host agent only to save reserve system resources.

Installing GUI-based SANWatch 1. After installation is initiated, you will be guided to the Infortrend SANWatch Setup wizard. Click Next to continue.



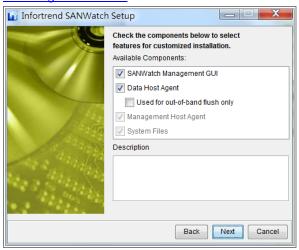
2. The installation program asks for Full or Custom installation. You can also select the installation folder here.

Choose Full installation if you intend to <u>manage SANWatch directly from</u> <u>the host computer</u>. Then skip to Step 4.

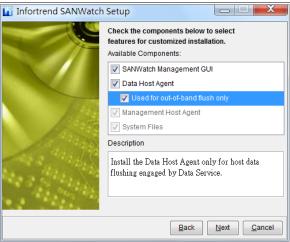


Infortrend SANWatc	h Setup
	Click the type of Setup you prefer, then click Next
	Install SANWatch software, including its Management Host Agent, Data Host Agent, and related files. Recommended for most users. © Custom
	You may choose the options you want to install. Recommended for advanced users. Destination Folder C:\Program Files\Infortrend Inc\SAN Browse
	Back Next Cancel

3. Otherwise, choose Custom installation, and in the component list corner, select the module(s) you need <u>based on the computer on which you are</u> installing SANWatch.



If you are using DB Flush Agent for <u>taking snapshot images with database</u> <u>applications</u>, select Data Host Agent and/or <u>Out-of-Band Flush Only.</u> Click Next to continue.



4. Select if you want to install SANWatch in <u>a single host computer or</u>

redundant host computers. For the redundancy mode, specify the IP addresses of the master and slave host computers. If you choose to manage your RAID subsystem network using dual computers, it is strongly recommended you install and log in to SANWatch on the master host first, and make sure it's online before installing SANWatch on the slave-host.

Infortrend SANWatch	n Setup	
$\bigcap (o)$	Select Single or R Centralized Manage Single	edundancy Mode of gement
	Redundancy:	Master Host
	Master-host IP:	172.28.10.83
	Slave-host IP:	Please input slave-host IP here.
	Redundancy:	Slave Host
	Master-host IP:	Please input master-host IP here.
	Slave-host IP:	172.28.10.83
		Back Next Cancel

When the installation has completed, restart the computer.

Information
Please restart the computer to make sure settings and services take effect correctly.
ОК

- Installing data host 1. Extract the SANWatch installation package using the following command: unzip SANWatch_[x.0.x.xx].zip
 - 2. Navigate to the SANWatch directory: cd SANWatch-[x.0.x.xx]
 - 3. Change the access permission of the executable file: chmod 755 linuxCmd.sh
 - 4. Run linuxCmd.sh: ./linuxCmd.sh

agent only (Linux

command line)

5. Type yes when you are prompted with the question "Would you like to install Java-based RAID Manager now?"

Java-based GUI RAID Manager Installation Procedure

SECTION I : JRE v1.6.0_25 Installation
*NOTE: 1.Before you can run Java-based program successfully, you should have
installed JRE(Java Runtime Enviroment).
2.JRE v1.6.0_25 will be installed on /usr/local/jre1.6.0_25 .
Would you like to install JRE v1.6.0_25 now?
Please type yes or no.
yes

6. When you are asked whether to install all agents or selected agents only, use the "-s /usr/local dataHost" command to install the data host

agent: Install JRE v1.6.0_25 finished! SECTION II : Java-based RAID Manager Installing by GUI or Command *NOTE: Selecting which installing method you preferred, GUI or command line. Would you like to install Java-based RAID Manager now? Please type yes or no. yes ------- Install Command Information ------Installing all agents => command format: -a (install direction) Example: -a /usr/local Installing selected agents => command format: -s (install direction) hostType Example: -s /usr/local dataHost managementHost(one of the agents or both) -s /usr/local dataHost

The data host agent is now installed successfully. It will be activated automatically during system startup, saving you the trouble of having to manually start the service.

Installing VSS Module (for Windows)

I nad Balance

VSS (Microsoft VisualSourceSafe) is a package for creating virtual libraries of computer files, including those in databases, in a Windows environment. You need VSS if you intend to take snapshot images while using database applications (Oracle, SQL, MS Exchange).

 Installation procedures
 Activate SANWatch.exe and click VSS in the SANWatch installation corner or enter the VSS directory in the SANWatch CD-ROM.

 SANWatch[®] GUI Software Installation

 • SANWatch[®] Management Tool

 • Windows Platform (run linux.sh)

 • Solaris Platform (run unix.sh)

 • Solaris Platform (run unix.sh)

 • Windows Platform

 • Windows Platform

Select the suitable installation file and execute it.

File	os	Bit
VSS-v1.0.1.23_x86	Windows Server	32-bit
VSS-v1.0.1.23_x64	Windows Server	64-bit

The Setup Wizard will appear. Follow the instructions to complete the installation.



Reboot the computer when the installation is complete.

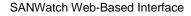
Uninstalling/Upgrading SANWatch

Uninstalling
SANWatchUninstall SANWatch just as you would with any other applications. For example
in Windows, go to Start > All Programs > Infortrend Inc > Uninstall SANWatch.Upgrading
SANWatchIn order to upgrade SANWatch into a new version, you need to uninstall the
current version and then install the new version. Visit the Support site for the
latest version of SANWatch.

SANWatch Interface

System Settings Language	About		🚰 Rep	olication Manager	Help	🕝 Data Reload
Device	Device Status			_		
Device List	oup Name -	🎲 Status 👻	🛃 System Perfe	ormance	Capacity	
B S024 Gical Volumes SD cache pool Prives Channels Data Hosts Schedules	DS 3024RTE	в 💽 ок	CPU: 0% Memory: 0%	Read: 0.00 MB/s Write: 0.00 MB/s	Tiee. 0 MD	Total: 6.13 TB
	Add a	Device device using its IP address or Discovery ver all devices that are connec to out-of-band connections. iroup devices together to simplify de	ted to this server via		move Device move a device from the li nick. Setup for New Device scover and configure a ne step setup wizard.	

This chapter describes how to navigate the SANWatch Home interface and use the functions available from there. You can learn about basic GUI elements, how to find online help tools, adding and configuring hardware devices (RAID subsystems or JBODs), configuring data replication (volume mirror and volume copy) and automatic event notification.



Navigating the User Interface

Logging into the User Interface

Log In

Logging into the SANWatch Browser Interface is easy and straightforward: type in the IP address of the host computer into the browser.

Enter the IP address of the host computer into the browser and press the Enter key.

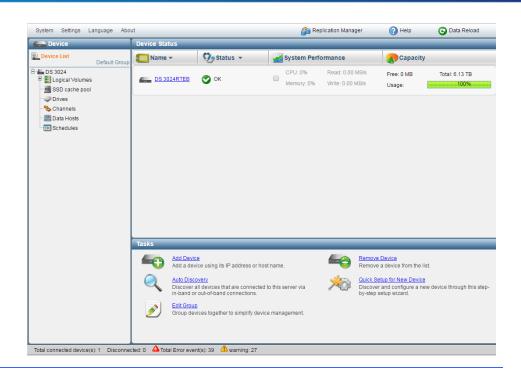


The login screen will appear. Enter the password (the default password is **root**) and click Login. (You may check Remember Password if you prefer automatically logging into the interface in the future)

li	P Address	
	172.24.110.38	
P	assword	
	••••	
5	Remember Password SSL Login	Login

The user interface will appear.





Log Off Select the System > Log Off menu. The user interface will return to the Log In screen.

System Settings Language	
Export System Information	O Infortrend
Shutdown Device	IP Address
Test Event	172.24.110.38
Enable Debug Log	Password
Disable Debug Log	••••
Logout	Remember Password
Logout	SSL Login

Changing Login Passwords

You can modify the default SANWatch login password, or set a new password for storage subsystems.

Go to	SANWatch Home > Top menu bar > Settings > Password Settings
	System Settings Language About
	Dev Notification Settings
	Password Settings

ChangingSelect the Management Host tab, click Change Password, and enter theSANWatch Loginexisting password and new password (twice for confirmation). The default login

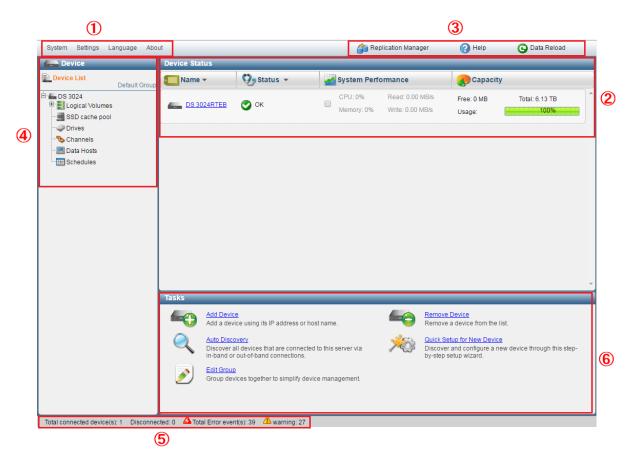


Currently Connected Management Host IP Address: 127.0.0.1 Change Password ssword for the subsystem, you need to er ccess or configure the hardware setting for tab to view the list of subsystems and their		Password Settings			
IP Address: 127.0.0.1 Change Password Second		Management Host Subsystem			
Change Password			Currently Connecte	d Management Ho	st
ssword for the subsystem, you need to er ccess or configure the hardware setting for tab to view the list of subsystems and thei IP Address Type Saved Pa 127.0.0.1 In-Band			IP Address	s: 127.0.0.1	
ccess or configure the hardware setting for tab to view the list of subsystems and their IP Address Type Saved Pa 127.0.0.1 In-Band			Change	Password	
ccess or configure the hardware setting for tab to view the list of subsystems and their IP Address Type Saved Pa 127.0.0.1 In-Band		Old Password:			
ccess or configure the hardware setting for tab to view the list of subsystems and their IP Address Type Saved Pa 127.0.0.1 In-Band		New Password:			
127.0.0.1 In-Band	Password to a Subsystem	subsystem. Select the Subsystem tab t			_
127.0.0.1 In-Band					
		Model Name	IP Address	Туре	Saved Password
127.0.0.1 In-Band		DS 3016R / ESDS 3016R	127.0.0.1	In-Band	
		DS 3016G / Target	127.0.0.1	In-Band	
					Edit Password
ubsystem from the		Management Host Subsystem Available Subsystems/Agents Model Name DS 3016R / ESDS 3016R	IP Address 127.0.0.1		Type In-Band
	Highligh button.	nt the storage subsy	/stem from the lis	t and click th	e Edit Password
		Highlight the storage subsy button.	/stem from the lis	t and click th	e Edit Password
d.		button.	/stem from the lis	t and click th	e Edit Password
		button.	vstem from the lis	t and click th	e Edit Password
		button. Edit Password Enter the new password.	ystem from the lis	t and click th	e Edit Password

🛻 Device
🚬 Device List
Channels

Enter Subsystem Password	d	×
Please enter the password to e	enable configuration of this device.	
Subsystem Password:	••••	
	ОК	Cancel

Getting to Know the User Interface



Display Element Description

 1: Top menu bar
 The menu items at the top left allow you to export system settings, log off /

 (Left)
 shutdown the subsystem (NOT supported by EonServ), configure notifications and passwords, change the display language, and view the SANWatch version information.



2: Main window	The current status and the configurations of the item chosen in the left sidebar will appear in this area.
3: Top menu bar (Right)	You may access the Replication Manager for configuring and running data replications, Online Help (this help document), and refresh the screen contents.
4: Side Column	You may view the system configurations (Device sidebar) or the storage configurations (Pool sidebar) in a tree structure to have an overview of the overall system. Details of the chosen (highlighted) item will appear to the right in the main window area.
5: Status bar	Summary of current device configurations and system events are updated in the bottom status bar.
6: Shortcuts in the Tasks corner	Convenient shortcuts to major functionalities are available for the item that is currently highlighted in the sidebar / main window area.

Navigating the Interface

	Although SANWatch is a browser-based software, most operations are designed as intuitive, desktop-like features.
Selecting an Item	You may click an item if the mouse cursor shape turns into a pointing device. The text color may also change as shown in this example. (Example: Pool List > Pool 1)

Depending on selection, a drop down list may appear by hovering the mouse cursor over the menu. (Example: Language menu)

	Language About	
	Pool	Language About
		English
		Deutsch
	(B)	Français
		Русский
Changing the Sequence	a list.	con next to a column header reverses the order of vice Status
Closing a Pop-up Window	Click the <i>Close / Cancel</i> buttor or click the is icon at the top	right to close a pop-up window.
Refreshing the Screen	Click the <i>Data Reload</i> menu at be updated to the latest status PHelp Otta Reload	t the top right bar. The user interface contents will
Event Notices	A sign may appear on the devi requires the user's attention.	ce icon (x or \land)when there are events that



Using Help Tools

Changing the Display Language

Switch the display language from the default English to your preferred language in an instant.



Steps

Select the desire language from the drop-down menu to change the interface displayed language. (Example: from English to German)



Available Languages	A A A A A	English (default) German French Japanese Simplified Chinese Traditional Chinese Korean
Notes		Some texts might not be translated (for example, texts that are embedded in a diagram or the official license agreement). In those cases, the texts will remain English, the default language. In case you have accidentally changed the language (and thus lost sight of the "Language" menu), the Language menu tab is the third tab from the right (or second from the left) on the menu bar.



Viewing the SANWatch Version Information

View the current version number of SANWatch and/or the end user license agreement.

Go To	SANWatch Home > Top menu bar > About System Settings Language About
Steps	<text></text>
Viewing the License Agreement	Click the <i>License Agreement Details</i> link in the window to view the end user license agreement contents. SANWatch is Infortrend's storage management software that enables users to discover, configure, administer, and monitor storage solutions with the help of a user-friendly graphic interface. License Agreement Details For legal considerations, the license agreement is not necessarily translated into non-English languages.
Accessing Infortrend Website	Clicking the <i>Infortrend Technology, Inc.</i> link takes you to the <u>official website</u> of Infortrend. Copyright © 2013 Infortrend Technology, Inc. All rights reserved.



Viewing Online Help

View the help contents (this document) when you need descriptions/instructions for complicated or unfamiliar features.

Go To	SANWatch Home > Top menu bar > Help
	😭 Replication Manager 🕜 Help 🕓 Data Reload
Steps	The Online Help will appear in a separate screen in a new tab or a pop-up window. The contents are organized in the same manner as the PDF version of the help document.



Working with the Devices View

system Settings Language A	bout		😭 Rej	plication Manager	Help	🕒 Data Reload
Device	Device Status					
Device List Default Gro	up Name -	💔 Status 👻	🛃 System Perf	ormance	Capacity	
DS 3024 E Logical Volumes SSD cache pool	DS 3024RTEE	ок 📀 ок	CPU: 0% Memory: 0%	Read: 0.00 MB/s Write: 0.00 MB/s	Free: 0 MB Usage:	Total: 6.13 TB 100%
Channels Channels Data Hosts Schedules						
	Tasks Add ad	device using its IP address or h	nost name.	Rem	ove Device ove a device from the lis	t.
	Auto D	iscovery				

This chapter describes how to monitor and configure the hardware: RAID subsystems, JBOD expansion enclosures, hard drives, and so on.

Viewing the List of Hardware and the Status

All hardware information can be accessed from the Device Sidebar in the user interface.



Channels Data Hosts

Steps

Go To

When you click the *Device* tab in the left sidebar, the list of hardware recognized by the system will appear.





The hardware status summary will appear to the right, in the main screen.

Device Status				
🔲 Name 🗸	🤥 Status 👻	System Performance		
D0 2046D			CPU: 1%	Read: 0.00 MB/s
DS 3016R	💟 ок	✓	Memory: 0%	Write: 0.00 MB/s

System Performance

To enable monitoring system performance, check the System Performance checkbox.

System Performance					
L.	CPU: 0%	Read: 0.00 MB/s			
V	Memory: 0%	Write: 0.00 MB/s			

Because the monitoring function affects system performance and it is therefore disabled by default.

System Status

The system status column shows the status of each hardware device.

Device Status				
Name 🗸	🤥 Status 👻			
Master	💽 ок			

If system events have been reported, you may click the Recent Event link to view all the events related to that hardware device.

Slave		- <u>-</u>	Failure Recent event: <u>A</u> 2,	
Event Log				
Event Log	Schedule Ev	/ent Log		
		1		
Error and	Warning •	All Types	s 🔻	
Error and Index 👻	Warning ▼ Severity ▼	All Types	s ▼ Date/Time ▼	Events 👻
-		1		
Index 👻	Severity 👻	Type 👻	Date/Time 👻	Events CHANNEL:1 Host channel disconnected (slot B) CHANNEL:0 Host channel disconnected (slot B)



To refresh the status (in case you want to make sure that the hardware status has been updated), click Data Reload on the top menu bar.

😭 Replication Manager 🛛 🌔	? Help	🕒 Data Reload
---------------------------	--------	---------------

Adding a New Device (RAID Subsystem or JBOD Expansion Enclosure)

To start configuring your RAID subsystem or JBOD expansion enclosure through the SANWatch Browser Interface, all you have to do is to connect the device to the network and then use the one-touch device discovery functionalities introduced here.

Prerequisites Before adding a subsystem/JBOD to the user interface, make sure that the subsystem has already been connected to the network and a valid IP address has been assigned to it.

> If you are using Internet Explorer, go to Tools > Internet Options > Security, and then do the following before adding a new device:

- Click Sites and add 127.0.0.1 to the list of trusted websites.
- Click Custom Level and enable Active Scripting under Scripting.

Go To SANWatch Home > Device sidebar > Device List > Tasks corner



Steps You can add (discover) a device in two ways: specify a known IP address or search a range of IP addresses.

Specifying an IP Address

Click Add Device in the Tasks pane.



Enter the IP address of the device.

Device IP Address	10.0.0.222	
Assign Group	Default Group 💌	Create Group

By default, the device will be added to a device group called Default Group. You can assign the device to a different group or even create a new group. (To learn



Assign Group	Default Group	-	Create Group
	Default Group		

The device will be added to the host computer. Click Cancel to stop the process.

rogress			
Connecting to the device/host .	•		
	10%	completed)

F

The new device will appear in the sidebar when done.

Searching for a range of IP addresses

You may use the Auto Discovery function to search for your device if you do not know its specific IP address but its subnet range. (You may also use this function to search multiple devices within a range of IP addresses)



Enter the range of IP addresses.

IP Address Range from	172.27.120.1	to 172.27.120.254
Assign Group	Default Group	Create Group

By default, the device, if found, will be added to a device group called Default Group. You can assign the device to a different group or even create a new group. (To learn more about device groups, see the next section in this help document.)

Click Start. The new device will appear in the sidebar when done.

Removing a Device (RAID Subsystem or JBOD Expansion Enclosure)

You may remove a device from your system easily. User data and device configurations will not be affected; the device will be simply deregistered from your system.



Steps

Click Remove Device.





Check the device you wish to remove.

Re	move Device
	Specify specific device(s)
	Device Name
	🔽 Master
	🗖 Slave

Click on "Remove" at the bottom to remove the device.



Editing Groups and Group Assignments

You can organize the list of devices into groups to easily manage complicated network with clusters of devices, especially when there are multiple instances of same models.

Notes

- All devices must be assigned to a group. (By default, they are assigned to a group called Default Group.)
 - > A device cannot be assigned to multiple groups.
 - List of groups are directly visible in the sidebar.



Creating a Group

Go to SANWatch Home > Sidebar > Device List > Tasks corner.



Click Edit Group.





Group devices together to simplify device management.

Check the box next to the device you wish to add to the new group and click on "Create Group" at the bottom.

Create Group

Enter the group name and click OK.

Group Name		
------------	--	--

The new group will appear in the list.

Edit Group	
Default Group	
🗖 Master	
🗖 Slave	
New Group 2	

Renaming a Group

Go to SANWatch Home > Sidebar > Device List > Tasks corner.



Click Edit Group.

Group devices together to simplify device management.

Click to highlight the group that you want to rename and click Rename Group.

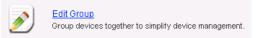
You are not allowed to rename Default Group.
New Group 2
Click Rename Group.
Rename Group
Enter the new name and click OK.
Group Name
The new group name will appear in the list.

Edit Group	
Default Group	
🗖 Master	
🗖 Slave	
New Group	

Reassigning a Device to another Group Go to SANWatch Home > Sidebar > Device List > Tasks corner.



Click the Edit Group icon.



Check the device that you want to reassign to a different group.

Edit Group	
Default Group	
🗖 Master	
🔽 Slave	
New Group	

Click on "Move Device".

Group Name

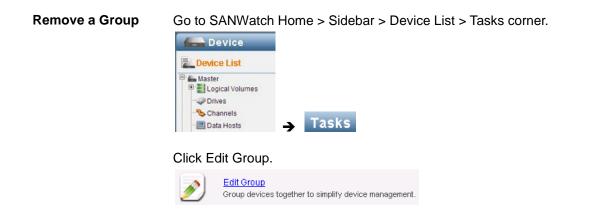
Create Group	Rename Group	Move Device	Close

Select a group in the drop-down list.

default 💌	
default	ĺ
New Group 2	

Click "OK" and the device will be assigned to a different group.







Click the name of the group you want to remove, click Delete Group, and click Yes in the confirmation message that appears.

Delete Group

All devices assigned to the group will be moved to the Default Group.

Exporting System Settings

Go to

SANWatch Home > Top menu bar > System > Export System Information



Steps

The list of connected devices (RAID subsystem or JBOD) will appear. Check the device(s) whose system information you wish to export. Then click the button **With core dump** if you wish to export the system information with memory core dump. Click the button **W/o core dump** if you only want to export system information without memory core dump.

🗖 Device Name			
🔽 Master			
✓ Slave	With core dump	W/o core dump	Cancel

The system information will be archived in a package of Zip file, including text (.txt) and Microsoft Excel (.xlsx) format files) and downloaded to a folder on your computer.

Export event log The exported data includes log files for all events, actions and unhandled events in text and Excel formats. The user can make use of the functions such as "filter," "sort" and "search" provided by Microsoft Excel on the event log data.

Unhandled event(s): Because the latest exported event will be marked, when exporting unhandled events, the exporting event will begin from the first un-exported event.

The filename of all events and action logs in Excel format should be "*ctrlID*_SupportEvent.xlsx."

The filename of unhandled events in Excel format should be "*ctrllD*_Unhandled_SupportEvent.xlsx."

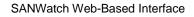
The event log file contains the following columns:



Device: Device name

•

	Index: The order of event occurrences
	• Severity: Severity is categorized into the following four levels.
	(1) Information: There is no subsystem issue. Users do not have to
	be informed of the operation result.
	(2) Warning: Some issues occurred and users have to be informed.
	However, the system has no malfunction risk.
	(3) Error: An error occurred and the system is still operational.
	However, the system has a malfunction risk if another error
	occurs.
	(4) Critical: System failure occurred and resulted in serious
	malfunction.
	• Date/Time : The date and time of the event occurrence
	• Code : Event code for looking up entries in the event service guideline
	 Event: This is the exported message. In the text file, this is the message for general users. In the Excel file, this is the message for first line support personnel.
	Hyperlink: This is a hyperlink to content in
	"Event-Service_Guide_Table.docx" (the troubleshooting guide) related to
	the event provided to help users easily find information on how to handle the event.
Action log	User actions are also logged for audit purposes. The action log data is exported to the file " <i>ctrlID_</i> ActionLog.txt" and contains the following columns:
	Index: Serial number
	• Date/Time: The issue date and time of the user action
	• Operation : The type of the user action
	• Target : The target of the user action
	Code: Operation ID
	• Events: Descriptions of user actions
Export system configuration	The exported data includes system configuration information in the file "ctrIID_Conf.html," which presents the device and configuration in a tree structure. Each node can be collapsed or expanded. You can use the "find" function provided by the browser to search for keywords.
Export memory dump	When exporting system information, the user can choose whether to also export core dump files. Click the button With core dump or W/o core dump for the corresponding action. The memory dump will create 4 files (maximum). The maximum size of each file is 512 MB.



Troubleshooting guide	The exported data also includes a file "Event-Service_Guide_Table.docx" which is a troubleshooting guide containing all information about error events and handling procedures. Each event includes three entries:
	Basic Information: Event ID & severity.
	• Detail : Event message, root cause and all information about the problem.
	• Recovery procedure : Steps to take to resolve the problem.
Exported data size	The log records include:
limit	Internal events
	External events
	 Act logs (EI command for "set")
	The size limit of each file is 15MB.

Resetting/Shutting Down the System (NOT supported by EonServ)

Before resetting or upgrading the subsystem, make sure you finish all current tasks and export the system information if necessary. This feature is NOT supported by EonServ models.

Go to SANWatch Home > Top menu bar > System, and select Shutdown Device from the menu.



The list of connected devices (RAID or JBOD) will appear. Check the device you want to shut down and click OK.



vailable Device:	s —			Volumes in Use	
Name 🕶	Model 🕶	IP Address 🔻	JBOD 🕶		
🔽 Master		10.0.0.5	0		
🗖 Slave		10.0.0.18	0		

Currently used storage volumes will become unavailable for hosts and users after shutting down the device. (The user data inside the device will remain intact.)

Test Event

Go to	SANWatch Home > Top menu bar > System > Test Event
	System Settings Language
	Export System Information
	Shutdown Device
	Test Event
	Er Test Event Log

Steps The confirmation pop-up window will appear to ensure the action of testing being generated.



Go to: SANWatch Home > Top menu bar > Setting > Notification Settings

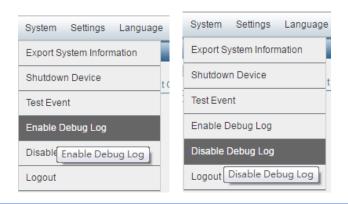
The function is used to check Notification Settings. Before testing this event, check Notification Setting correct or not. The function tab will test settings based on Notification Settings.



tification Settings				
eremail 🖉 Fax 🖨 SMS	🔏 MSN 📑 S	SNMP Broadcast	.og 🖉 Plugin	
Enable Email Notification				
– Email Settings –				
Severity:	Information	•		
Mail Subject:	RAID Event			
SMTP Server:				
SMTP Port:	25			
Security:	SSL	▼		
Account:	ABC			
Password:	•••••			
Sender Email:	abc@infortrend.c	om		
Erreil Deseiver Orthings				
 Email Receiver Settings 				
Receiver Name		Receiver Email Address		Severity
Email Receiver 1		abc@infortrend.com		Error
			Add	Edit Delete

Enable or Disable Debug Log

Go to SANWatch Home > Top menu bar > System > Enable Debug Log / Disable Debug Log



Steps Select from drop-down menu either to enable or disable recording debug logs. The confirmation pop-up window will appear to ensure the action of log recording enabled or disabled.



If enabled the logs recording, check Event logs from the list. Go to: Device > Tasks > Event Log.

Subsystem Infor	mation			
Detail Information	Model: IP Address: Service ID: Controller ID: Firmware Version:	DS 3024RTEB 172.24.110.36 524377 (0x80059) 524377 (0x80059) 5.55C.08	Status: Recent Events: A Error: 39 Warning: 2' View	
c	Throughput IOf Throughput IOf Control Throug	50 now(sec)	Used S	city: 6.13 TB pace: 6.13 TB (100%) le Space: 0 MB (0%)
hard drives	tep-by-step setup wizard to co nside the selected device. <u>iew</u> ailed information of enclosures		System Settings Configure generic system pa Event Log View the system events and	

Click on Event Log to check if debug logs appeared on the list or no debug event shown. If select debug logs disabled, the system will stop recording.

vent Log	Schedule Ev	ent Log			
All Events	•	All Types	5 T		
Index 👻	Severity 👻	Туре 🔺	Date/Time 🔺	Events 👻	Code 👻
2	0	985	2011/09/01 22:40:33	CHANNEL:6 Host channel disconnected (slot A)	0x11098101
3	0	ବୟ	2011/09/01 22:40:33	CHANNEL:7 Host channel disconnected (slot A)	0x11098101
1	0	ବନ୍ତ	2011/09/01 22:40:33	CHANNEL:5 Host channel disconnected (slot A)	0x11098101
4	0	a	2011/09/01 22:40:34	Controller initialization completed (slot A)	0x02018101
6	0	Ø	2011/09/01 22:40:39	NAME:Logical Volume 1 ID:474514A064B383D6 Status changed to online (slot A)	0x02130008
12	4	\$	2011/09/01 22:40:39	NAME:Logical Volume 1 ID:474514A064B383D6 Space allocation exceeded 2%, used:98% (slot A)	0x22130026
9	Δ	Ø	2011/09/01 22:40:39	NAME:Logical Volume 1 ID:474514A064B383D6 Space allocation exceeded 2%, used:95% (slot A)	0x22130026
13	Δ	Ø	2011/09/01 22:40:39	NAME:Logical Volume 1 ID:474514A064B383D6 Space allocation exceeded 2%, used:99% (slot A)	0x22130026

Data Replication

on Remote

Replication

Replication M	Manager					
Select an e	xis <mark>ting</mark> replication pair	r to reconfigure t	he data prote	ction setting	s, or create a new pa	ir.
Replication Pairs	s:					Functions:
Name	Туре	Priority	Progress	Status	Description	 Information
	I					🚷 Network Diagnostic Tool
						🛟 Create Replication Pair
						😑 Delete Replication Pair
						🛞 Edit Replication Pair
						📗 Pause / Resume
						🗠 Synchronize
						4 Asynchronize
						👍 Split
						🖏 Mapping
						豰 Target Volume Auto Mapping
						🛸 Switch
						Close

Volume copy and mirror can be done inside the same subsystem or across physically distant locations. For RAID systems, there is no difference between local replication and remote replication in terms of usage but the license is separated. Make sure you have acquired the correct license (local replication or remote replication).

Note	When setting up a copy or mirror task involving volumes in different networks:
	 Open TCP/IP ports on the firewall to allow communication between SANWatch and the subsystems. Check <u>TCP/IP and UDP Port</u> <u>Assignments</u> to avoid using default ports. You cannot create a remote replication or disk roaming task between EonStor DS and EonStor GS devices. To set up an asynchronous volume mirror or volume copy task, activate the DB Flush Agent first. Check <u>Configuring Out-of-Band Flush Using</u> <u>DB Flush Agent</u> for reference.
Firmware Vers	ion It is strongly recommended to run remote replication only if the same firmware

version is shared among the subsystems involved (source and target devices)

Opening the Replication Manager

All replication-related operations can be accessed from the Replication Manager window. You may create a new replication pair, view the progress, and reconfigure the settings.

Go to	SANWatch Home > Top menu bar > Replication Manager
	🚰 Replication Manager 🕜 Help 🕓 Data Reload
Steps	When the Replication Manager window opens, the list of currently available replication pairs and their status will appear to the left.
	Replication Manager X
	Select an existing replication pair to reconfigure the data protection settings, or create a new pair.



Available functions are listed in the sidebar to the right. To view the configurations of replication pairs, click Information.



Detailed information on the replication pair will appear.

Replication Pair Information

Pai	r Details	
	Pair ID:	762F073911419D37
	Created Time:	03/26/2013 19:20 PM
	Completed Time:	03/26/2013 21:20 PM
	Split Time:	The pair has not been split yet.
	Sync Commenced Time:	03/26/2013 21:20 PM
So	irce Details	
	Name:	Virtual Volume 1
	Pool:	Pool 2
	Volume Set ID:	4FAFAA3E35B045A3
	Mapped:	No



Diagnosing the Network Status for Replication

You may check the current devices available on the network to see if remote replication pairs can be created safely between devices.

Replication Manager Place Click Network Diagnostic Tool. Functions: Information Image: Network Diagnostic Tool Image: N	Click Network Diagnostic Tool. Functions: Information Create Replication Pair Highlight the source device you wish to diagnose and click Next. Network Diagnostic Select Source Replication Device Please select the source device for the diagnostic task.	SANWatch Home > Top menu bar > Replication Manager					
Functions: Information Image: Network Diagnostic Tool Image: Network Diagnostic Tool Image: Create Replication Pair Highlight the source device you wish to diagnose and click Next. Network Diagnostic Select Source Replication Device Please select the source device for the diagnostic task.	Functions: i) Information iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	Replication I	Manager 🕜 Help	GDa	ata Reload		
Functions: Information Image: Network Diagnostic Tool Image: Network Diagnostic Tool Image: Create Replication Pair Highlight the source device you wish to diagnose and click Next. Network Diagnostic Select Source Replication Device Please select the source device for the diagnostic task.	Functions: information						
 Information Network Diagnostic Tool Create Replication Pair Highlight the source device you wish to diagnose and click Next. Network Diagnostic Select Source Replication Device Please select the source device for the diagnostic task.	Information Image: Network Diagnostic Tool Image: Network Diagnostic Tool Image: Create Replication Pair Highlight the source device you wish to diagnose and click Next. Network Diagnostic Network Diagnostic	Click Network	Diagnostic Tool.				
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Select Source Replication Device Please select the source device for the diagnostic task.	Network Diagnostic × Select Source Replication Device Please select the source device for the diagnostic task. ID + IP Address + Model + Name + ID + IP Address + DS 3016G 8000D 10.10.1.1	🕀 Create Replica	ition Pair				
Select Source Replication Device Please select the source device for the diagnostic task.	Network Diagnostic × Select Source Replication Device Please select the source device for the diagnostic task. ID + IP Address + Model + Name + ID + IP Address + DS 3016G 8000D 10.10.1.1	_					
Select Source Replication Device Please select the source device for the diagnostic task.	Select Source Replication Device Please select the source device for the diagnostic task. Model → Name → ID → IP Address → DS 30160 8000D 10.10.1.1	Highlight the s	ource device you wi	sh to diagn	ose and click Nex	t.	
Please select the source device for the diagnostic task.	Model Name ID IP Address DS 30160 8000D 10.10.1.1	Network Diagnostic				2	
Model Name ID ID IP Address	DS 3016G 8000D 10.10.1.1	Hetwork Diagnostic					
		Select Source Replicat Please select the sou					
		Select Source Replicat Please select the sou Model -	urce device for the diagnostic task.				
		Select Source Replicat Please select the sou Model - DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1		
		Select Source Replicat Please select the sou Model - DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1		
		Select Source Replicat Please select the sou Model - DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1		
		Select Source Replicat Please select the sou Model - DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1		
		Select Source Replicat Please select the sou Model - DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1		
		Select Source Replicat Please select the sou Model - DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1		
		Select Source Replicat Please select the sou Model - DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1		
Step 1 / 3	Step 1 / 3	Select Source Replica Please select the sou Model DS 30166 DS 30166	Ince device for the diagnostic task.	8000D	10.10.1.1 127.0.0.1		

Highlight the system you wish to diagnose and click Next.

Specify the amount of diagnostic data packet (64K per each). Valid values: 1-10000.

Number of Diagnostic Packet:	100	(1-10000)
------------------------------	-----	-----------

Click Diagnose. The diagnose result will appear.

	e: , ID: 8000D, IP: 10									
Laws Target ID: 00051 ID: 403.0.04	Source Device: Model: DS 3016G, Name: , ID: 8000D, IP: 10.10.1.1									
Target Device: Model: DS 3016G, Name: Target, ID: 80054, IP: 127.0.0.1										
		100	ostic Packet:	lumber of Diagno						
t Connected Received Time Rate Xfer Lost L	Connect	Target	Link	Source						
DAVCH:0 OK 100/100 8.478ms 737.2MB/s	H:0 OK	SlotAVCH:0	Up	SlotA/CH:0						
			Down	SlotA/CH:1						
			Down	SlotA/CH:2						
			Down	SlotA/CH:3						
			Down							

The Link column shows whether the source and device systems are connected or not (thus can form a remote replication pair or not).

Source	Link	Target
SlotA/CH:0	Up	SlotA/CH:0
SlotA/CH:1	Down	
SlotA/CH:2	Down	
SlotA/CH:3	Down	

To automatically refresh the status, check the Auto Refresh box.

To export the result to a local folder, click the Export button.

Export Log	Refresh	Close
------------	---------	-------



If the target partition (for EonStor DS subsystems) or virtual volume (for ESVA subsystems) has snapshot image(s), you cannot create a volume copy.
For more information about snapshots, go to the following location and click the Help icon at the top-right corner:
EonStor DS subsystems: SANWatch Home > Device sidebar > Device List >
device name > Logical Volumes > LV name > Partitions ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name >
Virtual Volumes

Go to	SANWatch Home > Top menu Bar > Replication Manager
	😭 Replication Manager 🛛 😮 Help 🕓 Data Reload

Steps

Click Create Replication Pair in the Functions area.

Information
 Network Diagnostic Tool
 Create Replication Pair

😑 Delete Replication Pair

Method 1: Select your source from an existing partition or virtual volume and click on Next.

Select exist volume for replication pair creation
 C Create a new volume as the source of replication pair

Select your source device and click on Next.

Source Device: DS 3016G

The list of available partitions or virtual volumes will appear. Highlight (yellow) the source and click Next.

•

Partition Name	Logical Volume	Status	Total Capacity
Partition 1	Logical Volume 1	The volume has been mounted.	10 GB
Partition 2	Logical Volume 1	The volume has been mounted.	10 GB
Partition 3	Logical Volume 1	The volume has been mounted.	10 GB

Select the target device (hardware) from the drop-down list. If you select Local, then the source and target partitions or virtual volumes are located on the same subsystem.

Target device: Local

The list of available logical volumes or pools will appear. Highlight (yellow) the target logical volume or pool and click Next.

Logical Volume	Logical Drive Amount	Status	Total Capacity
Logical Volume 1	2 logical drive(s)	On-Line	409.44 GB



Method 2: Create a new partition or virtual volume as the source.

- O Select exist volume for replication pair creation
- Create a new volume as the source of replication pair

Click on Next to create a new partition or virtual volume.

Create Replication Pair

Configure the parameters of the partition.					
Partition Name:	Partition 8				
Size:	10	GB 🔽			
🔽 Initialize Partition After Ci	reation				
📕 Enable Thin-Provisioning	3				
Minimum Reserved Space					
	0	GB 🔽 0 %			
🔲 Map Partition to Host					

Check the "Enable Auto Reside Ratio Setting" box (for ESVA subsystems only) if you wish and click on Next.

🔲 Enable Auto Reside Ratio Setting

Reside	Tier	Size	Used	Reside Size
	0	136.48 GB	42.3 GB	5 GB
V	1	272.96 GB	2.74 GB	5 GB

Enter the name of the volume copy.

Replication Pair Name:	Volume Copy
Replication ran Name.	

Setup Volume Copy schedule.

C Volume Copy			
Schedule	01/09/2013 🔢 3	- : 6	-
Schedule Name:	New Schedule 1		
Operation Priority:	Normal		
Remote Timeout Threshold:	30 Seconds	~	

If you select Volume Copy, the option "Schedule" will automatically be checked by default.

Schedule

Click in the schedule box and select the date, time (24hr format) and priority by clicking the date in the calendar, choose time and priority from the drop down boxes, then click on Next.



[04/01	1/2014	4		3		•	6 🔽
ľ	0	April 2014				0		
	Su	Мо	Tu	We	Th	Fr	Sa	-
			1	2	3	4	5	
I	6	7	8	9	10	11	12	
Į	13	14	15	16	17	18	19	
l	20	21	22	23	24	25	26	
	27	28	29	30				

If the source and target partitions or virtual volumes are on located on different subsystems, user may click Diagnose Network to check on the network connection status.

Diagnose Network

Set the number of diagnostic packets

Number of Diagnostic Packet: 100 (1-10000)

Click Diagnose for connection status.

Source Device:	e Device: Model: DS 3016G, Name: , ID: 8000D, IP: 10.10.1.1				
Target Device:	Model: DS 3016G, Name: , ID: 80054, IP: 127.0.0.1				
Number of Diagnostic Packet: 100					
Source	Link	Target	Connected I		
SlotA/CH:0	Up	SlotA/CH:0	ОК		
SlotA/CH:1	Down				
SlotA/CH:2	Down				
SlotA/CH:3	Down				
Auto Refresh (10 seconds)					

A summary will appear.

Summary	
Name:	VolumeMirror 3
Type:	Synchronous Volume Mirror
Priority:	Normal
Schedule:	None
Summary of Source	
Device:	DS 3016G, 10.10.1.1
Logical Volume Name:	Logical Volume 1
Name:	Partition 1
Size:	10 GB
Summary of Target	
Device:	DS 3016G, 10.10.1.1
Logical Volume Name:	Logical Volume 1
Name:	Partition 6
Size:	10 GB

Confirm all settings and click on OK to create the Replication Pair.

A progress window will show creation progress.



Creating the partition .	•	
	26%	completed
nformation		

The newly created replication pair will appear.

Name	Туре	Priority	Progress	Status	Description
Volume Copy	N/A	Normal		Uninitialized	
Volume Mirror 1	Volume Mirror	Normal		Split	

If the volume copy has been scheduled, it will appear in the Schedule view. Click the Schedules menu in the sidebar.

Schedules	
Schedule List	
Name	Туре
T Volume Copy Schedule	Volume Copy, Once

Parameters	Priority	Specifies access priority. For example, higher priority can be assigned to volumes serving applications and lower priority to volumes storing archives or user data.
	Remote Timeout Threshold	The remote timeout threshold option allows you to avoid breaking a remote replication pair when the network connection between the source and the target becomes unstable or too slow. You may choose how long the controller will wait (timeout). The replication pair will receive better protection if the timeout period is long, but fewer interruptions impact the host performance. The reverse is also true: shorter timeout \rightarrow less impact \rightarrow more risk of breaking the pair apart.
		Enabled:
		Depending on the situation, the controller either splits or halts the volume mirror when there is no network activity for the length of the timeout period.
		Disabled:
		Host I/O may be impacted seriously when the network connection becomes unstable.



This option is for remote replication pairs only. If you create a local replication pair, this option will be disabled.

How Remote	Stage 1: Syncing has been interrupted.				
Timeout Threshold Works	Background syncing will be stopped for the Wait (timeout) period (default: 30 seconds) and will be retried.				
	Stage 2: Fails to sync to the remote target.				
	If the target volume cannot be found, the un-synced data blocks will be marked. The system will continue syncing the next data blocks. An event will be posted.				
	Stage 3: Still fails to sync to the remote target.				
	The system attempts to sync the marked data blocks for several times. If target volume is still not found, sync will be aborted and uncompleted sync data will be marked. An event will be posted.				
	If the system reboots before the sync retry count reaches the threshold, sync operation will restart after the reboot and the retry count will be reset.				
	Stage 4: Replication pair will be marked as abnormal				
	The status of the split replication pair will be updated as abnormal so that users can avoid creating host LUN mapping via such target volume.				
Viewing the Progress	The newly created replication pair will be initialized upon creation or according to the schedule. You may pause (and resume) the process.				
	The length of each process depends on the capacity of the replication pair. In some cases, the process finishes within a matter of seconds.				
	 Edit Replication Pair Pause / Resume Synchronize 				
	When initialization has been completed, the status of the replication pair will change into Completed.				
	Progress Status Description				

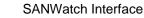
If network connection is lost during the process, the status of the replication pair will change into Non-Complete.

Completed



Creating a Volume Mirror

Notes	-	us mirror	is NOT re	commended or		ate a volume mirror. ections as high I/O
Go to	SANWatch Ho		o menu ba			
	Replication	wanager	- Contraction of the second se	G Data I	Reload	
	You can also create volume mirrors by schedule. For more information, go to the following location and click the Help icon at the top-right corner: EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Schedules ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Schedules					
Steps	Click Create R Information Network Diagno Create Replicat Delete Replicat Select your so click on Next. Create a new vo	istic Tool ion Pair on Pair urce from me for replica	n an existir	ng volume or c	reate a new sc	urce volume and
	Select your so	urce devi	ice and clie	ck on Next.		
	Source Device: DS 3016G					
	The list of avai EonStor DS su partition and c Partition Name Partition 1	ubsystem	s) will app		yellow) the so	partitions (for urce volume or Total Capacity
	Partition 2	Logical Volur		The volume has been mo		10 GB
	Partition 3	Logical Volur		The volume has been mo	ounted.	10 GB
	Select the target device (hardware) from the drop-down list.					
	Target device:	Local		•		
	EonStor DS su click Next.		• •			ical volumes (for get volume and
	Logical Volume	Logical Drive Amount			Status	Total Capacity
	Logical Volume 1		2 logical drive	(5)	On-Line	409.44 GB



Create a new partition or virtual volume as the source

- O Select exist volume for replication pair creation
- Create a new volume as the source of replication pair

Click on Next to create a new partition or virtual volume. Create Replication Pair

Configure the parameters of the partition.					
Partition Name:	Partition 8				
Size:	10	GB 👤			
🔽 Initialize Partition After	Creation				
📕 Enable Thin-Provision	ng				
Minimum Reserved Space	9				
0	0	GB 🗾 0 %			
Map Partition to Host					

Check the "Enable Auto Reside Ratio Setting" box if you wish and click on Next.

🔲 Enable Auto Reside Ratio Setting

This option is available for ESVA subsystems only.

Reside Tier		Size	Used	Reside
	0	136.48 GB	42.3 GB	5 GI
	1	272.96 GB	2.74 GB	5 GI

Enter the name of the volume mirror.

Select Volume Mirror priority and type.

- (0)	Volume Mirror	
	Operation Priority:	Normal
	Volume Mirror Type:	Synchronous Mirror O Asynchronous Mirror
		Support Incremental Recovery
		Compress Data before Transmission
		Configure the sync point inside the target volume (target snapshot).
	Remote Timeout Threshold:	30 Seconds

"Support Incremental Recovery" and "Compress Data before Transmission" are available only when the source and the target reside in different locations (remote replication).

"Support Incremental Recovery" is always enabled for synchronous mirror; it is disabled by default for asynchronous mirror.

"Compress Data" is supported by ESVA subsystems only and available for asynchronous mirror only. Furthermore, enabling it requires licensing from Infortrend.

Select the remote timeout threshold. This option defines how long the system will continue to try connecting with the target device when establishing a remote replication connection. If the timeout period is longer, the remote replication connection will become more stable due to fewer disruptions, but system performance will be affected.

This option is available only when the source and the target reside in different locations (remote replication).

User may click "Diagnose Network" to check on the network connection status.

Diagnose Network

Set the number of diagnostic packets

Number of Diagnostic Packet:	100	(1-10000)
------------------------------	-----	-----------

Click on Diagnose for connection status

Source Device: Model: DS 3016G, Name: , ID: 8000D, IP: 10.10.1.1							
Target Device:	Model: DS 3016G, Name: , ID: 80054, IP: 127.0.0.1						
Number of Diagnostic Packet: 100							
Source Link Target Connected I							
SlotA/CH:0	Up	SlotA/CH:0	OK				
SlotA/CH:1	Down						
SlotA/CH:2	Down						
SlotA/CH:3	Down						
Auto Refrech (10 seconds)							

📕 Auto Refresh (10 seconds)

Click Next. The summary will appear.

Summary	
Name:	Volume Sync Mirror 2
Description:	
Type:	Synchronous Volume Mirror
Priority:	Normal
Schedule:	None
Summary of Source	
Device:	Master, 10.0.0.5
Pool Name:	Pool 1
Name:	Virtual Volume Source Test1
Size:	20 GB
Summary of Target	
Device:	Master, 10.0.0.5
Pool Name:	Pool 2
Name:	Virtual Volume Target Test 1
Size:	20 GB

Click OK. The new replication pair will appear in the list.

Name	Туре	Priority	Progress	Status	Description
Volume Mirror 1	Volume Mirror	Normal		Split	
Volume Sync Mirror 2	Volume Mirror	Normal		Mirror	



Parameters	Priority	Specifies access priority. For example, higher priority can be assigned to volumes serving applications and lower priority to volumes storing archives or user data.
	Synchronous / Asynchronous	When the synchronous mode is enabled, the host will write data to both the source and target at the same time. In the asynchronous mode, the host I/O will be allocated to the source volume only, thus allowing higher bandwidth and optimized performance. New data will be written later into the target in batch, avoiding heavy I/O traffic.
	Incremental Recovery	Allows you to "move back" to the source volume if it recovers. The new data accumulated in the target volume during downtime will then be gradually copied to the source volume.
	Compress Data	If the bandwidth is not enough for asynchronous mirroring, compressing data reduces the amount of I/O.
		This option impacts the subsystem performance by taking up extra computing power.
	Target snapshot	For Asynchronous Mirror only. The system will take snapshots in the target volume for every asyncing task but only the latest snapshot of asyncing target volume will be kept.
	Remote Timeout Threshold	The remote timeout threshold option allows you to avoid breaking a remote replication pair when the network connection between the source and the target becomes unstable or too slow. You may choose how long the controller will wait (timeout). The replication pair will receive better protection if the timeout period is long, but fewer interruptions impact the host performance. The reverse is also true: shorter timeout \rightarrow less impact \rightarrow more risk of breaking the pair apart.
		Enabled:
		Depending on the situation, the controller either splits or halts the volume mirror when there is no network activity for the length of the timeout period.
		Disabled:
		Host I/O may be impacted seriously when the network connection becomes unstable.

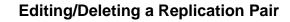
This option is for remote replication pairs only. If you create a



local replication pair, this option will be disabled.

How Remote	Stage 1: Syncing has been interrupted.			
Timeout Threshold Works	Background syncing will be stopped for the Wait (timeout) period (default: 30 seconds) and will be retried.			
	Stage 2: Fails to sync to the remote target.			
	If the target volume cannot be found, the un-synced data blocks will be marked. The system will continue syncing the next data blocks. An event will be posted.			
	Stage 3: Still fails to sync to the remote target.			
	The system attempts to sync the marked data blocks for several times. If the target volume is still not found, sync will be aborted and uncompleted sync data will be marked. An event will be posted.			
	If the system reboots before the sync retry count reaches the threshold, sync operation will restart after the reboot and the retry count will be reset.			
	Stage 4: Replication pair will be marked as abnormal			
	The status of the split replication pair will be updated as abnormal so that users can avoid creating host LUN mapping via such target volume.			
Viewing the Progress	The newly created replication pair will be initialized upon creation or according to the schedule.			
	The length of each process depends on the capacity of the replication pair. In some cases, the process finishes within a matter of seconds.			
	Edit Replication Pair Pause / Resume Synchronize			
	When initialization has been completed, the status of the replication pair will change into Completed. Progress Status Description Completed			
	If network connection is lost during the process, the status of the replication pair will change into Non-Complete.			





Go to	SANWatch Home > Top	SANWatch Home > Top menu bar > Replication Manager		
	Peplication Manager	🕜 Help	🕒 Data Reload	
Editing a Pair	Highlight a replication pa	air (yellow) in	the list.	

Highlight a replication pair (yellow) in the list.

Name	Туре	Priority
VolumeMirror 3	Volume Mirror	Normal
VolumeMirror 3	Volume Mirror	Normal

Click Edit Replication Pair in the Sidebar.

😑 Delete Replication Pair			
🍪 Edit Replication Pair			
📕 Pause / Resume			

You may change the name and priority of the replication pair and add a short description to it.

Volume Pair Name:	VolumeMirror 3	
Description:		
Operation Priority:	Normal	•
Remote Timeout Threshold:	30 Seconds	-
Incremental Recovery	Supported	
Compression:	Disabled	-

Deleting a Pair

Highlight a pair (yellow) in the list.

Name	Туре	Priority
Volume Copy	N/A	Normal
Volume Mirror 1	Volume Mirror	Normal

Click Delete Replication Pair in the Sidebar.

Ð	Create Replication Pair
0	Delete Replication Pair

🛞 Edit Replication Pair

Deleting a volume copy pair removes the relationship between the source and target volume: the logical volumes or pools themselves stay intact.

We recommend you to delete volume copy pairs once the volume copy task has been completed, since the pair only serves as a reference log. However, DO NOT remove a volume copy pair if the volume copy has not been completed. If you do so, the target volume data will become corrupted and thus unusable. Needless to say, the ongoing task will also be interrupted.



Mapping the Source or the Target to Host LUN

Go to

SANWatch Home > Top menu bar > Replication Manager

😭 Replication Manager	🕜 Help	🕓 Data Reload
-----------------------	--------	---------------

Steps

Highlight the replication pair (yellow).

Name	Туре	Priority
RemoteMirror 2	Volume Mirror	Normal

Click Mapping in the Sidebar.

📬 Split
🖏 Mapping
🔜 Target Volume Auto Mapping

Select whether to map the source or the target (mapping to the target is not always available depending on the replication pair's conditions)

e	Source Replication Pair for Mapping	
0	Target Replication Pair for Mapping	

Click OK to select the channel and click on Create.

Host LUN Mapping				
Ma <mark>p</mark> this partition to the host or man				
E cu				
CH 🔺	Target 👻	LUN 🖵		
0	112	0		
⊽ 1	112	0		

The mapping configuration window will appear.

 Create a host LUN mapping set automatically. 	
● Fibre 16 Gbps 🛛 ⊖ iSCSI 1.0 Gbps	
 Customize the host LUN mapping configuration 	15.
Fibre 16 Gbps OiSCSI 1.0 Gbps	
- Slot A-	
Channel 0 Channel 1	
Channel 0 Channel 1	
Customize the LUN Number:	•
Use Extended Host LUN Functionality:	
Host ID/Alias	
	• • • • • • • • • • • • • • • • • • •
Host ID Mask	FFFFFFFFFFFFF
Filter Type	Include •
Access Mode	Read/Write •
	Configure Host ID/WWN Alias



If you let the system create LUN mapping automatically, check it. For hybrid models, you need to select the host type.

۲	Create a host LUN mapping set automatically.
	Fibre 16 Gbps iSCSI 1.0 Gbps
0	Customize the host LUN mapping configurations

Fibre 16 Gbps OISCSI 1.0 Gbps

Manual Configuration

If you manually configure the LUN mapping, check the Customize option and select the Channels.

Customize the host LUN mapping configurations	
● Fibre 16 Gbps 🛛 iSCSI 1.0 Gbps	
- Slot A-	
Slot B Channel 0 @ Channel 1	
Customize the LUN Number:	1 •
Use Extended Host LUN Functionality:	
Host ID/Alias	▼
Host ID Mask	FFFFFFFFFFFFF
Filter Type	Include •
Access Mode	Read/Write
	Configure Host ID/WWN Alias

Select the LUN number from the drop-down list.

Customize the LUN Number:

1

•

Click OK. The list of Host LUN Mapping configurations will appear in the window.

			anage existing				
CH 🔺	Target 👻	LUN 👻	Host ID 👻	Alias 👻	Priority 👻	Filter Type 👻	Access Mode 👻
0	112	0				Include	
1	112	0				Include	
2	112	0				Include	
🗖 З	112	0				Include	

(To delete LUN mappings, you may check the Channels and click Delete).

Using Extended LUN Mapping (Fibre Channel)

Extended LUN Mapping is available only for manual configuration.

Click Use Extended LUN Functionality and enter or select the parameters.

✓ Use Extended Host LUN Functionality:

Host ID/Alias	2100001B32917B90
Host ID Mask	FFFFFFFFFFFFF
Filter Type	Include
Access Mode	Read/Write

- Host ID/Alias: Specifies the host ID, referring to WWPN port name. You can also see OUI (Organizationally Unique Identifier) of an ESVA: "00:D0:23" oui. Note: Avoid checking the OUI while mapping host LUN.
- > Host ID Mask: Works as a prefix mask in hexadecimal format.
- Filter Type: Specifies whether to allow (include) WWNs or forbid (exclude) them from accessing after filtering.
- Access Mode: Specifies the access right of LUN mapping for the host: read-only or read-write.
- Configure Host-ID/WWN List (enabled only when Extended Host LUN Functionality has been enabled.)

llias	Group	Host ID / WWN		Controll	er
Alias		2101001B32A96	31C	Slot A	ł

In the Edit Host-ID/WWN list window, click Add to create an entry and enter the node name (WWN Name) for identifying HBA ports in SAN. An HBA card may have one node name and multiple port names. The node name can be a nickname such as "SQLserver_port" instead of the real name.

Add WWN		×
Add/Edit Host ID/Alias		
Host ID/Alias	2100001B32917B90 🔽 Add	
Alias:		
	ОК	Cancel
		Lancei

Click OK. Repeat the above process to create more LUN mappings especially if you have multiple HBA ports accessing the same virtual volume (e.g., in high-availability application).

Assigning a WWN to a Group

A WWN group allows multiple host LUNs to be accessed in a single mask, which becomes useful in a clustered storage server environment.

To create a group and assign a WWN to it, highlight a WWN (yellow).

Alias	Group	Host ID / WWN	Controller
Alias		2100001B32917B90	Slot A

Click Assign Group and select the group from the drop-down menu.



WWN group				×
WWN Name(s)				
Host ID: Group:	2100001B32917B90 Group 1	Add		
		ОК	Cancel	

To add a new group, click Add and enter the group name.

New Group	Group 1

The group name will appear in the list.

A	llias	Group	Host ID / WWN	Controller
	Alias	Group 1	2100001B32917B90	Slot A

To unassign a WWN from a group, click Unassign Group.

Deleting a WWN Name from the List

Highlight a WWN in the list and click Delete.

Changing the Alias name

To edit the alias name of the WWN, click Edit and enter the new name.

Edit WWN		×
Add/Edit Host ID/Alias		
Host ID/Alias	2100001832917890	
Alias:	Alias	
	ОК	Cancel

Using Extended LUN Mapping (iSCSI Channel)

Extended LUN Mapping is available only for manual configuration.

Click Use Extended LUN Functionality and enter the parameters.

	Configure iSCSI Initiator Alias	
Priority	Normal	•
Access Mode	Read/Write	•
Filter Type	Include	•
Alias		•
Use Extended Host LUN Functionality:		



- Alias: Specifies a pre-configured iSCSI initiator instance. To create a new initiator alias, click the Configure iSCSI Initiator Alias button.
- Filter Type: Specifies whether to allow (include) initiators or to forbid (exclude) them from accessing after filtering.
- Access Mode: Specifies the access right of LUN mapping for the host: read-only or read-write.
- Priority: Specifies access priority. For example, higher priority can be assigned to volumes serving applications and lower priority to volumes storing archives or user data.

Configuring iSCSI Initiator Alias

Click Configure iSCSI Initiator Alias.

						×
Config	jure <mark>i</mark> SCSI Ini	tiator Alias				
Alias:	Group	Host IQN:	Username:	Target Name:	IP Address:	Netmask:
	Add	Edit	Delete	Assign Group	Unassign Group	Close

Click Add to create an entry and enter the parameters.



Host IQN: Infortrend's storage IQN is composed of the system serial number and 3 more digits in the following format:

iqn.2002-10.com.infortrend:raid.snXXXXXXXXXXX

6 digits of serial number follows "sn."

The next 3 digits are: channel number, host ID, LD ownership.

The LD ownership digit is either "1" or "2" where "1" indicates Controller A and "2" indicates Controller B. The IQN is in accordance with how you map your logical drive to the host ID/LUN. For example, if you map a logical drive to host channel 0 and AID1, the last 3 digits will be 011.

- > Alias: Assign an easy to remember name for the iSCSI initiator.
- > Username/Password: Specifies the user name and password for CHAP

88

authentication. This information is the same as the CHAP target node name and CHAP secret in the OS setting. The User Password (One-way, from initiator) has to be at least 12 bytes.

- Target Name/Password: Specifies the target name and password for CHAP authentication. This information is the same as the CHAP initiator node name and CHAP secret in the OS setting. The Target Password (Two-way, outbound from storage) has to be at least 14 bytes.
- IP Address/Netmask: Specifies the IP address and subnet mask, if necessary. Multiple initiator ports on an application server can sometimes share the same IQN.

Click OK. Repeat the above process to create more LUN mappings especially if you have multiple HBA ports accessing the same virtual volume (e.g., in high-availability application).

Assigning an Initiator to a Group

A group allows multiple host LUNs to be accessed in a single mask, which becomes useful in a clustered storage server environment.

To create a group and assign an initiator to it, highlight an initiator (yellow).

Click Assign Group and select the group from the drop-down menu.

Host ID:	2101001B32A9631C		
Group:	Group 1	•	Add

To add a new group, click Add and enter the group name.

New Group	Group 1	
-----------	---------	--

The group name will appear in the list.

To unassign an initiator from a group, click Unassign Group.

Deleting an Initiator Name from the List

Highlight an initiator in the list and click Delete.

Editing the Initiator

To edit the configuration of an initiator, click Edit.



Switching the Roles of a Replication Pair

You may swap the roles (source and target) of a replication pair.

Notes	 To switch the roles, you need to split the replication pair. Make sure there is no important data transaction going at the moment. In a replication pair, the target must have the equal or more capacity than the source. Therefore, to switch the roles properly, it is best that the source and the target pair have the same amount of capacity. 							
Go to	SANWatch Home		u bar > Help		on Mana ata Reload	iger		
Step 1: Splitting the Replication Pair	Highlight a replican Replication Pairs:	ation pair.						
	Name	Туре	Priority	Progress				
	Volume Mirror 1	Volume Mirror	Normal					
	Click Split in the sidebar.							
	Progress Status	Description						
	Split							
Step 2: Switching the Roles	While the highlig Mapping Target Volume Auto Switch The source and the Information to co Information Network Diagnostic Create Replication	he target wil	l swap t	heir roles				



Syncing a Replication Pair

	increme	ntal data	• • •	repair t	he dama	on pair when you have to perform aged content of the source pair, th purce.
Notes	sure ≻ Sync	there is r hronous	no important	data tra T recon	ansaction nmendec	at has already been split. Make going at the moment. d over WAN connections as high
Go to		tch Hom	e > Top meni	u bar > Help		ion Manager ata Reload
Syncing the Pair	Highligh Replication	-	ation pair.			
	Name	Name		Priority	Progress	
	Volume Mil	ror 1	Volume Mirror	Normal		
	Confirm	that the	status has be	en Spl	lit.	
	Progress	Status	Description			
		Split				
		e / Resume ronize	e in the Side	bar.		
	-	rce and t	he target will	be syr	nced and	the status will go back to normal
	Progress	Status	Description			
				_		

Using the Incremental Recovery Option in Asynchronous Mirror

The Incremental Recovery option allows you to "move back" to the source volume if it recovers. The new data accumulated in the target volume during downtime will then be gradually copied to the source volume.

This option affects the I/O performance and takes up extra space in the target volume due to the meta data to keep track of the difference.

ConditionsWhen creating a volume mirror, select the volume mirror type as "Asynchronous
Mirror" and enable "Support Incremental Recovery."

You also have to be remindful of the source volume condition:

- If the source volume is still missing, you can map the target volume to the host and keep the data difference between the source volume (normal asynchronous mirroring).
- If the source volume recovers, you have to switch the source and target role first, and then start asynchronous mirroring. See below for detailed steps.
- > The target volume must be unmapped.

Go to	SANWatch Home > Top menu bar > Replication Manager
	😭 Replication Manager 🛛 🕐 Help 🕓 G Data Reload

Step 1: Splitting the Replication Pair	Highlight a replication pair.						
	Name		Туре	Priority	Progress		
	Volume Mirror 1		Volume Mirror	Normal			
	Click Split in the sidebar.						
Step 2: Switching the Roles	Mapping Mapping 🚲 Target Volur 🞕 Switch	ne Auto Iv	lapping			Switch in the Sidebar. S. After completion, click	



Information to confirm the new parameters.

0	Information	
Q,	Network Diagnostic Tool	
0	Create Replication Pair	

Step 3: RecoveringThe source volume has become the target, and the target volume becomes thethe Pairsource.

Click Asynchronize in the Sidebar.

🛬 Synchronize
Asynchronize
📥 Split

Wait until the status becomes Async.

Progress	Status	Description
	Async	

Start the asynchronous volume mirror process. Then original source volume will receive the incremental difference form original target and keep each other synced.

Select the Role Switch function again. The original source volume will go back to the source of the volume pair, completing the recovery process.

The incremental recovery process can be applied only once per pair.



The automatic failover function helps achieving continuous data transaction when a replication pair gets broken. When the host (recovery) agent fails to locate the source volume of a replication pair due to a disaster such as power outages, it will try to map the target volume to the host for failover. Because the target volume is a copy of the source, users can continue their operations using the data on the target side.

Because the failover job is engaged by the agent and needs the mapping operation, it will still cause downtime on the host for seconds or even minutes (depends on the environment).

This feature is available when all of the following conditions have been met:

> Remote replication pairs, not local replication pairs

- > Volume mirror pairs, not volume copy pairs
- > Volume mirrors pairs with source volumes already being mapped
- This feature is available only for synchronous volume mirror tasks, with in-band configurations (in **Data hosts**) completed on both the source and target sites. Check <u>Adding a Host</u> for reference.

Go to SANWatch Home > Top menu bar > Replication Manager

₍₁₎ Replication Manager	? Help	🕓 Data Reload
-------------------------------------	--------	---------------

Steps

Note

Highlight a replication pair.

Replication Pairs:					
Name	Туре	Priority	Progress		
Volume Mirror 1	Volume Mirror	Normal			

Click Target Volume Auto Mapping in the Sidebar.

🦏 Mapping
💑 Target Volume Auto Mapping
📚 Switch

.....

Select the host agent for configuring auto failover and click Next.

Select the Host Agent for Auto Mapping	
Select the agent(s) and enable auto mapping.	
Data Host Agent IP Address	Summary of Settings

The Auto Failover configuration window will appear.

-	b lume Auto Mapp Ire the host LUN r	-	ı settings s	uch as auto ma	pping for th	e target vo	olume pair		
Enable Auto Mapping for the Target Volume									
Cł	Check Source Volume for Failures: 30 Seconds								
[- Select LUN Mapping Set(s) for the Target Volume								
	Select CH Target LUN Host ID Alias Group Priority					Priority	Access Mode		
	~	0	112	Default				Default	Read/Write
	~	1	112	Default				Default	Read/Write
	v	2	112	Default				Default	Read/Write
	V	3	112	Default				Default	Read/Write
								Add	Delete

- Enable: Check this box to enable or disable auto failover (mapping).
 Enable Auto Mapping for the Target Volume
- Check Period: Specify the length of the timeout period for pausing and retrying the sync operation when it fails.

Check Source Volume for Failures: 30 Seconds

LUN Mapping List: Select the LUN mapping for the target volume. You may create a new LUN mapping (see the next step) by clicking on Add.

•

Add

Trigger a File (optional): Check this box to run a script or program after mapping the target volume to the host. For example, you may run a scanning script file.

🗖 Run an Executable File after Mapping the Target Volume to the Host

To add a new LUN mapping, click Add.

Add

The LUN mapping window will appear. For details of LUN mapping creation, refer to the Mapping section.

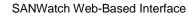


 Create a host LUN mapping set automatically. Fibre Channel C iSCSI 								
Customize the host LUN mapping configurations.								
FC-Host iSCSI-Host								
Slot A Channel 0 Channel 1 C	Channel 2 🔲 Channel 3							
Slot B Channel 0 Channel 1 C	Channel 2 🔲 Channel 3							
Customize the LUN Number:	¥							
🔲 Use Extended Host LUN Functionality								
Host ID/Alias								
Host ID Mask	FFFFFFFFFFFFF							
Filter Type	Include 🔽							
Access Mode	Read/Write							
Priority	Normal							
	Configure Host ID/WWN Alias							

Click OK. The "Auto Map" column shows the current Auto Failover (Mapping) status of the replication pair. (Empty means no setting has been configured). Replication Pairs:

Name	Туре	Priority	Auto Map
RemoteMirror 1	Volume Mirror	Normal	Enabled
RemoteMirror 2	Volume Mirror	Normal	

Remote replication and disk roaming cannot be executed between EonStor DS and EonStor GS.





Notifying Users of System Events

The following notification services are available:

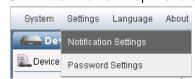
- Phone Home: Notify Infortrend service center of critical events through an email message (ESVA subsystems only).
- > Email: Notifies users through an email message.
- > Fax: Notifies users through a fax message.
- > SMS: Notifies users through an SMS mobile phone message.
- > MSN: Notifies users through an MSN computer chat message.
- > **SNMP**: Notifies users through SNMP protocol.
- > **Broadcast**: Sends notifications via LAN networks.
- > Log: Notifies users by sending system logs via email.
- > Plugin: Activate user-specified applications when a system event occurs.



Activating Notification Settings

Go to

SANWatch Home > Top menu bar > Settings > Notification Settings



Steps

The Notification Settings will appear in the main window, showing email notification settings by default.

Notification Settings

otification	n Settings								
@]email	≟ ,Fax	SMS	8 MSN	SNMP	Broadcast	Log	2 Plugin		
🗖 Enable E — Email Si	Email Notifica ettings ——	ition						 	
Severity: Mail Subj	oct:		Notificatio						
SMTP Se			RAID EVe	ril					
SMTP Po	rt:		25						
Security:			None		_				
Account:									
Passwor	d:								
Sender E	mail:								
– Email R	eceiver Settir	gs ———							
Receive	r Name			Receiver	Email Address			Severity	
(No F	Recipient)								
							Add	Edit	Delete
				Import Sett	ings Export S	ettings	OK	Cancel	Apply



Notifying via Phone Home (ESVA subsystems only)

The Phone Home feature allows critical events will automatically be delivered to Infortrend service center.

Go to	SANWatch Home > Top Home tab	menu bar > S	Settings > Notification Settings > Phone					
Configuring Phone Home	Check Enable Phone Home Service. Enable Phone Home Service							
	Choose Enabled from the Daily Heart-Beat Check drop-down menu if you want to deliver a system health report back to Infortrend on a daily basis.							
	Daily Heart-Beat Check:	Enabled	•					
	deliver the Phone Home menu if you want Email	package. Ch	and port number through which you wish to hoose SSL from the Security drop-down itted in encrypted format.					
	SMTP Server:							
	SMTP Port	25						
	Security:	None	·					
	Enter a valid email acco	unt, passwor	d, and address.					
	Account:							
	Password:							
	Sender Email:							
	Fill in your company nan number with which Infor Company Name: Contact Person: Contact Phone Number:	-	erson (system administrator), and a phone ntact you.					
	immediately. Click Test F	Phone Home prtrend's serv	the health report back to Infortrend to test the validity of your Email account rice center. You should be able to receive Test Phone Home					
	Infortrend does not hav	e access to t	the data in your ESVA subsystem.					



Notifying via Email

Email notification automatically sends an email message to users when a system event occurs.

Configuring Email Sende	er Settings	rner.
•		
Severity:	Notification	
Mail Subject:	RAID Event	
SMTP Server:		
SMTP Port:	25	
Account:		
Password:		
Sender Email:		
To add a new email receive Add Edit Enter the parameters and Email Address :	er, click Add in the Email R Delete click Add to confirm. receiver@email.com	eceiver Settings corner.
	Check Enable Email Notific Finable Email Notification Configuring Email Sender Enter the sender parameter Severity: Mail Subject: SMTP Server: SMTP Server: SMTP Port: Account: Password: Sender Email: Configuring Email Receiv Add Edit Enter the parameters and Email Address :	Check Enable Email Notification.

The new email receiver will appear in the Email Receiver Setting corner.

Receiver Name Receiver Email Address Severity					
	Email Receiver 1	receiver@email.com		Notification	
			Add	Edit Delete	

Completing the Configuration

- Click OK to confirm and close the Notification Settings.
- > Click Cancel to reset the entered parameters.
- Click Apply to confirm the entered parameters and continue configuring other notifications.

ОК	Cancel	Apply
UK		- oppiy



Parameters	Email Address	Specifies the email address of the receiver.
	Severity > Notification	Notifies users whenever a system event occurs.
	Severity > Warning	Notifies users of all warning and critical messages.
	Severity > Critical	Notifies users only when critical issues occur.
	SMTP Server	Specifies the SMTP mail server name. Example: infortrend@smtp.com
	SMTP Port	Specifies the SMTP mail server port number.
	Account	If sending an email requires logging into an account, specifies the account name.
	Password	If sending an email requires logging into an account, specifies the password.
	Sender Email	Specifies the sender email address.

Notifying via Fax		
	You need to install the following modules to your computer before using this feature.	
	 Windows Messaging (MAPI) in Windows environment (software module) One modem port compatible with FAX Command Class 2.0 (hardware module) 	
Go to	SANWatch Home > Top menu bar > Settings > Notification Settings > FAX tab	
Adding a new FAX receiver	Enabling Notification	
	Check Enable Broadcast Notification.	
	Enable Fax Notification	
	Configuring Fax Settings	
	Specify the severity and the fax queue size in the Fax Settings corner.	
	Fax Settings	
	Queue Size: 1	
	Click Add in the Fox Dessiver Setting corner	
	Click Add in the Fax Receiver Setting corner.	
	Add Edit Delete	
	Enter the parameters and click Add.	
	Receiver Telephone Number :	
	External Line : Delay (Seconds) : 1	
	Severity: Notification	
	The new fax recipient will appear in the SNMP Receiver Setting corner.	
	 Completing the Configuration Click OK to confirm and close the Notification Settings. Click Cancel to reset the entered parameters. Click Apply to confirm the entered parameters and continue configuring other notifications. 	
	OK Cancel Apply	
Parameters	Receiver TelephoneSpecifies the Fax number, including the countryNumbercode. Example: 14085555555	

Queue Size	Specifies the fax queue size.
External Line	Sends out an outside line dial tone before the fax number. Range: 0 to 9.
Delay (Seconds)	Specifies the interval between the outside line dial tone and the fax number in seconds. Range: 1 to 9.
Severity > Notification	Notifies users of all events.
Severity > Warning	Notifies users of all warnings and critical events.
Severity > Critical	Notifies users only when critical issues occur.



Notifying via SMS

You need to install one GSM modem to your computer for using this feature. The following modems are tested to comply with SANWatch.

- ➢ Siemens TC35
- Wavecom Fast Rack M1206

Go to	SANWatch Home > Top menu bar > Settings > Notification Settings > SMS tab
	E Fax SMS SMSN

Enabling Notification

Check Enable SMS Notification.

Configuring SMS Sender Settings

Enter the sender information and specify the severity.

– SMS Settings –	
Severity:	Notification
COM Port:	1
Pin Code:	
Notification Period:	5000
Number of Retries:	3

Configuring SMS Receiver Settings

Click Add in the SMS Receiver Setting corner.

Add	Edit	Delete
-----	------	--------

Enter the parameters and click Add.

Receiver Cell Phone Number :	+ 1 - 999999999	
Severity:	Notification	•

A new MSN recipient will appear.

Receiver Name	Receiver Cell Phone Number		Severity	
SMS Receiver 1	1-999999999		Notification	
		Add	Edit	Delete

Completing the Configuration

- > Click OK to confirm and close the Notification Settings.
- > Click Cancel to reset the entered parameters.
- Click Apply to confirm the entered parameters and continue configuring other notifications.

ОК	Cancel	Apply
----	--------	-------



Parameters	Receiver Cell Phone Number	Specifies the phone number, including the country code, to which the SMS message will be sent. Example: +1-4085555555
	Severity > Notification	Notifies users of all events.
	Severity > Warning	Notifies users of all warnings and critical events.
	Severity > Critical	Notifies users only when critical issues occur.
	COM Port	Specifies the port number to which the message will be sent.
	Pin Code	Specifies the PIN Code of the phone.
	Notification Period	Specifies the notification period of the SMS message.
	Number of Retries	Specifies how many times the SMS will be resent in case it does not reach the receiver.



	You need to have a w will be sent to a Skyp		t to use this feature. Notices
Go to		op menu bar > Settings > No J ^{SNMP}	otification Settings > MSN ico
Adding a new MSN	Enabling Notification	n	
receiver	Check Enable MSN Notification.		
	Configuring MSN Sender Settings		
	 MSN Settings Severity: Sender MSN Username: Sender MSN Password: 	Notification	
	Configuring MSN Receiver Settings		
		Receiver Setting corner.	
	Add	Edit Delete	
	Enter the parameters	and click Add.	
	MSN Account :	test@hotmail.com	
	Severity:	Notification	
	A new MSN recipient	will appear.	
	Receiver Name	Receiver MSN Username	Severity
	MSN Receiver 1	test@hotmail.com	Notification
			Add Edit Delete
			Add Edit Delete
	Completing the Cont	figuration	
	Completing the Cont Click OK to confirm	figuration	
	Completing the Cont Click OK to confirm Click Cancel to res	figuration n and close the Notification s set the entered parameters. irm the entered parameters	Settings.

Parameters

MSN Account

Specifies the MSN chat account name. Example: Infortrend@hotmail.com.



Sender MSN Account	Specifies the MSN chat account name of the sender. Example: Infortrend@hotmail.com
Sender MSN Password	Specifies the password for the sender MSN account.
Severity > Notification	Notifies users of all events.
Severity > Warning	Notifies users of all warnings and critical events.
Severity > Critical	Notifies users only when critical issues occur.



Notifying via SNMP

SNMP (Simple Network Management Protocol) is a network protocol used to monitor network-attached devices.

Go to	SANWatch Home >	Top menu bar : ⊑ [∾] Broadcast	> Settings > Notificati	ion Settings > SNMP tab
Adding a new SNMP receiver	Enabling Notification Check Enable SNMP Notification.			
	Configuring the Local Side Select the severity and enter the IP address of the local side.			
	Configuring the Remote Side Click <i>Add</i> to add a new SNMP receiver.			
	Enter the parameters and click Add. Receiver IP Address : 192.168.4.133 Severity: Notification]
	The new SNMP reci SNMP Receiver Settings Receiver Name SNMP Trap Receiver 1	pient will appea	Receiver IP Address 192.168.4.133	Severity Notification
 Completing the Configuration Click OK to confirm and close the Notification Settings. Click Cancel to reset the entered parameters. 				Add Edit Delete
	 Click Apply to confirm the entered parameters and continue configuring other notifications. OK Cancel Apply 			

Parameters

Receiver IP

Specifies the IP address of the SNMP receiver.



	Example: 192.168.4.133
Severity > Notification	Notifies users of all events.
Severity > Warning	Notifies users of all warnings and critical events.
Severity > Critical	Notifies users only when critical issues occur.
SNMP Local IP	Specifies the IP address of the SNMP sender. Example: 192.168.4.133



Notifying via Broadcasting				
	Broadcasting sends notifica	tions via LAN networks.		
Go to	SANWatch Home > Top me Broadcasting tab	_	cation Settings >	
Adding a new	Enabling Notification			
Broadcasting receiver	Check Enable Broadcast Notification.			
	Configuring Settings			
	Click Add in the Broadcast Receiver Settings corner. Add Edit Delete Enter the parameters and click Add.			
	The host name must be er	ntered as an email addres	SS.	
		st@email.com tification		
	The new Broadcast recipier	nt will appear.		
	Receiver Name	Receiver Host Name	Severity	
	Broadcast Receiver 1	host@email.com	Notification	
		(Add Edit Delete	
	 Completing the Configuration Click OK to confirm and Click Cancel to reset the Click Apply to confirm the notifications. 	close the Notification Set entered parameters.	d continue configuring other	
Parameters	Receiver Host Name	Specifies the email ac	ldress of the receiver.	
	Severity > Notification	Notifies users of all ev	vents.	
	Severity > Warning	Notifies users of all wa	arnings and critical events.	



Severity > Critical

Notifies users only when critical issues occur.



Sending System Log to Users

Users may periodically receive system log information by emails.

Steps Click the Log tab in the Notification Settings menu. (The log notification setting appears by default when you activate the Notification Settings.) Broadcast i≣ Log 🗵 Plugin Check Enable Log Notification. Enable Log Notification Enter the notification parameters. Startup Status: Disabled Ŧ SMTP Server: SMTP Port: 25 Account: Password: Sender Email: Receiver Email: Notification Period (Hours): 1

Completing the Configuration

- > Click OK to confirm and close the Notification Settings.
- Click Cancel to reset the entered parameters.
- Click Apply to confirm the entered parameters and continue configuring other notifications.



Parameters	Startup Status	Enables or disables the log notification.		
	SMTP Server	Specifies the SMTP mail server name. Example: infortrend@smtp.com		
	SMTP Port	Specifies the SMTP mail server port number.		
	Account	If sending an email requires logging into an account, specifies the account name.		



Password	If sending an email requires logging into an account, specifies the password.
Sender Email	Specifies the email address of the sender.
Receiver Email	Specifies the receiver's email address.
Notification Period	Specifies how frequently the log will be sent to the receiver.



Activating Applications upon Events

You may activate user-specified applications when a system event occurs.

StepsCopy the plug-in executable file into the folder. Example: Application.exe (in
case of Windows)

Activate the Notification Settings.

Click the Plugin tab in the Notification Settings menu. The Plugin setting will appear.



Creating the Plug-in

Click Create Plugin in the Plugin corner and enter the details of the plugin program.

Create Plugin	Delete Plugin	
Description of Plugin		
Plugin Label		
Application Program		•

Creating the Receiver

Click Add to show an input field dialog box. Enter the configuration string to be read when the application program starts. A configuration argument may look like this:

"\plugin\userprogram.exe uid=xx model=xxx-xxx ip=xxx.xxx.xxx

ctrlrName=N/A severity=1 evtStr="Evt String" recv="customized string"

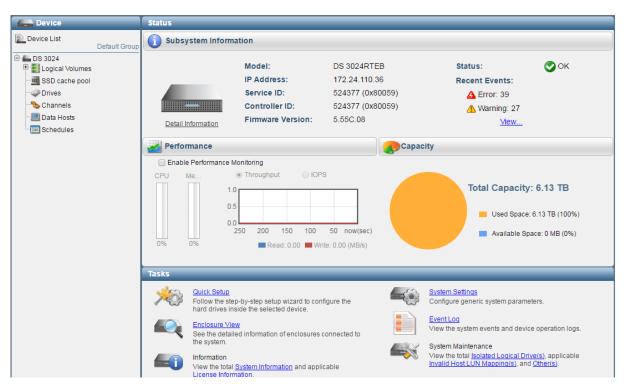
Plugin Receiver Settings —

Receiver Data

Parameters	Plugin Description	User-defined description of the plugin program			
	Plugin Label	User-defined title of the plugin program			
	Application Program	The list of application programs stored in the plug-in subfolder			



Working with Devices



This chapter describes how to view and configure hardware parameters of a device, including system performance, event log, hard disk drive configuration, and invalid/isolated logical drive and host LUN settings.

Viewing the Overall Status

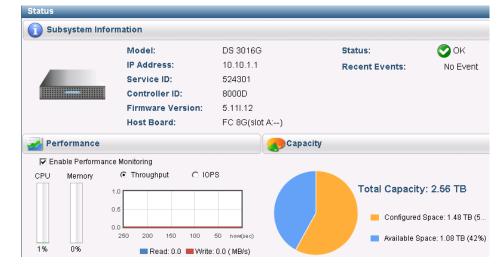
The status of each device (RAID system or JBOD expansion enclosure) is summarized in the Subsystem Information page, where you can quickly grasp the hardware configuration, performance, storage capacity.

Go To

SANWatch Home > Device sidebar > device name



Viewing the Subsystem Information The device status will be summarized in the Status corner.



Hardware Configurations

The basic system configurations and overall system status will be listed in the Subsystem information corner. You can see the model name, IP address, controller ID (might be required when receiving technical support), and firmware version.

	Model:	DS 3016G
	IP Address:	10.10.1.1
	Service ID:	524301
	Controller ID:	8000D
	Firmware Version:	5.111.12
	Host Board:	FC 8G(slot A:)

Events

Most recent system events will be listed in the Recent Events corner. To view all

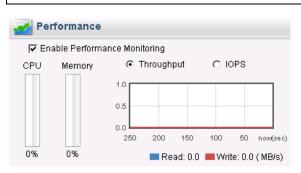
past events, click the Event Log menu in the Tasks corner.



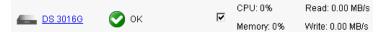
Performance Monitor

Check the Enable Performance Monitoring checkbox to see the CPU/memory usage and read/write throughput.

The Performance Monitor is disabled by default to save system resources.

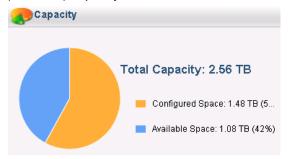


You may also click Device List in the top-left corner to view the summary of system performance in the Device Status list view.



Storage Capacity

See the amount and ratio of used (configured) capacity and the remaining (available) capacity.



You may also view a quick summary in the Device Status list view.





Changing Login Passwords

You can modify the default login password or set a new password for logging into SANWatch management host or accessing storage subsystems.

-				
Go to	SANWatch Home > To	p menu bar > Se	ettings > Pase	sword Settings
	System Settings Langu	lage About		
	Dev Notification Settin	gs		
	Device Password Setting	s		
Changing SANWatch Login Password	Select the Managemer login password of the S Management Host Subsys	SANWatch mana tem Currently C	-	
Assigning a Password to a Subsystem	Once you set up a pa whenever you try to a subsystem. Select the Subsystem Management Host Subsystem	ccess or configu	ire the hardw	are setting for that
	Available Subsystems/Agents		-	
	Model Name	IP Address	Туре	Saved Password
		127.0.0.1	In Band	
	-	127.0.0.1	In Band	Wrong Password
				Edit Password
	Highlight the storage st button. Edit Password		he list and cli	ck the Edit Password
	Enter the new passwor			
	Set Subsystem Password			
	Set Subsystem Password			
	Subsystem Password:			
	After specifying a pass	word, when you	try to access	the hardware device page,

you will be asked to enter the password.



E Device		
🖹 Device List		
Channels		
Enter Subsystem Password		×
Please enter the password to enable configura	ation of this device.	
Subsystem Password: ••••	sword	
	ОК	Cancel

Note

To reset the passwords, restore factory settings.

Monitoring System Performance

You can see the current system performance in a glance from the device home page. The System Information corner allows you to see further detailed information including controller throughput and cache usage.

Because status monitor affects system performance, the monitoring functions are disabled by default.

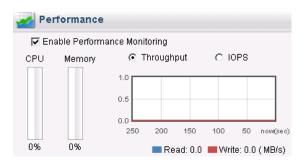
Overall System Performance

Go to SANWatch Home > Device sidebar > device name.



Check the Enable Performance Monitoring checkbox to see the CPU/memory usage and read/write throughput.

The Performance Monitor is disabled by default to save system resources.



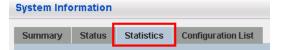
Controller Performance and Cache Usage Click System Information in the Tasks corner.



_____ Information

View the total System Information and applicable License Information.

Select the Statistics tab in the System Information screen that appears.



Check the item you want to monitor: Controller Read/Write performance and cache usage (dirty cache).

Operation Description		Graph
✓ Primary Controller Disk Read/Write Performance (MB/sec)	0.00	0.5
Secondary Controller Disk Read/Write Performance (MB/sec)	0.00	1.0 0.5 0.0
🗹 Dirty Cache (%)	0.00	0.5

Viewing the Hardware Status LED

The Enclosure View gives you a quick overview of the currently installed hardware modules (hard drives, power supplies, controllers) in the device as well as the hardware status LEDs.

For precise definition and status of the hardware modules and their LEDs, refer to the hardware manual.

Go To SANWatch Home > Device sidebar > Device List > device name> Tasks corner



Enclosure View

Click Enclosure View in the Tasks corner.



See the detailed information of enclosures connected to the system.

The front/rear view of the device will appear. Each circle (green/red) indicates an LED indicator.

Front View					
•					
•					
•	•				
0					
Rear View					
•	8	8			
	0 0				

To have a quick view of a hardware module's info, hover your mouse over the module, and the info will be displayed in a tooltip.

•	Slot: 1, (Channel: 4, ID: 0) SS Status: On-Line Drive, Size: Revision Number: 8862 Logical Drive: 4DF35352 Life Remaining: 99%	

"Life Remaining" is available for SSD drives only.

Hard Drives (Front View)



: Currently installed

Currently uninstalled or in an error state

Power Supplies (Rear View)



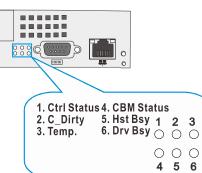
: The LED on the left side indicates the power supply

status LED. The two LEDs on the right side indicates the cooling fan status LEDs.

Controllers (Rear View)



: The six LEDs indicate controller status LEDs.



Name	Color	Status	
Green indicates that a RAID co		Green indicates that a RAID controller is operating healthily.	
1. Ctrl	Green/	Amber indicates that a component failure has occurred, or	
Status	Amber	inappropriate RAID configurations have caused system faults.	
		is also lit during the initialization process.	
		Amber indicates the following:	
		- Cache Memory is dirty.	
		- Data in flash backup module is being flushed to cache.	
2. C_Dirty	Amber	- Errors occurred with cache memory (ECC errors).	
		- Data is being flushed from flash backup module to drive	
		(when power is restored).	
		- Battery voltage is lower than 2.5V.	

	-	
		- Battery temperature reading is abnormal (out of the 0 to 45°C
		range).
		- Battery is not present.
		OFF indicates that the cache is clean, and that the battery
		backup unit is capable of sustaining memory in case of power
		loss.
		Blinking Amber indicates cached data is being transferred to
		the flash module after the occurrence of a power outage. Once
		the transfer is done, all LEDs will turn off.
		This signal is local to each controller.
		Amber indicates that the detected CPU/board/chassis
		temperature has exceeded the higher temperature threshold.
3. Temp.	Amber	
		OFF indicates that the detected temperature reading is within the
		safe range.
		Green steady on indicates the CBM module is ready. Both a BBU
		and flash modules are present.
4. CBM	Green/	Amber steady on indicates CBM failure, meaning either BBU or
4. CDW	Green	flash has failed. When lit, it also indicates either BBU or a flash is
Status	Amber	missing in a redundant-controller system.
		Blinking means a BBU is being charged.
		OFF means BBU is not installed in a single-controller "G" model.
i		
5. Hst Bsy	Green	Blinking Green to indicate traffic on the host bus.



Viewing System Information

The System Information screen shows you the current status and configurations of the device (system).

SANWatch Home > Device sidebar > Device List > device name> Tasks corner

Steps

Go To

Click System Information in the Tasks corner.



View the total <u>System Information</u> and applicable <u>License Information</u>.

The system information screen will appear.

Summary Status Statistics Configuration List

Device	Description
Controller	Cache:2048MB (ECC DDR), Firmware:5.11I.12, Boot Record:2.22A, Serial Number:8426476 (0x8093EC)
Channel	Channel 0 (Host, Fibre, Speed:8.0 Gbps)
Channel	Channel 1 (Host, Fibre, Speed:)
Channel	Channel 2 (Host, Fibre, Speed:)
Channel	Channel 3 (Host, Fibre, Speed:)
Logical Drive	ID:40296E98, RAID 1, 136.48 GB
Logical Drive	ID:EB8AF43, RAID 1, 136.48 GB
Logical Drive	ID:579052F0, RAID 5, 272.96 GB
Logical Volume	ID:1197167F0609B3EA, 409.44 GB
LUN	CH ID:0, SCSI ID:112, LUN Set0
LUN	CH ID:1, SCSI ID:112, LUN Set0
LUN	CH ID:2, SCSI ID:112, LUN Set0
LUN	CH ID:3, SCSI ID:112, LUN Set0

The Entire System Configuration

To view all system information (settings) at once, select the Configuration List tab.



Summary	Status	Statistics	Configuration List	
DS 3016 Softw SA System Cc Cc Cc Ma To Fin Bc State Side Side	IR Array (17 are Informa NWatch Co minformation onfiguration aintenance p tal Cache S mware Vers sobrecord Ve ontroller Pos ot A Serial N ot B Serial N ot B Serial N	2.27.113.24) tition ommander: 3.0. on e: 10/02/2013 - password: Not password: Not size: 8192MB (E sion: 5.11G.20 resion: 2.22A sition: Stot A Number: 8093D Number: 8093D S: 007DB3CA	a. 18 18:51 PM Set Set ECC DDR) F A	
Ca -ID Ho -Ho E Co	of NVRAM of NVRAM ost Board - S ost Board - S ontroller Dev	o Module (Redu Defaults: V2.17 Slot A: ISCSI 10 Slot B: ISCSI 10 vice me: CPU Temp	3, SN: 8091f5 3, SN: 80920b	

Controller/Cache Status

To monitor controller throughput and cache usage (dirty cache), select the Statistics tab and check the item you want to monitor.

You can monitor the overall system throughput and storage capacity usage from the Device home page screen, in the Performance corner.

System Information		×
Summary Status Statistics Configuration List		
Operation Description	Value	Graph
✓ Primary Controller Disk Read/Write Performance (MB/sec)	0.00	1.0 0.5 0.0
✓ Secondary Controller Disk Read/Write Performance (MB/sec)	0.00	1.0 0.5 0.0
✓ Dirty Cache (%)	0.00	1.0 0.5 0.0

Temperature/Voltage

To monitor the voltage and temperature of the device, click the Status tab.

When the voltage/temperature reaches preconfigured thresholds, an event message will be sent to notify the user of potentially hazardous situation. You can change the threshold settings from the System Settings link in the Tasks corner.

Summary	Status Statistics Con	nfiguration List		
Device Na	me	Value	Status	
Total Ca	ache Size	8192MB (ECC DDR)		
Firmwar	e Version	5.11G.20		
Boot Re	cord Version	2.22A		
Serial N	umber - Slot A (Primary)	8426463 (0x8093DF)		
Serial N	umber - Slot B (Secondary)	8426458 (0x8093DA)		
CPU Te	mperature	41.5 C	Temp. within safe range	
Controlle	er Temperature(1)	41.0 C	Temp. within safe range	
Controller Temperature(2)		57.0 C	Temp. within safe range	
Controller Temperature(3)		49.0 C	Temp. within safe range	
+5V Value		5.21 V	Voltage within acceptable range	
+12V Va	alue	12.01 V	Voltage within acceptable range	
Cache E	Backup Module		Cache Backup Module charging OFF (battery fully charged)	
iSCSI 10	3		iSCSI 1G functioning normally	
CPU Te	mperature(Redundant)	38.0 C	Temp. within safe range	
Controlle	er Temperature(1)(Redundant)	37.5 C	Temp. within safe range	1

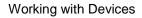
Controller and Channel Settings

To view the current controller and channel configurations, select the Summary tab.

Sy	stem Info	rmation	1		
5	Summary	Status	Statistics	Configuration List	
	Device		Description		
	Controlle	er	Cache:81921	MB (ECC DDR), Firmware:	
	Channel Channel 0 (H		lost, LAN, Speed:Negotiat		
	Channel		Channel 1 (Host, LAN, Speed:Negotial		
	Channel	l	Channel 2 (F	lost, LAN, Speed:)	
	Channel	I	Channel 3 (F	lost, LAN, Speed:)	
	Logical I	Drive	ID:4103F611	, RAID 5, 837.87 GB	
	Logical	Volume	ID:1570BF12	26107609F, 837.87 GB	

To configure channel settings, click the Channels link in the sidebar.

Device	
Device List	
	Default Group
🗄 🔚 DS 3024	
🗄 🔜 Logical Volumes	
SSD cache pool	
- Orives	
🔩 Channels	
🖳 📃 Data Hosts	
Schedules	





Resetting/Shutting Down the System

Resetting/Shutting Down the System

There are several ways to reset all or part of the system (device).

- Shutting down the device (RAID subsystem or JBOD)
- Shutting down the controller
- Resetting the controller

Before resetting or upgrading the subsystem, make sure you finish all current tasks and save the configuration settings if necessary. **Saving System** Go to SANWatch Home > top menu bar > System > Export System Information. Settings The list of connected devices (RAID or JBOD) will appear. Check the device and click OK. **Export System Information** Select the devices for exporting their system information. Device Name Model Name **IP Address** DS 3016G 10.10.1.1 The system information can be downloaded into a local folder in Zip format (text format). To view the system information on screen, click System Information in the Tasks corner. Information View the total <u>System Information</u> and applicable <u>License Information</u>. Shutting Down the Go to SANWatch Home > top menu bar > System > Shutdown Device. **Device (Enclosure)** The list of connected devices (RAID or JBOD) will appear. Check the device you want to shut down and click OK. **Shutdown Device** Select one or more devices to shutdown Available Devices -🔲 Name 🔻 Model -IP Address 🔻 JBOD -DS 3016G 10.10.1.1 0 Currently used storage volumes will become unavailable for hosts and users after shutting down the device (The user data inside the device will

remain intact)

Shutting Down the Controller (NOT supported by EonServ) As opposed to shutting down the device (the whole enclosure), shutting down only the controller does not power off the whole system.

Go to SANWatch Home > Device sidebar > Device List > device name > Tasks corner.



Click System Settings.

System Settings Configure generic system parameters.

The System Settings screen will appear. Select the System tab.

Check Shutdown Controller and click Apply.

System	Download/Upload	Password
O Mute I	Beeper	
O Rese	t Controller	
 Shutd 	lown Controller	
O Resto	ore Factory Settings	

Resetting the Controller (NOT supported by EonServ) Go to SANWatch Home > Device sidebar > Device List > device name > Tasks corner.



Click System Settings.



The System Settings screen will appear. Select the System tab.

Check Reset Controller and click Apply.

System	Download/Upload	Password		
C Mute i	Beeper			
Reset Controller				
O Shutdown Controller				
C Restore Factory Settings				



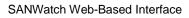
Restoring Factory Default Settings (NOT supported by EonServ)

	Restoring the default settings is the last resort for solving system errors, since it erases all system configurations.			
Pre-Restoration Works	 Before you restore the default settings, save the current configurations: Stop all host IOs. Export system configurations. Make a list of host ID/LUN mapping information. 			
Go to	SANWatch Home > Device sidebar > Device List > device name > Tasks corner			
Steps	Click System Settings.			

The System Settings screen will appear. Select the System tab.

Check Restore Factory Settings and click Apply.

System	Download/Upload	Password		
O Mute Beeper				
O Reset Controller				
O Shutdown Controller				
Restore Factory Settings				





Configuring System Settings

System Set	tings							
Controller	Communication	System	Trigger	Host-Side	Drive-Side	Disk Array		
Controller	entifier (HEX)	DB3C/ +00:00 10/03/ 9)		SNTP Confi SNTP IP I	guration ist	Add Delete	
Write-Bac	Parameters k Cache: ache Flush Time:	Enable			SNMP Com			
						ОК	Cancel	Apply



Summary of System Configurations

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click System Settings.



The System Settings screen will appear.

System Set	ungs				,
Controller	Communication	System	Trigger	Host-Side	Drive-Side
Controlle	dentifier (HEX)	C7D1 +00:0 03/21 11		×	SNTP Configuration SNTP IP List Add Delete Polling Period (hours) -1
Write-Ba	I Parameters ——— :k Cache: Cache Flush Time:	Enab Disal		Y	SNMP Community SNMP Community:
					OK Cancel Apply

To change the settings, pick an item, select a different option, and click Apply or OK at the bottom. The following is the list of configurable items. Default values are marked in **bold** letters.

Controller Here you can configure the controller parameters.

Item	Options	Configuration List
Controller Name: (user-defined, empty) Unique Identifier: (device-defined) Time Zone: -12:45 to 00:00 to +13:45 (NOT supported by EonServ) Date/Time: (computer-defined) (NOT supported by EonServ)	Controller Setting(s)	Controller Parameters
Caching Parameters	Write-Back Cache: Enabled / Disabled	

111



	Periodic Cache Flush Time (sec): Disabled
SNTP Configuration (NOT supported by EonServ)	SNTP IP List: (user-defined, empty) Polling Period (hr): (user-defined, empty)
SNMP Community	(user-defined)

Communication Here you can configure the network and serial communication settings.

(Not on EonServ)

Options	Configuration List
IPV4/IPV6	
Terminal Emulation: Enabled Baud Rate: 2400 ~ 38400	Communication > COM 1
Enable network protocol support	
Add/Delete Server IP	
All channels except CH0	
	IPV4/IPV6 Terminal Emulation: Enabled Baud Rate: 2400 ~ 38400 Enable network protocol support Add/Delete Server IP

System

Here you can perform system maintenance (reset, memory export/import, etc.).

Item	Options	Configuration List
System	Mute Beep Sound	
,	Reset Controller	
	Shutdown Controller	
	Force Fail Slot A Controller	
	(R-models only)	
	Force Fail Slot B Controller	
	(R-models only)	
	Restore Factory Defaults	
Download / Upload	Update FW	
	Update FW and Boot Disk	
	Import NVRAM from Host Disk	
	Export NVRAM to Host Disk	
	Import NVRAM from Disk	
	Export NVRAM to Disk	
Password	Change admin password	
Redundant	Cache Synchronization on	
	Write-Through	
	Adaptive Write Policy	

Trigger

Here you can configure device upper / lower temperature and voltage thresholds and events to trigger notifications.

Highlight a threshold parameter and click on Configure to set upper / lower thresholds, or check a trigger event.



	ltem	Options	Configuration List			
	Threshold	CPU temperature Controller temperature +5 Value +12 Value	Upper / lower threshold			
	Trigger	Controller Failure CBM Low or Failure Power Supply Failure Cooling Fan Failure Temperature Exceeding Threshold	NA			
Host-Side	Here you can configure host c	omputer and host interface	settings.			
	Item	Options/Description				
	Maximum Number of Queued I/O	This setting determines the may channel that are acceptable to c				
		Consider the host's memory, nu capacity when changing this set can set a higher value.				
		Note: Setting the value to 1024 performance.	generally provides the optimum			
	LUN per Host SCSI ID	This setting determines the maximum number of LUNs per host SCSI ID. When users access the system through a host SCSI ID, they see the associated LUNs as drives.				
		Note: Each controller can host up total host SCSI IDs. To check ho go to Channels > Host Channe channel to count checked IDs.	ow many host SCSI IDs are set,			
	Login Authentication with CHAP	This setting determines whether the system should authenticate a user's identity with CHAP (Challenge-handshake authentication protocol).				
		Note: This option is available to	iSCSI-host models only.			
	Jumbo Frames	When enabled, this setting allow Ethernet frame's size and there performance.				
		All end devices in the iSCSI net frame function activated, and sh setting.				
		Note: This option is available to	iSCSI-host models only.			
	Max Concurrent Host-LUN Connections	This setting determines the may connections.	kimum concurrent host-LUN			
		Note: You can set a higher valu than four logical drives or partiti				
	Tags Reserved per Host-LUN Connection	This setting determines the min that each connection should pro reserves resources accordingly	ocess. Then, the system			
		When you set a higher value, th resources for your connections.				



Peripheral Device Type	This setting allows the system to create a virtual peripheral device that users can access when the system does not have a LUN or storage space.	
	The virtual peripheral device works as a portal between users and the system. Users can get needed system information through it.	
Peripheral Device Qualifier	The setting determines the status of the virtual peripheral device.	
	Connected : The virtual peripheral device is connected to the system.	
	Supported but not Connected : The virtual peripheral device is supported by the system, but it is not connected to the system for access.	
Device Supports Removable Media	This setting determines whether the system supports attached media sources like DVD and CD-ROM.	
	Note: This setting only works in legacy versions of SANWatch.	
LUN Applicability	This setting determines how a SCSI ID is mapped to a LUN.	
	First Undefined LUN: Map the first available LUN to the SCSI ID.	
	Only Undefined LUN 0's: When the system has no LUNs, create a virtual LUN and map it to the SCSI ID.	
Cylinder/Head/Sector	This setting determines the size of a logical drive in units of cylinders, heads, and sectors. Specifying larger numbers increases a logical drive's size.	

Drive-side

Here you can configure hard drive interface settings.

Item	Options	Configuration List
Auto-Assign Global Spare Drive	Enabled / Disabled	Drive-Side Parameters
Auto Rebuild on Drive Swap (sec)	Disabled / 5 to 15 to 60	Drive-Side Parameters
SAF-TE/SES Device Check Period (sec)	Disabled / 0.05 to 60.0	Drive-Side Parameters
Disk Access Delay Time (sec)	No Delay / 5 to 60 to 75	Drive-Side Parameters
Disk I/O Timeout (sec)	0.5 to 30.0	Drive-Side Parameters
SMART	Disabled / Detect Only / Clone Only / Copy & Replace / Fail Drive	Drive-Side Parameters
Maximum Number of Tags	Disabled / 1 to 4 to 128	Drive-Side Parameters
Drive Motor Spin Up	Enabled / Disabled	Drive-Side Parameters
Power Saving (Level 1 & Level 2)	Disabled / 1 min to 1 hour	Drive-Side Parameters
SED Authentication Key	Create / Modify	Drive-Side Parameters

Disk Array

Here you can configure hard drive array settings.

Item	Options	Configuration List
Rebuild Priority	Normal / Improved / High	Disk array parameters
Verify Write on LD Initialization	Disable / Enable	Disk array parameters
Verify Write on LD Rebuild	Disable / Enable	Disk array parameters
Verify Write on Normal Access	Disable / Enable	Disk array parameters
Maximum Drive Response Timeout	Disable / 160(ms) / 320(ms) / 960(ms)	Disk array parameters
AV Optimization Mode	Disable / Fewer Streaming seconds	Disk array parameters
Read-ahead Option for Media Editing	Disable / SD Stream (50Mb/s) seconds / HD Stream (100Mb/s) seconds / 2K_4K Stream (100Mb/s+) seconds	Disk array parameters



Updating the Firmware

Download the latest firmware from Infortrend, and update the system OS (this web interface) of your subsystem's controller(s).

Prerequisite I: Checking Current Firmware Version	sidebar > Device List >	device name > S	go to SANWatch Home > Do Status corner. The firmware v em information section.		
	Alonso	Model:	DS 1016GE		
		IP Address:	172.27.112.110		
		Service ID:	8532316 (0x82315C)		
		Controller ID:	2315C		
		Firmware Version:	5.12F.05		
		Host Board:	FC 8G(Slot A:8511457 (0x81DFE1))		
Prerequisite II: Exporting System Configuration	Go to SANWatch Hom System Settings > Sys System Settings		ar > device name > Tasks sid ad/Upload tab	debar >	
	Controller Communication	n System Trigger			
	System Download/Uplo	ad Password			
	 Update Firmware 				
	 Update Firmware and Be 	pot Record			
	- ·				
	 Import NVRAM from Host Disk 				

Export NVRAM to Host Disk

- O Import NVRAM from Disk
- Export NVRAM to Disk

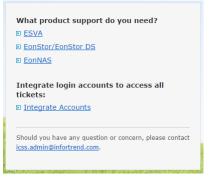
Select Export NVRAM to Host Disk and click OK. For more information, click the Help icon at the top-right corner and look for the Exporting /Importing NVRAM section.

Prerequisite III: Obtaining the Firmware Package	Before retrieving the latest firmware from Infortrend, make sure you already have a user account at Infortrend's <u>Customer Support System</u> , which was created when you registered your subsystem online.
	Go to http://support.infortrend.com, and then enter your account information to log in.

Olnfortrend Customer Support System

Email address Password Forgot your password Re-send activation e-mail	support	to learn more about the su ion	Important: Please click system enhancement no	
Forgot your password Re-send activation e-mail			Email address	
Re-send activation e-mail			Password	
Veen me signed in				
		or Create New Accoun	Keep me signed in	

Select the type of subsystem you are using. For ESVA users, click ESVA. For EonStor/EonStor DS users, click EonStor/EonStor.



In the page that appears, choose Downloads > Firmware & Software from the top menu.



In the Firmware Search section that appears, enter either of the following serial numbers, and then click Search: "System S/N" or "Controller S/N"

	Search	Clear
Controller S/N		
1234567		

When the search is complete, firmware available for your subsystem will be shown in the Firmware Available section. Click Download to download it to

your computer.



Updating the Firmware

Go to SANWatch Home > Device sidebar > Device List > device name >



Click System Settings.



The System Settings screen will appear. Go to System > Download/Upload.



Download/Upload

Click Browse under Update Firmware, locate the ".BIN" file you downloaded from Infortrend, and then click Open.



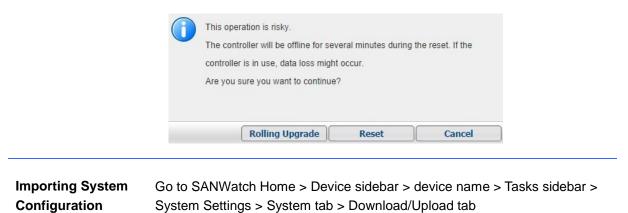
In the confirmation dialog that appears, click Yes to start the updating process.

1	The operation will take effect after the controller resets.
	Are you sure you want to update the firmware now?

At the end of the updating process, you are required to reset your controller(s) for the operation to take effect:

For R-models, you can click Rolling Upgrade to reset the controllers one by one, thus decreasing system downtime; or, you can click Reset to reset the controllers simultaneously.

For other models, click Reset to reset the controller.



System Settings



Select Import NVRAM from Host Disk and click Browse to locate the system configuration file you've exported before updating the firmware. For more information, click the Help icon at the top-right corner and look for the Exporting /Importing NVRAM section.

Configuring Voltage/Temperature Thresholds

A RAID subsystem or a JBOD enclosure is equipped with internal voltage and temperature sensors. When the current voltage/temperature reaches a preconfigured threshold, an event will be notified to the user to indicate potentially hazardous situation.

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Configuring the Temperature / Voltage Thresholds Click System Settings.

System Settings Configure generic system parameters.

The System Settings screen will appear. Select the Trigger tab. The threshold settings will appear.

Tasks

Trigger

Configuring the Voltage/Temperature Threshold

Highlight an item in the list.

Γ	- Threshold		Î
	Device Name	Current Value	
	CPU Temperature	42.5 C	
	Controller Temperature	46.0 C	
	+5V Value	5.21 V	
	+12V Value	12.01 V	

Click Configure. The configuration screen will appear. Enter the threshold value or you may click Disabled if you want to disable the threshold (and notification).



Selecting Triggered Item

You can select which events will trigger the subsystem to notify the user.

To receive notifications when the temperature reaches the threshold, make sure that the Temperature Exceeding Threshold checkbox has been selected. – Trigger ——

CBM Low or Failure

Power Supply Failure

🗖 Cooling Fan Failure

📕 Temperature Exceeding Threshold



Configuring the IP Address

You may change the IP address of the device, but doing so will disconnect the user interface in the old address. Make sure that you note down the new IP address and reconnect with the user interface using the new address.

Notes	You are not allowed to assign any of the following system reserved IP addresses to your subsystem:
	▶ 127.x.x.x
	 ▶ 128.0.x.x ▶ 191.255.x.x
	> 192.0.x.x
	➤ 223.255.255.x

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click System Settings.

System Settings Configure generic system parameters.

The System Settings screen will appear. Select the Communication > Management Port tab.

(Controller	Communi	ication	System	Trigger	Hos
	Manager	nent Port	RS-232	isns	Trunk Gro	up

Highlight the management (LAN) port you wish to configure and click Configure.

	IPv4 Type	IPv4 IP Address	IPv6 Type	IPv6 Address
LAN 0	Static	10.0.0.222	Disabled	

You may configure the IP address (IPV4 or IPV6).



IPv4			
Type: 💽 Static O DH	ICP Ö RARP		
Slot A			
IP address:	10.0.0.222		
Subnet mask:	255.255.255.0		
Default gateway:	0.0.0.0		
IPv6			
Type: O Static O Aut	to 💿 Disabled		
Slot A			
IPV6 address:			
Subnet prefix length:			
Route:			

The following system reserved IP addresses should not be used for your subsystem: 169.254.1.1~169.254.254.254.254.

Parameters	IPV4 Type	 Static: Specifies a fixed address. DHCP: Allows the network router to pick an available address for the device. RARP: Reverse Address Resolution Protocol is an old type of networking protocol used by a host computer to request its Internet Protocol (IPv4) address from an administrative host.
	IP Address / Subnet Mask / Default Gateway	Specifies (or lets the router pick) the IP address set for the device.
	IPV6 Type	 Static: Specifies a fixed address. Auto: Corresponds to the DHCP setting in IPV4 address. The router will automatically pick an address for the device. Disabled: Disables IPV6 (and enables IPV4).
	IPV6 Address	Specifies (or lets the router pick) the IP address set for the device.
	Subnet Prefix Length	Corresponds to the Subnet setting in IPV4.
	Route	A route is required to reach externally with IPV6 using an IPV6 router on the network.

Create SED Authentication Key for LD/LV Protection (EonStor DS subsystems only)

The SED (Self-Encrypting Drive) authentication key allows you to protect logical drives or logical volumes with SED security using drive-level encryption. You can enable SED for your subsystem with a "global key" or "local key(s)."

- Global key: This key can be used to encrypt all logical drives of your subsystem. Until you disable SED for a logical drive, SED encryption will always be effective.
- Local key: This key is used to encrypt a specified logical drive, and is available only when the global key is not created in the subsystem. In other words, creating a global key will overwrite the local key and hide its options in SANWatch. SED security using local keys will become ineffective after the system reboots; enabling it requires you to import the key file or password after each system reboot.

SED security only works on logical drives or logical volumes composed of SED drives only.

Go toFor global key: SANWatch Home > Device sidebar > Device List > device
name > Tasks corner > System Settings > Drive-Side tab



For local key: Navigate to a logical drive that supports SED, click Configure Logical Drive in the Tasks corner.

E Device
Device List Default G
ESDS 3016R(FC 8G)
E E Logical Volume 1
🖵 🌉 Logical Drives

Steps (Global Key)

Click Create.

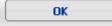


In the window that appears, use either of the following options to enable SED security.

Select the creation mode for the au	thentication key.
 Use a password to generate 	the authentication key for SED drives
New Password:	
Confirm New Password:	
Create an encrypted key file a	s the SED authentication key

- Use a password for SED authentication.
- Create an encrypted key file for SED authentication. You can either click Generate to create a new key, which will be downloaded and saved on your computer as a ".bin" file. Click Browse to locate and import the key file you just downloaded.

Click OK to generate the SED authentication key or password.



Now you can enable SED security for a logical drive or logical volume using the global key by doing the following:

Navigate to a logical drive or logical volume that supports SED, click Configure Logical Drive or Configure Logical Volume in the Tasks corner, and choose Enabled from the SED Security drop-down menu.

It is strongly recommended that you keep your SED authentication password or key file in a safe medium.

Modifying or Removing SED Authentication Key	Click Modify. Modify
	Use the SED password or key file you created while enabling SED password or
	key to unlock it, and click OK.
	 Authentication key generated via Password
	Required an Encrypted Key File for SED authentication
	SED Key File: Browse → OK
	In the window that appears, do either of the following:
	Select the creation mode for the authentication key.
	 Use a password to generate the authentication key for SED drives
	New Password:
	Confirm New Password:
	 Create an encrypted key file as the SED authentication key

- To modify the SED key or password: Enter a new password or create a new key file to change the SED password or key, and then click OK.
- > To remove the SED key or password: Leave the password fields blank and



	ОК	Cancel	
Managing Local	Click Create or Modify	to enable SED security using a password or k	ey file.
Keys for a Logical	Set LD A-Key	Absent: Create Modify	

Configuring Power Saving Settings

The power-saving option can enhance disk spin-down function for all disks on your subsystem. When there is no host I/O, disk drives may enter two power-saving modes: Level 1 for idle mode and Level 2 in spin-down mode.

- Level 1: Hard disks enter the standby mode by lowering their spinning speed (RPM)
- Level 2: Hard disk' read/write heads become idle by moving away from disk surfaces

You can further tailor power saving settings to your needs by applying different settings to a logical drive, including its local spares. To do so, go to SANWatch Home > Device > Logical Volumes > Logical Volume Name > Logical Drives > Logical Drive Name \rightarrow Tasks, and then click Power Saving.

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click System Settings.



The System Settings screen will appear. Select the Drive-Side tab.

Drive-Side

Power saving settings are near the bottom.

Power Saving:	L	Level 1:	
		Disable	•
	tł	hen Level 2:	
		Disable	•

Power Saving Level

Select the Drive-Side tab and configure the power saving mode.

Three options are available: Disabled, Level 1 only, and Level 1 then Level 2.

Waiting Period

You may also configure the waiting period for switching to the power saving mode.



- > Level 1: 1 to 60 minutes without I/O requests
- > Level 2: 1 to 60 minutes of Level 1 state

To configure power saving levels for individual logical drives, select the logical drive in the Device sidebar, and click Power Saving in the Tasks corner.

LevelsPower Saving RatioLevel 115% to 20%		Recovery Time	ATA Command	SCSI Command
Level 1	15% to 20%	1 second	Idle	ldle
Level 2	80%	30-45 seconds	Standby	Stop



Configuring Time Settings

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click System Settings.



The System Settings screen will appear. Select the Controller tab.

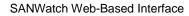
Controller

Configure the controller name, unique identifier, time zone, date, and time.

 Controller Parameters 		
Controller Name		
Unique Identifier (HEX)	8000D	
Timezone (GMT)	+00:00	
Date	03/14/2014	
Time	17 💌 : 17 💌	

To configure the date, click the calendar icon to the right and select the correct date.

Timezone (GMT)	+00:	00			•		
Date	07/2	07/29/2014					
Time	O July 2014					0	
	Su	Мо	Tu	We	Th	Fr	Sa
			1	2	3	4	5
Cooking Decemeters	6	- 7	8	9	10	11	12
Caching Parameters Write-Back Cache:	13	14	15	16	17	18	19
Periodic Cache Flush Time:	20	21	22	23	24	25	26
i chodio odono i doni filine.	27	28	29	30	31		



Trunking Host Interfaces to Increase Bandwidth

Increase network bandwidth by combining (trunking) multiple LAN interfaces into one, creating a link aggregation configuration.

Trunking offers the following benefits:

- > Increased bandwidth: bandwidths of multiple interfaces will be added up.
- Improved security: Even when one LAN interface fails, the other interface will keep the network connection intact.

Notes

- > Multiple LAN ports on your hardware must be connected to the network.
 - The network switch must be compatible with trunking.
 - > The trunking option is available only for iSCSI-host models.

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner

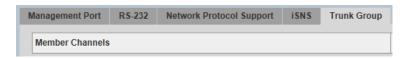


Steps

Click System Settings.

System Settings Configure generic system parameters.

The System Settings screen will appear. Select the Communication tab and select the Trunk Group tab.



Click the Create button. In the popup window, check the LAN interfaces you wish to combine (trunk) and click OK.



The new trunk configuration will appear.



ß	lanagement Port RS-232 iSNS Trunk Group		
	Member Channels	IPv4	IPv6
	4, 5	DHCP	Disabled
			Create Delete

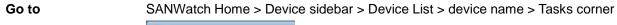
To delete the trunk group, click the Delete button.



Muting the Beeper Sound

Each RAID system or JBOD expansion enclosure contains hardware beep mechanism to notify users when system errors and hardware failures occur. You may mute the sound on the hardware directly (please refer to the hardware manual for details) or do so remotely through the user interface.

You can only mute the currently beeping sound: you cannot disable the buzzer setting from the user interface.





Steps

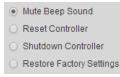
Click System Settings.



The System Settings screen will appear. Select the System > System tab.



Check Mute Beep Sound and click OK.





Exporting/Importing NVRAM

NVRAM (non-volatile memory in storage subsystems) contains system configuration information. You may export it to preserve the current system status or import it to restore system configurations.

When to Export NVRAM	 After firmware upgrade Before replacing both controllers After mapping logical drives to host LUN or changing system configurations
When to Import NVRAM	 The system has been unstable Both controllers have been replaced The firmware version of the NVRAM to be imported must match the firmware
	version of the current system.
Location	Two options are available for storing the NVRAM information:Disk: Uses the subsystem's internal storage.
	At least one logical drive must exist in the subsystem.
	Host Disk: Uses the host computer's storage.

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click System Settings.

System Settings Configure generic system parameters.

The System Settings screen will appear. Select the System > Download/Upload tab.

Controller	Communication	System	Trigger	Host-Side
System	Download/Upload	Password		

Select a NVRAM option, click Browse to locate the file, and click OK.



Import NVRAM from Host Disk

Browse Browse NVRAM File:

C Export NVRAM to Host Disk

- C Import NVRAM from Disk
- C Export NVRAM to Disk



Detect logical drives (or pool elements for ESVA subsystems) that no longer belong to specific logical volumes (or pools for ESVA subsystems) to remove them from the system and subsequently reuse them.

Go to

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click Isolated Logical Drive(s).



The list of isolated logical drives will appear.

Isolated LD/Element					×	
Select the logical drive(s) or pool ele	ment(s) for running ma	aintenance tasks.				
Device Element ID Size Status RAID Level Assigned						
DS B24F-R2852-6, 80101	6DC40782	33.99 GB	Good	RAID 1		

If no isolated elements exist, the window will not appear.

Check the system you wish to remove and click Delete.

Delete



Removing Invalid Host Mappings

Detect invalid host mappings and remove their settings.

Go to SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click Invalid Host LUN Mappings.

System Maintenance View the total Isolated Logical Drive and applicable Invalid Host LUN Mappings

The list of invalid host mappings will appear.

Invalid Ho	st LUN Mapping							
Select th	ne LUN mapping set(s) for running	maintenance tasks.						
Select	Device	Unknown ID	СН	Target	LUN	Host ID	Alias	Group
	ESVA E75-2230, 84DB8	317289985927AA6A	0	0	0			
	ESVA E75-2230, 84DB8	317289985927AA6A	0	1	0			
	ESVA E75-2230, 84DB8	317289985927AA6A	1	0	0			
	ESVA E75-2230, 84DB8	317289985927AA6A	1	1	0			

If no invalid mappings exist, the window will not appear.

Check the mapping you wish to remove and click Delete.

Delete



Check Miscellaneous Events

Detect a list of miscellaneous events by the system. The event types, reasons, status will be displayed details on the table, such as problems of partition.

Go to SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click Other(s) to check if any event being discovered on the list.

22	System Maintenance							
*	View the total Isolated Logical Drive(s), applicable Invalid Host LUN Mapping(s),							
	and <mark>Other(s)</mark> .							

The list of other type of error events will appear.

Event Type	Target Unique ID	Status	Cause	Severity	Action
Partition of LV:4E14C315169DB362	403E6BDD1F10A031	Incomplete partition	Partition creation or removal is not completed	Warning	Could be deleted
Partition of LV:4E14C315169DB362	51093C863CD4FA8A	The partition is abnormal but has no immediate risk of danger	The partition size should be multiples of LV's data section size (2MB).	Warning	Contact technical support. Please don't expand the partition on your own.

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Working with System Events

Events are signals from the storage subsystem that the users (administrators) should know in order to manage the system.

In SANWatch, the Notification module collects the event status and sends them to the user through various channels. The following notification settings are available:

- > Notifying users in case of system events
- Periodically sending out system log
- > Activating user-specified applications in case of system events

Types of Events

Events can be categorized by (1) their scope and (2) their severity. For the detailed list of events and their descriptions, see the Troubleshooting Guide. Contact the <u>Support</u> to obtain it.

Scope of Events	Event Type	Scope				
	Controller Event	Describes the events related to the storage system controllers.				
	Drive Event	Describes the events related to the physical disk drives.				
	Host Event	Describes the events related to the host computer and host ports.				
	Logical Drive Event	Describes the events related to logical drives and logical volumes.				
	System Event	Describes the events related to the overall storage subsystem.				
Severity of Events	There is a combination of warning, error, and information levels.					
	Severity	Description				
	critical error	Describes the events that users should pay immediate attention and perform required actions.				
	error	Describes the events that users should pay attention and perform required actions.				
	warning	Describes the events that users should pay attentions.				
	information	Describes the events that notify users of non-critical changes in system status.				



Viewing Event Log

Go To

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Procedures

Click the Event Log menu in the Tasks corner.

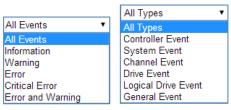


Event Log View the system events and device operation logs.

The list of events will appear.

vent Log	Schedule E	vent Log				
All Events	~	All Type	s 🗸			
Index 👻	Severity 👻	Туре 👻	Date/Time 👻	Events 👻	Code 👻	
45	0	985	2013/10/03 09:35:24	CHANNEL:1 Host channel speed changed to 1Gb	0x11098103	
44	0	995	2013/10/03 09:35:24	CHANNEL:1 Host channel connected	0x01098102	
43		985	2013/10/03 09:35:21	CHANNEL:1 Host channel disconnected (2)	0x11098101	
41		995	2013/10/03 09:35:18	CHANNEL:0 Host channel speed changed to 100Mb	0x11098106	
40	0	985	2013/10/03 09:35:18	CHANNEL:0 Host channel connected	0x01098102	
39		985	2013/10/03 09:35:02	CHANNEL:0 Host channel disconnected	0x11098101	
38	0	8	2013/10/02 19:01:46	LD:413F611 Logical drive on-line initialization completed	0x020A8202	
37	0		2013/10/02 17:49:52	NAME:Volume ID:1570BF12617609F Logical volume created	0x020B0028	
36	0	8	2013/10/02 17:49:35	LD:413F611 Logical drive on-line initialization started	0x020A8102	
35	0		2013/10/02 17:49:35	LD:413F611 Logical drive created	0x020A8206	
34	0	8	2013/10/02 17:49:34	LD:413F611 Logical drive creation started	0x020A8106	
33	0	8	2013/10/02 16:34:14	CHANNEL:4 ID:3 Drive scanned (3)	0x0208C101	
30	0	985	2013/10/02 16:12:21	CHANNEL:0 Host channel speed changed to 1Gb	0x11098103	
29	0	985	2013/10/02 16:12:21	CHANNEL:0 Host channel connected	0x01098102	

Select the severity and type of events to filter which events will appear.



Click the triangle next to a header to reverse the ascending or descending order.

Index 👻

Parameters

Event Type

Selects the types (scopes) of events that will be listed.



Severity Selects the severity of events that will be listed.



Exporting Event Log

Go To

SANWatch Home > Device sidebar > Device List > device name > Task corner



Steps

Click the Event Log menu in the Tasks corner.



The list of events will appear.

vent Log	Schedule E	vent Log				
All Events		All Type	s 🔽			
Index 👻	Severity 👻	Туре 👻	Date/Time 👻	Events 👻	Code 👻	
45	0	98	2013/10/03 09:35:24	CHANNEL:1 Host channel speed changed to 1Gb	0x11098103	
44	0	98	2013/10/03 09:35:24	CHANNEL:1 Host channel connected	0x01098102	
43		98	2013/10/03 09:35:21	CHANNEL:1 Host channel disconnected (2)	0x11098101	
41		98	2013/10/03 09:35:18	CHANNEL:0 Host channel speed changed to 100Mb	0x11098106	
40	0	985	2013/10/03 09:35:18	CHANNEL:0 Host channel connected	0x01098102	
39		985	2013/10/03 09:35:02	CHANNEL:0 Host channel disconnected	0x11098101	
38	0		2013/10/02 19:01:46	LD:413F611 Logical drive on-line initialization completed	0x020A8202	
37	0	0	2013/10/02 17:49:52	NAME:Volume ID:1570BF12617609F Logical volume created	0x020B0028	
36	0		2013/10/02 17:49:35	LD:413F611 Logical drive on-line initialization started	0x020A8102	
35	0		2013/10/02 17:49:35	LD:413F611 Logical drive created	0x020A8206	
34	0		2013/10/02 17:49:34	LD:413F611 Logical drive creation started	0x020A8106	
33	0	8	2013/10/02 16:34:14	CHANNEL:4 ID:3 Drive scanned (3)	0x0208C101	
30	0	985	2013/10/02 16:12:21	CHANNEL:0 Host channel speed changed to 1Gb	0x11098103	
29	0	985	2013/10/02 16:12:21	CHANNEL:0 Host channel connected	0x01098102	

Click Export. You can save the log into a local file in text format.

Export



To receive event notifications (especially when the system encounters abnormal status such as high temperature or power supply failure), make sure that the triggering mechanism has been activated.

Go To

SANWatch Home > Device sidebar > Device List > device name > Tasks corner



Steps

Click System Settings in the Tasks corner.

System Settings Configure generic system parameters.

The System Settings screen will appear. Select the Trigger tab.

Trigger

Configuring the Voltage/Temperature Threshold

Highlight an item in the list.

Γ	– Threshold –	
	Device Name	Current Value
	CPU Temperature	42.5 C
	Controller Temperature	46.0 C
	+5V Value	5.21 V
	+12V Value	12.01 V

Click Configure. The configuration screen will appear. Enter the threshold value or you may click Disabled if you want to disable the threshold (and notification).

Lower Threshold (0 to 20):	þ 🗖 Disa	bled
Upper Threshold (50 to 100):	90 🗖 Disa	bled

Selecting Triggered Item

You can select which events will be notified to the user.

To receive notifications when the temperature reaches the threshold, make sure that the Temperature Exceeding Threshold checkbox has been enabled. – Trigger –

CBM Low or Failure

Power Supply Failure

🗖 Cooling Fan Failure

Temperature Exceeding Threshold



If you have any license-related issues (local and remote replication) with your subsystem, contact your dealer. License Types You will need to apply or download a license key for using the following features in EonStor DS series. The Standard License is provided for free for all users. The Advanced License might need to be purchased beforehand. Feature/Functionality License Type Standard Local Replication Standard License Standard License Connecting an EonStor DS RAID system with an EonStor JBOD (Applicable when an equivalent EonStor model is available as a compatible JBOD for that particular RAID system) Standard License Thin Provisioning Advanced Local Replication Advanced License **Advanced License** Remote Replication Automated Storage Tiering Advanced License Advanced License SSD cache pool Notes When your license expires, apply for a license renewal. > When you have upgraded your features, apply for a license upgrade. > If you want to try out the advanced license features for 30 days, apply for a Trial License. It is required to reset the system for the license to take effect after a license

The licensing policy might change without notice. If necessary, check with the customer support for the latest license policy status.

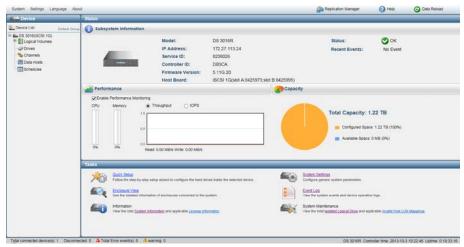
is installed.

Generating the License Application File

Before starting any EonStor DS license process, please check whether Infortrend's SANWatch management suite, which was shipped together with the EonStor DS storage system, has been properly installed.

Steps

Enter the SANWatch Browser Interface.



Select (highlight) the subsystem for which you want to apply for a license.



Click License Information in the Tasks corner.



In the License Key window, click Generate License Application File.



Curr	rent License	
	[⊕] EonPath	
	Thin Provisioning	
	[⊕] Snapshot	
	[⊕] Scale-Out	
	Tolume Copy	
	🖳 Volume Mirror	
	E	
		Generate License Application File

A reminder appears explaining that a License Application File can only be used to generate one license. Click **OK**.

Save the License Application file.



Generating the Standard License Key

Steps

Visit Infortrend's EonStor DS Software License website:

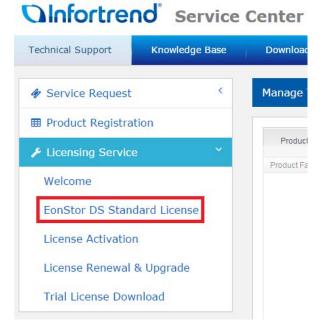
<u>http://support.infortrend.com/</u> and log in. If you don't have an account, please click **Create an account** to register for one.

ic

Technical Support Knowledge Base Download

Technical Support Email address Your email address Password Remember me	Knowledge base	Down
Technical Support	1.2.1	New
Email address		
Your email address		
Password		
Remember me		
Logi	n	
Lost Password	Create an account	

For a Standard License, please select EonStor DS Standard License.



Carefully read the information, click the checkbox, and click Next.

EonStor DS Standard Local Replication License Download

Please read the following notification and requirement before click **Next**.

The standard license includes snapshot and volume copy/mirror.

```
SANWatch version must be v.2.1.b or later.
```

After finishing the process, you must download the License Key File directly since you will not receive any e-mail notifications.

 $\ensuremath{ \ensuremath{ \mathbb{S}} }$ I have read and understand the above information.

Upload the License Application File you obtained through SANWatch, and click **Next**.

EonStor DS Standard Local Replication License Download

 B Step 1 . Upload License Apply File

 Make sure that the License Apply File is the latest version. (If you are not sure, you can re-generate the License Apply File from SANWatch that is connected to your EonStor DS system)

 Step 2 . Fill in customer information

 Step 3 . Download License Key File

 Please upload License Apply File generated in SANWatch, then click "Next".

 License Apply File

Fill in customer information and click Next.

EonStor DS Standard Local Replication License Download

Step 1 . Upload License Apply	/ File
Step 2 . Fill in customer in	Iformation
Step 3 . Download License Ke	ay File
Please Fill in the following requi	ired information, then click "Next".
Name *	
Email Address *	
Confirm Email *	
Company	
Phone	
Company Address	
Country *	Select
Industry *	
EonStor DS Vendor Name	

🗉 I wish to receive product information from Infortrend

Next

Next

Next

Download the License Key File by clicking **Download**.

EonStor DS Standard Local Replication License Download

Step 1. Upload License Apply File
Step 2. Fill in customer information

Step 3. Download License Key File
Please dick on Download to receive the License Key File immediately

Download

In case you encounter any problem when uploading the downloaded file to your EonStor DS system, please re-generate the License Apply File and go through this

Retrieve License[®] process again, or contact Infortrend for help.

Save the License Key File in a preferred location and upload it to SANWatch.



Generating the Advanced License

You can try out advanced license features for 30 days using the Trial License before making a purchase decision.

Steps

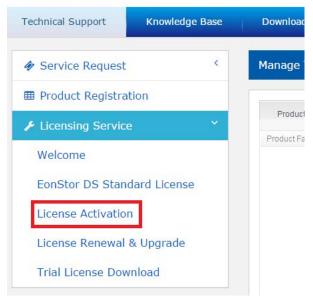
Visit Infortrend's EonStor DS Software License website:

<u>http://support.infortrend.com/</u> and log in. If you don't have an account, please click **Create an account** to register for one.

Olnfortrer	Service	Center
Technical Support	Knowledge Base	Downloa
Technical Support	121	New Tic
Email address		
Your email address		
Password		
Remember me		
Login		
Lost Password	Create an account	

For an Advanced License, please click License Activation.

OInfortrend[®] Service Center



Upload the License Application File you obtained through the SANWatch software and click **Next**.



Step 1 . Upload Licen	se Apply File				
Make sure that the License Apply File is the latest version. (If you are not sure, you can re-generate the License Apply File from SANWatch EonOne that is connected to your EonStor DS / GS system)					
Step 2 . Insert Softwar	e License Serial Number				
Step 3 . Download Licer	nse Key File				
ase insert License Apply File	generated in SANWatch / EonOne, then click "Next".				
icense Apply File	[魏]][[][]][[]]][[]]][[]]][[]]][]][]][]][
	[暹擇檔案] 未選擇任何檔案				

Fill in the License Serial Number you received, and then click **Add**. After adding the License Serial Number, click **Next**.

	File
Step 2 . Insert Software Lice	ense Serial Number
(You can enter multiple add-on li	icense codes)
Step 3 . Download License Key	File
	License Serial Number, then click on "Next".
lease use "Add" and "Remove" if you v	would like to activate multiple software licenses in this EonStor DS / GS system.
License Serial Number	Add
	(Enter one license code at a time)
License	Remove
Activated License	

You can generate multiple licenses in a single activation process. Simply fill in another License Serial Number and click add. The added licenses will be listed in the **License** box.

Click **Download** to receive the License Key File.

License Activation

Thank you for purchasing EonStor DS / GS Software License.

Please click on Download to receive License Key File immediately. You will not receive any e-mail notification for license activation.



Save the License Key File at a preferred location and upload it to SANWatch.

Upgrading Standard License to Advanced License

Here we will introduce how to upgrade from a current standard license to a new advanced license.

Steps

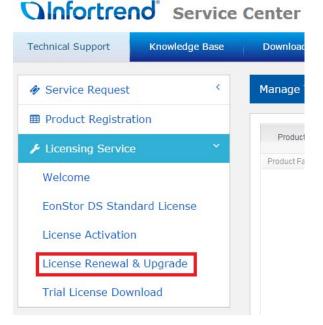
Visit Infortrend's EonStor DS Software License website:

<u>http://support.infortrend.com/</u> and log in. If you don't have an account, please click **Create an account** to register for one.

Oinfortrend[®] Service Center

Technical Support	Knowledge Base	Downloa
Technical Support	1.9.1	New Tio
Email address		
Your email address		
Password		
Remember me		
Log	in	
Lost Password	Create an account	

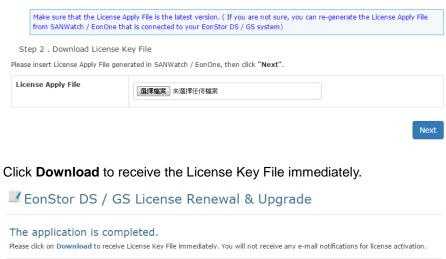
If you have already purchased a standard license and wish to upgrade to advanced license, please click on **License Renewal & Upgrade**.



Upload the License Application File you generated through SANWatch and click **Next**.

EonStor DS / GS License Renewal & Upgrade

Step 1 . Upload License Apply File



In case you encounter any problem when uploading the downloaded file to your EonStor DS / GS system, please re-generate the License Apply File and go through this "Retrieve Licesne" process again, or contact Infortrend for help.

Save the License Key File at a preferred location and upload it to SANWatch.

Renewing the License

If you have lost a previously generated License Key File, you can re-generate it through the license website.

Steps

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<u>http://support.infortrend.com/</u> and log in. If you don't have an account, please click **Create an account** to register for one.

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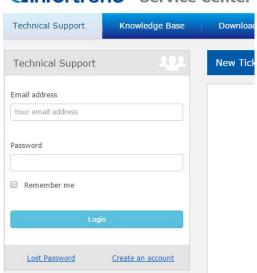
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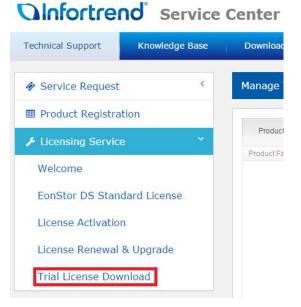
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Step 2 . Complete	required information						
Step 3 . Download Li	Step 3 . Download License Activation File						
Please Fill in the follow	ing required information, then click "Next".						
Name *							
Email Address *							
Confirm Email *							
Company							
Phone							
Company Address							
Country *	Select						
Industry *							
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Save the License Key File at a preferred location and upload it to SANWatch.

Working with SSD Cache Pool (EonStor DS subsystems only)

Evice Device	SSD Cache Po	ool Status							
Device List Default Group	SSD Cacl	SSD Cache Pool Information							
DS S16F-G2850 Discrete State Pool SD cache pool Drives Channels Data Hosts Schedules	SSD cache	Membe		118.75 G 2/4 Enable Disable	38				
	Drive Lis	t							
	Slot ID	Model	Size	Life Rem	Serial No.	Status	SED D	JB	
	<u>SSD</u> <u>S</u> S	SSDSA2SH064	59.37 GB	99%	CVEM913600D4	On-Line Drive	No) ^
	SSD <u>S</u> 1	TS64GSSD720	59.37 GB	0%	A074881903235	On-Line Drive	No		
		<u>dd Disk</u> dd SSD disk(s) to SSD	cache pool.			<u>ve Disk</u> ve member disk(s) from	SSD cache p	pol.	•

SSD cache pool is a pool composed of SSD drives, designed to accelerate application workloads by automatically copying the most frequently accessed data (a.k.a. the hot data) to the lower latency SSD drives, so that next time when the same data is requested by a host computer, the subsystem will retrieve it from the SSD cache pool (instead of other drives), thus boosting the data reading performance for the host. SSD cache pool is especially useful for environments with intensive random reading requests, such as OLTP and databases, etc.

Since the SSD cache pool works in ways similar to that of a cache, data stored in it will be removed after the controller is reset or shut down.

To use the SSD cache pool, additional license is required. Go to SANWatch home > Device sidebar > Device List > device name > Tasks corner > License Information (under Information) to apply for it.

Configuring SSD Cache Pool (EonStor DS subsystems only)

Notes and limitations	SSD cache pool can only accelerate the reading process for host computers. Writing data from host computers to the SSD cache pool is currently not supported.
	"Sequential read" is not supported by the SSD cache pool, meaning using the SSD cache pool will not enhance the reading performance for sequential data, such as multimedia files. On the other hand, the SSD cache pool can enhance the random reading performance for databases and OLTP.
	After configuring the SSD cache pool for the first time, resetting the controller is required. Resetting the controller will not be required for future configuration.
	Designating drives located in JBOD enclosures as member drives of the SSD cache pool is not allowed.
	> One controller can manage up to 4 member drives in the SSD cache pool.
	 RAID configuration is not available for member drives in the SSD cache pool.
	Data stored in the SSD cache pool will be removed every time the subsystem reboots.

SANWatch Home > Device sidebar > Device List > device name > SSD Cache pool > Task corner



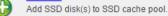
Activating the SSD cache pool

Go to

Click Add Disk in the Tasks corner.



Add Disk



Select any of the available SSD disks from the list.

🗌 Slot ID 👻	Model 👻	Size 💌	Life 👻	Serial No. 👻	Status 👻	SED 👻	JB ▼
🖌 Slot 1	SSDSA2SH064G1GC	59.37 GB	99%	CVEM913	Formatted Drive	No	
Slot 2	TS64GSSD720	59.37 GB	0%	A0748819	Formatted Drive	No	

Click OK and then click Close when the process is complete.



If you are enabling the SSD cache pool for the first time, you will be required to reset the controller for the function to take effect. Resetting the controller will not be required for future configuration.



Enabling or disabling the SSD	Click Disable or Enable in the Tasks corner.
cache pool function	SST Disable Or Enable Enable
Tunction	Click Yes and then click Close when the process is complete.
	Yes Close
Enabling SED	Make sure all member drives support SED before proceeding.
Security	Click SED Security - Enable in the Tasks corner.
	SSC SED Security - Enable SED Set a SED password or create a key file to enable SED.
	In the window that appears, choose an option from the SED security drop-down menu, and then click Apply to enable or disable SED security.
	Configure the parameters of this logical drive.
	SED Security Enabled Apply
	For more information about using a "global" or "local" key to protect drives with SED security, go to SANWatch Home > Device sidebar > Device List > device name, click the Help icon at the top-right corner, and look for the SED related topic. SED security will be enabled when the setting is completed. Click Apply and Close to finish.
Enclosure View	To view the position of member drives, click Front view in the Tasks corner.
	The position of the member drives will be highlighted in the enclosure view.
Removing member drives	Click Remove Disk in the task corner. SSE Remove Disk Remove member disk(s) from SSD cache pool.

In the window that appears, select the disk(s) you want to remove.

🗌 Slot ID 👻	Model 👻	Size 👻	Life 👻	Serial No. 👻	Status 👻	SED 👻	JB 👻
Slot 1	SSDSA2SH064G1GC	59.37 GB	99%	CVEM913	Formatted Drive	No	
Slot 2	TS64GSSD720	59.37 GB	0%	A0748819	Formatted Drive	No	

Click OK and Yes to confirm the change.





Working with Drives

The Drives menu allows you to view the current hard disk drive configurations inside the device (RAID subsystem or JBOD) and monitor the performance, identify the drive with system errors (red system LED), clone (copy) the contents of a drive to another one, and delete the system reserved space inside a drive to save storage capacity.



Viewing Drive Parameters

Go to SANWatch Home > Device sidebar > Device List > device name > Drives.



The list of installed hard drives will appear.

Drive List	
Slot ID 🔺	Model 🔻
Slot 2	ST31463568S
🧼 <u>Slot 3</u>	ST314635688
Slot 4	ST3146356SS

Click the link to see the parameters of the hard drive.

Slot:	1
Model:	ATA SSDSA2SH064G1GC
Serial Number:	CVEM913600MH064K
Status:	Used Drive
Size :	59.37 GB
Speed:	300MB
Revision Number:	8862
Logical Drive:	
Life Remaining:	99%

"Life Remaining" is available for SSD drives only.

You may click Refresh to update the parameters to the latest status.

Refresh



Click the System Information link in the Tasks corner.



Viewing System Hardware **Parameters** (including drive parameters)

Click the Configuration List tab. All system parameters will be listed.

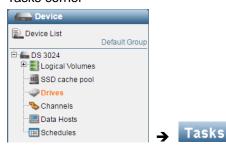
Summary	Status	Statistics	Configuration List
🗏 Physi	ical Drive Inf	ormation	
⊟ si	ot: 1		
	"Chl: 4(5)		
	SCSI ID: 0		
	Size(MB): 3	815191	
	Status: On-	Line Drive	
	Speed: 600	MB	
	LD: AF23C	00	
	Vender and	Product ID: SE	EAGATE ST4000NM00
	Revision N	umber: 0003	
	Serial Num	ber: S1Z04TYM	/10000K440
	Disk Capac	city (blocks): 78	14037167
⊟ si	ot: 2		
	"Chl: 4(5)		

Scanning Drives

To scan a disk drive, it must be an enclosure spare drive or a global spare drive.

Go to

SANWatch Home > Device sidebar > Device List > device name > Drives > Tasks corner



Scheduling Drive Scanning

Click Drive Scan in the Tasks corner.



Scan a drive and check the status of its data blocks.

The drive (media) scan window will appear.

Select the <mark>d</mark> rive	and its parameters to	run media scan.			
RA	ID				
	•	•	•	•	
	•			•	
	•				
				1	
	Drive Slot :				
	Priority	Low	~		
	Mode	Single	-		
				Apply	Close

Select the drive to scan (slot 8 in this case).



Media Scan					×
Select the drive	and its parameters to ru	n media scan.			
RAI	D				
	•	•	•	•	
		•		•	
	•				
	•			•	
	Drive Slot :	8			
	Priority	Low			
	Mode	Single	•		
				Apply	Close

Select the priority and mode, and then click Apply.

The scan will start.

Aborting the Scan

To stop the scan from running, click the drive which is being scanned. The button will turn into "Abort" and you may click it.

Select the <mark>d</mark> rive :	and its paramet <mark>e</mark> rs to ru	in media scan.			
RAI	D				
	•	•	•	•	
				•	1
	•				
	Drive Slot :	8]	
	Abort the media scan	process of selected c	Irives.		
				Abort	Close

 Priority
 Specifies how much of the system resource be used for scanning. The higher the priority, the faster the scanning but the system performance will decrease.

 Mode
 Specifies the scanning to be performed once

Specifies the scanning to be performed (Execution Once) or continuously.

Cloning a Drive

Cloning refers to taking a backup copy of a drive that has been predicted to fail in the near future. You may receive indications of drive failures such as bad sectors through event notifications. When a drive fails, the clone target drive automatically takes place of the failed one to prevent system downtime.

The source drive can be a member of a logical drive (or pool element). The destination (target) drive must be a spare drive.

Go to

SANWatch Home > Device sidebar > Device List > device name > Drives >



Steps

Click the Clone menu in the Tasks corner.



The front view of the drive slots will appear. Click to select the source drive.

rive and use clone it t	o a spare drive in the F	Perpetual Clone mode	or in the Replace After Clone mode	э.
θ	•) e	•	
0	•			
•	•			
lease select the sou	rce drive (as a membe	r drive of a logical drive	e) to be cloned.	
)rive Slot :	6			
Perpetual Clone	C Replace Aft	ar Clana		
	e esse select the sou rive Slot :	lease select the source drive (as a membe prive Slot : 6	Image: select the source drive (as a member drive of a logical drive trive Slot :	lease select the source drive (as a member drive of a logical drive) to be cloned. rive Slot : 6

Select cloning type.

œ

Perpetual Clone 🔅 Replace After Clone

> Perpetual Clone: The source drive continues operation after cloning. The



target drive will be labeled as a "clone drive" and will not be used until the source drive fails. When the source drive actually fails, the target drive takes its place.

Replace After Clone: After cloning, the target drive takes place of (replaces) the source drive. The source drive will not be used any more, waiting to be replaced by a new drive.

Click Apply. The target drive (a spare drive) will be chosen automatically and the source drive will be cloned.

Replacing a Drive

Instead of waiting for a drive to fail (and then be replaced automatically), you may replace a drive that is likely to fail soon with a drive manually.

The source drive must be a member of a logical drive (or pool element). The destination (target) drive must not be a member of a logical drive nor a spare drive.

Go to

SANWatch Home > Device sidebar > Device List > device name > Drives >



Steps

Click Copy & Replace in the Tasks corner.



The Copy & Replace window will appear.

elect the s	ource drive and copy its content	is to the target driv	e. Then, replace the s	source drive.	
	545				
	RAID				
		•			
		•	•	•	1
					-
					-
		•			
	Step 1: The source drive	cannot be a men	nber of a logical drive		
	The source drive slot has	s been selected:			
	The target drive slot has	been selected:			

Click to select the source drive, and click Next

The source drive must be part of a logical drive (or pool element).

Click to select the target drive, and click Apply.

The target drive cannot be a member of a logical drive (or pool element).

The content of the source drive will be copied to the target drive, and then the



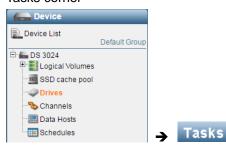
target drive takes place of the source drive.

Identifying a Drive

You may flash the LED on the drive trays to identify the drive hardware-wise on a storage subsystem enclosure.

Go to

SANWatch Home > Device sidebar > Device List > device name > Drives > Tasks corner



Steps

Click Drive Identification.



The front view of the drive slots will appear.

Identify Drive			×
Identify <mark>se</mark> lected drives by flashing their L	ED.		
RAID			
•	• •		
	• •		
	• •		
•	•		
Drive Slot :			
	Flash Selected Drives		
	C Flash All Drives		
	O Flash All But Selected Drives		
		Apply	Cancel

Click the drive you would like to identify. The selected drive will be highlighted and its ID number will appear in the Drive Slot field.

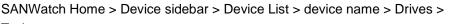


	RAID	
	Drive Slot :	2 Flash Selected Drives Flash All Drives Flash All But Selected Drives
	Select how the hard drive Flash Selected Drives Flash All Drives Flash All But Selected D	LED(s) will be flashed and click Apply.
	The LED of the selected (seconds.	or unselected) drives will turn blue for five to ten
Parameters	Flash Selected Drive	Flashes only the LED of the selected drive.
	Flash All Drives	Flashes the LED of all drives in the subsystem enclosure.
	Flash All but Selected Drives	Flashes the LED of all drives in the storage subsystem enclosure but the selected drive.

Configuring the Reserved Space of a Drive

A formatted drive includes a reserved section to be used for event logs and storage virtualization, so that these contents will not be erased upon system reset. You may remove the reserved section (unformatting a drive) to bring the drive status to "new." This operation is necessary for debugging purposes, especially if you intend to do a read/write test on a drive; otherwise, it is not recommended.

Go to





Steps

Click the Reserved Space link in the Tasks corner.



The front view of the drive slots will appear.

Clear Reserved Space				
Please select the drive for clearing it	s reserved space.			
RAID				
•		•	•]
•]
· · · · · · · · · · · · · · · · · · ·				Į
				J
Drive Slot :]	
The drive cannot be	a member of a logical (drive.		
			Format	Close

Click the drive you would like to format or reformat. The selected drive will be highlighted and its ID number will appear in the Drive Slot field.

	2	

RAID			
•	•	•	•
•	•	•	•
•	•		•
•	•		
Drive Slot :	1		
The drive is unformatte	d.		

The system determines if the drive has been formatted or not.

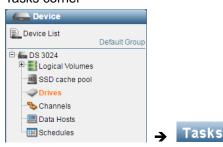
- If the drive has been formatted, click the Reformat button at the bottom to proceed.
- If the drive has been unformatted, click the Format button at the bottom to proceed.

Assigning Spare Drives (EonStor DS subsystems only)

You need a hard drive that is not part of a logical drive yet. Warning: It is HIGHLY RECOMMENDED that you assign a SPARE DRIVE! Without a spare drive, there is an increased risk of data loss!

Go to

SANWatch Home > Device sidebar > Device List > Device Name > Drives > Tasks corner



Steps

Click Spare Drive Maintenance in the Tasks corner.



Spare Drive Maintenance Select a drive and assign it to a local/global/enclosure spare drive.

The Spare Drive Management window will appear.

RAID				
•	• •			
	•			
	•			
•	•		•	
Select the drive to add (or the spare drive to delete.			
Drive Slot :	1			
 Global Spare 	C Local Spare	O Enclo	osure Spare	

Highlight an available drive.

	•	

The drive slot number will also appear.

Drive Slot :	7
--------------	---



.

	The drive must not b	be a part of an existing lo	ogical drive.
	Select the type of the	spare drive.	
	 Global Spare 	O Local Spare	C Enclosure Spare
	 Local spare: Spa Enclosure spare 	are drive for logical volu re drive for logical drives Spare drive for that par will turn into a spare driv	s ticular subsystem enclosure
Deleting Spare	This option is availa	ble when one or more sp	pare drives exist.
	Spare Drive Maint Select a drive and a	ssign it to a local/global/enclosure spare o agement window will ap	drive.
	RAID	ve to add or the spare drive to delete.	
	Global S	oare C Local Spare	C Enclosure Spare
			Add Close

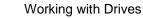
Highlight an existing spare drive (marked by the plus sign to the left).

•		
	•	
•		

The drive slot ID will also appear.

Drive Slot :	7

Click Delete to delete the spare drive. The drive will return into a normal (unused) drive.



Monitoring Disk Drive Usage (Performance Monitor)

The Performance Monitor allows you to view the disk drive usage and performance status in real time to help identify where the system performance bottleneck lies.

Go to

SANWatch Home > Device sidebar > Device List > device name > Drives >



Opening the Performance Monitor Click the Performance Monitor menu in the Tasks corner.



The Disk Performance Monitor will open updating the disk drive usage in real time.

Performance Monitor
View Options
🔽 Latency (ms)
Rate (MB/s)
Read Write
Drives
Logical Drive ID: 40296e98 📥
Drive Slot 2 Channel 4
Drive Slot 3 Channel 4
Logical Drive ID: 579052f0
Drive Slot 4 Channel 4
Drive Slot 5 Channel 4
Drive Slot 6 Channel 4
Logical Drive ID: eb8af43
Drive Slot 9 Channel 4
Drive Slot 10 Channel 4
Drive Slot 7 Channel 4
Select a drive to view its parameters.
Logical Drive
Spare Drive

Monitor Graph	Drive Slot 2 Channel4
	 Title: Specifies the slot location and host channel ID of each drive. Vertical axis: Shows the latency. 1.00 millisecond = 100%. Horizontal axis: Shows the current time.

30 💌 Second

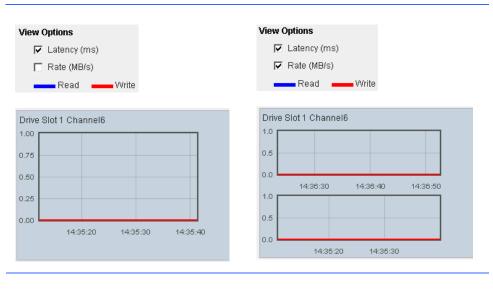
 Configuring the
 To set the averaging time and duration (x-axis), use the drop-down menu in the sidebar.

 Average
 Image
 Image

 Image
 Image
 Image

 Duration
 Duration
 Duration

You can select the y-axis item from the sidebar. By default, the y-axis is set to show both latency and data rate. You may replace it with data rate or latency.



Average	Specifies the data averaging period: 1, 2, 4, and 8 seconds.
Duration	Specifies the time range of the monitor screen: 30, 60, 90, 120, and 160 seconds.

Drive Categories All physical and logical drives are categorized and listed in the sidebar.

and List	Logical Drive ID: 19a5ab9 Drive Slot 5 Channel 4(5) Drive Slot 1 Channel 4(5) Drive Slot 2 Channel 4(5) Drive Slot 3 Channel 4(5) Drive Slot 4 Channel 4(5) Drive Slot 8 Channel 4(5) Select a drive to view its parameters. Logical Drive Spare Drive Unused Drive				
	Logical Drive	The hard disk is part of a logical drive.			
	Spare Drive	The hard disk is part of a local or global spare drive.			
	Unused Drive	The hard disk does not exist, or is not part of a logical drive.			
Recording the Status	You may record the Recording button.	disk performance data into a log file. Click the Start			
	The recording window will appear. Performance Monitor				
	 Start at	ie Ⅲ Hour: 0 ▼ Minute: 0 ▼			
	 Stop at Stop Manually Stop after Record Duration: Hour: 	0 Minute: 0 Second: 30			
	– Log Parameters – Average Period of Log: H	Hour: 0 Minute: 0 Second: 10			
	Select the starting til Start at Immediately Start at a predefined tim Date:	me: right now or later.			

If you click the calendar icon, you can select the starting date.

 Start at 	t a predefined time								
Date:	Hour: 0								
	0		Ju	ily 20'	14		0		
- Stop at -	Su	Мо	Tu	We	Th	Fr	Sa		
Stop N			1	2	3	4	5		
 Stop a Recor 	6	7	8	9	10	11	12		
	13	14	15	16	17	18	19		
- Log Para	20	21	22	23	24	25	26		
Avera	27	28	29	30	31				

Select the ending time: manually or after a fixed period.

۲	Stop Manually			
0	Stop after			
	Record Duration: Hour: 0	Minute: 0	Second: 30	

Select how frequently the data will be sampled.

Average Period of Log: Hour: 0 Minute: 0 Second: 10

Click OK. The button will turn into Stop Recording and Download Log. You can manually stop the recording and/or download the result into a local file.

Stop recording	
Download log	
00:00:04	

Working with Channels (NOT Supported by EonServ)

🛻 Device	Channel List				
	t Group				
E G 3016(FC 8G)	Channel ID 🔺	Data Rate 🔺	Max Speed 🔺	Current Speed 🔺	Status 🔺
Prives	Channel 0	Auto	8 Gbps	8.0 Gbps	Link Up
- Schannels - Data Hosts - Schedules	Channel 1	Auto	8 Gbps		Link Down
	Channel 2	Auto	8 Gbps		Link Down
	Expansion				
	Channel ID		Speed	Status	
			No Data		

This chapter describes how to view and configure the current host channel configurations, give an alias to a channel, group channels, and check whether the channels are properly connected.



Viewing ChannelGo to SANWatch Home > Device sidebar > Device List > device name >ParametersChannels.



The list of host-device channels will appear.

Channel List					
🖳 Host					
Channel ID 🔺	Data Rate 🔺				
<u>Channel 0</u>	Auto				
<u>Channel 1</u>	Auto				
Channel 2	Auto				

Click the link to see the parameters of each channel.

available for Fibre channels only.
Point-to-Point
8.0 Gbps
Link Up
AID 112: 210000D02308000D; BID : undefined;
AID 112: 200000D02308000D; BID : undefined;
112,

You may click Refresh to update the parameters to the latest status.



Configuring the Host Channel Settings

Go to

SANWatch Home > Device sidebar > Device List > device name > Channels > Tasks corner



Steps

Click Host Channel Settings in the Tasks corner.



The list of channels and their configurations will appear.

Channel 4	Channel 5	Channel 0	Channel 1	Channel 2	Cha	nnel 3			
Parameters	S			ID				MCS Group	
Current Dat	a Rate:			AID		BID			
Ourrent Tra	nsfer Bandwidt	h: iSCSI		0		F 0	-	© 0	
Pv4 Type:		DHCP		 1		I		C 1	
SlotA IPv4 IF	P Address:			 2		F 2		C 2	
BlotB IPv4 If	P Address:			Г 3		Г 3		© 3	
Pv6 Type:		Disabled		F 4		F 4		C 4	
SlotA IPv6 A	ddress:			F 5		5		C 5	
BlotB IPv6 A	ddress:			F 6		F 6			
Configure	-			7	-	7	-		

iSCSI Channel Configurations

hannel 4 Channel 5 C	hannel O	Channel 1	Channel 2	Cha	nnel 3		
Parameters			ID				MCS Group
Current Data Rate:			AID		BID		
Current Transfer Bandwidth:	iscsi		0		F 0		© 0
Pv4 Type:	DHCP		[1		V 1		© 1
SlotA IPv4 IP Address:			F 2		F 2		C 2
SlotB IPv4 IP Address:			Г 3		Г 3		© 3
Pv6 Type:	Disabled		F 4		F 4		C 4
SlotA IPv6 Address:			F 5		F 5		C 5
SlotB IPv6 Address:			F 6		F 6		
Configure			7	-	F 7	-	

Click Configure to modify the IP address, subnet, and gateway (route). Note that each slot has its own IP configuration.



Type: O Static 💿 DHCP O RARP	
Slot A	Slot B
IP address:	IP address:
Subnet mask:	Subnet mask:
Default gateway:	Default gateway:
Slot A	Slot B
Slot A	Slot B
IPV6 address:	IPV6 address:
Subnet prefix length:	Subnet prefix length:

iSCSI Parameters	Channel ID	Specifies the LUN mapping ID number.
	MCS Group	MC/S (Multiple Connections per Session) protocol allows combining several channels to improve performance and failover rates.
	Туре	 (Configurable) Static: Specifies a fixed IP address. DHCP (Auto): Allows the router/switch to pick an available IP address for the subsystem. RARP: The Reverse Address Resolution Protocol (RARP) requests the IP (IPv4) address from an administrative host. Disable: Disables the IPV6 address protocol (used when IPV4 is used instead of IPV6).
	IP Address	(Configurable) Specifies the IP address in IPV4 or IPV6 format.
	Subnet Mask, Default Gateway, or Route	(Configurable) Allows users to specify the surrounding subnet and gateway for the subsystem to specify the network subdivision.
Fibre Channel Configurations	-	rable parameters for a Fibre Channel port (you may a rate for some channels).



	Parameters		ID	ID		
	Current Data Rate: Default Data Rate: Current Transfer Bandwidth: Node Name AID 112: 200000D0230C7D12 BID 113: 200000D0231C7D12	4.0 Gbps Auto ♥ Serial Port Name AID 112: 240000D0230C7D12 BID 113: 240000D0231C7D12	AID ↓ 112 ↓ 113 ↓ 114 ↓ 115 ↓ 115 ↓ 116 ↓ 117 ↓ 118 ↓ 119	BID ☐ 112 ☐ 113 ☐ 114 ☐ 115 ☐ 116 ☐ 117 ☐ 118 ☐ 119	•	
	<u>.</u>	Specifies th	e I I N m	apping ID number.		
	Channel ID Data Rate	Specifies th	ne data ra	ate of the Fibre Cha		
Parameters	Data Rate	Specifies th	ne data ra			
Fibre Channel Parameters nfiniBand Channel Configurations	Data Rate	Specifies th	e data ra	ate of the Fibre Cha		

InfiniBand Channel Channel ID Parameters Specifies the LUN mapping ID number.



Giving Alias / Assigning WWNs to Groups

Go to

SANWatch Home > Device sidebar > Device List > device name > Channels > Tasks corner



Steps

Click Scan Port Information in the Tasks corner.



The list of alias and WWN (World Wide Name) will appear.

Channel 0	Channel 1 Channel	el 2 Channel 3 Oth	ers iSCSI		
WWN		1	Controller	Alias	Group
210000	24FF3F6E96		Slot A		
210000	1B321A97E5		Slot A		
210000	24FF3F6E96		Slot B		
210000	1B321A97E5		Slot B		

Assigning/Deleting an Alias/WWN

To assign an alias for a WWN, highlight it, click Edit and enter an alias.

Host ID/Alias	2101001B32A9631C	
Alias:	Alias	

The alias will appear in the WWN list.

Channel O	Channel 1	Channel 2	Channel 3	Others	iSCSI	
WWN	www		Controller		Alias	
2101	01832A9631C			Slot A		Alias

To delete the alias/WWN, click Delete.

Assigning a WWN to a group

After giving an alias to a WWN, you may bundle it to a group. Click Assign

Group. The Group Assignment window will appear.

	Host ID:	2101001B32A9631C	
Assign Group	Group:		Add

Click Add to name the new group, or choose an existing group from the drop-down menu.

Add	New Group	Group1

Click OK.



If the group already has LUN mappings, you will be prompted to decide whether you want to add existing LUN mapping(s) already created for the group. Click Yes to include the same LUN mapping(s) for the WWN.

A	Do you want to create the same LUN mapping(s) for		
	2101001B32A93E1C (alias02) of Group1?	→	Yes

The WWN will be assigned to a group.

Unassigning a WWN from a Group

To unassign a WWN from a group, click Unassign Group, and follow the onscreen instruction to complete the setup.

Depending on the Group's LUN mapping configuration, you might be prompted to decide whether you want to remove existing LUN mapping(s) already created for the group. Click Yes to remove the same LUN mappings for the WWN.

Do you want to remove all LUN mapping(s) created for			_
2101001B32A93E1C (alias02) of Group1?	→	Yes	



The converged host board allows you to change the channel type for all its four physical ports. When the channel type is changed, all ports on the converged host board will be using the new type after system reboot.

Currently the following channel types are supported by the converged host board includes:

- Fibre Channel 8G
- Fibre Channel 16G
- ➢ iSCSI 10G.

Notes and limitations

- System requirement for converged host board: EonStor DS 4000 series.
- LUN mappings should be removed before changing the channel type.
- For FC 16G, its data rate could be optionally set as 16G/8G/4G; For FC 8G, its data rate could be optionally set as 8G/4G.
- If the channel type of the ports on the converged host board is set as Fibre 16G or Fibre 8G, then the storage subsystem could only be connected with other devices through the point-to-point (FC-P2P) topology, meaning Arbitrated Loop (FC-AL) is not supported by the converged host board.
- For Fibre Channel ports on other types of host boards, Arbitrated Loop is supported by Fibre 8G ports, allowing you to change their fibre connection to either loop only or point-to-point only (at System Settings > Host-Side). Arbitrated Loop is not supported by Fibre 16G ports.
- For Fibre Channel ports on other types of host boards, their SCSI ID starts with 112. For the converged host board, its physical ports are all regarded as iSCSI ports even if their type is configured as FC 8G/16G, and their iSCSI IDs are specified according to the following rule:
 Controller A: (accumulated iSCSI channel number) x 16
 Controller B (if available): (accumulated iSCSI channel number) x 16 +1

Note: The channel number starts from "0", which is also the number of the first physical port.

The example below demonstrates how to figure out the iSCSI IDs for all available channels on Controller A of a storage subsystem.

Channel Number	Channel Type	iSCSI ID
0	iSCSI	0 x 16 = 0
1	iSCSI	1 x 16 = 16
2	FC	112
3	FC	112
4	converged host board	2 x 16 = 32
5	converged host board	3 x16 = 48
6	iSCSI	4 x 16 = 64
7	iSCSI	5 x 16 = 80

Go to

SANWatch Home > Device sidebar > Device List > device name > Channels > Tasks corner



Steps

Click Host Board Channel Type in the Tasks corner.



This option is available only when a converged host board is installed on your controller.

In the window that appears, select one of the checkboxes to change the channel type of all physical ports on the converged host board to the one you specified.

	Channel 4	Channel 5	Channel 6	Channel 7
Mode 1	Fibre 16G	Fibre 16G	Disabled	Disabled
Mode 2	Fibre 8G	Fibre 8G	Fibre 8G	Fibre 8G
Mode 3	iSCSI 10G	iSCSI 10G	iSCSI 10G	iSCSI 10G

Click Apply.

For the change to take effect, restart the storage subsystem.

Parameters	Mode 1	If you select this mode, only the first two ports of the host board will be available for connectivity, with their channel type configured as Fibre 16G.
	Mode 2	If you select this mode, all of the 4 ports will be available for connectivity, with their channel type changed to Fibre 8G.
	Mode 3	If you select this mode, all of the 4 ports will be available for connectivity, with their channel type changed to iSCSI 10G.



Checking System Health

Go to

SANWatch Home > Device sidebar > Device List > device name > Channels > Tasks



Steps

Click System Health Status Settings in the Tasks corner.



The system will check all channel connections, and display the following message if all connections are normal or approved.

Check Connection Status



All connections are normal and approved. If you want to update the approval list, please change the current setting manually and check again.

If abnormal or unapproved connections are found, the system will display their status in a list.

Approved	Туре 💌	Channel ID 🔻	Speed -	Status 🕶
	Host	2		Link Down
	Host	3		Link Down
	Host	4		Link Down
	Host	5		Link Down

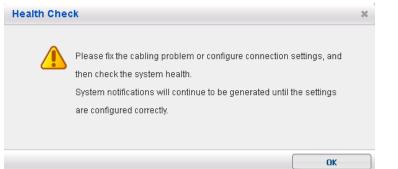
Select the channel(s) whose status you want to approve. If the status to be approved is found to be unhealthy (= contains some network problems), a warning message will appear.



> If you click Yes, the message will disappear and the Health Check link will be

disabled (= the connections are normal)

> If you click No, some suggestions on improving the connectivity will appear.

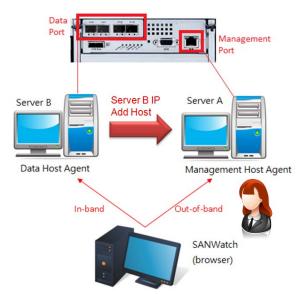




System Settings L	anguage Abo	đ			👔 Replication Manage	r 🕜 Help	G Data Reload
evice		Data Host					
Device List	Default Group	Host Name	IP Address	05	In-Band Agent Version	Mounted V	lume
		EVT-PC140	127.0.0.1	Windows Server 2008 R2	4.0	0	
	New Group 2						
E → DB 3016(8CS110) P → Logical Volumes → Drives → Channels → Channels → Channels → Channels → Channels → Channels → Channels → Channels → Channels							
		Tasks					
		Add Host Add a managem	ent data host by its IP address or host name.		Disconnect Host Remove a host from the manageme	nt list.	
		Configure the da	d abase fluch setting of a host with an agent.		Select a host and view its multiple b	O (MPIO) connection topology.	
Pool							

This chapter describes how to add or disconnect a host computer to/from the current system, configure database flush settings, and configure multiple IO (MPIO) topology of the system.

About Out-of-band & In-band management



(Data Host Agent and Management Host Agent are included in SANWatch)

Out-of-band	 In-band
Manages the storage through LAN	Manages the storage through host
connections.	channels.

Adding a Host

Before You Start Go to the host server (for example, Windows Server 2012 R2) > iSCSI Initiator > Targets.

Next, enter a channel IP address of your EonStor DS device in the Target field.

Then, click **Quick Connect** to add your device to the **Discovered targets** list. Click **OK** to finish the setting.

Quick (Connect				
		g on to a target usin arget and then click	ng a basic connection, t Quick Connect.	ype the IP	address or
Target	172	2.24.110.41		Q	uick Connect
iscovi	ered targets	1		_	
Name				Status	Refresh
T TOT THE				516165	
		advanced options, se	elect a target and then		Connect
lick C	onnect.		-		Connect
lick Cr 'o con	onnect. Inpletely disc	onnect a target, sel	-		Connect
lick Cr 'o con	onnect.	onnect a target, sel	-		
lick Cr o con hen d	onnect. npletely disc lick Disconne rget propert	onnect a target, sel ect.	ect the target and		
dick Cr To con then d	onnect. npletely disc lick Disconne rget propert	onnect a target, sel	ect the target and		Disconnect
lick Cr fo con hen d for tar elect for co	onnect. Inpletely disconne lick Disconne rget propert the target a nfiguration o	onnect a target, sel ect. ies, including config ind dick Properties. of devices associate	ect the target and		Disconnect
lick Cr fo con hen d for tar elect for co	onnect. Inpletely disconne lick Disconne rget propert the target a nfiguration o	onnect a target, sel ect. ies, including configu ind dick Properties.	ect the target and uration of sessions,		Disconnect Properties
lick Cr fo con hen d for tar elect for co	onnect. Inpletely disconne lick Disconne rget propert the target a nfiguration o	onnect a target, sel ect. ies, including config ind dick Properties. of devices associate	ect the target and uration of sessions,		Disconnect Properties
lick Cr fo con hen d for tar elect for co	onnect. Inpletely disconne lick Disconne rget propert the target a nfiguration o	onnect a target, sel ect. ies, including config ind dick Properties. of devices associate	ect the target and uration of sessions,		Disconnect Properties
lick Co fo con hen d for tar elect for co	onnect. Inpletely disconne lick Disconne rget propert the target a nfiguration o	onnect a target, sel ect. ies, including config ind dick Properties. of devices associate	ect the target and uration of sessions,		Disconnect Properties
lick Co fo con hen d for tar elect for co	onnect. Inpletely disconne lick Disconne rget propert the target a nfiguration o	onnect a target, sel ect. ies, including config ind dick Properties. of devices associate	ect the target and uration of sessions,		Disconnect Properties
lick Ci io con hen d or tai elect or co	onnect. Inpletely disconne lick Disconne rget propert the target a nfiguration o	onnect a target, sel ect. ies, including config ind dick Properties. of devices associate	ect the target and uration of sessions,		Disconnect Properties

Go to SANWatch Home > Device sidebar > Device List > device name > Data Hosts > Tasks corner



Click Add Host.



Add Host Add a management data host by its IP address or host name.

Enter the IP address of the new host, then click Add.

d Host			(
Enter the IP address	of the data host and add it to	the list of manage	d hosts.
Host IP address:	172.24.110.79		
		Add	Close

The new host will appear in the Data Host corner.

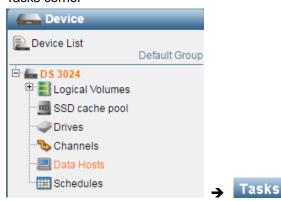
Data Host		
Host Name 🔺	IP Address 🔺	OS 🛥
ClusterNode2	127.0.0.1	Windows Server 2012



Removing (Disconnecting) a Host

Go to

SANWatch Home > Device sidebar > Device List > device name > Data Hosts > Tasks corner



Steps

Click Disconnect Host.

Disconnect Host Remove a host from the management list.

Check the host you wish to disconnect from the list and click Disconnect.

Disconnects data boots		anus the least from the list	
Disconnect a data host i	rom the selected device and rer	nove the nost from the list.	
🗖 Host Name	IP Address	05	
EVT-PC140	127.0.0.1	Windows Server 2008 R2	

The host will be removed from the list.

Data Host		
Host Name	IP Address	0\$

Disconnecting the host will not affect its configurations. When you reconnect host to the device again, previous configurations will remain intact.

Editing Multipath Devices through EonPath

Only available for Windows 2003 and before. For Windows 2008 and later, use Microsoft native MPIO settings.

- 1. Before configuring EonPath setting, you have to install EonPath driver on the host server first (server with Data host agent). For more information about installing EonPath driver, see <u>Working with multipath</u>.
- 2. You need to add a host (server with Data host agent) to enable in-band management.

Go to

SANWatch Home > Device sidebar > Device List > device name > Data Hosts > Tasks corner



Steps

Click the EonPath menu in the Tasks corner.



Select a host and view its multiple I/O (MPIO) connection topology.

The list of current hosts will appear. Highlight the host you would like to configure and click Next.

EonPath				
Select the data host for configuring	multiple paths first.			
lost Name		IP Address		
EVT-PC140		127.0.0.1		
		[Next	Cancel

You can view the list of current multipath devices.

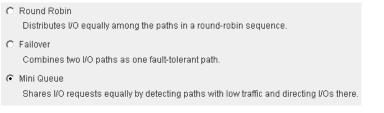
Index	Device	Enclo	sure ID	Volume ID	Status		Size	^
0		25	092	2D746E3107358AD	Used Device,	OK, Passive,	50 GB	
1		25	092	3AA6CD40392D97A0	Used Device,	OK, Passive,	60 GB	
2		25	092	2D746E3107358AD	Used Device,	OK,	50 GB	
3		25	092	3AA6CD40392D97A0	Used Device,	OK,	60 GB	
Multipa	ath Device —							-
Multipa Index	ath Device	evice	Enclosure II) Volume ID	Number of Paths	Load Balance Method	Size	•
			Enclosure IC 25092	Volume ID 2D746E3107358AD			Size 50 GB	
Index	Multipath D	e1			Number of Paths	Load Balance Method		
Index	Multipath D				Number of Paths	Load Balance Method		

You can edit an existing multipath device.

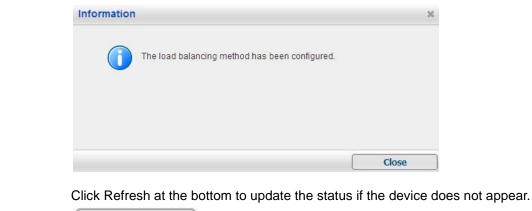


Select the load balancing policy.

Load balancing applies only to active paths (not applicable to passive paths).



Click OK to finish editing the multipath pair, and then click Close to close the Information window.



 Refresh

 Parameters
 Failover
 There will be no balancing among multiple paths. One dedicated path will be used for all data transactions, and if

the main path fails, the remaining path will take over its role.



Mini Queue	Data transactions are shared with all paths. The data load will be dynamically distributed according to the length of the job queue.
Round Robin	Data transactions are shared with all paths. The data load will be equally distributed in a round-robin fashion.



Monitoring Multipath Devices in EonPath

Only available for Windows 2003 and before.

For Windows 2008 and later, use Microsoft native MPIO settings.

Go to

SANWatch Home > Device sidebar > Device List > device name > Data Hosts > Tasks corner



Steps

Click the EonPath menu in the Tasks corner.

EonPath Select a host and view its multiple I/O (MPIO) connection topology.

The list of current hosts will appear. Highlight the host you would like to configure and click Next.

EonPath		
Select the data host for configuring multipl	le paths first.	
lost Name	IP Address	
EVT-PC140	127.0.0.1	

Select the Statistics tab. The list of multipath device statistics chart will appear.

EonPath Setting	js				х
Multipath Device	Statistics				
Enable	Device	Throughput (Mbps)	Throughput Record		
M	MPDevice1	0.00	0.5		
				Refresh	Close

Select the checkbox next to the multipath device you want to monitor. The graph will update the I/O statistics in real time.

Enable	Device
N	MPDevice1

To refresh the plot, click Refresh.



Flushing Host Cache Memory for Database

When database applications (SQL, Oracle, etc.) are running in the host computer, user data will be temporarily stored inside the host computer's memory (cache memory) before transferred into the RAID subsystem. When you run a replication job (such as snapshot or volume mirror), you must make sure that transferring cache memory content into the RAID subsystem is completed before backing up your data; otherwise, there will be data inconsistency between RAID subsystem and host computer.

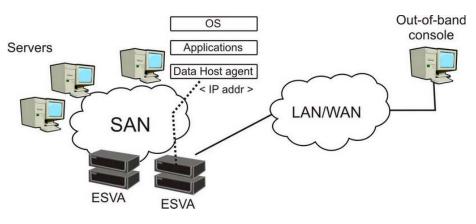
The database flush mechanism ensures that any cache data in the host computer will be flushed (transferred) into the RAID system before a replication job is triggered.

In-Band VS.There are two types of cache memory flush, depending on the connectionOut-of-Bandbetween the host computer and the subsystem.

In-Band Flush

Flushing the cache memory will be triggered by the host computer itself, which is connected to the subsystem through in-band connection. This is the standard flush method when there is only one data host computer or Windows Virtual Machine (VM) is not running in the host computer.

Out-of-Band Flush



Flushing the cache memory will be triggered by an out-of-band host computer. This method is required in the following cases:

- Multiple host computers with database applications are connected to the subsystem. In-band flush might be in conflict when more than one host computers tries to back up user data at the same time. In this case, out-of-band flush allows multiple servers to perform data flushing in series without conflict.
- Windows Virtual Machine (VM), installed on ESX server, is running in the host computer. VM itself cannot initiate cache data flushing on its own, thus the host computer needs to use the out-of-band connection to initiate flushing indirectly.

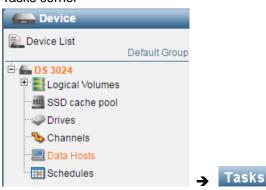
Configuring In-Band Flush Using DB Flush Agent

If you are holding data in database forms, you need to flush all data into the storage subsystem before doing a backup job. The DB (database) Flush module in SANWatch allows you to perform it automatically.

DB Flush works for the following databases:

- > SQL
- Microsoft Exchange
- > Oracle

SANWatch Home > Device sidebar > Device List > device name > Data Hosts > Tasks corner



Step 1: Activating **DB Flush Agent**

Go to

Click DB Flush Agent in the Tasks corner.



DB Flush Agent Configure the database flush setting of a host with an agent.

The list of current hosts will appear. Highlight the host you would like to configure and click Next.

B Flush Agent	
Select a <mark>d</mark> ata host for configuring a da	abase flush task.
lost Name	IP Address
EVT-PC140	127.0.0.1
	Next Cancel

The DB Flush Agent setting screen will appear.



	DB Flush Agent Settings X			
	Configure the database for flushing the data during data service operations.			
	Connected Host IP Address: 127.0.0.1			
	Cluster Settings			
	Enable Cluster Support: Host IP Address of Secondary Node:			
	DB Flush Settings			
	Index - Type - DB Name - DB Server - Enable -			
	Add Edit Delete			
	🔽 Enable Fluch Log			
	OK Cancel			
Step 2: Enabling	Changing the database clustering setting will reset other DB Flush Agent			
Database				
Clustering	settings.			
olusioning	Database clustering refers to storing sequential rows of a database table on a			
	disk. It will boost the database performance for server-centric database			
	systems, since the server can perform database operations by direct access to			
	disk.			
	UISK.			
	To enable database clustering, check the Enable Cluster Support checkbox and			
	select DB Cluster. If you would like to add another node, select Host and enter			
	the IP address.			
	Cluster Settings			
	Enable Cluster Support: Host			
	IP Address of Secondary Node: Host DB Cluster			
Step 3: Enabling	Enable the flush log if you want:			
Flush Log				
U	Event logs for clustered nodes will be kept on this machine.			
	Events will be reported in the following locations.			
	Windows: Event Viewer			
	Linux: /var/log/messages			
	Solaris: /var/adm/messages			
	Enable Flush Log			
Step 4: Configuring	Click Add. The DB Flush setting window will appear.			

Step 4: ConfiguringClick Add. The DB Flush setting window will appeaDatabase FlushSettings



dd DB Flush Settings			
Select the database connec	tion parameters for the data flush task.		
DB Type:	SQL Server		
DB Server Name:			
Listen Port:	1433		
DB Name:			
DB Administrator:			
Password:			
Flush Operation:	Enable 💌		

Enter the parameters and click OK.

L

The new database flush setting will appear in the DB Flush Agent screen.

Click OK and close DB Flush Agent.

	ОК)
Parameters	DB Туре	Specifies the database from Oracle, SQL Server, and MS Exchange.
	DB Server Name	Specifies the user-defined name of the database server.
	DB Listen Port	Specifies the network port (default 1433) which the database listener (a software that manages the network traffic between the database and client) monitors.
	DB Name	Specifies the user-defined name of the database.
	DB Administrator	Specifies the database administrator user name. Enter a "sa" (System Administrator) login name. The "sa" name can be disabled when you select the security level of your database. By disabling "SA" access, no one will have access to a database system, except logging in as the Windows Administrator. Refer to this section for how to enable an "sa" login.
	DB Password	Specifies the database password.
	Enable DB Flush	Allows flushing database inside cache memory into a local file before taking snapshot images.

Viewing DB Flush Events (Windows)

The default path to system event can be found in: C:\app\Administrator\product\11.1.0\db_1

From here you can check on related events.

You can examine event messages from *Windows Computer Management -> System Tools -> Event Viewer -> and Application.*

Event messages generated by the DB Flush agent are listed below.

List of Events	Message	Description
	unsupported platform	The OS platform is not supported
	config file not exist or damaged	No associated DBFlush configuration file exists or the file is missing.
	config file io error	Could not access the DBFlush configuration file.
	dbflush no config, do nothing	No valid DBflush configuration.
	begin suspend database diskno=xx	Starts DBFlush operation on partition or virtual volume index #.
	dbflush x: is disabled, do nothing	DBFlush configuration profile index X is manually disabled.
	server x suspend fail	DBFlush on server X operation failed.
	suspend database fail	DBFlush operation failed.
	end suspend database	DBFlush operation completed.
	enter resume database	DBFlush operation ended, resuming normal database operation
	server x: resume database fail	DBFlush operation ended, failed to resume normal database operation.



end resume database

DBFlush operation ended, resumed normal database operation.

Using DB Flush Agent in Oracle 10g

	To ensure the integrity of snapshot copies, before taking a snapshot for a database, users should make sure that all data in the cache memory are flushed to the storage system. For databases a dedicated DB Flush Agent can take over the flushing task automatically. However for other databases, the flushing task has to be done manually.		
Note	 The configuration example below assumes that the Oracle database, including its data, log and control files, are all stored in partitions or virtual volumes on the storage system. <u>SQL*PLUS</u> is an Oracle command-line utility program. 		
Step 1. Suspend or Shutdown the Database	Depending on whether you would like to perform snapshot protection online or offline, you can choose to suspend or shutdown the database. To perform snapshot online, you should suspend the database with the following SQL*PLUS2 commands.		
	<pre>c:\sqlplus /nolog SQL>conn / as sysdba SQL>alter system suspend; To perform snapshot offline, you should shut down the database with the following SQL*PLUS commands. c:\sqlplus /nolog SQL>conn / as sysdba SQL>shutdown immediate; SQL>startup mount</pre>		
Step 2. Take Snapshots	SQL>exit In SANWatch GUI, take snapshots for the partitions or virtual volumes storing the database. If files of the Oracle database are stored in more than partitions or virtual volumes, to ensure data consistency, please be sure to use the Group Snapshot feature to simultaneously take snapshots for them.		
Step 3. Resume or Restart Database Service	<pre>If you just suspended the database, resume its service with the following SQL*PLUS commands. c:\sqlplus /nolog SQL>conn / as sysdba SQL>alter system resume; If you just shutdown the database, restart its service with the following SQL*PLUS commands. c:\sqlplus /nolog SQL>conn / as sysdba SQL>shutdown immediate; SQL>startup;</pre>		

SQL>exit	
----------	--

Then restart the service on your host server.

When necessary, you can use the snapshots to rollback data or restore files.

Test Script	Below is a sample script that runs tests on growing databases in Oracle.			
	create table student (id int, name varchar(10), english int, math int, chinese int) tablespace users; create or replace procedure loopinsert as i int:=1; begin			
	for i in 1500000 loop INSERT INTO student (id, name, english, math, chinese) SELECT max(id)+1, 'sk', max(english) + 1, max(math) + 1, max(chinese) + 1 from student; commit; end loop; end;			
	/ exec loopinsert; commit;			

Examining BackupYou may perform snapshot backup using schedules that start from an activeProcessdatabase and verify correctness of backup by performing the rollback function.

The backup process can be examined through Oracle Log File Viewer.

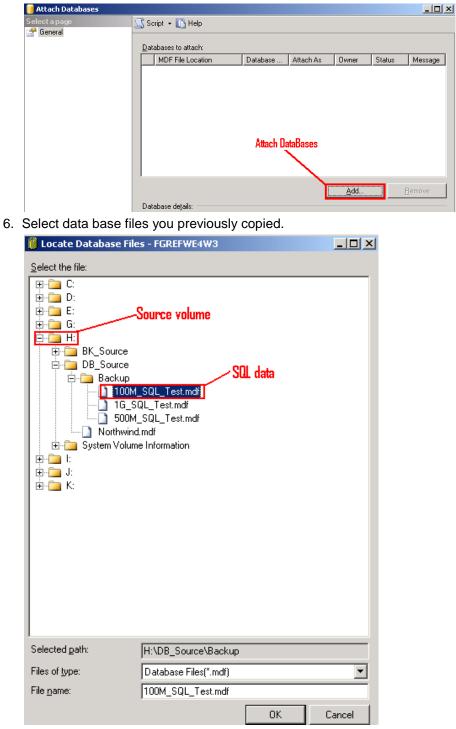
	Doal Log (b) Export € Refresh 🍸 Filter 🔍 Search [] Help Log file summay: No filter applied			
ase Mail Ierver				
5/23/2009 1:0	Date		Source	Message
1 - 5/23/2009		5/23/2009 1:07:06 AM	Backup	Database backed up. Database: db, creation date(time): 2009/05/23(01:00:48), pages dumped: 276, first LSN: 43:355:47, last LSN: 43:425:1, number of dump devices: 1, device in
- 5/23/2009		5/23/2009 1:07:06 AM	spid55	1/D was resumed on database db. No user action is required.
/23/2009		5/23/2009 1:05:50 AM	spid55	1/0 is frozen on database db. No user action is required. However, if 1/0 is not resumed promptly, you could cancel the backup.
23/2009	1	5/23/2009 1:01:41 AM	Logon	Login failed for user 'sa'. Reason: Failed to open the explicitly specified database. [CLIENT: 172.16.80.130]
23/2009	1	5/23/2009 1:01:41 AM	Logon	Error: 18456, Severity: 14, State: 38.
		5/23/2009 1:00:49 AM	spid57	Setting database option PAGE_VERIFY to CHECKSUM for database db.
	[=]	E700700001-00-40 AM	onidE7	Cabling defection action MILLITED to OM for defection dis

Using DB Flush Agent in MS SQL

To ensure the integrity of snapshot copies, before taking a snapshot for a database, users should make sure that all data in the cache memory are flushed to the storage system.

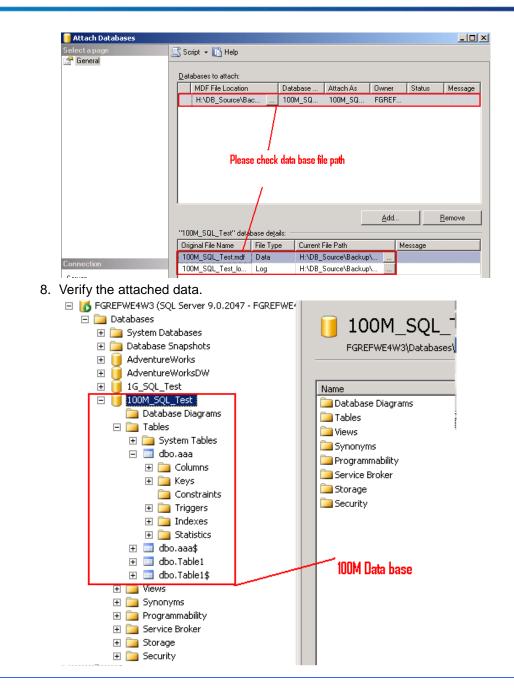
Sample Database Configuration Using SQL Server 2005	Create volumes. Leave enough unallocated storage space in volumes for performing snapshot backup. Depending on the size of data changes and how frequently they are changed, you normally require 2 to 3 times of a partition or virtual volume capacity for taking snapshot backup.
	When taking snapshots for database applications, such as Oracle, use "Group Snapshot" in the scheduler. Using Group Snapshots ensure consistency between database volumes and log volume. A Group snapshot is taken by selecting multiple source volumes.
	 Map virtual volumes to hosts. To test backup, copy data files to a virtual volume. Start Microsoft SQL Server 2005.
	Accessories SQL Server Mangement Studio Image: Computer Associates Image: SQL Server Mangement Studio Image: SQL Server 2005 Image: Configuration Tools Image: Microsoft Visual Studio 2005 Image: Configuration and Tutorials Image: Microsoft Visual Studio 2005 Image: Performance Tools Image: Visual Studio 2005 Image: Performance Tools Image: Visual Studio 2005 Image: Performance Tools Image: Visual Studio 2005 Image: Visual Studio 2005 Image: Visual Studio 2005
	 4. Use the Attach function to assign a virtual volume as database location. FGREFWE4W3 (SQL Server 9.0.2047 - FGREFWE4 Databases Syster Datab Attach Restore Database H Adven Restore Database Restore Files and Filegroups Security Refresh Server Roles Credentials Server Objects Replication Management Management Notification Services SQL Server Agent (Agent XPs disabled)

5. On the ensuing screen, click the Add button to attach databases.



7. Verify the correct file paths.





```
Test Script
```

Below is a sample script that runs tests on growing databases in SQL.

create table DBFlush.dbo.DBtest

(ID bigint, Rrd_Name char(20), Math float, English float, Chinease float, physical float); use DBflush GO declare @a int,@Temp_Name varchar(10),@c int ,@d int,@e int, @f int, @Out_String varchar(30) set @a=1 set @Temp_Name='sk'



set @c=99
set @d=99
set @e=99
set @f=99
while @a<=1000000
begin
insert into DBflush.dbo.DBtest
(ID,Rrd_Name,Math,English,Chinease,physical) values
(@a,@Temp_Name,@c,@d,@e,@f)
set @a=@a+1
set @Out String = 'This Record NO is:' + Str(@a)
PRINT @Out_String;
end

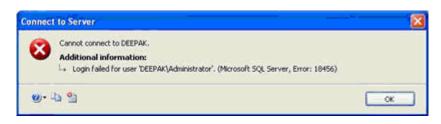
Examining BackupYou may perform snapshot backup using schedules that start from an active
database and verify correctness of backup by performing the rollback function.

Check Windows Computer Management -> System Tools -> Event Viewer -> and Application.

omputer Management (Local)	Туре	Date	Time	Source	Category	Event	User	Computer
System Tools	Information	5/23/2009	1:07:06 AM	MSSQL\$AAA	Backup	18264	SYSTEM	CDSERVER134
Event Viewer	Information	5/23/2009	1:07:06 AM	IFT DBflushAgent	None	1	N/A	CDSERVER134
	Information	5/23/2009	1:07:06 AM	IFT DBflushAgent	None	1	N/A	CDSERVER134
	Information	5/23/2009	1:07:06 AM	IFT DBflushAgent	None	1	N/A	CDSERVER134
System	Information	5/23/2009	1:07:06 AM	MSSQL\$AAA	Server	3198	SYSTEM	CDSERVER134
Windows PowerShell	Information	5/23/2009	1:07:06 AM	MSSQLSERVER	Backup	18264	SYSTEM	CDSERVER134
General Folders General Shared Folders General Users and Groups	Information	5/23/2009	1:07:06 AM	MSSQLSERVER	Server	3198	SYSTEM	CDSERVER134
- 🔣 Local Users and Groups - 🙀 Performance Logs and Alert:	Information	5/23/2009	1:06:07 AM	MSSQLSERVER	Server	833	N/A	CDSERVER134
	Information	5/23/2009	1:06:02 AM	IFT DBflushAgent	None	1	N/A	CDSERVER134
Storage	Information	5/23/2009	1:05:55 AM	IFT DBflushAgent	None	1	N/A	CDSERVER134
🔐 🎒 Removable Storage	Information	5/23/2009	1:05:52 AM	IFT DBflushAgent	None	1	N/A	CDSERVER134
Disk Defragmenter	(1) Information	5/23/2009	1:05:50 AM	MSSQL\$AAA	Server	3197	SYSTEM	CDSERVER134
Bisk Management	Information	5/23/2009	1:05:48 AM	MSSQLSERVER	Server	3197	SYSTEM	CDSERVER134
Services and Applications	Information	5/23/2009	1:05:47 AM	IFT DBflushAgent	None	1	N/A	CDSERVER134
- 🗐 Telephony	Information	5/23/2009	1:04:44 AM	ESENT	General	101	N/A	CDSERVER134
Services	Information	5/23/2009	1:02:58 AM	RAID-Agent	None	105	N/A	CDSERVER134

Enabling SA Login in MS SQL

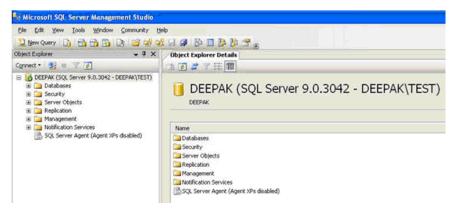
If you disabled sa login or forgot sa login password, the following message will appear.



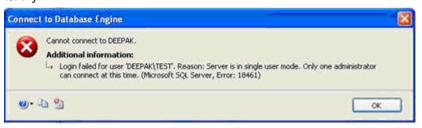
Refer to the below screenshot that shows the members of the Windows Administrators group.

Administrators	Properties 🛛 🛛 🔀				
General					
Adm	nistrators				
Description: mplete and unrestricted access to the computer/doma Members:					
Administra	tor				
Add	Bemove				
	OK. Cancel Apply				

Note	MSSQLSERVER is for default instance, if you are proceeding in a named instance then use MSSQL\$Instancename instead of MSSQLSERVER.
Steps	 Login with the ID Test @OS Level. Stop SQL Server 2005 using this command. NET STOP MSSQLSERVER Start SQL Server 2005 in Single-User mode using this command. NET START MSSQLSERVER /m Log into SQL Server 2005 using the ID Test as shown in the below screenshot.



 Since SQL Server is started in Single-User mode it will allow only one connection and hence you will get the following error if you click the "New Query"



 Disconnect and close the Object Explorer and then connect using "New Query" you will be able to connect as shown below, and then enable SA login using the command - ALTER Login SA enable.



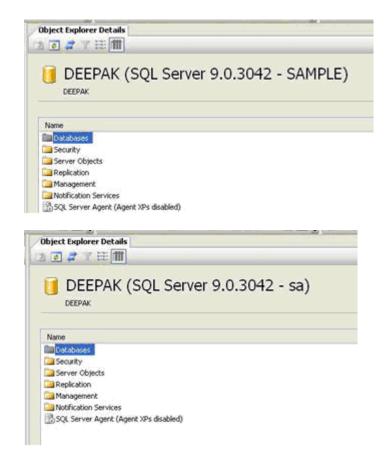
7. If you want to create a new SQL Level login with sysadmin privilege, you can perform as shown in the below screenshot.



8. Now you need to Stop SQL Server and start it normally using this command.

NET START MSSQLSERVER

9. Connect using SA or the new login you created and proceed as shown below,





Steps (Windows Environment)	 In Windows, open Server Manager > Configuration > Services. Server Manager (WIN-TETV2M8J6 Roles Features Diagnostics Event Viewer O Performance Device Manager Configuration Configuration Task Scheduler Windows Firewall with Ads Services WMI Control Local Users and Groups
	2. Make sure Data Host Agent for RAID Controller has started.
	Cryptographic Services Provides fo Started Automatic Network S Data Host Agent for RAID Controller Started Automatic Local System DCOM Server Process Launcher The DCOM Started Automatic Local System
	3. Go to Server Manager > Storage > Disk Management.
	Storage Windows Server Backup Disk Management
	 4. Select the disk in which the volume you want to flush resides. If it is labeled as "Disk 1," then "1" will become the disk ID for SANWatch flush agent configuration. Disk 1 Basic 465.76 GB Online
	5. Refer to "
	 Configuring Out-of-Band Flush Using DB Flush Agent" for SANWatch configuration to complete data flush.
Steps (Linux and Solaris Environment)	1. In Linux, start data host agent. [root@tsdRHL55 /] # ps -ef grep newAgent root 2675 1 0 09:06 ? 00:00:03 /usr/local/jre1 -cp newAgent.jar:jconn3.jar:log4j.jar newagent.Agent /usr/loca root 3707 2927 0 09:36 pts/1 00:00:00 grep newAgent [root@tsdRHL55 /] #
	 Select the device to be flushed. For example, you may select the device named "sdb," located at the end of the list.

88

[rootVtsdRHL55 ~]# more /proc/partitions major minor #blocks name

8	0	245117376	sda
8	1	104391	sda1
8	2	245007315	sda2
253	0	242909184	dm-0
253	1	2064384	dm-1
8	16	52428800	sdb
[root]	tsdRH	L55 ~]# cd	1

3. Open SANWatch with your web browser, locate the partition or virtual volume where the database is located by going to:

(EonStor DS subsystems) SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > partition name

(ESVA subsystems) SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > VV name

- 4. Click the Help icon at the top-right corner, and look for the "
- 5. Configuring Out-of-Band Flush Using DB Flush Agent" section for SANWatch configuration to complete data flush.



Working with the Logical Volumes or Pools View

System Settings Language Abo	ut		🕋 Replication Manager	Help	🕒 Data Reload
Device	Logical Volume Li	st			
Device List Default Group	🔲 Name 🔺	🎲 Status 🔺	Logical Drive Amount 🔺	Capacity	
Board Stopp	Logical Vol	On-Line	1 Logical Drives	Available: 1.41 T Usage :	TB Total: 1.63 TB
	Logical Vol	On-Line	1 Logical Drives	Available: 3.67 1 Usage :	TB Total: 3.68 TB
	Tasks				
	Add a n	Logical Volume lew logical volume using ava systems connected to the ser		Delete Logical Volume Remove the selected log	ical volume.

This chapter describes the overall parameters of logical volumes (for EonStor DS subsystems) or pools (for ESVA subsystems) included in a device (for EonStor DS subsystems) or across multiple devices (for ESVA subsystems) and how to create a logical volume or pool.

RAID Levels Available

What is RAID? The term RAID summarizes technologies that can distribute data to multiple drives, to achieve a high data transfer rate and fail-safe systems. RAID stands for "Redundant Array of Independent Disks". Redundant means that the failure of a single drive will not cause the failure or disruption of the entire system, or even lead to data loss.

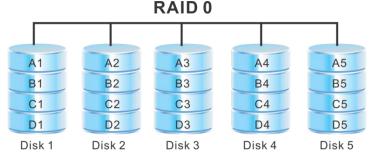
RAID is built on technologies such as mirroring (mirroring two or more drives), duplexing (mirroring with 2 controllers) and striping (Combination of multiple drives to a logical drive and block-wise data distribution to these drives).

There are different ways to distribute data to multiple disks, so that the highest possible data throughput and reliability is achieved. These are referred to as RAID level.

The following sections further describe the configurations of and applications for each RAID level, as well as how to calculate the capacity utilization.

RAID 0

RAID 0 is the fastest RAID mode. In a RAID 0 array, the available capacities of each disk are added together so that one logical volume mounts on the computer. If one physical disk in the array fails, the data of all disks becomes inaccessible because parts of the data have been written to all disks.

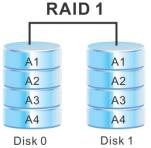


Applications

RAID 0 is ideal for users who need maximum speed and capacity. Video editors working with very large files may use RAID 0 when editing multiple streams of video for optimal playback performance. A RAID 0 array is more suited for actively working with files (editing video, for example) and should not be used as a single storage backup solution or on mission critical systems.

RAID 1

In a RAID 1 array, the data is written again to a second physical disk. This is the so-called mirror disk. If one of the two disks fails, the data is still fully available on the other disk. Use of the disk can continue normally. The disadvantage of RAID 1 is the TCO, because double the capacity than net required has to be calculated and invested.



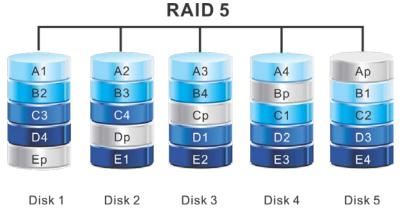
Applications

RAID 1 is ideal for applications requiring high fault tolerance at a low cost, without heavy emphasis on large amounts of storage capacity or top performance. Especially useful in situations where the perception is that having a duplicated set of data is more secure than using parity. For this reason, RAID 1 is popular used in data bases for accounting and other financial data. It is also commonly used for enterprise servers, and for individual users requiring fault tolerance with a minimum of hassle and cost.

RAID 5

In RAID 5, data is striped across all disks (minimum of three) and a parity block for each data block (#p in the diagram) is written on the same stripe. If one physical disk fails, the data from the failed disk can be rebuilt onto a

replacement disk. No data is lost in the case of a single disk failure, but if a second disk fails before data can be rebuilt to a replacement drive, all data in the array will be lost.

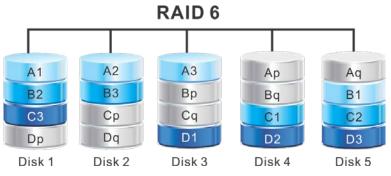


Applications

RAID 5 combines data safety with efficient use of disk space. Disk failure does not result in a service interruption because data is read from parity blocks. RAID 5 is useful for archiving and for people who need performance and constant access to their data, like video editors.

RAID 6

In RAID 6, data is striped across all disks (minimum of four) and a two parity blocks for each data block (p and q in the diagram at right) is written on the same stripe. If one physical disk fails, the data from the failed disk can be rebuilt onto a replacement disk. This Raid mode can support up to two disk failures with no data loss. RAID 6 provides for faster rebuilding of data from a failed disk.

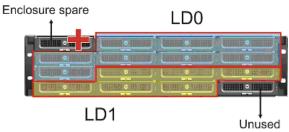


Applications

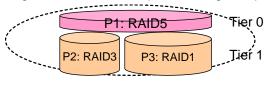
RAID 6 provides data reliability with the addition of efficient rebuilding in case of a failed drive. RAID 6 is therefore useful for people who need serious security with less of an emphasis on performance.

General Rules for Configuring Virtual Pools (ESVA subsystems only)

Enclosure Spare If RAID1 is selected as the RAID level, the first HDD will automatically become an Enclosure Spare. Since RAID1 requires an even number of drives; the last drive in the enclosure will not be utilized. This is applicable to all enclosures within a RAID1 virtual pool.

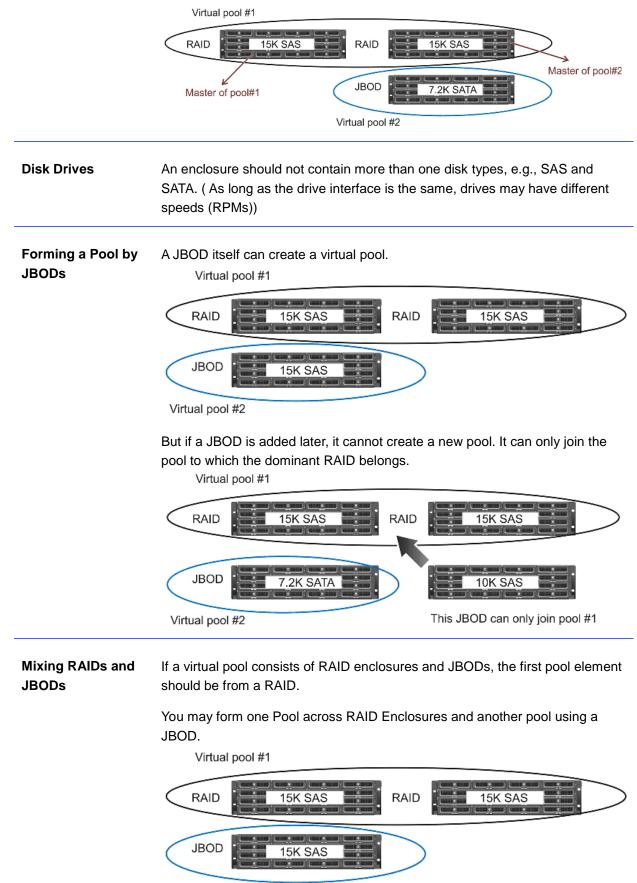


RAID LevelsA virtual pool can contain multiple RAID levels by using storage tiering. For
example, you may use RAID 3 for Tier 0 and RAID 5 for Tier 1. The following
diagrams show an example of mixing multiple pool elements in one tier level.



If storage tiering is not enabled, we recommend that a virtual pool use only one RAID level to optimize performance.

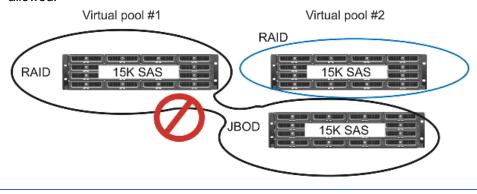
Elements	 An element should not span across multiple enclosures. If a virtual pool spans across two or more RAIDs, the RAID controller of the first element becomes the master.
Tiering	 The maximum level of tiering in a virtual pool is four. Here are the recommended rules for assigning pool elements to tier levels. Tier 0: SSD Tier 1: FC/SAS (RAID 1) Tier 2: FC/SAS (RAID 0/3/5/6) Tier 3: SATA
Max Number	 The maximum number of RAID units in a virtual pool is twelve (not including JBODs). The maximum number of virtual pools controlled by a master ESVA unit controller is seven.
Master/Member	A RAID enclosure can be a member of a pool and the master of another pool at the same time.



Virtual pool #2

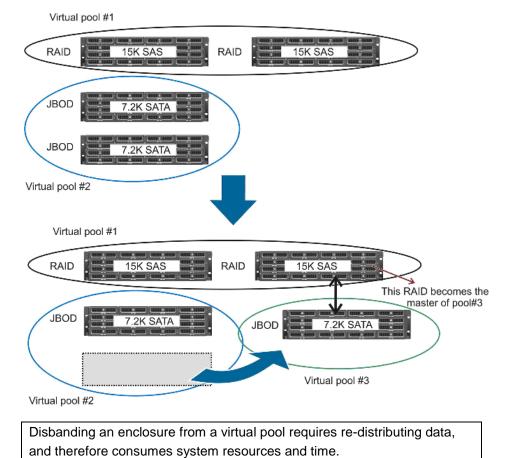


Combining a RAID and a JBOD which is attached to another RAID is not allowed.



Disbanding a JBOD from a Pool

You may balance the load by disbanding a JBOD from the pool and attach it to another RAID.

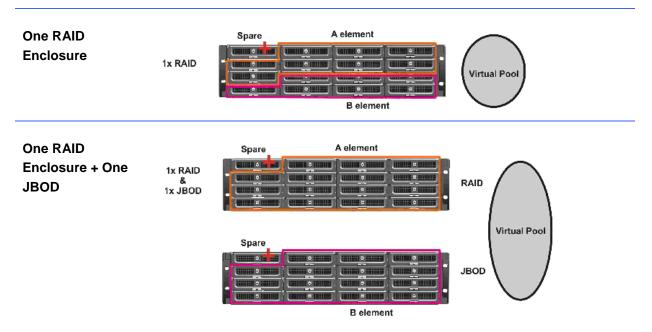


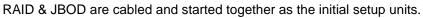
Examples of Combining RAID enclosures and JBODs (ESVA subsystems only)

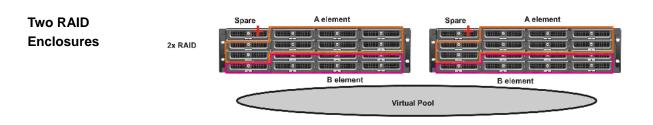
By default, the SANWatch wizard automatically groups physical disk drives into logical elements which you may manually reconfigure later.

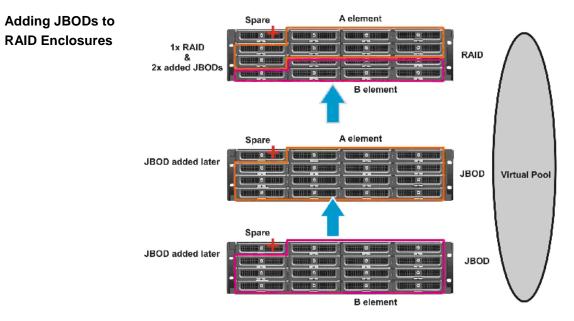
The defaults may use eight or seven drives in a pool element, which theoretically provides best throughput. They are automatically assigned to different RAID controllers to leverage all computing power within an enclosure.

The below samples show elements in RAID5 or RAID6 configuration. The (A) elements and (B) elements indicate ownership by dual-active RAID controllers.









JBODs were not included in the initial setup and were added into the pool later.



Viewing the List of Logical Volumes or Pools

All volume information can be accessed from the Device sidebar in the user interface.

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List



Steps

Go To

The list of logical volumes or pools and their logical drives or pool elements will appear.

The logical volume or pool status summary will appear to the right, in the main screen.

Logical Volume List			
🔲 Name 🔺	😲 Status 🔺	Eugical Drive Amount 🗸	Capacity
Logical Volume 1	📀 On-Line	1 Logical Drives	Available: 272.93 Total: 272.96 GB Usage : 0%

Clicking the name of each item to see detailed configuration.



The Status column shows whether this volume is in a healthy (no error) status.



The Logical Drive Amount (EonStor DS subsystems only) column shows the number of its member logical drives .

	Logical Drive Amount -	
1 Lo	qical Drives	

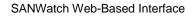
The System Performance (ESVA subsystems only) column shows the summary of system performance.



-	System Performance
2	Read: 0.00 MB/s
	Write: 0.00 MB/s

The capacity column shows the total and available (free) capacity allocated for this volume/pool.

Capacity		
Available: 272.93	Total: 272.96 GB	
Usage :	0%	



Creating a Virtual Pool and Virtual Volumes (ESVA subsystems only)

You can create both a virtual pool and its virtual volumes at the same time. You can also manually (and separately) create a virtual volume.

	The maximum size of a pool is 2PB.			
Process	 Creating a virtual pool or virtual volumes takes four steps: Selecting pool elements Configuring tiering (if tiering has been enabled) Creating virtual volumes Confirming the result 			
Go To	SANWatch Home > Pool sidebar > Pool List > Tasks corner			
Step1: Selecting Pool Elements	Click Create Pool in the Tasks corner.			
	Next Cancel			

Enter the pool name and description.

Step 1: Configure Pool Parameters		
Pool Name:	Pool 3	
Description:	New Pool	

Enable storage tiering (this option will show up when you have the tiering license).

Storage Tiering: Enable 💌

Highlight an ESVA/JBOD in the Available Extensions List and click Customize.

Available Extensions	
Slave, DA78C, 10.0.0.18	
Raw Capacity of the Selected	Customize
Device: 558.42 GB	

The Customize Pool Element window will appear.

Customize Pool Element *					
Configure the	Configure the parameters to customize a pool element.				
Spare Disk Settings Add Enclosure Spare Disk Amount of Current Enclosure Spare Disk: 0 Select Disks to Create the Pool					
	Size	Chara	Product ID		
Slot	5120	Spare	Product ID		
1	33.99 GB		FUJITSU MAU3036RC (SAS)		
2	33.99 GB		FUJITSU MAX3036RC (SAS)		
Capacity of Sele	Capacity of Selected Disks: 2				
Element Size:		33.99 GB			
RAID Level:		RAID1 T			
Assignment:		Slot A	•		

You may add a spare disk to the new pool.

Add Enclosure Spare Disk	0	•	
Amount of Current Enclosure Spare	Dista		

This option will be active only when there are spare drives available. You can create and add a spare drive later.

Select disk drives for the first pool element. If you wish to create multiple pool elements (especially for storage tiering), make sure you do not select all available disk drives.

- Select Disks to Create the Pool -

Slot	Size	Spare	Product ID	
1	33.99 GB	-	FUJITSU MAU3036RC (SAS)	
2	33.99 GB	-	FUJITSU MAX3036RC (SAS)	

Select the RAID level and the assigned controller. The number and size of disk drives will be updated in the Selected Amount and Element Size corner.

Capacity of Selected Disks:	2		
Element Size:	33.99 GB		
RAID Level:	RAID1	•	
Assignment:	Slot A	۲	

Click Apply. The ESVA system with the new pool element will appear in the Pool Extent List. (The first pool element will become the master element.)

© Slave, DA78C, 10.0.0.18	
Disk:0, Size:0 MB	Elements

To add more pool elements, repeat above steps.

When all elements have been added, highlight the extension and click Elements to confirm the list of pool elements included in this pool.

Pool Extensions	
Slave, DA78C, 10.0.0.18	
Disk:2, Size:279.2 GB	
DISK.2, 5128.279.2 0B	Elements

You may remove unwanted elements (except for the master element) here.

Element List							
View or re	move pool ele	ments of a devic	e.				
Remove	Element ID	Logical Drive	Size	Device			
			279.21 GB	ESVA F75-2830, DA78C			
			,	<u> </u>			
			App	oly Cancel			

Select the RAID level and the maximum possible pool size in the Settings corner.

AND Level RAID 1 The RAID Level of evel in the Custo lick Next. pare Disk	 Maximum Size 2 PB pption will be disabled if you have already chosen the RAID mize dialogue. Creates enclosure spare disk(s) for the virtual pool. You need to have available disks inside the enclosure. Specifies the RAID level of the virtual pool: RAID 0, 1, 5, and 6. RAID 5 and RAID 6 offer protection against one and two drive failure, respectively. If you want to take extra caution against data loss (for example, a media error
evel in the Custo lick Next. pare Disk	 mize dialogue. Creates enclosure spare disk(s) for the virtual pool. You need to have available disks inside the enclosure. Specifies the RAID level of the virtual pool: RAID 0, 1, 5, and 6. RAID 5 and RAID 6 offer protection against one and two drive failure, respectively. If you want to take extra
pare Disk	need to have available disks inside the enclosure. Specifies the RAID level of the virtual pool: RAID 0, 1, 5, and 6. RAID 5 and RAID 6 offer protection against one and two drive failure, respectively. If you want to take extra
-	need to have available disks inside the enclosure. Specifies the RAID level of the virtual pool: RAID 0, 1, 5, and 6. RAID 5 and RAID 6 offer protection against one and two drive failure, respectively. If you want to take extra
AID Level	and 6. RAID 5 and RAID 6 offer protection against one and two drive failure, respectively. If you want to take extra
	two drive failure, respectively. If you want to take extra
	occurs while rebuilding a failed drive), it is recommended to take RAID 6.
ool Name	Specifies the virtual pool's name.
escription	Specifies a short description of the virtual pool.
torage Tiering	When enabled, you can configure tiering. See procedures below for details.
laximum Size	Specifies the maximum pool size from 64TB up to 2PB. The size also determines the data block section size whic ESVA uses to distribute data across pool elements. The larger the Maximum Size, the larger the section size becomes which may not be optimal for random and small I/Os. Use the default size for optimal performance.
	In order to perform <u>remote mirror</u> , the maximum size of the pool pairs need to match each other.
ED Security	Protects pool data with SED security.
	escription torage Tiering aximum Size

The Storage Tiering Setting appears.

Configure	Tier Level for F	ool Element -					
Model		Name	ID	JBOD	Element Size	RAID	Tier
ESVA F	75-2830	Slave	DA78C		279.21 GB	RAID1	1 💌
	er Information			Tie	r Size		llsori
Tier	Element				r Size		Used
					r Size 0.00 GB		Used 0 MB
Tier	Element						
Tier 0	Element a				0.00 GB		0 MB

Confirm the list of pool element included in the pool.

Configure Tier Level for Pool Element —

Model	Name	ID
ESVA F75-2830	Slave	DA78C

Select the tier level of each pool element.

JBOD	Element Size	RAID	Tier
	279.21 GB	RAID1	1

Confirm the summary of pool elements and their tiers in the Storage Tier Information corner.

— Storage Tier Information —

Tier	Element Amount	Tier Size	Used
0	0	0.00 GB	0 MB
1	1	279.21 GB	0 MB
2	0	0.00 GB	0 MB
3	0	0.00 GB	0 MB

Click Next.

 Step 2 Parameters
 Tier Level
 Specifies the tier level of this pool. Four levels exist, with tier 0 having the highest priority. Here are the recommended tier levels for pool element types.

- ➤ Tier 0: SSD
- ➤ Tier 1: FC/SAS (RAID 1)
- Tier 2: FC/SAS (RAID 0/3/5/6)
- ➢ Tier 3: SATA

You may select the same or different tier levels for pool elements. Data in the higher tier will be accessed primarily.

Step 3: Configuring Virtual Volume	In the Create Virtual Volume window, check "Create Virtual Volume."								
	Create a new virtual volume and configure its parameters.								
	Pool Name: Pool 3 Pool Size: 279.2 GB I Create Virtual Volume Volume Size: 1								
	Γ	Virtual Volume Settings]
		Name Virtual V	/olume 1	Size 139.6	Unit GB 🔽	Thin-Provisioning	Initialize	Map	
	Ţ	otal Provisioni	ng: 139.6 GB			Back N	ext	Canc	el
	. /								
	You m	•	Pool 3	his box and	create virt	ual volumes la	ater.		
	Pool Si		279.2 GB						
	🔽 Cre	ate Virtual Vo	olume						
	Select	the num	ber of vol	umes.					
	Volume	Size: 1							
	Name	al Volume Se e 'irtual Volum	e 1	iize 139.6	Unit GB 🔽	lume Setting c			
		-	-	iers are ava may modify		ect in which tig ng later.	er each	volum	e will

Check if you want to enable thin-provisioning/initializing or mapping.

Thin-Provisioning	Initialize	Мар
Γ	N	

Click Next.

Volume Size

Step 3 Parameters

To change the volume size, double-click the number. If Thin Provision is activated, you may enter a volume size



larger than the pool size.	
----------------------------	--

Unit	Select the unit of volume size: MB, GB, or TB.
Tier Resided	Defines in which storage tier the virtual volume exis When you select "All," the virtual volume capacity w divided equally among the tiers. You may change the ratio manually later.
Thin-Provisionin g	When checked, a thin-provisioned volume with minimum reserved space (0%) will be created.
	When unchecked, a full-provisioned volume with initialization will be created.
	Thin provisioning allows you to allocate a large and virtual capacity for a logical volume regardless of th physical capacity actually available. Actual space is only when data writes occur. By automatically alloca system capacity to applications as needed, thin provisioning technology can significantly increase st utilization.
	When the volume is initialized, the virtual volume's addresses will be allocated consequentially for larg and/or sequential I/Os. This is ideal for audio/video application such as media post-editing and video on-demand.
Мар	Automatically maps the volume to all host channels which allows all SAN servers to access the volume. Uncheck this parameter if you intend to create host mapping later.

Step 4: Confirming the New Pool

A summary will appear. Verify configuration details and click OK. If you have chosen not to create virtual volumes or LUN mapping, you may do so later.



View the summary of the newly crea	ted pool.	
Pool:		
Name:	Pool 3	
Description:	New Pool	
RAID Level:	RAID 1	
Size:	279.2 GB	
Devices:		
Master Subsystem:	Slave, DA78C, 10.0.0.18	
Member Subsystem:		
Storage Tiering:		
Tier 1	Element Amount: 1, Size: 279.21 GB	
Virtual Volume:		
Amount:	1	
Virtual Volume 1 Name:	Virtual Volume 1	
Size:	139.6 GB	
Thin-Provisioning:	NO	
Initialize After Creation:	YES	
Map:	YES	

The pool will appear in the list.

Pool Status	Pool Status							
🔲 Name 🔺	💔 Status 🗸	2	System Performance					
Pool 1	💽 On-line	2	Read: 0.00 MB/s Write: 0.00 MB/s					
Pool 2	💽 On-line		Read: 0.00 MB/s Write: 0.00 MB/s					
Pool 3	💽 On-line		Read: 0.00 MB/s Write: 0.00 MB/s					

Creating a Logical Volume (EonStor DS subsystems only)

Note The maximum size of a logical volume is 256TB (before firmware version 3.88) and 512TB (after firmware version 3.88). Make sure that the size of the partition is in line (you cannot make the size of the partition larger than the size of the logical volume). For the latest status, checking with technical support is recommended.

Go To

SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > Tasks corner



Steps

Click Create Logical Volume, and the configuration window will appear.



 Select Create storage spaces in Symmetric Active/Active mode or Asymmetric Active/Active mode under "Select the mode for creating a pool" (Note that this feature will only display/available with two controllers attached on the storage device).

Create Logical Volume Select the mode for creating a pool • Create storage spaces in Symmetric Active/Active mode. Symmetric active-active controller - any volume can be accessed in parallel from any target port on any controller with nearly equal performance. • Create storage spaces in Asymmetric Active/Active mode

Asymmetric active-active controller - both controllers are available to process I/O for their assigned LUNs and they provide standby capability for each other(non-assigned LUNs).

Asymmetric Active/Active mode: read the description carefully, then assign a controller for this pool from the assignment scroll down list (Controller in Slot A / Controller in Slot B).

Symmetric Active/Active mode: read the description carefully. You do not need to assign a controller under this mode. Symmetric Active/Active configuration allows host I/O to come from both controllers. The logical drives of the pool will be evenly distributed to the two controllers. You can create a symmetric pool with multiple logical drives, which will be automatically assigned to controller A or B at creation/boot-up.

2. Select the member drives that will be added to the LV or pool and configure



the parameters.

Create Logical Volu	ume								
Create Logical Volume Create a logical volu	me and configure its	s parameters.							
Logical Volume Na Logical Volume 1									
			Slot	Size	Туре				
				33.99 GB	SAS				
			₹ 2	33.99 GB	SAS				
			⊘ 3	33.99 GB	SAS				
Number of Member	10 •	RAID L RAID5 V	₹ 4	33.99 GB	SAS				
Write Policy:	10 v Default v		. 5	33.99 GB	SAS				
SED Security	Disable •	· · · · · · · · · · · · · · · · · · ·	. €	33.99 GB	SAS				
,	1		₹ 7	418.93 GB	SAS				
			. ⊗ 8	136.66 GB	SAS				
				(00 (0 00					

Parameters	Logical Volume Name	Enter a unique name for the volume. Disable or Enable. For more information about storage tiering, click a logical volume or pool in the Device sidebar, click the Help icon at the top-right corner, and look for "Storage Tiering." Select the number of drives you wish to have in the logical volume. Select the RAID level to protect your data. The available RAID level depends on the number of disk drives.				
	Storage Tiering / Tier Index					
	Number of Member Drives					
	RAID Level					
		RAID level	Minimum number of drives	Minimum number of drives for Symmetric A/A mode		
		RAID 0	1	2		
		RAID 1	2	4		
		RAID 3	3 (4 if you want to add a spare drive)	6 (7 if you want to add a spare drive)		

	RAID 5	3 (4 if you want to add a spare drive)	6(7 if you want to add a spare drive)				
	RAID 6	4 (5 if you want to add a spare drive)	8(9 if you want to add a spare drive)				
Write Policy	Specifies the write policy: Default (write policy is determined by the controller's caching mode and event trigger mechanism), Write-Back (writing is considered complete when cache data is overwritten), or Write-Through (writing is considered complete only after the disk data is overwritten). Selecting Write-Through increases security but decreases performance.						
Assignment Specifies to which controller slot the new logical volume v be assigned. This section will be concealed when you configure the logical volume under Symmetric Active/Activ mode.							
Stripe Size	Specifies th	a is available for R-models e array stripe size. Do not are sure the modified value e.	change this value				
SED Security	SED (Self E Before ena should be • A SE Home > Tas SED	nether you want to protect to incrypting Drives) security. abling this option, the follow met: D authentication key is create > Device sidebar > Device sks corner > System Setting Authentication Key). ember drives support SED	ving requirements ated (at SANWatch e List > device name gs > Drive-Side tab >				

Click **Next**, view the summary information, and then click OK to complete the setup.

Creating a Logical Volume with RAID Level 30/50/60

Note Logical volumes with RAID level 30/50/60 are created by expansion with logical drives.

The following explains how to create a RAID 50 logical volume as an example.

Step 1

Create a RAID 5 logical volume.

Refer to Creating a Logical Volume.

Select three drives and set the RAID level as RAID5.

Create Logical Volume Create a logical volume	and configure its paran	netera.			
opical Volume Name:	Logical Volume 2				
			Slot	Size	Type
			82	279.14 08	SAS
			23	279.14.08	SAS
			24	279.14 GB	SAS
			85	279.21 GB	SAS
		-	0.6	279.21 08	SAS
Storage Tiering.	and the second and the second s	TierIndex: 1	07	33.99.08	SAS
lumber of Member Drives: Write Policy:		RAID Level: RAID5 Assignment: Slot 8	0.8	33.99 GB	SAS
tripe Size.	128K	• .		1	
SED Security		Total Capacity: 550.29 GB	L		

Step 2

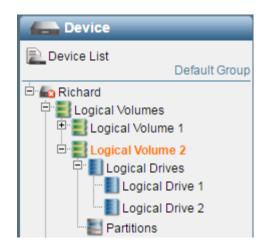
Add a logical drive to the logical volume that was created.

Refer to Adding a Logical Drive to an Existing Logical Volume.

Select three drives and set the RAID level as RAID5.

Add Logical Drive						×
Add Logical Drive Create a logical Drive, co	nfigure its parameters ar	nd add it into Logical Volume.				
RAID						
•	•	θ	Slot	Size	Туре	
	•	• •	5	279.21 GB	SAS	
			₽ 6	279.21 GB	SAS	
			₹ 7	33.99 GB	SAS	
			₹ 8	33.99 GB	SAS	
)				
Storage Tiering:	Disable •	Tier Index: 1 🔹				
Number of Member Drives:	3 🔻	RAID Level: RAID5 •				
Write Policy:	Default 🔻	Assignment Slot B 🔻				
Stripe Size:	128K •]				
SED Security	Disable •	Total Capacity: 59.99 GB				*
				Next	Cancel	

Then, you can see the logical drive is added to the logical volume.



This step can be repeated to create a RAID 50 logical volume with three logical drives (RAID 5 + RAID 5 + RAID 5).

You can use this method to create a RAID 30/50/60 logical volume. You can also create a logical volume with logical drives of mixed RAID levels, e.g. RAID 5 + RAID 6.

To create a RAID 10 logical volume, if you select 4 or more member drives and set the RAID level to RAID1, it will automatically be a RAID 10 configuration.

Deleting a Logical Volume or Pool

Deleting a logical volume or pool might lead to loss of data.

Delete the host LUN mapping (if applicable) before you delete the logical volume (for EonStor DS subsystems) or pool (for ESVA subsystems).

Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Tasks corner



Steps

Click Delete Logical Volume (for EonStor DS subsystems) or Delete Pool (for ESVA subsystems) in the Tasks corner.



Select the virtual volume or pool and click Remove.

Delete Logical Volume						
🖵 Logical Volume Name	Status	Total Capacity				
Cogical Volume 1	On-line	465.26 GB				
Logical Volume 2	On-line	232.63 GB				

Working with Logical Volumes or Pools

🛻 Device	Logical Volume Status					
Device List Default Group	🚺 Logical Volume Info	ormation		Capacity		
ESDS 3016R(FC 8G) ELogical Volumes Control Volume 1 Control Vol	Logical Volume 1	Size: ID: Logical Drive Size: Partition Size: Status:	272.96 GB 478B881E689705E0 1 0 • On-Line		Total Capacity: 272.5 Configured Space: 0 Data Service: 28 MB (Available Space: 272	MB (0%) (0%)
	E Logical Drive Memb	ers		Partition Mem	ibers	
	Logical Drive Name	Status	Capacity	Partition Name	Size	Мар
	Logical Drive 1	Good	272.96 GB		No Data	
	Tasks		<u>.</u>	1		
		ive / Expand Logical Volume city of this logical volume using e	existing or newly added		Logical Volume this logical volume.	
	Edit the configure	ical Volume ations of this logical volume.		Thresh View ar	nold nd configure the capacity threshold	d settings.
	Storage Tiering Functions include) es <u>Enable Tiering, Information,</u> an	d <u>Tier Migration</u> .			

This chapter describes the parameters of a logical volume (for EonStor DS subsystems) or a pool (for ESVA subsystems).



Viewing the Logical Volume or Pool Status

The status of each volume or pool is summarized in the Information page, where you can quickly grasp the configuration, performance, storage capacity.

Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name

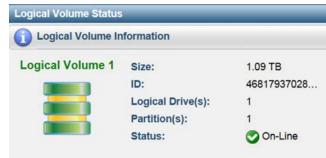


Viewing Volume/Pool Information The volume/pool status will be summarized in the Status corner.



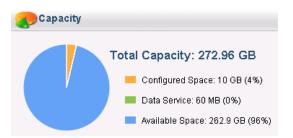
Volume or Pool Configurations

The basic configurations and overall system status will be listed in the Volume Information or Pool Information corner. You can see its size (capacity), ID, status, logical drive information (for EonStor DS subsystems only), or source subsystem(s) (ESVA subsystems only).



Volume or Pool Capacity

See the amount and ratio of used (configured) capacity and the remaining (available) capacity. You may also view the ratio of capacity used for data service (snapshot, remote replications).



Logical Drive Information (EonStor DS subsystems only)

View the list of member logical drives and their detailed configurations (available when clicking the link).

El Logical Drive Members			
Logical Drive Name	Status	Capacity	
Logical Drive 1	Good	272.96 GB	

Partition Information (EonStor DS subsystems only)

View the list of LUN mappings and their detailed configurations (available when clicking the link).

Partition Members		
Partition Name	Size	Мар
Partition 1	10 GB	No

Source Subsystem (ESVA subsystems only)

You can see the subsystem in which the main pool element (collection of disk drives) is located. The subsystem status is also displayed to the right, and clicking the link takes you to the device configuration page for the subsystem.

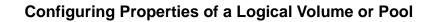
Source Subsystem:				
Master	📀 ОК			

Performance Monitor (ESVA subsystems only)

Check the Enable Performance Monitoring checkbox to see the read/write throughput or IOPS.

The Performance Monitor is disabled by default to save system resources.





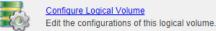
Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name >



Steps

Click Configure Logical Volume or Configure Pool in the Tasks corner.



Change the parameters in the Logical Volume Parameters corner. Click OK to confirm changes.

Configure the parameters of th	is logical volume, such as its name
Logical Volume Name:	Logical Volume 1
Write Policy:	Default 🗾
Assignment:	Slot A

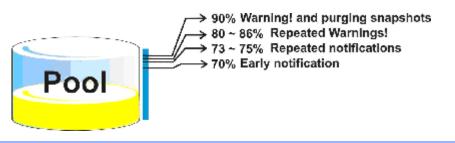
Parameters	Name	Specifies the logical volume name. This option is available only for EonStor DS subsystems.	
	Write Policy	 When "Write-back" (also Default) is enabled, the write requests from the host will be held in cache memory and distributed to disk drives later. Write-back caching can dramatically improve write performance by caching the unfinished writes in memory and letting them be committed to drives in a more efficient manner. In the event of power failure, a battery backup module can hold cached data for days (usually 72 hours). When "Write-back" is disabled (i.e., the Write-through is adopted,) host writes will be directly distributed to individual disk drives. The Write-through mode is safer if your controller is not configured in a redundant pair and there is no battery backup or UPS device to protect cached data. 	

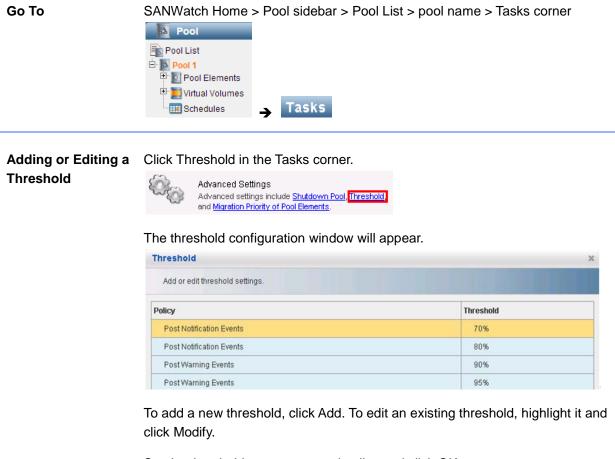
	Assignment	Specifies the controller to which this logical drive or pool element belongs.	
		Do not change this setting unless you are ready to switch the controller.	
Controller Reassignment Procedure	 recommend you to foll 1. List the logical volu 2. Shutdown the contr 3. Change the assign through the RS-232 command. For deta manual. 	 To re-assign a logical volume or pool to a different controller, we strongly recommend you to follow these steps: 1. List the logical volume (or pool) and all its logical drives (or pool elements 2. Shutdown the controller. 3. Change the assignment through the command terminal (typically connect through the RS-232 interface) using the set Logical Drive/Volume command. For details, refer to the CLI (Command Language Interface) manual. 	

Setting Pool Capacity Thresholds (ESVA subsystems only)

You need to reorganize a virtual pool before applications use up its capacity; otherwise, data loss might occur. You can set up a capacity threshold and receive notification when pool usage surpasses the threshold.

You can configure multiple threshold levels which may trigger notification or purge.





Set the threshold percentage and policy and click OK.

Threshold Percentage:	70	%
Policy:	Post Notification Events	

Threshold Policy Post Notification Events Sends out an event notification.



	Post Warning Events Post Critical Events Post Critical Events + Run Purge Operation		Sends out a warning notification.			
			Sends out a crit	Sends out a critical notification.		
			Sends out a critical notification and purges (deletes) snapshot images until the used space becomes lower than the threshold.			
	Post Critical Disassociate Images		snapshot image	tical notification and m es invalid until the amc valid) data becomes lo	ount of	
Deleting a Threshold	Highlight a threshold and click Delete.					
Configuring Purge Policy	This operation is applicable to thresholds with the "Post Critical Events + Run Purge Operation" setting.					
	Highlight a threshold and click Purge Rule. Policy Post Critical Events + Run Purge Operation The list of snapshot image purge policy for the threshold's virtual volume appears. Highlight the policy to edit and click Edit.					
				lume		
	Configure the pure	ge rule of snapshot image	96.			
	Partition Name Virtual Volume 1	Purge Rule Keep the Number of	Images within 7 Week(s)	Current / Max Number of Images	Activated NO	
	Configure the purge policy. First, select if you want to purge snapshot images when an expiration date arrives (by time period) or if the number of images reaches a threshold (by image count).					
	Edit the purge rule of partitions.					
		Gnapshot Image By tin ne Images for:	ne period 7	Week		
		Gnapshot Image By im ne Number of s within:	age count			

ОК

Cancel

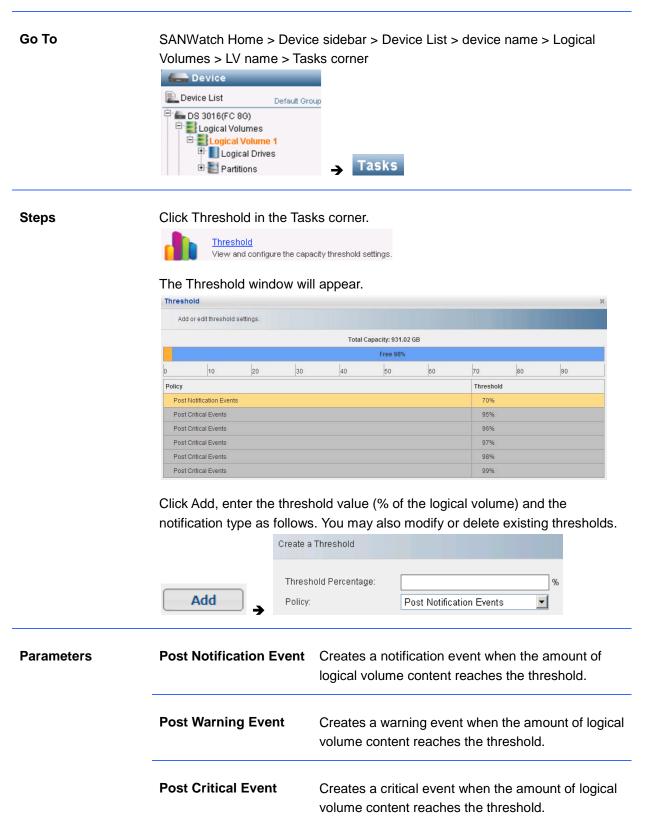


Purge Parameters Purge Threshold		Specifies the threshold policy: duration (By Time) or the number of snapshot images (By SI Count).	
	Value	Specifies the values.	



Configuring Notification Thresholds (EonStor DS subsystems only)

This feature is available only for EonStor DS series.



	Run Purge Post Critical Event + Disassociate		Creates a critical event and purges all <u>snapshot</u> <u>images</u> when the amount of logical volume content reaches the threshold. Creates a critical event and make all snapshot images invalid when the amount of logical volume content reaches the threshold.			
Configuring Purge Rules	 This setting is applicable only when there is a policy with the Post Critical Event + Run Purge option. Purge refers to removing old snapshot images to prevent the storage cap used up by unused snapshot image files. Click Purge Rule in the Threshold screen. 					
	Configure the	purge rule of snapsho	t images.	ges.		
	Partition Name	Purge Rule		Current / Max Number of Images	Activated	
	Partition 1	Keep the Number	of Images within 7 Week(s)	0/256	NO	
	Highlight the purge setting and click Edit. The purge rule scr Edit the purge rule of partitions.					
	O Purge Sn	apshot Image By tin	ne period			
	Keep the	Images for:	7	Week		
	O Purge Snapshot Image By image count					
	Keep the Images v	Number of ⁄ithin:				
Purge Parameters	Purge Thre		•	old policy: duration (I images (By SI Coun	•	
	Value	S	Specifies the values			



Adding a Logical Drive to an Existing Logical Volume (EonStor DS subsystems only)

By default, creating a logical volume (LV) also creates a logical drive (LD) on it. However, you may add a logical drive to an existing logical volume by following the procedures below.

SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Tasks corner

Tasks



Steps

Go To

Click Add Logical Drive in the Tasks corner.



Add Logical Drive / Expand Logical Volume Expand the capacity of this logical volume using existing or newly added drives.

The configuration window will appear.

Add Logical Drive Create a logical Drive, co	nfigure its parameter	rs ar	nd add it into Lo	gical Volum	e.
RAID					
	, e	6		<u> </u>	•
		Ē			
		ĩ			
i i i i i i i i i i i i i i i i i i i		î			
		_			
Storage Tiering:	Enable	۲	Tier Index:	1	•
Number of Member Drives:	3	۲	RAID Level:	RAID5	•
Write Policy:	Default	۲	Assignment:	Slot A	•
Stripe Size:	128K	۲			
SED Security	Disable	۲	Total Capacit	y: 1.08 TE	В

For information about the options on the window, refer to the Steps section of "Creating a Virtual Pool and Virtual Volumes (ESVA subsystems only)

> You can create both a virtual pool and its virtual volumes at the same time. You can also manually (and separately) create a virtual volume.

The maximum size of a pool is 2PB.



Process	Creating a virtual pool or virtual volumes takes four steps:
	 Selecting pool elements Configuring tiering (if tiering has been enabled) Creating virtual volumes Confirming the result
Go To	SANWatch Home > Pool sidebar > Pool List > Tasks corner
Step1: Selecting Pool Elements	Click Create Pool in the Tasks corner.
	Disk:0, Size:0 MB Elements Raw Capacity of the Selected Device: 0 MB Step 3: Configure RAID Settings RAID Level RAID 5 ▼ Maximum Size 2 PB ▼ SED Security Enable ▼ Po
	Next

Enter the pool name and description.

Step 1: Configure Pool Parameters Pool Name: Pool 3

Pool Name:	Pool 3	
Description:	New Pool	

Enable storage tiering (this option will show up when you have the tiering license).

Storage Tiering: Enable 💌

Highlight an ESVA/JBOD in the Available Extensions List and click Customize.

Available Extensions	
Slave, DA78C, 10.0.0.18	
Raw Capacity of the Selected	Customize

The Customize Pool Element window will appear.

Configure the parameters to customize a pool element.							
Add Enclosure	Spare Disk Settings Add Enclosure Spare Disk O Amount of Current Enclosure Spare Disk: 0						
- Select Disks to Create the Pool							
Slot	Size	Spare	Product ID				
1	33.99 GB		FUJITSU MAU3036RC (SAS)				
2	33.99 GB		FUJITSU MAX3036RC (SAS)				
Capacity of Sele	cted Disks:	2					
Element Size:		33.99 GB					
RAID Level:		RAID1	¥				
Assignment:		Slot A	T				

You may add a spare disk to the new pool.

Add Fards and Draw Disk		
Add Enclosure Spare Disk	0 •	
Amount of Current Enclosure Spare I	Disk: 0	

This option will be active only when there are spare drives available. You can create and add a spare drive later.

Select disk drives for the first pool element. If you wish to create multiple pool elements (especially for storage tiering), make sure you do not select all available disk drives.

Slot	Size	Spare	Product ID
1	33.99 GB	-	FUJITSU MAU3036RC (SAS)
2	33.99 GB	-	FUJITSU MAX3036RC (SAS)

Select the RAID level and the assigned controller. The number and size of disk drives will be updated in the Selected Amount

and Element Size corner.

Capacity of Selected Disks:	2	
Element Size:	33.99 GB	
RAID Level:	RAID1	•
Assignment.	Slot A	•

Click Apply. The ESVA system with the new pool element will appear in the Pool Extent List. (The first pool element will become the master element.)

Pool Extensions	
Slave, DA78C, 10.0.0.18	
Disk:0, Size:0 MB	Elements

To add more pool elements, repeat above steps.

When all elements have been added, highlight the extension and click Elements to confirm the list of pool elements included in this pool.

Deal Extension

Elements

You may remove unwanted elements (except for the master element) here.

lement Li	ist			
View or re	move pool ele	ements of a devic	:e.	
Remove	Element ID	Logical Drive	Size	Device
			279.21 GB	ESVA F75-2830, DA78C
		1	1	1
			Apr	oly Cancel
			App	oly Cancel

Select the RAID level and the maximum possible pool size in the Settings corner.

Step 3: Configure RAID Settings					
RAID Level	RAID 1	T	Maximum Size	2 PB	•

The RAID Level option will be disabled if you have already



	Click Next.	
Step 1 Parameters	Spare Disk	Creates enclosure spare disk(s) for the virtual pool. You need to have available disks inside the enclosure.
	RAID Level	Specifies the RAID level of the virtual pool: RAID 0, 1, 5, and 6.
		RAID 5 and RAID 6 offer protection against one and two drive failure, respectively. If you want to take extra caution against data loss (for example, a media error occurs while rebuilding a failed drive), it is recommended to take RAID 6.
	Pool Name	Specifies the virtual pool's name.
	Description	Specifies a short description of the virtual poo
	Storage Tiering	When enabled, you can configure tiering. See procedures below for details.
	Maximum Size	Specifies the maximum pool size from 64TB up to 2PB. The size also determines the data block section size which ESVA uses to distribute data across pool elements. The larger the Maximum Size, the larger the section size becomes which may not be optimal for random and small I/Os. Use the default size for optimal performance.
		In order to perform <u>remote mirror</u> , the maximum size of the pool pairs need to match each other.
	SED Security	Protects pool data with SED security.

Step 2: Configuring Tiering

If storage tiering has not been enabled, you will see the next step, Configuring Virtual Volumes.



The Storage Tiering Setting appears.

		ol Element –					
Model		Name	ID	JBOD	Element Size	RAID	_
ESVA F	75-2830	Slave	DA78C		279.21 GB	RAID1	
Storage Ti Tier	ier Information – Element Ar			Tie	r Size		Us
Tier	Element Ar						Us
					r Size 0.00 GB		Us
Tier	Element Ar						Us
Tier 0	Element Ar				0.00 GB		Us

Confirm the list of pool element included in the pool.

– Configure Tier Level for Pool Element –

Model	Name	ID
ESVA F75-2830	Slave	DA78C

Select the tier level of each pool element.

JBOD	Element Size	RAID	Tier
	279.21 GB	RAID1	1 🔽

Confirm the summary of pool elements and their tiers in the Storage Tier Information corner.

Tier	Element Amount	Tier Size	U
0	0	0.00 GB	
1	1	279.21 GB	
2	0	0.00 GB	
3	0	0.00 GB	

Click Next.

Tier Level

Step 2 Parameters

Specifies the tier level of this pool. Four levels exist, with tier 0 having the highest priority. Here are the recommended tier levels for pool element types.

➤ Tier 0: SSD

- Tier 1: FC/SAS (RAID 1)
- Tier 2: FC/SAS (RAID 0/3/5/6)
- ➤ Tier 3: SATA

You may select the same or different tier levels for pool elements. Data in the higher tier will be accessed primarily.

Step 3:In the Create Virtual Volume window, check "Create VirtualConfiguringVolume."Virtual VolumeCreate Virtual Volume

Create Virtual Volume					
Create a n <mark>e</mark> w virtual volu	ime and confi	igure its parameter	rs.		
Pool Name:	Pool 3				
Pool Size:	279.2 GB				
Create Virtual Vol	ume	Volume Size: 1	•		
— Virtual Volume Se	ttings ——				
Name		Size	Unit	Thin-Provisioning	Initialize
Virtual Volum	ie 1	139.6	GB 💌	Γ	V
				·	
Total Provisioning: 13	39.6 GB				
				Back	Next

You may also uncheck this box and create virtual volumes later.

Pool Name: Pool 3 Pool Size: 279.2 GB

Select the number of volumes.

Volume Size: 1

The volumes will then appear in the Virtual Volume Setting corner.

Г	– Virtual Volume Setti	ngs ———		
	Name		Size	Unit
	Virtual Volume	1	139.6	GB 🔽

(When multiple storage tiers are available) Select in which tier each volume will reside (Default: All). You may modify this setting later.

Check if you want to enable thin-provisioning/initializing or

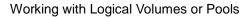


mapping.

Thin-Provisioning	Initialize	Мар
Γ		

Click Next.

Step 3 Parameters	Volume Size	To change the volume size, double-click the number. If Thin Provision is activated, you may enter a volume size larger than the pool size.
	Unit	Select the unit of volume size: MB, GB, or TB.
	Tier Resided	Defines in which storage tier the virtual volume exists. When you select "All," the virtual volume capacity will be divided equally among the tiers. You may change the ratio manually later.
	Thin-Provisio ning	When checked, a thin-provisioned volume with no minimum reserved space (0%) will be created.
		When unchecked, a full-provisioned volume with initialization will be created.
		Thin provisioning allows you to allocate a large amount of virtual capacity for a logical volume regardless of the physical capacity actually available. Actual space is used only when data writes occur. By automatically allocating system capacity to applications as needed, thin provisioning technology can significantly increase storage utilization.
		When the volume is initialized, the virtual volume's LBA addresses will be allocated consequentially for large and/or sequential I/Os. This is ideal for audio/video application such as media post-editing and video on-demand.
	Мар	Automatically maps the volume to all host channels, which allows all SAN servers to



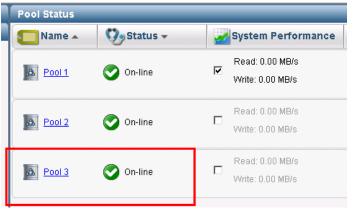
access the volume. Uncheck this parameter if you intend to create host LUN mapping later.

Step 4: Confirming the New Pool

A summary will appear. Verify configuration details and click OK. If you have chosen not to create virtual volumes or LUN mapping, you may do so later.

summary			
View the summary of the newly created	1 pool.		
Pool:			
Name:	Pool 3		
Description:	New Pool		
RAID Level:	RAID 1		
Size:	279.2 GB		
Devices:			
Master Subsystem:	Slave, DA78C, 10.0.0.18		
Member Subsystem:			
Storage Tiering:			
Tier 1	Element Amount: 1, Size: 279.21 GE	ł	
Virtual Volume:			
Amount:	1		
Virtual Volume 1 Name:	Virtual Volume 1		
Size:	139.6 GB		
Thin-Provisioning:	NO		
Initialize After Creation:	YES		
Map:	YES		
		Back	ОК

The pool will appear in the list.



Creating a Logical Volume."

Expanding a Logical Volume (EonStor DS subsystems only)

You may expand a logical volume's size in these steps.

Expand the size of its member logical drives. You must expand all logical drives that belong to this logical volume.

Expand the size of the logical volume following the procedures below.

SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Tasks corner



Steps

Go To

Click Expand Logical Volumes in the Tasks corner.



Add Logical Drive / Expand Logical Volume Expand the capacity of this logical volume using existing or newly added drives.

The expansion screen will appear.

Expand Logical Volume	×
Expand the logical drive using available capacity.	
Maximum Expansion Size:238214 MB	
Expand Cancel	

The system will automatically select all available capacity for expansion.

Click Expand to begin the process.

Check the logical volume status in the list to see the expanded size.



Expanding/Shrinking a Virtual Pool (ESVA subsystems only)

Types of Expansion You may expand a virtual pool in two ways:

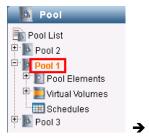
- Adding more disk drives/enclosures to the original pool element: In this case, you are going to add disk drives in the same RAID level.
- Adding different pool elements: If you have enabled storage tiering, you can also add pool elements with different RAID levels to an existing pool, by separating their tier level. The data will be written to the tier with the higher level first.

Make sure you have prepared sufficient number of available disk drives corresponding to the RAID level of the element you want to add.

NoteWhen you try to expand the pool via scale-out mechanism (by adding more
ESVA subsystems), we strongly recommend you to build the RAID group as a
pool using the same firmware version.

Go To

SANWatch Home > Pool sidebar > Pool List > pool name > Tasks corner



Expanding a Virtual Pool (Adding a Pool Element) Click Configure Pool in the Tasks corner.



Highlight a ESVA/JBOD in the Pool Extent List and click Customize.

Tasks

nize

In the Customize window that appears, select the disk drives that will be added.

- Select Disks to Create the Pool ------

🗖 Slot	Size	Spare
V 1	279.21 GB	
2	279.21 GB	



Select the RAID and assigned slot and click OK.

Capacity of Selected Disks:	1	Element Size:		
RAID Level:	•	Assignment:	Slot A	•

Highlight the pool in the Pool Extension list and click Elements.

Pool Extensions	
@ Master, C7D12, 127.0.0.1	
Slave, DA78C, 127.0.0.1	
Disk:2, Size:558.42 GB	Elements

Confirm that the newly added pool elements appear in the list.

🗆 Remove	Element ID	Logical Drive	Size	Device
			279.21 GB	ESVA F75-2830, DA78C

Select the data migration priority in the Settings and click Next.

Step 3: Configure RAID Settings

RAID Level	RAID 0	-	Migration Priority High	-
10.00 00101	1.1 110 0		ingration from, fright	

The Pause priority is not used until data migration actually starts.

The Storage Tiering Setting (if selected) appears. Confirm that the newly added pool element appears.

Configure Poo	ol Element Tier I	Level				
Model	Name	ID	JBOD	Element Size	RAID	Tier
ESVA F70-28		9CFCF	N/A	931.25 GB	RAID1	1 💌
ESVA F70-28		9CFCF	N/A	1.81 TB	RAID0	2 💌
ESVA F70-28		9CFCF	N/A	931.25 GB	RAID1	1 💌

Select the tier level of the newly added element(s). The new element can expand an existing tier or become a new tier for the pool.

Element Size	RAID	Tier
931.25 GB	RAID1	1 💌
1.81 TB	RAID0	2 💌
931.25 GB	RAID1	1 💌
		0
		1
		2
		3

Confirm the summary of pool elements and their tiers in the Storage Tier Information corner.

Storage Tier Information		
Tier	Element#	Tier Size
0	0	0 MB
1	1	931.25 GB
2	1	1.81 TB
3	1	931.25 GB

The summary of the updated pool configuration will appear. Click OK.

Pool:	
Name:	Pool 2
Description:	
RAID Level:	RAID 0
Size:	837.63 GB
Migration Priority:	High
Devices:	
Master Subsystem:	Master, C7D12, 127.0.0.1

Data migration will begin

Shrinking a Virtual Pool (Removing a **Pool Element)**

Make sure you have deleted the virtual volumes that reside in the pool element to be deleted.

Click Configure Pool in the Tasks corner.



Highlight an ESVA/JBOD in the Pool Extension List and click Elements.

Pool Extensions

1 OOI EXCITIBIOITIB	
@ Master, C7D12, 127.0.0.1	
C Slave, DA78C, 127.0.0.1	
Disk:2, Size:558.42 GB	Elements

Select the element you want to remove and click Apply.

62A32F125A12C7A7 1CE8C10A 279.21 GB ESVA F75-2830, DA780
02A32F123A12C7A7 1CE0C10A 279.210B E0VAF75-2030, DA760
02A32FT20AT2C7A7 TCE6CT0A 273.2T6B E8VA F75-2630, DA



•

The summary of the updated pool configuration will appear. Click OK.



Pool:		
	Name:	Pool 2
	Description:	
	RAID Level:	RAID 1
	Size:	837.63 GB
	Migration Priority:	High
Device	es:	
	Master Subsystem:	Master, C7D12, 127.0.0.1

Data migration will begin.



Assigning a Spare Drive to a Pool (ESVA subsystems only)

	Make sure that an available drive exists (not part of a virtual pool or virtual volume yet).
Enclosure vs. Local Spare Drive	 Enclosure spare drives can be access by all pool elements inside the subsystem enclosure. Local spare drives are exclusive to the pool element the drives are assigned to.
Go To	SANWatch Home > Pool sidebar > Pool List > pool name > Tasks corner

Steps

Click Configure Spare Disk in the Tasks corner.



The spare drive configuration screen will appear.

- Select Device or Element	Assign	Drive as Spare ——		
▶ Pool 1	Slot	Size	Status	

Highlight the pool (enclosure spare) or pool element (local spare) to which the spare disk will be assigned.

Pool (Enclosure)



Element (Local)

Select Device or Element -



Check the spare disk on the right-side corner and make sure the status (Enclosure or Local) is correct.

- Assign Drive as Spare -

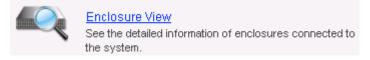
Slot	Size	Status	

Click the Apply button to assign the spare drive.

Go to Device List > Device > Drives.

🛻 Device
📄 Device List
🗄 🔚 Master
🖻 🚛 Slave
Drives
🏷 Channels
🛄 Data Hosts

Click Enclosure View in the Tasks corner.



The newly assigned spare drive in the front panel figure will show a "+" sign, indicating that it is a spare drive.



Setting Up Thin Provisioning and Host Reclaim

About Thin Provisioning	logical volume or poor Actual space is used system capacity to ap significantly increase	ws you to allocate a large amount of virtual capacity for a I regardless of the physical capacity actually available. only when data writes occur. By automatically allocating oplications as needed, thin provisioning technology can storage utilization. Thin provisioning also greatly simplifies d management tasks. For more information, see the
	The thin provisioning prerequisites:	g / reclaim feature is available in systems with following
	EonStor DS G7 syst	ems: FW3.86C or later ems: FW3.91B or later I 3000 series by default, supports thin provisioning.
	Dynamically allocati performance is the t	vendor for more details! ng capacity affects the overall performance. If op priority (such as in AV applications), we recommend rovisioning (= use full provisioning).
About Host Reclaim	whenever new files a files remain intact, bu the long run. As a res appears less than its	ps increasing the amount of physical storage on demand re added. This works perfectly as long as all of the original t in reality some files will be deleted by host computers in ult, available LV or pool capacity of your subsystem often real available size. In order to make the most use of e of deleted files/blocks should be checked occasionally to logical volume.
	virtual volumes, and " currently used area. I provisioning, and is e	tion calculates the size of the deleted files in partitions or shrink" the logical volume or pool size so that it reflects the Host reclaim should be used in conjunction with thin specially useful for data replication such as snapshot and Illowing for shortened replication time and reduced target
	Host Reclaim only w Linux.	orks when the host computer is running on Windows or
Prerequisites	The subsystem need	s to meet the following conditions.
	License	Thin Provisioning Image: Thin provisioning Due to Expire No due day
		To view the license information, go to SANWatch Home

To view the license information, go to SANWatch Home > Device sidebar > Device List > device name > Tasks



	corner > License Information
Firmware	To view the firmware version, open SANWatch Home > Device sidebar > Device List > device name > Status corner > Firmware Version
SANWatch	To view the SANWatch version, go to SANWatch Home > About.
Thin-Provisioned Partition or Virtual Volume Size	Maximum 256TB or 512TB The maximum size of a single partition or virtual volume is 256TB (before firmware version 3.88) or 512TB (after firmware version 3.88). Make sure that the size of the logical volume or pool is in line (you cannot make the size of the partition or virtual volume larger than the size of the logical volume or pool). For the latest status, checking with technical support is recommended.
	Although we allow you to "over-provision" (the size of the thin-provisioned partition or virtual volume can be larger than the actual logical volume size), the partition or virtual volume size cannot exceed the size limit for the EonStor DS series.

Thin Provisioning Settings

1. Thin provisioning is configured during creating a partition (for EonStor DS subsystems) or virtual volume (for ESVA subsystems).



- Add a new partition using available space to a logical volume.
- 2. In the partition or VV creation screen, thin provisioning options will appear in the lower half.

Configure the parameters of t	he partition.	
Partition Name:	Partition 1	
Size:	100	GB 🗾
📕 Initialize Partition After C	reation	
🔽 Enable Thin-Provisionin	g	
Minimum Reserved Space		
	38	GB 🗾 38 %
🔲 Map Partition to Host		

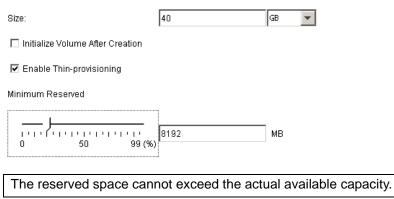
3. After the new partition or virtual cool has been created, create one or more notification thresholds to make sure that the administrator receives warning/critical messages before all of the logical volume space or pool will be used up, and to give him or her ample time for expanding the size of the

logical volume.

We recommend you to create multiple thresholds to stay on the safe side. (Example: notification for 70%, warning for 90%, critical for 95%, critical and purge snapshot images for 99%) Case 1: Full If you uncheck "Enable Thin-provisioning," thin provisioning will be disabled and **Provisioning (Thin** all of the configured logical volume size or pool size (in the below diagram's Provisioning case, 14GB) will be taken from the capacity actually available. The partition or **Disabled**) virtual volume will be created as a continuous physical space reserved only for the target application, and then will be initialized if the "Initialize Volume After Creation" box is checked (you may uncheck this option if you prefer). Logcial Volume Available Capacity: 20.84 GB Size: 14 GB -☑ Initialize Volume After Creation 🔲 Enable Thin-provisioning Minimum Reserved 14336 0 50 100 (%) MB Full provisioning is suitable for mission-critical applications with large amount of uninterrupted data, such as audio/video streams. Dynamically allocating space and expanding usable area slows the I/O performance down, therefore allocating a large physical capacity from the beginning optimizes the performance. Case 2: Thin To enable thin provisioning, check the "Enable Thin-provisioning" box and select Provisioning the Minimum Reserved space using the slider. When the application use up the minimum reserved area, additional space will be taken from the rest of the logical volume (or virtual pool) space and will be added to the partition or virtual volume dynamically. In this example, The actual logical volume size or pool is 20GB but the partition or virtual volume is set at 40GB, larger than the available size. This is fine as long as the minimum reserved space (the actual physically allocated space) is smaller than the logical volume size or pool size: 8GB in this case.



Logcial Volume Available Capacity: 20.84 GB



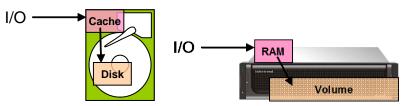
Storage Tiering

This section is applicable when storage tiering has been enabled.

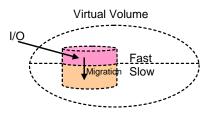
What is Storage Tiering?

What Tiering is
aboutTiering creates vertical layers inside a virtual pool (or logical volume for EonStor
DS subsystems) to improve data I/O performance compared to the traditional,
monolithic pool.

Tiering is a simulation of cache mechanism deployed in a disk drive or a RAID subsystem, where data transaction takes place in fast cache memory without waiting for slower physical drives to respond.



To simulate cache system inside a pool, a tier system separates the pool elements (or logical drives for EonStor DS subsystems) into layers called tiers. I/O transaction will primarily occur between the higher tier, where pool elements or logical drives with faster access (such as a LD composed of SSDs) will be assigned. The data will then be migrated into the lower tier, where slower but more economically feasible pool elements or logical drives (such as a pool element composed of SATA drives) are assigned.



Benefits of Tiering > Fast data transaction: Data will always be written to the top tier first, then will be migrated into lower tiers. By assigning a pool element or logical drive to fast drives (such as SSDs) to the top tier, you can achieve higher data throughput.
 > Flexible pool configuration: You can mix different RAID levels and drive types (SSD / SAS, NL-SAS, etc.) inside a virtual pool; you are no longer restricted to build it from a single hardware type.
 > Economic pool creation: You can assign fast but expensive hardware to the top tier, and construct lower tiers with slower but more economic hardware.

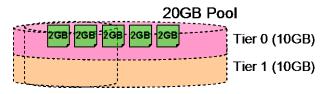
Tiered Migration
By default, the host always writes to the highest priority tier (usually Tier 0). In

order not to use up all capacity of the top tier, you will need to migrate

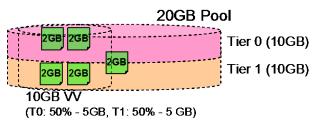


unimportant data into lower tiers, either manually or automatically by schedule.

Before: All data is written to the top tier, or tier 0.



After: Some data will be migrated to the lower tier, or tier 1.



"Hotness" of Data The system determines the priority of data by two factors:

- Residing time: the newer, the higher priority
- > Access frequency: the more heavily accessed, the higher priority

Data with higher priority is marked as "hot" and will likely reside in higher tiers after migration.

Tiering Rules	
Tier Levels	ESVA and EonStor DS system may have four tier levels to choose from, with tier 0 the fastest. Here are the recommended tier levels for RAID and drive types.
	Tier 0: SSD
	 Tier 1: SAS Tier 2: Nearline SAS
	 Tier 3: SATA
	SSD and SAS drives have fast I/Os but are expensive, suited for performance-oriented usage. NL-SATA drives are slower but are inexpensive, suited for capacity-oriented usage.
Host I/O Priority	 The host always writes to the highest tier in a given pool or logical volume. Data service (snapshot, volume copy, volume mirror) will occur at the lowest tier.
License	To use storage tiering, you need to <u>apply for a tiering license</u> . Go to Device > Information > License Information.
	Information View the total <u>System Information</u> and applicable <u>License Information</u> .
	Click License information.
	License Information
	Current License
	■ Volume Copy
	Volume Mirror Synchrounous Remote Replication
	Asynchrounous Remote Replication
	E-Storage Tiering Expiration Date=No Due Date E-JBOD
Virtual Volumes	A virtual volume (for ESVA subsystems) or partition (for EonStor DS subsystems) can exist either entirely inside one tier or among multiple tiers. In case of the latter, you will need to specify the ratio of the virtual volume assigned to each tier.
	Tiered pool
	VV1 100% 50% Tier 0
	50% Tier 1
Posorvo Patio	Tier reserve ratio defines the capacity in higher tiers that will not be used up by

Reserve Ratio Tier reserve ratio defines the capacity in higher tiers that will not be used up by

	tiered pools/volumes. Because the highest tier will be accessed preferentially, there is a risk of data filling up all capacity of the higher tiers. Setting the reserve ratio secures free space for the higher tiers.
	You cannot set a reserve ratio for the lowest tier. (= If there is only one tier level, you cannot configure the reserve ratio.)
Limitations on Provisioning and Tiering	Here are the limitations regarding creating a thin/full <u>provisioned</u> partition (for EonStor DS subsystems) or virtual volume (for ESVA subsystems) on a tiering-enabled logical volume:
	 If you check Initialize Partition after Creation or Initialize Virtual Volume after Creation to create a full provisioned partition or VV, data stored on the partition or VV could only reside on one tier. Only data stored on thin provisioned partition could be migrated between another tier. If you check Enable Thin-Provisioning to create a thin provisioned partition, or VV you are not allowed to set minimum reserved space for it.
Existing Elements after Obtaining Tiering License	The logical volumes / drives (or pools / pool elements for ESVA subsystems) that were created before <u>obtaining Tiering license</u> will be summarized as follows.
	Logical volumes or pools:
	 Existing LVs or pools could be tiered but with only one tier. The default tier index belongs to the first volume element.
	Logical drives or pool elements:
	All logical drives or pool elements will reside in their logical volume's or

All logical drives or pool elements will reside in their logical volume pool's tier if the LV or pool has been transformed into a tiered one.



Activating Storage Tiering for Legacy Logical Volumes or Pools

You may enable tiering for pools or logical volumes that were created without enabling tiering.

Go to

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Tasks corner



Enabling Storage Tiering

Click Enable Tiering in the Tasks corner.



Storage Tiering Functions includes Enable Tiering,

Select the tiering level and click OK.

Assign logical drives	to different tiers			
	logical drive should be assigned to	a higher tier, such	n as Tier 0.	
				and the second se
Logical Drivo Namo	Statue	Tupo	Canacity	Tior
Logical Drive Name	Status	Туре	Capacity	Tier

All pool elements (or logical drives) of the pool (or logical volume) will be transferred to one tier.

Users may click Information to view the pool's (or logical volume's) tiering information.

Storage Tiering Functions includes Enable Tiering, Information, Information					
		Tier0	Tier1	Tier2	Tier3
Summary of Tier Information					
Size		1.81 TB			931.25 GB
All Volumes	Used	10 GB(0.5%)			0 MB(0.0%)
	Data Service	0 MB(0.0%)			0 MB(0.0%)
	Reserved	186.25 GB(10.0%)			0 MB(0.0%)
Volume Details					
Destition 4	Used	10 GB(100.0%)			0 MB(0.0%)
Partition 1	Data Service	0 MB(0.0%)			0 MB(0.0%)

You can click Tier Migration to perform tier migration for optimized data allocation.



Storage Tiering Functions includes <u>Enable Tiering</u>, <u>Information</u>, and <u>Tier Migration</u>.

Or you can perform tier migration by schedule, go to SANWatch Home > Device sidebar > Device List > device name > Schedules, click the Help icon at the top-right corner, and then search for "Creating Tiered Data Migration by Schedule" for more information.

Changing Residing Tiers for Elements or LDs Click Tier Setting in the Tasks corner.



Storage Tiering Functions include <u>Disable Tiering, Tier Setting</u>,

Select tier levels for elements or LDs, and then click OK.

			10 1200 2007	
Higher-periormanc	e logical drive should be as:	signed to a higher tier, su	ch as Tier 0.	
	Chatria	Tuno	Canacity	-
Logical Drive Name	Status	Туре	Capacity	Tier
Logical Drive Name	Good	SAS	1.81 TB	0 T

Disabling Storage Tiering Click Disable Tiering in the Tasks corner, and then click Yes in the dialog that appears.





Configuring Tier Reserve Ratio for VV of the / Pool (only available for ESVA subsystems)

Tier reserve ratio defines the capacity in higher tiers that will not be used up by tiered pools. Because the highest tier will be accessed preferentially, there is a risk of data filling up all capacity of the higher tiers. Setting the reserve ratio secures free space for the higher tiers.

VV must be thin-provisioned to set tier ratio. You cannot set a reserve ratio for the lowest tier. (= If there is only one tier level, you cannot configure the reserve ratio.)

Configuring Tier Reserve Ratio Under Advanced Settings in the Tasks corner, click Tier Ratio Setting.



Tier Ratio Setting

Configure tiering parameters for the virtual volume including the residing tier and ratio.					
Volume Size: 10 GB ☐ Enable Auto Reside Ratio Setting					
				Reside Size	
V	0	136.48 GB	76 MB	5 GB	
	1	272.96 GB	2.74 GB	5 GB	

"Enable Auto Reside Ration Setting" is available for ESVA subsystems only.

Using the above screenshot as an example, user can allocate 100% of the reserve ratio to either tier or split it 50 / 50 amongst the two tiers.

Configure the ratio and click OK.





Viewing Tiering Information

Go to

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Tasks corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Tasks corner

E Device				
Device List Default Group		Pool		
DS 3016(FC 8G)		Pool List		
E Logical Volumes		Pool Elements		
El Logical Drives		🗉 🗾 Virtual Volumes		_
🗉 🛃 Partitions	or	Schedules	→	Task

Steps

Click Information under Storage Tiering in the Tasks corner.



Functions includes Enable Tiering, Information, and Tier Migration.

Existing tiering information will appear.

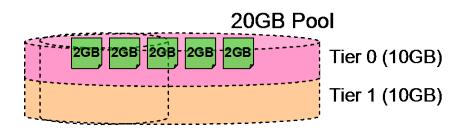
Information					1
	Tier0	Tier1	Tier2	Tier3	
Summary of Tier Information					
	1.81 TB			931.25 GB	
Used	10 GB(0.5%)			0 MB(0.0%)	
Data Service	0 MB(0.0%)			0 MB(0.0%)	
Reserved	186.25 GB(10.0%)			0 MB(0.0%)	
Used	10 GB(100.0%)			0 MB(0.0%)	
Data Service	0 MB(0.0%)			0 MB(0.0%)	
	Used Data Service Reserved Used	University 1.81 TB Used 10 GB(0.5%) Data Service 0 MB(0.0%) Reserved 186.25 GB(10.0%) Used Used 10 GB(100.0%)	Information 1.81 TB Used 10 GB(0.5%) Data Service 0 MB(0.0%) Reserved 186.25 GB(10.0%) Used Used 10 GB(100.0%)	Information Image: Second	Information 931.25 GB Used 1.81 TB 931.25 GB Data Service 0 MB(0.0%) 0 MB(0.0%) Reserved 186.25 GB(10.0%) 0 MB(0.0%) Used 10 GB(100.0%) 0 MB(0.0%)

Parameters	Used	Shows the size and ratio of used data capacity in each tier level.
	Data Service	Shows the size and ratio of capacity used for data replication (snapshot, volume copy, volume mirror).
	Reserved	Shows the tier reserve ratio of the volume.

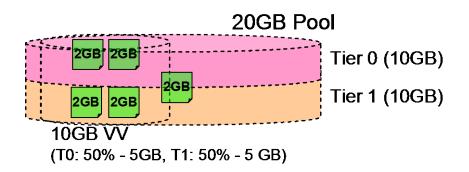
Configuring Tiered Data Migration

About TieredBy default, the host always writes to the highest priority tier (usually Tier 0) asMigrationlong as there is available space. In order not to use up all capacity of the top
tier, you will need to migrate unimportant data to lower tiers, either manually or
automatically by schedule.

Before: All data is written to the top tier, or tier 0.



After: Some data will be migrated to the lower tier, tier 1.



Limitations Tier migration together with the performance gain it brings are NOT available for full-provisioned partition.

 Go to
 EonStor DS subsystems: SANWatch Home > Device sidebar > Device List >

 device name > Logical Volumes > LV name > Tasks corner

 ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name >

 Tasks corner

- Device		
Device List Default Group	Pool	
DS 3016(FC 8G) Logical Volumes Logical Volume 1 Logical Drives Partitions	Pool List Pool 1 Pool Elements Virtual Volumes Schedules	→ Tasks

Steps

Tiered migration is available only when there are more than one tiers.

Click Tier Migration under Storage Tiering.



Storage Tiering Functions includes <u>Enable Tiering</u>, Information, and <u>Tier Migration</u>



the migration timing: immediate or scheduled.

Tier Migration		
Select one or	more partitions and run ti	ered migration to optimize data allocation
 Start Migrat 	ion Immediately	
Priority:	Normal]
C Schedule T	High Normal	
	Low	

Priority options are: High / Normal / Low

Create Schedule			
Summary Confirm the summary of the c	reated schedule.		
Schedule Type:	Tier Migration		
Select Target:	Logical Volume 1: Partition 1		
Schedule Settings:			
Name:	New Schedule 1		
Start Date:	2012/12/26		
End Date:	2012/12/26		
Repeat:	daily		
Start Time:	7:9		
Priority:	Medium		

For scheduled migration, see below.

Scheduled Tiered Migration	To run a scheduled tiered migration, the subsystem must be connected to SANWatch Manager through in-band connection.
	Select scheduled migration and click on Next.
	C Schedule Tiered Migration

The schedule setting window will appear



Configur <mark>e</mark> the schedu	le parameters.	
Schedule Name:	New Schedule 1	
Source:	Partition 1 (49CE7F8733E237EA)	
Start Date:	12/27/2012	End Date: 12/27/2012 📰 🗖 Repeat
	C Recurring Days of Week	🔲 Sun 🗖 Mon 🗖 Tue 🗖 Wed 🗖 Thu 🗖 Fri 🗖 Sat
	O Recurring Days of fortnight	🗌 Sun 🗌 Mon 🗖 Tue 🗖 Wed 🗖 Thu 🦳 Fri 🗍 Sat
	C Recurring Days of Month	Set Days
Start Time:	2 💽 6	
Priority:	Normal	

Name the schedule. The source information (virtual pool) appears below the name.

Schedule Name:	New Schedule 1
Source:	Partition 1 (49CE7F8733E237EA)

Set the start date and end date of this migration. To make it a repeated process with no end date, check the Repeat box.

Start Date:	12/27/2012		End Date:	12/27/2012	🧰 🗖 Repeat
Set the date.					
O Daily					
C Recurring Days of V	Veek	🖵 Sun 🗖 Mon 🗖 T	ue 🥅 Wed 🥅	Thu 🥅 Fri 🥅 Sat	
C Recurring Days of fo	ortnight	🗖 Sun 🗖 Mon 🗖 T	ue 🥅 Wed 🥅	Thu 🥅 Fri 🥅 Sat	
C Recurring Days of N	lonth	Set Days			
Set the starting	time.				
Start Time:	2	6 📕			
Choose a priorit	tv lovol				

Choose a priority level.

Priority:	Normal 🗾
	High
	Normal
	Low

Click OK. Migration will start at the specified date.

To check the schedule, go to SANWatch Home > Device sidebar > Device List > device name > Schedules.





If another migration is already ongoing at the scheduled start time, the ongoing migration will be cancelled and the scheduled migration will begin.



Tier Migration Policies

Migration Priorities Tier migration has the following priorities:

Before migration

- ≻ High
- Medium
- > Low

Case 1: Single	
Virtual Volume or	
Partition	

The virtual pool (or logical volume for EonStor DS subsystems) Pool 1 is comprised of a single virtual volume (or partition for EonStor DS subsystems) VV-1 which has three tiers, T0, T1, and T2. The data blocks, A to E, are written into the top tier, T0.

	VV-1 (6G)		
VV1-T0 (Reside: 2G) VV1-T1 (Reside: 2G)	ABC	DE	Tier 0 (5G, Res: 1G) Tier 1 (5G, Res: 1G)
VV1-T2 (Reside: 2G)	Pool	1 (15G)	Tier 2 (5G, Res: X)
	FUUI	1 (156)	

After migration

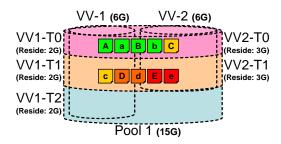
Data blocks are migrated to lower tiers, according to their volume tier ratios.

VV-1 (6G)	
DE	
CA	
в	
Þ	

Case 2: Multiple Virtual Volumes

Before migration

The virtual pool (or logical volume for EonStor DS subsystems) Pool 1 is comprised of two virtual volumes (or partitions for EonStor DS subsystems) VV-1 with tiers T0-T2 and VV-2 with tiers T0 and T1. The data blocks, Aa to Ee, are written to the top two tiers, T0 and T1.



After migration



Data blocks are migrated to lower tiers, according to their tier settings and pool tier reserves.

	VV-1 (6G)	VV-2 (6G)
Tier 0 (5G, Res: 1G) Tier 1 (5G, Res: 1G)	DE	d e c b a
Tier 2 (5G, Res: X)	В	



Viewing Tier Migration Information

	This feature is available when <u>tiered data migration</u> has been enabled. Viewing tier information is available when more than one tiers are available.
Go to	EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Tasks corner Tasks corner

Steps

Click Information under Storage Tiering in the Tasks corner.



Storage Tiering Functions includes Enable Tiering, Information, and Tier Migration.

The migration status of tiers and volumes in the pool (or logical volume) will appear.

Informa	414
morma	uuv

momedon					
		Tier0	Tier1	Tier2	Tier3
Summary of Tier Information					
Size		1.81 TB			931.25 GB
	Used	10 GB(0.5%)			0 MB(0.0%)
All Volumes	Data Service	0 MB(0.0%)			0 MB(0.0%)
	Reserved	186.25 GB(10.0%)			0 MB(0.0%)
Volume Details					
	Used	10 GB(100.0%)			0 MB(0.0%)
Partition 1	Data Service	0 MB(0.0%)			0 MB(0.0%)

Migration Statistics Parameters

The diagram below shows an example of tier migration.

Tier Migration <u>VV-1</u> <u>VV-1</u> VV-2 VV-2 Tier 0 AB HIJ FC KI J Tier 1 DE KL AE H L Tier 2 BG FG ----------Pool 1 Pool 1

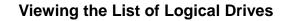
Here is the migration result of virtual volume (or partition for EonStor DS subsystems) VV-1.

Promoted	Demoted	Migrate-In				
X	2 (A,B)	2 (D,F)				
1 (D)	0	1 (A)				
1 (F)	Х	1 (B)				
Here is the migratio	Here is the migration result of virtual pool (or logical volume) Pool1.					
Promoted	Demoted	Migrate-In				
X	3 (A,B,H)	3 (D,F,K)				
2 (D,K)	0	2 (A,H)				
1 (F)	X	1 (B)				

Working with the Logical Drives or Pool Elements View

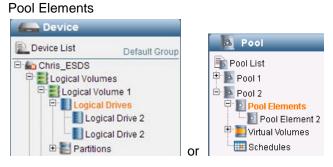
System Settings Language Abor	ut		🕋 Replication Manager	Help	🕒 Data Reload	
Evice Device	Logical Drive List			_		
Device List	💶 Name 🔺	🎲 Status 🔺	RAID Level 🔺		Capacity 🔺	
DS 3024 Logical Volumes Logical Volume 1 Logical Volume 2 Logical Volume 2 Descriptions SSD cache pool Drives Channels Data Hosts Schedules	Logical Drive 1	Good	RAID 5	3.60	3 ТВ	

A logical drive (for EonStor DS subsystems) or pool element (for ESVA subsystems) is a collection of disk drives that serves as a virtual storage element that constitutes a logical volume (for EonStor DS subsystems) or virtual pool (for ESVA subsystems). You may create and configure logical drives or pool elements when you create a virtual pool or logical volume. This chapter describes how to view the status of all elements in a logical volume or pool: logical drive or pool element configuration, capacity, hardware device, and task progress (if available).



Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Logical Drives ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name >



Steps

The list of logical drives or pool elements recognized by the system will appear. The logical drive or pool element status summary will appear to the right, in the main screen.

Logical Drive List					
📒 Name 🔺	🎲 Status 🔺	RAID Level 🔺	Capacity 🔺		
Logical Drive 1	📀 Good	RAID 6	272.96 GB		

Logical Drive or Pool Element

Click the link to view detailed configurations of each logical drive or pool element that is included in the logical volume or pool.



The Status corner shows whether this logical drive is in a healthy (no error) status.



RAID Level

The RAID level corner shows the RAID configuration used for this logical drive.

88	RAID Level 🔺
RAI	D 6

Capacity

The capacity of each logical drive appears. To view the total capacity of volumes or devices, go to the respective menus.



-

To refresh the status (in case you want to make sure that the logical volume or pool status has been updated), click the *Data Reload* menu at the top bar.

😭 Replication Manager 🛛 🌔	? Help	Ġ Data Reload

Note

If the Help screen does not appear, you might need to enable pop-up windows from the browser's configuration options.



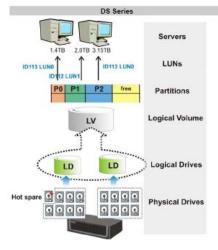
Working with Logical Drives or Pool Elements

System Settings Language Abo	ut	貸 Replication Manager	🕜 Help	🕒 Data Reload
🛻 Device	Logical Drive Status			
Device List Default Group	🕦 Logical Drive Information			
ESDS 3016R(FC 8G)	Logical Drive 1 Size: Index: ID: RAID Level Stripe Size		Status:	🕑 Good
- Data Hosts	Front View			
Schedules 🗄 💼 Target(FC 8G)	RAID			
	Tasks			
	Add Disk / Expand Logical D Add drives to this logical drive to		Rebuild / Regenerate Rebuild the logical drive o regenerate the parity data	r check its integrity and
	Configure Logical Drive Edit the configurations of this log	gical drive.	Power Saving View the power saving s settings.	status and configure the
	Scan the logical drive to check t block.	he status of each data	Restart Logical Drive Restart the logical drive if locked.	it is offline or has been

This chapter describes how to view and change parameters of a logical drive (for EonStor DS subsystems) or pool element (for ESVA subsystems), configure power saving setting, and add a logical drive or pool element to a remote hardware device. If a logical drive or pool element has been offline or locked, you may restart it manually.

From Physical Drive to Logical Drive (or Pool Element) to Logical Volume (or Pool)

The diagram shows the hierarchy from physical drives to the host computer.



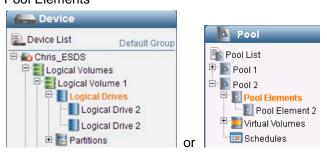
- A collection of physical drives creates a logical drive (for EonStor DS subsystems) or pool element (for ESVA subsystems).
- A collection of logical drives or pool elements creates a logical volume (for EonStor DS subsystems) or pool (for ESVA subsystems).
- A logical volume or pool can be separated into partitions (for EonStor DS subsystems) or virtual volumes (for ESVA subsystems).
- Each partition or virtual volume is assigned with a LUN (logical unit number) from the host computer.

Viewing the Logical Drive Status

The status of each logical drive is summarized in the Logical Drive Information page, where you can quickly grasp the element configuration and locations of member hard disk drives.

Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Logical Drives ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Pool Elements



Viewing the Logical Drive or Pool Element Information The logical drive or pool element status will be summarized in the Status corner.

Logical Drive In	rormation				
Logical Drive 1	Size:	272.96 GB		Status:	💽 Goo
	Index:	A0			
	ID:	561C2C58			
	RAID Level:	RAID 6			
	Stripe Size:	128KB			
RAID					
-	; (•	•	•	
	•[•			
	• Í	Θ	•	•	

Logical Drive or Pool Element Configurations

The basic system configurations and overall system status will be listed in the Logical Drive Information corner. You can see the size (capacity), logical drive or element ID, RAID level, and the controller module location.

Logical Drive Status					
Logical Drive 1	Size:	272.96 GB			
	Index:	AO			
	ID:	561C2C58			
	RAID Level:	RAID 6			
	Stripe Size:	128KB			
Status: 🛛 📀 Good	l i				

Hard Drive Locations

The front view corner shows the hard drive configurations of the device the logical drive or pool element belongs to.

		•	•
•			
(+)	0	+	0

Green status LED shows that the hard drive is online.

		•
--	--	---

The location of logical drive or pool element is highlighted in different colors.



Adding Disk Drives to a Logical Drive (EonStor DS subsystems only)

Add more member drives or spare drive(s) to expand the size of the logical drive.

Before you attempt to expand a logical drive, make sure there are available (unused) disk drives inserted to the enclosure. **Warning:** It is HIGHLY RECOMMENDED that you assign a SPARE DRIVE!

Without a spare drive, there is an increased risk of data loss!

Go ToSANWatch Home > Device sidebar > Device List > device name > Logical
Volumes > LV name > Logical Drives > Tasks corner



Steps

Click Add Disk in the Tasks corner.



Check the drive you want to add from the list.

Add Disk		×
Select a drive and	add it to the logical drive as a member drive	e or a local spare drive.
□ Slot	Size	
▼ 6	136.48 GB	
7	136.48 GB	
B	136.48 GB	
1 1	418.93 GB	
E in	440.00.00	•

Select if you want to add it as a spare drive or as part of the logical drive.

Add Member Drive		Add Local Spare Drive
------------------	--	-----------------------

If a local spare drive has been added

The spare drive will be marked in the front view.

•		
		•
•		

If member drives have been added

Depending on the RAID level of the logical drive, you may need to add more than one drive at a time.

The drive will be added and the progress will appear in the Status corner.

Status: 🔥 🔥 Good, Adding Disk



Expanding the Size of a Logical Drive (EonStor DS subsystems only)

Expand a logical	drive by adding unuse	d area in the disk drives.
Enpaña a logioa	and by adamig anabo	

When All Disk Capacity Has Been	You cannot expand a logical drive if all disk drive capacity has been used up for the logical drive. In that case, there are two options:
Used	 You may add more disk drives. You may copy and replace member disk drives with larger capacity drives, and then use the additional capacity to expand the logical drive following steps in this section. You must replace all member drives.

Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Logical Drives > Tasks corner



Steps

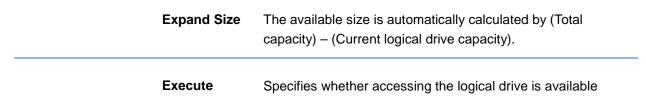
Click Expand Logical Drive in the Tasks corner.



The Expansion screen will appear.

Expand Log	ical Drive					×
Expand th	e capacity of t	ne logical drive.				
Maximur	n Expansion	Size: 69879 MB				
Expand:		On-Line		-		
			Expand		Cancel	

Select the initialization mode and click Expand.



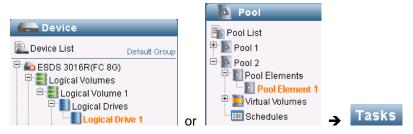


Expandduring initialization (On-Line) or not available (Off-Line). Note(Initialization)that in On-Line initialization, read/write performance to the
logical drive will decrease because of the background
initialization process.



EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Logical Drives > LD name > Tasks corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Pool Elements > PE name > Tasks corner



Configuring Properties

Go To

Click Configure Logical Drive (for EonStor DS subsystems) or Configure Pool Element (for ESVA subsystems) in the Tasks corner.



Change the parameters in the screen.

Configure the parameters of this logical drive.

Logical Drive Name:	Logical Drive	1	
Write Policy:	Default		•
LD Assignment:	Slot A		
SED Security	Disabled		•
Set LD A-Key	Absent:	Create	Modify

Logical Drive Name or Pool Element Name (EonStor DS subsystems only)	Specifies the name for this logical drive.
Write Policy (EonStor DS subsystems only)	Changes the write policy: Write-back (default) or Write-through. For detailed descriptions, see below.
LD Assignment (EonStor DS subsystems only)	The option cannot be modified because LD and its LV should be managed by the same controller. To change the LV's controller, select it in the Device sidebar, and click Configure Logical Volume in the Tasks corner.
SED Security (EonStor DS subsystems only)	Enhances data security with SED for all logical drives on your subsystem. Once enabled, all LDs will be SED-protected, therefore this mechanism is

called "global key."

DS subsystems only)Device sidebar > Device List > device na Tasks corner > System Settings > Drive- tab > SED Authentication Key) will disab hide this option here.Enhances data security with SED using a key" for this logical drive. SED security wit enabled whenever a "local key" is created imported. SED security using local keys w become ineffective after system reboots.Write Back vs. Write Through> When "Write-back" is "Enabled," the write requests from the host w in cache memory and distributed to disk drives later. Write-back ca dramatically improve write performance by caching the unfinished memory and letting them be committed to drives in a more efficient In the event of power failure, a battery backup module can hold ca for days (usually 72 hours).> When "Write-back" is "Disabled" (i.e., the Write-through is adopted writes will be directly distributed to individual disk drives. The Write			Before enabling this option, first create a SED authentication key at SANWatch Home > Device sidebar > Device List > device name > Tasks corner > System Settings > Drive-Side tab.	
key" for this logical drive. SED security wie enabled whenever a "local key" is created imported. SED security using local keys we become ineffective after system reboots; for requires you to import the key file or pass every time the subsystem reboots. Write Back vs. > When "Write-back" is "Enabled," the write requests from the host we in cache memory and distributed to disk drives later. Write-back card dramatically improve write performance by caching the unfinished memory and letting them be committed to drives in a more efficient In the event of power failure, a battery backup module can hold car for days (usually 72 hours). When "Write-back" is "Disabled" (i.e., the Write-through is adopted writes will be directly distributed to individual disk drives. The Write mode is safer if your controller is not configured in a redundant pait there is no battery backup or UPS device to protect cached data. Configuring Power Saving in the Tasks corner. Select the power saving status and configure the settings. The power saving screen will appear. Select the power saving screen will appear.			Creating a global key (at SANWatch Home > Device sidebar > Device List > device name > Tasks corner > System Settings > Drive-Side tab > SED Authentication Key) will disable and hide this option here.	
 Write Through in cache memory and distributed to disk drives later. Write-back cadramatically improve write performance by caching the unfinished memory and letting them be committed to drives in a more efficient. In the event of power failure, a battery backup module can hold cat for days (usually 72 hours). When "Write-back" is "Disabled" (i.e., the Write-through is adopted writes will be directly distributed to individual disk drives. The Write mode is safer if your controller is not configured in a redundant pait there is no battery backup or UPS device to protect cached data. Configuring Power Saving in the Tasks corner. Savings Click Power Saving in the Tasks corner. Select the power saving status and configure the settings. The power saving screen will appear. Select the power saving policy of this logical drive. Level 1: Disabled Disabled Disabled 			Enhances data security with SED using a "local key" for this logical drive. SED security will be enabled whenever a "local key" is created and imported. SED security using local keys will become ineffective after system reboots; Enabling it requires you to import the key file or password every time the subsystem reboots.	
Savings Power Saving View the power saving status and configure the settings. The power saving screen will appear. Select the power saving policy of this logical drive. Level 1: Disabled	Through	When "Write-back" is "Disabled" (i.e., the Write-through is adopted,) host writes will be directly distributed to individual disk drives. The Write-through mode is safer if your controller is not configured in a redundant pair and		
Select the power saving policy of this logical drive.		Power Saving View the power saving status and configure the settings. The power saving screen will appear.		
	-			
Power Saving Level	I	Power Saving Level		

Select the Drive-Side tab and configure the power saving mode.

Three options are available: Disabled, Level 1 only, and Level 1 then Level 2.



Waiting Period

You may also configure the waiting period for switching to the power saving mode.

- > Level 1: 1 to 60 minutes without I/O requests
- Level 2: 1 to 60 minutes of Level 1 state

If you want to configure the power saving levels for the entire device, go to SANWatch Home > Device sidebar > Device List > device name > Tasks corner > System Settings > Drive-Side tab > Power Saving

Level	Power Saving	Recovery	ΑΤΑ	SCSI
1	15-20%	1 sec	Idle	Idle
2	80%	30 to 40 sec	Standby	Stop

Regenerating Parities Parity regeneration applies to RAID level 1 or above and checks if data inconsistency or error has occurred with data parity.

Click Regenerate in the Tasks corner.



The parity data will be regenerated.

Scanning Logical Drives or Pool Elements

 Go To
 EonStor DS subsystems: SANWatch Home > Device sidebar > Device List >

 device name > Logical Volumes > LV name > Logical Drives > LD name > Tasks

 corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Pool Elements > PE name > Tasks corner



Steps	Click Media Scan in the Tasks corner.	
	Media Scan Scan the logical drive	to check the status of each data block.
	The scan configuration	on window will appear.
	Select the priority and the mod	le of media scan for logical drives.
	Priority: Mode:	Normal Single
Parameters	Priority	The higher the priority, the faster the scanning but the system performance will decrease.
	Mode	Scans once (Execution Once) or continuously.



Migrating Logical Drive between RAID 5 and RAID 6 (EonStor DS subsystems only)

Migration allows you to change the RAID level of a logical drive to another. You may need to add or delete member drives due to the minimum required number of drives for a RAID level.

Migrating works only for logical drives with RAID 5 or RAID 6 level. You cannot migrate a logical drive if it is already part of a logical volume. In order to migrate from RAID 5 to RAID 6, you need at least one available drive.

Go To

SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Logical Drives > LD name > Tasks corner



Steps

Click on RAID Migration



Rebuild / Regenerate / RAID Migration Rebuild the logical drive or check its integrity and regenerate the parity data.

_

Current RAID level will show.

RAID Migration

Change the RAID level configuration of the selected logical drive through RAID migration.

Current RAID Level: RAID 6	Current	RAID	Level:	RAID 6
----------------------------	---------	------	--------	--------

Change to Level:	RAID 5
------------------	--------

The last used drive will be removed from the RAID group:

Slot	Size
Slot: 5	418.93 GB
Slot: 2	136.48 GB
Slot: 3	136.48 GB
Slot: 4	136.48 GB
Slot: 6	136.48 GB
Slot: 7	136.48 GB

4. Click on the Migrate button.

Migrate

5. Click on Data Reload to refresh drive statuses







Rebuilding a Logical Drive or Pool Element

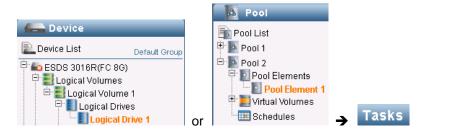
The Rebuild menu is available only when a logical drive or pool element is in a Degraded state due to drive failure(s).

 Go To
 EonStor DS subsystems: SANWatch Home > Device sidebar > Device List >

 device name > Logical Volumes > LV name > Logical Drives > LD name > Tasks

 corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Pool Elements > PE name > Tasks corner



Steps

Click Rebuild in the Tasks corner.



Select the logical drive or pool element that is in a degraded state and click Rebuild.

If the logical drive or pool element does not go back to healthy state after rebuilding, remove it and create a new one.

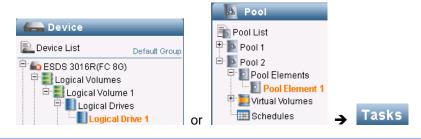
Restarting a Logical Drive or Pool Element

If you need to shut down a logical drive before moving it (all member drives) into another enclosure, or if a pool element has gone offline or has been locked, you might need to restart it.

Go To

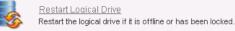
EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Logical Drives > LD name > Tasks corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Pool Elements > PE name > Tasks corner



Steps

Click Restart Logical Drive or Restart Pool Element in the Tasks corner.



Configuring Remote Pool Element (ESVA subsystems only)

You may assign a pool element to another hardware device so that the remote device can extend its capacity and use the pool element as part of its own pool.

Note To use this feature, the hardware device must be connected and online.

Step 1: Obtaining the Device ID and Channel IP Address In the Device sidebar of SANWatch, click the target device to which the pool will be assigned remotely.



Click System Information in the Tasks corner.



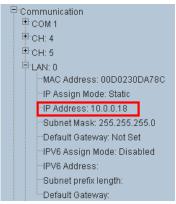
View the total System Information and applicable License Information.

Select the Configuration List tab and go to Controller Setting(s) > RAID Unique Identifier.



Copy the first half of the Identifier (for example, 894860).

Go to the Communication > LAN > IP Address and copy the IP address.



Step 2: Configuring Remote Pool Go to SANWatch Home > Sidebar, locate the pool element you want.

Element

Pool
💼 Pool List
🗄 🔤 Pool 1
🖻 🌆 Pool 2
Pool Elements
Pool Element 2
🙂 🔜 Virtual Volumes
Schedules

Click Remote Element in the Tasks corner.



Configure the parameters of this pool elements manually if it has been assigned to the pool remotely.

The Remote Element window will appear.

Remote Element		×
Configure <mark>th</mark> e parameters of the pool el	ement which is not located in the pool's	s master subsystem.
Device ID for Element Assignment Data Service Channel IP Address		Add IP Address Delete IP Address
Current Device ID	818450	
		Unassign Cancel

Enter the remote device ID and add the IP address you just copied.

Device ID for Element Assignment	894860	
Data Service Channel IP Address	10.0.0.18	Add IP Address
		Delete IP Address
Current Device ID	818450	

Working with the Partitions or Virtual Volumes View

System Settings Language Abo	ut			摿 Replication Manager	Help	🕒 Data Reload
E Device	Partition Lis	t .				
Device List Default Group	🔲 Name 🔺	Thin Prov 🔻	Lun Map 👻	Data Protection	n 👻 🌏 Capacity	
DS 3024	Partition	<u>1</u> No	Yes	Snapshots: 0	Free: 0 MB Usage:	Total: 10 GB 100%
Logical Volume 2 Logical Drives Logical Drives Drititions SSD cache pool						
⊋ Drives & Channels 						
Schedules						
	Tasks					
		<u>Create Partition</u> Add a new partition using av volume.	ailable space to a lo	gical	<u>Delete Partition</u> Remove an existing partitio	n.

This chapter describes the overall parameters of partitions (for EonStor DS subsystems) or virtual volumes (for ESVA subsystems) included in a logical volume (for EonStor DS subsystems) or pool (for ESVA subsystems).

General Rules	
Maximum Number	The maximum number of partitions or virtual volumes are:
	> Per RAID: 80
	> Per JBOD: 40
Note on	Over-provisioning is a situation that may occur inside a thin-provisioned
Over-Provisioning	storage system. It means that the available physical capacity is actually LESS than the logical capacity allocated for applications. Over-provisioning has the
	advantage of maximizing capacity utilization, but also has the risk of I/O failure
	when the actual usage reaches the physical limitation, which might crash the application or even the host.
	Over-provisioning is allowed but not recommended. If there is any possibility
	for allocating or wasting out all the spaces (over-provisioning), a warning message will be generated but you may still be able to create partitions (for
	EonStor DS subsystems) or virtual volumes (for ESVA subsystems).



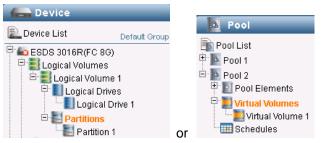
Viewing the List of Partitions or Virtual Volumes

All partition or virtual volume information can be accessed from the sidebar in the user interface.

Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes



Steps

When you click the Partitions or Virtual Volumes tab in the left sidebar, the list of partitions or VVs and their parameters recognized by the system will appear.

Partition List						
Name 🔺	🛃 Thin Prov 🗸	LUN Map 👻	📄 Data Protection 🗸	Capacity	•	
Partition 1	Yes	No	Snapshots: 0	Free: 10 GB	Total: 10 GB	
				Usage:	0%	

Clicking the name of each partition or virtual volume will lead to detailed configuration page for the volume.



The Thin Prov tab (EonStor DS subsystems only) show whether thin provisioning was enabled on this partition.



The LUN Mapping tab shows whether this partition or virtual volume has been mapped to the host.

шм Мар 👻	
No	

The Data Protection corner shows the number of snapshot images taken for this partition or virtual volume.



Dat	a Protection
Snapsho	ts: O

The capacity corner shows the total and available (free) capacity allocated for this partition or virtual volume.

🌏 Capacity 🗸			
Free: 10 GB	Total: 10 GB		
Usage:	0%		

To refresh the status (in case you want to make sure the status has been updated), click the *Data Reload* menu at the top bar.

🚰 Replication Manager 🕜 Help 🕓 Data Reload	I
--	---

Note

If the Help screen does not appear, you might need to enable pop-up windows from the browser's configuration options.

Creating a Partition or Virtual Volume

NoteThe maximum size of a single partition or virtual volume is 256TB (before
firmware version 3.88) and 512TB (after firmware version 3.88). Make sure that
the size of the logical volume or pool is in line (you cannot make the size of the
partition or virtual volume larger than the size of the logical volume or pool). For
the latest status, checking with technical support is recommended.

Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > Tasks corner



Steps

Click Create Partition (for EonStor DS subsystems) or Create Virtual Volume (for ESVA subsystems) in the Tasks corner.



Add a new partition using available space to a logical volume

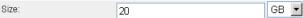
The configuration window will appear.

Configure the parameters of the partition.				
Partition Name:	Partition 1			
Size:	20 GB 🔽			
Initialize Partition After Creation				
Enable Thin-Provisioning				
Minimum Reserved Space				
7.20 GB 🗾 36 %				
Map Partition to Host				

Enter the name of the partition or virtual volume.

Partition Name:	Partition 1

Enter the size and select the unit.



The size of a partition or virtual volume must be the multiples of 2MB.

Enable Initialization or Thin-Provisioning (mutually exclusive).

🔽 Initialize Partition After Creation

Enable Thin-Provisioning

For more detailed description on thin provisioning, refer to the next section.

Set the minimum reserved amount.

Minimum Reserved Space		
	7.20	GB 🔽 36

You may map the partition or virtual volume to the host here or do it later.

%

🔲 Map Partition to Host

For details of mapping, refer to the instructions that follow.

Click Next. If you are creating a partition or VV on a tiered logical volume or pool, decide the residing tier and ratio.

Tier Ratio Se	etting				×
Configure t	tiering parameters fo	r the partition including the re	esiding tier and ratio.		
Volume Size: 20	GB				
Reside	Tier	Size	Used	Reside Size	
v	0	1.09 TB	16 MB	10 GB	

Click Next. The summary will appear.

Partitio	n			
	Name:	Partition 1		
	Size:	20 GB		
	Minimum Reserved Space:	7.19 GB		
	Initialize Volume After Creation:	No		
Logical	Volume			
	Name:	Logical Volume 1		
	Size:	272.96 GB		
	Available:	260.1 GB		
Host Mapping				
	Map:	No		

The partition or virtual volume will appear in the list.

Size	Specifies the size and unit of the partition or virtual volume. If Thin Provisioning is enabled, the total size of partitions or virtual volumes can exceed the size of the logical volume or pool.
	The minimum size of a partition or virtual volume is 10GB.
Initialize Partition (or Virtual Volume) After Creation	When this option is enabled, the partition or VV's LBA addresses will be allocated consequentially for large and/or sequential I/Os. This is ideal for audio/video application such as media post-editing and video on-demand.

Thin Provisioning	Enables thin provisioning. Move the slide bar to set the percentage of the partition or VV capacity that will be physically allocated as a safe reserve. If the reserve reaches 100%, the partition or VV becomes fully-provisioned (all space is allocated from the virtual pool). For more information, refer to the next sections.
Map Partition (or Virtual Volume) to Host	Maps the partition or virtual volume to all host ports. If you want to select the host port, you may map it manually later. For more information, refer to the next sections.



About Thin Provisioning

	Thin provisioning allows you to allocate a large amount of virtual capacity for a logical volume or pool regardless of the physical capacity actually available. Actual space is used only when data writes occur. By automatically allocating system capacity to applications as needed, thin provisioning technology can significantly increase storage utilization. Thin provisioning also greatly simplifies capacity planning and management tasks. For more information, see the Infortrend website. Dynamically allocating capacity affects the overall performance. If performance is the top priority (such as in AV applications), we recommend you to disable thin provisioning (= use full provisioning).			
Thin Provisioning Settings	Thin provisioning is configured during partition or VV creation in a logical volume or pool.			
	In the creation screen, thin provisioning options will appear in the lower half. Initialize Partition After Creation Enable Thin-Provisioning Minimum Reserved Space Image: Im			
Case 1: Full Provisioning (Thin Provisioning Disabled)	If you uncheck "Enable Thin-provisioning," thin provisioning will be disabled and all of the configured logical volume or pool size (in the below diagram's case, 14GB) will be taken from the capacity actually available. The partition or VV will be created as a continuous physical space reserved only for the target application, and then will be initialized if the "Initialize Partition (or Virtual Volume) After Creation" box is checked (you may uncheck this option if you prefer). Size: 20 GB I Initialize Partition After Creation Enable Thin-Provisioning Minimum Reserved Space			

Full provisioning is suitable for mission-critical applications with large amount of uninterrupted data, such as audio/video streams. Dynamically allocating space



and expanding usable area slows the I/O performance down, therefore allocating a large physical capacity from the beginning optimizes the performance.

Case 2: ThinTo enable thin provisioning, check the "Enable Thin-Provisioning" box and selectProvisioningthe Minimum Reserved space using the slider.

When the application uses up the minimum reserved area, additional space will be taken from the rest of the logical volume or pool space and will be added to the partition or VV dynamically.

In this example, the actual logical volume size is 10GB but the partition is set at 20GB, larger than the available size. This is fine as long as the minimum reserved space (the actual physically allocated space) is smaller than the logical volume size: 7.20GB in this case.

Size:	20	GB 💌			
🔽 Initialize Partition After Creation					
Enable Thin-Provisioning					
Minimum Reserved Space					
	7.20	GB 🗾 36 %			

The reserved space cannot exceed the actual available capacity.

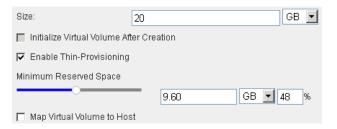


Provisioning and Reserved Space

Here are the three patterns of provisioning/initialization combinations.

Options	 Initialize Partition (or Virtual Volume) After Creation: Initializes the partition or virtual volume content. This option becomes available only when Thin Provision is disabled (= Full Provision is enabled), because a partition or virtual volume must have its full capacity in physical storage space to be initialized. Enable Thin-Provisioning: When checked, thin-provisioning (physical partition or virtual volume capacity will be provided as required) will be enabled. When unchecked, full-provisioning (all of the partition or virtual volume capacity will be provided physically). Minimal reserve: The minimal physical capacity that will always be allocated to the partition or virtual volume. If the minimal reserve is set at 0%, the partition or VV does not have any real capacity of the partition or VV always matches the theoretical maximum (= becomes the same as full provisioning).
Full Provisioning with Initialization	 Initialization + 100% minimal reserve Size: 20 GB Initialize Virtual Volume After Creation Enable Thin-Provisioning Minimum Reserved Space 20 GB 100 % Map Virtual Volume to Host This configuration can reside in only one storage tier.
Full Provisioning without Initialization	 Thin provisioning + 100% minimal reserve Size: 20 GB Initialize Virtual Volume After Creation Enable Thin-Provisioning Minimum Reserved Space 20 GB 10 % Map Virtual Volume to Host This configuration is not allowed in multi-tiered LVs or pools.
Thin Provisioning with Minimal Reserve Space	Thin provisioning + 1-99% minimal reserve





This configuration is not allowed in multi-tiered LVs or pools.

Thin-Provisioning without Minimal Reserve Space

Thin provisioning + 0% minimal reserve

Size:	20	GB 💌
📕 Initialize Virtual Volume Aft	er Creation	
🔽 Enable Thin-Provisioning		
Minimum Reserved Space		
0	0.00	GB 🔽 0 %
🔲 Map Virtual Volume to Hos	st	



Mapping/Unmapping Partitions or Virtual Volumes to Host

Host LUN mapping is also a part of creating partitions (for EonStor DS subsystems) or virtual volumes (for ESVA subsystems).

Mapping Host LUN	The Host Mapping Configuration Window					
	The diagram below shows the prompt for Fibre-channel models. For hyle (Fibre and iSCSI) host models, you need to configure both settings. (Example: Hybrid models)					
	Oreate a host LUN mapping set automatically.					
	Fibre 8 Gbps OISCSI 1.0 Gbps					
	 Customize the host LUN mapping configurations. 					
	Fibre 8 Gbps OISCSI 1.0 Gbps					
	Slot A-					
	Channel 0 Channel 1 Channel 2 Channel 3					
	Channel 0 Channel 1 Cha	nnel 2 📄 Channel 3				
	Customize the LUN Number:					
	Use Extended Host LUN Functionality:					
	Host ID/Alias TFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF					
	Filter Type	Include •				
	Access Mode	Read/Write •				
		Configure Host ID/WWN Alias				

Automatic Configuration

If you let the system create LUN mapping automatically, check it. For hybrid models, you need to select the host type.

Create a host LUN mapping set automatically.
 Fibre 8 Gbps iSCSI 1.0 Gbps

Manual Configuration

۲

If you manually configure the LUN mapping, check the Customize option and select the Channels.

Customize the host L	UN mapping con	figurations.		
Fibre 8 Gbps () ISCSI 1.0 Gbps	3		
Slot A Channel 0	Channel 1	Channel 2		
Slot B				1
	Channel 1	Channel 2	Channel 3	
				۰.

Select the LUN number from the drop-down list.

🔽 Customize the LUN Number:	1	Ŧ	I
-----------------------------	---	---	---

Click OK. The list of Host LUN Mapping configurations will appear in the window.

CH 🔺	Target 👻	LUN 👻	Host ID 👻	Alias 👻	Priority 👻	Access Mode 👻
0	112	0				
0	113	0				
1	112	0				
1	113	0				
2	112	0				
2	113	0				
🗖 З	112	0				
🗖 З	113	0				

Using Extended LUN Mapping (Fibre Channel)

Extended LUN Mapping is available only for manual configuration.

Click Use Extended LUN Functionality and enter or select the parameters.

Use Extended Host LUN Functionality:

Host ID/Alias	2101001B32A9631C(Alias)
Host ID Mask	FFFFFFFFFFFFF
Filter Type	Include
Access Mode	Read/Write
Priority	Normal

- Host ID/Alias: Specifies the host ID, referring to WWPN port name. You can also see OUI (Organizationally Unique Identifier) of a system: "00:D0:23" oui. Note: Avoid checking the OUI while mapping host LUN.
- > Host ID Mask: Works as a prefix mask in hexadecimal format.
- Filter Type: Specifies whether to allow (include) WWNs or to forbid (exclude) them from accessing after filtering.
- Access Mode: Specifies the access right of LUN mapping for the host: read-only or read-write.
- Priority: Specifies access priority. For example, high priority can be assigned to volumes serving applications and lower priority to volumes storing archives or user data.

Configure Host-ID/WWN List (enabled only when Extended Host LUN Functionality has been enabled.)

Edit Host ID/Alia	s				
Alias	Group	Host ID / WWN		Control	ller
HOSTPC		2101001B32A	\9631C		

In the Edit Host-ID/WWN list window, click Add to create an entry and enter the node name (WWN Name) for identifying HBA ports in SAN. An HBA card may have one node name and multiple port names. The node name can be a nickname such as "SQLserver_port" instead of the real name.

Add/Edit Host ID/Alias			
Host ID/Alias Alias:	2101001B32A9631C	Add)
		ОК	Cancel

Click OK. Repeat the above process to create more LUN mappings especially if you have multiple HBA ports accessing the same virtual volume (e.g., in high-availability application).

Assigning a WWN to a Group

A WWN group allows multiple hosts to be accessed in a single mask, which becomes useful in a clustered storage server environment.

To create a group and assign a WWN to it, highlight a WWN (yellow).

Alias	Group	Host ID / WWN	Controller
Alias		2101001B32A9631C	Slot A

Click Assign Group and select the group from the drop-down menu.



WWN Name(s)	
Host ID: Group:	2101001B32A9631C Group 1 Add
	OK Cancel

To add a new group, click Add and enter the group name.

New Group	Group 1	
-----------	---------	--

The group name will appear in the list.

Alias	Group	Host ID / WWN	Controller
Alias	Group1	2101001B32A9631C	Slot A
Alias	Group1	2101001B32A9631C	Slot A
Alias	Group 1	2101001B32A9631C	Slot A

To unassign a WWN from a group, click Unassign Group.

Deleting a WWN Name from the List

Highlight a WWN in the list and click Delete.

Changing the Alias name

To edit the alias name of the WWN, click Edit and enter the new name.

Add/Edit Host ID/Alias		×
Host ID/Alias	2101001B32A9631C	
Alias:	Alias	
	ОК Са	ncel

Using Extended LUN Mapping (iSCSI Channel)

Extended LUN Mapping is available only for manual configuration.

Click Use Extended LUN Functionality and enter the parameters.

Use Extended Host LUN Functionality:

Filter Type Access Mode	Include Read/Write	• •
Priority	Normal	• •
,	Configure iSCSI Initiator Alias	

- Alias: Specifies a pre-configured iSCSI initiator instance. To create a new initiator alias, click the Configure iSCSI Initiator Alias button.
- Filter Type: Specifies whether to allow (include) initiators or to forbid (exclude) them from accessing after filtering.
- Access Mode: Specifies the access right of LUN mapping for the host: read-only or read-write.
- Priority: Specifies access priority. For example, high priority can be assigned to partitions or virtual volumes serving applications and lower priority to partitions or virtual volumes storing archives or user data.

Configuring iSCSI Initiator Alias

Click Configure iSCSI Initiator Alias.

jure <mark>iS</mark> CSI Init	liator Alias				
Group	Host IQN:	Username:	Target Name:	IP Address:	Netmask:
Add	Edit	Delete	Assign Group	Unassign Group	Close
	Group		Group Host IQN: Username:	Group Host IQN: Username: Target Name:	Group Host IQN: Username: Target Name: IP Address:

Click Add to create an entry and enter the parameters.

Host IQN:	Add
Alias:	
Username:	
Password:	
Target Name:	
Target Password:	
IP Address:	
Netmask:	

 Host IQN: Infortrend's storage IQN is composed of the system serial number and 3 more digits in the following format: iqn.2002-10.com.infortrend:raid.snXXXXXXXX
 6 digits of serial number follows "sn." The next 3 digits are: channel number, host ID, LD ownership. The LD ownership digit is either "1" or "2" where "1" indicates Controller A and"2" indicates Controller B. The IQN is in accordance with how you map your logical drive to the host ID/LUN. For example, if you map a logical drive to host channel 0 and AID1, the last 3 digits will be 011.



- > Alias: Assign an easy to remember name for the iSCSI initiator.
- Username/Password: Specifies the user name and password for CHAP authentication. This information is the same as the CHAP target node name and CHAP secret in the OS setting. The User Password (One-way, from initiator) has to be at least 12 bytes.
- Target Name/Password: Specifies the target name and password for CHAP authentication. This information is the same as the CHAP initiator node name and CHAP secret in the OS setting. The Target Password (Two-way, outbound from storage) has to be at least 14 bytes.
- IP Address/Netmask: Specifies the IP address and subnet mask, if necessary. Multiple initiator ports on an application server can sometimes share the same IQN.

Click OK. Repeat the above process to create more LUN mappings especially if you have multiple HBA ports accessing the same virtual volume (e.g., in high-availability application).

Assigning an Initiator to a Group

A group allows multiple host LUNs to be accessed in a single mask, which becomes useful in a clustered storage server environment.

To create a group and assign an initiator to it, highlight an initiator (yellow).

Click Assign Group and select the group from the drop-down menu.

Host ID:	2101001B32A9631C		
Group:	Group 1	•	Add

To add a new group, click Add and enter the group name.

The group name will appear in the list.

To unassign an initiator from a group, click Unassign Group.

Deleting an Initiator Name from the List

Highlight an initiator in the list and click Delete.

Editing the Initiator

To edit the configuration of an initiator, click Edit.

Unmapping Host LUN

Select the host LUN you want to unmap.

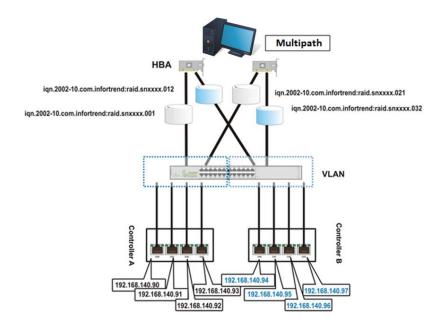
CH 🔺	Target 👻	LUN 👻	
0	112	0	
0	113	0	
v 1	112	0	

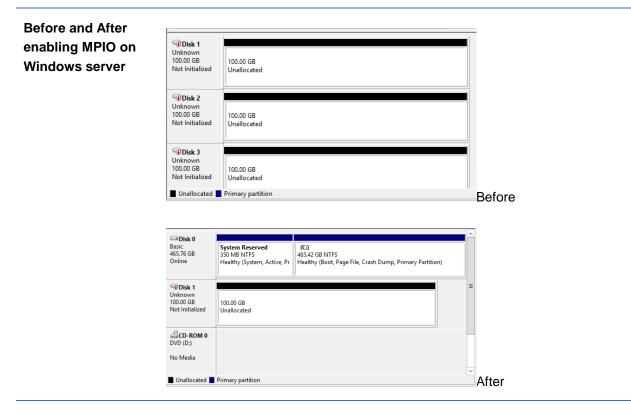
Click Delete.

Managing LUN Mapping on the Host Side	Select the partition or virtual volume whose LUN mappings you want to manage, click the Help icon at the top-right corner, and then search for " Managing LUN Mapping on the Host Side" for detailed instruction.
Notes	 By mapping a partition or virtual volume to multiple ports on multiple HBAs, you acquire path redundancy. To manage fault-tolerant paths to a single volume, you should have EonPath driver installed on Windows servers, Device Mapper on Linux, and Solaris MPXIO on Solaris platforms (Sparc machines). To acquire HBA port names, you may access utility software/website from the HBA vendor. In hybrid models, the iSCSI host channels are by default used for remote replication.

Working with Multipath

Multi-path I/O functionality can recognize and manage redundant data paths to an individual volume. It ensures greater reliability through the path failover mechanism in the event of cabling component failures.



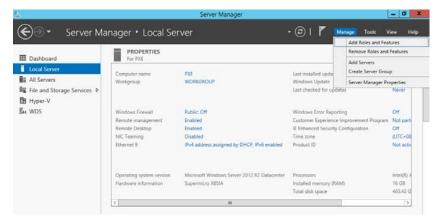


For Linux OS On Linux/Unix platforms, it is recommended using the native MPIO driver. For detailed configurations, refer to the application note.

Enabling Linux Device Mapper Multipath on EonStor®

Enabling the MPIO on Windows server 2012 R2

1. Server Manager → Manage → Add Roles and Features



2. Click Next until the Features step and check the Multipath I/O. We have already installed the features so it shows (installed).

a	Add Roles and Features Wizard	_ _ X
E Select features Before You Begin Installation Type Server Selection Server Roles Features Confirmation Results	Add Roles and Features Wizard Select one or more features to install on the selected server. Features Guroup Policy Management Guroup Policy	DESTINATION SERVER PXE DESCRIPTION Multipath I/O, along with the Microsoft Device Specific Module (DSM) or a third-party DSM, provides support for using multiple data paths to a storage device on Windows.
	Media roundation Message Queuing Multipath I/O (Installed) Network Load Balancing Peer Name Resolution Protocol Quality Windows Audio Video Experience RAS Connection Manager Administration Kit (CMA < < III >> </td <td>> Install Cancel</td>	> Install Cancel

3. Server Manager \rightarrow Tools \rightarrow MPIO

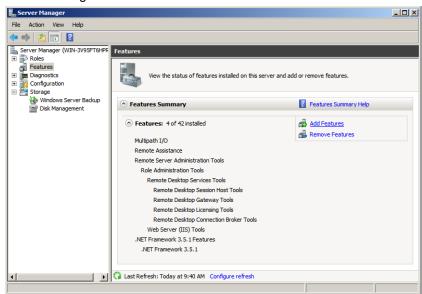
).		Server Manager		_ 0 X
😧 🗧 🗧 Server Ma	inager • Local Se	rver	• @	Manage Tools View Help
Dashboard	PROPERTIES For PXE	PXE	Last i	Computer Management Defragment and Optimize Drives Event Viewer
All Servers File and Storage Services Hyper-V	Workgroup	WORKGROUP	Wind Last c	Hyper-V Manager ISCSI Initiator Local Security Policy MPIO
ធ្វី៖ WDS	Windows Firewall Remote management Remote Desktop NIC Teaming Ethernet 9	Public: Off Enabled Enabled Disabled IPu4 address assigned by DHCP, IPu6 enabled	Wind Custi IE Enl Time Prode	UNITIO COBIC Data Sources (32-bit) COBIC Data Sources (64-bit) Performance Monitor Resource Monitor Security Configuration Wizard Services System Configuration
	Operating system version Hardware Information	Microsoft Windows Server 2012 R2 Datacenter Supermicro XBSIA	Proce Instal Total	System Information Task Scheduler Windows Deployment Services
	<			Windows Firewall with Advanced Security Windows Memory Diagnostic Windows PowerShell Windows PowerShell (\$60) Windows PowerShell (\$50)
	Filter	• (ii) • (ii) م		Windows PowerShell ISE (x86) Windows Server Backup

4. You will find the storage device shows in the Discover Multi-Paths tab. Click Add and reboot the server to enable MPIO.

MPIO Properties	x
MPIO Devices Discover Multi-Paths DSM Install Config	uration Snapshot
SPC-3 compliant	
Device Hardware Id	
IFT GS 3000 Series	
Add support for iSCSI devices	
Add support for SAS devices	
	Add
Others	
Device Hardware Id	
	Add
ОК	Cancel

Enabling the MPIO on Windows server 2008 R2

1. Server Manager → Features → Add Features



2. Check the Multipath I/O. We have already installed the features so it shows (installed).

Add Features Wizard Select Features	<u>×</u>
Features Confirmation Progress Results	Select one or more features to install on this server. Peatures:
	< Previous Next > Install Cancel

 Click Start and type "MPIO" to launch the MPIO Properties panel. Click on the Discover Multi-Paths tab and check the box for "Add support for iSCSI devices". Click Add and reboot the system.

MPIO Properties
MPIO Devices Discover Multi-Paths DSM Install Configuration Snapshot
To add support for a new device, click Add and enter the Vendor and
Product Jds as a string of 8 characters followed by 16 characters. Multiple Devices can be specified using semi-colon as the delimiter.
To remove support for currently MPIO'd devices, select the devices and then click Remove.
Devices:
Device Hardware Id
IFT B12S-G2240
IFT B12S-R1030
IFT B12S-R2240
IFT DS 1000 Series
IFT DS 2000 Series
IFT DS 3000 Series
IFT DS 4000 Series
IFT DS A24S-G2130
Add Remove
More about adding and removing MPIO support
OK Cancel

Installing EonPath (Multipathing) Driver (only for Windows 2003 and before)

 Download EonPath from the support site <u>http://support.infortrend.com/</u>

Download \rightarrow Firmware & Software



Alnfortrend EonSt		Ipport ty Profile		KevinHWKo@infortrend.com.Lopo ESVA EonNAS
Menu > Downloads > Firmware & Software				
How to Download? How to Find System Sitv?	Softwar	Available		
Firmware Search	Software:	Ecopath		
Please enter your S/N or choose from the model name	Version: Download:	1.23.2.50_D5_9 Windows	Release Date: 2015/1/6	
System S/N			1	
Model Name			ny since we recommend users upgrading firmware b vare by submitting a boxet. We will provide the downli	
Software Search				
SoftwareType				

2. Execute the Setup file to install. Restart the computer when the installation is complete.

🕞 EonPath 1.23.2.45 Setup	
	Welcome to the EonPath 1.23.2.45 Setup Wizard This wizard will guide you through the installation of EonPath 1.23.2.45.
	It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer. Click Next to continue.
	Cancel

 You can configure the setting of EonPath via SANWatch.
 SANWatch Home > Device sidebar > Device List > device name > Data Hosts > Tasks corner > EonPath For more information about EonPath see <u>Working with Hosts</u>.

Deleting Partitions or Virtual Volumes

To delete a partition or virtual volume, you need to delete the following features if they have been applied.

- Delete Snapshot images
- > Delete Partition Pair or Volume Pair relationships
- Delete LUN mappings

Deleting a partition or virtual volume will also delete all of its data.

 Go To
 EonStor DS subsystems: SANWatch Home > Device sidebar > Device List >

 device name > Logical Volumes > LV name > Partitions > Tasks corner

 ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name >

 Virtual Volumes > Tasks corner



Steps

Click Delete Partition or Delete Virtual Volume in the Tasks corner.



Delete Partition

Select the partition or virtual volume and click Delete.

Partition Name	Status	Capacity
----------------	--------	----------

A warning message will appear. Click Yes to proceed.



Working with Partitions or Virtual Volumes

System Settings Language Abou	ıt					🕋 Replication Manager	Help	🕒 Data Reload
Evice	Partition Status							
Device List Default Group	Partition Information				Capacity			
Bo 3016(ISCS11G) Cojcal Volumes Logical Volume Logical Drives Logical Drives Logical Drives Logical Drives Partitions Partitions Drives Orkenels	Partition 1	Size: ID: Status: Map: Replication:	10 GB 662A23042158A159 The volume has been mounted. No			Total Capacity: 10 GE Used Space: 10 GB (10 Available Space: 0 MB	0%)	
Data Hosts	EUN Mapping Informa	ation			Snapshot of S	elected Partition		
Schedules	Channel	Host ID	Assignment		Snapshot Image ID	Activated Time		Size
		No Data]^		No Data		
				~				
	Tasks						_	
	Configure Parti Edit the configur Snapshot Take snapshots	city of this partition using avai t <u>tion</u> ation of this partition.	lable space in a logical volume.		Remove Remov Remove Remove Rem	e Partition we this partition. <u>LUN Mapping</u> nis partition to the host or manage exist nced Settings m, Flush and <u>Unassign</u>	ing LUN mappings	3.
	operations.							

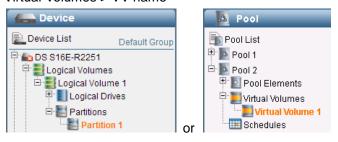
This chapter describes how to view status and parameters of a partition (for EonStor DS subsystems) or virtual volume (for ESVA subsystems), expand or shrink its size, configure host LUN, take snapshot images, and configure advanced settings such as database flush and reclaiming unused space.

Viewing Partition or VV Status

The status of each partition or virtual volume is summarized in the Partition Information or Virtual Volume Information page, where you can quickly grasp the configuration, performance, storage capacity.

Go To

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > partition name ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > VV name



Viewing the Partition or VV Information

The partition or VV status will be summarized in the Status corner.

Virtual Volume Inform	ation		Capacity		
Virtual Volume 1	Size: ID: Status; Map: Replication;	11 GB 00420D0322F5032A Mount succeeded No Source of Volume Mirror 1		Total Capacity: 11 GB Used Space: 0 MB (0%) Reserved Space: 0 MB (0%) Available Space: 11 GB (100%)	
LUN Mapping Informat	ion		Snapshots of Se	elected Virtual Volume	
Channel	Host ID	Assignment	Snapshot Image ID	Created Time	Size
			z		

Partition or VV Configurations

The basic partition or virtual volume configurations and overall system status will be listed in the Partition Information or Virtual Volume Information corner. You can see the size (capacity), partition ID, status, mapping information, and replication information (if you click the link, the Replication Manager will open up to show you detailed configurations of data replication services).

i Partition Information		
Partition 1	Size:	20 GB
and the second se	ID:	5EB5879017864A19
	Status:	📀 Mount succeeded
	Map:	No
Detail Information	Replication:	

Click the Detail Information link below the partition or virtual volume icon to view more parameters, such as created time and current tasks in progress and

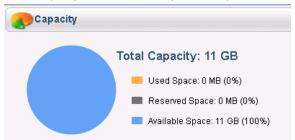


storage tiering status. Click Refresh to update the status.

Detail Information		×
View the p <mark>a</mark> rameters o	of the selected partition.	
Name:	Partition 1	
ID:	5EB5879017864A19	
Created Time:	Sat, Apr 19 12:00:05 2014	
Size:	20 GB(20480 MB)	
Used:	20 GB(20480 MB)	
Progress:		
Fully Initialized:	Yes	
	Refresh Clos	e

Capacity

See the amount and ratio of used (configured) capacity and the remaining (available) capacity. You may also view the ratio of capacity used for data service (snapshot, remote replications).



LUN Mapping Information

Shows the current LUN mapping status (if available). You can create or configure host LUN mapping from the Tasks corner, Host LUN Mapping icon.

E LUN Mapping In	formation	
Channel	Host ID	Assignment

Snapshot Information

Shows the current list of snapshot images for the partition or virtual volume. You can create a new snapshot image from the Tasks corner, Snapshot icon.

Snapshot of Select	ed Partition	
Snapshot Image ID	Activated Time	Size



Expanding Partitions (EonStor DS subsystems only)

Expanding the capacity of a partition is available only when its partition or volume has available capacity.

Go To

SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > partition name > Tasks corner



Steps

Click Expand Partition in the Tasks corner.



Expand the capacity of this partition using available space in a logical volume.

The expansion setting window will appear. Specify the capacity you want to expand.

Expand Partition		х
Expand the partition using available ca	apacity in a logical volume.	
Current Size: Minimum Expansion Space: Configured Size:	20 GB 227.54 GB 10	GB 👤
	OK	Cancel

Expansion will begin. When it is completed, check that the size of the partition has increased by the specified amount.

Reclaiming Unused Partition Space (EonStor DS subsystems only)

In thin-provisioned partitions, you cannot reuse the space of deleted data unless you reclaim it manually. The storage subsystem is aware of the actual space usage in the host and will optimize data allocation in the subsystem.

Note > To reclaim unused space, the partition or virtual volume has to be mapped to the host.
 > The Partition Space Reclaim function is only supported in Microsoft

Go ToSANWatch Home > Device sidebar > Device List > device name > Logical
Volumes > LV name > Partitions > partition name > Tasks corner



Windows or Linux environments.

Steps

Click Reclaim in the Advanced Settings in the Tasks corner.



The Reclaim window will appear. Select the priority and click OK.

Reclaim		×
Are you sure you want to r	reclaim the free space in this volume?	
Reclaim Priority:	High	•
	Yes	No

- High Priority: Reclaim will be processed efficiently but might affect the system performance.
- Normal Priority: Follows the original reclaim setting that might be processed slowly but has less chance of affecting the system performance.

If a reclaim process is already ongoing, you need to wait until it is completed or stop the existing process and restart it.



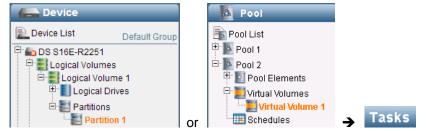
Configure Host LUN Mappings

Host LUN mapping is also a part of creating partitions or virtual volumes.

Go To EonStor DS sub

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > partition name > Tasks corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > VV name > Tasks corner



Mapping/Unmapping	Before configuring LUN mapping, go to:
Host LUN	EonStor DS subsystems: SANWatch Home > Device sidebar > Device List >
	device name > Logical Volumes > LV name > Partitions
	ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name >
	Virtual Volumes
	Click the Help icon at the top-right corner, and search for the
	"Mapping/Unmapping Partitions or Virtual Volumes to Host " section for
	detailed instructions on LUN mapping configurations.



Managing LUN Mapping on the Host Side

In this section, an example of configuring LUNs on the host side is shown for Windows, Linux, and Solaris environment.

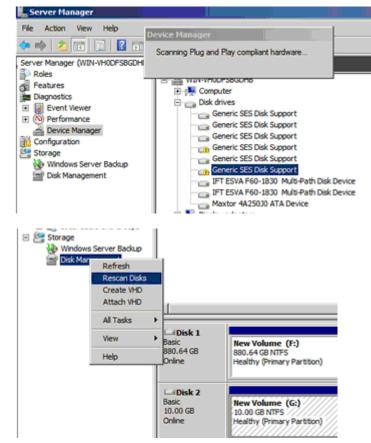
Notes If you are unable to find any LUN from the host side, try to change the type of SES device by doing the following:

Go to SANWatch Home > Device sidebar > Device List > device name > Tasks corner > System Settings > Host-side tab, and then choose "No Device Present (Type=0x7F)" from the Peripheral Device Type drop-down menu.

Restart your subsystem for the change to take effect.

Managing LUNs on Windows Server

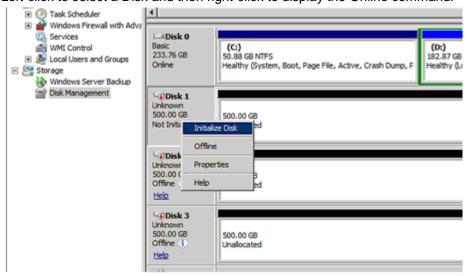
The below process shows screens captured from Windows Server 2008 R2, Server Manager. With mapped partitions, you can scan, initialize, and format these partitions.





Basic 233.76 GB Online	(C:) 50.88 GB NTFS Healthy (System, Boot, Page File, Acti	(D:) 182.87 GB NTFS Healthy (Logical Drive)	12 M Unal
Gisk 2 Basic 10.00 GB Offine	Online Properties		
Basic 410.20 GB	Help New Volume (H:) 410.20 GB NTFS Healthy (Primary Partition)		

Left-click to select a Disk and then right-click to display the Online command.



When done, right-click to display and execute the Initialize Disk command.

	Initialize Disk
Basic 233.76 G8 Online	You must initialize a disk before Logical Disk Manager can access it. Select disks: Disk 1
Disk 1 Inknown 00.00 G8 Vot Initialized	Use the following partition style for the selected disks:
Disk 2 Unknown 500.00 GB Offline	GPT (GUID Partition Table) Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
Disk 3 Unknown	OK Cancel
500.00 GB Offline 1 Help	S00.00 GB Unallocated

Proceed with the rest of the procedure following the onscreen instructions.

Disk 0 Basic 233.76 GB Online	(C:) 50.88 GB NTFS Healthy (System, Boot,	, Page File, Active, Crash Dump, F	(D:) 182.87 GB NTFS Healthy (Logical Drive)
Disk 1 Basic 500.00 GB Online	500.00 GB Unallocated	New Simple Volume New Spanned Volume New Striped Volume	
Disk 2 Unknown 500.00 GB	500.00 GB	New Singed Volume New Mirrored Volume New RAID-5 Volume	
Offline 🕕 Help	Unallocated	Properties	
		Help	
Disk 3 Unknown 500.00 GB Offline Help	500.00 GB Unallocated		

Right-click on an Unallocated partition to create a New Simple Partition.

Follow the instructions on the Partition Wizard to complete the rest of the procedure.

ew Simple Volume Wizard				>
		e to the Ne Wizard	w Simple	
	This wizard h	elps you create a sir	nple volume on a	a disk.
	A simple volu	me can only be on a	single disk.	
	To continue,	click Next.	-	
		< Back	Next >	Cancel
lew Simple Volume Wizard				
Specify Volume Size Choose a volume size t		he maximum and mi	nimum sizes.	
Maximum disk space in	MB:	511997		
Minimum disk space in	MB:	8		
Simple volume size in N	IB:	511997	[



New Simple Volume Wizard	×
Assign Drive Letter or Pa For easier access, you ca	ath an assign a drive letter or drive path to your partition.
 Assign the following of Mount in the following Mount in the following Do not assign a drive 	g empty NTFS folder: Browse
	< Back Next > Cancel
New Simple Volume Wizard	×
Format Partition To store data on this part	ition, you must format it first.
Choose whether you war	it to format this volume, and if so, what settings you want to use.
C Do not format this	volume
 Format this volume 	e with the following settings:
File system:	NTFS
Allocation unit s	ize: Default
Volume label:	New Volume
🔽 Perform a qu	uick format
Enable file a	nd folder compression
	< Back Next > Cancel
New Simple Volume Wizard	
	Completing the New Simple Volume Wizard
	You have successfully completed the New Simple Volume Wizard.
	You selected the following settings: Volume type: Simple Volume Disk selected: Disk 1 Volume size: 511997 MB Drive letter or path: F: File system: NTFS Allocation unit size: Default Volume label: New Volume Ourick format: Yes
	To close this wizard, click Finish.
	< Back Finish Cancel

Managing LUNs on Shell commands are shown below as how to manage LUNs on Linux. Linux

[root@rh53-admin ~]# /etc/init.d/multipathd restart Stopping multipathd daemon: [FAILED] Starting multipathd daemon: [OK]

[root@rh53-admin ~]# cd /proc [root@rh53-admin proc]# /etc/init.d/multipathd restart Stopping multipathd daemon: [ÖK] Starting multipathd daemon: OK] ſ [root@rh53-admin proc]# [root@rh53-admin proc]# cat partitions #blocks name 78150744 sda major minor 8 0 8 104391 sda1 1 8 2 78043770 sda2 8 20971520 sdb 16 8 17 10482688 sdb1 8 32 20971520 sdc 8 33 10482688 sdc1 8 48 20971520 sdd 8 49 10482688 sdd1 8 64 20971520 sde 8 65 10482688 sde1 253 0 73891840 dm-0 253 4128768 dm-1 1 253 20971520 dm-2 2 10482688 dm-3 253 3 [root@rh53-admin proc]# [root@rh53-admin ~]# ls anaconda-ks.cfg install.log scsidev-2.37 Desktop install.log.syslog scsidev-2.37.tar.tar [root@rh53-admin ~]# cd / [root@rh53-admin /]# Is bin dev home lost+found misc net proc sbin srv tftpboot usr boot etc lib media mnt opt root selinux sys tmp var [root@rh53-admin /]# cdd home/ bash: cdd: command not found [root@rh53-admin /]# cd home/ [root@rh53-admin home]# ls 1.4 peggy SANWatch_2.1.a.06 [root@rh53-admin home]# cd 1.4/ [root@rh53-admin 1.4]# ls README virtual1.4.tar.gz Virtual_1.4_Release_Note.txt Virtual_Linux_1.4_PVR.txt [root@rh53-admin 1.4]# tar -xzf virtual1.4.tar.gz [root@rh53-admin 1.4]# ls README Virtual_1.4_Release_Note.txt Virtual_Linux_1.4_PVR.txt virtual1.4 virtual1.4.tar.gz [root@rh53-admin 1.4]# cd virtual1.4 [root@rh53-admin virtual1.4]# Is INSTALL LICENSE objs UNINSTALL virtuald [root@rh53-admin virtual1.4]# chmod 777 INSTALL [root@rh53-admin virtual1.4]# ./INSTALL DRIVER DISCLAIMER PLEASE CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE YOU USE OR LOAD THIS SOFTWARE: 1. This driver software is created by Infortrend and is provided "AS IS" and Infortrend cautions users to determine for themselves the suitability of the version of this software. 2. Infortrend disclaims any express or implied warranty, relating to sale and/or use of Infortrend products, including, liability or warranties relating to fitness for a particular purpose, merchantability or infringement of any patent, copyright or other intellectual property right.

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By loading or using the software, you agree to the above disclaimer. Accept? (Y/N): y

Install virtual Driver for Kernel 2.6.18-128.el5 ./INSTALL: line 67: insserv: command not found call depmod Load module ... load virtual for dm Starting virtual: [root@rh53-peggy virtual1.4]# modinfo virtual filename: /lib/modules/2.6.18-128.el5/kernel/drivers/virtual/virtual.ko version: 1.4 author: Infortrend Inc. license: GPL srcversion: B890F953F061460C34430B9 depends: scsi_mod 2.6.18-128.el5 SMP mod_unload 686 REGPARM vermagic: 4KSTACKS gcc-4.1 parm: masterTarget:charp cacheCoverSizeInGB:int parm: parm: cachePercentage:int [root@rh53-peggy virtual1.4]# cd /proc [root@rh53-peggy proc]# cat partitions major minor #blocks name 8 78150744 sda 0 8 104391 sda1 1 8 2 78043770 sda2 8 16 20971520 sdb 8 17 10482688 sdb1 8 20971520 sdc 32 8 33 10482688 sdc1 8 20971520 sdd 48 8 49 10482688 sdd1 8 64 20971520 sde 8 65 10482688 sde1 253 0 73891840 dm-0 253 4128768 dm-1 1 253 2 20971520 dm-2 253 3 10482688 dm-3 2015231 sdf 8 80 2015200 sdf1 8 81 231 0 10482688 virtual0 [root@rh53-admin proc]# reboot

[root@rh53-admin ~]# cd /proc [root@rh53-admin proc]# cat partitions major minor #blocks name

8	0	78150744 sda
8	1	104391 sda1
8	2	78043770 sda2
8	16	31457280 sdb
8	32	31457280 sdc
8	48	31457280 sdd

ps'

-	3 1 4128768 dm-1 3 2 31457280 dm-2
	t@rh53-admin proc]# cat partitions or minor #blocks name
mk [rov mk File OS Blo Fire 395 395 395 395 395 395 395 395 395 395	3 1 4128768 dm-1 3 2 31457280 dm-2 1 0 31457280 virtual0 t@rh53-admin proc]# mkfs -t ext. /dev/virtual0 s.ext.: No such file or directory t@rh53-admin proc]# mkfs -t ext3 /dev/virtual0 s.ext.: No such file or directory t@rh53-admin proc]# mkfs -t ext3 /dev/virtual0 s.ext.: No such file or directory t@rh53-admin proc]# mkfs -t ext3 /dev/virtual0 s.ext.: No such file or directory t@rh53-admin proc]# mkfs -t ext3 /dev/virtual0 s.ext.: No such file or directory t@rh53-admin proc]# mkfs -t ext3 /dev/virtual0 s.ext.: No such file or directory t@rh53-admin proc]# mkfs -t ext3 /dev/virtual0 s.ext.: No such file or directory system label= type: Linux ck size=4096 (log=2) gment size=4096 (log=2) gment size=4096 (log=2) gment size=4096 (log=2) gto in odes, 7864320 blocks 216 blocks (5.00%) reserved for the super user t data block=0 stimum filesystem blocks=0 block groups 68 blocks per group, 32768 fragments per group 84 inodes per group erblock backups stored on blocks:
160	32768, 98304, 163840, 229376, 294912, 819200, 884736, 5632, 2654208, 4096000
Cre	ing inode tables: done ating journal (32768 blocks): done
18([roi [roi [roi]os [roi	s filesystem will be automatically checked every 20 mounts or days, whichever comes first. Use tune2fs -c or -i to override. t@rh53-admin proc]# t@rh53-admin proc]# mount /dev/virtual0 /mnt/vv t@rh53-admin proc]# cd /mnt/vv t@rh53-admin vv]# ls +found t@rh53-admin vv]#
[ro	t@rh53-admin ~]# cd /proc t@rh53-admin proc]# cat partitions or minor #blocks name
24 25 25 25 [roi	3 1 4128768 dm-1 3 2 41943040 dm-2

Usage: fdisk [-I] [-b SSZ] [-u] device

- E.g.: fdisk /dev/hda (for the first IDE disk)
 - or: fdisk /dev/sdc (for the third SCSI disk)
 - or: fdisk /dev/eda (for the first PS/2 ESDI drive)
 - or: fdisk /dev/rd/c0d0 or: fdisk /dev/ida/c0d0 (for RAID devices)

[root@rh53-admin proc]# fdisk -l

Disk /dev/sda: 80.0 GB, 80026361856 bytes 255 heads, 63 sectors/track, 9729 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes

Device Boot	Start	End	Blocks	ld
System				
/dev/sda1 *	1	13	104391	83 Linux
/dev/sda2	14	9729	78043770	8e
Linux LVM				

Disk /dev/sdb: 42.9 GB, 42949672960 bytes 64 heads, 32 sectors/track, 40960 cylinders Units = cylinders of 2048 * 512 = 1048576 bytes

Disk /dev/sdb doesn't contain a valid partition table

Disk /dev/sdc: 42.9 GB, 42949672960 bytes 64 heads, 32 sectors/track, 40960 cylinders Units = cylinders of 2048 * 512 = 1048576 bytes

Disk /dev/sdc doesn't contain a valid partition table

Disk /dev/sdd: 42.9 GB, 42949672960 bytes 64 heads, 32 sectors/track, 40960 cylinders Units = cylinders of 2048 * 512 = 1048576 bytes

Disk /dev/sdd doesn't contain a valid partition table

Disk /dev/sde: 42.9 GB, 42949672960 bytes 64 heads, 32 sectors/track, 40960 cylinders Units = cylinders of 2048 * 512 = 1048576 bytes

Disk /dev/sde doesn't contain a valid partition table

Disk /dev/dm-2: 42.9 GB, 42949672960 bytes 255 heads, 63 sectors/track, 5221 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes

Disk /dev/dm-2 doesn't contain a valid partition table [root@rh53-admin proc]# cd /home/ [root@rh53-admin home]# Is 1.4 peggy SANWatch_2.1.a.06 [root@rh53-admin home]# cd 1.4/ [root@rh53-admin 1.4]# Is README Virtual_1.4_Release_Note.txt Virtual_Linux_1.4_PVR.txt virtual1.4 virtual1.4.tar.gz [root@rh53-admin 1.4]# cd virtual1.4 [root@rh53-admin virtual1.4]# Is INSTALL LICENSE objs UNINSTALL virtuald virtual.ko [root@rh53-admin virtual1.4]# chmod 777 UNINSTALL [root@rh53-admin virtual1.4]# ./UNINSTALL uninstall /lib/modules/2.6.18-128.el5/kernel/drivers/virtual [root@rh53-admin virtual1.4]# cd /pro bash: cd: /pro: No such file or directory [root@rh53-admin virtual1.4]# cd /proc [root@rh53-admin proc]# cat partitions major minor #blocks name

8	0	78150744 sda
8	1	104391 sda1
8	2	78043770 sda2
8	16	41943040 sdb
8	32	41943040 sdc
8	48	41943040 sdd
8	64	41943040 sde
253	0	73891840 dm-0



253 253 1 4128768 dm-1 2 41943040 dm-2 [root@rh53-admin proc]#

Managing LUNs on Solaris (Enabling iSCSI initiators)	•	Solaris iSCSI Software and Hardware Requirements Solaris iSCSI software and devices The Solaris10 1/06 or later release for Solaris iSCSI initiator software The Solaris10 8/07 or later release for Solaris iSCSI target software The following software packages:
		 SUNWiscsir–Sun iSCSI Device Driver(root) SUNWiscsiu–Sun iSCSI Management Utilities(usr) SUNWiscsitgtr–Sun iSCSI Target Device Driver(root) SUNWiscsitgtu–Sun iSCSI Target Management Utilities(usr) Any supported NIC To verify availability of initiator and target service: Become super user. Verify that the iSCSI software packages are installed. # pkginfo SUNWiscsiu SUNWiscsir System SUNWiscsir Sun iSCSI Device Driver (root) System SUNWiscsir Sun iSCSI Management Utilities (usr) Verify that you are running a Solaris10 1/06 or later release. Confirm that your TCP/IP network is setup by telneting an iSCSI target using port 3260.
	•	Configure iSCSI Target Discovery
	•	Become super user.
	•	To configure the target device to be discovered dynamically or statically:
	•	Configure the device dynamically discovered (SendTargets).
		 # iscsiadm add discovery-address10.0.0.1:3260 The iSCSI connection is not initiated until the discovery method is enabled. See the next step.
	•	Configure the device statically discovered.
		 # iscsiadm add static-config eui.5000ABCD78945E2B,10.0.0.1 The iSCSI connection is not initiated until the discovery method is enabled. See the next step
		Enable the iCCCI torget discovery method using one of the following:

Enable the iSCSI target discovery method using one of the following:

If you have configured a dynamically discovered (SendTargets) device, enable the Send Targets discovery method.
 # isosiadm modify discovery --sendtargets enable
 If you have configured static targets, enable the static target

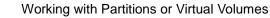
discovery method.

iscsiadm modify discovery --static enable

Create the iSCSI device links for the local system. •

•

devfsadm -- i iscsi _



Configuring Out-of-Band Flush Using DB Flush Agent

If you are holding data in database forms, you need to flush all data into the storage subsystem before doing a backup job. The DB (database) Flush module in SANWatch allows you to perform it automatically.

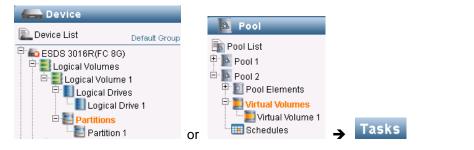
DB Flush works for the following databases:

- > SQL
- Microsoft Exchange
- Oracle

For more information about configuring out-of-band flush on the host side, refer to "Configuring Out-of-Band Flush."

Go to

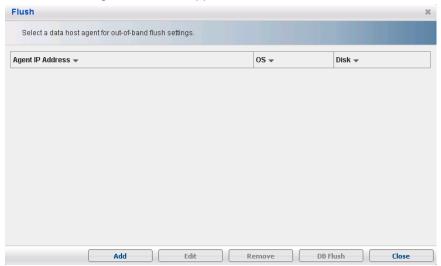
EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > Tasks corner



Step 1: Activating DBFlush Agent Click Flush in the Tasks corner.

Advanced Settings Reclaim, Flush and Unassign

The Flush Settings window will appear.



Click Add to add a setting. In the Flush Agent Setting, enter the host agent IP

address, select the OS type, and enter the following in the Disk field: -For Windows, the Disk ID (the "1" in "Disk 1" for example) -For Linux: /dev/ID (such as /dev/sdb in the above case) -For Solaris: /dev/dsk/ID (such as /dev/dsk/sdb in the above case)

Out-of-Band Flush Setting		×
Agent IP Address		
OS Disk	Windows	
	Hint: Disks are used to specify the volume in a host. In Windows, a numeric index will appear. In other OS, it will appear in a directory format such	-
	OK Cancel	

You will see the Flush Agent list, select the item for which you want to perform out-of-band flush.

Agent IP Address 🔻	0S 🕶	Disk 👻
192.168.5.3	Windows	1

Click DB Flush. The DB Flush Agent setting screen will appear.

	P Address:	127.0.0.1			
– Cluster Settin	gs				_
🗖 Enable	Cluster Support:	Host	~		
IP Add	ress of Secondar	v Node:			
		,			
-DB Flush Sett	ings ———				_
Index 👻	Туре 👻	DB Name 👻	DB Server 👻	Enable 👻	
inuex 💌					
inuex 👻	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
muex •	0,000				
muex •	, jpe				
muex •					~

Step 2: Enabling Database	Changing the database clustering setting will reset other DB Flush Agent settings.
Clustering	Database clustering refers to storing sequential rows of a database table on a disk. It will boost the database performance for server-centric database systems, since the server can perform database operations by direct access to disk.
	To enable database clustering, check the Enable Cluster Support checkbox and

To enable database clustering, check the Enable Cluster Support checkbox and select DB Cluster. If you would like to add another node, select Host and enter the IP address.

DB Туре	Specifies the da MS Exchange.	atabase from Oracle, SQL Server, and
		bear in the DB Flush Agent screen.
Enter the parameters	and click OK.	
DB Name. DB Administrator: Password: Flush Operation:	Enable	
Listen Port:	1433	
DB Type: DB Server Name:	SQL Server	
Select the database conn	ection parameters for the d	lata flush task.
Click Add. The DB FI Add DB Flush Settings	ush setting windov	<i>w</i> will appear.
	-	
-	-	
Windows: Event \	/iewer	
-		-
Enable the flush log i	f you want:	
	Si Secondary Node.	DB Cluster
		Host
🔰 🔽 Enable Clus	ter Sunnort:	Host 🔹
	IP Address of Enable the flush log i > Event logs for clus > Events will be rep Windows: Event \ Linux: /var/log/me Solaris: /var/adm/ Image: Click Add. The DB Flush Add DB Flush Settings Select the database conr DB Type: DB Server Name: Listen Port: DB Administrator: Password: Flush Operation: Enter the parameters The new database flush Click OK and close D	Select the database connection parameters for the of DB Type: SQL Server DB Server Name:

DB Server Name	Specifies the user-defined name of the database server.
DB Listen Port	Specifies the network port (default 1433) which the database listener (a software that manages the network

traffic between the database and client) monitors.

DB Name Specifies the user-defined name of the database.



DB Administrator	Specifies the database administrator user name. Enter a "sa" (System Administrator) login name. The "sa" name can be disabled when you select the security level of your database. By disabling "SA" access, no one will have access to a database system, except logging in as the Windows Administrator. Refer to this section for how to enable an "sa" login.
DB Password	Specifies the database password.
Enable DB Flush	Allows flushing database inside cache memory into a local file before taking snapshot images.

Working with Snapshots

General Snapshot Rules

Number of Snapshots	 The maximum number of snapshot images in a partition or virtual volume is 1024. The maximum number of snapshot images in a logical volume or pool is: 16000. The maximum number of online snapshot images (snapshots mapped to hosts) is 1024.
Space Concerns	 The storage space required for storing snapshot images is automatically allocated from the logical volume or pool in SANWatch, 30% of free space will be marked, and if you use more than 70% of its space, you will be notified. Make sure you always have enough space. The space required for taking snapshots is determined by how frequently gour data change. Space-saving Point-in-time, Copy-on-write methodology of the tobe-modified o
Database Concerns	When taking snapshots for database applications such as Oracle, use "Group Snapshot" in the scheduler. You can select multiple source partitions or virtual volumes when creating a snapshot schedule. Using Group Snapshots ensure integrity of backup data between database and log partitions or virtual volumes.
What to Evaluate when Planning	 When planning snapshots, evaluate the following concerns: How many data changes will occur within a time frame? How many snapshots might you need to recover? How long can you tolerate loss of data (= how frequently do you need to take snapshots)?

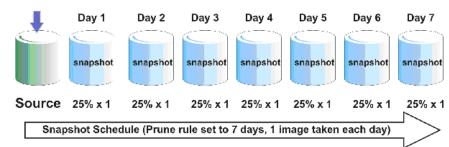


Case Study: Calculating the Required Space

Here we calculate required data space based on these assumptions.

- > 25% of data is expected to change every day.
- > A snapshot is taken every day.
- > You need 7 snapshots to preserve data protection.
- \succ The lifespan of a snapshot is 7 days.

25% data is changed everyday!



The storage space required from a logical partition will be: $(25\% \times 1) + (25\% \times 1) = 1.75$ times of the source partition size.

Pruning vs. PurgingTo use the storage space efficiently, there are two mechanisms, pruning and
purging, that allows you to automatically remove older snapshot images.

Pruning

Pruning refers to removing older snapshot images once it reaches the threshold size or passes the retention period. Pruning occurs according to the threshold conditions, regardless of the availability of storage space. Pruning can be configured when creating snapshot images.

Purging

Purging refers to removing older snapshot images when the used storage space hits the threshold (= available space becomes insufficient). Purging will continue until the used storage space becomes lower than the threshold setting or all snapshot images are deleted or marked as invalid (the original data will always remain intact). Purging can be configured when creating notification thresholds for virtual pools.

Purging takes priority over pruning and is considered as a critical issue for the overall system. When purging occurs, you may take either of the following actions:

- Increase the size of the logical volume or pool to expand the available storage space
- Remove unnecessary data from existing LVs or pools or reconfigure them to use storage space more efficiently
- Increase the pruning threshold (least recommended)

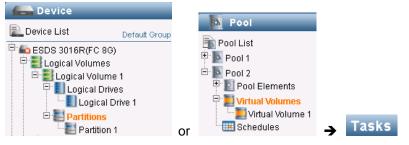
If a snapshot image is marked as invalid during purging, that image can no longer be used and needs to be deleted immediately.

Taking Snapshots

Go to

Steps

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > Tasks corner



You can also take snapshots by schedule. For more information, go to the following location and click the Help icon at the top-right corner: EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Schedules ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Schedules

Click Snapshot in the Tasks corner.



Snapshot Take snapshots of this partition, view the profiles of snapshot images, and run snapshot-related operations.

Select the partition or virtual volume you wish to take snapshots of.

Take snapshot on this partiton.

Take snapshots on selected partitons.

If you choose to select other partitions or VVs, select Take snapshots on selected partitions (or virtual volumes), and select the partition(s) or VVs you wish to take snapshot images of.

Partition Name	Logical Volume Name	Device ID
☑ Partition 2	Logical Volume 1	8000D
Partition 1	Logical Volume 1	8000D
✓ Partition 6	Logical Volume 1	8000D

Click Take Snapshot to execute.

Take Snapshot

The snapshot image will be taken immediately and the result will appear in the list.

🗖 Index 🔺	Snapshot Image ID 👻	Name 👻	Activated Time 👻	Map LUN 👻	Description 👻
1	453A090043645686		Tue, Mar 26 15:20:07 2013	No	

Configuring

Select a snapshot image and click Edit.

	Take a snan	shot image of this virtual volur	ne and run related task	(5.		
		-				
	Index ▲	Snapshot Image ID - 453A090043645686	Name 👻	Activated Time - Tue, Mar 26 15:20:07 2013	Map LUN -	Description -
	You may	Edit Delete	Map ame and d	Rollback Take Si	,	me Copy Close
	Edit Sna	pshot				×
	Edit the	name and description	on for this snaps	shot.		
		apshot Name: scription :				
Configuring Snapshots	Navigate to the partition or virtual volume whose snapshots you want to more and click Snapshot in the Tasks corner. Image: Snapshot Take snapshots of this partition, view the profiles of snapshot images, and run snapshot-related operations.					
	-	Snapshot in t Snapshot Take snapshots of this	he Tasks c	orner.	and run	
	and click	Snapshot in t Snapshot Take snapshots of this snapshot-related opera	he Tasks c partition, view th ations.	orner.		d click Edit.
	and click	Snapshot in t Snapshot Take snapshots of this snapshot-related opera	he Tasks c partition, view th ations.	corner. e profiles of snapshot images, a the snapshot ima	ige ID, an	d click Edit.
	and click	Snapshot in t Snapshot Take snapshots of this snapshot-related oper- ext, check the	be Tasks c partition, view thations. box next to	corner. e profiles of snapshot images, a the snapshot ima	ige ID, an ∎D -	
	and click	Snapshot in t Snapshot Take snapshots of this snapshot-related oper- ext, check the	he Tasks of partition, view th ations. box next to	e profiles of snapshot images, a o the snapshot ima snapshot image	ige ID, an ⊧ID ↓	
	and click	Snapshot in t Snapshot Take snapshots of this snapshot-related oper- ext, check the Next Edit name and des	he Tasks of partition, view th ations. box next to	e profiles of snapshot images, a o the snapshot ima snapshot image	lge ID, an ■ ID - ⁸²²⁶⁶⁸ -→	•
	and click	Snapshot in t Snapshot Take snapshots of this snapshot-related oper- ext, check the Next Edit name and des	he Tasks of partition, view thations. box next to	e profiles of snapshot images, a to the snapshot images Snapshot image 6C687FAB74	lge ID, an ■ ID - ⁸²²⁶⁶⁸ -→	•
	and click	Snapshot in t Snapshot Take snapshots of this snapshot-related oper- ext, check the Next Edit name and des shot	he Tasks of partition, view thations. box next to	e profiles of snapshot images, a to the snapshot images Snapshot image 6C687FAB74	lge ID, an ■ ID - ⁸²²⁶⁶⁸ -→	•



Note



Snapshot Take snapshots of this partition, view the profiles of snapshot images, and run snapshot-related operations.

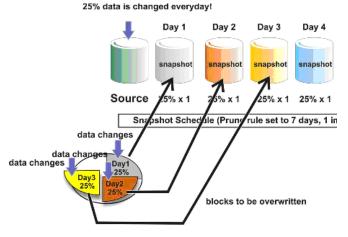
Click Next, check the box next to the snapshot image ID, and click Edit.

	🗖 Index 🔺	Snapshot image ID 👻				
Next	V 1	6C687FAB74B2E66B				
Click Delete and then click Yes.						
Delete 🔒	Yes					

Taking multiple snapshots at once is useful for database applications that require coherent and simultaneous backup of multiple partitions or virtual volumes.

Recovering Source Partition or Virtual Volume from a Snapshot (Rollback)

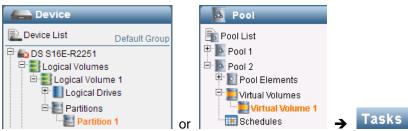
If you rollback a source partition (for EonStor DS subsystems) or virtual volume (for ESVA subsystems) back to a specific state, all images must remain intact because data is consequentially stored in different snapshot images. The below example shows a source partition or VV with 3 daily snapshots. If you want to rollback to day 1, all 3 images must be intact, ready to be referred to in order for past data to be pieced together.



Go to

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > partition name > Tasks corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > VV name > Tasks corner



Steps

If the partition or virtual volume has been mapped, you must unmap the partition or VV first in order to rollback a snapshot image into the partition or virtual volume.

Click Snapshot in the Tasks corner.



Take snapshots of this partition, view the profiles of snapshot images, and run snapshot-related operations.

Click Next and select the snapshot image you want to rollback.

	🗖 Index 🔺	Snapshot image ID 👻
Next	V 1	6C687FAB74B2E66B



Click Rollback, and then click Yes in the confirmation dialog.

Rollback

The source virtual volume or partition will be rolled back.

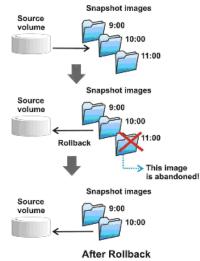
The process can take up to several minutes depending on the size of source virtual volume or partition.

Yes

You may re-establish <u>host LUN mappings</u> for the source virtual volume or partition.

Note on Rollback Timing

If a snapshot image rolls a source partition or virtual volume back, snapshot images taken after that image will be erased. In the example below, the snapshot image taken at 11:00 will be lost because the original source partition or virtual volume it was referring to was replaced by the image taken at 10:00.



Mapping a Snapshot Image to the Host

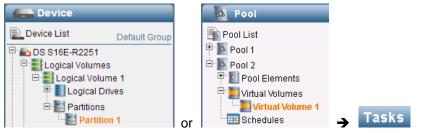
The mapping process is twofold. After mapping a snapshot in SANWatch, you need to assign a drive letter to it in the host computer environment.

 Go to
 EonStor DS subsystems: SANWatch Home > Device sidebar > Device List >

 device name > Logical Volumes > LV name > Partitions > partition name >

 Tasks corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes > VV name > Tasks corner



Steps

Click Snapshot in the Tasks corner.



Take snapshots of this partition, view the profiles of snapshot images, and run snapshot-related operations.

Click Next and check the box next to the snapshot image ID.

		🔲 Index 🔺	Snapshot image ID 👻
Next	→	v 1	6C687FAB74B2E66B

Click Map.

The Host LUN Mapping window will appear. The rest of the steps to take are the same as mapping a partition or virtual volume to a host. For detailed instruction, go to:

- EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions
 ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Virtual Volumes
- Click the Help icon at the top-right corner, and search for "Mapping/Unmapping Partitions or Virtual Volumes to Host."

Assigning a DriveBefore accessing data in the snapshot, you need to assign a drive letter to it.Letter to theHere are the procedures for Windows Server environment.SnapshotImage: Comparison of the state of the st

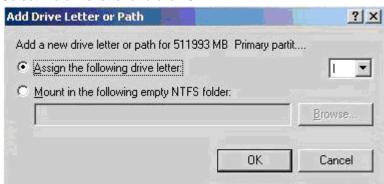
1. When an image is mapped, it will appear as a new drive to the computer.

Elle Action View Window E	telp										16
· -> 🗈 🖬 😫 🖬 🕼 🗡	< f 😼										
Computer Management (Local)	Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free	Fault Tolerance	Overhead	
E 🗱 System Tools	DATA (E:)	Partition Partition	Basic Basic	NTES	Healthy Healthy	499.99 GB 50.00 GB	499.99 GB 2.20 GB	100 % 4 %	No No	0% 0%	
🗄 🛺 Shared Folders	Local Disk (C:)	Partition		NTES	Healthy (System)	30.00 GB	17.58 GB	58 %	No	0%	
Koral Users and Groups Gerformance Logs and Alert: Gerformance Logs and Alert: Gerformance Togs and Alert: Gerformance Manager Storage Gerformance Manager	New Volume (E:)			NTES	Healthy	49.99 GB	0 MB	0%	No	0%	
	New Volume (G:)			NTES	Healthy	49.98 GB	49.92 GB	99 %	No	0%	
🖃 🧟 Device Manager	@VP2_VV1 (H:)	Partition			Healthy		460.47 GB	92 %	No	0%	
	CPDisk 2 Basic 49.98 GB Online	New Vo 49.98 GB Healthy	Exp	lore							
	Basic 49.98 GB	49.98 GE Healthy	B Exp Mar Cha	lore k Partition as	Active Itter and Paths						
	Basic 49.98 GB Online CPDisk 3 Basic	49.98 GE Healthy	Exp Mar Cha Eorr	lore k Partition as inge Drive Le	tter and Paths						
	Basic 49,98 GB Online Colline Basic 499,99 GB Online Colline	49.98 GB Healthy VP2_VV 499.99 G	8 Exp Mar Cha Eorr Dek	lore k Partition as nge Drive Le nat	tter and Paths						
	Basic 49.98 GB Online CPDisk 3 Basic 499.99 GB Online	49,98 GP Healthy 499.99 G Healthy	Erop Mar Cha Eorr Dele Brot	lore k Partition as inge Drive Le mat ste Partition. perties	tter and Paths						

- 2. Right-click on the disk and select Change Drive Letters and Path.
- 3. Click Add in the prompt.

iw access to) this volume by us	ing the follow	ing drive lette	er and paths:
Add	Change	Remove		

4. Select the drive letter and click OK.



5. You should be able to access the data in the snapshot.

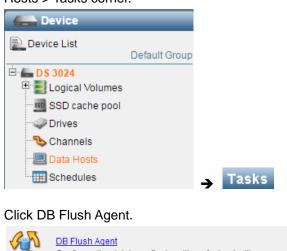
Recovering Database Volume from Grouped Snapshots

Background The procedure below is based on a simple configuration: two virtual volumes presented to the host, one as Data volume and the other as Log volume for SQL Server.

📔 Attach Databases					<u>1</u> [_ 🗆 ×
Select a page	🔄 Script 👻 📑 Help						
🚰 General							
	Databases to attach:						
	MDF File Locatio	on I	Database	Attach As	Owner	Status	Message
	G:\TestDB.mdf		TestDB	TestDB	930786		
	1						
					Add	I F	Remove
	"TestDB" database d	eteile					
		-					
	Original File Name	File Type		File Path	N	lessage	
Connection	TestDB.mdf	Data	and the second s	tDB.mdf			
Server:	TestDB.ldf	Log	F:\Test	DB.Idf			
localhost\							
Connection:							
9307863ESVA\Administrator							
J View connection properties							
The connection properties							
	1						
Progress				Ado	l Catalog	F	Remove
Ready							
New Z							
500-514 1							
					(ЭК	Cancel

Step 1: Configuring SANWatch

Go to SANWatch Home > Device sidebar > Device List > device name > Data Hosts > Tasks corner.



Configure the database flush setting of a host with an agent.

Select a data host for configuring database flush, and click Next.



Host Name	IP Address
PC152	172.27.112.60

Next

Click Add. A configuration prompt will appear.

	DB Type:	SQL Server
	DB Server Name:	172.27.112.60
	Listen Port:	1433
	DB Name:	testDB
	DB Administrator:	sa
	Password:	
Add	Flush Operation:	Enable •

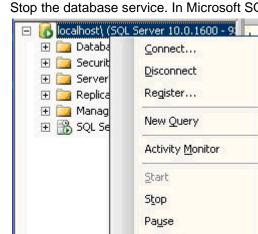
Configure the parameters, click OK, and wait for the configuring progress to complete.

	Connecting to the database		
ОК →		8%	Completed

Open SANWatch Manager and create snapshot schedule.

DB Туре	Select the database type from Oracle, SQL, and MS Exchange.					
DB Server Name	Shows the IP address of the in-band server.					
Listen Port	Specifies the database listen port. A default value is given.					
DB Name	Specifies the name of the database.					
DB Administrator	Specifies the name of the database administrator. A default value is given.					
Password	Specifies the password for the database administrator.					
Flush Operation	Flushes the database when a snapshot image is taken. For this procedure, you need to enable (check) this option.					
	DB Server Name Listen Port DB Name DB Administrator Password					

Step 2: RollbackHere we assume that the database has been corrupted and we need to recoverSnapshot Imagesthe database to a certain point.



Stop the database service. In Microsoft SQL server, right-click and select Stop.

в

In the SANWatch Manager, unmap the database volume.

Refer to the "Recovering Source Volume from a Snapshot (Rollback)" section for more information.



Creating a Volume Copy from a Snapshot Image

To create a volume copy, you must have at least one <u>snapshot image</u> ready.

Go to

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Logical Volumes > LV name > Partitions > partition name > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > Virtual

Volumes > LV name > Tasks corner 📥 Device 🖹 Device List Default Group 🖻 🔚 DS 3016(FC 8G) 💩 Pool 🖻 🛃 Logical Volumes Rool List 🖻 🗾 Logical Volume 1 🗄 💽 Pool 1 😑 🗾 Logical Drives Pool Elements 📗 Logical Drive 1 🖹 🛄 Virtual Volumes ا 🔡 Logical Drive 3 Virtual Volume 1 🖻 🗾 Partitions Schedules Tasks E Partition 1 or

Steps

Click Snapshot in the Tasks corner.

Tal

Snapshot Take snapshots of this partition, view the profiles of snapshot images, and run snapshot-related operations.

Click Next, check the box next to the snapshot image ID, and click Volume Copy.

	🗖 Index 🔺	Snapshot image ID 👻		
Next →	I	6C687FAB74B2E66B	→	Yolume Copy

Follow the instructions.

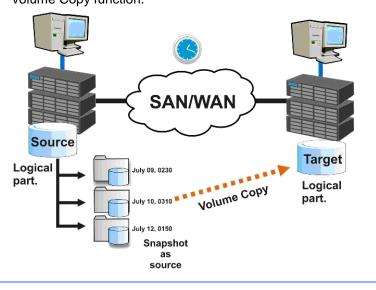


Taking Backup of Snapshot Images

Here are three ways to take backups of snapshot images using tape storage and/or <u>Volume Copy/Mirror</u> functions described later in this manual.

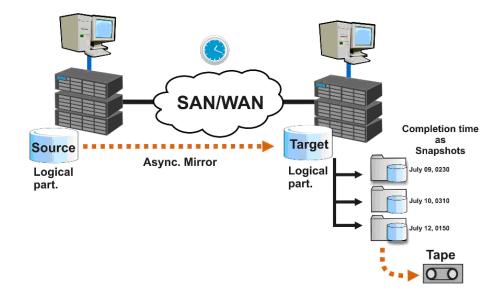
 Using Tape Backup
 Snapshots are saved to tape media during system low time.

 Image: Snapshots source sour



Using	Snapshots can be saved (mirrored) to a remote location using the
Asynchronous	Asynchronous Mirror function. Other backup methods, such as tape media, can
Mirror	be used in the remote site.





Working with Schedules

E Device		Schedule L	.ist	_	_	_			
Device List		Name 🔺		LV Name 🔺	Туре 🔺	Last Run 🔺	Last Result 🔺	Next Run 🔺	
	Default Group	Media	Scan Sch		Media Scan	Thu, Oct 06	07:	Thu, Oct 20 07:	1
DS 3024		Media	Scan Sch		Media Scan	Thu, Oct 06	; 07:	Thu, Oct 20 07:	
🍫 Channels 🛄 Data Hosts									
Schedules									
									-
		Tasks	_			_			
				<u>ule</u> sk for a data host so th in subsystems.	at it runs		Delete Schedule Remove an existing sched	luled task.	
			<u>Edit∕View Sch</u> Edit the paran	edule neters of an existing sc	heduled task.		Backup / <u>Restore</u> Backup or restore schedul host.	e settings to or from a data	

This chapter describes how to create a scheduled task (snapshot, volume mirror) and backup or restore schedule settings.



Viewing Schedules

Go to

SANWatch Home > Device sidebar > Device List > device name > Schedules



View

The list of scheduled tasks will appear in the Schedule list corner.

lame 🔺	LV Name 🔺	Туре 🔺
🔢 Media Scan Schedule 1		Media Scan
🔢 Media Scan Schedule 2	-	Media Scan
🔢 Media Scan Schedule 3	-	Media Scan
New Schedule 1	Logical Volume 1 (78C15	Take Snapshot, Interval

Parameters	Name	Shows the name of the scheduled task.
	LV Name (or Pool Name)	Shows the name of logical volume (for EonStor DS subsystems) or pool (for ESVA subsystems) where the scheduled task is executed.
	Туре	Shows the type of the task (Snapshot, Volume Mirror, Remote Replication, and Tiered Migration) and associated parameters.
	Last Run	Shows the previous date and time when the scheduled task was executed.
	Last Result	Shows the result of the last execution of the scheduled task.
	Next Run	Shows the next date and time when the scheduled task will be executed.





Creating Schedules: General Rules

Go to

SANWatch Home > Device sidebar > Device List > device name > Schedules > Tasks corner



Steps

Click Create Schedule in the Tasks corner.

Select the type of scheduled task you want to add.



Select the schedule option.

Create Schedule

Snapshot
 Volume Mirror

<u> </u>	
0	Create a Tiered Migration Schedule
	Media Scan

Changing the IPScheduled asynchronous volume mirror will fail If the remote IP (host server IPAddressfor In-band or subsystem IP for out-of-band) changes between (a) and (b).

- > (a) When the volume pair is created
- > (b) When the scheduled async volume mirror begins

It is best if you can keep the IP address fixed after creating the volume pair, but if you need to change it, follow these steps.

- 1. Restart SANWatch.
- 2. Re-discover the new IP address or add it manually.
- 3. Open SANWatch Manager from the subsystem with the updated IP address.
- 4. Remove the existing schedule.
- 5. Sync/async the volume pair to fix the broken link due to the changed IP address.
- 6. Create a new schedule with the updated IP address.

You can change the remote IP from the firmware (LCD menu or text interface) after creating a volume mirror (remote replication) pair. Note that if you do this, the remote pair will be broken. In order to remove a broken pair,

you must first unassign the target in SANWatch. Changing the remote IP after creating a remote replication pair is not allowed in SANWatch. If you wish to change the IP, you need to first un-assign the target volume of the remote replication pair. After changing the IP, you can safely re-assign the pair by syncing/asyncing it manually.

Taking Snapshots by Schedule

Notes

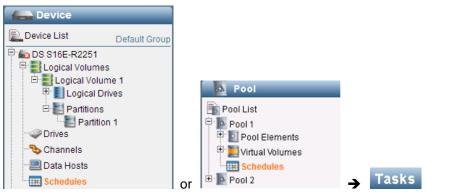
> The interval between two snapshots must be 10 minutes or longer.

- If a snapshot taking process takes longer than the interval, the next snapshot will be abandoned and the first snapshot will be completed instead.
- > If multiple schedules take place at the same time, both schedules will fail.

Go to

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Schedules

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Schedules

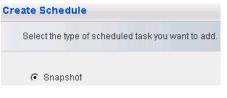


Steps

Click Create Schedule in the Tasks corner.



Select Snapshot and click Next.



Check the box next to the device that contains the partition(s) (for EonStor DS subsystems) or virtual volume(s) (for ESVA subsystems) you wish to take snapshots of and click Next.

Create Schedule	
Select the devices to take snapshot sched	ules.
Device Name	Device ID
N	8000D

Select partition(s) or virtual volume(s), and click on Next.

Create Schedule

Configure the target of the scheduled task.				
Partition Name	Partition ID			
Partition 2	665F58D61EFF96F3			
Partition 1	5B7D2D2C29356F02			
Partition 6	192DD10F47E963E1			

Enter your schedule parameters.

Schedule Name:	New Schedule 1	
Source:	Partition 2 (665F58D61EFF96F3), Partition 1 (5B7D2D2C29356F02), Partition 6 (192DD10F47E963E
Start Date:	01/11/2013	End Date: 01/11/2013 📰 🗖 Repeat
	C Recurring Days of Week C Recurring Days of Month	Sun Mon Tue Wed Thu Fri Sat
Start Time:	3 ▼: 3 ▼ ▼ Once Backup Every 1 Hour ▼	End Time 23 💽: 59 💌
Prune Rule:	Purge Snapshot Images By Repair State S	etention Period

Parameters	Schedule Name	Enter a name for the snapshot schedule.
	Source	Shows the selected source for snapshot.
	Start/End Date	Specifies the duration of this schedule. To configure, click the part you want to configure (for example the year). If there is no stop date, check the Repeat box.
	Daily / Recurring Week Day / Recurring Days of Month	Specifies the recurrence of this schedule. Daily Check the Daily checkbox. The scheduled task will be executed every day.
		Weekly Check on which day the scheduled task will be executed. © Recurring Days of Week Sun I Mon Tue Wed I Thu Fri Sat Monthly

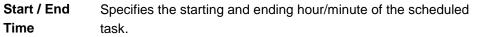


Click Set Days.

Recurring Days of Month	Set Days
service and pays or month	Jecodys

Select the days of each month on which the scheduled task will be executed.

<u>□</u> 1	2	🔽 З	□ 4	5	6	□ 7	□ 8	9	[10	
🗖 11	12	I 13	14	<u> </u>	<u> </u>	<u>□</u> 17	<u> </u>	<u> </u>	2 0	
1 21	1 22	1 23	24	1 25	1 26	27	1 28	🗖 29	I 30	
1 31										



Start Time:	15	• : 49	•
End Time 23	• : 59	•	

Configure the interval (frequency) using the drop-down list.

If you execute the task only once, check the Take Once box. The task will be executed on the Start Time.

🔽 Take Once

 Prune rule
 Specifies the amount (Snapshot Image Count) or period (Retention Period) of snapshots that will be stored in the system.

 Prune Pule:
 © Pures Snapshot Images By Retention Period

rune Rule:	 Purge Snapshot Images By Retention Period 	
	Keep images for the following period:	7
	C Purge Snapshot Images By Image Count	
	Keep images within the following number:	256

Click Next when done and confirm summary settings and click OK.



Summary Confirm the summary of the created schedule.		
Schedule Type:	Snapshot	
Selected Target:	Partition 2	
Schedule Settings:		
Name:	New Schedule 1	
Start Date:	2014/8/5	
End Date:	2014/8/5	
Repeat:	Daily	
Start Time:	11:38	
End Time:		
Once:	Yes	
Backup:		
Prune Rule:	By Retention Period:7 Weeks	

The snapshot schedule should appear in the Schedule List area.

Name 🔺	LV Name 🔺
New Schedule 1	Logical Volume 1 (78C15

Exporting/ImportiClick the Help icon at the top-right corner and look for "Backing Up or Restoringng ScheduledSchedule Settings."Backup TasksImport Setting Set

Creating Volume Mirror by Schedule

NoteAt least one volume mirror pair must exist to create a volume mirror schedule
task. Go to SANWatch Home > Device sidebar > Device List, click the Help icon
at the top-right corner, and look for "Creating a Volume Mirror" for more
information about volume mirror.

Go to

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Schedules > Tasks corner ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Schedules > Tasks corner



Steps

Click Create Schedule in the Tasks corner.



The list of tasks will appear. Check Volume Mirror and click Next.

Create Schedule
Select the type of scheduled task you want to add.
Snapshot
Volume Mirror
Create a Tiered Migration Schedule
🔘 Media Scan

The list of volume mirror pairs will appear. Select a pair and click Next.

You may locate the sync point inside the target volume.
Configure the sync point inside the target volume (target snapshot).

1	- Available Volume Mirror Pairs		
Name 👻 Type 👻		Туре 🗸	Priority 🗸
	RemoteMirror 2	(Volume Set Lost)	High

The schedule parameters will appear.



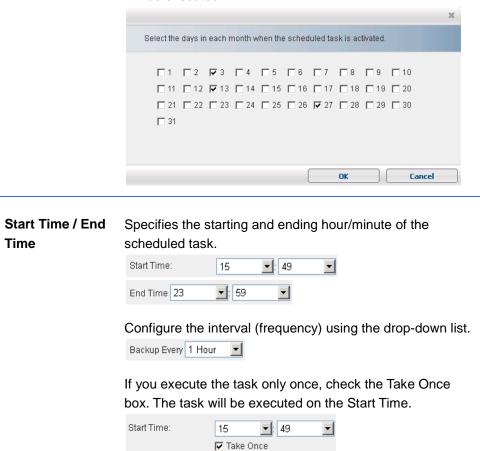
	Create Schedule X
	Schedule Settings Configure the schedule parameters.
	Schedule Name: Schedule 1
	Start Date: 03/26/2013 End Date: 03/26/2013 Im C Repeat C Daily C Recurring Days of Week Sun [Mon [Tue] Wed [Thu [Fri] Sat
	Image: Constraint of the set Days Set Days Start Time: 15
	Backup Every 1 Hour Images Prune Rule: Images Support Images By Retention Period Images Keep images for the following period: 7 Images Images Count Images By Image Count Images Keep images within the following number: 1024
	Keep images within the following number: 1024 Step 3 of 4 Back Next
Parameters	Name Enter the name of the scheduled task. Schedule Name: Schedule 1
	Start/End Date Specifies the duration of this schedule. To configure, click the calendar icon and select the date. Image: Ima
	Daily / RecurringSpecifies the recurrence of this schedule.Week Day /DailyRecurring DaysDaily
	of Month Check the Daily checkbox. The scheduled task will be executed every day.
	Weekly
	Check on which day the scheduled task will be executed.
	Recurring Days of Week

Monthly

Click Set Days.

Set Days

Select the days of each month on which the scheduled task will be executed.



Click Next. The summary of the scheduled task will appear.

Create Schedule		
Summary		
Confirm the summary of the cre	eated schedule.	
Schedule Type:	Snapshot	
Selected Target:	Virtual Volume 2	
Schedule Settings:		
Name:	Schedule 1	
Start Date:	2013/3/26	
End Date:	2013/3/26	
Repeat:	daily	
Start Time:	15:49	
End Time:		
Take Once:	Yes	
Backup:		
Prune Rule:	time:7 Weeks	

Click OK. The scheduled task will appear in the list.

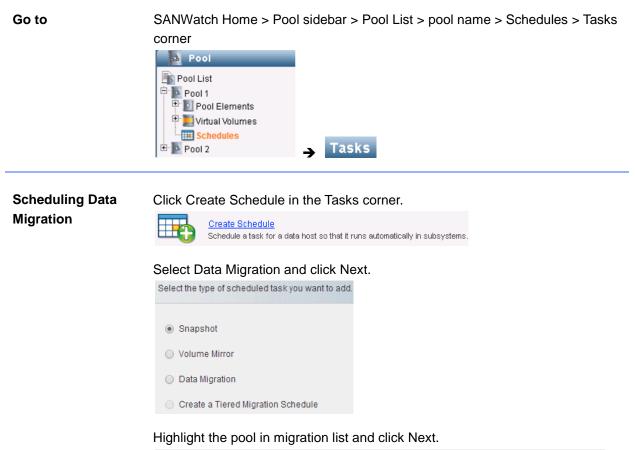
Schedule List	
Name	Туре
🚃 Schedule1	Take SI, Interval

Changing the IP Scheduled asynchronous volume mirror will fail If the remote IP (host server IP Address for In-band or subsystem IP for out-of-band) changes between (a) and (b). (a) When the volume pair is created > (b) When the scheduled async volume mirror begins It is best if you can keep the IP address fixed after creating the volume pair, but if you need to change it, follow these steps. 1. Restart SANWatch. 2. Re-discover the new IP address or add it manually. 3. Open SANWatch Manager from the subsystem with the updated IP address. 4. Remove the existing schedule. 5. Sync/async the volume pair to fix the broken link due to the changed IP address. 6. Create a new schedule with the updated IP address. You can change the remote IP from the firmware (LCD menu or text interface) after creating a volume mirror (remote replication) pair. Note that if you do this, the remote pair will be broken. In order to remove a broken pair, you must first unassign the target in SANWatch. Changing the remote IP after creating a remote replication pair is not allowed in SANWatch. If you wish to change the IP, you need to first un-assign the target volume of the remote replication pair. After changing the IP, you can safely re-assign the pair by syncing/asyncing it manually.

Creating Data Migration by Schedule (ESVA subsystems only)

This feature is different from tiered data migration, of which the purpose is to adjust the capacity ratio in a multi-tiered virtual volume according to the tier ratio settings.

The Data Migration feature helps with automatic data migration between pool elements after the pool is expanded or shrunk.



Name 👻	ID 💌	Size 💌	Available 👻	Progress 💌	Status 👻
Pool 2	5618CEA460FD946B	559.49 GB	557.1 GB	Data migrating paused (1%)	On-line

Configure the schedule and click OK.



Create Schedule					×
Schedule Settings Configure the schedule	e parameters.				
Schedule Name:					
Start Date:	04/08/2013 C Daily C Recurring Days of Week C Recurring Days of Month	End Date: 04/08/20		Thu 🥅 Fri 🥅 Sat	
Start Time:	14 💽 37 💌				
Priority:	Normal				
Step 3 of 4			Back	Next	Cancel

The summary will appear. Confirm and click OK.

Schedule Type:	Data Migration Priority	
Select Target: Pool 2		
Schedule Settings:		
Name:	Schedule2	
Start Date:	2013/4/8	
End Date:	2013/4/8	
Repeat:	28	
Start Time:	14:37	
Priority:	Medium	

The new schedule will appear.

Scheduling Parameters	Start/Stop Date	Specifies the duration of this schedule. To configure, click the part you want to configure (for example the year) and use the Up/Down arrow buttons. If there is no stop date, check the Repeat box.
	Daily / Recurring Week Day / Recurring Days of Month	Specifies the recurrence of this schedule.
	Start Time	Specifies the starting time of the migration task.
	Migration Priority	Specifies the amount (Snapshot Image Count) or period (Snapshot Image Time) of snapshots that will be stored in the system.



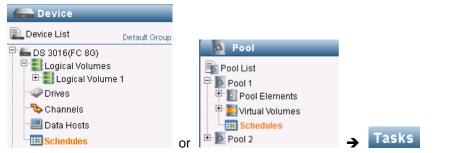
Creating Tiered Data Migration by Schedule

This feature only works when one or more logical volumes or pools that reside in multiple tiers exist in the subsystem.

Go to

EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Schedules > Tasks corner

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Schedules > Tasks corner



Steps

Click Create Schedule in the Tasks corner.



Schedule a task for a data host so that it runs automatically in subsystems.

The list of tasks will appear. Check Create a Tiered Migration Schedule and click Next.

Select the type of scheduled task you wa	nt to add.
Snapshot	
Volume Mirror	
 Create a Tiered Migration Schedule 	
Media Scan	
U media Scan	

The list of tiered logical volumes or pools will appear. Select one of them and click Next.

Select the logical volume for the scheduled tiered migration task.	
Name 👻	ID 🗸
Logical Volume 1	762FAF6B148BFAD7

The schedule parameters will appear.



Create Schedule	
Configure the schedule param	neters.
Schedule Name: New	Schedule 1
Source: Partit	tion 1 (47CF54A26690F342), Partition 3 (1FF9BB774A64BCD4), Partition 2 (2758F1817DCBE06C)
● Da ○ Re ○ Re	5/2014 End Date: 08/15/2014 IIII Repeat ally ecurring Days of Week Sun Mon Tue Wed Thu Fri Sat ecurring Days of fortnight Sun Mon Tue Wed Thu Fri Sat ecurring Days of Month Set Days Set Days Sat Sat Sat
Start Time: 15	▼ : 52 ▼
Priority: Norm	nal 🔻
Start/End Date	Schedule Name: Schedule 1 Specifies the duration of this schedule. To configure, clic the calendar icon and select the date. Image: Specifies the duration of this schedule. To configure, clic the calendar icon and select the date. Image: Specifies the duration of this schedule. To configure, clic the calendar icon and select the date. Image: Specifies the duration of this schedule. To configure, clic the calendar icon and select the date. Image: Specifies the duration of the schedule. Image: Specifies the the schedule. Image: Specifies the duration of the schedule. Image: Specifies the schedule. Image: Specifies the schedule. Image: Specifies the schedule.
Daily / Recurring Week Day / Recurring Days of	End Date: 03/26/2013 Repeat Specifies the recurrence of this schedule. Daily
Month	Check the Daily checkbox. The scheduled task will be executed every day.
	Weekly
	Check on which day the scheduled task will be executed Recurring Days of Week Sun Von Tue Wed Thu Fri Sat



Monthly

Click Set Days.
© Recurring Days of Month Set Days

Select the days of each month on which the scheduled task will be executed.

	×
	Select the days in each month when the scheduled task is activated.
	1 2 7 3 4 5 6 7 8 9 10 11 12 7 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
	OK Cancel
Start Time / End Time	Specifies the starting and ending hour/minute of the scheduled task. Start Time: 15 • 49 • End Time: 23 • 59 • Configure the interval (frequency) using the drop-down
	list. Backup Every 1 Hour If you execute the task only once, check the Take Once box. The task will be executed on the Start Time.
	Start Time: 15 1: 49

Click Next. The summary of the scheduled task will appear.

eate Schedule	
Summary Confirm the summary of the cre	eated schedule.
Schedule Type:	Snapshot
Selected Target:	Virtual Volume 2
Schedule Settings:	
Name:	Schedule 1
Start Date:	2013/3/26
End Date:	2013/3/26
Repeat:	daily
Start Time:	15:49
End Time:	
Take Once:	Yes
Backup:	
Prune Rule:	time:7 Weeks



Click OK. The scheduled task will appear in the list.

Schedule List	
Name	Туре
Schedule1	Take SI, Interval



Scanning Disk Drives by Schedule (EonStor DS subsystems only)

Go to

SANWatch Home > Device sidebar > Device List > device name > Schedules > Tasks corner



Steps

Click Create Schedule in the Tasks corner.



С

The list of tasks will appear. Check Media Scan and click Next.

reate schedule
Select the type of scheduled task you want to add.
 Snapshot
 Volume Mirror
Create a Tiered Migration Schedule
Media Scan

The front view of the device will appear. Select the drives that will be scanned.

Destination Type:	Select Member Dri	ves of Logical Drive	•			
RAID						
	•	•	•	Slot	Size	
	•	•		✓ 1	3.63 TB	
	•	•		✓ 2	3.63 TB	
	•	•		₹ 3	3.63 TB	
				✔ 4	3.63 TB	
				€ 5	3.63 TB	
				₹ 6	3.63 TB	
				₹ 7	3.63 TB	-

- Select Member Drives of a Logical Drive: Click a drive that belongs to a logical drive in the front panel, and all member drives (including local spare drives) for that logical drive will be selected.
- Select All Logical Drives: All drives that are members of logical drives will be selected.
- All Global / Enclosure Spare Drives: Only global / enclosure spare drives will be selected.
- All Assigned Drives: All drives that are part of a logical drive (or pool element), logical volume (or pool), and partition (or virtual volume) will be selected.



All Eligible Drives: All healthy drives, whether a part of a logical drive or not, will be selected.

Click Next. The schedule parameters will appear.

Create Schedule	
Configure the schedule	e parameters.
Controller time:	2014-8-6 11:50:20
Start Date:	08/06/2014
Start Time:	0 •
Period:	Execution Once
Options	Execute on Controller Initialization Execute on All Target Elements at Once Priority Normal

Parameters Start Date / Specifies the start date, start time, and period of this schedule. Start Time / Period Options Choose whether to scan: > When the controller gets initialized > All drives at once (if you choose the priority as high, scanning will be executed rapidly but the system performance may be affected) Options Execute on Controller Initialization 🔲 Execute on All Target Elements at Once Priority High •

Click Next. The summary of the scheduled task will appear.

Create Schedule	
Summary Confirm the summary of the created s	chedule.
Schedule Type:	Media Scan
Select Target:	Select Member Drives of Logical Drive
Schedule Settings:	
Start Date:	2014/8/6
Start Time:	00:00
Scan Every:	Execution Once
Options:	
Execute on Controller Init	No
Execute on All Target Ele	No
Priority:	Normal



Click OK. The scheduled task will appear in the list.



Editing/Deleting Schedules

Go to

SANWatch Home > Device sidebar > Device List > device name > Schedules > Tasks corner



Editing a Schedule

Click Edit/View Schedule in the Tasks corner.



The list of scheduled task will appear. Highlight the task to be edited and click Next.

For media scan related scheduled tasks, you are only allowed to click View to view their summary information.

Select the scheduled task.		
Schedule Name	LV Name	Туре
Media Scan Schedule 3		Media Scan
New Schedule 1	Logical Volume 1 (6AFDE75E3F7FCBD1)	Take Snapshot, Interval

The schedule parameters will appear. They are the same as those you configured while creating the schedule task. Reconfigure them and click Next.

Schedule Name:	New Schedule 1
Source:	Partition 2 (665F58D61EFF96F3), Partition 1 (5B7D2D2C29356F02), Partition 6 (192DD10F47E963E1)
Start Date:	01/11/2013 End Date: 01/11/2013 Engeat
Start Time:	C Daily C Recurring Days of Week Sun Mon Tue Wed Thu Fri Sat Set Days Set Days Set Days C Noce Backup Every 1 Hour
Prune Rule:	Purge Snapshot Images By Retention Period
	Conce Backup Every 1 Hour

The summary of the scheduled task will appear.



Summary	
Confirm the summary of the c	reated schedule.
-	
Schedule Type:	Snapshot
Selected Target:	Partition 2
Schedule Settings:	
Name:	New Schedule 1
Start Date:	2014/8/5
End Date:	2014/8/5
Repeat:	Daily
Start Time:	11:38
End Time:	
Once:	Yes
Backup:	-
Prune Rule:	By Retention Period:7 Weeks

Click OK and Close. The scheduled task will reappear in the list.

Schedule List	
Name 🔺	LV Name 🔺
New Schedule 1	Logical Volume 1 (78C15

Deleting a **Scheduled Task**

Click Delete Schedule in the Tasks corner.



5

Delete Schedule Remove an existing scheduled task.

The list of scheduled task will appear. Highlight the task to be deleted and click Delete.

elete Schedule				
Z Schedule Name	Туре	9		
☑ Schedule1	Т	ake SI, Interval		
			Delete	Class
			Delete	Close

The scheduled task will be removed from the list.

Name 🔺	LV Name 🔺
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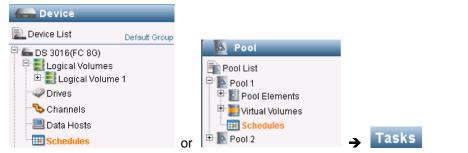
Backing Up or Restoring Schedule Settings

You may save the schedule settings to a local file, or import an existing settings into your subsystem. This feature is useful for moving your RAID environment from one subsystem (or controller) to another.

To use this feature: Your SANWatch must be connected to the subsystem via in-band connection. At least one backup schedule (snapshot or mirror) must exist.

 Go to
 EonStor DS subsystems: SANWatch Home > Device sidebar > Device List > device name > Schedules

ESVA subsystems: SANWatch Home > Pool sidebar > Pool List > pool name > Schedules



Backing up Settings Click Backup in the Tasks corner.



Backup

Backup / Restore Backup or restore schedule settings to or from a data host.

The list of available hosts will appear. Highlight the host and click OK.

Select the data host for backing up the sch	nedule settings.
Host Name	IP Address
Management Host	172.28.10.110

The settings of scheduled tasks will be exported as a zip file and downloaded to your computer.

schedule_setting_172.28.10.110.zip

Restoring Settings Click Restore in the Tasks corner.



Backup / <u>Restore</u> Backup or restore schedule settings to or from a data host.

The list of available hosts will appear. Highlight the host and click Browse.

Restore		
Select the data host that contains the schedule settings and then r	estore them.	
Host Name	IP Address	
Management Host	172.28.10.110	

Select the settings file (*.zip) from a local folder. The settings will be uploaded and restored on the selected host.

NoteThe configuration data is in a proprietary format and is packed in zip format
(*.zip). When you import a configuration data, do not unpack the zip file – select
the original zip file and import it.



Appendix

TCP/IP and UDP Port Assignments

Use these ports if you manually configure secure access to SANWatch. Contact your network administrators if management access needs to span across protected networks.

Software	58630	SSL port for connecting RAID subsystem
	58632	Non-SSL port for connecting RAID subsystem
	58641	Port for receiving automatic discovery responses
	8818	Port for SANWatch
Management Host Agent	58634	Port for receiving requests from the Notification Manager
	58635	Port for redundant configurations when synchronizing Management Host Agent
	58641	Port for receiving automatic discovery responses
	58699	Port for receiving requests for portal access to SANWatch
In-Band Data Host Agent	58630	SSL port for a console to connect to Data Host Agent
Agent	58632	Non-SSL port for a console to connect to Data Host Agent
	58640	Port for receiving automatic discovery requests.
VSS Agent	58650	Port for receiving VSS requests.
MPIO Agent	58670	Port for receiving MPIO requests.
UDP Port	58640	Should be enabled for all modules
Assignments	58641	Should be enabled for all modules

