



Highly Reliable

S Y S T E M S

High-Rely NetSwap/NetSwap Plus/RAIDFrame Plus Backup System



User Manual V2.16

Please Read This First

Important Quick Start Information for your High-Rely drive

- When using “High-Rely Classic” media trays the drive will not spin up until the key is turned on. This is by design and prevents accidental media removal.
- Please do NOT ATTEMPT TO REMOVE High-Rely classic media from their drive bays without “unlocking” the drive with the key first! Forced removal of the drive will void your warranty. The key has a mechanical interlock that blocks the drive from being removed. This note does not apply to MPac media, which is removed by simply flipping the metal locking tab out or RAIDPac media which is removed by pushing the release tab and pulling.
- We recommend telling all operating systems. to “safely remove” the drive prior to removing drive to avoid removing drive during a write. If you are sure the drive is not being used, you may skip this step at your own discretion.
- The latest Service Packs are important! Microsoft has continued to Debug removable drives on the Windows 2000, XP, 2003, Vista, Windows 7, 2008 and beyond. If you do not have the latest service packs you may have problems. For example, XP machines without appropriate Service Packs cannot properly recognize drives above 137GB. While it may appear to work, the drive will corrupt data when it fills above that level. Windows XP and 2003 operating systems do not recognize greater than 2TB drives or GPT partition tables. Read the manual or our web site for more details.
- If you are swapping multiple trays in your removable device, you may have a drive letter problem as you change your media. Sometimes Windows will assign drive letters randomly which can cause your backup software to fail. **You can use the High-Rely Drive Manager utility HRDM2.MSI to solve this problem.** To do this, install HRDM2 on the machine that the High-Rely system will be connected to.
- Larger hard drives are extremely sensitive to shock. Please handle all media with care when transporting off-site or removing and use our padded carrying cases to avoid data loss. Best practice removal is partially extracting the media, wait 20 seconds for it to spin down and then finish pulling it out.
- Photos and screen shots in this manual may not reflect your exact product or operating system.

The information in this manual primarily documents Windows. Although our products are known to work with Windows NT, Linux, Mac OS X and other operating systems, at this time, our tech support can assist with Windows platforms only.

NetSwap/RAIDFrame Plus User Manual v2.16

Copyright © 2011-2019 by Highly Reliable Systems, Inc.

All rights reserved. No parts of this work may be reproduced in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems - without the written permission of the publisher.

Products that are referred to in this document may be either trademarks and/or registered trademarks of the respective owners. The publisher and the author make no claim to these trademarks.

While every precaution has been taken in the preparation of this document, the publisher and the author assume no responsibility for errors or omissions, or for damages resulting from the use of information contained in this document or from the use of programs and source code that may accompany it. In no event shall the publisher and the author be liable for any loss of profit or any other commercial damage caused or alleged to have been caused directly or indirectly by this document

Table of Contents

1 Introduction.....	7
2 NetSwap/RAIDFrame Plus Hardware.....	8
2.1 Front Panel.....	8
2.1.1 Desktop Chassis(legacy).....	8
2.1.2 2U Rackmount Chassis (NetSwap Plus only).....	9
2.1.3 4U 8 Bay Rackmount Chassis (NetSwap Plus only).....	10
2.1.4 4U RAIDFrame Rackmount Chassis (RAIDFrame Plus only)(legacy).....	11
2.1.5 Mini Chassis.....	12
2.1.6 Power On Procedure.....	12
2.1.7 Power Off Procedure.....	13
2.2 Rear Panel.....	13
2.2.1 Desktop Chassis(legacy).....	13
2.2.2 2U Rackmount Chassis (2 or 4 Bay).....	14
2.2.3 4U Rackmount Chassis (8 bay or RAIDFrame)(legacy).....	15
2.2.4 Mini Chassis.....	16
3 NetSwap/RAIDFrame Plus Administration.....	17
3.1 Quick Setup.....	18
3.2 Disk Preparation.....	21
3.2.1 Formatting Disks.....	21
3.2.2 Sharing Disks.....	22
3.2.3 Creating RAID Disks (NetSwap/RAIDFrame Plus only).....	23
3.3 Replication (NetSwap/RAIDFrame Plus Only).....	24
3.3.1 Replication Jobs, Locations, and Targets.....	24
3.3.2 Setting up a Basic Replication Job.....	25
3.3.3 Seeding.....	30
3.3.3.1 Seed Using a Replication Seed Job.....	30
3.3.3.2 Seed Using SpeedSeed™.....	31
3.3.4 Snapshots.....	36
3.4 Administration Reference.....	38
3.4.1 Page Layout.....	38
3.4.2 Status Menu.....	39
3.4.2.1 Status.....	39
3.4.2.2 Tasks.....	41
3.4.2.3 View Log.....	42
3.4.3 Settings Menu.....	43
3.4.3.1 Network.....	43
3.4.3.2 Dynamic DNS (NetSwap/RAIDFrame Plus Only).....	46
3.4.3.3 Admin.....	47
3.4.3.4 Disks.....	49
3.4.3.5 iSCSI.....	51
3.4.3.6 Windows Networking.....	55

3.4.3.7 NFS.....	61
3.4.3.8 SMTP.....	62
3.4.3.9 Alerts.....	64
3.4.3.10 Date/Time.....	67
3.4.3.11 Dashboard Registration.....	69
3.4.3.12 Export Configuration.....	70
3.4.3.13 Import Configuration.....	70
3.4.3.14 Restore Default Configuration.....	71
3.4.3.15 Docs & Software.....	71
3.4.4 Replication (NetSwap/RAIDFrame Plus Only).....	72
3.4.4.1 Settings.....	72
3.4.4.2 Jobs.....	73
3.4.4.3 Remote Locations.....	92
3.4.4.4 Targets.....	99
3.4.4.5 Amazon Import/Export Jobs.....	101
3.4.5 Virtualization Menu (Select models only, Experimental).....	104
3.4.5.1 Virtual Machines.....	104
3.4.5.2 Install Utility OS.....	108
3.4.6 System Menu.....	108
3.4.6.1 Reboot Device.....	108
3.4.6.2 Shutdown Device.....	109
3.4.6.3 Check for Updates.....	109
3.4.6.4 Update Device.....	110
3.4.7 Disk Properties.....	111
3.4.7.1 Format.....	117
3.4.7.2 Disk Tools.....	120
3.4.7.3 Share.....	122
3.4.7.4 Safely Remove.....	122
3.4.7.5 Smart Info.....	124
3.4.7.6 Mirror Schedule (Plus models only).....	125
3.4.7.7 Mount Disk.....	127
3.4.7.8 Quick DeltaSync.....	127
3.4.8 Seeding Operations (NetSwap/RAIDFrame Plus Only).....	129
3.4.8.1 Make Seed.....	129
3.4.8.2 Unmark Seed Disk.....	130
3.4.8.3 Seed RAID Disk.....	131
3.4.9 Create RAID Disk (NetSwap/RAIDFrame Plus only).....	132
3.4.10 RAID Properties (NetSwap/RAIDFrame Plus only).....	134
3.4.10.1 Resume RAID.....	137
3.4.10.2 Pause RAID.....	137
3.4.10.3 Break RAID.....	138
3.4.10.4 Add Disk.....	139
3.4.10.5 Remove Disk.....	140
4 High-Rely iSCSI Connector Software.....	141
4.1 Installation.....	141

4.2 Operation.....	145
4.2.1 iSCSI Targets.....	145
4.2.1.1 Connect.....	146
4.2.1.2 Safely Remove.....	147
4.2.1.3 Refresh.....	147
4.2.2 Persistent/Favorite Targets.....	148
4.2.2.1 Edit.....	148
4.2.2.2 Remove.....	149
4.2.2.3 Refresh.....	149
5 Configuration Examples.....	149
5.1 iSCSI Mode.....	149
5.1.1 Windows.....	149
5.2 More Examples.....	159
6 Restore to Factory Defaults.....	159
7 NetSwap/RAIDFrame Plus Console.....	160
7.1 Configure Network.....	161
7.1.1 Hostname.....	161
7.1.2 Ethernet X.....	162
7.2 Configure Date/Time.....	163
7.2.1 NTP.....	165
7.2.2 Windows Server.....	165
7.2.3 Manual.....	166
7.3 Restore Default Settings.....	167
7.4 Reboot.....	167
7.5 Shutdown.....	168
8 Remote Monitoring and Management (RMM) Support.....	169
8.1 Network (TCP/HTTP) Based Monitoring.....	169
8.1.1 Log Files.....	169
8.1.2 Disk Status Files.....	169
8.1.3 Replication Status Files.....	170
8.1.4 Disk Flag Files.....	171
8.1.5 Replication Job Flag Files.....	172
8.2 File Based Monitoring.....	173
8.3 LabTech RMM.....	174
8.3.1 Network Monitor.....	174
8.3.2 File Based Monitor.....	181
8.4 Level Platforms Managed Workplace 2012.....	186
8.4.1 Device Availability Monitor.....	186
8.4.2 Custom Log File Monitor.....	194
8.4.3 Performance Counters Monitor.....	201
9 GPL Code Statement.....	207

1 Introduction

The NetSwap/RAIDFrame Plus is a removable-media network-attached backup system connecting via Gigabit Ethernet using either iSCSI or standard Network Attached Storage (NAS) networking protocols. 10 Gigabit Ethernet is available as an option.

The NetSwap/RAIDFrame Plus family consists of the NetSwap 200 series (single removable bay, 1 internal disk, and RAID), the 2 or 4 bay 2U rack-mount NetSwap 400 series (2 or 4 removable bays and RAID), the 2 bay NetSwap 300 series mini-tower (2 bays and RAID), the 8 bay 4U rack-mount NetSwap 800 series (8 removable bays and RAID), and the 2 or 4 bay RAIDFrame 2000 and 4000 4U rack-mount (2 or 4 RAIDPac removable bays and RAID). With the exception of the RAIDFrame plus, all NetSwap models can be equipped with either the High- Rely Classic or MPac media bays.

With the NetSwap/RAIDFrame Plus backup system you can choose one of two sharing modes for each disk: iSCSI or NAS (Network Attached Storage) connecting over Windows Networking(SMB/CIFS) and NFS. Windows networking is also called (SMB/CIFS) which stand for “Server Message Block/Common Internet File System”. NFS stands for “Network File System”, which is often used in Unix/Linux and for virtualization platforms like VMware.

It is possible to have both Windows networking (SMB/CIFS) and NFS networking turned on at once for each disk. The NetSwap/RAIDFrame Plus's internal (NetSwap 200 series only) and removable drive's are available as a simple Windows network share and as a NFS export point (folder) – basically as Network Attached Storage (NAS) with a removable drive.

In iSCSI mode the NetSwap/RAIDFrame Plus cannot simultaneously share the disk as a NAS device since the entire removable hard drive is dedicated to direct connectivity. A given machine (server) will directly connect and use the entire removable drive. The NetSwap/RAIDFrame Plus's removable drives are connected using iSCSI initiator software and supports optional CHAP username/name and password/secret to improve security. If you need to make an iSCSI drive available to multiple servers for backup simply “share” the drive on the machine with the iSCSI initiator software, making it available as a network wide resource. This may be thought of as re-sharing the drive to the rest of the network.

Disks may be formatted with with encryption if desired for added protection. The encryption is compatible with the popular TrueCrypt disk encryption software allowing for the disk to be decrypted on any system capable of running TrueCrypt. Some models of the NetSwap/RAIDFrame Plus include hardware encryption.

Some models add the ability to replicate backups off site; either to another NetSwap or to various cloud storage providers (including Dropbox, Amazon S3, Google Cloud Storage) or servers or providers using FTP or SFTP protocols.

2 NetSwap/RAIDFrame Plus Hardware

2.1 Front Panel

The front panel of the devices are as follows:

2.1.1 Desktop Chassis (legacy)



Illustration 1: Desktop Chassis Front Panel

1	Power/Alarm Indicator*
2	Power Button
3	Removable Drive Bay
4	Clear Alarm Button*
5	Disk Activity Indicator
6	USB Port
7	Bay Status Indicators*

*Note: Bay Status Indicators, Alarm Indicator and Clear Alarm button only on G2 models.

2.1.2 2U Rackmount Chassis (NetSwap Plus only)

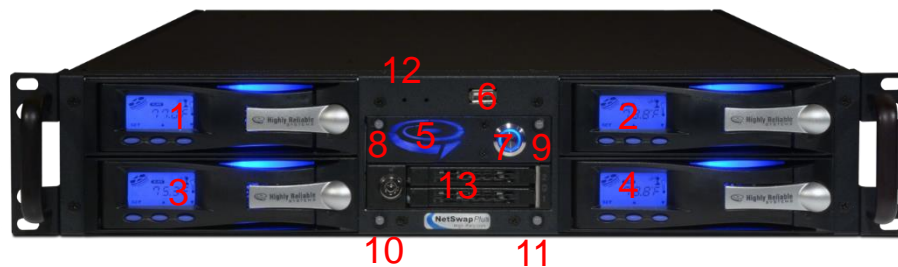


Illustration 2: 2U Rackmount Chassis Front Panel

1	Removable Bay 1
2	Removable Bay 2
3	Removable Bay 3
4	Removable Bay 4
5	Power/Alarm Indicator*
6	USB Port
7	Power Switch
8	Bay 1 Status Indicator*
9	Bay 2 Status Indicator*
10	Bay 3 Status Indicator*
11	Bay 4 Status Indicator*
12	Clear Alarm Button*
13	Removable Boot Disk Bay

*Note: Bay Status Indicators, Alarm Indicator and Clear Alarm button only on G2 models.

2.1.3 4U 8 Bay Rackmount Chassis (NetSwap Plus only)



Illustration 3: 4U 8 Bay Rackmount Chassis Front View

1	Removable Bay 1
2	Removable Bay 2
3	Removable Bay 3
4	Removable Bay 4
5	Removable Bay 5
6	Removable Bay 6
7	Removable Bay 7
8	Removable Bay 8
9	Removable Boot Disk Bay
10	Power/Alarm Indicator
11	Power Button
12	USB Port
13	Clear Alarm Button

*Note: Bay Status Indicators, Alarm Indicator and Clear Alarm button only on G2 models.

2.1.4 4U RAIDFrame Rackmount Chassis (RAIDFrame Plus only)(legacy)



Illustration 4: 4U RAIDFrame Rackmount Chassis Front View

1	Removable RAIDPac Bay 1
2	Removable RAIDPac Bay 2
3	Removable RAIDPac Bay 3
4	Removable RAIDPac Bay 4
5	Removable Boot Disk Bay
6	Power/Alarm Indicator
7	Power Button
8	USB Port
9	Bay 1 Indicator
10	Bay 2 Indicator
11	Bay 3 Indicator
12	Bay 4 Indicator

*Note: Bay Status Indicators, Alarm Indicator and Clear Alarm button only on G2 models.

2.1.5 Mini Chassis



Illustration 5: 2 Bay Mini

1	Power Button
2	Reset Button/Unit Activity
3	Removable Drive Bay 1
4	Removable Drive Bay 2
5	Removable Boot Disk Bay
6	Bay 1 Status Indicator
7	Bay 2 Status Indicator
8	USB 3.0/ USB C Ports
9	Drive Activity Indicator (Amber)
10	Drive Activity Indicator (Green)

2.1.6 Power On Procedure

To power on the device, press and release the power button. The clear ring surrounding the power button will glow blue when the power is on.

2.1.7 Power Off Procedure

To power off (shutdown) the device press and release the power button. The device will gracefully shutdown by saving any unwritten data and properly disconnecting devices. **NOTE: YOU MUST SAFELY REMOVE ANY MEDIA CONNECTED TO REMOTE SERVERS THROUGH ISCSI BEFORE POWERING OFF THE DEVICE OR DATA LOSS OR CORRUPTION MAY OCCUR!!!!**

If the device does not power down automatically after pressing the power button, the device can be forced to power down by pressing and holding the power button until the device powers off.

You can also power off (shutdown) the device through the web administration interface as documented below.

2.2 Rear Panel

The rear panel on the devices are as follows:

2.2.1 Desktop Chassis (legacy)



Illustration 6: Desktop Chassis Back View

1	PS/2 Keyboard/Mouse
2	VGA/DVI Video Connectors
3	USB Ports
4	10/100/1000 MB Ethernet Port
5	Power Receptacle - Auto-switch 110/220 Volts

Note layout may vary depending on motherboard used.

2.2.2 2U Rackmount Chassis (2 or 4 Bay)

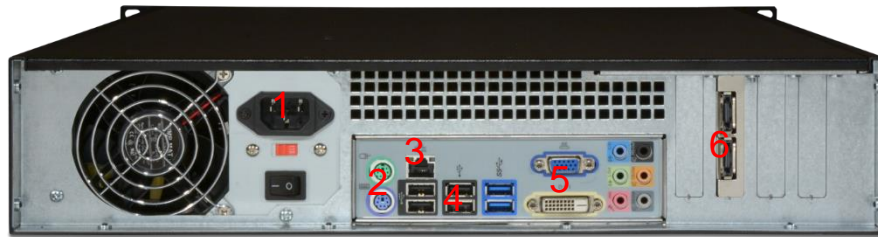


Illustration 7: 2U Chassis Back View (2 or 4 Bay)

1	Power Receptacle - 110/220 Volts Some power supplies are auto-switch and some are not – check power supply before connecting power.
2	PS/2 Keyboard/Mouse
3	10/100/1000 MB Ethernet Port
4	USB Ports
5	DVI/VGA Video Connectors
6	eSATA Ports (optional)

Note layout may vary depending on motherboard used.

2.2.3 4U Rackmount Chassis (8 bay or RAIDFrame) (legacy)



Illustration 8: 4U Rackmount Chassis Back View (8 Bay or RAIDFrame)

1	PS/2 Keyboard/Mouse
2	10/100/1000 MB Ethernet Port
3	USB Ports
4	DVI/VGA Video Connectors
5	10 Gb Ethernet (optional)
6	eSATA Ports (optional)
7	Power Receptacle - 110/220 Volts Some power supplies are auto-switch and some are not – check power supply before connecting power.

Note layout may vary depending on motherboard used.

2.2.4 Mini Chassis



Illustration 9: 2 Bay Mini

1	Power Receptacle - Auto-switch 110/220 Volts
2	Video Connectors
3	Gigabit Ethernet Port
4	USB 3.0 Ports
5	PCIE Expansion Slot

Note layout may vary depending on motherboard used.

3 NetSwap/RAIDFrame Plus Administration

Although the NetSwap/RAIDFrame Plus has a VGA, keyboard, and mouse port for emergency use, the device is normally administered through a web browser so it will not be necessary to directly connect a monitor. Just hook the device up via an Ethernet cable to your network or directly to the configuring machine and power it up. Now open a browser on the configuring machine using standard port 80 (or securely over SSL on port 443).

By default the NetSwap will use a dual IP mode of DHCP+STATIC which means it will attempt to get an IP address using DHCP as well as use a static IP of 192.168.1.50. The NetSwap Locator software available from our website (<https://high-rely.com>) can be used to locate the NetSwap on your network.

To connect to the NetSwap/RAIDFrame Plus either use the NetSwap Locator (skip to step 3) or browse to 192.168.1.50:

1. If you are currently using a different IP address scheme on your network, you will need to temporarily change the TCP/IP properties of your configuration computer's network adapter to access this IP. We recommend making your Network card something like 192.168.1.49 with a netmask of 255.255.255.0 (as long as this address is unused... “ping 192.168.1.49” first to verify nothing responds).

Open a web browser and enter “**192.168.1.50**” into the address bar.

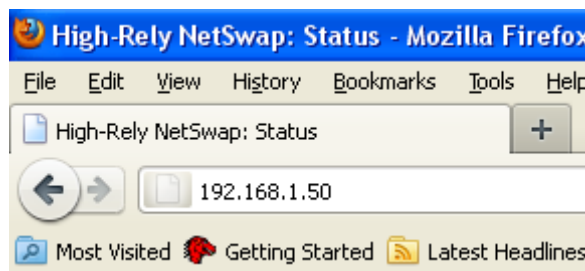


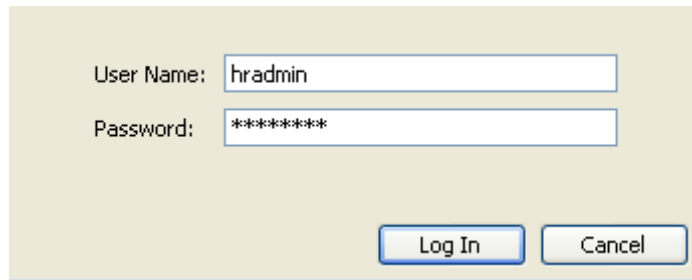
Illustration 10: Web Browser Address Bar

2. If you are unable to connect to the NetSwap/RAIDFrame Plus default IP Address you may have to use the supplied USB key to reload factory defaults.
3. When prompted enter for username and password:

User Name: hradmin

Password: password

Please NOTE: the username and password are BOTH case sensitive – you will need to use all lower case.



User Name: hradmin

Password: *****

Log In Cancel

Illustration 11: Username/Password Entry

3.1 Quick Setup

This section provides a set of steps to quickly configure the NetSwap/RAIDFrame Plus and get it connected to your network. A complete reference for the administration interface is provided below.

1. **Change the Admin Password**

Click the 'Admin' option under 'Settings' on the administration menu. Enter a new password and matching confirmation password and click the 'Save' button.

2. **Set Network Settings**

You will want to adjust the NetSwap/RAIDFrame Plus to match your network IP numbering scheme. Click the 'Network' option under 'Settings' on the administration menu. We recommend STATIC IP mode rather than DHCP since this device will be accessed by the backup software at a fixed location. Make sure to choose an address outside your DHCP scope (or make a reservation). Enter the desired values for IP address, Netmask, Gateway, and DNS and click the 'Save' button. After changing the network settings you may need to reconfigure your configuring machine's network adapter back to it's previous IP to both work with the rest of the network and to reconnect to the NetSwap/RAIDFrame Plus on the new number scheme.

3. **Prepare Hard Disks**

Prepare each removable disk (and the internal disk on equipped NetSwap Plus models) and share the disks as detailed in the 'Disk Preparation' section below.

4. **Connect to the NetSwap/RAIDFrame Plus**

iSCSI – Connect using the iSCSI Initiator using the IP Address, Target Name, and CHAP authentication as set using the 'iSCSI' menu option (the default is no CHAP authentication). See the detailed walk through in a later chapter for more detail. You should install the High-Rely iSCSI Connector software described below to allow safe removal of the hard drive when swapping.

When using iSCSI we recommend turning off off default indexing service. Right click the drive in Explorer and select properties. Uncheck “Allow files on this drive to have contents indexed in addition to file properties.”

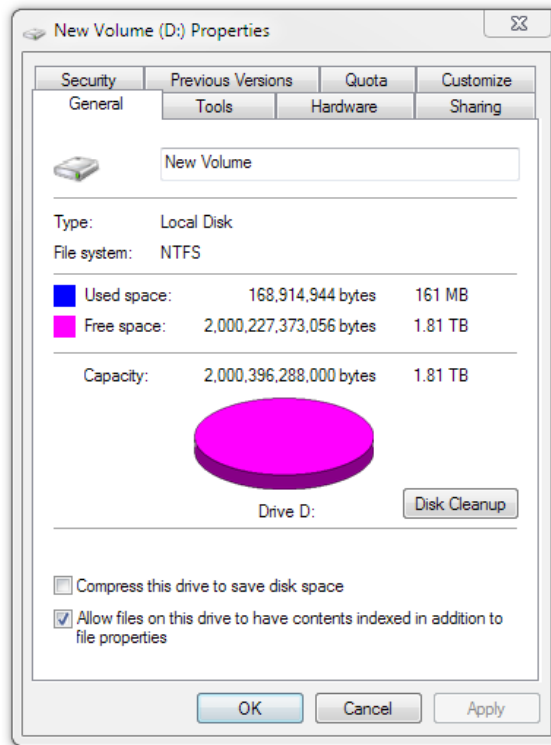


Illustration 12: File Indexing

NAS - Connect using the Network Browser or from the command line on Windows using the command “net use <drive> \\<NetSwap/RAIDFrame Plus ip or hostname>\<share name>”, for example:

net use x: [\\192.168.1.50\Backup](http://192.168.1.50/Backup) password /user:bill

You may want to verify that your Windows network card is at the highest possible speed (e.g. Gigabit Ethernet). Right click your network connection, select status and verify Speed:

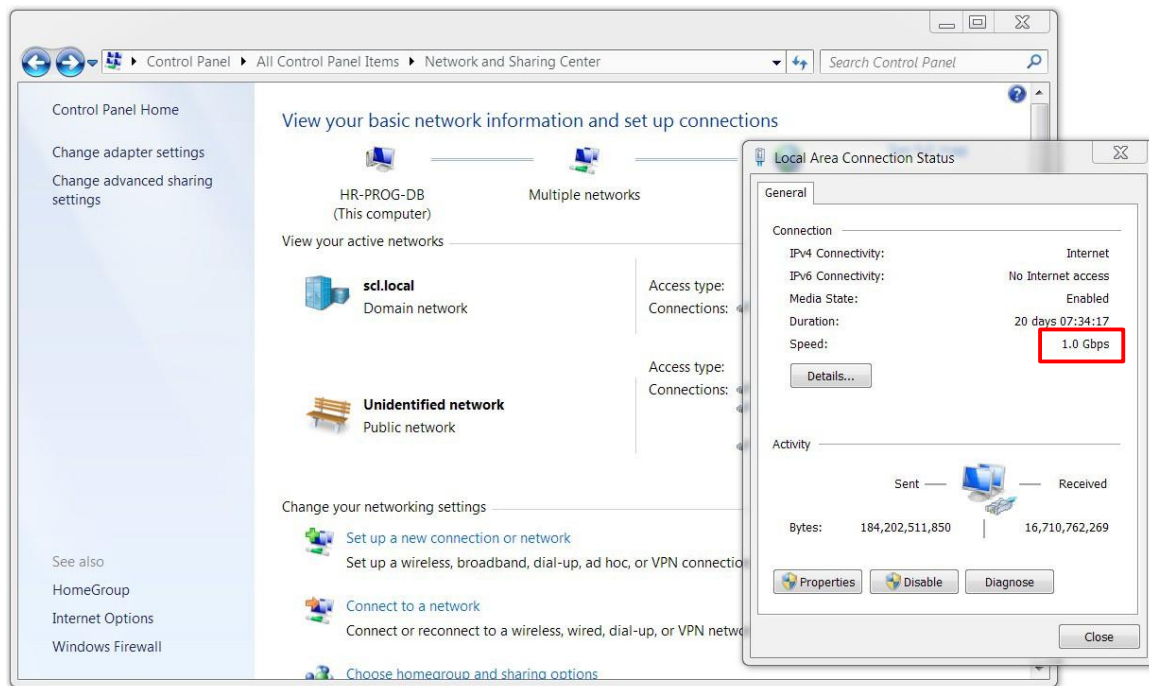


Illustration 13: Windows Network Settings

Note: When sharing via NAS `\\server\share...` we assume that the client's backup software supports and internally retains storing NTFS and SHARE level permissions. If you copy files directly to NetSwap/RAIDFrame Plus drive using explorer, Robocopy or similar file program to the NetSwap/RAIDFrame Plus drive may not preserve all user and group permissions.

3.2 Disk Preparation

3.2.1 Formatting Disks

Each disk must be formatted by the NetSwap/RAIDFrame Plus before it can be shared either iSCSI or NAS. This not only clears and prepares the disk for use but also records meta-data to the disk so the NetSwap/RAIDFrame Plus can recognize the disk when it is inserted later.

To format a disk click the 'Format' button in the 'Action' column next to the disk you would like to format from the 'Disks' menu option as shown below:

The screenshot shows the NetSwap Plus web interface. The top header includes the 'Highly Reliable' logo, 'NetSwap Plus' title, 'Network Attached Backup' subtitle, 'Software Version: 2.0', and 'Hostname: HR-NETSWAP'. A left sidebar contains navigation links for Status, Setup, Disks, and System. The main content area is titled 'Disks:' and has a 'Display:' dropdown set to 'Installed Disks'. It contains two tables: 'Physical Disks (2)' and 'Mirror Disks'. The 'Physical Disks' table lists two disks, DISK-2442 and DISK-6146, both with a status of 'Installed Not Shared'. A red arrow points to the 'Format' button in the 'Action' column for DISK-2442. The 'Mirror Disks' table shows 'No disks found.' and a 'Create Mirror Disk' button. On the right, a 'Disks Help' section provides information on displaying disks, naming them, and setting share modes.

Friendly Disk Name	Mode	Details	Status	Action
DISK-2442	N/A	2.00TB Filesystem: NTFS	Installed Not Shared	Properties Format Identify
DISK-6146	N/A	2.00TB Filesystem: NTFS	Installed Not Shared	Properties Format Identify

Friendly Disk Name	Mode	Details	Status	Action
No disks found.				

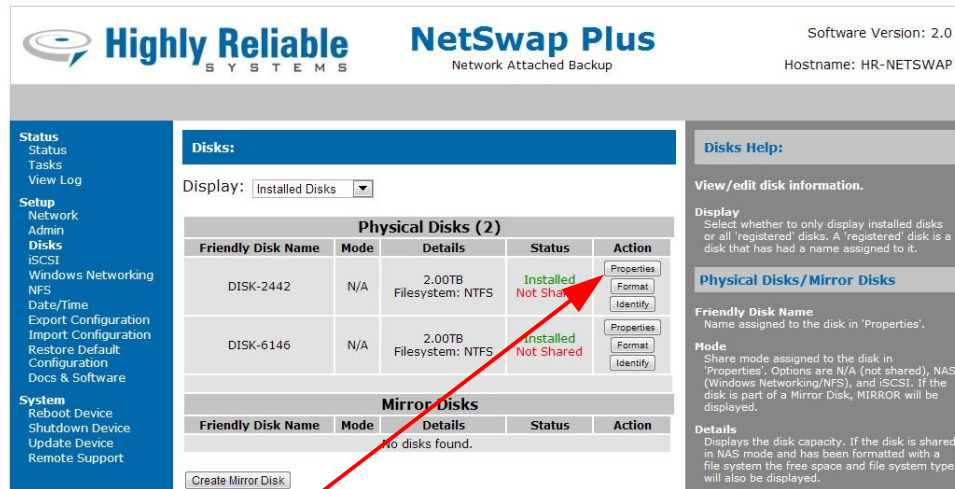
Format Disk Action
Button

Illustration 14: Format Disk Action Button

See the 'Format' section below for more information on formatting disks.

3.2.2 Sharing Disks

Once disks have been formatted and any RAID disks have been created and formatted (NetSwap/RAIDFrame Plus models only) disks can be shared as either iSCSI or NAS by setting the Share Mode on the disk 'Properties' screen. To access the disk properties click the 'Properties' button on the Disks menu option as shown below:



The screenshot shows the NetSwap Plus web interface. The top header includes the 'Highly Reliable' logo, 'NetSwap Plus' title, 'Network Attached Backup' subtitle, 'Software Version: 2.0', and 'Hostname: HR-NETSWAP'. A left sidebar contains navigation links under 'Status' (Status, Tasks, View Log), 'Setup' (Network, Admin, Disks, iSCSI, Windows Networking, NFS, Date/Time, Export Configuration, Import Configuration, Restore Default Configuration, Docs & Software), and 'System' (Reboot Device, Shutdown Device, Update Device, Remote Support). The main content area is titled 'Disks:' and has a 'Display:' dropdown set to 'Installed Disks'. It contains two tables: 'Physical Disks (2)' and 'Mirror Disks'. The 'Physical Disks' table has columns: Friendly Disk Name, Mode, Details, Status, and Action. It lists two disks: DISK-2442 and DISK-6146, both with Mode 'N/A', 2.00TB capacity, NTFS filesystem, and Status 'Installed Not Shared'. Each disk has a 'Properties' button in the Action column. A red arrow points to the 'Properties' button for DISK-2442. The 'Mirror Disks' table is empty, showing 'No disks found.' and a 'Create Mirror Disk' button. A 'Disks Help' sidebar on the right provides information on displaying disks, naming disks, and share modes.

Friendly Disk Name	Mode	Details	Status	Action
DISK-2442	N/A	2.00TB Filesystem: NTFS	Installed Not Shared	Properties Format Identify
DISK-6146	N/A	2.00TB Filesystem: NTFS	Installed Not Shared	Properties Format Identify

Friendly Disk Name	Mode	Details	Status	Action
No disks found.				

Disk Properties Button

Illustration 15: Disk Properties Button

From the disk properties screen you can set the disk name (used as the share name in NAS mode) and the Share Mode. Note that if a disk is part of a mirror disk it cannot be shared directly, the mirror disk must be shared. See the 'Disk Properties' section below for more details.

3.2.3 Creating RAID Disks (NetSwap/RAIDFrame Plus only)

Once all disks are formatted (see above) you can create RAID disks from one or more of the disks. To create a RAID disk click the 'Create RAID Disk' button on the 'Disks' menu as shown below:

The screenshot shows the NetSwap Plus web interface. The top header includes the 'Highly Reliable SYSTEMS' logo, 'NetSwap Plus' title, and 'Network Attached Backup' subtitle. On the right, it displays 'Software Version: 2.14', 'Serial #: HR00000000', 'Hostname: HR-NETSWAP-5608', and 'Tue Jul 21 16:14:21 2015'. A build date of '2015.07.21.15.06.52' is also present.

The left sidebar contains a navigation menu with categories: Status, Setup, Replication, and System. The 'Disks' menu item is highlighted.

The main content area is titled 'Disks:' and includes a 'Display:' dropdown set to 'Installed Disks', with 'Refresh' and 'Rescan Disks' buttons. Below this is a table for 'Physical Disks (2)'. The table has columns: Bay #, Friendly Disk Name, Mode, Details, Status, and Action. It lists two disks: DISK-0226 (NAS, 6.00TB, 5.94TB free, NTFS, DeltaSync Master, Installed Shared, SMART: OK) and DISK-2249 (N/A, 4.00TB, Filesystem: NTFS, DeltaSync Slave: DISK-0226, Installed Not Shared, Synced Errors: 0, SMART: OK). Each row has an 'Action' column with buttons for Properties, Safely Remove, Pause DeltaSync, Quick DeltaSync, and Identify.

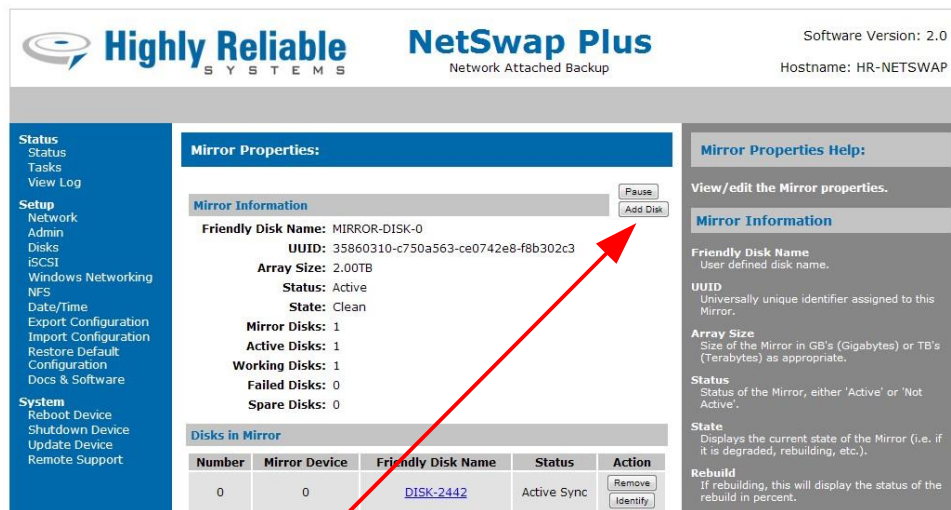
Below the physical disks table is a section for 'RAID Disks' with columns: #, Friendly Disk Name, Mode, Details, Status, and Action. It currently shows 'No disks found.' and a 'Create RAID Disk' button at the bottom. A red arrow points to this button.

On the right side, there is a 'Disks Help:' section with a 'View/edit disk information.' link. It includes a 'Display' section explaining registered disks, a 'Refresh' button, a 'Rescan Disks' button with a warning, and a 'Physical Disks/RAID Disks' section with definitions for Bay #, #, Friendly Disk Name, and Mode.

Create RAID Button

Illustration 16: Create RAID Disk Button

Once the RAID disk is created, it must be formatted. If creating a RAID 1 (Mirror) with multiple disks that will be swapped in/out, each additional disk that will be hot-swapped for backup must be added to the RAID using the 'Add Disk' action from the 'RAID Properties' screen as shown below:



Add Disk Button

Illustration 17: Add Disk Button

Note that when adding additional backup disks to a new RAID 1 disk you do not have to wait for the rebuild operation to complete before physically removing the disk and adding other disks because the rebuild will need to run again anyway when the disk is swapped in for backup.

When creating a RAID 1 (Mirror) disk using disks that were previously part of a RAID 1 disk where existing data is to be preserved, create the RAID 1 disk with just one of the disks that is known to contain good data and then add the additional disk(s). This will insure the disk with the good data is the 'master' and the data is preserved. **NOTE: Even though you specify a master disk when creating a RAID 1 disk, this master setting is only used for Scheduled Mirroring. To preserve data, create the RAID 1 disk with a single disk as described above.**

3.3 Replication (NetSwap/RAIDFrame Plus Only)

Replication of folders or entire disks are supported from one NetSwap to another NetSwap (or multiple NetSwaps). Replication is incremental and supports data compression and encryption levels up to AES-256.

3.3.1 Replication Jobs, Locations, and Targets

A Replication Job is created on the source NetSwap (the NetSwap with data to be replicated) and defines the source, the destination, job options such as compression level and bandwidth limiting, and a schedule that determines when a job will be run.

The source and destination for the job can either be a local disk or a Remote Location (remote NetSwap or other remote server). Only disks that are shared in NAS mode can be used for a source or destination, unshared and disks shared iSCSI cannot be used. Normally the source for the Replication

Job is a local disk/folder and the destination is a Target on a remote NetSwap, although the source and destination can be swapped to create a “pull” replication job that can be used for restoring data. In addition, both source and destination can be local disks to copy data from one disk to another in order to seed the remote backup.

A Replication Target is created on the destination NetSwap (the NetSwap to which data is to be replicated). A Target defines a folder on a local disk to receive the replicated data and a username and password required to access the target. Only disks that are shared in NAS mode can be used for a Target. Multiple Targets can be created pointing to different folders on a single disk to support replicating data from multiple NetSwaps to a single remote NetSwap.

3.3.2 Setting up a Basic Replication Job

To begin, make sure your firewall is configured correctly to allow outbound traffic from the NetSwap being replicated from and the correct ports are forwarded to the NetSwap that is being replicated to. By default, if the replication job is not being encrypted the port is 873 and if it is encrypted the default is 8873 (these can be changed on the Replication Settings screen). You may also want to enable Remote Administration on the NetSwap being replicated to and forward the port (by default 9090) to the NetSwap as well to allow remote administration of the NetSwap.

Create a Target on the remote NetSwap (the NetSwap that is to receive the replicated data) by clicking on the 'Targets' menu option under 'Replication' and then clicking on the 'New' button.

Edit Target:

Name:

Username:

Password:

Confirm Password:

☒ Active

Select	Disk Name	Bay #	Identify
<input checked="" type="radio"/>	Name: MIRROR-DISK-0 Capacity: 3.99TB	N/A	<input type="button" value="Identify"/>

Folder

Path:

Selected Path:

Edit Target Help:

View/Edit Target. A Target defines a disk and folder on this device that will be shared with remote devices for replication.

Name
Descriptive name for this Target.

Username
Username for this Target.

Password
Password for this Target.

Confirm Password
Enter the password again.

Disk
Select the disk for this Target. Note: this will only display disks that are shared in NAS mode; disks that are shared iSCSI cannot be a Target disk.

Folder
Select the folder on the selected disk for this Target.

Illustration 18: Replication Target

Enter a name, username, and password and then select the desired disk and folder where the data will be stored and then click 'Save' to save the Target.

Next, on the NetSwap to be replicated, create a Job by clicking on the 'Jobs' menu option under 'Replication' and then clicking the 'New' button. This will popup the Job wizard that will guide you through setting the details of the new Job.

New Replication Job:

Source:

Source Type: Local Disk

Source Disk

Select	Disk Name	Identify
<input checked="" type="radio"/>	Name: MIRROR-DISK-0 Capacity: 3.99TB	<input type="button" value="Identify"/>

Source Folder

Path: MIRROR-DISK-0:\

Name	Last Modified
------	---------------

Selected Path: MIRROR-DISK-0\ (entire disk)

Snapshot Storage: MIRROR-DISK-0 (500GB Reserved)

Previous

Next

Finish

Cancel

New Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Source

Source Type
Select the type of the source. Options are 'Local Disk' and 'Remote Location'.

For Local Disk:

Source Disk
Select the disk for the source. Note: this will only display disks that are shared in NAS mode; disks shared iSCSI cannot be used as source or destination.

Source Folder
Select the folder on the disk.

Snapshot Storage
Select the disk to use for snapshot storage if a disk snapshot is desired or or select 'Do not create snapshot' if no snapshot is desired.

If selected, a read-only copy of the disk being replicated will be created that is frozen at the time the Replication Job starts using the Snapshot Storage to store any writes to the disk. The Snapshot Storage must be large enough to store all writes to the disk that will occur while the Replication Job is running or disk writes will fail once the storage is full. The safest way to know there is enough space on the Snapshot Storage disk is to use a disk with a capacity greater than or equal to the capacity of the disk being replicated or create a Snapshot Reserve that is equal in size to half the capacity of the disk.

The Snapshot Storage disk may either be an entire disk that is not shared or a disk that has been formatted with a Snapshot

Illustration 19: Replication Job - Source

Select the 'Local Disk' as the 'Source Type' and select a disk and folder to be replicated and click the 'Next' button.

Copyright © 2011-2019 by Highly Reliable Systems, Inc. All rights reserved.

26

New Replication Job:

Destination:

Destination Type: Remote Location ▼

Location: Remote NetSwap ▼ Edit

Target: OfficeBackup ▼ Get Targets

Username: user Test

Password:

<< Previous Next >> Finish Cancel

New Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Destination

Destination Type
Select the type of the destination. Options are 'Local Disk' and 'Remote Location'.

For Local Disk:

Source Disk
Select the disk for the destination. Note: this will only display disks that are shared in NAS mode; disks shared (iSCSI) cannot be used as source or destination.

Source Folder
Select the folder on the disk.

For Remote Location:

Location
Select the Remote Location. Options are to create a new Remote Location or select a Remote Location that has already been defined.

Target
Select the Target on the Remote Location. Click 'Get Targets' to retrieve the list of targets from the Remote Location.

Username
Enter the Username for the selected Target. Click the 'Test' button to test authentication with the Remote Location with the Username and Password.

Password
Enter the Password for the selected Target.

Illustration 20: Replication Job - Destination

Select 'Remote Location' for 'Destination Type'. For 'Location' select 'New Remote Location' and a window will popup to allow creation of a new 'Remote Location'.

Edit Remote Location:

Name: Remote NetSwap

Hostname/IP: 10.1.1.207

Port: 873

Encryption Type: None ▼

Save Cancel

Edit Remote Location Help:

View/Edit Remote Location.

Name
Descriptive name for the Remote Location.

Hostname/IP
The hostname (machine and domain name) or IP of the Remote Location.

Port
TCP/IP port for of the Remote Location.
Note: this port may need to be opened on your firewall or router

Encryption Type
Select the type of encryption to be used when transferring data across the network/internet. Options are AES-256, TRIPLE DES, AES-128, RC4, DES, and none. Encryption can slow down data transfer so if your data is already encrypted such as by a VPN or backup or archive program, you may want to set this to

Illustration 21: Remote Location

Enter a name, the hostname or IP address of the remote NetSwap, the TCP/IP port, select 'None' for the encryption level and click 'Save' to save the new Remote Location. The default TCP/IP port for unencrypted replication is 873 and for encrypted replication is 8873. The ports are defined on the remote NetSwap in the 'Settings' menu option under 'Replication'.

Now that the Remote Location has been created, select the desired Target. To retrieve the Targets shared by the remote NetSwap and fill in the Target drop down, click the 'Get Targets' button. Next enter the username and password for the selected Target. Click the 'Test' button to verify the username and password are correct and then click 'Next'.

Edit Replication Job:

Options:

Job Name:

Job 1

Next Job:

Compression:

None

(higher = more compression)

Retries on Failure:

2

☐ Bi-directional Sync

Note: Bi-directional Sync will cause both the Source and Destination to be synchronized such that changes to the Source will be copied to the Destination and changes to the Destination will be copied to the Source.

Bandwidth Limits

Start		End		Bandwidth Limit	
00:00	HH:MM	23:59	HH:MM	0	KB/s (0 = no limit)
00:00	HH:MM	23:59	HH:MM	0	KB/s (0 = no limit)
00:00	HH:MM	23:59	HH:MM	0	KB/s (0 = no limit)

Note: 100KB/s is approximately 1Mb/s

Advanced Options

« Previous

Next »

Finish

Cancel

Edit Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Options

Job Name

Enter a descriptive name for the job.

Next Job

Select a job to be run after this job completes. This allows "chaining" multiple jobs to run one after the other to avoid having to schedule multiple jobs and be sure they do not run at the same time.

Compression

Select the level of compression. Options are 'None' and levels 1-9. The higher the level the more compression but slower speed. Higher compression levels may speed up the job if the outbound bandwidth is low. Lower compression levels (or none) may speed up the job if the outbound bandwidth is high or on a LAN.

Bi-directional Sync

Enable or disable bi-directional sync. By default this is disabled for normal replication. Bi-directional Sync will cause both the Source and Destination to be synchronized such that changes to the Source will be copied to the Destination and changes to the Destination will be copied to the Source.

Bandwidth Limits

This table defines up to 3 bandwidth limit ranges to limit bandwidth use by the job to a specific limit in KB/s when run during a specific time of day. The first range that matches will be used. For instance, this can be used to limit bandwidth during the day to say 50KB/s

Illustration 22: Replication Job - Options

Enter a name for the Job and click 'Next'.

New Replication Job:

Schedule:

☒ Enable Schedule

☐ Every 1 minutes(s) ☐ between 08:00 HH:MM and 17:00 HH:MM
☒ Every 1 hour(s) ☐ between 08:00 HH:MM and 17:00 HH:MM
☐ Every 1 day(s) starting 08/22/13 MM/DD/YY at 00:00 HH:MM
☐ Every 1 week(s) starting 08/22/13 MM/DD/YY

☒ Sunday at 00:00 HH:MM
☒ Monday at 00:00 HH:MM
☒ Tuesday at 00:00 HH:MM
☒ Wednesday at 00:00 HH:MM
☒ Thursday at 00:00 HH:MM
☒ Friday at 00:00 HH:MM
☒ Saturday at 00:00 HH:MM

☐ Every 1 month(s) starting 08/22/13 MM/DD/YY

« Previous Next » Finish Cancel

New Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Schedule

Enable Schedule
Enable or disable the scheduling of this job. If enabled, the job will be scheduled according to the defined schedule.

Every <n> minute(s)
Select to schedule the job to run every <n> minutes on the specified days and optionally between a start and stop time. For example, every 10 minutes every Monday through Friday between 8am and 5pm (08:00 and 17:00).

Every <n> hour(s)
Select to schedule the job to run every <n> hours on the specified days and optionally between a start and stop time. For example, every 1 hour every Monday through Friday between 8am and 5pm (08:00 and 17:00).

Every <n> day(s)
Select to schedule the job to run every <n> days starting at a specific date and time. For example, every 2 days starting on 07/16/12 at 17:15.

Every <n> week(s)
Select to schedule the job to be run every <n> weeks on specific days of the week at specific times starting on specific date. For example, every 1 week on Monday at 06:00, Wednesday at 06:00, and Friday at 19:00 starting on 07/16/12.

Every <n> month(s)
Select to schedule the job to be run every <n> months on specific days of the month at specific times starting on a specific date. For example, every 1 month on the 1st and 15th at 06:00 starting on 07/16/12.

Illustration 23: Replication Job - Schedule

For the schedule, we will just use the default of running the Job every hour. Click 'Finish' the save the new Job. Now the Job will be displayed on the 'Jobs' page and will show that it is Ready and has never been run.

Highly Reliable SYSTEMS **NetSwap Plus** Network Attached Backup

Software Version: 2.10
Serial #: HR00000002
Hostname: HR-NETSWAP
Thu Aug 22 11:40:56 2013

Status
Status
Tasks
View Log

Setup
Network
Dynamic DNS
Admin
Disks
iSCSI
Windows Networking
NFS
SMTP
Alerts
Date/Time
Export Configuration
Import Configuration
Restore Default Configuration
Docs & Software

Replication
Settings
Jobs
Remote Locations
Targets

System
Reboot Device
Shutdown Device
Update Device
Remote Support

Replication Jobs:

☒ Auto Refresh

Name	Type	Status	Last Result
Backup to Remote	NetSwap	Ready	Success

Replication Jobs Help:

View/Edit the currently defined Replication Jobs.

Name
Job name.

Type
Type of Replication Job.

Status
Status of the Replication Job. Options are 'Ready' if the job is ready and scheduled to run, 'Running' if the job is currently running, and 'Disabled' if the schedule for the job has been disabled.

Last Result
Result of last run. Options are 'Success' if the job ran successfully, 'Failure' if the job failed, and 'Canceled' if the job was canceled.

Action Buttons:

Start (run) the selected job(s) immediately.
 Stop the selected job(s) immediately.
 Create a new Replication Job.

Illustration 24: Replication Jobs

To run the Job immediately, click the checkbox next to Job and click the 'Start' button. Once the Job is started, the Status column will show that the Job is 'Running' and will display a progress bar. You may

want to check 'Auto Refresh' so the page will periodically refresh to show the progress of the Job. Once the job is completed, the Status will go back to 'Ready' and the Last Result will display 'Success' or 'Failure'. To view the history and logs for the Job, check the box next to Job and click the 'History' button.

Job History for 'Backup to Remote':

Job History			
View Log	Start Date	Start Time	Result
<input checked="" type="radio"/>	08/23/2013	09:00:01	Success
<input type="radio"/>	08/23/2013	08:00:01	Success
<input type="radio"/>	08/23/2013	07:00:01	Success
<input type="radio"/>	08/23/2013	06:00:01	Success
<input type="radio"/>	08/23/2013	05:00:01	Success
<input type="radio"/>	08/23/2013	04:00:01	Success
<input type="radio"/>	08/23/2013	03:00:01	Success
<input type="radio"/>	08/23/2013	02:00:01	Success
<input type="radio"/>	08/23/2013	01:00:01	Success

Job Log		
Date	Time	Log Entry
2013-08-23	09:00:08	Snapshot from 'MIRROR-DISK-0' created
2013-08-23	09:00:08	Job 'Backup to Remote' (id:1) started, try 1.
2013-08-23	09:00:08	rsync args: -atPHvvAX --numeric-ids --delete --inplace - -contimeout=60 --log- file=/var/log/netswap/rsync1_20130823_090001.log /disks/snapshots/52ec1852-9f71-477b-a83b- 22807cd86e10/ rsync://user@10.1.1.207:873/OfficeBackup
2013-08-23	09:00:08	Sync 0 started
2013-08-23	09:00:08	Job completed in 7 seconds, 0.03KB sent, 0.01KB received, 0.00 MB/sec
2013-08-23	09:00:08	Success

Illustration 25: Replication Job History

3.3.3 Seeding

If the data to be replicated is large, it is desirable to seed the Job by copying the data to a local hard disk and carry that disk to the remote NetSwap/Service and copy the data onto the remote NetSwap/Service rather than waiting for the Replication Job to send the data across the network.

There are several ways to create a seed disk on the NetSwap: 1) create a Seed Replication Job for a specific Replication Job, 2) if you are replicating from a RAID 1 Disk, use the SpeedSeed options (described below in section 3.4.8), 3) setup both NetSwap's on a LAN and run the Replication Job for the first time across the LAN then transport the remote NetSwap to the off site location.

3.3.3.1 Seed Using a Replication Seed Job

Insert the disk to be used as the seed disk into the NetSwap (format if necessary). From the Replication Jobs screen, select the Replication Job you wish to seed and click the 'Seed Out' button. Select the

Standard Seed type, the disk to be used for the seed and set the name and options as required (see the section below on Seed Out Jobs). If you are seeding a Replication Job to Amazon S3, you also need to create an AWS Import Job from the options page (you should familiarize yourself with the procedures required to send data to Amazon on the AWS website). Click 'Finish' to create the job. A Replication Seed Out Job will be created that is associated with the Replication Job selected and will use the settings from that job to create the seed (e.g. which folder, etc.)

Once the Job is created, run the Job by selecting the seed Job from the Jobs screen and clicking 'Start'. The NetSwap will copy the files to the seed disk and perform any preparation required depending on the type of Replication Job. For Amazon S3 seed disks, the SIGNATURE file (created by Amazon when you create an AWS Import job) will be copied to the disk as required. The job can be monitored like a regular Replication Job from the Replication Jobs screen.

Once the Job is completed, remove the disk.

If seeding a remote NetSwap, transport the disk to the remote NetSwap and insert the disk. Select the desired Target from the Replication Targets screen and click 'Seed In'. Fill in the name and select desired options and click 'Finish'. This will create a Replication Seed In Job with the correct disk and folder for the Target. Run the Job and remove when completed.

If seeding to Amazon S3 remove the disk and label it with the Disk Id you selected and pack for shipping along with a filled out Amazon Packing List and ship to the address specified by Amazon for that AWS Import job (this address is supplied by Amazon when the AWS Import job is created and is specific to the data center where your bucket is located). You should familiarize yourself with the requirements for sending media to Amazon on the AWS website. You can monitor the progress of the AWS Import job through the Replication Seed Out Job (don't delete it until the data is successfully seeded to Amazon) or from the 'Amazon I/E Jobs' screen.

3.3.3.2 Seed Using SpeedSeed™

The SpeedSeed™ option takes advantage of the fact that when synced (not rebuilding) both disks in a RAID 1 (Mirror) Disk contain identical data and one disk can be removed immediately to create a seed and be transported to the remote site.

For this example we will be using two NetSwap Plus's each with a 4TB internal disk.

To create the seed disk on the NetSwap to be replicated from a synced RAID 1 Disk, select the 'Disks' menu option.

Disks:

Display: Installed Disks ▼ Refresh Rescan Disks

Physical Disks (2)					
Bay #	Friendly Disk Name	Mode	Details	Status	Action
1	DISK-0226	RAID	6.00TB RAID Disk 0	Installed Active sync SMART: OK	<div>Properties</div> <div>Identify</div> <div>Make Seed</div>
2	DISK-2249	RAID	4.00TB RAID Disk 0	Installed Active sync SMART: OK	<div>Properties</div> <div>Identify</div> <div>Mirror Schedule</div> <div>Make Seed</div>

RAID Disks					
#	Friendly Disk Name	Mode	Details	Status	Action
0	RAID-DISK-0	N/A	4.00TB Filesystem: NONE RAID 1	Active Not Shared	<div>Properties</div> <div>RAID Properties</div> <div>Format</div> <div>Check Redundancy</div> <div>Pause</div>

Create RAID Disk

Illustration 26: Make Seed

Click the 'Make Seed' button for the disk to be used as the seed, in our case DISK-2249. Once confirmed, this will remove the disk from the RAID 1 Disk and mark it as a seed disk. Once completed, remove the disk from the NetSwap and transport it to the remote site and insert into the remote NetSwap.

Disks:

Display: Installed Disks ▾ Refresh Rescan Disks

Physical Disks (2)					
Bay #	Friendly Disk Name	Mode	Details	Status	Action
1	DISK-0226	N/A	6.00TB Filesystem: NTFS	Installed Not Shared SMART: OK	<div>Properties</div> <div>Format</div> <div>Identify</div>
2	DISK-2249	N/A	4.00TB Filesystem: NTFS Seed Disk	Installed Not Shared SMART: OK	<div>Properties</div> <div>Format</div> <div>Identify</div> <div>Unmark Seed</div> <div>Seed RAID Disk</div>

RAID Disks

#	Friendly Disk Name	Mode	Details	Status	Action
No disks found.					

Create RAID Disk

Illustration 27: Seed RAID Disk

In the image above from the remote NetSwap, we see our seed disk installed, the internal disk, and we have no RAID 1 Disks. Click the 'Seed RAID Disk' button for the seed disk.

Disks:

Display: Installed Disks Refresh Rescan Disks

Physical Disks (2)					
Bay #	Friendly Disk Name	Mode	Details	Status	Action
1	DISK-0226	N/A	6.00TB Filesystem: NTFS	Installed Not Shared SMART: OK	<div>Properties</div> <div>Format</div> <div>Identify</div>
2	DISK-2249	RAID	4.00TB RAID Disk 0	Installed Active sync SMART: OK	<div>Properties</div> <div>Identify</div>

RAID Disks					
#	Friendly Disk Name	Mode	Details	Status	Action
0	RAID-DISK-0	N/A	4.00TB Filesystem: NONE RAID 1	Active Degraded Not Shared	<div>Properties</div> <div>RAID Properties</div> <div>Format</div> <div>Check Redundancy</div> <div>Pause</div>

Create RAID Disk

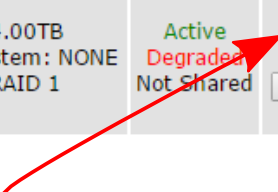


Illustration 28: RAID Disk Seeded

Once the RAID 1 Disk is seeded we can see in the image above a RAID Disk has been created from DISK-2249 and is in a degraded state since only one disk is active.

At this point the RAID 1 Disk has been seeded with the data and is immediately ready for replication to and a Replication Target can be created on the NetSwap for the RAID Disk and a Replication Job can be created and started on the original NetSwap.

Next we will add the internal disk (DISK-0226) to the RAID Disk. Click the 'RAID Properties' button for the RAID Disk.

RAID Properties:

RAID Information

Friendly Disk Name: RAID-DISK-0
RAID #: 0
UUID: d9b34751-55cf6dae-03d20a24-2b8fdb3e
Array Size: 4.00TB
RAID Level: RAID 1 (Mirror)
Status: Active
State: Clean, Degraded
RAID Disks: 2
Active Disks: 1
Working Disks: 1
Failed Disks: 0
Spare Disks: 0

Pause

Add Disk

Advanced Options

RAID Disks:
Min Sync Speed: MB/s
Max Sync Speed: MB/s

Save

Cancel

Disks in RAID

Bay #	Number	RAID Device	Friendly Disk Name	Status	Action
N/A	0	0		Removed	
2	1	1	DISK-2249	Active Sync Master	<div style="border: 1px solid #ccc; padding: 2px 5px; margin-bottom: 2px;">Remove</div> <div style="border: 1px solid #ccc; padding: 2px 5px;">Identify</div>

Illustration 29: RAID Properties

From the RAID Properties screen click the 'Add Disk' button.

NetSwap Plus
Network Attached Backup

Software Version: 2.14
 Serial #: HR00000000
 Hostname: **HR-NETSWAP-5608**
 Wed Jul 22 10:54:16 2015
 Build: 2015.07.21.15.06.52

Status
 Tasks
 View Log
 Setup
 Network
 Dynamic DNS
 Admin
 Disks
 iSCSI
 Windows Networking
 NFS
 SMTP
 Alerts
 Date/Time
 Dashboard Registration
 Export Configuration
 Import Configuration
 Restore Default Configuration

Add Disk to RAID:

RAID Identification

Friendly Disk Name: RAID-DISK-0
RAID #: 0
UUID: d9b34751-55cf6dae-03d20a24-2b8fdb3e
Array Size: 4.00TB
Raid Level: RAID 1 (Mirror)
Status: Active
State: Clean, Degraded

Available Disks (select one)

Select	Disk Name	Bay #	Identify
<input type="radio"/>	Name: DISK-0226 Capacity: 6.00TB	1	Identify

Add

Reset

Add Disk to RAID Help:

Add a disk to the selected RAID.

RAID Identification

Friendly Disk Name
User defined disk name.

UUID
Universally unique identifier assigned to this RAID Set.

Array Size
Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level
RAID level for this RAID set.

Status
Status of the RAID Set, either 'Active' or 'Not Active'.

Illustration 30: Add Disk

Select the internal disk and click the 'Add' button.

The screenshot shows the NetSwap Plus web interface. The top header includes the 'Highly Reliable SYSTEMS' logo, 'NetSwap Plus Network Attached Backup', and system information: Software Version: 2.14, Serial #: HR00000000, Hostname: HR-NETSWAP-5608, Wed Jul 22 10:56:26 2015, and Build: 2015.07.21.15.06.52.

The left sidebar contains navigation links: Status (Status, Tasks, View Log), Setup (Network, Dynamic DNS, Admin, Disks, iSCSI, Windows Networking, NFS, SFTP, Alerts, Date/Time, Dashboard Registration, Export Configuration, Import Configuration, Restore Default Configuration, Docs & Software), Replication (Settings, Jobs, Remote Locations, Targets, Amazon I/E Jobs), and System (Reboot Device, Shutdown Device, Check for Updates, Update Device).

The main content area is titled 'Disks:'. It has a 'Display:' dropdown set to 'Installed Disks' and buttons for 'Refresh' and 'Rescan Disks'. Below this are two tables:

Physical Disks (2)					
Bay #	Friendly Disk Name	Mode	Details	Status	Action
1	DISK-0226	RAID	6.00TB RAID Disk 0	Installed Rebuilding 0% SMART: OK	Properties Identify Mirror Schedule
2	DISK-2249	RAID	4.00TB RAID Disk 0	Installed Rebuilding 0% SMART: OK	Properties Identify

RAID Disks					
#	Friendly Disk Name	Mode	Details	Status	Action
0	RAID-DISK-0	N/A	4.00TB Filesystem: NTFS RAID 1	Active Degraded Rebuilding 0% 6h, 11.0m remaining 631.44 GB/hr Not Shared	Properties RAID Properties Format Pause

Below the RAID Disks table is a 'Create RAID Disk' button.

The right sidebar contains 'Disks Help' and 'View/edit disk information'. The 'View/edit disk information' section includes a 'Display' dropdown, a 'Refresh' button, and a 'Rescan Disks' button. It also contains a 'Physical Disks/RAID Disks' section with details about the disk's bay, name, mode, and details.

Illustration 31: RAID Disk Rebuilding

From the Disks screen we can see the RAID Disk is rebuilding and copying the data from the seed disk to the internal disk.

Because this was the first time this device was seeded a new RAID Disk was created that is a duplicate of the original RAID Disk. Subsequent seeds will not need to create the RAID Disk and when the 'Seed RAID Disk' button is clicked when seeding, the existing RAID Disk will be stopped and restarted with the seed disk as the master and the internal disk will automatically be added back in and the RAID Disk will begin rebuilding and copying the data to the internal disk without further interaction.

3.3.4 Snapshots

The NetSwap has the ability to create a disk snapshot when starting a Replication Job so that the data remains as it was when the Replication Job started. This is useful when the data being replicated may change while the Replication Job is running, such as when incremental backups are run on a continuous basis (such as hourly), so that the integrity of the data is maintained.

Disk snapshots require that extra disk space be allocated to store all the changes to the data that may occur while the Replication Job is running. There are two ways to allocate space for a snapshot: 1) when formatting the disk to be replicated, specify the amount of space to be reserved for the snapshot, or 2) use another unshared disk for the snapshot.

Enough space must be allocated to store all the changes that could occur. If the NetSwap runs out of snapshot space for the disk, writes to the disk will fail. If you know that only 200GB could possibly change while the Replication Job is running, then you could reserve 200GB. The safest option is to have the snapshot space the same size as the disk. In the case where space is being reserved when the disk is formatted, reserve half the disk for the snapshot. In the case where a separate disk is being used for the snapshot, use two disks of the same size.

To specify that a Replication Job is to create a snapshot when it is run, select a disk for 'Snapshot Storage' for the 'Source' of the Replication Job as shown below:

Source:

Source Type: Local Disk

Source Disk

Select	Disk Name	Identify
<input checked="" type="radio"/>	Name: MIRROR-DISK-0 Capacity: 3.99TB	<input type="button" value="Identify"/>

Source Folder

Path: MIRROR-DISK-0:\

Name	Last Modified
------	---------------

Selected Path: MIRROR-DISK-0\ (entire disk)

Snapshot Storage: MIRROR-DISK-0 (500GB Reserved)

« Previous

Next »

Finish

Cancel

Edit Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Source

Source Type
Select the type of the source. Options are 'Local Disk' and 'Remote Location'.

For Local Disk:

Source Disk
Select the disk for the source. Note: this will only display disks that are shared in NAS mode; disks shared iSCSI cannot be used as source or destination.

Source Folder
Select the folder on the disk.

Snapshot Storage
Select the disk to use for snapshot storage if a disk snapshot is desired or select 'Do not create snapshot' if no snapshot is desired.

If selected, a read-only copy of the disk being replicated will be created that is frozen at the time the Replication Job starts using the Snapshot Storage to store any writes to the disk. The Snapshot Storage must be large enough to store all writes to the disk that will occur while the Replication Job is running or disk writes will fail once the storage is full. The safest way to know there is enough space on the Snapshot Storage disk is to use a disk with a capacity greater than or equal to the capacity of the disk being replicated or create a Snapshot Reserve that is equal in size to half the capacity of the disk.

The Snapshot Storage disk may either be an entire disk that is not shared or a disk

Illustration 32: Replication Job - Snapshot Storage Selection

3.4 Administration Reference

3.4.1 Page Layout

Highly Reliable

SYSTEMS

NetSwap Plus

Network Attached Backup

Software Version: 2.0

Hostname: HR-NETSWAP

Status

Status

Tasks

View Log

Setup

Network

Admin

Disks

iSCSI

Windows Networking

NFS

Date/Time

Export Configuration

Import Configuration

Restore Default

Configuration

Docs & Software

System

Reboot Device

Shutdown Device

Update Device

Remote Support

Menu

Status: Header

Basic Information

Hostname: HR-NETSWAP

Date/Time: Thu May 24 12:41:12 2012

Uptime: 0 days, 23:38 hours

NIC 0 Settings

MAC Address: 8c:89:a5:c1:a2:7b

Connected: Yes

Speed: 1000Mb/s

IP Mode: DHCP

IP Address: 10.1.1.127

Netmask: 255.255.255.0

Gateway: 10.1.1.3

DNS Settings

DNS1 10.1.1.2

DNS2 10.1.1.205

Physical Disks (2)

Friendly Disk Name	Mode	Details	Status
DISK-1392	MIRROR	2.00TB Mirror Disk 0	Installed
DISK-5317	MIRROR	2.00TB Mirror Disk 0	Installed

Mirror Disks

Friendly Disk Name	Mode	Details	Status
MIRROR-DISK-0	iSCSI	2.00TB	Active Degraded Shared

Status Help:

Displays the current status and is updated automatically.

Basic Information

Hostname
Current hostname.

Date/Time
Current time and date.

Uptime
Days and hours the device has been running since last boot.

Nic X Settings

A section for each NIC (Network Interface Card) installed where X will be 0, 1, etc.

MAC Address
Ethernet hardware MAC address.

Connected
Shows if the NIC is connected to a network.

Speed
Ethernet connection speed in MB/s.

IP Mode
Current IP mode. Options are: DHCP, STATIC, or DISABLED

IP Address
Current network IP address.

Netmask
Current network netmask.

Gateway
Current network gateway.

Form Area

Illustration 33: Form Layout

3.4.2 Status Menu

3.4.2.1 Status

The Status option displays the current status and configuration of the NetSwap/RAIDFrame Plus. This page automatically updates every 10 seconds.

Highly Reliable **NetSwap Plus**
SYSTEMS Network Attached Backup

Software Version: 2.10
Serial #: HR00000002
Hostname: HR-NETSWAP
Tue Aug 27 16:11:15 2013

Status:
[Refresh](#)

Basic Information
Hostname: HR-NETSWAP
Date/Time: Tue Aug 27 16:11:45 2013
Uptime: 1 days, 03:16 hours

Alert Status
Alarm: On (Muted) [Clear Alarm](#)
Reason: Replication Job 'Job 2' (id:2) Failed

Ethernet 0 Settings
MAC Address: d4:3d:7e:9f:5a:ce
Connected: Yes
Speed: 1000Mb/s
IP Mode: DHCP
IP Address: 10.1.1.124
Netmask: 255.255.255.0
Gateway: 10.1.1.3

DNS Settings
DNS1: 10.1.1.2
DNS2: 10.1.1.205

Physical Disks (2)

Bay #	Friendly Disk Name	Mode	Details	Status
1	DISK-9819	NAS	4.00TB 3.49TB free Filesystem: NTFS Reserve: 500GB	Installed Shared SMART: OK
N/A	DISK-0266	N/A	4.00TB Filesystem: NONE Internal	Installed Not Shared SMART: OK

Mirror Disks

#	Friendly Disk Name	Mode	Details	Status
No disks found.				

Replication Jobs

Name	Type	Status	Last Result
Job 1	NetSwap	Disabled	Never Ran
Job 2	NetSwap	Disabled	Never Ran

Status Help:
Displays the current status and is updated automatically.

Basic Information
Hostname: Current hostname.
Date/Time: Current time and date.
Uptime: Days and hours the device has been running since last boot.

Alert Status
Alarm: Displays whether or not the alarm is on and if it is muted. If the alarm is on, a 'Clear Alarm' button will appear allowing the alarm to be cleared.
Reason: The reason the alarm was triggered.

Ethernet X Settings
A section for each Ethernet port installed where X will be 0, 1, etc.
MAC Address: Ethernet hardware MAC address.
Connected: Shows if the NIC is connected to a network.
Speed: Ethernet connection speed in MB/s.
IP Mode: Current IP mode. Options are: DHCP, STATIC, or DISABLED.
IP Address: Current network IP address.
Netmask: Current network netmask.
Gateway: Current network gateway.

DNS Settings
Displays current DNS server settings.

Illustration 34: Status

Basic Information

Hostname

The current hostname as defined in 'Network Settings'.

Date/Time

Current date and time.

Uptime

Current system uptime (i.e. time since system was booted).

Alarm Status (NetSwap/RAIDFrame Plus Only)

Alarm

Displays whether or not the alarm is on and if it is muted. If the alarm is on, a 'Clear Alarm' button will appear allowing the alarm to be cleared.

Reason

The reason the alarm was triggered.

Dashboard**Connected**

'Yes' if connected to a remote NetSwap Dashboard, 'No' if not connected, or 'N/A' if this device is not registered with a remote NetSwap Dashboard.

Last Poll

The date and time of the last poll by a NetSwap Dashboard.

Ethernet X Settings

A section for each Ethernet port where X will be 0, 1, 2, etc.

MAC Address

Hardware MAC address for Ethernet port.

Connected

Yes or no.

Speed

Ethernet connection speed in MB/s.

IP Mode

Either DHCP or STATIC.

IP Address

Configured IP address

Netmask

TCP/IP netmask

Gateway

TCP/IP gateway IP address

DNS Settings**DNS 1**

DNS server 1 IP address.

DNS 2

DNS server 2 IP address.

Physical Disk/RAID Disks (RAID Disks only appears on NetSwap/RAIDFrame Plus)

Displays information on the currently installed physical and RAID disks.

Bay #

Bay in which disk is installed.

#

RAID disk number (only displayed for RAID disks).

Friendly Disk Name

Name assigned to the disk in 'Properties'.

Mode

Share mode assigned to the disk in 'Properties'. Options are N/A (not shared), NAS (Windows Networking/NFS), and iSCSI. If the disk is part of a RAID, RAID will be displayed.

Details


Displays the disk capacity. If the disk is shared in NAS mode and has been formatted with a file system the free space and file system type will also be displayed.

Status

Displays whether or not the disk is installed, whether or not it is shared, and if it is formatted. If the disk is being formatted, the format progress will be displayed as well. If it is a RAID Disk this displays the current status of the RAID Disk. This will indicate if the set is Active or not, if the array is degraded or not, and if rebuilding it will display the current rebuild status. Note: RAID disks are only applicable to NetSwap/RAIDFrame Plus.

3.4.2.2 Tasks

Displays the tasks status for currently active tasks and a history of the last 10 completed tasks. Updates automatically.

**Highly Reliable**
SYSTEMS

NetSwap Plus
Network Attached Backup

Software Version: 2.04
Hostname: HR-NETSWAP

Status
Status
Tasks
View Log

Setup
Network
Admin
Disks
iSCSI
Windows Networking
NFS
Date/Time
Export Configuration
Import Configuration
Restore Default
Configuration
Docs & Software

System
Reboot Device
Shutdown Device
Update Device
Remote Support

Tasks:

Active Tasks

ID	Description	Status Message	Work Completed	State
No active tasks found.				

Task History (last 10)

ID	Description	Status Message	Work Completed	State
19	Add Partition	Partition ignored 356ed9b0-bbcf-2540-93ff-f2e59e0cf3f6 sdb1	100%	Complete
18	Add Disk	High-Rely disk: 47ceef35-d09c-4907-8e92-5847bb96ec5f sdb	100%	Complete
17	Remove Disk	Disk removed: 47ceef35-d09c-4907-8e92-5847bb96ec5f sdb	100%	Complete
16	Remove Partition	Partition removed 47ceef35-d09c-4907-8e92-5847bb96ec5f sdb1	100%	Complete
15	Add Partition	Disk is already mounted: cb3339b7-94bb-46f4-bde9-4a6264f1ec8e md0p1 /disks/by-id/cb3339b7-94bb-46f4-bde9-4a6264f1ec8e	100%	Complete
14	Add Disk	High-Rely disk: cb3339b7-94bb-46f4-bde9-4a6264f1ec8e md0	100%	Complete
13	Add Partition	Partition ignored 356ed9b0-bbcf-2540-93ff-f2e59e0cf3f6 sdb1	100%	Complete
12	Add Disk	High-Rely disk: 47ceef35-d09c-4907-8e92-5847bb96ec5f sdb	100%	Complete
11	Add Partition	Partition ignored de9c828c-296a-c748-95d6-8cd53b39f55 sda2	100%	Complete
10	Add Partition	Partition mounted: cb3339b7-94bb-46f4-bde9-4a6264f1ec8e md0p1	100%	Complete

Tasks Help:

Displays the tasks status for currently active tasks and history of the last 10 completed tasks. Updated automatically.

Active Tasks/Task History

ID
Task ID.

Description
Simple description of the task.

Status Message
Short message describing what the task is doing.

Work Completed
Percentage of work completed.

State
Task state. Options are: Running, Completed, Error.

Copyright © 2011, 2012 Highly Reliable Systems, Inc. All Rights Reserved.

Illustration 35: Tasks

ID

Task ID.

Copyright © 2011-2019 by Highly Reliable Systems, Inc. All rights reserved.

41

Description

Simple description of the task.

Status Message

Short message describing what the task is doing.

Work Completed

Percentage of work completed.

State

Task state. Options are: Running, Completed, or Error.

3.4.2.3 View Log

Displays the last 200 lines of the current log and allows one to download the complete NetSwap/RAIDFrame Plus, System, Kernel, and Boot logs as text files.

The screenshot displays the NetSwap Plus web interface. At the top, the 'Highly Reliable SYSTEMS' logo is on the left, 'NetSwap Plus Network Attached Backup' is in the center, and 'Software Version: 2.0' and 'Hostname: HR-NETSWAP' are on the right. A left-hand navigation menu includes links for Status, Setup, and System. The main content area is titled 'View Log:' and shows a log of system events from 2012-05-23 11:08:08 to 11:08:13. Below the log, there are four buttons: 'Download NetSwap Log', 'Download System Log', 'Download Kernel Log', and 'Download Boot Log'. To the right of the log, a 'View Log Help:' section provides instructions on how to download the logs and lists the log files: NetSwap Log, Syslog, Kernel Log, and Boot Log. The footer of the page states 'Copyright © 2011, 2012 Highly Reliable Systems, Inc. All Rights Reserved.'

Illustration 36: View Log

3.4.3 Settings Menu

3.4.3.1 Network

Configure TCP/IP network settings.

The screenshot shows the RAIDFrame Plus Network Settings page. The left sidebar contains a menu with 'Status' (Status, Tasks, View Log) and 'Setup' (Network, Dynamic DNS, Admin, Disks, iSCSI, Windows Networking, NFS, SMTP, Alerts, Date/Time, Export Configuration, Import Configuration, Restore Default Configuration, Docs & Software). The 'Network Settings' section is active. The 'Host Information' section shows 'Hostname: HR-RAIDFRAME'. The 'Ethernet 0 Settings' section shows 'IP Mode: DHCP', 'IP Address: 10.1.1.147', 'Netmask: 255.255.255.0', 'Gateway: 10.1.1.3', 'DNS1: 10.1.1.2', and 'DNS2: 10.1.1.205'. There are 'Save', 'Reset', and 'Diagnostics' buttons. A note at the bottom states: 'Note: It can take up to 30 seconds when saving Network Settings.' The right sidebar contains 'Network Settings Help' with instructions to configure network settings and a note about reconnecting to the device when changing IP address or mode. It also has sections for 'Host Information' and 'Ethernet X Settings'.

Illustration 37: Network Settings - DHCP

The screenshot shows the RAIDFrame Plus Network Settings page with the 'IP Mode' set to 'STATIC'. The 'Host Information' section shows 'Hostname: HR-RAIDFRAME'. The 'Ethernet 0 Settings' section shows 'IP Mode: STATIC', 'IP Address: 192.168.1.50', 'Netmask: 255.255.255.0', 'Gateway: 192.168.1.1', 'DNS1: 8.8.8.8', 'DNS2: ', and 'MTU: 1500'. There are 'Save', 'Reset', and 'Diagnostics' buttons. A note at the bottom states: 'Note: It can take up to 30 seconds when saving Network Settings.' The right sidebar contains 'Network Settings Help' with instructions to configure network settings and a note about reconnecting to the device when changing IP address or mode. It also has sections for 'Host Information' and 'Ethernet X Settings'. The 'IP Mode' section explains that IP Mode can be DHCP, STATIC, or DISABLED, and that STATIC requires configuring IP Address, Netmask, Gateway, DNS1, and DNS2.

Illustration 38: Network Settings - STATIC

Illustration 39: DHCP+STATIC

Host Information

Hostname

TCP/IP hostname. The hostname can optionally contain a domain name, for example 'HR-NETSWAP.local'

Ethernet X Settings

One section for each Ethernet port installed where X is 0, 1, 2, etc.

IP Mode

IP Mode is DHCP, STATIC, DHCP+STATIC, or DISABLED. If STATIC is selected the Static IP Address, Netmask, Gateway, DNS1, and DNS2 will be used to configure the network. If DHCP+STATIC is selected the Static IP Address, Netmask, Gateway, DNS1, and DNS2 will be used to configure a secondary IP address for the network.

DHCP IP Address

IP Address. In DHCP mode, this is assigned automatically.

Netmask

Netmask. In DHCP mode, this is assigned automatically.

Gateway

Gateway. In DHCP mode, this is assigned automatically.

DNS1

DNS1. In DHCP mode, this is assigned automatically.

DNS2

DNS2. In DHCP mode, this is assigned automatically.

STATIC IP Address

IP Address. In DHCP mode, this is assigned automatically.

Netmask

Netmask. In DHCP mode, this is assigned automatically.

Gateway

Gateway. In DHCP mode, this is assigned automatically.

DNS1

DNS1. In DHCP mode, this is assigned automatically.

DNS2

DNS2. In DHCP mode, this is assigned automatically.

MTU

MTU is the maximum transmission unit or maximum size of a packet or frame on the network. Valid values are from 1500 to 7200 bytes. MTU set larger than 1500 bytes is often referred to as Jumbo Frames. This can only be set in STATIC mode.

Identify

This will blink the led's on the port for several seconds if supported by the Ethernet port.

Diagnostics

This brings up the Network Diagnostics screen show below:

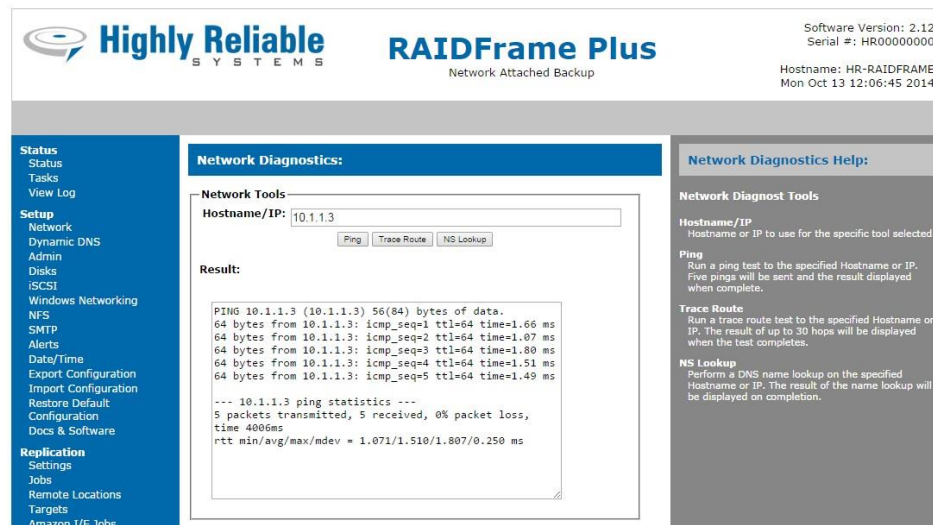


Illustration 40: Network Diagnostics

Enter a hostname or IP and click the button to run the desire tool (Ping, Trace Route, or NS Lookup). The result will be displayed below “Result:”.

3.4.3.2 Dynamic DNS (NetSwap/RAIDFrame Plus Only)

View/Edit Dynamic DNS Settings

Highly Reliable Systems **NetSwap Plus** Network Attached Backup

Software Version: 2.10
Serial #: HR00000002
Hostname: HR-NETSWAP
Thu Aug 22 11:20:50 2013

Dynamic DNS Settings:

Service: no-ip.com
Current IP: N/A
Last Update: N/A
Server: dynupdate.no-ip.com
Hostname: netswap.no-ip.biz
Username: highly
Password:
Confirm Password:
Update Interval (minutes): 5
☐ Log All Tests
Save Reset

Note: An update will be performed when the settings are saved. Do not save the settings unless settings have been changed as some dynamic DNS service providers will ban clients that update too often when the IP has not changed.

Dynamic DNS Settings Help:

View/Edit Dynamic DNS Settings.

Service
Select the dynamic DNS service being used or select 'Other' to use a service other than those listed.

Current IP
This displays the that was last assigned to the dynamic DNS host.

Last Update
Date and time of the last update.

Server
Hostname or IP of the server that accepts the dynamic DNS IP address updates.

Protocol
Select the dynamic DNS protocol. This is only displayed if the selected Service is 'Other'.

Options
Enter specific options for the dynamic DNS service being used. This is only displayed if the selected Service is 'Other'.

Hostname
The hostname to update. This is the hostname defined on your dynamic DNS service. For namecheap.com, this the machine name only (e.g. if the complete hostname is netswap1.yourdomain.com, this would be netswap1).

Illustration 41: Dynamic DNS Settings

Service

Select the dynamic DNS service being used or select 'Other' to use a service other than those listed.

Current IP

This displays the IP address that was last assigned to the dynamic DNS host.

Last Update

Date and time of the last update.

Server

Hostname or IP of the server that accepts the dynamic DNS IP address updates.

Protocol

Select the dynamic DNS protocol. This is only displayed if the selected Service is 'Other'.

Options

Enter specific options for the dynamic DNS service being used. This is only displayed if the selected Service is 'Other'.

Hostname

The hostname to update. This is the hostname defined on your dynamic DNS service. For namecheap.com, this the machine name only (e.g. if the complete hostname is netswap1.yourdomain.com, this would be netswap1).

Username

The username required to authenticate the update on the dynamic DNS service. This is not used for the namecheap.com service.

Domain

This is the domain portion of the complete hostname (e.g. if the complete host name is netswap1.yourdomain.com, this would be yourdomain.com). This is used for namecheap.com only.

Password

The password required to authenticate the update on the dynamic DNS service.

Confirm Password

Reenter the password for verification.

Update Interval (minutes)

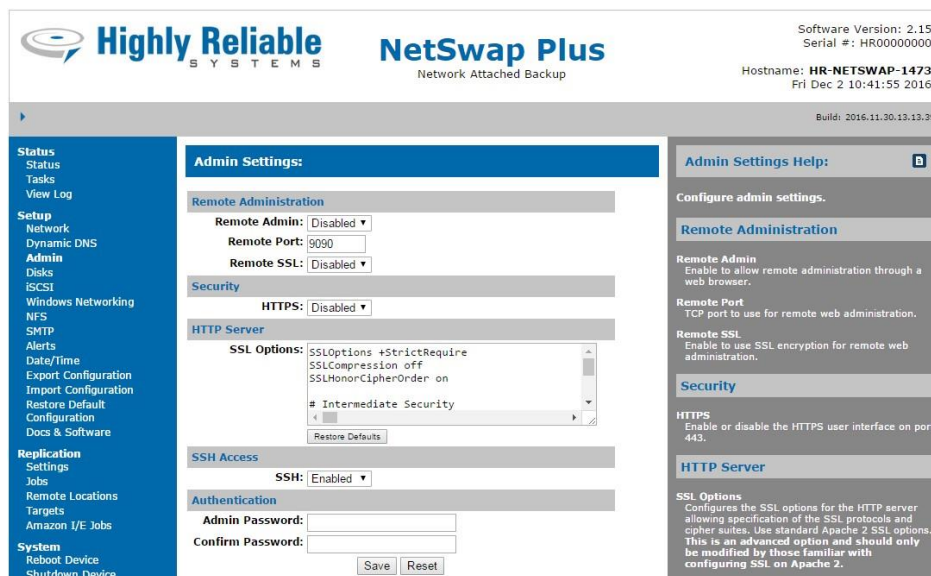
The update interval (time between updates) in minutes.

Log All Tests

Check this to log the output from the update that will be performed when 'Save' is clicked even if it is successful.

3.4.3.3 Admin

Configure the Administration settings.



The screenshot displays the 'Admin Settings' page of the NetSwap Plus software. The interface includes a left-hand navigation menu with categories like Status, Setup, Replication, and System. The main content area is titled 'Admin Settings:' and contains several sections: 'Remote Administration' with 'Remote Admin' set to 'Disabled' and 'Remote Port' at '9090'; 'Security' with 'HTTPS' set to 'Disabled'; 'HTTP Server' with 'SSL Options' configured; 'SSH Access' with 'SSH' set to 'Enabled'; and 'Authentication' with 'Admin Password' and 'Confirm Password' fields. A 'Save' button is at the bottom. On the right, there is an 'Admin Settings Help' section with a 'Configure admin settings.' link and detailed help text for each setting.

Illustration 42: Admin

Remote Administration

Remote Admin

Enable or disable the remote administration port. This port is provided as an alternate port to access the NetSwap/RAIDFrame Plus administration and can be used to map an IP address

external to your local network for remote access to the NetSwap/RAIDFrame Plus.

Remote Port

TCP port to assign for remote access. If you would like to access the device from outside your internal network on the internet, you will probably need to map this TCP port on your router or firewall to the IP address of this device.

Remote SSL

Enable or disable SSL encryption on the remote admin port.

Security

HTTPS

Enable or disable the HTTPS user interface on port 443.

HTTP Server

SSL Options

Configures the SSL options for the HTTP server allowing specification of the SSL protocols and cipher suites. Use standard Apache 2 SSL options. **This is an advanced option and should only be modified by those familiar with configuring SSL on Apache 2.**

SSH Access

SSH

Enable or disable SSH access to the console on port 22.

Authentication

Admin Password

Admin password. This is optional, only fill in if you wish to change the admin password.

Confirm Password

If changing the admin password, reenter the new password to confirm.

3.4.3.4 Disks

View/edit disk information. This page is automatically refreshed every 10 seconds.

Highly Reliable **NetSwap Plus**
S Y S T E M S Network Attached Backup

Software Version: 2.14
Serial #: HR00000000
Hostname: **HR-NETSWAP-5608**
Tue Jul 21 16:14:21 2015
Build: 2015.07.21.15.06.52

Status
Status
Tasks
View Log

Setup
Network
Dynamic DNS
Admin
Disks
iSCSI
Windows Networking
NFS
SMTP
Alerts
Date/Time
Dashboard Registration
Export Configuration
Import Configuration
Restore Default Configuration
Docs & Software

Replication
Settings
Jobs
Remote Locations
Targets
Amazon I/E Jobs

System

Disks:

Display:

Physical Disks (2)					
Bay #	Friendly Disk Name	Mode	Details	Status	Action
1	DISK-0226	NAS	6.00TB 5.94TB free Filesystem: NTFS DeltaSync Master	Installed Shared SMART: OK	<input type="button" value="Properties"/> <input type="button" value="Safe Remove"/> <input type="button" value="Pause DeltaSync"/> <input type="button" value="Quick DeltaSync"/> <input type="button" value="Identify"/>
2	DISK-2249	N/A	4.00TB Filesystem: NTFS DeltaSync Slave: DISK-0226	Installed Not Shared Synced Errors: 0 SMART: OK	<input type="button" value="Properties"/> <input type="button" value="Safe Remove"/> <input type="button" value="Format"/> <input type="button" value="Identify"/>

RAID Disks

#	Friendly Disk Name	Mode	Details	Status	Action
No disks found.					

Disks Help:

View/edit disk information.

Display
Select whether to only display installed disks or all 'registered' disks. A 'registered' disk is a disk that has had a name assigned to it.

Refresh the page immediately.

Cause the device to rescan the attached disks. This can take 30 seconds or more and may take shared disks offline temporarily.

Physical Disks/RAID Disks

Bay #
Bay in which disk is installed.

#
RAID disk number (only displayed for RAID disks).

Friendly Disk Name
Name assigned to the disk in 'Properties'.

Mode
Share mode assigned to the disk in 'Properties'. Options are N/A (not shared), NAS (Windows Networking/NFS), and iSCSI. If the disk is part of a RAID Disk, RAID will be displayed.

Illustration 43: Disks

Display

Select whether to only display installed disks or all 'registered' disks. A 'registered' disk is a disk that has had a name assigned to it.

Refresh

Refresh the page.

Rescan Disks

Cause the device to rescan the attached disks attached. Note, this can take from 30 seconds to several minutes to complete and may take disks offline temporarily.

Physical Disks/RAID Disks (RAID disks only appear on NetSwap/RAIDFrame Plus)

Bay

Bay in which disk is installed.

#

RAID disk number (only displayed for RAID disks).

Friendly Disk Name

Name assigned to the disk in 'Properties'.

Mode

Share mode assigned to the disk in 'Properties'. Options are N/A (not shared), NAS (Windows Networking/NFS), and iSCSI. If the disk is part of a RAID Disk, RAID will be displayed.

Details

Displays the disk capacity. If the disk is shared in NAS mode and has been formatted with a file system the free space and file system type will also be displayed.

Status

Displays whether or not the disk is installed, whether or not it is shared, and if it is formatted. If the disk is being formatted, the format progress will be displayed as well. If it is a RAID Disk this displays the current status of the Mirror Disk. This will indicate if the set is Active or not, if the array is degraded or not, and if rebuilding it will display the current rebuild status. **Note: RAID disks are only applicable to NetSwap/RAIDFrame Plus.**

Action

Buttons showing the actions that can be taken with the disk by clicking the button. Possibilities are:

Properties

View/edit disk properties

RAID Properties (only on NetSwap/RAIDFrame Plus)

View/edit Mirror properties.

Format

Format disk. Only displayed if disk is not shared or part of a Mirror Disk.

Identify

Identify disk by blinking disk light. Only displayed if disk is installed.

Share

Share disk if it is installed and has been safely removed.

Safely Remove

Safely remove disk if installed and shared in NAS mode.

Delete

Delete the disk from the system. Only displayed if the disk is not installed.

Resume (NetSwap/RAIDFrame Plus only)

Resume the RAID. This will enable the Mirror and make it available for sharing. This action should only be used as directed by Technical Support personnel. Only displayed if the RAID has been paused.

Pause (NetSwap/RAIDFrame Plus only)

Pause the RAID. This will disable the RAID and make it unavailable for sharing. No data or RAID configuration information will be lost. This action should only be used before "breaking" a RAID or as directed by Technical Support personnel. Only displayed if the RAID is enabled.

Break RAID (NetSwap/RAIDFrame Plus only)

Break the RAID. This will separate the disks that form the RAID. No data will be lost. To break the RAID Disk, the RAID Disk must first be Paused. Only displayed if the RAID has been paused.

Mirror Schedule

Configure the mirror schedule for this disk. Only applicable to the NetSwap/RAIDFrame Plus (see description in the Disk Properties section below).

Make Seed

Create seed on this disk by removing the disk from the mirror (RAID 1) disk and marking it as a seed disk. This option is only available on NetSwap/RAIDFrame Plus.

Unmark Seed

Unmark seed disk. This option is only available on NetSwap/RAIDFrame Plus.

Seed RAID Disk

Seed a RAID 1 disk with this disk.

If the RAID 1 (Mirror) disk currently exists, the RAID disk will be paused and restarted with this disk as the master disk and any other disks already in the RAID will be added to the restarted mirror disk and a rebuild will start, copying the data from the seed disk to the other disk(s). The data on the old RAID disk will be overwritten by the new data on the seed disk.

If the RAID disk does not exist, a new RAID disk will be created with the selected seed disk as the master.

This option is only available on NetSwap/RAIDFrame Plus.

Mount

Mount encrypted volume.

Pause DeltaSync

Pause DeltaSync for this disk so slave disks may be inserted and mounted to recover data. Only available on NetSwap/RAIDFrame Plus.

Resume DeltaSync

Resume a paused DeltaSync. Only available on NetSwap/RAIDFrame Plus.

Quick DeltaSync

Copy data from the disk to another disk using DeltaSync. Only available on NetSwap/RAIDFrame Plus.

3.4.3.5 iSCSI

iSCSI stands for Internet SCSI and allows client machines to send SCSI commands to remote storage servers such as the NetSwap/RAIDFrame Plus. This allows you to connect a single machine over the

network to the a disk on NetSwap/RAIDFrame Plus with the illusion that the NetSwap/RAIDFrame Plus is a local disk drive on your client machines. The functionality to use iSCSI drives is built into Windows Vista, Windows 7, Server 2008 and later Windows OS's natively. For Windows 2003 and Windows XP you will have to download Microsoft's free iSCSI initiator software.

How Does iSCSI Work?

There are two parts to the iSCSI protocol, the first being clients and the second being the storage device. Clients are called iSCSI initiators and can be configured either using hardware or software solutions.

The storage device (The NetSwap/RAIDFrame Plus) is called an iSCSI portal and runs software to receive the incoming requests from the iSCSI initiators. iSCSI portals advertise targets (drives) that iSCSI initiators can connect to.

Note: You should not connect more than one computer to a given iSCSI target. Data corruption can occur. If two or more computers need to access a disk shared iSCSI, attach the disk to one computer and share the disk from that computer.

The following screen shot shows the NetSwap/RAIDFrame Plus iSCSI screen. For a more detailed walk through See the chapter below titled “Configuration Examples”

The screenshot displays the NetSwap Plus iSCSI Settings interface. The top header includes the 'Highly Reliable NetSwap Plus' logo, 'Network Attached Backup', and 'Software Version: 2.08'. The hostname is 'hr-netswap-2u.hr-test.local'. The left sidebar contains navigation links: Status (Status, Tasks, View Log), Setup (Network, Admin, Disks, iSCSI, Windows Networking, NFS, SMTP, Email Alerts, Date/Time, Export Configuration, Import Configuration, Restore Default, Configuration, Docs & Software), and System (Reboot Device, Shutdown Device, Update Device, Remote Support). The main content area is titled 'iSCSI Settings:' and includes a 'Target Naming Convention: <iSCSI Target Base Name>:<iSCSI Disk>' section. Below this are fields for 'iSCSI Name Type' (set to 'Use Hostname'), 'iSCSI Target Base Name' (set to 'hr-netswap-2u.hr-test.local'), and 'Name iSCSI Disk by' (set to 'Disk Share Name'). The 'Global CHAP Information' section has fields for 'Name/User Name' (set to 'Administrator'), 'Secret/Password' (masked with asterisks), and 'Confirm Password'. There are 'Save' and 'Reset' buttons at the bottom. The right sidebar contains 'iSCSI Settings Help:' and 'Configure the iSCSI Settings.' It explains that iSCSI target names are formed by concatenating a <iSCSI Target Base Name> and a <iSCSI Disk> separated by a ':'. It also details the 'iSCSI Target Base Naming' options: 'Use Hostname', 'iSCSI Qualified Name (IQN)', and 'Free Form'.

Illustration 44: iSCSI Settings

Target Naming Convention: <iSCSI Target Base Name>:<iSCSI Disk>

iSCSI target names are formed by concatenating a <iSCSI Target Base Name> and a <iSCSI Disk> separated by a ':'. You can set the <iSCSI Target Base Name> to the Hostname, an IQN, or free form text. The <iSCSI Disk> can be set to the disk number, disk name, or disk ID.

iSCSI Target Base Naming

Determines how the iSCSI target base is formed. Options are 'Use Hostname', 'iSCSI Qualified Name (IQN)', and 'Free Form'.

In 'Use Hostname' mode the base portion of the target name will always be the same as the Hostname as defined in Network settings. In 'iSCSI Qualified Name (IQN)' mode, the base portion of the target name may be user modified and must conform the the IQN standard as

defined below. In 'Free Form' mode you may enter a free form name that conforms to host naming rules.

iSCSI Name Type

With iSCSI Name Type 'Use Hostname' this will display the current host name.

With iSCSI Name Type 'iSCSI Qualified Name (IQN)' the target name must be in the format:

iqn.<yyyy-mm>.<tld.domain.some.host>[:<identifier>]

The targets name (the iSCSI Qualified Name) must be a globally unique name (as defined by the iSCSI standard) and has to start with iqn followed by a single dot. The EUI-64 form is not supported. <yyyy-mm> is the date (year and month) at which the domain is valid. This has to be followed by a single dot and the reversed domain name. The optional <identifier> - which is freely selectable - has to be separated by a single colon. For further details please check the iSCSI spec.

Here is an example:

iqn.2003-12.com.high-rely:6143ec4a-3984-4aed-baa9-9fc2e50984b2.disk0

Leave Target Name blank to use the default Target Name.

With iSCSI Name Type 'Free Form' the target name can be any string conforming to normal host naming rules.

Name iSCSI disks by

Selects the <iSCSI Disk> portion of the target name. Options are: 'Disk Share Name', 'Disk Name', or 'Disk ID'.

CHAP Information

This sets the global iSCSI CHAP Information that can be applied for all disks shared iSCSI that do not have individual CHAP user names and passwords.

CHAP Name/User Name

User name to use when connecting to the iSCSI target on the device.

CHAP Secret/Password

Password to use when connecting to the iSCSI target on the device.

Confirm Password

Enter password again to confirm.

In the iSCSI Initiator on Windows after changing the target name, the old target name can sometimes be seen and Windows will possibly try to reconnect to it. This doesn't cause any problems, however to remove the old target name do the following:

Open iSCSI Initiator - Targets tab - Select the target showing status of "Reconnecting" - Select Details button - place check mark in box for Identifier - Select Log Off - Select OK on all screens to exit:

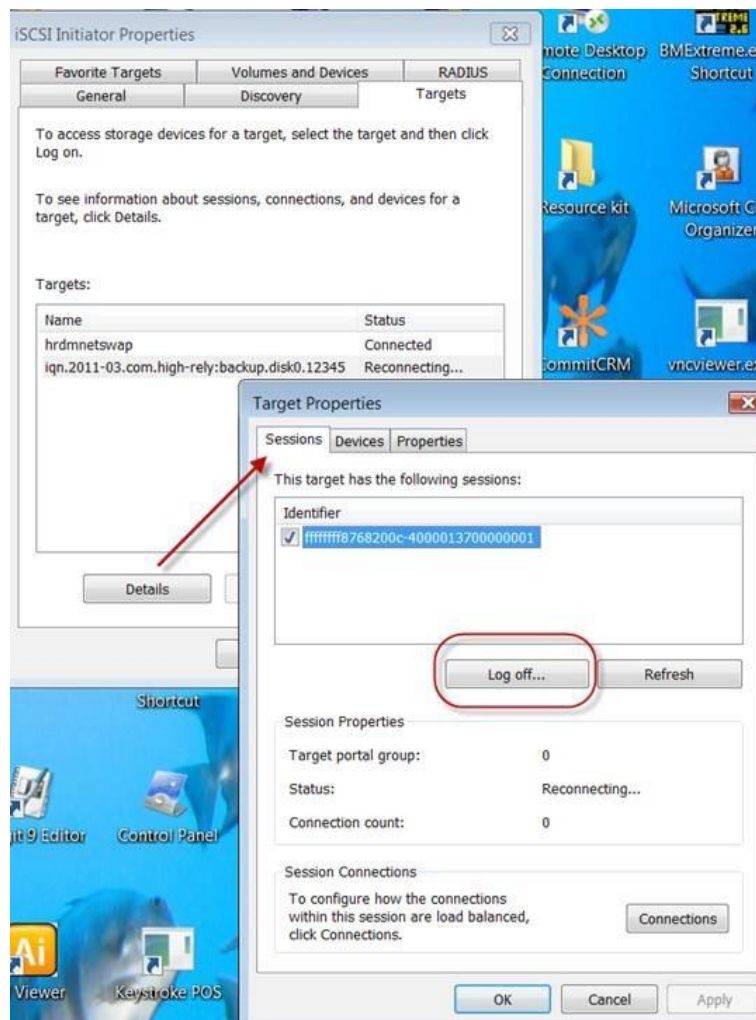


Illustration 45: iSCSI Initiator: Targets

3.4.3.6 Windows Networking

Configure Windows Networking settings.

The screenshot shows the 'Windows Networking Settings' page in NetSwap Plus. The left sidebar contains a navigation menu with sections: Status (Status, Tasks, View Log), Setup (Network, Dynamic DNS, Admin, Disks, iSCSI), Windows Networking (NFS, SMTP, Alerts, Date/Time, Dashboard Registration, Export Configuration, Import Configuration, Restore Default, Configuration, Docs & Software), and Replication (Settings, Jobs, Remote Locations, Targets, Amazon I/E Jobs). The main content area is titled 'Windows Networking Settings:' and includes sections for Connection Information (Hostname: HR-NETSWAP-5608), Sharing (Share Disk By: Disk Share Name, Enable Advanced Sharing, Enable Info and Status Shares), Authentication (Method: User, Workgroup: High-Rely), Global Access Control (User Name, Password, Confirm Password), and Advanced Options. The right sidebar contains a 'Windows Networking Settings Help' section with a 'Help' link and a 'Configure the Windows Networking Settings' section with a 'Connection Information' link. The bottom of the page has 'Save' and 'Reset' buttons.

Illustration 46: Windows Networking Setting - User

The screenshot shows the 'Windows Networking Settings' page in NetSwap Plus, configured for Active Directory. The left sidebar is identical to the previous screenshot. The main content area is titled 'Windows Networking Settings:' and includes sections for Connection Information (Hostname: HR-NETSWAP-5608), Sharing (Share Disk By: Disk Share Name, Enable Advanced Sharing, Enable Info and Status Shares), Authentication (Method: Active Directory, Domain: N/A, Join button), Global Access Control, and Advanced Options. The right sidebar is identical to the previous screenshot. The bottom of the page has 'Save' and 'Reset' buttons.

Illustration 47: Windows Networking Settings - Active Directory

Connection Information

Hostname

Displays the current hostname as defined in 'Network' settings. Make sure this machine name is not shared with any other device on the network. For example, if you had two NetSwap/RAIDFrame Plus, It would be important to make sure they were not both set to default.

Sharing

Share Disk By

Select how to generate the share name for each disk shared in NAS mode. Options are: 'Disk Share Name', 'Disk Name', or 'Disk ID'

Enable Advanced Sharing

This enables shares for all-disks, all-disks-by-id, and all-disks-by-name which are shares that contain all disks shared in separate folders by id or name.

Enable Info and Status Shares

This enables READ-ONLY shares (hr-info and hr-status) that contain documentation, software, drivers, and status and log files.

Authentication

Method

Defines the type of authentication used. Options are 'User' where a single username and password are defined to access shares on the device and 'Active Directory' where usernames and passwords are authenticated by a Domain Controller.

Note: If using Active Directory authentication, you should set the NetSwap/RAIDFrame Plus DNS to your Domain DNS (probably the Domain Controller) and set Date/Time update method to NTP and set the NTP server to your Domain Controller. If the date/time on the Domain Controller and the date/time on the NetSwap/RAIDFrame Plus do not match closely enough, authentication will fail.

For User Authentication

Workgroup

Workgroup name for Windows networking.

For Active Directory Authentication

Domain

Displays the current Domain if the device is currently joined to a Domain.

Global Access Control

For User Authentication

User Name

Username required to access the share. It is not necessary that this be a valid user name on your existing network or domain. For simplicity and security, user authentication on the NetSwap/RAIDFrame Plus is kept completely separate from the workgroup or domain to allow access to backup drives in a network emergency when domain controllers may be down.

Password

Password required to access the share. It is not necessary that this be a valid user password on your existing network or domain.

Confirm Password

Reenter password to confirm.

For Active Directory Authentication:

Allowed Users/Groups

Specific users and/or groups allowed to connect to the device. Leave blank to allow all users in the domain to connect.

Blocked Users/Groups

Specific users and/or groups that are not allowed to access to the device.

Admin Users/Groups

Specific users and/or groups that will receive administrative access when connected to the device.

Read Only Users/Groups

Specific users and/or groups that will have read only access (i.e. no write access) when connected to the device.

Read/Write Users/Groups

Specific users and/or groups that will have read and write access when connected to the device. Leave blank to allow all allowed users/groups read/write access.

Advanced Options

Advanced Windows networking configuration options. Only make changes to these values if you fully understand what you are doing or are directed to by High-Rely Technical Support personnel.

Global

Global options applied when in either 'User' or 'Active Directory' security mode.

User Global

Global options applied when in 'User' security mode.

ADS Global

Global options applied when in 'Active Directory' security mode.

User Share

Options applied to each share when in 'User' security mode.

ADS Share

Options applied to each share when in 'Active Directory' security mode.

Join Domain

Highly Reliable NetSwap Plus
SYSTEMS Network Attached Backup

Software Version: 2.12
Serial #: HR98765432
Hostname: HR-NETSWAP.HR-TEST.LOCAL
Thu Oct 23 11:00:33 2014
Build: 20141023101740

Join Domain:

Domain Information

Realm:

Domain:

Domain Controller: (optional)

Administrative Credentials

Username:

Password:

Join Domain Help:

Join a domain.

Domain Information

Realm
Realm (examples: MYDOMAIN.LOCAL or MYDOMAIN.EXAMPLE.COM).

Domain
Domain name (example: MYDOMAIN).

Domain Controller
Hostname or IP of Domain controller. This is optional and generally not needed.

Administrative Credentials

Username
Username of domain user with authority to join computers to domains.

Password
Password for user on domain.

Illustration 48: Join Domain

Domain Information

Realm

Realm (examples: MYDOMAIN.LOCAL or MYDOMAIN.EXAMPLE.COM).

Domain

Domain name (example: MYDOMAIN)

Domain Controller

Hostname or IP of Domain Controller. This is optional and generally not needed.

Administrative Credentials

Username

Username of domain user with authority to join computers to domains.

Password

Password for user on domain.

Leave Domain

The screenshot shows the NetSwap Plus web interface. At the top, the logo for 'Highly Reliable Systems' and 'NetSwap Plus' is displayed, along with the software version '2.08' and the hostname 'hr-netswap-2u.hr-test.local'. A left-hand menu contains various system management options. The main content area is titled 'Leave Domain:' and contains a section for 'Administrative Credentials' with input fields for 'Username:' and 'Password:', and 'Leave' and 'Cancel' buttons. To the right, a 'Leave Domain Help:' section provides instructions on leaving a domain and the required credentials.

Highly Reliable Systems NetSwap Plus
Software Version: 2.08
Hostname: hr-netswap-2u.hr-test.local

Leave Domain:

Administrative Credentials

Username:

Password:

Leave Domain Help:

Leave a domain.

Administrative Credentials

Username
Username of domain user with authority to remove computers from a domain.

Password
Password for user on domain.

Copyright © 2011-2013 Highly Reliable Systems, Inc. All Rights Reserved.

Illustration 49: Leave Domain

Administrative Credentials

Username

Username of domain user with authority to remove computers from a domain.

Password

Password for user on domain.

Testing the Connection

Please note that a disk formatted before accessing via Windows Networking as shown below.
Please refer to the appropriate walk through for that.

To test the connection:

Technique #1: Click Start, Run and in the run dialog box type \\192.168.1.50 (or whatever the IP address of your NetSwap/RAIDFrame Plus box) OR \\Hostname (the name you set using the browser above). Generally using the IP address provides the best quick test to prove connectivity to the device.



Illustration 50: Run Command

Technique #2: Open a command line on Windows (Start, Run, CMD) on the prompt enter “net use <drive> \\<NetSwap/RAIDFrame Plus ip address or hostname>\<share name>”, for example:

net use x: \\192.168.1.50\Backup password /user:bill /Persistent:Yes

Note that this “maps” the drive letter X: to the NetSwap/RAIDFrame Plus so that from now on the NetSwap/RAIDFrame Plus can be accessed from the Windows machine by referring to drive letter X:. You may view a mapping by typing “Net use” and remove a mapping by typing:

net use x: /d

Technique #3: Right Click Network Devices and select Map Network Drive. Enter \\hostname\sharename and select “reconnect at logon”. You can also use \\ipaddress\sharename. You will be asked for username and password entered into the NetSwap/RAIDFrame Plus device earlier

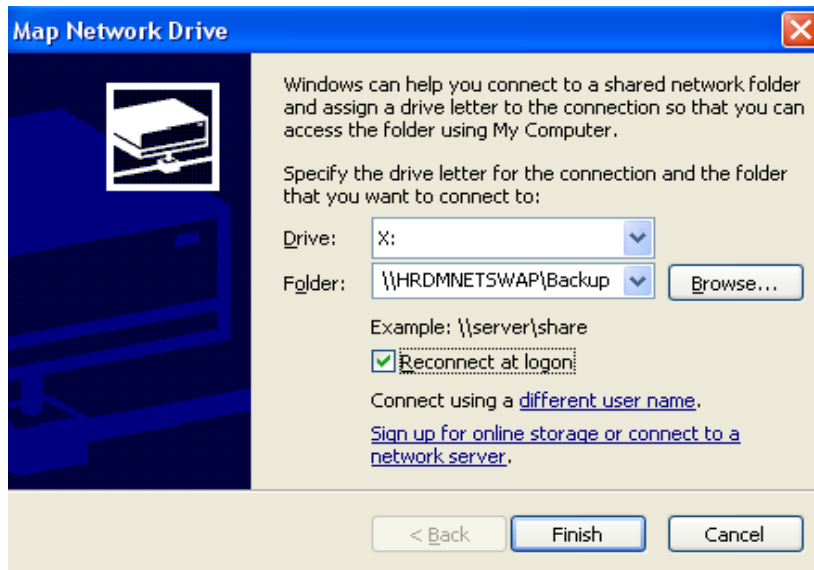


Illustration 51: Map Network Drive

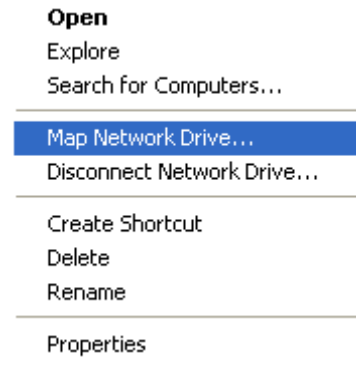


Illustration 52: Map Network Drive Menu

3.4.3.7 NFS

Configure the NFS settings.

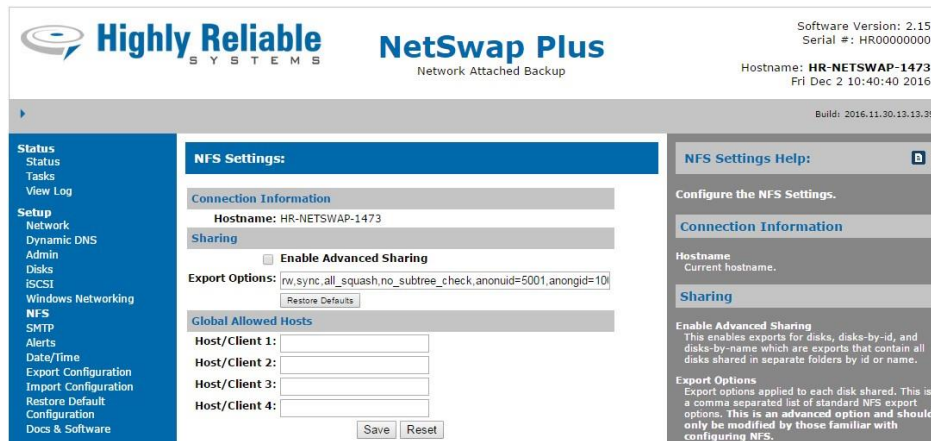


Illustration 53: NFS Settings

Connection Information

Hostname

Displays the current hostname as defined in 'Network' settings.

Sharing

Enable Advanced Sharing

This enables exports for disks, disks-by-id, and disks-by-name which are exports that contain all disks shared in separate folders by id or name.

Export Options

Export options applied to each disk shared. This is a comma separated list of standard NFS export options. **This is an advanced option and should only be modified by those familiar with configuring NFS.**

Global Allowed Hosts

Global allowed hosts that can be applied to each disk shared in NAS mode.

Host/Client 1-4

The hosts or clients that are allowed to connect to the NFS export point. This can be specified in one of two ways:

1. Host or machine name with optional domain name. Wildcards '*' and '?' are allowed. Examples are: '*' allows any computer to connect, '*.example.com' allows any computer in the example.com domain.
2. IP address followed by an optional netmask as 'address/netmask'. The netmask may be specified in dotted-decimal format, or as a contiguous mask length (for example, either '/255.255.252.0' or '/22' appended to the network base address). Examples are: '10.1.1.106' allows only the machine at 10.1.1.106, '10.1.1.0/255.255.255.0' or '10.1.1.0/24' allows all machines in the 10.1.1.0 subnet (e.g. 10.1.1.1, 10.1.1.2, etc.).

3.4.3.8 SMTP

Configure SMTP Settings. If SMTP Relay Host is blank, the device will be configured to send email directly. If SMTP Relay username/password are left blank, no authentication will be performed.

The screenshot displays the RAIDFrame Plus web interface. The top header includes the 'Highly Reliable SYSTEMS' logo, the product name 'RAIDFrame Plus', and the tagline 'Network Attached Backup'. It also shows 'Software Version: 2.07' and 'Hostname: HR-RAIDFRAME'. A left-hand navigation menu lists various system functions. The main content area is titled 'SMTP Settings:' and contains several input fields: 'SMTP Domain' (set to 'high-rely.com'), 'SMTP Email From' (set to 'hadmin@high-rely.com'), 'SMTP Relay Host' (set to 'smtp.gmail.com'), and 'SMTP Relay Port' (set to '587'). There is a checked box for 'Enable TLS'. Below these are fields for 'SMTP Relay Username' (set to 'highrely'), 'SMTP Relay Password' (masked with dots), and 'Confirm Password' (also masked). 'Save' and 'Cancel' buttons are at the bottom of the form. A note states: 'Note: It can take up to 30 seconds when saving Email Settings.' To the right of the settings form is an 'SMTP Settings Help:' section with detailed instructions for each field.

SMTP Settings:

SMTP Domain:

SMTP Email From:

SMTP Relay Host:

SMTP Relay Port:

☒ Enable TLS

SMTP Relay Username:

SMTP Relay Password:

Confirm Password:

Note: It can take up to 30 seconds when saving Email Settings.

SMTP Settings Help:

Configure SMTP Settings.

SMTP Domain
The domain name this device should use when sending email.

SMTP Email From
The 'From' field when sending email. If blank, the default of hadmin@HOSTNAME will be used where HOSTNAME is as defined in [Network Settings](#).

SMTP Relay Host
The Relay host to use to send email.

SMTP Relay Port
The port on the Relay host to use to send email (leave blank for the default of 25).

Enable TLS
Enable TLS (Transport Layer Security) to provide encrypted communication to the Relay host.

SMTP Relay Username
Username for authentication with the Relay host. Leave blank if no authentication is required.

SMTP Relay Password
Password for authentication with the Relay host. Leave blank if no authentication is required.

Confirm Password
SMTP Relay Password again form verification.

Copyright © 2011, 2012 Highly Reliable Systems, Inc. All Rights Reserved.

Illustration 54: SMTP Settings

SMTP Domain

The domain name this device should use when sending email.

SMTP Email From

The 'From' field when sending email. If blank, the default of hradmin@HOSTNAME will be used where HOSTNAME is as defined in Network Settings.

SMTP Relay Host

The Relay host to use to send email.

SMTP Relay Port

The port on the Relay host to use to send email (leave blank for the default of 25).

Enable TLS

Enable TLS (Transport Layer Security) to provide encrypted communication to the Relay host.

SMTP Relay Username

Username for authentication with the Relay host. Leave blank if no authentication is required.

SMTP Relay Password

Password for authentication with the Relay host. Leave blank if no authentication is required.

Confirm Password

SMTP Relay Password again for verification.

3.4.3.9 Alerts

Configure alerts.

Software Version: 2.14
Serial #: HR00000000
Hostname: HR-NETSWAP-5608
Tue Jul 21 16:55:42 2015
Build: 2015.07.21.15.06.52

Alert Settings:

Alert Email Address(s):

☐ Mute Alarm
☐ Enable Hardware Watchdog Timer

Alert	Email	Alarm
Alert on Device Startup	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Device Shutdown	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Disk Remove	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Disk Insert	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Disk Faulty	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Degraded	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Active	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Inactive	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Rebuild Status	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Rebuild Complete	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Rebuild Failed	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alert on RAID Disk Fail	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Fail Spare	<input type="checkbox"/>	<input type="checkbox"/>
Alert on RAID Disk Disappeared	<input type="checkbox"/>	<input type="checkbox"/>
Alert on DeltaSync Started	<input type="checkbox"/>	<input type="checkbox"/>
Alert on DeltaSync Completed	<input type="checkbox"/>	<input type="checkbox"/>
Alert on DeltaSync Failed	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Disk SMART Prefail	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Disk SMART Failing	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alert on Replication Job Started	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Replication Job Completed	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Replication Job Failed	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alert on Logged Error	<input type="checkbox"/>	<input type="checkbox"/>
Alert on Low Disk Space	<input type="checkbox"/>	<input type="checkbox"/>
Minimum Drive Space (MB): <input type="text" value="3000"/>		

Alert Settings Help:

Configure alerts.

Alert Email Address(s)
The email address to send alerts to. Multiple email addresses must be separated by a comma. Also see 'SMTP' settings to configure an SMTP relay server if necessary.

Mute Alarm
If checked, the audible alarm will be muted. The alarm light will still blink when the alarm is triggered, however. This option is only available on the G2 models of the NetSwap/RAIDFrame Plus.

Enable Hardware Watchdog Timer
If checked, the Hardware Watchdog Timer will be enabled. The Hardware Watchdog Timer will perform a hardware reboot if it detects that the device is locked up or frozen. This option is only available on the G2 models of the NetSwap/RAIDFrame Plus.

For each of the following alerts, there is an 'Email' checkbox and an 'Alarm' checkbox. Check 'Email' to have an email sent when the alert is triggered and check 'Alarm' to have the audible alarm sound and the alarm light blink when the alert is triggered. Note: the audible alarm and alarm light are only available on the G2 models of the NetSwap/RAIDFrame Plus.

Alert on Device Startup
Alert whenever the device is booted up.

Alert on Device Shutdown
Alert whenever the device is shutdown or rebooted.

Alert on Disk Remove
Alert whenever a disk is removed.

Alert on Disk Insert
Alert whenever a disk is inserted.

Alert on Disk Faulty
Alert whenever a disk is faulty.

Alert on RAID Disk Degraded
Alert whenever a RAID disk becomes degraded.

Alert on RAID Disk Active
Alert whenever a RAID disk becomes active.

Alert on RAID Disk Inactive
Alert whenever a RAID disk becomes inactive.

Alert on RAID Disk Rebuild Status

Illustration 55: Alert Settings

Alert Email Address(s)

The email address to send alerts to. Multiple email addresses must be separated by a comma. Also see 'SMTP' settings to configure an SMTP relay server if necessary.

Mute Alarm

If checked, the audible alarm will be muted. The alarm light will still blink when the alarm is triggered, however. This option is only available on the G2 models of the NetSwap/RAIDFrame Plus.

Enable Hardware Watchdog Timer

If checked, the Hardware Watchdog Timer will be enabled. The Hardware Watchdog Timer will perform a hardware reboot if it detects that the device is locked up or frozen. This option is only available on the G2 models of the NetSwap/RAIDFrame Plus.

For each of the following alerts, there is a an 'Email' checkbox and an 'Alarm' checkbox. Check 'Email' to have an email sent when the alert is triggered and check 'Alarm' to have the audible alarm sound and the alarm light blink when the alert is triggered. Note: the audible alarm and alarm light and is only available on newer models of the NetSwap/RAIDFrame Plus.

Alert on Device Startup

Alert whenever the device is booted up.

Alert on Device Shutdown

Alert whenever the device is shutdown or rebooted.

Alert on Disk Remove

Alert whenever a disk is removed.

Alert on Disk Insert

Alert whenever a disk is inserted.

Alert on Disk Faulty

Alert whenever a disk is faulty.

Alert on RAID Disk Degraded

Alert whenever a RAID disk becomes degraded.

Alert on RAID Disk Active

Alert whenever a RAID disk becomes active.

Alert on RAID Disk Inactive

Alert whenever a RAID disk becomes inactive.

Alert on RAID Disk Rebuild Status

Alert whenever a RAID disk rebuild status changes. This will send alerts when a rebuild starts and finishes as well as several status updates as the rebuild progresses.

Alert on RAID Disk Rebuild Complete

Alert whenever a RAID disk rebuild finishes.

Alert on RAID Disk Rebuild Failed

Alert whenever a RAID disk rebuild fails.

Alert on RAID Disk Fail

Alert whenever a disk in a RAID disk fails. Note: this alert will also trigger when a disk swapped. In this case, the disk has not actually failed.

Alert on RAID Disk Fail Spare

Alert whenever a spare disk in a RAID disk fails.

Alert on RAID Disk Disappeared

Alert whenever a RAID disk disappears.

Alert on DeltaSync Started

Alert whenever a DeltaSync is started.

Alert on DeltaSync Completed

Alert whenever a DeltaSync has completed successfully.

Alert on DeltaSync Failed

Alert whenever a DeltaSync has failed.

Alert on Disk SMART Prefail

Alert whenever a disk reports a SMART status of Prefail. Advise running diagnostics on the disk.

Alert on Disk SMART Failing

Alert whenever a disk reports a SMART status of Failing. The disk has failed and should be replaced.

Alert on Replication Job Started

Alert whenever a replication job is started.

Alert on Replication Job Completed

Alert whenever a replication job has completed successfully.

Alert on Replication Job Failed

Alert whenever a replication job has failed.

Alert on Logged Error

Alert whenever an error is logged to the log file. This does not alert on normal messages written to the log file.

Alert on Low Disk Space

Alert when available internal hard drive space is below the threshold set by 'Minimum Drive Space'.

Minimum Drive Space

Specifies the minimum drive space in MB (megabytes) allowed before an alert is sent.

3.4.3.10 Date/Time

Configure the Timezone, Update Method, NTP (Network Time Protocol) servers, Windows Server and optionally set the current data and time. If Update Method is NTP and NTP servers are defined the NetSwap/RAIDFrame Plus will automatically update the current date and time to the date and time supplied by the configured servers. If Update Method is Windows Server, the NetSwap/RAIDFrame Plus will automatically update date and time from the specified Windows server.

The screenshot shows the 'Date/Time Settings: NTP' configuration page in the NetSwap Plus interface. The page has a blue sidebar on the left with a menu including Status, Setup, Date/Time, and System. The main content area is titled 'Date/Time Settings:' and contains two sections: 'Basic Information' and 'Update Information'. In the 'Basic Information' section, the 'Date/Time' is 'Wed May 23 11:22:38 2012' and the 'Timezone' is 'America/Los_Angeles'. In the 'Update Information' section, the 'Update Method' is 'NTP', and two 'NTP Server' fields are both set to '0.pool.ntp.org'. There are 'Save' and 'Cancel' buttons at the bottom. On the right, there is a 'Date/Time Settings Help:' section with a 'Basic Information' subsection explaining the 'Date/Time' and 'Timezone' settings, and an 'Update Information' subsection explaining the 'Update Method' options (NTP, Windows Server, Manual).

Illustration 56: Date/Time Settings: NTP

The screenshot shows the 'Date/Time Settings: Windows Server' configuration page in the NetSwap Plus interface. The layout is similar to the NTP page, with a blue sidebar and a main content area titled 'Date/Time Settings:'. The 'Basic Information' section shows the 'Date/Time' as 'Thu May 24 13:59:07 2012' and the 'Timezone' as 'America/Los_Angeles'. The 'Update Information' section shows the 'Update Method' as 'Windows Server' and a 'Windows Host/IP' field. 'Save' and 'Cancel' buttons are at the bottom. The right-hand 'Date/Time Settings Help:' section is identical to the one in the NTP page, providing context for the configuration options.

Illustration 57: Date/Time Settings: Windows Server

Highly Reliable **NetSwap Plus**
S Y S T E M S Network Attached Backup

Software Version: 2.0
Hostname: HR-NETSWAP

Status
Status
Tasks
View Log

Setup
Network
Admin
Disks
iSCSI
Windows Networking
NFS

Date/Time
Export Configuration
Import Configuration
Restore Default Configuration
Docs & Software

System
Reboot Device
Shutdown Device
Update Device
Remote Support

Date/Time Settings:

Basic Information
Date/Time: Thu May 24 13:59:07 2012
Timezone: America/Los_Angeles

Update Information
Update Method: Manual
Set Date: MM/DD/YYYY
Set Time: HH:MM (24 hour format)
Save Cancel

Date/Time Settings Help:
Configure the date and time settings.

Basic Information
Date/Time
Current time and date.
Timezone
Select the correct timezone from the dropdown list.

Update Information
Update Method
Method used to automatically update the date and time. Options are NTP (Network Time Protocol), Windows Server, and Manual. In NTP mode, the date and time will be updated from the specified NTP server(s). In Windows Server mode, the date and time will be updated from the specified Windows server. In Manual mode the date and time will not be automatically updated.

Illustration 58: Date/Time Settings: Manual

Basic Information

Date/Time

The current date and time.

Timezone

Select the correct timezone from the dropdown list.

Update Information

Update Method

Method used to automatically update the date and time. Options are NTP (Network Time Protocol), Windows Server, and Manual. In NTP mode, the date and time will be updated from the specified NTP server(s). In Windows Server mode, the date and time will be updated from the specified Windows server. In Manual mode the date and time will not be automatically updated.

NTP Server 1

The hostname or ip of the primary NTP (Network Time Protocol) server. Only appears when using NTP updates.

NTP Server 2

The hostname or ip of the secondary NTP (Network Time Protocol) server. This is optional. Only appears when using NTP updates.

Windows Host/IP

The windows hostname or IP address to synchronize time/date with. Only appears when using Windows Server updates.

Set Date

Enter a date in MM/DD/YYYY format to set the date or leave blank to leave the date set to it's current setting. Only appears when using Manual updates.

Set Time

Enter a time in HH:MM format to set the time or leave blank to leave the time set to it's current setting. Only appears when using Manual updates.

3.4.3.11 Dashboard Registration

Register this NetSwap with a NetSwap Dashboard. The NetSwap Dashboard is a RMM tool designed specifically to monitor local and remote NetSwap devices and is available for free as a download from the high-rely.com website.

The screenshot shows the 'Dashboard Registration' window of the NetSwap Plus software. The window has a title bar with 'Highly Reliable SYSTEMS' and 'NetSwap Plus Network Attached Backup'. The top right corner displays software version 2.14, serial number HR00000000, and host information: 'Hostname: HR-NETSWAP-5608', 'Tue Jul 21 16:12:03 2015', and 'Build: 2015.07.21.15.06.52'. On the left is a blue sidebar menu with options: Status, Tasks, View Log, Setup, Network, Dynamic DNS, Admin, Disks, iSCSI, Windows Networking, NFS, SMTP, Alerts, Date/Time, Dashboard Registration (highlighted), Export Configuration, Import Configuration, Restore Default, and Configuration. The main area is titled 'Dashboard Registration:' and contains three sections: 'Dashboard Information' with fields for 'Connected: Yes', 'Registered: Yes', 'URL: https://10.1.2.60', and 'NetSwap ID: 1678672492'; 'Administrative Credentials' with 'Username:' and 'Password:' fields; and 'Help:' with instructions to 'Register with a NetSwap Dashboard.' and 'Dashboard Information' including 'URL' and 'NetSwap ID' fields. At the bottom of the registration section are 'Register', 'Unregister', and 'Cancel' buttons.

Illustration 59: Dashboard Registration

Dashboard Information

URL

URL for NetSwap Dashboard.

NetSwap ID

ID for the NetSwap on the NetSwap Dashboard. Leave blank to have an ID assigned by the Dashboard.

Administrative Credentials

Username

Username of user with that is an Administrator on the NetSwap Dashboard.

Password

Password for user on the NetSwap Dashboard.

3.4.3.12 Export Configuration

This option allows saving the NetSwap/RAIDFrame Plus configuration to a file.

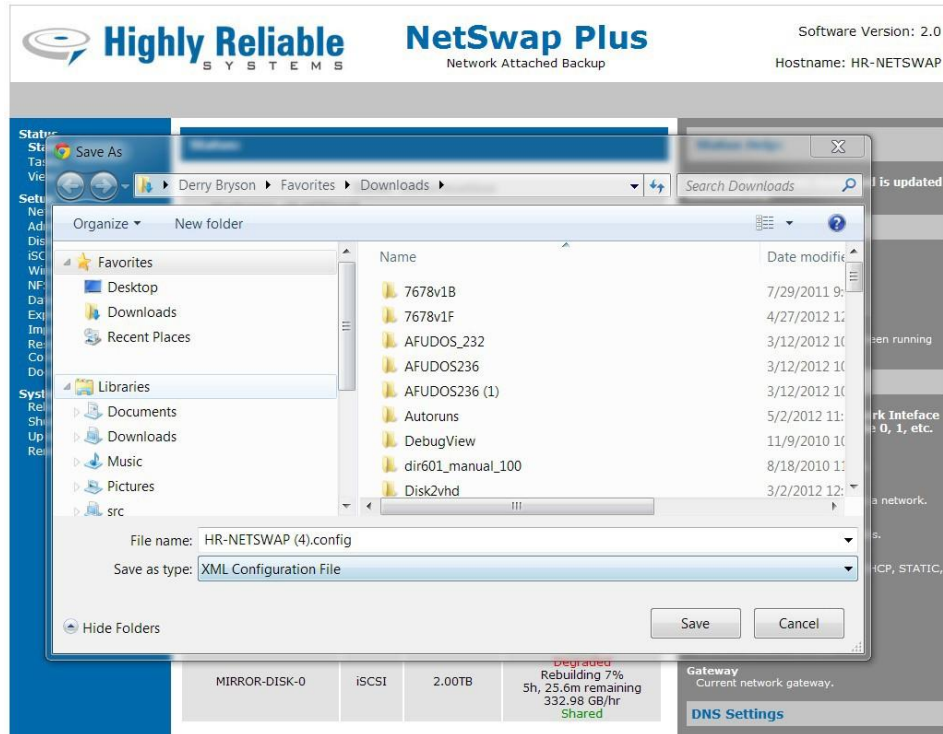


Illustration 60: Export Configuration

Once you click on this option, you will be prompted to select a folder in which to save the configuration file. Select a folder and click 'Ok' to download the configuration file.

3.4.3.13 Import Configuration

This option is used to import a previously exported configuration file.



Illustration 61: Import Configuration

Enter the name of the configuration file or click the 'Browse' button to browse for the configuration file you wish to import. Then click the 'Upload' button. The configuration file will be uploaded to the NetSwap/RAIDFrame Plus and the new configuration will be loaded. This may take up to 30 seconds depending what changes are made. If the IP address is changed, you will need to connect to the NetSwap/RAIDFrame Plus on the new IP address.

3.4.3.14 Restore Default Configuration

This option will restore the NetSwap/RAIDFrame Plus to the factory default settings.

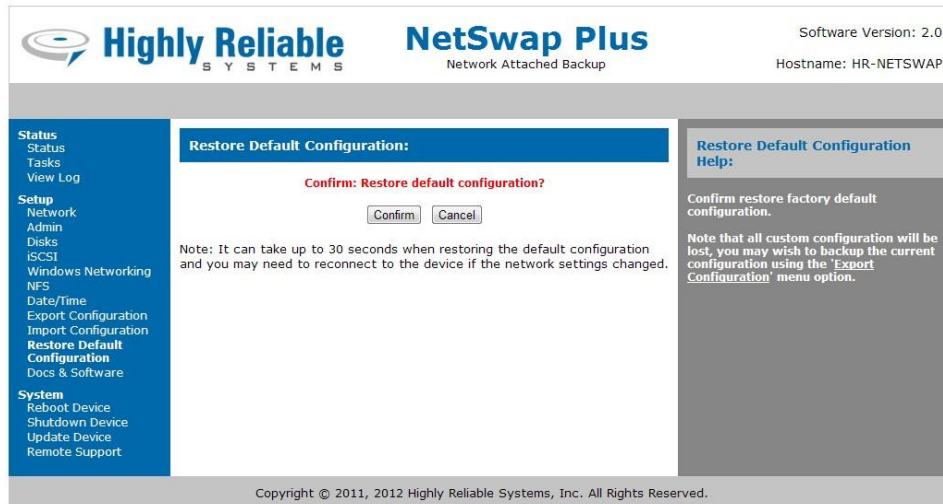


Illustration 62: Restore Default Configuration

Click 'Confirm' to restore factory default settings.

3.4.3.15 Docs & Software

This option provides documentation and software for use with the NetSwap/RAIDFrame Plus that may be downloaded through your web browser.

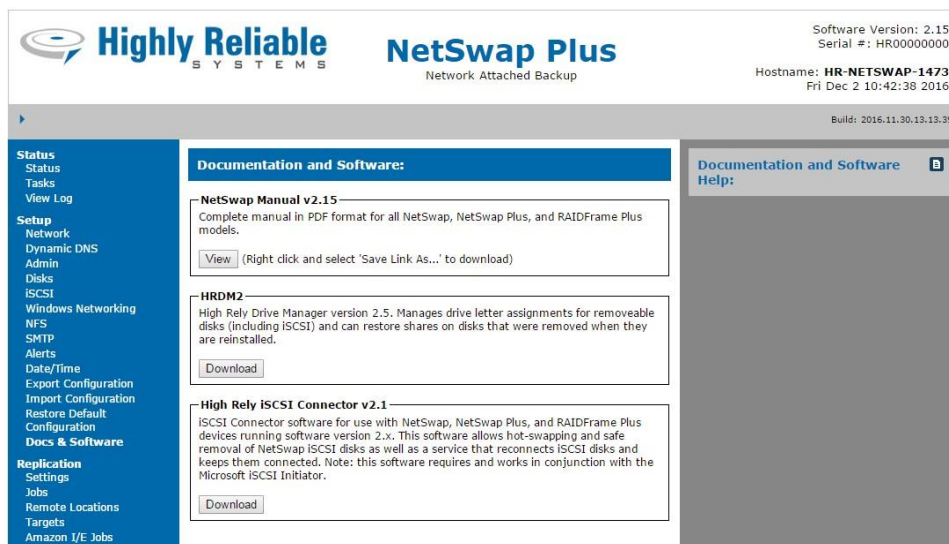


Illustration 63: Docs & Software

3.4.4 Replication (NetSwap/RAIDFrame Plus Only)

3.4.4.1 Settings

This option allows setting various replication settings.

The screenshot shows the 'Replication Settings' page of the NetSwap Plus software. The interface includes a sidebar with navigation links like Status, Setup, and Alerts. The main content area is titled 'Replication Settings:' and contains fields for 'Port' (873) and 'SSL Port' (8873). Below these are 'Advanced Options' including 'Rsync Timeout' (0 seconds), 'Rsync Std Options' (atPHwAX --numeric-ids --contimeout=60), and 'Rsync Bi-directional' options (atPHwAX --numeric-ids --contimeout=60). There is a checkbox for 'Write Sync Output to Log' and 'Save'/'Cancel' buttons. A 'Replication Settings Help' sidebar on the right explains the 'Port' and 'SSL Port' settings and notes that ports 12000-12100 are reserved for internal use.

Illustration 64: Replication Settings

Basic Replication Settings

Port

This defines the incoming network port for non-encrypted replication jobs. You may need to forward this port in your firewall or router to this device.

SSL Port

This defines the incoming network port for encrypted replication jobs. You may need to forward this port in your firewall or router to this device.

Note: ports 12000-12100 are reserved for internal use.

Advanced Options

Global Advanced Rsync options. These are the default Rsync options used for replication jobs that do not define their own local options.

Only make changes to these values if you fully understand what you are doing or are directed to by High-Rely Technical Support personnel.

Rsync Timeout

This determines how long to wait without response from rsync before retrying. The default is 0 seconds, or no timeout.

Rsync Std Options

Rsync options used for a standard replication job (i.e. not bi-directional).

Rsync Bi-direction Options

Rsync options used for a bi-directional replication job.

Write Sync Output to Log

Check this box to have the log output from replication job written to the log.

3.4.4.2 Jobs

View/Edit the currently defined Replication Jobs.

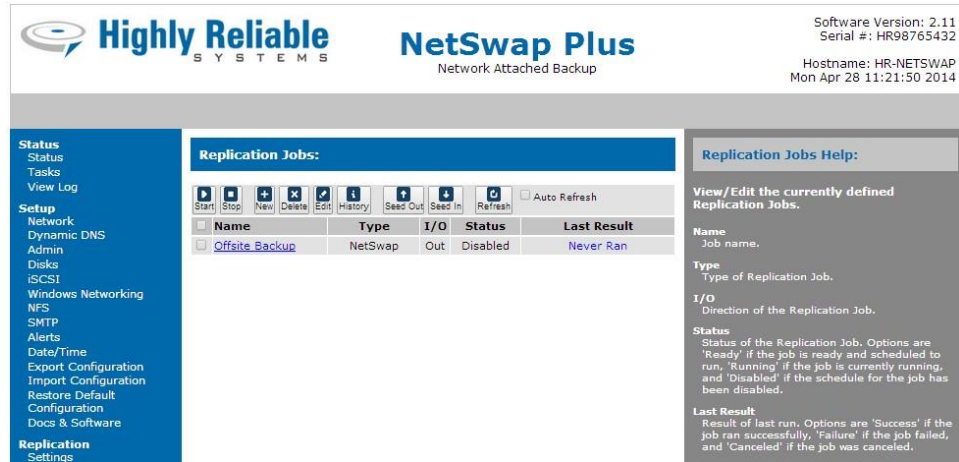


Illustration 65: Replication Jobs

Name

Job name.

Type

Type of Replication Job.

I/O

Replication Job direction, 'In' or 'Out'.

Status

Status of the Replication Job. Options are 'Ready' if the job is ready and scheduled to run, 'Running' if the job is currently running, and 'Disabled' if the schedule for the job has been disabled.

Last Result

Result of last run. Options are 'Success' if the job ran successfully, 'Failure' if the job failed, and 'Canceled' if the job was canceled.

Action Buttons

Start

Start (run) the selected job(s) immediately.

Stop

Stop the selected job(s) immediately.

New

Create a new Replication Job.

Delete

Delete the selected job(s). Running jobs cannot be deleted.

Edit

Edit the selected job.

History

Edit the selected job.

Seed Out

Create a new seed out job for the selected Replication job;.

Seed In

Create new seed in job for the selected Replication Job.

Refresh

Refresh the jobs.

New/Edit Replication Job

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Select Job Type:

New Replication Job:

Select Job Type:

- ☒ NetSwap Replicate to/from NetSwap to NetSwap or between disks on a single NetSwap
- ☐ Dropbox Replicate to/from a Dropbox account
- ☐ S3/S3 Compatible Replicate to/from:
 - Amazon S3 Bucket
 - Google Cloud Storage
 - Dreamhost DreamObjects Bucket
 - Other S3 compatible service
- ☐ FTP Replicate to/from an FTP server
- ☐ SFTP Replicate to/from an SFTP server

« Previous Next » Finish Cancel

New Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Select Job Type

NetSwap
Replicate to or from another NetSwap device or from disk to disk on this NetSwap. Supports secure transfers over SSL.

Dropbox
Replicate to or from a Dropbox account. Supports secure transfers over SSL.

S3/S3 Compatible
Replicate to or from S3 or S3 compatible bucket. Will work with any service 100% compatible with Amazon S3. Supports secure transfer over SSL.

FTP
Replicate to or from an FTP server (File Transfer Protocol). Supports secure transfers over SSL.

SFTP
Replicate to or from an SFTP server (Secure File Transfer Protocol over SSH).

Illustration 66: Select Job Type

NetSwap

Replicate to or from another NetSwap device or from disk to disk on this NetSwap. Supports secure transfers over SSL.

Dropbox

Replicate to or from a Dropbox account. Supports secure transfers over SSL.

S3/S3 Compatible

Replicate to or from S3 or S3 compatible bucket. Will work with any service 100% compatible with Amazon S3. Supports secure transfer over SSL.

FTP

Replicate to or from an FTP server (File Transfer Protocol). Supports secure transfers over SSL.

SFTP

Replicate to or from an SFTP server (Secure File Transfer Protocol over SSH).

Source:

New Replication Job:

Source:

Source Type: Local Disk

Select	Disk Name	Identify
<input checked="" type="radio"/>	Name: MIRROR-DISK-0 Capacity: 3.99TB	Identify

Source Folder

Path: MIRROR-DISK-0:\

Selected Path: MIRROR-DISK-0:\ (entire disk)

Snapshot Storage: MIRROR-DISK-0 (500GB Reserved)

« Previous Next » Finish Cancel

New Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Source

Source Type
Select the type of the source. Options are 'Local Disk' and 'Remote Location'.

For Local Disk:

Source Disk
Select the disk for the source. Note: this will only display disks that are shared in NAS mode; disks shared iSCSI cannot be used as source or destination.

Source Folder
Select the folder on the disk.

Snapshot Storage
Select the disk to use for snapshot storage if a disk snapshot is desired or or select 'Do not create snapshot' if no snapshot is desired.

If selected, a read-only copy of the disk being replicated will be created that is frozen at the time the Replication Job starts using the Snapshot Storage to store any writes to the disk. The Snapshot Storage must be large enough to store all writes to the disk that will occur while the Replication Job is running or disk writes will fail once the storage is full. The safest way to know there is enough space on the Snapshot Storage disk is to use a disk with a capacity greater than or equal to the capacity of the disk being replicated or create a Snapshot Reserve that is equal in size to half the capacity of the disk.

The Snapshot Storage disk may either be an entire disk that is not shared or a disk that has been formatted with a Snapshot

Illustration 67: New/Edit Replication Job - Source

Source Type

Select the type of the source. Options are 'Local Disk' and 'Remote Location'.

For Local Disk:

Source Disk

Select the disk for the source. Note: this will only display disks that are shared in NAS mode; disks shared iSCSI cannot be used as source or destination.

Source Folder

Select the folder on the disk.

Snapshot Storage

Select the disk to use for snapshot storage if a disk snapshot is desired or select 'Do not create snapshot' if no snapshot is desired.

If selected, a read-only copy of the disk being replicated will be created that is frozen at the time the Replication Job starts using the Snapshot Storage to store any writes to the disk. The Snapshot Storage must be large enough to store all writes to the disk that will occur while the Replication Job is running or disk writes will fail once the storage is full. The safest way to know there is enough space on the Snapshot Storage disk is to use a disk with a capacity greater than or equal to the capacity of the disk being replicated or create a Snapshot Reserve that is equal in size to half the capacity of the disk.

The Snapshot Storage disk may either be an entire disk that is not shared or a disk that has been formatted with a Snapshot Reserve greater than 0. If an unshared disk is used, data on the disk will be destroyed.

For Remote Location:**Location**

Select the Remote Location. Options are to create a new Remote Location or select a Remote Location that has already been defined.

NetSwap:**Target**

Select the Target on the Remote Location. Click 'Get Targets' to retrieve the list of targets from the Remote Location. Targets are defined on the remote device.

Username

Enter the Username for the selected Target. Click the 'Test' button to test authentication with the Remote Location with the Username and Password.

Password

Enter the Password for the selected Target.

Dropbox:**Source Folder**

Select the folder.

S3/S3 Compatible:**Bucket**

Select desired bucket. Click 'Get Buckets' to retrieve the list of buckets.

Source Folder

Select the folder.

FTP:

Source Folder

Select the folder.

SFTP:

Source Folder

Select the folder.

Destination:

New Replication Job:

Destination:

Destination Type: Remote Location

Location: Remote NetSwap Edit

Target: OfficeBackup Get Targets

Username: user Test

Password: ****

<< Previous Next >> Finish Cancel

New Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Destination

Destination Type
Select the type of the destination. Options are 'Local Disk' and 'Remote Location'.

For Local Disk:

Source Disk
Select the disk for the destination. Note: this will only display disks that are shared in NAS mode; disks shared iSCSI cannot be used as source or destination.

Source Folder
Select the folder on the disk.

For Remote Location:

Location
Select the Remote Location. Options are to create a new Remote Location or select a Remote Location that has already been defined.

Target
Select the Target on the Remote Location. Click 'Get Targets' to retrieve the list of targets from the Remote Location.

Username
Enter the Username for the selected Target. Click the 'Test' button to test authentication with the Remote Location with the Username and Password.

Password
Enter the Password for the selected Target.

Illustration 68: New/Edit Replication Job - Destination

Destination Type

Select the type of the destination. Options are 'Local Disk' and 'Remote Location'.

For Local Disk:

Source Disk

Select the disk for the destination. Note: this will only display disks that are shared in NAS mode; disks shared iSCSI cannot be used as source or destination.

Source Folder

Select the folder on the disk.

For Remote Location:

Location

Select the Remote Location. Options are to create a new Remote Location or select a Remote Location that has already been defined.

NetSwap:

Target

Select the Target on the Remote Location. Click 'Get Targets' to retrieve the list of targets from the Remote Location. Targets are defined on the remote device.

Username

Enter the Username for the selected Target. Click the 'Test' button to test authentication with the Remote Location with the Username and Password.

Password

Enter the Password for the selected Target.

Dropbox:

Destination Folder

Select the folder.

S3/S3 Compatible:

Bucket

Select desired bucket. Click 'Get Buckets' to retrieve the list of buckets.

Destination Folder

Select the folder.

FTP:

Destination Folder

Select the folder.

SFTP:

Destination Folder

Select the folder.

Options:

Edit Replication Job:

Options:

Job Name:

HR-TEST S3

Next Job:

Compression:

None

(higher = more compression)

Retries on Failure:

0

☐ Bi-directional sync

Note: Bi-directional Sync will cause both the Source and Destination to be synchronized such that changes to the Source will be copied to the Destination and changes to the Destination will be copied to the Source.

☐ Perform a trial run with no changes made

Bandwidth Limits

Start		End		Bandwidth Limit (KB/s, 0 = no limit)	
00:00	HH:MM	23:59	HH:MM	Up: 100	Down: 10000
00:00	HH:MM	23:59	HH:MM	Up: 0	Down: 0
00:00	HH:MM	23:59	HH:MM	Up: 0	Down: 0

Note: 100KB/s is approximately 1Mb/s

Advanced Options

« Previous

Next »

Finish

Cancel

Edit Replication Job Help:

'None' and levels 1-9. The higher the level the more compression but slower speed. Higher compression levels may speed up the job if the outbound bandwidth is low. Lower compression levels (or none) may speed up the job if the outbound bandwidth is high or on a LAN.

Bi-directional sync

Enable or disable bi-directional sync. By default this is disabled for normal replication. Bi-directional Sync will cause both the Source and Destination to be synchronized such that changes to the Source will be copied to the Destination and changes to the Destination will be copied to the Source.

Perform a trial run with no changes made

Check this box to perform a trial run without transferring or deleting files. This can be useful to see what would be transferred/deleted or checking for problem files or folders that may be causing replication to fail by checking the log file after the job is complete.

Bandwidth Limits

This table defines up to 3 bandwidth limit ranges to limit bandwidth use by the job to a specific limit in KB/s when run during a specific time of day. The first range that matches will be used. For instance, this can be used to limit bandwidth during the day to say 50KB/s between 8am and 5pm (08:00 to 17:00) and no limit between 5pm and 8am (17:00 to 08:00).

Start Time

Start time for bandwidth limit range (HH:MM 24 hour format).

Stop Time

Stop time for bandwidth limit range (HH:MM 24 hour format).

Bandwidth Limit

Illustration 69: New/Edit Replication Job: Options

Job Name

Enter a descriptive name for the job.

Next Job

Select a job to be run after this job completes. This allows "chaining" multiple jobs to run one after the other to avoid having to schedule multiple jobs and be sure they do not run at the same time.

Compression

Select the level of compression. Options are 'None' and levels 1-9. The higher the level the more compression but slower speed. Higher compression levels may speed up the job if the outbound bandwidth is low. Lower compression levels (or none) may speed up the job if the outbound bandwidth is high or on a LAN.

Bi-directional Sync

Enable or disable bi-directional sync. By default this is disabled for normal replication. Bi-directional Sync will cause both the Source and Destination to be synchronized such that changes to the Source will be copied to the Destination and changes to the Destination will be copied to the Source.

Perform a trial run with no changes made

Check this box to perform a trial run without transferring or deleting files. This can be useful to see what would be transferred/deleted or checking for problem files or folders that may be causing replication to fail by checking the log file after the job is complete.

Bandwidth Limits

This table defines up to 3 bandwidth limit ranges to limit bandwidth use by the job to a specific limit in KB/s when run during a specific time of day. The first range that matches will be used. For instance, this can be used to limit bandwidth during the day to say 50KB/s between 8am and 5pm (08:00 to 17:00) and no limit between 5pm and 8am (17:00 to 08:00).

Start Time

Start time for bandwidth limit range (HH:MM 24 hour format).

Stop Time

Stop time for bandwidth limit range (HH:MM 24 hour format).

Bandwidth Limit

Bandwidth limit for the bandwidth limit range in KB/s (0 = no limit).

Advanced Options

Advanced options. Only make changes to these values if you fully understand what you are doing or are directed to by High-Rely Technical Support personnel. Note: not all options are available for all types of Remote Locations.

Use Global Options (NetSwap only)

Check this box to use the Global options defined in Replication Settings.

Rsync Std Options (NetSwap only)

Rsync options used for a standard replication job (i.e. not bi-directional).

Rsync Bi-direction Options (NetSwap only)

Rsync options used for a bi-directional replication job.

Propagate deletions

If checked, if a file or folder has been deleted on one side, it will be deleted on the other side. This option is ignored when performing bi-directional replication. **Warning: this can be very dangerous, use with caution; if you replicate from an empty folder to a folder containing data, it will delete the existing data.**

Safe copy using temporary files

If checked, when copying, copy to a temporary file first and then rename to the destination file. This prevents incomplete or corrupt files in the case where replication terminates unexpectedly. Requires additional disk space on destination to store temporary files.

Stats Update Time

Maximum time in seconds between updates of file stats.

Override locks

If checked, overwrite any existing lock files. This can be useful if a job terminates unexpectedly and leaves lock files behind that stop the job from running.

Use disk storage for analysis (reduces memory usage)

If checked, disk storage space will be used when analyzing the files and folders to be transferred rather than system memory. This can be used for jobs with a large number of files and/or folders that are aborting due to low system memory.

Use reduced redundancy storage (S3 only)

If checked, files will be stored on reduced redundancy storage.

Use server side encryption (S3 only)

If checked, files will be encrypted on the server.

Access Policy (S3 only)

Select an access policy under which files will be created. If blank, the default will be used.

Send keepalives (FTP only)

If checked, NOOP commands will be sent periodically on the command channel during file transfers. This is used to stop some FTP servers from dropping the connection due to inactivity on the command channel during long file transfers.

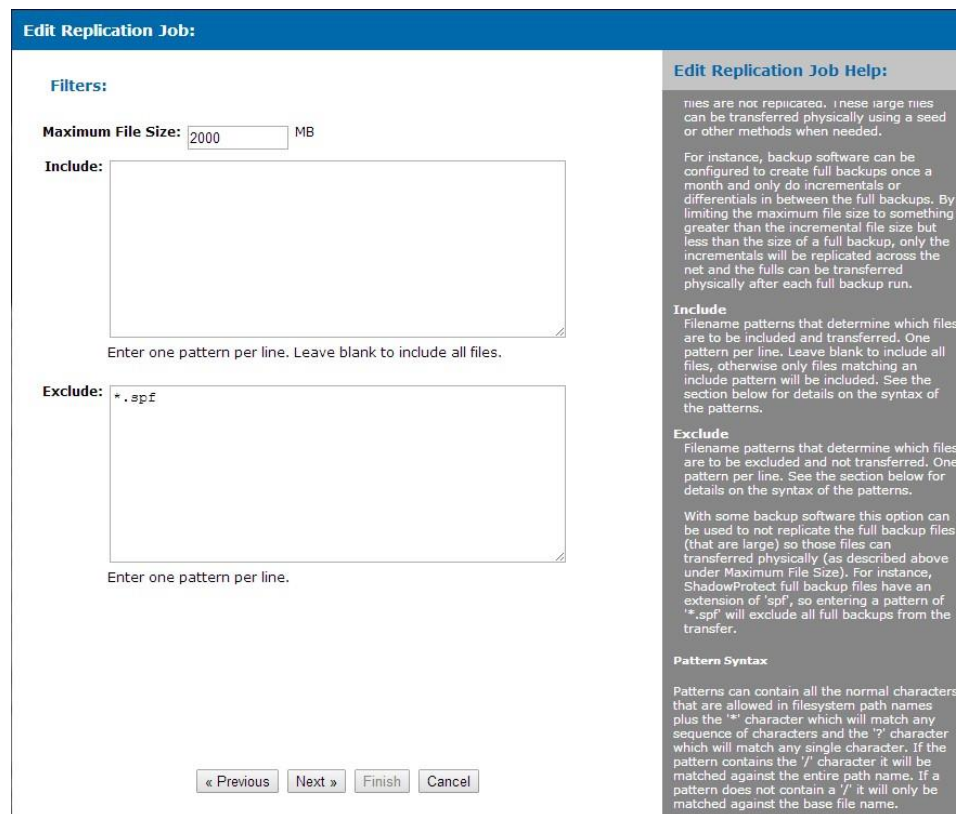
Block Size (FTP only)

Data transfer blocksize in KB. Larger values can increase transfer speed. Set to 0 to use default value of 1024 (1MB).

Window Size (SFTP only)

SSH channel window size in KB. Larger values can increase transfer speed. Set to 0 to use default value of 2048 (2MB).

Filters:



Edit Replication Job:

Filters:

Maximum File Size: 2000 MB

Include:

Enter one pattern per line. Leave blank to include all files.

Exclude: *.spf

Enter one pattern per line.

< Previous Next > Finish Cancel

Edit Replication Job Help:

Files are not replicated. These large files can be transferred physically using a seed or other methods when needed.

For instance, backup software can be configured to create full backups once a month and only do incrementals or differentials in between the full backups. By limiting the maximum file size to something greater than the incremental file size but less than the size of a full backup, only the incrementals will be replicated across the net and the fulls can be transferred physically after each full backup run.

Include
Filename patterns that determine which files are to be included and transferred. One pattern per line. Leave blank to include all files, otherwise only files matching an include pattern will be included. See the section below for details on the syntax of the patterns.

Exclude
Filename patterns that determine which files are to be excluded and not transferred. One pattern per line. See the section below for details on the syntax of the patterns.

With some backup software this option can be used to not replicate the full backup files (that are large) so those files can be transferred physically (as described above under Maximum File Size). For instance, ShadowProtect full backup files have an extension of 'spf', so entering a pattern of '*.spf' will exclude all full backups from the transfer.

Pattern Syntax
Patterns can contain all the normal characters that are allowed in filesystem path names plus the '*' character which will match any sequence of characters and the '?' character which will match any single character. If the pattern contains the '/' character it will be matched against the entire path name. If a pattern does not contain a '/' it will only be matched against the base file name.

Illustration 70: New/Edit Replication Job: Filters

Maximum File Size

Maximum size of files that will be transferred.

This is useful to limit the size of files that are transferred so that large files that would take too long to transfer such as full backup files are not replicated. These large files can be transferred physically using a seed or other methods when needed.

For instance, backup software can be configured to create full backups once a month and only do incrementals or differentials in between the full backups. By limiting the maximum file size to something greater than the incremental file size but less than the size of a full backup, only the incrementals will be replicated across the net and the fulls can be transferred physically after each full backup run.

Include

Filename patterns that determine which files are to be included and transferred. One pattern per line. Leave blank to include all files, otherwise only files matching an include pattern will be included. See the section below for details on the syntax of the patterns.

Exclude

Filename patterns that determine which files are to be excluded and not transferred. One pattern per line. See the section below for details on the syntax of the patterns.

With some backup software this option can be used to not replicate the full backup files (that are large) so those files can be transferred physically (as described above under Maximum File Size). For instance, ShadowProtect full backup files have an extension of 'spf', so entering a pattern of '*.spf' will exclude all full backups from the transfer.

Pattern Syntax

Patterns can contain all the normal characters that are allowed in filesystem path names plus the '*' character which will match any sequence of characters and the '?' character which will match any single character. If the pattern contains the '/' character it will be matched against the entire path name. If a pattern does not contain a '/' it will only be matched against the base file name.

Schedule:

Edit Replication Job:

Schedule:

☐ Enable Schedule

Every

1

minutes(s)

☐ between

08:00

HH:MM

and

17:00

HH:MM

☒ Sun

☒ Mon

☒ Tue

☒ Wed

☒ Thu

☒ Fri

☒ Sat

Every

1

hour(s)

☒ between

08:15

HH:MM

and

18:00

HH:MM

☒ Sun

☒ Mon

☒ Tue

☒ Wed

☒ Thu

☒ Fri

☒ Sat

Every

1

day(s) starting

07/21/15

MM/DD/YY

at

00:00

HH:MM

Every

1

week(s) starting

07/21/15

MM/DD/YY

☒ Sunday

at

00:00

HH:MM

☒ Monday

at

00:00

HH:MM

☒ Tuesday

at

00:00

HH:MM

☒ Wednesday

at

00:00

HH:MM

☒ Thursday

at

00:00

HH:MM

☒ Friday

at

00:00

HH:MM

☒ Saturday

at

00:00

HH:MM

Every

1

month(s)

starting

07/21/15

MM/DD/YY

1st

at

00:00

Add Day

Action URL's and Programs

Action	URL/Download
Start Job	http://hr-netswap1/cmds/start_repl_job.php?jobid=1
	Download VBScript Program With Prompt
	Download VBScript Program Without Prompt

« Previous

Next »

Finish

Cancel

Edit Replication Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Schedule

Enable Schedule
Enable or disable the scheduling of this job. If enabled, the job will be scheduled according to the defined schedule.

Every <n> minute(s)
Select to schedule the job to run every <n> minutes on the specified days and optionally between a start and stop time. For example, every 10 minutes every Monday through Friday between 8am and 5pm (08:00 and 17:00).

Every <n> hour(s)
Select to schedule the job to run every <n> hours on the specified days and optionally between a start and stop time. For example, every 1 hour every Monday through Friday between 8am and 5pm (08:00 and 17:00).

Every <n> day(s)
Select to schedule the job to run every <n> days starting at a specific date and time. For example, every 2 days starting on 07/16/12 at 17:15.

Every <n> week(s)
Select to schedule the job to be run every <n> weeks on specific days of the week at specific times starting on specific date. For example, every 1 week on Monday at 06:00, Wednesday at 06:00, and Friday at 19:00 starting on 07/16/12.

Every <n> month(s)
Select to schedule the job to be run every <n> months on specific days of the month at specific times starting on a specific date. For example, every 1 month on the 1st and 15th at 06:00 starting on 07/16/12.

Illustration 71: New/Edit Replication Job: Schedule

Enable Schedule

Enable or disable the scheduling of this job. If enabled, the job will be scheduled according to the defined schedule.

Every <n> minute(s)

Select to schedule the job to run every <n> minutes on the specified days and optionally between a start and stop time. For example, every 10 minutes every Monday through Friday between 8am and 5pm (08:00 and 17:00).

Every <n> hour(s)

Select to schedule the job to run every <n> hours on the specified days and optionally between a start and stop time. For example, every 1 hour every Monday through Friday between 8am and 5pm (08:00 and 17:00).

Every <n> day(s)

Select to schedule the job to run every <n> days starting at a specific date and time. For example, every 2 days starting on 07/16/12 at 17:15.

Every <n> week(s)

Select to schedule the job to be run every <n> weeks on specific days of the week at specific times starting on specific date. For example, every 1 week on Monday at 06:00, Wednesday at 06:00, and Friday at 19:00 starting on 07/16/12.

Every <n> month(s)

Select to schedule the job to be run every <n> months on specific days of the month at specific times starting on a specific date. For example, every 1 month on the 1st and 15th at 06:00 starting on 07/16/12.

Action URL's and Programs

These URL's and programs can be used to to perform actions on this Replication job from a remote computer. Right click on the URL and select 'Copy link address' and use that to create a shortcut on your desktop or download the VBScript program to your desktop.

Start Job

URL and program download to start this replication job.

New/Edit Seed Job In

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Seed Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Select Seed Type:

Edit Replication Seed In Job:

Select Seed Type:

☒ **Standard Seed** Copy data from seed disk from S3/S3 Compatible Service.

☐ **SpeedSeed™** Use current data on an SpeedSeed™ seed disk and prep for S3/S3 Compatible Service.

« Previous Next » Finish Cancel

Edit Replication Seed In Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Select Seed Type

Standard Seed
Copy data to/from seed disk.

Speed Seed
Seed to/from Mirror Disk member.

Illustration 72: Seed In Job - Seed Type

Standard Seed

Copy data to/from seed disk.

Speed Seed

Seed to/from Mirror Disk member.

Source Disk:

Edit Replication Seed In Job:

Source Disk:

Select	Disk Name	Bay #	Identify
<input type="radio"/>	Name: DISK-0957 Capacity: 3.00TB	1	<input type="button" value="Identify"/>
<input checked="" type="radio"/>	Name: DISK-0409 Capacity: 500.11GB	N/A	<input type="button" value="Identify"/>

« Previous

Next »

Finish

Cancel

Edit Replication Seed In Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Source Disk

Select the disk to seed to/from.

Illustration 73: Seed In Job - Source Disk

Select the disk to seed from.

Options:

Edit Replication Seed In Job:

Options:

Job Name:

☐ Start job immediately

☒ Ignore source job maximum file size filter

☒ Ignore source job exclude filter

☒ Use Amazon AWS Import/Export Service

Amazon Export Job Status

Job Id:

Create Date: Wed Apr 23 2014 15:21:07 GMT-0700 (Pacific Daylight Time)

Type: Export

Status: Pending - The specified job has not started.

Disk Id: HRTEST3

Location: NotReceived - AWS has not received your device.

Carrier: N/A

Tracking Number: N/A

Ship To Address: AWS Import/Export
JOBID DEP2A
2646 Rainier Ave South Suite 1060
Seattle, WA 98144
United States
206-266-6868

Packing List Form: [AWS Import/Export Packing Slip](#)

Edit Replication Seed In Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Options

Job Name
Enter a descriptive name for the job.

Start job immediately
If checked, the job will start running as soon as the 'Finish' button is clicked.

Ignore source job maximum file size filter
If checked, the maximum file size filter from the source job will be ignored.

Ignore source job exclude filter
If checked, the exclude filter from the source job will be ignored.

Illustration 74: Seed In Job - Options

Job Name

Enter a descriptive name for the job.

Start job immediately

If checked, the job will start running as soon as the 'Finish' button is clicked.

Ignore source job maximum file size filter

If checked, the maximum file size filter from the source job will be ignored.

Ignore source job exclude filter

If checked, the exclude filter from the source job will be ignored.

The following only appears for 'S3/S3 Compatible' jobs.

Use Amazon AWS Import/Export Service

If checked, use the the Amazon AWS Import/Export service to import or export seed data from a bucket at Amazon.

Job Id

AWS job id.

Create Date

Date and time job was created.

Type

Job type: import or export.

Status

Current job status.

Disk Id

Disk Id assigned when the job was created to identify the disk.

Location

Current location of the disk.

Carrier

Carrier used to return the disk if it has been shipped from Amazon.

Tracking Number

Tracking number of the package containing the disk if it has been shipped from Amazon.

Ship To Address

Address to ship the disk to.

Packing List Form

Link to the packing list form that must be filled out and included with the disk when shipped.

New/Edit Seed Job Out

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Seed Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Select Seed Type:

Edit Replication Seed Out Job:

Select Seed Type:

☒ Standard Seed

Copy data to seed disk and prep for S3/S3 Compatible Service.

☐ SpeedSeed™

Use current data on an available Mirror Disk member and prep for S3/S3 Compatible Service.

« Previous

Next »

Finish

Cancel

Edit Replication Seed Out Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Select Seed Type

Standard Seed

Copy data to/from seed disk.

Speed Seed

Seed to/from Mirror Disk member.

Illustration 75: Seed Out Job - Seed Type

Standard Seed

Copy data to/from seed disk.

Speed Seed

Seed to/from Mirror Disk member.

Destination Disk:

Edit Replication Seed Out Job:

Destination Disk:

Select	Disk Name	Bay #	Identify
<input type="radio"/>	Name: DISK-0957 Capacity: 3.00TB	1	<input type="button" value="Identify"/>
<input checked="" type="radio"/>	Name: DISK-0409 Capacity: 500.11GB	N/A	<input type="button" value="Identify"/>

☒ **Delete existing files**

Note: Disk must be formatted!

Edit Replication Seed Out Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Source Disk

Select the disk to seed to/from.

Illustration 76: Seed Out Job - Destination Disk

Select the disk to seed to.

Options:

Edit Replication Seed Out Job:

Options:

Job Name:

☐ Start job immediately

☒ Ignore source job maximum file size filter

☒ Ignore source job exclude filter

☒ Use Amazon AWS Import/Export Service

Amazon Import Job Status

Job Id: 8WKBJ

Create Date: Tue Apr 01 2014 15:00:14 GMT-0700 (Pacific Daylight Time)

Type: Import

Status: Complete - The data load completed

Disk Id: HRTEST3

Location: Returned - Your device has been returned.

Carrier: UPS

Tracking Number: 1Z0032030398319851

Ship To Address: AWS Import/Export
JOBID 8WKBJ
2646 Rainier Ave South Suite 1060
Seattle, WA 98144
United States
206-266-6868

Packing List Form: [AWS Import/Export Packing Slip](#)

« Previous Next » Finish Cancel

Edit Replication Seed Out Job Help:

Use the 'Previous' and 'Next' buttons to move backwards and forwards through the wizard sections. Use the 'Finish' button to save the Replication Job and close the wizard. Use the 'Cancel' button to close the window without saving.

Options

Job Name
Enter a descriptive name for the job.

Start job immediately
If checked, the job will start running as soon as the 'Finish' button is clicked.

Ignore source job maximum file size filter
If checked, the maximum file size filter from the source job will be ignored.

Ignore source job exclude filter
If checked, the exclude filter from the source job will be ignored.

Illustration 77: Seed Out Job - Options

Job Name

Enter a descriptive name for the job.

Start job immediately

If checked, the job will start running as soon as the 'Finish' button is clicked.

Ignore source job maximum file size filter

If checked, the maximum file size filter from the source job will be ignored.

Ignore source job exclude filter

If checked, the exclude filter from the source job will be ignored.

The following only appears for 'S3/S3 Compatible' jobs.

Use Amazon AWS Import/Export Service

If checked, use the the Amazon AWS Import/Export service to import or export seed data from a bucket at Amazon.

Job Id

AWS job id.

Create Date

Date and time job was created.

Type

Job type: import or export.

Status

Current job status.

Disk Id

Disk Id assigned when the job was created to identify the disk.

Location

Current location of the disk.

Carrier

Carrier used to return the disk if it has been shipped from Amazon.

Tracking Number

Tracking number of the package containing the disk if it has been shipped from Amazon.

Ship To Address

Address to ship the disk to.

Packing List Form

Link to the packing list form that must be filled out and included with the disk when shipped.

3.4.4.3 Remote Locations

View/Edit the currently defined Remote Locations.

A Remote Location specifies the details of a remote NetSwap device (e.g. the hostname/IP address and port).

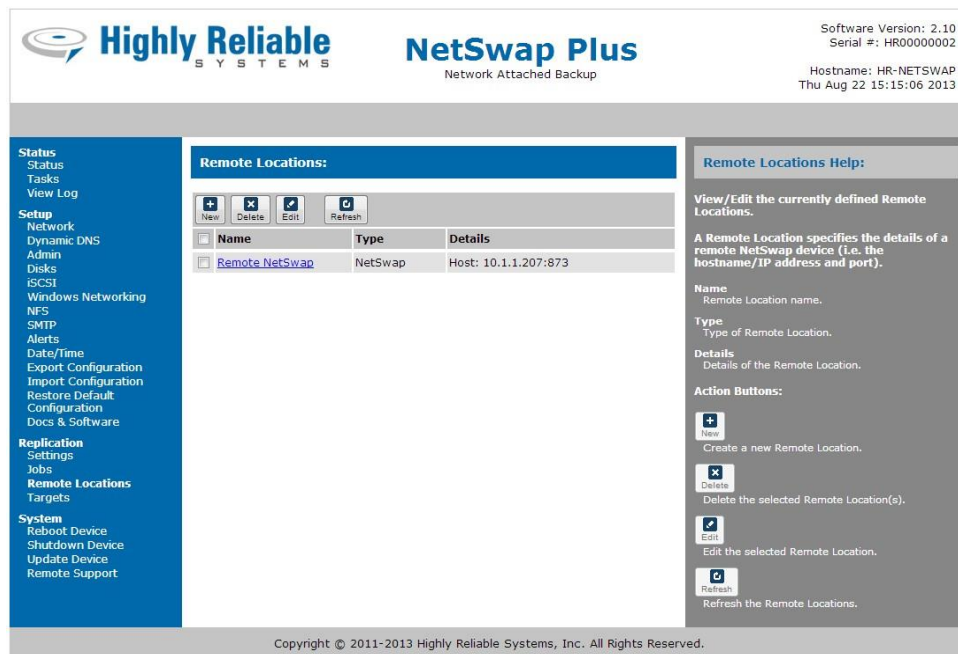


Illustration 78: Remote Locations

Name

Remote Location name.

Type

Type of Remote Location.

Details

Details of the Remote Location.

Action Buttons

New

Create a new Remote Location.

Delete

Delete the selected Remote Location(s).

Edit

Edit the selected Remote Location.

Refresh

Refresh the Remote Locations.

New/Edit Remote Location

NetSwap:

Edit Remote Location:

Type: NetSwap ▼

Name: Netswap 1

Hostname/IP: 10.1.1.114

Port: 873

Encryption Type: None ▼

Save Cancel

Edit Remote Location Help:

View/Edit Remote Location.

Type
Select the type of the remote location.

Name
Descriptive name for the remote NetSwap.

Hostname/IP
The hostname (machine and domain name) or IP of the remote NetSwap.

Port
TCP/IP port for the remote NetSwap. Note: this port may need to be opened on your firewall or router

Encryption Type
Select the type of encryption to be used when transferring data across the network/internet. Options are AES-256, TRIPLE DES, AES-128, RC4, DES, and none. Encryption can slow down data transfer so if your data is already encrypted such as by a VPN or backup or achive

Illustration 79: New/Edit Remote Location: NetSwap

Type

Select the type of the remote location.

Name

Descriptive name for the Remote Location.

Hostname/IP

The hostname (machine and domain name) or IP of the Remote Location.

Port

TCP/IP port for of the Remote Location. Note: this port may need to be opened on your firewall or router

Encryption Type

Select the type of encryption to be used when transferring data across the network/internet. Options are AES-256, TRIPLE DES, AES-128, RC4, DES, and none. Encryption can slow down data transfer so if your data is already encrypted such as by a VPN or backup or achive program, you may want to set this to 'None'. The default is 'None'.

Dropbox:

Edit Remote Location:

Type:

Name:

Description:

Authorized: Yes

Edit Remote Location Help:

View/Edit Remote Location.

Type
Select the type of the remote location.

Name
Name for the Dropbox account.

Description
Description of the Dropbox account.

Authorized
This will display 'Yes' if the NetSwap has been authorized to access the associated Dropbox account, or 'No' if not.

Clicking this button will allow authorizing the NetSwap to access a Dropbox account. This involves logging to a Dropbox account, allowing the NetSwap access, and copy and pasting the authorization key into the box providing and saving it.

Illustration 80: New/Edit Remote Location: Dropbox

Type

Select the type of the remote location.

Name

Name for the Dropbox account.

Description

Description of the Dropbox account.

Authorized

This will display 'Yes' if the NetSwap has been authorized to access the associated Dropbox account, or 'No' if not.

Authorize Now

Clicking this button will allow authorizing the NetSwap to access a Dropbox account. This involves logging to a Dropbox account, allowing the NetSwap access, and copy and pasting the authorization key into the box providing and saving it.

Authorizing Dropbox

Dropbox Authorization:

Complete the steps below to authorize access to a Dropbox account:

1. [Click here](https://www.dropbox.com/1/oauth2/authorize?locale=&client_id=udzzx3pp9jeo2wv&response_type=code) to open the Dropbox authorization page in a new window or visit this page:
https://www.dropbox.com/1/oauth2/authorize?locale=&client_id=udzzx3pp9jeo2wv&response_type=code.
2. Click "Allow" (you might have to log in first).
3. Copy and paste the authorization code into the field below and click "Save".

Authorization Code:

Dropbox Authorization Help:

Illustration 81: Dropbox Authorization

This gives the authorization that allows the NetSwap to access a Dropbox account. Follow the steps in the window as shown above and copy & paste the authorization code provided by Dropbox and click 'Save'.

S3/S3 Compatible:

Edit Remote Location:

Type:

Name:

Service:

Access Endpoint:

Access Key Id:

Secret Key:

☒ Secure Mode (encrypted)

☐ Use sub-domain or virtual hosting calling format

Edit Remote Location Help:

View/Edit Remote Location.

Type
Select the type of the remote location.

Name
Descriptive name for the Remote Location.

Service
Select the service being used and in the case of Amazon S3, the region.

Access Endpoint
The URL used to access the S3 service excluding the 'http://' or 'https://'.

Access Key Id
Access key id assigned by the service.

Secret Key
Secret key assigned by the service.

Secure Mode (encrypted)
If checked, SSL will be used when accessing the service and transferring data.

Illustration 82: New/Edit Remote Location: S3/S3 Compatible

Type

Select the type of the remote location.

Name

Descriptive name for the Remote Location.

Service

Select the service being used and in the case of Amazon S3, the region.

Access Endpoint

The URL used to access the S3 service excluding the 'http://' or 'https://'.

Access Key Id

Access key id assigned by the service.

Secret Key

Secret key assigned by the service.

Secure Mode (encrypted)

If checked, SSL will be used when accessing the service and transferring data.

Use sub-domain or virtual hosting calling format

If checked, sub-domain format access will be used.

Manage AWS Jobs

Manage the AWS Import/Export Jobs for this account (if using Amazon AWS S3).

FTP:

The screenshot shows a web-based configuration interface titled "Edit Remote Location:". The main form area contains the following fields and options:

- Type:** A dropdown menu with "FTP" selected.
- Name:** A text input field containing "NetSwap113".
- Hostname/IP:** A text input field containing "10.1.1.211".
- Port:** A text input field containing "21".
- Username:** A text input field containing "hadmin".
- Password:** A text input field with masked characters ".....".
- Mode Selection:** Two radio buttons are present:
 - ☐ Active FTP mode (off: Passive mode)
 - ☐ Secure mode (encrypted)
- Buttons:** "Save" and "Cancel" buttons at the bottom.

On the right side of the dialog, there is a "Help" panel titled "Edit Remote Location Help:". It contains the following information:

- View/Edit Remote Location.**
- Type:** Select the type of the remote location.
- Name:** Descriptive name for the FTP server.
- Hostname/IP:** The hostname (machine and domain name) or IP of the FTP server.
- Port:** TCP/IP port for the FTP server. The default is 21.
- Username:** Login username.
- Password:** Login password.
- Active FTP mode:** If checked active FTP mode will be used, otherwise passive FTP mode is used.

Illustration 83: New/Edit Remote Location: FTP

Type

Select the type of the remote location.

Name

Descriptive name for the FTP server.

Hostname/IP

The hostname (machine and domain name) or IP of the FTP server.

Port

TCP/IP port for the FTP server. The default is 21.

Username

Login username.

Password

Login password.

Active FTP mode

If checked active FTP mode will be used, otherwise passive FTP mode is used (default). Active mode requires the FTP server to connect to the NetSwap on another port. This is often blocked by a router or firewall and will require special rules to allow access. In passive mode the NetSwap initiates all connections and this is generally supported by routers and firewalls; however, the FTP server's firewall must be configured appropriately.

Secure mode (encrypted)

If checked, SSL will be used to secure connection.

SFTP:

The screenshot shows a web-based configuration interface titled "Edit Remote Location:". The main form area contains the following fields and controls:

- Type:** A dropdown menu with "SFTP" selected.
- Name:** A text input field containing "Win 8 SFTP".
- Hostname/IP:** A text input field containing "10.1.1.110".
- Port:** A text input field containing "22".
- Username:** A text input field containing "derry".
- Password:** A text input field with masked characters ".....".
- At the bottom right of the form are "Save" and "Cancel" buttons.

To the right of the main form is a grey sidebar titled "Edit Remote Location Help:". It contains a section titled "View/Edit Remote Location." followed by definitions for the form fields:

- Type:** Select the type of the remote location.
- Name:** Descriptive name for the SFTP server.
- Hostname/IP:** The hostname (machine and domain name) or IP of the SFTP server.
- Port:** TCP/IP port for the SFTP server. The default is 22.
- Username:** Login username.
- Password:** Login password.

Illustration 84: New/Edit Remote Location: SFTP

Type

Select the type of the remote location.

Name

Descriptive name for the SFTP server.

Hostname/IP

The hostname (machine and domain name) or IP of the SFTP server.

Port

TCP/IP port for the SFTP server. The default is 22.

Username

Login username.

Password

Login password.

3.4.4.4 Targets

View/Edit the currently defined Targets.

A Target is a folder on this NetSwap device that is shared for use by a remote NetSwap device. Prior to setting up a Replication Job on a remote NetSwap device that will replicate to this device, a target must be created by selecting a disk and folder and setting a username and password.

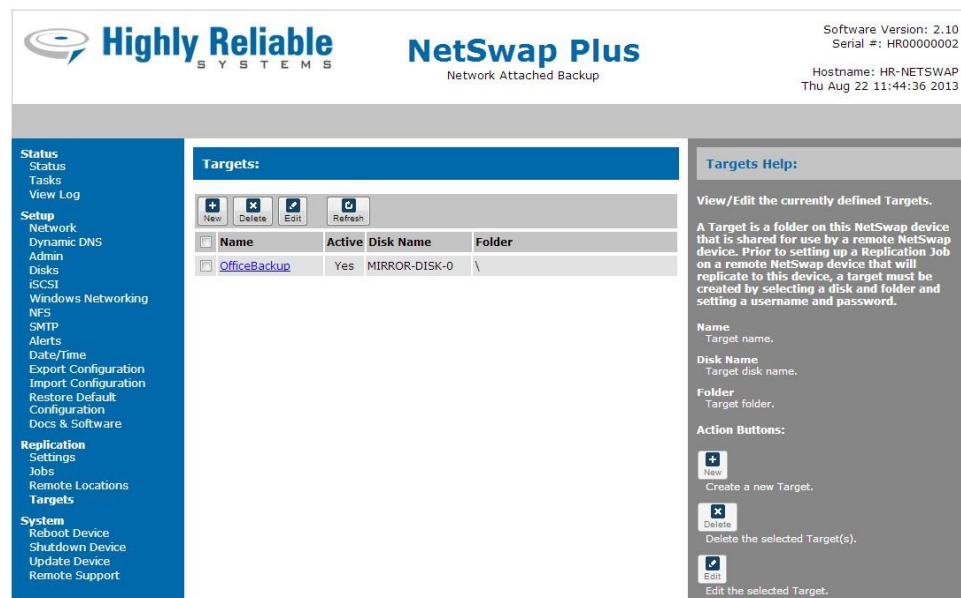


Illustration 85: Targets

Name

Target name.

Disk Name

Target disk name.

Folder

Target folder.

New

Delete

Edit

Refresh

New/Edit Target

View/Edit Target. A Target defines a disk and folder on this device that will be shared with remote devices for replication.

Illustration 86: New/Edit Target

Name

Descriptive name for this Target.

Username

Username for this Target.

Password

Password for this Target.

Confirm Password

Enter the password again.

Disk

Select the disk for this Target. Note: this will only display disks that are shared in NAS mode; disks that are shared iSCSI cannot be a Target disk.

Folder

Select the folder on the selected disk for this Target.

3.4.4.5 Amazon Import/Export Jobs

View/Edit the currently defined Amazon Import/Export jobs.

The screenshot shows the RAIDFrame Plus web interface. The top header includes the logo, 'RAIDFrame Plus Network Attached Backup', and system information: 'Software Version: 2.10', 'Serial #: HR12345678', 'Hostname: HR-RAIDFRAME.hr-test.local', and 'Mon Apr 28 13:43:01 2014'. A left sidebar contains navigation links for Status, Setup, and various configuration options. The main content area is titled 'Amazon Import/Export Jobs:' and features a 'Remote Location' dropdown set to 'HR S3 US-WEST-1'. Below this is a table of jobs with columns for Job Id, Type, Seed Job, and Status. The table lists five jobs: DEF2A (Export, Pending), 48UY (Export, Canceled), 67SPH (Export, Canceled), Q2DDT (Export, Canceled), and ZR9KJ (Export, Canceled). A 'More' link is at the bottom of the table. To the right of the table is a 'Help' section titled 'Amazon Import/Export Jobs Help:' which provides instructions for viewing/editing jobs, selecting remote locations, and defining job types and seed jobs.

Job Id	Type	Seed Job	Status
DEF2A	Export	S3 Seed In Base Seed In	Pending
48UY	Export	N/A	Canceled
67SPH	Export	N/A	Canceled
Q2DDT	Export	N/A	Canceled
ZR9KJ	Export	N/A	Canceled

Illustration 87: Amazon Import/Export Jobs

Remote Location

Select the remote location for the Amazon account to access.

Job Id

Job Id for the job.

Type

Type of job, Import or Export.

Seed Job

Replication Seed Job this import/export job is associated with.

Status

Status of the job.

Action Buttons:

New

Create a new Amazon Export job. Import jobs are created when creating the Replication Seed Job.

Cancel

Cancel the selected job(s).

Edit

Edit the selected job.

Refresh

Refresh the jobs.

New/Edit Amazon Import/Export Job

View/Edit Amazon Import/Export job.

View/Edit Amazon Export Job:

Job Id: DEP2A
Create Date: Wed, 23 Apr 2014 15:21:07 -0700
Type: Export
Status: Pending - The specified job has not started.
Location: NotReceived - AWS has not received your device.
Carrier: N/A
Tracking Number: N/A
Ship To Address: AWS Import/Export
JOBID DEP2A
2646 Rainier Ave South Suite 1060
Seattle, WA 98144
United States
206-266-6868
Bucket: hrtest
Disk Id:
Notification Email:
Service Level:
Password:
Confirm Password:
Folder: /

Select	Disk Name	Bay #	Identify
<input type="radio"/>	Name: DISK-2974 Capacity: 4.00TB	3	<input type="button" value="Identify"/>
<input type="radio"/>	Name: DISK-4732 Capacity: 500.11GB	N/A	<input type="button" value="Identify"/>

File System Type:
☐ Copy Signature file to disk

[Return Address](#)

View/Edit Amazon Export Job Help

View/Edit Amazon Import/Export job.

Job Id
Job Id assigned by Amazon.

Create Date
Date job was created.

Type
Job type. Import or Export.

Status
Current status of the job.

Location
Location of the disk.

Carrier
Carrier used to ship disk to back.

Tracking Number
If the disk has been shipped, this is the tracking number.

Ship To Address
Address to which the disk should be shipped.

Bucket
Bucket to be imported or exported.

Disk Id
Disk Id to be placed on the disk before shipment to identify the disk.

Notification Email
Email address(s) to send notifications concerning this job. Multiple addresses should be separated by a ';' character.

Service Level
Level of shipping service. Standard or Expedited

Password
Password used to encrypt the data on the disk. Required for Export jobs.

Illustration 88: New/Edit Amazon Export Job

Job Id

Job Id assigned by Amazon.

Create Date

Date job was created.

Type

Job type. Import or Export.

Status

Current status of the job.

Location

Location of the disk.

Carrier

Carrier used to ship disk to back.

Tracking Number

If the disk has been shipped, this is the tracking number.

Ship To Address

Address to which the disk should be shipped.

Bucket

Bucket to be imported or exported.

Disk Id

Disk Id to be placed on the disk before shipment to identify the disk.

Notification Email

Email address(s) to send notifications concerning this job. Multiple addresses should be separated by a ';' character.

Service Level

Level of shipping service. Standard or Expedited

Password

Password used to encrypt the data on the disk. Required for Export jobs.

Confirm Password

Enter the password again to confirm. Required for Export jobs.

Access Policy

Access policy for imported files. Import jobs only.

Storage Class

Class of storage to use. Options are Standard and Reduced Redancy. Import jobs only.

Erase disk after import

If checked, disk will be erased before shipment back. Import jobs only.

Folder

Folder to export. Export jobs only.

Disk

Disk to be prepped for shipment.

File System Type

File system to use when formatting the disk before data is written to the disk. Options are NTFS and EXT4. Export jobs only.

Copy Signature file to disk

If checked, the Signature file for the job will be written to the selected disk. Export jobs only.

Return Address

Name and address to which the disk should be returned when the job is complete.

Customs Information

Information required for Customs if disk will cross Country boundaries. Consult the Amazon documentation for details.

3.4.5 Virtualization Menu (Select models only, Experimental)

3.4.5.1 Virtual Machines

View/edit virtual machines.

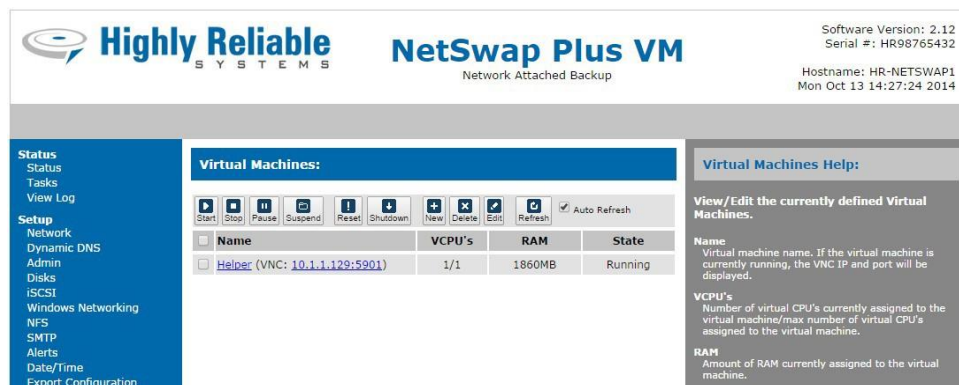


Illustration 89: Virtual Machines

Name

Virtual machine name. If the virtual machine is currently running, the VNC IP and port will be displayed.

VCPU's

Number of virtual CPU's currently assigned to the virtual machine/max number of virtual CPU's assigned to the virtual machine.

RAM

Amount of RAM currently assigned to the virtual machine.

State

Current state of the virtual machine: 'Running', 'Paused', 'Shutdown', 'Crashed', or 'Dying'.

Action Buttons

Start

Start the selected virtual machine(s).

Stop

Stop the selected virtual machine(s). This immediately stops the virtual machine, it is not gracefully shutdown.

Pause

Pause the selected virtual machine(s). The virtual machine will remain in memory but its CPU will be stopped.

Suspend

Pauses the selected virtual machine(s), saves the state of the virtual machine(s) to disk, and stops the virtual machine(s). Click 'Start' to restore a virtual machine to its previous state.

Reset

Perform a virtual hardware reset of the selected virtual machine(s).

Shutdown

Request a shutdown of the selected virtual machine(s).

New

Create a new virtual machine.

Delete

Delete the virtual machine(s). Running virtual machines cannot be deleted.

Edit

Edit the selected virtual machine.

Refresh

Refresh the virtual machines.

View/Edit virtual machine settings.

Illustration 90: New/Edit Virtual Machine

Name for the virtual machine. May only contain letters, numbers, and '_'.

This indicates that the virtual machine is active and can be started. Inactive virtual machines cannot be started and will not start on system startup.

Number of virtual CPU's to assign to this virtual machine.

Amount of RAM in MB's to assign to this virtual machine.

Type of video emulation. For OS's from Windows XP and later should use 'Standard VGA'.

Amount of memory assigned to the virtual machine's video adapter.

Password required to access the VNC port for this virtual machine. May be blank.

Confirm Password

The VNC password again for confirmation.



Startup Action

Action to be taken on the virtual machine when the systems starts up. Options are: 'None' to do nothing or 'Start' to start the virtual machine on startup or if the virtual machine was suspended on the previous shutdown, it will be restored.

Shutdown Action

Action to be taken on the virtual machine on system shutdown. Options are: 'Stop' to simply stop the virtual machine, 'Suspend and Save' to suspend the virtual machine and save it's current state, or 'Shutdown' to request the virtual machine guest OS to shutdown.

Storage

Use the  button to add a new disk and the  button to remove a disk.

Interface

Type of virtual disk controller interface to attach this disk to. Options are: 'IDE', 'SCSI', and 'Xen PV'. Both 'IDE' and 'SCSI' provide both their respective virtual interface as well as the Xen paravirtualized interface. 'Xen PV' only provides the paravirtualized interface. The Xen PV drivers need to be installed to access the paravirtualized interface. The Xen PV drivers are available for installation by checking 'Attach VM Tools ISO'.

Image Type

Type of the disk image. Options are: 'RAW Disk' to attach an entire disk, 'RAW File' to use a raw file on mounted disk, 'VHD File' to use a VHD file on a mounted disk, 'VHD File BlkTap' to use a VHD file on a mounted disk using the BlkTap driver, this is useful for some VHD files that are not recognized properly by the 'VHD File' option, 'VHDX File' to use a VHDX file on a mounted disk, 'VMDK File' to use a VMDK file on a mounted disk, 'VDI File' to use a VDI file on a mounted disk, and 'ISO File' to use an ISO file on a mounted disk.

Disk

Select the disk that is either the disk image or contains the disk image.

File Name

The path and name of the file that contains the disk image. Click the button to browse the disk to select the correct file or create a new file of the specified type.



Boot Order

Select the order in which disks will be checked during boot. Options are: 'Disk' to check disks only, 'Disk, CDROM' to check disks then CDROM's, 'CDROM' to check CDROM's only, and 'CDROM, Disk' to check CDROM's then disks.

Attach VM Tools ISO

Check to attach an ISO image containing the Xen PV drivers and other tools.

Network

Use the  button to add a new network adapter and the  button to remove a network adapter.

Virtual Adapter

Virtual adapter number.

Physical Adapter

Physical adapter in the host machine to assign to this virtual adapter.

MAC Address

Optional MAC address for the virtual adapter of the form 'XX:XX:XX:XX:XX:XX'. If blank, a unique address will be assigned starting with Xen's unique identifier '00:16:3e'.

3.4.5.2 Install Utility OS

This will install the optional Utility OS from the supplied USB key drive onto a reserved portion of the system boot disk. The Utility OS is a preconfigured OS installation used to perform various tasks or offload tasks from a computer or server, such as running StorageCraft's Image Manager.



Illustration 91: Install Utility OS

3.4.6 System Menu

3.4.6.1 Reboot Device

This option will save all cached data and safely reboot the device.

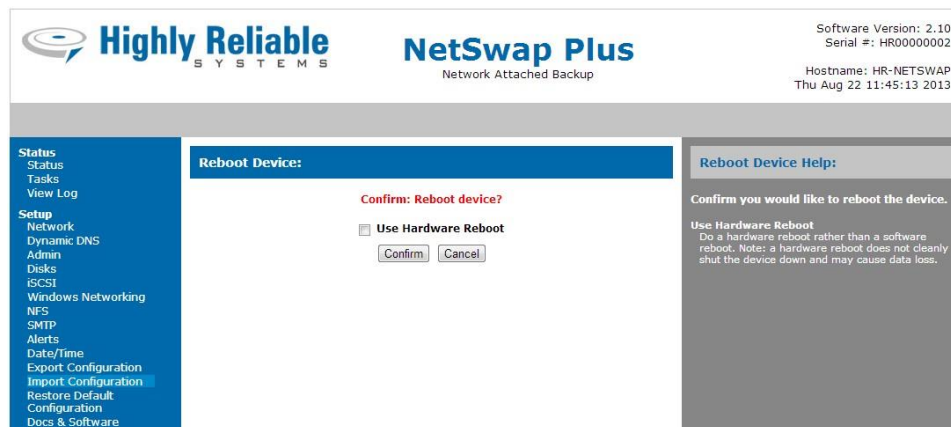


Illustration 92: Reboot

Click 'Confirm' to confirm you wish to reboot the device. The device will require from 30 to 60 seconds to reboot.

Use Hardware Reboot

Do a hardware reboot rather than a software reboot. Note: a hardware reboot does not cleanly shut the device down and may cause data loss. This option is only available on G2 models of the NetSwap/RAIDFrame Plus.

3.4.6.2 Shutdown Device

This option will save all cached data and safely shutdown the device.

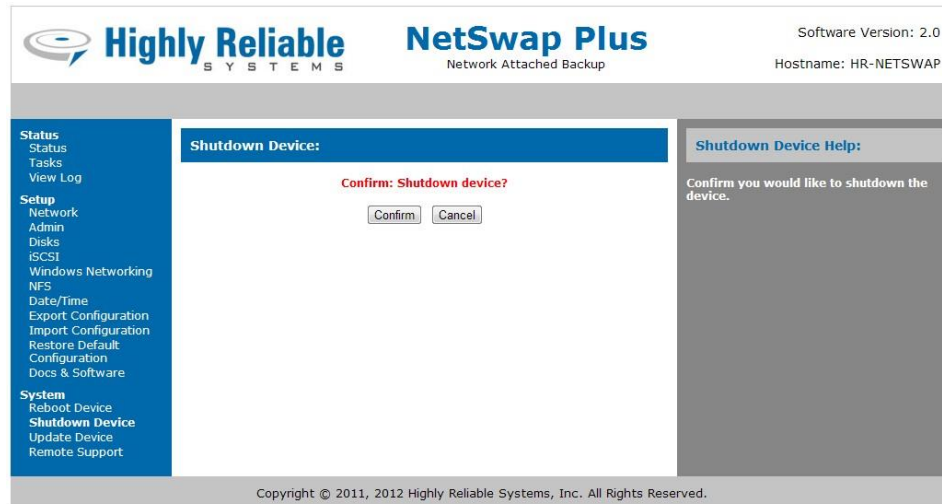


Illustration 93: Shutdown

Click 'Confirm' to confirm you wish to shutdown the device.

3.4.6.3 Check for Updates

This option will check to see if there is a software update available for this device. If an update is available a screen similar to the following will be displayed:

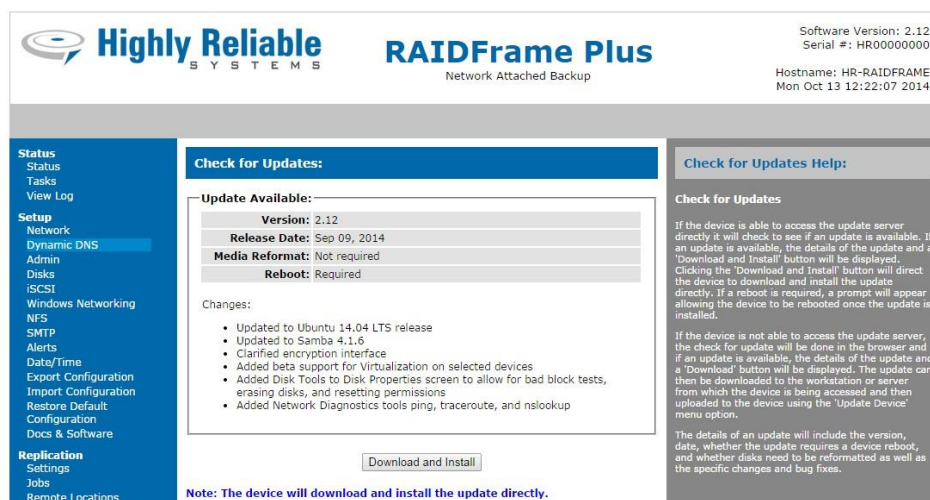


Illustration 94: Check for Updates

Version

The software version of the update.

Release Date

Date the update was released.

Media Reformat

This will display 'Required' if the update requires the media to be reformatted or 'Not required' if not.

Reboot

This will display 'Required' if a the update requires a reboot of the device or 'Not required' if not.

Changes

A description of the changes included in the update.

If the device is connected to the internet and can directly access the update server, the button will say 'Download and Install'. When pressed the device will directly download the update and install it.

If the device is not connected to the internet and cannot access the update server, the button will say 'Download Update'. When pressed, this button will start a download of the update file to your computer. Once the download completes, select 'Update Device' and upload and install the update.

3.4.6.4 Update Device

This option is used to update the device software with an update file supplied by High-Rely support staff.

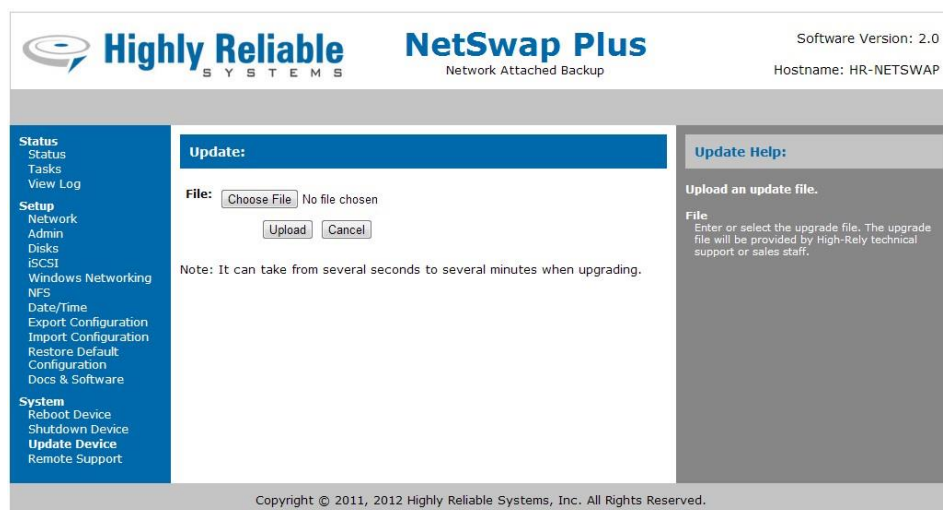


Illustration 95: Update Device

Choose the file name of the update file. Click the 'Upload' button to upload the update to the device and perform the software update. You will be informed when the update is complete.

3.4.7 Disk Properties

View/edit the disk properties.

The screenshot shows the RAIDFrame Plus web interface. The left sidebar contains navigation links for Status, Setup, Replication, and System. The main content area is titled 'Disk Properties:' and is divided into several sections: 'Disk Identification' (Disk ID: 4fccc259-fcfe-4d3b-a226-cfacd789cbb4, Alt ID: JMicon_H_W_RAID0_DY2J8HSSLVZQ4A000IZ7, Friendly Disk Name: DISK-0976), 'Disk Information' (Vendor: ATA, Model: JMicon H/W RAID, Device: sdc (dm-0), Capacity: 12.00TB, Snapshot Reserve: 0GB, Snapshot Active: No, File System: NTFS, Installed: Yes, Shared: No, Formatted: Yes, SMART Status: OK), 'Diagnostic Tests' (Last Test Type: N/A, Last Test Date: N/A, Bad Blocks Found: 0), and 'Sharing' (Share Mode: None). The 'Share Mode' dropdown is set to 'None', with a tooltip indicating that NAS share mode enables both Windows Networking and NFS. Action buttons for Identify, Format, Disk Tools, and SMART Info are present. A 'Disk Properties Help' sidebar on the right provides additional information and instructions.

Illustration 96: Disk Properties: Share Mode - None

The screenshot shows the RAIDFrame Plus web interface with the 'Share Mode' dropdown set to 'iSCSI'. The 'Sharing' section now includes a 'Share Name' field (DISK-0976) and an 'iSCSI Target' field (HR-RAIDFRAME:DISK-0976-CTRL (Not Connected)). A new section, 'iSCSI CHAP Username/Password', is also visible. The 'Disk Properties Help' sidebar on the right has been updated to reflect the iSCSI configuration.

Illustration 97: Disk Properties: Share Mode - iSCSI

Highly Reliable **RAIDFrame Plus**
S Y S T E M S Network Attached Backup

Software Version: 2.12
Serial #: HR00000000
Hostname: HR-RAIDFRAME
Mon Oct 13 12:53:31 2014

Status
Status
Tasks
View Log

Setup
Network
Dynamic DNS
Admin
Disks
iSCSI
Windows Networking
NFS
SMTP
Alerts
Date/Time
Export Configuration
Import Configuration
Restore Default
Configuration
Docs & Software

Replication
Settings
Jobs
Remote Locations
Targets
Amazon I/E Jobs

System
Reboot Device
Shutdown Device
Check for Updates
Update Device
Remote Support

Disk Properties:

Disk Identification

Disk ID: 4fccc259-fcfe-4d3b-a226-cfacd789cbb4
Alt ID: JMicon_H_W_RAID0_DYZ38HSSLVZQ4A000IZ7
Friendly Disk Name: DISK-0976

Disk Information

Vendor: ATA
Model: JMicon H/W RAID
Device: sdc (dm-0)
Capacity: 12.00TB
Snapshot Reserve: 0GB
Snapshot Active: No
File System: NTFS
Installed: Yes
Shared: No
Formatted: Yes
SMART Status: OK

Diagnostic Tests

Last Test Type: N/A
Last Test Date: N/A
Bad Blocks Found: 0

Sharing

Share Mode: NAS NAS share mode enables both Windows Networking and NFS.
Share Name: DISK-0976

Windows Networking Access Control
NFS Allowed Hosts/Clients
Mount Settings

Save Cancel

Disk Properties Help:

View/edit the disk properties.

Disk Identification

Disk ID
Unique ID assigned to each disk when they are formatted.

Alt ID
Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (i.e. eSATA vs. USB3).

Friendly Disk Name
User defined disk name.

Action Buttons
Buttons showing the actions that can be taken with the disk by clicking the button. Possibilities are:

Format
Format disk. Only displayed if disk is not shared or part of a Mirror Set.

Identify
Identify disk by blinking disk light. Only displayed if disk is installed.

Share
Share disk if it is installed and has been safely removed.

Safely Remove
Safely remove disk if installed and shared in NAS mode.

SMART Info
Display SMART (Self-Monitoring, Analysis and Reporting Technology) information if supported by the disk.

Mirror Properties
View/edit Mirror properties.

Mirror Schedule
Configure the mirror schedule for this disk.

Illustration 98: Disk Properties: Share Mode - NAS

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Friendly Disk Name

User defined disk name. This may be used as the Share Name when shared in NAS mode or as part of the iSCSI Target Name depending on the settings in the 'Windows Networking' screen and the 'iSCSI' screen.

Disk Information

Vendor

Disk vendor information if supplied.

Model

Disk model information if supplied.

Device

Linux device name for this disk. This can be used to match disk errors in the kernel log with specific disks.

Capacity

Size of the disk in GB or TB.

Snapshot Reserve

Amount of the disk in GB that has been reserved for use as Replication snapshot storage.

Installed

'Yes' if disk is currently installed or 'No' if not installed.

Shared

'Yes' if disk is currently shared or 'No' if not.

Formatted

'Yes' if the disk is formatted or 'No' if not.

SMART Status

'OK' if the disk is ok, 'PREFAIL' if the is in the process of failing, and 'FAILING' if the disk is failing.

Sharing**Share Mode**

Mode in which to share the disk. Options are:

- **None** - Not shared.
- **iSCSI** - Share as an iSCSI target.
- **NAS** - Share as Networked Attached Storage using Windows Networking and NFS.

Share Name

Share Name for this disk. This is used as the share name in Windows Networking and the target name portion in iSCSI if the 'Disk Share Name' option is selected in Windows Networking Settings and iSCSI Settings. Only displays if Share Mode is NAS or iSCSI.

iSCSI Target

Displays the target name for this disk. This will be N/A if the Share Mode is just being set to iSCSI. Only displays if Share Mode is iSCSI.

Shared As

Displays the current share name for this disk. If the disk is just being set to NAS mode this will be N/A. Only displays if Share Mode is NAS.

iSCSI CHAP Username/Password

Use Individual CHAP Username/Password

Check to use an individual iSCSI CHAP Username and Password or uncheck to use the Global CHAP Username/Password (see iSCSI Settings) for this disk. Only displays if Share Mode is iSCSI.

CHAP Name/User Name

CHAP Name/User Name for this disk if not using global settings. Only displays if Share Mode is iSCSI and 'Use Individual CHAP Username/Password' is checked.

CHAP Secret/Password

CHAP Secret/Password for this disk if not using global settings. Only displays if Share Mode is iSCSI and 'Use Individual CHAP Username/Password' is checked.

Confirm Password

CHAP password again for verification. Only displays if Share Mode is iSCSI and 'Use Individual CHAP Username/Password' is checked.

Windows Networking Access Control

Use Individual Access Control

Check to use individual Access Control or uncheck to use the global Access Control defined in Windows Networking Settings. Only displays if Share Mode is NAS.

Allowed Users/Groups

Specific users and/or groups allowed to connect to the device. Leave blank to allow all users in the domain to connect.

Blocked Users/Groups

Specific users and/or groups that are not allowed to access to the device.

Admin Users/Groups

Specific users and/or groups that will receive administrative access when connected to the device.

Read Only Users/Groups

Specific users and/or groups that will have read only access (i.e. no write access) when connected to the device.

Read/Write Users/Groups

Specific users and/or groups that will have read and write access when connected to the device. Leave blank to allow all users read/write access.

NFS Allowed Hosts/Clients

NFS Exports

Displays the current NFS exports for this disk. If the disk is just being set to NAS mode this will be N/A. Only displays if Share Mode is NAS.

Use Individual NFS Hosts/Clients

Check to use individual Hosts/Clients or uncheck to use the global Hosts/Clients defined in NFS Settings. Only displays if Share Mode is NAS.

Host/Client 1-4

The hosts or clients that are allowed to connect to this disk's export point if not using global Hosts/Clients. This can be specified in one of two ways:

- Host or machine name with optional domain name. Wildcards '*' and '?' are allowed.
- IP address followed by an optional netmask as 'address/netmask'. The netmask may be specified in dotted-decimal format, or as a contiguous mask length (for example, either '/255.255.252.0' or '/22' appended to the network base address)

Only displays if Share Mode is NAS and 'Use Individual NFS Hosts/Clients' is checked.

Mount Settings

Disk already contains encrypted data

Check if the disk contains an encrypted volume. To create an encrypted volume, format the disk with encryption enabled.

Disk already contains encrypted file container

Check if the encrypted volume is stored in a file container.

Filename

Name of the file that contains the encrypted volume.

Automount

If checked, the disk will be automatically mounted when inserted.

Password

Encryption password for the volume.

New files created as sparse files

With this option checked, all new files created will be created as sparse files. This is not recommended.

Use NTFS-3G driver

If checked, use the standard Linux userspace NTFS-3G driver instead of the optimized NetSwap NTFS kernel driver. Use of the NTFS-3G driver can slow down disk access.

DeltaSync Settings

Disabled

If selected, DeltaSync is disabled for this disk.

DeltaSync Source Disk

If selected, makes this disk a DeltaSync source disk. The data on this disk will be synced to specified destination disks.

Mode

DeltaSync Mode. Options are:

- **One Shot** – Run once and stop
- **One Shot Scheduled** – Start sync at the specified time
- **One Shot Manual** – Start when triggered by an Action URL or program (see Disk Tools)
- **Continuous** – Sync and then continuously keep disks in sync
- **Continuous Scheduled** – Start sync at the specified time and then continuously keep disks in sync
- **Continuous Manual** – Start when triggered by an Action URL or program (see Disk Tools) and then keep disks in sync

At

Scheduled time in HH:MM format (if using scheduled mode).

Snapshot Storage

Disk selected for snapshot storage or None if no snapshot is used.

Safe copy using temporary files

If checked, when copying, copy to a temporary file first and then rename to the destination file. This prevents incomplete or corrupt files in the case where the sync terminates unexpectedly. Requires additional disk space on slave disk to store temporary files.

DeltaSync Destination Disk

If selected, this disk is a DeltaSync destination disk. This disk will be synced to the data on the specified source disk.

Source Disk

Select the source disk for this destination disk (the disk from which to sync data to this disk).

Action Buttons

Format

Format disk. Only displayed if disk is not shared or part of a Mirror Disk. See below.

Disk Tools

Access the disk tools for this disk. See below.

Identify

Identify disk by blinking disk light. Only displayed if disk is installed.

Share

Share disk if it is installed and has been safely removed. See below.

Safely Remove

Safely remove disk if installed and shared in NAS mode. See below.

Smart Info

Display SMART (Self-Monitoring Analysis and Reporting Technology) information if supported by the disk. See below.

Mirror Properties

View/edit Mirror properties – see below. Only applicable to NetSwap/RAIDFrame Plus models.

Mirror Schedule

Configure the mirror schedule for this disk. Only applicable to the RAIDFrame Plus models.

3.4.7.1 Format

Format and Partition Removable Drive. All disks must be formatted by the NetSwap/RAIDFrame Plus before use.

This is useful to quickly erase all data on the removable hard drive or when the file system on the removable drive has become corrupted. This will partition the hard drive with one partition for the entire hard drive and format the partition with the selected file system.

Highly Reliable Systems **NetSwap Plus** Network Attached Backup

Software Version: 2.15c
Serial #: HR00000000
Hostname: HR-NETSWAP-1261
Fri Oct 13 13:08:02 2017
Build: 2017.10.13.12.53.49

Format and Partition Disk:

Disk Identification Identify

Disk ID: 38331b86-0360-4653-9462-2928981a5b5f
Alt ID: ST4000DM000-1F2168_Z301P2XB
Name: DISK-5033

Partition Settings

Partition Table Type: GUID Partition Table (GPT) ▼
Disk Size: 4001GB
Snapshot Reserve Size (GB): 0

Encryption Settings

☐ Encrypt Data
☐ Use File Container
File Name: /volume.tc
Password:
Confirm:
Encryption Algorithm: AES ▼
Hash Algorithm: RIPEMD-160 ▼
☒ Use Weak Keys
☐ Secure Erase

File System Settings

File System Type: NTFS ▼
Block Size (bytes): Default ▼
FRS Size (bytes): Default ▼
Volume Label: New Volume
Format Reset

Format and Partition Disk Help:

Format and Partition Disk

This is useful to quickly erase all data on the hard drive or when the file system on the drive has become corrupted. This will partition the hard drive with one partition for the entire hard drive and format the partition with the selected file system.

Disk Identification

Disk ID
Unique ID assigned to each disk when they are formatted.

Alt ID
Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (i.e. eSATA vs. USB3).

Name
User defined disk name.

Partition Settings

Partition Table Type
The format of the partition table to write to the disk. The options are 'MBR Partition Table' and 'GUID Partition Table (GPT)'. The MBR partition table format is an older partition table format and is usable on drives up to 2.19 TB (terabyte or 10¹² bytes). The GPT partition table format is used by newer BIOS's and OS's and is usable on drives up to 9.4 ZB (zettabyte or 10²¹ bytes). Some OS's cannot read the GPT partition table (or drives greater than 2TB) and must use the MBR format.

Disk Size
Displays the size or capacity of the disk in GB.

Snapshot Reserve Size (GB)
Set to the amount of space in GB's out of the total disk capacity to reserve as Snapshot storage for

Illustration 99: Format Disk

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Name

User defined disk name.

Partition Settings**Partition Table Type**

The format of the partition table to write to the disk. The options are 'MBR Partition Table' and 'GUID Partition Table (GPT)'. The MBR partition table format is an older partition table format and is usable on drives up to 2.19 TB (terabyte or 10^{12} bytes). The GPT partition table format is used by newer BIOS's and OS's and is usable on drives up to 9.4 ZB (zettabyte or 10^{21} bytes). Some OS's cannot read the GPT partition table (or drives greater than 2TB) and must use the MBR format.

Encryption Settings (TrueCrypt compatible)**Encrypt Data**

Check this box to create an encrypted volume

Use File Container

Check this box to use a file to store the encrypted volume rather than encrypting the entire partition.

File Name

Name of the file used as a file container. This file will automatically be sized to the maximum size possible for the partition.

Password

Password used to encrypt the volume. We recommend a password of at least 20 characters that includes letters (upper and lower case), numbers, and special characters such as @^=\$*+ etc. It should not contain names, dates of birth, or words found in a dictionary.

Confirm

Confirm the password by reentering it.

Encryption Algorithm

The algorithm used to encrypt volume data. Supported options are:

- AES
- Twofish
- Serpent
- AES-Twofish-Serpent
- Serpent-Twofish-AES
- Twofish-AES
- AES-Serpent

- Serpent-Twofish

All algorithms use a 256 bit key. **Note: a cascade encryption algorithm (e.g. AES-TwoFish-Serpent) can be many times slower than a non-cascade one (e.g. AES).**

Hash Algorithm

The hash algorithm used to generate the encryption keys. Supported options are:

- RIPEMD-160 (160 bit hash)
- SHA-512 (512 bit hash)
- Whirlpool (512 bit hash)

Use Weak Keys

Check this box to use a "less random" but faster random number generator when generating keys. This may decrease the time needed to create an encrypted volume, but may weaken the security of the volume.

Secure Erase

Check this box to initialize the volume with random data. This can strengthen the security of the volume by making sure the amount of space used on the volume cannot be determined, but will significantly slow down creation of an encrypted volume as random data will be written to each block on the disk.

File System Settings

File System Type

The file system to used to format the drive. Options are 'EXT4', 'NTFS', and None. Formatting EXT4 takes approximately .2 seconds per GB, a 1TB drive will take approximately 3.5 minutes to format.

NTFS can be read natively if the drive is connected directly to a Windows system. (We recommend using a Highly Reliable Systems eSATA or USB3 device that accepts your media.)

Selecting 'None' is useful when preparing a disk for use when sharing disks iSCSI and with VMWare ESXi/vSphere.

Block Size (bytes)

The block or cluster size in bytes. The default for NTFS is 4K. The default for EXT4 is automatically determined based on the drive size.

FRS Size (bytes)

NTFS only. The File Record Segment or FRS size in bytes. The FRS size determines the number of extents allowed per file. To support large files (>500GB) it is recommended to use 4096. The default is 4096.

Setting this to 4096 is same as using the '-UseLargeFRS' option with the Format-Volume cmdlet in Windows PowerShell or the '/L' option with the format command from the Windows command line.

Volume Label

Volume Label to assign when formatting the removable drive.

3.4.7.2 Disk Tools

This allows various tools be run on the selected disk including checking the disk for errors, erasing the disk and resetting permissions on the files and folders on the disk.

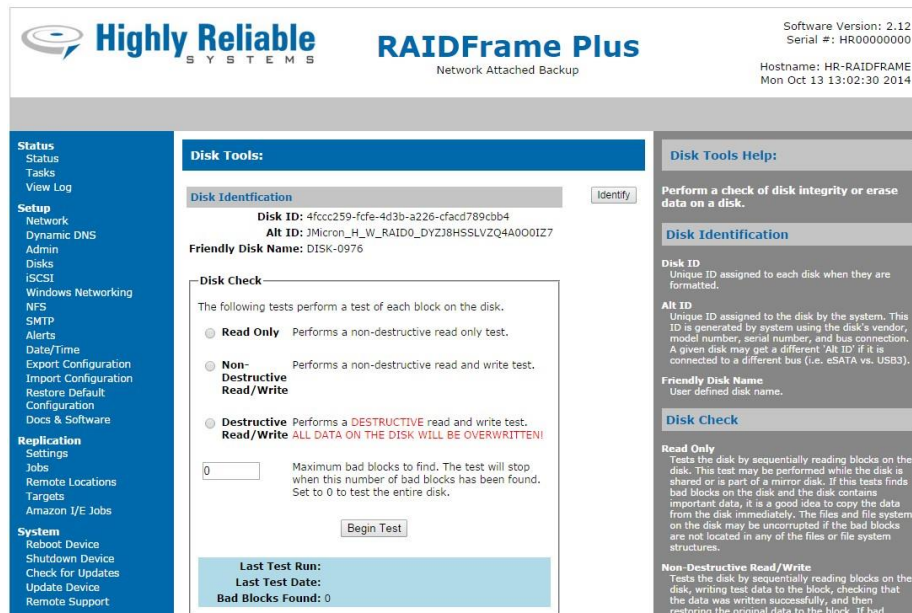


Illustration 100: Disk Tools

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Friendly Disk Name

User defined disk name. This may be used as the Share Name when shared in NAS mode or as part of the iSCSI Target Name depending on the settings in the 'Windows Networking' screen and the 'iSCSI' screen.

Disk Check

Read Only

Tests the disk by sequentially reading blocks on the disk. This test may be performed while the disk is shared or is part of a mirror disk. If this tests finds bad blocks on the disk and the disk contains important data, it is a good idea to copy the data from the disk immediately. The files and file system on the disk may be uncorrupted if the bad blocks are not located in any of the

files or file system structures.

Non-Destructive Read/Write

Tests the disk by sequentially reading blocks on the disk, writing test data to the block, checking that the data was written successfully, and then restoring the original data to the block. If bad blocks are found, see above. NOTE: The device should be connected to a UPS or data may be lost due to power failure.

Destructive Read/Write

Tests the disk by sequentially writing test patterns to each disk block and checking that the data was written successfully. The last pattern written is 0's that should trigger the bad block relocation or remapping feature of the hard disk so this may correct some or all of any bad blocks on the disk. A follow up test can be used to see if bad blocks have been fixed. NOTE: THIS WILL OVERWRITE THE EXISTING DATA ON THE DISK.

Maximum bad blocks to find

The disk check will stop when this number of bad blocks has been found. If set to 0, the entire disk will be checked. It is often useful to set this to 1 since even 1 bad block means the disk is having problems and there is little reason to continue checking. Small numbers of bad blocks may be corrected by triggering the disks bad block relocation or remapping feature by erasing the disk or running a Destructive Read/Write disk check on the disk.

Erase Disk

Begin/End

Erases the first and last 100MB of the disk. This can be useful to remove bad partition tables or raid meta data. NOTE: THIS WILL OVERWRITE THE EXISTING DATA ON THE DISK.

Entire Disk

Erases the entire disk. This can be useful to cause the disk to relocate or remap bad blocks on the disk. Note: this is not a secure erase, it simply writes 0's to every block on the disk. NOTE: THIS WILL OVERWRITE THE EXISTING DATA ON THE DISK.

Reset Permissions

Permissions Only

Resets permissions to allow read, write and delete by any user.

Permissions and Ownership

Resets permissions as above and sets ownership to the user defined in 'Windows Networking'.

Action URL's and Programs

The following URL's and programs can be used to perform actions on this disk from a remote computer. Right click on the URL and select 'Copy link address' and use that to create a shortcut on your desktop or download the VBScript program to your desktop.

Safely Remove

URL and program download to safely remove the disk.

Share

URL and program to re-share a disk after it has been safely removed.

Pause DeltaSync

URL and program download to pause a continuous DeltaSync.

Resume DeltaSync

URL and program download to resume a paused continuous DeltaSync.

3.4.7.3 Share

This shares the removable drive and makes it available for use.

This is useful if you have 'Safely Removed' the drive and need to use the drive without physically removing and inserting the drive.

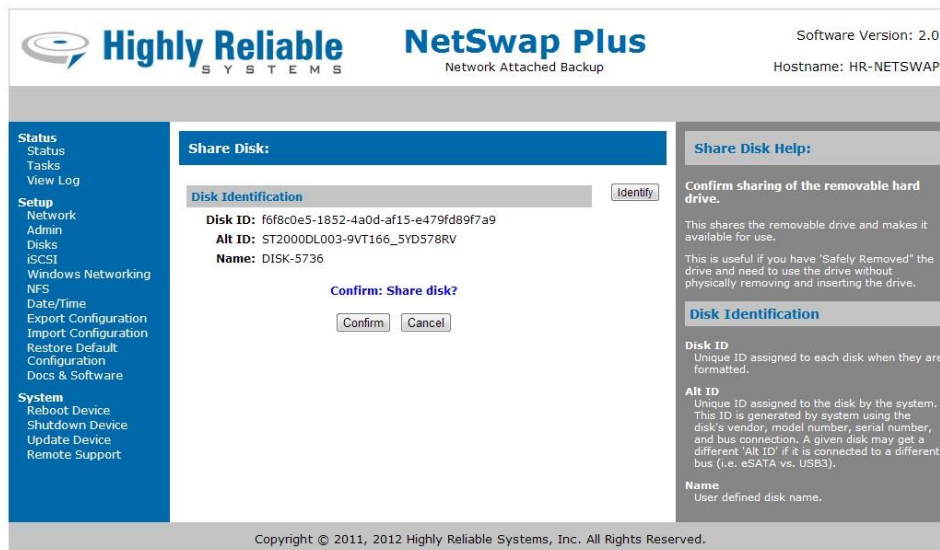


Illustration 101: Share

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Name

User defined disk name.

3.4.7.4 Safely Remove

This will flush all cached writes to the disk and disconnect it from the device so it is safe to remove without data loss.

Never remove a disk without using the 'Safely Remove' option or data loss or corruption can occur.

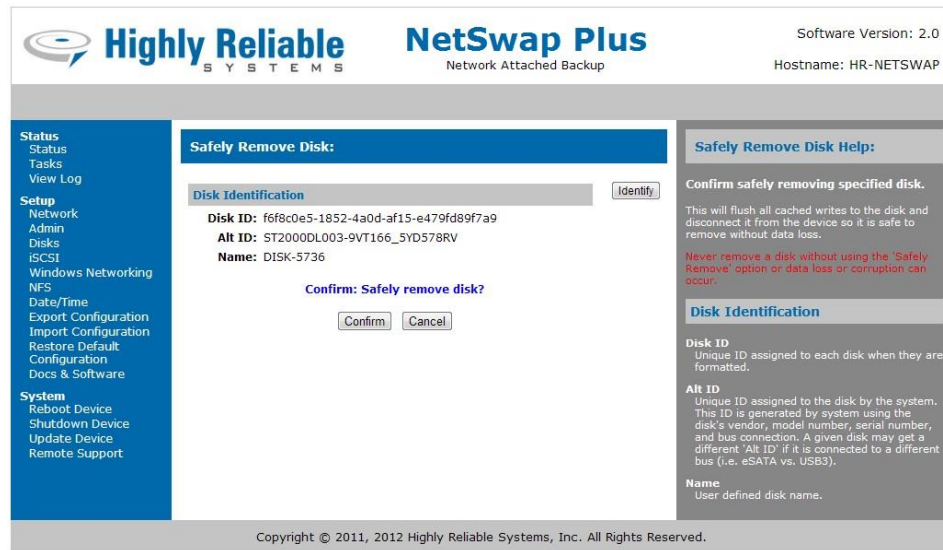


Illustration 102: Safely Remove

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Name

User defined disk name.

3.4.7.5 Smart Info

Display the SMART (Self-Monitoring, Analysis and Reporting Technology) information from the disk.
Note: disks connected via USB do not support SMART.

The screenshot shows the NetSwap Plus web interface. The top header includes the 'Highly Reliable SYSTEMS' logo, the 'NetSwap Plus' title with 'Network Attached Backup' subtitle, and software version '2.0' with hostname 'HR-NETSWAP'. A left sidebar contains navigation links: Status, Setup, and System, each with sub-links. The main content area is titled 'SMART Info:' and contains three sections: 'Disk Identification' (showing Disk ID, Alt ID, and Name), 'Smart Information' (displaying detailed SMART data including device model, serial number, capacity, and various SMART capabilities), and 'SMART Info Help:' (providing explanatory text about SMART and disk identification).

Illustration 103: Smart Info

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Name

User defined disk name.

SMART Information

Displays the SMART information as read from the disk.

3.4.7.6 Mirror Schedule (Plus models only)

View/edit the mirror schedule.

The screenshot shows the RAIDFrame Plus web interface. The top header includes the logo, 'RAIDFrame Plus Network Attached Backup', and 'Software Version: 2.05'. The sidebar on the left lists navigation options: Status, Setup, and System. The main content area is titled 'Disk Mirror Schedule:' and contains three sections: 'Disk Identification' (showing Disk ID, Alt ID, and Friendly Disk Name), 'Disk Information' (showing Vendor, Model, Capacity, and SMART Status), and 'Mirror Frequency' (with radio buttons for Continuous, Continuous with Scheduled Redundancy Check, and Scheduled, and various time interval options). The right-hand panel contains 'Disk Mirror Schedule Help' with sub-sections for Disk Identification, Disk Information, and Mirror Frequency, providing detailed explanations for each field.

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Friendly Disk Name

User defined disk name. This may be used as the Share Name when shared in NAS mode or as part of the iSCSI Target Name depending on the settings in the 'Windows Networking' screen and the 'iSCSI' screen.

Disk Information

Vendor

Disk vendor information if supplied.

Model

Disk model information if supplied.

Capacity

Size of the disk in GB or TB.

SMART Status

'OK' if the disk is ok, 'PREFAIL' if the is in the process of failing, and 'FAILING' if the disk is failing.

Mirror Frequency

Continuous

Select to specify that the disk should be attached to the mirror disk continuously.

Continuous with Scheduled Redundancy Check

Select to specify that the disk should be attached to the mirror disk continuously and that a mirror redundancy check be performed on the scheduled below. The mirror redundancy check verifies that the mirror is intact (both disks contain the same data) and corrects any errors found if possible.

Scheduled

Select to specify that the disk should be mirrored on the schedule specified below.

Every <n> hour(s)

Select to schedule the disk to be mirrored every <n> hours starting at a specific time. For example, every 3 hours starting at 09:00 am.

Every <n> day(s)

Select to schedule the disk to be mirrored every <n> days starting at a specific date and time. For example, every 2 days starting on 07/16/12 at 17:15.

Every <n> week(s)

Select to schedule the disk to be mirrored every <n> weeks on specific days of the week at specific times starting on specific date. For example, every 1 week on Monday at 06:00, Wednesday at 06:00, and Friday at 19:00 starting on 07/16/12.

Every <n> month(s)

Select to schedule the disk to be mirrored every <n> months on specific days of the month at specific times starting on a specific date. For example, every 1 month on the 1st and 15th at 06:00 starting on 07/16/12.

3.4.7.7 Mount Disk

Mount an encrypted volume.

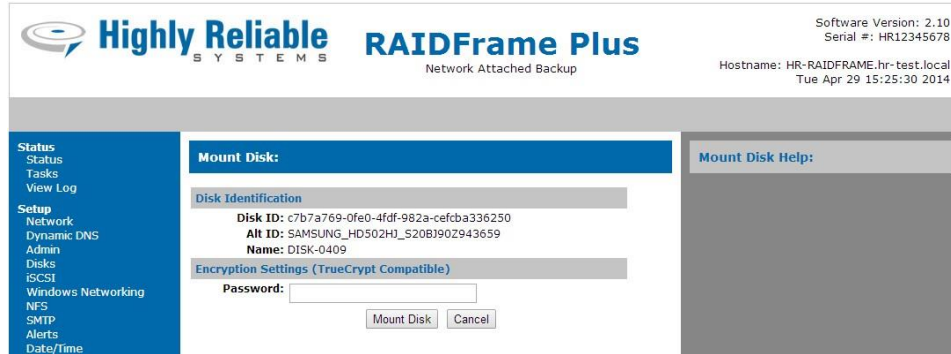


Illustration 104: Mount Disk

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Friendly Disk Name

User defined disk name. This may be used as the Share Name when shared in NAS mode or as part of the iSCSI Target Name depending on the settings in the 'Windows Networking' screen and the 'iSCSI' screen.

Encryption Settings(TrueCrypt compatible)

Password

Enter password used to encrypt volume.

3.4.7.8 Quick DeltaSync

Perform a quick one-time copy of data from source disk to destination disk using DeltaSync. DeltaSync copies only files and folders from the source disk that are different or do not exist on the destination disk.

Note: it does delete existing files and folders on the destination disk if they do not exist on the source disk.

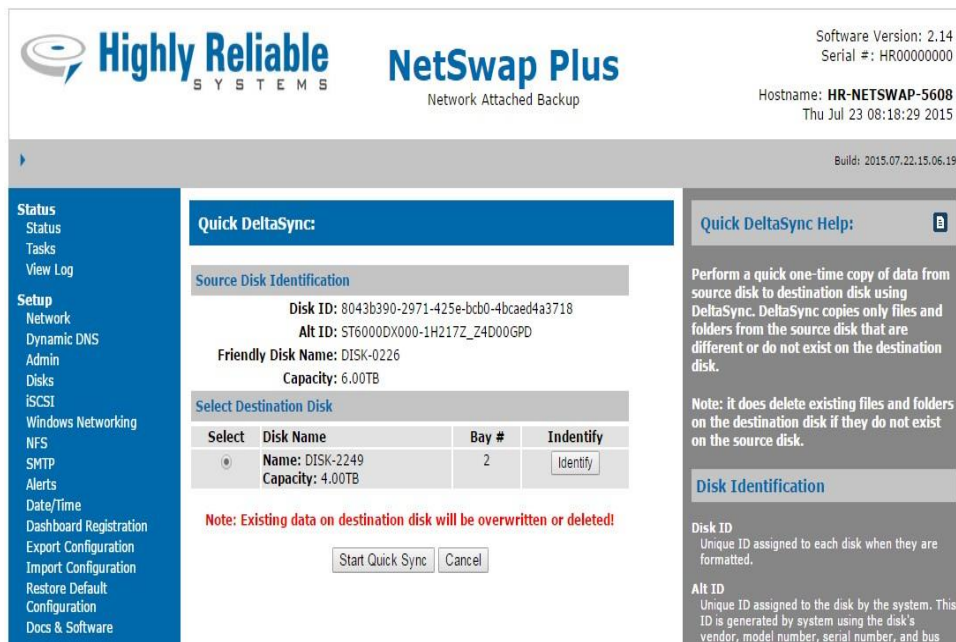


Illustration 105: Quick DeltaSync

Source Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (i.e. eSATA vs. USB3).

Friendly Disk Name

User defined disk name.

Capacity

Size of the disk in GB or TB.

Select Destination Disk

Select the disk to sync the data to.

3.4.8 Seeding Operations (NetSwap/RAIDFrame Plus Only)

3.4.8.1 Make Seed

Mark the selected disk as a seed disk and remove it from the mirror disk. In order for a disk to be made into a seed disk it must be a member of an active mirror disk and the mirror disk must not be rebuilding.



Illustration 106: Make Seed

RAID Identification

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this RAID Set.

Array Size

Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for this RAID set.

Status

Status of the RAID Set, either 'Active' or 'Not Active'.

State

Displays the current state of the RAID Set (e.g. if it is degraded, rebuilding, etc.).

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Friendly Disk Name

User defined disk name.

Click 'Confirm' to make the seed disk, or 'Cancel' to cancel the operation.

3.4.8.2 Unmark Seed Disk

Unmark seed disk. The seed will be unmarked and can be added back to the RAID disk it was removed from by removing and reinserting the disk. No data on the disk will be destroyed.

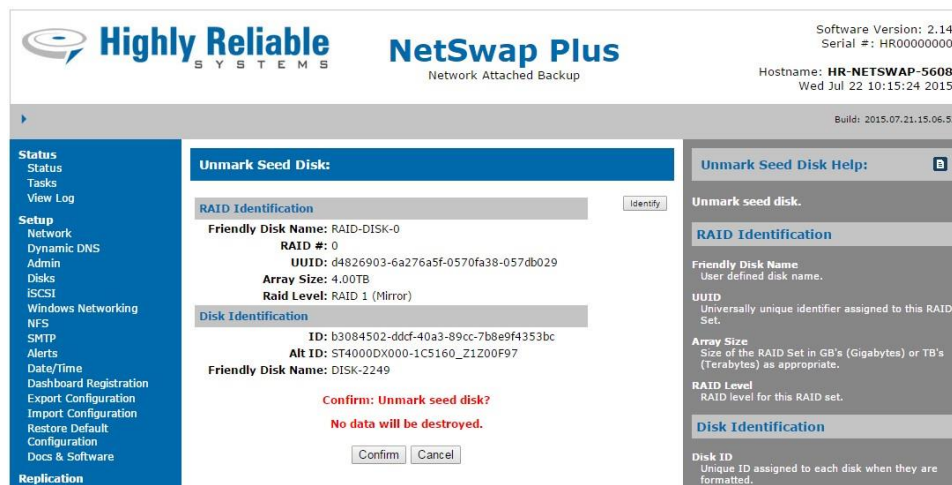


Illustration 107: Unmark Seed Disk

RAID Disk Identification

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this RAID Set.

Array Size

Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for this RAID set.

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Friendly Disk Name

User defined disk name.

3.4.8.3 Seed RAID Disk

Seed a RAID 1 disk with the specified disk.

If the RAID disk currently exists, the RAID disk will be paused and restarted with the selected disk as the master disk and any other disks already in the RAID will be added to the restarted RAID disk and a rebuild will start, copying the data from the seed disk to the other disk(s). The data on the old RAID disk will be overwritten by the new data on the seed disk.

If the RAID disk does not exist, a new RAID disk will be created with the selected seed disk as the master.

The screenshot shows the 'Seed RAID Disk' configuration page in the NetSwap Plus web interface. The page has a blue sidebar with navigation links: Status, Setup, and Replication. The main content area is titled 'Seed RAID Disk' and contains a 'RAID Identification' section with fields for 'Friendly Disk Name' (RAID-DISK-0), 'RAID #' (0), 'UUID' (d4826903-6a276a5f-0570fa38-057db029), 'Array Size' (4.00TB), and 'RAID Level'. Below this is a 'Disk Identification' section with fields for 'ID' (b3084502-ddcf-40a3-89cc-7b8e9f4353bc), 'Alt ID' (ST4000DX000-1C5160_Z1Z00F97), and 'Friendly Disk Name' (DISK-2249). A warning message states: 'Warning: Existing RAID disk 'RAID-DISK-0' will be paused and restarted with this disk as the master. All data on 'RAID-DISK-0' will be overwritten by the seed disk data.' Below this is a 'Confirm: Seed RAID from selected disk?' message with 'Confirm' and 'Cancel' buttons. A 'Seed RAID Disk Help' sidebar on the right provides additional instructions.

Illustration 108: Seed RAID Disk

RAID Identification

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this RAID Set.

Array Size

Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for this RAID set.

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (e.g. eSATA vs. USB3).

Friendly Disk Name

User defined disk name.

Click 'Confirm' to seed a RAID disk from the selected disk or 'Cancel' to cancel the operation.

3.4.9 Create RAID Disk (NetSwap/RAIDFrame Plus only)

Create a new RAID disk from physical disks.

The screenshot shows the NetSwap Plus web interface. The top header includes the 'Highly Reliable' logo, 'NetSwap Plus' title, and 'Network Attached Backup' subtitle. On the right, it displays 'Software Version: 2.14', 'Serial #: HR00000000', 'Hostname: HR-NETSWAP-5608', and the date 'Wed Jul 22 08:30:14 2015'. A build date 'Build: 2015.07.21.15.06.52' is at the bottom right.

The left sidebar contains navigation links: Status, Tasks, View Log, Setup (Network, Dynamic DNS, Admin, Disks, iSCSI, Windows Networking, NFS, SMTP, Alerts, Date/Time, Dashboard Registration, Export Configuration, Import Configuration, Restore Default Configuration, Docs & Software), and Replication Settings.

The main content area is titled 'Create RAID Disk:'. It features a table of 'Available Disks' with columns for 'Select', 'Disk Name', 'Capacity', 'Bay #', 'Identify', and 'Master'. Two disks are listed: 'DISK-0226' (6.00TB, Bay 1) and 'DISK-2249' (4.00TB, Bay 2). Below the table, the 'RAID Information' section shows 'RAID Level' set to 'RAID 1 (Mirror)', 'Chunk Size' set to '16K', and checkboxes for 'Assume Clean', 'Use Write-Intent Bitmap', and 'Use MAX Array Size Possible'. A 'Custom Array Size (GB)' field is set to 0. 'Create' and 'Reset' buttons are at the bottom.

On the right, the 'Create RAID Disk Help:' section provides instructions on selecting disks for RAID 1 (Mirror) and a note about creating a RAID 1 with existing data.

Illustration 109: Create RAID Disk

Available Disks

Select the disks to be configured into a RAID Disk. For RAID 1, you should also select one of the disks to be the “master” or the disk that is not removed.

Note: To create a RAID 1 (mirror) with a specific disk as the master disk, create the RAID Disk with only the master disk selected. Then after the RAID Disk is created add the remaining disks to the RAID Disk using the 'Add Disk' button on the 'RAID Properties' screen as shown below. This will preserve any data that may be on the master disk.

RAID Information

RAID Level

Select RAID Level. Options are:

- RAID 0 (Striped)
- RAID 1 (Mirror)
- RAID 5 (Single Parity)
- RAID 6 (Double Parity)
- RAID 10 (Mirror + Striped)

Chunk Size

RAID chunk size for RAID 0, RAID 5, RAID 6, and RAID 10. The default is 16K and provides the best performance with most filesystems. For NTFS the Block Size selected when formatting should be a multiple of the Chunk Size for best performance. For instance, for a Chunk Size of 16K, the NTFS Block Size should be set to 32K or 64K (Note: If the Block Size is set to 'Default' when formatting the NetSwap will calculate the best Block Size to use, if possible).

Assume Clean

Causes the Mirror to start in a clean state.

Use Write-Intent Bitmap

Check this to create a RAID (RAID 5 or 6 only) with a write-intent bitmap. A write-intent-bitmap keeps track of changes made to the RAID that will reduce rebuild times if the device crashes or a disk is removed and reinserted. It can degrade write performance and will not improve rebuild speed if a disk fails and is replaced.

Use MAX Array Size Possible

Check this to create the largest RAID Disk possible with the selected disks. This will be a multiple of the size of the smallest disk selected as shown below where N is number of disks selected and S is the size of the smallest disk:

RAID 0 (Striped)	$N * S$
RAID 1 (Mirror)	S
RAID 5 (Single Parity)	$(N - 1) * S$
RAID 6 (Double Parity)	$(N - 2) * S$
RAID 10 (Mirror + Striped)	$(N / 2) * S$

Custom Array Size

If not using the MAX Array Size, enter the number of GB (GigaBytes) to be used for the RAID Disk.

3.4.10 RAID Properties (NetSwap/RAIDFrame Plus only)

View/edit the RAID properties.

Highly Reliable Systems **NetSwap Plus**
Network Attached Backup

Software Version: 2.14
Serial #: HR00000000
Hostname: HR-NETSWAP-5608
Wed Jul 22 08:47:46 2015
Build: 2015.07.21.15.06.52

RAID Properties:

RAID Information Pause Add Disk

Friendly Disk Name: RAID-DISK-0
RAID #: 0
UUID: 7494bc92-d2fda67b-d7a367f8-597b853b
Array Size: 4.00TB
RAID Level: RAID 1 (Mirror)
Status: Active
State: Clean
RAID Disks: 2
Active Disks: 2
Working Disks: 2
Failed Disks: 0
Spare Disks: 0

Advanced Options

RAID Disks:
Min Sync Speed: MB/s
Max Sync Speed: MB/s
Save Cancel

Disks in RAID

Bay #	Number	RAID Device	Friendly Disk Name	Status	Action
1	0	0	DISK-0226	Active Sync Master	Remove Identify
2	1	1	DISK-2249	Active Sync	Remove Set Master Identify

RAID Properties Help: ?

View/edit the RAID properties.

RAID Information

Friendly Disk Name
User defined disk name.

UUID
Universally unique identifier assigned to this RAID.

Array Size
Size of the Mirror in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level
RAID level for this RAID set.

Status
Status of the Mirror, either 'Active' or 'Not Active'.

State
Displays the current state of the Mirror (i.e. if it is degraded, rebuilding, etc.).

Rebuild
If rebuilding, this will display the status of the rebuild in percent.

Remaining Time
Time remaining for rebuild to complete.

Rebuild Speed
Speed of the rebuild.

RAID Disks
Total number of disks in the RAID Disk.

Active Disks
Number of disks currently active in the RAID Disk.

Working Disks
Number of disks currently working in the RAID Disk.

Illustration 110: RAID Properties

RAID Information

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this Mirror.

Array Size

Size of the RAID in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for RAID set.

Status

Status of the RAID, either 'Active' or 'Not Active'.

State

Displays the current state of the RAID (e.g. if it is degraded, rebuilding, etc.).

Rebuild

If rebuilding, this will display the status of the rebuild in percent.

Remaining Time

Time remaining for rebuild to complete.

Rebuild Speed

Speed of the rebuild.

RAID Disks

Total number of disks in the RAID Disk.

Active Disks

Number of disks currently active in the RAID Disk.

Working Disks

Number of disks currently working in the RAID Disk.

Failed Disks

Number of disks that have failed in the RAID Disk.

Spare Disks

Number of disks available as spares in the RAID Disk.

Action Buttons

Buttons showing the actions that can be taken with the RAID by clicking the button. Possibilities are:

Resume

Resume the Mirror. This will enable the RAID and make it available for sharing. This action should only be used as directed by Technical Support personnel. Only displayed if the RAID has been paused.

Pause

Pause the RAID. This will disable the RAID and make it unavailable for sharing. No data or RAID configuration information will be lost. This action should only be used before "breaking" a RAID or as directed by Technical Support personnel. Only displayed if the RAID is enabled.

Break RAID

Break the RAID. This will separate the disks that form the RAID. No data will be lost. Only displayed if the RAID has been paused.

Add Disk

Add disk to RAID. Adding a disk makes the disk a part of the RAID and rebuilding will begin immediately. Only displayed if the RAID is not paused.

Advanced Options**RAID Disks**

Number of active disks in the RAID. This can only be modified for RAID 1 (Mirror).

Use Write-Intent Bitmap

Check this to use a write-intent bitmap (RAID 5 or 6 only). A write-intent-bitmap keeps track of changes made to the RAID that will reduce rebuild times if the device crashes or a disk is removed and reinserted. It can degrade write performance and will not improve rebuild speed if a disk fails and is replaced.

Min Sync Speed

The minimum speed in MB/s when syncing or rebuilding the RAID disk. The default value is 1 which places priority on reads and writes to the disk (such as a backup job) rather than syncing the RAID disk.

Max Sync Speed

The maximum speed in MB/s when syncing or rebuilding the RAID disk. The default value is 1000 which allows syncing at the fastest possible speed.

Disks in RAID

Bay #

Bay in which disk is installed.

Number

Disk number.

RAID Device

Position of the disk in the set starting at 0.

Friendly Disk Name

Name of the disk.

Status

Displays the current status of the disk as either active or spare.

Action

Buttons showing the actions that can be taken with the disk by clicking the button. Possibilities are:

Remove

Remove disk from RAID. This will remove the RAID meta-data from the disk so that is no longer a part of the RAID, but will not destroy any data on the disk. All partitions and file systems will remain intact (for RAID 1).

Identify

Identify disk by blinking disk light. Only displayed if disk is installed.

3.4.10.1 Resume RAID

Resume the RAID. This will enable the RAID and make it available for sharing. This action should only be used as directed by Technical Support personnel. Only displayed if the RAID has been paused.

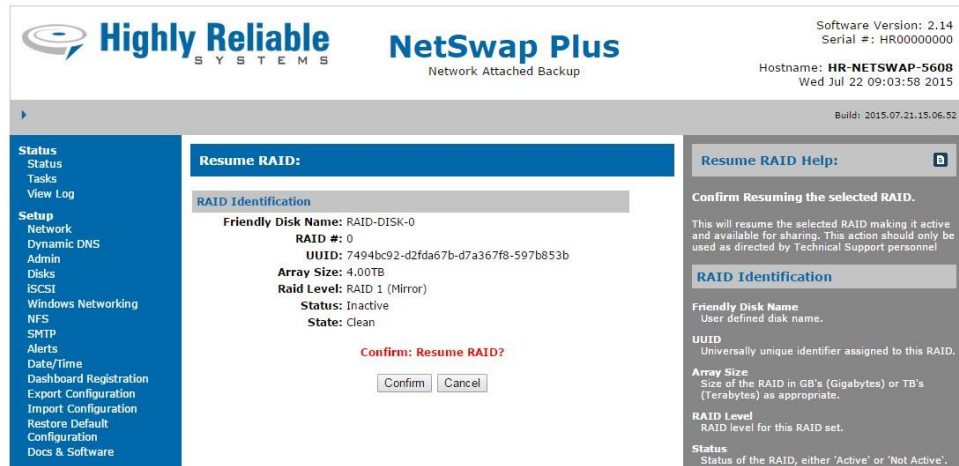


Illustration 111: Resume RAID

3.4.10.2 Pause RAID

Pause the RAID. This will disable the RAID and make it unavailable for sharing. No data or RAID configuration information will be lost. This action should only be used before "breaking" a RAID or as directed by Technical Support personnel. Only displayed if the RAID is enabled.

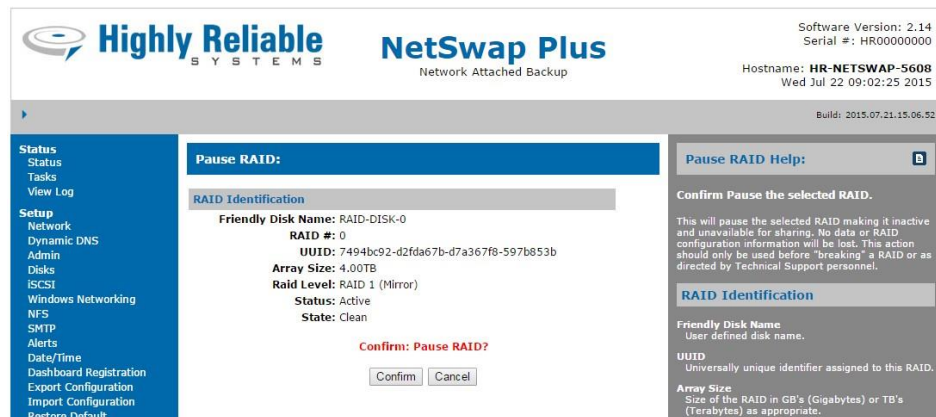


Illustration 112: Pause RAID

RAID Identification

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this RAID Set.

Array Size

Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for this RAID set.

Status

Status of the RAID Set, either 'Active' or 'Not Active'.

State

Displays the current state of the RAID Set (i.e. if it is degraded, rebuilding, etc.).

3.4.10.3 Break RAID

Break the RAID. This will separate the disks that form the RAID. No data will be lost. Only displayed if the RAID has been paused.

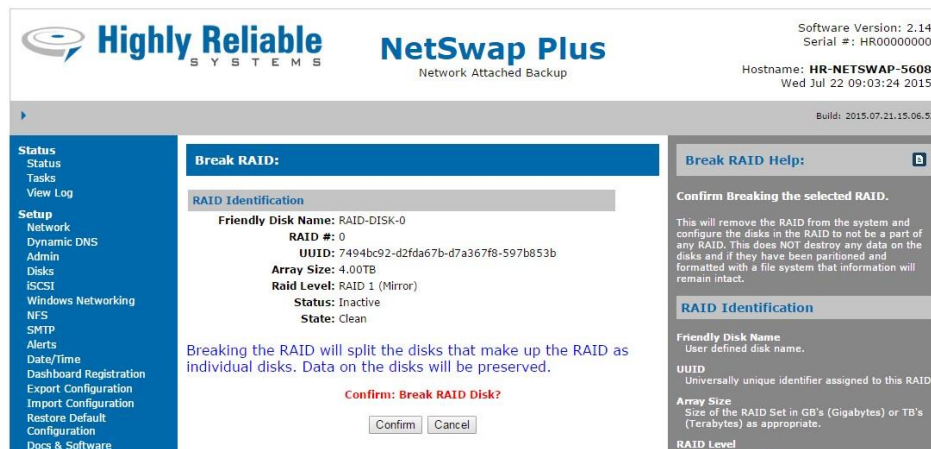


Illustration 113: Break RAID

RAID Identification

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this RAID Set.

Array Size

Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for this RAID set.

Status

Status of the RAID Set, either 'Active' or 'Not Active'.

State

Displays the current state of the RAID Set (i.e. if it is degraded, rebuilding, etc.).

3.4.10.4 Add Disk

Add disk to RAID. Adding a disk makes the disk a part of the RAID and rebuilding will begin immediately. Only displayed if the RAID is not paused.

The screenshot shows the NetSwap Plus web interface. The top header includes the logo, version (2.14), serial number (HR00000000), and hostname (HR-NETSWAP-5608). The left sidebar contains navigation links: Status, Tasks, View Log, Setup, Network, Dynamic DNS, Admin, Disks, iSCSI, Windows Networking, NFS, SMTP, Alerts, Date/Time, Dashboard Registration, Export Configuration, Import Configuration, Restore Default, and Configuration. The main content area is titled 'Add Disk to RAID:' and contains a 'RAID Identification' section with fields for Friendly Disk Name (RAID-DISK-0), RAID # (0), UUID (7494bc92-d2fda67b-d7a367f8-597b853b), Array Size (4.00TB), RAID Level (RAID 1 (Mirror)), and Status (Active). Below this is a table for 'Available Disks (select one)' with columns for Select, Disk Name, Bay #, and Identify. The table shows one disk: DISK-2249 with a capacity of 4.00TB. There are 'Add' and 'Reset' buttons. A right-hand panel titled 'Add Disk to RAID Help:' provides additional information about RAID identification, array size, RAID level, and status.

Illustration 114: Add Disk

RAID Identification

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this RAID Set.

Array Size

Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for this RAID set.

Status

Status of the RAID Set, either 'Active' or 'Not Active'.

State

Displays the current state of the RAID Set (i.e. if it is degraded, rebuilding, etc.).

Action Buttons

Buttons showing the actions that can be taken with the disk by clicking the button. Possibilities are:

Identify

Identify disk by blinking disk light. Only displayed if disk is installed

Available Disks

Select the disk to be added to the RAID.

3.4.10.5 Remove Disk

Remove disk from RAID. This will remove the RAID meta-data from the disk so that is no longer a part of the RAID, but will not destroy any data on the disk (for RAID 1). All partitions and file systems will remain intact.

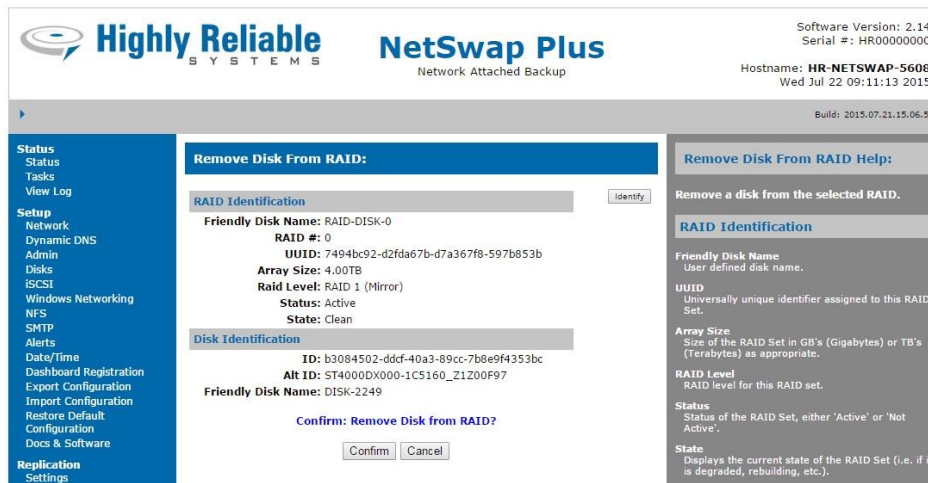


Illustration 115: Remove Disk

RAID Identification

Friendly Disk Name

User defined disk name.

UUID

Universally unique identifier assigned to this RAID Set.

Array Size

Size of the RAID Set in GB's (Gigabytes) or TB's (Terabytes) as appropriate.

RAID Level

RAID level for this RAID set.

Status

Status of the RAID Set, either 'Active' or 'Not Active'.

State

Displays the current state of the RAID Set (i.e. if it is degraded, rebuilding, etc.).

Action Buttons

Buttons showing the actions that can be taken with the disk by clicking the button. Possibilities are:

Identify

Identify disk by blinking disk light. Only displayed if disk is installed

Disk Identification

Disk ID

Unique ID assigned to each disk when they are formatted.

Alt ID

Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (i.e. eSATA vs. USB3).

Friendly Disk Name

User defined disk name.

4 High-Rely iSCSI Connector Software

The software allows easy configuration and management of iSCSI connected NetSwap/RAIDFrame Plus devices. It allows connection and safe removal of iSCSI hard drives to insure data safety.

Safely removing the hard drive before physically removing the drive from the NetSwap/RAIDFrame Plus is important to insure that any cached data is written to the drive. Otherwise data corruption can occur.

The software consists of a High-Rely iSCSI Connector Service (a Windows service) to manage automatically connecting and reconnecting iSCSI attached NetSwap/RAIDFrame Plus hard drives and the High-Rely iSCSI Connector Admin program that allows you to connect and safely remove NetSwap/RAIDFrame Plus iSCSI hard drives and to configure the High-Rely iSCSI Connector Windows service to automatically connect and reconnect NetSwap/RAIDFrame Plus iSCSI hard drives.

The software is compatible with Windows XP SP2+, Server 2003 SP2+, 2008, Vista, and Windows 7. It is not compatible with Windows 2000, XP without SP2 or Server 2003 without SP2.

This software is not a replacement for the Microsoft iSCSI Initiator. It works with the iSCSI Initiator to make sure disks are reconnected if connection is lost or disks are swapped and allows safe removal of the disks.

Note that you must have administrator privileges to install and run this program.

4.1 Installation

The software is available on the network share HR-INFO on the NetSwap/RAIDFrame Plus or can be downloaded from our website at: <http://high-rely.com>

Click on the installation executable.

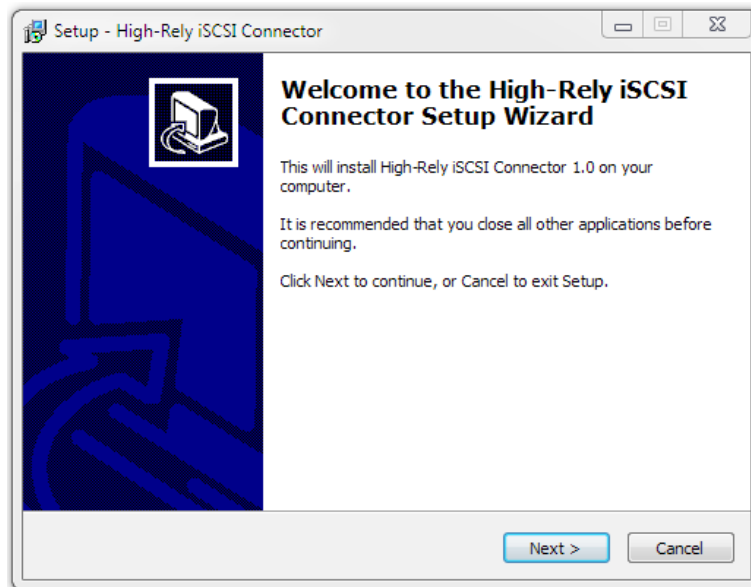


Illustration 116: High-Rely iSCSI Connector Setup Wizard

Click 'Next' to begin the installation.

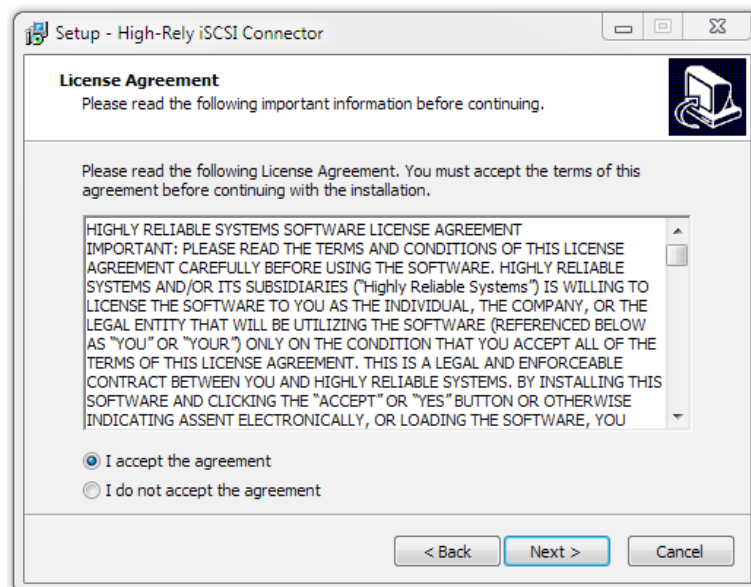


Illustration 117: High-Rely iSCSI Connector Setup Wizard License

Accept the license agreement and click 'Next'.

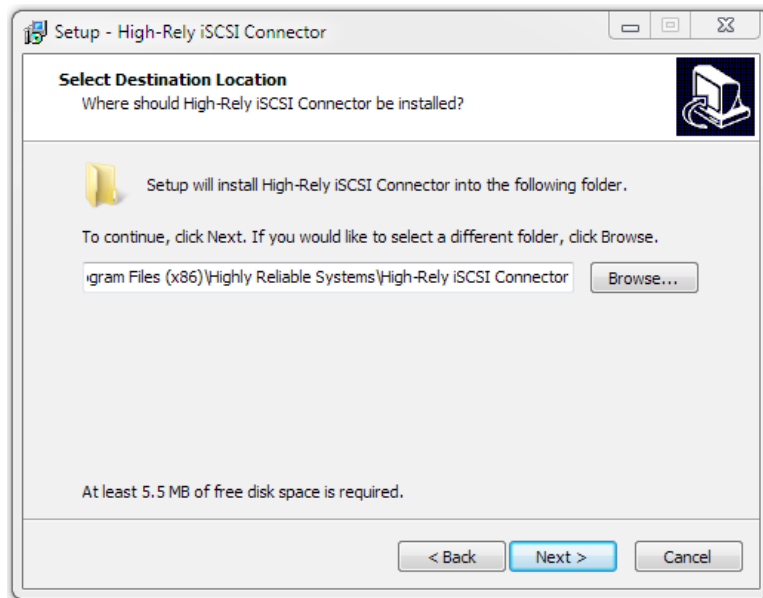


Illustration 118: High-Rely iSCSI Connector Setup Wizard Destination

Select a location on your hard disk to install the software or use the default. Click 'Next' to continue.

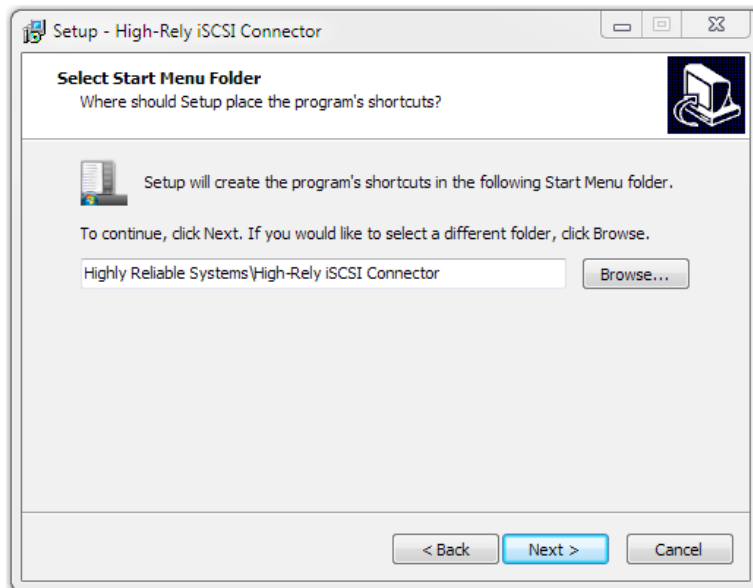


Illustration 119: High-Rely iSCSI Connector Setup Wizard Shortcuts

Enter the name of the Start menu folder or use the default. Click 'Next' to continue.

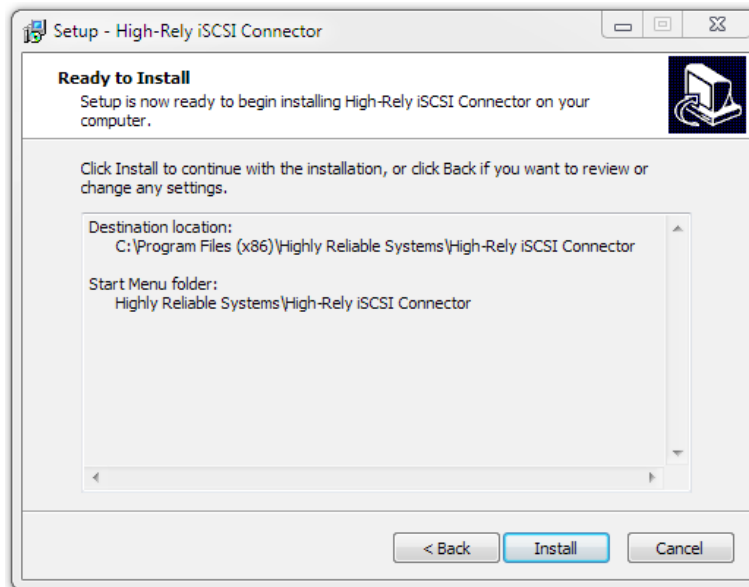


Illustration 120: High-Rely iSCSI Connector Setup Wizard Install

Verify the destination and Start menu folders. Click 'Install' to begin the installation. The software will be installed. Several windows may pop up during the installation, this is normal.

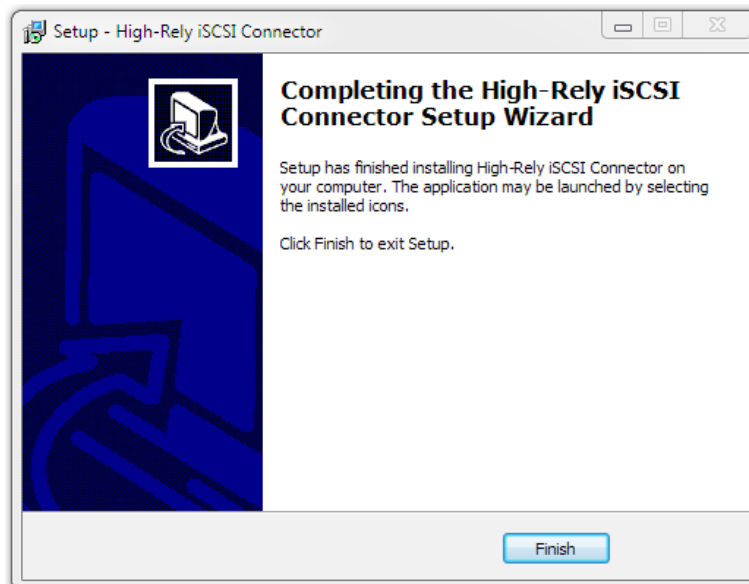


Illustration 121: High-Rely iSCSI Connector Setup Wizard Complete

Click 'Finish' to complete the installation.

4.2 Operation

4.2.1 iSCSI Targets

This tab displays the current iSCSI targets, what drive letter they are attached to (if any), and the connection status.



Illustration 122: iSCSI Targets

From this tab you may 'Connect' to a NetSwap/RAIDFrame Plus iSCSI hard drive, 'Safely Remove' a NetSwap/RAIDFrame Plus iSCSI hard drive, and refresh the list of iSCSI targets.

4.2.1.1 Connect

To connect to an unconnected iSCSI target, select the target and click the 'Connect' button. You will be prompted for CHAP name/username and secret/password and whether or not to make this connection persistent. Making a connection persistent tells the High-Rely iSCSI Connector Service to automatically connect or reconnect to the NetSwap/RAIDFrame Plus hard drive whenever it is available and will add the target to the list of persistent/favorite targets.

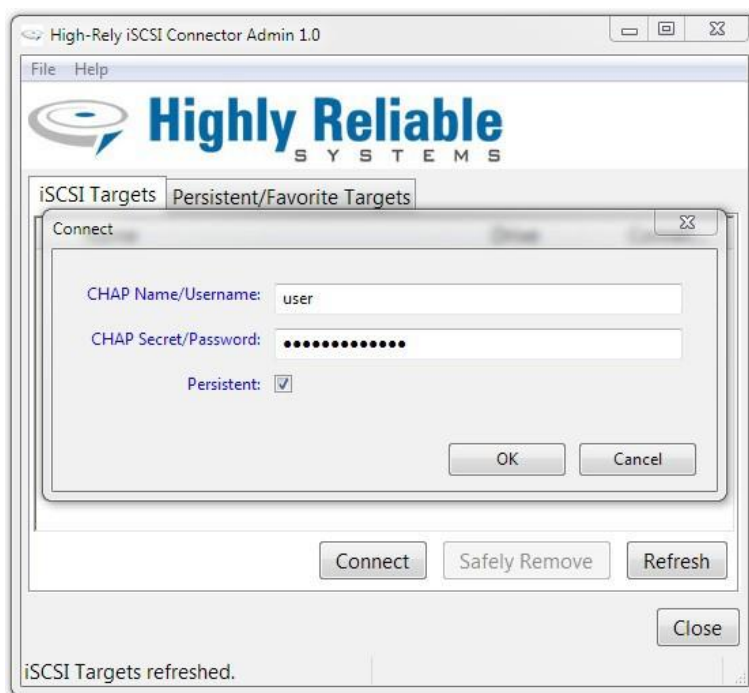


Illustration 123: iSCSI Target Connect

4.2.1.2 Safely Remove

The 'Safely Remove' option instructs Windows to write any cached data to the NetSwap/RAIDFrame Plus and disconnect it from the system.

To safely remove a connected NetSwap/RAIDFrame Plus iSCSI target, select the target and click the 'Remove' button.

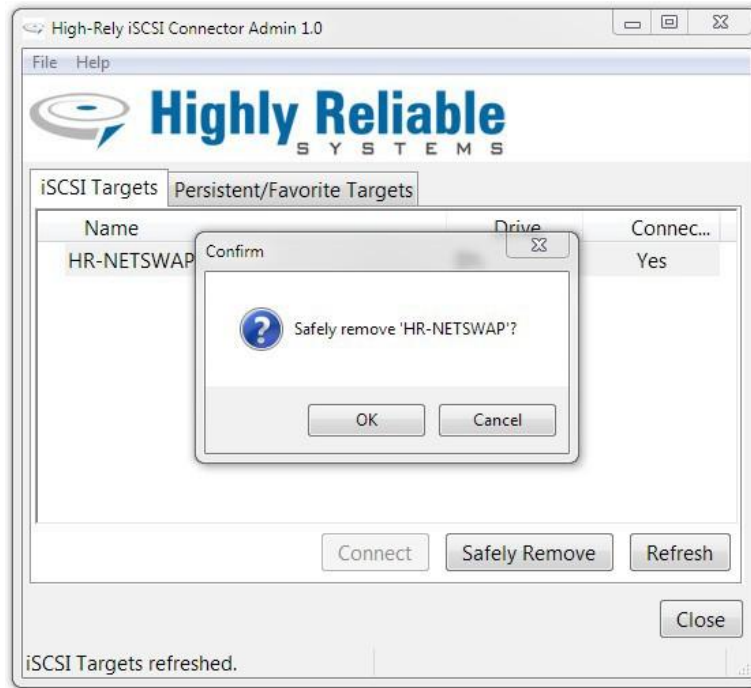


Illustration 124: iSCSI Target Safely Remove

You will be prompted to confirm the removal, click 'Ok' to confirm.

On success you will be notified when it is safe to remove the drive. On failure, you will be notified of the error encountered while attempting to remove the drive.

Note: Sometimes when you attempt to safely remove the NetSwap/RAIDFrame Plus drive you will be notified that it was unable to remove the drive because the device is in use. Sometimes Windows programs incorrectly leave files locked, so it may still be safe to remove the drive. Just make sure there are no programs (including Explorer) that may be accessing the drive.

4.2.1.3 Refresh

This option instructs Windows to refresh the current list of Targets. This may take 30 seconds or more depending on how many iSCSI target portals the iSCSI initiator has listed under 'Discovery'. You should remove any devices from Discovery that are no longer connected to the network as this can slow the refresh process down significantly.

4.2.2 Persistent/Favorite Targets

This tab displays the current list of Persistent or Favorite targets and whether or not they are to be automatically connected (and reconnected after being safely removed and swapped) by the High-Rely iSCSI Connector Service.

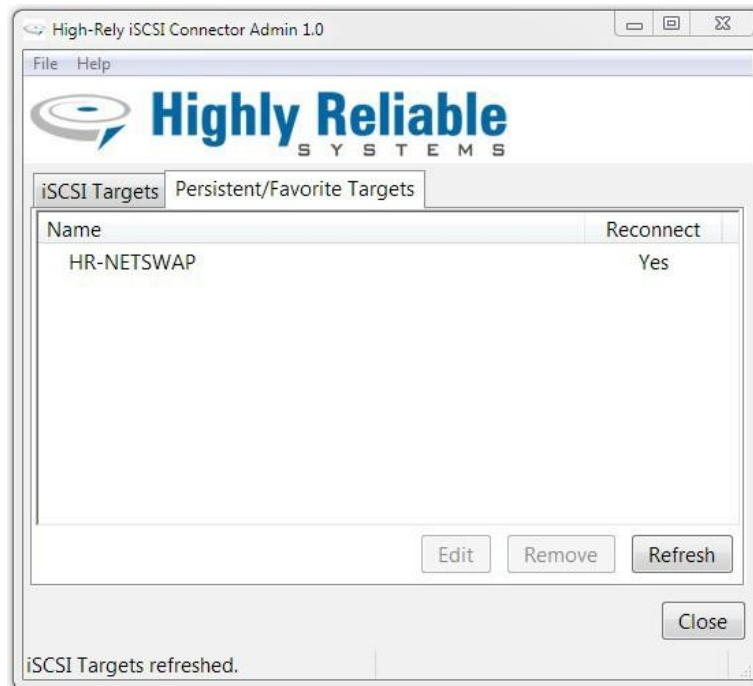


Illustration 125: Persistent/Favorite Targets

From this tab you may 'Edit' to a persistent target, 'Remove' a persistent target, and refresh the list of persistent/favorite targets.

4.2.2.1 Edit

This option allows you to edit the CHAP Name/Username, Secret/Password, and whether or not this device is to be reconnected automatically. Select the desired target from the list and click the 'Edit' button to edit the target information.

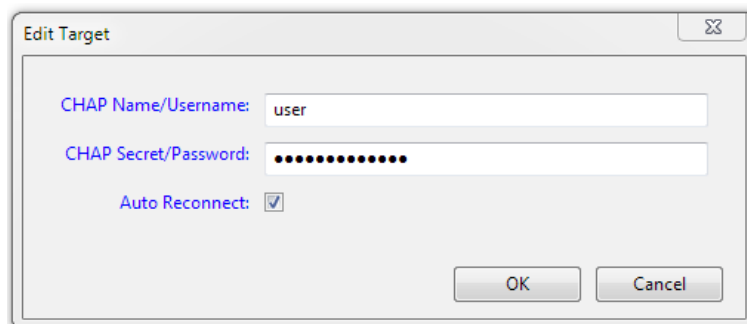


Illustration 126: Edit Persistent Target

Edit the information as desired and click 'Ok' to save the changes or 'Cancel' to exit without saving.

4.2.2.2 Remove

This option allows you to remove a target from the persistent/favorite targets list. Select the target to be removed and click the 'Remove' button.

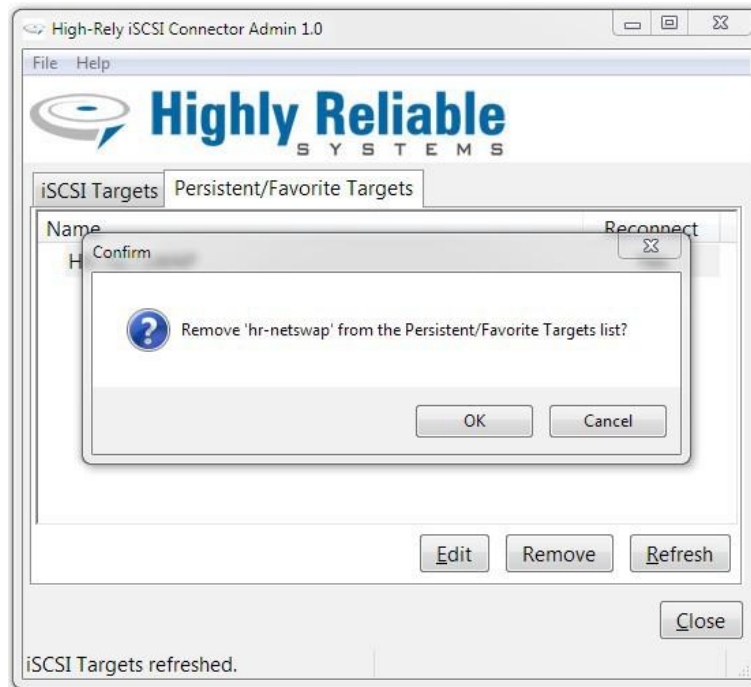


Illustration 127: Remove Persistent Target

You will be prompted to confirm the removal, click 'Ok' to confirm.

4.2.2.3 Refresh

This option refreshes the list of persistent/favorite targets from the Microsoft iSCSI Initiator. This is useful if changes have been made in the Microsoft iSCSI Initiator.

5 Configuration Examples

5.1 iSCSI Mode

5.1.1 Windows

This walk through starts at the HTML interface of the NetSwap/RAIDFrame Plus and shows the basics of sharing a disk in iSCSI. After setting up the NetSwap/RAIDFrame Plus side, the user will need to go to a Windows machine to establish the iSCSI connection using the iSCSI target software. Note that screen shots below are from Windows 7 and the actual screens on other versions of Windows may be slightly different.

If the disk has not been formatted by the NetSwap/RAIDFrame Plus, format the disk with the NTFS file system as detailed in the 'Disk Preparation' section above. Once formatted, select the disk properties from the 'Disks' screen as shown below:

The screenshot shows the NetSwap Plus web interface. The top header includes the logo for 'Highly Reliable Systems' and 'NetSwap Plus Network Attached Backup', along with 'Software Version: 2.0' and 'Hostname: HR-NETSWAP'. On the left is a navigation menu with options like Status, Tasks, View Log, Setup, Network, Admin, Disks, iSCSI, Windows Networking, NFS, Date/Time, Export Configuration, Import Configuration, Restore Default Configuration, Docs & Software, System, Reboot Device, Shutdown Device, Update Device, and Remote Support. The main content area is titled 'Disks:' and has a 'Display:' dropdown set to 'Installed Disks'. Below this is a table for 'Physical Disks (2)'. The table has columns: Friendly Disk Name, Mode, Details, Status, and Action. The first row is for DISK-2442, which is 'Installed' and 'Not Shared'. The second row is for DISK-6146, which is also 'Installed' and 'Not Shared'. A red arrow points to the 'Properties' button in the 'Action' column for DISK-6146. Below the Physical Disks table is a section for 'Mirror Disks' which currently shows 'No disks found.' and a 'Create Mirror Disk' button. On the right side, there is a 'Disks Help' section with information about displaying disks, naming disks, and share modes.

Friendly Disk Name	Mode	Details	Status	Action
DISK-2442	N/A	2.00TB Filesystem: NONE	Installed Not Shared	Properties Format Identify
DISK-6146	N/A	2.00TB Filesystem: NTFS	Installed Not Shared	Properties Format Identify

Disk Properties Button

Illustration 128: Disk Properties Button

From the Disk Properties screen optionally enter a name for disk and select 'iSCSI' from the 'Share Mode' drop down box.

Highly Reliable **NetSwap Plus** Software Version: 2.0
 NETWORK ATTACHED BACKUP Hostname: HR-NETSWAP

Status
 Status
 Tasks
 View Log

Setup
 Network
 Admin
 Disks
 iSCSI
 Windows Networking
 NFS
 Date/Time
 Export Configuration
 Import Configuration
 Restore Default Configuration
 Docs & Software

System
 Reboot Device
 Shutdown Device
 Update Device
 Remote Support

Disk Properties:

Disk Identification
 Disk ID: f6f8c0e5-1852-4a0d-af15-e479fd89f7a9
 Alt ID: ST2000DL003-9VT166_5YD578RV
 Friendly Disk Name: DISK-2442

Disk Information
 Vendor: ATA
 Model: ST2000DL003-9VT1
 Capacity: 2.00TB
 File System: NONE
 Installed: Yes
 Shared: No
 Formatted: Yes
 SMART Status: OK

Sharing
 Share Mode: iSCSI
 iSCSI CHAP Username/Password
☐ Use Individual CHAP Username/Password
 (Global CHAP Username/Password will be used if unchecked)

Save **Cancel**

Disk Properties Help:
 View/edit the disk properties.
Disk Identification
 Disk ID
 Unique ID assigned to each disk when they are formatted.
 Alt ID
 Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (i.e. eSATA vs. USB3).
 Friendly Disk Name
 User defined disk name.
 Action Buttons
 Buttons showing the actions that can be taken with the disk by clicking the button. Possibilities are:
 Format
 Format disk. Only displayed if disk is not shared or part of a Mirror Set.
 Identify
 Identify disk by blinking disk light. Only displayed if disk is installed.
 Share
 Share disk if it is installed and has been safely removed.
 Safely Remove
 Safely remove disk if installed and shared in NAS mode.
 SMART Info

Illustration 129: Disk Properties

Then click the 'Save' button. The NetSwap/RAIDFrame Plus will save the changes and begin sharing the disk in iSCSI mode. The 'Disks' screen will now show the disk as being shared iSCSI as shown below:

Highly Reliable **NetSwap Plus** Software Version: 2.0
 NETWORK ATTACHED BACKUP Hostname: HR-NETSWAP

Status
 Status
 Tasks
 View Log

Setup
 Network
 Admin
 Disks
 iSCSI
 Windows Networking
 NFS
 Date/Time
 Export Configuration
 Import Configuration
 Restore Default Configuration
 Docs & Software

System
 Reboot Device
 Shutdown Device
 Update Device
 Remote Support

Disks:
 Display: Installed Disks

Physical Disks (2)				
Friendly Disk Name	Mode	Details	Status	Action
DISK-2442	iSCSI	2.00TB	Installed Shared	Properties Identify
DISK-6146	N/A	2.00TB Filesystem: NTFS	Installed Not Shared	Properties Format Identify

Mirror Disks
 No disks found.

Create Mirror Disk

Disks Help:
 View/edit disk information.
 Display
 Select whether to only display installed disks or all 'registered' disks. A 'registered' disk is a disk that has had a name assigned to it.
 Physical Disks/Mirror Disks
 Friendly Disk Name
 Name assigned to the disk in 'Properties'.
 Mode
 Share mode assigned to the disk in 'Properties'. Options are N/A (not shared), NAS (Windows Networking/NFS), and iSCSI. If the disk is part of a Mirror Disk, MIRROR will be displayed.
 Details
 Displays the disk capacity. If the disk is shared in NAS mode and has been formatted with a file system the free space and file system type will also be displayed.

Illustration 130: Disks

Now if we look at the Disk Properties we can see the share mode set to iSCSI and see the iSCSI Target Name that the disk will be shared under, in this case 'HR-NETSWAP:DISK-2442':

The screenshot shows the 'Disk Properties' window in the NetSwap Plus software. The window has a blue sidebar on the left with a menu containing 'Status', 'Setup', and 'System' sections. The main area is titled 'Disk Properties:' and contains several sections: 'Disk Identification' with fields for Disk ID, Alt ID, and Friendly Disk Name; 'Disk Information' with fields for Vendor, Model, Capacity, File System, Installed, Shared, Formatted, and SMART Status; 'Sharing' with a 'Share Mode' dropdown set to 'iSCSI' and a 'Target' field containing 'iSCSI HR-NETSWAP:DISK-2442 (Not Connected)'; and 'iSCSI CHAP Username/Password' with a checkbox for 'Use Individual CHAP Username/Password'. A 'Save' button is at the bottom. On the right, there is a 'Disk Properties Help' sidebar with instructions on how to use the various buttons like 'Format', 'Identify', 'Share', 'Safely Remove', and 'SMART Info'.

Highly Reliable NetSwap Plus
S Y S T E M S Network Attached Backup
Software Version: 2.0
Hostname: HR-NETSWAP

Status
Status
Tasks
View Log

Setup
Network
Admin
Disks
iSCSI
Windows Networking
NFS
Date/Time
Export Configuration
Import Configuration
Restore Default Configuration
Docs & Software

System
Reboot Device
Shutdown Device
Update Device
Remote Support

Disk Properties:

Disk Identification
Disk ID: f6f8c0e5-1852-4a0d-af15-e479fd89f7a9
Alt ID: ST2000DL003-9VT166_5YD578RV
Friendly Disk Name: DISK-2442

Disk Information
Vendor: ATA
Model: ST2000DL003-9VT1
Capacity: 2.00TB
File System: NONE
Installed: Yes
Shared: Yes
Formatted: Yes
SMART Status: OK

Sharing
Share Mode: iSCSI
iSCSI HR-NETSWAP:DISK-2442 (Not Connected)
Target: iSCSI HR-NETSWAP:DISK-2442 (Not Connected)

iSCSI CHAP Username/Password
☐ Use Individual CHAP Username/Password
(Global CHAP Username/Password will be used if unchecked)

Disk Properties Help:
View/edit the disk properties.

Disk Identification
Disk ID
Unique ID assigned to each disk when they are formatted.
Alt ID
Unique ID assigned to the disk by the system. This ID is generated by system using the disk's vendor, model number, serial number, and bus connection. A given disk may get a different 'Alt ID' if it is connected to a different bus (i.e. eSATA vs. USB3).
Friendly Disk Name
User defined disk name.

Action Buttons
Buttons showing the actions that can be taken with the disk by clicking the button. Possibilities are:
Format
Identify
Share
Safely Remove
SMART Info

Illustration 131: Disk Properties: iSCSI

You should have an iSCSI initiator in your Windows Control panel. If not, you will need to download the iSCSI Initiator software from the Microsoft website. If you are using Windows 2003 or XP make sure you have installed the latest service pack.

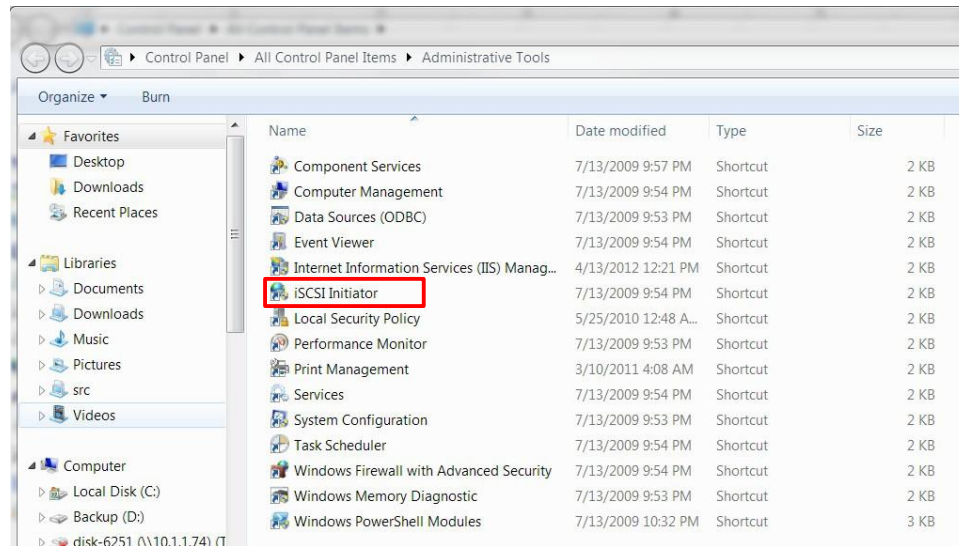


Illustration 132: Control Panel: iSCSI Initiator

Double click 'iSCSI Initiator' and select the “Discovery” tab, then 'Discover Portal...', put in the Hostname or IP address of your, accept the default port of 3260 and select OK:

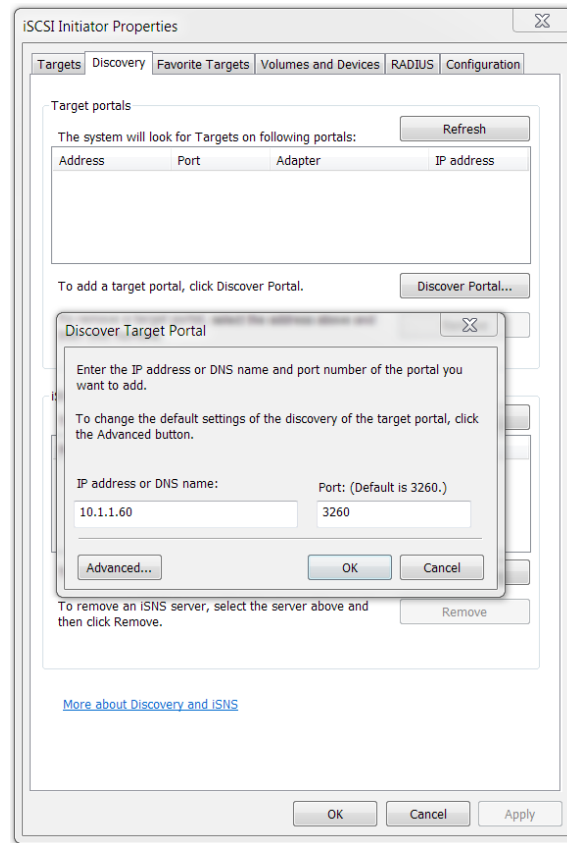


Illustration 133: iSCSI Initiator: Discovery

Go to the 'Targets' tab and click 'Refresh'. You should see the name of your iSCSI Target in the list.

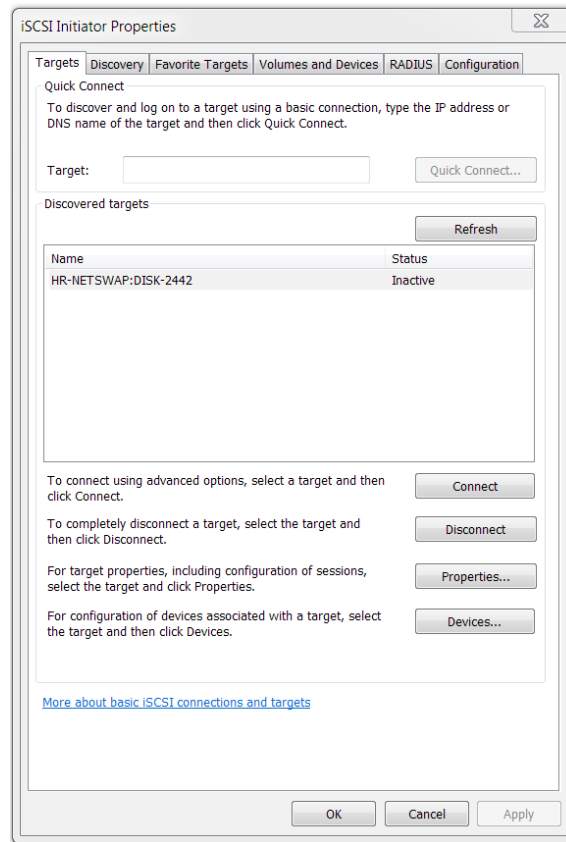


Illustration 134: iSCSI Initiator: Targets

Select your target server and click 'Connect'. Check to add this connection to the list of Favorite Targets so this connection will automatically be restored when the computer starts and click OK.

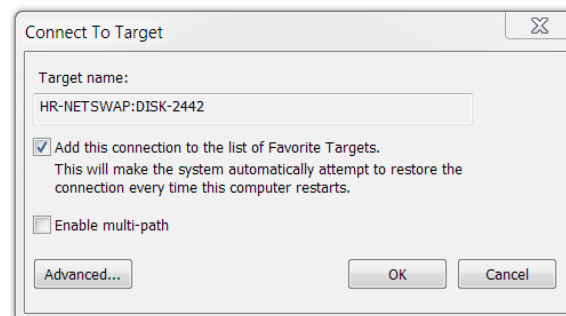


Illustration 135: iSCSI Initiator: Connect to Target

If you have set the CHAP username/password on the from the iSCSI menu option you will need to click the 'Advanced' button and enter the username and password as shown below:

The screenshot shows the 'Advanced Settings' dialog box for the iSCSI Initiator. The 'General' tab is selected. Under 'Connect using', there are three dropdown menus: 'Local adapter:' (Default), 'Initiator IP:' (Default), and 'Target portal IP:' (Default). Below this is a 'CRC / Checksum' section with two checkboxes: 'Data digest' (checked) and 'Header digest' (unchecked). The 'Enable CHAP log on' checkbox is checked. Below it is the 'CHAP Log on information' section, which includes a text box for 'Name:' containing 'user' and a text box for 'Target secret:' containing eight dots. At the bottom, there are three checkboxes: 'Perform mutual authentication' (unchecked), 'Use RADIUS to generate user authentication credentials' (unchecked), and 'Use RADIUS to authenticate target credentials' (unchecked). The dialog has 'OK', 'Cancel', and 'Apply' buttons at the bottom right.

Illustration 136: iSCSI Initiator: Advanced Settings

If the connection is successful, the status should change to Connected:

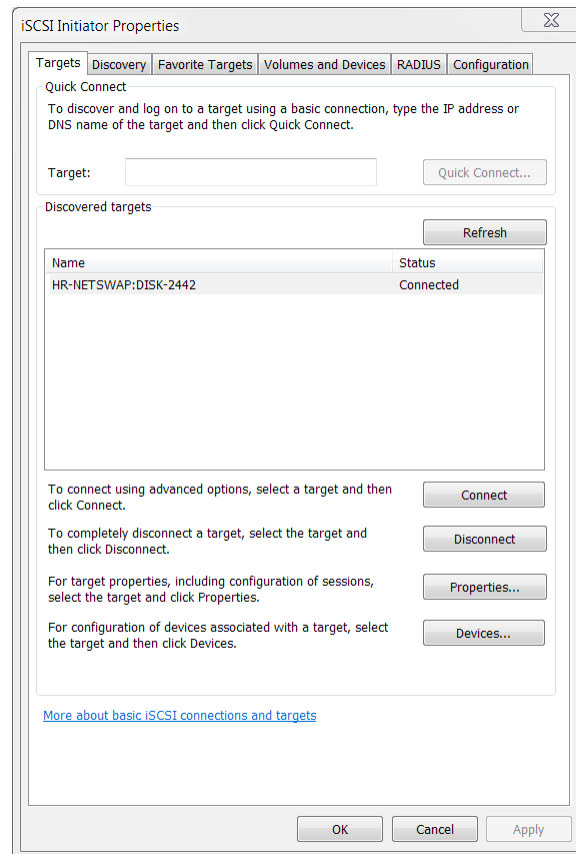


Illustration 137: iSCSI Initiator: Connected

Now right click 'Computer' on the 'Start Menu' and select Manage and Select Disk Management.
(Alternatively you can issue a Start, Run and type diskmgmt.msc):

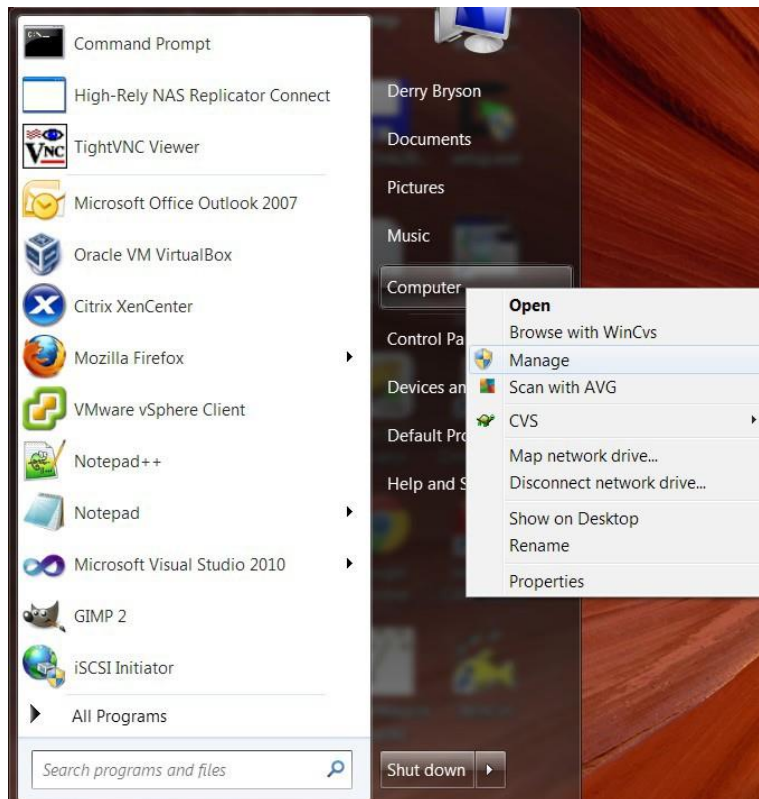


Illustration 138: Manage Computer

The newly connected iSCSI disk should show up in 'Disk Management' as shown below:

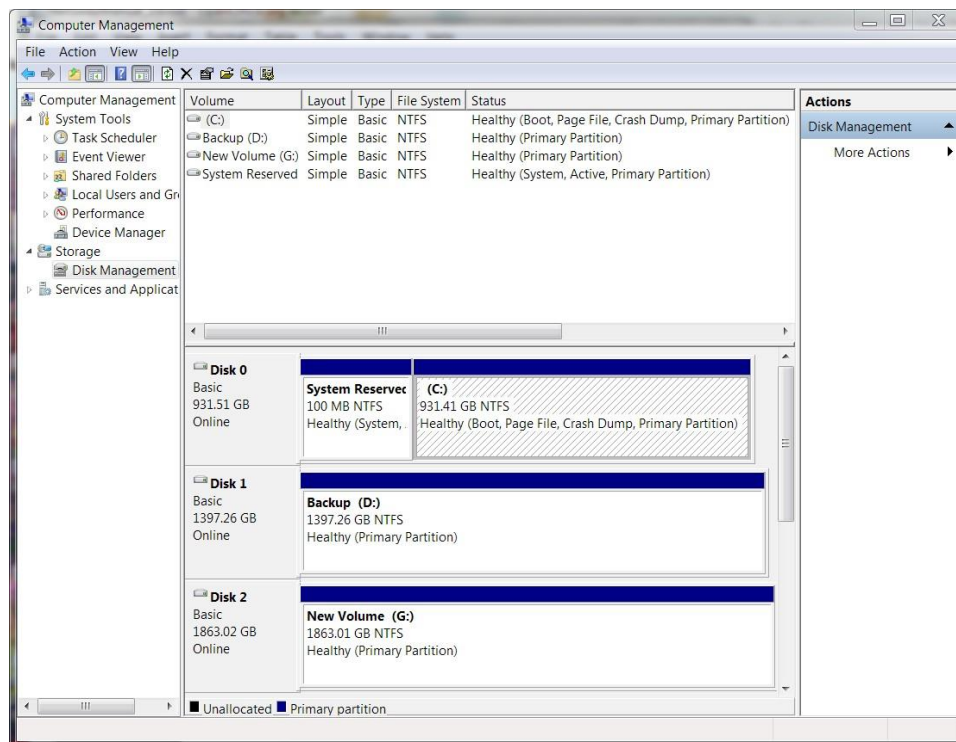


Illustration 139: Computer Management: Disk Management

In the picture above we can see the disk connected as drive G:. Because we formatted the disk on the we can see the disk is already formatted and ready to be used.

If this doesn't work remove all iSCSI settings and start over.

5.2 More Examples

More examples can be found on our website at: <http://high-rely.com>

6 Restore to Factory Defaults

In the event that your NetSwap/RAIDFrame Plus becomes corrupted and no longer functions properly the device may be restored to factory defaults using the USB Key drive included with your NetSwap/RAIDFrame Plus. The USB Key drive comes attached to the rear of the unit. The USB Key drive will be labeled with the Highly Reliable Systems logo.

Note: restoring to factory defaults WILL NOT DESTROY ANY DATA ON THE INTERNAL OR ANY REMOVABLE-MEDIA, it will only overwrite the internal software and settings on the NetSwap/RAIDFrame Plus.

You can save the current configuration of the unit using the web administration interface as documented above and restore that configuration after restoring your unit to factory defaults.

Follow the steps below to restore to factory defaults:

1. Power-off the unit by pressing and releasing the power button on the front of the device. If the device does not automatically power down within 20 seconds, press and hold the power button

until the device powers down.

2. Remove any removable-media from the unit. All removable-media must be removed or disconnected or the unit will not restore to defaults.
3. Insert the USB Key drive into an available USB port on the rear of the unit.
4. Power on the device by pressing the power button on the front of the device.
5. The unit will read the factory restore information from the USB Key drive and install it on the internal memory of the device. This will take several minutes to complete.
6. DO NOT TURN THE NETSWAP/RAIDFRAME PLUS OFF! When the restore is complete the NetSwap/RAIDFrame Plus will turn itself off. If the restore takes longer than 10 minutes, contact technical support.
7. Remove the USB Key drive from the rear of the device.
8. The NetSwap/RAIDFrame Plus is now restored to factory defaults. Consult the setup and administration sections of this manual, above, for information on setting up and configuring your NetSwap/RAIDFrame Plus.

7 NetSwap/RAIDFrame Plus Console

Under normal circumstances you will not need to access the NetSwap/RAIDFrame Plus device directly but rather you would access it through the Web Administration interface detailed above. However, in the case where the device IP address is lost or not known a keyboard and monitor can be attached to the rear of the NetSwap/RAIDFrame Plus to access the NetSwap/RAIDFrame Plus Console (if the NetSwap/RAIDFrame Plus Console does not show as below, hold down the <CTRL> and <ALT> keys and press the <F1> key).

The NetSwap/RAIDFrame Plus Console is a simple program that allows simple configuration of the device and reboot and shutdown options. It is based around a simple menu system to as shown below:

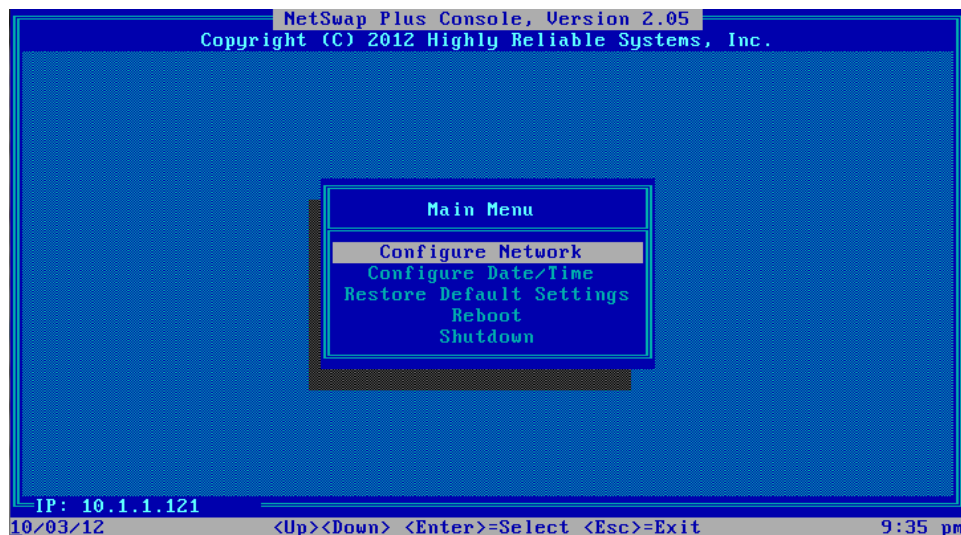


Illustration 140: NetSwap/RAIDFrame Plus Console

Use the <Up> and <Down> Arrow keys to select an option and press <Enter> to select.

7.1 Configure Network

This option allows setting the device's hostname and configure each installed NIC (Network Interface Card). If more than one NIC are installed, the first one will be labeled NIC 0, the second NIC 1, and so on.

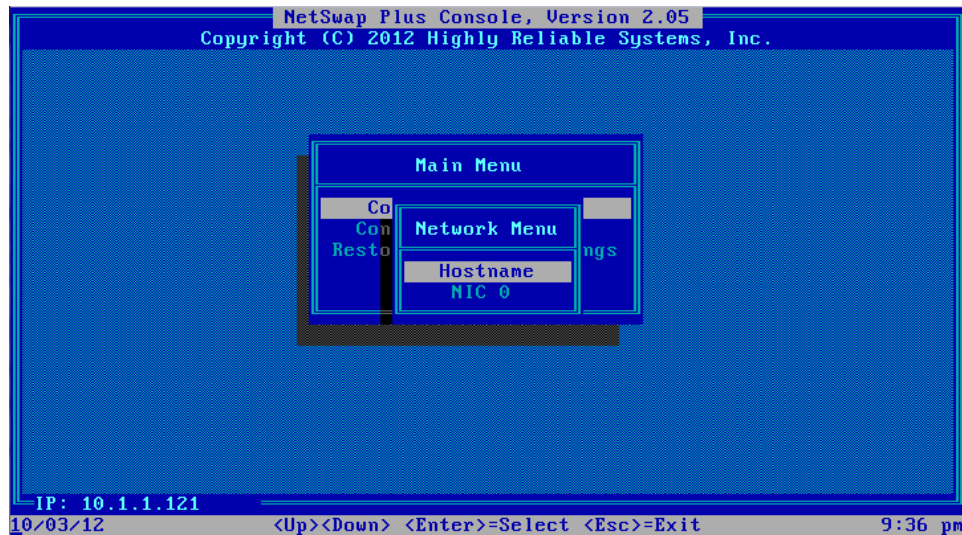


Illustration 141: Configure Network

7.1.1 Hostname

This option allows setting the device host name.

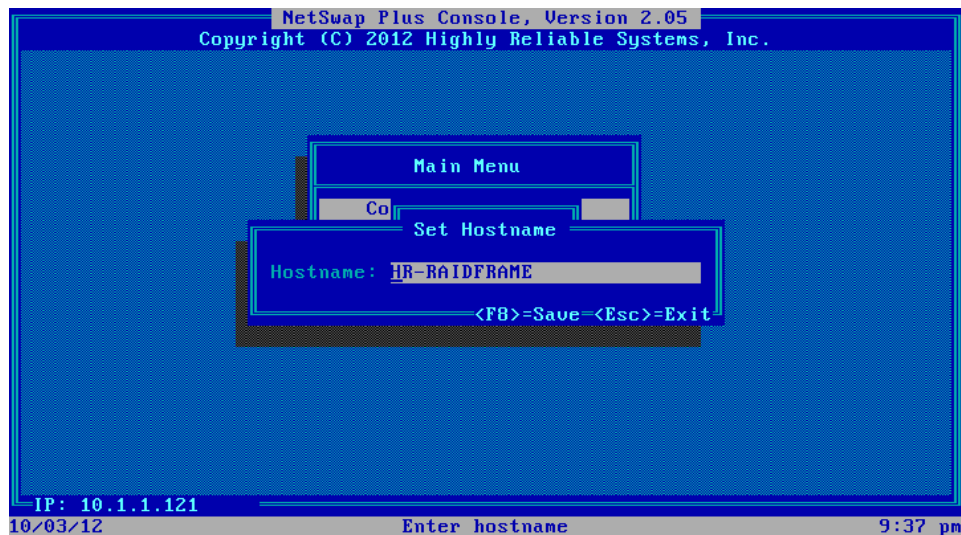


Illustration 142: Set Hostname

Enter the desired hostname and press <F8> to save. Only letters, numbers, '-' and '.' are allowed.

7.1.2 Ethernet X

This option allows configuration of a single selected Ethernet, for instance Ethernet 0 as shown below:

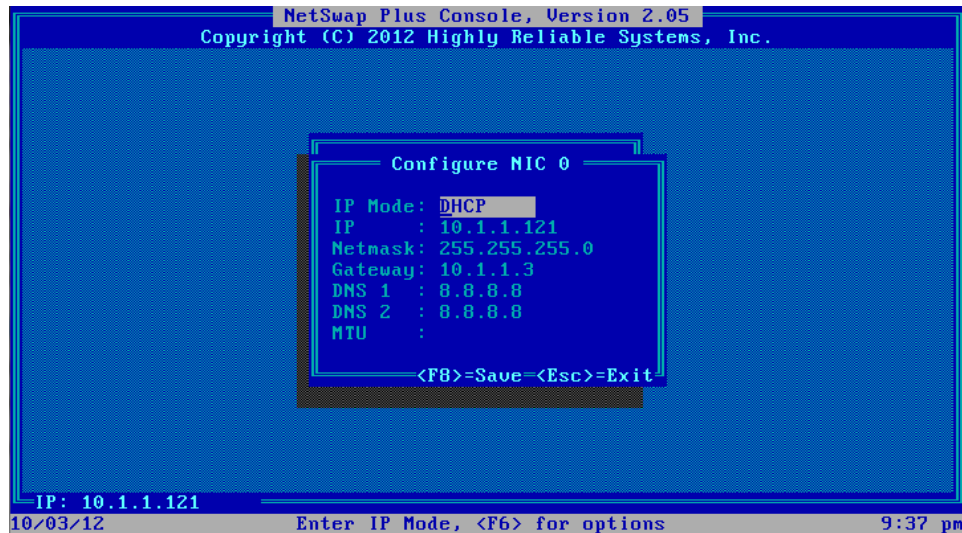


Illustration 143: Configure NIC 0

IP Mode

IP Mode is DHCP, STATIC, DHCP+STATIC or DISABLED. If STATIC is selected, the IP, Netmask, Gateway, DNS 1, DNS 2, and MTU fields will be active; otherwise, they will display only. Press <F6> to select a mode as shown below:

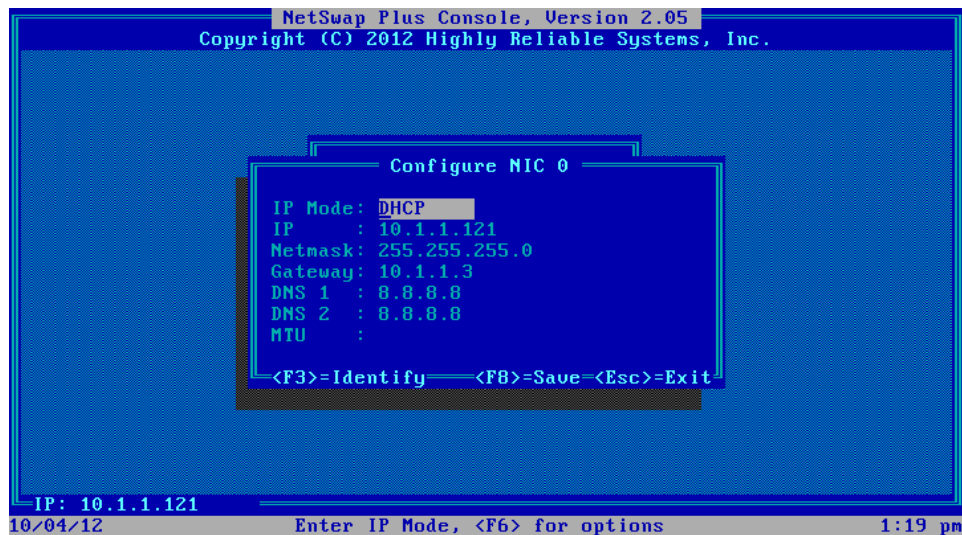


Illustration 144: Configure NIC 0

IP

IP Address. In DHCP mode, this will display the current IP.

Netmask

Network netmask. In DHCP mode this will display the current Netmask.

Gateway

Network gateway. In DHCP mode this will display the current Gateway.

DNS 1

Primary DNS server. In DHCP mode this will display the current primary DNS server.

DNS 2

Secondary DNS server. In DHCP mode this will display the current secondary DNS server.

MTU

Maximum transmission unit. In DHCP mode this will display the current MTU. Possible values are from 1500 to 16000.

Enter the desired values and press <F8> to save or <Esc> to exit. Press <F3> to blink the led's on the port if supported by the NIC.

7.2 Configure Date/Time

This option allows setting the timezone, date/time update method, and the options required for each method.

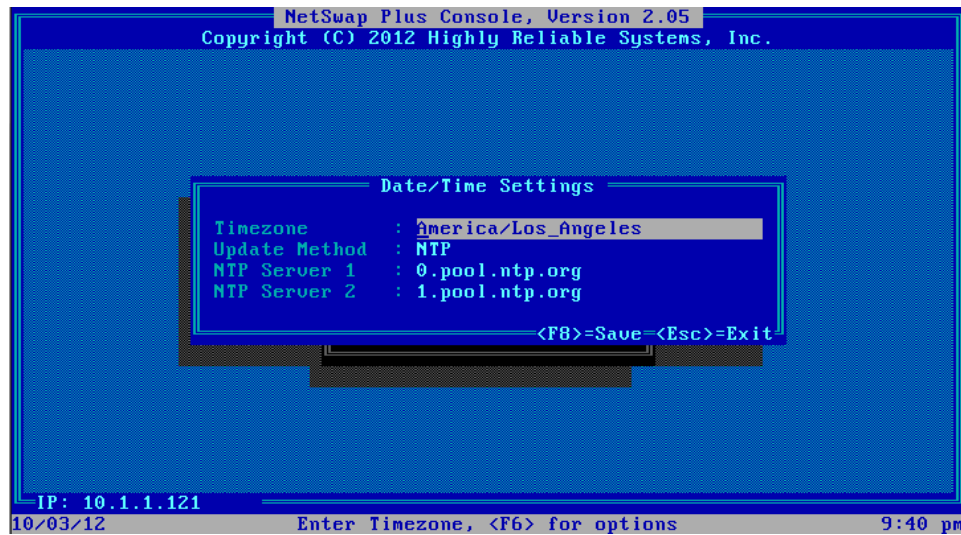


Illustration 145: Date/Time Settings

Timezone

Timezone by area/city. Press <F6> to select a timezone as shown below:

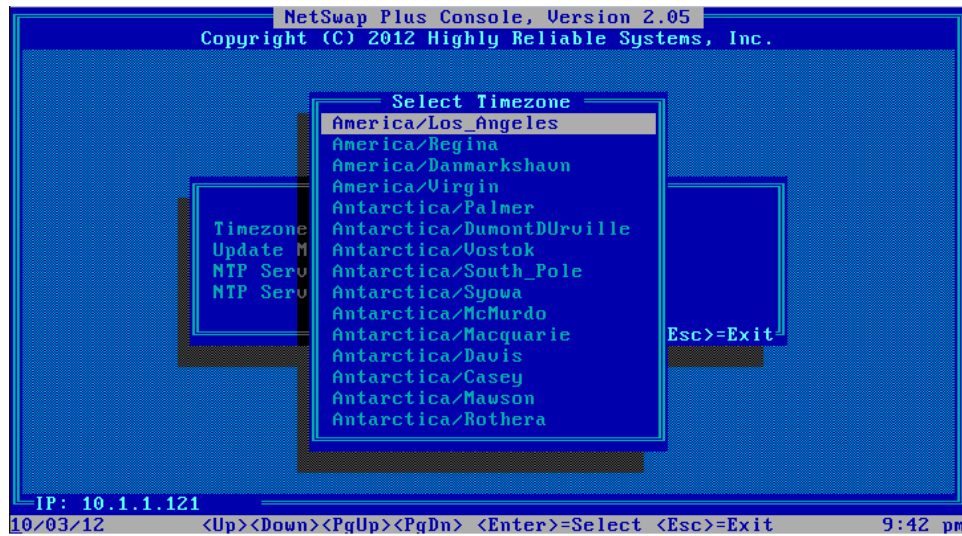


Illustration 146: Select Timezone

Use the <Up> and <Down> arrow keys to select a timezone and <Enter> to select or <Esc> to exit.

Update Method

The method used to keep the date and time current. Options are Ntp, Windows Server, and Manual. Depending on which method is selected, different fields are displayed for the options for the selected method.

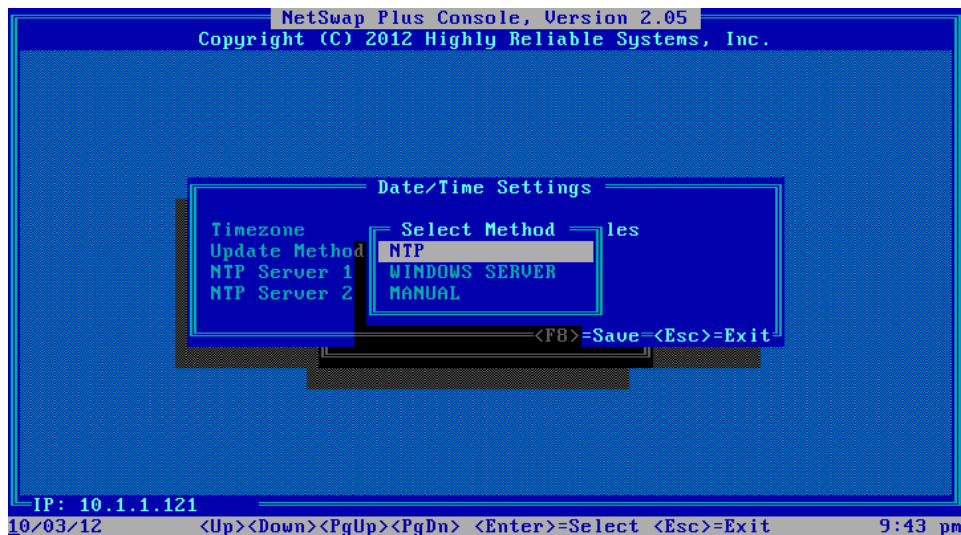


Illustration 147: Select Method

7.2.1 NTP

The NTP method uses the Network Time Protocol to update the date and time from the specified NTP server(s).

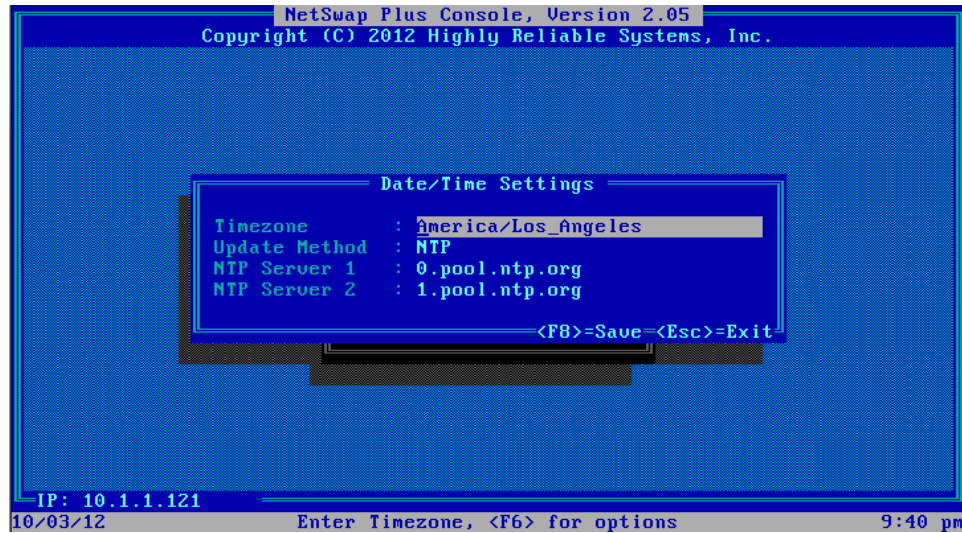


Illustration 148: Date/Time Settings - NTP

NTP Server 1

Primary NTP server. Can be an IP or hostname.

NTP Server 2

Secondary NTP server. Can be an IP or hostname.

7.2.2 Windows Server

The Windows Server method updates the date and time by periodically querying a Windows Server.

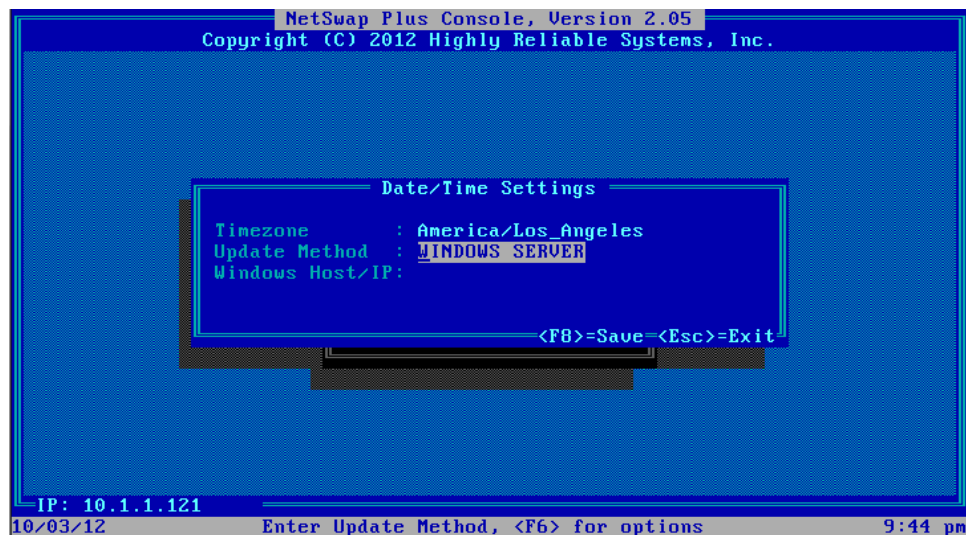


Illustration 149: Date/Time Settings - Windows Server

Windows Host/IP

The hostname or IP of the Windows Server.

7.2.3 Manual

The manual method allows directly setting the date and time.

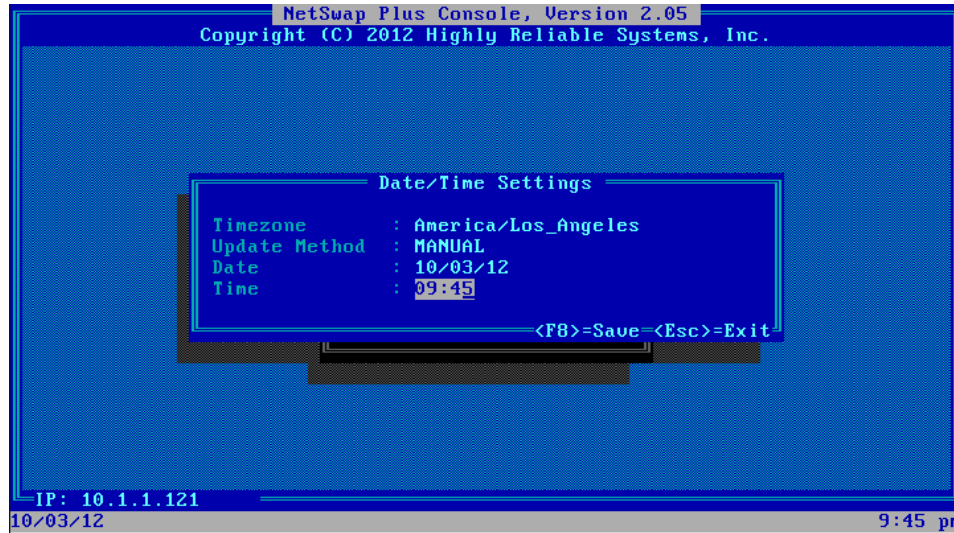


Illustration 150: Date/Time Settings - Manual

Date

Date in MM/DD/YY format.

Time

Time in HH:MM format.

Enter the desired values and press <F8> to save or <Esc> to exit.

7.3 Restore Default Settings

This option restores the device settings to their factory default values.

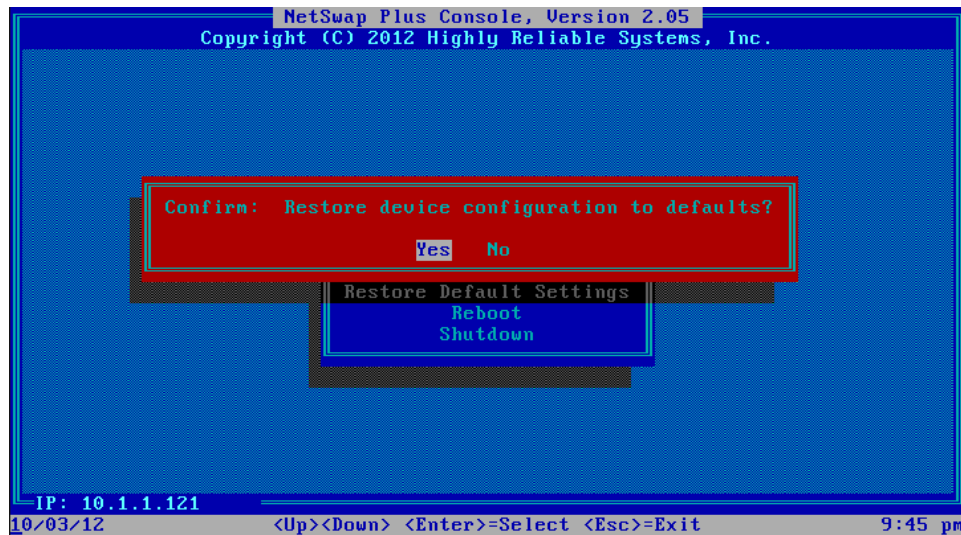


Illustration 151: Restore Default Configuration

Use the <Left> and <Right> arrow keys to select 'Yes' and press <Enter> to restore default settings or select 'No' and press <Enter> or press <Esc> to cancel and exit.

7.4 Reboot

This option will reboot the device.

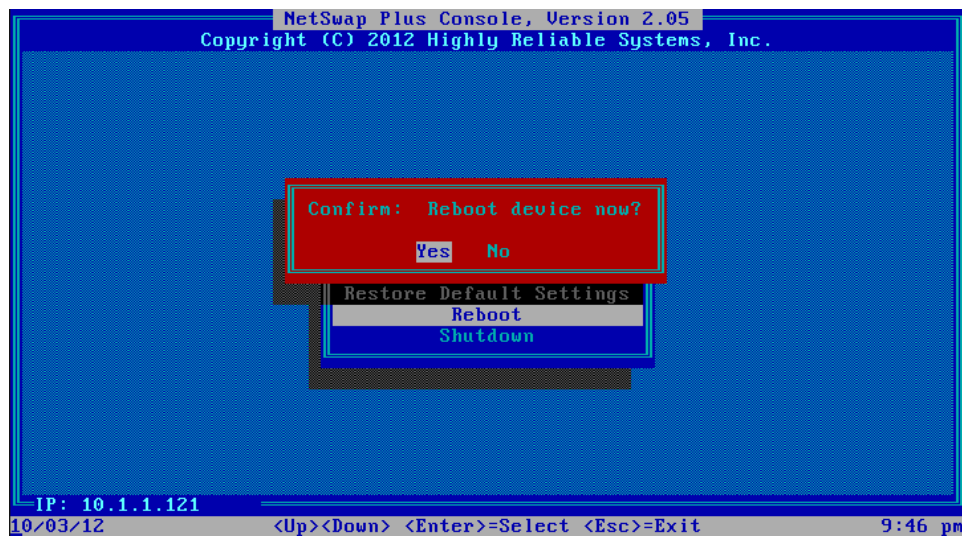


Illustration 152: Reboot Device

Use the <Left> and <Right> arrow keys to select 'Yes' and press <Enter> to reboot the device or select 'No' and press <Enter> or press <Esc> to cancel and exit.

7.5 Shutdown

This option will shutdown the device.

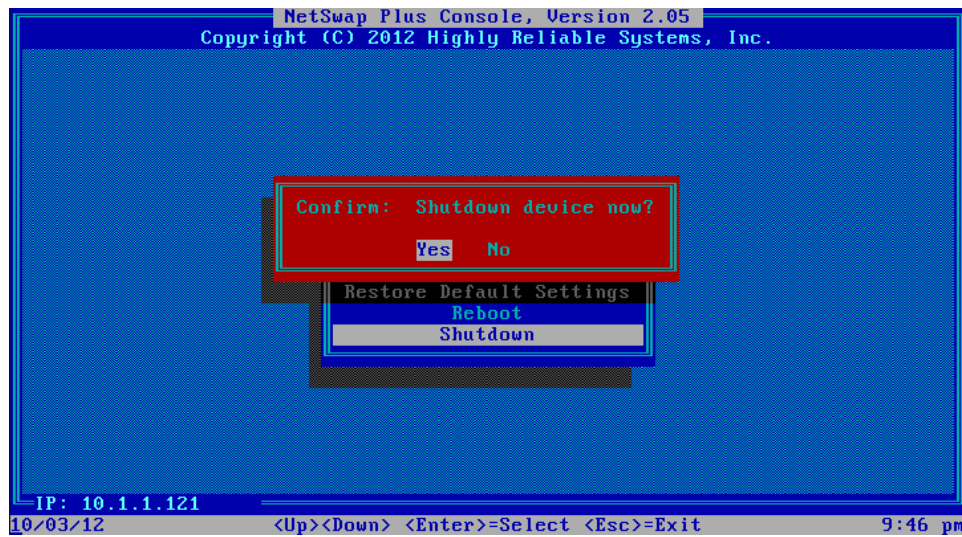


Illustration 153: Shutdown Device

Use the <Left> and <Right> arrow keys to select 'Yes' and press <Enter> to reboot the device or select 'No' and press <Enter> or press <Esc> to cancel and exit.

8 Remote Monitoring and Management (RMM) Support

The NetSwap/RAIDFrame Plus provides both network (TCP/HTTP) and file based methods to allow remote monitoring of the device status including hard drive removal/insertion, mirror status (e.g. degraded, rebuilding, etc.), sharing status etc.

8.1 Network (TCP/HTTP) Based Monitoring

The network based monitoring is accessed through the HTTP protocol over TCP/IP on port 80 using the standard GET HTTP method and is part of the web-based control interface used to configure the NetSwap/RAIDFrame Plus. Three types of status information are supported: log files, drive and mirror status files, and drive and mirror flag files.

8.1.1 Log Files

Four log files are supported:

- **NetSwap/RAIDFrame Plus Log** – Log generated by the NetSwap/RAIDFrame Plus software. Log number: 1
- **System Log** – Standard Linux syslog. Log number: 2
- **Kernel Log** – Standard Linux kernel log. Log number: 3
- **Boot Log** – Linux boot log. Records kernel boot messages. Log number: 4

The log files may be downloaded directly using a URL of the form:

http://<NetSwap/RAIDFrame Plus ip>/status/download_log.php&log=X

Where X is the log number as indicated above. So to download the System Log from a NetSwap/RAIDFrame Plus on ip 192.168.1.50 one would use the following URL:

http://192.168.1.50/status/download_log.php&log=2

This will return a text document (Content-type: text/plain) containing the entire system log file.

8.1.2 Disk Status Files

The status files are simple text files that contain current status of each disk or RAID active or installed in the NetSwap/RAIDFrame Plus.

Disk status files are named <disk name>.diskstatus where <disk name> is the name defined in the web interface. For example the disk status file for the disk named DISK-3350 would be DISK-3350.diskstatus.

Raid/mirror status files are named <disk name>.raidstatus. For example the raid status file for the mirror disk named MIRROR-DISK-0 would be MIRROR-DISK-0.raidstatus.

The status files can be accessed through the HTTP protocol using the GET method using a URL of the form:

<http://<NetSwap/RAIDFrame Plus ip>/status/disks/<file name>>

So to get the raid status file for MIRROR-DISK-0 on a NetSwap/RAIDFrame Plus on ip 192.168.1.50 one would use the following URL:

<http://192.168.1.50/status/disks/MIRROR-DISK-0.raidstatus>

Sample disk status file:

```
Disk: DISK-3350
ID: a6917e64-84e8-4419-ac92-99d7d1111043
Share Mode: NONE
Device: /dev/sda
Mount Point:
Raid Num: 0
Installed: true
Shared: false
Mounted: false
Removed: false
Free Space: 0
Low Space: false
```

Sample raid status file:

```
/dev/md0:
    Version : 1.0
    Creation Time : Wed Apr 11 10:56:00 2012
    Raid Level : raid1
    Array Size : 9765376 (9.31 GiB 10.00 GB)
    Used Dev Size : 9765376 (9.31 GiB 10.00 GB)
    Raid Devices : 2
    Total Devices : 2
    Persistence : Superblock is persistent

    Update Time : Mon Apr 23 11:33:27 2012
    State : clean
    Active Devices : 2
    Working Devices : 2
    Failed Devices : 0
    Spare Devices : 0


    Name : HR-NETSWAP:0 (local to host HR-NETSWAP)
    UUID : 0c626671:9d1981f3:4d070f49:164599e5
    Events : 4523


   Number    Major    Minor    RaidDevice State
    -----
    0         8         2         0      active sync    /dev/sda2
    1         8        16         1      active sync    /dev/sdb
```

All disk and RAID status files may be viewed using a web browser using a URL of the form:

<http://<NetSwap/RAIDFrame Plus ip>/status/disks>

8.1.3 Replication Status Files

The status files are simple text files that contain current status of each Replication Job on the NetSwap/RAIDFrame Plus.

Replication Job status files are named <job name>.jobstatus where <job name> is the name defined in the web interface. For example the Replication Job status file for the job named Job1 would be Job1.jobstatus.

Sample Replication Job status file:

```
Name: Job1
ID: 1
Type: NetSwap
Last Result: Failure
Last Run: 05/14/15 09:15:01
```

All Replication Job status files may be viewed using a web browser using a URL of the form:

<http://<NetSwap/RAIDFrame Plus ip>/status/replication>

8.1.4 Disk Flag Files

The flag files are simple text files that “flag” or indicate a specific status of a disk or raid. The name of a flag file consists of the disk name followed by a '.' and the flag name as follows: <disk name>.<flag name>. The contents of the flag file are simply the flag name itself in lower case.

The disk flags are:

- **installed/notinstalled** – indicates if the disk is installed or not.
- **shared/notshared** – indicates if the disk is shared or not.
- **mounted/notmounted** – indicates if the disk is mounted or not.
- **removed/notremoved** – indicates if the disk has been removed or not.
- **faulty/notfaulty** – indicates if the disk has been marked faulty or not.
- **spacelow/notspacelow** – indicates if the disk is low on space or not.
- **smartna/notsmartna** – indicates if the SMART information is not available or is available
- **smartprefail/notsmartprefail** – indicates if the disk has a SMART PREFAIL condition or not.
- **smartfailing/notsmartfailing** – indicates if the disk has a SMART FAILING condition or not.
- **smartok/notsmartok** – indicates if the disk has a SMART OK condition or not.
- **deltasyncing/notdeltasyncing** – indicates if the disk is currently syncing or not.
- **deltasynced/notdeltasynced** – indicates if the disk is synced or not.
- **deltasyncfailed/notdeltasyncfailed** – indicates if the disk has a DeltaSync failure or not.
- **deltaactivesync/notdeltaactivesync** – indicates if the disk is actively syncing or not.

The RAID flags are:

- **syncing** – indicates the raid is currently syncing or rebuilding.
- **sync0** – indicates the raid is syncing and is less than 25% complete.
- **sync25** – indicates the RAID is syncing and is between 25% and 50% complete.
- **sync50** – indicates the RAID is syncing and is between 50% and 75% complete.
- **sync75** – indicates the RAID is syncing and is between 75% and 100% complete.
- **synced** – indicates the RAID is synced.

- **degraded** – indicates the RAID is degraded.
- **active/notactive** – indicates if the RAID is active or not.
- **faulty/notfaulty** – indicates if the RAID has a faulty disk or not.

In addition to the flag files for each disk and RAID, there are disk flag files for all disks installed in the NetSwap/RAIDFrame Plus. The flag files are named NETSWAP-DISKS.<flag name>. The flags are:

- **faulty/notfaulty** – indicates if the any of the disks has been marked faulty or not.
- **spacelow/notspacelow** – indicates if any of the disks are low on space or not.
- **smartna/notsmartna** – indicates if the SMART information for any disk is not available or is available
- **smartprefail/notsmartprefail** – indicates if any of the disks has a SMART PREFAIL condition or not.
- **smartfailing/notsmartfailing** – indicates if any of the disks has a SMART FAILING condition or not.
- **smartok/notsmartok** – indicates if any of the disks has a SMART OK condition or not.
- **deltasyncfailed/notdeltasyncfailed** – indicates if any of the disks has a DeltaSync failure or not.

The flag files can be accessed through the HTTP protocol using the GET method using a URL of the form:

`http://<NetSwap/RAIDFrame Plus ip>/status/disks/<file name>`

Examples:

To check if DISK-3350 is shared on the NetSwap/RAIDFrame Plus on ip 192.168.1.50 one would use the following URL to check for the existence of the flag file:

`http://192.168.1.50/status/disks/DISK-3350.shared`

To check if MIRROR-DISK-0 is degraded on the NetSwap/RAIDFrame Plus on ip 192.168.1.50 one would use the following URL to check for the existence of the flag file:

`http://192.168.1.50/status/disks/MIRROR-DISK-0.degraded`

All disk and RAID flag files may be viewed using a web browser using a URL of the form:

`http://<NetSwap/RAIDFrame Plus ip>/status/disks`

8.1.5 Replication Job Flag Files

The flag files are simple text files that “flag” or indicate a specific status of a Replicatoin job. The name of a flag file consists of the Replication job name followed by a '.' and the flag name as follows: <job name>.<flag name>. The contents of the flag file are simply the flag name itself in lower case.

The Replication job flags are:

- **canceled/notcanceled** – indicates if the job has been canceled or not.
- **neverrun/notneverrun** – indicates if the job has never been run or not.
- **success/notsuccess** – indicates if the job was run successfully nor not.

- **failed/notfailed** – indicates if the job has failed or not.

In addition, there are flag files for all Replication Jobs defined. The flag files are named NETSWAP-REPLICATION-JOBS.<flag name>. The flags are:

- **failed/notfailed** – indicates if any of the jobs has failed or not.

The flag files can be accessed through the HTTP protocol using the GET method using a URL of the form:

`http://<NetSwap/RAIDFrame Plus ip>/status/replication/<file name>`

Examples:

To check if Replication job Job1 has failed on the NetSwap/RAIDFrame Plus on ip 192.168.1.50 one would use the following URL to check for the existence of the flag file:

`http://192.168.1.50/status/replication/Job1.failed`

To check if Replication job Job1 has succeeded on the NetSwap/RAIDFrame Plus on ip 192.168.1.50 one would use the following URL to check for the existence of the flag file:

`http://192.168.1.50/status/replication/Job1.succeeded`

All Replication Job flag files may be viewed using a web browser using a URL of the form:

`http://<NetSwap/RAIDFrame Plus ip>/status/replication`

8.2 File Based Monitoring

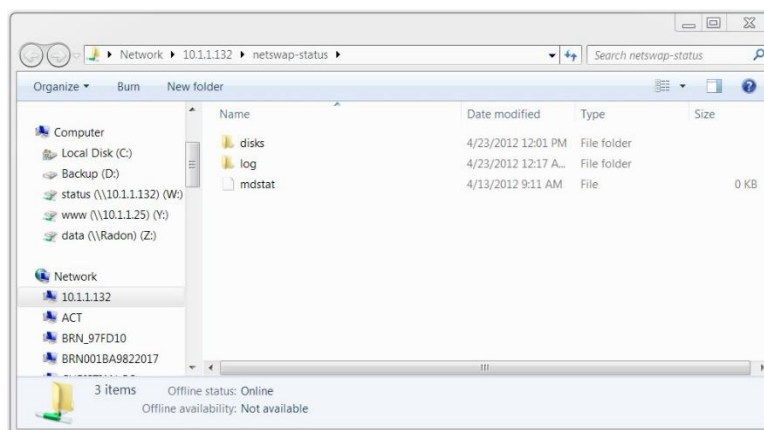
The file based monitoring is accessed through a special network share on the NetSwap/RAIDFrame Plus device called 'hr-status'. This is a read-only share that does not require authentication that can be easily referenced through a simple UNC path such as:

`\\<netswap hostname>\hr-status`

or

`\\<netswap ip>\hr-status`

Viewing the share on in Explorer on Windows 7 will show the following:



There are two folders, 'disks' and 'logs', and a special text file called 'mdstat'. The 'disks' folder contains the Status and Flag files as described in the section above on network monitoring. The 'log'

folder contains the Linux system log files including the NetSwap log file ('nabd.log'). The 'mdstat' text file contains raid status information as supplied by the Linux kernel and can be used to monitor the health and rebuild status of each raid/mirror disk in the system.

8.3 LabTech RMM

LabTech supports both network (TCP/HTTP) monitors and file based monitors and both can be used with the NetSwap/RAIDFrame Plus. Although LabTech supports some advanced scripting and EXE execution for monitors, this manual will only cover simple file existence checks using network and file based monitors.

In the following two sections we will setup monitors to monitor the status of RAID-DISK-0 on our NetSwap/RAIDFrame Plus on IP address 10.1.2.104. We will monitor the existence of the RAID-DISK-0.synced flag file as this file will exist when the RAID is synced and this file will not exist when the RAID is degraded.

8.3.1 Network Monitor

To setup a network monitor to monitor the existence of a flag file on a NetSwap/RAIDFrame Plus use the Monitor Wizard to create a new monitor. Select 'Monitor the Network' as shown below:

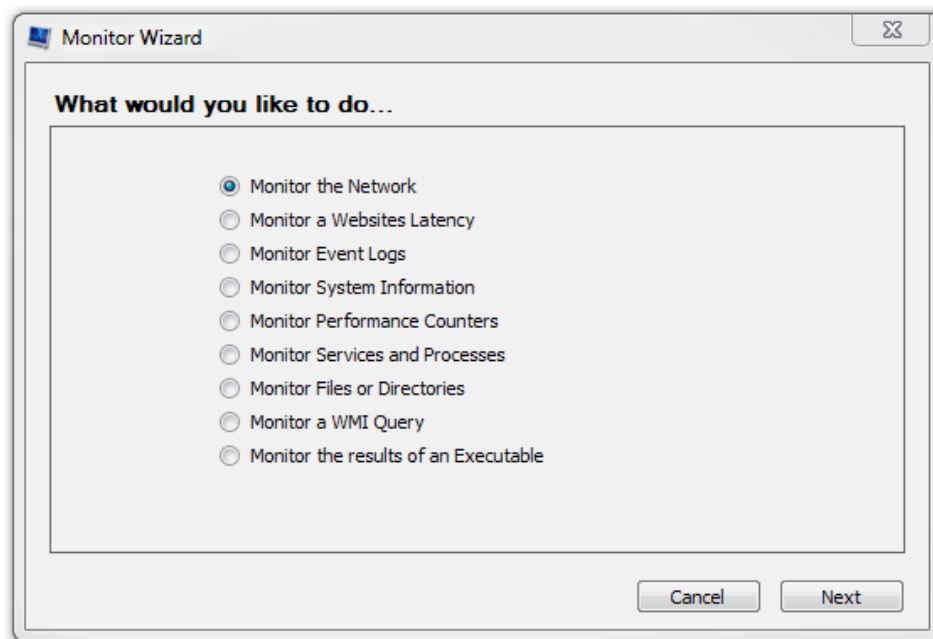


Illustration 154: LabTech Monitor Wizard: Select the Type of Monitor

Next, select TCP as the protocol:

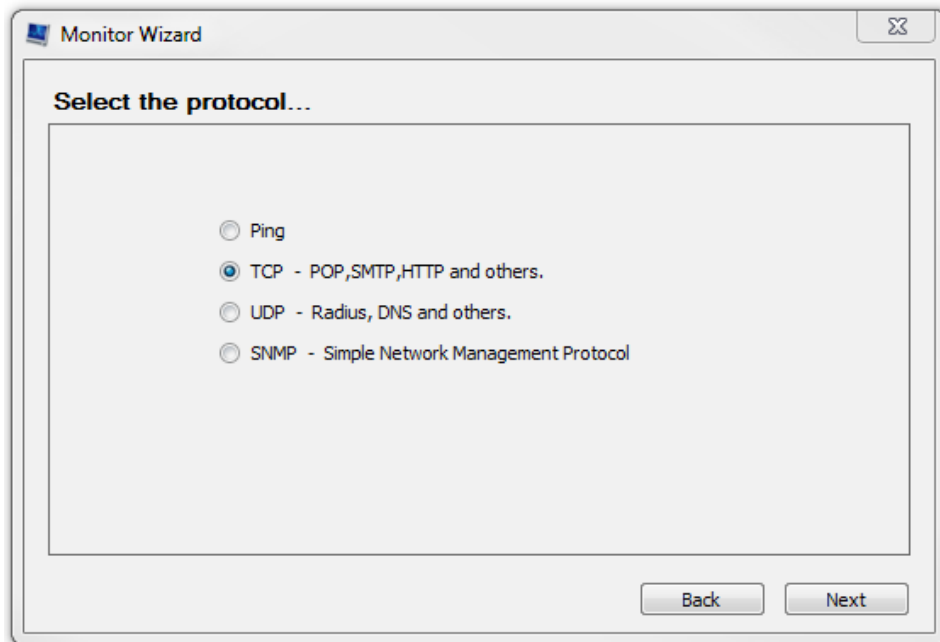


Illustration 155: LabTech Monitor Wizard: Select the Protocol

Enter the IP address of the NetSwap/RAIDFrame Plus (in this case we enter 10.1.2.104):

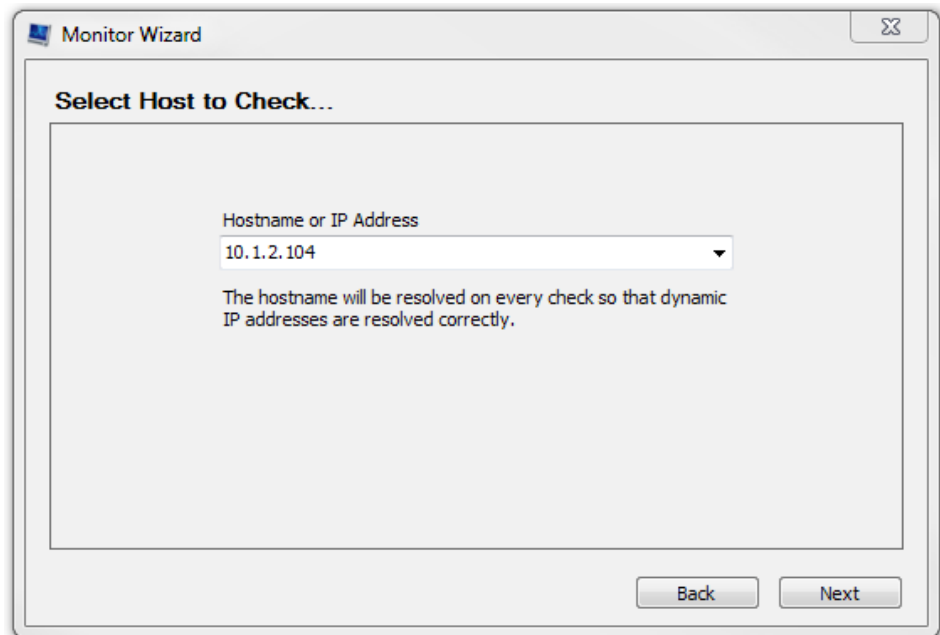


Illustration 156: LabTech Monitor Wizard: Select host to Check...

Select port 80 enter path to the file to be monitored, '/status/disks/RAID-DISK-0' in this case (the default will be '/'. This will allow us to monitor the status of the mirror and we can be alerted if the mirror becomes degraded because the RAID-DISK-0.synced file will not exist if the RAID disk is degraded.

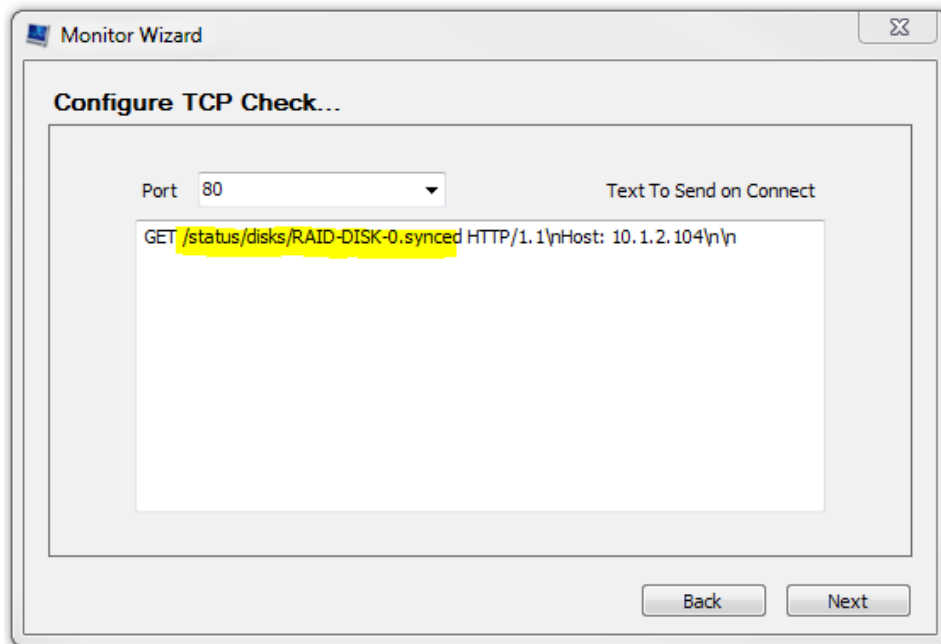


Illustration 157: LabTech Monitor Wizard: Configure TCP Check...

Compare using 'Equals' and enter 'HTTP/1.1 200 OK' as the Text to Compare with. 'HTTP/1.1 200 OK' will be returned by the NetSwap/RAIDFrame Plus as the standard response for HTTP indicating the file exists:

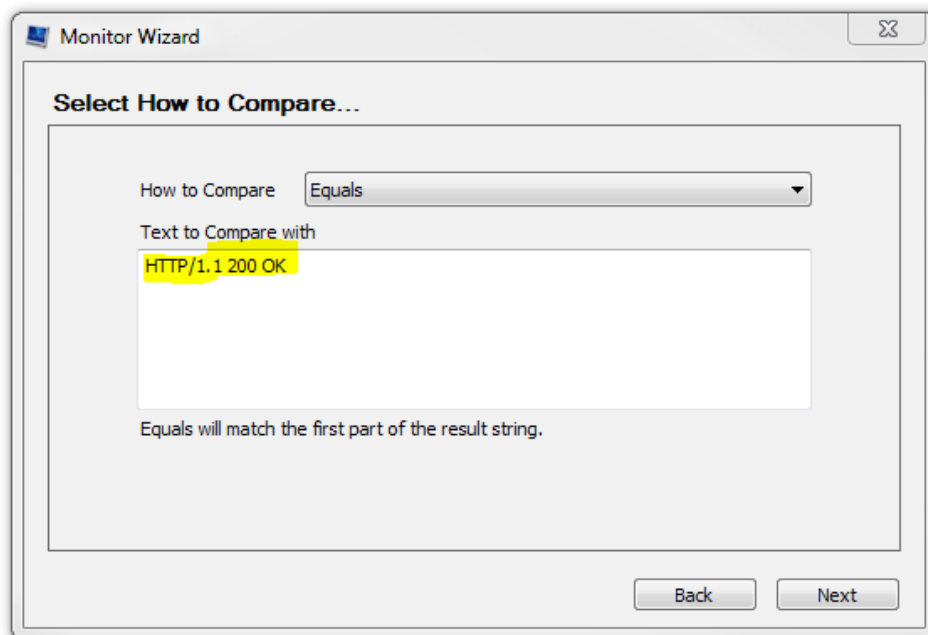


Illustration 158: LabTech Monitor Wizard: Select How to Compare

Select the Client and Computer on which to run the monitor:

The screenshot shows a Windows-style dialog box titled "Monitor Wizard". The main heading inside is "Select where you would like to run this...". Below this heading are three stacked dropdown menus. The first is labeled "Client" and has "Sierra Computer Group" selected. The second is labeled "Location" and has "High-Rely" selected. The third is labeled "Computer" and has "HR-PROG-DB-2" selected. At the bottom right of the dialog are two buttons: "Back" and "Next".

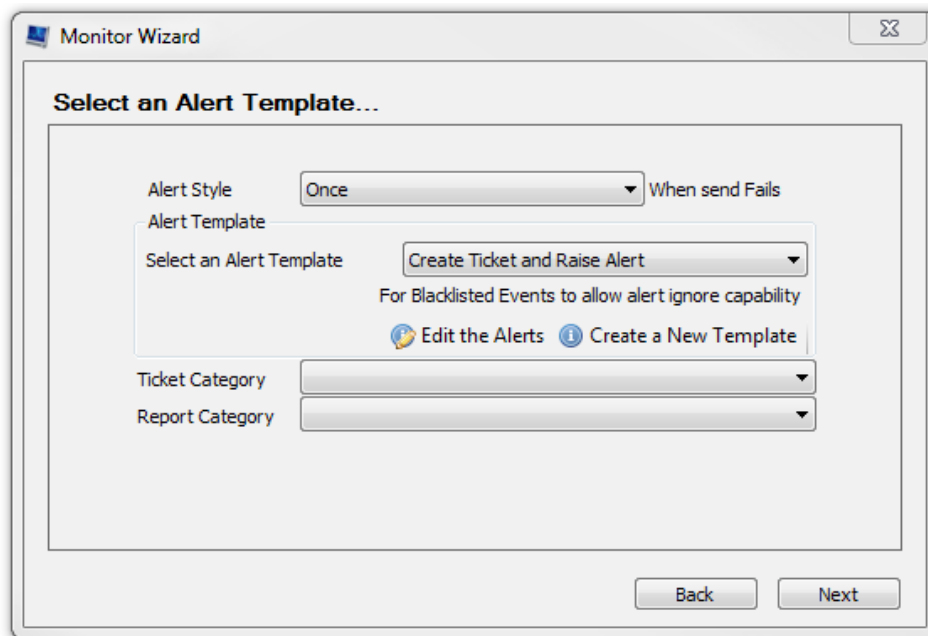
Illustration 159: LabTech Monitor Wizard: Select Where you Would Like to Run This...

Select how often to run the monitor:

The screenshot shows a second step of the "Monitor Wizard" dialog box. The main heading is "Select how often you would like this to run...". Below this heading is a single dropdown menu labeled "Frequency" with "5 Minutes" selected. At the bottom right of the dialog are two buttons: "Back" and "Next".

Illustration 160: LabTech Monitor Wizard: Select How Often You Would Like This to Run

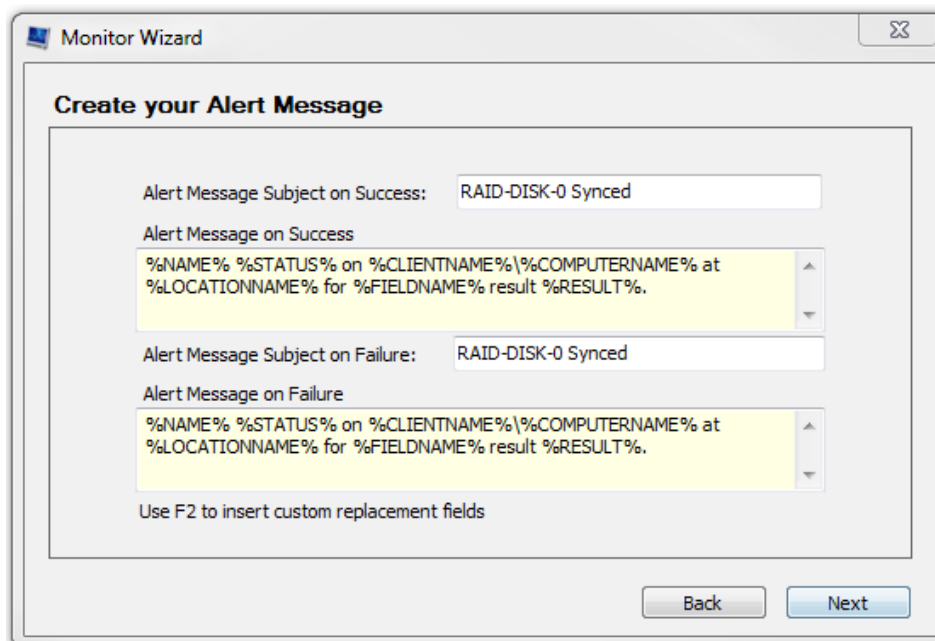
Select the alert template, defaults shown:



The screenshot shows the 'Monitor Wizard' window with the title 'Select an Alert Template...'. It contains several dropdown menus and buttons. The 'Alert Style' dropdown is set to 'Once', and the 'When send Fails' checkbox is checked. The 'Alert Template' dropdown is set to 'Create Ticket and Raise Alert'. Below this, there is a note: 'For Blacklisted Events to allow alert ignore capability'. There are two buttons: 'Edit the Alerts' (with a gear icon) and 'Create a New Template' (with an 'i' icon). At the bottom, there are 'Ticket Category' and 'Report Category' dropdowns, and 'Back' and 'Next' buttons.

Illustration 161: LabTech Monitor Wizard: Select an Alert Template...

Define the Alert Message, defaults shown:



The screenshot shows the 'Monitor Wizard' window with the title 'Create your Alert Message'. It contains text boxes for 'Alert Message Subject on Success' and 'Alert Message Subject on Failure', both set to 'RAID-DISK-0 Synced'. Below each subject box is a text area for the message body, containing the placeholder text: '%NAME% %STATUS% on %CLIENTNAME%\%COMPUTERNAME% at %LOCATIONNAME% for %FIELDNAME% result %RESULT%.'. At the bottom, there is a note: 'Use F2 to insert custom replacement fields'. There are 'Back' and 'Next' buttons.

Illustration 162: LabTech Monitor Wizard: Create you Alert Message

Enter the name for the monitor, we use 'NetSwap RAID-DISK-0 Synced'. Review the monitor setup and click 'Finish' if everything is set correctly:

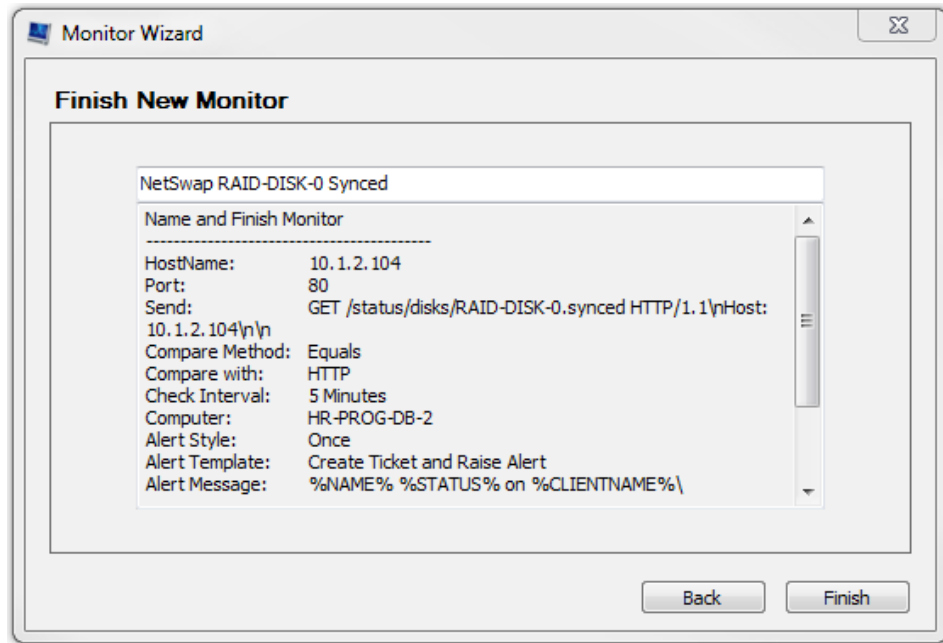


Illustration 163: LabTech Monitor Wizard: Finish New Monitor

Once the monitor is created, double click on the monitor. The configuration should be similar to what is shown below:

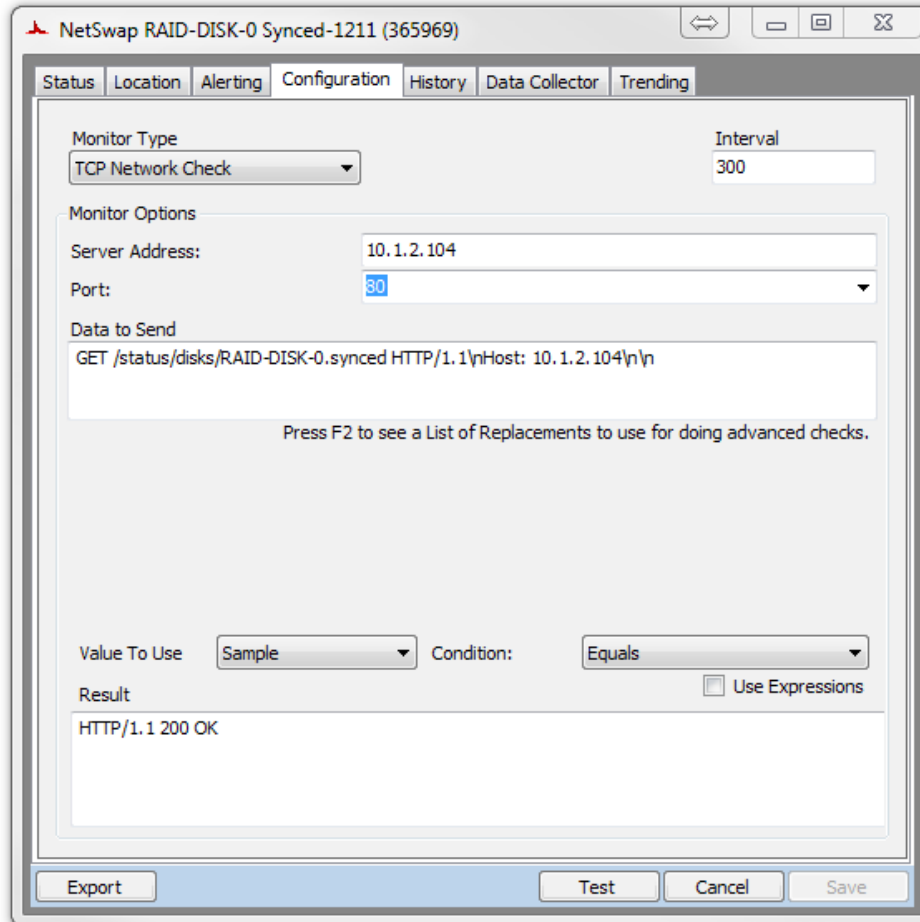


Illustration 164: LabTech Network Monitor Configuration

Test the monitor by clicking the 'Test' button and you should see something similar to the following:

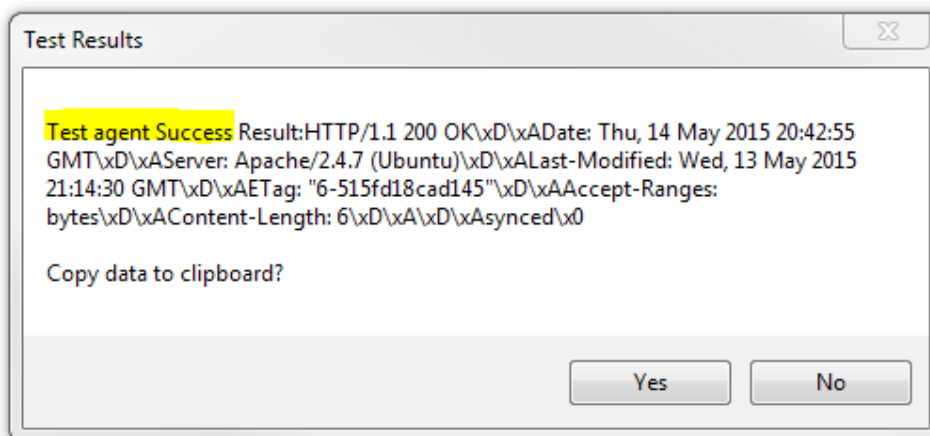


Illustration 165: LabTech Network Monitor Test Success

We can see that the test was successful.

8.3.2 File Based Monitor

To setup a file check monitor to monitor the existence of a flag file on a NetSwap/RAIDFrame Plus use the Monitor Wizard to create a new monitor. Select 'Monitor Files or Directories' as shown below:

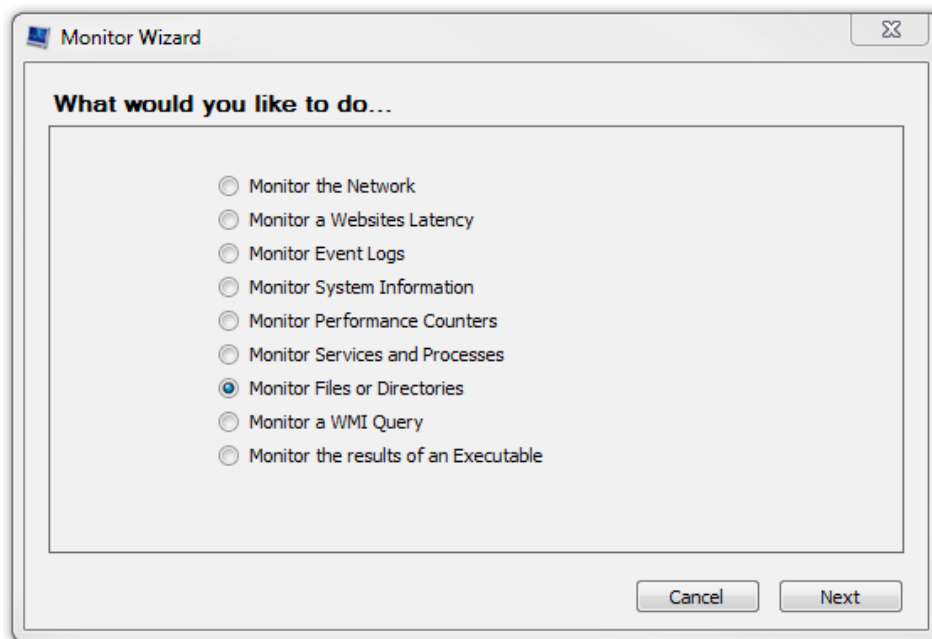


Illustration 166: LabTech Monitor Wizard: What would you like to do...

Enter the path to the file to be monitored ('\\10.1.2.104\\hr-status\\disks\\RAID-DISK-0.synced'). Note that you must use a UNC path here with either the IP address or hostname of the NetSwap/RAIDFrame Plus as mapped network drives cannot be seen by the LabTech monitoring service:

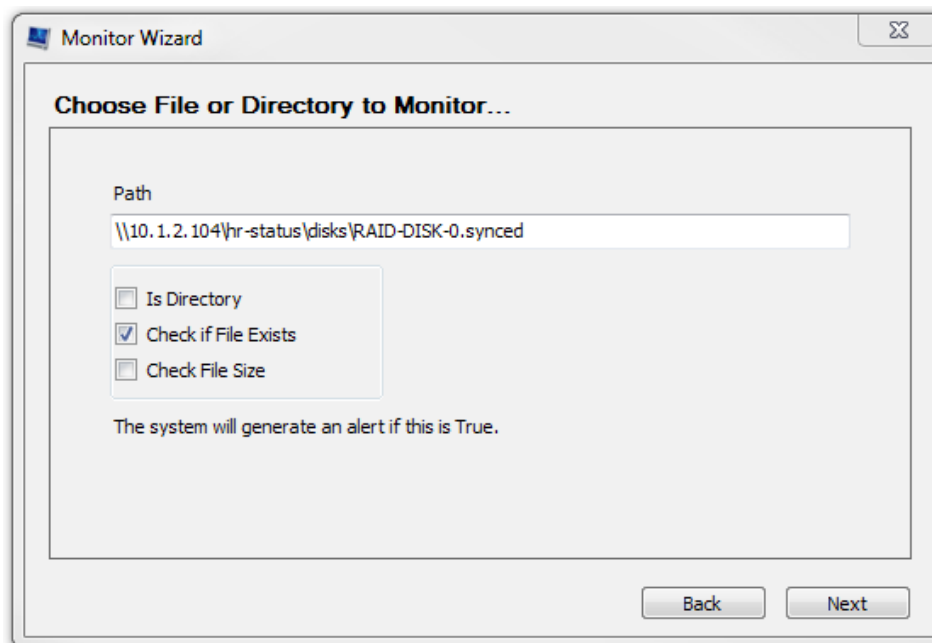


Illustration 167: LabTech Monitor Wizard: Choose File or Directory to Monitor...

Select the Client and Computer on which to run the monitor:

The screenshot shows a window titled "Monitor Wizard" with a close button in the top right corner. The main heading inside the window is "Select where you would like to run this...". Below this heading, there are three vertically stacked dropdown menus. The first menu is labeled "Client" and has "Sierra Computer Group" selected. The second menu is labeled "Location" and has "High-Rely" selected. The third menu is labeled "Computer" and has "HR-PROG-DB-2" selected. At the bottom right of the window, there are two buttons: "Back" and "Next".

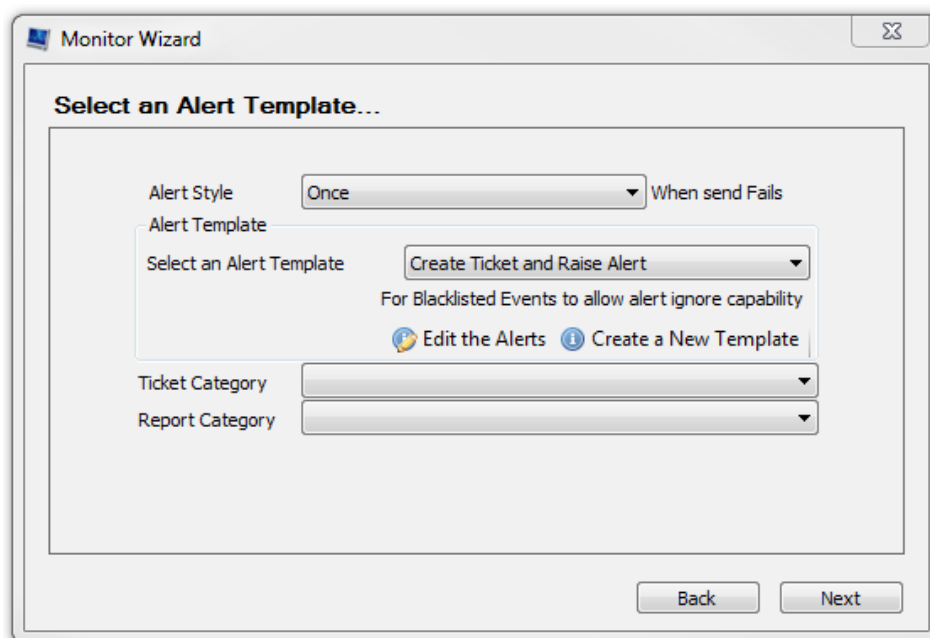
Illustration 168: LabTech Monitor Wizard: Select where you would like to run this...

Select how often to run the monitor:

The screenshot shows a window titled "Monitor Wizard" with a close button in the top right corner. The main heading inside the window is "Select how often you would like this to run...". Below this heading, there is a single dropdown menu labeled "Frequency" with "5 Minutes" selected. At the bottom right of the window, there are two buttons: "Back" and "Next".

Illustration 169: LabTech Monitor Wizard: Select how often you would like this to run...

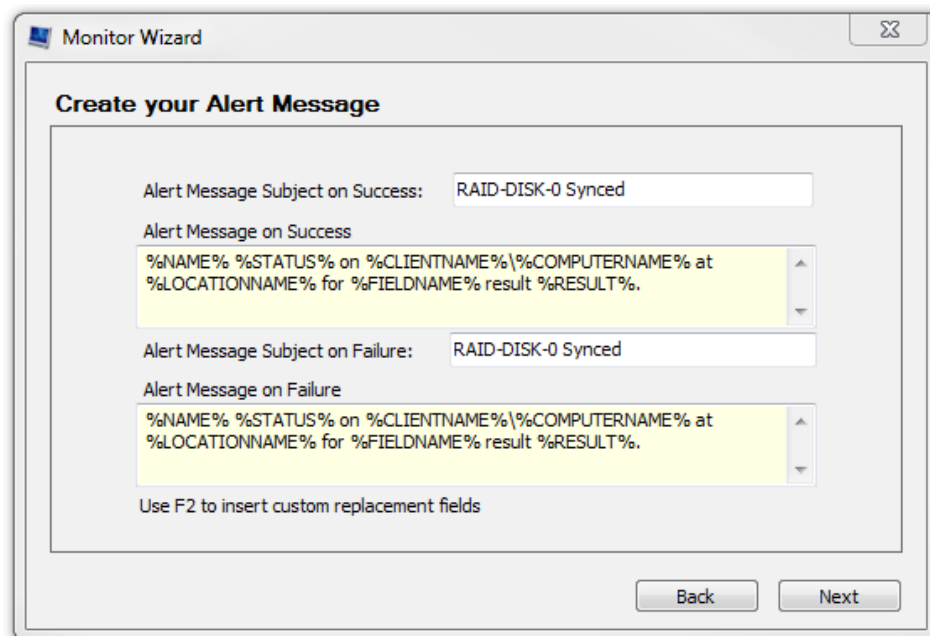
Select the alert template, defaults shown:



The screenshot shows the 'Monitor Wizard' window with the title 'Select an Alert Template...'. It contains several fields: 'Alert Style' is set to 'Once' with a dropdown arrow; 'When send Fails' is a label; 'Alert Template' is a section containing 'Select an Alert Template' with a dropdown menu showing 'Create Ticket and Raise Alert'; below this is the text 'For Blacklisted Events to allow alert ignore capability' and two links: 'Edit the Alerts' and 'Create a New Template'; 'Ticket Category' and 'Report Category' are both dropdown menus. At the bottom right are 'Back' and 'Next' buttons.

Illustration 170: LabTech Monitor Wizard: Select an Alert Template...

Define the Alert Message, defaults shown:



The screenshot shows the 'Monitor Wizard' window with the title 'Create your Alert Message'. It contains several fields: 'Alert Message Subject on Success' and 'Alert Message Subject on Failure' are both text boxes containing 'RAID-DISK-0 Synced'; 'Alert Message on Success' and 'Alert Message on Failure' are both text areas containing the same placeholder text: '%NAME% %STATUS% on %CLIENTNAME%\%COMPUTERNAME% at %LOCATIONNAME% for %FIELDNAME% result %RESULT%.'; at the bottom is the text 'Use F2 to insert custom replacement fields'. At the bottom right are 'Back' and 'Next' buttons.

Illustration 171: LabTech Monitor Wizard: Create your Alert Message

Enter the name for the monitor, we use 'NetSwap RAID-DISK-0 Synced'. Review the monitor setup and click 'Finish' if everything is set correctly:

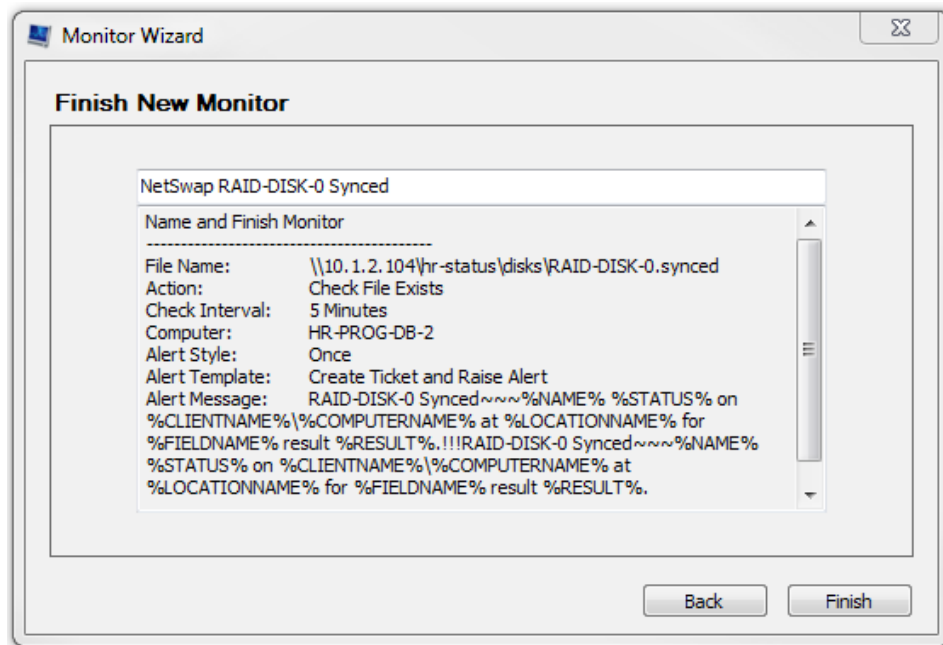


Illustration 172: LabTech Monitor Wizard: Finish New Monitor

Once the monitor is created, double click on the monitor. The configuration should be similar to what is shown below:

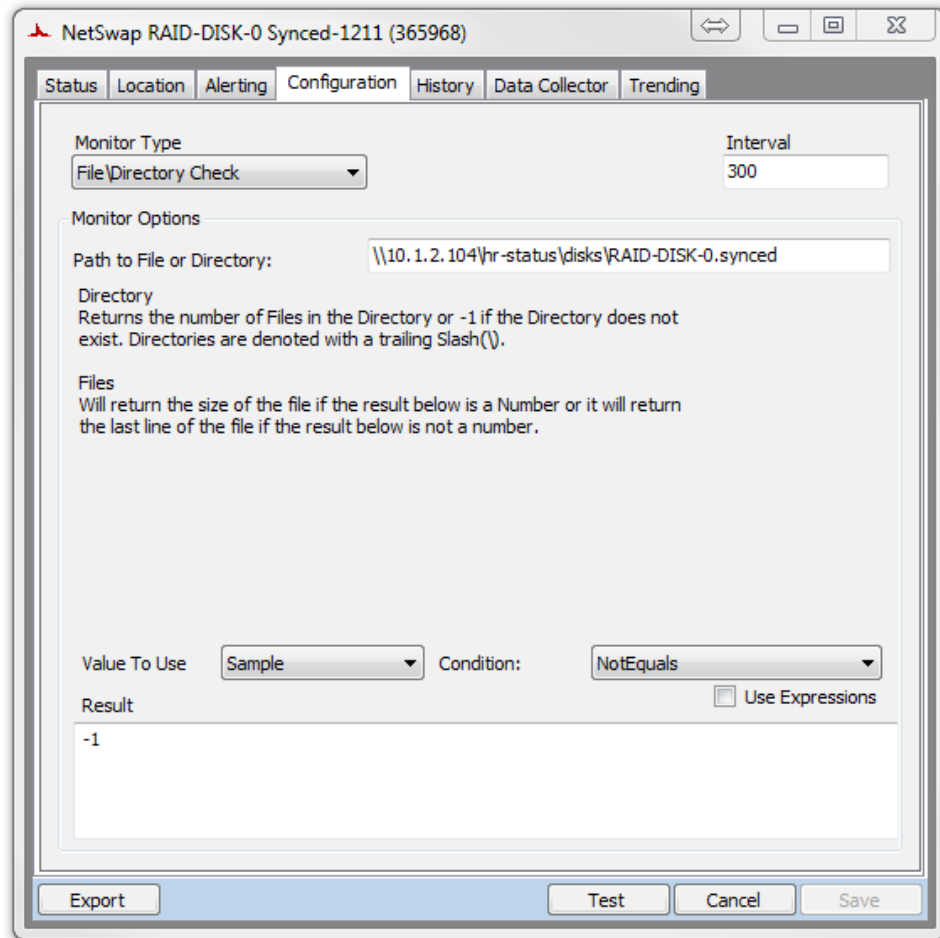


Illustration 173: LabTech File Monitor Configuration

Test the monitor by clicking the 'Test' button and you should see something similar to the following:

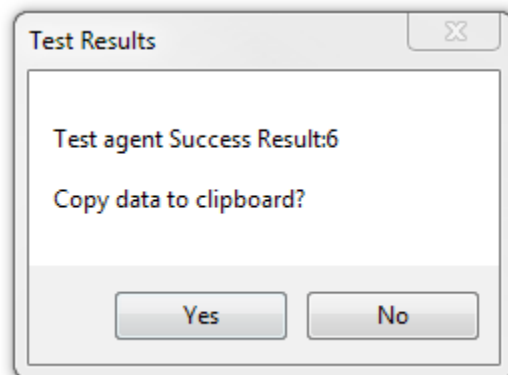


Illustration 174: LabTech File Monitor Success

We can see that the test was successful.

8.4 Level Platforms Managed Workplace 2012

Managed Workplace supports several methods of monitoring a NetSwap/RAIDFrame Plus:

- **Device Availability Monitor** – Monitors the responsiveness of the device on the network generating an alert if the device is offline.
- **Custom Log File Monitor** – Can be used to monitor the status of disks and mirror disks generating alerts if is not shared, if a mirror disk is degraded or rebuilding, etc.
- **Performance Counters Monitor** – Can be used to monitor the available disk space on an attached iSCSI disk and generate an alert when disk space is low. Various other performance related metrics (such as I/O performance, etc.) can be monitored as well.

The following sections will detail setting up each of these types of monitors using the Web-based version of Managed Workplace 2012.

8.4.1 Device Availability Monitor

Before setting up the Device Availability Monitor the NetSwap device must be added to the site.


Select the desired site from 'Site Management' screen (Configuration->Site Management) and click on the 'Network Discovery' tab and then click on 'Modify'

Site Management

Site: **highly Reliable Systems, Inc.**

[General](#) [Configuration](#) [Resources](#) [Network Discovery](#) [Device Exclusion](#) [Device Managers](#) [Support](#)

Network Scan (local network) - Last Scan: 6/11/2013 5:28:26 PM

[Scan Now](#) [Modify](#) 

Intel® vPro™ Credentials

User name: -

Password: -

SNMP V1/V2 Community Strings:

Community String	Description
public	

Scan Settings:

Type	Skip	IP Addresses	Description
Single		10.1.1.207	NetSwap S

Discovery Settings

[Modify](#)

Site Management

Site: highly Reliable Systems, Inc.

Modify Network Scan Settings

Intel® vPro® Credentials:

Change Password

User name:

Password:

SNMP V1/V2 Community Strings:

Add Delete

<input type="checkbox"/>	Community String	Description
<input type="checkbox"/>	public	

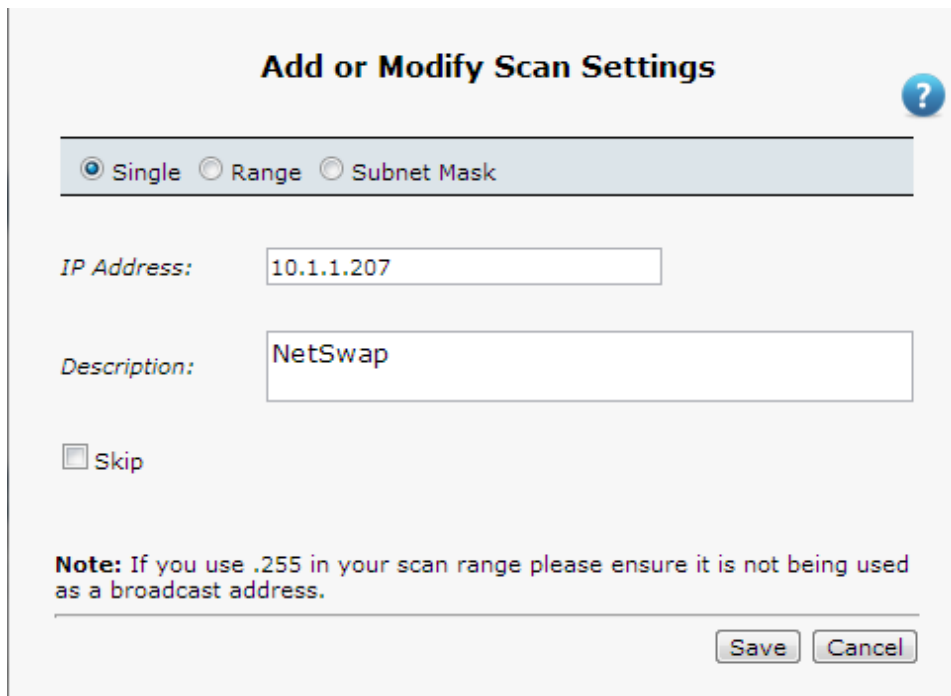
Scan Settings

Add Delete

Total IP Addresses: 1

<input type="checkbox"/>	Type	Skip	IP Addresses	Description	Total IP Addresses
<input type="checkbox"/>	Single		10.1.1.207	NetSwap S	1

Enter the IP address and a description for the NetSwap/RAIDFrame Plus and click 'Save'.



Add or Modify Scan Settings ?

☒ Single ☐ Range ☐ Subnet Mask

IP Address:

Description:

☐ Skip

Note: If you use .255 in your scan range please ensure it is not being used as a broadcast address.

Then click 'Save' on the 'Modify Network Scan Settings' to start the scan.

To create the monitor, go to the 'Monitoring and Alerting Rules Configuration' screen (Configuration->Monitor and Alert Rules) and select the correct site and device and click on 'Add Monitor'.



Monitoring And Alerting Rules Configuration

Site: Device:

Add Monitor **Enable** **Disable** **More Actions** ▼

0 Monitors - **10.1.1.207**

▼

<input type="checkbox"/>	Monitor Title ▲	State	Type
No monitors for this device.			



- >
- >
- >
- >
- >

- ules
- dules
- Alert Rules
- ories

Monitoring And Alerting Rules Configuration

Device

Policy Module

Cloud Service

Site: @ghly Reliable Systems Inc.

Device: 10.1.1.207

Choose monitor type

Device Availability

Add Monitor Cancel

0 Monitors - 10.1.1.207

13 IIiD £1

Monitor Title

Alert Configs

State

No monitors for this device.

Enter a title and description for the NetSwapRAIDFrame Plus device in the 'Monitor' tab.

Monitoring And Alerting Rules Configuration

Add Device Availability Monitor

Device: 10.1.1.207

Monitor | Alerts

Monitoring Rule

Title:

NetSwap Availability

Description:

Checks if NetSwap is available on the network.

Device Availability Rule

Availability for devices monitored by Onsite Managers is determined through ICMP ECHO requests. For devices with Device Managers installed, availability is determined through messaging between the Device Manager and the Service Center. This monitor type is not applicable to Mobile Devices which use the Mobile Device Availability monitor to determine availability.

Save

Cancel

Click on the 'Alerts' tab and then click the 'Add Alert Configuration' button.

Monitoring And Alerting Rules Co

Add Device Availability Monitor
Device: 10.1.1.207

Monitor Alerts

Add Alert Configuration

Alert Configuration	Description
---------------------	-------------

Enter a Title and Description for the alert and click the 'Add Alert Rule' button.

Alert Configuration

Alert

Title: NetSwap Unavailable *

Description: The NetSwap at 10.1.1.207 is unavailable.

Alert Rules

☒ Alert when any rule conditions are met

☐ Alert when all rule conditions are met

Add Alert Rule

Alert Categories, Actions and Notifications

Alert Categories: • Uncategorized

Alert Actions: ☐ Create Trouble Ticket ☐ Self-Heal ☐ Run Script


Alert Notifications: ☐ Send Email

Escalation Notification: ☐ Escalate Alert

Save Cancel

Select the amount of time the NetSwap/RAIDFrame Plus is offline to trigger the alert and click the 'Save' button.

Availability Rule Parameters

Trigger alert when Device is Down for 

Check desired options under 'Alert Categories, Actions, and Notifications' and click the 'Save' button.


Alert Configuration

Alert

Title: *

Description:


Alert Rules

Rule Description	Modification Date	
<u>Device has been down for 5 minutes</u>	6/11/2013 6:54:47 PM	

☒ Alert when any rule conditions are met

☐ Alert when all rule conditions are met

Alert Categories, Actions and Notifications

Alert Categories: • **Uncategorized** 

Alert Actions: ☒ Create Trouble Ticket ☐ Self-Heal ☐ Run Script

Alert Notifications: ☐ Send Email

Escalation Notification: ☐ Escalate Alert

Click 'Save' to save the new monitor.

Add Device Availability Monitor

Device: 10.1.1.207

MonitorAlerts

Add Alert Configuration

Alert Configuration	Description	
NetSwap Unavailable	The NetSwap at 10.1.1.207 is unavailable.	✖

SaveCancel

8.4.2 Custom Log File Monitor

A Custom Log File monitor can be used to parse text files for specific key words. The NetSwap/RAIDFrame plus device has a special share that is always available containing Status Files (as detailed in the Status Files section above). These files are available through a UNC path that can be used with the Managed Workplace Custom Log File monitor. We will detail setting up a monitor to detect when a Mirror disk is degraded by parsing the RAID status file for the Mirror disk looking for the keyword 'degraded'. Similarly we could look for the keyword 'rebuilding' or 'recovering' to alert when the mirror is being rebuilt.

To create the monitor, go to the 'Monitoring and Alerting Rules Configuration' screen (Configuration->Monitor and Alert Rules) and select the correct Site and for the Device select a computer that can access the HR-STATUS share on the NetSwap/RAIDFrame Plus. A good choice is the computer on which Onsite Manager is installed. Once the Site and Device are selected, click on 'Add Monitor'.

Monitoring And Alerting Rules Configuration

Device

Policy Module

Cloud Service

Site: highly Reliable Systems, Inc. Device: HR-SVR2008-TEST

Add Monitor Enable Disable More Actions▼View: By Sum

7 Monitors - **HR-SVR2008-TEST**

⏪ ⏩ 1 ⏪ ⏩

Page size: 50

7 items in

<input type="checkbox"/>	Monitor Title ▲	State	Type	Alert Configs	Polling	Sc
<input type="checkbox"/>	LogicalDisk % Free Space - _Total	Enabled	Performance Counters	0	15 min	Ru
<input type="checkbox"/>	LogicalDisk % Free Space - C:	Enabled	Performance Counters	0	15 min	Ru
<input type="checkbox"/>	LogicalDisk % Free	Enabled	Performance Counters	0	15 min	Ru

Select the 'Custom Logs' monitor type and click on the 'Add Monitor' button.

Monitoring And Alerting Rules Configu

Q Device

r,S Policy Module

Cloud 5.service

Site: highly Reliable Systems, Inc. | Device: HR-SVR2008-TEST

Choose monitor type

Custom Logs

Add Monitor

Cancel

7 Monitors - HR-SVR2008-TEST

K

<

1

>

X

Page size: 50

	Monitor Title ^	State	Type	Alert Configs	P
IEI	LogicalDisk % Free Space- _Total	Enabled	Performance CoInters	0	
IFI	LogicalDisk % Free	Enabled	Performance CoInters	0	

Enter a Title and Description for the monitor. For the UNC File Path we will use the RAID status file for the first Mirror disk, MIRROR-DISK-0, which for a device on IP 10.1.1.207 is '\\10.1.1.207\hr-status\disks\MIRROR-DISK-0.raidstatus'. User Name and Password are not required. For Search String enter 'degraded'. Leave the Options unchecked and scroll down and set the Interval as desired.

Monitoring And Alerting Rules Configuration

Add Custom Logs Monitor

Device: HR-SVR2008-TEST

Monitor | Alerts

Monitoring Rule

Title: MIRROR-DISK-0 Degraded

Description: MIRROR-DISK-0 is degraded.

Custom Log Monitor

UNC File Path: \\10.1.1.207\hr-status\disks\MIRROR-DISK-0.raidstatus

Authentication

User Name:

Password:

Search Settings

Search String: degraded

Options: ☐ Match case ☐ Match whole word

Save Cancel

Select the 'Alert' tab and click the 'Add Alert Configuration' button.

Monitoring And Alerting Rules Configur

Add Custom Logs Monitor

Device: HR-SVR2008-TEST

Monitor

Alerts

Add Alert Configuration

Alert Configuration	Description
---------------------	-------------

Save

Enter a Title and Description for the alert and click the 'Add Alert Rule' button.

Alert Configuration

Alert

Title: *

Description:

Alert Rules

☒ Alert when any rule conditions are met
☐ Alert when all rule conditions are met

Add Alert Rule

Alert Categories, Actions and Notifications

Alert Categories:

- Uncategorized

Alert Actions: ☐ Create Trouble Ticket ☐ Self-Heal

Alert Notifications: ☒ Send Email

Escalation Notification: ☐ Escalate Alert

Categorize Alert...
☐ Run Script

Save Cancel

Click the 'Save' button to save the Alert Rule.

Custom Log Rule

An alert will be triggered when the specified search condition ('degraded') is matched.

Save Cancel

Check desired options under 'Alert Categories, Actions, and Notifications' and click the 'Save' button.

Alert Configuration

Alert

Title:

MIRROR-DISK-0 Degraded

*

Description:

MIRROR-DISK-0 is degraded.

Alert Rules

Rule Description	Modification Date	
An alert will be triggered when the specified search condition is matched.	6/12/2013 1:03:47 PM	X

- @ Alert when any rule conditions are met
- Alert when all rule conditions are met

Add Alert Rule

Alert Categories, Actions and Notifications

Alert Categories:

Uncategorized

Categorize Alert...

Alert Actions:

Create Trouble Ticket

Run Script

Alert Notifications:

Send Email

Escalation Notification:

Escalate Alert

Save

Cancel

Click the 'Save' button to save the new monitor.

Monitoring And Alerting Rules Configuration

Add Custom Logs Monitor

Device: HR-SVR2008-TEST

MonitorAlerts

Add Alert Configuration

Alert Configuration	Description	
MIRROR-DISK-0 Degraded	MIRROR-DISK-0 Is degraded.	

SaveCancel

8.4.3 Performance Counters Monitor

A Performance Counter monitor checks metrics for a device or application. For the NetSwap/RAIDFrame Plus these can be used to monitor disks that are attached iSCSI. Metrics that can be monitored include disk space used and various disk performance metrics such as disk I/O. We will show setting up a monitor for low disk space using the '% Free Space' counter.

To create the monitor, go to the 'Monitoring and Alerting Rules Configuration' screen (Configuration->Monitor and Alert Rules) and select the correct Site and for the Device select the computer to which the NetSwap/RAIDFrame Plus disk is attached via iSCSI. Once the Site and Device are selected, click on 'Add Monitor'.

Monitoring And Alerting Rules Configuration

Device

Policy Module

Cloud Service

Site: highly Reliable Systems, Inc. Device: HR-SVR2008-TEST

[Add Monitor](#) [Enable](#) [Disable](#) [More Actions](#)

View: By Sum

7 Monitors - HR-SVR2008-TEST

K

<

1

>

>

Page size: 50

7 items in

<input type="checkbox"/>	Monitor Title ^	State	Type	Alert Configs	Polling	Sc
<input type="checkbox"/>	LogicalDisk % Free Space - _Total	Enabled	Performance Counters	0	15 min	Ru
<input type="checkbox"/>	LogicalDisk % Free Space - C:	Enabled	Performance Counters	0	15 min	Ru
<input type="checkbox"/>	LogicalDisk % Free	Enabled	Performance Counters	0	15 min	Ru

Select the 'Performance Counters' monitor type and click on the 'Add Monitor' button.

Enter a Title and Description for the monitor. Select 'LogicalDisk' for Performance Object, select the desired drive letter for Object Instance and select '% Free Space' for the Counter. Set the Interval as desired.

Monitoring And Alerting Rules Configuration

Add Performance Counters Monitor

Device: HR-SVR2008-TEST

MonitorAlerts

Monitoring Rule

Title:Mirror Disk 0 Low Space

Description:Mirror Disk 0 is low on disk space.

☐ Enabled

Counter Selection

Performance Object:LogicalDisk

Object Instance:C: - E: - F: - G: - H: - I: - J: - K: - L: - M: - N: - O: - P: - Q: - R: - S: - T: - U: - V: - W: - X: - Y: - Z: - All Available Instanc

Counter:% Free Space

Counter Help:% Free Space is the percentage of total usable space on the selected logical disk drive that was free.

Scheduling

Polling Interval:5 minutes

Schedule:Run Always

(*)Required Field

SaveCancel

Select the 'Alert' tab and click the 'Add Alert Configuration' button.

Monitoring And Alerting Rules Configur

Add Custom Logs Monitor

Device: HR-SVR2008-TEST

Monitor

Alerts

Add Alert Configuration

Alert Configuration	Description
---------------------	-------------

Save

Enter a Title and Description for the alert and click the 'Add Alert Rule' button.

Alert Configuration

Alert

Title:

Mirror Disk 0 Low Disk Space *

Description:

Mirror Disk 0 is low on disk space.

Alert Rules

☒ Alert when any rule conditions are met

☐ Alert when all rule conditions are met

Add Alert Rule

Alert Categories, Actions and Notifications

Alert Categories:

● Uncategorized

Alert Actions:

☐ Create Trouble Ticket

☐ Self-Heal

Alert Notifications:

☐ Send Email

☐ Run Script

Escalation Notification:

☐ Escalate Alert

Categorize Alert...

Save

Cancel

Enter the desired threshold percentage and data points and click the 'Save' button to save the Alert Rule.

Performance Counter Rule Parameters

Trigger alert when performance counter '% **Free Space**' is

threshold * for the last * data points.

Check desired options under 'Alert Categories, Actions, and Notifications' and click the 'Save' button.

Alert Configuration

Alert

Title:

Description:

Alert Rules

Rule Description	Modification Date
Logical Disk E: free space is less than 10 for 2 data points	6/12/2013 5:16:03 PM

@ Alert when any rule conditions are met

| Add Alert Rule |

Alert when all rule conditions are met

Alert Categories, Actions and Notifications

Alert Categories: • Uncategorized

Alert Actions: Create Trouble Ticket

Self-Heal

Alert Notifications: Send Email

Escalation Notification: Escalate Alert

Categorize Alert...

Run Script

| Save | Cancel |

Click the 'Save' button to save the new monitor.


Monitoring And Alerting Rules Configuration

Add Performance Counters Monitor

Device: HR-SVR2008-TEST

MonitorAlerts

Add Alert Configuration

Alert Configuration	Description	
Mirror Disk 0 Low Disk Space	Mirror Disk 0 is low on disk space.	

Save

Cancel

9 GPL Code Statement

This product includes software code developed by third parties, including software code subject to the GNU General Public License ("GPL") or GNU Lesser General Public License ("LGPL"). The GPL and LGPL software included in this product were obtained from the Ubuntu 14.04 Server software release and source is available at <http://ubuntu.com>.



Contact Information

Highly Reliable Systems

1900 Vassar Street

Reno Nevada 89502-2109

TEL: 775-329-5139

FAX: 775-322-5397

www.high-rely.com