



NBMR For Linux

Bare Machine Recovery for Dell EMC NetWorker™

User Guide

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1 Document Conventions

The following typographical conventions are used throughout this guide:

/etc/passwd	represents command-line commands, options, parameters, directory names and filenames
Next >	used to signify clickable buttons on a GUI dialogue
Note:	describes something of importance related to the current topic



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2 Introduction

Bare Machine Recovery for Dell EMC NetWorker[™] (NBMR) provides disaster recovery capability for Dell EMC NetWorker[™] protected Linux Intel hosts.

It is possible to recover the original system to the same or dissimilar hardware. To protect a system, backups can be taken periodically, along with configuration information, which includes details of hard disks, network interfaces, etc.

This Guide shows the user how to save system configuration information, backup and recover a Linux Intel machine using NBMR. More detailed information is available from man pages for the NBMR components. The man pages are available after installation of NBMR.

This guide relates to NBMR for Linux Intel version 9.6.1 only.

Note: NBMR can only be used in conjunction with EMC NetWorker.

This guide describes how to:

- Save Configuration data using nbmrcfg
- Configure and run your Dell EMC NetWorker™ Client backup
- Perform a Disaster Recovery

2.1 Limitations

There are limits to what this version of NBMR for Linux Intel will support. It will NOT support:

- Platforms other than Intel
- Multi-boot operating systems
- Recovery of files that are being written to at the time of backup.

2.2 Further Information

Further information and advice on using NBMR may be found in the **Cristie Knowledge Base** (https://kb.cristie.com) or the **Cristie Forum** (https://forum.cristie.com).



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3 System Requirements

NBMR for Linux Intel can only be installed on a x86_64 Linux Intel (i.e. 64-bit) machine.

NBMR requires that EMC Networker client version 19.1 or later is already installed.

A minimum memory of **6 GB RAM** is required for booting the recovery environment and running a recovery.

Please refer to this web page https://www.cristie.com/support/matrix/ to determine the latest OS and Dell EMC NetWorker™ client/server support for NBMR Version 9.6.1.

Before NBMR can be used it must also be correctly licensed. Cristie provides a 30 day trial license with the product.



4 Supported Filesystems

Please refer to this web page https://www.cristie.com/support/matrix/ to determine the latest file system support for NBMR Version 9.6.1.



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5 UEFI and MBR BIOS Support

Note: recovery support is provided for conversion from uEFI to MBR BIOS. Conversion from legacy MBR BIOS to uEFI is not currently supported.

The recovery ISO is configured for both MBR (legacy) and uEFI boot. It can therefore boot into either environment. There are no special considerations that need to be made by the customer for uEFI machines. If your machine boots with elilo, prior to performing a backup please run:-

nbmrcfg -b elilo

All Cristie Bare Metal Recovery software handles the recreation of the uEFI partitions during the recovery of the machine, this is transparent to the user.

When recovering an uEFI enabled OS you must recover to uEFI capable hardware.

When recovery is to a different machine, you may need to manually configure the uEFI boot stanza in order to boot the recovered uEFI OS. Please refer to the Cristie Knowledgebase for further information on editing the boot stanza.

Note: when recovering an uEFI enabled OS, it is recommended that the recovery environment is booted in uEFI mode.



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6 Using NBMR For Disaster Recovery

This section describes the steps involved in using Dell EMC NetWorker™ in conjunction with NBMR for disaster recovery.

This description assumes that the Dell EMC NetWorker[™] client software has already been installed and configured.

To ensure your system is protected observe the following steps:

- 1. Install NBMR on the system you wish to protect.
- 2. Use the nbmrcfg program to capture and store the configuration of the system.
- 3. Backup the system with the Dell EMC NetWorker[™] client to a Dell EMC NetWorker[™] server as normal.

6.1 Saving the System Configuration

Configuration is always saved to **/NBMRCFG** - it can't be saved anywhere else. This guarantees it is always stored in the backup.

When saving the configuration information to the backup location, this must be done **before** the backup is run.

To save the configuration information for each machine, the supplied command line program <code>nbmrcfg</code> is used. It is recommended that this is run prior to running each backup to ensure the configuration is up to date.

6.2 NBMRcfg

To use the command line configuration saving program, type nbmrcfg. The configuration will automatically detect the machine boot loader and boot partition, however, if either are incorrectly detected you may specify additional options.

The available options of nbmrcfg can be shown using:

nbmrcfg --help

There is a full manual page for nbmrcfg available by typing man nbmrcfg.

Note: Do not use any flags with nbmrcfg because the recovery will fail if nbmrcfg is used with arguments.

This is a full list of options:

Option	Description
-b <name>,bootloader=<name></name></name>	Set boot loader to <name> (default is grub)</name>
-d <name>,bootdevice=<name></name></name>	Set boot device name to <name></name>
-l <file>,logfile=<file></file></file>	Set log file (default is cbmrcfg.log)



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-o <file>,output=<file></file></file>	Set output file (default is disrec.ini)
-p <permissions></permissions>	Set output file permissions (default 0600)
-v,verbose	Verbose mode
autorelabel= <n></n>	Automatically relabel SELinux if <n> != 0</n>
cobmr_boot_backup	CoBMR only. Intended to be used where the system is backed up
	using Cohesity's block based backup. Cohesity only snapshots LVM
	partitions and in most cases '/boot' will be on a standalone
	partition and be missed. This switch will perform a simple TAR
	based backup of '/boot' and put it in '/COBMRCFG' so it's included
	in the backup.
	Note: It should never be on for standard file based backups
disk_pattern= <pattern></pattern>	Only include disks matching <pattern></pattern>
disk_regex= <regex></regex>	Only include disks matching <regex></regex>
disk_skip= <pattern></pattern>	Don't include disks matching <pattern></pattern>
disk_skip_regex= <regex></regex>	Don't include disks matching <regex></regex>
disshw= <n></n>	Use dissimilar hardware support if <n> != 0</n>
filedev_mount_options= <string></string>	Set file device mount options
filedev_mount_target= <string></string>	Set file device mount target
format_pattern= <pattern></pattern>	Only format devices matching <pattern></pattern>
format_regex= <regex></regex>	Only format devices matching <regex></regex>
format_skip= <pattern></pattern>	Don't format devices matching <pattern></pattern>
format_skip_regex= <regex></regex>	Don't format devices matching <regex></regex>
mpath= <n></n>	Don't scan for mpath devices if <n> = 0</n>
partition_pattern= <pattern></pattern>	Only partition devices matching <pattern></pattern>
partition_regex= <regex></regex>	Only partition devices matching <regex></regex>
partition_skip= <pattern></pattern>	Don't partition devices matching <pattern></pattern>
partition_skip_regex= <regex></regex>	Don't partition devices matching <regex></regex>
local_fs	Don't include remote filesystems
local_disks	Don't include remote disks, e.g. iscsi
rc= <n></n>	Set return code to <n></n>
rescale_pattern= <pattern></pattern>	Only rescale devices matching <pattern></pattern>
rescale_regex= <regex></regex>	Only rescale devices matching <regex></regex>
rescale_skip= <pattern></pattern>	Don't rescale devices matching <pattern></pattern>
rescale_skip_regex= <regex></regex>	Don't rescale devices matching <regex></regex>
save_mpath_list	Save mpath details
vg_pattern= <pattern></pattern>	Only create VGs matching <pattern></pattern>
vg_regex= <regex></regex>	Only create VGs matching <regex></regex>
vg_skip= <pattern></pattern>	Don't create VGs matching <pattern></pattern>
vg_skip_regex= <regex></regex>	Don't create VGs matching <regex></regex>
help,usage	Print this message and exit
version	Print the version and exit

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6.3 Creating a NBMRCfg Pre-Schedule

The purpose of the pre-schedule command is to run the NBMR configuration program on the source machine automatically when the Dell EMC NetWorker[™] scheduled backup has triggered, this makes sure the config file used in the backup is up to date.

This works by adding a script to the source machine and modifying the Client Properties in the Dell EMC NetWorker[™] administrator console to point to the script.

Once this is completed Dell EMC NetWorker[™] will run the script on the client that triggers NBMRCFG, then the Dell EMC NetWorker[™] backup starts.

There are certain conditions that should be meet:

- The script name must begin with either the prefix 'save' or 'nsr' and must not exceed 64 characters.
- The script must reside on the client in the same directory as the Dell EMC NetWorker™ save command.
- The Dell EMC NetWorker[™] save command must be used in the backup program.
- All commands within the program file must complete successfully. Otherwise, the Dell EMC NetWorker[™] server cannot complete the remaining instructions e.g. the actual backup. NBMR / Dell EMC NetWorker[™] Linux pre-script.

This simple script is required to call the NBMRCFG script in /usr/bin. The script is then set in the All rights reserved. Server Client so Networker can run it automatically when backup is initiated. This will capture the current state of the machine and save it to /NBMRCFG/ nbmrcfg.log

Creating the script:

Create a bash script called nsr_nbmr.sh

(Note: the script has to be prefixed with 'nsr' for Networker to recognise it) edit the file and add the following script (simply calling NBMRCFG) then save it:

Note: that you need to declare and export the path because the Networker client isn't root so it needs to know the path:

```
#!/bin/bash
export PATH=$PATH:/usr/local/bin:/usr/local/sbin:/usr/bin:/usr/sbin:/bin:/sbin:/root/bin
nbmrcfg
exit
```

Move the script to /usr/bin:

Add executable permissions for all users to the script (755):

Add the name of the script to the 'Apps & Modules' tab of the client properties in Dell EMC NetWorker[™] Administrator Console in the 'Pre command' field.

🕔 Client Properties - gm-ce	ntos-74		×
General Apps & Modules GI	obals (1 of 2) \ Globals (2 of 2) \ Sn	napshot Management \Restricted Data Zones \	
Access		NDMP	
Remote user:		NDMP:	
Password:		NDMP multistreams enabled:	
		Disable IPv6:	
Backup		NDMP array name:	
Backup command:		NDMP vendor information:	7
Pre command:	nsr_nbmr.sh		
Post command:			
NAS device:			
Application information:	NSR_PS_DEBUG_LEVEL=0	Probe	
		Probe resource name:	-



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7 NetWorker Client Backup

The backup is performed using the command line savefs, for example:

savefs -v -s <hostname> <filesystem>

Where <hostname> is the host name or IP address of the EMC NetWorker server that the backup will be stored upon and <filesystem> is the name of the file system you wish to backup. The backup command should be repeated for each file system that will need to be recovered in the event of a disaster recovery. As a minimum Cristie recommends backing up the root ('/') and boot ('/boot') file systems. For example, the following screenshot shows the backup of root being initiated.

Note: Please ensure you backup all file systems that are involved in the boot process. If any are missing your restored system may not boot correctly.

Note 2: If the system is uEFI, ensure that the '/boot/efi' filesystem has been included in your backup.



Please refer to your NetWorker User documentation for a full discussion of the backup options.

Alternately use save -v -s <hostname> <filesystem> where filesystem could be / to backup everything from root.

For Dell EMC NetWorker[™] version 19.4 or later you must save the **NetWorker Authentication** database. Without this file it will not be possible to authenticate the server during a recovery sequence. Please copy the database to a suitable location on the network accessible to a potential disaster recovery using NBMR.

To save the database and after the first backup with NBMR installed, run the following script:

nbmr save authdb <directory>

Where <directory> can be a mounted share or say /tmp. In the latter case manually copy



the database to a network share afterwards. This will create a file called nsrladb-<hostname>.tgz which you can later load from the recovery environment.

[root@np-rhel83 /]# nbmr_save_authdb /mnt/cristie/nigelp/NBMR/Linux/ Saving NBMR authentication data to /mnt/cristie/nigelp/NBMR/Linux//nsrladb-np-rh el83.tgz____

It is important to note that the NetWorker Authentication database should be saved after the first backup. Doing it immediately after installing the NBMR will not produce a useable authentication database file.

7.1 Housekeeping

In order to ensure that you can recover to the latest version of the operating system that was installed on your Linux Intel machine, you must ensure that a Dell EMC NetWorker[™] backup is performed every time the operating system files change. In addition you should also configure a run of the NBMRCfg.exe program using a pre-script on the server (if supported) prior to the backup.

This is not always possible, so **Cristie Software Ltd.** recommends that the Dell EMC NetWorker[™] backup be performed regularly. However, you should choose a period which reflects the rate of change of data in your own organisation. Although the configuration data will change less frequently than the operating system, it is a wise precaution to update this regularly. For example, this can be achieved by creating a cron job for your schedule or by defining a scheduled backup for the required client machine on the Dell EMC NetWorker[™] server.



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8 Performing a Recovery

When a machine has failed, it can be recovered using the XBMR bootable product CD/ DVD-ROM or DR ISO (if your host supports this capability). XBMR is a separate product to NBMR. It is a generic Recovery Environment for all Cristie Linux BMR products.

You should ensure your machine's BIOS is set up to boot from CD/DVD-ROM or ISO as appropriate.

The process encompasses the following stages:

- Boot into XBMR Recovery Environment and configure as required
- Read Configuration Data from your backup
- **Restore** Files from your backup
- Load additional drivers (if necessary)
- Reboot into recovered OS

Boot the machine using the **XBMR** bootable CD ROM or ISO. You will then be presented with the screen below:

X-Windows based Linux recovery environment	
Text based Linux recovery environment	
Use the \uparrow and \downarrow keys to change the selection.	
Press 'e' to edit the selected item, or 'c' for a command prompt.	
Press Escape to return to the previous menu.	
The selected entry will be started automatically in 13s.	

Cristie recommends that you choose the graphical X-Windows recovery environment mode which loads the **Cristie Recovery Environment**. You will be presented with the **license** screen. Click I Accept if you agree with the licencing terms.



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The Product Selection drop-down menu will then be shown. Now select the Cristie product used during the backup - NBMR in this case.

Cristie Recovery Environment (9.6.1.3305)								
	Choose which product to recover NBMR •							
	Sales: +44 1453 847000 email: sales@cristie.com © Cristie Software Ltd 2016-2024							

Click OK. You will then see the NBMR Recovery Environment main menu.



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Cristie recommends selecting the **Automatic Recovery Wizard** option from the **Recovery Environment** main menu. This will then display the **Setup NBMR Location** dialogue box, where you can specify the Dell EMC NetWorker™ Server information.

Mozilla Firefox			E					
O D localhost/nbmr_setup_location.php	ជ] ≡	:					
Setup NBMR Location Provide NetWorker Server information. This wizard will take you through the steps to fully recover your system from a backup.								
Server Hostname: EMC-SRV1 Server IP Address: 10.10.16.42 Authentication Database /mnt/authdb/nigelp/NBMR/Lint Browse Network Setup Setup Networker Hosts	> (Cance	el					

Now enter the Server details (of the Dell EMC NetWorker[™] Server where the backup resides). Enter the Server hostname and IP address. If your server is version 19.4 or later and **old authentication** is disabled on the server, you must include a path to the authentication database. It will not be possible to recover any files without this database

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when old authentication is disabled. Contact your Dell EMC NetWorker[™] administrator if you are unsure of any of the settings.

If it is required to configure the local network settings (i.e. the XBMR Recovery Environment), click the Network Setup button. Now enter your new network settings. You must set the IP and hostname of the original host for NBMR recoveries.

Mozilla Firefox				凹
🔿 🗅 localhost/ne	twork_setup.php		ជ	≡
Network Setu	p			
Interface:	eth0 0:c:29:72:52:5d CON ~			
IP Address:	10.10.11.186	DHCP		
Subnet Mask:	255.0.0.0]		
Gateway:	10.0.1.100]		
Hostname:	np-rhel83]		
Nameserver:	10.0.1.108]		
CA Certificate Bundle		Browse		
			ок с	ancel

Select OK to save your changes. The Start Network screen will then display the network changes being implemented.



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Mozilla Firefox		巴
O D localhost/show_output.php	☆	≡
Start Network		
disrec (c) Cristie Software Ltd. 2008-2024 hostname: np-rhel83 eth0 10.10.11.186 255.0.0.0 Network setup complete		
	C	lose

Click Close to return to the Setup NBMR Location Wizard.Now click Next > and the Get Configuration dialogue will be shown. Entering a recovery date and time will restore an available backup nearest (but earlier) to the specified date/time.

O D localhost/nbmr_restore_configuration.php		ដ	≡
Get Configuration			
Specify the restore settings here.			
Recovery Date	(mm/dd/yyyy)		
Recovery Time	(HH:MM)		
	< Back	lext > Ca	ancel

If you wish to recover a backup other than the latest (the default) select a particular date/time - a Point-in-Time (PIT). Click the Date field and a calendar will pop-up like this:

Mozilla Firefox										
O 🗅 localhost/nbmr_re	estore	e_cor	nfigu	ratior	n.php	C			☆	≡
Get Configuration										
Specify the restore settings	here.									
Recovery Date	3/2/2	2023					- (r	mm/dd/www)		
Recovery Time	0		Mar	ch 20)23		0	н:,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
NetWorker recover options	Su	Мо	Tu	We	Th	Fr	Sa			
				1	2	3	4	J		
	5	6	7	8	9	10	11			
	12	13	14	15	16	17	18			
	26	20	21	22	23 30	24 31	25			
									1.5	
								< Back Next >	> _Ca	ance

In this example this would recover a backup closest to 32 March 2023 00:00am. Note Dell EMC NetWorker™ will find the closest incremental backup looking backwards in time.

Normally, nothing needs to be entered under **NetWorker recover options**. If you do need to enter any parameters, it will probably be standard Dell EMC NetWorker[™] options. Any parameters entered will be passed to the Dell EMC NetWorker[™] server unchanged, but they must be prefixed with a '-'. For example **-resourceutilization=2**. Please consult your Dell EMC NetWorker[™] User Manual for full details.

Note: for a list of these parameters and how to use them you should consult the relevant Dell EMC NetWorker™ User Guide.

Click Next > to continue. This will then restore the configuration from the backup.



Mozilla Firefox		e
O D localhost/show_output.php	☆	≡
Copy Configuration From Backup		
Recovering 1 file from /NBMRCFG/ into /etc/cbmr Total estimated disk space needed for recover is 36 KB. Requesting 1 file(s), this may take a while 179728:recover: Initializing the recovery session with the NetWorker server 'EMC-SRV1' to recover the selected files. Recover start time: Thu Mar 2 15:20:29 2023 179718:recover: Initializing to recover multiple streams of data from the NetWorker server 'EMC-SRV1'. Requesting 1 recover session(s) from server. 179714:recover: Initializing the child threads to recover the given recovery stream from the NetWorker server 'EMC-SRV1'. 179713:recover: Initializing to set up a connection to start reading the data from the recover stream. ./disrec.ini 179716:recover: Coordinating all the child recovery processes. 179717:recover: Releasing all the resources held by the recovery process. 179721:recover: All recovery streams from the NetWorker server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully. Received 1 file(s) from NSR server 'EMC-SRV1' are read successfully on the client 'np-rhel83'.		
Abort < Back Next	> C	ancel

Click Next > to continue to the **Start Recovery** phase. You will then be presented with the Start Recovery options. Here you can change the configuration of the system being restored.

	Cristie Recovery Environment (NBMR 9.6.1.3305)	
Cristie		?
	Automatic Recovery	
	Manual Recovery	
	Tools	
	Show Logfiles	
	Copy Logfiles	
	Reboot	
	Sales: +44 1453 847000 email: sales@cristie.com © Cristie Software Ltd 2016-2024	

Ensure that you **un-tick** the **SELinux Relabel** option, to ensure that your original SELinux settings are maintained. Only leave this box ticked, if you know that your SELinux settings

need to be reset.

Select the **Sync** tick-box if you wish to sync existing files. This option will then run a recovery sequence of everything from the restore phase onwards - so a file restore, then a dissimilar hardware step and finally a make bootable step. If the client supports incremental restores, this will save a lot of time.

For the target machine tick **Dissimilar harware support** if you want the recovery to automatically inject drivers for any new devices detected at the end of the recovery. This is the default.

If you are recovering Multipath/PowerPath disks, you must check the tick-box for **Multipath/PowerPath Support**. Not doing so will cause the disks to be treated as non-Multipath/PowerPath disks. You can then select and customise your Multipath/PowerPath disk layout by clicking on the Multipath Options or PowerPath Options button. Note this option is only enabled if multipath disks are set in the configuration.

I Multipath Options - Mozilla Firefox 回					
Iocalhost/mpath_options.php					
Multipa	Multipath Options				
Recover	Original device	New device			
	boot 3600c0ff000d70ba1a95c0c5a01000000 20G /dev/sda,/dev/sdc	3600c0ff000d70ba16c7d0c5a01000000 20G /dev/sda/dev/sdd			
	mpathb 3600c0ff000d70ba1c4dc435a01000000 17G /dev/sdb,/dev/sdd	3600c0ff000d70ba1a95c0c5a01000000 20G /dev/sdb/dew/sdc			
		OK Cancel			

If you wish, you may customise your disk layout, volume group or filesystem selection by clicking on the Recovery Options button.



Recovery Options Mozilla Firefox	xĽ
O localhost/recovery_options.php	90% 🟠 🗏
Recovery Options	
Boot Options	
Add UEFI entry	
Auto - Override the default bootloader	
Map Disks	
The original and new disks are shown below. If required, drag a Dragging a new disk onto a row which already has a new disk v uncheck all	new disk to a different row to customise the proposed layout. will swap those entries.
Recover Original disk	New disk
Recover Original disk /dev/sda 40GB	New disk /dev/sda 40GB vmw_pvscsi
Recover Original disk Image: Weight of the second secon	New disk /dev/sda 40GB vmw_pvscsi
Recover Original disk Image: constraint of the state of	New disk /dev/sda 40GB vmw_pvscsi
Recover Original disk Ø /dev/sda 40GB Volume Groups uncheck all Ø rhel_iy-rhel-9-efi (/dev/sda3) Filesystems	New disk /dev/sda 40GB vmw_pvscsi
Recover Original disk ✓ /dev/sda 40GB Volume Groups uncheck all ✓ rhel_iy-rhel-9-efi (/dev/sda3) Filesystems uncheck all ✓ / (/dev/mapper/rhel_iyrhel9efi-root xfs) ✓ /boot (/dev/sda2 xfs) ✓ ✓ /boot/efi (/dev/sda1 vfat) ✓	New disk /dev/sda 40GB vmw_pvscsi
Recover Original disk ✓ /dev/sda 40GB Volume Groups uncheck all ✓ rhel_iy-rhel-9-efi (/dev/sda3) Filesystems uncheck all ✓ /(dev/mapper/rhel_iyrhel9-efi-root xfs) ✓ /boot (/dev/sda2 xfs) ✓ /boot/efi (/dev/sda1 vfat) GPT	New disk /dev/sda 40GB vmw_pvscsi

Note: disks that have been configured in the Multipath/PowerPath Options menu will not be visible on the Recovery Options menu.

Note: de-selecting a filesystem will disable filesystem creation and file restore.

If the system to be recovered contains BTRFS subvolumes you may configure whether they are recreated during recovery. Click the **Btrfs Options** button to bring up the menu (note this option is only displayed if BTRFS volumes are present).



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De-selecting a checkbox will prevent the recovery from recreating the subvolume. Click OK to save and continue.

Note: Some subvolumes can not be de-selected due to a child subvolume dependency or if it is a root subvolume.

If you wish to change the Network Settings in advance of recovery, select **Post Recovery Network.** This option is only available for SLES 11 or later, and Red Hat 6 or later.



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Post Recovery Network - Mozilla Firefox					
(i) loca	③ localhost/post_recovery_network.php ♥ ☆ Ξ				
Post R This dialo mask, or a unchange each inter	Post Recovery Network This dialog allows the post recovery network settings to be changed. Each interface may be given a static IP address and subnet mask, or allocated a DHCP address. The hostname, default gateway and nameserver may also be changed. Empty fields will be left unchanged on the recovered system. If network information is tied to the original hardware addresses, details should be added here for each interface required after recovery, even if the network details are not to be changed.				
Enabled	Interface	MAC Address	IP Address	Subnet Mask	DHCP
	eth0	00:0c:29:72:52:5d			
Hostname	e				
Gateway					
Namesen	ver				
Post Rec	overy Script				
					OK Cancel

When you are satisfied that all options are correct, click OK to confirm.

Note: The Post Recovery Network button will only be displayed if the functionality of this feature can actually be performed on the restored system.

When you are satisfied that all options are correct, click OK to confirm and return to the **Start Recovery** dialogue. Finally select Next > to start the recovery, which will begin with a dialog like this:



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Mozilla Firefox		巴
O D localhost/show_output.php	☆	≡
Recovery Status		
disrec (c) Cristie Software Ltd. 2008-2024 File descriptor 4 (/var/log/cbmr/recovery.log) leaked on vgremove invocation. Parent PID 23857: sh Logical volume "root" successfully removed Volume group "rhel" successfully removed File descriptor 4 (/var/log/cbmr/recovery.log) leaked on pvremove invocation. Parent PID 23860: sh Labels on physical volume "/dev/sda2" successfully wiped. size_multiplier=1.00x Syncing disk '/dev/sda' sda1: 0 2097152 /dev/sda 2048 sda2: 0 60815360 /dev/sda 2099200		
	Abort	Close

The completion of the recovery is signified with a pop-up box like this:

Mozilla Firefox		凹
O D localhost/show_output.php	☆] ≡
Recovery Status		
ex 0 and kernel /boot/vmlinuz-4.18.0-372.26.1.el8_6.x86_64 Editing '/mnt/slash/dev/mapper/thel-root' already exists '/mnt/slash/dev/mapper/thel-swap' already exists Editing '/mnt/slash/tet/grub2-efi.cfg' fopen '/mnt/slash/tet/grub2-efi.cfg': No such file or directory mknod '/mnt/slash/dev/sda' 8 0: File exists '/mnt/slash/dev/sda' 8 0: File exists '/mt/slash/dev/sda' 8 0: File exists '/mt/slash/dev/sda' 8 0: File exists '/mt/slash/dev/sda' 8 0: File exists '/mt/slash/umounted /mnt/slash/umounted Recovery finished		
*	Abort	Close

Cristie recommends that the log files are always saved. If the machine fails to boot after the restore Cristie Support will require copies of the log files to diagnose any problems. Details on how to save log files are described in the section **Copy Log Files**.

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Note: if you are recovering to dissimilar hardware: NBMR will find the required module (s) automatically. Normally this will happen with no further user intervention.

Click OK to close the pop-up box, followed by the Close button to return to the Main Menu.

Finally select **Reboot** from the Main Menu to boot the restored machine, if post recovery options are not required.

8.1 Build Custom ISO

To create a custom recovery ISO, firstly boot the supplied XBMR DR ISO on a suitable host system and select the appropriate XBMR product. Then select the **Tools** menu.

Mozilla Firefox		凹
O 🖸 localhost/tools.php	☆	≡
 Manage Drivers Network Setup Set Keyboard Layout Change password Start SSH Run shell Build custom ISO 		
	start	Close

Now select Build custom ISO and click Start. The main build ISO dialogue is shown:



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Mozilla Firefox				IJ
🔿 🗅 localhost/cus	tom_iso.php		☆	≡
Build custom Is	50			
Output directory*	/mnt/iso/nigelp/NBMR/Linux/IS	Browse		
Output filename*	NBMR-Custom.iso			
Logfile directory	/mnt/log/nigelp/Logs	Browse		
CD-ROM device*	/dev/sr0	Browse		
Load Driver		Browse		
Kernel Parameters				
Include new password				
		C	K Ca	ancel

You will need to configure the following fields:

- Output directory is a network share (use Browse to select and mount a share).
- Output filename must include the .iso extension.
- Logfile directory is a network share (use Browse to select and mount a share).
- CD-ROM device (use Browse to select a CD/DVD-ROM device from /dev).
- Load Driver select the path to an optional driver file. Ensure this is compatible with the system being recovered.
- Kernel Parameters specify any extra parameters to be passed to the kernel at boot time. Be careful this is not syntax checked.
- Include new password option will include your new ssh/http password if you have changed it in the tools menu prior to building the custom ISO.

Populate the fields as required, for example. Then click OK to begin the ISO creation.





The following progress screen will show when the ISO is successfully built.

Mozilla Firefox		巴
O D localhost/show_output.php	☆	≡
Build custom ISO		
73.04% done, estimate finish Thu Mar 2 15:58:46 2023 75.47% done, estimate finish Thu Mar 2 15:58:47 2023 80.34% done, estimate finish Thu Mar 2 15:58:47 2023 82.78% done, estimate finish Thu Mar 2 15:58:47 2023 85.21% done, estimate finish Thu Mar 2 15:58:47 2023 90.07% done, estimate finish Thu Mar 2 15:58:47 2023 92.51% done, estimate finish Thu Mar 2 15:58:47 2023 94.94% done, estimate finish Thu Mar 2 15:58:47 2023 94.94% done, estimate finish Thu Mar 2 15:58:47 2023 95.1% done, estimate finish Thu Mar 2 15:58:47 2023 94.94% done, estimate finish Thu Mar 2 15:58:47 2023 94.94% done, estimate finish Thu Mar 2 15:58:47 2023 97.38% done, estimate finish Thu Mar 2 15:58:48 2023 97.38% done, estimate finish Thu Mar 2 15:58:48 2023 97.38% done, estimate finish Thu Mar 2 15:58:49 2023 10tal translation table size: 2048 Total rockridge attributes bytes: 10741 Total directory bytes: 65536 Path table size(bytes): 542 Max brk space used 43000 205390 extents written (401 MB) Copying CDROM files Copying new files Making new ISO image ISO build /mnt/iso/nigelp/NBMR/Linux/ISOs/NBMR-Custom.iso complete		
	Abort	Close

Click Close to complete the operation. At this point you may either cancel the recovery operation or continue as required.

The created ISO may now be used to directly recover the host from the backup. However

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operator intervention will be required to specify the backup location details.

8.2 **Command Line Recoveries**

XBMR also has the ability to control all aspects of a DR sequence without using the web or curses based GUIs. To do this it uses a script based command line manually run from the built-in bash prompt. This is an advanced feature and should not be used until the User becomes familiar with NBMR DR principles and procedures.

The command line parameters supplied to the script are divided into 4 groups, Network, Mount, Networker and General, as follows:

.....

Network options:

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network_number= <number></number>	Set network number (default is 0)
route_number= <number></number>	Set route number (default is 0)
ip_address= <ip_address></ip_address>	Set recovery environment IP address
netmask= <ip_address></ip_address>	Set recovery environment network mask
hostname= <string></string>	Set recovery environment hostname
gateway= <ip_address></ip_address>	Set recovery environment default gateway
ethtool= <command/>	Pass options to ethtool

Mount options:

mount_number= <number></number>	Set mount number (default is 0)
mount_path= <path></path>	Set mountpoint
mount_share <device></device>	Set mount device
mount_username= <name></name>	Set mount username
mount_passwd= <passwd></passwd>	Set mount password
mount_ip_address <ip_address></ip_address>	Set mount IP address

Networker options:

	Set Networker server IP address
networker_ip_address= <ip_address></ip_address>	
networker_hostname= <string></string>	Set Networker server hostname
networker_authdb= <path> Specify path to the NetWorker server authentication dat</path>	
	forces a tar backup of /boot - this is needed for block based backups to work
General options:	
help	Show help message and exit
sshd=<1 0>	Start ssh daemon if value=1
reload= <string></string>	Reload module with options
passwd= <string></string>	Set password for SSH and HTTP

--find_multipaths=<yes|no> Set find_multipaths option in multipath.conf

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disshw=<1 0>	Turn on dissimilar hardware support if value=1
mpath=<1 0>	Turn on multipath support if value=1
sleep= <number></number>	Sleep for <number> seconds</number>
log_dir= <path></path>	Copylogs to mounted <path></path>
bootloader= <name></name>	Set bootloader to <name></name>
autorelabel=<1 0>	Turn on SELinx autorelabel if value=1
convert_to_mbr	Supply when recovering an EFI system to an MBR target
product= <type></type>	One of abmr, cbmr, cobmr, nbmr, rbmr or tbmr

Example (a TBMR recovery)

restoreproduct=tbmrreload="ibmveth old_large_send=1"ethtool="-k eth	Utso
ip_address="10.10.10.186"netmask="255.0.0.0"hostname="crist:	e1"
gateway="10.0.1.100"tsm_ip_address="10.10.11.98"convert_to_r	ıbr
tsm_node="chrisw-sles11-hyperv-mpath"tsm_passwd="chrisw"	
find_multipaths="no"mpath="1"disshw="1"sshd="1"	
log_dir="/mnt/log/log"bootloader="yaboot"autorelabel="0"	
mount_path="/mnt/log"mount_share="//10.1.1.26/chris\$"	
mount_username="chris"mount_passwd="mypassword"	

Since this is a complex command line, and easy to get wrong during data entry, we advise preparing the command line in an editor elsewhere and pasting it into the bash prompt.



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9 Post Recovery Options

After performing a recovery, it is possible to undertake the following actions:

- Copy Log Files (Cristie recommends that this action is always undertaken after a recovery)
- View Log Files

9.1 Copy Log Files

Select the

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icon from the Cristie Recovery Environment main menu.

Click Browse to select a location to copy the log files to.

Mozilla Firefox	핃
O localhost/copy_logs.php	☆ =
Copy Logfiles	
Specify the location where the files need to be copied.	
Browse	
	OK Cancel

Select Browse to mount a network drive.



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💿 Mozilla Firefox			 		旦
🗘 🗅 localho	ost/share_setup.php?directory	/=/mnt/log		☆	≡
Mount Net	work Share / Device	(/mnt/log)			
Share / Device:	//10.1.1.60/test-scratch]			
Username:	nigelp]			
Password:	•••••]			
IP Address:]			
Domain:	software]			
Options:]			
			Ok	Ca	incel

A successful mount is signified by:

Mozilla Firefox		U
O localhost/show_output.php	☆	≡
Mount Network Share / Device		
//10.1.1.60/test-scratch mounted at /mnt/log		
*	(Close

Select a directory on the mounted share:



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Mozilla Firefox	E
O D localhost/copy_logs.php	☆ =
Copy Logfiles	
Specify the location where the files need to be copied.	
/mnt/log/nigelp/Logs Browse	
	OK Cancel

Click OK to copy the logfiles.

Mozilla Firefox	E
O D localhost/show_output.php	☆ =
Copy Logfiles	
<pre>./hosts ./hosts ./isvirtual.log ./lspk ./lspci ./lspci ./messages ./modules ./mount_shares.log ./multipath-v1 ./multipath-v2 ./network ./parted ./percentage.log ./post_recovery.log ./recovery.log ./recotery.log ./rectanterelease ./remote.ini ./restore_config.log ./run_answerfile.log ./scsi ./status.ini</pre>	
./subvol_list ./webdr.log	
*	Close

Ensure this is a location which can be easily accessed in case there is a need to email the log files to Cristie for support purposes.

Click Close to return to the **Recovery Environment** Main Menu.



Note: log files are essential if you require support from Cristie. They detail exactly what has happened during the recovery on your system. Without them, it is very difficult for Cristie to offer meaningful support.

9.2 Show Log Files

To view log files, select the icon from the Main Menu. This will display the list of available logfiles:

Mozilla Firefox					IJ
O 🗅 localhost/vie	w_logs.php			☆	≡
Click on a file to view i	ts contents.				
Name	Date	Time	Size		
cplogs.log	02 Mar 2023	15:29:41	172		
post_recovery.log	02 Mar 2023	15:29:40	147		
percentage.log	02 Mar 2023	15:29:47	25631		
restore_config.log	02 Mar 2023	15:20:31	17083		
curl_debug.log	02 Mar 2023	15:08:03	8009		
mount_shares.log	02 Mar 2023	15:08:04	244		
webdr.log	02 Mar 2023	15:29:47	437		
bmr_management.log	02 Mar 2023	14:55:52	637		
discovery_main.log	02 Mar 2023	15:21:20	2532		
run_answerfile.log	02 Mar 2023	14:55:47	94		
<u>recovery.log</u>	02 Mar 2023	15:29:46	7432296		
				C	lose

Click on the log you wish to view. Check the summary information at the bottom of the recovery status report for any errors.

Click Close to finish.



10 Cristie Technical Support

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If you have any queries or problems concerning your Bare Machine Recovery for Dell EMC NetWorker[™] product, please contact Cristie Technical Support. To assist us in helping with your enquiry, make sure you have the following information available for the person dealing with your call:

- NBMR Version Number
- Installed OS type and version
- Any error message information (if appropriate)
- Description of when the error occurs
- All Cristie log files relating to the source or recovery machine. This is very important to help us provide a quick diagnosis of your problem

Contact Numbers - Cristie Software (UK) Limited

Technical Support	+44 (0) 1453 847 009
Toll-Free US Number	1-866-TEC-CBMR (1-866-832-2267)
Knowledgebase	kb.cristie.com
Forum	forum.cristie.com
Sales Enquiries	sales@cristie.com
Email	support@cristie.com
Web	www.cristie.com

Support Hours

05:00 to 17:00 Eastern Standard Time (EST) Monday to Friday

Out-of-Hours support available to customers with a valid Support Agreement - Severity 1

issues* only

UK Bank Holidays** classed as Out-of-Hours - Severity 1 issues only.

*Severity 1 issues are defined as: a production server failure, cannot perform recovery or actual loss of data occurring.

**For details on dates of UK Bank Holidays, please see www.cristie.com/support/

Cristie Software Ltd. are continually expanding their product range in line with the latest technologies. Please contact the Cristie Sales Office for the latest product range.

