





Automated Disaster Recovery User Guide

For Windows

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Bare Machine Recovery for TSM

1 Introduction

This document describes how to configure and run automated disaster recoveries in conjunction with one of the Cristie range of bare machine disaster recovery products; TBMR in this case.

The steps required to prepare for automated Disaster Recovery (DR) are as follows:

- 1. Install the TBMR product
- 2. Create the system configuration
- 3. Create a system backup
- 4. Create an automated DR answer file
- 5. Optionally inject the answer file into the DR recovery environment or copy to a Windows compatible removable device (e.g. USB disk)

The steps required to *run* an automated DR are as follows:

- 1. If the DR answer file is located on a removable device, ensure it is connected to the recovery machine
- 2. Boot the customised DR recovery environment

Each step is explained in the following chapters of this document.

1.1 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	

2 **Preparation**

To enable successful automated DR, the following steps should be taken.

2.1 Install TBMR

Run a normal installation of the Cristie TBMR product. Refer to the separate product **Installation and Licensing Guide** for instructions on how to do this.

The Cristie Answer File Creator (AFC) program will be installed along with the main product.

Note: The AFC should be installed on Windows Vista/2008 or later. Earlier Windows OS's are not supported.

2.2 Create System Configuration

With TBMR, a system configuration will be captured to the system during the installation. If this isn't run automatically for some reason (e.g. the license is invalid or it times out etc.), run the supplied **TBMRCfg.exe** program manually from the script **RunTBMR.cmd** using the installed Start menu shortcut or ensure the TSM backup is configured to create the configuration as part of a TSM Pre-Sched operation.

Refer to the separate TBMR User Guide for further details on this.

2.3 Create System Backup

Use the TSM backup client to create a full backup as described in the separate **TBMR User Guide** document.

2.4 Create Answer File For Automated DR

During an interactive DR session, the user would normally specify recovery parameters. Such parameters would typically include:

- setup network details (DHCP/static IP, gateway IP etc)
- network details of the TSM server (hostname/IP address, port no.)
- · define disk partition layout for recovery
- · select partitions to recover
- commence SystemState/file restore
- view/copy log files
- re-boot after DR
- · driver location for dissimilar recovery where applicable

During an unattended DR, this same information must be prepared in advance - captured to an answer file and made available to the DR environment as part of the DR start-up process.

Cristie supply an **Answer File Creator** (AFC) tool with their BMR products to help you create the answer file. The format of the file is in the form of a structured INI file and may be edited by any Windows editor such as Notepad or Wordpad. However, it is strongly recommended that the AFC tool is used to initially create the answer file.

2.4.1 Running the Cristie Answer File Creator Tool

Run the AFC tool from the Windows Start menu:



This will invoke the AFC Welcome dialogue:



Select Next> to continue to the following dialogue where you can choose to modify an existing file or create a new one.

Cristie Answer File Creator - Select File			×
New or Existing Answer File An answer file defines how the BMR Recover restore your machine.	ry environment should	configure and	Ċ
An Answer file is a configuration (.INI) file tha questions normally entered manually during s definition of the DR backup location.	t provides pre-defined ystem recovery. For ex	responses to kample, the	
Create a new answer file			
C Modify an existing answer file			
Enter the path and file name of the answe	r file:		
		Browse	
	< <u>B</u> ack <u>N</u>	lext> (Cancel

Select **Create a new answer file** and click the Next> button. You can then select the Cristie BMR product that the answer file is being created for.

Note: you may use the Next> and <Back buttons at any time to change information you have already entered before creating the answer file. Select Cancel at any time to abandon the answer file creation process and exit the program.

Cristie Answer File Creator - Select Product	X
Select Product Specify the Cristie product that will be used to recover the system with this answer file.	đ
Select Cristie recovery product:	
C Bare Machine Recovery EMC Avamar (ABMR)	
C Bare Machine Recovery Cristie BMR (CBMR)	
C Bare Machine Recovery for Cristie CloneManager (CloneManager)	
C Bare Machine Recovery for EMC NetWorker (NBMR)	
C Bare Machine Recovery for CommVault Simpana (SBMR)	
Bare Machine Recovery for IBM Tivoli TSM (TBMR)	
< Back Next >	Cancel

Choose the TBMR product and select Next>.

TBMR has the capability of restoring from either TSM Nodes or from TSM online backupsets.

stie Ans	wer File Creator - Select TSM Restore Type
Choose To i with	• Type of Restore dentify how the recovery will be made, first choose the type of restore to perform TSM.
F	lease specify the type of restore you wish to perform:
¢	Restore from a TSM node
¢	D Restore from a backupset stored on a TSM node

2.4.1.1 Restore From A TSM Node

You may optionally include a Certificate file to provide a Secure Sockets Layer (SSL) or Transport Layer Security (TLS) protocol secured connection for the TSM server.

Cristie Answer File Creator - Select TSM Certificate file location	×
Select TSM Certificate File Specify the path to the TSM Certificate File.	ð
This screen allows you to include a Certificate File to provide a Secure Sockets Layer (SSL) or Transport Layer Security (TLS) protocol secured connection with the TSM server. If you do not wish to include a Certificate File, then just click on 'Next>'	
Check this box to use a Certificate File.	
< Back Next > C	Cancel

If you click the tick box a file browse button will be displayed. Please enter the full path to the certificate file. This will be used during recovery so the path must be accessible during the unattended recovery sequence.

Check this box to use a Certificate File.	
C:\Program Files\Cristie\TBMR\cacert.pem	Browse

Specify the TSM Server and Client details:

TSM Server Details Server Address :	10.10.11.98		Port : 1	500		
Backupset Location :				Browse		
SM Client Details					1	
Node Name :	NIGELPTBMR					
User Id* :						
* Leave blar	k if you wish to use t	he default (i.e. sam	e as the Node	Name)		
Password :	•••••					
Point-in-time	PIT) restore					
09 December 2)13	▼ 16:30:28	* *			

Note: You may enter the server IP address in IPv4 or IPv6 form.

You may specify a different username/password (e.g. the Administrator) as an alternative to the Node password.

It may be that you want to restore the system to a specific **Point-in-Time** (PIT). If this is the case, select the restore date and time by ticking the PIT tick box. This will open up the date/time dialogue:

×	istie Answer File Creator - Specify TSM Details
Ċ	TSM Details Specify the TSM server and client details, and restore date/time.
1500 Browse	TSM Server Details Server Address : 10.10.11.98 Port : 1500 Rackupset Location : Bin
ie Name)	TSM Client Details Node Name : NIGELPTBMR User Id* : * Leave blank if you wish to use the default (i.e. same as the Node Nam Password : ••••••
Cancel	✓ Point-in-time (PIT) restore 18 January 2016 ✓ January 2017 ✓ January 2018 ✓ January 2016 ✓ January 2012 ✓ January 2016 ✓ January 2012 ✓ January 2012 ✓ <
1500 Browse	TSM Server Details Server Address : 10.10.11.98 Port : 1500 Backupset Location : Br TSM Client Details Node Name : NIGELPTBMR User Id* : Image: Server Address : NIGELPTBMR User Id* : * Leave blank if you wish to use the default (i.e. same as the Node Nate Password : ♥ Point-in-time (PIT) restore 14:32:37 Image: Server Address : Sun 18:01/2016 18 January 2016 14:32:37 Image: Server Address : Sun 18:01/2016 10 11:12:13:14:15:16:17 11:12:13:14:15:16:17 11:12:13:14:15:16:17 11:12:13:14:15:16:17 12:13:14:15:16:17 13:19:20:21:22:23:24 24:25:26:27:28:29:30:31:12:23:24 < Back Next > 11:12:13:14:15:16:17

If the selected TSM Node contains backups for more than one system, then select the system hostname to be restored in the next dialogue.

kupset	
inter backupset :	
chine Name	
VARNING :	
backups belonging t equired machine nam	o multiple machines are stored under a single node identity the e here:
ou may enter a mach vill be restored for the	ine name. There is no guarantee that the correct system state specified machine.
nter machine name:	
nter machine name.	

Press Next> to continue to the Specify Restore Options dialogue. Here you may specify whether just the default system drive (partition or volume) will be restored, or All drives or Selected drives. Select individual disks as A, B, C ... etc.

Specify where you want the restore log files to be copied at the end of DR process.

Note: the facility to specify the detail level is not available within TBMR.

Bare Machine Recovery for TSM

tie Answe	r File Creator - Specify Restore Options	
Specify R Select should	store Options which volumes are to be restored, the location of v be copied and the logfile detail level.	where the restore log files
Specify t	e drives to restore	
The b	oot and system drives will be restored regardless o	f any drive selection.
0	Default Drives	
•	VI drives	
0	Selected drives only	
	EA EB EC ED EE E	F 🗖 G 🗖 H
		N EO EP
		V E W E Z
Specify Copy k	he location where the restore log files should be c gfiles to the following folder:	copied
B:\nig	elp\Logs	Browse
	< Back	Next > Cancel

Press Next> to continue to the **Disk Operations** dialogue.

Here you may select either All disks or specific **Disk number(s)** to be partitioned. Disks are identified by number **0**, **1**, **2** etc. Commas are required.

You may also select **Default Drives**, **All drives** or **Selected drives only** to be formatted on restore. Select individual disks as **A**, **B**, **C** ... etc.

ristie Answer File Creator - Disk Oper	ations				×
Disk Operations When an existing disk layout does no changes), one or more disks may nee should be partitioned.	nt match the o d to be re-pa	niginal dis rtitioned. (k layout (Confirm th	e.g. hardw at the disk	are 🚺
Disk level action - Partition WARNING : All data on a disk will be lost if re-partitic environment whether recovery should p partitioned	med. Indicate rroceed in this	to the ur s case an	attended d which d	DR isks should	j pe
Note: Separate multiple disk	numbers by c	omma as	in 0,1		
Note: The boot and system drives will be	formatted alv	ways.			
C Default Drives					
All drives					
O Selected drives only					
			E a		
	<	Back	Nex	d >	Cancel

If the DR is to dissimilar hardware (ie. not the original system), then the recovered system may require new drivers to support different mass storage or network controllers. These new drivers are supplied by the customer and must be accessible to the **Dissimilar Hardware Wizard** (DHW) during the recovery process. Specify the location of a folder (or folders) where the DHW will retrieve these drivers from. For example, this could be a locally attached device like a USB disk or a network share, or both.

Dissimilar Hardware The Dissimilar Hardware Wizard in the unattended DR environment is used to inject Windows drivers into the recovering machine for any new hardware. Search paths Where the recovering machine has different hardware from the original system, the Dissimilar Hardware Wizard can detect the new devices and inject appropriate Windows drivers into the recovering machine ready for use when the restored machine re-boots (using Plug-and-Play). Enter the path(s) where the new device drivers can be found during the unattended recovery B:\nigelp\drivers Note: separate multiple paths with a semicolon (;) Image: Drivers will be injected into ISO using CRISP	Č
Search paths Where the recovering machine has different hardware from the original system, the Dissimilar Hardware Wizard can detect the new devices and inject appropriate Windows drivers into the recovering machine ready for use when the restored machine re-boots (using Plug-and-Play). Enter the path(s) where the new device drivers can be found during the unattended recovery B:\nigelp\drivers Note: separate multiple paths with a semicolon (;) Drivers will be injected into ISO using CRISP	
recovering machine ready for use when the restored machine re-boots (using Plug-and-Play). Enter the path(s) where the new device drivers can be found during the unattended recovery B:\nigelp\drivers Browse Note: separate multiple paths with a semicolon (;) C Drivers will be injected into ISO using CRISP	
Enter the path(s) where the new device drivers can be found during the unattended recovery B:\nigelp\drivers Browse Note: separate multiple paths with a semicolon (;) Image: CRISP	
B:\nigelp\drivers Browse Note: separate multiple paths with a semicolon (;) Drivers will be injected into ISO using CRISP	
Note: separate multiple paths with a semicolon (;)	
Type of devices to load It is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI devices, tick the following box.	

Tick **Drivers will be injected into ISO using CRISP** if you intend to manually add extra DHW drivers to your customised boot ISO during the CRISP ISO generation phase. This can be in addition to any drivers contained on the driver path specified above.

Normally only mass storage and network controllers need to be considered. However, if all driver classes need to be examined, select the Load all types of drivers tick box. Select Next> to continue to the Advanced Options dialogue.

Unless Cristie Support direct you to change these settings, leave them at their default settings.

Cristie Answer File Creator - Advanced Options	×
Advanced Options Specify the advanced options.	B
WARNING: Do not change these settings unless directed to by Cristie Support .	
Map disks automatically	
Update boot.ini	
Disable Compaq/HP Services	
Skip Automatic Dissimilar Hardware	
< Back Next > Ca	ancel

Press Next> to continue to the Network Connection dialogue. Here you can define a list of network connection credentials that will be used by automated DR to access any network shares identified in earlier dialogues (eg. copy log files, DHW drivers etc.).

Cristie Answer File Creator - Network Network Connections If a network path was previously sp to be copied), define the network a	Connections	location whe	re the logfiles are
Enter the network connection details Connection 1 Network Path: \\cristienas2\scratch Domain Name: stroud Username: rigelp Password: ••••••• Local Drive to Map: B:	Browse	Add to	Network Connection List
	<	Back	Next > Cancel

Press the Add to-> button to add a new definition to the Connection list. Use the Delete button to remove an existing Connection definition. Press Next> to continue to the Cloning Options dialogue. This allows you to automatically change the hostname and/or the IP address of the recovered system.

Add a new name for the recovered system in the **Computer** field. Change the hostname if required in the **Hostname** field.

The IP address can be changed for each adapter on the system. Note the adapter is identified by MAC address. This can be extracted from the current system or new adapters on a dissimilar target system. In the latter case identify the new adapters by MAC address (i.e. enter a new address in the Adapter field).

N	ote: The ad	dress can be s	supplied in e	ither IPv4 or IPv6 for
Cristie Ans Cloning Cha	swer File Creato g Options ange the hostnam	or - Cloning Related	Settings ters on the recovere	ed machine.
Comput	er CristieTest me: CristieTest			
Specify Enter th Adapter	the network adapted hardware address (00-0C-29-E1-0) (00-0C-20-0) (00-0C	ter settings ss or select one on this -15 dress automatically ig IP address	s -	Network Adapter List
IP / Sul Def	Address: bnet prefix length fault Gateway:	10.10.11.125 8 10.0.1.100 Vse static gateway	ay	
	Obtain DNS Se Use the followir	rver address automatic g DNS Server address 0.1.1.1	sally s	Add Delete
			< Back	Next > Cancel

These settings apply to the recovery environment only - not the restored machine.

Press the Add to-> button to add a new definition to the Adapter list. Use the Delete button to remove an existing Adapter definition. Press Next> to continue to the Reboot Options dialogue.

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Cristie Answer File Creator - Specify System Reboot Options
Windows Reboot Options Select the default Windows auto reboot option for successful or failed recoveries.
When recovery finished successfully
Normally Windows will reboot automatically after successful recovery and the recovered operating system will start. If you wish to reboot Windows manually, de-select the option below:
Feboot Windows automatically
Normally Windows will not reboot the operating system after a failed recovery. If you wish to automatically reboot Windows even on failure, select the option below:
Reboot Windows automatically
< <u>B</u> ack <u>N</u> ext > Cancel

Specify how the automated DR should handle the post recovery reboot when the DR finishes with success or failure. If the DR is successful, select the "When recovery finished successfully" **Reboot Windows Automatically** option. If the DR fails, it is unlikely that the reboot will succeed, so there is little point in proceeding with the reboot. However if a reboot should still be attempted, even in a failure scenario, tick the "When recovery finished with failure" **Reboot Windows Automatically** option.

The **Prompt for final recovery confirmation** reboot option allows the automated recovery process to display a last chance option to cancel an automated recovery. Normally the automated recovery runs completely unattended unless this option is ticked.

The completion of the Answer File definition is confirmed with the following dialogue:

Cristie Answer File Creator - Fi	inished	×
	You have finished creating/modifying the answer file.	
	< Back Finish Cance	1

Select **Finish** to generate the answer file. A pop-up will be displayed prompting for the name and location of where the AFC should create the answer file.

New Answer File	×
Enter the full path of the new answer file name:	
C:\Temp\DRAnswer.ini	Browse
<u>D</u> K <u>C</u> ancel	

Select a path and press OK. This will create a file called DRAnswerFile.ini in the C:\Temp folder.

Note: the answer file MUST be called DRAnswer.ini when transferred to the ISO.

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```
Answer File Content Example:
[ProductType]
Product = "TBMR"
[TbmrBackupLocation]
StorageType=Normal
ServerName=10.10.11.98
ServerPort=1500
NodeName=NIGELPTBMR
NodePassword=Encrypted: 828211CF2AC6B2
MachineName=
UserName=
UseTsmAsrCfg=0
PointInTime=
[RestoreData]
Drives = "All"
[LogFiles]
LogfileCopyPath = "B:\nigelp\Logs"
[NetLogin]
Connection1 = "params.Connection1"
[params.Connection1]
NetworkPath = "\\cristienas2\scratch"
Domain = "stroud"
Username = "nigelp"
Password = "Encrypted: 95860a8f6b9fbe1f"
MapToDrive = "B:"
[System]
RebootOnSuccess = "True"
RebootOnFailure = "False"
PauseForConfirmation = "False"
[DiskOperation]
PartitionDisk="All"
FormatVolume = "All"
[DissimilarHardware]
DriverPaths = "B:\nigelp\drivers"
[Cloning]
ChangeComputerName="CristieTest"
ChangeHostName="CristieTest"
ChangeNetworkSettings1 = "params.cloning.nic1"
[params.cloning.nic1]
AdapterName = "Intel(R) PRO/1000 MT Network Connection"
HardwareAddress = "00-0C-29-E1-0F-15"
SubnetMask = "255.0.0.0"
IPAddress = "10.10.11.125"
SubnetPrefixLength = 8
Gateway = "10.0.1.100"
```

DnsServer = "10.1.1.1"

2.4.1.2 Restore From A BackupSet Stored On A TSM Node

Select 'Restore from a backupset stored on a TSM node' and press Next>.

Cristie Answer File Creator - Select TSM Restore Type
Choose Type of Restore To identify how the recovery will be made, first choose the type of restore to perform with TSM.
Please specify the type of restore you wish to perform:
C Restore from a TSM node
Restore from a backupset stored on a TSM node; Restore from a backupset stored on a disk or removable media
other than tape
< Back Next > Cancel

You may optionally include a Certificate file to provide a Secure Sockets Layer (SSL) or Transport Layer Security (TLS) protocol secured connection for the TSM server.

Cristie Answer File Creator - Select TSM Certificate file location	×
Select TSM Certificate File Specify the path to the TSM Certificate File.	đ
This screen allows you to include a Cettifcate File to provide a Secure Sockets Layer (SSL) or Transport Layer Security (TLS) protocol secured connection with the TSM server. If you do not wish to include a Certificate File, then just click on 'Next>'	
Check this box to use a Certificate File.	
< Back Next >	Cancel

If you click the tick box a file browse button will be displayed. Please enter the full path to the certificate file. This will be used during recovery so the path must be accessible during the unattended recovery sequence.

Check this box to use a Certificate File.	
C:\Program Files\Cristie\TBMR\cacert.pem	Browse

Now specify the TSM Server and Client details.

istie Answer File Creator - Specify TSM Details	x
TSM Details Specify the TSM server and client details, and restore date/time.	
TSM Server Details	
Server Address : 10.10.11.98 Port : 1500	
Backupset Location : Browse	
TSM Client Details	
Node Name : NIGELPTBMR	
User Id* :	
* Leave blank if you wish to use the default (i.e. same as the Node Name)	
Password :	
Point-in-time (PIT) restore	
09 December 2013	
< Back Next > Cance	

Note: You may enter the server IP address in IPv4 or IPv6 form.

You may specify a different username/password (e.g. the Administrator) as an alternative to the Node password.

It may be that you want to restore the system to a specific **Point-in-Time** (PIT). If this is the case select the restore date and time by ticking the PIT tick box. This will open up the date/time dialogue:

Cristie Answ TSM Del	er Fi tails	le Cr	eato	r - Sp	ecify	TSM	l Deta	ils			
Speci	fy the	TSN	l serve	er and	clien	t detai	ils, and	l restore date/	time.		œ
- TSM Se	over F)otoik									
Sen	ver A	ddres	, s : 1(0.10.1	1.98				Port :	150	0
Backup	set Lo	ocatio	n : [В	rowse
r TSM Clie	ent De	etails									
	Node Name : NIGELPTBMR										
	User Id* :										
	*Le	eave	blank	if you	wish	to use	the d	efault (i.e. sam	e as the No	de Na	ame)
	Pa	sswor	d : 🖡	••••	•••						
	Poin	t-in-ti	me (Pl	T) res	tore						
18	3 Jar	nuary	201	6			-	14:32:37	*		
	•		Janu	ary 2	2016		Þ				
	Mon	Tue	Wed	Thu	Fri	Sat	Sun				
	28 4	29 5	30 6	31 7	1	2 9	3 10				
,	11	12	13	14	15	16	17				
	18 25	19 26	20 27	21 28	22 29	23 30	24 31	< Back	Next :	, I	Cancel
	1	2	3	4	5	6	7				
			Tod	lay: 1	18/0	1/20	16				

Select Next> to display the TSM Backupset and Machine Name dialogue:

Cristie Answer File Creator - TSM Backupset and Machine Name
TSM Backupset and Machine Name By default, the first backupset and machine name will be recovered if more than one backupset or machines are found in the same TSM node. If you wish to restore from a non-default backupset or machine, specify the correct details below.
Backupset
Enter backupset : TEST.26463456
Machine Name
WARNING :
If backups belonging to multiple machines are stored under a single node identify the required machine name here:
You may enter a machine name. There is no guarantee that the correct system state will be restored for the specified machine.
Enter machine name:
< Back Next > Cancel

Enter the name of the backupset. This name consists of two parts - a prefix specified when the backupset is first created, and an ID auto generated by TSM. For example, a typical name would be **TEST.26463456** where **TEST** is supplied by the User and the ID **26463456** is supplied by TSM. The full name is returned by TSM to the BA Client after creating the backupset, so please make a note of it. Alternatively, query the Node in the TSM database to get the full name (eg. **QUERY**

BACKUPSET NIGELPTBMR which will list all the backupsets for the Node NIGELPTBMR).

If the selected TSM Node contains backups for more than one system, then also select the system hostname to be restored in the next dialogue.

Note: neither IBM nor Cristie recommend this practice.

Press Next> to continue to the Specify Restore Options dialogue. Here you may specify whether just the default system drive (partition or volume) will be restored, or All drives or Selected drives. Select individual disks as A, B, C ... etc.

Specify where you want the restore log files to be copied at the end of DR process.

Specify	the drives	s to restore	e						-		
The	Default I	system dri Drives	ives will be	e restored	d regardle	ess of any	drive sel	ection.			
ē	All drives	s and a second									
C	Selected	drives or	nly								
	ΠA	🗖 В	ПC	D D	Ε	∏ F	∏ G	⊟н			
		ΓJ	🗖 К		Μ	🗖 N		ΠP			
	□ Q	🗖 R	🗖 S	ΠT	ΠU	$\Box \lor$	$\Box ~ \forall$	ΠZ			
- Specify Copy	/ the local logfiles to	tion where the follov	e the resto ving folder	re log file :	es should	be copie	d				
		-					_				

Press Next> to continue to the Disk Operations dialogue.

Here you may select either All disks or specific **Disk number(s)** to be partitioned. Disks are identified by number **0**, **1**, **2** etc. Commas are required.

You may also select **Default Drives**, **All drives** or **Selected drives only** to be formatted on restore. Select individual disks as **A**, **B**, **C** ... etc.

Cristie Answer File Creator - Disk Operations
Disk Operations When an existing disk layout does not match the original disk layout (e.g. hardware changes), one or more disks may need to be re-partitioned. Confirm that the disk should be partitioned.
Disk level action - Partition WARNING : All data on a disk will be lost if re-partitioned. Indicate to the unattended DR environment whether recovery should proceed in this case and which disks should be partitioned
Partition disk:
All disks Disk number(s): Note: Separate multiple disk numbers by comma as in 0,1
Volume level action - Format Note: The boot and system drives will be formatted always.
Default Drives All drives Selected drives only
< Back Next > Cancel

If the DR is to dissimilar hardware (ie. not the original system), then the recovered system may require new drivers to support different mass storage or network controllers. These new drivers are supplied by the customer and must be accessible to the **Dissimilar Hardware Wizard** (DHW) during the recovery process. Specify the location of a folder (or folders) where the DHW will retrieve these drivers from. For example, this could be a locally attached device like a USB disk or a network share or both.

Dissimilar Hardware The Dissimilar Hardware Wizard in the unat		_
Windows drivers into the recovering maching	tended DR environment is used to inject e for any new hardware.	Z
Search paths Where the recovering machine has different ha Hardware Wizard can detect the new devices a recovering machine ready for use when the rest Enter the path(s) where the new device drivers	rdware from the original system, the Dissimil and inject appropriate Windows drivers into tored machine re-boots (using Plug-and-Play can be found during the unattended recove	ar the /). ery
B:\nigelp\drivers	Brows	se
Drivers will be injected into ISO using CRIS	5P	
Type of devices to load It is generally only necessary to inject drivers for	mass storage and some network devices. CPU type etc.) can be safely ignored and l	-4

Tick Drivers will be injected into ISO using CRISP if you intend to manually add extra DHW

drivers to your customised boot ISO during the CRISP ISO generation phase. This can be in addition to any drivers contained on the driver path specified above.

Normally only mass storage and network controllers need to be considered. However, if all driver classes need to be examined, select the Load all types of drivers tick box. Select Next> to continue to the Advanced Options dialogue.

Unless Cristie Support direct you to change these settings, leave them at their default settings.



Press Next> to continue to the Network Connection dialogue. Here you can define a list of network connection credentials that will be used by automated DR to access any network shares identified in earlier dialogues (eg. copy log files, DHW drivers etc).

Cristie Answer File Creator - Networ Network Connections If a network path was previously is to be copied), define the network Enter the network connection details Connection 1 Network Path: \\cristienas2\scratch Domain Name: stroud Usemame: nigelp Password: ••••••••••••••••••••••••••••••••••••	rk Connections specified (e.g. the access credentia Browse	Add to	re the logfiles are	ion List
		Back	Next >	Cancel

Press the Add to-> button to add a new definition to the Connection list. Use the Delete button to remove an existing Connection definition. Press Next> to continue to the Cloning Options dialogue. This allows you to automatically change the hostname and/or the IP address of the recovered system.

Add a new name for the recovered system in the **Computer** field. Change the hostname if required in the **Hostname** field.

The IP address can be changed for each adapter on the system. Note the adapter is identified by MAC address. This can be extracted from the current system or new adapters on a dissimilar target system. In the latter case identify the new adapters by MAC address (i.e. enter a new address in the Adapter field).

Note: The address can be supplied in either IPv4 or IPv6 form.

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Cristie Answer File Creator - Cloning Related Settings
Cloning Options Change the hostname and network parameters on the recovered machine.
Computer Cristie Test Hostname: Cristie Test Specify the network adapter settings Enter the hardware address or select one on this Adapter: 00-0C-29-E1-0F-15 Obtain an IP address automatically Obtain an IP address IP Address: 10.10.11.125 Subnet prefix length: 8 Default Gateway: 10.0.1.100 If Use static gateway Obtain DNS Server address automatically Obtain DNS Server address Add DNS Server: 10.1.1.1
< Back Next > Cancel

These settings apply to the recovery environment only - not the restored machine.

Press the Add to-> button to add a new definition to the Adapter list. Use the Delete button to remove an existing Adapter definition. Press Next> to continue to the Reboot Options dialogue.

stie Answer File Creator - Specify System Reboot Options	l
Windows Reboot Options Select the default Windows auto reboot option for successful or failed recoveries.	Ê
When recovery finished successfully	
Normally Windows will reboot automatically after successful recovery and the recovered operating system will start. If you wish to reboot Windows manually, de-select the option below:	
Reboot Windows automatically	
to automatically reboot Windows even on failure, select the option below:	
< <u>B</u> ack <u>N</u> ext> Car	ncel

Specify how the automated DR should handle the post recovery reboot when the DR finishes with success or failure. If the DR is successful, select the "When recovery finished successfully" **Reboot**

Windows Automatically option. If the DR fails, it is unlikely that the reboot will succeed, so there is little point in proceeding with the reboot. However if a reboot should still be attempted, even in a failure scenario, tick the "When recovery finished with failure" **Reboot Windows Automatically** option.

The **Prompt for final recovery confirmation** reboot option allows the automated recovery process to display a last chance option to cancel an automated recovery. Normally the automated recovery runs completely unattended unless this option is ticked.

The completion of the Answer File definition is confirmed with the following dialogue:

Cristie Answer File Creator - Fi	inished	×
	You have finished creating/modifying the answer file.	
	< Back Finish Cano	el

Select **Finish** to generate the answer file. A pop-up will be displayed prompting for the name and location of where the AFC should create the answer file.

New Answer File	×
Enter the full path of the new answer file name:	
C:\Temp\DRAnswer.ini	Browse
<u>QK</u> ancel	

Select a path and press OK. This will create a file called DRAnswer.ini in the C:\Temp folder.

Note: the answer file MUST be called DRAnswer.ini when transferred to the ISO.

Answer File Content Example:

```
[ProductType]
Product = "TBMR"
[TbmrBackupLocation]
StorageType=BackupSetTsm
ServerName=10.10.11.98
ServerPort=1500
NodeName=NIGELPTBMR
NodePassword=Encrypted: 828211CF2AC6B2
MachineName=
UserName=
UseTsmAsrCfg=0
PointInTime=
BackupSetName=TEST.26463456
[RestoreData]
Drives = "All"
[LogFiles]
LogfileCopyPath = "B:\nigelp\Logs"
[NetLogin]
Connection1 = "params.Connection1"
[params.Connection1]
NetworkPath = "\\cristienas2\scratch"
Domain = "stroud"
Username = "nigelp"
Password = "Encrypted: 95860a8f6b9fbe1f"
MapToDrive = "B:"
[System]
RebootOnSuccess = "True"
RebootOnFailure = "False"
PauseForConfirmation = "False"
[DiskOperation]
FormatVolume = "Default"
PartitionDisk="All"
[DissimilarHardware]
DriverPaths = "B:\nigelp\drivers"
[Cloning]
ChangeComputerName="CristieTest"
ChangeHostName="CristieTest"
ChangeNetworkSettings1 = "params.cloning.nic1"
[params.cloning.nic1]
AdapterName = "Intel(R) PRO/1000 MT Network Connection"
HardwareAddress = "00-0C-29-E1-0F-15"
SubnetMask = "255.0.0.0"
IPAddress = "10.10.11.125"
SubnetPrefixLength = 8
Gateway = "10.0.1.100"
DnsServer = "10.1.1.1"
```

2.4.2 Run Program/Batch Files Post DR

It is possible to configure the automated DR process to run User defined program or batch files when the restore system boots.

To do this you must manually edit the created DRAnswer.ini file and add a **[UserRunOnceCmd]** section to the end of the file. For example (the programs and batch files shown are examples):

[UserRunOnceCmd] Command1 = "C:\Scripts\script1.cmd" Command2="D:\MyApplication\VerifyFunction.exe"

The programs or batch files must exist and be accessible on the full path specified. They are run as the system boots and before login is enabled.

2.5 Prepare Boot Media For Automated Recovery

The product boot media (i.e. the DR console ISO file) is prepared by the CRISP (Cristie ISO Producer) tool. Please refer to the separate CRISP User Guide documentation for details on how to do this.

To prepare boot media for automated recovery, the boot image must be customised to both auto boot and to add the answer file to an expected location. The auto boot modification is required because normally the Windows PE2 or PE5 distribution media is designed to prompt for DR boot. By default, it will not boot into DR unless a key is pressed. If no key is pressed, any installed OS is booted instead. This behaviour needs to be suppressed for automated recoveries.

Options in CRISP allow both the boot prompt to be removed and the answerfile to be added.

During an automated DR sequence, the Windows Windows PE2 or PE5 environment will search for the answer file in one of these locations and in this order of precedence:

- 1. The root folder of the Windows PE2 or PE5 boot environment (always drive X: when booted)
- 2. The root folder of the CD/DVD containing the TBMR distribution media
- 3. The root folder of any locally attached removable storage

As soon as a suitable answer file is found in one of these locations, the search stops and that answer file is used to control the automated DR process. If no answer file is found, the normal interactive DR GUI is started.

The boot image created for option 1 is suitable for network boot, but requires the standard TBMR boot image or WIM file to be customised using CRISP.

Use Option 3 above when customising the boot image is not required. In this case, simply copy the generated answer file to the root folder on suitable removable storage (eg. USB disk).

Note: the answer file will only be detected during boot if the file is located in one of the three locations specified above.

2.5.1 Customise Boot Media For Auto Boot

By default, the Windows PE2 or PE5 distribution media will display a prompt to boot into the DR environment when auto-run. If no key is pressed, any alternative installed OS is booted instead. For automated DR, this behaviour needs to be suppressed.

Please use the option in CRISP to suppress this prompt in the ISO image.

2.5.2 Add Answer File To Boot Image Root Folder

The Windows PE2 or PE5 boot image is in Microsoft WIM file format. Use the option in CRISP to add the answer file into this image.

3 Recovery

An automated recovery can be initiated either by a network or CD/DVD boot of the customised TBMR boot image as described in Prepare Boot Media For Automated Recovery.

Starting the boot process is the only part of the restore process that requires manual intervention. Even this can be avoided if a suitable Lights-Out system is in place or remote boot is possible.

Note: the system BIOS should be set to boot from the prepared Windows PE2 or PE5 boot ISO whether this is in the form of a physical CD/DVD or ISO image. It is also possible to network boot the Windows PE2 or PE5 image.

3.1 Boot Recovery Environment

Once the customised boot image is booted, the normal plug and play sequence will run. The automated DR will then proceed if the DR answer file is found in one of the prescribed locations. If the file is not found, the standard interactive GUI will be displayed.

Also if the DR answerfile has been configured with **prompt for final recovery confirmation** enabled, a confirmation message will be displayed before the DR proceeds. If the response to proceed is not given within 30 seconds then the automatic sequence will be halted. If this occurs then the main Recovery Environment menu will be displayed instead.

3.1.1 Answer File In CD/DVD Image

If the DR answer file is detected within the CD/DVD image, then the automated DR will proceed with no user intervention. Each step in the disaster recovery process will be displayed on the system console and recorded to a log file. This log file will be transferred to the location specified in the DR answer file at the end of the recovery.

At the end of the DR sequence, the logs will be copied to the location specified in the answer file. At this point the recovered system will be automatically booted if configured as such in the DR answer file. Otherwise manual intervention will be required to boot the system (by pressing the <ESC> key).

If errors are detected during the restore process, the recovery will halt or re-boot the system depending upon the setting in the answer file.

Note: if the boot media is configured to boot directly into the Windows PE2 or PE5 boot environment after recovery, manual intervention will be required to reset the boot sequence on the system. This must be done in order to prevent the Windows PE2 or PE5 boot environment being booted once more. Normally the system BIOS should be reset to boot from the OS disk as required.

3.1.2 Answer File On Removable Device

If the DR answer file is detected on any attached removable media, then the automated DR will proceed with no user intervention. Each step in the disaster recovery process will be displayed on the system console and recorded to a log file. This log file will be transferred to the location specified in the DR answer file at the end of the recovery.

At the end of the DR sequence, the logs will be copied to the location specified in the answer file. At this point the recovered system will be automatically booted if configured as such in the DR answer file. Otherwise manual intervention will be required to boot the system (by pressing the <ESC> key).

If errors are detected during the restore process, the recovery will halt or re-boot the system depending upon the setting in the answer file.

Note: if the boot media is configured to boot directly into the Windows PE2 or PE5 boot environment after recovery, manual intervention will be required to reset the boot sequence on the system. This must be done in order to prevent the Windows PE2 or PE5 boot environment being booted once more. Normally the system BIOS should be reset to boot from the OS disk as required.

3.2 Check Result Of Recovery

It is recommended that after the recovery has completed, the saved log files are inspected to ensure that the DR ran with no reported errors.

4 Cristie Technical Support

If you have any queries or problems concerning your Bare Machine Recovery for TSM 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:

- TBMR 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
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 Limited are continually expanding their product range in line with the latest technologies. Please contact the Cristie Sales Office for the latest product range. Should you have specific requirements for data storage and backup devices, then Cristie's product specialists can provide expert advice for a solution to suit your needs.