



# TBMR

**Cristie Bare Machine Recovery**

## Quick Start Guide

For AIX

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## 1 About TBMR for AIX

TBMR for AIX provides a file-based backup and disaster recovery (DR) system for AIX 5.1 and above.

The process of backing up and recovering an AIX machine comprises three phases:

1. Create a bootable recovery environment from the running machine
2. Perform the Disaster Recovery (DR) backup
3. Perform the recovery

All of the above actions may be performed using the Graphical User Interface run from the command `tbmr`. Documentation describing command line tools with the same functionality is also included, allowing you to easily create scheduled and scripted backups.

Use the command `man tbmr` to get an overview of TBMR functionality and the command line tools available.

*Note: TBMR must be installed and run by a user that has root access*

## 2 System Requirements

TBMR for AIX requires the following minimum hardware requirements:

<b>Disk Space</b>	16MB
<b>Memory</b>	256MB
<b>TSM Servers</b>	5.5 and above
<b>TSM Clients</b>	5.5.4.x and above

TBMR for AIX is suitable for all versions of AIX after 5.1. However, ACLs (Access Control Lists) are only supported in version 6.1 and above.

Open Source Prerequisites:

- ncurses >= 5.2
- libxml2 >= 2.6.21

These are included with the installation and may also be downloaded from the IBM AIX Toolbox for Linux website:

<http://www-03.ibm.com/systems/power/software/aix/linux/toolbox/download.html>

### 3 TBMR for AIX Software

Installation files can be downloaded by completing the registration form on the **Cristie** website:

<http://www.cristie.com/support/downloads>

The installation is available in `iso` and `tar.gz` archive formats.

## 4 Installation

TBMR can be installed via the **AIX System Management Interface** - smit or smitty - directly via RPM or from the archive. It is recommended that all installation files are installed using the same method.

The installation of TBMR requires the RPM package management tool: `fileset rpm.rte 3.0.5.20`. This tool is installed by default on AIX 5.1 ML9, 5.2 ML10, 5.3 ML6 and 6.1 ML1.

The version of this tool can be checked using the command `'lslpp -l rpm.rte'`. If the fileset is at an earlier maintenance level, then the `rpm.rte` file can be downloaded individually from: <http://www-933.ibm.com/support/fixcentral/>

### 4.1 Install via Smit/Smitty

TBMR can be installed via smit or smitty by selecting the fastpath 'install', for example by running:

```
> smitty install
```

The installation directory should be the `/bffs` directory on the CD or in the archive.

The prerequisites listed on the preceding page are contained in the directory alongside TBMR and will be installed automatically.

*Note: the smitty installation delegates to RPM. Therefore, if some packages have already been installed via RPM then the latest version available will be selected.*

### 4.2 Install via RPM

TBMR can also be installed using the RPM package management tool. The RPM packages are contained in the `/rpms` directory on the installation CD. As with the smitty installation, the open-source prerequisites are contained in this directory alongside TBMR.

The versions of prerequisites may be checked using the command:

```
>rpm -q ncurses libxml2
```

To install the TBMR rpm package type:

```
>rpm -Uvh tbmr-release-6.3.3-aix.5.1.ppc.rpm
```

Ensure that you are installing the version with the closest match to the installed operating system.

If installation fails because a dependency is missing, then running `updtvpkg` may resolve the issue by rebuilding the package database. If it does not, and all dependencies have been installed, then supplying the `--nodeps` argument to `rpm` will override these checks.

*Note: updtvpkg will only affect packages installed later, it should not affect the current running state of the machine*

## 4.3 Install from archive

Alternatively, TBMR may be installed without the aid of a package manager by opening the archive `tbmr-release-6.3.3.tar.gz` and running the install script as root:

```
> gunzip tbmr-release-6.3.3.aix5.1.tar.gz
> tar xf tbmr-release-6.3.3.aix5.1.tar
> sh ./tbmr-6.3.3/install.sh
```

At this point the temporary directory '`tbmr-6.3.3`' may be removed.

*Note: the same open source prerequisites are required as for the RPM and smitty installations*

## 4.4 Licence

Following the instructions in this section will result in a standard 30-day trial licence being installed. **Cristie** provide a 30 day trial licence so that the product can be fully evaluated before purchase.

If you have purchased a full licence, you will have been sent a 12 character licence key (xxxxxxxxxxxx). This may be applied with the command:

```
> tbmrcfg --licence xxxxxxxxxxxx
```

## 4.5 Uninstall

To uninstall if installed via `smit` or `smitty`, run '`smit remove`' or '`smitty remove`', then select the relevant packages for removal.

To uninstall the RPM package, enter:

```
> rpm -e tbmr-release
```

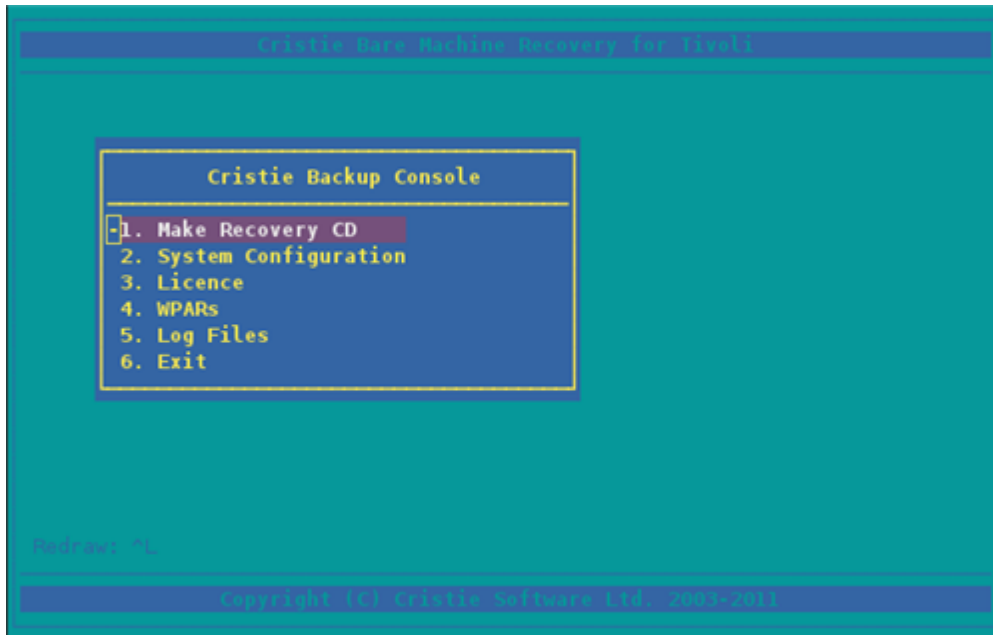
To uninstall the package via the installation archive, enter:

```
> sh ./tbmr-6.3.3/install.sh -u
```

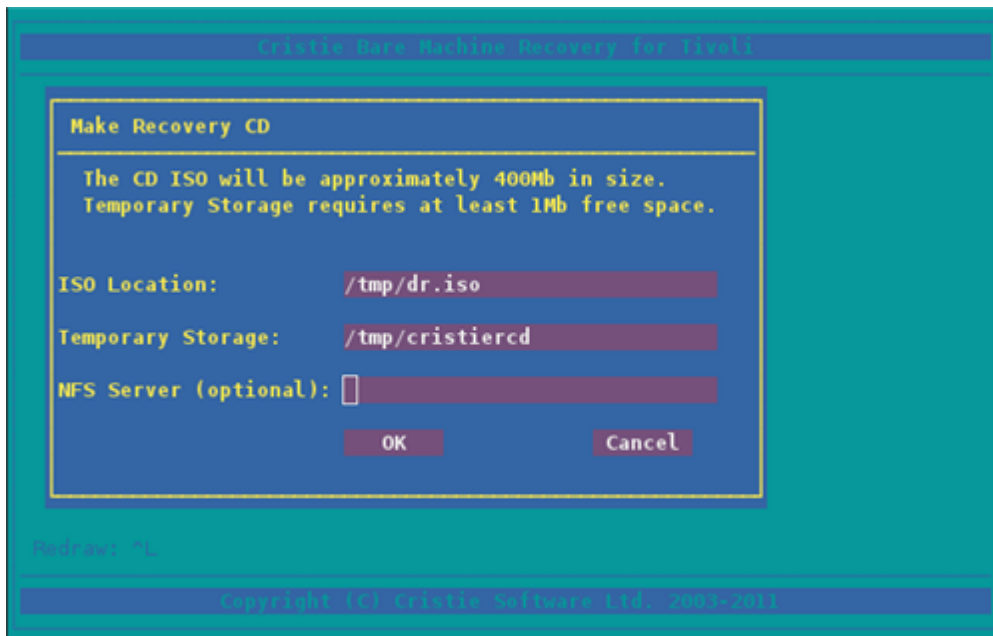
*Note: uninstalling will NOT remove the `tbmr-6.3.3` directory*

## 5 Creating a Recovery Image

As mentioned previously, all functionality can be accessed through the TBMR Graphical User Interface. After entering the command 'tbmr', the TBMR Console menu will be presented:



The first step is to create a recovery CD or PXE/NIM bootable image. This is an iso image that can either be burned to CD to boot the recovery environment or be extracted to create a network boot environment.



The GUI will create an iso file which may be burned to a CD using an iso burning tool such as burn\_cd:

```
> burn_cd -d /dev/cd0 recovery_cd.iso
```

**Note: the output log for CD creation is saved in '/var/log/cristie/mkdracd.log'**

## 5.1 PXE Booting

Alternatively, the CD can be extracted to create a PXE bootable environment. If the CD is extracted to the directory `'/recoverycd'` then the PXE environment can be setup as follows:

- **Copy** the file `'ppc/chrp/bootfile.exe'` to the TFTP sever directory
- **Export** `'/recoverycd'` over NFS
- **Create** a DHCP/BOOTP entry for the machine with option 151 specifying the NFS server IP address and 152 specifying the NFS server path

This is an example using ISC dhcpd under RedHat linux (`/etc/dhcp/dhcp.conf`):

```
> option aix-server code 151 = ip-address;
> option aix-path code 152 = text;
>
> host aix {
>   filename "/bootfile.exe";
>   option aix-server 192.168.1.100;
>   option aix-path "/recoverycd";
> }
```

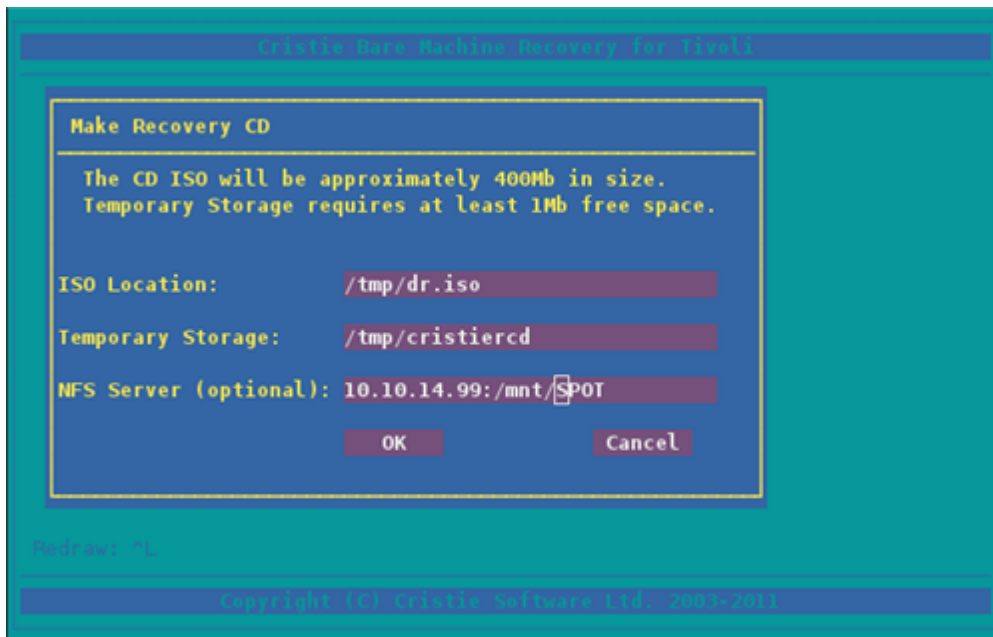
On an AIX NIM Master, the DHCP configuration itself (`'/etc/dhcpsd.cnf'`) contains detailed instructions to set up a host in the manner detailed above.

This is an example section of `/etc/dhcpsd.cnf` used to enable NIM booting of the recovery environment for the machine with MAC address `'01:02:03:04:05:06:07:08'`:

```
> supportBOOTP   yes
>
> client 6 01:02:03:04:05:06:07:08 192.168.1.199 {
>   option sa 192.168.1.100
>   option hd /recoverycd/
>   option bf bootfile.exe
> }
```

The attributes for the NFS server address and directory are set in a similar manner.

Alternatively, the NFS server may be set statically for the image by entering the full address (ie. `'10.10.14.99:/mnt/SPOT'`) into the **'NFS Server'** field of the dialogue:



*Note: in this case, DHCP will not be used and the recovery environment will boot up with the same IP address as the machine that created the CD*

## 6 Performing a DR backup

Performing a DR backup is split into two stages:

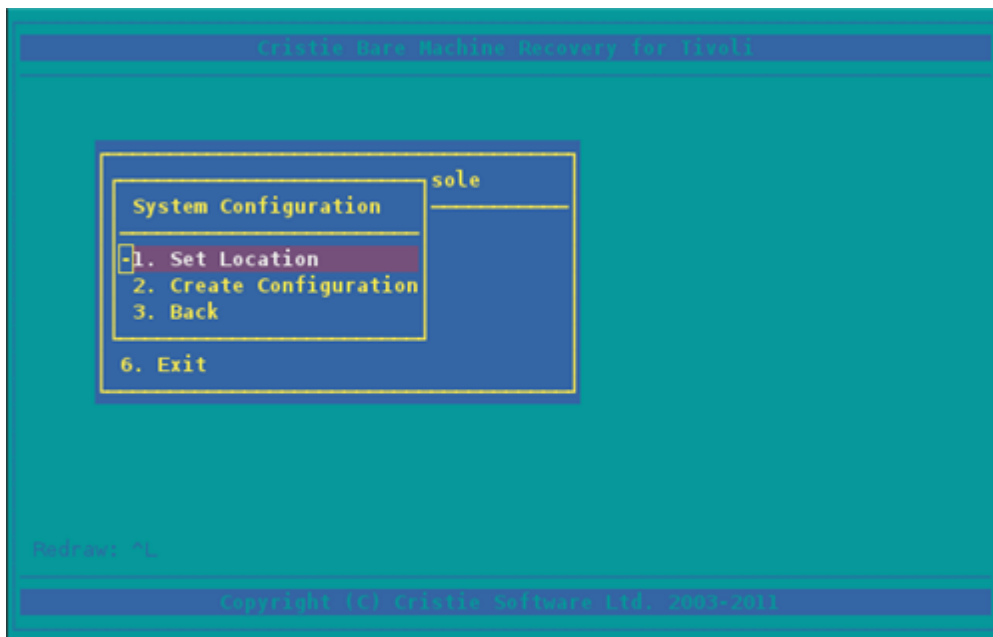
1. **Record** system information
2. **Perform** the system backup using TSM

The system information is recorded to allow the recovery environment to recreate the original system environment. This will include drive and file-system information, as well as information about essential packages for rebuilding the system (for example, to provide file encryption at recovery time).

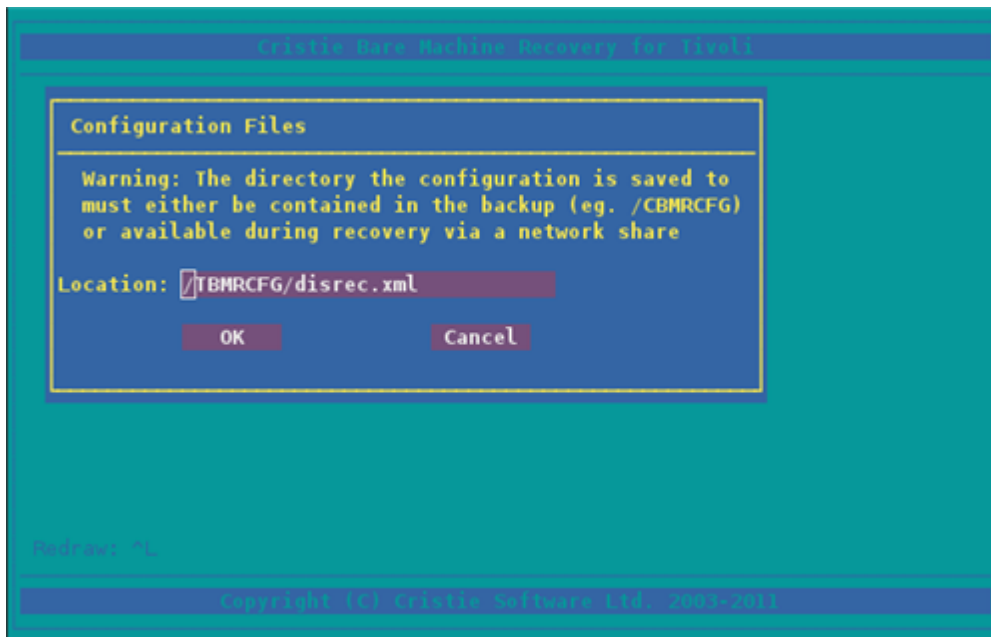
### 6.1 Recording System Information

The system information must be recorded and stored so that the system can be rebuilt at recovery time. This is performed using the `tbmrcfg` tool, available through the **System Configuration** option of the Graphical User Interface.

Selecting **System Configuration** from the main menu will open a sub-menu containing options for creating the configuration:

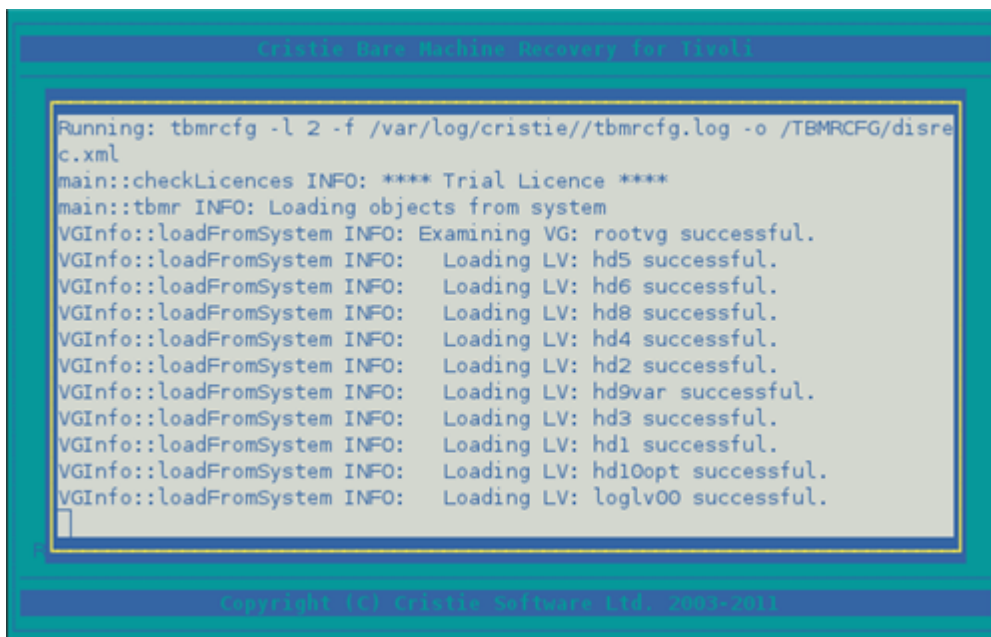


The default location of the configuration information is `/TBMRCFG/disrec.xml`. However, the **Set Location** option will allow you to select a different location if desired.



*Note: the location chosen MUST be included in the file paths specified in `dsm.sys` or `dsm.opt`. If you change the location of the configuration information, ensure this is included in the backup script*

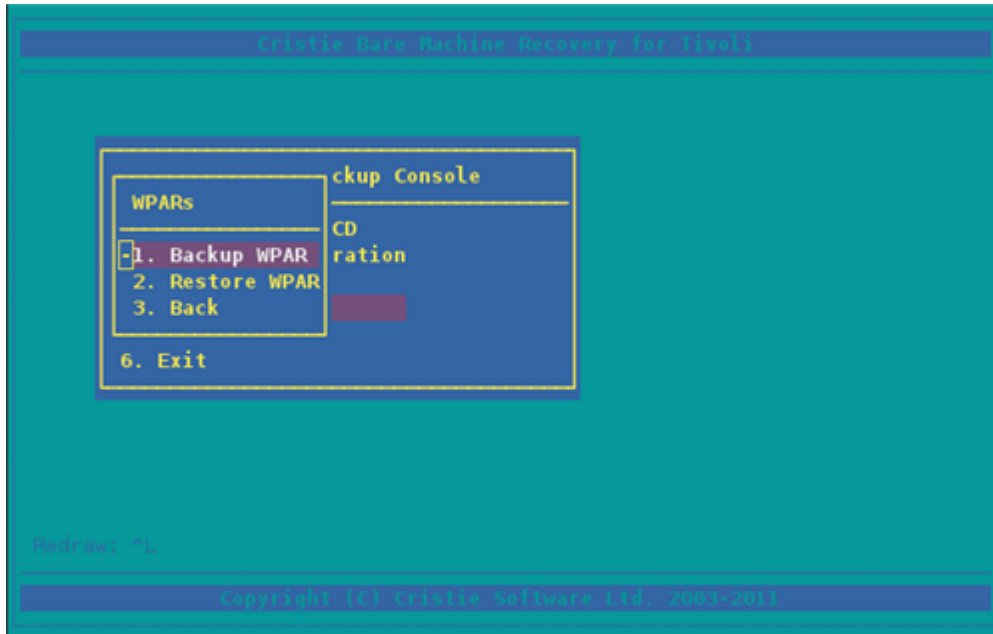
When running the configuration tool information, the current operations will be displayed:



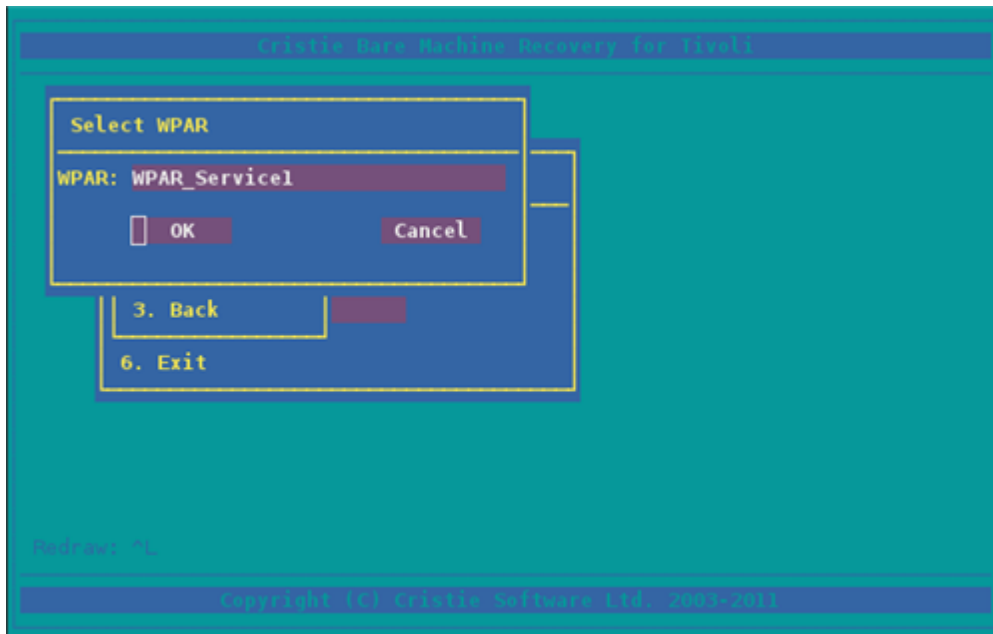
Once this operation is complete, the log file can be found in `/var/log/cristie/tbcfg.log`. This may also be viewed using the [Log Files](#) submenu.

## 6.2 WPARs

It is also possible to backup and restore individual WPARs using the TBMR GUI.



Selecting **Backup** or **Restore** presents a list of WPARs that may be recovered.



## 7 Performing a Recovery

The final stage will test the backup location supplied, then perform the recovery. Recovery is divided into six stages:

1. **VolumeGroups** - create the required volume groups
2. **LogicalVolumes** - create the required logical volumes
3. **FileSystems** - create file-systems on the logical volumes created in the previous step
4. **Mounting** - mount the file-systems
5. **Recovery** - recover files from the backup
6. **Make bootable** - make the system bootable

All stages are run though in order - consequently this can take a long time dependent upon the speed of disks and network interfaces. Once the recovery is complete, the system can be rebooted into its original state.

Before re-boot, however, it is very useful to make a copy of the log files generated during the recovery as shown in [Copying Log Files](#).

### 7.1 Starting the Recovery Environment

A recovery may be performed by booting into the recovery console from the recovery CD created earlier. The environment will initialise by attempting to acquire a network address via **DHCP** and starting an **SSH** server if available.

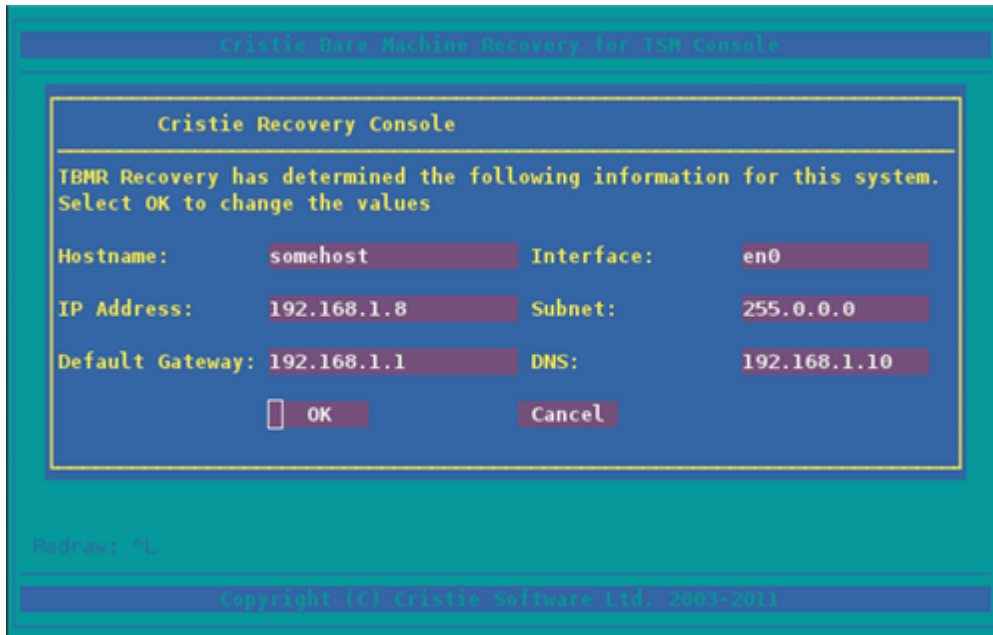
Once startup is complete, you must enter the username and password 'root' and 'root' to enter the recovery environment. This is required to enable AIX multi-user support and allow the use of ctrl-c to halt operations.

```
Welcome to the BMR Recovery Environment.
Enter username/password root/root to continue.
Username:
█
```

*Note: if the 'screen' utility is installed, then this step will be bypassed as screen provided its own*

*multi-user environment*

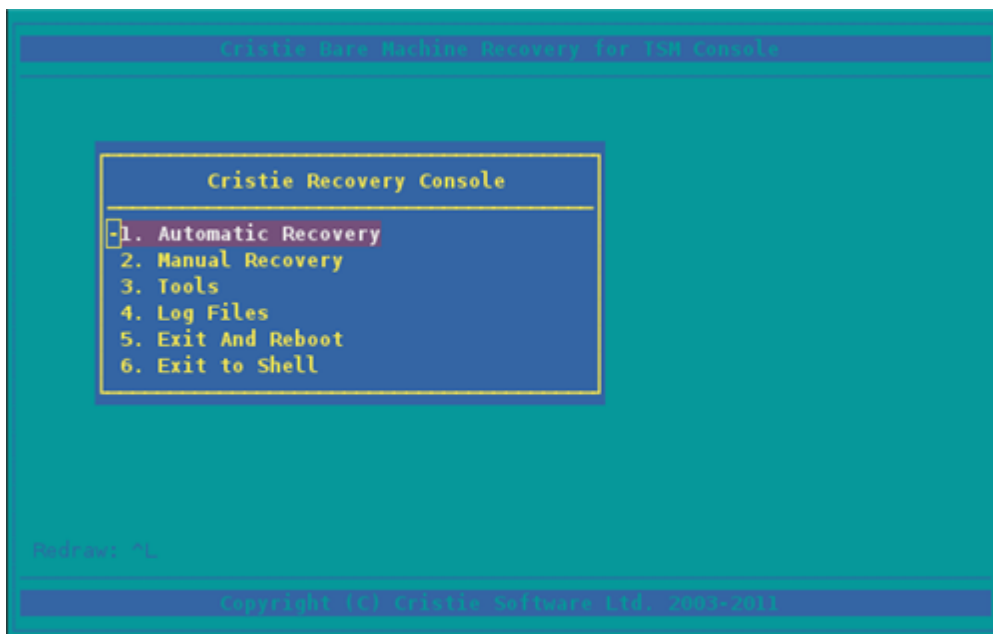
Once complete, a dialogue will be presented to change the network setup.



Selecting **Cancel** at this stage will leave these values as they are.

*Note: if no DNS entry is given, then all subsequent addresses MUST be given in dotted decimal form*

Once the network is setup, the **Recovery Main Menu** will be presented:



This presents two recovery styles - automatic and manual - as well as tools for managing the recovery environment and log files.

- The **automatic recovery** runs through all stages of the recovery and only provides options to recover just the root volume group or the whole machine

- The **manual recovery** allows the option of recovering only selected volume groups and running selected phases of the recovery individually

*Note: if the graphical environment is unusable at this stage, for example if the currently selected item appears to change unexpectedly, then the terminal type should be changed. See the [Trouble-shooting](#) section for further details*

### 7.1.1 Automatic Recovery Wizard

The **Automatic Recovery Wizard** takes you through the following steps in order:

1. **Setup Network** - if initial setup was unsatisfactory
2. **Backup Location** - specify the attributes of the TSM Server holding the backup
3. **Configuration** - read machine configuration information and set applicable options
4. **Perform Recovery** - start the recovery procedure
5. **Copy Log Files** - copy the log files generated by the recovery

#### Setup Network

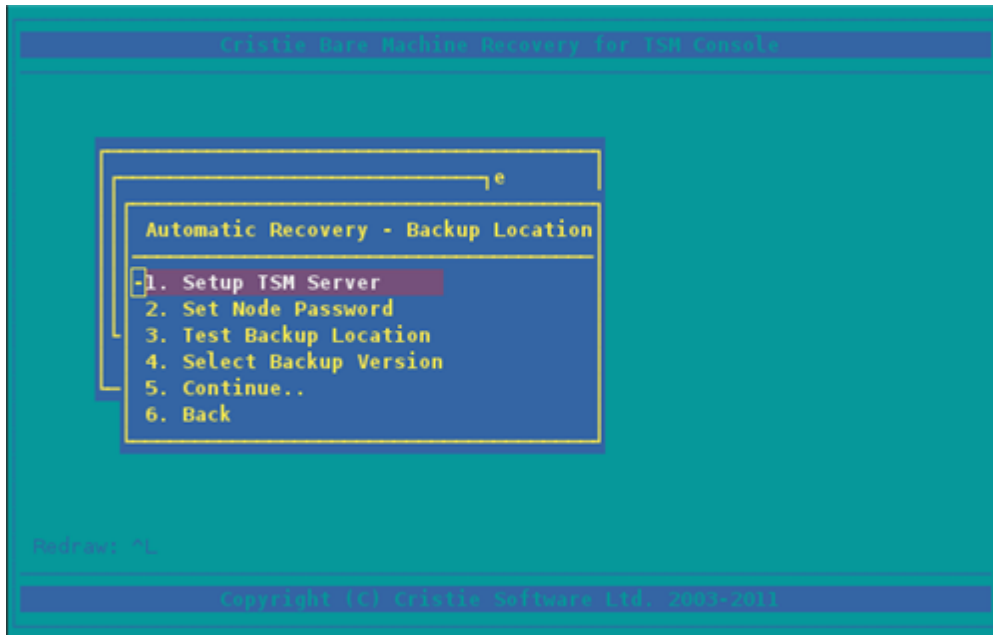
The network can be setup for any interfaces found using either DHCP (Dynamic Host Configuration Protocol) or manual configuration.

The manual configuration step is exactly the same as the initial network setup in the section [Starting the Recovery Environment](#). The DHCP setup will attempt to start a DHCP server (if one is not already started) and check for an IP address.

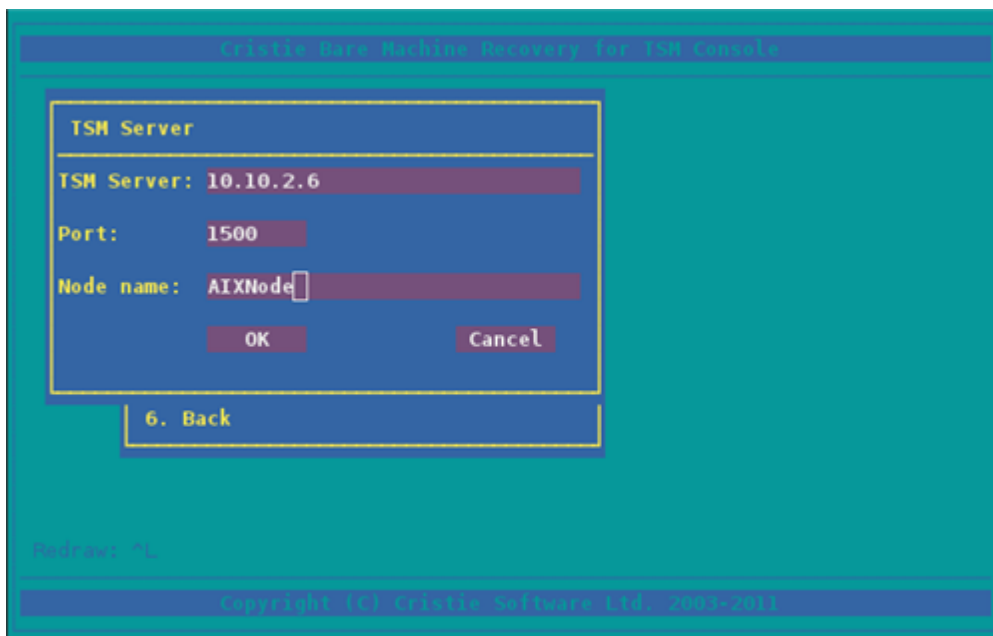
*Note: it is common to see warning messages during DHCP setup as interfaces may be polled whilst they are in uncertain states. The DHCP setup will fail if an IP Address is not received in ten seconds. Therefore, if DHCP fails initially, it may succeed on subsequent attempts after more time will have elapsed*

#### Backup Location

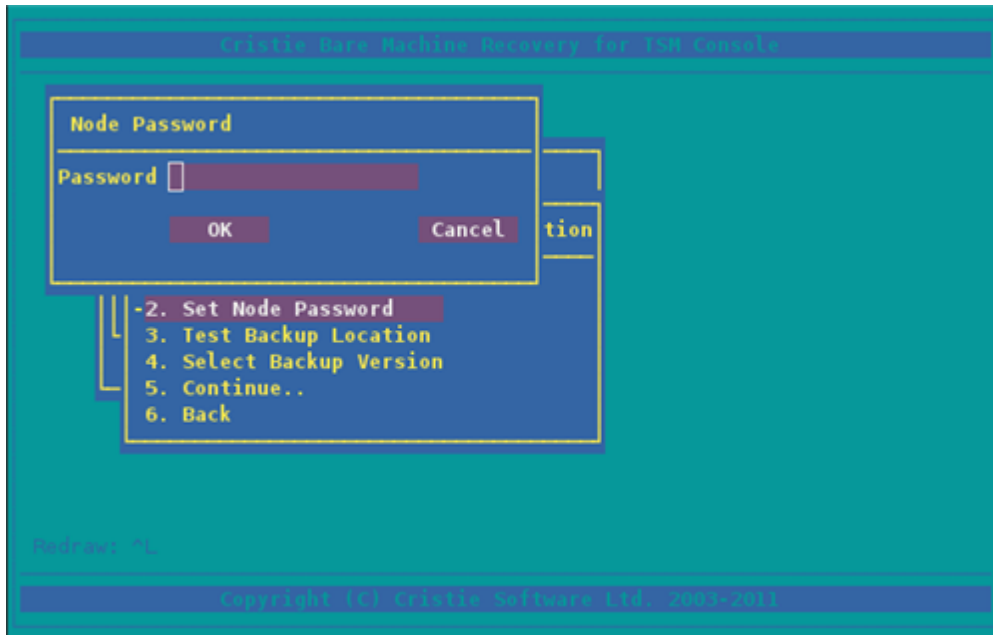
The backup location menu allows the user to set the TSM server and password.



The TSM server form requires the TSM Server Location (IP address or hostname), port (usually 1500) and Node name (usually the hostname of the machine backed up) to access the TSM server.



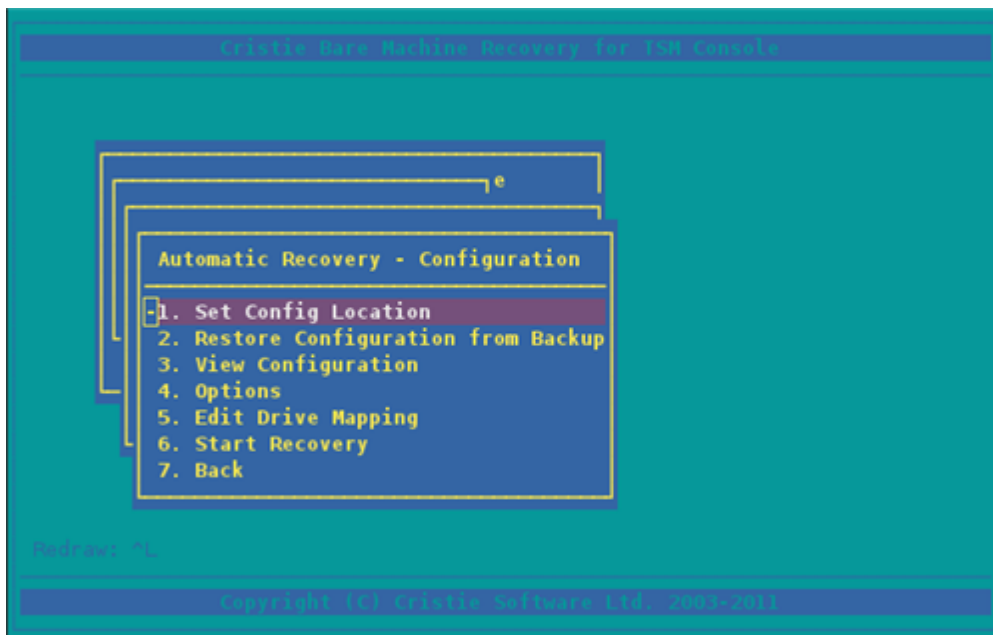
Once the TSM server has been setup, the settings may be tested using '**Test Backup Location**'. If the node password has not already been entered then it will be requested now.



Once the backup location has been successfully tested, you may proceed to the next stage of the automatic recovery: Configuration.

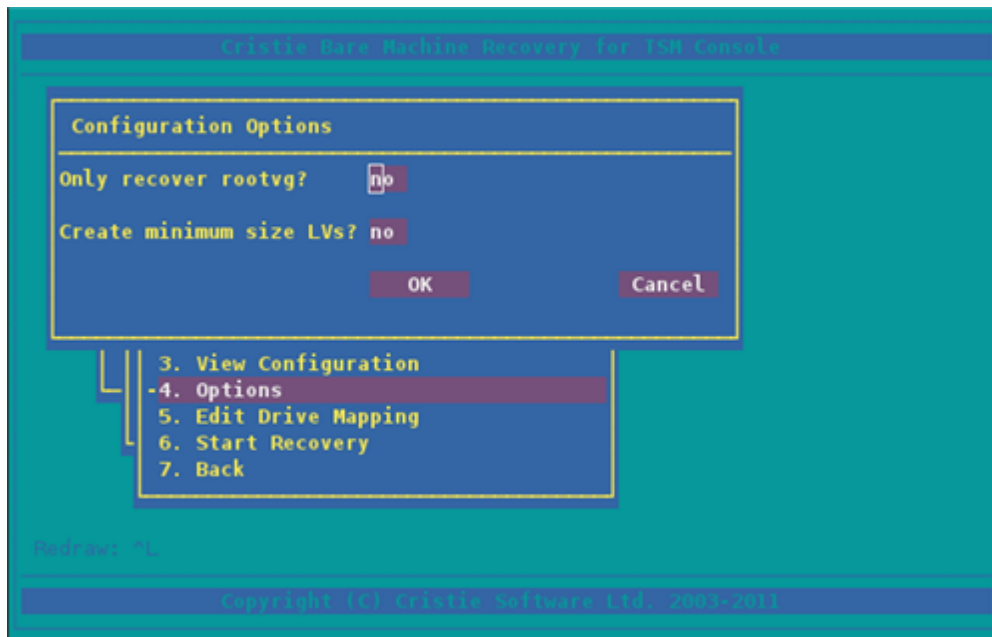
### Configuration

Before recovery can begin, the machine configuration information created earlier must be loaded into the recovery environment from the backup. This is performed by selecting the **Restore Configuration From Backup** option:



If the location of the configuration information was changed during [Recording System Information](#), you will need to enter the location chosen here.

Selecting the **Options** item will display any additional options that can be applied at this point.



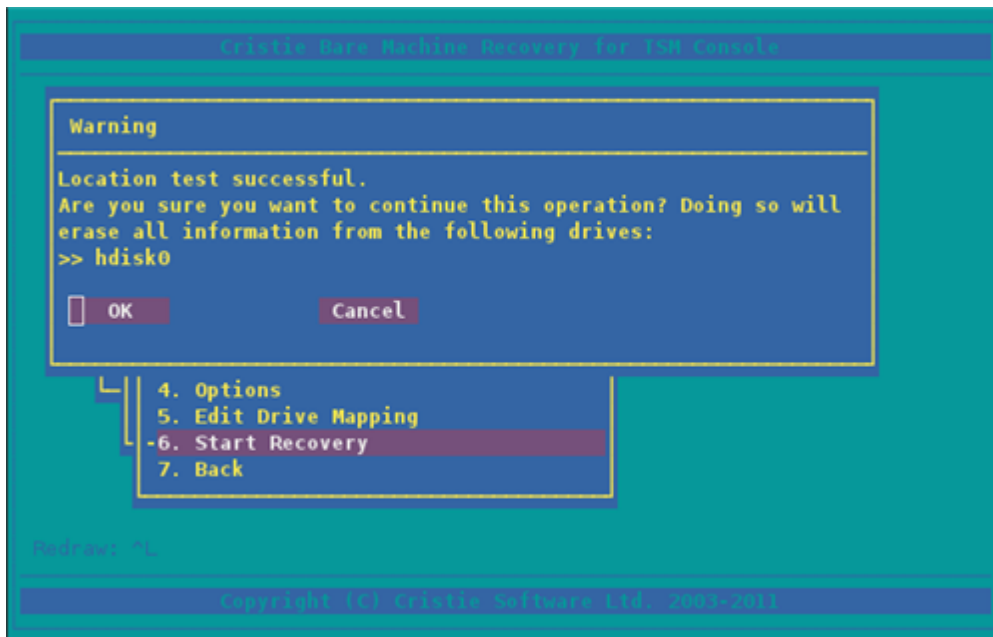
**Create Minimum Size LVs:** This option will ensure that the logical volumes created will be of the smallest size such that the data to restore fits. This option is useful if you are recovering to a machine with smaller disks.

**Only Recover Root VG:** By default, all volume groups are recovered. This option is useful in situations where data is stored on a second data-only volume group which is not included in the backup.

*Note: the minimum size calculation is performed when the configuration information is recorded. Therefore, you MUST record the configuration information before updating the TSM backup. If you do not, then the minimum size calculation may be too low and the data to be recovered will not fit on the restored machine*

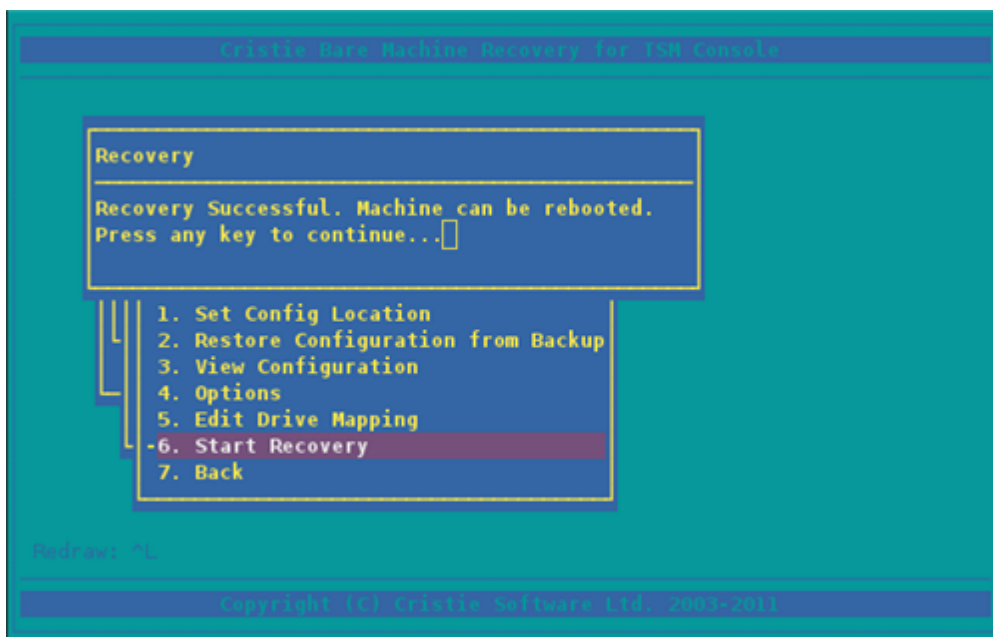
### Perform Recovery

Once the configuration has been restored, it will be possible to start the recovery. When this option is selected, the backup location will be tested and a confirmation dialogue presented:



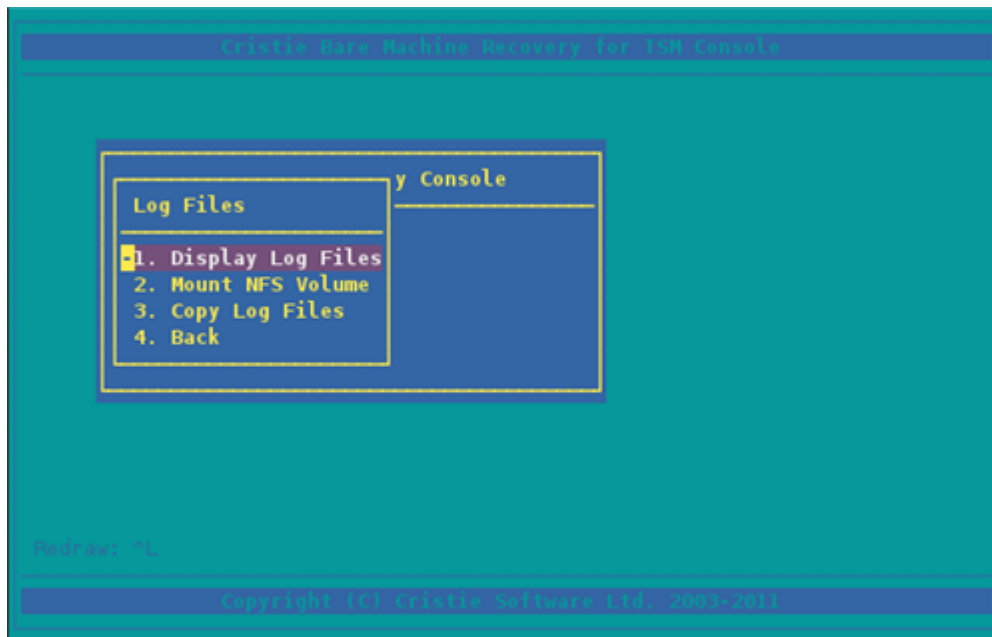
*Note: as soon as the automatic recovery is started, ALL data will be destroyed on the disks being recovered to*

Once the recovery is complete, you will be presented with a dialogue indicating that the machine can be rebooted:



### Copy Logs

Once the recovery is complete, a menu will be opened containing options for copying log files.

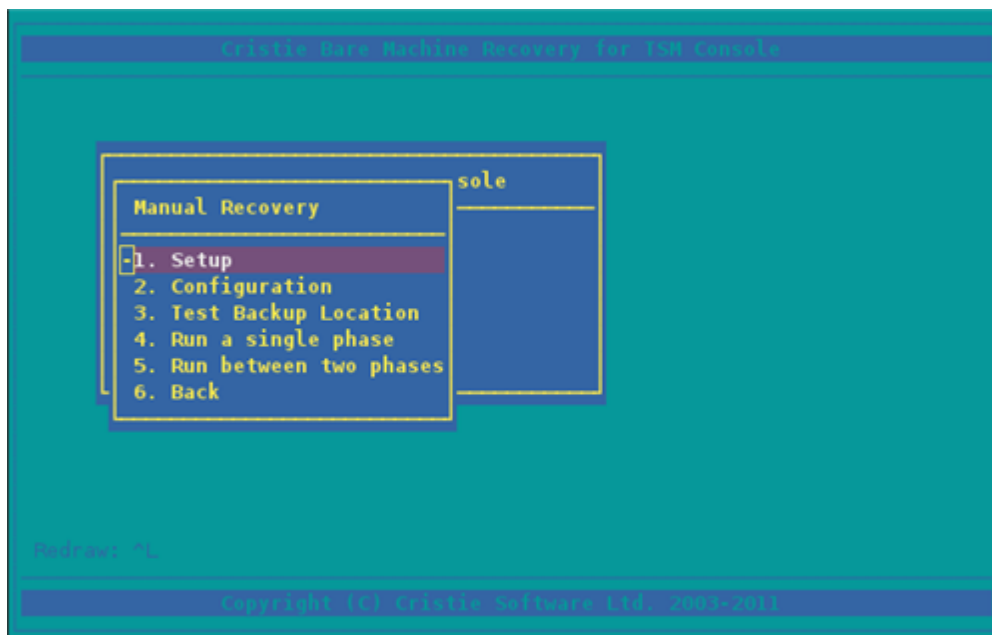


Copying the log files to an NFS share will allow any problems encountered during recovery and subsequent reboot to be diagnosed more quickly.

### 7.1.2 Manual Recovery

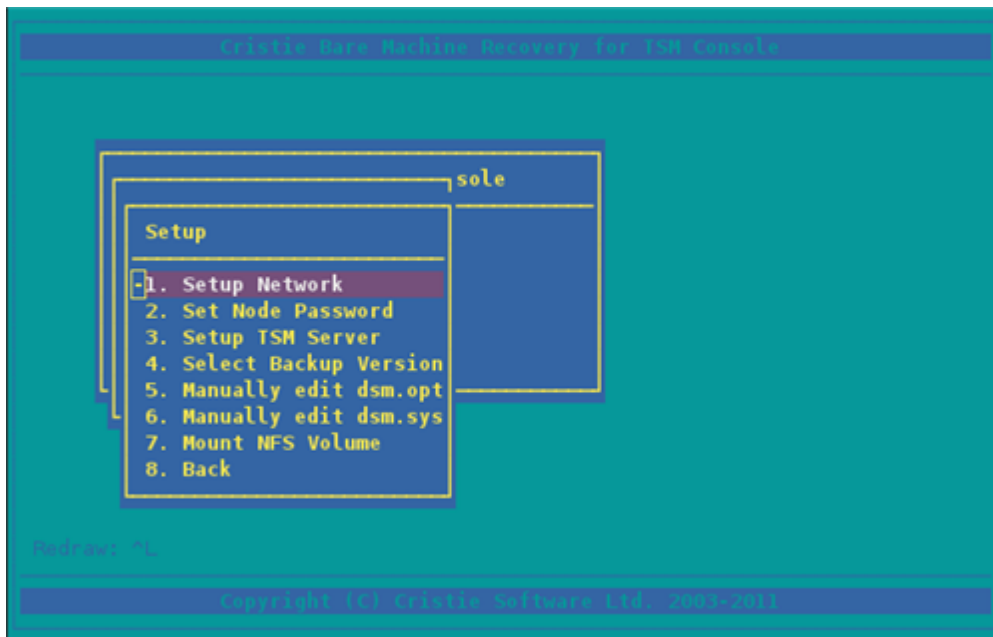
**Manual recovery** presents the stages performed during automatic recovery to be applied individually, but also allows you to **'Import from Host'**, which attempts to load file-systems from the current machine. This can be useful to continue an aborted recovery, or to retrieve information off a system which no longer boots.

The options in the manual recovery menu are shown as follows:



#### Setup

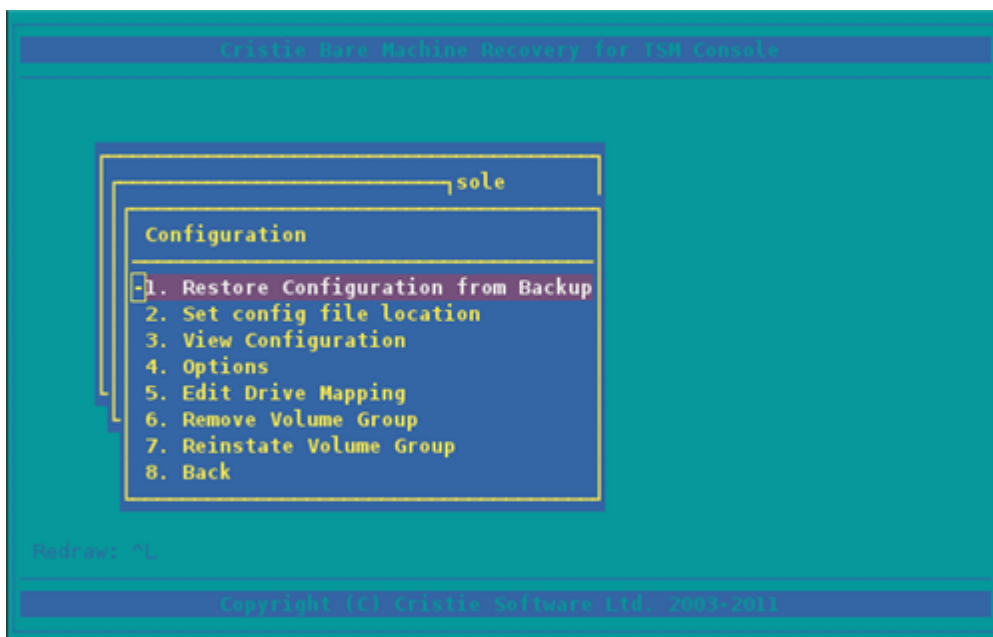
The setup menu allows you to setup networking (exactly as the first stage of automatic recovery), setup the TSM server and mount an NFS volume.



This menu also allows you to directly edit the dsm.opt and dsm.sys files. This may be useful if the TSM Server requires additional parameters not in the default setup.

### Configuration

The configuration menu allows you to restore the configuration from backup, select which Volume Groups should be restored and modify configuration options.



This menu allows you to control precisely which volume groups should be restored. This is in contrast to the options provided for automatic recovery, which will only allow restoration of all volume groups, or just the root.

### Test Backup Location

The third option allows you to test the backup location for connectivity before performing a restore. It is recommended that this step is always performed before recovering a system.

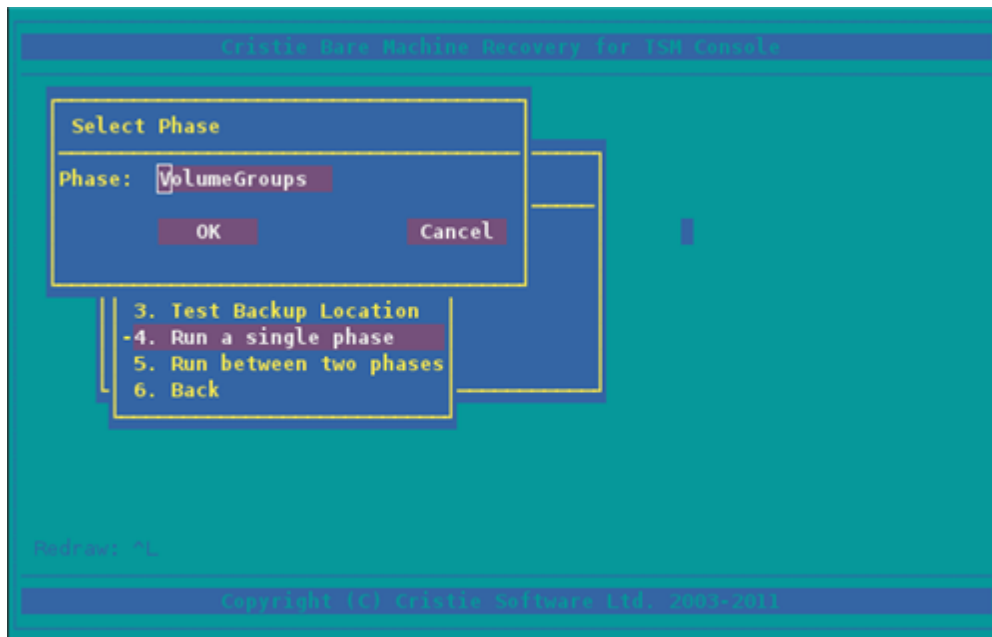
### Import from Host

This will attempt to import volume groups matching that in the configuration from the hosts system. This can be useful if, for example, the machine was restarted part-way through a recovery or if a recovered machine fails to boot.

If this situation is encountered, then it is recommended to first try to run the **Make Bootable** stage, or, if that fails, the **Restore** and **Make Bootable** stages. See the [Trouble-shooting](#) section for more details.

### Running a single recovery phase

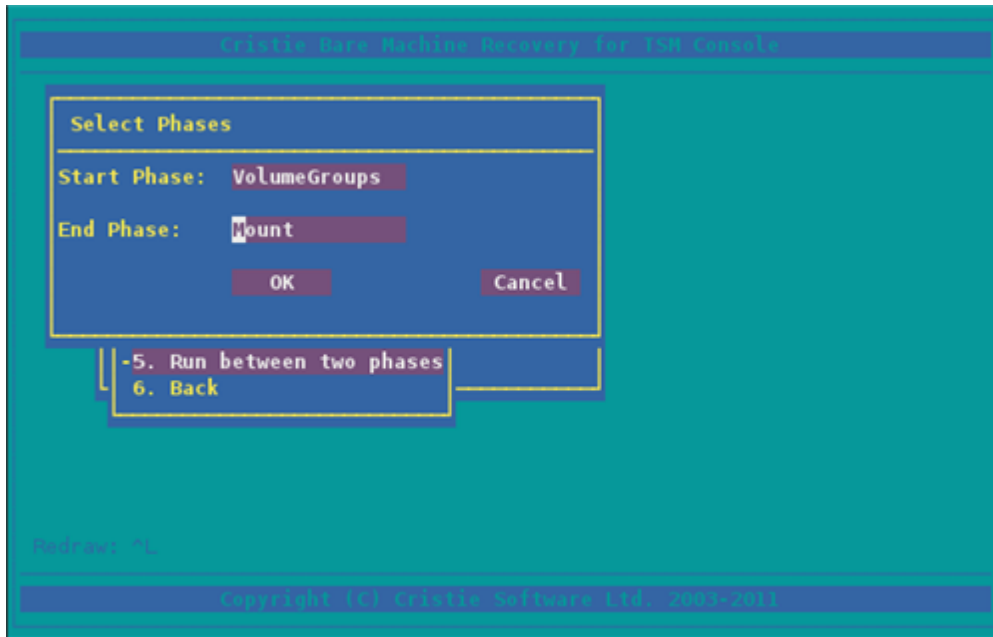
If a problem occurs during recovery, it may be desirable to attempt to run a single recovery phase. This option allows you to select a single phase and run it on its own.



*Note: running an earlier phase after a later phase, such as running LogicalVolumes after Restore, will RESET ANY WORK DONE BY THE LATER PHASE. You will therefore have to run the remaining phases as well to complete the restore*

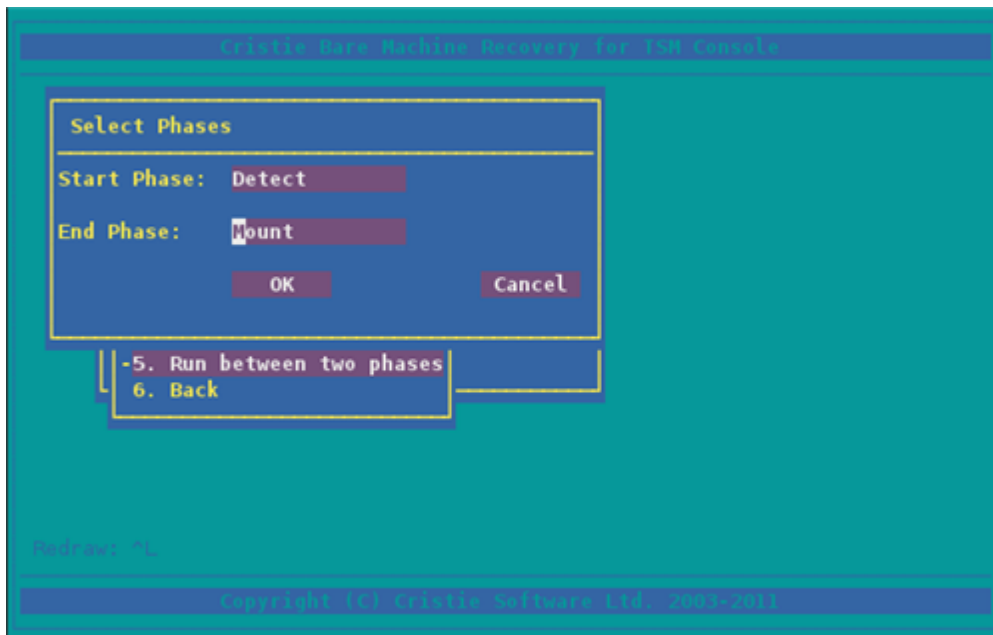
### Running between two recovery phases

The '**Run between two phases**' menu option allows you to run **all** phases, inclusively, between two selections. In the following example, the restore is being run from creation of the logical volumes to the mounting of file-systems:



This option may be used to restart a stalled recovery from the next phases to run until completion. For example, if the recovery stopped at the FileSystems stage, then running from Mounting to MakeBootable should result in a fully restored system.

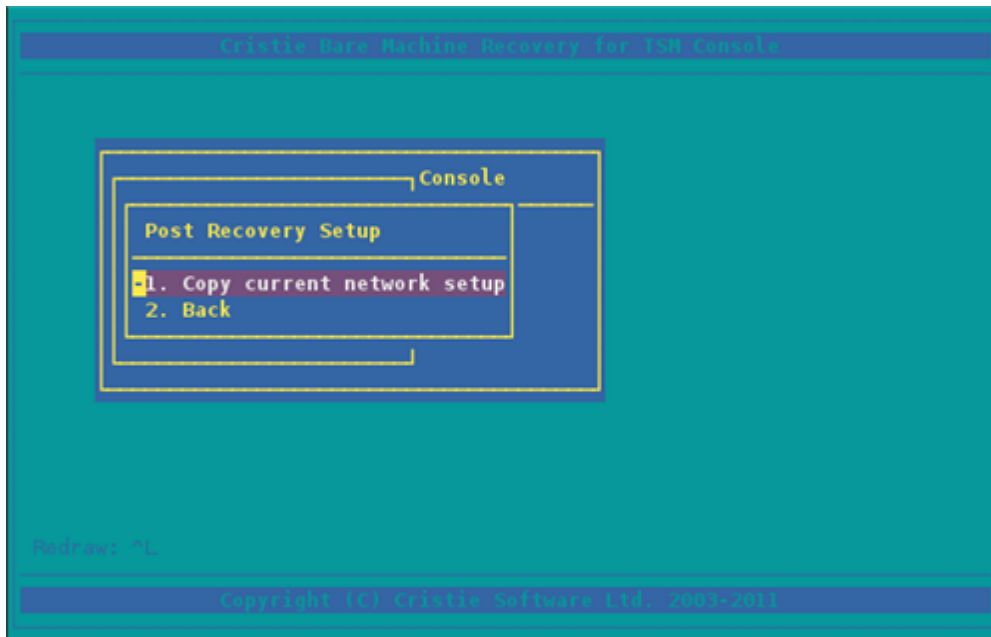
Additionally, there is a special option which will attempt to work out the last known phase:



This option is useful if it is not clear why the recovery stopped.

### 7.1.3 Post Recovery Changes

The **Post Recovery Changes** menu, accessed from the **Tools** menu, provides the option to copy the current network settings to the recovered machine.



This is a useful option if you are cloning or moving a recovered machine.

### 7.1.4 Trouble-shooting

#### Recovery:

If the automatic recovery fails at any point, then it may be possible to continue to recover the system by continuing the recovery at the next phase.

For example, if the recovery fails with the following error:

```
> Disrec::ERROR "The following commands failed in the last phase run"
> ...
> Disrec::ERROR "Review the logs and correct any errors before proceeding
> Disrec::ERROR "to the next phase (MOUNTING) "
```

Then it *may* be possible to get a working system by running the phases from Mounting until the final phase, MakeBootable.

All phases between Mounting and MakeBootable may be run by selecting **Run Between Two Phases** and selecting the Mounting and MakeBootable phases. If preferred, the phases may be run individually by selecting **Run Single Phase**.

Once the final phase, Make Bootable, has been run then it will be possible to reboot the machine. However, we recommend copying log files to an accessible location (to an NFS server for example) before performing the reboot.

#### Terminal:

The recovery environment uses the terminal 'aixterm' by default. However, for some displays or hardware this is not always appropriate. If the terminal is unusable, for example if the menu-options do not correctly line up, then it may be desirable to change the terminal type. This can be performed

by selecting **'Exit to Shell'** and running the environment using a different terminal.

```
dr exited. Type 'dr' to return to the recovery console.'
echo Change terminal type by typing TERM=terminal dr.
echo eg.
Type 'terms' to get a list of available terminals
#
█
```

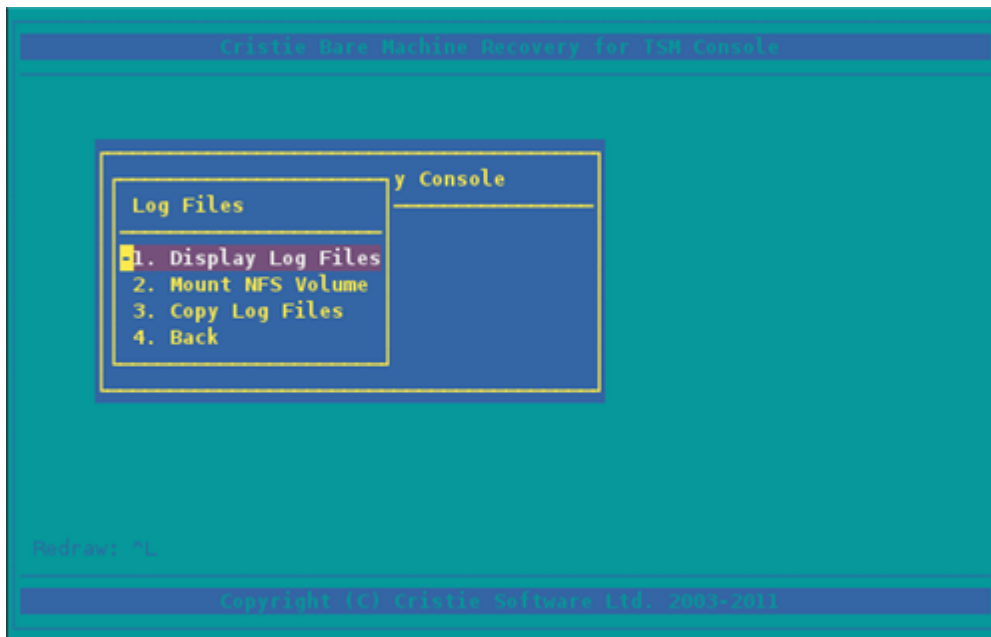
Typing 'terms' will produce a list of the terminals available. However, is typically quite long, it may be useful to try one of the following common terminal types first:

- xterm
- vt102
- vt100
- lft

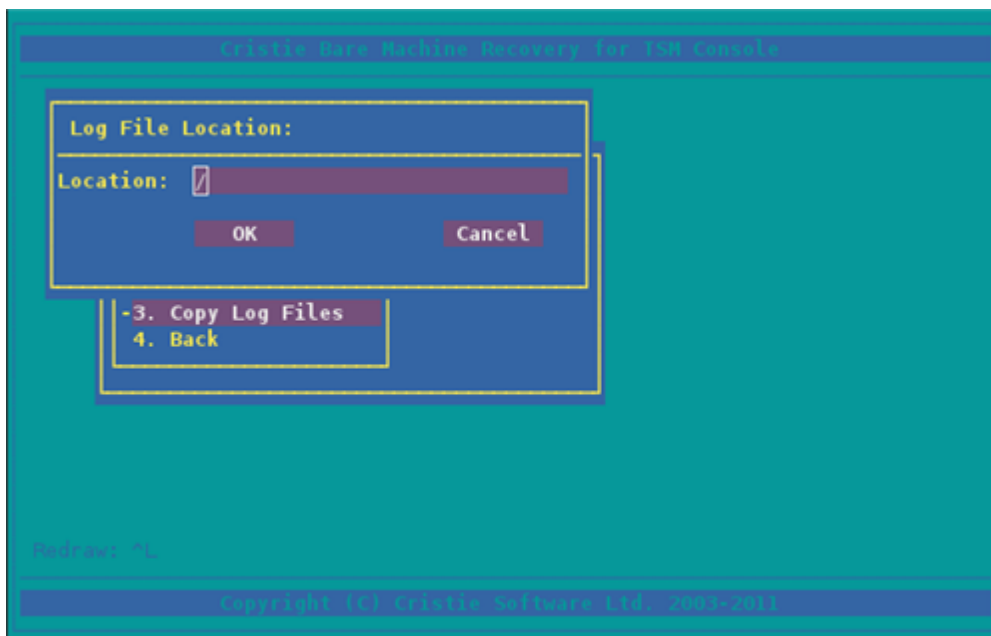
For example, typing '`TERM=vt100 dr`' will restart the recovery environment using the vt100 terminal type.

### 7.1.5 Copying Log Files

Once the recovery is complete, it is advised that you copy the log files to a suitable location before rebooting the system. It is recommended that you mount an NFS share and copy the log files to that location. These actions are performed using the **'Log Files'** option from the main menu:



The **Copy Log Files** option will ask for a location and create a date-stamped archive of the logs in the directory given.



The log files will be created with a filename in the form:

```
>logs-12:54-10092010.tar.gz
```

*Note: it is important that the directory selected is an NFS mount, as all information in the recovery environment is lost on reboot*

## 8 Cristie Technical Support

If you have any queries or problems concerning your Cristie Bare Machine Recovery 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
- Windows OS and Version Number
- Any error message information (if appropriate)
- Description of when the error occurs

### Contact Numbers - Cristie Software (UK) Limited

**Technical Support** +44 (0) 1453 847 009

**Technical Support Fax** +44 (0) 1453 847 003

**Toll-Free US Number** 1-866-TEC-CBMR (1-866-832-2267)

**Sales Enquiries** +44 (0) 1453 847 000

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**Email** [cbmr@cristie.com](mailto:cbmr@cristie.com)

**Web** [www.cristie.com](http://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/](http://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.