



Bare-Metal Restore Using RDX

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Revision 1.0 - Last Updated 11/10/2006

Introduction

The purpose of this whitepaper is to demonstrate how to use the RDX device to do a system backup and bare-metal restore of a standard PC running a Windows operating system. I've chosen a low cost single user application to manage the backup and restore operation, Symantec's Norton™ Save & Restore.

A bare-metal restore refers to a complete system restore to a blank system hard drive. A bare-metal restore provides you with a quick resolution to the case where a catastrophic failure occurs on your system hard drive and all operating system and other data is lost. The need for bare-metal restore is quite rare but it's nice to be prepared. It isn't enough to save just your value added data. When it comes time to restore your system you probably don't have the time to re-install Windows and all the applications you need to get your job done. The restore problem is further complicated because after re-installing applications you'll need to make sure they are all up to date.

The large RDX media sizes 40GB, 80GB, and 120GB and fast transfer rates make it easy to create a system restore point.

The RDX device is being used as the backup media only, not a boot device. Booting Windows from the RDX device is beyond the scope of this whitepaper.

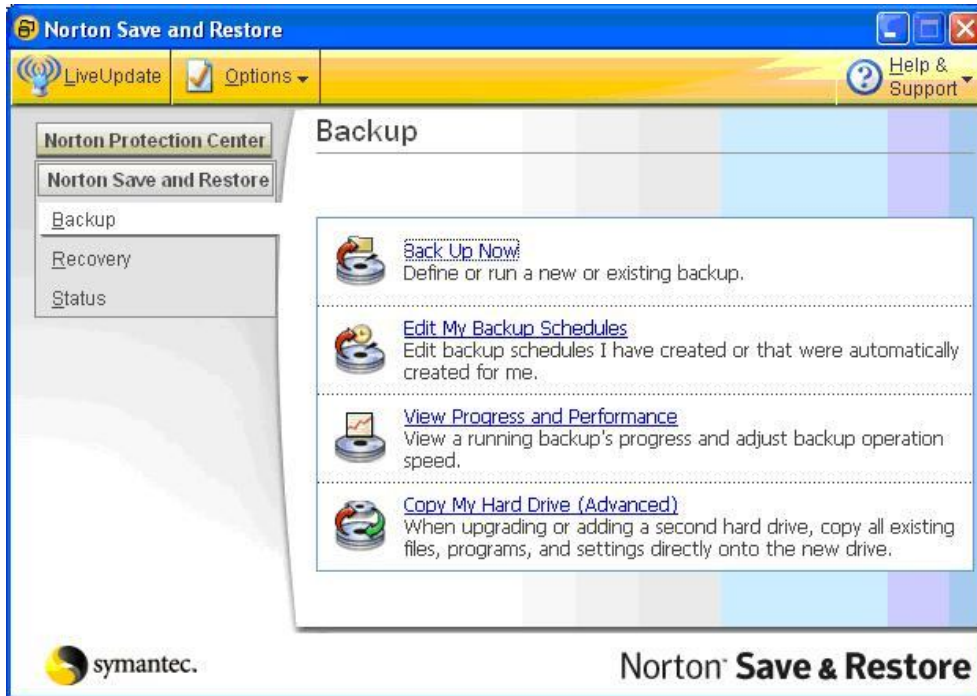
System Configuration

The following are the details of the system configuration used to do a system backup and system restore to bare-metal.

- Dell Optilex GX280, BIOS Rev. A08
 - 3GHz P4, 512MB RAM
- System HDD, 80GB SATA 3.5"
 - Single NTFS Partition
 - WinXP Professional
- USB RDX
 - 80GB cartridge
 - Single NTFS Partition
- Restore HDD, 80GB SATA 2.5"
 - No Partition
- Norton Save & Restore

System Backup

Start the Norton™ Save & Restore application.

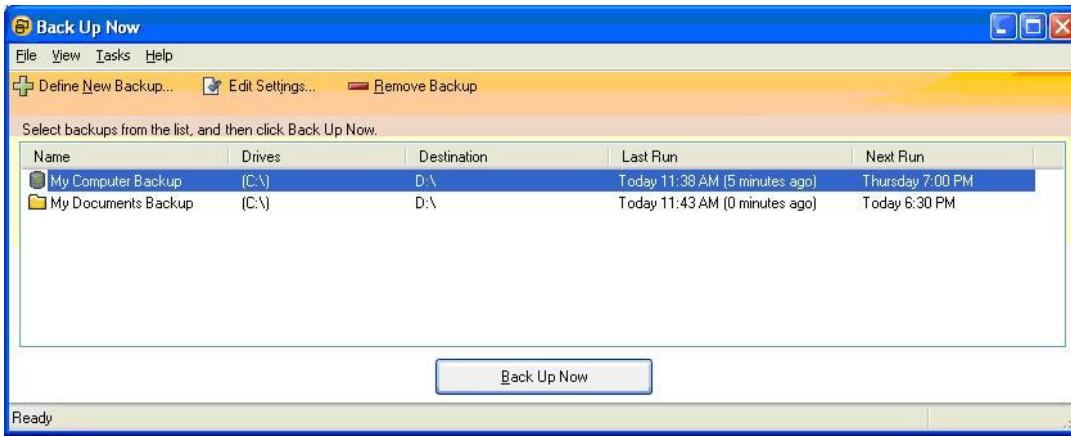


Select "Back Up Now". The application wizard leads you through the steps to create a backup job.

Note: when selecting the backup device:

1. ignore recommendation to use CD/DVD
2. browse and select the RDX device (by drive letter)
3. install the RDX cartridge in the RDX device

When the application wizard completes you should have the following backup jobs created.



Select "Back Up Now" to start creating a recovery point on your RDX cartridge.

Backup Job Details:

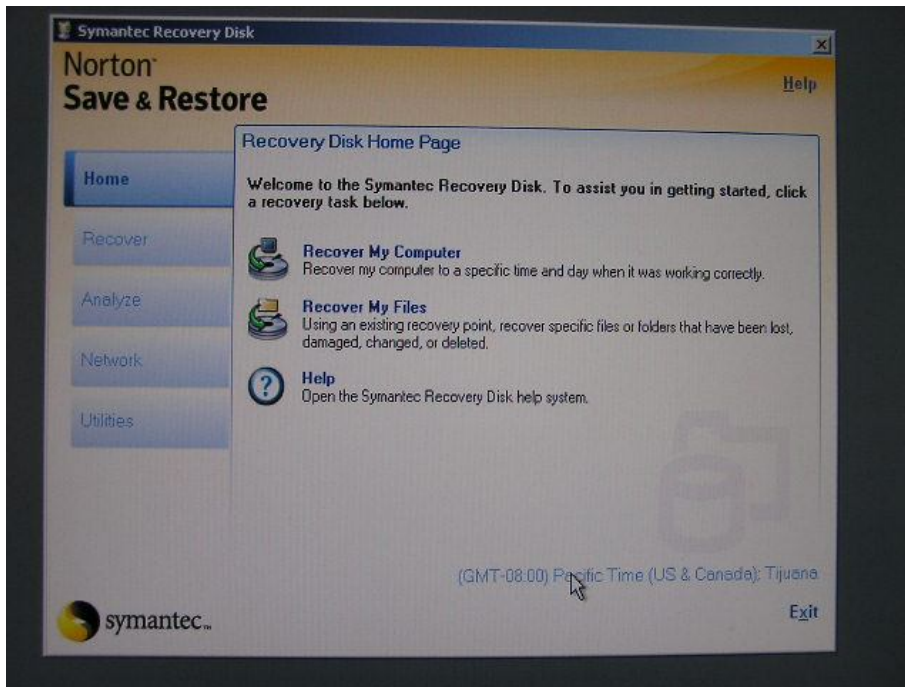
1. System Data Size = 6GB
2. Data Backup and Verify Time = 9 minutes

System Restore

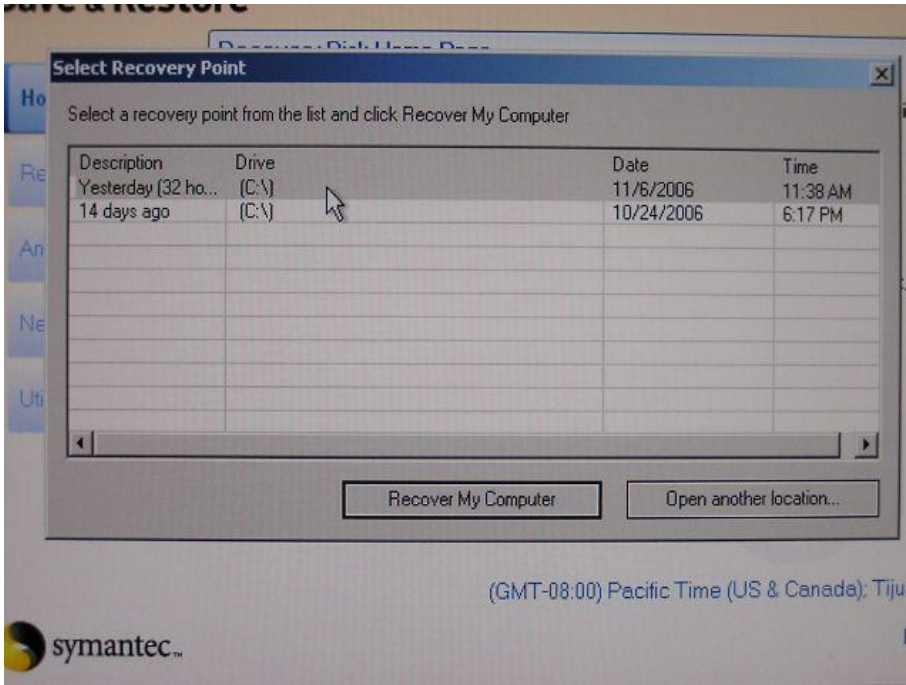
Simulating a bare-metal system restore requires that the existing system HDD be disabled. The easiest method to disable the existing system HDD, is to power off the system and disconnect the HDD host interface cable.

Bare-Metal Restore Steps:

1. Power off system
2. Open case
3. Unplug current system HDD interface cable
4. Attach alternate HDD to system for restore (no partitions)
5. Power on system
6. Wait for boot to fail (F1 – retry boot, F2 – enter BIOS setup)
7. Open CD/DVD tray, insert Norton™ Save & Restore CD
8. Insert the RDX cartridge with the system recovery point image
9. Restart the boot sequence (press the F1 key)
10. Wait for the Recovery CD boot to complete

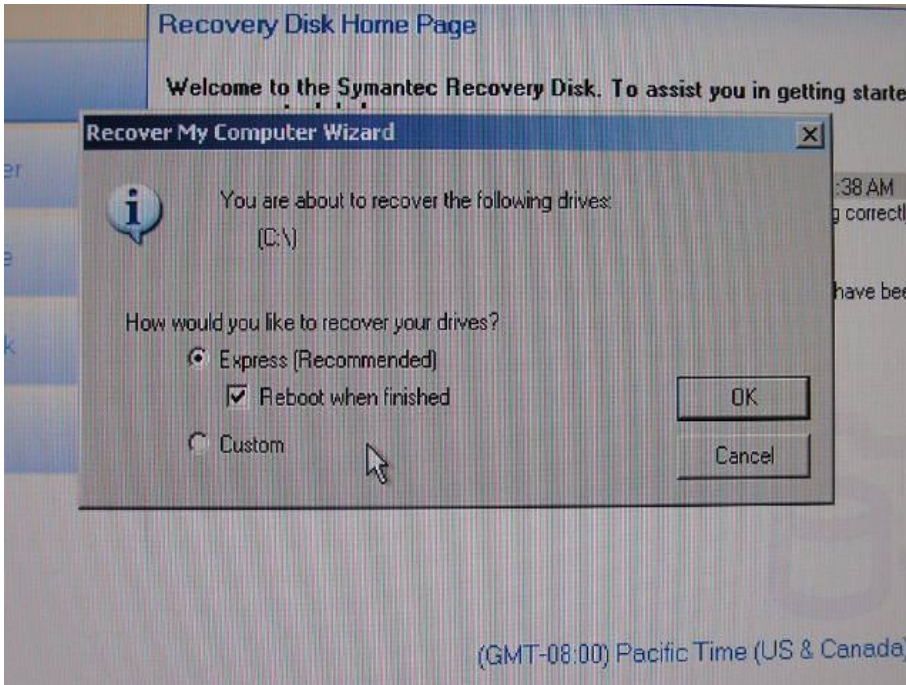


Select “Recover My Computer” from the main menu. The program then searches for media that contains a recovery point.



My RDX cartridge contained two recovery points. I selected the most recent recovery point to restore my system and clicked "Recover My Computer".

Once the recovery point is selected you'll be asked select system restore parameters.



I used the default restore parameters and clicked “OK” to start the restore process.

Restore Job Details:

1. System Data Size = 6GB
2. Data Verify and Restore Time = 9 minutes

Booting the Restored System

When the restore process completes the system is automatically rebooted. In my case the system booted from the alternate HDD installed. The alternate HDD contained my complete system and booted correctly to WinXP Pro.

There are issues that can occur during reboot that require the user to do a little more work. See the section below on known issues.

Known Issues

Original HDD Booted From Partition (2-N)

If the original system HDD contained multiple partitions and the boot partition was not partition 1. The error message “Windows Could Not Start Because of a Computer Disk Hardware Configuration Problem” will appear. The problem is that the contents of the boot.ini file specify the wrong boot partition on the restored HDD. To fix this problem you’ll need to edit the contents of the boot.ini file on the restored hard disk.

See the following articles from Microsoft:

“Error Message: Windows Could Not Start Because of a Computer Disk Hardware Configuration Problem”

<http://support.microsoft.com/kb/314477>

“How to edit the Boot.ini file in Windows XP”

<http://support.microsoft.com/kb/289022/EN-US/>

BIOS Boot Order Issues

If the default boot order differs from the boot order listed below the initial system reboot may be more complicated.

1. Hard Disk Drive
2. CD/DVD
3. USB

If the CD/DVD comes before the Hard Disk Drive in the boot order then the automatic reboot after restore starts to boot the recovery CD again. Quickly remove the recovery CD and restart the system boot.

If the USB device comes before the Hard Disk Drive in the boot order then the boot may fail because the cartridge inserted in the USB drive is not setup to boot.

The boot process halts with the error message:

“NTLDR missing”

“Press Ctrl+Alt+Delete to restart”

Remove the RDX cartridge and restart the system boot.

Summary

The whitepaper demonstrates that doing a system backup and bare-metal restore can be quite simple. The complications that I did encounter were easily overcome with some additional investigation.

There are multiple Windows utilities that support system backup and bare-metal restore. ProStor Systems does not intend to make any implied recommendations for the use of a specific backup/restore application.

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